Appendix A6.1
Transport Impact Assessment Report

Contents

Executive Summary

Introduction

The purpose of this document is to provide a comprehensive Transport Impact Assessment (TIA) of the proposed Tallaght / Clondalkin to City Centre Scheme Bus Corridor Scheme (hereafter referred to as the Proposed Scheme). The TIA also informs Chapter 6 of the EIAR (Traffic and Transport) for the Proposed Scheme which will assess the impacts and significance of those impacts in relation to the receiving environment of the Proposed Scheme.

The aim of the Proposed Scheme is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme are to:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements;
- Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable;
- Enhance the potential for walking by improving the pedestrian infrastructure on the corridor;
- Support the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets;
- Enable compact growth, regeneration opportunities and more effective use of land in Dublin, for present and future generations, through the provision of safe and efficient sustainable transport networks;
- Improve accessibility to jobs, education and other social and economic opportunities through the provision of improved sustainable connectivity and integration with other public transport services; and
- Ensure that the public realm is carefully considered in the design and development of the transport infrastructure and seek to enhance key urban focal points where appropriate and feasible.

The planning and design of the Proposed Scheme has been guided by these aims and objectives, with the need for the Proposed Scheme described in detail in Chapter 2 (Need for the Proposed Scheme) of the EIAR.

In line with the above objectives, this TIA is focused on the concept of the "movement of people" rather than the "movement of vehicles". The emphasis of the design philosophy is on maximising the capacity of the Proposed Scheme to move more people by sustainable modes whilst providing for the necessary movement of general traffic along it.

This TIA includes the comprehensive assessment impacts and benefits of the Proposed Scheme covering all transport modes for both Construction and Operational Phases.

Scheme Description

The Proposed Scheme, as described in detail in Chapter 4 (Proposed Scheme Description), measures approximately 15.5 km along the Core Bus Corridor with an additional offline cycling facility approximately 3.9 km in length. The Proposed Scheme consists of two sections that amalgamate the former Greenhills to City Centre CBC (Tallaght to City Centre) and Clondalkin to Drimnagh CBC (Clondalkin to Drimnagh) preferred route Core Bus Corridors.

The first section, the Tallaght to City Centre section, begins at the junction of Blessington Road / Cookstown Way and is routed along Belgard Square West, Belgard Square North, Belgard Square East, Blessington Road to the junction of R819 Greenhills Road and Bancroft Park. From here the Proposed Scheme is routed along the R819 Greenhills Road to Walkinstown Roundabout via new transport link roads; in the green area to the east of Birchview Avenue / Treepark Road; in the green area to the south of Ballymount Avenue, and in the green area

to the east of Calmount Road. From Walkinstown Roundabout the main Core Bus Corridor is routed along the R819 Walkinstown Road to the junction with R110 Long Mile Road and Drimnagh Road. The shared spine with the Clondalkin section commences at this junction and the Proposed Scheme is routed along the R110 to the junction of Dean Street and Patrick Street via Drimnagh Road, Crumlin Road, Dolphins Barn, Cork Street, St Luke's Avenue and Dean St. From here the Proposed Scheme is routed along the R137 via Patrick Street to the junction at Winetavern Street and Christchurch Place where the Proposed Scheme terminates within the City Centre. An offline cycle facility is proposed to facilitate cycling between Walkinstown Roundabout and Parnell Road (Grand Canal) where end to end cycle facilities are not feasible along the main corridor and provides a more direct route towards the city centre. This offline section of the Proposed Scheme is routed via Bunting Road, Kildare Road and Clogher Road.

The second section, the Clondalkin to Drimnagh section, begins at the junction of New Nangor Road and Woodford Walk and is routed along the R134 New Nangor Road, R810 Naas Road, R112 Walkinstown Avenue and the R110 Long mile Road to the junction of Walkinstown Road and Drimnagh Road where it is routed towards the city centre along the shared spine section as described above (in terms of traffic).

Throughout the Proposed Scheme bus stops will be enhanced to improve the overall journey experience for bus passengers.

Throughout the Proposed Scheme cycle facilities will be substantially improved with segregated cycle tracks provided along the links and protected junctions with enhanced signalling for cyclists provided at junctions. Where space for a segregated cycle track is not available on the main corridor an alternative cycle route via quiet roads is proposed.

Moreover, pedestrian facilities will be upgraded with additional signalised crossings and side road ramps provided. In addition, public realm works will be undertaken at key locations with higher quality materials, planting and street furniture provided to enhance the pedestrian's experience.

Assessment Methodology

The assessment of the Proposed Scheme in relation to the baseline transport environment required a qualitative assessment of changes to the transport environment, as well as quantitative analysis undertaken using a suite of multi-modal transport modelling tools which have been developed for the Proposed Scheme Infrastructure Works.

The qualitative assessments are as follows:

- Pedestrian Infrastructure: The changes to the quality of the pedestrian infrastructure as a result of the Proposed Scheme;
- Cycling Infrastructure: The changes to the quality of the cycling infrastructure as a result of the Proposed Scheme;
- Bus Infrastructure: The changes to the quality of the bus infrastructure because of the Proposed Scheme; and
- Parking / Loading: The changes to the availability of parking and loading because of the Proposed Scheme.

The quantitative assessments are as follows:

- People Movement: An assessment has been carried out to determine the potential impact that the Proposed Scheme will have on projected volume of people moving along the corridor by sustainable modes during the Operational Phase only;
- Bus Performance Indicators: The changes to the projected operational efficiency for buses as a result of the Proposed Scheme;
- General Traffic: The direct and indirect impacts on general traffic using the Proposed Scheme and surrounding road network; and
- Network-Wide Performance Indicators: The strategic changes to queuing, total travel times, total travel distance and average network speed.

The changes between the Do Minimum and Do Something scenarios have been presented in either a positive, negative or negligible / neutral magnitude of impacts as a result of the Proposed Scheme, dependant on the assessment topic. A high, medium, low or negligible rating has been applied to each impact assessment to determine the Magnitude of Impact. Where appropriate, the changes in conditions between the Do Minimum and Do Something scenarios are outlined using a Level of Service (LoS) approach. This concept allows a straightforward comparison of two differing scenarios using a series of metrics specifically developed for this purpose.

Baseline Environment

A detailed review of the existing traffic and transport conditions within the redline boundary of the Proposed Scheme has been undertaken, specifically for pedestrian, cycling, bus services and priority measures, general traffic and parking / loading facilities. The baseline conditions have been informed by several site visits of the local environment, comprehensive traffic surveys, and a desktop review of the most recent aerial photography.

Only 12.5% of the existing route provides segregated cycle tracks and 58% of the existing route is non-segregated cycle lanes. In terms of inbound and outbound provisions on the existing route (main corridor):

- Non-segregated cycling facilities are currently provided along approximately 59% (outbound) and 57% (citybound).
- Segregated cycling facilities are currently provided along approximately 11% (outbound) and 13% (citybound).
- The remaining extents of the existing route have no dedicated cycle provision or cyclists must cycle on the bus lanes where provided.

Bus services along the Proposed Scheme currently operate within a constrained and congested environment, with 31% priority outbound, 37% priority inbound, cumulatively equating to 34% of the length of the route (for 15.5km core bus corridor route).There are sections along the route of the Proposed Scheme with poor bus priority resulting in poor journey time reliability particularly at peak times. Automatic Vehicle Locator (AVL) data from existing bus services operating along the Proposed Scheme corridor has been used to examine the current standard deviation for bus services along the corridor. The AVL data indicates that current bus journey times have a standard deviation of approximately 12 minutes along the route of Proposed Scheme and with any further increases in traffic levels these issues are expected to be exacerbated. In addition to impacting on bus passengers, longer and less reliable bus services also require operators to use additional buses to maintain headways to fill gaps in the timetable. Aligned to this, the remaining sections of un-prioritised bus network can lead to bunching of buses which, in turn, means stops can become overcrowded, creating delays in boarding and alighting and the imbalanced use of bus capacity.

For the purpose of describing the Proposed Scheme it has been split into the following six sections:

- Section 1 – Tallaght to Ballymount;
- Section 2 – Ballymount to Crumlin;
- Section 3 – Crumlin to Grand Canal;
- Section 4 – Grand Canal to Christchurch;
- Section 5 – Woodford Walk (R113) / New Nangor Road (R134) to Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction; and
- Section 6 – Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh.

Section 1 begins at the junction of Blessington Road / Cookstown Way, and routes north around the perimeter of The Square, Tallaght. Travelling via Blessington Road and Main Road, the route then joins the southern end of R819 Greenhills Road at Bancroft Park junction. The route extends along the R819 Greenhills Road as far as Mayberry Road junction where a new bus only route will be constructed which re-joins the R819 Greenhills Road south of the M50 Bridge at Tymon Lane.

Section 2 commences on R819 Greenhills Road, south of the M50 overbridge. The route then branches north-west via Ballymount Avenue and north-east via Calmount Road, before re-joining R819 Greenhills Road at the Greenhills Industrial Estate to the south of Walkinstown Roundabout.

Section 3 of the Proposed Scheme passes north along R819 Walkinstown Road to the Long Mile Road / Walkinstown Road junction. After travelling east along R110 Drimnagh Road for approximately 800m, buses heading towards the City Centre will bear left at the junction of Drimnagh Road / Kildare Road / St Mary's Road. From here, the route continues in a north-east direction on R110 Crumlin Road for approximately 1.75km, until the junction with R111 Parnell Road is reached. As part of the Proposed Scheme, an alternative route for cyclists is provided along Bunting Road, St Mary's Road, Kildare Road and Clogher Road to link into the Grand Canal cycle route at R111 Parnell Road.

Section 4 commences at the R111 Dolphin Road / Parnell Road and R110 Dolphin's Barn Street junction. The corridor then routes in a north-easterly along R110 Cork Street, St Luke's Avenue, Dean Street, R137 Patrick Street, Nicholas Street and Christchurch Place.

Section 5 commences on R134 New Nangor Road at the junction with Woodford Walk. Heading east along R134 New Nangor Road, the scheme progresses underneath the M50 bridge and passes through the Riverview Business Park, Western Industrial Estate, and John F Kennedy Industrial Estate, until the junction with R810 Naas Road.

Section 6 routes east along R810 Naas Road which runs along the south-eastern edge of John F Kennedy Industrial Estate as far as R112 Walkinstown Avenue. From the junction with R112 Walkinstown Avenue, the scheme is routed southbound until the junction with R110 Long Mile Road. This section of the Proposed Scheme continues along R110 Long Mile Road for approximately 0.85km, before merging with Tallaght to City Centre section at the junction of Walkinstown Road and Drimnagh Road.

Potential Impacts

Construction Phase

The impacts during the construction phase are outlined in Table 1.1. During the construction phase, the Proposed Scheme will have temporary **Low Negative** impacts to pedestrian and bus access and parking and loading. A **Medium Negative** impact to cyclists is expected.

Significant impacts due to general traffic redistribution away from the direct study area are not anticipated during the Construction Phase based on the intended nature of the progressive works along the corridor whereby traffic flows are generally to be maintained in both directions. There may be a requirement for some localised temporary lane closures for short durations of the daytime and night-time, which will involve consultation between the appointed contractor and relevant authorities. Access for general traffic to existing residential and commercial units immediately adjacent to the Proposed Scheme is to be accommodated throughout the Construction Phase. Therefore, the impact on general traffic redistribution is anticipated to be a **Medium Negative** and temporary impact due to the short-term nature of any restrictions.

The impact of construction traffic is anticipated to result in a temporary **Low Negative** impact due to the low numbers of HGV vehicles anticipated which are and below the thresholds set out in the Transport Assessments Guidelines.

Table 1.1: Summary of Potential Construction Phase Impacts

Assessment Topic	Effect	Potential Impact
Pedestrian Access	Restrictions to pedestrians along Proposed Scheme.	Low Negative
Cycling Access	Restrictions to cyclists along Proposed Scheme	Medium Negative
Bus Access	Restrictions to public transport along Proposed Scheme.	Low Negative
Parking and Loading	Restrictions to parking / loading along Proposed Scheme.	Low Negative

Assessment Topic	Effect	Potential Impact
General Traffic	Restrictions to general traffic along Proposed Scheme	Medium Negative
	Additional construction traffic flows upon surrounding road network	Low Negative

Operational Phase

The Proposed Scheme will deliver positive impacts to the quality in terms of People Movement, pedestrian, cycling and bus infrastructure during the operational phase. These improvements will help to provide an attractive alternative to the private car and promote a modal shift to walking, cycling and public transport, allowing for greater capacity along the corridor to facilitate the sustainable movement of people.

Although it is recognised that there will be some negative impacts for general traffic and parking / loading availability, the Proposed Scheme will deliver strong positive impacts to the quality of pedestrian, cycling and bus infrastructure during the Operational Phase providing for enhanced levels of People Movement in line with the scheme objectives. These improvements will help to provide an attractive alternative to the private car and promote a modal shift to walking, cycling and public transport, allowing for greater capacity along the corridor to facilitate the sustainable movement of people as population and employment levels grow in the future.

Accordingly, it is concluded that the Proposed Scheme will deliver benefits from a sustainable transport point of view and will not result in a significant deterioration to the existing traffic conditions on the local road network during the operational phase, meeting the aim of the Proposed Scheme to provide enhanced walking, cycling and bus infrastructure, enabling and delivering efficient, safe, and integrated sustainable transport movement along the corridor.

- **Pedestrian Infrastructure:** The Proposed Scheme consists of measures to enhance the existing pedestrian infrastructure along the direct study area. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance. A Level of Service (LoS) junction assessment was undertaken using a set of five criteria to determine the impact that the Proposed Scheme has for pedestrians. The results of the impacted junctions demonstrate that the LoS during the Do Minimum scenario consists predominantly of the low B/ C /D / E ratings, with the exception of 3 F's and 4 A's. During the Do Something scenario, i.e., following the development of the Proposed Scheme, the LoS consists predominantly of the highest A / B ratings, with the exception of two Cs. Overall, the improvements to the quality of the pedestrian infrastructure will have a **High Positive impac**t in Section 2, **Medium Positive impact** in Section 1, Section 3, Section 4, Section 5 and Section 6.

- **Cycling Infrastructure:** The Proposed Scheme also consists of measures to enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic (and pedestrians) wherever practicable along the direct study area. A LoS assessment was undertaken using an adapted version of the NTA's National Cycle Manual Quality of Service (QoS) Evaluation criteria. The results of the assessment demonstrate that the LoS during the Do Minimum scenario consists of mainly B/C/D ratings. In the Do Something scenario, the LoS consists predominantly of the high ratings, with the exception of four B's and one C. Given the quality of the cycling infrastructure along the Proposed Scheme, the improvements will have a **Medium Positive impact** in Section 2, Section 3, Section 5 and Section 6 and a **Low Positive impact** in Section 1, and Section 4.

- **Bus Infrastructure:** The implementation of the Proposed Scheme will result in improvements in the quality of bus infrastructure provision along the direct study area. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance. A qualitative impact assessment has been undertaken based on the provision of bus priority, bus stop provision and changes to facilities. The results of the assessment demonstrate that the improvements to the quality of the bus infrastructure will have a **High Positive impact** in Section 2, Section 4 and Section 5, a **Medium Positive impact** in Section 1 and Section 3 and a **Low Positive impact** in Section 6 of the Proposed Scheme.

- **Parking and Loading:** A qualitative impact assessment has been undertaken of the Proposed Scheme impacts on the existing parking and loading. The results of the assessment demonstrate that the changes to the parking and loading provision will result in an overall loss of 534 spaces and 7 HGV spaces within the redline boundary of the Proposed Scheme, however the majority of these are off-street private parking spaces Given the nature of the loss in parking and the availability of alternative spaces in the indirect study area, the impact is expected to have a **Low Negative impact** in Section 1, Section 2, Section 3, Section 4 and Section 6 and a **Negligible impact** in Section 5 of the Proposed Scheme.

- **People Movement:** Given the proposed amendments to the pedestrian, cycling, bus and parking / loading infrastructure outlined above, the Proposed Scheme will have greater capacity to facilitate the sustainable movement of people travelling along the corridor. A quantitative impact assessment has been undertaken using outputs from the NTA's ERM and LAM, comparing the Do Minimum and Do Something peak hour scenarios for each forecast year (2028, 2043). The results of the assessment demonstrate that there will be an increase of 37% and 27% in the number of people travelling along the Proposed Scheme during 49% and 38% in the number of people travelling along the Proposed Scheme during the AM and PM Peak Hours. These increases are all due to the increased levels of people movement by sustainable modes facilitated by the Proposed Scheme. The analysis also shows that there will be an increase of 11% in the number of passengers boarding buses during the AM and PM Peak hours in 2028. During the 2043 scenario there will be an increase of approximately 6.4% and 38.4% in the number of passengers boarding buses during the AM and PM Peak hours respectively. Overall, it is adjudged that the Proposed Scheme will have a **High Positive impact** on the sustainable movement of people along the corridor.

- **Bus Network Performance Indicators:** A micro-simulation modelling assessment has been developed and network performance indicators of the bus operations along the 'end to end' corridor. The results of the assessment demonstrate that the total bus journey times on all modelled bus services will improve by between 8% and 12% during the AM and PM Peak hours of the 2028 Opening Year and 2043 Design Year. The Proposed Scheme will reduce total bus journey times along the Proposed Scheme by up to 12% in 2028 and 12% in 2043. Based on the AM and PM peak hours alone, this equates to **7.6 hours of savings in 2028 and 7.2 hours in 2043** combined across all buses when compared to the Do Minimum. On an annual basis this equates to approximately 5,750 hours of bus vehicle savings in 2028 and 5,450 hours in 2043, when considering weekday peak periods only. Journey time variation and reliability are shown to improve in all Do Something scenarios compared to the Do Minimum. Overall, it is anticipated that the improvements in journey times and reliability for bus users along the Proposed Scheme will have a **High Positive impact.**

- **General Traffic Network Performance Indicators:** There will be an overall reduction in operational capacity for general traffic along the direct study area, given the proposed infrastructural changes and rebalancing of priority towards sustainable modes outlined above. This reduction in operational capacity for general traffic will create some level of traffic redistribution away from the Proposed Scheme onto the surrounding road network.

  The LAM Opening Year 2028 model results were used to identify the impact in traffic flows between the Do Minimum and Do Something scenarios. A reduction in general traffic flows along a road link has been described as a positive impact to the environment. An increase in general traffic flows along a road link has been described as a negative impact to the environment. Reference has been given to TII's Traffic and Transport Assessment Guidelines as an indicator for best practice, to determine the key road links that require further traffic analysis due to the increase in traffic. Operational capacities were extracted from the LAM at the associated junctions of the key road links to identify the impact that the Proposed Scheme will have on the V / C ratios. The results are presented in terms of the significance of the impact to the V / C ratio for each junction based on its sensitivity and magnitude of impact.

  The results of the assessment demonstrate that the surrounding road network largely has the capacity to accommodate the redistributed general traffic as a result of the Proposed Scheme. The majority of assessed junctions that required further traffic analysis have V / C ratios that are broadly similar before and after the Proposed Scheme implementation. Overall, it has been determined that

the impact of the reduction in general traffic flows along the Proposed Scheme will be a **Medium Positive** impact whilst the impact of the redistributed general traffic along the surrounding road network will have a **Low Negative** impact.

- **Network Wide Performance Indicators:** Given the impacts to the traffic conditions outlined above, there will be a knock-on effect to the operational efficiency of the road network beyond the direct and indirect study areas. A quantitative impact assessment has been undertaken using outputs from the NTA's ERM and LAM to determine the conditions to queuing, travel times, travel distances and network speeds during the Do Minimum and Do Something scenarios. The results of the assessment demonstrate that the impacts to the network performance indicators range between -3.3% to +2.6% and will therefore have a **Negligible impact**.

Cumulative Assessment

In general, total trip demand (combining all transport modes) will increase into the future in line with population and employment growth. A greater share of the demand will be by sustainable modes (Public transport, Walking, Cycling) as facilitated by the GDA Strategy implementation.

The analysis indicates that the 12 BusConnects Proposed Schemes in place, there will be a high positive impact on sustainable mode share. The schemes will prevent any increase in private car traffic within the study area and will instead result in a reduction in car trips below 2020 levels.

In the 2028 Opening Year scenario, it is estimated that for people travelling within the 500m catchment area (including City Centre) there will be a 12% increase in public transport trips, 2% decrease in general traffic trips (i.e. motorists) and a 14% increase in cycling trips in the AM Peak Hour and a 12% increase in public transport, 3% decrease in general traffic and a 12% increase in cycling trips each day (7am-7pm). In the 2043 Design Year scenario, it is estimated that for people travelling within the 500m catchment area (including City Centre) there will be a 6% increase in public transport trips, 6% decrease in general traffic trips (i.e. motorists) and a 10% increase in cycling trips in the morning peak hour and a 7% increase in public transport, 7% decrease in general traffic and a 11% increase in cycling trips each day (7am-7pm).

General traffic levels reduce more in 2043 than when compared to 2028 due to the increased level of additional non-bus public transport infrastructure and services (MetroLink, Luas extensions and DART+ from the GDA Strategy) in tandem with the road capacity reduction measures as part of the Proposed Scheme leading to increased usage on all public transport modes.

The modelling outputs for the 2028 Cumulative Opening Year scenario demonstrate that there is a high growth in bus patronage along all the Proposed Schemes in the AM Peak Hour. The bigger increases occur in the inbound direction on the Blanchardstown to City Centre, the Rathfarnham to City Centre and the Bray to City Centre schemes where the loadings reach more than 2,000 additional passengers per Hour compared to the Do Minimum scenario.

In the 2028 Opening Year AM Peak Hour scenario with the Proposed Schemes in place, there will be an estimated 10% more passenger boardings across all public transport services and 17% more boardings on bus services. In the 2028 Opening Year PM Peak Hour scenario with the Proposed Schemes in place, there will be an estimated 11% increase in total passengers boarding Public transport services and 18% more passengers boarding buses services.

In the 2043 Design Year AM and PM Peak Hour scenarios, increase in total passengers boarding all public transport services will be 7% and 8% respectively, and the increase in passengers boarding bus services will increase by 11% and 14% respectively.

Overall, the Proposed Schemes are expected to deliver a High Positive Cumulative Impact on People Movement by sustainable modes.

Summary and Conclusions

The Proposed Scheme from Tallaght to the City Centre, Clondalkin to Drimnagh , comprises the development of improved bus priority along the entire route. This TIA provides a robust assessment of the scheme through qualitative assessment and quantitative analysis using a suite of multi-modal transport modelling tools.

During the construction phase, the Proposed Scheme will have temporary **Low Negative impacts** to pedestrian, bus access and parking and loading, with **Moderate Negative** impact to cyclists. General traffic redistribution is not anticipated to be a significant issue during the construction phase, however there will be a requirement for some localised temporary road closures for short durations of the daytime and night-time. Therefore, the impact on general traffic redistribution is anticipated to be a temporary **Medium Negative impact**. The impact of construction traffic is anticipated to result in a temporary **Low Negative impact** due to the low numbers of vehicles anticipated which are and below the thresholds set out in the Transport Assessments Guidelines.

During the Operational Phase, the Proposed Scheme will deliver strong positive impacts to the quality in terms of People Movement, pedestrian, cycling and bus infrastructure during the Operational Phase. These improvements will help to provide a more attractive alternative to the private car and promote a modal shift to walking, cycling and public transport, allowing for greater capacity along the corridor to facilitate the sustainable movement of people as population and employment levels grow in the future.

The Proposed Scheme will address sustainable mode transport infrastructure deficits while contributing to an overall integrated sustainable transport system as proposed in the GDA Transport Strategy. It will increase the effectiveness and attractiveness of bus services operating along the corridor and will result in more people availing of public transport due to the faster, more reliable journey times which the Proposed Scheme provides. This in turn will support the future increase to the capacity of the bus network and services operating along the corridor and thereby further increasing the attractiveness of public transport. In addition to this, the significant segregation and safety improvements to walking and cycling infrastructure that is a key feature of the Proposed Scheme will further maximise the movement of people travelling sustainably along the corridor. All of these changes combined will therefore cater for higher levels of future sustainable population and employment growth.

In the absence of the Proposed Scheme bus services will be operating in a more congested environment, leading to higher journey times for and lower reliability for bus journeys. This limits their attractiveness to users which will lead to reduced levels of public transport use, making the bus system less resilient to higher levels of growth and leading to increased levels of car use and congestion. The absence of walking and cycling measures that the Proposed Scheme provides will also significantly limit the potential to grow those modes into the future.

On the whole, the Proposed Scheme will make a significant contribution to the overall aims of BusConnects, the GDA Transport Strategy and allow the city to grow sustainably into the future, which would not be possible in the absence of the Proposed Scheme.

1. Introduction

This TIA presents a comprehensive review of the traffic and transport impacts associated with the Proposed Scheme, which has informed the production of the EIAR Traffic & Transport chapter. The TIA should be read in conjunction with the EIAR chapter and is included as Appendix A6.1 (Transport Impact Assessment Report) to the EIAR.

The Proposed Scheme, as described in detail in Chapter 4 (Proposed Scheme Description), measures approximately 15.5 km along the Core Bus Corridor with an additional offline cycling facility approximately 3.9 km in length. The Proposed Scheme consists of two sections that amalgamate the former Greenhills to City Centre CBC (Tallaght to City Centre) and Clondalkin to Drimnagh CBC (Clondalkin to Drimnagh) preferred route Core Bus Corridors.

The first section, the Tallaght to City Centre section, begins at the junction of Blessington Road/ Cookstown Way and is routed along Belgard Square West, Belgard Square North, Belgard Square East, Blessington Road to the junction of R819 Greenhills Road and Bancroft Park. From here the Proposed Scheme is routed along the R819 Greenhills Road to Walkinstown Roundabout via new transport link roads; in the green area to the east of Birchview Avenue/Treepark Road; in the green area to the south of Ballymount Avenue, and in the green area to the east of Calmount Road. From Walkinstown Roundabout the main Core Bus Corridor is routed along the R819 Walkinstown Road to the junction with R110 Long Mile Road and Drimnagh Road. The shared spine with the Clondalkin section commences at this junction and the Proposed Scheme is routed along the R110 to the junction of Dean Street and Patrick Street via Drimnagh Road, Crumlin Road, Dolphins Barn, Cork Street, St Luke's Avenue and Dean St. From here the Proposed Scheme is routed along the R137 via Patrick Street to the junction at Winetavern Street and Christchurch Place where the Proposed Scheme terminates within the City Centre. An offline cycle facility is proposed to facilitate cycling between Walkinstown Roundabout and Parnell Road (Grand Canal) where end to end cycle facilities are not feasible along the main corridor and provides a more direct route towards the city centre. This offline section of the Proposed Scheme is routed via Bunting Road, Kildare Road and Clogher Road.

The second section, the Clondalkin to Drimnagh section, begins at the junction of New Nangor Road and Woodford Walk and is routed along the R134 New Nangor Road, R810 Naas Road, R112 Walkinstown Avenue and the R110 Long mile Road to the junction of Walkinstown Road and Drimnagh Road where it is routed towards the city centre along the shared spine section as described above (in terms of traffic).

Throughout the Proposed Scheme bus stops will be enhanced to improve the overall journey experience for bus passengers.

Throughout the Proposed Scheme cycle facilities will be substantially improved with segregated cycle tracks provided along the links and protected junctions with enhanced signalling for cyclists provided at junctions. Where space for a segregated cycle track is not available on the main corridor an alternative cycle route via quiet roads is proposed.

Moreover, pedestrian facilities will be upgraded with additional signalised crossings provided and side road ramps provided. In addition, public realm works will be undertaken at key locations with higher quality materials, planting and street furniture provided to enhance the pedestrians' experience.

Table 1.1 summarises the changes which will be made to the existing transport environment along the corridor as a result of the Proposed Scheme.

Table 1.1: Summary of Changes as a result of the Proposed Scheme

Total Length of Proposed Scheme	**15.5km (+3.9km offline cycling facility)**	
Features	**Existing (km)**	**Proposed Scheme (km)**
Bus Lanes		
Inbound	5.4	14.2
Outbound	4.5	13.8
Bus Priority through Traffic Management		
Inbound	0.3	0.6

Total Length of Proposed Scheme	15.5km (+3.9km offline cycling facility)	
Features	**Existing (km)**	**Proposed Scheme (km)**
Outbound	0.3	0.6
Total Bus Priority (both directions)	10.5	29.2 (+176%)
Bus Measures		
Proportion of Route with Bus Priority Measures	34% (Core Bus Corridor)	94% (Core Bus Corridor)
Cycle Facilities – Segregated		
Inbound	2.1	16.6
Outbound	1.7	17.4
Cyclist Facilities – Non-segregated (not including un-segregated Bus Lanes)		
Inbound	8.8	0.8
Outbound	9.1	0.8
Cyclist Facilities – Overall		
Total Cyclist Facilities (both directions)	21.7	38.5
Proportion Segregated	17.2%	93%
Other Features		
Number of Pedestrian Signal Crossings	135	181

The Proposed Scheme is supported by a series of drawings which are contained in Volume 3 of the EIAR. The following drawings (listed in Table 1.2) should be read in conjunction with this TIA.

Table 1.2: List of Drawings

Drawing Series Number	Description
BCIDA-ACM-GEO_GA-0809001_XX_00-DR-CR-9001	General Arrangement
BCIDA-ACM-GEO_CS-0809001_XX_00-DR-CR-9001	Typical Cross Sections
BCIDA-ACM-TSM_GA-0809001_XX_00-DR-CR-9001	Traffic Signs and Road Markings
BCIDA-ACM-TSM_SJ-0809001_XX_00-DR-TR-9001	Junction System Design

1.1 Aim and Objectives of the Proposed Scheme

The aim of the Proposed Scheme is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme are to:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements; and
- Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable;
- Support the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets;
- Enable compact growth, regeneration opportunities and more effective use of land in Dublin, for present and future generations, through the provision of safe and efficient sustainable transport networks;
- Improve accessibility to jobs, education and other social and economic opportunities through the provision of improved sustainable connectivity and integration with other public transport services; and
- Ensure that the public realm is carefully considered in the design and development of the transport infrastructure and seek to enhance key urban focal points where appropriate and feasible.

The planning and design of the Proposed Scheme has been guided by these aims and objectives.

1.1.1 People Movement

The aims and objectives outlined above are underpinned by the central concept and design philosophy of '***People Movement'.*** People Movement is the concept of the optimization of roadway space and / or the prioritisation of the movement of people over the movement of vehicles along the route and through the junctions along the Proposed Scheme. The aim being the reduction of journey times for higher person carrying capacity modes (bus, walking and cycling), which in turn provides significant efficiencies and benefits to users of the transport network and the environment.

A typical double-deck bus takes up the same road space as three standard cars but typically carries 50-100 times the number of passengers per vehicle. On average, a typical double-deck bus carries approximately 60-70 passengers making the bus typically 20 times more efficient in providing people movement capacity within the equivalent spatial area of three cars. These efficiency gains can provide a significant reduction in road network congestion where the equivalent car capacity would require 50 or more vehicles based on average occupancy levels. Consequently, by prioritising the movement of bus over cars, significantly more people can be transported along the limited road space available. Similarly, cyclists and pedestrians require significantly less roadway space than general traffic users to move safely and efficiently along the route. Making space for improved pedestrian infrastructure and segregated cycle tracks can significantly benefit these sustainable modes and encourage greater use of these modes.

With regards to this traffic and transport chapter, People Movement is the key design philosophy and the Proposed Scheme impacts (both positive and negative) have been assessed on that basis.

1.1.2 Preliminary Design Guidelines

To support the 'People Movement' led approach to the design of the Proposed Scheme, the Preliminary Design Guidance Booklet for BusConnects Core Bus Corridors (PDGB) (NTA 2021) (refer to Appendix A4.1 in Volume 4 of the EIAR) was developed. This guidance document was prepared to ensure that a consistent design approach was taken across the various BusConnects Schemes and that the objectives of the project are achieved. A 'People Movement' led design involves the prioritisation of people movement, focusing on maximising the throughput of sustainable modes (i.e. Walking, Cycling and Bus modes) in advance of the consideration and management of general vehicular traffic (private car) at junctions.

In support of this approach, a project specific People Movement at Signal Calculator (PMSC) was developed. The PMSC was applied at the initial design development stage, to provide an initial estimate of green time allocation for all movements at a typical junction, on the basis that sustainable mode movements should be accommodated foremost to maximise people movement with the remaining green time allocated to general traffic movements. The calculations were underpinned by:

- The number of buses required to be accommodated along the Proposed Scheme, as per the BusConnects Network Re-design proposals;
- The provision of a high Level of Service for cyclists at each junction along the Proposed Scheme; and
- The pedestrian crossing width and crossing timing requirements based on the provision of a high Level of Service for pedestrians at each junction along the Proposed Scheme.

The outputs of the calculator provided an initial estimate of the green times and vehicle capacity movements based on inputs and assumptions for each junction along the Proposed Scheme. The calculator provided an estimate of the People Movement for the junction in question (by mode) and was used to adjust proposals with a view to maximising the total person throughput at each junction along the Proposed Scheme during the iterative design process, described further below in Section 6.2.3. Details on the development of junction designs along the Proposed Scheme are included in TIA Appendix 2 (Junction Design Report).

The People Movement Calculation and the identification of available general traffic capacity from this initial exercise was enhanced further by the Proposed Scheme Transport Models described in Section 4.3 below.

1.1.3 Iterative Design Process and Mitigation by Design

Throughout the development of the Preliminary Design for the Proposed Scheme there have been various design stages undertaken based on a common understanding of the maturity of the design at a given point in time. Part of this process, and the reason for developing a multi-tiered modelling framework (described in Section 4.3.1), was to ensure the environmental and transport impacts were mitigated to the greatest extent possible during design development and to enable information on potential impacts to be provided from the various Environmental Impact Assessment (EIA) and Transport Impact Assessment (TIA) disciplines back into the design process for consideration and inclusion in the proposals This resulted in mitigation being embedded into the design process by the consideration of potential environmental impacts throughout the Preliminary Design development.. A multi-tiered modelling framework (described in Section 4.3.1) was developed to support this iterative design process,

Diagram 1.1 below illustrates this process whereby the emerging design for the Proposed Scheme have been tested using the transport models as part the iteration. The transport models provided an understanding of the benefits and impacts of the proposals (mode share changes, traffic redistribution, bus performance etc.) with traffic flow information also informing other environmental disciplines (such as Air Quality, Noise and Vibration, Climate etc.) which in turn allowed feedback of potential impacts into the design process to allow for changes and in turn mitigation to be embedded in the designs. The design process included physical changes (e.g., cycle lane widening) and adjustments to traffic signals including changes to staging, phasing and green times to limit traffic displacement to the greatest extent possible as well as traffic management arrangements and/or turn bans where appropriate. This ensured that any displaced traffic was kept to a minimum and was maintained on higher capacity roads, whilst continuing to meet scheme objectives along the Proposed Scheme.

The iterative process concluded when the design team were satisfied that the Proposed Scheme met its required objectives (maximising the people movement capacity of the Proposed Scheme) and that the environmental impacts and level of residual impacts were reduced to a minimum whilst ensuring the scheme objectives remained satisfied.

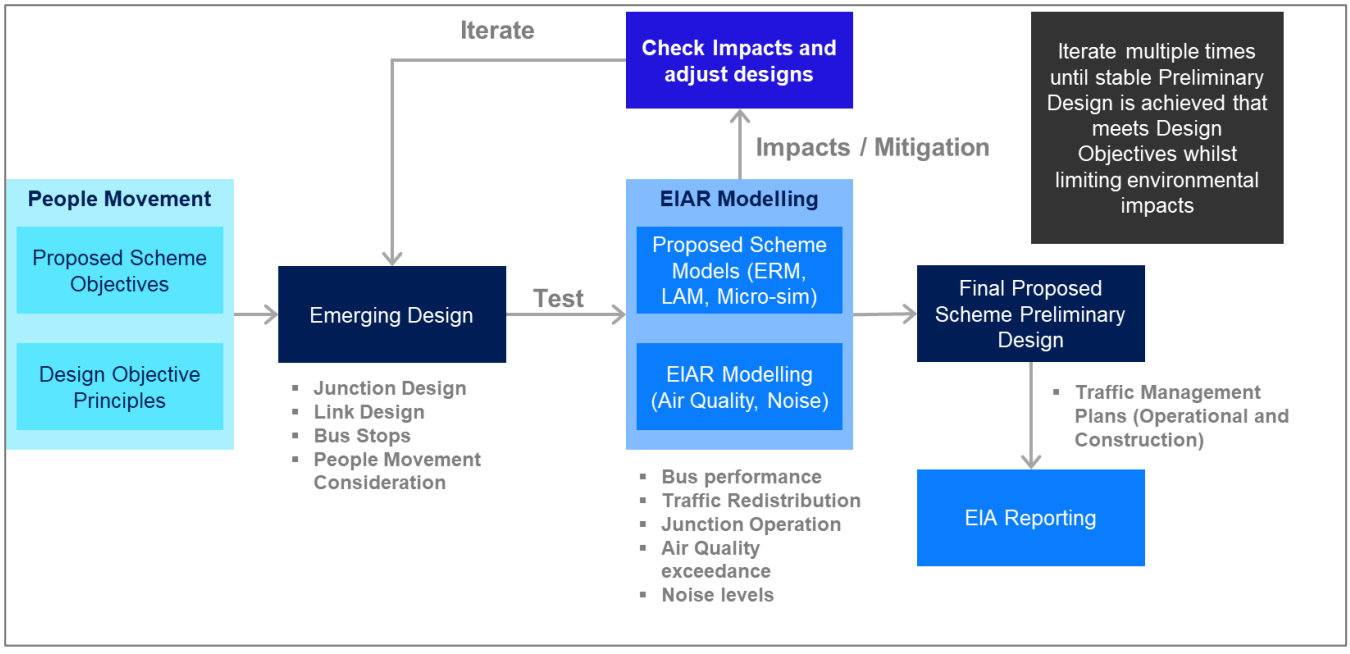

Diagram 1.1: Proposed Scheme Impact Assessment and Design Interaction

The impacts presented in this report are based on the final Preliminary Design for the Proposed Scheme which includes the embedded mitigation developed as part of the iterative design process described above.

1.2 Purpose and Structure of This Report

This TIA includes the comprehensive assessment of impacts and benefits of the Proposed Scheme covering all transport modes for both Construction and Operational Phases. The TIA also informs the Traffic and Transport

chapter of the EIAR for the Proposed Scheme which assesses the impacts and significance of those impacts in relation to the receiving transport environment of the Proposed Scheme.

The traffic and transport impacts assessment have been undertaken in accordance with latest guidance, which includes the 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA 2022), the 'Traffic and Transport Assessment Guidelines' (TII 2014), the National Cycle Manual (NTA 2011) and the UK Design Manual for Roads & Bridges (DMRB) Environmental assessment and monitoring (formerly HA 205/08, HD 48/08, IAN 125/15, and IAN 133/10), LA104 Revision 1 (Highways England, 2020).

The assessment of traffic and transport impacts and benefits of the Proposed Scheme considers the following transport receptors:

- Pedestrians / mobility impaired;
- Cyclists;
- Buses;
- General traffic; and
- On-street parking, off-street parking, loading, taxis.

In addition, the following modes of transport are considered as part of the modelling:

- Public Transport;
- Traffic including private car, taxis and goods vehicles;
- Walking; and
- Cycling.

The impact assessments have been carried out based on the following scenarios:

- **'Do Nothing'** – The 'Do Nothing' scenario represents the current baseline traffic and transport conditions of the direct and indirect study areas **without** the Proposed Scheme in place, which has been outlined in Section 5 (Baseline Environment). This scenario forms the reference case by which to compare the Proposed Scheme ('Do Something') for the qualitative assessments only.
- **'Do Minimum'** – The 'Do Minimum' scenario (Opening Year 2028, Design Year 2043) represents the likely traffic and transport conditions of the direct and indirect study areas including for any transportation schemes which have taken place, been approved or are planned for implementation, **without** the Proposed Scheme in place. This scenario forms the reference case by which to compare the Proposed Scheme ('Do Something') for the quantitative assessments. Further detail on the scheme and demand assumptions within this scenario are included further below in section **6.1.3**.
- **'Do Something'** – The 'Do Something' scenario represents the likely traffic and transport conditions of the direct and indirect study areas including for any transportation schemes which have taken place, been approved or are planned for implementation, **with** the Proposed Scheme in place (i.e. the Do Minimum scenario with the addition of the Proposed Scheme). The Do Something scenario has been broken into two phases:
    - **Construction Phase (Construction Year 2024) –** This phase represents the single worst-case period which will occur during the construction of the Proposed Scheme; and
    - **Operational Phase (Opening Year 2028, Design Year 2043) –** This phase represents when the Proposed Scheme is fully operational.

The remaining structure of the report is set out as follows:

- **Chapter 2 – Study Area:** This chapter sets out both the direct and indirect study areas of the TIA;
- **Chapter 3 – Policy Context:** This chapter sets out the policy context in which the Proposed Scheme has been developed;
- **Chapter 4 – Assessment Methodology:** This chapter sets out the proposed method of assessment for the quantitative and qualitative perspectives;
- **Chapter 5 – Baseline Environment**: This chapter will set out the baseline conditions against which the Proposed Scheme has been assessed;

- **Chapter 6 – Potential Impacts:** This chapter provides the assessment of the Proposed Scheme in both the Construction and the Operational Phase. It focusses on walking, cycling, bus, general traffic and parking and loading using the methods set out in Chapter 4. It considers both operational and construction scenarios;
- **Chapter 7 – Cumulative Assessment:** This chapter provides an assessment of the cumulative impact of the Proposed Scheme in conjunction with the other eleven Proposed Schemes within the BusConnects Dublin – Core Bus Corridor Infrastructure Works;
- **Chapter 8 – Summary and Conclusions**: This chapter provides a summary of the TIA and the conclusions which can be drawn from it; and
- **Chapter 9** – **References**: contains the traffic and transport sources referred to within this chapter.

2. Study Area

The direct and indirect impacts have been considered with reference to the following study area extents (as shown in Diagram 2.1):

- **Direct Study Area** – The Proposed Scheme (i.e. the transport network within the red line boundary – the boundary of the physical works of the scheme); and
- **Indirect Study Area** – This is the area of influence the Proposed Scheme has on changing traffic volumes above a defined threshold with reference to TII's Traffic and Transport Assessment Guidelines (May 2014) (see Section 6.2.4.5 for further details on the threshold applied in relation to traffic volume changes used in the definition of the indirect study area).

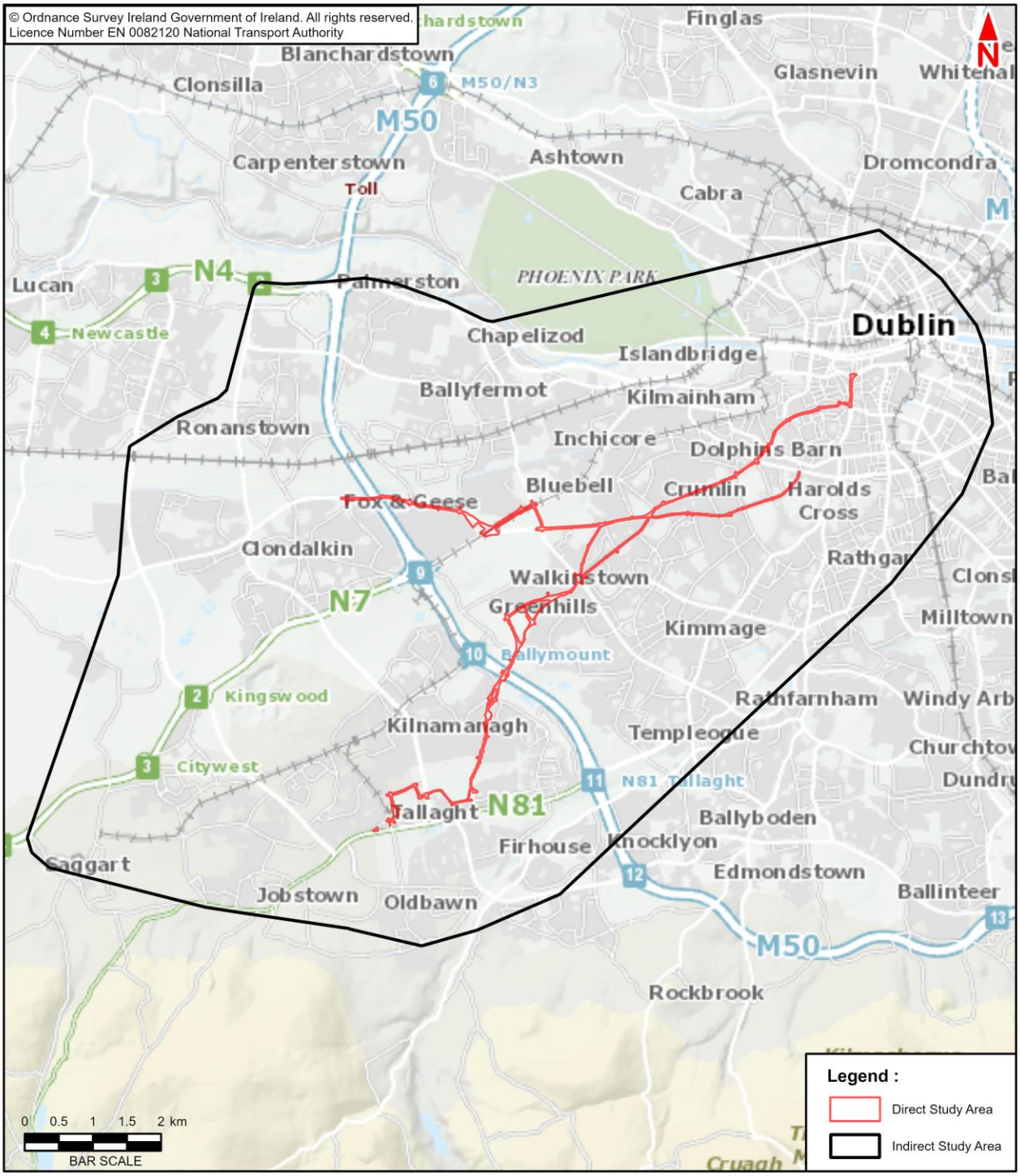

Diagram 2.1: Proposed Scheme Direct & Indirect Study Area.

3. Policy Context

This chapter outlines the national, regional and local transport and planning policies applicable to the Proposed Scheme. Alignment of the Proposed Scheme with current planning policy at all levels is an important determining factor in planning decisions. Through this summary of policy, the following sections demonstrate that the Proposed Scheme has this alignment and thus is compliant with transport and planning policies.

3.1 National Guidelines

3.1.1 Traffic and Transport Assessment Guidelines

To determine the traffic and transport impact that the Proposed Scheme has in terms of an increase in general traffic flows on the direct and indirect study areas, a robust assessment has been undertaken, with reference to Transport Infrastructure Ireland's (TII) most recent Traffic and Transport Assessment Guidelines (TII 2014).

This document is considered best practice guidance for the assessment of transport impacts related to changes in traffic flows due to proposed developments and is an appropriate means of assessing the impact of general traffic trip redistribution on the surrounding road network.

According to Section 1.3 of the Traffic and Transport Assessment Guidelines (TII 2014):

> *'a Traffic and Transport Assessment is a comprehensive review of all the potential transport impacts of a proposed development or re-development, with an agreed plan to mitigate any adverse consequences'.*

The guidelines aim to provide a framework to promote an integrated approach to development, ensuring that proposals promote more efficient use of investment in transportation infrastructure which reduces travel demand and promotes road safety and sustainable travel. The document is considered best practice guidance for the assessment of transport impacts related to changes in traffic flows due to proposed developments and is generally an appropriate means of assessing the traffic and transport impact of additional trips on the surrounding road network.

3.1.2 Design Manual for Urban Roads and Streets

The Design Manual for Urban Roads and Streets (DMURS) (DTTS 2019) promotes an integrated street design approach within urban areas (i.e. cities, towns, and villages) focused on:

- Influence by the type of place in which the street is located; and
- Balancing the needs of all users.

A further aim of this Manual is to put well designed streets at the heart of sustainable communities to promote access by walking, cycling and public transport.

The principles, approaches and standards set out in this Manual apply to the design of all urban roads and streets (with a speed limit of 60 km/h or less), except: (a) Motorways (b) In exceptional circumstances, certain urban roads and streets with the written consent of Sanctioning Authorities.

The Manual is underpinned by a holistic design-led approach, predicated on a collaborative and consultative design process. There is specific recognition of the importance to create secure and connected places that work for all, characterised by creating new and existing streets as attractive places with high priority afforded to pedestrians and cyclists while balancing the need for appropriate vehicular access and movement.

To achieve a more place-based/integrated approach to road and street design, the following four core principles are promoted within the manual:

- Connected Networks - To support the creation of integrated street networks which promote higher levels of permeability and legibility for all users, and with emphasis on more sustainable forms of transport;

- Multi-Functional Streets - The promotion of multi-functional, place-based streets that balance the needs of all users within a self-regulating environment;
- Pedestrian Focus - The quality of the street is measured by the quality of the environment for the user hierarchy pedestrians considered first; and
- Multi-disciplinary Approach - Greater communication and co-operation between design professionals through the promotion of a plan-led, multidisciplinary approach to design.

3.1.3 Traffic Signs Manual

The Traffic Signs Manual (DTTS, 2019) promotes safety, health and welfare for road workers and users. The manual details the traffic signs which may be used on roads in Ireland, including sign layout, sign symbols, the circumstances in which they are required, and the associated rules for positioning them.

Of direct relevance to the assessment of traffic and transport impacts, Chapter 7 - Road Markings outlines the function of road markings, the legalities of road markings and the application of road markings on roads in Ireland. Chapter 8 - Temporary Traffic Measures and Signs for Roadworks outlines the application of temporary traffic management (TTM) at work sites on public roads; this chapter offers instructions and guidance to road users in relation to the use of TTM and outlines the signs to be used at roadworks.

3.1.4 Traffic Management Guidelines

The Traffic Management Guidelines (DTTS, 2019) provides guidance on a number of issues including, but not limited to, traffic planning, traffic calming and management, incorporation of speed restraint measures and the provision of suitably designed facilities for public transport users and vulnerable road users.

A core component of the Guidelines is rooted in decision making and balancing priorities, including those that are in conflict with one another. The Guidelines identifies common objectives to be addressed when managing the transport network:

- Environmental improvement;
- Congestion relief;
- Capacity improvement;
- Safety;
- Accessibility;
- Economic vitality; and
- Politics.

The Proposed Scheme has been designed and assessed with reference to the set of guidance documents listed throughout Section 3.1.

3.2 National Policy

3.2.1 National Planning Framework - Ireland 2040 Our Plan (NPF) (2018)

Project Ireland 2040 was launched by the Government in February 2018 and includes two elements:

- the National Planning Framework - Ireland 2040 Our Plan (NPF) (2018); and
- the National Development Plan (2018- 2027).

Project Ireland 2040 provides the framework for future development and investment in Ireland and is the overall Plan from which other, more detailed plans will take their lead, including city and county development plans and regional strategies. The National Planning Framework (NPF) (Department of Housing, Local Government and Heritage, 2020) is a tool to assist the achievement of more effective regional development.

The NPF now represents the overarching national planning policy document, of direct relevance to the planning functions of regional and planning authorities, including An Bord Pleanála. The NPF is the successor to The National Spatial Strategy (NSS), published in November 2002 and has a statutory basis.

The NPF states that the key future growth enablers for Dublin include:

> *'...The development of an improved bus-based system, with better orbital connectivity and integration with other transport networks...'*
>
> *'...Delivery of the metropolitan cycle network set out in the Greater Dublin Area Cycle Network Plan inclusive of key commuter routes and urban greenways on the canal, river and coastal corridors.'*

It is a policy of the NPF (Objective 74) to secure the alignment of the NPF and the National Development Plan (NDP) through delivery of the National Strategic Outcomes. The BusConnects scheme is identified in National Strategic Outcome 4, 'Sustainable Mobility', which includes the delivery of:

> *'…key public transport objectives of the Transport Strategy for the Greater Dublin Area (2016-2035) by investing in projects such as New Metro Link, DART Expansion Programme, BusConnects in Dublin'.*

It also allows for the development of:

> *'a comprehensive network of safe cycling routes in metropolitan areas to address travel needs.'*

By enhancing travel by both public transport and active modes the Proposed Scheme accords with the National Planning Framework.

3.2.2 National Development Plan (NDP) (2018- 2027)

The National Development Plan (NDP) (2018- 2027) (Department of Public Expenditure and Reform, 2018) sets out the investment priorities that will underpin the implementation of the NPF, through a total investment of approximately €116 billion to ensure ongoing employment maintenance and creation, with appropriate regional development. This investment is also to provide clarity to the construction sector, allowing the industry to provide the capacity and capability required to deliver the Government's long-term investment plans.

The NDP illustrates the commitment to reforming how public investment is planned and delivered. This is being achieved through a shift to integrated regional investment plans, stronger co-ordination of sectoral strategies and more rigorous selection and appraisal of projects to secure value-for-money.

The NDP states that investment in public transport infrastructure will be accelerated to support the development of an integrated and sustainable national public transport system consistent with the NPF's National Strategic Outcomes of 'Sustainable Mobility' as well as 'Compact Growth'. It outlines that the programmes and underlying projects proposed for delivery during the period up to 2027 which includes the BusConnects scheme, as follows:

> *'Delivery of the full BusConnects programme for all of Ireland's cities (inclusive of ticketing systems, bus corridors, additional capacity, new bus stops and bus shelters etc.'*
>
> *'Delivery of comprehensive cycling and walking network for Ireland's cities.'*

The NDP promotes the BusConnects proposals, of which the Proposed Scheme forms part, and requires improvements cycles networks such as those included in the scheme. Therefore, the Proposed Scheme is aligned with the NDP.

3.2.3 Draft National Investment Framework for Transport in Ireland (NIFTI) (2021)

The draft National Investment Framework for Transport in Ireland (NIFTI) (Department of Transport, 2021) was recently published by the Department of Transport (DTTS) for public consultation in March 2021. The purpose of the NIFTI is to support the delivery of the Project Ireland 2040 NPF and NDP by providing a strategic framework for future transport investment that is aligned with their spatial objectives and the National Strategic Outcomes

(NSOs). The NIFTI has been developed to ensure decision making in land transport investment enables the NPF, supports the Climate Action Plan, and promotes positive social, environmental, and economic outcomes throughout Ireland. NIFTI establishes four investment priorities and objectives, of which new projects must align with at least one:

- Decarbonisation;
- Protection and Renewal;
- Mobility of People and Goods in Urban Areas; and
- Enhanced Regional and Rural Connectivity.

The development of BusConnects is aligned with Project Ireland 2040, and by extension the NIFTI. The principle of the overall BusConnects programme aligns with at least three of the NIFTI investment priorities; protecting and renewing Dublin's public transport network, enabling better mobility for people across the Dublin City-region, and supporting the decarbonisation of Dublin's transport network.

3.2.4 Smarter Travel: A Sustainable Transport Future (2009 – 2020)

Smarter Travel: A Sustainable Transport Future (2009 – 2020) (DTTS, 2019) presents an overall policy framework for sustainable transport in Ireland. The policy sets out a vision, goals and targets to be achieved, and outlines 49 actions that form the basis for achieving a more sustainable transport future. The relevant parts of this policy to the BusConnects scheme are set out in Chapter 4 and 5, as follows:

> *Chapter 4: Actions to Encourage Smarter Travel: 'Action 4 - The delivery of public transport, cycling and promotion of more sustainable travel patterns generally in many existing urban centres can only be achieved through retrofitting. We will require local authorities to prepare plans to retrofit areas towards creating sustainable neighbourhoods so that walking and cycling can be the best options for local trips, for example to reach local facilities such as shops and schools.'*
>
> *Chapter 5: Actions to Deliver Alternative Ways of Travelling: 'Action 12 - Implement more radical bus priority and traffic management measures to improve the punctuality and reliability of bus services and to support more efficient use of bus fleets. This may involve making some urban streets car-free, creating tram-like priorities in others and making greater use of roads/hard shoulders by buses.'*

The Proposed Scheme will support these actions in providing improvements to pedestrian and cycle amenities along the proposed route, whilst also providing greater reliability for road-based public transport.

3.2.5 National Cycle Policy Framework

In support of the Smarter Travel Policy, the National Cycle Policy Framework (NCPF) (DTTS, 2009) was adopted by Government in 2009 and includes the following statements and commitments, as stated in the Executive Summary:

> *'The mission is to promote a strong cycling culture in Ireland. The vision is that all cities, towns, villages and rural areas will be bicycle friendly. Cycling will be a normal way to get about, especially for short trips. Cycling contributes to improved quality of life and quality of the public realm, a stronger economy and business environment, and an enhanced environment. A culture of cycling will have developed in Ireland to the extent that 10% of all trips will be by bike by 2020.'*

Objective 2 of the NCPF is to *'ensure that the urban road infrastructure (with the exception of motorways) is designed / retrofitted so as to be cyclist-friendly and that traffic management measures are also cyclist friendly.'* This involves junction treatment and traffic management, including combined bus and cycle priority measures.

The Proposed Scheme supports the objectives of the NCPF through the provision bus and cycle priority measures.

3.2.6 Statement of Strategy (2016 – 2019)

The Statement of Strategy (Department of Transport, Tourism and Sport (DTTS), 2019) is the DTTS's primary strategic plan and sets out the key priorities for the period 2016 – 2019. It details the Government's high-level goals and objectives, providing the framework for more detailed planning and individual performance management. The strategy mission is:

> *'to shape the safe and sustainable development of transport, tourism, and sport, to support economic growth and social progress.'*

DTTS's high level goal for land transport is:

> *'to best serve the needs of society and the economy through safe, sustainable and competitive transport networks and services.'*

This will be sought with an emphasis on:

- Safety;
- Enhancing services;
- Facilitating and promoting more sustainable forms of transport, including walking and cycling;
- Achieving value-for-money; and
- Promoting sound governance.

The Proposed Scheme will contribute to improved road safety through improvement works at key junctions and upgrades to the pedestrian and cyclist infrastructure along the proposed route. The Proposed Scheme will enhance bus, walking and cycling services which will, in turn, facilitate and promote travel by these modes.

3.2.7 Road Safety Strategy

The Road Safety Strategy 2021– 2030 (RSA 2021) works towards achieving 'Vision Zero' which is to achieve the long term goal of eliminating deaths and serious injuries in road traffic collisions by 2050. The strategy '*involves the promotion of the safer modes (e.g., public transport, such as bus and rail travel), and the promotion and provision of safe road environments for otherwise healthy, active modes. This includes walking and cycling, where the risks of death and serious injury in the event of a collision are higher than for protected in-vehicle road users*.'

The Road Safety Strategy acknowledges that '*The promotion and increased uptake of public transport can greatly contribute to fatality and serious injury reductions over the course of the 2021-2023 strategy'*. It continues '*The substantial societal benefits of increased active travel (i.e. walking or cycling) must also be acknowledged in light of Ireland's climate objectives, including reduced emissions, traffic congestion and noise pollution, and increased physical activity and its related health benefits*.'

A key action of Phase 1 of the strategy, during the 2021 – 2025 period is to '*construct 1,000km of segregated walking and cycling facilities to provide safe cycling and walking arrangements for users of all ages'.*

The Proposed Scheme will provide the infrastructure necessary to facilitate a public transport network which the Strategy acknowledges is a 'safer mode' of travel.

The Proposed scheme will contribute to improved road safety through improvement works at junctions and upgrades to the pedestrian and cycling infrastructure along the route. The Proposed Scheme provides for significant additional segregation between active travel users and the public road to help enhance safety.

3.2.8 Building on Recovery: Infrastructure and Capital Investment (2016-2021)

The Capital Plan (Department of Public Expenditure and Reform, 2015) presented the findings of a Government-wide review of infrastructure and capital investment policy and outlined the Government's commitment to ensuring that the country's stock of infrastructure is capable of facilitating economic growth. The plan identifies the need to improve public transport facilities noting:

'It is therefore essential that road, rail and public transport networks are developed and maintained to the standard required to ensure the safe and efficient movement of people and freight. In addition, getting people out of cars and onto public transport has a key role to play in reducing Ireland's carbon emissions, by providing a viable, less polluting alternative to car and road transport for many journeys.'

The transport capital allocation in the plan is largely framed by the recommendations and priorities set out in the 2015 DTTS Strategic Investment Framework for Land Transport, which centre on:

- Maintaining and renewing the strategically important elements of the existing land transport system;
- Addressing urban congestion; and
- Maximise the contribution of land transport networks to our national development.

The Capital Plan key objective is to provide €3.6 billion of Public Transport Investment including further upgrading of Quality Bus Corridors. The Proposed Scheme is consistent with these recommendations, priorities and objectives as set out in the DTTS investment framework, and the Capital Plan.

3.2.9 The Sustainable Development Goals National Implementation Plan (2018 – 2020)

In September 2015, 'Transforming Our World, the 2030 Agenda for Sustainable Development (the 2030 Agenda)' was adopted by all 193 Members States of the United Nations (UN).

The 2030 Agenda aims to deliver a more sustainable, prosperous, and peaceful future for the entire world, and sets out a framework for how to achieve this by 2030. This framework is made up of 17 Sustainable Development Goals (SDGs) which cover the social, economic and environmental requirements for a sustainable future which are shown in Diagram 3.1.

Diagram 3.1: The 17 Sustainable Development Goals

The Sustainable Development Goals National Implementation Plan (Department of the Environment, Climate and Communications, 2018) is in direct response to the 2030 Agenda for Sustainable Development and provides a whole-of-government approach to implement the 17 Sustainable Development Goals (SDGs) above.

The Plan also sets out 19 specific actions to implement over the duration of this first SDG National Implementation Plan. The BusConnects scheme aligns with Goals 9 and 11 as they include the following targets:

'Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation: Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including

regional and transborder infrastructure, to support economic development and human wellbeing, with a focus on affordable and equitable access for all.'

'Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.'

The above goals align with the aim of the Proposed Scheme.

3.2.10 Climate Action Plan

The Climate Action Plan (CAP) 2023 (Government of Ireland 2023) is the second update to Irelands CAP 2019 and was launched on the 21st December 2022. The 2023 CAP sets out the sectoral emissions ceilings and the implementation of carbon budgets. The CAP is a roadmap to deliver a halving of Irelands emissions by 2030.

The transport sector has an aim of a 50% reduction in emissions by 2030. The 'Avoid' (reduce or avoid the need for travel – land use planning), 'Shift' (Shift to more environmentally friendly modes – public transport, active travel), 'Improve' (Improve the energy efficiency of vehicle technology- vehicle efficiency, clean fuels) approach has been adopted to help achieve these targets. CAP 2021 targets have been updated to include '*a 20% reduction in total vehicle kilometres, a reduction in fuel usage, and significant increases to sustainable transport trips and modal share'*

Section 15.2.2 'Recalibration of the Decarbonisation Pathway for Transport' states that the NTA Modelling team revalidated and recalibrated the decarbonisation pathway for CAP21. It goes on to say that this exercise *'identified additional measures to delivering 50% emissions abatement by 2030.'* It further outlines that: *'The range of measures modelled includes known public transport schemes as set out in the National Development Plan (NDP);* (inter alia) *further acceleration of road space reallocation towards public and active travel modes; car-free urban centres'.*

Section 15.3.3 '*Avoid and Shift'* sets out the following:

'Greater prioritisation and reallocation of existing road space towards public transport and active travel will be a key supporting element for the new DMS. This already forms a crucial element of the BusConnects programme in each of our five cities. It is also a key recommendation from the OECD's Redesigning Ireland's Transport for Net Zero report.'

Section 15.3.3 '*Shift'* outlines the following in regard to '*Major Public Transport Infrastructure Programme':*

'*Key milestones have already been achieved on major infrastructural projects, including BusConnects in each of our 5 cities and the Greater Dublin Area's DART+ Programme and Metrolink, which will continue to be progressed through public consultations and the planning systems.'*

Table 15.7 *'Key Actions to Deliver Abatement in Transport for the Period 2023-2025'* includes under the measure *'Major Public Transport Infrastructure Programme'* and the heading *'Shift'* (inter alia) '*Advance BusConnects programme in 5 cities'* under the actions for 2023, 2024 and 2025.

The delivery of the Proposed Scheme will provide the transport infrastructure required to deliver sustainable transport options that will support the key actions set out in the Climate Action Plan 2023. The Proposed Scheme will expand, enhance and connect to pedestrian and cycle networks and will assist in facilitating modal shift. It is clear that the targets set out within CAP 2023 are closely linked to the delivery of key transport infrastructure projects, such as the BusConnects Programme and therefore the Proposed Scheme.

3.3 Regional Policy

3.3.1 Greater Dublin Area Transport Strategy 2022 – 2042

The Transport Strategy for the Greater Dublin Area 2022-2042 (NTA 2022) (hereafter described as the GDA) was published for consultation on the 9 November 2021. It was adopted in January 2023 and replaces the previous Transport Strategy for the Greater Dublin Area 2016-2035. The overall aim of the strategy is '*To provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports the regional economy'.* A key focus of the strategy is to enable increased use of other transport modes to meet environmental, economic and social objectives related to emissions, congestion and car dependency. It sets a clear direction towards a 50% reduction in CO_2 emissions within the GDA area by 2030.

Section 1 'Introduction' reaffirms that '*Investment in bus priority and bus service improvements – BusConnects Dublin'* is a '*Major Project provided for in the strategy'*.

The NTA priorities are set out, as follows:

1. 'Priority 1. '*Undertake strategic transport planning seeking the optimal alignment of land use and transport policy and practice, enabling an increased proportion of travel by sustainable transport modes'*;
2. Priority 2. '*Promote the use of more sustainable modes of transport'*; and
3. Priority 3. '*Implement an effective infrastructure investment programme that delivers sustainable and public transport infrastructure in a cost effective manner*.'

Section 9.3 'International Gateways' comments that: '*This strategy incorporates MetroLink, BusConnects Dublin and demand management measures which will enhance and protect essential access to Dublin Airport and ensure that it will operate in a sustainable fashion in terms of landside transport.*'

Section 9.4 'Design and Planning of Schemes' sets out: *'In designing and planning transport infrastructure schemes, it can be tempting for agencies, stakeholders and the public to focus on the one primary objective of the scheme, without giving due attention to the myriad other aspects which need to be considered and the wider benefits which may accrue. Examples of this include the step-change in the quality of the cycle network proposed as part of BusConnects Dublin'*

Section 9.5.2 'Major Interchange Facilities/Mobility Hubs' references that '*Under BusConnects Dublin, a number of interchanges are currently in development and as the DART+ and light rail projects currently being designed are progressed, additional facilities will be developed.'* It further comments that *'Dublin Airport also comprises a major interchange facility with multiple bus services converging at this location, as well as a major taxi facility. This interchange will be enhanced through the delivery of MetroLink and improved local and orbital bus services as part of BusConnects.'* It continues at section 9.5.3 in regard to *'Other Interchanges'* that *' With the introduction of significantly enhanced orbital bus services as part of BusConnects Dublin, it is anticipated that the role of interchange will increase*.'

There is added emphasis on the delivery of public transport, active travel and enhanced accessibility to sustainable modes of transport in the GDA, all of which the Proposed Scheme will help to deliver.

3.3.2 Greater Dublin Area Cycle Network Plan

The Greater Dublin Area Cycle Network Plan (National Transport Authority (NTA), 2013) was adopted by the NTA in early 2014 following a period of consultation with the public and various stakeholders. This plan forms the strategy for the implementation of a high quality, integrated cycle network for the Greater Dublin Area. This involved the expansion of the urban cycle network from 500km to 2,480km comprising a mixture of cycle tracks and lanes, cycle ways and infrastructure-free cycle routes in low traffic environments. Within the urban network, this would consist of a series of routes categorised as follows:

- **Primary**: Main cycle arteries that cross the urban area and carry most cycle traffic – target quality of service (QoS) of two abreast + overtaking width = 2.5m;

- **Secondary**: Link between principle cycle routes and local zones – target QoS of single file + overtaking width = 1.75m; and

- **Feeder:** Cycle routes within local zones and/or connection from zones to the network levels above.

During the course of the analysis carried out to identify the preferred core bus corridors for the BusConnects scheme, the provision of these cycle routes was considered at all stages. Therefore, as part of the analysis, any upgrading of infrastructure to provide bus priority also provides cycling infrastructure, where practical, to the appropriate level and quality of service (as defined by the NTA National Cycle Manual) required for primary and secondary cycle routes.

The revised GDACNP 2022 forms part of the GDA Transport Strategy (as adopted in January 2023) and is a component of the transport strategy.

The 2022 GDACNP is a review of the 2013 plan to ensure a fit for purpose cycle network for all users and trip types. The network comprises of the following routes:

- Primary;
- Secondary;
- Feeder;
- Greenway; and
- Inter-urban.

It aims for 322km of Primary cycle network, 1,060 Secondary cycle network and 954km of Greenway routes.

The Greater Dublin Area Transport Strategy 2022, sets out Measure CYC1 - GDA Cycle Network which outlines the following:

'It is the intention of the NTA and the local authorities to deliver a safe, comprehensive, attractive and legible cycle network in accordance with the updated Greater Dublin Area Cycle Network.'

By enhancing cycling facilities, the Proposed Scheme accords with the Greater Dublin Area Cycle Network Plan.

3.3.3 Regional Spatial and Economic Strategy for the Eastern and Midlands Region (2019-2031)

A Regional Spatial and Economic Strategy (RSES) is a strategic plan and investment framework to shape future growth and to better manage regional planning and economic development throughout the region.

The RSES (Eastern and Midland Regional Assembly, 2019) builds on the foundations of Government policy in Project Ireland 2040, which combines spatial planning with capital investment, and has been prepared from an extensive bottom up consultation process. It is an integrated cohesive policy document that provides a Spatial Strategy to manage future growth in the region. It identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives.

The region includes three subregions or Strategic Planning Areas (SPAs), namely the Midland, Eastern and Dublin SPAs, as shown in Diagram 3.2.

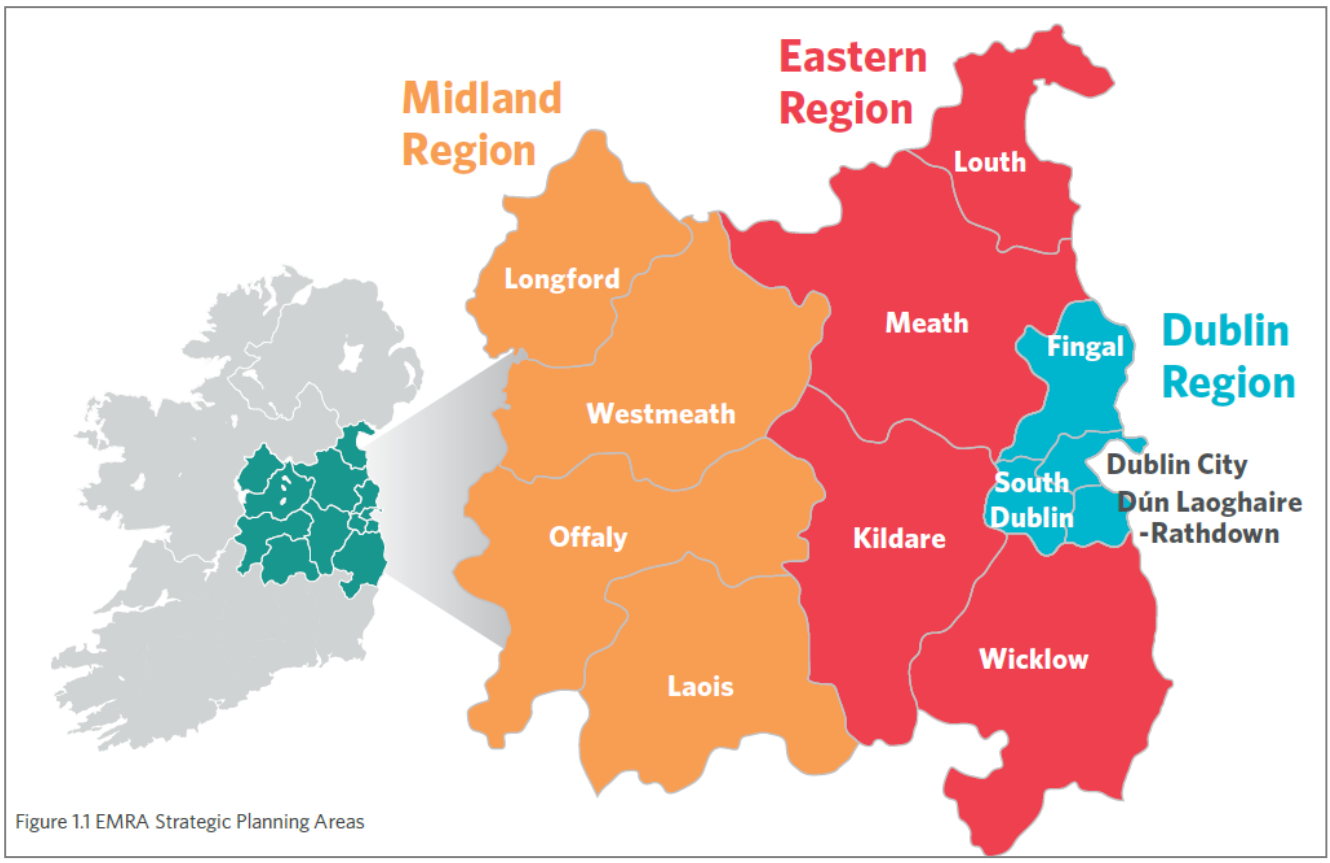

Diagram 3.2: RSES Planning Areas

Dublin City and suburbs is considered in the context of the Dublin Metropolitan Area Strategic Plan (MASP) and is dealt with in greater detail in Chapter 5 of the RSES. The principles underpinning the development of the MASP include the effective integration of transport planning with spatial planning policies, from regional down to local level and the alignment of associated transport and infrastructure investment priorities. The national policy in metropolitan areas is to increase sustainability through greater alignment of land use and transport.

The RSES highlights the BusConnects scheme as a key transport infrastructure investment in the metropolitan area as set out in national policy. The MASP Sustainable Transport Regional Policy Objectives (RPO) are:

> *'RPO5.2: Support the delivery of key sustainable transport projects including Metrolink, DART and LUAS expansion programmes, BusConnects and the Greater Dublin Metropolitan Cycle Network and ensure that future development maximises the efficiency and protects the strategic capacity of the metropolitan area transport network, existing and planned.'*
>
> *'RPO 8.9: The RSES supports delivery of the bus projects…subject to the outcome of appropriate environmental assessment and the planning process.'*

Table 3.1: Extract from RSES RPO8.9 – Bus Projects for the Region

Extract from RSES RPO8.9 (Table 8.3: Bus Projects for the Region)
Core Bus Corridors comprising 16 radial routes and 3 orbital routes in Dublin
Regional Bus Corridors connecting the major regional settlements to Dublin
Dublin Metropolitan Bus Network Review
Network reviews for the largest settlements across EMRA, with a view to providing local bus services
Review of bus services between settlements

Extract from RSES RPO8.9 (Table 8.3: Bus Projects for the Region)
Review of local bus services throughout EMRA, including services to small towns and villages and the rural transport programme
New interchange and bus hub facilities
New fare structures
Enhances passenger information
Improvements to bus waiting facilities
Integrated time tabling of bus and rail into a coherent national and regional network

The RSES highlights the wider BusConnects proposals as a project, given that the Proposed Scheme fall within this it can be considered to be aligned with it.

3.3.4 Dublin City Council Development Plan (2022 – 2028)

The 2022 – 2028 DCDP (DCC, 2022) was adopted on the 2nd of November 2022 and came into effect on the 14th of December, it guides how the city will develop to meet the needs of its residents, visitors and workers. The vision for the city is:

The vision of the DCDP is to establish champion compact city living, distinct character, a vibrant culture, and a diverse, smart, green, innovation-based economy. DCC aims to establish the city as one of Europe's most sustainable, dynamic, and resourceful city regions. The DCDP places sustainable transport as a core principle in the future development of the city:

> *'Within the next 10 years, Dublin will have an established international reputation as one of Europe's most sustainable, dynamic and resourceful city regions. Dublin, through the shared vision of its citizens and civic leaders, will be a beautiful, compact city, with a distinct character, a vibrant culture and a diverse, smart, green, innovation-based economy. It will be a socially inclusive city of urban neighbourhoods with excellent community and civic infrastructure based on the principles of the 15 minute city, all connected by an exemplary public transport, cycling and walking system and interwoven with a high quality bio-diverse, green space network. In short, the vision is for a capital city where people will seek to live, work, experience, invest and socialise, as a matter of choice.'*

In 'Translating the Core Strategy into Development Plan Policies and Objectives', the core strategy has the following supports:

> *'The Core Strategy will promote development and appropriate intensification along the routes of the three key public transport projects to be developed over the development plan period comprising Bus Connects (2021 – 2023)'*

The DCDP recognises that increasing capacity on public transport including bus corridors is a means to promoting modal change and active travel.

Policy SMT1 Modal Shift and Compact Growth states ' *To continue to promote modal shift from private car use towards increased use of more sustainable forms of transport such as active mobility and public transport, and to work with the National Transport Authority (NTA), Transport Infrastructure Ireland (TII) and other transport agencies in progressing an integrated set of transport objectives to achieve compact growth.'*

Policy SMT16 Walking, Cycling and Active Travel states, ' *To prioritise the development of safe and connected walking and cycling facilities and prioritise a shift to active travel for people of all ages and abilities, in line with the city's mode share targets*.'

SMT22 goes on to state the support of delivering key sustainable transport projects such as BusConnecs to help provide an integrated public transport network with efficient interchange between transport modes is key. It is therefore clear that BusConnects and the delivery of same is an important objective of the DCDP. The DCDP fully

supports the BusConnects Programme of works and its policy/objectives are aligned with the Proposed Scheme. The Proposed Scheme will deliver the infrastructure necessary to provide a sustainable transport system, to support the enhancement and growth of the cycle and pedestrian network and achieve a modal shift.

3.3.5 Dublin City Centre Transport Study

The National Transport Authority (NTA) and Dublin City Council (DCC) published a set of proposals to enhance overall movement in Dublin City Centre and to improve the attractiveness of the city centre for shoppers, tourists, workers, and residents.

The Transport Study (DCC and NTA, 2016) has been developed as an input into the Dublin City Development Plan (DCDP) 2016-2022 and sets down a framework for how Dublin City's transport network can be redefined to cater for this increased demand, by better utilising the existing infrastructure available, and by moving towards a more sustainable and efficient use of the public realm within the city centre.

The key objectives of the Transport Strategy are to:

1) Protect the investment that has been, and continues to be made in public transport across the city;
2) Guarantee the future development potential of the City Centre, and improve confidence in the ability of the City Centre to be the key focus of future investment;
3) Increase the capacity, reliability and use of public transport into and within the City Centre;
4) Improve the quality of service for cycling and walking, with particular emphasis on the 'core' City Centre;
5) Ensure that the city develops in a way which will provide a better living and working environment for residents and visitors alike; and,
6) Provide an agreed framework for continued transport investment within the City Centre.

The Proposed Scheme directly contributes towards achieving objectives 3 and 4 of the Transport Strategy.

3.4 Local Policy

3.4.1 South Dublin County Development Plan (2022 – 2028)

The South Dublin County Development Plan (SDCDP) (South Dublin County Council, 2022) sets out the land use framework to guide future development with a focus placed on the places of residence, the places of work, and how people interact and move between these places while protecting the environment. The aim is to progress to a more sustainable development pattern for South Dublin in the immediate and long-term future up to 2040 and beyond.

SDCDP covers the administrative area of South Dublin County, which is 223 sq. kilometres in extent, as shown in Diagram 3.3. The County extends from the River Liffey to the Dublin Mountains and borders the administrative areas of Dublin City, Fingal, Dun Laoghaire Rathdown, Wicklow and Kildare.

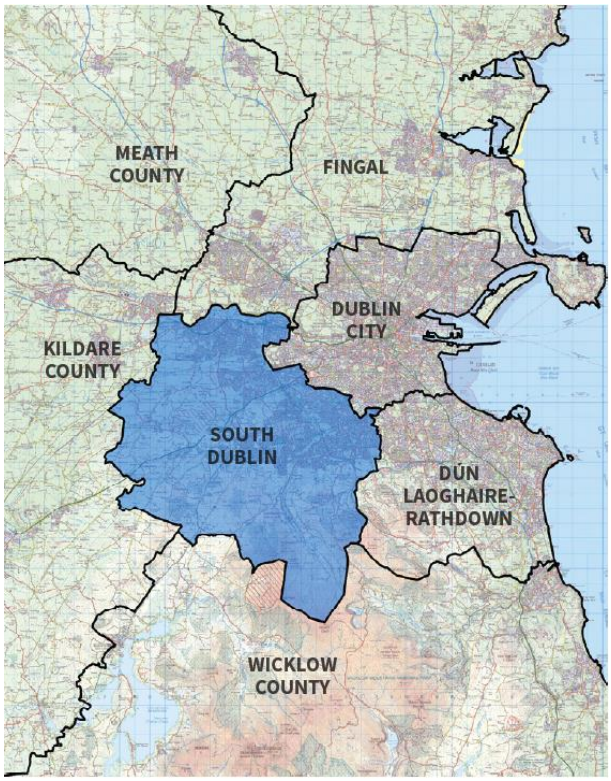

Diagram 3.3: South Dublin Regional Context

The Plan sets out in Chapter 7 (Sustainable Movement) that the key transport vision is to *'Increase the number of people walking, cycling and using public transport and reduce the need for car journeys, resulting in a more active and healthy community, a more attractive public realm, safer streets, less congestion, reduced carbon emissions, better air quality, and a positive climate impact'.*

The overarching Transport and Movement policy (SM1) is to promote ease of movement within, and access to South Dublin by *'integrating sustainable land-use planning with a high-quality sustainable transport and movement network for people and goods.'* The policy includes a transition to more sustainable travel modes including walking (15% target mode share), cycling (10% target mode share) and public transport (25% target mode share).

In line with the overarching policy, '*SM1 Objective 3'* states the requirement: *'To support the delivery of key sustainable transport projects including DART and Luas expansion programmes, BusConnects and the Greater Dublin Metropolitan Cycle Network in accordance with RPO 5.2 of the RSES/MASP.' (Emphasis Added).*

Policy SM2 Walking and Cycling, notes the need to *'re-balance movement priorities towards more sustainable modes of transportation by prioritising the development of walking and cycling facilities and encouraging a shift to active travel for people of all ages and abilities.'*

Policy SM3 Public Transport, notes the need to *'promote a significant shift from car-based travel to public transport in line with County targets and facilitate the sustainable development of the County by supporting and guiding national agencies in delivering major improvements to the public transport network.'*

The BusConnects scheme is featured within this document, as a key programme to improve public transport, ensure safe cycling facilities and address climate change: '*Transition to public transport will be aided by improvements in the pipeline including the roll-out of BusConnects which will include proposals for six new dedicated bus routes through the County. BusConnects will provide a redesigned more efficient bus network with high frequency spines, new orbital routes and increased bus services.'*

The Proposed Scheme satisfies this aspiration and thus can be considered to align with the SDCDP 2022-2028.

3.4.2 Local Area Plan for the Liberties Area (2009)

The Local Area Plan (LAP) is a statutory document that acts according to requirements set out in the Planning & Development Act of 2000 and the related Amendment of 2002.

The Liberties LAP (Dublin City Council, 2009) is bounded by the River Liffey to the north, R137 Patrick Street to the east and St. James Hospital to the west. To the south the LAP covers the R110 Cork Street and extends to include Brown St S, Oscar Square, Mill Street and Fumbally Lane. The Liberties LAP outlines the development opportunities up to 2020 for the western segment for the inner-city including those for regeneration and required infrastructure improvements. Overarching objectives of LAP which are of relevance to the Proposed Scheme include the following:

- To provide for appropriate social and community infrastructure to support the existing population, which is growing and becoming increasingly diverse;
- To promote the principles of good urban design including improving connectivity and enhancing the legibility and permeability of the Liberties in relation to the wider cityscape
- To create a high-quality network of public spaces, parks and streets;
- To promote sustainable modes of transport by making them convenient and attractive including walking and cycling routes and by facilitating the provision of public transport infrastructure and optimising its use; and
- To encourage environmental sustainability by improving biodiversity, facilitating recycling, and minimizing the use of non-renewable resources including energy.

Critically, the LAP identifies a vision where convenient and reliable public transport is the main mode of transportation for the area with the Proposed Scheme being supportive in that regard.

3.4.3 Tallaght Town Centre Local Area Plan (2020)

The purpose of the LAP is to provide a strategic framework for sustainable development in Tallaght Town Centre. The area is home to a number of major institutions, alongside economic clusters. The main vision of the plan is for the LAP to create :

"An inclusive and vibrant Town Centre, a connected and accessible place with an attractive built environment for families of all kinds, workers, visitors and tourists. A place where people can live, work, visit and have fun in lively and liveable spaces."

In order to support the vision, the plan recognises the need to provide cycling and pedestrian links within the town centre, alongside enhanced bus services across the town centre. The objectives in the LAP which are of relevance to the Proposed Scheme include the following:

- Delivery a network of connected neighbourhoods - To provide a vision for each of the neighbourhood areas and provide guidance on future building form in these areas, in terms of land use, building frontage, access and movement, green infrastructure and building height; and
- Mitigate climate change - To create walkable neighbourhoods, green the urban area and place energy efficiency at the heart of new building design.

The plan notes that walking and cycling should be encouraged through upgrading the network, and cycle priority. The plan supports maximising public transport use through new opportunities such as those associated with the Proposed Scheme. The plan notes it is committed to supporting the Bus Connects project.

3.4.4 Naas Road Lands Local Area Plan (2013)

The Naas Roads lands have been identified as a strategically significant area for improved integration, currently considered a 'gateway' to the city. The strategic location of the lands to the south west of Dublin city centre, allows good transport links to the city centre and Tallaght. The key objective in the LAP relevant to the Proposed Scheme as noted as follows:

" To deliver a quality movement and access infrastructure that prioritises public transport, cyclists and pedestrians while managing an appropriate role for the car."

The existing road network is noted to be congested, hence the LAP encouraging movement by public transport, cycling and walking and acknowledges the need to redesign the road network and provide new public transport facilities. The LAP specifically mentions Walkinstown Avenue as having strong potential for a new bus corridor, tying in the with Proposed Scheme route. In addition, a key objective is noted as creating new pedestrian and cycle links connecting Naas Road, Drimnagh and improved links on Walkinstown Avenue and Long Mile Road. This supports the Proposed Scheme design.

3.5 Legislation

There is no legislation specifically relevant to this TIA.

4. Assessment Methodology

This chapter of the TIA details the methodologies used to assess the impacts of the Proposed Scheme on the receiving transport environment.

The assessment of the Proposed Scheme in relation to the baseline transport environment required a qualitative assessment of changes to the transport environment, as well as quantitative analysis undertaken using a suite of multi-modal transport modelling tools which have been developed for the Proposed Scheme.

The assessment of traffic and transport benefits and impacts of the Proposed Scheme required an approach which provided information on, for example, the mode share changes along the route, people movement by different modes of transport travelling along the corridor as well as traffic re-routing impacts on the surrounding road network. The approach required an assessment of bus, pedestrian and cycle operations and bus reliability with a focus on the movement of people along the route.

The traffic and transport impact assessments have been undertaken in accordance with the 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA 2022), the 'Traffic and Transport Assessment Guidelines' (TII 2014), the National Cycle Manual (NTA 2011) and the UK Design Manual for Roads & Bridges (DMRB) Environmental assessment and monitoring (formerly HA 205/08, HD 48/08, IAN 125/15, and IAN 133/10), LA104 Revision 1 (Highways England, 2020). A range of transport modelling tools which sit within the framework of the NTA's Eastern Regional Model (ERM) have been used.

Where relevant a Level of Service (LoS) has been derived for each mode of travel. The benefits of this approach are outlined subsequently.

4.1 Data Collection and Collation

The TIA has two distinct parts, qualitative methods which consider the physical changes to transport networks and quantitative assessments which are based upon outputs from the transport modelling. The following sections describe the data collection and collation for each method of assessment.

4.1.1 Qualitative Assessment Data Collection

This section discusses the data collection undertaken to inform the qualitative assessment metrics set out in Section 4.2 and Section 6.

4.1.1.1 Site Surveys

A walkover of the route of the Proposed Scheme was undertaken to ensure an up-to-date record of the existing environment was used to complete the qualitative assessment. The surveys focussed on the following aspects which are relevant to the assessment:

- Provision for the movement of pedestrians, cyclists and vehicles;
- Location of, and facilities at, bus stops; and
- Current parking and loading facilities.

These surveys were supplemented by specially commissioned aerial photography along the full length of the Proposed Scheme.

4.1.1.2 Mapping Data

Three sources of mapping data have been used to inform the analysis, Ordnance Survey Mapping (OSM), NavStreets and OpenStreet Map.

OSM is created by Ordnance Survey Ireland which provides detailed mapping for a variety of uses. For the Traffic and Transport Chapter OSM has been used to establish accurate road naming and the location of physical highway features.

NavStreets is a street-level GIS dataset which covers the Republic of Ireland, including the Greater Dublin Area. Two sets of data from this dataset have been used to inform the EIAR:

- Road Network: Functional Class of each road link in the road network, which is a road type indicator, reflecting traffic speed and volume, as well as the importance and connectivity of the road. The Functional Class information has been used to help inform the metrics for identifying the sensitivities of roads in the indirect study area.
- Points of Interest: NavStreets contains information on a wide range of "points of Interest". This has been referred to when identifying sensitive community receptors, such as schools, healthcare facilities, places of worship, retail clusters, etc, when determining how sensitive a particular location is to changes in terms of traffic and transport facilities.

OSM and NavStreets have been supplemented by OpenStreet Map which is an open-source database of geographic data (i.e. Points of Interest, Land Use and Places of Worship). This has been used to further identify community facilities and open spaces in proximity to the Proposed Scheme.

4.1.2 Quantitative Assessment Data Collection

The following chapter provides an overview of the data collection exercise undertaken to facilitate the calibration and validation of the Local Area Model (LAM), Proposed Scheme micro-simulation and junction models. Existing data sources were reviewed to identify available traffic counts and locate gaps in observed information across the model area. This review was used to define a specification for additional counts which were commissioned for the area. The combination of new commissioned counts, and existing available information, provided a comprehensive dataset for calibration and validation.

This section discusses the data collection undertaken to inform the quantitative assessment metrics set out in Section 6. Further detail can be found in TIA Appendix 1 (Transport Modelling Report).

4.1.2.1 Existing Data Review (Gap Analysis)

A review of existing traffic survey data available for the model area was undertaken from the following sources:

- NTA Traffic Count Database: A mixture of Automatic Traffic Counts (ATC) and Junction Turning Counts (JTC) from previous studies covering a range of years; and
- TII Automatic Traffic Counters (ATCs): Permanent TII ATCs located on national strategic roads across the network with data publicly available online.

The NTA, Dublin City Council and the other local authorities undertake periodic counts within their administrative areas in connection with their own local schemes. These surveys are conducted throughout the year and a limited set of data was available within the area of the Proposed Scheme.

Information on bus passenger volumes was already available and included in the modelling process as part of the ERM base model calibration and validation, which includes the annual canal and M50 cordon counts as well as ticketing data.

4.1.2.2 Commissioned Traffic Survey Data

Due to the scale of the Proposed Scheme, a full set of consistent up to date traffic counts for a neutral period e.g. November / February when schools, colleges were in session was completed for the Proposed Scheme. Traffic surveys were undertaken in November / December 2019 (Pre COVID- 19) with the surveyed counts used as inputs to the model calibration and validation process of the strategic model and micro-simulation model. The two types of counts used in the study are Junction Turning Counts (JTCs) and Automatic Traffic Counts (ATCs).

The various components of traffic have different characteristics in terms of operating costs, growth and occupancy. The surveys used the most common vehicle categories, as defined in the COBA (Cost Benefit Analysis) Manual:

- Cars: Including taxis, estate cars, 'people carriers' and other passenger vehicles (for example, minibuses and camper vans) with a gross vehicle weight of less than 3.5 tonnes, normally ones which can accommodate not more than 15 seats. Three-wheeled cars, motor invalid carriages, Land

Rovers, Range Rovers and Jeeps and smaller ambulances are included. Cars towing caravans or trailers are counted as one vehicle unless included as a separate class;

- Light Goods Vehicles (LGV): Includes all goods vehicles up to 3.5 tonnes gross vehicle weight (goods vehicles over 3.5 tonnes have sideguards fitted between axles), including those towing a trailer or caravan. This includes all car delivery vans and those of the next larger carrying capacity such as transit vans. Included here are small pickup vans, three-wheeled goods vehicles, milk floats and pedestrian controlled motor vehicles. Most of this group is delivery vans of one type or another;
- Other Goods Vehicles (OGV 1): Includes all rigid vehicles over 3.5 tonnes gross vehicle weight with two or three axles. Also includes larger ambulances, tractors (without trailers), road rollers for tarmac pressing, box vans and similar large vans. A two or three axle motor tractive unit without a trailer is also included;
- Other Goods Vehicles (OGV 2): This category includes all rigid vehicles with four or more axles and all articulated vehicles. Also included in this class are OGV1 goods vehicles towing a caravan or trailer; and
- Buses and Coaches (PSV): Includes all public service vehicles and work buses with a gross vehicle weight of 3.5 tonnes or more, usually vehicles with more than 16 seats.

An overview of the commissioned data is provided Table 4.1.

Table 4.1: Survey Overview

Survey Type	Company	Number	Date
JTC	NATIONWIDE	58	Thu 28/11/2019
ATC	NATIONWIDE	17	17/11/2019 - 1/12/2019

The JTCs are 24-hour counts broken down into 15-minute segments over a full day. All main junctions along the Proposed Scheme have been included and provide information on the volume, and types of vehicles, making turning movements at each location. This data is utilised within the models to ensure that the flow of vehicles through the main junctions on the network is being represented accurately.

The ATCs were taken for an entire week. The vehicle categories surveyed are motorcycles, cars, LGVs, OGV 1, OGV 2 and PSVs. The ATC data provides information on:

- The daily and weekly profile of traffic along the Proposed Scheme; and
- Busiest time periods and locations of highest traffic demand on the network.

Summary information related to the JTCs and ATCs collected for the Proposed Scheme is shown in Section 0.

4.1.2.3 Road and Bus Journey Time Data

4.1.2.3.1 Bus Journey Time Data

Bus Journey time data for the Proposed Scheme was provided by the NTA from the Automatic Vehicle Location (AVL) dataset used to monitor bus performance. The data provides information on bus travel time and dwell times at existing bus stops and has been used to inform the development of the transport models used to assess the impacts of the Proposed Scheme.

4.1.2.3.2 TomTom Road Journey Time Data

Road Journey time data for the Proposed Scheme models has been sourced from TomTom, who calculate journey times using vehicle position data from GPS-enabled devices and provide this on a commercial basis to a number of different users. The NTA purchased a license to access the Custom Area Analysis dataset through the TomTom TrafficStats portal. The NTA has an agreement with TomTom to provide anonymised travel time information covering six areas of Ireland and for certain categories of road.

Data is provided based on the area specified by the agreement; however, the date and time range of the data can be specified by the user. For the development of the strategic model and micro-simulation models the following query on the data was applied:

- 2019 weekdays (Monday to Thursday) from mid-January until end of November, excluding all bank holidays and days close to those dates.

The data is provided in the form of a GIS shapefile and accompanying travel time database file. The shapefile contains topographical details for each road segment, which is linked to the travel time database via a unique link ID. The database file then contains average and median travel time, average and median speed, the standard deviation for speed, the number of observations and percentile speeds ranging from 5 to 95 for each link.

4.1.2.3.3 TomTom Data Processing

In order to compare the journey times of specific links and routes between the TomTom data and the road assignment models developed for the Proposed Scheme, the two datasets were linked. After importing both the road assignment model and TomTom networks into the GIS environment, ensuring both datasets are in the same coordinate system, the selected routes were then be linked using a spatial join functionality.

Before applying the data to the models, it was checked to ensure that it was fit for purpose. The review included checks of the number of observations that form the TomTom average and median times and checks of travel times against Google Maps travel times.

The TomTom Custom Area Analysis dataset was processed to provide observed journey times against which the LAM and micro-simulation model could be validated along the Proposed Scheme.

4.1.2.3.4 TomTom Data Application

The processed journey time data was used to validate the LAM and the micro-simulation models at an end-to-end travel time level, with intermediate segment travel times used to inform the calibration of both models. Further information about the journey time validation process can be found in TIA Appendix 1 (Transport Modelling Report).

4.2 Appraisal Method for the Assessment of Impacts

4.2.1 Overview

This section provides an overview of the methodologies that have been used to assess the potential traffic and transport impacts of the Proposed Scheme during both the Construction and Operational Phases. The assessments have been carried out as follows:

- Outlining the Assessment Topics; and
- Determining the Predicted Magnitude of Impacts.

Further detail on the assessment methodologies is provided in Section 6.

4.2.2 Outlining the Assessment Topics

The traffic and transportation impacts have been broken down into the following assessment topics for both the construction and Operational Phases:

- The qualitative assessments are as follows:
  - **Pedestrian Infrastructure:** The changes to the quality of the pedestrian infrastructure as a result of the Proposed Scheme;
  - **Cycling Infrastructure:** The changes to the quality of the cycling infrastructure as a result of the Proposed Scheme;
  - **Bus Infrastructure:** The changes to the quality of the bus infrastructure as a result of the Proposed Scheme; and

- **Parking / Loading:** The changes to the availability of parking and loading as a result of the Proposed Scheme.

- The quantitative assessments are as follows:
  - **People Movement:** An assessment has been carried out to determine the potential impact that the Proposed Scheme will have on the projected volume of people moving along the Proposed Scheme by sustainable modes during the Operational Phase only;
  - **Bus Performance Indicators:** The changes to the projected operational efficiency for buses as a result of the Proposed Scheme;
  - **General Traffic:** The direct and indirect impacts that will occur for the general traffic conditions on the Proposed Scheme and surrounding road network; and
  - **Network-Wide Performance Indicators:** The strategic changes to queuing, total travel times, total travel distance and average network speed.

4.2.3 Determining the Predicted Magnitude of Impacts

The methodology used for determining the predicted magnitude of impacts has considered the traffic and transport conditions of the environment before and after the Proposed Scheme is in place.

The impact assessments have been carried out in relation to the following scenarios:

- **Do Minimum** – The 'Do Minimum' scenario (Opening Year 2028, Design Year 2043) represents the likely traffic and transport conditions of the direct and indirect study areas including for any transportation schemes which have taken place, been approved or are planned for implementation, **without** the Proposed Scheme in place. This scenario forms the reference case by which to compare the Proposed Scheme ('Do Something') for the quantitative assessments.
- **Do Something** – The 'Do Something' scenario represents the likely traffic and transport conditions of the direct and indirect study areas including for any transportation schemes which have taken place, been approved or are planned for implementation, **with** the Proposed Scheme in place (i.e. the Do Minimum scenario with the addition of the Proposed Scheme). The Do Something scenario has been broken into two phases:
  - **Construction Phase (Construction Year 2024) –** This phase represents the single worst-case period which will occur during the construction of the Proposed Scheme.
  - **Operational Phase (Opening Year 2028, Design Year 2043) –** This phase represents when the Proposed Scheme is fully operational.

The changes between the Do Minimum and Do Something scenarios have been presented in either a positive, negative or neutral magnitude of impacts as a result of the Proposed Scheme, depending on the assessment topic. A high, medium, low or negligible rating has been applied to each impact assessment to determine the Magnitude of Impact. Refer to Section 6 for further information on the methodology in applying these ratings for each assessment.

4.2.3.1 Level of Service Impact Assessment

To outline the changes in conditions between the Do Minimum and Do Something scenarios a Level of Service (LoS) approach has been developed for the impact assessments, where appropriate. This concept allows a straightforward comparison of two differing scenarios using a series of metrics specifically developed for this purpose.

The concept of LoS was originally developed in the United States' Transportation Research Board's (TRB) Highway Capacity Manual (TRB 2000). Under this concept, potential values for a performance measure are divided into six ranges, with each range assigned a letter grade ranging from "A" (highest quality) to "F" (lowest quality). LoS concepts are applied universally throughout the world, and have their basis in Highway Capacity Manual and, particularly for bus network assessments, in the Transit Capacity and Quality of Service Manual (TRB 2003).

LoS concepts are not target based or rigid in their application and bespoke versions are developed to suit the particular receiving environment of the scheme under consideration or the particular user problems that the scheme and/or project is seeking to address. A mix of quantitative and qualitative indicators can be used and

summarised as a LoS. The process enables integrated planning and decision making across all modes rather than any specific mode which can create a bias in the assessment process (e.g. focusing on Car Volume over Capacity (V/C)). It is intended that the LoS framework for the Proposed Scheme will provide an easily understandable summary of the impact of each assessment topic, where applied.

4.3 Transport Modelling Methodology

A multi-tiered transport modelling approach has been developed. The NTA's East Regional Model (ERM) was the primary modelling tool and provided the overarching information on forecast travel demand for each mode of transport. The ERM was supported by other modelling tools which provide more granular level traffic information and allow for detailed and refined modelling at a local network and junction level. For this purpose, a cordoned (sub-set model) corridor-wide, road (motorised vehicle only) based Local Area Model (LAM) in combination with a multi-modal corridor micro-simulation model and local junction models have been used which work in tandem with the ERM.

Through the multi-tiered transport modelling approach, the following modes of transport have been considered:

- Public Transport including inter-urban rail, suburban rail, DART, light rail (Luas), bus, and MetroLink;
- Traffic including private car, taxis and goods vehicles;
- Walking; and
- Cycling.

Further detail on the modelling can be found in TIA Appendix 1 (Transport Modelling Report) of the EIAR which details the model development, data inputs, calibration and validation and forecast model development for the suite of models used to support the assessment.

4.3.1 Proposed Scheme Transport Models

This section sets out the various transport modelling tools that have been developed and used to inform the preparation of the TIA and Chapter 6 (Traffic and Transport) of the EIAR and has supported design decisions. The purpose of each tool is detailed and the use of the tool for each element of the Proposed Scheme is defined.

The modelling tools that have been developed do not work in isolation but instead work as a combined modelling system driven by the ERM as the primary source for multi-model demand and trip growth etc. which is passed from the ERM to the cordoned local area model, micro-simulation models and junction models for the Proposed Scheme which have been refined and calibrated to represent local conditions to a greater level of detail then that contained within the ERM.

Importantly, no one tool can provide the full set of modelling data required to inform both the EIAR and TIA requirements and to support design iterations and decisions e.g. the ERM via the LAM has provided road traffic flow information (for example Annual Average Daily Traffic (AADT) and link speed data which has been used to inform Air Quality and Noise models).

The micro-simulation model is the most appropriate tool to provide the end-to-end bus journey times for the Proposed Scheme based on the detailed interaction of vehicle movements along the corridor. In addition, the LAM has been used directly for supporting design development decisions and to assist with an understanding of the implications of banned turns and potential trip redistribution away from the Proposed Scheme during both the Construction and Operational Phases.

4.3.1.1 Transport Modelling Hierarchy

There are four tiers of transport modelling which are used to assess the Proposed Scheme and these are detailed below and shown graphically in Diagram 4.1.

- **Tier 1 (Strategic Level):** The NTA's ERM is the primary tool which has been used to undertake the strategic modelling of the Proposed Scheme and has provided the strategic multi-modal demand outputs for the forecast years;

- **Tier 2 (Local Level):** A Local Area Model (LAM) has been developed to provide a more detailed understanding of traffic movement at a local level. The LAM is a subset model created from the ERM and contains a more refined road network model used to provide consistent road-based outputs to inform the TIA, EIA and junction design models. This includes information such as road network speed data and traffic redistribution impacts for the Operational Phase. The LAM also provides traffic flow information for the micro-simulation model and junction design models and has been used to support junction design and traffic management plan testing;
- **Tier 3 (Corridor Level):** A micro-simulation model of the full 'end to end' corridor has been developed for the Proposed Scheme. The primary role of the micro-simulation model has been to support the ongoing development of junction designs and traffic signal control strategies and to provide bus journey time information for the determination of benefits of the Proposed Scheme; and
- **Tier 4 (Junction Level):** Local junction models have been developed, for each junction along the Proposed Scheme to support local junction design development. These models are informed by the outputs from the above modelling tiers, as well as the junction designs which are, as discussed above, based on people movement prioritisation.

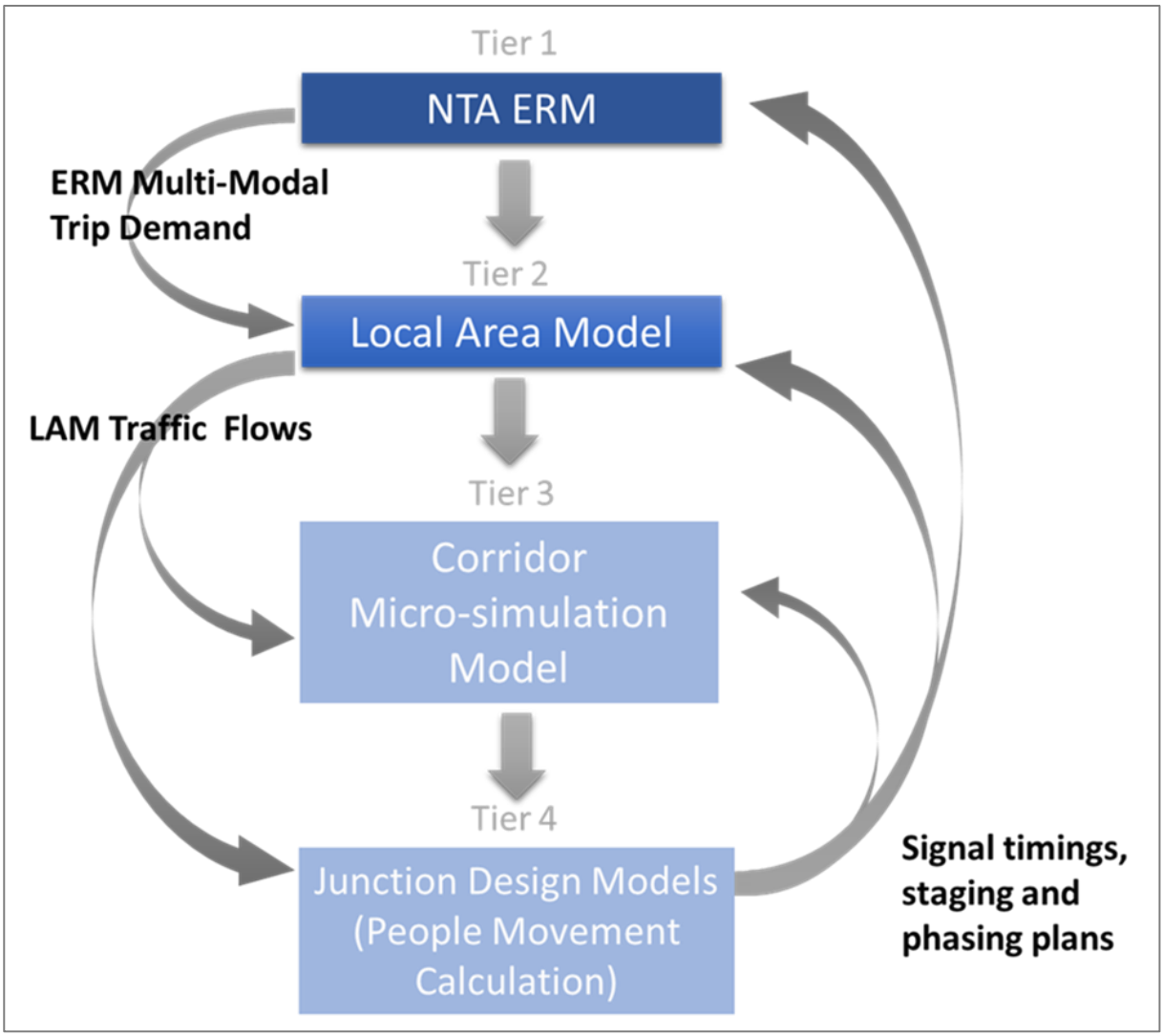

Diagram 4.1: Proposed Scheme Modelling Hierarchy

The purpose of each of the modelling tools is summarised in Table 4.2.

Table 4.2: Modelling Tool and Purpose

Tool	Purpose	Inputs
NTA ERM	Forecast Multi-Modal demand impacts Proposed Scheme including both area wide and corridor level Mode share Policy assessment (e.g. demand management) Donor Network for LAM	NTA Forecast Planning Data (2020,2028,2043) Future year Proposed Scheme information (Traffic signal plans and timings)
Local Area Model (LAM)	General Traffic Redistribution impacts Link Flows (AADTs) Link Speeds Junction turning flows Construction Strategy and Traffic Management measure testing Donor network for Proposed Scheme Micro-sim model	Traffic surveys Journey time data ERM forecast matrices Proposed Scheme designs Proposed Scheme Traffic signal plans and timings
Micro-simulation Model	Operational features Design validation Person delay measurement Bus journey times Queue formation Scheme visualisation	LAM demand matrices Proposed Scheme designs Proposed Scheme Traffic signal plans and timings
Junction Design Models / People Movement Calculation	Junction design tool Proposed Scheme signal plan and timing development People Movement Calculation	Junction Turning flows from LAM

The following sections describe in further detail each of the modelling tools used to inform this TIA and their role within the assessment of the Proposed Scheme.

4.3.1.2 NTA Regional Modelling System (RMS) and East Regional Model (ERM)

The East Regional Model is part of the NTA's Regional Modelling System (RMS) for Ireland that allows for the appraisal of a wide range of potential future transport and land use alternatives. The RMS comprises the National Demand Forecasting Model (NDFM); five large-scale, detailed, multi-modal regional transport models; and, a suite of Appraisal Modules. The five regional models comprising the RMS are focussed on the travel to-work areas for Dublin (represented by the aforementioned East Regional Model (ERM)), for Cork (represented by the South West Regional Model (SWRM)), for Limerick (represented by the Mid-West Regional Model (MWRM)), for Galway (represented by the West Regional Model (WRM)) and for Waterford (represented by the South East Regional Model (SERM)).

The key attributes of the five regional models include; full geographic coverage of each region, detailed representations of all major surface transport modes including active modes, road and public transport networks and services, and of travel demand for five time periods (AM, 2 Inter-Peaks, PM and Off-Peak). The RMS encompasses behavioural models calibrated to 2017 National Household Travel Survey data that predict changes in trip destination and mode choice in response to changing traffic conditions, transport provision and/or policies which influence the cost of travel.

4.3.1.2.1 Purpose of the RMS

The NTA uses the RMS to help inform decisions required during strategy development and to assess schemes and policy interventions that are undertaken as part of its remit. The RMS has been developed to provide the NTA with the means to undertake comparative appraisals of a wide range of potential future transport and land use options, and to provide evidence to assist in the decision-making process. Examples of how the RMS can assist the NTA include testing new public transport schemes by representing the scheme in the assignment networks, testing demand management measures by, for example, changing the cost of parking or number of parking spaces within the regional model or testing the impacts of new land use by changing the planning data assumptions within the NDFM.

The RMS includes the 2016 Census/POWSCAR and 2017 National Household Travel Survey (NHTS) data sets and the NTA has included a range of improvements to the main model components where identified and implemented. These improvements include improving and making changes to such elements as the NDFM, development of the Long-Distance Model, updated zoning, networks, and parking modules; best-practice discrete choice modelling using the NHTS and POWSCAR datasets to estimate the parameters of the behavioural models, improved model runtimes, and general model functionality improvements.

4.3.1.2.2 RMS Components

The NTA RMS comprises of the following three main components, namely:

- The National Demand Forecasting Model (NDFM);
- 5 Regional Models (including the ERM); and
- A suite of Appraisal Modules.

The NDFM takes input attributes such as land-use data, population etc., and estimates the total quantity of daily travel demand produced by, and attracted to, each of the 18,641 Census Small Areas in Ireland.

The ERM is a strategic multi-modal transport model representing travel by all the primary surface modes – including, walking and cycling (active modes), and travel by car, bus, rail, tram, light goods and heavy goods vehicles, and broadly covers the Leinster province of Ireland including the counties of Dublin, Wicklow, Kildare, Meath, Louth, Wexford, Carlow, Laois, Offaly, Westmeath, and Longford, plus Cavan and Monaghan.

The ERM is comprised of the following key elements:

- **Trip End Integration:** The Trip End Integration module converts the 24-hour trip ends output by the NDFM into the appropriate zone system and time period disaggregation for use in the Full Demand Model (FDM);
- **The Full Demand Model (FDM):** The FDM processes travel demand, carries out mode and destination choice, and outputs origin-destination travel matrices to the assignment models. The FDM and assignment models run iteratively until an equilibrium between travel demand and the cost of travel is achieved; and
- **Assignment Models:** The Road, Public Transport, and Active Modes assignment models receive the trip matrices produced by the FDM and assign them in their respective transport networks to determine route choice and the generalised cost for each origin and destination pair.

Destination and mode choice parameters within the ERM have been calibrated using two main sources: Census 2016 Place of Work, School or College - Census of Anonymised Records (2016 POWSCAR), and the Irish National Household Travel Survey (2017 NHTS).

4.3.1.2.3 The use of the ERM for the Proposed Scheme

The NTA's ERM is the most sophisticated modelling tool available for assessing complex multi modal movements within an urban context. This provides a consistent framework for transport assessments. The ERM is the ideal tool to use as a basis for the assessment of the Proposed Scheme and to estimate its multi-modal impact. In addition, it provides the platform to forecast future trip demand and distribution.

The NTA ERM is, therefore, the primary high-level modelling tool for the strategic transport assessment of the Proposed Scheme and provides the sole source of multi-modal forecast trip / person demand for each of the scenarios assessed. The ERM provides the strategic impacts and benefits of the Proposed Scheme and the outputs from the ERM provide key inputs to the TIA and EIAR.

4.3.1.3 Local Area Model (LAM)

To support the detailed assessment of the Proposed Scheme a more disaggregated urban area traffic model has been developed, as a cordoned model from the ERM, that incorporates the most up to date traffic survey data. The LAM provides an appropriate level of detail required to inform the various disciplines and levels of decision making within the Proposed Scheme Infrastructure Works e.g., capturing the impact of redistribution of traffic on

streets and roads not included within the strategic detail of the ERM. As such, a Local Area Model (LAM) has been developed to support the assessment of the Proposed Scheme.

The LAM is compatible with the ERM road network, being a direct extraction from the ERM road model, but with the addition of extra road network and zoning detail. The LAM is calibrated and validated with the most recent 2019/2020 traffic survey data and journey time information, which ensures that the model reflects 'on-the-ground' conditions for the Proposed Scheme in February 2020 (e.g., prior to COVID-19 restrictions).

The LAM which is a more refined version of the road network model component of the ERM has been used throughout the Proposed Scheme development to provide all road-based outputs to inform the TIA, EIA and junction design models. i.e. AADTs, road network speed data, traffic re-distribution impacts during construction and operation of the Proposed Scheme. The LAM also provides traffic flow information for the corridor micro-simulation models and junction design models.

4.3.1.3.1 Count Data for Calibration and Validation

A full set of consistent updated traffic counts for a neutral period was completed for the Proposed Scheme. Traffic surveys were undertaken in and February 2020 (Pre COVID- 19) with the surveyed counts used as inputs to the model calibration and validation process.

Private cars and taxis were aggregated as a single vehicle type for input to the LAM model. The OGV1 and OGV2 categories were also aggregated as HGVs. PSVs are modelled as fixed routes with a specific frequency in the model (as per timetabled services) and as such were not included in the model inputs. Separate input files were prepared for the following time periods.

- AM: 0800-0900;
- Lunch Time (LT): 1200-1300;
- School Run (SR): 1500-1600;
- PM: 1700-1800; and
- Off Peak (OP): 2000-2100.

The JTCs were merged into a 'flat format' database which permits the extraction of counts grouped by modelled hour (AM, LT, SR or PM) and modelled vehicle category (Car, LGV or HGV). Turn count records were given a unique movement identifier (AB, AC, AD etc). These identifiers were then associated with their respective nodes in the LAM. In some cases, there is a unique one-to-one relationship between the turn counts and the LAM network as shown in Diagram 4.2.

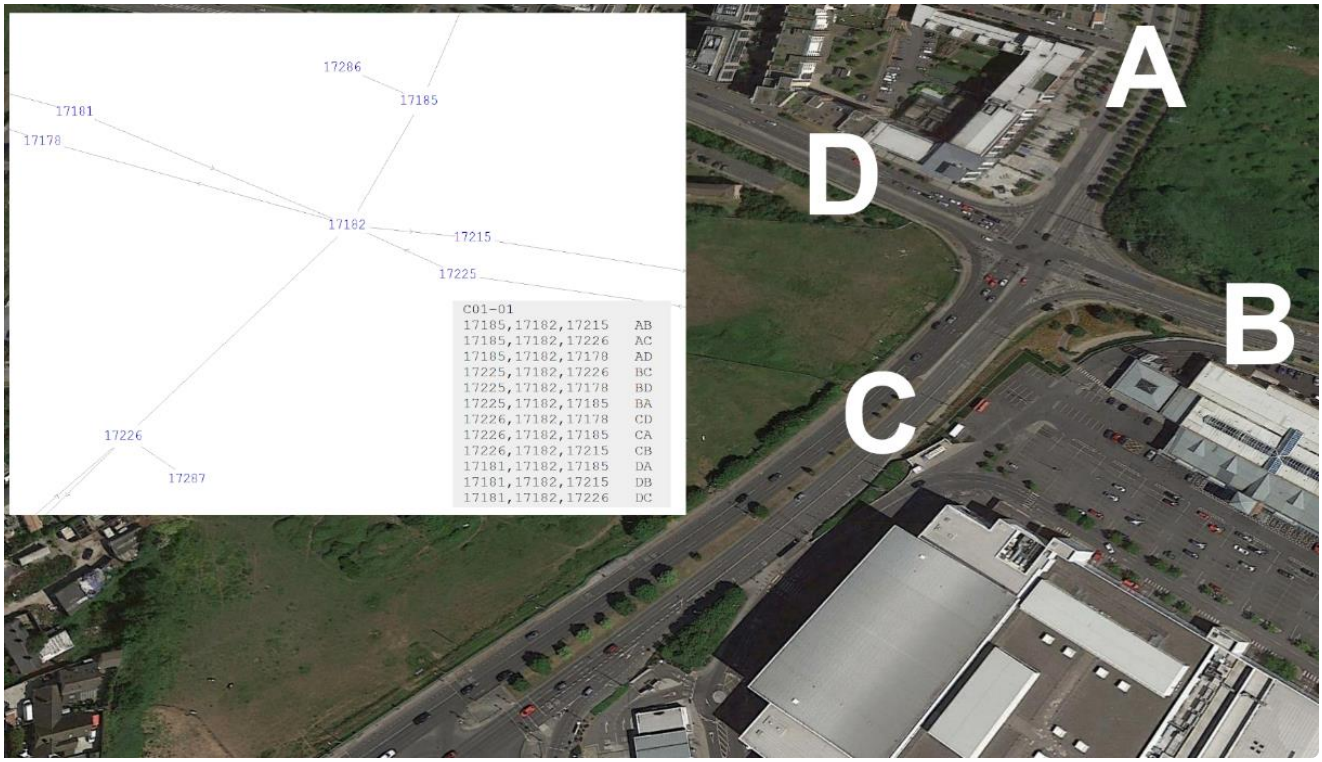

Diagram 4.2: Bus Connects LAM Node Matching (Junction C01-01)

The flows for complex junctions were obtained by combining certain turning movement flows, as shown in Diagram 4.3

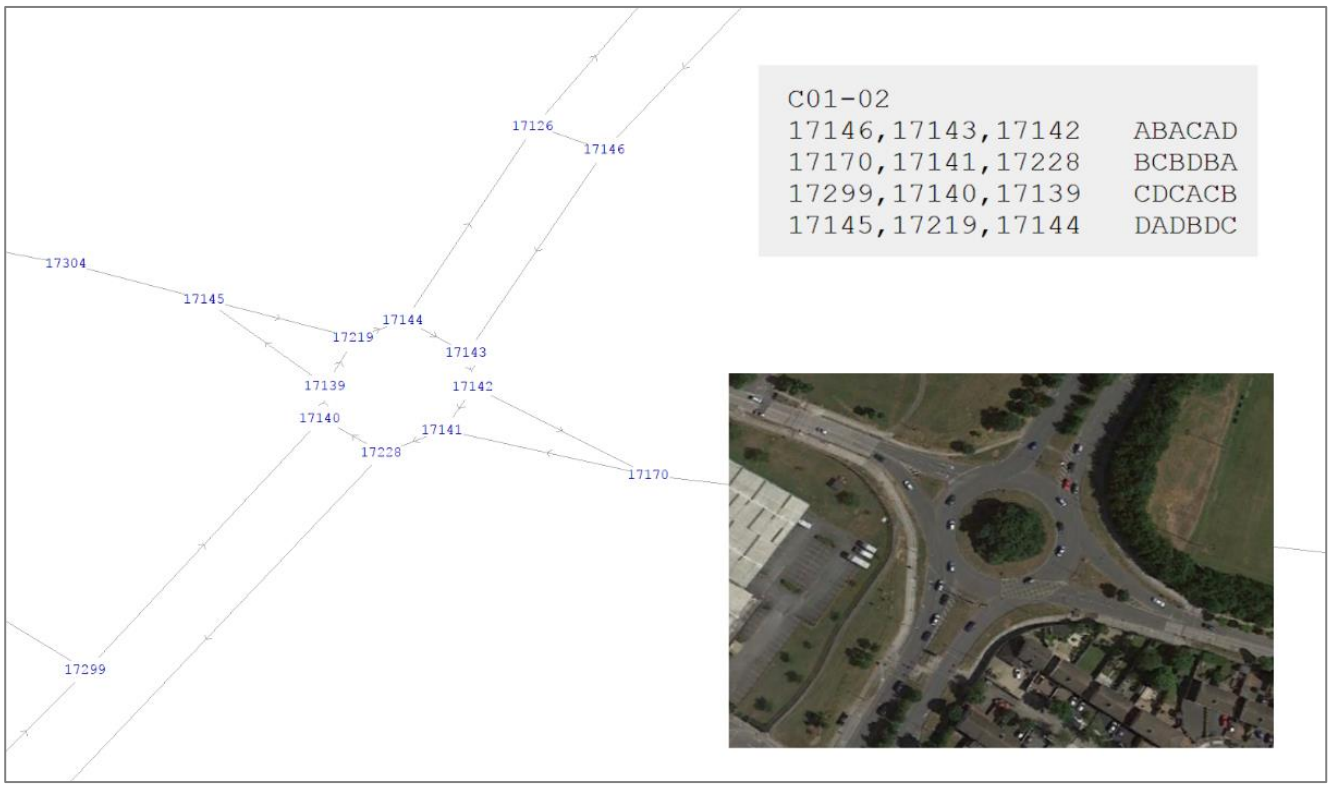

Diagram 4.3: Bus Connects LAM Node Matching (Junction C01-02)

4.3.1.4 Proposed Scheme Micro-Simulation Model

A micro-simulation model has been developed for the full continuous 'end-to-end' route of the Proposed Scheme. The 'end-to-end' corridor micro-simulation model has been developed to assist in the operational validation of the scheme designs and to provide visualisation of scheme operability along with its impacts and benefits.

The term 'end-to-end' refers to the point of model 'entry' (start of Proposed Scheme) to the point of model 'exit' (end of Proposed Scheme) rather than the actual bus service terminus points which, in most cases, lie outside of the modelled area. The modelling of the Proposed Scheme displays the differences in travel time for buses along the full length of the Proposed Scheme, including delay at individual locations.

The Proposed Scheme Micro-simulation model network is shown in Diagram 4.4.

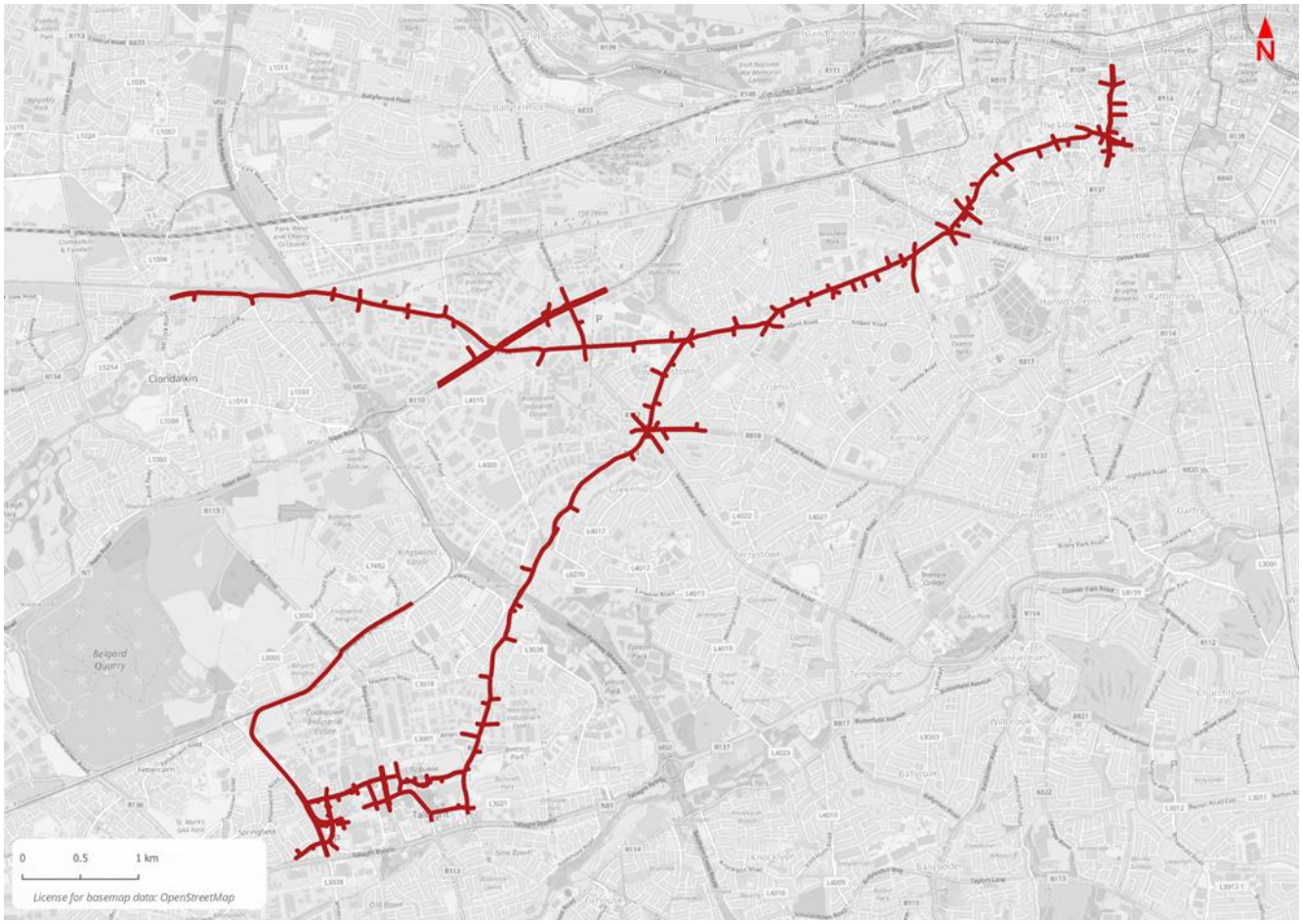

Diagram 4.4: Proposed Scheme Microsimulation Model Network

4.3.1.4.1 Role of the Corridor Micro-Simulation Models

The Proposed Scheme micro-simulation model has provided key information on end-to-end bus and car journey times along the Proposed Scheme. The Proposed Scheme micro-simulation model is supplied traffic flow information from the LAM and uses consistent information from the junction design models, in terms of signal plans, green times, staging, phasing and offsets. 3D Visualisations of sections of the Proposed Scheme have been developed based on the 2D models to help visualise and demonstrate the benefits and impacts of the scheme to stakeholders.

Overall, the Proposed Scheme micro-simulation model has provided key transport metric inputs to the TIA in terms of operational features, vehicle interaction, person level delay and bus journey time and reliability performance.

4.3.1.5 Junction Design Models

The fourth tier of modelling in the modelling hierarchy to support the assessment of the Proposed Scheme is the individual junction design models that have been developed for junctions along the Proposed Scheme. These junction design models are supplied with traffic flow information from the LAM and from the micro-simulation model for the Proposed Scheme. The LAM, Micro-simulation and local junction models contain consistent design, transport demand, signal phasing and staging information. Further information is contained in TIA Appendix 2 (Junction Design Report).

4.3.1.5.1 Role of the Junction Design Models

The junction design models have been used to inform junction design considerations as part of the formulation of the Preliminary Design for the Proposed Scheme. The junction models have been developed for standalone junction assessments and for combinations of secondary (off-line to Proposed Scheme) junctions. The junction models have been used in combination with the Proposed Scheme micro-simulation model at 'hot-spot' locations for operational testing and 'proof of concept' development of the preferred design.

The junction design models are important supporting design tools for analysis of the design proposals and have informed the development of signal plans and phasing at junctions along the Proposed Scheme. The junction models have been used to inform the LAM and Proposed Scheme micro-simulation model, with information such as design amendments, signal plans and timings being fed back in the iterative process where appropriate.

As part an iterative process, the resultant scheme designs were then re-modelled in the ERM, LAM and micro-simulation models to understand the strategic and corridor specific issues and inform the preparation of the TIAs and EIARs and the planning submission for the Proposed Scheme.

5. Baseline Environment

This Section provides an overview of the existing traffic and transport conditions within the redline boundary of the Proposed Scheme. The baseline conditions have been informed by several site visits of the local environment, comprehensive traffic surveys, and a desktop review of the most recent aerial photography.

Only 12.5% of the existing route provides segregated cycle tracks and 58% of the existing route is non-segregated cycle lanes. In terms of inbound and outbound provisions on the existing route:

- Non-segregated cycling facilities are currently provided along approximately 59% (outbound) and 57% (citybound).
- Segregated cycling facilities are currently provided along approximately 11% (outbound) and 13.5% (citybound).
- The remaining extents of the existing route have no dedicated cycle provision or cyclists must cycle on the bus lanes where provided.

5.1 Bus Journey Times

Bus services along the Proposed Scheme currently operate within a constrained and congested environment, with 31% priority outbound, 37% priority inbound, cumulatively equating to 34% of the length of the route (for 15.5km core bus corridor route).There are sections along the route of the Proposed Scheme with poor bus priority resulting in poor journey time reliability particularly at peak times. Automatic Vehicle Locator (AVL) data from existing bus services operating along the Proposed Scheme corridor has been used to examine the current standard deviation for bus services along the corridor. The AVL data indicates that current bus journey times have a standard deviation of approximately 12 minutes along the route of Proposed Scheme and with any further increases in traffic levels these issues are expected to be exacerbated. In addition to impacting on bus passengers, longer and less reliable bus services also require operators to use additional buses to maintain headways to fill gaps in the timetable. Aligned to this, the remaining sections of un-prioritised bus network can lead to bunching of buses which, in turn, means stops can become overcrowded, creating delays in boarding and alighting and the imbalanced use of bus capacity.

5.2 Traffic Count Data

5.2.1 Junction Turning Counts (JTCs)

Table 5.1 displays the JTCs collected for the Proposed Scheme, the locations of which are shown in Diagram 5.2 and Diagram 5.2. The results demonstrate that the busiest junction in the study area is the Nangor Road / Naas Road junction (70,341 daily movements). The next busiest junctions are:

- High Street / Christchurch (62,018 daily movements);
- Walkinstown Roundabout (55,372 daily movements);
- Ushers Quay/Merchants Quay (55,354 daily movements); and
- Patrick Street/Dean Street (51,674 daily movements).

The least busy junction in the study area is the Calmount Road Parkway/Calmount Avenue junction within the Ballymount Industrial Estate with 3,222 daily movements.

Table 5.1: JTC Locations and Daily, AM and PM Movements

JUNCTION IDENTIFIER	JUNCTION NAME	TYPE	DAILY MOVEMENTS	AM MOVEMENTS	PM MOVEMENTS
8-1	Nangor Road/Woodford Walk	Signals	28,173	1,890	2,197
8-2	Nangor Road/Riverview Business Centre	Roundabout	23,486	1,719	1,930
8-3	Nangor Road/Oak Road	Signals	33,365	2,497	2,380
8-4	Nangor Road/Willow Road	Signals	23,542	1,670	1,516
8-5	Nangor Road/Killeen Road	Signals	31,701	2,236	2,185
8-6	Nangor Road/Naas Road	Signals	70,341	5,115	3,975
8-7	Naas Road/Walkinstown Avenue	Signals	46,202	3,053	2,868

JUNCTION IDENTIFIER	JUNCTION NAME	TYPE	DAILY MOVEMENTS	AM MOVEMENTS	PM MOVEMENTS
8-8	Walkinstown Avenue/Long Mile Road	Signals	47,509	3,423	2,841
8-9	Long Mile Road/Walkinstown Parade	Priority	26,872	2,073	1,477
8-10	Long Mile Road/Slievebloom Park	Priority	24,510	1,937	1,344
8-11	R110 Longmile Road/Parkmore Industrial Estate	Signals	35,214	2,546	1,993
9-1	Belgard Square South/Belgard Square West	Roundabout	10,656	457	838
9-2	Old Blessington Road/Belgard Square West	Signals	16,758	715	1,308
9-3	Belgard Square North/Belgard Square West	Roundabout	25,076	1,900	1,705
9-4	Belgard Road North/Belgard Square East	Roundabout	23,507	1,583	1,706
9-5	Belgard Square North/Belgard Road	Roundabout	31,661	2,001	2,299
9-6	ITT Access Road/Greenhills Road	Priority	14,162	973	797
9-7	Greenhills Road/Airton Road	Signals	19,021	1,224	1,182
9-8	Greenhills Road/Hibernian Industrial Estate (South)	Signals	17,719	1,094	1,063
9-9	Greenhills Road/Broomhill Road	Priority	19,274	1,246	1,173
9-10	Greenhills Road/Mayberry Road	Signals	28,041	2,092	1,928
9-11	Greenhills Road/Castletymon Road	Signals	27,439	2,182	2,019
9-12	Greenhills Road/Ballymount Road Upper	Priority	25,640	2,065	1,781
9-13	Ballymount Avenue/Calmount Road	Roundabout	13,262	1,323	800
9-14	Calmount Road/Calmount Avenue	Priority	3,222	394	229
9-15	Walkinstown Roundabout	Priority	55,372	3,855	3,662
9-16	Walkinstown Road/Kilnamanagh Road	Signals	16,552	999	1,126
9-17	Walkinstown Road/Long Mile Road	Signals	38,567	2,660	2,349
9-18	Drimnagh road/Errigal Road	Signals	35,563	2,346	2,147
9-19	Drimnagh Road/Kildare Road	Signals	35,529	2,347	2,167
9-20	Crumlin Road/Cooley Road	Signals	28,543	1,905	1,680
9-21	Crumlin Road/Sundrive Road	Signals	38,691	2,710	2,630
9-22	Crumlin Road /Dolphin Road	Signals	35,431	2,558	2,360
9-23	Dolphins Barn/South Circular Road	Signals	34,020	2,321	2,298
9-24	Cork Street/Marrowbone Lane	Signals	19,269	1,321	1,305
9-25	Cork Street/Ardee Street	Signals	20,165	1,356	1,424
9-26	St. Luke's Avenue/Dean Street	Signals	20,654	1,215	1,374
9-27	Dean Street/Patrick Street	Signals	51,674	3,382	3,162
9-28	Patrick Street/Bride Road	Signals	45,175	2,747	2,679
9-29	High Street/Christchurch Place	Signals	62,018	4,005	3,561
9-30	R110 Crumlin Road/Windmill Road	Priority	23,379	1,444	1,329
9-31	R110 Crumlin Road/Clonard Road	Priority	23,019	1,403	1,315
9-32	R110 Crumlin Road/Bangor Drive	Priority	23,053	1,417	1,301
9-33	R110 Crumlin Road/Dunnes Stores Crumlin Shopping Centre	Priority	23,478	1,418	1,370
9-34	R110 Crumlin Road/Old County Road	Priority	22,881	1,412	1,324
9-35	R137 Patrick Street/Bull Alley Street	Signals	37,965	2,478	2,291
9-36	R810 High Street/R108 Cornmarket	Signals	47,010	3,095	2,483
9-37	R148 Arran Quay/R148 Inns Quay	Signals	43,571	3,220	2,180
9-38	R148 Usher's Quay/R148 Merchant's Quay	Signals	55,354	2,994	3,394
9-39	R148 Inns Quay/R148 Ormond Quay	Priority	31,530	2,277	1,772
9-40	R148 Merchant's Quay/R148 Wood Quay	Signals	38,184	1,754	2,652
9-41	R148 Ormond Quay Upper/R148	Signals	35,314	2,426	2,061

JUNCTION IDENTIFIER	JUNCTION NAME	TYPE	DAILY MOVEMENTS	AM MOVEMENTS	PM MOVEMENTS
	Ormond Quay Lower				
9-42	R148 Essex Quay/R148 Wellington Quay	Signals	34,238	1,759	2,405
9-43	Crumlin Road/Old County Road	Priority	26,309	1,778	1,613
9-44	Crumlin Road/Herberton Road	Signals	24,278	1,747	1,497
9-45	R110 Cork Street/Donore Avenue	Signals	24,046	1,686	1,659
9-46	Dean Street/R137 Patrick Street	Signals	28,758	1,867	1,748
9-47	Dean Street/Francis Street	Priority	23,857	1,528	1,538

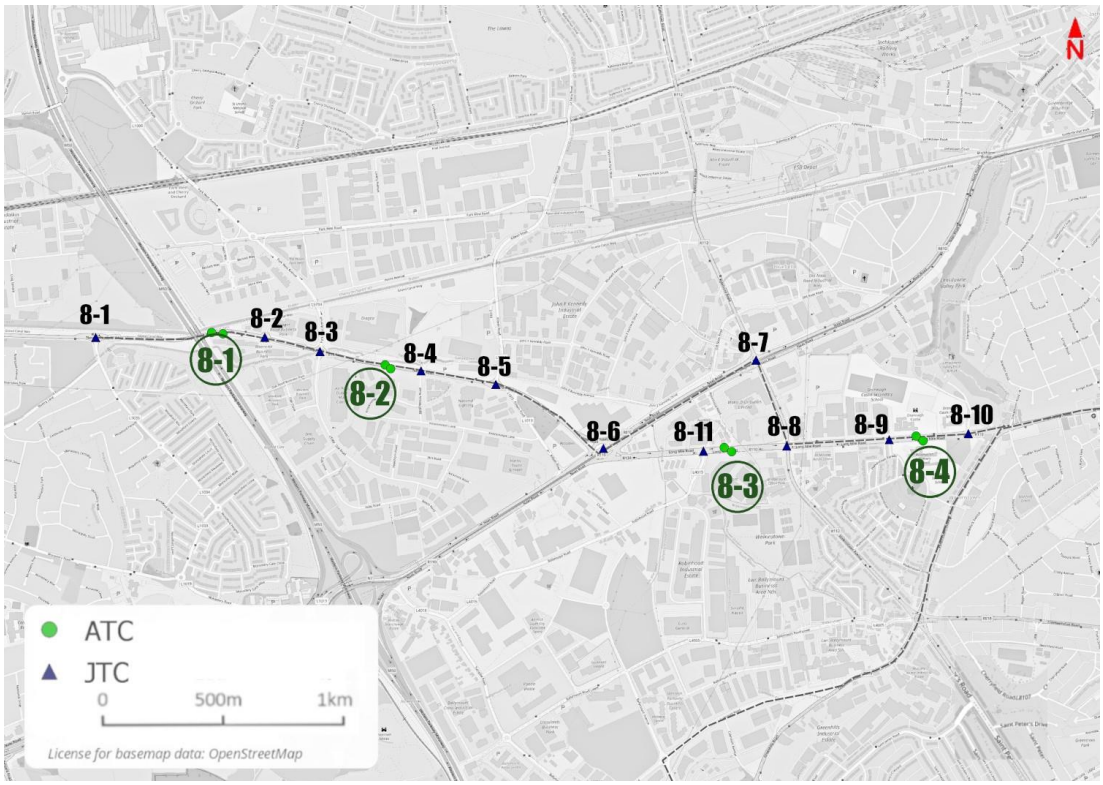

Diagram 5.1: ATC and JTC Traffic Count Locations (1)

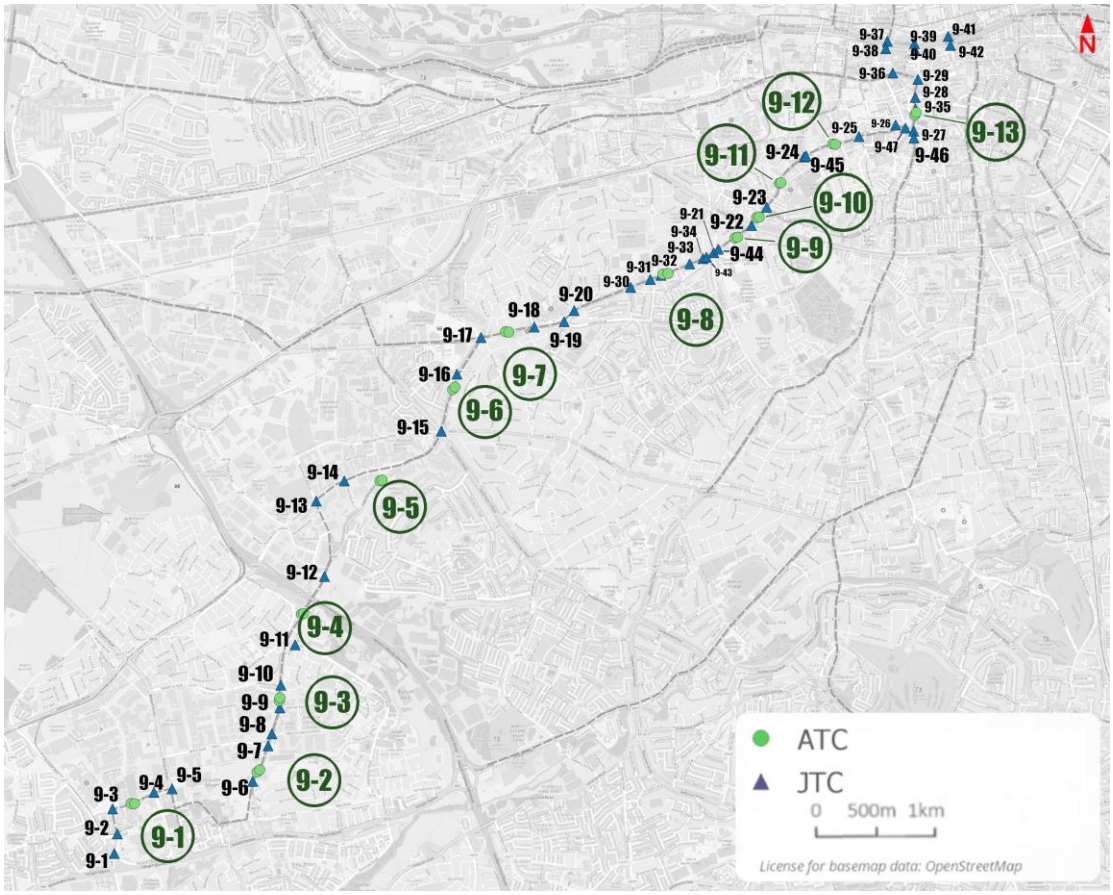

Diagram 5.2: ATC and JTC Traffic Count Locations (2)

5.2.2 Automatic Turning Counts (ATCs)

Table 5.2 displays the ATCs collected for the Proposed Scheme, the locations of which are shown in Diagram 5.1 and Diagram 5.2. The highest ATC daily flows are on the Long Mile Road and Patricks Street. Some ATC counts did not have reliable counts for a full week and were excluded from the dataset.

Table 5.2: ATC Locations, Daily, AM and PM Movements

ATC IDENTIFIER	ATC LOCATION	DIRECTION	DAILY MOVEMENTS	AM MOVEMENTS	PM MOVEMENTS
8.1A	Nangor Road east of M50	Eastbound	9,346	1,099	342
8.1B		Westbound	11,712	410	1,343
8.2A	Nangor Road east of Oak Road	Eastbound	10,127	764	425
8.2B		Westbound	9,532	621	658
8.3A	Long Mile Road west of Walkinstown Avenue	Eastbound	13,953	947	968
8.3B		Westbound	14,389	956	686
8.4A	Long Mile Road east of Walkinstown Avenue	Northbound	10,777	716	718
8.4B		Southbound	10,828	921	387
9.1A	Belgard Square North	Eastbound	9,132	723	634
9.1B		Westbound	7,568	582	538
9.2A	Greenhills Road at Astropark	Eastbound	6,466	532	293
9.2B		Westbound	6,016	310	429
9.3A	Greenhills Road south of Mayberry Road	Eastbound	8,035	428	518
9.3B		Westbound	7,933	623	407
9.4A	Greenhills Road south of M50	Eastbound	excluded	excluded	excluded

ATC IDENTIFIER	ATC LOCATION	DIRECTION	DAILY MOVEMENTS	AM MOVEMENTS	PM MOVEMENTS
9.4B		Westbound	excluded	excluded	excluded
9.5A	Greenhills Road north of Calmount Avenue	Eastbound	8,272	632	427
9.5B		Westbound	8,753	463	675
9.6A	Walkinstown Avenue	Eastbound	6,392	414	378
9.6B		Westbound	7,393	441	509
9.7A	Long Mile Road	Eastbound	17,189	1,158	1,091
9.7B		Westbound	13,757	925	688
9.8A	Crumlin Road west of Crumlin Shopping Centre	Eastbound	10,523	724	614
9.8B		Westbound	10,435	519	611
9.9A	Crumlin Road south of Canal	Eastbound	excluded	excluded	excluded
9.9B		Westbound	excluded	excluded	excluded
9.10A	Dolphins Barn	Eastbound	9,724	686	595
9.10B		Westbound	11,209	597	915
9.11A	Cork Street	Eastbound	9,993	470	756
9.11B		Westbound	9,095	722	508
9.12A	Cork Street	Eastbound	7,626	323	623
9.12B		Westbound	7,476	542	409
9.13A	Patricks Street	Northbound	15,958	1,118	755
9.13B		Southbound	15,321	717	909

5.3 Baseline Conditions

5.3.1 Overview

In describing the baseline conditions, the scheme has been divided into six no. sections in accordance with the proposed design. The six sections are outlined as follows:

- Section 1 – Tallaght to Ballymount;
- Section 2 – Ballymount to Crumlin;
- Section 3 – Crumlin to Grand Canal;
- Section 4 – Grand Canal to Christchurch;
- Section 5 – Woodford Walk (R113) / New Nangor Road (R134) to Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction; and
- Section 6 – Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh

5.3.2 Section 1 - Tallaght to Ballymount

This section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 1 of the Proposed Scheme.

The section begins at the junction of Blessington Road / Cookstown Way, and routes north around the perimeter of The Square, Tallaght. Travelling via Blessington Road and Main Road, the route then joins the southern end of R819 Greenhills Road at Bancroft Park junction. The route extends along the R819 Greenhills Road as far as Mayberry Road junction where a new bus only route will be constructed which re-joins the R819 Greenhills Road south of the M50 Bridge at Tymon Lane.

5.3.2.1 Pedestrian Infrastructure

Belgard Square West and the western half of Belgard Square North benefit from footways of approximately 6.0m in width, and up to 7.0m in places. The footways on both sides of the highway narrow however on the approach to the Tallaght Hospital roundabout, with each footway being approximately 2.0m in width. Similarly the footways on both sides of Belgard Square North heading east towards Technological University Tallaght (TUD) narrow to approximately 2.0m in width. On Belgard Square East and Blessington Road respectively, the eastern and northern footways are approximately 4.5m to 7.0m in width, compared to 2.0m to 3.0m for the western and southern footways. For Blessington Road between Belgard Road and Main Road footway widths narrow to less than 2.0m in some sections. On Main Road, the north footway is nominally 2.0m wide but there are some areas where the footway width is below 2.0m, the southern footway has some wide areas of footway but generally the footway width is 2.0m – 3.0m.

After passing the Bancroft Park junction, there are shared pedestrian and cyclist facilities on both sides of the carriageway, which continue to the Airton Park junction. The shared surface is between 3.0m to 5.0m in width.

Between Airton Park and Mayberry Road, there are footways either side of the carriageway. At this point, pedestrians must cross to the western footway along R819 Greenhills Road. Between this point and the northernmost extent of Tymonville Crescent, only the western footway is available, form this location to the M50 bridge, the footways continue on both sides of the carriageway.

Whilst there are some instances of grassed areas being provided to create a path segregated from the main road, much of the footway is immediately adjacent to the carriageway.

Throughout this section, there is good provision of segregation between pedestrians and road traffic, with grassed areas, bollards and stepped tracks providing physical barriers at various stages. Guardrails are found at some crossings in this section, along with tactile paving and dropped kerbs. Furthermore, much of the paving appears to be smooth, even and modern, particularly near Belgard Square.

There are several pedestrian crossings along Section 1 of the Proposed Scheme, the majority of which are signalised. Pedestrian crossing facilities can be found at the following locations:

- The four-arm Blessington Road / Cookstown Way junction has signalised crossings on all arms. The crossings contain dropped kerbs and tactile paving;
- On Belgard Square West, near The Square Tallaght car park (signalised Pelican crossing). The crossing contains dropped kerbs and tactile paving;
- The four-arm Belgard Square West / Blessington Road junction has signalised crossings on the north, east and south arms, near the tram stop. The crossings contain dropped kerbs and tactile paving;
- Courtesy raised table pedestrian crossing on Belgard Square West near Broadfield Hall building. The crossing contains tactile paving;
- A pelican crossing 20m from the eastern arm of the three-arm Belgard Square West / Belgard Square North roundabout. The crossing contains dropped kerbs and tactile paving;
- The three arm Belgard Square North / Exchange Hall Access signalised junction has signalised crossings on all arms. The crossings contain dropped kerbs and tactile paving;
- The four-arm Belgard Square East / Blessington Road junction has signalised crossings on all four arms. The crossings contain dropped kerbs and tactile paving;
- The four-arm Blessington Road / Belgard Road signalised junction has signalised crossings on all four arms. The crossings contain dropped kerbs and tactile paving;
- The three-arm Blessington Road / Main Road signalised junction has signalised crossings on all three arms. The crossings contain both raised table and dropped kerbs with tactile paving;
- At the junction of Main Road / Old Greenhills Road dropped kerbs and buff tactile paving are provided, no road marking is provided for pedestrians;
- At the junction of R819 Greenhills Road and Bancroft Park (signalised Pelican crossing). The crossing contains dropped kerbs and tactile paving;
- Approximately 15m north of the TUD access road on R819 Greenhills Road (signalised Pelican crossing) The crossing contains dropped kerbs and tactile paving.
- The three-arm R819 Greenhills Road / Airton Road signalised junction has signalised crossings on the western and southern arms along with right turn pocket into Airton Road for vehicles travelling south on the R819 Greenhills Road. The crossings contain dropped kerbs and tactile paving;
- The four-arm R819 Greenhills Road / Harvey Norman Store / Hibernian Industrial Estate signalised junction has signalised crossings on both minor arms and the southern arm. The crossings contain dropped kerbs and tactile paving;
- The three-arm R819 Greenhills Road / Mayberry Road junction has signalised crossings on the western and southern arms. The crossings contain dropped kerbs and tactile paving;
- The three-arm R819/ Greenhills Road / Castletymon Road junction has signalised crossings on the northern and eastern arms. The crossings contain dropped kerbs and tactile paving; and
- At the junction of R819 Greenhills Road and Temple Woods (signalised Pelican crossing). The crossing contains dropped kerbs and tactile paving.

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. The locations of the pedestrian crossings are illustrated in Figure 6.3a in TIA Appendix 3 (Maps).

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footway widths) at each junction along Section 1 of the Proposed Scheme is included in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

5.3.2.2 Cycling Infrastructure

The cycle facilities along Section 1 of the Proposed Scheme comprise on-road and off-road cycle tracks on both sides of the carriageway, except for certain lengths where there are bus lanes or restricted road widths.

Heading eastbound towards the City Centre, cycle facilities in this section commence on Belgard Square North after the pedestrian crossing approximately 20m east of Tallaght University Hospital entrance, here an on-road

advisory cycle lane in both directions extends just beyond the Exchange Hall junction. From there the eastbound cycle track is level and bollard segregated, the westbound cycle lane continues to the entrance to The Dublin Climbing Centre where the westbound cycle lane is level segregated from the road as far as the Belgard Square North / Belgard Square East junction. There are Sheffield bicycle stands located adjacent to commercial buildings on Belgard Square West and along the first 200m of Belgard Square North.

The cycle track continues along Belgard Square East up to the junction with Blessington Road, with the exception of a 20m length on the western side of the highway where there is a conflict with a discontinued lay-by bus stop. Along Blessington Road, the cycle track / zipway is present on the northern side of the road only up to the junction with Belgard Road. After passing this junction, the cycle track / zipway on the northern side continues up to the Metro Café Bar on Main Street.

From this point, there is no cycling provision for approximately 500m, until an on-road cycle lane at the junction of Main Road and Old Greenhills Road. The lane is for eastbound cyclists only and continues until the junction with R819 Greenhills Road.

Heading northbound of R819 Greenhills Road, cycling provision can be found just after passing the junction with Bancroft Park, where a shared surface for pedestrians and cyclists is provided on both sides of the carriageway. The width of the cycle track is approximately 1.8m and continues for approximately 440m until the junction with Airton Road is reached.

At the Airton Road junction, cyclists on each side of the carriageway join on-road cycle lanes. The lanes run continuously from this point up to the M50 bridge (approximately 1.3km).

The existing cycle facilities along Section 1 of the Proposed Scheme are illustrated in Figure 6.4a in TIA Appendix 3 (Maps).

Further details of the baseline cycling facilities (i.e. level of segregation from vehicles, capacity for cycling two abreast and / or overtaking, and junction treatment) along the length of Section 1 of the Proposed Scheme is included in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

5.3.2.3 Bus Infrastructure

5.3.2.3.1 Bus Priority Measures

Bus lanes are provided on Section 1 of the Proposed Scheme at the following locations:

- `Bus Only' eastbound on Blessington Road at Blessington Road / Cookstown Way junction;
- 'Bus Only' access from Belgard Square West onto Cookstown Way; and
- A bus gate that only allows only buses to travel east-west and west-east along Blessington Road between Belgard Road and Main Road.

5.3.2.3.2 Bus Stop Facilities

There are currently 16 bus stops along Section 1 of the Proposed Scheme. The inbound stops are as follows:

- Stop 4348 on Belgard Square West;
- Stop 4646 at Tallaght Hospital / Belgard Square North;
- Stop 4647 on Belgard Square North, 80m west of Belgard Square East; and
- Stops 4435, on Main Street 140m north of Old Bawn Road;
- Stop 2633 on R819 Greenhills Road, 50m north of Airton Road;
- Stop 2369 on R819 Greenhills Road, 30m north of Mayberry Road;
- Stop 2370 on R819 Greenhills Road, at Park View;
- Stop 2371 on R819 Greenhills Road, 40m north of Temple Woods;

The outbound stops are:

- Stop 2339 on R819 Greenhills Road, 30m south of Temple Woods;
- Stop 2340 on R819 Greenhills Road, 30m south of Parkview;
- Stop 2601 on R819 Greenhills Road, 80m south of Mayberry Road; and
- Stop 4446 on R819 Greenhills Road, 40m north of Airton Road;
- Stop 2557 on Blessington Road, 120m north of Main Road;
- Stop 4436 on Blessington Road, 40m east of Belgard Road;
- Stop 4640 on Belgard Square North at Tallaght Hospital; and
- Stop 4347 at The Square, Tallaght (Belgard Square West).

There are some areas of this section where there is a sizeable gap (600m – 700m) between stops, such as between South Dublin County Council offices (Tallaght Hospital stop 4640) and Tallaght, Blessington Road (4436); or Belgard Square North (4647) and Tallaght Village (4435).

The majority of bus stops provide timetable information, and under half provide shelter and seating. Nine bus stops have an indented drop-off area, with all others situated in line with bus lanes. Table 5.3 outlines the availability of bus stop facilities at the existing sixteen bus stops along Section 1 of the Proposed Scheme.

Table 5.3: Section 1 – Availability of Bus Stop Facilities (of a Total 16 no. Bus Stops)

Bus Stop Facility	Number of Bus Stops in Baseline with Facility	Percentage of Bus Stops in Baseline with Facility
RTPI	7	44%
Timetable information	13	81%
Shelter	7	44%
Seating	7	44%
Accessible Kerbs	5	31%
Indented Drop Off Area	9	56%

The existing bus facilities along Section 1 of the Proposed Scheme are illustrated in Figure 6.5a in TIA Appendix 3 (Maps). The bus services which operate along Section 1 are outlined in Table 5.4.

Table 5.4: Section 1 – Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
27	Jobstown - Tallaght (The Square) - Walkinstown Cross (The Kestrel) - Dolphin's Barn Cross - Eden Quay - Fairview - Artane Roundabout - Clare Hall	10 minutes	10-15 minutes
49	Tallaght (The Square) - The Mill / Old Bawn Rd. - Templeogue Village - Pearse Street	30 minutes	30-60 minutes
27	Clare Hall – Artane Roundabout – Fairview – Dolphin's Barn Cross – Walkinstown Cross – Tallaght (The Square) - Jobstown	10 minutes	10–15 minutes
54a	Ellensborough / Kiltipper Way - Old Blesssington Rd. (The Square) - Spawell - Harold's Cross Green - Pearse Street	30 minutes	30-60 minutes
65	Blessington / Ballymore - Cross Chapel - Tallaght (The Square) - Templeogue - Terenure - Rathmines - Camden St - Poolbeg St.	120 minutes	120 minutes
75/75a	Tallaght - Dundrum - Stillorgan - Dun Laoghaire	30 minutes	30 minutes
76	Tallaght (The Square) – Clondalkin Village – Neilstown Road (Coldcut Road) – Ballyfermot - Chapelizod	20 minutes	30 minutes
76a	Tallaght (The Square) – Clondalkin Village – Neilstown Road (Coldcut Road) – Ballyfermot – Chapelizod – Blanchardstown Centre	50 minutes	No Services
77a	Citywest - Tallaght (The Square) - Balrothery - Walkinstown Cross - Dolphin's Barn - Ringsend Rd.	15-20 minutes	20-30 minutes
77x	Citywest - Ellensborough - Kiltipper Way - Cuckoo's Nest - Dolphin's Barn - Fleet St. - UCD Belfield	Once a day (07:20)	No service
132	Bushras - Main Street - Water Street - Dwyer Square - Main Street - Redmond Place	180 minutes	180 minutes
175	Monaghan - Cootehill - Cavan	120 minutes	180 minutes

5.3.2.4 General Traffic

The roads within Section 1 of the Proposed Scheme are mostly single carriageway, with the exception of 100m of dual carriageway on Blessington Road between the junctions with Belgard Square East and Belgard Road. Generally, there is one operating lane in each direction for general traffic, although on the approach to some junctions and along the aforementioned section of Blessington Road, the number of lanes increases.

The width of the carriageway varies between different points of this section. At some points (particularly Belgard Road West and Main Street), the carriageway is as narrow as 7.0m in places. By contrast, some sections, such as on Blessington Road, the highway is as wide as 17m (including median). The R819 Greenhills Road is approximately 8.0m in width. This portion of the Proposed Scheme is subject to a speed limit of 50 km/h.

The existing major junction arrangements along the section are as follows:

- Blessington Road / Cookstown Way four-arm signalised junction;
- Belgard Square South / Belgard Square West three-arm roundabout;
- Belgard Square West / Old Blessington Road four-arm signalised junction;
- Belgard Square West / Belgard Square North / Tallaght Hospital access four-arm roundabout;
- Belgard Square North / Exchange Hall Access signalised junction
- Belgard Square North / Belgard Square East four-arm roundabout;
- Belgard Square East / Blessington Road four-arm signalised junction;
- Blessington Road / Belgard Road four-arm signalised junction;
- Blessington Road / Main Road three-arm signalised junction
- Main Road / Old Greenhills Road three-arm priority junction;
- R819 Greenhills Road / Airton Road three-arm signalised junction;
- R819 Greenhills Road / Harvey Norman Retail Park four-arm signalised junction;
- R819 Greenhills Road / Broomhill Road three-arm priority junction;
- R819 Greenhills Road / Hibernian Industrial Estate three-arm priority junction;
- R819 Greenhills Road / Mayberry Road three-arm signalised junction; and
- R819 Greenhills Road / Castletymon Road three-arm signalised junction.

The characteristics of each major junction is described in turn below, alongside satellite images which are extracts from Figure 6.6 in TIA Appendix 3 (Maps).

Blessington Road / Cookstown Way four-arm signalised junction:

The northern arm of this junction has a one lane approach, and the southern arm a two-lane approach, alongside a left turning slip lane. The eastern arm has a bus only lane approach. The western arm has a bus only approach lane with a left turn slip lane onto Cookstown Way (northbound) for general traffic. This junction is illustrated in Image 5.1.

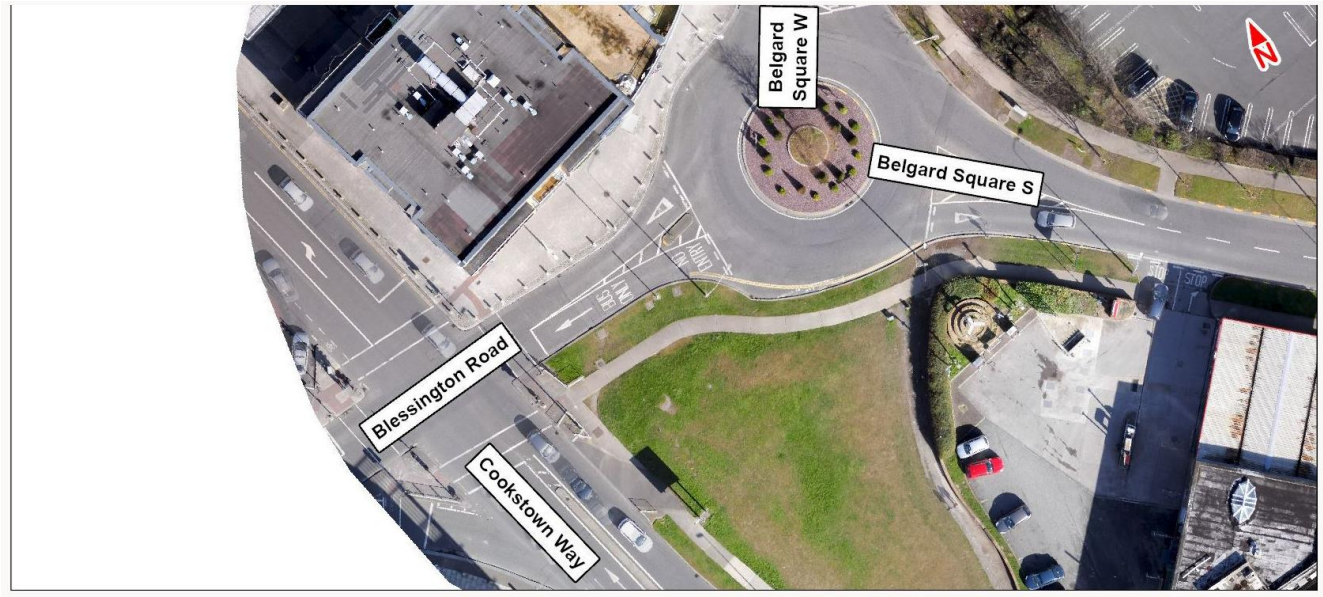

Image 5.1: Blessington Road / Cookstown Way Signalised junction

Belgard Square South / Belgard Square West three-arm roundabout:

This roundabout has an inscribed circle diameter of approximately 16.0m. Each arm of this priority roundabout comprises an entry and exit lane. The exit arm onto Cookstown Way is for buses only. This junction is illustrated in Image 5.2.

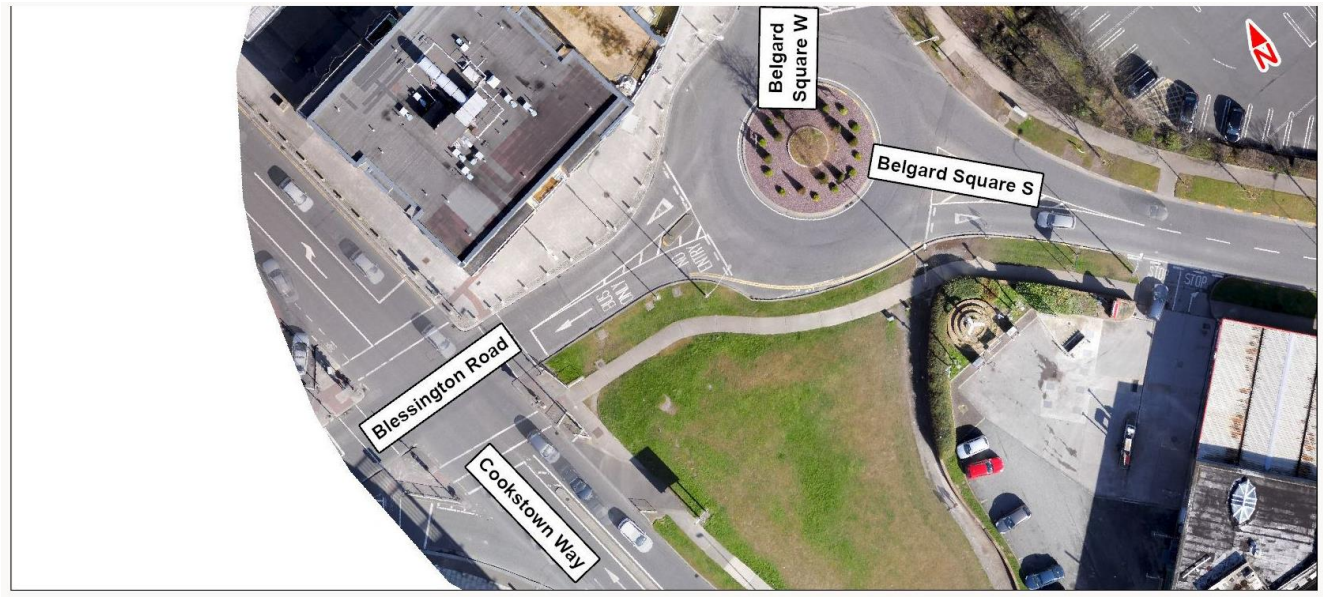

Image 5.2: Belgard Square South / Belgard Square West Roundabout junction

Belgard Square West / Old Blessington Road four-arm signalised junction:

Vehicles crossing the northern arm of this junction must pass over the tram line (Tallaght Luas Stop). Consequently, there is a yellow box at this arm to ensure vehicles do not enter the junction unless this exit is free.

The Belgard Square West north arm has a single approach lane for straight ahead movements only (no left or right turn allowed) controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane.

The Old Blessington Road east arm has a single approach lane for straight ahead and right turn movements only (no left turn allowed) controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane.

The Belgard Square West south arm has two approach lanes, one lane for straight ahead and left turning movements and one lane for right turn movements controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane.

The Old Blessington Road west arm has two approach lanes, one lane for straight ahead only (no left turn allowed) and one lane for right turn movements controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane. This junction is illustrated in Image 5.3.

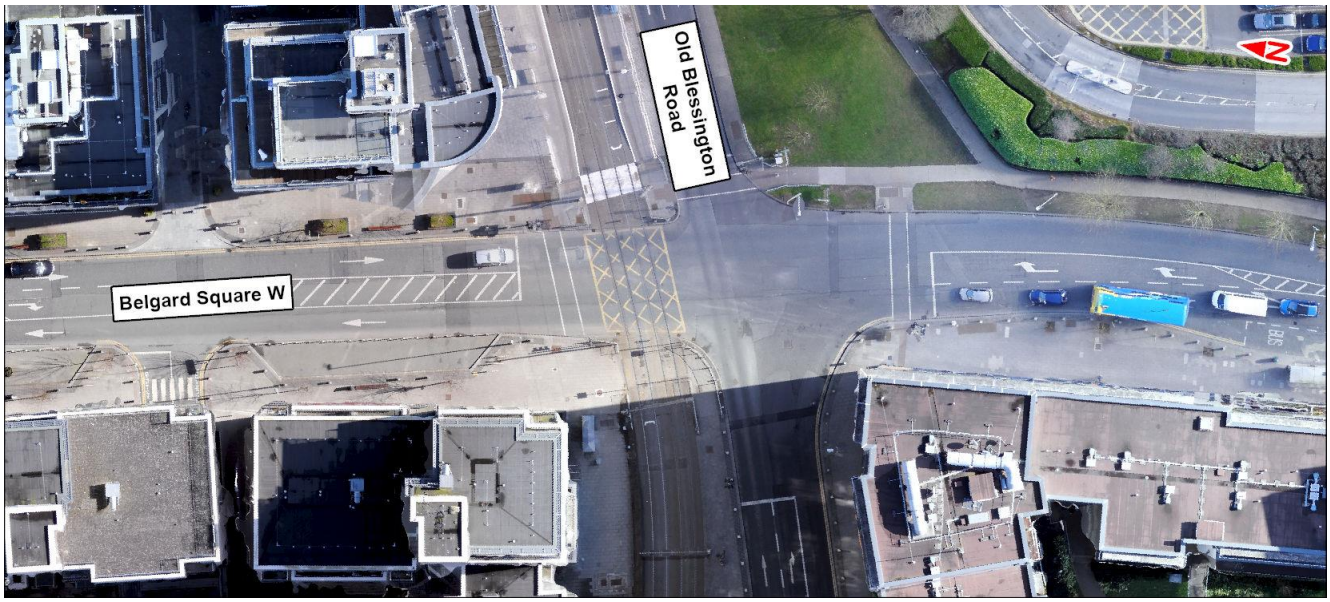

Image 5.3: Belgard Square West / Old Blessington Road Signalised Junction

Belgard Square West / Belgard Square North / Tallaght University Hospital access four-arm roundabout:

This junction provides access to Tallaght University Hospital (TUH).

The north arm (TUH entrance) has a single yield approach lane for all movements. Exit onto this arm comprises a single traffic lane.

The east arm (Belgard Square North) has two yield approach lanes, one lane for straight ahead and left turn movements and one lane for right turn movements. Exit onto this arm comprises a single traffic lane.

The south arm (Belgard Square West) has two yield approach lanes, one lane for straight ahead and left turn movements and one lane for right turn movements. Exit onto this arm comprises a single traffic lane.

The west arm has two yield approach lanes, one lane for left turn movements and one lane for right turn and straight ahead movements. Exit onto this arm comprises a single traffic lane. This junction is illustrated in Image 5.4.

Image 5.4: Belgard Square West / Belgard Square North / Tallaght Hospital Roundabout

Belgard Square North / Exchange Hall Access three-arm signalised junction:

The north arm, Belgard to Cookstown Link Road (Exchange Hall Access) has a single approach lane and a segregated cycle track for all movements controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane and an advisory on-road cycle lane.

The east arm (Belgard Square North) has two approach lanes and an advisory on-road cycle lane, one traffic lane is for straight ahead movements and one traffic lane is for right turn movements only controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane with advisory on-road cycle lane.

The west arm (Belgard Square North) has a single approach lane and an advisory on-road cycle lane for all movements controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane and an advisory on-road cycle lane. This junction is shown in Image 5.5

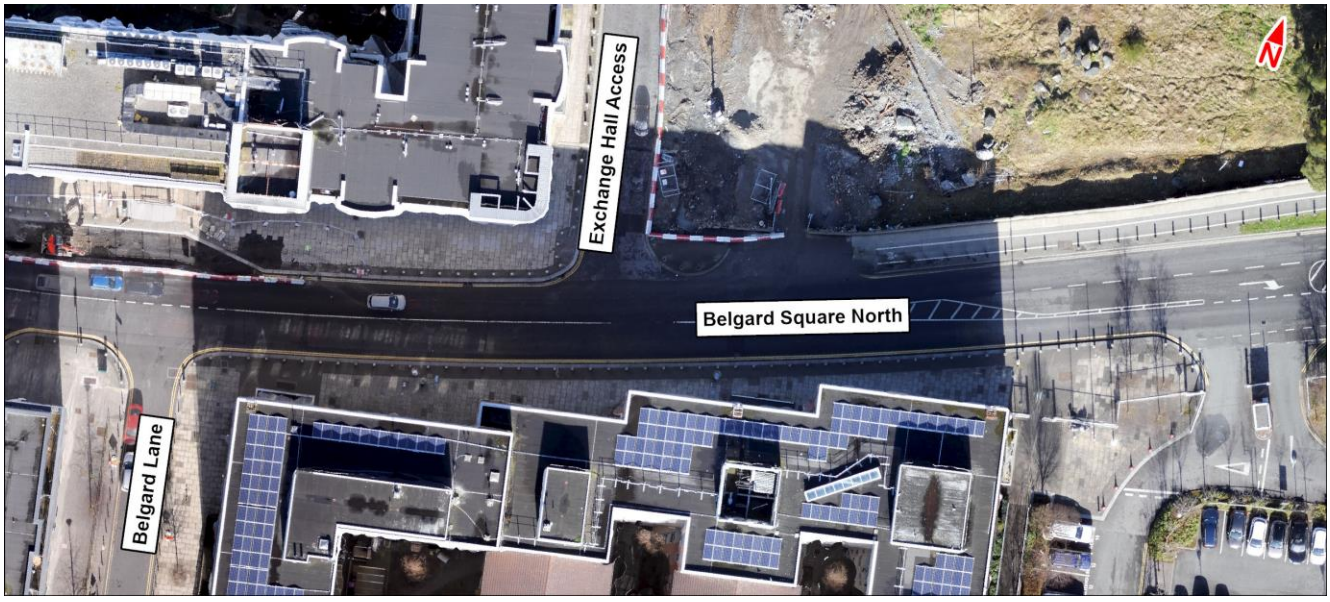

Image 5.5: Belgard Square North / Exchange Hall Access Signalised Junction

Belgard Square North / Belgard Square East four-arm roundabout:

The north arm has a single yield approach lane for all movements. Exit onto this arm comprises a single traffic lane. The only road markings at this private access arm are for a cycle track / footway crossing. The east arm has a single yield approach lane and segregated cycle track. Exit onto this arm comprises a single traffic lane and off-road cycle track.

The south arm (Belgard Square East) has a single yield approach lane and segregated cycle track. Exit onto this arm comprises a single traffic lane and off-road cycle track.

The west arm (Belgard Square North) has a single yield approach lane and segregated cycle track. Exit onto this arm comprises a single traffic lane and segregated cycle track. This junction is shown in Image 5.6.

Image 5.6: Belgard Square North / Belgard Square East Roundabout

Belgard Square East / Blessington Road four-arm signalised junction:

At the centre of the junction is a yellow box which ensures vehicles do not enter the junction unless their exit is clear.

The north arm has a single approach lane and an off-road cycle track for all movements controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane and a segregated cycle track. A raised cycle / pedestrian crossing is present on this arm.

The east arm has two approach lanes, one lane for straight ahead and left turning movements and one lane for right turn movements controlled by a set of signal heads. Exit onto this arm comprises two traffic lanes with segregated cycle track (Zipway).

The south arm has a single approach lane for straight ahead and left turn movements only (no right turn allowed) controlled by a set of signal heads. Exit onto this arm comprises single traffic lane.

The west arm has a single approach lane for all movements controlled by a set of signal heads. There is also a segregated cycle track (Zipway) on this arm. Exit onto this arm comprises single traffic lane. This junction is shown in Image 5.7.

Image 5.7: Belgard Square East / Blessington Road Signalised Junction

Blessington Road and Belgard Road four-arm signalised junction:

This is the largest signalised junction in this section of the Proposed Scheme. The north arm (R113 Belgard Road) has two approach lanes, one for straight ahead and left turn movements and one for right turn movements and an advisory on-road cycle lane controlled by a set of signal heads. Exit onto this arm comprises two traffic lanes and an advisory on-road cycle lane. A raised cycle / pedestrian crossing is present on this arm.

The east arm (Blessington Road) has a single approach lane for all traffic movements controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane.

The south arm (R113 Belgard Road) has two approach lanes and a slip lane, the slip lane is for left-turn movements, one approach lane for straight movements and one approach lane for right-turn movements, on approach there is also an advisory on-road cycle lane and a segregated cycle track all controlled by a set of signal heads. Exit onto this arm comprises a single traffic lane and segregated cycle track.

The west arm (Blessington Road) has two approach lanes, one for straight ahead and left-turn movements and one for right-turn movements only controlled by a set of traffic signals and a segregated cycle track (Zipway). Exit onto this arm consists of two traffic lanes and yield slip lane. This junction is shown in Image 5.8.

Image 5.8: Blessington Road / Belgard Road Signalised Junction

Blessington Road / Main Road three-arm signalised junction:

The north arm (Blessington Road) has two approach lanes, one for left-turn movements and one for right/straight ahead movements controlled by a set of signal heads. Exit onto this arm consists of single traffic lane.

The east arm (Main Road) has two approach lanes, one for right-turn movements and one for left-turn movements controlled by a set of signal heads. Exit onto this arm consists of single traffic lane.

The south arm has a single approach lane for straight ahead and right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single traffic lane. This junction is shown in Image 5.9.

Image 5.9: Blessington Road / Main Road Signalised Junction

Main Road / Old Greenhills Road three-arm priority junction:

The north arm has a single lane for all traffic movements, priority is given to traffic on Main Road. Exit onto this arm consists of a single traffic lane.

The east arm has a single lane for all traffic movements with priority over traffic exiting from Old Greenhills Road.

The west arm has a single lane and on-road advisory cycle lane for all traffic movements with priority over traffic exiting from Old Greenhills Road. This junction is shown in Image 5.10.

Image 5.10: Main Road / Old Greenhills Road Priority Junction

R819 Greenhills Road / Airton Road three-arm signalised junction:

The north (R819 Greenhills Road) arm has two approach traffic lanes and an advisory on-road cycle lane, one traffic lane for right-turn movements and one traffic lane for straight ahead movements controlled by a set of signal heads. Exit onto this arm consists of single traffic lane and advisory on-road cycle lane.

The south (R819 Greenhills Road) arm has a single traffic lane for left-turn and straight ahead movements and an on-road advisory cycle lane controlled by a set of signal heads. Exit onto this arm consists of a single traffic lane and a segregated cycle track.

The west arm (Airton Road) has two traffic lanes and an advance stop line for cyclists, one traffic lane for left turn traffic movements and one traffic lane for right-turn traffic movements controlled by a set of signal heads. Exit onto this arm consists of a single traffic lane. This junction is shown in Image 5.11.

Image 5.11: R819 Greenhills Road / Airton Road Signalised Junction

R819 Greenhills Road / Harvey Norman Retail four-arm signalised junction:

The north arm (R819 Greenhills Road) has two approach traffic lanes and an advisory on-road cycle lane, one traffic lane for right-turn movements and one traffic lane for straight ahead and left-turn movements controlled by a set of signal heads. Exit onto this arm consists of single traffic lane and advisory on-road cycle lane.

The west arm (Harvey Norman Retail) has two approach lanes, one for left-turn movements and one for straight ahead and right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The south arm (R819 Greenhills Road) has two approach traffic lanes and an advisory on-road cycle lane, one traffic lane for right-turn movements and one traffic lane for straight ahead and left-turn movements controlled by a set of signal heads. Exit onto this arm consists of single traffic lane and advisory on-road cycle lane.

The east arm has two approach lanes, one for left-turn movements and one for straight ahead and right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single lane. This junction is shown in Image 5.12.

Image 5.12: R819 Greenhills Road / Harvey Norman Retail Access Signalised Junction

R819 Greenhills Road / Broomhill Road three-arm priority junction:

The north arm (R819 Greenhills Road) has a single approach lane for all movements and advisory on-road cycle lane with priority over traffic exiting Broomhill Road. Exit onto this arm consists of a single lane and advisory on-road cycle lane.

The south arm (R819 Greenhills Road) has a single approach lane for all movements and advisory on-road cycle lane with priority over traffic exiting Broomhill Road. Exit onto this arm consists of a single lane and advisory on-road cycle lane.

The west arm (Broomhill Road) has a single approach lane for all movements with priority is given to traffic on R819 Greenhills Road. Exit onto this arm consists of a single traffic lane. This junction is shown in Image 5.13

Image 5.13: R819 Greenhills Road / Broomhill Road Priority Junction

R819 Greenhills Road / Hibernian Industrial Estate three-arm priority junction:

The north arm has a single approach lane for all movements and advisory on-road cycle lane with priority over traffic exiting Hibernian Industrial Estate. Exit onto this arm consists of a single lane and advisory on-road cycle lane.

The east arm has a single approach lane for all movements with priority is given to traffic on R819 Greenhills Road. Exit onto this arm consists of a single traffic lane.

The south arm has a single approach lane for all movements and advisory on-road cycle lane with priority over traffic exiting Hibernian Industrial Estate. Exit onto this arm consists of a single lane and advisory on-road cycle lane. This junction is shown in Image 5.14.

Image 5.14: R819 Greenhills Road / Hibernian Industrial Estate Priority Junction

R819 Greenhills Road / Mayberry Road three-arm signalised junction:

The north arm (R819 Greenhills Road) has two approach traffic lanes and an advisory on-road cycle lane, one traffic lane for right-turn movements and one traffic lane for straight ahead movements controlled by a set of signal heads. Exit onto this arm consists of single traffic lane and advisory on-road cycle lane.

The south arm (R819 Greenhills Road) has two approach traffic lanes and an advisory on-road cycle lane, one traffic lane for left-turn movements and one traffic lane for straight ahead movements controlled by a set of signal heads. Exit onto this arm consists of single traffic lane and advisory on-road cycle lane.

The east arm (Mayberry Road) has two approach traffic lanes and an advisory on-road cycle lane, one traffic lane for left-turn movements and one traffic lane for right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single traffic lane and advisory on-road cycle lane. This junction is shown in Image 5.15.

Image 5.15: R819 Greenhills Road / Mayberry Road Signalised Junction

R819 Greenhills Road / Castletymon Road three-arm signalised junction:

The north (R819 Greenhills Road) arm has two approach traffic lanes and an advisory on-road cycle lane, one traffic lane for left-turn movements (no markings) and one traffic lane for straight ahead movements (no markings) controlled by a set of signal heads. Exit onto this arm consists of single traffic lane and advisory on-road cycle lane.

The east arm (Castletymon Road) has two approach lanes, one for left-turn movements and one for right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The south (R819 Greenhills Road) arm has two approach traffic lanes and an advisory on-road cycle lane, one traffic lane for right-turn movements and one traffic lane for straight ahead movements controlled by a set of signal heads. Exit onto this arm consists of single traffic lane and advisory on-road cycle lane. This junction is shown in Image 5.16.

Image 5.16: R819 Greenhills Road / Castletymon Road Signalised Junction

5.3.2.5 Existing Parking / Loading

There is parking directly on Section 1 of the Proposed Scheme at the following locations:

- There are seven informal parking spaces on the west side of Blessington Road, to the north of the junction with Main Road, where vehicles park perpendicular to the kerb;
- There are currently thirty-four pay & display spaces and two disabled spaces, Main Street and Old Greenhills Road; and
- There are currently three hundred and forty-five parking spaces associated with a range of commercial entities (car sales) on Greenhills Road, to the west of the M50 bridge.

Large nearby car parks (adjacent parking) close to Section 1 of the Proposed Scheme route can be found at:

- Service Station, Belgard Square South – approximately 80 spaces;
- The Square, Tallaght: Belgard Square West – approximately 2,500 spaces;
- Tallaght Cross East: Belgard Square West – approximately 445 spaces;
- Tallaght Cross West: Belgard Square West – approximately 1,600 spaces;
- Tallaght University Hospital: Belgard Square North – approximately 165 spaces;
- Exchange Hall, Belgard Square North – approximately 593 spaces; and
- A number of other off-street private car parks – approximately 1739 spaces.

5.3.3 Section 2 - Ballymount to Crumlin

The following section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 2 of the Proposed Scheme, between Ballymount to Crumlin.

Section 2 commences on R819 Greenhills Road, south of the M50 overbridge. The route then branches north-west via Ballymount Avenue and north-east via Calmount Road, before re-joining R819 Greenhills Road at the Greenhills Industrial Estate to the south of Walkinstown Roundabout.

5.3.3.1 Pedestrian Infrastructure

Passing over the M50 bridge, there are footways of approximately 1.5m – 2.0m in width on both sides of the carriageway. The footways are separated from the road by a small, grassed verge, until the R819 Greenhills Road, Ballymount Road Upper bus stop (no. 2337) is reached.

Ballymount Avenue is currently only accessed from R819 Greenhills Road via Ballymount Road Upper and has a footway along the western side of the carriageway only, separated by a grassed bank. Calmount Road has footways of 2.0m in width along both sides of the carriageway which are also separated from the road by grassed banks. Calmount Road currently leads to a Cul-de-Sac, with no access to R819 Greenhills Road.

From the Upper Ballymount Road bus stop (no. 2337), the western footway of R819 Greenhills Road is approximately 1.5m - 2.0m width and immediately adjacent to the road, while the eastern footway (1.8m width) is set back and segregated by a grassed verge. This layout continues for approximately 450m, until the junction with Kilakee Drive. At this point, footway is only available on the west side of the road, pedestrians using the eastern footway must either cross over to the west (no crossing provided) or take a 200m detour via Kilakee Drive before they re-join R819 Greenhills Road.

An informal footway is currently provided near the R819 Greenhills Road (Calmount Avenue) bus stop (no. 2335), to enable pedestrian access from R819 Greenhills Road onto Calmount Avenue. Calmount Avenue has footways of approximately 2.0m width along both sides of the carriageway, separated via a grassed bank.

Continuing on R819 Greenhills Road, the footways on the northern side of the road narrow to 1.5m in width (immediately adjacent to the road) until the access road to Greenhills Industrial Estate. From this point, despite there being a footway provided on both sides of the road, there are typically vehicles parked on the south-eastern footway, obstructing pedestrian movements.

Pedestrian crossing facilities can be found at these locations:

- R819 Greenhills Road 70m north of Ballymount Road Upper junction near Tymon Park (signalised Pelican crossing);
- R819 Greenhills Road (signalised Pelican crossing), 75m south of Walkinstown Roundabout; and
- R819 Greenhills Road (courtesy crossing), 10m south of Walkinstown Roundabout.

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. The location of pedestrian crossings is illustrated in Figure 6.3b in TIA Appendix 3 (Maps).

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at each junction along Section 2 of the Proposed Scheme is included in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

5.3.3.2 Cycling Infrastructure

The cycle facilities along Section 2 of Proposed Scheme comprise of advisory on-road cycle lanes on both sides of the carriageway, except for certain lengths where there are bus lanes or restricted road widths.

Heading northbound from the M50 bridge on R819 Greenhills Road, on-road advisory cycle lanes run continuously until where the new junction with Calmount Avenue will be constructed. There are currently no cycling facilities on Calmount Avenue and Calmount Road. Re-joining R819 Greenhills Road, the on-road advisory cycle lanes resume and continue until approximately 40m short of the southern arm of the Walkinstown roundabout.

There is no formal cycle parking, or designated cycle hire parking racks, along this section of the route.

The existing cycle facilities along Section 2 of the Proposed Scheme is illustrated in Figure 6.4b in TIA Appendix 3 (Maps).

Further details of the baseline cycling facilities (i.e. level of segregation from vehicles, capacity for cycling two abreast and / or overtaking, and junction treatment) along the length of Section 2 of the Proposed Scheme is included in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

5.3.3.3 Bus Infrastructure

5.3.3.3.1 Bus Priority Measures

There are currently no designated bus lanes along Section 2 of the Proposed Scheme.

5.3.3.3.2 Bus Stop Facilities

There are currently eight bus stops along Section 2 of the Proposed Scheme. The inbound stops are as follows:

- Stop 2372 on R819 Greenhills Road at Old Tymon Lane, 300m north-west of the M50 overbridge;
- Stop 2373 on R819 Greenhills Road, 100m south of the Lidl access; and
- Stop 2377 R819 Greenhills Road, 115m south of Walkinstown Roundabout.

The outbound stops are:

- Stop 2337 on R819 Greenhills Road, at Old Tymon Lane;
- Stop 2336 to south of the Greenhills Road / Killakee Road junction;
- Stop 2335 on R819 Greenhills Road, 25m north of the Lidl access;
- Stop 4662 on R819 Greenhills Road, opposite Tyremaster retail service; and
- Stop 2334 on R819 Greenhills Road, 170m south of Walkinstown Roundabout.

Of the eight bus stops along Section 2 of the Proposed Scheme, three are intended whilst the other bus stops are inline along the carriageway. Over half of bus stops provide timetable information, whilst just under half provide shelter and seating.

The contents of Table 5.5 outlines the availability of bus stop facilities at the existing eight bus stops along Section 2 of the Proposed Scheme.

Table 5.5: Section 2 – Availability of Bus Stop Facilities (of a Total 8no. Bus Stops)

Bus Stop Facility	Number of Bus Stops in Baseline with Facility	Percentage of Bus Stops in Baseline with Facility
RTPI	0	0%
Timetable information	6	75%
Shelter	2	25%
Seating	2	25%
Accessible Kerbs	0	0%
Indented Drop Off Area	3	38%

The existing bus facilities along Section 2 of the Proposed Scheme are illustrated in Figure 6.5b in TIA Appendix 3 (Maps). The bus services which operate along Section 2 are outlined in Table 5.6.

Table 5.6: Section 2 – Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
27	Jobstown - Tallaght (The Square) - Walkinstown Cross (The Kestrel) - Dolphin's Barn Cross - Eden Quay - Fairview - Artane Roundabout - Clare Hall	10 minutes	10-15 minutes
77a	Citywest - Tallaght (The Square) - Balrothery - Walkinstown Cross - Dolphin's Barn - Ringsend Rd.	15-20 minutes	20-30 minutes
77x	Citywest - Ellensborough - Kiltipper Way - Cuckoo's Nest - Dolphin's Barn - Fleet St. - UCD Belfield	Once a day (07:20)	No service

5.3.3.4 General Traffic

R819 Greenhills Road within this section of Proposed Scheme is single carriageway, operating primarily with one northbound and one southbound lane, and is approximately 8.0m in width for the majority of the route. The main

exceptions to this are at the approach to junctions, where the road widens, and the number of lanes increases. This section is subject to a 50km/h speed limit.

The existing major junction arrangements along Section 2 of the Proposed Scheme are as follows:

- Ballymount Avenue / Calmount Road four-arm roundabout; and
- Walkinstown six-arm roundabout.

The characteristics of each major junction is described in turn below, alongside satellite images which are extracts from Figure 6.6 in TIA Appendix 3 (Maps).

Ballymount Avenue / Calmount Road four-arm roundabout:

The north (Ballymount Avenue) arm has a single yield approach lane for all movements. Exit onto this arm comprises a single traffic lane. The east arm (Calmount Road) has a single yield approach lane for all movements. Exit onto this arm comprises a single traffic lane.

The south arm (Ballymount Avenue) has a single yield approach lane for all movements. Exit onto this arm comprises a single traffic lane. The west arm (Calmount Road) has a single yield approach lane for all movements. Exit onto this arm comprises a single traffic lane. This junction is shown in Image 5.17.

Image 5.17: Ballymount Avenue / Calmount Road Roundabout

Walkinstown Roundabout six-arm roundabout:

The R819 Greenhills Road arm has three yield approach lanes without lane direction arrow markings. Exit onto this arm comprises a single wide traffic lane.

The Ballymount Road Lower arm has two yield approach lanes without lane direction arrow markings. Exit onto this arm comprises a single wide traffic lane.

The R112 Walkinstown Avenue arm has three yield approach lanes without lane direction arrow markings. Exit onto this arm comprises a single wide traffic lane.

The R819 Walkinstown Road arm has three yield approach lanes without lane direction arrow markings. Exit onto this arm comprises a single wide traffic lane.

The Cromwellsfort Road arm has three yield approach lanes without lane direction arrow markings. Exit onto this arm comprises a single wide traffic lane. The St. Peter's Road arm has three yield approach lanes without lane

direction arrow markings. Exit onto this arm comprises a single wide traffic lane. This junction is illustrated in Image 5.18.

Image 5.18: Walkinstown Roundabout (Northern Section)

Image 5.19: Walkinstown Roundabout (Southern Section)

5.3.3.5 Existing Parking / Loading

There is parking directly on Section 2 of the Proposed Scheme at the following locations:

- Informal parking on both sides of Calmount Road, between Ballymount Avenue and Calmount Avenue, with potential estimated space for approximately 35 vehicles.

Nearby car parks close to Section 2 of the Proposed Scheme can be found at:

- Maxol Greenhills Road – approximately 15 spaces;
- Lidl Car Park – 160 spaces;
- Bloomfield Garage – 11 spaces;
- Various Adjacent parking spaces on R819 Greenhills Road – approximately 441 spaces;
- Weirs Motors commercial parking – 20 spaces; and
- Walkinstown Roundabout – 88 (adjacent), 31 (informal) and 9 Taxi spaces.

5.3.4 Section 3 - Crumlin to Grand Canal

This section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 3 of the Proposed Scheme.

After Walkinstown Roundabout, the Proposed Scheme passes north along R819 Walkinstown Road to the Long Mile Road / Walkinstown Road junction. After travelling east along R110 Drimnagh Road for approximately 800m, buses heading towards the City Centre will bear left at the junction of Drimnagh Road / Kildare Road / St Mary's Road. From here, the route continues in a north-east direction on R110 Crumlin Road for approximately 1.75km, until the junction with R111 Parnell Road is reached. As part of the Proposed Scheme, an alternative route for cyclists is provided along Bunting Road, St Mary's Road, Kildare Road and Clogher Road to link into the Grand Canal cycle route at R111 Parnell Road.

5.3.4.1 Pedestrian Infrastructure

Throughout Section 3, the footways on each side of the carriageway are generally 2m to 3m in width. Along R819 Walkinstown Road the footways widen to 3m and continue up to the junction with R110 Long Mile Road. However, vehicles are commonly parked on the footways throughout this section of route, with this issue being particularly prevalent within 150m north of the Walkinstown roundabout. There are some instances where the footways widen, such as near Crumlin Children's Hospital, where the footway widens to 4.5m. However, there are numerous instances throughout this section where vehicles are parked on the footways, obstructing the flow of pedestrians.

Bunting Road has continuous footways on both sides of the road between R818 Cromwellsfort Road and Kildare Road. These are typically 2m in width. The paved area available to pedestrians is actually much wider, typically around 6m in width, but the section nearest the carriageway is typically taken up by illegally parked vehicles and bisected by an avenue of planted trees.

Kildare Road has footways along both sides of the road throughout. These are generally between 1.5m to 3m in width, however on the northern side of Kildare Road, vehicles park alongside the footways off the carriageway. This parking is uncontrolled, with only a change in pavement colouring indicating where vehicles should park. Evidence of parked vehicles reducing the effective footway width, has been observed in this section.

The western section of Clogher Road (between its junctions with Kildare Road and Sundrive Road) also has footways on both sides of the carriageway which are used for off-street parking, and the effective width is at times reduced to less 1m because of this. After the Sundrive Road junction, the presence of parking alongside the footways ceases, and the footways widen to approximately 3m on both sides of the road. The footways continue on both sides of Clogher Road until the junction with Parnell Road, at widths of approximately 3-4 m despite some off-street parking.

There are several pedestrian crossings along Section 3 of the Proposed Scheme. Pedestrian crossing facilities can be found at the following locations:

- On R819 Walkinstown Road, 50m north of Walkinstown roundabout (signalised Pelican crossing);
- The four-arm R819 Walkinstown Road / Kilnamanagh Road signalised junction has signalised crossings on all arms;
- The three-arm R110 Long Mile Road / R819 Walkinstown Road signalised junction has signalised crossings on two arms;
- The four- arm R110 Drimnagh Road /Slievebloom Road / Balfe Road signalised junction has signalised crossings on three arms;
- The three-arm R110 Drimnagh Road / Errigal Road signalised junction has signalised crossings on two arms;
- The four – arm R110 Drimnagh Road / Kildare Road signalised junction has signalised crossings on all arms.
- The three arm R110 Crumlin Road / Cooley Road signalised junction has a signalised crossing on one arm;
- On R110 Crumlin Road, 20m to the east of Rafters Road (signalised Pelican crossing);

- On R110 Crumlin Road, at the junction with Iveagh Gardens (signalised Pelican crossing);
- On R110 Crumlin Road, 20m to the east of Clonard Road (signalised Pelican crossing);
- On R110 Crumlin Road, 15m to the west of Ardagh Road (signalised Pelican crossing);
- On R110 Crumlin Road, 40m to the west of Old County Road, at Crumlin Shopping Centre (signalised Pelican crossing);
- The four-arm R110 Crumlin Road / Sundrive Road / Herberton Road signalised junction has signalised crossings on all arms.
- On R110 Crumlin Road, near Loreto Primary School (Pelican crossing);
- The four-arm R110 Crumlin Road / R110 Dolphin's Barn / R111 Dolphin Road / Parnell Road signalised junction has signalised crossings on the western, southern and eastern arms;
- The four-arm Kildare Road / Windmill Road signalised junction has a signalised crossing on one arm;
- The four-arm Kildare Road / Bangor Road signalised junction has signalised crossings on three arms;
- The four-arm Clogher Road / Sundrive Road signalised junction has signalised crossings on two arms;
- Across Clogher Road outside Pearse College (Toucan crossing); and
- Across Clogher Road east of the junction with Rutland Avenue (Pelican crossing).

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. The location of pedestrian crossings is illustrated in Figure 6.3c in TIA Appendix 3 (Maps).

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at each junction along Section 3 of the Proposed Scheme is included in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

5.3.4.2 Cycling Infrastructure

The cycle facilities along this section of the Proposed Scheme comprise on-road cycle lanes (frequently shared with bus lanes) throughout the entire length of the carriageway. There are no cycle facilities along R819 Walkinstown Road, until 160m from the junction with R110 Long Mile Road, where there is a shared bus and cycle lane.

A shared bus and cycle lane is in operation for approximately 280m on R110 Drimnagh Road (after the Balfe Road bus stop) up to St Mary's Drive. At this junction, a cycle-only lane is provided, but after negotiating the junction, cyclists are required to share with buses once again until the Crumlin Hospital bus stop (stop 1424). At this point, an on-road cycle lane 1.3m in width is provided once more and remains present on both sides of the carriageway with some shared bus lane sections until the junction with Sundrive Road and Herberton Road (approximately 1.2km). Advanced stop line stacking locations are provided for cyclists travelling east-west at this junction. Between the junctions with Sundrive Road and Herberton Road to Dolphin's Barn, the facilities consist of a shared bus and cycle lane.

Bunting Road / St Mary's Street, which is off the proposed bus route for the corridor, but part of the Proposed Scheme, has on-road cycle lanes for its full extent between R818 Cromwellsfort Road and Kildare Road. There are no cycle facilities on Kildare Road or Clogher Road.

There is no formal cycle parking, or designated cycle hire parking racks, along this section of the route.

The existing cycle facilities along Section 3 of the Proposed Scheme is illustrated in Figure 6.4c in TIA Appendix 3 (Maps).

Further details of the baseline cycling facilities (i.e. level of segregation from vehicles, capacity for cycling two abreast and / or overtaking, and junction treatment) along the length of Section 3 of the Proposed Scheme is included in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

5.3.4.3 Bus Infrastructure

5.3.4.3.1 Bus Priority Measures

Bus lanes along Section 3 of the Proposed Scheme are present at the following locations:

- A northbound bus lane of 160m in length on Walkinstown Road, on the approach to R110 Long Mile Road;
- A southbound bus lane of 60m in length, which terminates 50m to the north of Walkinstown Roundabout;
- Largely continuous bus lanes in both directions on R110 Long Mile Road and Drimnagh Road, between Slievebloom Park and Cooley Road. The eastbound bus lane continues for approximately 50m beyond Cooley Road; and
- Largely continuous bus lanes in both directions on R110 Crumlin Road, between Sundrive Road and R111 Parnell Road / Grand Canal. The bus lanes typically terminate 50m-80m before major junctions and recommence approximately 50m afterwards.

5.3.4.3.2 Bus Stop Facilities

There are currently forty-six bus stops along Section 3 of the Proposed Scheme. The inbound stops are as follows:

- Stop 2378 on R819 Walkinstown Road, 90m north of Walkinstown Roundabout;
- Stop 2183 on R819 Walkinstown Road, 50m north of Kilnamanagh Road;
- Stop 2184 on R819 Walkinstown Road, 140m south of R819 Drimnagh Road;
- Stop 2185 on R110 Drimnagh Road, at Slievebloom Road;
- Stop 1421, 1423 and 7043 on R110 Drimnagh Road, 35m - 150m east of Errigal Road;
- Stop 1424 on R110 Drimnagh Road, 55m east of Kildare Road;
- Stop 2186 on R110 Crumlin Road, 30m west of Raphoe Road;
- Stop 2187 on R110 Crumlin Road, 70m west of Clonard Road;
- Stop 2188 on R110 Crumlin Road, at Ardagh Road;
- Stop 2189 on R110 Crumlin Road, 70m west of Old County Road;
- Stop 1436 on R110 Crumlin Road, 130m north-east of Herberton Road;
- Stop 3952 on R110 Crumlin Road, 50m west of Rutland Avenue
- Stop 2331, on St. Mary's Road, opposite Fernvale Drive;
- Stop 1397 on Kildare Road, 95m to the west of Kildare Park;
- Stop 1398 on Kildare Road, 95m to the west of Windmill Road;
- Stop 1399 on Kildare Road, 60m to the east of Clonard Road;
- Stop 5148 on Kildare Road, 60m to the east of Bangor Road;
- Stop 1401 on Clogher Road, 80m east of Saul Road;
- Stop 1402 on Clogher Road, 50m east of Sundrive Road;
- Stop 1403 on Clogher Road, 50m east of Rutland Avenue;
- Stop 1404 on Clogher Road, 70m north-east of Aughavannagh Road; and
- Stop 1405 on Clogher Road, 70m south of R111 Parnell Road.

The outbound stops are:

- Stop 2333 on R819 Walkinstown Road, 70m north of Walkinstown Roundabout;
- Stop 2332 on R819 Walkinstown Road, 40m south of Kilnamanagh Road;
- Stop 2103 on R819 Walkinstown Shopping Centre;
- Stop 2102 on R110 Drimnagh Road, 70m east of Balfe Road;
- Stop 2101 on R110 Drimnagh Road, 50m west of Kildare Road;
- Stop 2099 on R110 Crumlin Road, 60m north-east of Kildare Road;

- Stop 2097 on R110 Crumlin Road, 70m west of Windmill Road;
- Stop 2096 on R110 Crumlin Road, 40m west of Clonard Road;
- Stop 2095 on R110 Crumlin Road, 50m north-east of Ardagh Road;
- Stop 1409 on R110 Crumlin Road, 60m north-east of Herberton Road;
- Stop 1407 on R110 Crumlin Road, 50m south-west of Rutland Avenue;
- Stop 2317 on St. Mary's Road at St. Mary's Parish Church;
- Stop 1396 on Kildare Road, 160m to the east of St Mary's Road.
- Stop 7414 on Kildare Road, 90m to the east of Kildare Park;
- Stop 1442 on Kildare Road, 50m to the west of Clonard Road;
- Stop 1441 on Kildare Road, 70m to the west of Bangor Road;
- Stop 3356 on Kildare Road, 75m to the east of Bangor Road;
- Stop 3355 on Clogher Road at Slane Road junction.
- Stop 1389 on Clogher Road, 50m east of Sundrive Road; and
- Stop 1388 on Clogher Road, 70m west of Rutland Avenue;
- Stop 1387 on Clogher Road, 50m north-east of Aughavannagh Road; and
- Stop 1386 on Clogher Road, 110m south of R111 Parnell Road

Near three quarters of bus stops provide timetable information, with nearly half providing shelter and accessible kerbs. Real time passenger information is also provided at fifteen stops.

Table 5.7 outlines the availability of bus stop facilities at the existing forty-six bus stops along Section 3 of the Proposed Scheme.

Table 5.7: Availability of Bus Stop Facilities (of a Total 46no. Bus Stops)

Bus Stop Facility	Number of Bus Stops in Baseline with Facility	Percentage of Bus Stops in Baseline with Facility
RTPI	15	33%
Timetable information	33	72%
Shelter	22	48%
Seating	18	39%
Accessible Kerbs	22	48%
Indented Drop Off Area	1	2%

The existing bus facilities along Section 3 of the Proposed Scheme are illustrated in Figure 6.5c in TIA Appendix 3 (Maps). The bus services which operate along Section 3 are outlined in Table 5.8.

Table 5.8: Section 3 – Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
17 / 17d	Blackrock Rail Station - UCD Belfield - Churchtown Rd - Kimmage Rd. - Rialto	20 minutes	30 minutes
18	Newgrove Avenue - Burlington Road - Sundrive Road - Kylemore Road - Hollyville Lawn	15-20 minutes	20-30 minutes
27	Jobstown - Tallaght (The Square) - Walkinstown Cross (The Kestrel) - Dolphin's Barn Cross - Eden Quay - Fairview - Artane Roundabout - Clare Hall	10 minutes	10-15 minutes
56a	Tallaght (The Square) - Cookstown Rd. - Walkinstown Cross - Dolphin's Barn - Ringsend Rd.	75 minutes	75 minutes
77a	Citywest - Tallaght (The Square) - Balrothery - Walkinstown Cross - Dolphin's Barn - Ringsend Rd.	15-20 minutes	20-30 minutes
77N	R110 Cork Street - Dolphin's Barn - R110 Crumlin Road - Walkinstown Roundabout - R819 Greenhills Road - Tallaght Village - Blessington Road - Tallaght (Westbrook Estate)	Friday / Saturday 00:00; 02:00; 04:00	
77x	Citywest - Ellensborough - Kiltipper Way - Cuckoo's Nest - Dolphin's Barn - Fleet St. - UCD Belfield	Once a day (07:20)	No service

Service	Route	Typical Service Frequency	
		Weekday	Weekend
122	Drimnagh Rd. (Our Lady's Hospital) - Kelly's Corner - O'Connell St. - St. Peter's Church (Cabra Rd.) - Ashington	15 minutes	20 minutes
123	Walkinstown (Kilnamanagh Rd.) - St. James's Hospital - O'Connell St. - Ballybough Rd. (Clonliffe Rd.) - Marino (Griffith Ave.)	12 minutes	15-20 minutes
151	Foxborough - Parkwest - Drimnagh Rd. - Dolphin's Barn - Dame St. / Ormond Quay - Docklands (East Rd.)	Peak: 15 minutes / Off-peak 20-30 minutes	20-30 minutes

5.3.4.4 General Traffic

R819 Walkinstown Road is 8m - 9m wide, with a single carriageway in both directions. It has a speed limit of 50km/h. It is mostly residential with properties bordering both sides of the road. There is a small retail mall and a large shopping centre on R819 Walkinstown Road. There is an outbound bus lane for approximately 60m on approach to Walkinstown Roundabout and an inbound bus lane for approximately 160m on approach to the R110 Long Mile Road / Walkinstown Road junction, there are no cycle lanes.

R110 Long Mile Road / R110 Drimnagh Road is dual carriageway between Slievebloom Park and Slievebloom Road thereafter R110 Drimnagh Road is a single carriageway, 50km/h road. The width of the carriageway is typically 14.0m but does increase to up to 17.0m on the approach to some junctions. The carriageway has two lanes operating in each direction: one lane dedicated for buses (with cyclists permitted to use this lane) and one for general traffic; although there are some exceptions on the approach to junctions. The area is busy with traffic, and is largely residential, with many driveways, parks and amenities available.

R110 Crumlin Road is a single carriageway, 50km/h road. The width of the carriageway is typically 14.0m but does increase to up to 17.0m on the approach to some junctions. The carriageway has two lanes operating in each direction: one lane dedicated for buses (with cyclists permitted to use this lane) and one for general traffic; although there are some exceptions on the approach to junctions. Bus lanes in both directions are not available between Cooley Road and Herberton Road / Sundrive Road junction, over this length on-road cycle lanes are provided. The area is busy with traffic, and is largely residential, with many driveways, parks and amenities available.

Bunting Road runs between R818 Cromwellsfort Road and St Agnes Terrace and has a single lane in either direction. The width of the carriageway is typically 7 – 7.5m wide. It has a speed limit of 50km/h, and there are speed cushions at regular intervals along its whole length. Although on a bus route, there are no bus priority features. On-road cycle lanes commence 60m to the east of Cromwellsfort Road and run on both sides of the carriageway along the full extent of Bunting Road.

St Mary's Road is an extension of Bunting Road and runs from St Agnes Terrace to Kildare Road. It is 6m wide and has a single lane in either direction. It has a speed limit of 50km/h, but unlike Bunting Road there are no speed reduction measures in place. Although on a bus route, there are no bus priority features. The cycle lanes on Bunting Road continue on St Mary's Road, terminating 40m to the south-west of the Kildare Road junction.

Kildare Road runs in an east-west between R110 Drimnagh Road and Clogher Road. It has a speed limit of 50km/h, and there are regular speed cushions along the section. Kildare Road is typically 9m wide and has a single lane in either direction. Although on a bus route, there are no bus priority features, and there is no cycle provision.

Clogher Road runs north-east from Kildare Road towards R111 Parnell Road. It is typically 9m wide (except for a short section between Kildare Road and Sundrive Road where it is 6m wide) and has a single lane in either direction. It has a speed limit of 50km/h, and there are speed cushions at regular intervals along its length. Although on a bus route, there are no bus priority features, and there is no cycle provision.

The existing major junction arrangements along Section 3 of the Proposed Scheme are as follows:

- R819 Walkinstown Road / Kilnamanagh Road four-arm signalised junction;
- R110 Long Mile Road /R819 Walkinstown Road three-arm signalised junction;
- R110 Drimnagh Road / Slievebloom Road / Balfe Road four-arm signalised junction;

- R110 Drimnagh Road / Errigal Road three-arm signalised junction;
- R110 Drimnagh Road / St. Mary's Road / Kildare Road four-arm signalised junction;
- R110 Crumlin Road / Cooley Road three-arm signalised junction;
- R110 Crumlin Road / Herberton Road / Sundrive Road four-arm signalised junction;
- R110 Crumlin Road / R111 Dolphin Road / Parnell Road four-arm signalised junction;
- Kildare Road / Windmill Road four-arm signalised junction;
- Kildare Road / Clonard Road four-arm roundabout junction;
- Kildare Road / Bangor Road four-arm signalised junction;
- Clogher Road / Sundrive Road four-arm signalised junction;
- Clogher Road / Rutland Avenue four-arm priority junction; and
- Clogher Road / R111 Parnell Road four-arm signalised junction.

The characteristics of each major junction is described in turn below, alongside satellite images which are extracts from Figure 6.6 in TIA Appendix 3 (Maps).

R819 Walkinstown Road / Kilnamanagh Road four-arm signalised junction:

The north arm (R819 Walkinstown Road towards Tallaght) has a single approach lane for all movements controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The east arm (Walkinstown Shopping Centre) has a single approach lane (no lane markings) for all movements controlled by a set of signal heads. Exit onto this arm consists of a single lane (no lane markings).

The south arm (R819 Walkinstown Road towards City Centre) has a single approach lane for all movements controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The west arm (Kilnamanagh Road) has a single approach lane for all movements controlled by a set of signal heads. Exit onto this arm consists of a single lane. This junction is shown in Image 5.20.

Image 5.20 R819 Walkinstown Road / Kilnamanagh Road Signalised Junction

R110 Long Mile Road / R819 Walkinstown Road three-arm signalised junction:

The east arm has two approach lanes for straight ahead movements towards the M50 / N7 and a left-turn slip lane towards Tallaght controlled by a set of signal heads. Exit onto this arm consists of two lanes, a central median separates inbound and outbound traffic lanes.

The south arm has two approach lanes for right-turn movements only towards the City centre (left-turn movements not permitted) controlled by a set of signal heads. Exit onto this arm consists of a single lane and a merge slip lane from the east.

The west arm has three approach lanes, one for buses only, one for general traffic straight ahead movements and one right-turn lane controlled by a set of signal heads. Exit onto this arm consists of two lanes, a central median separates inbound and outbound traffic lanes. This junction is shown in Image 5.21

Image 5.21: R110 Long Mile Road / R819 Walkinstown Road Signalised Junction

R110 Drimnagh Road /Slievebloom Road / Balfe Road four-arm signalised junction:

The north arm (Slievebloom Road) is a one-way southbound only, single approach lane for left and right-turning traffic onto R110 Drimnagh Road controlled by a set of signal heads.

The east arm (R110 Drimnagh Road) has three approach lanes for straight ahead movements towards the M50 / N7 and Tallaght controlled by a set of signal heads. The left approach lane is for traffic turning left onto Balfe Road or onto the left-turn slip lane for R819 Walkinstown Road at the next junction towards Tallaght. Exit onto this arm consists of two lanes for City Centre bound traffic, a central median separates inbound and outbound traffic lanes.

The south arm (Balfe Road) has a single approach lane for left and right-turn movements westbound and eastbound controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The west arm has two approach lanes and a bus stop lane for City Centre bound traffic (right-turn movements onto Balfe Road is not permitted) controlled by a set of signal heads. Exit onto this arm consists of three lanes, two straight ahead lanes towards the M50 /N7 and a left-turn lane towards Tallaght via R819 Walkinstown Road. A central median separates inbound and outbound traffic lanes. This junction is illustrated in Image 5.22.

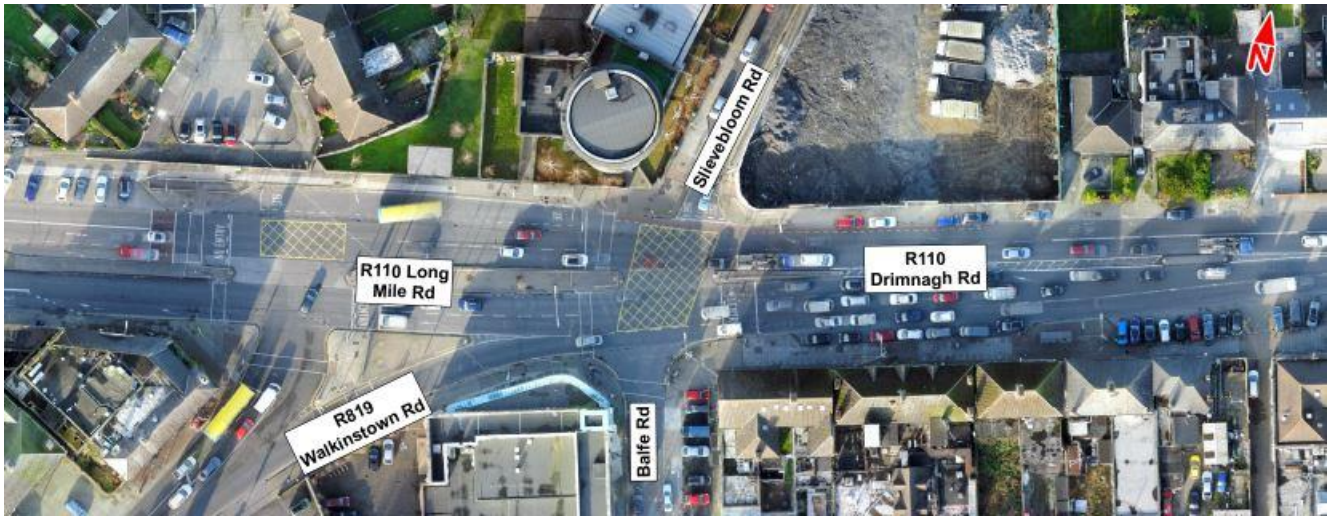

Image 5.22: R110 Long Mile Road / R819 Walkinstown Road Signalised Junction

R110 Drimnagh Road / Errigal Road three-arm signalised junction:

The north arm (Errigal Road) has a single approach lane with cyclist advance stop line for left-turn and right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The east arm (R110 Drimnagh Road) has three approach lanes with cyclist advance stop line, two lanes for straight ahead movements and one right-turn lane onto Errigal Road controlled by a set of signal heads. Exit onto this arm consists of one bus lane and one general traffic lane for City Bound traffic.

The west arm (R110 Drimnagh Road) has two approach traffic lanes and a single advisory on-road cycle lane, one traffic lane for left-turn traffic movements onto Errigal Road and the other traffic lane for straight ahead movements controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and one advisory on-road cycle lane. This junction is shown in Image 5.23.

Image 5.23: R110 Drimnagh Road / Errigal Road Signalised Junction

R110 Drimnagh Road / St Mary's Road / Kildare Road four-arm signalised junction:

The north-east arm (R110 Drimnagh Road) has three approach lanes and an advisory on-road cycle lane, one traffic lane for left-turn onto Kildare Road and straight ahead for St. Mary's Road, one bus lane and one traffic lane for straight ahead continuing on R110 Drimnagh Road. Exit onto this arm consists of one general traffic lane and one bus lane for City Centre bound traffic controlled by a set of signal heads, a central median separates inbound and outbound traffic lanes.

The east arm (Kildare Road) has a single approach lane for traffic towards M50 / N7 (bus only right turn to City Centre) and a single left-turn slip lane for traffic onto St. Mary's Road controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The south arm (St. Mary's Road) has a single approach lane and an on-road cycle lane with advance stop line for all movements. Exit onto this arm consists of a single lane.

The south-west arm (R110 Drimnagh Road) has three approach lanes, one straight ahead bus lane, one straight ahead traffic lane and one right-turn lane for Kildare Road and St. Mary's Road controlled by a set of signal heads. Exit onto this arm consists of a single bus lane and a single traffic lane, a central median separates inbound and outbound traffic lanes. This junction is shown in This junction is shown in Image 5.24.

Image 5.24: R110 Drimnagh Road / St Mary's Road / Kildare Road Signalised Junction

R110 Crumlin Road / Cooley Road three-arm signalised junction:

The north-west arm (Cooley Road) has a single approach lane for left-turn and right-turn traffic movements onto R110 Crumlin Road with a stop line set-back for vehicle turning movements onto Cooley Road controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The north-east arm (R110 Crumlin Road) has three approach lanes and an on-road advisory cycle lane with advance cycle stop line, traffic lanes consist of one left-turn lane for traffic turning left at the next junction, one straight ahead lane and one right-turn lane onto Cooley Road controlled by a set of signal heads. Exit onto this arm consists of one bus lane and one general traffic lane.

The south-west arm (R110 Crumlin Road) has two approach lanes and an on-road advisory cycle lane, one traffic lane for left-turn and straight ahead movements and one traffic lane for straight ahead movements controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and one on-road advisory cycle lane. This junction is shown in Image 5.25.

Image 5.25: R110 Crumlin Road / Cooley Road Signalised Junction

R110 Crumlin Road / Herberton Road / Sundrive Road four-arm signalised junction:

The north arm (Herberton Road) has two approach lanes, one lane for right-turn movements and one lane for straight ahead movements and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single wide lane.

The north-east arm (R110 Crumlin Road) has three approach lanes, one for straight ahead and left-turn movements, one for straight ahead movements, one for right-turn movements and a cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane.

The south arm (Sundrive Road) has two approach lanes, one lane for right-turn movements and one lane for straight ahead movements and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single wide lane.

The south-west arm (R110 Crumlin Road) has three approach lanes, one for straight ahead and left-turn movements, one for straight ahead movements, one for right-turn movements and an advisory on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane. This junction is shown in Image 5.26.

Image 5.26: R110 Crumlin Road / Sundrive Road / Herberton Road Signalised Junction

R110 Crumlin Road / R111 Dolphin Road / Parnell Road four-arm signalised junction:

The north-east arm (R110 Dolphin's Barn) has two approach lanes for straight ahead movements only (left-turn and right-turn movements not permitted) and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of one bus lane and one general traffic lane.

The east arm (R111 Parnell Road) has a single approach lane for left-turn and straight ahead movements (no right-turn permitted) and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single traffic lane and on-road cycle lane.

The south-west arm (R110 Crumlin Road) has two approach lanes for straight ahead movements only (left-turn and right-turn movements not permitted) controlled by a set of signal heads. Exit onto this arm consists of a wide single lane.

The west arm (R111 Dolphin Road) has a single approach lane for all movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single traffic lane and on-road cycle lane. This junction is shown in Image 5.27.

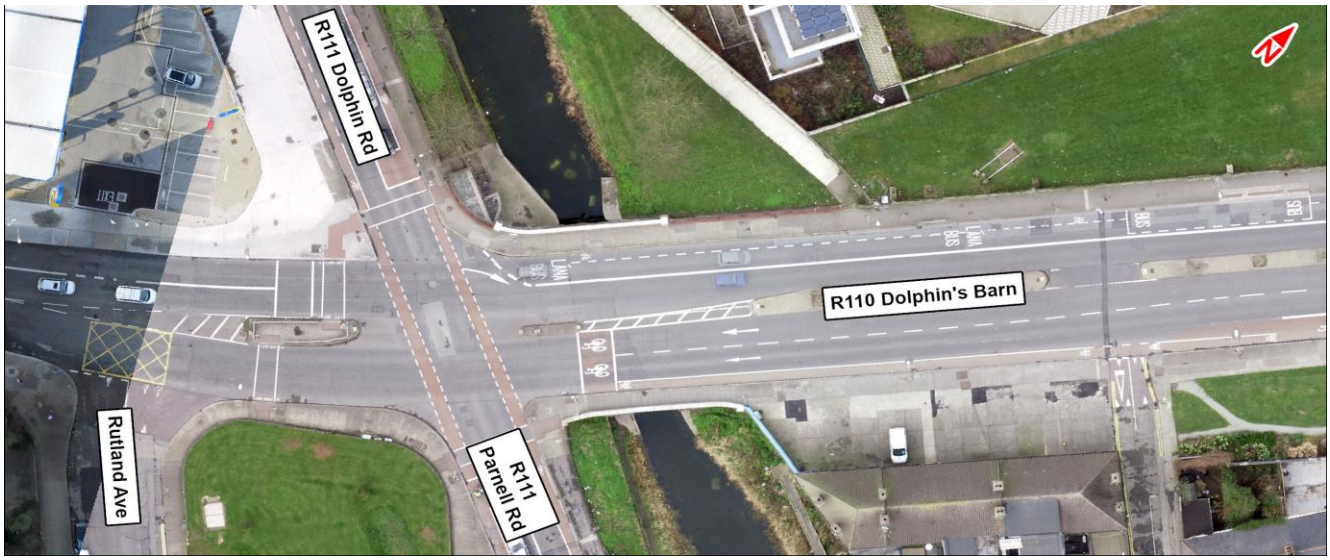

Image 5.27: R110 Crumlin Road / R111 Parnell Road / Dolphin Road Signalised Junction

Kildare Road / Windmill Road four-arm signalised junction:

All arms at the junction have a single lane approach, with the exception of Windmill Road south, which has a short, segregated left-turn lane, with an exit width of approximately 8.5m. This segregation is via a refuge island. The junction is shown in Image 5.28

Image 5.28: Kildare Road / Windmill Road Signalised Junction.

Kildare Road / Clonard Road four-arm priority roundabout:

This mini-roundabout has an 18m inscribed diameter, with a painted, rather than kerbed, central island. Each arm has a single lane on approach. Pedestrian refuge splitter islands are present on the Kildare Road approaches. The junction is shown in Image 5.29

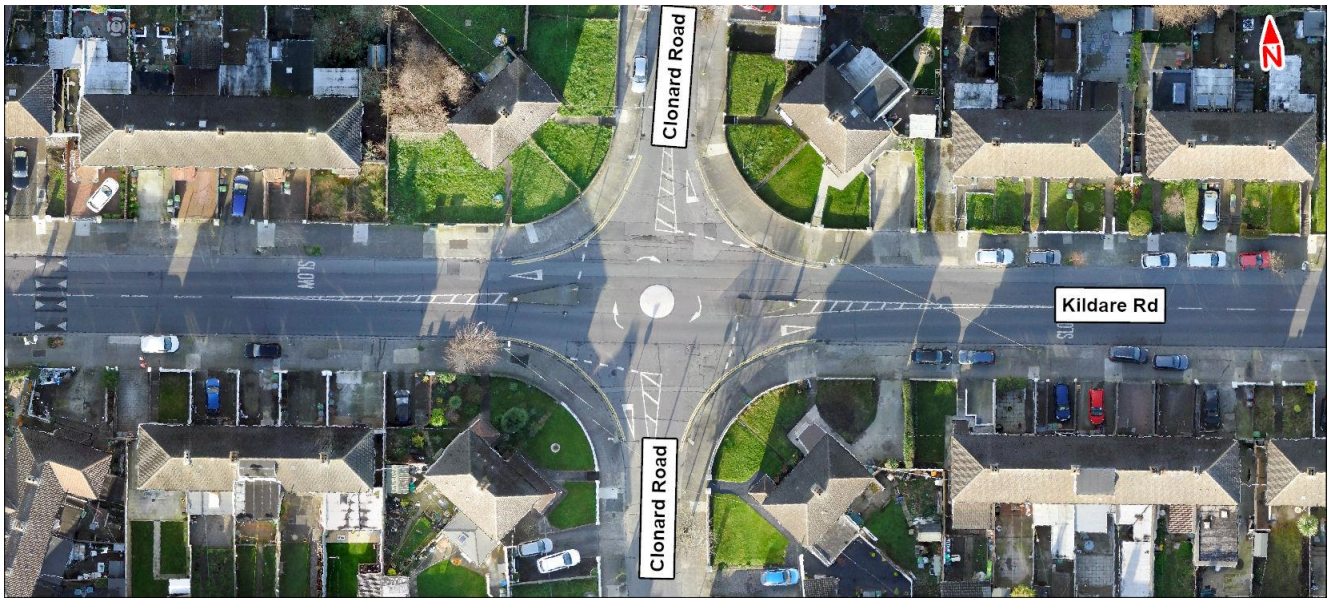

Image 5.29: Kildare Road / Clonard Road Priority Roundabout.

Kildare Road / Bangor Road four-arm signalised junction:

Each arm of the signalised junction has a single lane on approach. Signalised pedestrian crossings, with dropped kerbs and tactile paving are provided across both Bangor Road arms and Kildare Road west arm. The approach road width is approximately 3.5m-4m on all arms. The junction is shown in Image 5.30.

Image 5.30: Kildare Road / Bangor Road Signalised Junction

Clogher Road / Sundrive Road four-arm signalised junction:

Each arm of the signalised junction has a single lane on approach. Signalised pedestrian crossings, with dropped kerbs and tactile paving are present on Clogher Road west and Sundrive Road north. The remaining arms have dropped kerb crossings, which are not signalised. The junction is shown in Image 5.31.

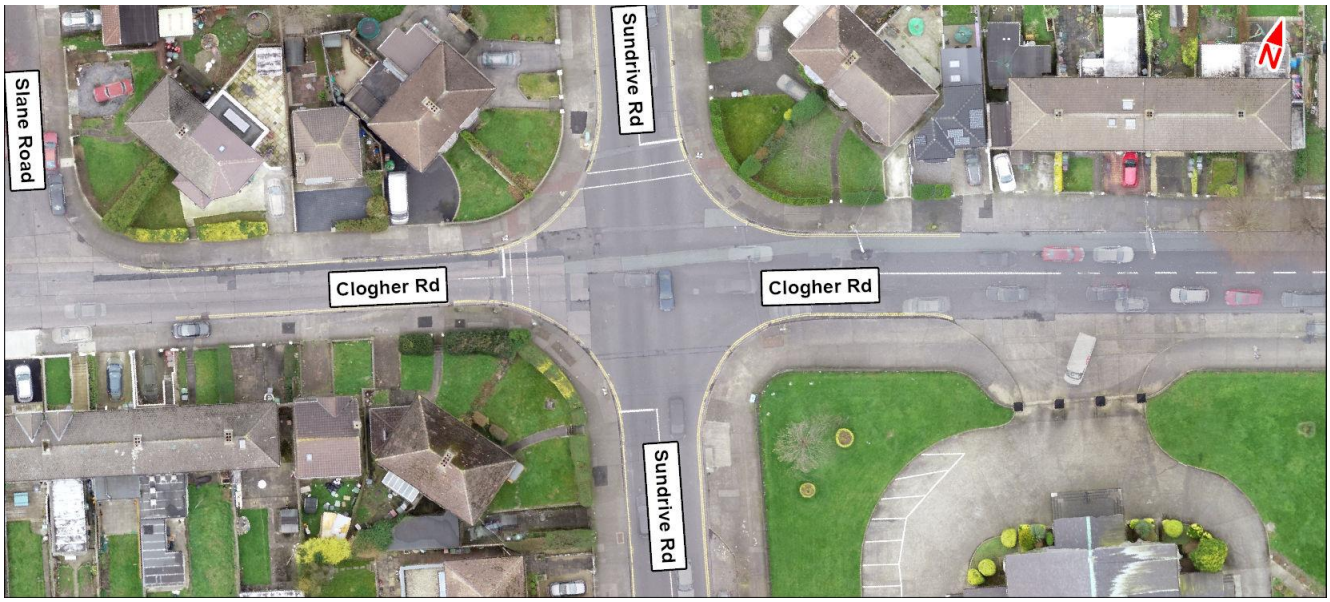

Image 5.31: Clogher Road / Sundrive Road Signalised Junction

Clogher Road / Rutland Avenue four-arm priority junction:

Clogher Road forms the major arms at this priority crossroads and has a single lane in either direction. A pelican crossing 20m to the east of the junction provides a controlled crossing point for pedestrians. Both of the Rutland Avenue arms have a single lane on approach to the junction. The junction is shown in Image 5.32.

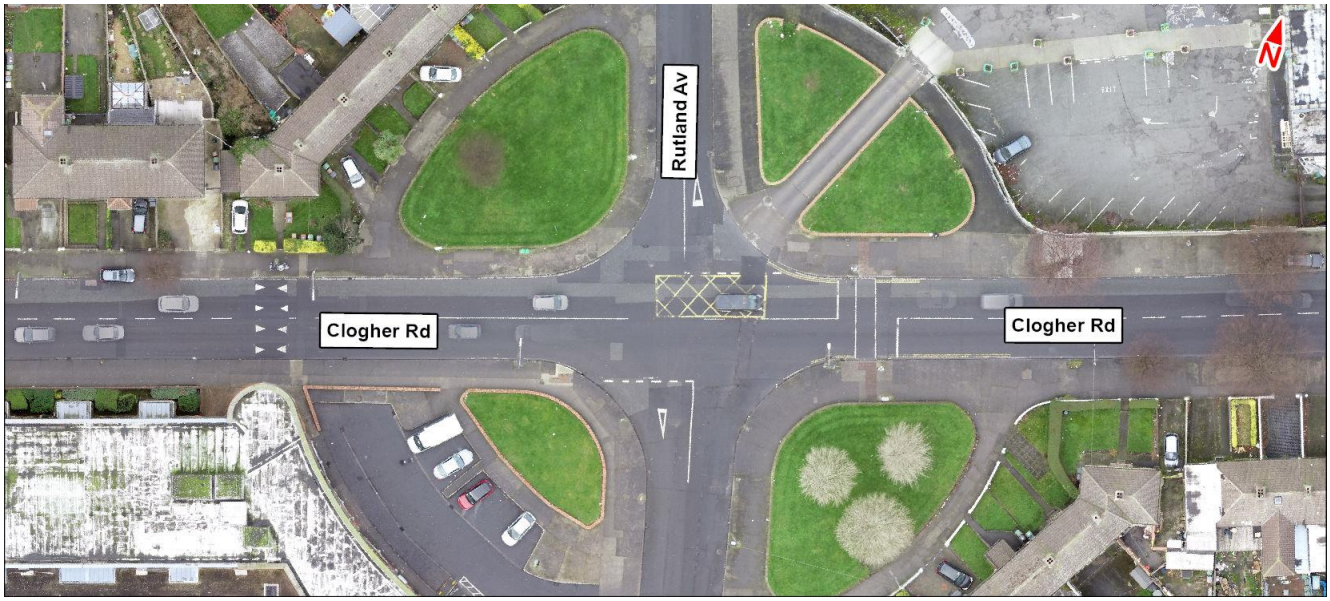

Image 5.32: Clogher Road / Rutland Avenue Priority Junction

Clogher Road / R111 Parnell Road four-arm signalised junction:

R111 Parnell Road forms the major arm of this junction and has a single lane with on-road cycle lane in both directions. A pelican crossing 10m to the west of the junction provides a controlled crossing point for pedestrians. Clogher Road joins from the south and has a single lane approach. The junction is shown in Image 5.33.

Image 5.33: Clogher Road / R111 Parnell Road signalised Junction

Existing Parking / Loading

- 47 adjacent parking spaces on R819 Walkinstown Road at Walkinstown Medical Centre and Walkinstown Mall;
- On R819 Walkinstown Road, 185 adjacent parking spaces at SuperValu (Walkinstown Shopping Centre), 45 adjacent spaces at Walkinstown Road Car Park and 4 adjacent spaces at Retail unit;
- On R110 Drimnagh Road, 2 taxi parking bays, 40 informal parking spaces, 20 commercial parking spaces and 21 adjacent parking spaces;
- On R110 Crumlin Road, 12 taxi parking bays, 1 loading bay, 37 informal parking spaces and 983 adjacent parking spaces;
- On Bunting Road / St. Mary's Road, 52 informal parking spaces, 19 paid parking spaces and 5 adjacent parking spaces; and

- On Kildare Road / Clogher Road, 59 informal parking spaces.

5.3.5 Section 4 - Grand Canal to Christchurch

This section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 4 of the Proposed Scheme between Grand Canal and Christchurch.

Section 4 commences at the R111 Dolphin Road / Parnell Road and R110 Dolphin's Barn Street junction. The corridor then routes in a north-easterly along R110 Cork Street, St Luke's Avenue, Dean Street, R137 Patrick Street, Nicholas Street and Christchurch Place.

5.3.5.1 Pedestrian Infrastructure

This section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 4 of the Proposed Scheme.

R110 Dolphin's Barn Street is dual carriageway as far as the R811 South Circular Road. From the R811 South Circular Road junction. The corridor then head in a north-easterly along R110 Cork Street, St Luke's Avenue and Dean Street. Proceeding along Dean Street the route heads north onto R137 Patrick Street and Nicholas Street as far as Christchurch Place.

5.3.5.2 Pedestrian Infrastructure

Footways are provided on both sides of the carriageway along the entirety of the section. A paved footway approximately 2.5m wide is provided on both sides of the street along Dolphin's Barn and R110 Dolphin's Barn Street. At the junction with R811 South Circular Road on the eastern side, the footway crosses through a small car park. No physical separation is provided between the parking area and the footway. Footways are provided along both sides of the road along R110 Cork Street, St Luke Avenue and Dean Street. The width varies between 2.5m and 3.5m approximately. On some sections, bollards are provided to increase the degree of separation between the footway and the road.

St Patrick's Road, between Dean Street and Bull Alley Street, benefits from a wide paved footway, the width of which varies between 4.0m to 8.5m wide on the east of the carriageway. The footway provided on the western side of the carriage is narrower (approximately 2.5m).

There are several pedestrian crossings along Section 4 of the Proposed Scheme, the majority of which are signalised. Pedestrian crossing facilities can be found at the following locations:

- The four-arm R811 South Circular Road / R110 Dolphin's Barn Street signalised junction has signalised crossings on all four arms. The crossings on the R110 Dolphin's Barn Street are staggered due to the presence of a refuge island.;
- Across Dolphin's Barn 15m to the south of Emerald Square (signalised Pelican crossing);
- The four -arm R110 Cork Street / Marrowbone Lane / Donore Avenue signalised junction has signalised crossings on all four arms;
- Across R110 Cork Street in front of Weaver Park (signalised Pelican crossing);
- The four-arm R110 Cork Street / Ardee Street signalised junction has signalised crossings on all four arms;
- Across R110 St Luke's Avenue, 15m to the west of Brabazon Street (signalised Pelican crossing);
- The three-arm R110 St Luke's Avenue / Dean Street signalised junction has signalised crossings on all three arms;
- The four-arm Dean Street / New Street / Kevin Street Upper / R137 Patrick Street signalised junction has signalised crossings on three arms;
- Across R137 St. Patrick Street just north of Bull Alley Street (signalised Pelican crossing); and
- Across R137 St. Patrick Street 5m to the south of Bride Road (signalised Pelican crossing).

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. The location of pedestrian crossings is illustrated in Figure 6.3d in TIA Appendix 3 (Maps).

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at each junction along Section 4 of the Proposed Scheme is included in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

5.3.5.3 Cycling Infrastructure

The cycle facilities along Section 4 of the Proposed Scheme primarily comprise on-road cycle lanes located on both sides of the carriageway, with widths between 1.2m and 1.5m. On the R110 Dolphin's Barn Street / R110 Cork Street / St Luke's Avenue / Dean Street / R137 Patrick Street and R137 Nicholas Street, advisory cycle lanes are provided on both sides of the road throughout, with an exception between R111 Parnell Street and R811 South Circular Road junctions where the outbound cycle lane is replaced with a bus lane for part of this section.

Advanced stacking locations for cyclists are provided in several places along this section of the Proposed Scheme, including on the R110 Dolphin's Barn at its junction with the R811 South Circular Road, Marrowbone Lane, Ardee Street and The Coombe, and the R137 at its junctions with The Coombe, Bride Road, and R108 High Street.

Cycle parking stands are provided at the following locations in the vicinity of the Proposed Scheme:

- Three Sheffield stands (accommodating 6 bicycles) on the R110 Dolphin's Barn Street near the junction with Reuben Street and a further three Sheffield stands (accommodating six bicycles) on Reuben Street;
- Five Sheffield stands (accommodating 10 bicycles) on Cameron Street near its junction with R110 Cork Street;
- Four Sheffield stands (accommodating 8 bicycles) on R110 Cork Street south-west of Donore Avenue;
- Six cycle stands (accommodating 12 bicycles) on R110 Cork Street south of Robinson's Court junction;
- Five Sheffield stands (accommodating 10 bicycles) on Ormand Street near the junction with R110 Dolphin's Barn Street;
- Fourteen Sheffield stands (accommodating 28 bicycles) on R110 Dean Street opposite the junction with New Row South;
- Five Sheffield stands (accommodating 10 bicycles) on R137 Patrick Street at the junction with R110 Kevin Street Upper;
- Five Sheffield stands (accommodating 10 bicycles) on R137 Patrick Street adjacent to St Patrick's Cathedral;
- Five Sheffield stands (accommodating 10 bicycles) on R137 Patrick Street adjacent to St Patrick's Park;
- Six Sheffield stands (accommodating 12 bicycles) and a further two Sheffield stands (accommodating four bicycles) on R137 Patrick Street between the junctions with Dillon Place South and Bride Road;
- Four Sheffield stands (accommodating eight bicycles) on R137 Nicholas Street near the junction with R137 Christchurch Place; and
- Six Sheffield stands on R137 Christchurch Place near the junction with Werburgh Street.

The existing cycle facilities along Section 4 of the Proposed Scheme is illustrated in Figure 6.4d in TIA Appendix 3 (Maps).

Further details of the baseline cycling facilities (i.e. level of segregation from vehicles, capacity for cycling two abreast and / or overtaking, and junction treatment) along the length of Section 4 of the Proposed Scheme is included in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

5.3.5.4 Bus Infrastructure

5.3.5.4.1 Bus Priority Measures

Bus lanes along Section 4 of the Proposed Scheme are present at the following locations:

- Northbound and Southbound bus lane on R110 Dolphin's Barn Street / Cork Street / St Luke's Avenue between R111 Dolphin Road and Dean Street. The bus lanes terminates approximately 50m-80m ahead of major junctions, and commences approximately 50m afterwards; and
- A short, northbound bus lane of approximately 200m in length on R137 Patrick Street, running from St Patrick's Road to Bride Road.

5.3.5.4.2 Bus Stop Facilities

There are currently 13 bus stops along Section 4 of the Proposed Scheme. The inbound stops are as follows:

- Stop 2190 on R110 Dolphin's Barn Street, 80m north of R111 Dolphin Road;
- Stop 4434 on R110 Cork Street, 15m north of Boardman's lane;
- Stop 2379 on R110 Cork Street at Marion Villas;
- Stop 2382 on R110 St Luke's Avenue, 40m west of Brabazon Place;
- Stop 5099 on R110 St Luke's Avenue, 90m south of Dean Street; and
- Stop 2383 on R137 Patrick Street, 40m north of Dean Street.

The outbound stops are:

- Stop 2385 on R137 Nicholas Street, 35m north of Ross Road;
- Stop 2312 on R110 St Luke's Avenue, 75m south of Dean Street;
- Stop 2313 on R110 St Luke's Avenue, 35m west of Brabazon Place;
- Stop 2314 on R110 St Luke's Avenue, 60m east of Ormond Street;
- Stop 2315 on R110 St Luke's Avenue, 70m east of Donore Avenue;
- Stop 2094 on R110 Dolphin's Barn Street, at The Coombe Hospital; and
- Stop 1406 on R110 Dolphin's Barn Street, 40m south of R811 South Circular Road.

The majority of bus stops along Section 4 of the Proposed Scheme have timetable information, with half containing real time passenger information. One bus stop has an intended drop off area, with the rest in line with the bus stop

The contents of Table 5.9 outlines the availability of bus stop facilities at the existing 13 bus stops along Section 4 of the Proposed Scheme.

Table 5.9: Section 4 – Availability of Bus Stop Facilities (of a Total 13 no. Bus Stops)

Bus Stop Facility	Number of Bus Stops in Baseline with Facility	Percentage of Bus Stops in Baseline with Facility
RTPI	7	54%
Timetable information	10	77%
Shelter	8	61%
Seating	8	61%
Accessible Kerbs	5	39%
Indented Drop Off Area	1	7%

The existing bus facilities along Section 4 of the Proposed Scheme are illustrated in Figure 6.5d in TIA Appendix 3 (Maps). The bus services which operate along Section 4 are outlined in Table 5.10.

Table 5.10: Section 4 – Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
27	Jobstown - Tallaght (The Square) - Walkinstown Cross (The Kestrel) - Dolphin's Barn Cross - Eden Quay - Fairview - Artane Roundabout - Clare Hall	10 minutes	10-15 minutes
49	Pearse Street - Leonard's Corner - Templeogue Village -The Mill / Old Bawn Rd. - Tallaght (The Square)	15 minutes	30 minutes
54a	Pearse Street - Harold's Cross Green - Spawell - Old Blessington Rd. (The Square) - Ellensborough / Kiltipper Way	30 minutes	30-60 minutes
56a	Ringsend Rd. - Dolphin's Barn - Walkinstown Cross - Cookstown Rd. - Tallaght (The Square)	75 minutes	75 minutes
77a	Citywest - Tallaght (The Square) - Balrothery - Walkinstown Cross - Dolphin's Barn - Ringsend Rd.	15-20 minutes	20-30 minutes
77x	Citywest - Ellensborough - Kiltipper Way - Cuckoo's Nest - Dolphin's Barn - Fleet St. - UCD Belfield	Once a day (07:20)	No service
150	Hawkins St. - Kevin St. (Patrick St.) / Patrick St. (Dean St.) - Donore Ave. (South Circular Rd.) - St. Agnes Rd. - Rossmore	20 minutes	20-30 minutes
151	Docklands (East Rd.) - Dame St. / Ormond Quay - Dolphin's Barn - Drimnagh Rd. - Parkwest - Foxborough	20 minutes	20-30 minutes

5.3.5.5 General Traffic

R110 Dolphin's Barn Street is a dual carriageway road operating with two southbound and two northbound lanes, including one dedicated bus lane and on-road cycle lane inbound and partial dedicated bus lane and partial on-road cycle lane outbound. The road is approximately 17.0m wide. After the Dolphin's Barn Street / South Circular Road junction, the road becomes a four lane carriageway including one dedicated bus lane and on-road cycle lane in both directions with an approximate total width of 15.0m. A 50km/h speed limit is in enforcement along this road.

R110 Cork Street within this section of the Proposed Scheme is a four-lane carriageway road operating with two southbound and two northbound lanes, including one dedicated bus lane and on-road cycle lane in each direction. The road is approximately 15.0m wide. A 50km/h speed limit is in enforcement along this road.

R110 St Luke's Avenue is a four-lane carriageway road operating with two southbound and two northbound lanes, including one dedicated bus lane and on-road cycle lane in each direction. The road is approximately 15.0m wide, with the exception of the approach to main junctions. A 50km/h speed limit is in enforcement along this road.

Dean Street is a short section of road (approximately 150m) linking St Luke's Avenue to Patrick Street. It is a single carriageway approximately 11.0m wide, providing three lanes mostly at either end and an on-road cycle lane. It becomes wider (approximately 17m) in proximity with the junction with Patrick Street, where it accommodates three eastbound lanes and one westbound lane. A 50km/h is in enforcement along this road.

The R137 Patrick Street / Nicholas Street within this section of the Proposed Scheme is a four-lane carriageway over most of its length with five lanes at either end with on-road cycle lanes in both directions. The first section of road, between Dean Street and Bull Alley Street, is approximately 13m wide. It has a northbound bus lane. After Bull Alley Street, the road splits into a dual carriageway (approximately 18.5m wide in total) with four lanes, two northbound and two southbound including a northbound bus lane until Bride Road, where the road enters Nicholas Street and widens to accommodate five lanes (three northbound and two southbound). No bus lane is provided in this last section of road. The road width in this section varies between 19.5m and 25.0m where a bus layby is provided. A 50km/h speed limit is in enforcement along this road.

The existing major junction arrangements along Section 4 of the Proposed Scheme are as follows:

- R110 Dolphin's Barn Street, R811 South Circular Road four-arm signalised junction;
- R110 Cork Street / Marrowbone Lane / Donore Avenue four-arm signalised junction;
- R110 Cork Street / Ardee Street/ R110 St Luke's Avenue four-arm signalised junction.
- R110 St Luke's Avenue / The Coombe / Dean Street three-arm signalised junction.
- Dean Street / New Street / Kevin Street Upper / Patrick Street four-arm signalised junction.

- R137 Patrick Street / Bride Road three-arm Signalised Junction;
- R137 Nicholas Street / Christchurch Place / Winetavern Street / High Street four–arm signalised junction.

The characteristics of each major junction is described in turn below, alongside satellite images which are extracts from Figure 6.6 in TIA Appendix 3 (Maps).

R110 Dolphin's Barn Street / R811 South Circular Road four-arm signalised junction:

The north-east arm (R110 Dolphin's Barn Street) has two approach lanes, one for straight ahead and left-turn movements and one for right-turn movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane.

The east arm (R811 South Circular Road) has two approach lanes, one for straight ahead and left-turn movements and one for right-turn movements and a left-turn slip road controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The south-west arm (R110 Dolphin's Barn Street) has two approach lanes, one for straight ahead and left-turn movements and one for right-turn movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane.

The west arm (R811 South Circular Road) has two approach lanes, one for straight ahead and left-turn movements and one for right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single lane. This junction is shown in Image 5.34.

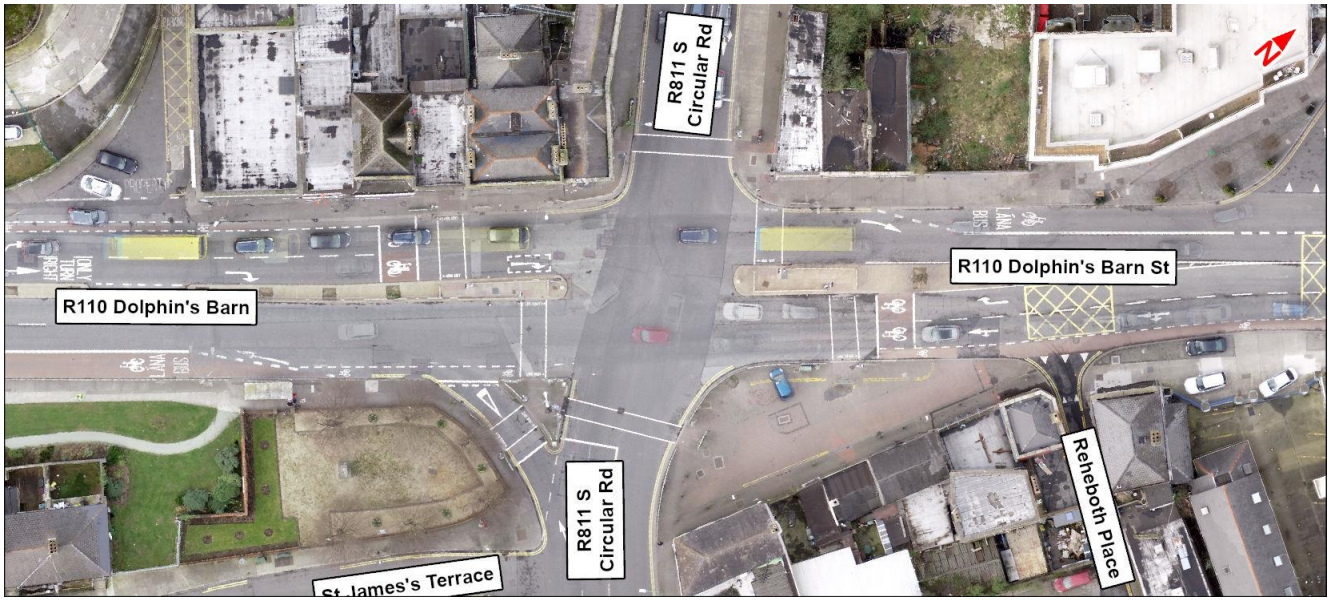

Image 5.34: R110 Dolphin's Barn Street / R811 South Circular Road Signalised Junction

R110 Cork Street / Marrowbone Lane / Donore Avenue four-arm signalised junction:

The north-east arm (R110 Cork Street) has two approach lanes, one for straight ahead and left-turn movements and one for straight ahead and right-turn movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane.

The east arm (Donore Avenue) has a single approach lane for all movements controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The south-west arm (R110 Cork Street) has two approach lanes, one for straight ahead and left-turn movements and one for straight ahead movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane.

The west arm (Marrowbone Lane) has a single approach lane for all movements and an on-road advisory cycle lane controlled by a set of signal heads. Exit onto this arm consists of a single lane and on road-advisory cycle lane. This junction is shown in Image 5.35.

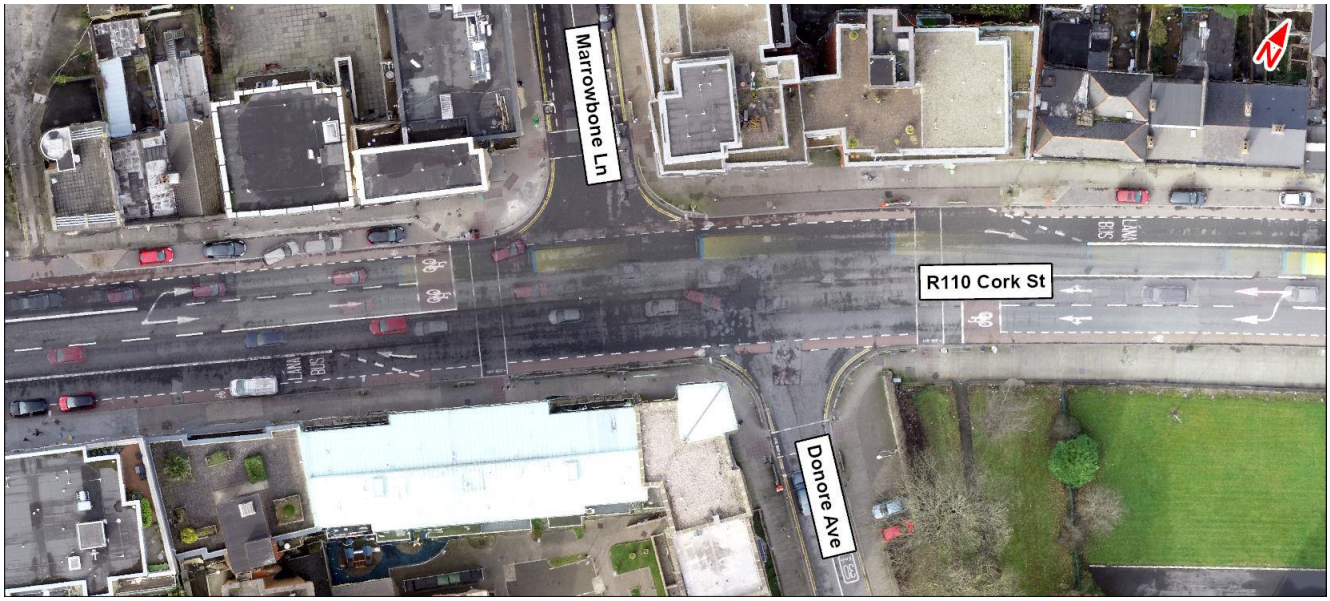

Image 5.35: R110 Cork Street / Marrowbone Lane / Donore Avenue Signalised Junction

R110 Cork Street / Ardee Street / R110 St Luke's Avenue four-arm signalised junction:

The east arm (R110 St. Luke's Avenue) has two approach lanes, one for straight ahead and left-turn movements and one for straight ahead and right-turn movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane.

The south arm (Ardee Street) has a single approach lane for all movements controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The west arm (R110 Cork Street) has two approach lanes, one for straight ahead and left-turn movements and one for straight ahead and right-turn movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane.

The north arm (Ardee Street) has a single approach lane for all movements controlled by a set of signal heads. Exit onto this arm consists of a single lane. This junction is shown in Image 5.36.

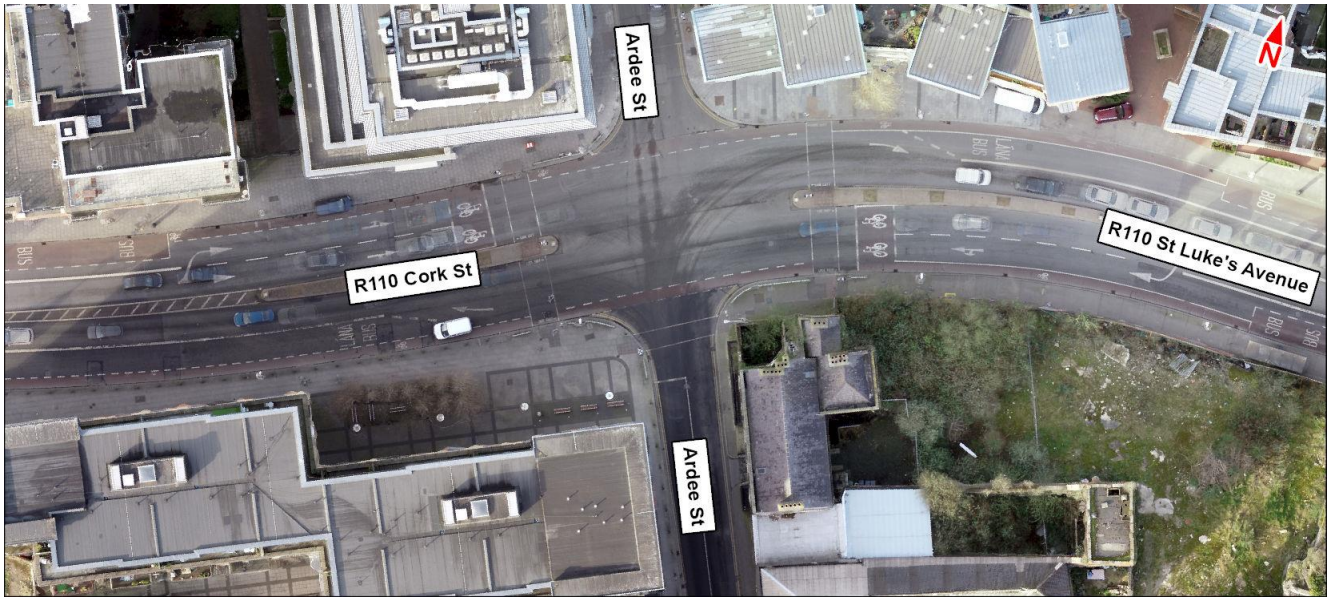

Image 5.36: 110 Cork Street / Ardee Street/ R110 St Luke's Avenue Signalised Junction

R110 St Luke's Avenue / The Coombe / Dean Street three-arm signalised junction:

The east arm (Dean Street) has two approach lanes, one for straight ahead movements and one for left-turn movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide lane and on-road cycle lane.

The south arm (R110 St. Luke's Avenue) has two approach lanes, one bus lane for right-turn movements and one traffic lane for right-turn movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane and on-road cycle lane.

The west arm (The Coombe) has a single approach lane for all movements controlled by a set of signal heads. Exit onto this arm consists of a single lane. This junction is shown in Image 5.37.

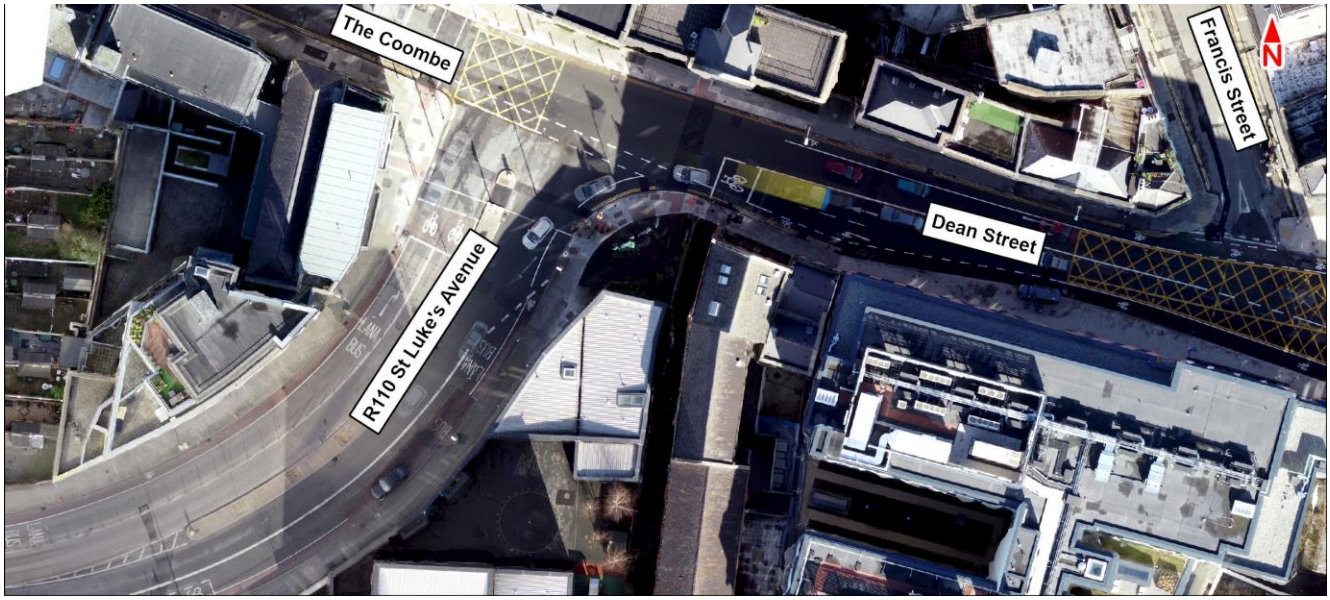

Image 5.37: R110 St Luke's Avenue / The Coombe / Dean Street Signalised Junction

R110 Dean Street / R137 New Street South / R110 Kevin Street Upper / R137 Patrick Street four-arm signalised junction:

The north arm (R137 Patrick Street) has three approach lanes, one for straight ahead and left-turn movements, one for straight ahead movements and one for straight ahead and right-turn movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and an on-road advisory cycle lane.

The east arm (Kevin Street Upper) has a single approach lane for all movements and an on-road cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The south arm (R137 New Street South) has three approach lanes, one for straight ahead and left-turn movements, one for straight ahead movements and one for right-turn movements and a cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and an on-road cycle lane.

The west arm (Dean Street) has two approach lanes for straight ahead movements (no right-turn permitted) and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single traffic lane and an on-road cycle lane. This junction is shown in Image 5.38.

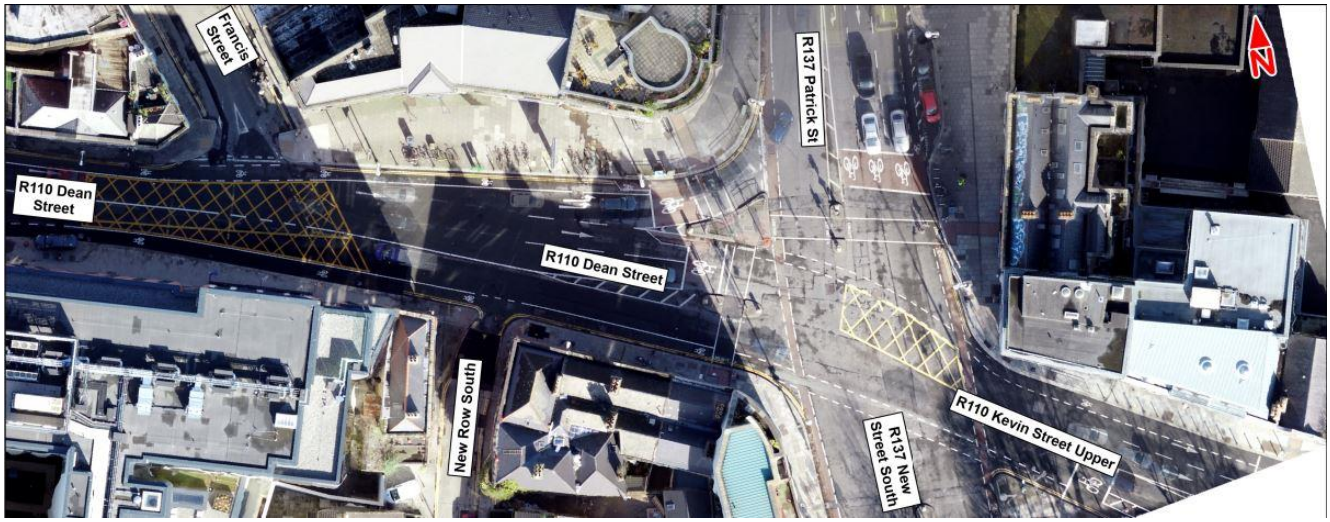

Image 5.38: Dean Street / New Street / Kevin Street Upper / Patrick Street Signalised Junction

R137 Patrick Street / Bride Road / R137 Nicholas Street three-arm signalised junction:

The north arm (R137 Nicholas Street) has two approach lanes for straight ahead movements only and an on-road advisory cycle lane controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and an on-road cycle lane.

The east arm (Bride Road) is one-way westbound only and has two approach lanes, one for right-turn movements, one for left-turn movements and an on-road advisory cycle lane controlled by a set of signal heads.

The south arm (R137 Patrick Street) has two approach lanes for straight ahead movements only and an on-road advisory cycle lane controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and an on-road cycle lane. This junction is shown in Image 5.39.

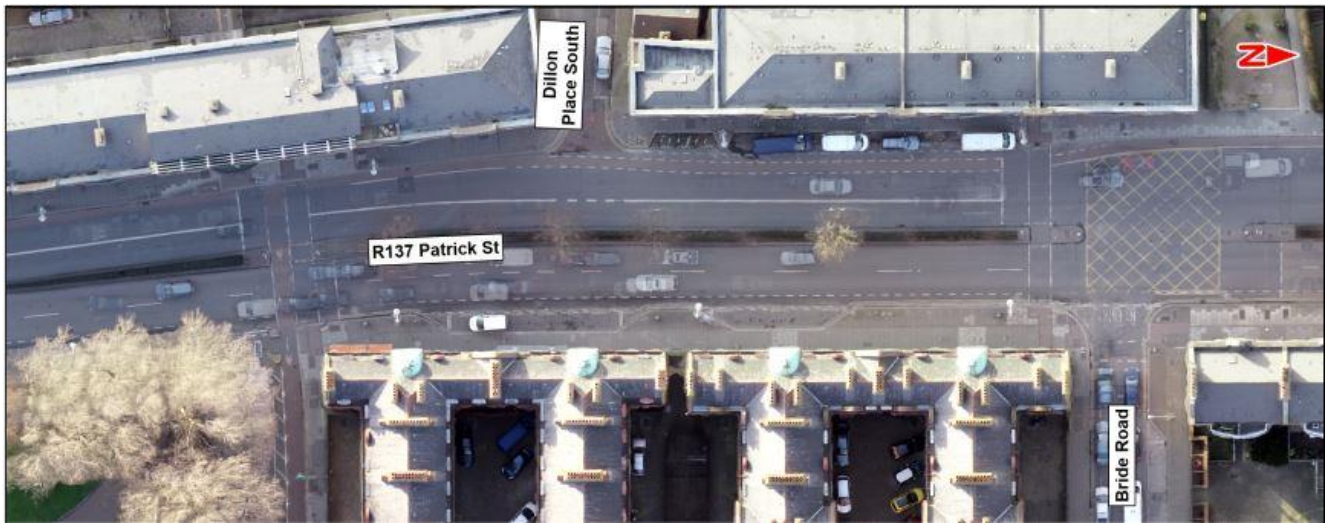

Image 5.39: R137 Patrick Street / Bride Road / Nicholas Street Signalised Junction

R137 Nicholas Street / Christchurch Place / Winetavern Street / High Street four–arm signalised junction:

The north arm (Winetavern Street) is one-way only northbound and has a wide single lane and on-road advisory cycle lane.

The east arm (Christchurch Place) has three approach lanes, one for left-turn movements, one for straight ahead movements, one for straight ahead and right-turn movements and two on-road advisory cycle lanes with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and an on-road advisory cycle lane.

The south arm (R137 Nicholas Street) has three approach lanes, one for straight ahead movements, one for straight ahead and right-turn movements, one for right-turn movements and a left turn slip lane, there are also two on-road advisory cycle lanes with cycle advance stop lines controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and an on-road advisory cycle lane.

The west arm (High Street) has three approach lanes, one for straight ahead and left-turn movements, one for straight ahead and right-turn movements, one for right-turn movements and an on-road advisory cycle lane with cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and an on-road advisory cycle lane. This junction is shown in Image 5.40.

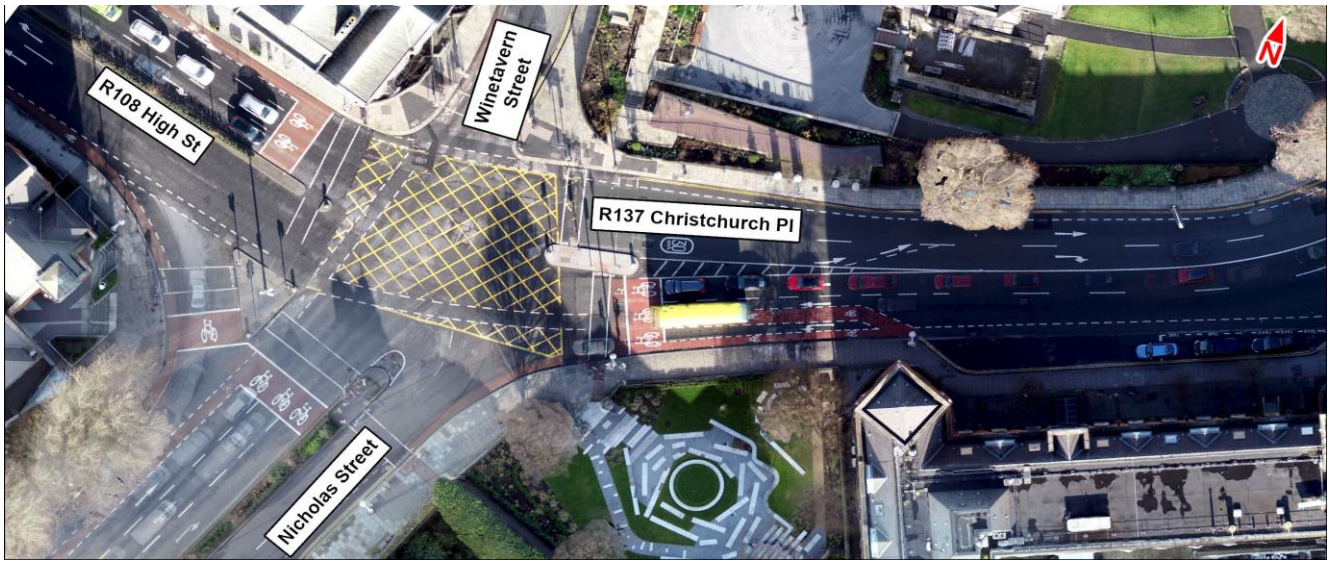

Image 5.40: R137 Nicholas Street / Christchurch Place / Winetavern Street / High Street Signalised Junction

5.3.5.6 Existing Parking / Loading

The existing conditions for parking and loading for this Section 4 of the Proposed Scheme are as follows:

- On R110 Dolphin's Barn Street and Cork Street 12 retail parking spaces, 317 adjacent parking spaces and 51 paid parking spaces (07:00 -19:00 Monday to Saturday); and
- On R137 Patrick Street and Nicholas Street 10 loading bays.

5.3.6 Section 5 – Woodford Walk (R113) / New Nangor Road (R134) to Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction

This Section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 5 of the Proposed Scheme.

This section commences on R134 New Nangor Road at the junction with Woodford Walk. Heading east along R134 New Nangor Road, the scheme progresses underneath the M50 bridge and passes through the Riverview Business Park, Western Industrial Estate, and John F Kennedy Industrial Estate, until the junction with R810 Naas Road.

5.3.6.1 Pedestrian Infrastructure

R134 New Nangor Road benefits from footways of approximately 2.0m in width, with street lighting columns situated along both sides of the carriageway. Passing through the industrial estates, areas of the footways are separated from the main carriageway by grassed areas.

There are several pedestrian crossings along R134 New Nangor Road, both signalised and uncontrolled. Pedestrian crossing facilities can be found at the following locations:

- The three-arm Woodford Walk / R134 New Nangor Road signalised junction has signalised crossings on southern and western arms. The crossings benefit from tactile paving and dropped kerbs. The crossings allow pedestrians to cross in stages with traffic islands providing pedestrian refuge at slip lanes;
- The four-arm R134 New Nangor Road / Oak Road signalised junction has signalised crossings on all four arms. The crossings benefit from tactile paving and dropped kerbs. The crossings allow pedestrians to cross in stages with traffic islands providing pedestrian refuge at slip lanes;
- The four-arm R134 New Nangor Road / Willow Road junction has crossings on the northern, eastern and southern arms. The crossings benefit from tactile paving and dropped kerbs;
- The three-arm R134 New Nangor Road / Killeen Road (north) signalised junction has signalised crossings on the R134 New Nangor Road and on Killeen Road. The crossings benefit from tactile paving and dropped kerbs. The crossings allow pedestrians to cross in stages with traffic islands providing pedestrian refuge at slip lanes;
- The three-arm R134 New Nangor Road / Killeen Road (south) signalised junction has a signalised crossing on Killeen Road. The crossing benefits from tactile paving and dropped kerbs; and
- The four-arm signalised junction at R134 New Nangor Road / R810 Naas Road / R110 Long Mile Road provides signalised crossings for the New Nangor Road arm, the Naas Road east arm and the Long Mile Road arm of the junction. These crossings comprise guard railings, dropped kerbs, tactile pavements and traffic island refuge areas.

Uncontrolled crossings at the roundabout at Nangor Business Park / Riverview Business Park benefit from dropped kerbs. The locations of the pedestrian crossings are illustrated in Figure 6.3e in TIA Appendix 3 (Maps).

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footway widths) at each junction along Section 5 of the Proposed Scheme is included in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

5.3.6.2 Cycling Infrastructure

There is a link to the Grand Canal Greenway at the Woodford Walk / New Nangor Road junction but there are no cycle-specific facilities within this section. Cyclists are permitted to cycle within the bus lanes, which are present for the majority of the carriageway in this section, but there is no physical segregation from motor vehicles, and no provisions for cyclists at junctions. There is also no formal cycle parking, or designated cycle hire parking racks, along this section of the route.

5.3.6.3 Bus Infrastructure

5.3.6.3.1 Bus Priority Measures

Bus lanes along Section 5 are present at the following locations:

- A continuous eastbound bus lane on R134 New Nangor Road, which runs from the start of the Proposed Scheme (to the west of Woodford Walk) to R110 Naas Road. This bus lane does not run continuously through the main junctions on the route, but typically terminates 60-80m short of these junctions, and restarts 50m downstream of the junctions. The exception is at the R134 New Nangor Road / Woodford Walk signalised junction, where a bypass lane is provided.
- A continuous westbound bus lane on R134 New Nangor Road, which runs from R810 Naas Road to the end of the Proposed Scheme (to the west of Woodford Walk) to. As per the eastbound direction, this bus lane does not run continuously through the main junctions on the route, but typically terminates 60-80m short of these junctions and restarts 50m downstream of the junctions. The exception is at the R134 New Nangor Road / Killeen Road signalised junction, where a bypass lane is provided.
- Due to width restrictions, there is no bus lane in either direction for a 200m section where R134 New Nangor Road passes underneath the M50.

5.3.6.3.2 Bus Stop Facilities

There are currently nine bus stops along Section 5 of the Proposed Scheme. The inbound stops are as follows:

- Stop 6152 on R134 New Nangor Road, to the west of Woodford Walk;
- Stop 6153 on R134 New Nangor Road, 70m west of the Riverview Business Park roundabout;
- Stop 6243 on R134 New Nangor Road, 130m west of Willow Road;
- Stop 6154 on R134 New Nangor Road, 90m west of L1014 Killeen Road; and
- Stop 6155 on R134 New Nangor Road, 220m north-west of R810 Naas Road.

The outbound stops are:

- Stop 6145 on R134 New Nangor Road, 220m north-west of R810 Naas Road;
- Stop 6146 on R134 New Nangor Road, 90m west of L1014 Killeen Road;
- Stop 6147 on R134 New Nangor Road, 130m west of Willow Road; and
- Stop 6149 on R134 New Nangor Road, 70m west of the Riverview Business Park roundabout.

All bus stops are situated inline with bus lanes and are without facilities, they are identified with a bus stop pole.

Table 5.11: Section 5 – Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
68x	Greenogue Business Park - Peamount - New Nangor Rd. - Naas Rd.- Robinhood Industrial Estate - Oblates Church - James St. (St. James's Hospital) - Thomas St. / Bridgefoot St.- Lord Edward St. / Fishamble St.- Dame St. / Central Bank - Hawkins St	Once a day (07:30)	No service
151	Foxborough - Parkwest - Drimnagh Rd. - Dolphin's Barn - Dame St. / Ormond Quay - Docklands (East Rd.)	Peak: 15 minutes / Off-peak 20-30 minutes	20-30 minutes
860	Park West Avenue - Kylemore Road - Sarsfield Quay - Arran Quay - Ormond Quay Upper - Parliament Street - Dame Street - 14-18 Aston Quay	20-30 minutes	No service

5.3.6.4 General Traffic

R134 New Nangor Road is a two-way single carriageway, with vehicles travelling in an east-west direction. Generally, there is one lane in each direction for general traffic, with a separate bus lane operating in each direction. On the approach to larger junctions, such as Oak Road and Willow Road, one side of the carriageway splits into two or three lanes to provide additional capacity. The carriageway has a broadly straight alignment, save for the slight curve on the approach to R110 Naas Road.

This section of the Proposed Scheme is subject to a 60km/h speed limit, and has one bridge above the carriageway, which carries traffic along the M50. The carriageway is bounded by a footway for pedestrians, with pedestrians occasionally afforded greater segregation through the presence of grass verges.

The major junctions along this section of R134 New Nangor Road are:

- R134 New Nangor Road / Woodford Walk three-arm signalised junction;
- R134 New Nangor Road / Nangor Road Business Park four-arm roundabout;
- R134 New Nangor Road / Oak Road four-arm signalised junction;
- R134 New Nangor Road / Willow Road four-arm signalised junction;
- R134 New Nangor Road / Killeen Road (north) signalised junction;
- R134 New Nangor Road / Killeen Road (south) signalised junction; and
- R134 New Nangor Road / R110 Naas Road / R110 Long Mile Road four-arm signalised junction.

The characteristics of each major junction is described in turn below, alongside satellite images which are extracts from Figure 6.6 in TIA Appendix 3 (Maps).

R134 New Nangor Road / Woodford Walk three-arm signalised junction:

The east arm (R134 new Nangor Road) has two straight ahead approach lanes, one for bus only, one for general traffic and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of one general traffic lane and one bus lane.

The south arm (Woodford Walk) has one right-turn approach lane and one left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single wide lane.

The west arm (R134 New Nangor Road) has two approach lanes, one for straight ahead movements, one for right-turn movements onto Woodford Walk controlled by a set of signal heads and an island segregated bus lane for straight ahead movements. Exit onto this arm consists of a single wide merge lane. This junction is shown in Image 5.41.

Image 5.41: R134 New Nangor Road / Woodford Walk Signalised Junction

R134 New Nangor Road / Nangor Road Business Park four-arm priority roundabout:

The north arm (Nangor Road Business Park) has two yield approach lanes. Exit onto this arm consists of a single lane. The east arm (R134 New Nangor Road) has two yield approach lanes, one for left-turn movements and one for straight ahead and right-turn movements. Exit onto this arm consists of a single wide merge lane. The south arm (Riverview Business Park) has a single wide approach lane for all movements. Exit onto this arm consists of a single lane. The west arm (R134 New Nangor Road) has two yield approach lanes, one for left-turn movements and one for straight ahead and right-turn movements. Exit onto this arm consists of a single wide merge lane. This junction is shown in Image 5.42.

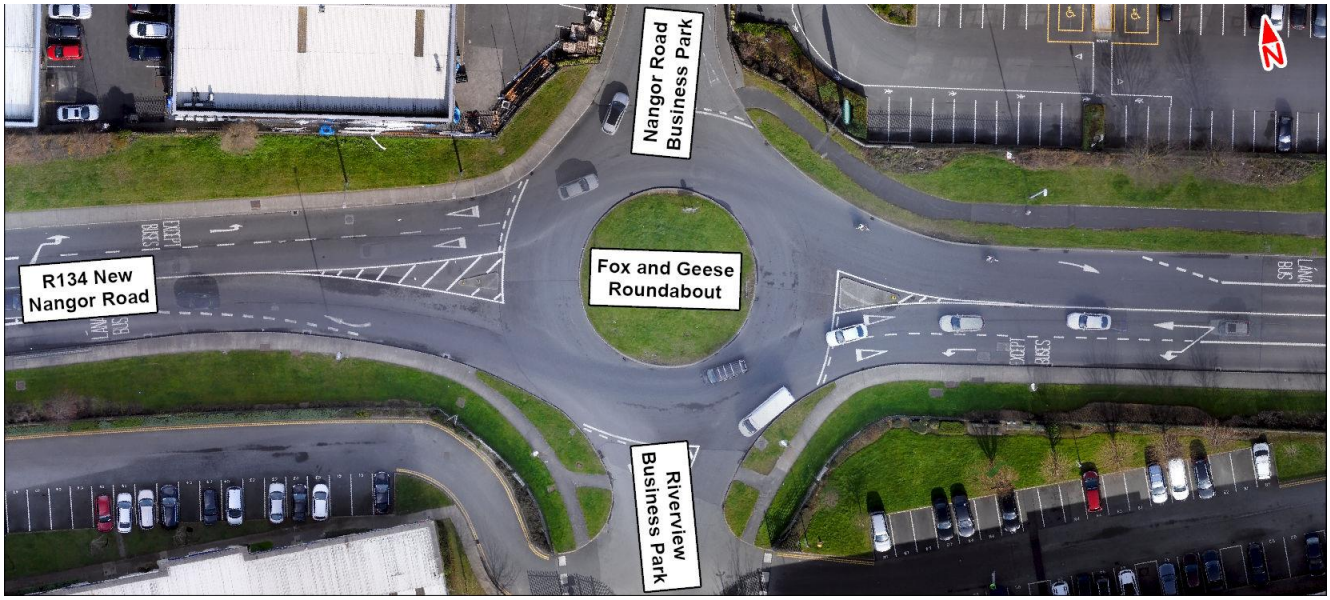

Image 5.42: R134 New Nangor Road – Nagor Road Business Park Priority Roundabout

R134 New Nangor Road / Oak Road four-arm signalised junction:

The north arm (Park West Avenue) has two approach lanes, one for straight ahead movements, one for right-turn movements and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The east arm (R134 New Nangor Road) has two approach lanes, one for straight ahead movements, one for right-turn movements and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The south arm (Oak Road) has two approach lanes, one for straight ahead movements, one for right-turn movements and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The west arm (R134 New Nangor Road) has two approach lanes, one for straight ahead movements, one for right-turn movements and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane. This junction is shown in Image 5.43.

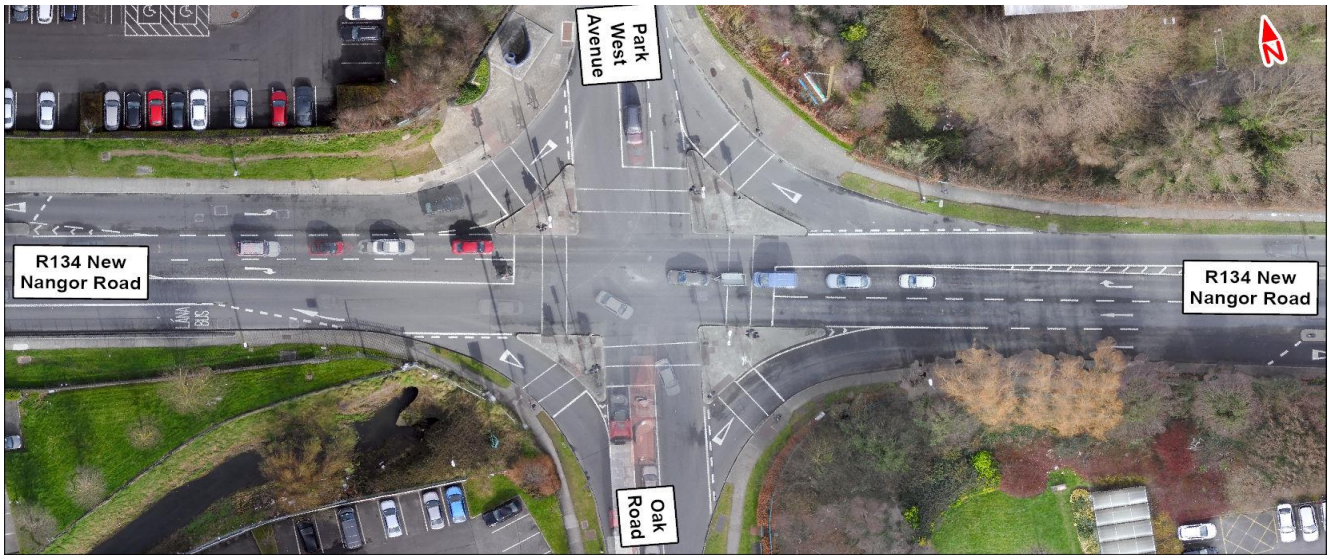

Image 5.43: R134 New Nangor Road / Oak Road Signalised Junction

R134 New Nangor Road / Willow Road four-arm signalised junction:

The north arm (Diageo Baileys) has a single approach lane managed by camera-controlled signalling and is restricted for HGV access only. Exit onto this arm consists of a single lane.

The east arm (R134 New Nangor Road) has two approach lanes, one for straight ahead and left-turn movements, one for straight ahead and right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane.

The south arm (Willow Road) has two approach lanes, one for straight ahead and left-turn movements, one for right-turn movements and a cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The west arm (R134 New Nangor Road) has two approach lanes, one for straight ahead movements and one for right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single wide merge lane. This junction is shown in Image 5.44.

Image 5.44: R134 New Nangor Road / Willow Road Signalised Junction

R134 New Nangor Road / Killeen Road (north) three-arm signalised junctions:

The north arm (Killeen Road) has a single approach lane and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The east arm (R134 New Nangor Road) has two approach lanes, one for straight ahead movements, one for right-turn movements onto Killeen Road controlled by a set of signal heads and a straight ahead bus lane segregated by a traffic island. Exit onto this arm consists of two lanes.

The west arm (R134 New Nangor Road) has two approach lanes for straight ahead movements and a left-turn slip lane onto Killeen Road controlled by a set of signal heads. Exit onto this arm consists of a single wide lane and a bus lane. This junction is shown in Image 5.45.

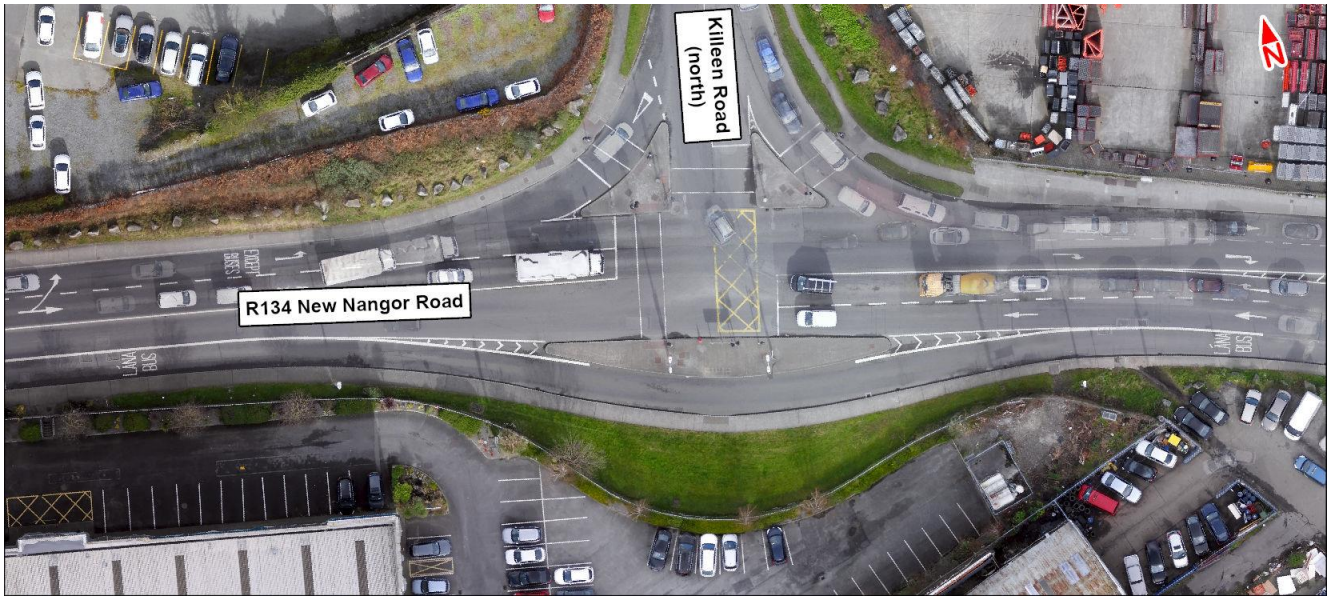

Image 5.45: R134 New Nangor Road / Killeen Road Signalised Junctions

R134 New Nangor Road / Killeen Road (south) signalised junction:

The east arm (R134 New Nangor Road) has two approach lanes, one for straight ahead movements, one for left-turn movements (except buses) onto Killeen Road controlled by a set of signal heads and straight-ahead bus lane segregated by a traffic island. Exit onto this arm consists of a single wide merge lane.

The south arm (Killeen Road) has two approach lanes, one for left-turn movements and one for right-turn (time restricted Mon – Fri) movements controlled by a set of signal heads. Exit onto this arm consists of a single lane.

The west arm (R134 New Nangor Road) has two approach lanes, one for straight ahead movements and one for right-turn movements onto Killeen Road controlled by a set of signal heads. Exit onto this arm consists of two traffic lanes and a bus lane. This junction is shown in Image 5.46.

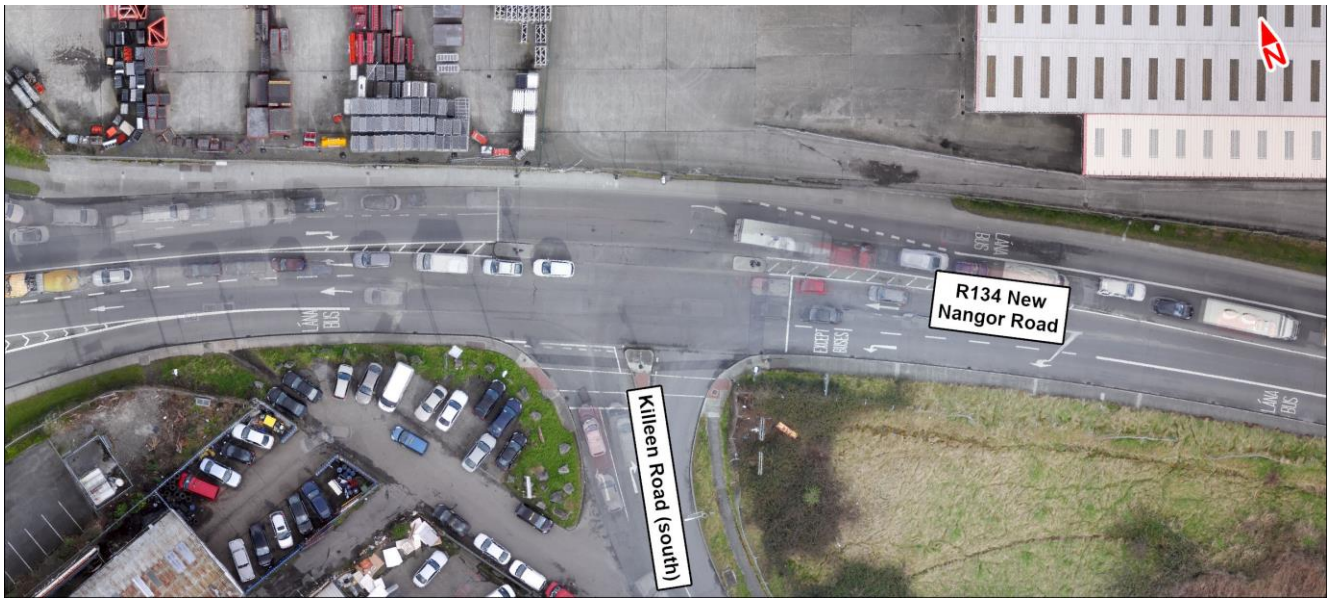

Image 5.46: R134 New Nangor Road / Killeen Road (south) Signalised Junctions

R110 Naas Road / R134 New Nangor Road / R110 Long Mile Road four-arm signalised junction:

The north-west arm (R134 New Nangor Road) has three approach lanes expanding to four lanes (two for straight ahead movements towards the R110 Long Mile Road, two for right-turn movements towards the N7 / M50) and a left turn slip lane towards the R810 Naas Road controlled by a set of signal heads. Exit onto this arm consists of two lanes and a merge lane.

The east arm (R810 Naas Road dual carriageway) has three straight ahead approach lanes and two slip lanes (one for right-turn movements towards R134 New Nangor Road, one for left turn movements towards R110 Long Mile Road) and an on-road advisory cycle lane controlled by a set of signal heads. Exit onto this arm consists of three lanes and a merge slip lane. The LUAS light rail is within the central median.

The south-east arm (R110 Long Mile Road) has three lanes (two for straight ahead towards the R134 New Nangor Road, one for straight ahead / left-turn towards N7 / M50) and a left-turn slip lane towards N7 / M50 controlled by a set of signal heads. Exit onto this arm consists of two lanes.

The west arm (R810 Naas Road dual carriageway) has three straight ahead approach lanes and two slip lanes (one for movements towards R134 New Nangor Road / R110 Long Mile Road, one for movements towards R110 Long Mile Road) and an on-road advisory cycle lane controlled by a set of signal heads. Exit onto this arm consists of three lanes and a merge slip lane. The LUAS light rail is within the central median. This junction is shown in Image 5.47.

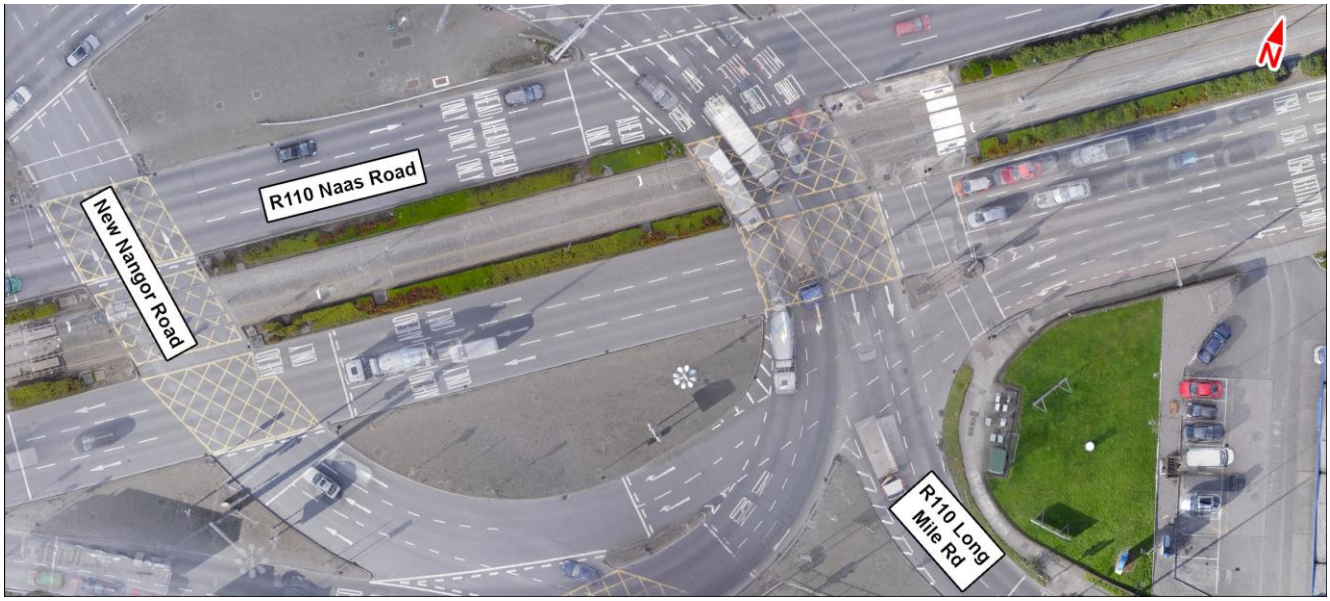

Image 5.47: R110 Naas Road / R134 New Nangor Road / R110 Long Mile Road Signalised Junction

5.3.6.5 Existing Parking / Loading

There are currently no on-street parking spaces or loading bays along R134 New Nangor Road, between Woodford Walk and R110 Naas Road. The road is subject to "no waiting at any time" restrictions, preventing parking along its whole length.

Any parking, loading or servicing associated with the existing businesses along this section of road is undertaken within the side roads or designated areas on private premises. Two of the largest of these private car parking areas are:

- Between M50 overbridge and Park West Avenue, 458 adjacent parking spaces;
- Between Park West Avenue and Willow Road, 454 and 10 HGV adjacent parking spaces; and
- Between Willow Road and New Nangor Road / Naas Road junction, 1,688 and 167 HGV adjacent parking spaces, 7 informal parking spaces, 90 commercial spaces.

5.3.7 Section 6 – Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh

This section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 6 of the Proposed Scheme, between Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh.

Section 6 routes east along R810 Naas Road which runs along the south-eastern edge of John F Kennedy Industrial Estate as far as R112 Walkinstown Avenue. From the junction with R112 Walkinstown Avenue, the scheme is routed southbound until the junction with R110 Long Mile Road. This section of the Proposed Scheme continues along R110 Long Mile Road for approximately 0.85km, before merging with Tallaght to City Centre section at the junction of Walkinstown Road and Drimnagh Road.

5.3.7.1 Pedestrian Infrastructure

Footways and public lighting are provided on both sides of the carriageway on R110 Naas Road and R112 Walkinstown Avenue. In relation to its surrounding land use, the walking facilities along this section are considered to be adequate.

The footway provision generally provides adequate space for much of the length of the section, with footways widths being approximately 2.0m, with dropped kerbs and tactile paving in place, in addition to guardrails at the major junction with R134 New Nangor Road at the beginning of the section. There are some pinch points along

the southern footway on R110 Naas Road near the junction with Robinhood Road; not just due to a narrower footway (1.5m), but also due to obstructions from street furniture such as lighting.

Signalised pedestrian crossing facilities on R110 Naas Road can be found at the following locations:

- A staggered pelican crossing located on R110 Naas Road, 25m west of the junction with Robinhood Road on the westbound carriageway and 30m west of the Old Naas Road junction on the eastbound carriageway. This crossing also incorporates guard railings, dropped kerbs, tactile paving and a traffic island refuge at the carriageway median where the LUAS light rail is located;
- The four-arm signalised junction at Naas Road / Kylemore Road / Walkinstown Avenue, there are two staggered, signalised crossings, on the west and north arms of the junction. At the western arm, the crossing provides access the Kylemore LUAS stop which runs through the central median of the two carriageways;
- At the junction of R112 Walkinstown Avenue and R110 Long Mile Road, there are three signalised crossings, at the west, north and south arms of the junction. At the western arm, the crossing has a traffic island refuge area at the centre of the carriageway;
- Near Drimnagh Castle Secondary School, there is a staggered, signalised Pelican crossing with a traffic island refuge area at the centre of the carriageway; and
- Near Drimnagh Castle Primary School, there is a non-signalised crossing with a traffic island refuge area at the centre of the carriageway.

Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. The locations of the pedestrian crossings are illustrated in Figure 6.3f in TIA Appendix 3 (Maps).

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at each junction along Section 6 of the Proposed Scheme is included in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

5.3.7.2 Cycling Infrastructure

The cycle facilities along R810 Naas Road comprise of on-road and off-road cycle tracks on both sides of the carriageway, apart from short sections where there are bus lanes or restricted road widths. There are no cycle facilities along R112 Walkinstown Avenue in this section.

Travelling eastbound along R810 Naas Road, there is a one-way cycle track immediately adjacent to the carriageway, which begins at the junction with R134 New Nangor Road. This continues for approximately two-thirds of this section of R110 Naas Road with a section of full segregation at the bus stop bypass at the John F Kennedy Drive stop, cyclists are required to join the main carriageway, sharing a bus lane between the junctions of John F Kennedy Drive / Old Naas Road and Kylemore Road / Walkinstown Avenue.

Travelling westbound along R810 Naas Road, there is a one-way on-road cycle lane throughout the length of the road delineated by road markings and partially with coloured tarmac. However, the cycle lane is subject to potential illegal parking adjacent to Naas Road Autos at the junction with Robinhood Road. This would result in cyclists having to merge onto the main carriageway.

There are few cycle-specific facilities at the signalised junctions within this section. There are advanced stacking locations for cyclists along R112 Walkinstown Avenue at the junctions with R810 Naas Road and R110 Long Mile Road.

On R110 Long Mile Road, there is a one-way cycle lane on both sides of the carriageway which runs continuously from the junction with R110 Long Mile Road / R112 Walkinstown Avenue to the junction with R110 Long Mile Road / Slievebloom Park. The lanes are approximately 1.8m in width, and are on-road, delineated by road markings and coloured tarmac.

There are a number of locations, in both directions, where vehicles are required to cross cycle lanes if turning left at junctions, such as at the Walkinstown Avenue / Long Mile Road junction. There is also a potential point of conflict at the Slievebloom Park bus stop and the Bluebell (Dublin City) Drimnagh Castle School stop, where buses are required to cross the cycle lanes.

There is no formal cycle parking, or designated cycle hire parking racks, along Section 6 of the Proposed Scheme.

The existing cycle facilities along Section 6 of the Proposed Scheme are illustrated in Figure 6.4f in TIA Appendix 3 (Maps).

Further details of the baseline cycling facilities (i.e. level of segregation from vehicles, capacity for cycling two abreast and / or overtaking, and junction treatment) along the length of Section 6 of the Proposed Scheme is included in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

5.3.7.3 Bus Infrastructure

5.3.7.3.1 Bus Priority Measures

Bus lanes along Section 6 are present at the following locations:

- A north-eastbound bus lane on R810 Naas Road which commences approximately 180m to the north-east of R134 New Nangor Road and runs for approximately 500m to the Walkinstown Avenue junction. This bus lane is not continuous, as it terminates early at the approaches to both the John F Kennedy Drive and Walkinstown Avenue junctions.
- A south-westbound bus lane on R810 Naas Road which commences approximately 80m to the south-west of the Robinhood Road junction and runs for 250m before terminating 170m to the north-east of Long Mile Road.

5.3.7.4 Bus Facilities

5.3.7.4.1 Bus Stop Facilities

There are currently 13 bus stops along Section 6 of the Proposed Scheme. The inbound stops are as follows:

- Stop 1980 on R810 Naas Road, 220m north-east of R134 New Nangor Road;
- Stop 1981 on R810 Naas Road, 130m south-west of R112 Walkinstown Avenue;
- Stop 2787 on Walkinstown Avenue, 150m north of R110 Long Mile Road;
- Stops 2181 on R110 Long Mile Road, 110m east of R112 Walkinstown Avenue;
- Stop 2182 on R110 Long Mile Road, 15m west of Walkinstown Parade; and
- Stop 2778 on R110 Long Mile Road, 130m west of Slievebloom Park.

The outbound stops are:

- Stop 2726 on R110 Long Mile Road, 20m west of Slievebloom Park;
- Stop 2727 on R110 Long Mile Road, 120m east of Walkinstown Parade;
- Stop 2105 on R110 Long Mile Road, 180m west of Walkinstown Parade;
- Stop 2780 on R112 Walkinstown Avenue, 120m south of R810 Naas Road;
- Stop 1956 on R810 Naas Road, at Kylemore Luas Stop;
- Stop 1957 on R810 Naas Road, 90m west of Robinhood Road; and
- Stop 1958 on R810 Naas Road, 170m east of Long Mile Road.

Of the 13 bus stops along Section 6 of the Proposed Scheme, two are indented whilst all other stops are inline along the carriageway.

All bus stops provide timetables, with the majority providing seating, shelter and accessible kerbs. The content of Table 5.12 outlines the availability of bus stop facilities at the existing 13 bus stops along Section 6 of the Proposed Scheme.

Table 5.12: Section 6 – Availability of Bus Stop Facilities (of a Total 13no Bus Stops)

Bus Stop Facility	Number of bus stops in baseline with Facility	Percentage of Bus Stops in baseline with Facility
RTPI	0	0%
Timetable information	13	100%
Shelter	12	92%
Seating	12	92%
Accessible Kerbs	11	85%
Indented Drop Off Area	2	15%

The existing bus facilities along Section 6 of the Proposed Scheme are illustrated in Figure 6.5f in TIA Appendix 3 (Maps). The bus services which operate along Section 6 are outlined in Table 5.13.

Table 5.13: Section 6 – Bus Service Frequency

Service Route	Route	Typical Service Frequency	
		Weekday	Weekend
13	Grange Castle - Clondalkin Village - Naas Rd. (John Sisk and Sons) - Tyrconnell Rd. (Blacklion) - St. James's Hospital - O'Connell St. - Drumcondra Rail Station - Main St. Ballymun - Harristown	10-15 minutes	15-20 minutes
18	Newgrove Avenue - Burlington Road - Sundrive Road - Kylemore Road - Hollyville Lawn	15-20 minutes	20-30 minutes
68	Hawkins St. - Camden St. - Bulfin Rd. - Clondalkin Village - Cherrywood Villas - Newcastle / Greenogue Business Park	60 minutes	60-75 minutes
69	Rathcoole - Green Isle Hotel - Clondalkin Village - Naas Rd. (John Sisk and Sons) - Tyrconnell Rd. - Parkgate St - Hawkins St.	60 minutes	60-75 minutes
69x	Rathcoole - Hawkins St.	Once a day each direction (07:30 / 17:45)	No service
126 / 126a / 126d	Rathangan - Kildare - Newbridge - Naas - Dublin	30 minutes	30 minutes
130	Castle Ave. - Mount Prospect Ave. - Vernon Ave. - Fairview - Lwr. Abbey St	10 minutes	15 – 20 minutes
860	Temple bar, Central Bank – Parkwest, Park West Hotel	30 minutes	n/a
27	Jobstown - Tallaght (The Square) - Walkinstown Cross (The Kestrel) - Dolphin's Barn Cross - Eden Quay - Fairview - Artane Roundabout - Clare Hall	10 minutes	10-15 minutes
56a	Tallaght (The Square) - Cookstown Rd. - Walkinstown Cross - Dolphin's Barn - Ringsend Rd.	75 minutes	75 minutes
151	Foxborough - Parkwest - Drimnagh Rd. - Dolphin's Barn - Dame St. / Ormond Quay - Docklands (East Rd.)	Peak: 15 minutes / Off-peak 20-30 minutes	20-30 minutes

5.3.7.5 General Traffic

R810 Naas Road is a dual carriageway traveling east to west, which is subject to a speed limit of 60km/h. The Luas line runs along the centre of R810 Naas Road between the two carriageways. Each of the two carriageways is typically 11.0m in width, but in places the carriageway widens to approximately 17.0m in width (for instance, travelling westbound at the junction with R134 New Nangor Road).

Travelling eastbound along R810 Naas Road, there are three lanes predominantly, with two of these lanes designated for general traffic, with one for bus priority. Travelling westbound, the carriageway is slightly narrower between the junction with Kylemore Road / Walkinstown Avenue and Robinhood Road, at just two lanes for general traffic. However, after passing Robinhood Road, the road mirrors the eastbound carriageway for the most part, with three lanes (two for general traffic and one bus lane).

R112 Walkinstown Avenue is a two-way single carriageway which travels in a relatively straight alignment north - south and varies in width between 11.0m – 13.0m. The road is generally to a speed limit of 60 km/h, although the speed limit is decreased to 50 km/h on the approach to R110 Long Mile Road.

The southbound arrangement consists of a single carriageway between R810 Naas Road and the access point with Agnelli House. Following this access point, vehicles begin to diverge into two lanes, until the junction with R110 Long Mile Road is reached, which has three lanes. Travelling northbound, the road layout is largely the same, with a wide single lane from the junction with R110 Long Mile Road until approximately 80m ahead of the R810 Naas Road junction where this side of the carriageway splits into two lanes. Despite two bus stops on this road, there are no dedicated bus lanes.

R110 Long Mile Road comprises of a two-way carriageway with a 60km/h speed limit, until the junction with R110 Drimnagh Road, where the speed limit reduces to 50km/h. Each carriageway is approximately 8m in width with some sections increasing to 17m wide at the junction of R110 Long Mile Road / R112 Walkinstown Avenue. There are many access points along the road to various shops and businesses operating along R110 Long Mile Road.

For much of its length, the carriageway consists of a cycle lane, a dedicated bus lane, and one lane for general traffic. The exceptions to this are on the approach to the signalised junctions with other roads.

The existing major junction arrangements along Section 6 of the Proposed Scheme are as follows:

- R110 Naas Road / Kylemore Road / R112 Walkinstown Avenue four-arm signalised junction; and
- R112 Walkinstown Avenue / R110 Long Mile Road four-arm signalised junction.

The characteristics of each major junction is described in turn below, alongside satellite images which are extracts from Figure 6.6 in TIA Appendix 3 (Maps).

Naas Road / R112 Kylemore Road / R112 Walkinstown Avenue four-arm signalised Junction:

The north arm (R112 Kylemore Road) has two straight ahead approach lanes and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of a single wide lane.

The east arm (R810 Naas Road) has four approach lanes, one for left-turn movements, two for straight ahead movements and one for right-turn movements controlled by a set of signal heads. Exit onto this arm consists of a single traffic lane and a bus lane. The LUAS light rail is within the central median.

The south arm (R112 Walkinstown Avenue) has two approach lanes, one for straight ahead and left-turn movements, one for straight ahead and right-turn movements and a cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide lane.

The west arm (R810 Naas Road) has three approach lanes, one straight ahead bus lane, one straight ahead traffic lane, one right-turn lane and a left-turn slip lane controlled by a set of signal heads. Exit onto this arm consists of two lanes. The LUAS light rail is within the central median. This junction is shown in Image 5.48.

Image 5.48: R110 Naas Road / Kylemore Road / R112 Walkinstown Avenue Signalised Junction

R112 Walkinstown Avenue / R110 Long Mile Road four-arm signalised junction:

The north arm (R112 Walkinstown Avenue) has three approach lanes, one slip lane for left-turn movements, one for straight ahead movements, one for right-turn movements and a cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a wide lane.

The east arm (R110 Long Mile Road) has four approach lanes, one for general traffic left turn movements, one bus lane, one for general traffic straight ahead movements, one for general traffic right-turn movements, an on-road advisory cycle lane and a cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of two lanes, one straight ahead lane and one merge lane.

The south arm (R112 Walkinstown Avenue) has two approach lanes, one for left-turn and straight ahead movements, one for right-turn and straight ahead movements and a cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of a single wide lane.

The east arm (R110 Long Mile Road) has four approach lanes, one for general traffic left turn movements, one bus lane, one for general traffic straight ahead movements, one for general traffic right-turn movements, an on-road advisory cycle lane and a cycle advance stop line controlled by a set of signal heads. Exit onto this arm consists of two lanes, one straight ahead lane and one bus lane. This junction is shown in Image 5.49.

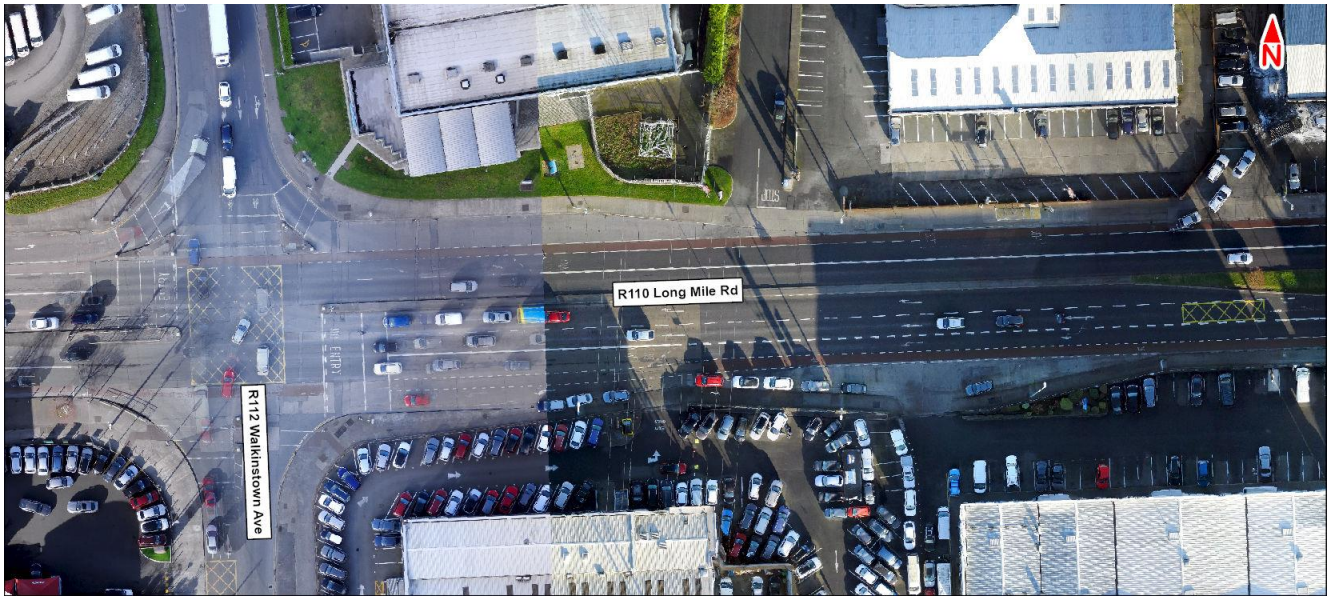

Image 5.49: R112 Walkinstown Avenue / R110 Long Mile Road Signalised Junction

5.3.7.6 Existing Parking and Loading

The existing conditions for parking and loading for this Section 6 of the Proposed Scheme are as follows:

- On R810 Naas Road, 280 commercial spaces (car sales) and 115 adjacent parking spaces;
- On R112 Walkinstown Avenue, approximately 1000 spaces (Southwest Gate development); and
- On R110 Long Mile Road, 250 + 94 HGV commercial spaces (car sales), 22 informal spaces and 509 adjacent spaces.

Illegal parking has been observed in several locations on Long Mile Road, including on the westbound carriageway at the corner of the Long Mile Road / Walkinstown Avenue junction, and on both sides of the road in the vicinity of the Drimnagh Castle Secondary and Primary Schools.

6. Potential Impacts

6.1.1 Characteristics of the Proposed Scheme

The characteristics of the Proposed Scheme are described in detail in Chapter 4 (Proposed Scheme Description) of this EIAR.

6.1.2 'Do Nothing' Scenario

With regards to this Traffic and Transport chapter, the 'Do Nothing' scenario means there would be no changes to existing transport infrastructure, so infrastructure provision for buses, pedestrians and cyclists would remain the same. The streetscape would continue to be based around the movement and parking requirements of private cars instead of people. High levels of traffic are associated with discouraging pedestrian and cyclist activity and this activity would be further discouraged as traffic congestion remains the same or increases. The baseline situation of congestion and journey time reliability issues for buses would also continue, and potentially be exacerbated over time as traffic congestion increases in line with travel demand growth.

6.1.3 'Do Minimum' Scenario

The 'Do Minimum' scenario represents the likely traffic and transport conditions of the direct and indirect study areas **without** the Proposed Scheme in place. This scenario forms the reference case by which to compare the Proposed Scheme ('Do Something'). The opening year for the Proposed Scheme is assumed to be 2028, with a design assessment year (opening + 15 years) assumed to be 2043.

For the qualitative analysis the assessment is in relation to the conditions of the existing transport network, which have been outlined in Section 5 (Baseline Environment) corresponding with a Do Nothing scenario. As a result of the COVID-19 pandemic a number of temporary transport mobility measures have been implemented. Due to their temporary status, the measures are not considered a permanent long-term feature of the receiving environment and as such have not been considered in the impact assessments.

For the quantitative analysis (i.e. the transport modelling elements of the impact assessment), the Do Minimum scenario is based on the 'likely' conditions of the transport network and includes for any known permanent improvements or changes to the road or public transport network that have taken place, been approved or are planned for implementation. The transport schemes and demand assumptions within the Do Minimum scenario are detailed below.

6.1.3.1 Do Minimum Transport Schemes

The core reference case (Do Minimum) modelling scenarios (Opening year - 2028 and Design year - 2043) are based on the progressive roll-out of the Greater Dublin Area (GDA) Transport Strategy 2022-2042 (GDA Strategy), with a partial implementation by 2028, in line with National Development Plan (NDP) investment priorities and the full implementation by 2043.

The GDA Strategy provides an appropriate transport receiving environment for the assessment of the Proposed Scheme for the following reasons:

- The GDA Strategy is the approved statutory transportation plan for the region, providing a framework for investment in transport within the region up to 2042;
- The GDA Strategy provides a consistent basis for the 'likely' future receiving environment that is consistent with Government plans and Policies National Planning Framework (NPF) and National Development Plan (NDP); and
- Schemes within the GDA Strategy are a means to deliver the set of objectives of the GDA Strategy. The sequencing and delivery of the strategy is defined by the implementation plan, but the optimal outcome of aiming to accommodate all future growth in travel demand on sustainable modes underpins the Strategy.

The Do Minimum scenarios (in both 2028 and 2043) include all other elements of the BusConnects Programme of projects (apart from the CBC Infrastructure Works elements) i.e. the new BusConnects routes and services (as

part of the revised Dublin Area bus network), new bus fleet, the Next Generation Ticketing and integrated fare structure proposals are included in the Do Minimum scenarios.

In 2028, other notable Do Minimum transport schemes include; the roll out of the DART+ Programme, Luas Green Line capacity enhancement and the Greater Dublin Area Cycle Network Plan implementation (excluding BusConnects CBC elements). As outlined above, the 2043 Do Minimum scenario assumes the full implementation of the GDA Strategy schemes, so therefore assumes that proposed major transport schemes such as MetroLink, Luas line extensions to Lucan, Finglas, Poolbeg and Bray are all fully operational.

TIA Appendix 1 (Transport Modelling Report) contains further information on the modelling assumptions contained within the Do Minimum scenario including the full list of transport schemes included.

6.1.3.2 Do Minimum Transport Demand

The transport demand changes for the 2028 and 2043 assessment years have been included in the analysis contained within this chapter, using travel demand forecasting, which accounts for increases in population and economic activity, in line with planned growth contained within the NPF, Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland region and the local development plans for the GDA local authorities.

It is envisaged that the population will grow by 11% up to 2028 and 25% by 2043 (above 2016 census data levels). Similarly, employment growth is due to increase by 22% by 2028 and 49% by 2043 (Source: NTA Reference Case Planning Sheets 2028, 2043).

The GDA Strategy (along with existing supply side capacity constraints e.g., parking availability, road capacity etc.) has the effect of limiting the growth in car demand on the road network into the future. Total trip demand will increase into the future in line with demographic growth (population and employment levels etc.). To limit the growth in car traffic and to ensure that this demand growth is catered for predominantly by sustainable modes, a number of measures will be required, that include improved sustainable infrastructure and priority measures delivered as part of the NDP/GDA Strategy. In addition to this, demand management measures will play a role in limiting the growth in transport demand, predominantly to sustainable modes only. The result will be only limited or no increases in overall demand for travel by private car. The Proposed Scheme will play a key role in this as part of the wider package of GDA Strategy measures.

In general, total trip demand (combining all transport modes) will increase into the future in line with population and employment growth. A greater share of the demand will be by sustainable modes (Public Transport (PT), Walking, Cycling). Private car demand may still grow in some areas but not linearly in line with demographics, as may have occurred in the past.

In terms of the transport modelling scenarios for the traffic and transport assessment, as per the Strategy proposals, there are no specific demand management measures included in the Do Minimum scenario in the 2028 Opening year, other than constraining parking availability in Dublin at existing levels. For the design year, 2043 scenario, a proxy for a suite of demand management measures is included in the Do Minimum in line with the target to achieve a maximum 45% car driver commuter mode share target, across the GDA, as outlined in the Strategy.

6.1.4 'Do Something' Scenario

The Do Something scenario represents the likely conditions of the direct and indirect study areas with the Proposed Scheme in place. The traffic and transport elements of the Proposed Scheme are presented in detail in Chapter 4 (Proposed Scheme Description) of the EIAR.

6.2 Construction Phase

This section considers the potential temporary traffic and transport impacts that construction of the Proposed Scheme will have on the direct and indirect study areas during the construction phase.

Chapter 5 (Construction) of the EIAR has been prepared to demonstrate the likely approach that will be taken to construct the Proposed Scheme, while it also provides an overview of the construction activities necessary to undertake the works, including information on a proposed Construction Compound, construction plant and

equipment. This assessment, as outlined herein, provides an overview of the potential traffic and transport impacts of the Construction Phase based on the information set out in Chapter 5 (Construction) of the EIAR.

A Construction Environmental Management Plan (CEMP) has been prepared and is included as Appendix A5.1 in Volume 4 of the EIAR. The CEMP which will be updated and finalised by the appointed contractor prior to construction commencing. The CEMP comprises the construction mitigation measures, which are set out in this EIAR, and will be updated with any additional measures which may be required by the conditions attached to An Bord Pleanála's decision. Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum during the Construction Phase. The CEMP has regard to the guidance contained in the TII Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, and the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015).

All of the content provided in the CEMP will be implemented in full by the appointed contractor and its finalisation will not affect the robustness and adequacy of the information presented and relied upon in this TIA.

As with any construction project, the appointed contractor will be obliged to prepare a comprehensive Construction Traffic Management Plan (CTMP). In preparing the CTMP for the proposed works, the appointed contractor will be required to give consideration where practicable to facilitate and identify opportunities for the maximum movement of people during the construction period through implementing the following hierarchy of transport mode users:

- Pedestrians;
- Cyclists;
- Public Transport; and
- General Traffic.

Access will be maintained for emergency vehicles along the Proposed Scheme, throughout the Construction Phase.

6.2.1 Description of Construction Works

The Proposed Scheme has been divided into six principal sections. The division line between sections has been determined by grouping similar carriageway types together. These sections have been further subdivided into 45 sub-sections, according to the types of construction works required. The sections / sub-sections are the following (Diagram 6.1):

- **Section 1:** Tallaght to Ballymount:
  - **Section 1a:** Old Blessington Road / Belgard Square South Junction / Belgard Square West Roundabout;
  - **Section 1b:** Tallaght Bus Interchange;
  - **Section 1c:** Old Blessington Road;
  - **Section 1d:** Belgard Square West;
  - **Section 1e:** Belgard Square West / Belgard Square North Junction;
  - **Section 1f:** Belgard Square North;
  - **Section 1g:** Belgard Square North / Belgard Square East Junction;
  - **Section 1h:** Belgard Square East;
  - **Section 1i:** Belgard Square East / Blessington Road Junction;
  - **Section 1j:** Blessington Road;
  - **Section 1k:** Belgard Road / Blessington Road Junction;
  - **Section 1l:** Blessington Road – St. Maelruain's Church to Courthouse Square Apartments;
  - **Section 1m:** Main Road;
  - **Section 1n:** Old Greenhills Road;
  - **Section 1o:** Greenhills Road, Tallaght; and
  - **Section 1p:** Bus Route, Parkview.

- **Section 2:** Ballymount to Crumlin:
  - **Section 2a:** Greenhills Road, Ballymount;
  - **Section 2b:** Ballymount Avenue;
  - **Section 2c:** Calmount Road / Ballymount Avenue Junction;
  - **Section 2d:** Calmount Road;
  - **Section 2e:** Greenhills Road and Calmount Avenue;
  - **Section 2f:** Greenhills Road, Greenhills;
  - **Section 2g:** Walkinstown Roundabout (including Ballymount Road Lower And St. Peter's Road);
  - **Section 2h:** Link Road between St. Peter's Road to Greenhills Road;
  - **Section 2i:** Cromwellsfort Road; and
  - **Section 2j:** Walkinstown Avenue.
- **Section 3:** Crumlin to Grand Canal:
  - **Section 3a:** Walkinstown Road;
  - **Section 3b:** Drimnagh Road;
  - **Section 3c:** Bunting Road and St Mary's Road;
  - **Section 3d:** Drimnagh Road / Crumlin Road / Kildare Road / St. Mary's Road Junction;
  - **Section 3e:** Crumlin Road;
  - **Section 3f:** Kildare Road;
  - **Section 3g:** Sundrive Road Junction; and
  - **Section 3h:** Clogher Road.
- **Section 4:** Grand Canal to Christchurch:
  - **Section 4a:** Dolphins' Barn Street, Cork Street and St. Luke's Avenue;
  - **Section 4b:** Dean Street;
  - **Section 4c:** Patrick Street / Kevin Street Upper / New Street South / Dean Street Junction;
  - **Section 4d:** Patrick Street and Nicholas Street; and
  - **Section 4e:** Christchurch Cathedral / Nicholas Street Junction.
- **Section 5:** Woodford Walk / New Nangor Road to Long Mile Road / Naas Road) / New Nangor Road junction.
  - **Section 5a:** New Nangor Road; and
  - **Section 5b:** Naas Road / Long Mile Road junction.
- **Section 6:** Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh:
  - **Section 6a:** Naas Road;
  - **Section 6b:** Naas Road / Walkinstown Avenue Junction;
  - **Section 6c:** Walkinstown Avenue;
  - **Section 6d:** Walkinstown Avenue / Long Mile Road Junction; and
  - **Section 6e:** Long Mile Road.

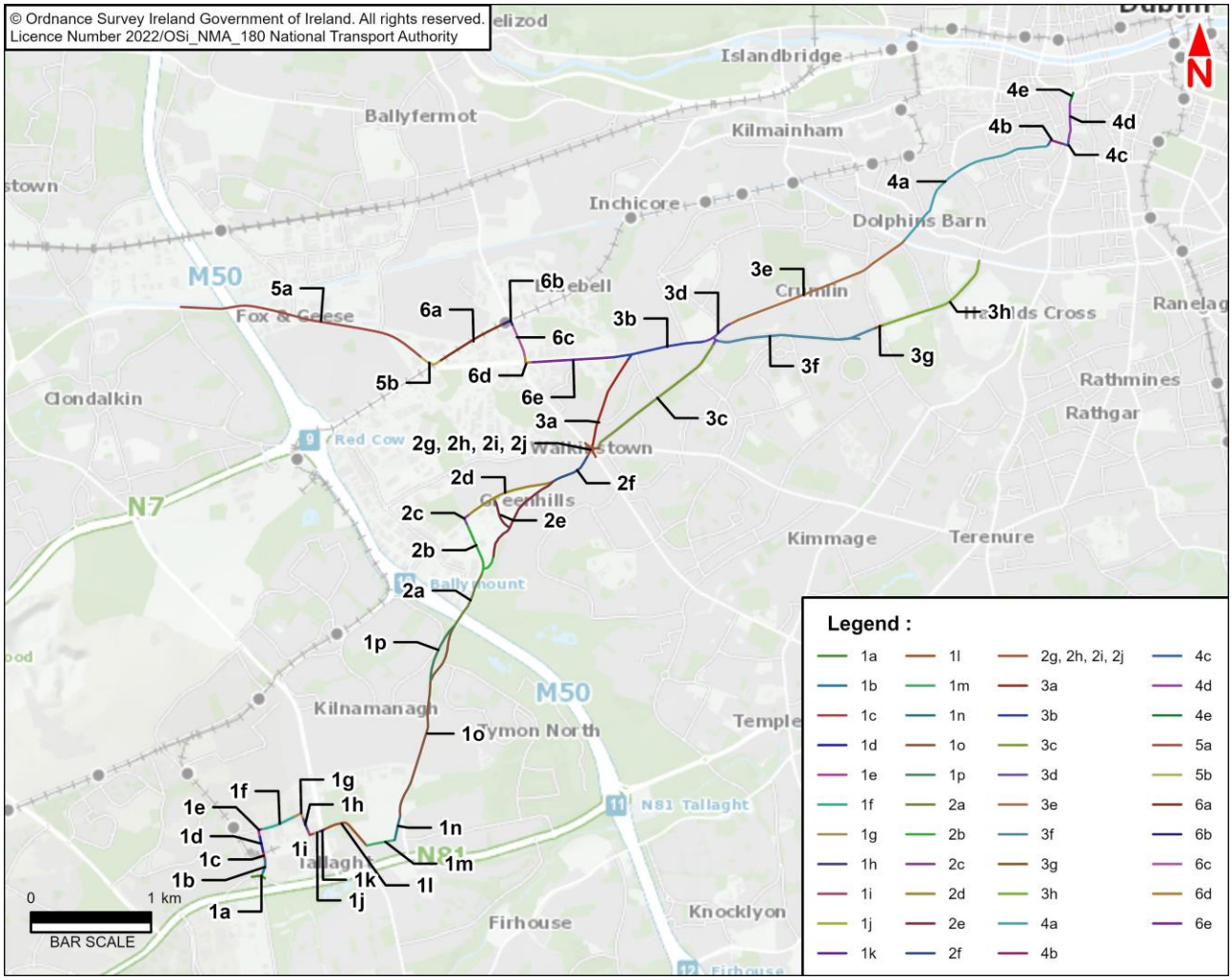

Diagram 6.1: Proposed Subsections of Construction Phase

6.2.2 Construction Programme

An outline, indicative programme for the Proposed Scheme is provided in Chapter 5 (Construction) of the EIA. The Proposed Scheme is estimated to require some 36 months (approximately) to complete, however, individual activities will have shorter durations. Works are envisaged to proceed concurrently on multiple work-fronts to minimise the overall construction duration.

6.2.3 Construction Route

Access to and egress from the construction compounds is permitted via dedicated construction vehicles routes. The haulage of material on site is anticipated to be minimal. There will however be the removal of excavated material and the delivery of construction materials to site. It is anticipated that the exporting and delivery of materials will be executed as efficiently as possible using dedicated Construction Access Routes. Construction vehicles will be directed to access work sections via the Proposed Scheme and dedicated routes on the National and Regional Road Network where practicable, to minimise use of the local road network.

The location for a Construction Compound is identified in Diagram 6.2

The appointed contractor's CTMP shall include measures for managing traffic in and out of the compound. Access to and egress from the Construction Compounds will be permitted via temporary access points directly from:

- Old Blessington Road for TC1;
- R819 Greenhills Road for TC2;
- R819 Greenhills Road for TC3;

- R819 Greenhills Road for TC4;
- Tymon Lane / R819 Greenhills Road for TC5;
- R819 Greenhills Road for TC6;
- Ballymount Avenue / R819 Greenhills Road for TC7;
- Bunting Road for TC8;
- Crumlin Road for TC9;
- Crumlin Road / Parnell Road for TC10
- Dean Street for TC11;
- Killeen Road / New Nangor Road for TC12; and
- R110 Long Mile Road for TC13.

The following national roads are expected to be used as construction vehicle access routes during the Construction Phase of the Proposed Scheme:

- N7;
- M50 Motorway; and
- N81.

The following regional roads are expected to be used as Construction Access Routes during the Construction Phase of the Proposed Scheme:

- R110;
- R112;
- R134;
- R137;
- R810; and
- R819.

The Proposed Scheme includes construction related activities on Calmount Road, Bunting Road and Kildare Road (Crumlin). These local roads are expected to be used as Construction Access Routes during the Construction Phase of the Proposed Scheme.

Given the length and varying nature of each subsection it is proposed to establish 12 construction compounds for the duration of the works. These are:

- **Construction Compound TC1:** Old Blessington Road / N81;
- **Construction Compound TC2:** R819 Greenhills Road / Bancroft Park
- **Construction Compound TC3:** Birchview Avenue / Greenhills Road
- **Construction Compound TC4:** Green space along Greenhills Road, between Treepark Road and Old Greenhills Road;
- **Construction Compound TC5:** Green space along Greenhills Road, to the north of Tymon Lane
- **Construction Compound TC6:** R819 Greenhills Road, outside Tallaght Truck Dismantlers, north-east of the M50 Motorway;
- **Construction Compound TC7:** Green space at New Ballymount Avenue / Greenhills Road junction
- **Construction Compound TC8:** Bunting Park, along Bunting Road;
- **Construction Compound TC9:** Green space at Rafters Road / Crumlin Road;
- **Construction Compound TC10**: Parnell Road / Rutland Avenue;
- **Construction Compound TC11:** Dean Street / Patrick Street;
- **Construction Compound TC12:** Green area between New Nangor Road and Killeen Road;
- **Construction Compound TC13:** Along the Long Mile Road, south of the New Nangor Road / Naas Road / Long Mile Road junction

The appointed contractor will be responsible for developing the final layout and use of the Construction Compound within the framework set out within the EIAR. The Contractor may identify other (or additional) Construction Compound locations, subject to gaining all necessary approvals. In addition to the Construction Compound, temporary / portable welfare facilities will be provided along the Proposed Scheme.

Diagram 6.2 illustrates the proposed construction routes to and from the construction compounds.

Diagram 6.2: Proposed Construction Routes and Main Compound Location

6.2.4 Potential Construction Impact

Construction of the Proposed Scheme has the potential to impact people's day-to-day activities along the corridor while the works are underway. Chapter 5 (Construction) of the EIAR and the CEMP (Appendix A5.1 in Volume 4 of the EIAR), identify impactful activities, considers their effect, and identifies mitigation measures to reduce or remove their impact insofar as practicably possible.

For construction activities on or adjacent public roads, all works will be undertaken in accordance with DTTS's 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks' and associated guidance. Chapter 5 (Construction) of the EIAR contains temporary traffic management proposals for the Proposed Scheme. These proposals maintain safe distance between road users and road workers, depending on the type of construction activities taking place and existing site constraints. Temporary diversions, and in some instances temporary road closures, may be required where a safe distance cannot be maintained to undertake works necessary to complete the Proposed Scheme. All road closures and diversions will be determined by the NTA, who may liaise with the local authority and An Garda Siochana, as necessary. The need for temporary access restrictions will be confirmed with residents and businesses prior to their implementation.

6.2.4.1 Pedestrian Provisions

As described in Chapter 5 (Construction) of the EIAR, pedestrians may be temporarily impacted by construction activities along the Proposed Scheme corridor. Pedestrian diversions and temporary surface footways will be

used to facilitate pedestrian movements around work areas. Access to local amenities, such as to bus stops, traffic crossings, private dwellings, and businesses, may be temporarily altered but access will be maintained.

Due consideration will be given to pedestrian provisions in accordance with Section 8.2.8 of the DTTS Chapter 8, Temporary Traffic Measures and Signs for Roadworks of the Traffic Signs Manual (DTTS 2019a) and the DTTS Temporary Traffic Management Design Guidance (DTTS 2019b), to ensure the safety of all road users, in particular pedestrians (including able-bodied pedestrians, wheel-chair users, mobility impaired pedestrians, pushchair users etc.). Therefore, where footways are affected by construction, a safe route will be provided past the works area, and where practicable, provisions for matching existing facilities for pedestrians. Due consideration will also be given to the need for temporary ramps, and measures for accessible users, where changes in elevation are temporarily introduced to facilitate works and footway diversions. Entrance points to the construction zone will be controlled as required.

6.2.4.2 Cycling Provisions

Cyclists may be temporarily impacted by construction activities along the Proposed Scheme corridor. As part of Temporary Traffic Management arrangements, the appointed Contractor will give due consideration to cyclist provision in accordance with Section 8.2.8 of the DTTS Chapter 8, Temporary Traffic Measures and Signs for Roadworks of the Traffic Signs Manual (DTTS 2019a) and the DTTS Temporary Traffic Management Design Guidance (DTTS 2019b), including the use of site-based risk assessments. Therefore, where cycle tracks are affected by construction, a safe route will be provided past the work area, and where practicable, provisions for matching existing facilities for cyclists will be made.

6.2.4.3 Public Transport Provisions

Existing public transport routes will be maintained throughout the duration of the Construction Phase of the Proposed Scheme (notwithstanding potential for occasional road closures / diversions as described in Chapter 5 (Construction) of the EIAR. Wherever practicable, bus services will be prioritised over general traffic. However, the temporary closure of sections of existing dedicated bus lanes may be required to facilitate the construction of new bus priority infrastructure that is being developed as part of the Proposed Scheme. It is also likely that some existing bus stop locations may need to be temporarily relocated to accommodate the works. In such cases operational bus stops will be safely accessible to all users.

6.2.4.4 Parking and Loading

Parking and loading locations may be temporarily impacted by construction activities along the Proposed Scheme corridor. There may be temporary restrictions to on-street parking and loading facilities. The appointed contractor will discuss temporary traffic management measures with the road authority and directly affected residents/business with the aim of minimising disruption.

6.2.4.5 General Traffic

The Proposed Scheme will be constructed to ensure the mitigation of disturbance to residents, businesses and existing traffic. Localised temporary lane or road closures may be required for short periods. Details of illustrative temporary traffic management measures to facilitate construction of the Proposed Scheme are included in Chapter 5 (Construction) of the EIAR. All road closures and diversions will be determined by the NTA, who may liaise with the local authority and An Garda Siochana, as necessary. It should be noted that access will be maintained for emergency vehicles along the Proposed Scheme, throughout the Construction Phase.

6.2.4.5.1 General Traffic Redistribution

Significant impacts due to general traffic redistribution away from the direct study area are not anticipated during the Construction Phase based on the intended nature of the progressive works along the corridor whereby traffic flows, in general, are to be maintained in both directions. There may be a requirement for some localised temporary lane closures during the day, which will involve consultation between the appointed contractor and relevant authorities. Access for general traffic to existing residential and commercial units immediately adjacent to the Proposed Scheme is to be accommodated throughout the Construction Phase.

It is noted that a full night-time closure of the M50 mainline in both directions is required to install a pedestrian and cycle bridge between New Nangor Road, Naas Road, and the Long Mile Road. (Structure Reference: ST-

02). The NTA and the appointed contractor will liaise with Transport Infrastructure Ireland (TII) in advance of the works taking place. It is expected that each bridge structure will be lifted into place over one night. During the temporary night-time road closure, traffic will be diverted at Junctions 10 and 11 via the N81, R113 and R838. Analysis of TII Traffic monitoring Unit (TMU) data between these junctions indicates that this period (10pm-6am) represents approximately 5-6% of total 24hr demand with on average approximately 1,000 vehicles per hour would be required to divert during this period. This period represents the least trafficked time on the M50 and a single night-time closure is considered acceptable to facilitate the bridge construction.

The appointed contractor will develop a CTMP that gives due consideration to provision of local access requirements and designates appropriate diversion routes in the case where localised temporary closures are required. Overall, for these reasons, the impact on general traffic redistribution is anticipated to be **Medium Negative and Short Term** due to the temporary nature of any restrictions.

For the purpose of Air Quality (Chapter 7), Climate (Chapter 8) and Noise & Vibration (Chapter 9) impacts assessments, a worst-case scenario for construction activities was considered for assessment purposes and has been modelled in the LAM based on a notional stage of construction whereby Sections 1a, 1f, 1j, 1k, 1m, 1o, 2f, 3b, 3e, 6a and 6c were under construction concurrently. Further details on the impacts assessment can be found within these chapters.

6.2.4.5.2 Construction Traffic Generation

Site Operatives: As described in Chapter 5 (Construction) of this EIAR, it is expected that there will be approximately 250 to 270 personnel directly employed across the Proposed Scheme, rising to 300 personnel at peak construction.

Typical work hours on site are between 07:00 and 23:00 with staff working across early and late shifts, with these hours to be agreed with DCC/SDCC. The adopted shift patterns help minimise travel by personnel during the peak hour periods of 08:00 to 09:00 and 17:00 to 18:00.

The appointed contractor will prepare a Construction Stage Mobility Management Plan (CSMMP) which will be developed prior to construction, as described in Appendix A5.1 CEMP in Volume 4 of this EIAR, to actively discourage personnel from using private vehicles to travel to site. The CSMMP will promote the use of public transport, cycling and walking by personnel. Private parking at the Construction Compound will be limited. Vehicle-sharing will be encouraged, subject to public health guidelines, where travel by private vehicle is a necessity e.g. for transporting heavy equipment. A combination of CSMMP measures, as well as work shift patterns, means that fewer than 10 trips by private vehicle are envisaged to and from site during peak periods.

Heavy Goods Vehicles (HGVs): Additional construction traffic will be generated during the Construction Phase of the Proposed Scheme, for the purpose of the following:

- Clearance of existing site material and waste;
- Deliveries of construction material; and
- Removal of construction waste material.

Chapter 5 (Construction) of this report provides a breakdown of the expected operation for the construction of the Proposed Scheme during each subsection. It should be noted that the CTMP will control vehicular movement along the construction route, including restrictions on the number of HGVs accessing and egressing the construction works throughout the day to mitigate the impacts to general traffic on the surrounding road network.

Based on construction activities associated with the Proposed Scheme, the maximum number of HGVs expected to be in operation across the Proposed Scheme during peak haulage activities is 28 vehicles.

In a typical hour during peak haulage activity of the Proposed Scheme, 40% of HGVs are anticipated to be in operation on the public road network which equates to approximately 11 HGVs. A total of 11 two-way HGV movements are therefore expected in a typical hour during peak haulage activity of the Proposed Scheme.

Overall Peak Hour Impacts: The contents of Table 6.1 the anticipated maximum construction traffic generation by site operatives and HGVs during the AM and PM Peak Hours.

Table 6.1: Anticipated Maximum Construction Traffic Generation during Construction Phase

Peak Hour	Arrivals		Departures		Total Two-Way Traffic Flows (pcus)
	Car / Van (1 pcu)	HGV (2.3 pcu)	Car / Van (1 pcu)	HGV (2.3 pcu)	
AM Peak Hour	10	26	0	26	62
PM Peak Hour	0	26	10	26	62

Given that the above impacts are minimal and comfortably below the thresholds set out in TII's Guidelines for Transport Assessments, it is considered appropriate to define the general traffic impacts of the Construction Phase to have a **Low Negative and Short Term** impact. Therefore, no further analysis is required for the purpose of this assessment.

It should be noted that further detail on the restrictions to construction vehicle movements during the peak periods of the day will be contained within the appointed contractor's CTMP prior to construction.

6.2.5 Construction Phase Summary

The contents of Table 6.2 present a summary of the potential impacts of the Proposed Scheme during Construction Phase.

Table 6.2: Summary of Potential Construction Phase Impacts

Assessment Topic	Effect	Potential Impact
Walking	Restrictions to pedestrians along Proposed Scheme.	Low Negative and Short Term
Cycling	Restrictions to cyclists along Proposed Scheme	Medium Negative and Short Term
Bus	Restrictions to public transport along Proposed Scheme.	Low Negative and Short Term
Parking and Loading	Restrictions to parking / loading along Proposed Scheme.	Low Negative and Short Term
General Traffic	Restrictions to general traffic along Proposed Scheme	Medium Negative and Short Term
	Additional construction traffic flows upon surrounding road network	Low Negative and Short Term

6.3 Operational Phase

6.3.1 Overview

As previously noted, the impact assessment for the Operational Phase has been outlined in terms of a qualitative (walking, cycling, bus infrastructure and parking / loading) and quantitative (bus journey times / reliability, general traffic and people movements) impact analysis, which are outlined in the following sections.

6.3.2 Qualitative Assessment

6.3.2.1 Qualitative Assessment Methodology

The structure of the qualitative assessment is consistent with the Baseline Environment (Section 5) where the Proposed Scheme has been split into six sections. This has allowed for a more detailed analysis of the quality of the infrastructure proposals per section. The approach for each qualitative assessment is outlined below.

6.3.2.1.1 Pedestrian Infrastructure

The impacts to the quality of the Pedestrian Infrastructure as a result of the Proposed Scheme have been considered with reference to any changes to the existing pedestrian facilities along footways and crossing locations within the direct study area. Reference has been made to the overall changes along the full length of the Proposed Scheme and the impact assessment primarily focuses only on the pedestrian facilities at junctions to provide a direct comparison between the Do Minimum and Do Something scenarios.

Where the Proposed Scheme introduces a change to a junction layout, the potential impact on pedestrians has been assessed using a set of criteria, which has been derived from a set of industry standards and guidance listed in Section 3.Table 6.3 outlines the assessment criteria for each junction.

Table 6.3: Pedestrian Junction Assessment Criteria

Aspect	Indicator
Routing	Are pedestrian crossings (signalised or uncontrolled) available on all arms?
Directness	Where crossings are available, do they offer direct movements which do not require diversions or staggered crossings i.e., no or little delay required for pedestrians to cross in one direct movement?
Vehicular speeds	Are there measures in place to promote low vehicular speeds, such as minimally sized corner radii and narrow carriageway lane widths?
Accessibility	Where crossings exist, are there adequate tactile paving, dropped kerbs and road markings for pedestrians (including able-bodied, wheelchair users, mobility impaired and pushchairs)?
Widths	Are there adequate footway and crossing widths in accordance with national standards?

A LoS rating has been applied to each junction for both the Do Minimum and Do Something scenarios based on whether the above indicators have been met. Table 6.4 displays the LoS rating based on the number of indicators met.

Table 6.4: Pedestrian Junction Assessment LoS

LoS	Indicators Met (of a Total of 5)
A	5
B	4
C	3
D	2
E	1
F	0

When comparing the Do Minimum and Do Something scenarios for pedestrians, the terms outlined in Table 6.5 have been used to describe the potential impact, based on the changes in the Qualitative Pedestrian LoS rating.

Table 6.5: Description of Impact for Pedestrian Qualitative Assessment

Magnitude of Impact	Change in LoS Rating
High	4 to 5
Medium	2 to 3
Low	1
Negligible	0

6.3.2.1.2 Cycling Infrastructure

The potential impacts to the quality of the cycling infrastructure as a result of the Proposed Scheme have been considered with reference to the changes in physical provision for cyclists provided during the Do Minimum and Do Something scenarios. The NTA's National Cycle Manual's Quality of Service (QoS) Evaluation criteria (NTA, 2011) have been adapted for use in assessing the cycling qualitative impact along the Proposed Scheme. The refined cycling facilities criteria are as follows:

- **Segregation:** a measure of the separation between vehicular traffic and cycling facilities;
- **Number of adjacent cyclists / width:** the capacity for cycling two abreast and / or overtaking ('2+1' accommodates two abreast plus one overtaking); and
- **Junction Treatment:** a measure of the treatment of cyclist traffic at existing junctions.

Table 6.6 outlines the assessment criteria with reference to the corresponding LoS ratings.

Table 6.6: Cycling Assessment Criteria

LoS	Segregation	No. of adjacent cyclists/width		Junction treatment
A+	High degree of separation. Minimal delay	2+1	2.5m	Cyclists get green signal priority at signalised junctions / has priority across uncontrolled junctions
A	Well separated at mid-link with some conflict at intersections	1+1	2.0m	Toucan crossings at signalised junctions for cyclists along CBC / Protected junctions not already classified as A+ for junction treatment
B	On-road cycle lanes or carriageway designated as 'quiet cycle routes'	1+1	1.75m	Cyclists share green time with general traffic and cycle lanes continue through the junction, for junctions not already classified as A or A+ for junction treatment
C	Bicycle share traffic or bus lanes	1+0	1.25m	Cyclists share green time with general traffic with cycle facilities (advanced stacking locations / cycle lanes) available up to the junction but don't continue through
D	No specific bicycle facilities	1+0	0.75m	No specific bicycle facilities

As the cycle provision varies along the corridor, each section of the Proposed Scheme has been further separated into smaller subsections in order to apply the cycling assessment criteria appropriately.

When comparing the Do Minimum and Do Something scenarios for cyclists, the terms outlined in Table 6.7 have been used to describe the potential impact, based on the changes in the Qualitative Cycling LoS rating.

Table 6.7: Description of Impact for Cycling Qualitative Assessment

Magnitude of Impact	Change in LoS Rating
High	3 to 4
Medium	2
Low	1
Negligible	0

6.3.2.1.3 Bus Infrastructure

The implementation of the Proposed Scheme will result in changes in the quality of bus infrastructure provision along the route, including dedicated bus lanes and bus stop upgrades / relocations. Improvement in bus priority measures will reduce the interaction between buses and general traffic and reduce the likelihood of delays.

The qualitative impact assessment has been undertaken based on the following factors:

- Provision of bus lanes;
- Bus stop provision; and
- Changes to the existing bus stop facilities:
  - Real-time information;
  - Timetable information;
  - Shelters;
  - Seating;
  - Accessible kerbs; and
  - Removal of indented drop off areas, where appropriate.

The magnitude of impact of the Proposed Scheme, applied to the qualitative review of the above factors, is set out in Table 6.8.

Table 6.8: Magnitude of Impact for Bus Users Qualitative Assessment

Impact	Description of Impact / Proposed Changes
High positive	Significant benefit for bus stop users with no disbenefits
Medium positive	Positive impact for bus stop users with benefits outweighing any minor disbenefits.
Low positive	Slight benefit for users with benefits outweighing any disbenefits.
Negligible impact	Marginal impact to user buses where any benefits or disbenefits are offset.
Low negative	Slight negative impact for users with disbenefits marginally outweighing benefits.
Medium negative	Negative impact for bus users with benefits not outweighing any disbenefits.
High negative	Complete removal of provision.

6.3.2.1.4 Parking and Loading

The impacts of the Proposed Scheme on parking and loading provision have been assessed through a comparison of the availability of spaces or lengths of bay in the Do Minimum (baseline environment) and Do Something scenarios. The assessment has taken the parking information and considers the impact of any changes on the general availability of parking and loading in the vicinity of the Proposed Scheme. It classifies parking into the following categories:

- Designated Paid Parking;
- Permit Parking;

- Disabled Permit Parking;
- Loading / Unloading (in designated Loading Bays)
- Loading / Unloading (outside designated Loading Bays)
- Taxi Parking (Taxi Ranks);
- Commercial vehicles parked for display (car sales); and
- Informal Parking (i.e. parking alongside the kerb which is unrestricted).

This qualitative assessment has also taken account of adjacent parking on side streets which is defined as alternative parking locations along side roads within 200 – 250m of the Proposed Scheme.

Significance ratings for the impacts of any changes in parking provision have been generated for each specific instance of change and for each section of the Proposed Scheme. The ratings are based upon professional judgement and experience and consider:

- The magnitude of change in parking availability;
- The availability of alternative parking; and
- Nearby land uses, such as businesses.

6.3.2.1.5 Section 1 – Tallaght to Ballymount

6.3.2.1.5.1 Pedestrian Infrastructure

The key infrastructural changes to the pedestrian link along Section 1 of the Proposed Scheme are the following:

- Upgrade of existing signalised crossing and removal of left-turn slip-lane on the south-western arm of the Cookstown Way/ Blessington Road junction;
- Conversion of roundabout at the Belgard Square South / Belgard Square West junction into a signalised junction, providing signalised pedestrian crossing facilities where none currently exist;
- Conversion of roundabouts on Belgard Square North at Belgard Square West and Belgard Square East junctions into signalised junctions, providing signalised pedestrian crossing facilities on all arms;
- Provision of new signalised pedestrian crossings at the junction of Main Road / Old Greenhills Road;
- Upgrade of existing signalised crossing and removal of left-turn slip lane on the western arm of the Belgard Road/ Blessington Road junction;
- Provision of new signalised pedestrian crossing on R819 Greenhills Road north of the junction with Broomhill Road and Hibernian Industrial Estate;
- Provision of raised table crossing intersecting with bus lanes, to the south of Treepark Road, opposite the R819 Greenhills Road / Castletymon Road junction;
- Provision of raised table crossings at R819 Greenhills Road / Parkview accesses;
- Provision of raised table crossings at commercial access between the R819 Greenhills Road/ Temple Woods junction and the R819 Greenhills Road / Tymon Lane junction; and
- Provision of a Toucan crossing intersecting with bus lanes to the south of Treepark Road, opposite the R819 Greenhills Road/ Temple Woods junction.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 1 of the Proposed Scheme are summarised in Table 6.9. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

Table 6.9: Section 1 - Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
Blessington Road / Cookstown Way signalised junction	A0	C	A	Medium Positive
Belgard Square South / Belgard Square West roundabout (to signalised junction)	A0	E	A	High Positive
Belgard Square West / Old Blessington Road signalised junction	A175	D	B	Medium Positive
Belgard Square West / Belgard Square North / Tallaght Hospital access roundabout to signalised junction	A400	D	A	Medium Positive
Belgard Square North / Belgard Square East roundabout to signalised junction	A775	D	A	Medium Positive
Blessington Road / Belgard Road signalised junction	A1075	C	B	Low Positive
Main Road / Old Greenhills Road signalised junction	A1775	B	A	Low Positive
R819 Greenhills Road / Bancroft Park priority junction	A1975	C	A	Medium Positive
R819 Greenhills Road / Airton Road signalised junction	A2450	D	A	Medium Positive
R819 Greenhills Road / Harvey Norman Retail Park signalised junction	A2550	D	B	Medium Positive
R819 Greenhills Road / Broomhill Road priority junction	A2725	D	B	Medium Positive
R819 Greenhills Road / Hibernian Industrial Estate priority junction	A2775	D	A	Medium Positive
R819 Greenhills Road / Mayberry Road signalised junction	A2950	C	A	Medium Positive
R819 Greenhills Road / Castletymon Road signalised junction	B225	C	A	Medium Positive
R819 Greenhills Road / Temple Woods priority junction	B425	B	A	Low Positive
R819 Greenhills Road / Tymon Lane priority junction	B551	F	C	Medium Positive
Section Summary		**D**	**B**	**Medium Positive**

The contents of Table 6.9 demonstrate that the Proposed Scheme will have a positive long-term impact on the quality of the pedestrian infrastructure within Section 1 (Tallaght to Ballymount) during the Operational Phase.

The LoS during the Do Minimum scenario ranges between F and C, with two out of the 16 impacted junctions along this section given the low E / F ratings. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.3. The LoS will improve to an A or B rating at 15 of the impacted junctions in the Do Something scenario and a C rating at one of the impacted junctions in the Do Something scenario. This is as a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased footway and crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and the National Disability Authority (NDA) 'Building for Everyone: A Universal Design Approach' (NDA 2020) with regards to catering for all users, including those with disabilities.

Overall, it is anticipated that there will be a **Medium Positive impact** to the quality of the pedestrian infrastructure along Section 1 of the Proposed Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor.

6.3.2.1.5.2 Cycling Infrastructure

The key cycling improvements along Section 1 of the Proposed Scheme can be summarised as follows:

- Provision of upgraded cycling facilities at signalised junctions to provide continuous cycle lanes through major signalised junctions with hard island segregation for left-turn movements and right-turn movements;
- Provision of a continuous 2.0m wide cycle tracks on both sides of Belgrade Square North between Tallaght Hospital (TUH) and Belgard Square East;
- Provision of a continuous 2.0m wide cycle tracks on both sides of Belgrade Square East;
- Upgrade of existing signalised crossing to a Toucan crossing on the western arm of the Belgard Road/ Blessington Road junction;
- Provision of a 2.0m wide cycle track in both directions on the R819 Greenhills Road;
- Upgrade of existing signalised crossing on Bancroft Park south of the Greenhills Road junction to a Toucan Crossing.
- Provision of a 2.0m wide cycle tracks inbound and outbound on R819 Greenhills Road and the green space east of Treepark Road between Mayberry Road and M50 overbridge, inbound and outbound east/west two-way cycle track links also provided between R819 Greenhills Road and Treepark Road;
- Upgrade of existing signalised crossings on the R819 Greenhills Road arms of the R819 Greenhills Road / Airton Road signalised junction to Toucan crossings;
- Upgrade of existing signalised crossings to Toucan crossings on t the R819 Greenhills Road / Castletymon Road junction;
- Provision of a Toucan crossing intersecting with bus lanes to the south of Treepark Road, opposite the R819 Greenhills Road/ Temple Woods junction.
- Provision of upgraded cycling facilities at signalised junctions to provide continuous cycle lane; and
- Upgrade of existing signalised crossing on R819 Greenhills Road north of Temple Woods junction to a Toucan Crossing.

Along Section 1, the Proposed Scheme will provide a 60mm set down kerb segregation between the footway and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation (as is the case for most of the baseline environment) is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle track kerb will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.10 outline the cycling qualitative assessment along Section 1 of the Proposed Scheme, which sets out the overall Do Minimum LoS and the Do Something LoS and the description of impact. Please refer to TIA Appendix 4.2 (Cycling Infrastructure Assessment) which outlines in further detail the methodology behind each LoS rating given to the Do Minimum and Do Something scenarios.

Table 6.10: Section 1 – Cycling Impact during Operational Phase

Locations	Chainage	Do Minimum LoS	Do Something LoS	Impact
Belgard Square South to Tallaght Hospital	A0 – A400	D	B	Medium Positive
Tallaght Hospital to Belgard Square East	A400 – A750	B	A	Low Positive
St Maelruain's Church to Greenhills Road	A1250 – A2000	D	C	Low Positive
R819 Greenhills Road between Bancroft Park junction and Castletymon Road	A2000 – A3350	C	A	Medium Positive
Castletymon Road to M50 overbridge	A3350 / B250 - A3700 / B551	C	A	Medium Positive

Locations	Chainage	Do Minimum LoS	Do Something LoS	Impact
Section Summary		**C**	**B**	**Low Positive**

The contents of Table 6.10 demonstrate that the scheme will have a positive long-term impact on the cycling environment between Belgard Square South and the R819 Greenhills Road.

The LoS rating of the cycling facilities range from D to B in the Do Minimum, with two of the five impacted junctions having a low D rating. The Los rating will improve to a C in one of the impacted junctions, a B to one of the impacted junctions, an A to three of the impacted junctions in the Do Something scenario respectively. These ratings have been determined using the previously referenced criteria set out in Table 6.6. This is as a result of improved segregation for cyclists and junction treatment in the form of cycle lanes traversing priority junctions and continuing through signalised junctions with protected treatment as part of the Proposed Scheme.

Overall, it is anticipated that there will be a **Low Positive impact** to the quality of the cycling infrastructure along Section 1 of the Proposed Scheme, during the Operational Phase.

6.3.2.1.5.3 Bus Infrastructure

It is proposed that there will be a total of 16 bus stops along Section 1 of the Proposed Scheme – eight inbound and eight outbound, alongside a new eight-stance bus interchange will also be created at The Square, which will be accessed from Belgard Square East and Old Blessington Road. This represents a significant 'step-change' in the bus services provided locally.

There are currently 16 bus stops along Section 1 of the Proposed Scheme. Table 6.11 presents a summary of the changes in the number and location of bus stops along Section 1 of the Proposed Scheme.

Table 6.11: Section 1 – Overview of Amendments to Bus Stop Locations

Direction	Stop	Chainage	Do Something	Comment
Inbound	4348	A105	Retained	Length of bus stop significantly extended. Eight-stance bus interchange added (chainage A125).
Inbound	4646	A490	Retained	N/A
Inbound	4647	A690	Removed	Existing bus stop removed due to proximity of proposed bus stops on Belgard Square East.
Inbound	-	A820	New	New stop located on Belgard Square East, 330m from bus stop 4646.
Inbound	4435	A1400	Retained	N/A
Inbound	-	A1935	New	Proposed bus stop on Old Greenhills Road, serving the new bus only link between at Old Greenhills Road / Bancroft Park. Located 535m from bus stop 4435.
Inbound	2633	A2470	Retained	N/A
Inbound	2369	A3000	Retained	N/A
Inbound	2370	B150	Removed	Existing bus stop removed due to proximity of proposed bus stops opposite the Greenhills Road / Castletymon Road junction.
Inbound	-	A3360	New	Proposed bus stop on the green to the east of the new raised table, opposite the Greenhills Road / Castletymon Road junction. Located 360m from bus stop 2369.
Inbound	2371	B455	Removed	Existing bus stop removed due to proximity of proposed bus stops opposite the Greenhills Road / Castletymon Road junction.

Direction	Stop	Chainage	Do Something	Comment
Outbound	2339	B400	Removed	Existing bus stop removed due to proximity of proposed bus stops opposite the Greenhills Road / Castletymon Road junction.
Outbound	2340	B150	Retained	N/A
Outbound	2601	A2850	Retained	N/A
Outbound	4446	A2490	Retained	N/A
Outbound	-	A1910	New	Proposed bus stop on Old Greenhills Road, serving the new bus only link between at Old Greenhills Road / Bancroft Park. Located 470m from bus stop 2557.
Outbound	2557	A1440	Retained	N/A
Outbound	4436	A1130	Retained	N/A
Outbound	-	A820	New	New stop located on Belgard Square East, located 300m from bus stop 4640.
Outbound	4640	A520	Retained	N/A
Outbound	4347	A50	Removed	Existing bus stop removed given proximity of eight stance interchange (chainage A125).

The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

The contents of Table 6.12 provides a summary of the changes to the bus stop infrastructure along Section 1 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios. Note, this does not include the eight-stance bus interchange where all stops will contain all facilities and be within a bus only / pedestrianised area.

Table 6.12: Section 1 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	7	44%	16	100%	It is proposed that all bus stops provide real-time information.
Timetable information	13	81%	16	100%	It is proposed that all bus stops provide timetable information.
Shelter	7	44%	14	88%	It is proposed that all but two bus stops along this section is to be provided with shelter
Seating	7	44%	14	88%	It is proposed that all but two bus stops along this section will provide seating.
Accessible Kerbs	5	31%	16	100%	Full provision.
Indented Drop Off Area	9	56%	1	6%	One bus stop will be indented. All other proposed bus stops will be located inline within bus lanes.
Total Stops	**16**		**16**		An eight-stance bus interchange also added to this section.

The contents of Table 6.12 indicates that there are significant improvements to the bus stop facilities along Section 1 of the Proposed Scheme. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 1 of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance.

The Proposed Scheme improves the quality of existing bus infrastructure along Section 1 of the Proposed Scheme, which will provide long-term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is **Medium Positive.**

6.3.2.1.5.4 Parking and Loading

The proposals will impact on existing parking along Section 1 of the Proposed Scheme and the main changes are as follows:

- The removal of 65 spaces at The Square Tallaght car park, currently comprising 2500 spaces. This is associated with off-street private parking.
- The reinstatement of 3 loading bay spaces on Belgard Square West.
- The removal of 21 permit / pay & display spaces and one disabled space on Old Greenhills Road, between Main Street and Greenhills Road. Alternative pay & display parking is available within 200m on Main Street, and privately within The Village Green Shopping Centre car park.

  The removal of 12 private parking spaces in a 120 space car park at West Park Fitness, which is located to the east of Greenhills Road, just to the north of the TUD access junction. This is to provide sufficient carriageway width to provide two traffic lanes, two bus lanes, eastbound and westbound cycle tracks and footways in this location. The parking spaces are located on private land and potential mitigation for this area would be to extend and redesign the Athletics Club car park to provide additional car parking.

The contents of Table 6.13 present a summary of the proposed changes to parking along Section 1 of the Proposed Scheme.

Table 6.13: Section 1 – Overall Changes in Parking / Loading Spaces

Location	Parking Type	Do Minimum	Do Something	Change
Belgard Square	Adjacent Parking (Car Park)	6000	5935	-65
	Loading Bay	0	3	3
Main Street / Old Greenhills Road	Designated Paid Parking	34	14	-20
	Disabled Parking	2	1	-1
	Informal Parking	7	7	0
Greenhills Road – west of M50 bridge	General Commercial	345	345	0
	Adjacent Parking (Car Park)	920	908	-12
Total		**7308**	**72413**	**-95**

As shown in Table 6.13, there are approximately 7308 current parking spaces affected within the area of the Section 1 of the Proposed Scheme. Under the proposals, 3 loading bays will be provided and 95 parking spaces will be lost, the majority being private car parking spaces. This change is considered to have a **Low Negative Impact,** due to the low numbers of non-private spaces lost and the presence of a large number of similar types of spaces within proximity to the affected locations. This impact is considered acceptable in the context of the aim of the Proposed Scheme, to provide enhanced walking, cycling and bus infrastructure on this key access corridor.

6.3.2.1.6 Section 2 – Ballymount to Crumlin

6.3.2.1.6.1 Pedestrian Infrastructure

The key infrastructural changes to the pedestrian link along Section 2 of the Proposed Scheme are the following:

- Footways with a minimum running width of 2.0m;
- Pedestrianisation of Ballymount Road Upper;

- Provision of new signalised crossing on Calmount Road, 100m north of the road merging with the R819 Greenhills Road; and
- Closure of the R819 Greenhills Road at the new Calmount Road / R819 Greenhills Road intersection, allowing pedestrian access only.

The assessment of the qualitative impacts on the pedestrian infrastructure for Section 2 of the Proposed Scheme is summarised in Table 6.14. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

Table 6.14: Section 2: Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
R819 Greenhills Road / Ballymount Road Upper priority junction	A3950	D	A	Medium Positive
New junction: Ballymount Avenue / R819 Greenhills Road priority junction	A4200	-	B	-
New junction: Ballymount Avenue / Ballymount Avenue priority junction	A4400	-	B	-
Ballymount Avenue / Calmount Road signalised junction	A4650	C	A	Medium Positive
New junction: Calmount Avenue / R819 Greenhills Road roundabout	C425	-	A	-
Calmount Road / Calmount Avenue priority junction	A4950	D	A	Medium Positive
R819 Greenhills Road / B&G Ltd priority junction	A5650	F	B	High Positive
Walkinstown Roundabout	A5900	E	A	High Positive
Section Summary		**E**	**A**	**High Positive**

The contents of Table 6.14 demonstrate that the Proposed Scheme will have a positive long-term impact on the quality of the pedestrian infrastructure along Section 2 (Ballymount to Crumlin) during the Operational Phase.

The LoS during the Do Minimum scenario ranges between F and C, with two of the eight impacted junctions along this section given the low E / F ratings. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.3. The LoS will improve to an A rating at five of the impacted junctions and a B rating at three of the impacted junctions Do Something scenario. Of these, it is noted three are new junctions along Section 2. The LOS increase is as a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased footway and crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and the National Disability Authority (NDA) 'Building for Everyone: A Universal Design Approach' (NDA 2020) with regards to catering for all users, including those with disabilities.

Overall, it is anticipated that there will be a **High Positive impact** the quality of the pedestrian infrastructure along Section 2 of the Proposed Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor.

6.3.2.1.6.2 Cycling Infrastructure

The key cycling improvements along Section 2 of the Proposed Scheme can be summarised as follows:

- Provision of a 2.0m wide cycle track in both directions on the R819 Greenhills Road, Ballymount Avenue, Calmount Avenue and Calmount Road;

- Provision of new Toucan crossing on the eastern arm of the new Ballymount Avenue / R819 Greenhills Road priority junction
- Provision of new Toucan crossing on the southern arm of the Calmount Road / Calmount Avenue junction; and
- Provision of upgraded cycling facilities at signalised junctions and proposed roundabouts to provide a continuous cycle lane.

Along Section 2, the Proposed Scheme will provide a 60mm set down kerb segregation between the footway and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation (as is the case in some areas of the baseline environment) is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle track kerb will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.15 outline the cycling qualitative assessment along Section 2 of the Proposed Scheme, which sets out the overall Do Minimum LoS and the Do Something LoS and the description of impact. A detailed breakdown of the assessment along each section can be found in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

Table 6.15: Section 2 Cycling Impact during Operational Phase

Locations	Chainage	Do Minimum LoS	Do Something LoS	Impact
M50 Overbridge to Calmount Road / Ballymount Avenue roundabout	A4150 - A4700	C	A	Medium Positive
Calmount Road to Walkinstown Roundabout	A4700- A5900	B	A	Low Positive
Greenhills Road / Ballymount Avenue to Greenhills Road / Greenhills Road green space	C50 - A5500	C	A	Medium Positive
Calmount Road/ Calmount Avenue to Calmount Avenue / Greenhills Road proposed roundabou	A4950- C425	D	A	Medium Positive
Section Summary		**C**	**A**	**Medium Positive**

The contents of Table 6.15 demonstrate that the scheme will have a positive long-term impact on the cycling environment between the R819 Greenhills Road and Walkinstown Roundabout

The LoS rating of the cycling facilities will improve from a D to A in one subsection, C to A in two subsections and from a B to an A in one subsection in the Do Minimum compared to the Do Something, determined using the previously referenced criteria set out in Table 6.6. This is as a result of improved segregation for cyclists and junction treatment in the form of cycle lanes traversing priority junctions and continuing through signalised junctions with protected treatment as part of the Proposed Scheme.

Overall, it is anticipated that there will be a **Medium Positive impact** to the quality of the cycling infrastructure along Section 2 of the Proposed Scheme, during the Operational Phase. The findings of the cycling assessment fully aligns with the objective of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, to 'Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable'.

6.3.2.1.6.3 Bus Infrastructure

It is proposed that there will be a total of 10 bus stops along Section 2 of the Proposed Scheme - five inbound and five outbound. This is two more than in the Do Minimum scenario, a number of bus stops have been removed in certain locations, and a number of bus stops proposed.

There are currently eight bus stops along Section 2 of the Proposed Scheme. Table 6.16 presents a summary of the changes in the number and location of bus stops along Section 2 of the Proposed Scheme.

Table 6.16: Section 2 – Overview of Amendments to Bus Stop Locations

Direction	Stop	Chainage	Do Something	Comment
Inbound	2372	A4065	Removed	Existing bus stop removed due to close proximity with proposed bus stops at the new Greenhills Road / Ballymount Avenue junction.
Inbound	-	A4250	New	Proposed bus stop to the north of the new Greenhills Road / Ballymount Avenue junction.
Inbound	-	A4765	New	Proposed bus stop on Calmount Road, 75m east of the Ballymount Avenue / Calmount Road junction.
Inbound	2373	C310	Removed	Existing bus stop removed due to new bus stops on Calmount Road.
Inbound	-	A5010	New	Proposed bus stop on Calmount Road, 35m east of the Calmount Road / Calmount Avenue junction.
Inbound	-	A5370	New	Proposed bus stop to on Calmount Road, 15m west of the proposed pelican crossing near the Calmount Road / Greenhills Road merge.
Inbound	2377	A5765	Retained	N.A
Outbound	2337	A3925	Removed	Existing bus stop removed due to new bus stops being provided along this section of the Proposed Scheme, allowing a re-balance of bus stop provision.
Outbound	-	A4130	New	Proposed bus stop on Ballymount Avenue, near the new Greenhills Road/ Ballymount Avenue junction.
Outbound	2336	A4125	Removed	Existing bus stop removed due to new stop on Ballymount Avenue (chainage A4130).
Outbound	-	A4600	New	Proposed bus stop on Ballymount Avenue, 45m south of the Ballymount Avenue / Calmount Road junction.
Outbound	-	A4900	New	Proposed bus stop on Calmount Road, 35m west of the Calmount Road / Calmount Avenue junction.
Outbound	2335	C460	Removed	Existing bus stop removed due to new roundabout junction.
Outbound	4662	C700	Removed	Existing bus stop removed due to close proximity of new bus stop on Calmount Road.
Outbound	-	A5440	New	Proposed bus stop on Calmount Road, at the new merge with Greenhills Road/
Outbound	2334	A5690	Retained	N/A

The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

Table 6.17 provides a summary of the changes to the bus stop infrastructure along Section 2 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios.

Table 6.17: Section 2 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	0	0%	10	100%	It is proposed that all bus stops provide real-time information.
Timetable information	6	75%	10	100%	It is proposed that all bus stops provide timetable information.
Shelter	2	25%	10	100%	It is proposed that all bus stops along this section is to be provided with shelter.
Seating	2	25%	10	100%	It is proposed that all bus stops along this section will provide seating.
Accessible Kerbs	0	0%	10	100%	Full provision.
Indented Drop Off Area	3	38%	1	10%	One bus stop (no. 2334) will be indented. All other proposed bus stops will be located in line with bus lanes.
Total Stops	**8**		**10**		Increase in two bus stops compared to the Do Minimum.

The contents of Table 6.17 indicate that there are significant improvements to the bus stop facilities along Section 2 of the Proposed Scheme. One bus stop will have an indented drop off area, allowing no delay in general traffic flow. All other bus stops will be provided inline within dedicated bus lanes along the corridor, meaning that buses will not incur delay when setting off after picking up passengers. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 2 of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance.

The Proposed Scheme improves the quality of existing bus infrastructure along Section 2 of the Proposed Scheme, which will provide long-term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is **High Positive.**

6.3.2.1.6.4 Parking and Loading

The Proposed Scheme will impact on existing parking along Section 2. The areas of parking changes are as follows:

- The removal of parking capacity for 35 vehicles on both sides of Calmount Road, between Ballymount Avenue and Calmount Avenue, to allow for bus lanes and cycle lanes on either side of the road. Whilst there is limited opportunity for alternative parking in the vicinity, the 35 parking spaces are not associated with commercial premises and therefore are not expected to have an impact on local business, with private parking accesses located within the vicinity.
- The reduction of 61 spaces at the DPD Depot, B&Q and Parts for Cars car park on Greenhills Road to accommodate road widening. This is private land.
- The removal of 35 adjacent spaces, 5 taxi spaces and two informal spaces at Walkinstown roundabout to allow for road widening and cycle tracks.
- Two loading bays have been provided on Walkinstown Avenue to mitigate design impacts at Walkinstown Roundabout.

The contents of Table 6.18 present a summary of the proposed changes to parking along Section 2 of the Proposed Scheme between the Do Minimum and Do Something scenarios.

Table 6.18: Section 2 – Overall Changes in Parking / Loading Spaces

Location	Parking Type	Do Minimum	Do Something	Change
Calmount Road: Between Ballymount Avenue and Calmount Avenue	Informal Parking	35	0	-35

Location	Parking Type	Do Minimum	Do Something	Change
Greenhills Road: Between Calmount Road and Walkinstown Avenue	Adjacent Parking (Car Parks)	450	389	-61
	Commercial Parking	20	20	0
Walkinstown Roundabout	Informal Parking	30	28	-2
	Adjacent Parking	88	53	-35
	Taxi Parking	9	4	-5
	Loading Bay	0	2	2
Total		**632**	**496**	**-136**

As shown in Table 6.18, there are approximately 632 current parking spaces affected within the area of the Section 2 of the Proposed Scheme. Under the proposals, 136 parking spaces will be lost, 96 of these private parking spaces. Possible mitigation may include the reconfiguration of existing parking spaces to minimise any loss of spaces required to improve the environment, particularly for pedestrians and cyclists. The overall parking impact of the loss in parking is considered to have a **Low Negative Impact**. This effect is considered acceptable in the context of the aim of the Proposed Scheme, to provide enhanced walking, cycling and bus infrastructure on this key access corridor.

6.3.2.1.7 Section 3 – Crumlin to Grand Canal

6.3.2.1.7.1 Pedestrian Infrastructure

The key infrastructural changes to the pedestrian link along Section 3 of the Proposed Scheme are the following:

- Proposed speed limit reduction from 50km/h to 30 km/h between Cooley Road junction and R111 Parnell Road (Grand Canal) junction;
- A shared pedestrian and cycle landing zone is provided to the rear of the bus stop (chainage E800) on Kildare Road;
- Provision of raised table crossings at side roads;
- One -way access onto Clonard Road and Bangor Drive from Crumlin Road, fully pedestrianising the left hand lane, on approach to the junction;
- Pelican crossing at the Crumlin Road/ Crumlin College junction moved approximately 50m east, outside the Crumlin Road/ Brickfield Drive bollards; and
- Removal of left-turn slip lanes on Sundrive Road and Herberton Road at R110 Crumlin Road junction.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 1 of the Proposed Scheme are summarised in Table 6.19. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

Table 6.19: Section 3 – Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
R819 Walkinstown Road / Walkinstown Drive priority junction	A6100	B	A	Low Positive
R819 Walkinstown Road / Thomas Moore Road priority junction	A6150	B	A	Low Positive
R819 Walkinstown Road / Kilnamanagh Road signalised junction	A6400	B	A	Low Positive
R110 Long Mile Road / R819 Walkinstown Road signalised junction	F4225	D	B	Medium Positive
R110 Drimnagh Road / Slievebloom Road / Balfe Road priority junction	A6750 - A6850	D	B	Medium Positive

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
R110 Drimnagh Road / Castle Centre Access priority junction	A7100	C	A	Medium Positive
R110 Drimnagh Road / St Mary's Drive priority junction	A7200	D	A	Medium Positive
R110 Drimnagh Road / St. Mary's Road / Kildare Road signalised junction	A7450	C	A	Medium Positive
R110 Crumlin Road / Cooley Road / R110 Crumlin Road / Crumlin Park priority junction	A7625	C	B	Low Positive
R110 Crumlin Road / Rafters Road priority junction	A7775	C	A	Medium Positive
R110 Crumlin Road / Raphoe Road priority junction	A7875	D	B	Medium Positive
R110 Crumlin Road / Iveagh Gardens priority junction	A8000	C	A	Medium Positive
R110 Crumlin Road / Windmill Road priority junction	A8125	B	A	Low Positive
R110 Crumlin Road / Clonard Road priority junction	A8300	D	A	Medium Positive
R110 Crumlin Road / Bangor Drive priority junction	A8400	D	B	Medium Positive
R110 Crumlin Road / Ardagh Road priority junction	A8525	D	A	Medium Positive
R110 Crumlin Road / Crumlin Shopping Centre priority junction	A8650	C	B	Low Positive
R110 Crumlin Road / Old County Road priority junction	A8800	C	A	Medium Positive
R110 Crumlin Road / Herberton Road / Sundrive Road signalised junction	A8900	D	B	Medium Positive
R110 Crumlin Road / Rutland Avenue priority junction	A9240	C	A	Medium Positive
R110 Crumlin Road / R111 Dolphin Road / Parnell Road signalised junction	A9275	E	B	Medium Positive
Cromwellsfort Road / Bunting Road priority junction	D0	D	A	Medium Positive
Bunting Road / Wallace Road / Harty Avenue priority junction	D400 - D450	D	B	Medium Positive
Bunting Road / Balfe Road priority junction	D625	C	B	Low Positive
Bunting Road / St Agnes Road priority junction	D1025	C	B	Low Positive
St Mary's Road / Fernvale Drive priority junction	D1250	C	A	Medium Positive
Kildare Road / Kildare Park priority junction	E325	D	B	Medium Positive
Kildare Road / Windmill Road signalised junction	E550	D	A	Medium Positive
Kildare Road / Cashel Road priority junction	E650	E	B	Medium Positive
Kildare Road / Clonard Road priority junction	E750	B	A	Low Positive

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
Kildare Road / Kildare Road priority junction	E850	C	B	Low Positive
Kildare Road / Bangor Road priority junction	E1025	C	A	Medium Positive
Kildare Road / Clogher Road priority junction	E1175	E	A	High Positive
Clogher Road / Slane Road priority junction	E1325	C	B	Low Positive
Clogher Road / Sundrive Road signalised junction	E1400	D	A	Medium Positive
Clogher Road / Clogher Road priority junction	E1750	D	A	Medium Positive
Clogher Road / Rutland Avenue priority junction	E1850	C	A	Medium Positive
Clogher Road / Aughavannagh Road priority junction	E2050	D	A	Medium Positive
Section Summary		**D**	**A**	**Medium Positive**

The contents of Table 6.19 demonstrate that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure at junctions between Walkinstown Roundabout and Grand Canal.

The LoS during the Do Minimum scenario ranges from E to B, with 18 of the 38 impacted junctions along this section given the low D/E rating. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.3. The LoS will improve to an A rating at 23 of the impacted junctions and a B at 15 junctions in the Do Something scenario. This is as a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased footway and crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and Building for Everyone: A Universal Design Approach (NDA 2020) with regards to catering for all users, including those with disabilities

Overall, it is anticipated that there will be a **Medium Positive** impact to the quality of the pedestrian infrastructure along Section 3 (Crumlin to Grand Canal) of the Proposed Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor

6.3.2.1.7.2 Cycling Infrastructure

The key cycling improvements along Section 3 of the Proposed Scheme can be summarised as follows:

- Provision of shared bus lanes in both directions on R819 Walkinstown Road between Walkinstown Roundabout and R110 Long Mile Road;
- Provision of 2.0m wide cycle tracks in both directions, segregated from bus lanes on Drimnagh Road;
- Upgrade of pelican crossing to Toucan crossing on the western arm of the Drimnagh Road/ Errigal Road signalised junction;
- Upgrade of pelican crossing to Toucan crossing on the western arm of the Drimnagh Road/ Cooley Road signalised junction;
- Provision of segregated cycle tracks in both directions along Bunting Road / St Mary's Street. Provision of traffic calming measures and raised tables across side streets;
- Tapered cycle lanes provided on Herberton Road and Sundrive Road on approach to the junction with Crumlin Road;
- Provision of segregated wide cycle tracks in both directions on Kildare Road and Clogher Road (with the exception of a section between the Clogher Road/ Saul Road junction and Clogher Road/

Sundrive Road junction). Road markings will indicate that Kildare Road and Clogher Road are 'Quiet Routes' (in traffic terms); and

- Provision of upgraded cycling facilities at signalised junctions to provide continuous cycle lane.

Along Section 3, the Proposed Scheme will provide a 60mm set down kerb segregation between the footway and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle track kerb will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents Table 6.20 outline the cycling qualitative assessment along Section 3 of the Proposed Scheme, with reference to the accompanying sensitivity for each section and the resultant Significance of Impact. Please refer to TIA Appendix 4.2 (Cycling Infrastructure Assessment) which outlines in further detail the methodology behind each LoS rating given to the Do Minimum and Do Something scenarios.

Table 6.20: Section 3 – Cycling Impact during Operational Phase

Locations	Chainage	Do Minimum LoS	Do Something LoS	Impact
Walkinstown Roundabout to R110 Long Mile Road	A5970 – A6750	D	B	Medium Positive
R819 Walkinstown Road / Drimnagh Road to R110 Drimnagh Road / Kildare Road / St Mary's	A6750 – A7500	B	A	Low Positive
Bunting Road to Clogher Road via Kildare Road	D0 - E2447	B	A	Low Positive
Section Summary		**C**	**A**	**Medium Positive**

The contents of Table 6.20 demonstrate that the scheme will have positive long-term impact on the cycling environment between the Walkinstown Roundabout and Dolphin Road.

The LoS rating of the cycling facilities will improve from a D to a B in one subsection and from a B to an A in two subsections in Do Minimum compared to the Do Something, determined using the previously referenced criteria set out in Table 6.6. This is as a result of improved segregation for cyclists and junction treatment in the form of cycle lanes traversing priority junctions and continuing through signalised junctions with protected treatment as part of the Proposed Scheme.

The Bunting Road to Clogher Road route is proposed as a quiet cycle route in terms of traffic flows, with cycle tracks provided on both sides of the road and priority of junctions. This provides an alternative route for cyclists using Walkinstown Road, which is proposed to have shared bus and cycle facilities.

Overall, it is anticipated that there will be a **Medium Positive** impact to the quality of the cycling infrastructure along Section 3 of the Proposed Scheme, during the Operational Phase. The findings of the cycling assessment fully aligns with the objective of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, to 'Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable'.

6.3.2.1.7.3 Bus Infrastructure

It is proposed that there will be a total of 36 bus stops along Section 3 with seven fewer inbound and three fewer outbound, than in the Do Minimum.

There are currently 46 bus stops along Section 3 of the Proposed Scheme. Table 6.21 presents a summary of the changes in the number and location of bus stops along Section 3 of the Proposed Scheme.

Table 6.21: Section 3 – Overview of Amendments to Bus Stop Locations

Direction	Stop	Chainage	Do Something	Comment
Inbound	2378	A6030	Retained	N/A
Inbound	2183	A6450	Retained	N/A
Inbound	2184	A6620	Removed	Existing bus stop removed due to the bus stops being in close proximity to those at the Walkinstown Road / Kilnamanagh Road.
Inbound	2185	A6790	Retained	N/A
Inbound	1421	A7275	Retained	N/A
Inbound	1423	A7345	Removed	Existing bus stop removed due to the close proximity of other bus stops.
Inbound	7043	A7395	Removed	Existing bus stop removed due to the close proximity of other bus stops.
Inbound	1424	A7550	Retained	N/A
Inbound	2186	A7855	Removed	Existing bus stops removed due to the close proximity of other bus stops.
Inbound	2187	A8265	Retained	N/A
Inbound	2188	A8530	Removed	Existing bus stop removed to allow a rebalance of stops, due to a number of proposed bus stops are various locations.
Inbound	2189	A8710	Retained	N/A
Inbound	1436	A9015	Retained	N/A
Inbound	3952	A9190	Retained	N/A
Inbound	2331	D1280	Removed	Existing bus stop removed due to new bus stops proposed in close proximity on Kildare Road.
Inbound	1397	E230	Retained	N/A
Inbound	1398	E475	Retained	N/A
Inbound	1399	E795	Retained	N/A
Inbound	5148	E1070	Retained	N/A
Inbound	1401	E1260	Removed	Existing bus stop removed due to the close proximity of other bus stops.
Inbound	1402	E1445	Retained	N/A
Inbound	1403	E1900	Retained	N/A
Inbound	1404	E2130	Retained	N/A
Inbound	1405	E2370	Retained	N/A
Outbound	2333	A6015	Retained	N/A
Outbound	2332	A6370	Retained	N/A
Outbound	-	A6705	New	Proposed bus stop 50m south of the Long Mile Road / Walkinstown Road junction. Located 335m from bus stop 2332.
Outbound	2103	A6500	Removed	Existing bus stop removed due to the bus stops being in close proximity to those at the Walkinstown Road / Kilnamanagh Road.

Direction	Stop	Chainage	Do Something	Comment
Outbound	2102	A6880	Removed	Existing bus stop removed to allow a rebalance of stops, due to a number of proposed bus stops at various locations
Outbound	-	F4190	New	Proposed bus stop located to the east of the Walkinstown Road / Long Mile Road junction.
Outbound	2101	A7440	Retained	N/A
Outbound	2099	A7550	Removed	Existing bus stop removed due to the close proximity of other bus stops.
Outbound	2097	A8060	Removed	Existing bus stop removed due to the close proximity of other bus stops.
Outbound	2096	A8250	Retained	N/A
Outbound	2095	A8580	Removed	Existing bus stop removed to allow a rebalance of stops, due to a number of proposed bus stops are various locations
Outbound	-	A8735	New	Proposed bus stop on Crumlin Road located 130m west of the Crumlin Road / Sundrive Road/ Herberton Road junction
Outbound	1409	A8950	Retained	N/A
Outbound	1407	A9180	Retained	N/A
Outbound	2317	D1130	Retained	N/A
Outbound	1396	E160	Retained	N/A
Outbound	7414	E415	Retained	N/A
Outbound	1442	E680	Retained	N/A
Outbound	1441	E970	Retained	N/A
Outbound	3356	E1110	Retained	N/A
Outbound	3355	E1320	Removed	Existing bus stop removed due to the close proximity of other bus stops.
Outbound	1389	E1480	Retained	N/A
Outbound	1388	E1780	Retained	N/A
Outbound	1387	E2110	Retained	N/A
Outbound	1386	E2330	Retained	N/A

The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

The contents of Table 6.22 outline a summary of the improvements to the bus stop infrastructure along Section 3 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios.

Table 6.22: Section 3 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	15	33%	36	100%	It is proposed that all bus stops provide real-time information.

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
Timetable information	33	72%	36	100%	It is proposed that all bus stops provide timetable information, this is consistent with Do Minimum.
Shelter	22	48%	36	100%	It is proposed that all bus stops along this section is to be provided with shelter.
Seating	18	39%	36	100%	It is proposed that all bus stops along this section is to be provided with seating.
Accessible Kerbs	22	48%	36	100%	It is proposed that all bus stops provide timetable information.
Indented Drop Off Area	1	2%	0	0%	All stops inline.
Total Stops	**46**		**36**		10 fewer stops along Section 3 compared to the Do Minimum

The contents of Table 6.22 indicate that there are improvements to the bus stop facilities along Section 3 of the Proposed Scheme. All stops along this section will be inline, meaning that buses will not incur delay when setting off after picking up passengers. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 3 of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance.

The Proposed Scheme improves the quality of existing bus infrastructure along Section 3 of the Proposed Scheme, which will provide long-term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is **Medium Positive**.

6.3.2.1.7.4 Parking and Loading

The proposals will impact on existing parking along Section 3 of the Proposed Scheme and the main changes are as follows:

The changes to parking and loading in Section 3 have been considered in two parts

- Changes along the proposed CBC corridor itself; and
- Changes along the proposed 'Quiet Routes' for cyclists, along the Bunting Road / St Mary's Road corridor, and the Kildare Road / Clogher Road corridor.

The areas of parking change along the proposed CBC corridor are as follows:

- The Supervalu store on the east side of Walkinstown Road currently has a 185-space car park. Under the proposals, 41 spaces would be removed to widen Walkinstown Road sufficiently to provide a general traffic lane and a bus lane in both directions. This could be mitigated by the provision of approximately fourteen number parallel car parking spaces in the remaining area.
- The removal of 45 informal spaces on the north side of Long Mile Road and the south side of Drimnagh Road between Slievebloom Park and Kildare Road junction. These spaces mostly serve rows of businesses and local shops. The perpendicular parking arrangement is considered to be dangerous and could lead to conflicts between reversing vehicles and westbound traffic on Drimnagh Road. 18 parking spaces, 2 disabled spaces and 2 taxi spaces will be provided to serve rows of businesses and local shops on Drimnagh Road and Long Mile Road, alternative informal parking is available nearby on Hughes Road.
- The removal of two spaces out of 7 taxi spaces on the north side of Crumlin Road, immediately to the east of Kildare Road, adjacent to Crumlin Hospital and the removal of all 5 taxi spaces at Crumlin Shopping Centre. There is mitigation proposed at Crumlin Shopping Centre.
- There are currently six informal spaces on Crumlin Road west of the Kildare Road junction which will be removed. Under the Proposed Scheme, two properties have driveways and two new spaces will be provided to formalise parking arrangements.

- There are currently 25 informal spaces on Crumlin Road between Clonad Road and Sundrive Road which appear to be used by businesses. Under the Proposed Scheme, all have driveways / hardstanding which could be provided to formalise parking arrangements.
- The removal of two adjacent spaces on at the HSE centre on Crumlin Road, reconfiguration of existing parking is possible mitigation.

The areas of parking change along the proposed 'Quiet Routes' for cyclists are as follows:

- There are currently a 111 informal parking spaces on Bunting Street, St. Mary's Road, Kildare Road and Clogher Road. The proposed scheme will result in a removal of 48 spaces. 66 parking spaces have been provided on Kildare Road.

The contents of Table 6.23 presents a summary of the proposed changes to parking along Section 3 of the Proposed Scheme.

Table 6.23: Section 3 – Overall Changes in Parking / Loading Spaces

Location	Parking Type	Do Minimum	Do Something	Change
Walkinstown Road	Adjacent Parking (Car Park)	27281	254	-27
Drimnagh Road	Informal Parking	63	18	-45
	Disabled Permit Parking	3	4	+1
Crumlin Road	Informal Parking	54	41	-13
	Adjacent Parking (Car Park)	983	981	-2
	Taxi	12	5	-7
Bunting Road / St Mary's Street / Kildare Road/ Clogher Road	Informal Parking	111	67	-44
Total		**1507**	**1370**	**--137**

As shown in Table 6.23, there are approximately 1507 current parking spaces affected within the area of the Section 3 of the Proposed Scheme. Under the proposals, 137 parking spaces will be lost, a mixture of informal parking adjacent parking and taxi spaces. The Proposed Scheme will formalise the parking arrangements at these locations to improve the environment, particularly for pedestrians and cyclists. In one out of four locations impacted by parking changes (Walkinstown Road) the majority of the loss is associated with private land, and therefore it is noted that just over half of the spaces being removed are associated with informal or taxi parking. There is alternative parking available surrounding the corridor, with residents having driveways and with five taxi spaces having already identified alternative parking. Therefore, the overall impact of this loss of parking is considered to have a **Low Negative Impact.** This effect is considered acceptable in the context of the aim of the Proposed Scheme, to provide enhanced walking, cycling and bus infrastructure on this key access corridor.

6.3.2.1.8 Section 4 – Grand Canal to Christchurch

6.3.2.1.8.1 Pedestrian Infrastructure

The key infrastructural changes to the pedestrian link along Section 4 of the Proposed Scheme are the following:

- Provision of raised table crossings at side roads;
- Provision of raised table junction at South Circular Road / Dolphin's Barn junction; and
- Removal of left-turn slip lane at Dean Street / Patrick Street junction.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 4 of the Proposed Scheme are summarised in Table 6.24. A detailed breakdown of the assessment at each impacted junction, including a

list of the junctions which experience no change, can be found in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

Table 6.24: Section 4 – Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
R110 Dolphin's Barn Street, R811 South Circular Road signalised junction	A9475	C	A	Medium Positive
R110 Cork Street / Cameron Street priority junction	A9900	C	B	Low Positive
R110 Cork Street / Marrowbone Lane / Donore Avenue signalised junction	A10025	B	A	Low Positive
R110 Cork Street / Ormond Street priority junction	A10350	B	A	Low Positive
R110 Cork Street / Robinson's Court priority junction	A10425	B	A	Low Positive
R110 Cork Street / Ardee Street / R110 St Luke's Avenue signalised junction	A10510	D	A	Medium Positive
R110 St Luke's Avenue / The Coombe / Dean Street signalised junction	A10850	C	A	Low Positive
Dean Street and Francis Street priority junction	A10950	C	B	Low Positive
Dean Street and New Row South priority junction	A10960	B	A	Low Positive
Dean Street / New Street / Kevin Street Upper / Patrick Street signalised junction	A11000	C	B	Low Positive
R137 Patrick Street / St Patrick's Close priority junction	A11050	C	B	Low Positive
R137 Patrick Street / Bull Alley Street priority junction	A11190	C	B	Low Positive
R137 Patrick Street / Dillon Place South priority junction	A11225	C	B	Low Positive
R137 Patrick Street / Bride Road priority junction	A11300	B	A	Low Positive
R137 Nicholas Street / Ross Road priority junction	A11340	C	B	Low Positive
R137 Nicholas Street / Christchurch Place / Winetavern Street / High Street signalised junction	A11450	D	A	Medium Positive
Section Summary		**C**	**A**	**Medium Positive**

The contents of Table 6.24 demonstrate that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure at junctions between Grand Canal and Christchurch.

The LoS during the Do Minimum scenario ranges from B to D, with eleven of the 16 impacted junctions along this section given the low C/ D rating. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.3. The LoS will improve to an A rating at nine of the impacted junctions and a B at seven junctions in the Do Something scenario. This is as a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and Building for Everyone: A Universal Design Approach (NDA 2020) with regards to catering for all users, including those with disabilities.

Overall, it is anticipated that there will be **Medium Positive impact** to the quality of the pedestrian infrastructure along Section 4 (Grand Canal to Christchurch) of the Proposed Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor.

6.3.2.1.8.2 Cycling Infrastructure

This assessment outlines the changes to the quality of cycling provision along Section 4 of the Proposed Scheme.

The key cycling improvements along Section 4 of the Proposed Scheme can be summarised as follows:

- Provision of continuous 2.0m wide cycle tracks on both sides of R110 Dolphin's Barn / Cork Street between R111 Dolphin Road and Cameron Street, replacing primarily 1.5m wide on-road cycle lanes;
- Provision of continuous cycle tracks on both sides of R110 Cork Street between Cameron Street and R137 New Patrick Street, replacing primarily 1.25m-wide on-road cycle lanes along this route; and
- Provision of continuous 2.0m wide cycle tracks on both sides of R137 Patrick Street between Dean Street and Christchurch Place, replacing 1.5m wide on-road cycle lanes.
- Upgrade of signalised crossings to Toucan crossings on the eastern and western arms of the R110 Cork Street / Marrowbone Lane / Donore Avenue junction;
- Upgrade of signalised crossing to Toucan crossing on the northern arm of the R137 Patrick Street / Bull Alley Street priority junction;
- Upgrade of signalised crossings to Toucan crossings on the eastern and western arms of the R110 Cork Street / Ardee Street / R110 St Luke's Avenue junction; and
- Provision of upgraded cycling facilities at signalised junctions to provide continuous cycle lanes.

Along Section 4, the Proposed Scheme will provide a 60mm set down kerb segregation between the footway and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle track kerb will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.25 outline the cycling qualitative assessment along Section 4 of the Proposed Scheme. A detailed breakdown of the assessment along each section can be found in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

Table 6.25: Section 4 – Cycling Impact during Operational Phase

Locations	Chainage	Do Minimum LoS	Do Something LoS	Impact
R111 Dolphin Road to Ardee Street	A9250 – A10500	B	A	Low Positive
Ardee Street to R137 Patrick Street / St. Patrick's Close	A10500 – A11050	C	A	Medium Positive
R137 Patrick Street / St. Patrick's Close to Christchurch Place	A11050 – A11406	B	A	Low Positive
Section Summary		**B**	**A**	**Low Positive**

The contents of Table 6.25 demonstrate that the scheme will have a positive long-term impact on the cycling environment between the Grand Canal and Christchurch.

The LoS rating of the cycling facilities will improve from a C to an A in one subsection, from a B to a A in two subsections in the Do Minimum compared to the Do Something, determined using the previously referenced criteria set out in Table 6.6. This is as a result of improved segregation for cyclists and junction treatment in the form of cycle lanes traversing priority junctions and continuing through signalised junctions with protected treatment as part of the Proposed Scheme.

Overall, it is anticipated that there will be **Low Positive impact** to the quality of the cycling infrastructure along Section 4 of the Proposed Scheme, during the Operational Phase. The findings of the cycling assessment fully aligns with the objective of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, to 'Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable'.

6.3.2.1.8.3 Bus Infrastructure

It is proposed that there will be a total of 14 bus stops along Section 4 of the Proposed Scheme – seven inbound and seven outbound. This is one stop more than the number of bus stops as in the Do Minimum.

There are currently 13 bus stops along Section 4 of the Proposed Scheme. Table 6.26 presents a summary of the changes in the number and location of bus stops along Section 4 of the Proposed Scheme.

Table 6.26: Section 4 – Overview of Amendments to Bus Stop Locations

Direction	Stop	Chainage	Do Something	Comment
Inbound	2190	A9350	Removed	Existing bus stop removed due to the close proximity of other bus stops.
Inbound	-	A9525	New	Proposed bus stop on Dolphin's Barn Street, 25m north-east of the Dolphin's Barn Street / South Circular Road junction.
Inbound	4434	A9780	Retained	N/A
Inbound	2379	A10120	Retained	N/A
Inbound	2382	A10590	Retained	N/A
Inbound	5099	A10750	Retained	N/A
Inbound	2383	A11050	Retained	N/A
Inbound	-	A11340	New	Proposed bus stop on Clanbrassil Street, located 45m east of the Nicholas Street / Bride Road junction. Located 290m from bus stop 2383.
Outbound	2385	A11390	Retained	N/A
Outbound	-	A11145	New	Proposed bus stop on Patrick Street, 35m south of the Patrick Street / Bull Alley Street junction. Located 335m from bus stop 2313.
Outbound	2312	A10810	Retained	N/A
Outbound	2313	A10590	Retained	N/A
Outbound	2314	A10420	Removed	Existing bus stop removed due to the close proximity of other bus stops.
Outbound	2315	A10120	Retained	N/A
Outbound	2094	A9670	Retained	N/A
Outbound	1406	A9420	Retained	N/A

The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

The contents of Table 6.27 outline a summary of the changes to the bus stop infrastructure along Section 4 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios.

Table 6.27: Section 4 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	7	54%	14	100%	It is proposed that all bus stops provide real-time information.
Timetable information	10	77%	14	100%	It is proposed that all bus stops provide timetable information, this is consistent with Do Minimum.
Shelter	8	61%	13	93%	It is proposed that all but one bus stops along this section is to be provided with shelter.
Seating	8	61%	13	93%	It is proposed that all but one bus stops along this section is to be provided with seating.
Accessible Kerbs	5	39%	14	100%	It is proposed that all bus stops provide timetable information.
Indented Drop Off Area	1	7%	0	0%	All stops inline.
Total Stops	**13**		**14**		One more bus stop along Section 2 compared to the Do Minimum.

The contents of Table 6.27 indicate that there are improvements to the bus stop facilities along Section 4 of the Proposed Scheme. All stops along this section will be inline, within dedicated bus lanes along the entirety of the corridor. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 4 (no shelters nor seating at one bus stop in Christchurch to maintain existing heritage realm) of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidelines which has been developed with cognisance to the relevant accessibility guidance. The Proposed Scheme improves the quality of existing bus infrastructure along Section 4 of the Proposed Scheme, which will provide long term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is **High Positive**.

6.3.2.1.8.4 Parking and Loading

The proposals will impact on existing parking along Section 4 of the Proposed Scheme and the main changes are as follows:

- The removal of seven pay and display spaces between Dolphins Barn and Christchurch, aligning with the public realm improvement plan. There are aims to provide alternatives along South Circular Road.
- The removal of 12 private parking spaces between Dolphins Barn and Christchurch. There are a plentiful number of other private parking spaces in the vicinity.
- The removal of one loading bay space, with space for one vehicle, located on the west side of Patrick Street between Dillon Place South and Bride Road. The loading bay serves the commercial properties on the west side of the road. This is being removed for the provision of a northbound cycle track. Possible mitigation would be to provide an alternative loading bay parking on St Patricks Close.

The contents of Table 6.28 present a summary of the proposed changes to parking along Section 4 of the Proposed Scheme between the Do Minimum and Do Something scenarios.

Table 6.28: Section 4 – Overall Changes in Parking / Loading Spaces

Location	Parking Type	Do Minimum	Do Something	Change
Dolphin's Barn Street / Cork Street / St Luke's Avenue	Designated Paid Parking	51	44	-7

Location	Parking Type	Do Minimum	Do Something	Change
	Adjacent Parking (Car Parks)	317	305	-12
Dean Street / Patrick Street / Christchurch	Loading Bay	10	9	-1
Total		**378**	**358**	**-20**

As shown in Table 6.28, there are currently approximately 378 parking spaces affected along Section 4 of the Proposed Scheme and is it proposed that 20 of these spaces are removed. The Proposed Scheme will formalise the parking arrangements at these locations to improve the environment, particularly for pedestrians and cyclists. Given the availability of equivalent types of parking along adjacent streets within 200m of these locations (and typically within under 100m), the overall impact of this loss of parking is considered to have a **Low Negative Impact**. This impact is considered acceptable in the context of the aim of the Proposed Scheme, to provide enhanced walking, cycling and bus infrastructure on this key access corridor.

6.3.2.1.9 Section 5 – Woodford Walk (R113) / New Nangor Road (R134) to Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction

6.3.2.1.9.1 Pedestrian Infrastructure

The key infrastructure changes to pedestrian links along Section 5 of the Proposed Scheme are summarised as follows:

- Footways with a minimum running width of 2.0m;
- Removal of left-turn slip lanes at the R134 New Nangor Road / Oak Road junction;
- Connection from the existing Grand Canal Greenway to the R134 New Nangor Road footway and cycle track east of the M50 overbridge and R134 New Nangor Road Cycle track west of the M50 overbridge;
- Raised table provision added to the Diageo Bailys access junction, off the R134 New Nangor Road;
- Raised table provision added to Toyota access of the R134 New Nangor Road;
- Removal of left-turn slip lanes at the R134 New Nangor Road / Killeen Road (north) junction; and
- Proposed provision of a pedestrian / cycle bridge to provide grade-separated facilities for all pedestrian and cycle movements at the R134 New Nangor Road / R810 Naas Road / R110 Long Mile Road signalised junction.

The assessment of the qualitative impacts on the pedestrian infrastructure for Section 5 of the Proposed Scheme is summarised in Table 6.29. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

Table 6.29: Section 5 – Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
R134 New Nangor Road / Woodford Walk signalised junction	F50	D	A	Medium Positive
R134 New Nangor Road / Nangor Road Business Park roundabout	F750	E	A	High Positive
R134 New Nangor Road / Oak Road signalised junction	F1000	C	A	Medium Positive
R134 New Nangor Road / Diageo Access priority junction	F1200	D	B	Medium Positive
R134 New Nangor Road / Willow Road signalised junction	F1400	D	A	Medium Positive
R134 New Nangor Road / Killeen Road (north) signalised junction	F1725	E	A	High Positive

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
R134 New Nangor Road / Killeen Road (south) signalised	F1825	D	B	Medium Positive
R134 New Nangor Road / R810 Naas Road / R110 Long Mile Road signalised junction	F2250	E	B	Medium Positive
Section Summary		**D**	**A**	**Medium Positive**

The contents of Table 6.29 demonstrate that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure at junctions between the Woodford Walk / New Nangor Road junction to the Long Mile Road / Naas Road / New Nangor Road junction.

The LoS during the Do Minimum scenario ranges from E to C, with seven of the eight impacted junctions along this section given the low D/ E rating. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.3. The LoS will improve to an A rating at five of the impacted junctions and a B at three junctions in the Do Something scenario. This is as a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and Building for Everyone: A Universal Design Approach (NDA 2020) with regards to catering for all users, including those with disabilities.

Overall, it is anticipated that there will be a **Medium Positive impact** to the quality of the pedestrian infrastructure along Section 5 of the Proposed Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor.

6.3.2.1.9.2 Cycling Infrastructure

The key cycling improvements along Section 5 of the Proposed Scheme can be summarised as follows:

- Provision of continuous 2m wide cycle tracks on both sides of R134 New Nangor Road from the New Nangor Road/ Woodford Walk junction to the New Nangor Road / Killeen Road junction;
- Provision of continuous two-way 3.5m wide cycle tracks on the northern side of R134 New Nangor Road, and a continuous 2m wide cycle track on the southern side of New Nangor Road between the New Nangor Road / Killeen Road junction and the R134 New Nangor Road / R810 Naas Road / R110 Long Mile Road junction;
- Provision of continuous two-way cycle track linking Killeen Road (north) to Killeen Road (south);
- Provision of link between the new cycle track on the north of R134 New Nangor Road and Grand Canal Greenway, in the vicinity of the M50 overbridge;
- Proposed provision of a pedestrian / cycle bridge to provide grade-separated facilities for all pedestrian and cyclist movements at the R134 New Nangor Road / R810 Naas Road / R110 Long Mile Road signalised junction; and
- Provision of upgraded cycling facilities at signalised junctions to provide continuous cycle lanes.

Along Section 5, the Proposed Scheme will provide a 60mm set down kerb segregation between the footway and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation (as is the case in some areas of the baseline environment) is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle track kerb will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.30 outline the cycling qualitative assessment along Section 5. A detailed breakdown of the assessment along each section can be found in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

Table 6.30: Section 5 – Cycling Impact during Operational Phase

Locations	Chainage	Do Minimum LoS	Do Something LoS	Impact
Woodford Walk to R810 Naas Road.	F0 – F2300	C	A	Medium Positive

The contents of Table 6.30 demonstrate that the scheme will have a positive long-term impact on the cycling environment between the Woodford Walk / New Nangor Road junction and the Long Mile Road / Naas Road / New Nangor Road junction.

The LoS rating of the cycling facilities will improve from a C to an A in the Do Minimum compared to the Do Something, determined using the previously referenced criteria set out in Table 6.6. This is as a result of improved segregation for cyclists and junction treatment in the form of cycle lanes traversing priority junctions and continuing through signalised junctions with protected treatment as part of the Proposed Scheme.

Overall, it is anticipated that there will be a **Medium Positive** impact to the quality of the cycling infrastructure along Section 5 of the Proposed Scheme, during the Operational Phase.

The findings of the cycling assessment fully aligns with the objective of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, to 'Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable'

6.3.2.1.9.3 Bus Infrastructure

It is proposed that there will be a total of 11 bus stops along Section 5 of the Proposed Scheme – six inbound and five outbound. This is two more stops than in the Do Minimum, one inbound and one outbound.

There is currently a total of nine bus stops along Section 5 of the Proposed Scheme. Table 6.31 presents a summary of the changes in the number and location of bus stops along Section 5 of the Proposed Scheme.

Table 6.31: Section 5 – Overview of Amendments to Bus Stop Locations

Direction	Stop	Chainage	Do Something	Comment
Inbound	-	N/A	New	Proposed bus stop on Woodford Walk, 35m south of the New Nangor Road / Woodford Walk junction.
Inbound	6152	F0	Retained	Existing bus stop location on a bypass that is being removed, new bus stop moved onto New Nangor Road, 35 east of the New Nangor Road / Woodford Walk junction.
Inbound	6153	F660	Removed	Existing bus stop removed due to the close proximity to new bus stops on New Nangor Road.
Inbound	-	F900	New	Proposed bus stop on New Nangor Road, 55m west of the New Nangor Road / Oak Road junction. Located 900m from bus stop 6152.
Inbound	6243	F1335	Retained	N/A
Inbound	6154	F1615	Retained	N/A
Inbound	6155	F2085	Retained	N/A
Outbound	6145	F2150	Retained	N/A
Outbound	6146	F1650	Retained	N/A
Outbound	6147	F1350	Retained	N/A

Direction	Stop	Chainage	Do Something	Comment
Outbound	-	F900	New	Proposed bus stop on New Nangor Road, 55m west of the New Nangor Road / Oak Road junction.
Outbound	6149	F650	Removed	Existing bus stop removed due to the close proximity to new bus stops on New Nangor Road.
Outbound	-	F110	New	Proposed bus stop on New Nangor Road, 65m east of New Nangor Road. Woodford Walk junction.

The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

The contents of Table 6.32 outline a summary of the changes to the bus stop infrastructure along Section 5 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios.

Table 6.32: Section 5 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	0	0%	11	100%	It is proposed that all bus stops provide real-time information.
Timetable information	0	0%	11	100%	It is proposed that all bus stops provide timetable information.
Shelter	0	0%	11	100%	It is proposed that all bus stops along this section is to be provided with shelter. A shelter will be added to inbound Stop 1218.
Seating	0	0%	11	100%	It is proposed that all bus stops along this section will provide seating.
Accessible Kerbs	0	0%	11	100%	Full provision.
Indented Drop Off Area	0	0%	0	0%	All proposed bus stops will be located inline within bus lanes.
Total Stops	**9**		**11**		Two more bus stops along Section 5 compared to the Do Minimum.

The contents of Table 6.32 indicate that there are significant improvements to the bus stop facilities along Section 5 of the Proposed Scheme. It is proposed that all bus stops will be provided inline within dedicated bus lanes along the entirely of the corridor, meaning that buses will not incur delay when setting off after picking up passengers. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 5 of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance.

The Proposed Scheme improves the quality of existing bus infrastructure along Section 5 of the Proposed Scheme, which will provide long-term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is **High Positive**.

6.3.2.1.9.4 Parking and Loading

The proposals will impact on existing parking along Section 5 of the Proposed Scheme and the main changes are as follows:

- The removal of seven informal parking spaces (cars parked on the grass verge) and 10 adjacent car parking spaces at Toyota Ireland.

- The removal of 140 private spaces and three HGV spaces at the R134 New Nangor Road / Long Mile Road / Naas Road junction due to the proposed pedestrian and cycle bridge. As the change in parking is on private land, with sufficient surrounding parking available.

The contents of Table 6.33 present a summary of the proposed changes to parking along Section 5 of the Proposed Scheme.

Table 6.33: Section 5 – Overall Changes in Parking / Loading Spaces

Location	Parking Type	Do Minimum	Do Something	Change
R134 New Nangor Road	Adjacent Parking (Car Parks)	831 and 35 HGV	821 and 31 HGV	-10 and –4 HGV
	Informal Parking	7	0	-7
R134 New Nangor Road / Long Mile Road / Naas Road junction	Adjacent Parking (Car Parks)	857 and 157 HGV	745 and 154 HGV	-112 and -3 HGV
Total		**1695 and 192 HGV**	**1566 and 195HGV**	**-129 and -7 HGV**

As shown in Table 6.33, there are approximately 1695 current parking spaces affected within the area and 192 HGV parking spaces along Section 5 of the Proposed Scheme, nearly all on private land. Under the proposals, 129 parking spaces and 7 HGV spaces will be lost. This change is considered to have a **Negligible Impact** due to the majority being on private land, and a small loss compared to numbers of parking spaces remaining. Mitigation measures such as extending current private parking spaces are proposed. This is considered acceptable in the context of the aim of the Proposed Scheme, to provide enhanced walking, cycling and bus infrastructure on this key access corridor.

6.3.2.1.10 Section 6 – Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh

6.3.2.1.10.1 Pedestrian Infrastructure

The key infrastructure changes to pedestrian links along Section 6 of the Proposed Scheme are summarised as follows:

- Footways with a minimum running width of 2.0m;
- Reduced carriageway (single lane one-way) with enhanced pedestrian facilities at R810 Naas Road / Old Naas Road junction;
- Removal of left-turn slip lane on R810 Naas Road to Kylemore Road;
- Proposed raised tables added to accesses off Walkinstown Avenue;
- Proposed raised tables added to a number of accesses off the R110 Long Mile Road; and
- New Toucan crossing on the R110 Long Mile Road to serve schools. The Toucan crossings on R110 Long Mile Road would be enhanced by the introduction of raised tables to slow vehicle speeds.

The assessment of the qualitative impacts on the pedestrian infrastructure for Section 6 of the Proposed Scheme is summarised in Table 6.34. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in TIA Appendix 4.1 (Pedestrian Infrastructure Assessment).

Table 6.34: Section 6 – Pedestrian Impact during Operational Phase

Junctions	Chainage	Do Minimum LoS	Do Something LoS	Impact
R810 Naas Road / Industrial Complex Access priority junction	F2425	E	B	Medium Positive
R810 Naas Road / Old Nass Road/ John F Kennedy Drive priority junction	F2750 - F2800	E	A	High Positive
R810 Naas Road / Robinhood Road priority junction	F2750 - F2800	D	A	Medium Positive
R810 Naas Road / Kylemore Road / R112 Walkinstown Avenue signalised junction	F2975	F	B	High Positive
R112 Walkinstown Avenue / R110 Long Mile Road signalised junction	F3350	D	A	Medium Positive
R110 Long Mile Road / Walkinstown Parade priority junction	F3775	D	C	Low Positive
R110 Long Mile Road / Slievebloom Park priority junction	F4100	B	A	Low Positive
Section Summary		**E**	**B**	**Medium Positive**

The contents of Table 6.34 demonstrate that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure at junctions between the Long Mile Road / Naas Road / New Nangor Road junction to Drimnagh.

The LoS during the Do Minimum scenario ranges from F to B, with three of the seven impacted junctions along this section given the low E / F rating. These ratings have been determined using the previously referenced assessment criteria set out in Table 6.3. The LoS will improve to an A rating at four of the impacted junctions and a B at two junctions and a C rating at one of the impacted junctions in the Do Something scenario. This is as a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and Building for Everyone: A Universal Design Approach (NDA 2020) with regards to catering for all users, including those with disabilities.

Overall, it is anticipated that there will be **Medium Positive** impact to the quality of the pedestrian infrastructure along Section 6 of the Proposed Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor.

6.3.2.1.10.2 Cycling Infrastructure

The key cycling improvements along Section 6 of the Proposed Scheme can be summarised as follows:

- Provision of cycle tracks and on both sides of R810 Naas Road between R110 Long Mile Road and R112 Walkinstown Avenue, replacing primarily on-road cycle lanes. On the north side of R810 Naas Road there will be a 3.25m wide, two-way cycle track. On the south side only a 2.0m cycle track will be provided;
- Provision of 1.5m – 2.0m wide cycle tracks in both directions on R112 Walkinstown Avenue, where no cycle provision currently exists;
- Provision of 2.0m wide cycle tracks in both directions on R110 Long Mile Road between R112 Walkinstown Avenue and R819 Walkinstown Road, replacing 1.5m-wide on-road cycle lanes;
- Upgrade of existing outbound pelican crossing to a Toucan crossing to the west of the Nass Road / Robinhood Road junction;
- Upgrade of existing inbound pelican crossing to a Toucan crossing to the west of the Nass Road / John F Kennedy Drive junction;

- Upgrade of existing pelican crossing to a Toucan crossing and provision of new Toucan crossing across R110 Long Mile Road to serve schools. The crossings would be enhanced by the introduction of raised tables to slow vehicle speeds; and
- Provision of upgraded cycling facilities at signalised junctions to provide continuous cycle lanes.

Along Section 6, the Proposed Scheme will provide a 60mm set down kerb segregation between the footway and the cycle track. This is of particular importance in the context of providing for pedestrians with visual impairments, whereby the use of white line segregation is not as effective for establishing a clear understanding of the change of pavement use and potential for cyclist / pedestrian interactions. The cycle track kerb will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.35 outline the cycling qualitative assessment along Section 6 of the Proposed Scheme. A detailed breakdown of the assessment along each section can be found in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

Table 6.35: Section 6 – Cycling Impact during Operational Phase

Locations	Chainage	Do Minimum LoS	Do Something LoS	Impact
R110 Long Mile Road to Nass Road / Walkinstown Avenue/ Kylemore Road junction	F2300 – F3000	C	A	Medium Positive
R810 Nass Road / Walkinstown Avenue/ Kylemore Road junction to R110 Long Mile Road	A3000 – A3350	C	A	Medium Positive
Walkinstown Avenue / R110 Long Mile Road junction to R110 Long Mile Road / Walkinstown Road	A3350 – A4100	B	A	Low Positive
Section Summary:		**C**	**A**	**Medium Positive**

The contents of Table 6.35 demonstrate that the scheme will have a positive long-term impact on the cycling environment between the Long Mile Road / Naas Road / New Nangor Road junction to Drimnagh.

The LoS rating of the cycling facilities will improve from a C to an A in two of the impacted junctions and from a B to an A at one of the impacted junctions in the Do Minimum compared to the Do Something, determined using the previously referenced criteria set out in Table 6.6. This is as a result of improved segregation for cyclists and junction treatment in the form of cycle lanes traversing priority junctions and continuing through signalised junctions with protected treatment as part of the Proposed Scheme.

Overall, it is anticipated that there will be a **Medium Positive** impact the quality of the cycling infrastructure along Section 6 of the Proposed Scheme, during the Operational Phase. The findings of the cycling assessment fully aligns with the objective of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, to 'Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable'.

6.3.2.1.10.3 Bus Infrastructure

It is proposed that there will be a total of eight bus stops along Section 6 of the Proposed Scheme – four inbound and four outbound. This is two fewer inbound bus stops and three fewer outbound bus stops than in the Do Minimum.

There are currently 13 bus stops along Section 6 of the Proposed Scheme. Table 6.11 presents a summary of the changes in the number and location of bus stops along Section 6 of the Proposed Scheme.

Table 6.36: Section 6 – Overview of Amendments to Bus Stop Locations

Direction	Stop	Chainage	Do Something	Comment
Inbound	1980	F2490	Removed	Existing bus stops removed due to the close proximity of other bus stops.
Inbound	1981	F2845	Retained	N/A
Inbound	-	F2935	New	Proposed bus stop located 40m west of the Naas Road / Walkinstown Avenue junction.
Inbound	2787	F3190	Removed	Existing bus stops removed due to the close proximity of other bus stops.
Inbound	2181	F3400	Retained	N/A
Inbound	2182	F3750	Removed	Existing bus stops removed due to the close proximity of other bus stops.
Inbound	2778	F3960	Retained	N/A
Outbound	2726	F4060	Removed	Existing bus stops removed due to the close proximity of other bus stops.
Outbound	2727	F3900	Retained	N/A
Outbound	2105	F3590	Removed	Existing bus stops removed due to the close proximity of other bus stops.
Outbound	-	F3285	New	Proposed bus stop on Walkinstown Avenue, located 365m from new bus stop with chainage F2920.
Outbound	-	F2920	New	Proposed bus stop located 40m north of the Long Mile Road / Walkinstown Avenue junction.
Outbound	2780	F3100	Removed	Existing bus stops removed due to the close proximity of other bus stops on the southern section on Walkinstown Avenue.
Outbound	1956	F2885	Retained	N/A
Outbound	1957	F2660	Removed	Existing bus stop removed due to the close proximity to other bus stop locations.
Outbound	1958	F2480	Removed	Existing bus stop removed due to the close proximity to other bus stop locations.

The layout of new bus stops is considered to better serve the existing and future catchment and be closer to existing and new pedestrian crossing facilities for improved convenience.

The contents of Table 6.37 outline a summary of the changes to the bus stop infrastructure along Section 1 of the Proposed Scheme, with reference to the number and percentage of bus stops that provide each facility in the Do Minimum and Do Something scenarios.

Table 6.37: Section 6 – Overview of Changes in Bus Stop Facilities

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
RTPI	0	0%	8	100%	It is proposed that all bus stops provide real-time information.
Timetable information	13	100%	8	100%	It is proposed that all bus stops provide timetable information.

Bus Stop Facility	Do Minimum		Do Something		Comment
	No. of Stops	Percentage of Stops	No. of Stops	Percentage of Stops	
Shelter	12	92%	8	100%	It is proposed that all bus stops along this section is to be provided with shelter. A shelter will be added to inbound Stop 1218.
Seating	12	92%	8	100%	It is proposed that all bus stops along this section will provide seating.
Accessible Kerbs	11	85%	8	100%	Full provision.
Indented Drop Off Area	2	15%	2	25%	Two bus stops indented; others located in line within bus lanes.
Total Stops	**13**		**8**		Five bus stops removed as part of rationalization of stops along Section 6.

The contents of Table 6.37 indicate that there are significant improvements to the bus stop facilities along Section 6 of the Proposed Scheme. It is proposed that three bus stops will contain an indented drop off area, all other bus stops will be provided inline within dedicated bus lanes along the entirely of the corridor. Improvements in the provision of real-time information, shelters, seating and accessible kerbs at the bus stops throughout Section 6 of the Proposed Scheme are assessed as providing an overall positive impact for bus passengers. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance.

The Proposed Scheme improves the quality of existing bus infrastructure along Section 6 of the Proposed Scheme, which will provide long-term benefits for bus users and aligns with the overarching aim to provide enhanced bus infrastructure on the corridor. The impact for this section of the Proposed Scheme is **Low Positive**.

6.3.2.1.10.4 Parking and Loading

The proposals will impact on existing parking along Section 6 of the Proposed Scheme and the main changes are as follows:

- The removal of 9 informal parking spaces in hardstanding area outside commercial and car sales commercial units on R110 Long Mile Road outbound carriageway east of Walkinstown Avenue / Long Mile Road junction.
- On R110 Long Mile Road west of the Walkinstown Parade junction, the existing informal parking bay will be reduced in length resulting in the loss of 4 spaces to cater for a 2.0m wide cycle track running along the inside kerb. 9 residential properties that front this parking layby have private driveways.

The contents of Table 6.38 present a summary of the proposed changes to parking along Section 6 of the Proposed Scheme.

Table 6.38: Section 6 – Overall Changes in Parking / Loading Spaces

Location	Parking Type	Do Minimum	Do Something	Change
R110 Long Mile Road	Informal Parking	26	9	-17

As shown in Table 6.38, there are currently approximately 26 parking spaces affected along Section 6 of the Proposed Scheme and is it proposed that 17 of these spaces are removed. Nine of the spaces being removed are associated with private commercial premises. The Proposed Scheme will formalise the parking arrangements at these locations to improve the environment, particularly for pedestrians and cyclists. Given the availability of equivalent types of parking along adjacent streets within 200m of these locations (and typically within under 100m), the overall impact of this loss of parking is considered to have a **Low Negative** impact. This impact is considered acceptable in the context of the aim of the Proposed Scheme, to provide enhanced walking, cycling and bus infrastructure on this key access corridor.

6.3.2.1.11 Summary of Corridor-Wide Infrastructure Works

6.3.2.1.11.1 Pedestrian Infrastructure

The Proposed Scheme will increase the number of controlled pedestrian crossings from 135 in the Do Minimum to 181 in the Do Something scenario, representing a 34% increase

6.3.2.1.11.2 Cycling Infrastructure

The Proposed Scheme will provide 16.6km inbound and 17.4km outbound of segregated cycle facilities which is an increase from only 2.1km inbound and 1.7km outbound in the Do Minimum scenario. In turn, there will be a decrease in non-segregated cycle facilities in the Do Something scenario compared to the Do Minimum as these facilities will be upgraded to segregated facilities in most cases with additional Quiet Street treatments.

Overall, cycle facilities in the Proposed Scheme will increase to approximately 85% outbound and 79% inbound, with the majority being segregated. The proportion of the corridor with segregated facilities (including quiet street treatment) will increase from 9.7% in the Do Minimum to 74% in the Do Something scenario.

6.3.2.1.11.3 Bus Priority Infrastructure

The Proposed Scheme will provide 12.4km inbound and 11.4km outbound of bus lanes across the corridor. This will represent an increased from 5.4km inbound and 4.5km outbound in the Do Minimum scenario. Bus priority through traffic management will be increased from 0.3km to 0.6km in the Do Something scenario. This contributes to an increase of 138% in total bus priority measures in both directions in the Do Something scenario compared to the Do Minimum. Overall, the Proposed Scheme will provide bus priority measures along 80% of the corridor.

6.3.2.1.11.4 Parking & Loading

The total parking provision will be reduced along the Proposed Scheme. The majority of this reduction is removal of off-street private parking. A minor number of informal general residential, commercial and taxi spaces are bringing removed. Aspects of the Proposed Scheme and network proposals are expected to mitigate the reduction in parking by reducing reliance on private cars due to availability of an improved bus network with journey reliability, by availability of improved cycling infrastructure, and by continued and managed use of private off-street parking. Similarly, many properties along the Proposed Scheme have driveways, and residents should be encouraged to utilise their available off-road space for parking (rather than seek to park on-street). Improved compliance with parking and loading bay regulations, and management of loading activities will also assist in offsetting the reduction in on-street parking spaces. It is concluded that the overall impact of loss of parking space on these streets is limited and will be largely offset by the cumulative effect of mitigations.

6.3.3 Quantitative Assessment

This quantitative assessment has been prepared with reference to the modelling outputs obtained from the four-tiered modelling approach outlined in Section 4.3. The following assessment topics have been considered:

- People Movement:
  - Peak Hour People Movement along the Proposed Scheme;
  - People Movement by Bus; and
  - Bus Boarding.
- Bus Network Performance Indicators:
  - Bus Journey Times; and
  - Bus Journey Time Reliability.
- General Traffic Network Performance Indicators:
  - Flow changes on the Direct Study Area; and
  - Redistributed flows and Junction Capacity Outputs on the Indirect Study Area.
- Overall Road Network-Wide Performance Indicators
  - Queuing;
  - Total Travel Times;
  - Total Travel Distance; and
  - Average Network Speed.

6.3.3.1 People Movement

In order to understand the benefit of the Proposed Scheme with regards to the Movement of People following the implementation of the proposed infrastructure measures, a quantitative People Movement assessment has been undertaken using outputs from the NTA ERM and LAM and comparing the Do Minimum and Do Something peak hour scenarios for each forecast year (2028, 2043).

The assessment of People Movement includes the following metrics:

- The average number of people moved by each transport mode (i.e., Car, Bus, Walking and Cycling) along the corridor in the inbound and outbound direction. This metric is compared for the Do Minimum and Do Something scenarios in the AM and PM peak hours for each forecast year (2028, 2043). This metric provides an estimate of the modal share changes along the route as a result of the Proposed Scheme measures; and
- People Movement by Bus:
  - AM and PM peak hour Bus Passenger Loadings along the Proposed Scheme for each forecast year (2028, 2043); and
  - Total Passengers Boarding Buses on bus routes that use any part of the Proposed Scheme for each forecast year (2028, 2043).

6.3.3.1.1 Peak Hour People Movement along the Proposed Scheme

To determine the impact that the Proposed Scheme has on modal share in the direct study area as a result of its implementation, the weighted average number of people moved by each mode (Car, Bus, Active Modes) has been extracted from the ERM / LAM. The analysis compares the Do Minimum and Do Something scenarios both in the inbound and outbound direction in the AM and PM peak hours (8-9am, 5-6pm) for each forecast year (2028, 2043).

As outlined previously, the same demographic assumptions (population, employment levels) are included in both the Do Minimum and Do Something scenarios. The bus network and frequency assumptions are also the same in both scenarios and are in line with the BusConnects bus network proposals. It is acknowledged, therefore, that the assessment is conservative in terms of the level of people movement that is predicted in the Do Something scenario.

The Do Something scenario will facilitate opportunities to increase bus network capacity operating along the corridor due to the extensive priority provided. In addition to this, the significant segregation and safety improvements to walking and cycling infrastructure that is a key feature of the Proposed Scheme will further maximise the movement of people travelling sustainably along the corridor and will therefore cater for higher levels of future population and employment growth. In the absence of the delivery of the Proposed Scheme, growth along this key corridor would continue to contribute to increased congestion and operational issues on the road network. The Proposed scheme delivers a reliable alternative to car-based travel that can support future sustainable growth and provide a positive contribution towards reducing carbon emissions.

6.3.3.1.1.1 2028 AM Peak Hour People Movement

Diagram 6.3 illustrates the People Movement by mode travelling along the Proposed Scheme inbound towards the city centre during the AM Peak Hour in 2028.

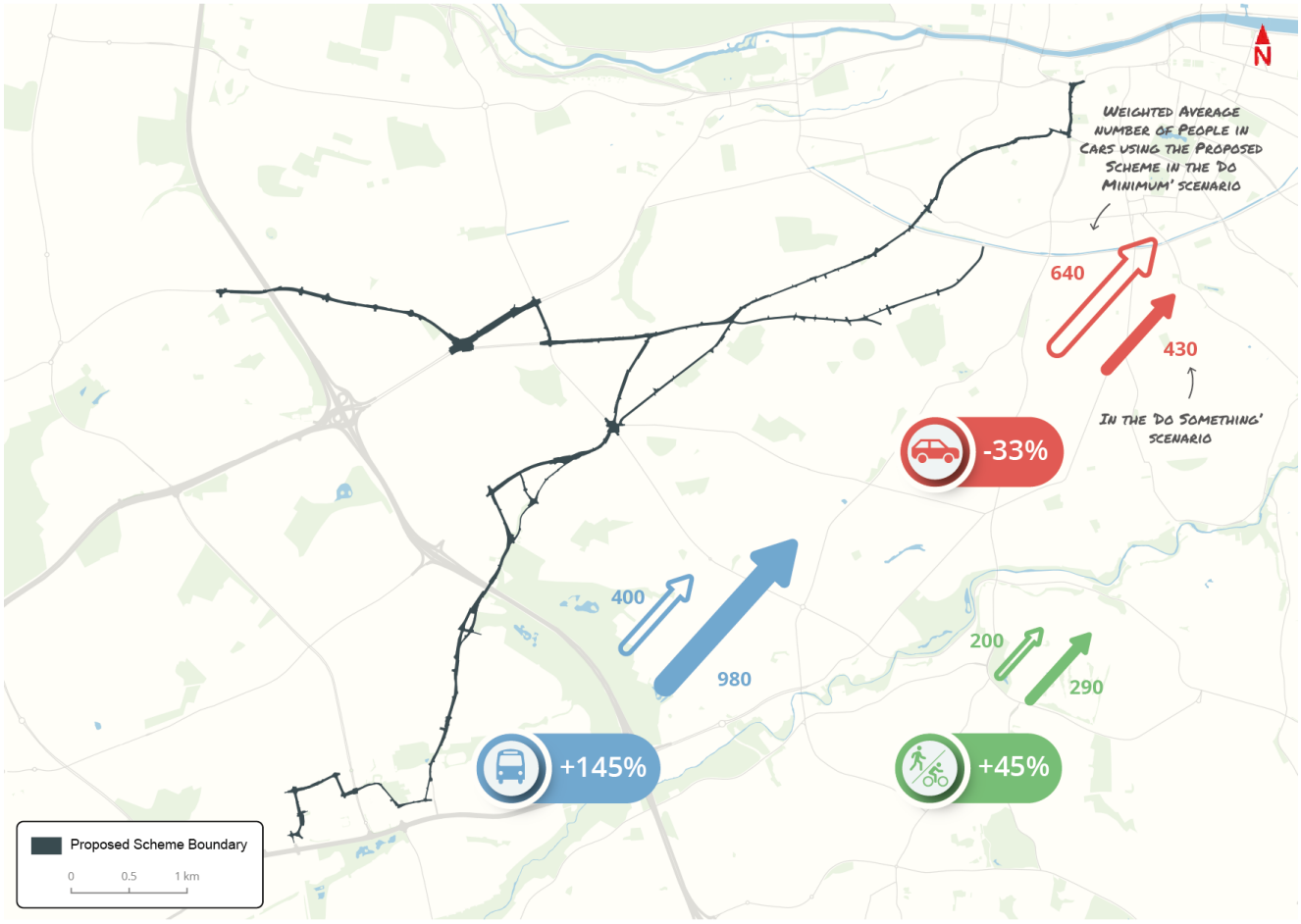

Diagram 6.3: People Movement by Mode travelling along the Proposed Scheme during 2028 AM Peak Hour

As indicated in Diagram 6.3, there is a reduction of 33% in the number of people travelling via car, an increase of 145% in the number of people travelling via bus and an increase of 45% in the number of people walking or cycling along the Proposed Scheme during the AM Peak Hour. It should be noted that the model predicts limited change in total walking trips between each scenario. This is due to the fact that walking trips in the Do Minimum scenario are also transferring to public transport and cycling due to the improved provision with any new walkers transferring from car replacing these trips.

The Proposed Scheme will facilitate a step change in the level of segregated cycling provision in comparison with existing conditions along the entire length of the corridor. The transport modelling undertaken, is therefore conservative in terms of the predicted cycling mode share. The Proposed Scheme has been designed to cater for much higher levels of cycling uptake and this will provide the opportunity for a significant increase in the movement

of people travelling sustainably along the corridor, which would otherwise not be achieved in the absence of the Proposed Scheme.

The contents of Table 6.39 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in an inbound direction towards the City Centre during the AM Peak Hour. The results indicate a 37% increase in people moved as a result of the Proposed Scheme and a 112% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.39: Modal Shift of 2028 AM Peak Hour along Proposed Scheme

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Inbound towards the City Centre	AM Peak Period	General Traffic	640	52%	430	25%	-210	-33%
		Public Transport	400	32%	980	58%	580	145%
		Walking	150	12%	140	8%	-10	-7%
		Cycling	50	4%	150	9%	100	200%
		Combined Walking/Cycling	200	16%	290	17%	90	45%
		Sustainable Modes Total	**600**	**48%**	**1,270**	**75%**	**670**	**112%**
		Total (All modes)	**1,240**	**100%**	**1,700**	**100%**	**460**	**37%**

6.3.3.1.1.2 2028 PM Peak Hour People Movement

Diagram 6.4 illustrates the People Movement by mode travelling along the Proposed Scheme outbound from the city centre during the PM Peak Hour.

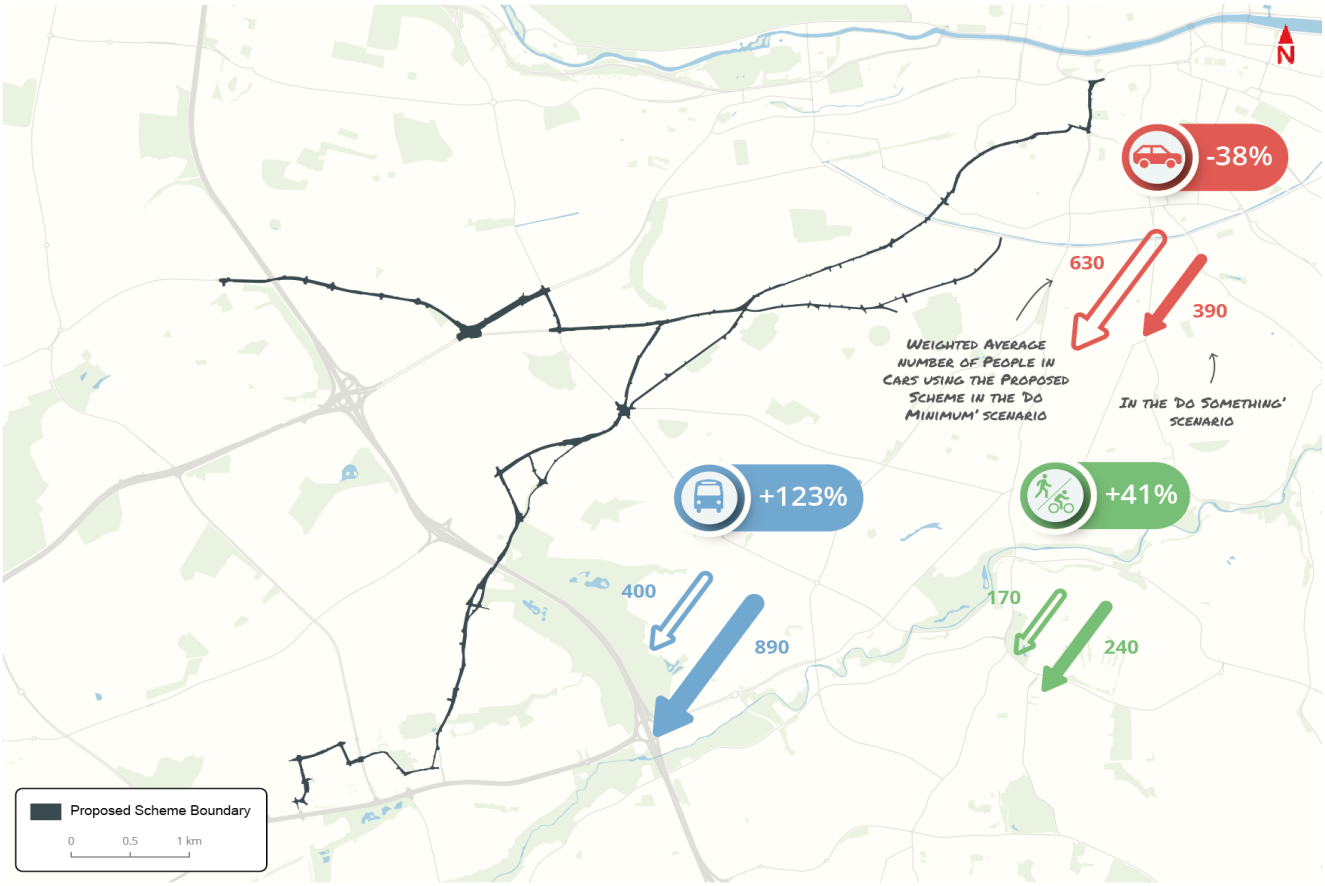

Diagram 6.4: People Movement by Mode travelling along the Proposed Scheme during 2028 PM Peak Hour

As indicated in Diagram 6.4, there is a reduction of 38% in the number of people travelling via car, an increase of 123% in the number of people travelling via bus and an increase in 41% in the number of people walking or cycling along the Proposed Scheme during the PM Peak Hour.

Table 6.40 outlines the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in an outbound direction from the City Centre during the PM Peak Hour. The results indicate 27% increase in people moved as a result of the Proposed Scheme and 98% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.40: Modal Shift of 2028 PM Peak Hour along Proposed Scheme

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Outbound from the City Centre	PM Peak Period	General Traffic	630	53%	390	26%	-240	-38%
		Public Transport	400	33%	890	59%	490	123%
		Walking	120	10%	110	7%	-10	-8%
		Cycling	50	4%	130	9%	80	160%
		Combined Walking/Cycling	170	14%	240	16%	70	41%
		Sustainable Modes Total	**570**	**48%**	**1,130**	**74%**	**560**	**98%**
		Total (All modes)	**1,200**	**48%**	**1,520**	**74%**	**320**	**27%**

6.3.3.1.1.3 2043 AM Peak Hour People Movement

Diagram 6.5 illustrates the People Movement by mode travelling along the Proposed Scheme inbound towards the city centre during the AM Peak Hour in 2043.

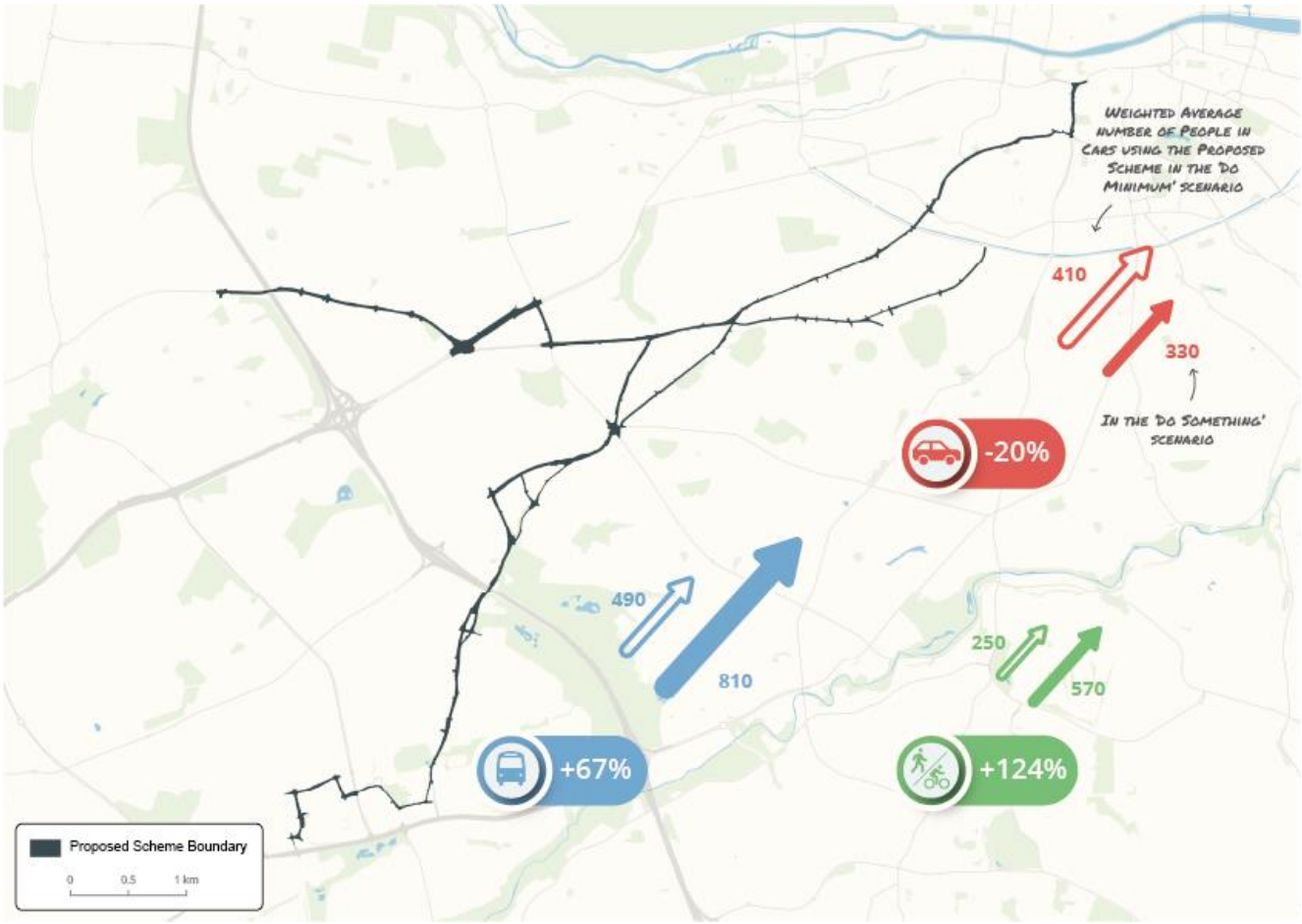

Diagram 6.5: People Movement by Mode travelling along the Proposed Scheme during 2043 AM Peak Hour

As indicated in Diagram 6.5, there is a decrease of 20% in the number of people travelling via car, an increase of 67% in the number of people travelling via bus and an increase of 124% in the number of people walking and cycling along the Proposed Scheme during the AM Peak Hour.

The contents of Table 6.41 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in an inbound direction towards the City Centre during the AM Peak Hour. The results indicate a 49% increase in people moved as a result of the Proposed Scheme and 87% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.41: Modal Shift of 2043 AM Peak Hour along Proposed Scheme

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Inbound towards the City Centre	AM Peak Period	General Traffic	411	36%	329	19%	-82	-20%
		Public Transport	486	42%	813	48%	327	67%
		Walking	156	14%	191	11%	35	23%
		Cycling	98	9%	377	22%	279	285%
		Combined Walking/Cycling	254	22%	568	33%	314	124%

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
		Sustainable Modes Total	740	64%	1,381	81%	641	87%
		Total (All modes)	1,151	100%	1,711	100%	559	49%

6.3.3.1.1.4 2043 PM Peak Hour People Movement

Diagram 6.6 illustrates the People Movement by mode travelling along the Proposed Scheme outbound from the city centre during the PM Peak Hour in 2043.

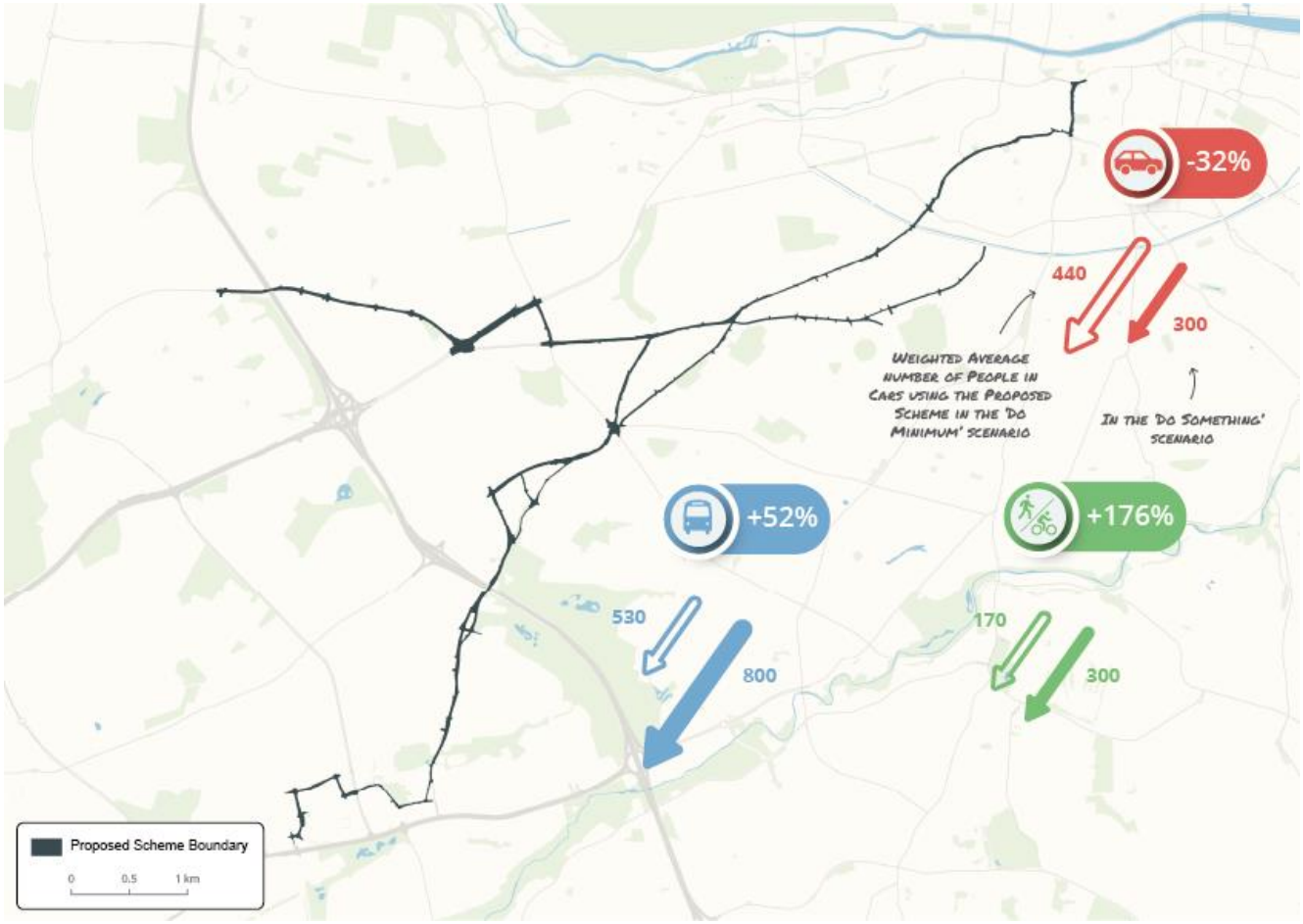

Diagram 6.6: People Movement by Mode travelling along the Proposed Scheme during 2043 PM Peak Hour

As indicated in Diagram 6.6, there is a decrease of 32% in the number of people travelling via car, an increase of 52% in the number of people travelling via bus and an increase of 176% in the number of people walking and cycling along the Proposed Scheme during the PM Peak Hour.

The contents of Table 6.42 outline the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in an outbound direction from the City Centre during the PM Peak Hour. The results indicate 38% increase in people moved as a result of the Proposed Scheme and 82% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.42: Modal Shift of 2043 PM Peak Hour along Proposed Scheme

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Outbound from the City Centre	PM Peak Period	General Traffic	440	39%	300	19%	-141	-32%
		Public Transport	525	46%	799	51%	274	52%
		Walking	86	8%	147	9%	61	72%
		Cycling	84	7%	320	20%	236	282%
		Combined Walking/Cycling	169	15%	467	30%	297	176%
		Sustainable Modes Total	**694**	**61%**	**1,266**	**81%**	**572**	**82%**
		Total (All modes)	**1,134**	**100%**	**1,565**	**100%**	**431**	**38%**

6.3.3.1.2 People Movement by Bus

The following section presents the ERM demand outputs for People Movement by Bus in terms of passenger loadings along the corridor. The results indicate that the improvements in bus priority infrastructure with the Proposed Scheme in place show a substantial increase in Bus patronage during the peak hours.

6.3.3.1.2.1 2028 AM Peak Hour Bus Passengers

Diagram 6.7 and Diagram 6.8 present the passenger loading profile comparing the Do Minimum and Do Something scenarios in the AM Peak Hour in the inbound direction in 2028.

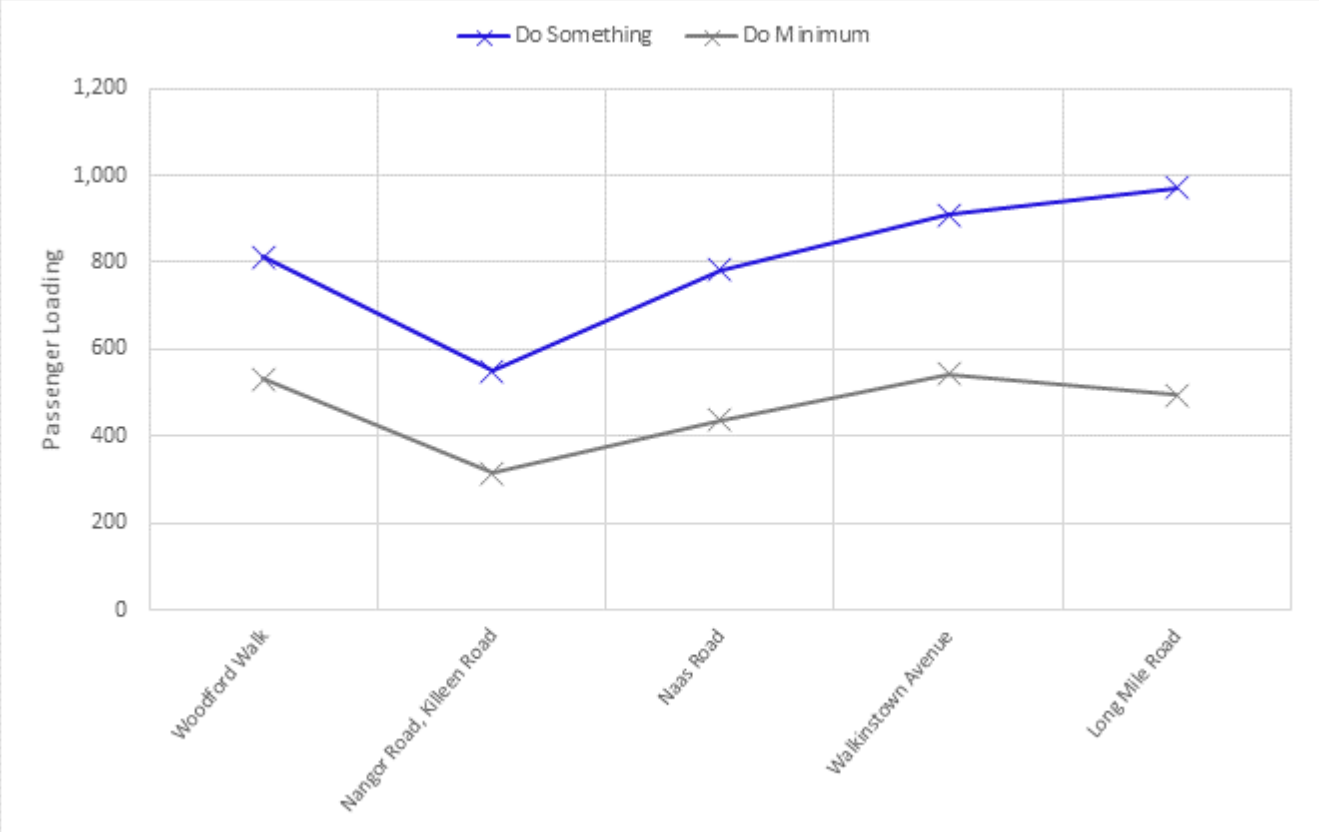

Diagram 6.7: 2028 AM Peak Hour Passenger Volume Along Proposed Scheme (inbound direction – Clondalkin to Drimnagh)

Diagram 6.7 shows higher levels of bus passenger loadings along the Clondalkin to Drimnagh section of the Proposed Scheme with a peak on the Long Mile Road, where the volume of passengers reaches 950 passengers in the AM Peak hour, compared to approximately 500 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along this section of the Proposed Scheme with approximately 200 to 500 additional users on the corridor, compared to the Do Minimum scenario.

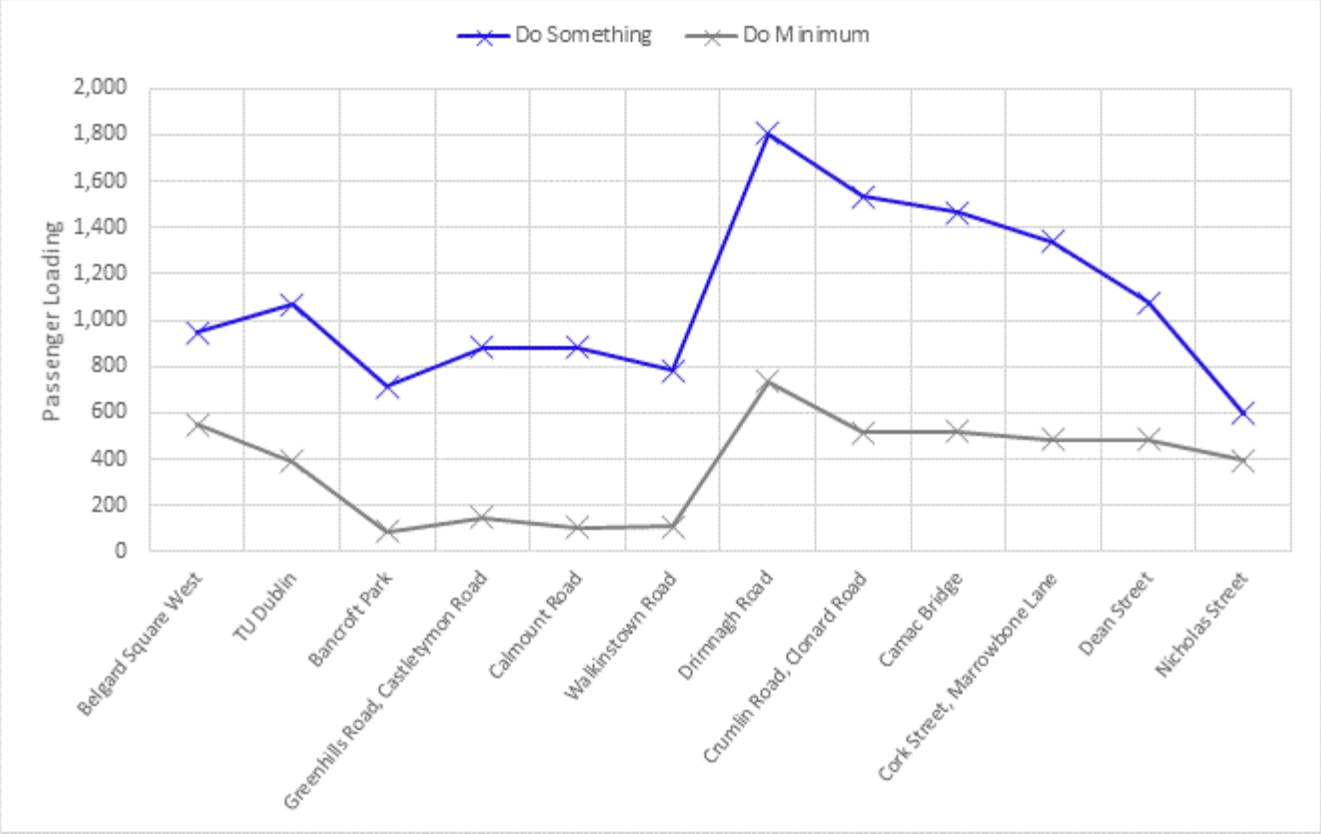

Diagram 6.8: 2028 AM Peak Hour Passenger Volume Along Proposed Scheme (inbound direction – Tallaght to City Centre)

Diagram 6.8 shows higher levels of bus passenger loadings along the Tallaght to City Centre section of the Proposed Scheme with a peak on Drimnagh Road where the two corridors meet and the D Spine services converge (D1 and D3 services combine with the D2, D4 and D5 services from this point). The volume of passengers reaches 1,800 passengers in the AM Peak hour, compared to approximately 700 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along this section of the Proposed Scheme with approximately 500 to 1,000 additional users on most of the corridor, compared to the Do Minimum scenario.

6.3.3.1.2.2 2043 AM Peak Hour Bus Passengers

Diagram 6.9 and Diagram 6.10 present the passenger loading profile comparing the Do Minimum and Do Something scenarios in the AM Peak Hour in the inbound direction in 2043.

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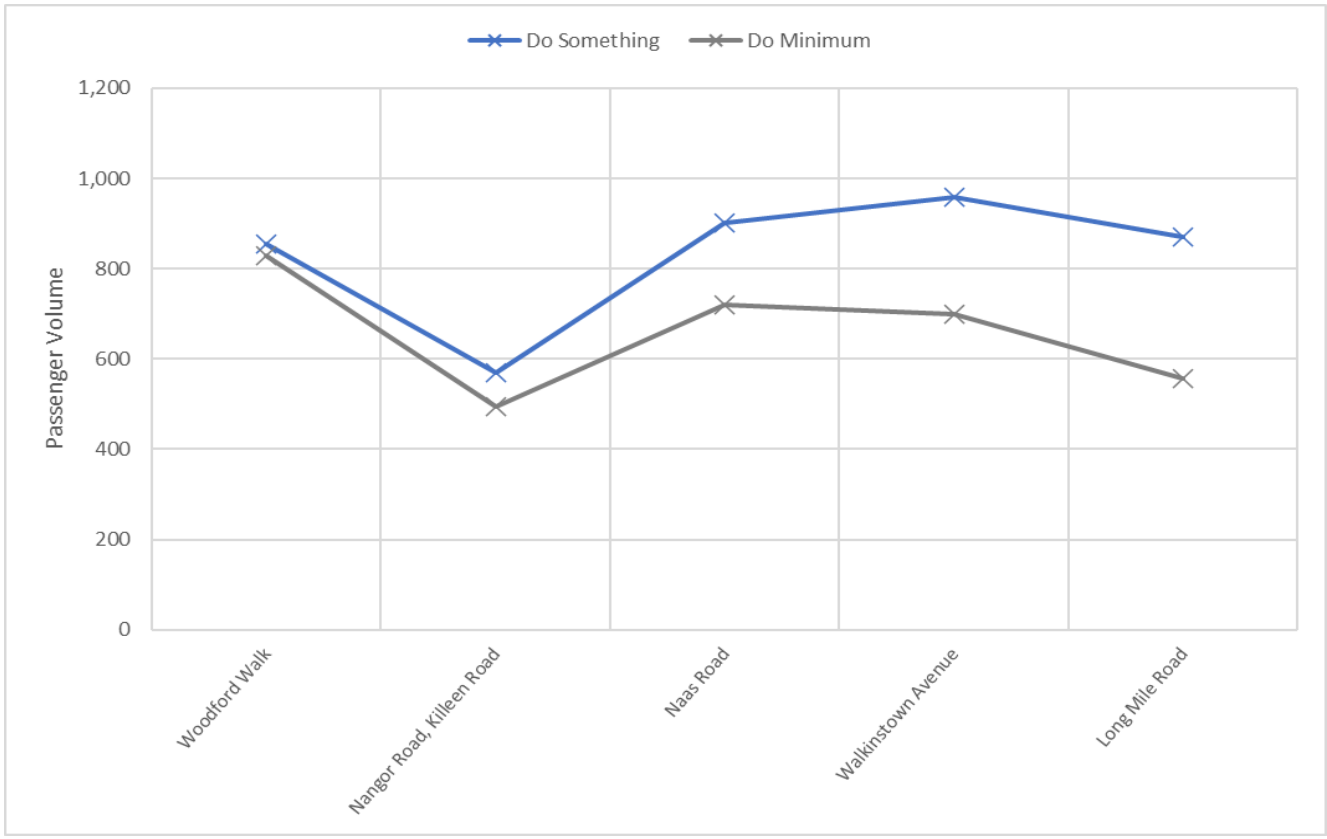

Diagram 6.9: 2043 AM Peak Hour Passenger Volume Along Proposed Scheme (inbound direction – Clondalkin to Drimnagh)

Diagram 6.9 shows higher levels of bus passenger loadings along the Clondalkin to Drimnagh section of the Proposed Scheme with a peak loading on the Long Mile Road, where the volume of passengers reaches 900 passengers in the AM Peak hour, compared to approximately 700 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along this section of the Proposed Scheme with approximately 200 to 400 additional users on the corridor, compared to the Do Minimum scenario.

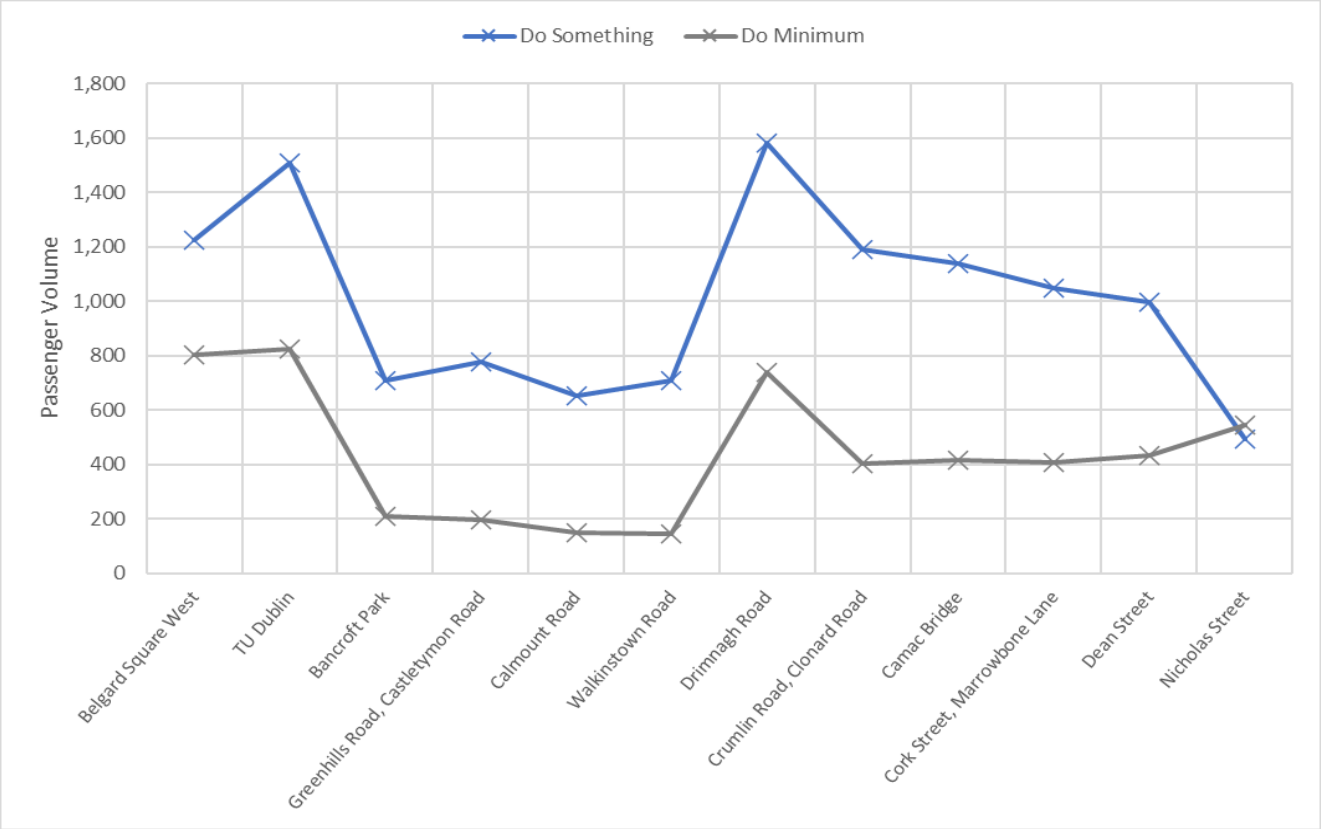

Diagram 6.10: 2043 AM Peak Hour Passenger Volume Along Proposed Scheme (inbound direction – Tallaght to City Centre)

Diagram 6.10 shows higher levels of bus passenger loadings along the Tallaght to City Centre section of the Proposed Scheme with a peak on Drimnagh Road where the two corridors meet and the D Spine services converge (D1 and D3 services combine with the D2, D4 and D5 services from this point). The volume of passengers reaches 1,600 passengers in the AM Peak hour, compared to approximately 850 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along this section of the Proposed Scheme with approximately 600 to 1,200 additional users on most of the corridor, compared to the Do Minimum scenario.

6.3.3.1.2.3 2028 PM Peak Hour Bus Passengers

Diagram 6.11 and Diagram 6.12 present the passenger loading profile comparing the Do Minimum and Do Something scenarios in the PM Peak Hour in the inbound direction in 2028.

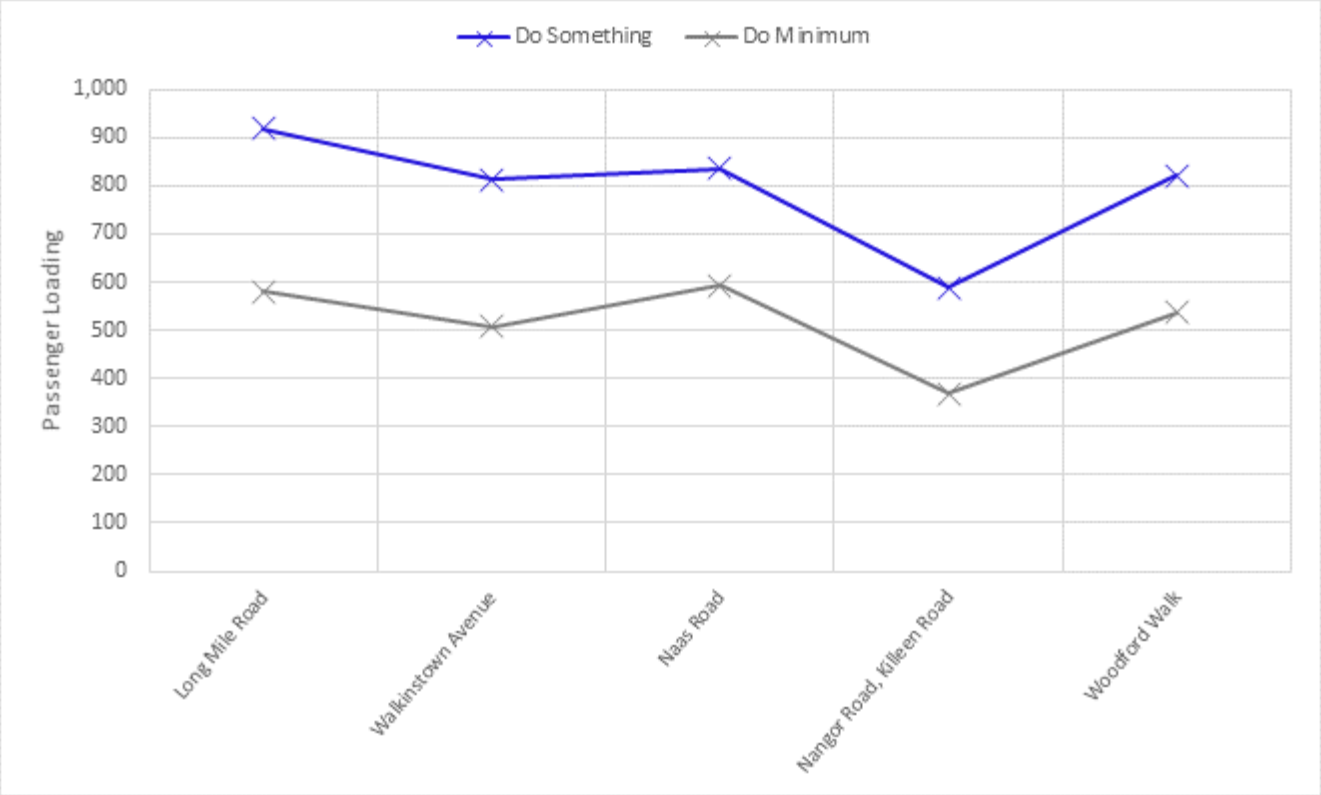

Diagram 6.11: 2028 PM Peak Hour Passenger Volume Along Proposed Scheme (outbound direction – Clondalkin to Drimnagh)

Diagram 6.11 shows higher levels of bus passenger loadings along the Clondalkin to Drimnagh section of the Proposed Scheme with a peak on the Long Mile Road, where the volume of passengers reaches 900 in the PM Peak hour, compared to approximately 600 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along this section of the Proposed Scheme with approximately 300 to 400 additional users on the corridor, compared to the Do Minimum scenario.

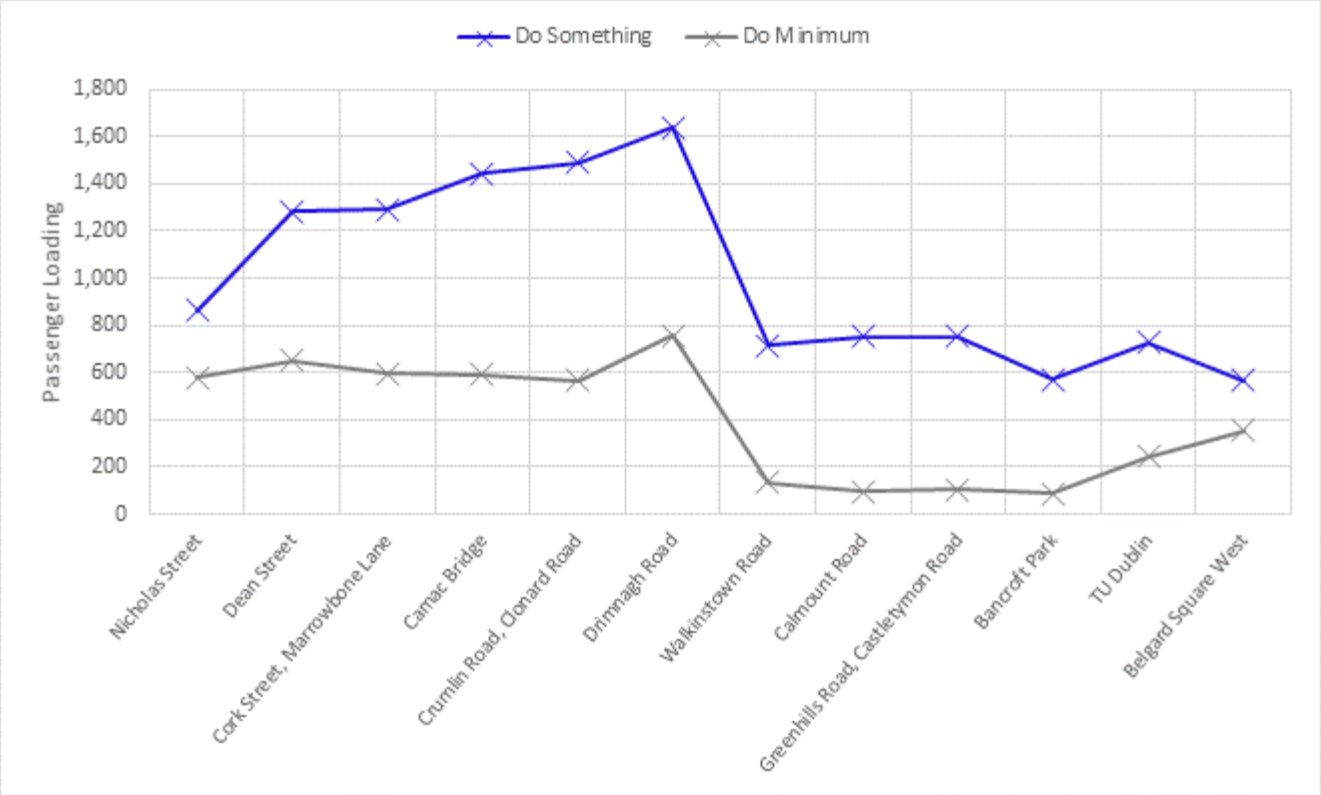

Diagram 6.12: 2028 PM Peak Hour Passenger Volume Along Proposed Scheme (outbound direction – Tallaght to City Centre)

Diagram 6.12 shows higher levels of bus passenger loadings along the Tallaght to City Centre section of the Proposed Scheme with a peak on Drimnagh Road where the two corridors meet and the D Spine services converge (D1 and D3 services combine with the D2, D4 and D5 services from this point). The volume of passengers reaches 1,600 passengers in the PM Peak hour, compared to approximately 750 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along this section of the Proposed Scheme with approximately 500 to 900 additional users on most of the corridor, compared to the Do Minimum scenario.

6.3.3.1.2.4 2043 PM Peak Hour Bus Passengers

Diagram 6.13 and Diagram 6.14 present the passenger loading profile comparing the Do Minimum and Do Something scenarios in the PM Peak Hour in the outbound direction in 2043.

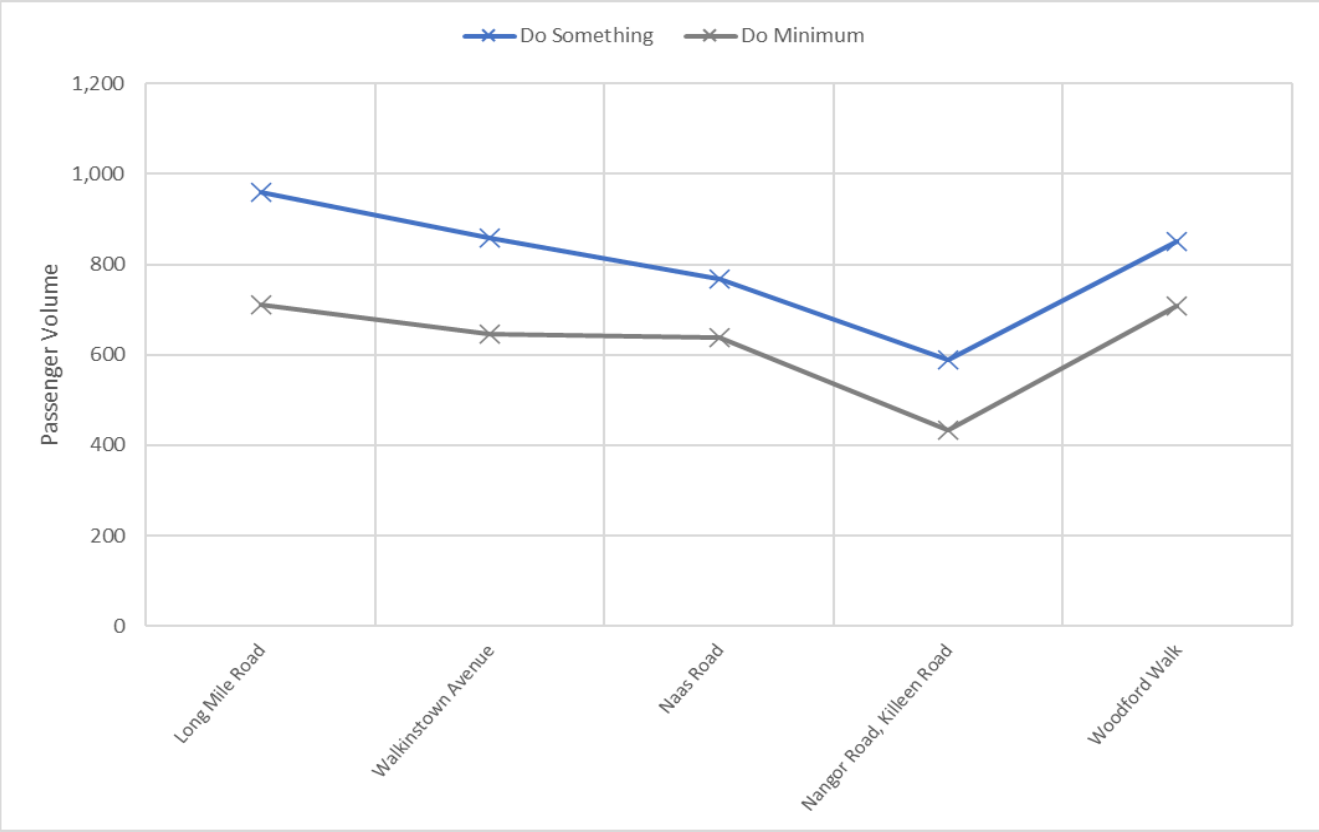

Diagram 6.13: 2043 PM Peak Hour Passenger Volume Along Proposed Scheme (outbound direction – Clondalkin to Drimnagh)

Diagram 6.13 shows higher levels of bus passenger loadings along the Clondalkin to Drimnagh section of the Proposed Scheme with a peak on the Long Mile Road, where the volume of passengers reaches 950 in the PM Peak hour, compared to approximately 700 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along this section of the Proposed Scheme with approximately 200 to 300 additional users on the corridor, compared to the Do Minimum scenario.

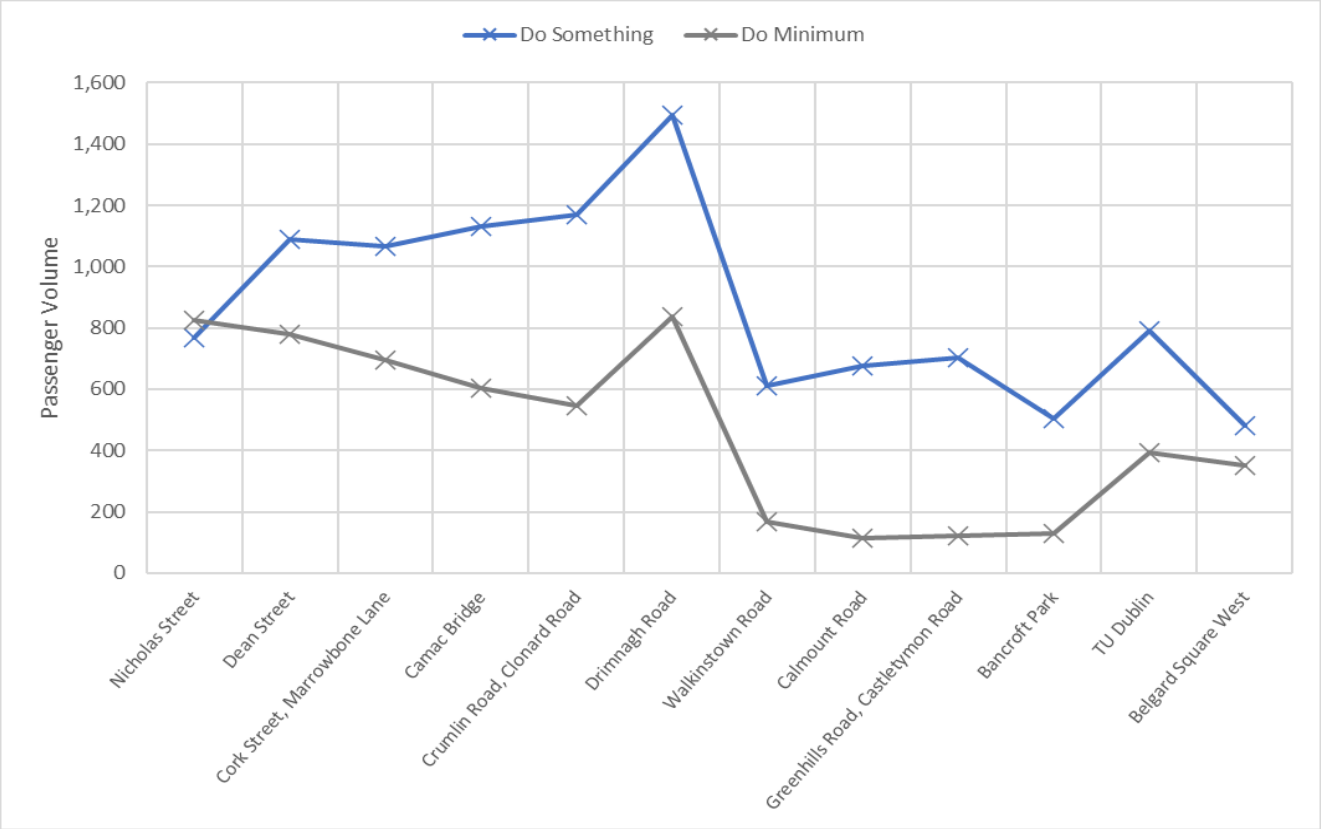

Diagram 6.14: 2043 PM Peak Hour Passenger Volume Along Proposed Scheme (outbound direction – Tallaght to City Centre)

Diagram 6.14 shows higher levels of bus passenger loadings along the Tallaght to City Centre section of the Proposed Scheme with a peak on Drimnagh Road where the two corridors meet and the D Spine services converge (D1 and D3 services combine with the D2, D4 and D5 services from this point). The volume of passengers reaches 1,500 passengers in the PM Peak hour, compared to approximately 900 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along this section of the Proposed Scheme with approximately 600 to 1,000 additional users on most of the corridor, compared to the Do Minimum scenario.

6.3.3.1.2.5 Bus Boardings

Since many bus services commence and end further away from the direct alignment of the Proposed Scheme, an additional assessment has been undertaken to compare the Do Minimum and Do Something total passengers boarding on bus routes that use any part of the Proposed Scheme (including those stops not directly on the Proposed Scheme) in both 2028 and 2043 forecast years. The results for the 2028 Opening Year scenario are indicated in Table 6.43.

Table 6.43: 2028 Peak Hour Bus Boardings on Routes using the Proposed Scheme (inc. boarding at stops outside Proposed Scheme)

Time Period	Do Minimum (no. of boardings)	Do Something (no. of boardings)	Difference in No. of Boardings	Difference (%)
AM Peak Hour	20,730	23,070	2,340	11.3%
PM Peak Hour	17,710	19,710	2,000	11.3%

The contents of Table 6.43 shows that there will be a 11.3% increase in people boarding bus routes which use the Proposed Scheme during the AM Peak Hour. This represents an addition of 2,340 passengers in the AM Peak hour.

In the PM Peak hour, there will be a 11.3% increase in people boarding bus routes which use the Proposed Scheme, representing an additional 2,000 passengers.

The comparison results for the 2043 Design Year scenario are indicated in Table 6.44.

Table 6.44: 2043 Peak Hour Bus Boardings on Routes using the Proposed Scheme (inc. boarding at stops outside Proposed Scheme)

Time Period	Do Minimum (no. of boardings)	Do Something (no. of boardings)	Difference in No. of Boardings	Difference (%)
AM Peak Hour	21,874	23,282	1,409	6.4%
PM Peak Hour	16,549	22,908	6,360	38.4%

The contents of Table 6.44 shows that there will be a 6.4%% increase in people boarding bus routes which use the Proposed Scheme during the AM Peak Hour. This represents an addition of 1,409 passengers in the AM Peak hour.

In the PM Peak hour, there will be a 38.4%%% increase in people boarding bus routes which use the Proposed Scheme, representing an additional 6,360 passengers.

6.3.3.1.3 People Movement – Overall Impact

The significance of impact for the movement of People Movement by sustainable modes with the Proposed Scheme in place has been appraised qualitatively, taking into account the changes in mode share, demand changes by mode along the Proposed Scheme as well as bus usage presented above. The Proposed Scheme has been adjudged to deliver a **High Positive impact** in terms of People Movement by sustainable modes. The Proposed Scheme can be shown to deliver significant improvements in people movement by sustainable modes along the Proposed Scheme corridor, particularly by bus, with reductions in car mode share due to the enhanced sustainable mode provision.

The findings of the People Movement assessment demonstrate that the Proposed Scheme aligns fully with the aims and objectives of the CBC Infrastructure Works, to 'provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor'.

6.3.3.1.4 Operational Impacts for Bus Passengers and Operators

6.3.3.1.4.1 Overview

The impacts of the Proposed Scheme for Bus Users and Operators have been assessed based on journey times and reliability metrics extracted from the micro-simulation model of the corridor.

Due to the stochastic nature of the micro-simulation software, model outputs based on the average of 20 simulation seed runs (minimum of 5 recommended as per Transport for London (2010) Traffic Modelling Guidelines) have been calculated between the point of Proposed Scheme entry and exit and compared against the corresponding Do Minimum scenarios.

The results for bus services using the Clondalkin to Drimnagh and Tallaght to City Centre sections of the Proposed Scheme have been presented separately so that bus services using the whole length of each section of the Proposed Scheme can be assessed.

Clondalkin to Drimnagh Section

6.3.3.1.4.2 Bus Journey Time and Reliability changes as a result of the Proposed Scheme

To give an overview of how the Proposed Scheme will impact on bus journey times along the corridor, outputs for the D1 service, which traverses the length of the New Nangor Road-Long Mile Road-Walkinstown Avenue-Long Mile Road section of the Proposed Scheme, have been extracted from the model. As outlined in Section 6.4.3.1, the assessment is based in the context of the full implementation of the BusConnects network re-design in both

the Do Minimum and Do Something scenarios, with this section of the Proposed Scheme servicing the D-Spine services.

Inbound Direction

Average journey times for the inbound D1 service in 2028 Opening Year and in 2043 Design Year can be seen in Table 6.45 A breakdown of the changes in average journey times for all other bus services using the Proposed Scheme can be found in Appendix A6.4.3 (Average Bus Journey Times).

Table 6.45: D1 Service Bus Average Journey Times (Inbound Direction)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	15.6	10.9	-4.7	-30%
2028 PM	15.4	10.7	-4.7	-31%
2043 AM	14.4	10.8	-3.6	-25%
2043 PM	16.0	10.8	-5.2	-33%

Additional information regarding the range of journey times (minimum, maximum, average and standard deviation) for inbound D1 buses in the Do Minimum (red) and Do Something (blue) can be seen in Table 6.46 and Diagram 6.15. Each dot in the diagram represents the journey time for each individual bus in each scenario. A larger range of journey times are an indication of lower levels of reliability in a given scenario.

Table 6.46: D1 Service – Range of Journey Times (Inbound Direction)

Peak Hour	Do Minimum				Do Something			
	MIN	MAX	AVG	STDEV	MIN	MAX	AVG	STDEV
2028 AM	12.8	18.7	15.6	1.4	9.3	12.8	10.9	0.7
2028 PM	13.1	18.8	15.4	1.3	9.1	12.3	10.7	0.6
2043 AM	12.0	17.3	14.4	1.3	9.0	12.6	10.8	0.7
2043 PM	13.5	20.0	16.0	1.5	9.1	12.6	10.8	0.7

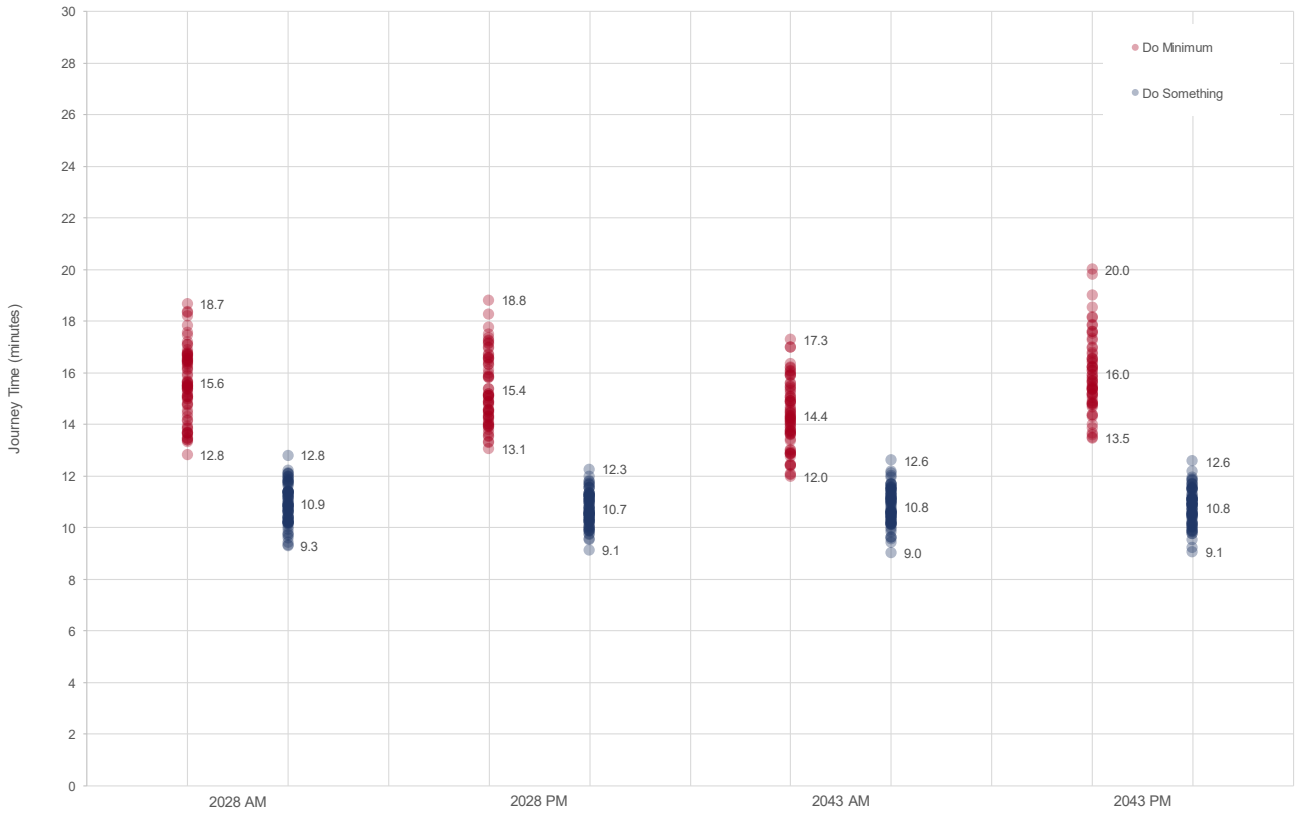

Diagram 6.15: D1 Bus Journey Times (Inbound Direction)

Based on the results presented in Table 6.45 the Proposed Scheme will deliver average inbound journey time savings for D1 service bus passengers of up to 4.7 minutes (30%) in 2028 (AM) and 3.6 minutes (25%) in 2043 (AM). Furthermore, results presented in Diagram 6.15 suggest an improvement in bus journey time reliability in all four scenarios, as indicated by the reduced ranges of journey times achieved with the individual durations focused much closer to the average journey times (lower standard deviation) in the Do Something scenario (blue dots) with the Proposed Scheme in place compared to the more dispersed range in the Do Minimum scenario (red dots).

Note that the variation in journey times shown above are based on one set of predicted flows for the Do Minimum and Do Something scenario. Traffic flows fluctuate daily which would mean that the variation in journey times would be much greater in the Do Minimum with any increases in traffic flows compared to the protection of journey time reliability provided by the bus priority measures that comprise the Proposed Scheme.

A comparison of average Do Minimum and Do Something inbound journey times are also illustrated in the cumulative time-distance graphs shown in Diagram 6.16 to Diagram 6.19. Note that the cumulative time-distance graphs are also based on the D1 service, which captures the full extent of this section of the Proposed Scheme to Walkinstown Road.

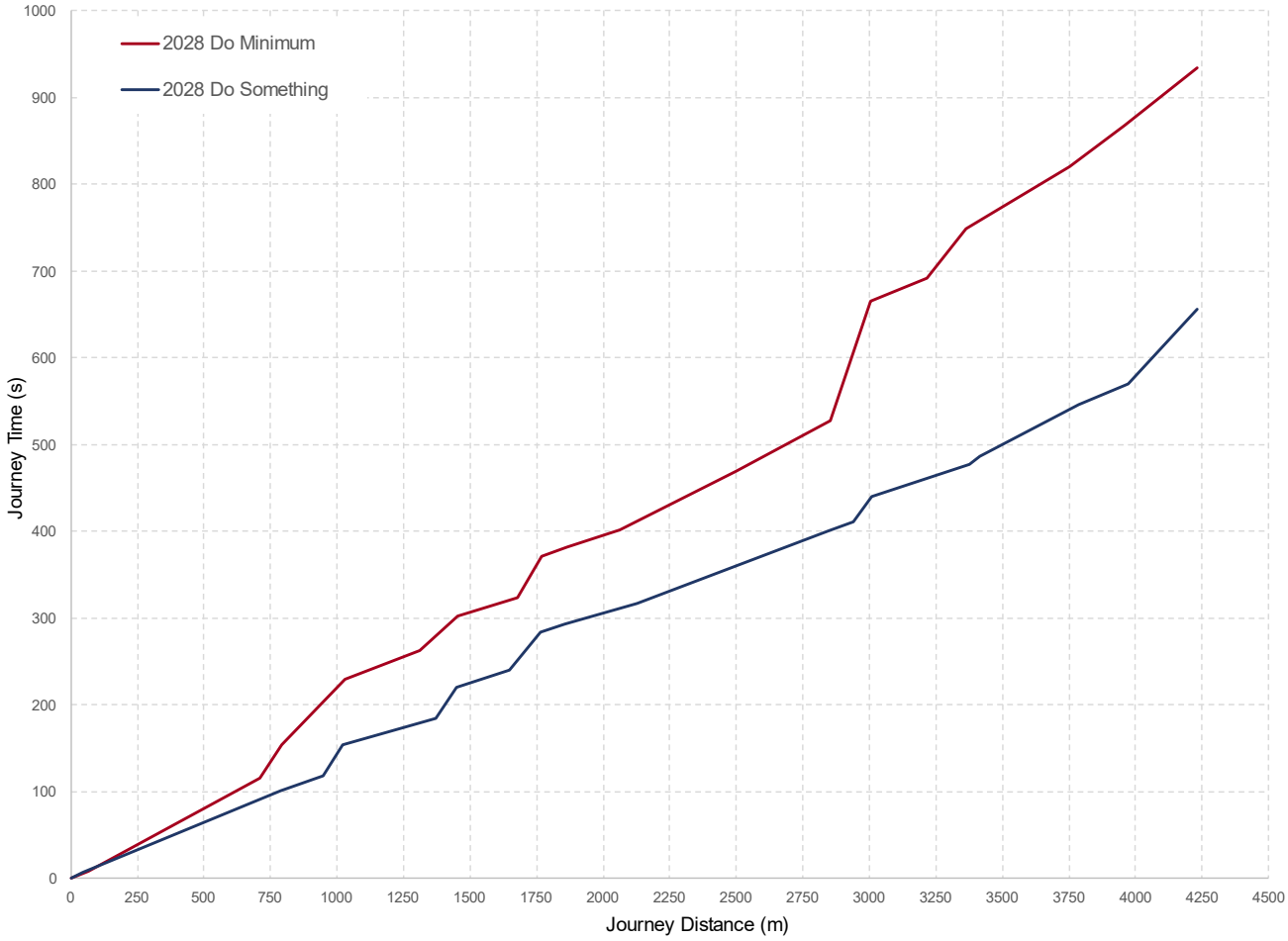

Diagram 6.16: D1 Bus Journey Time (2028 AM, Inbound)

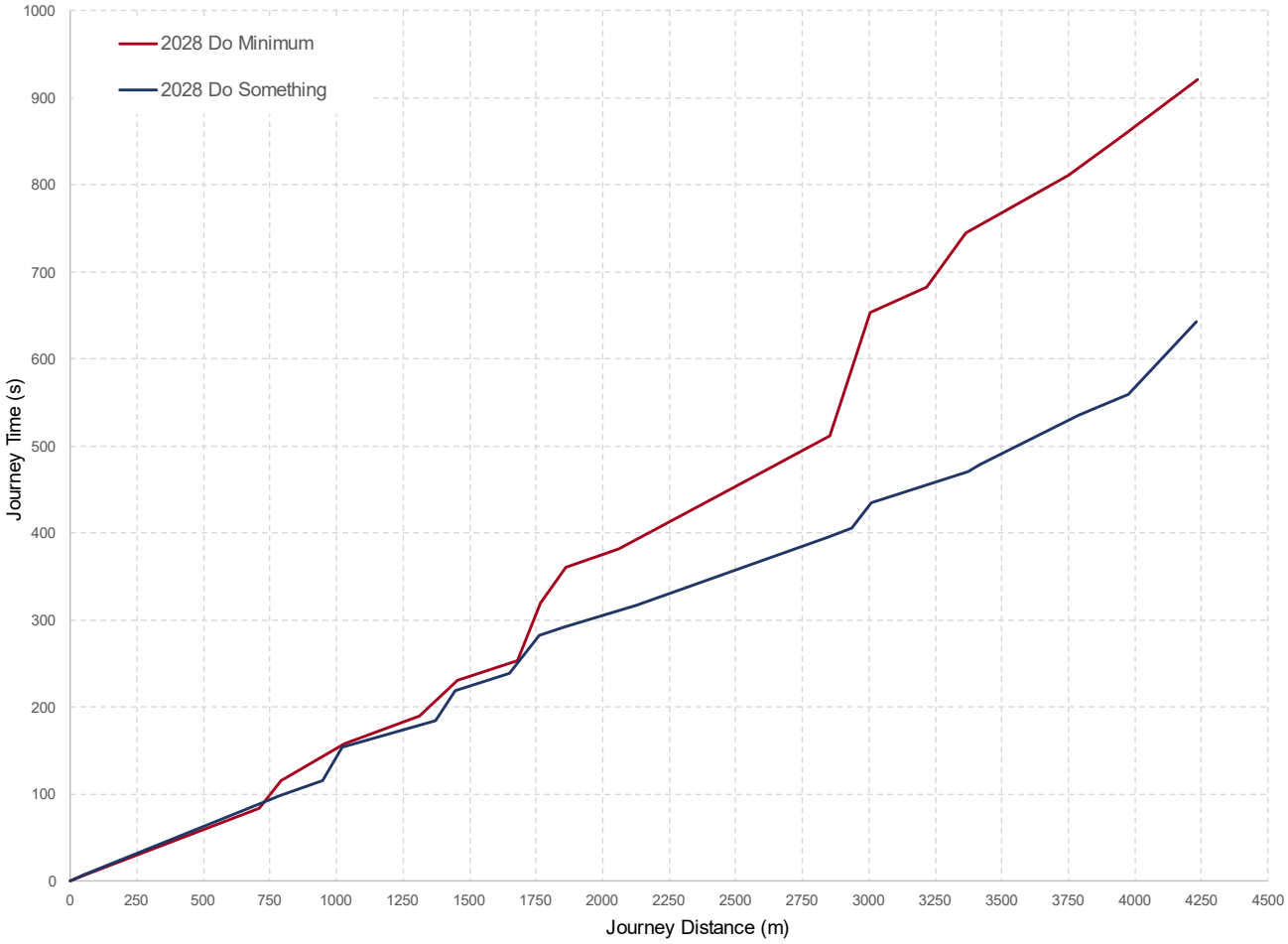

Diagram 6.17: D1 Bus Journey Time (2028 PM, Inbound)

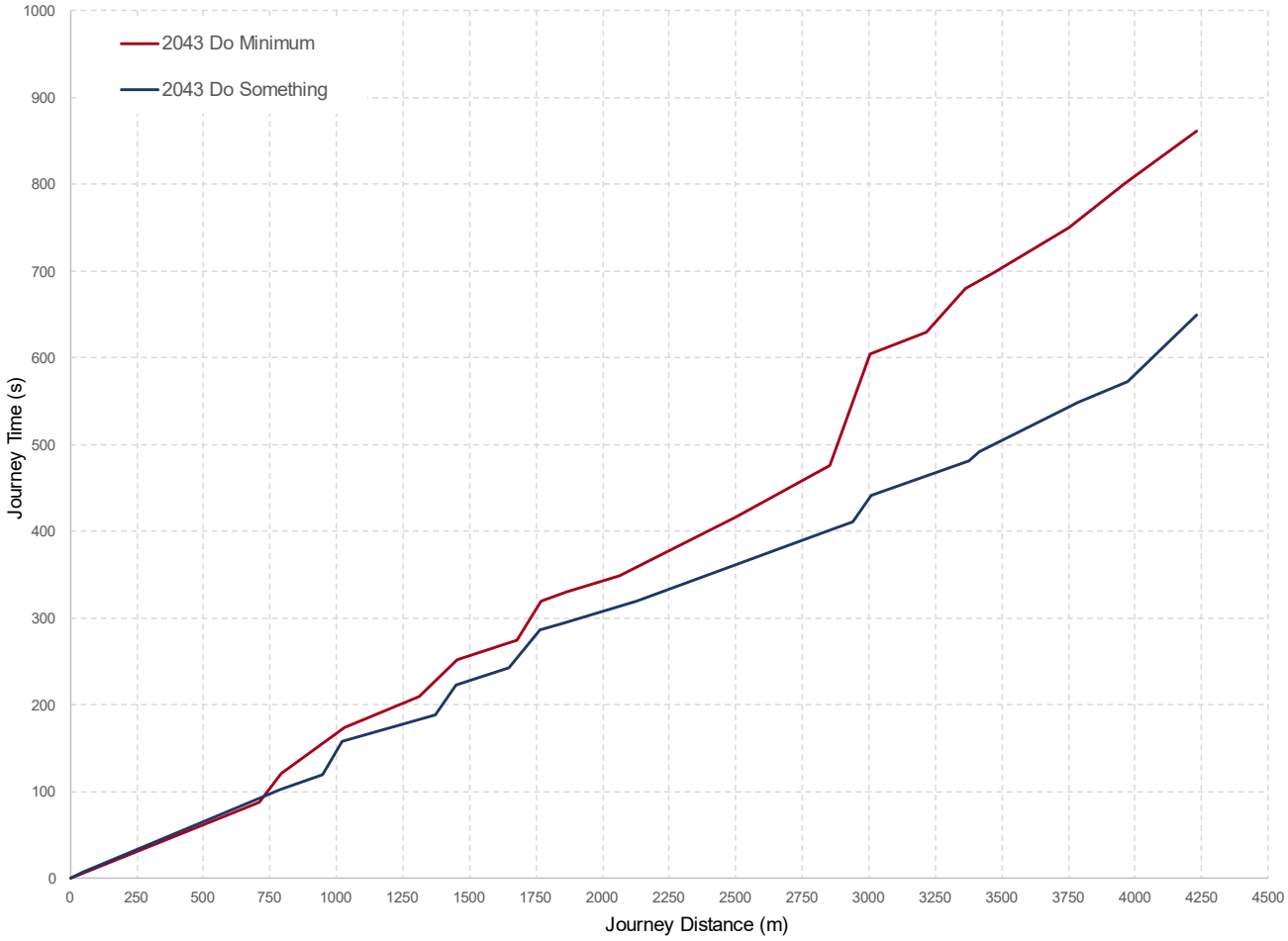

Diagram 6.18: D1 Bus Journey Time (2043 AM, Inbound)

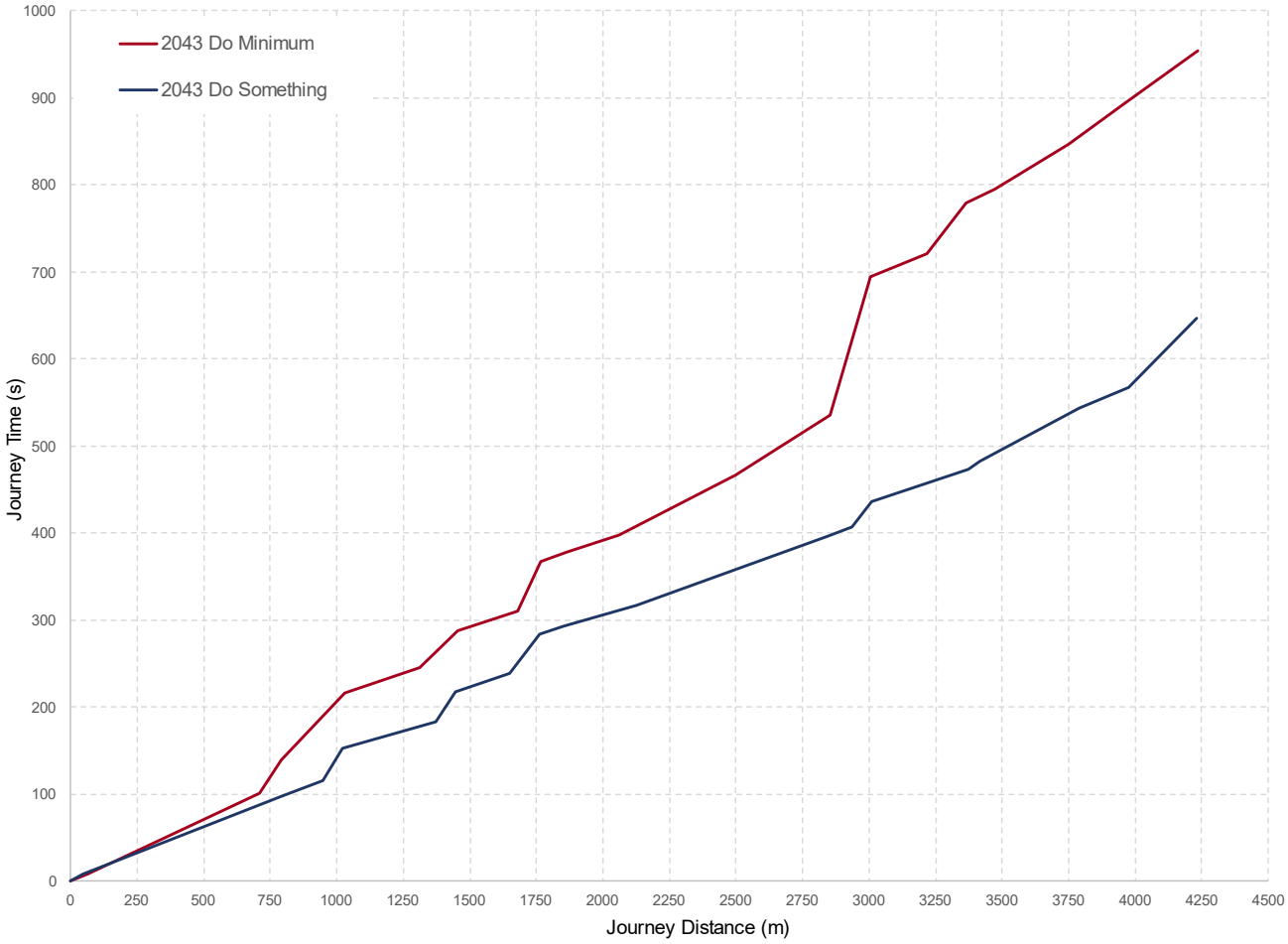

Diagram 6.19: D1 Bus Journey Time (2043 PM, Inbound)

Based on the results presented in Diagram 6.16 to Diagram 6.19 the Proposed Scheme is expected to deliver journey time savings, most notably on the section of New Nangor Road from the Riverview Business Centre junction and Naas Road at the Walkinstown Avenue junction. This is due to the introduction of additional sections of inbound bus lane, for example, on Walkinstown Avenue, that provides an uninterrupted bus lane as well as bus priority 'hurry calls' signalling (use of traffic signal plans to give buses priority ahead of general traffic) offered to mainline buses as part of the Proposed Scheme. Unlike in the existing configuration, the Proposed Scheme offers a dedicated bus lane for buses turning right at the Walkinstown Avenue junction. This coupled with the bus priority 'hurry calls' signalling for this movement, the design offers considerable benefits at this location.

Outbound Direction

Average journey times for the outbound D1 service in 2028 Opening Year and in 2043 Design Year can be seen in Table 6.47. A breakdown of the changes in average journey times for all other bus services using this section of the Proposed Scheme can be found in Appendix A6.4.3 (Average Bus Journey Times).

Table 6.47: D1 Service Bus Journey Times (Outbound Direction)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	15.0	12.9	-2.1	-14%
2028 PM	15.0	12.9	-2.1	-14%
2043 AM	14.7	13.2	-1.5	-10%
2043 PM	14.5	12.9	-1.6	-11%

Additional information regarding the range of journey times (minimum, maximum, average and standard deviation) for outbound D1 buses in the Do Minimum (red) and Do Something (blue) can be seen in Table 6.47 and Table 6.48. Each dot represents the journey time for each individual bus in each scenario. A larger range of journey times are an indication of lower levels of reliability.

Table 6.48: D1 Service – Range of Journey Times (Outbound Direction)

Peak Hour	Do Minimum				Do Something			
	MIN	MAX	AVG	STDEV	MIN	MAX	AVG	STDEV
2028 AM	12.2	18.1	15.0	1.3	10.5	15.5	12.9	1.0
2028 PM	12.2	18.7	15.0	1.2	10.6	15.2	12.9	0.9
2043 AM	12.1	17.6	14.7	1.2	11.3	15.4	13.2	0.9
2043 PM	12.1	17.3	14.5	1.2	10.5	15.4	12.9	0.9

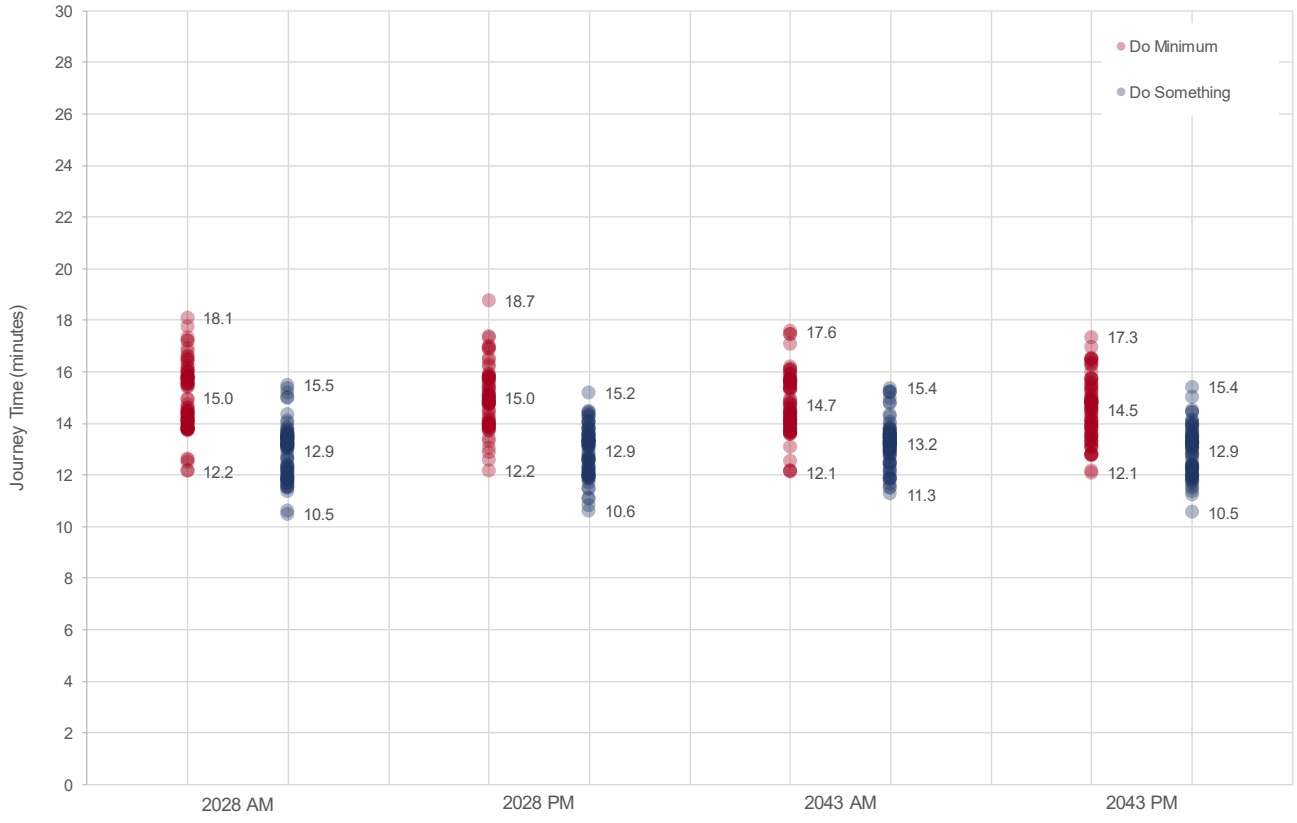

Diagram 6.20: D1 Bus Journey Times (Outbound Direction)

Based on the results presented in Table 6.48, the Proposed Scheme will deliver average outbound journey time savings for D1 service bus passengers of up to 2.1 minutes (14%) in 2028 (PM) and 1.6 minutes (11%) in 2043 (PM). Furthermore, results presented in Diagram 6.21:suggest an improvement in bus journey time reliability in all four scenarios as indicated by the reduced ranges of journey times achieved with the durations focused much closer to the average journey times (lower standard deviation) in the Do Something scenario (blue dots) with the Proposed Scheme in place compared to the more dispersed range in the Do Minimum scenario (red dots).

Note that the variation in journey times shown above are based on one set of predicted flows for the Do Minimum and Do Something scenario. Traffic flows fluctuate daily which would mean that the variation in journey times would be much greater in the Do Minimum with any increases in traffic flows compared to the protection of journey time reliability provided by the bus priority measures that comprise the Proposed Scheme.

A comparison of average Do Minimum and Do Something outbound journey times are also illustrated in the cumulative time-distance graphs shown Diagram 6.22 to Diagram 6.23. As above, the cumulative time-distance graphs are also based on the D1 service, which captures the full extent of the Proposed Scheme to Woodford Walk.

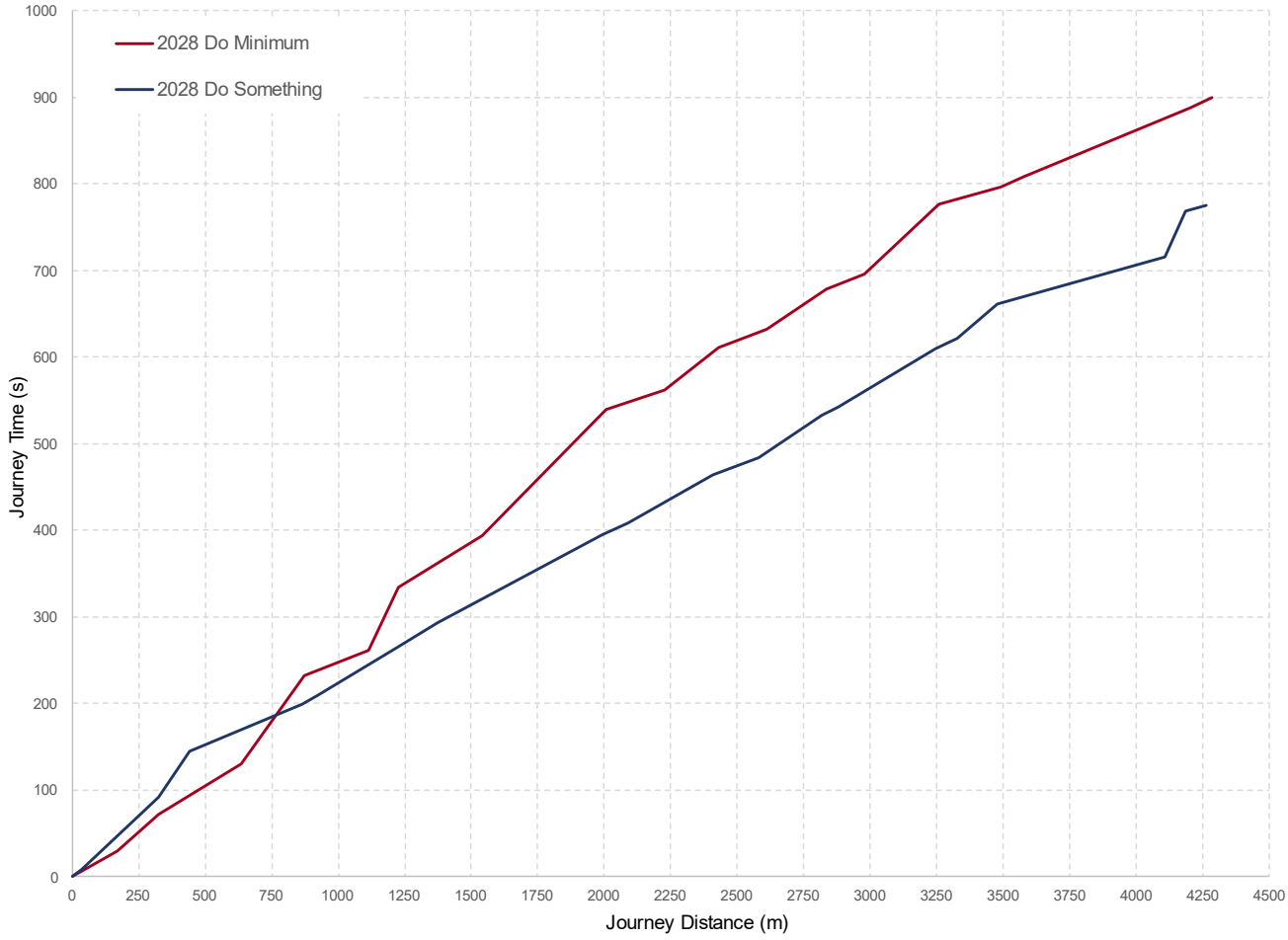

Diagram 6.24: D1 Bus Journey Time (2028 AM, Outbound)

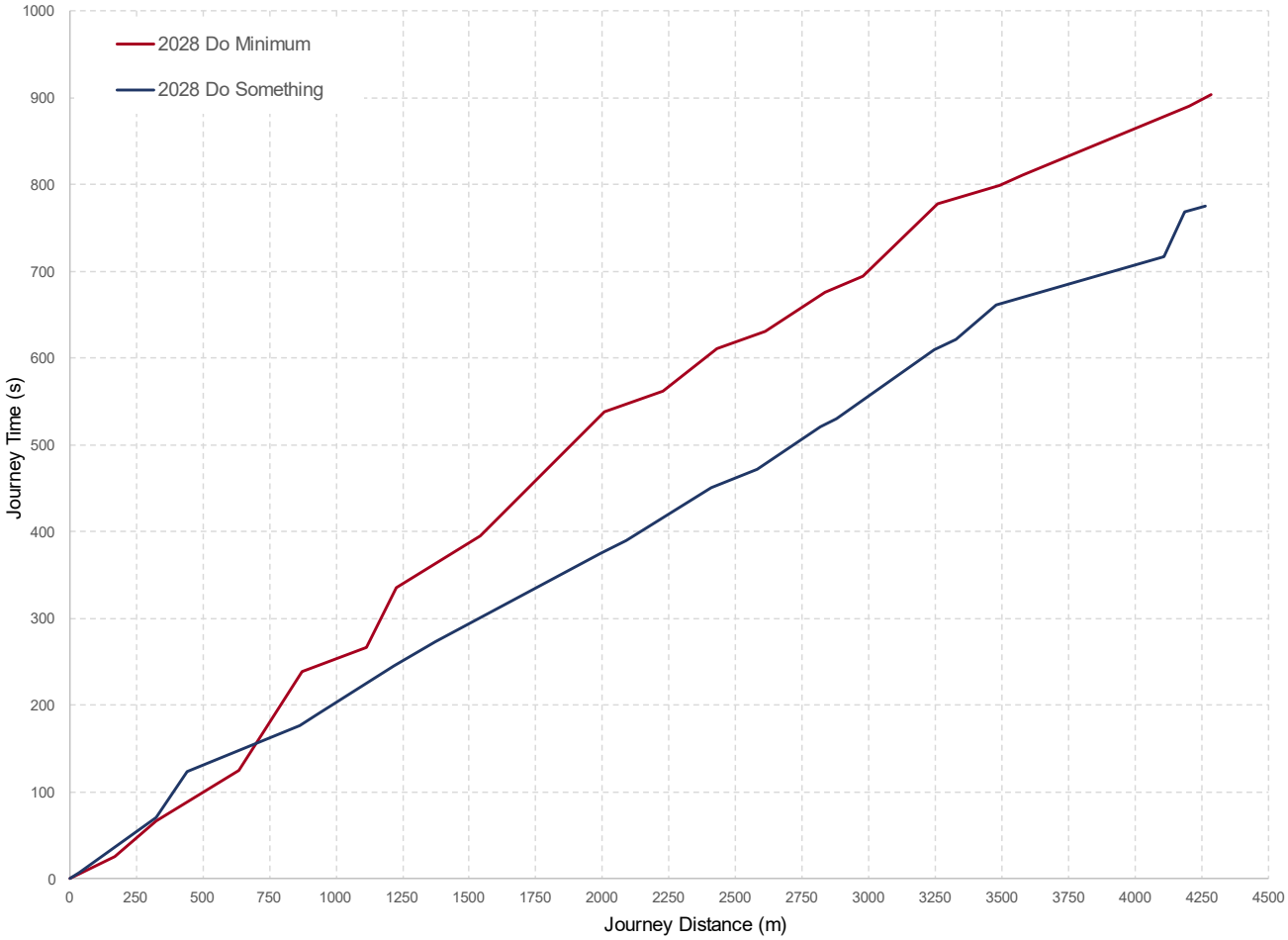

Diagram 6.25: D1 Bus Journey Time (2028 PM, Outbound)

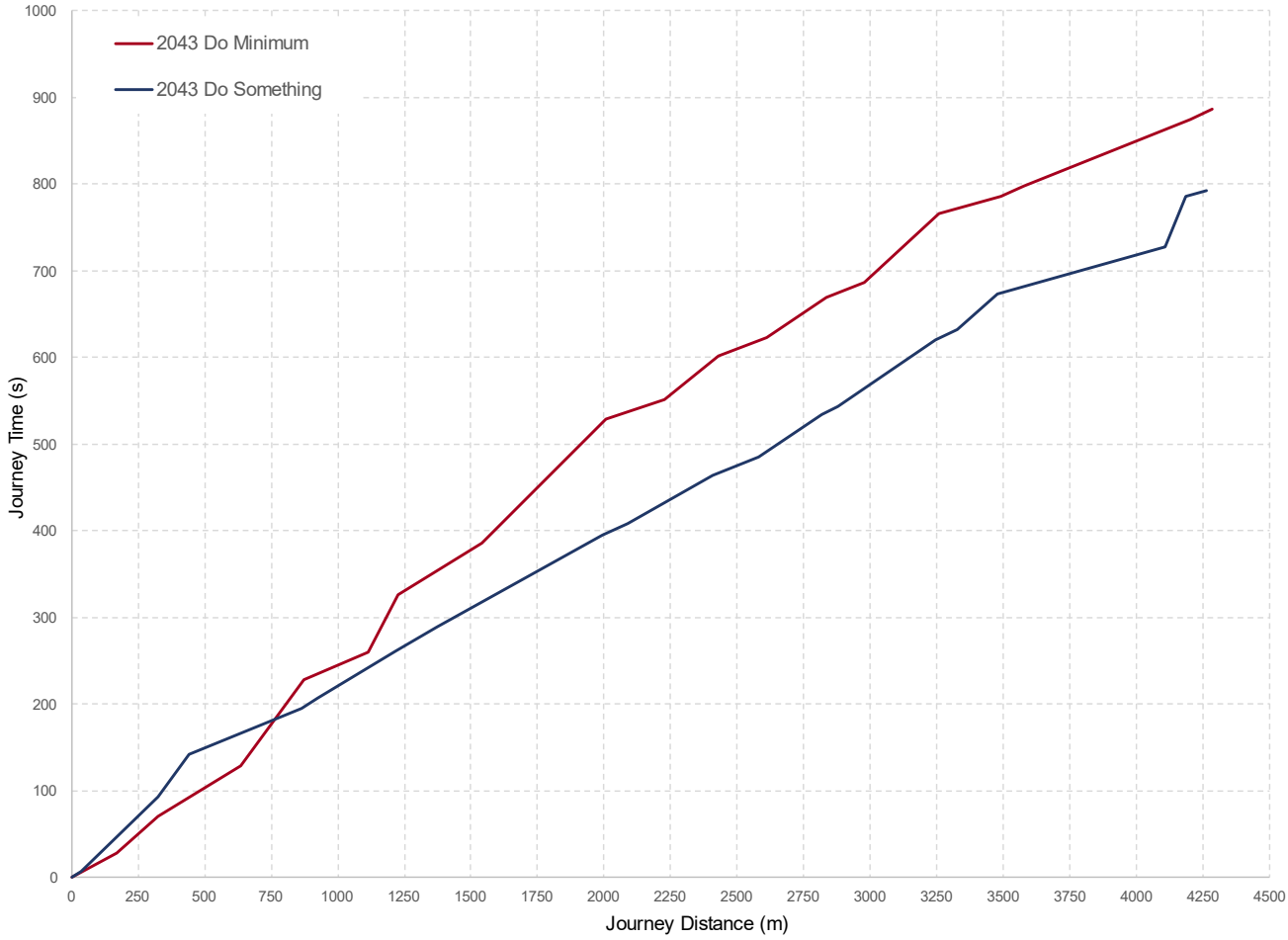

Diagram 6.26: D1 Bus Journey Time (2043 AM, Outbound)

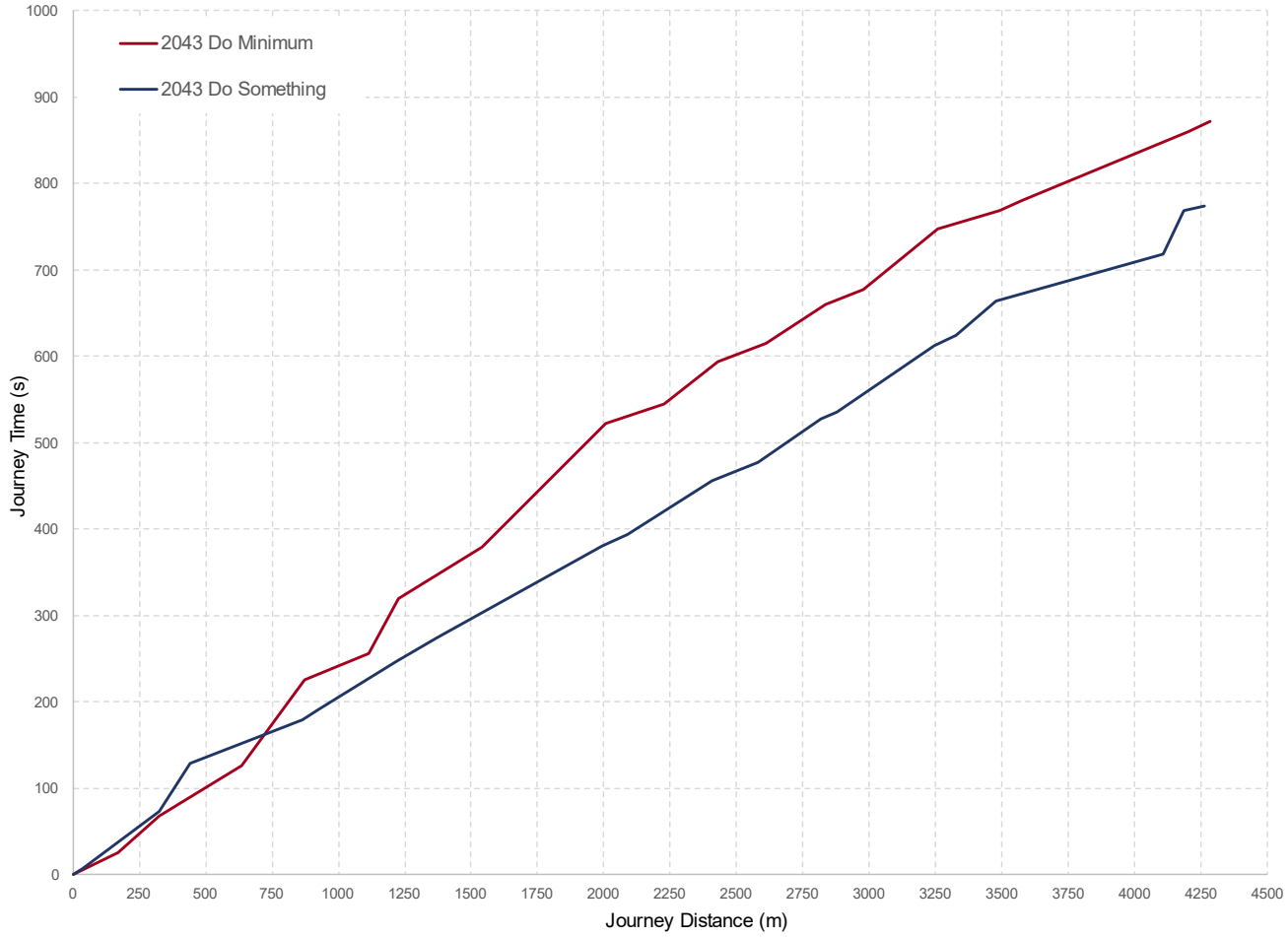

Diagram 6.27: D1 Bus Journey Time (2043 PM, Outbound)

Based on the results presented in Diagram 6.28 to Diagram 6.29 the Proposed Scheme is expected to deliver significant bus journey time savings in the outbound direction, most notably on key sections such as Long Mile Road from Walkinstown Avenue through the Killeen Road interchange and junctions along New Nangor Road. This is due to the introduction of a continuous outbound bus lane, consolidated bus stops, and the provision of bus priority 'hurry calls' signalling as part of the Proposed Scheme.

Tallaght to City Centre Section

6.3.3.1.4.3 Bus Journey Time and Reliability changes as a result of the Proposed Scheme

To give an overview of how the Proposed Scheme will impact on bus journey times along the Tallaght to City Centre section of the Proposed Scheme, outputs for the D2 service, which traverses the entire length of the section, have been extracted from the model. As outlined in Section 6.4,3 1 the assessment is based in the context of the full implementation of the BusConnects network re-design in both the Do Minimum and Do Something scenarios, with this section of the Proposed Scheme servicing the D-Spine services.

Inbound Direction

Average journey times for the inbound D2 service in the 2028 Opening Year and in the 2043 Design Year can be seen in Table 6.49. A breakdown of the changes in average journey times for all other bus services using the Proposed Scheme can be found in Appendix A6.4.3 (Average Bus Journey Times).

Table 6.49: D2 Service Bus Average Journey Times (Inbound Direction)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	52.7	45.7	-7.0	-13%
2028 PM	48.7	44.7	-4.0	-8%
2043 AM	47.4	45.0	-2.4	-5%
2043 PM	48.3	44.9	-3.4	-7%

Additional information regarding the range of journey times (minimum, maximum, average and standard deviation) for inbound D2 buses in the Do Minimum (red) and Do Something (blue) can be seen Table 6.50 and Diagram 6.25. Each dot in the diagram represents the journey time for each individual bus in each scenario. A larger range of journey times are an indication of lower levels of reliability in a given scenario.

Table 6.50: D2 Service – Range of Journey Times (Inbound Direction)

Peak Hour	Do Minimum				Do Something			
	MIN	MAX	AVG	STDEV	MIN	MAX	AVG	STDEV
2028 AM	46.7	62.1	52.7	3.1	38.6	51.7	45.7	2.7
2028 PM	43.6	54.5	48.7	2.2	40.2	49.0	44.7	2.1
2043 AM	42.8	51.8	47.4	2.2	41.0	50.8	45.0	2.4
2043 PM	42.5	53.1	48.3	2.3	39.9	50.5	44.9	2.5

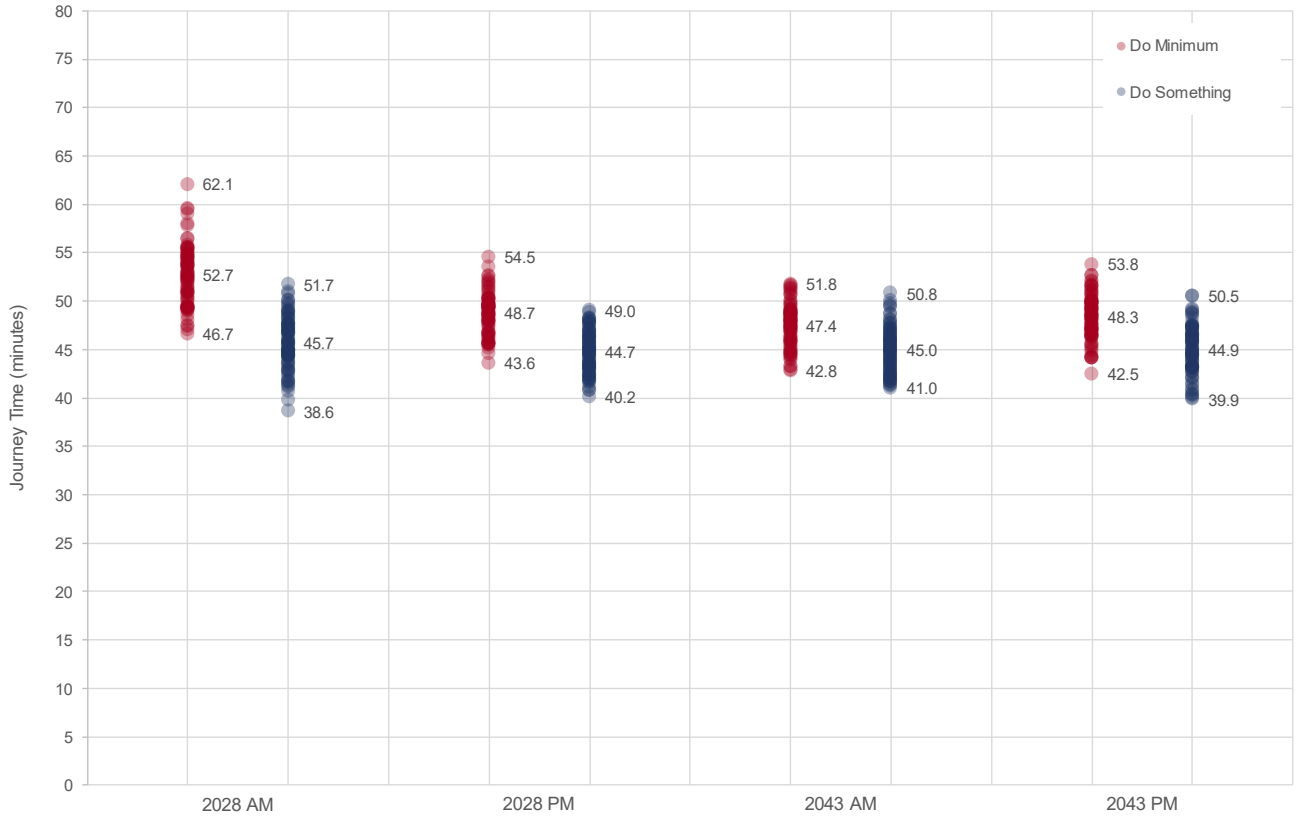

Diagram 6.30: D2 Bus Journey Times (Inbound Direction)

Based on the results presented in Table 6.50, the Proposed Scheme will deliver average inbound journey time savings, in the peak direction of travel, for D2 service bus passengers of up to 7.0 minutes (13%) in 2028 (AM) and 2.4 minutes (5%) in 2043 (AM).

Note that the variation in journey times shown above are based on one set of predicted flows for the Do Minimum and Do Something scenario. Traffic flows fluctuate daily which would mean that the variation in journey times would be much greater in the Do Minimum with any increases in traffic flows compared to the protection of journey time reliability provided by the bus priority measures that comprise the Proposed Scheme.

A comparison of average Do Minimum and Do Something journey times for the inbound D2 service are also illustrated in the cumulative time-distance graphs shown in Diagram 6.26 to Diagram 6.29.

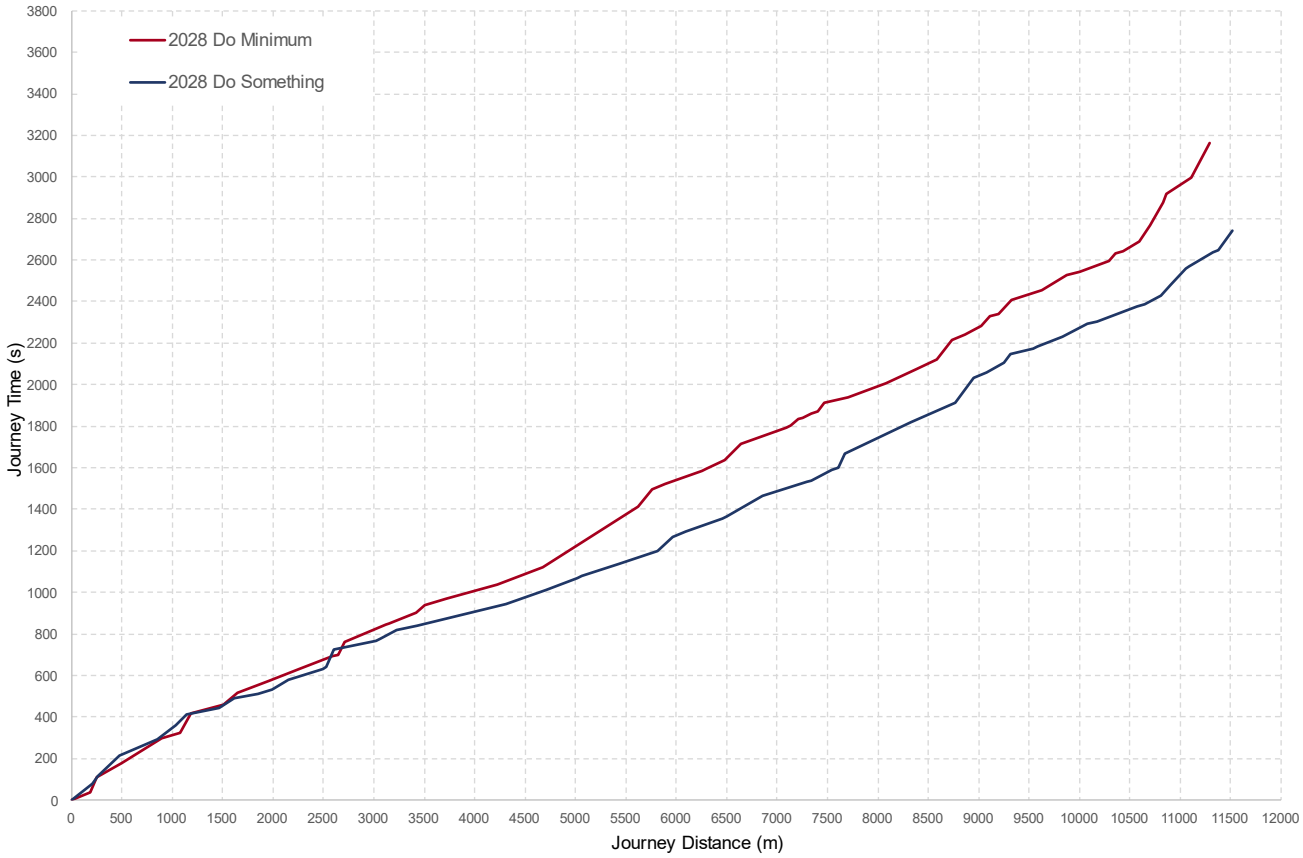

Diagram 6.31: D2 Bus Journey Time (2028 AM, Inbound)

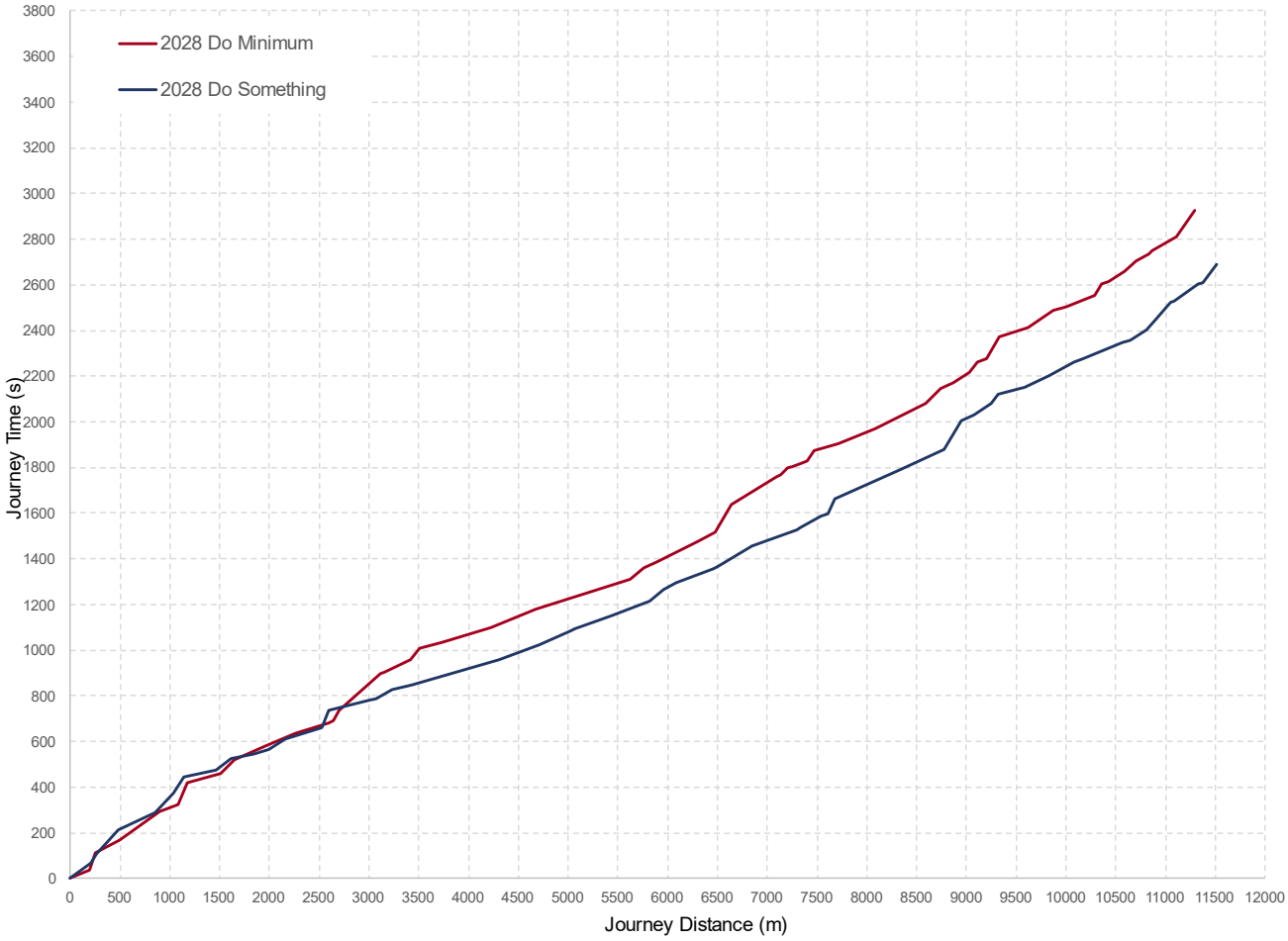

Diagram 6.32: D2 Bus Journey Time (2028 PM, Inbound)

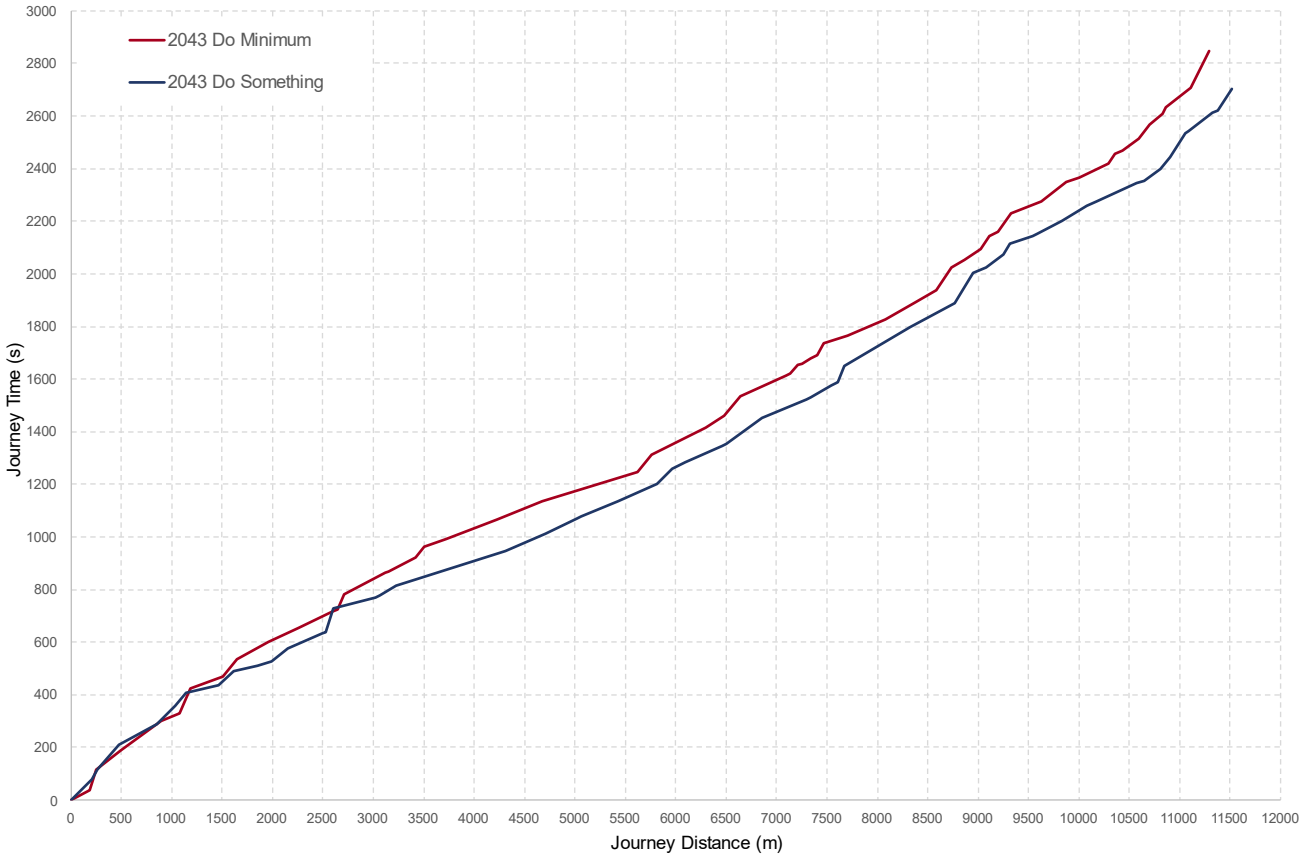

Diagram 6.33: D2 Bus Journey Time (2043 AM, Inbound)

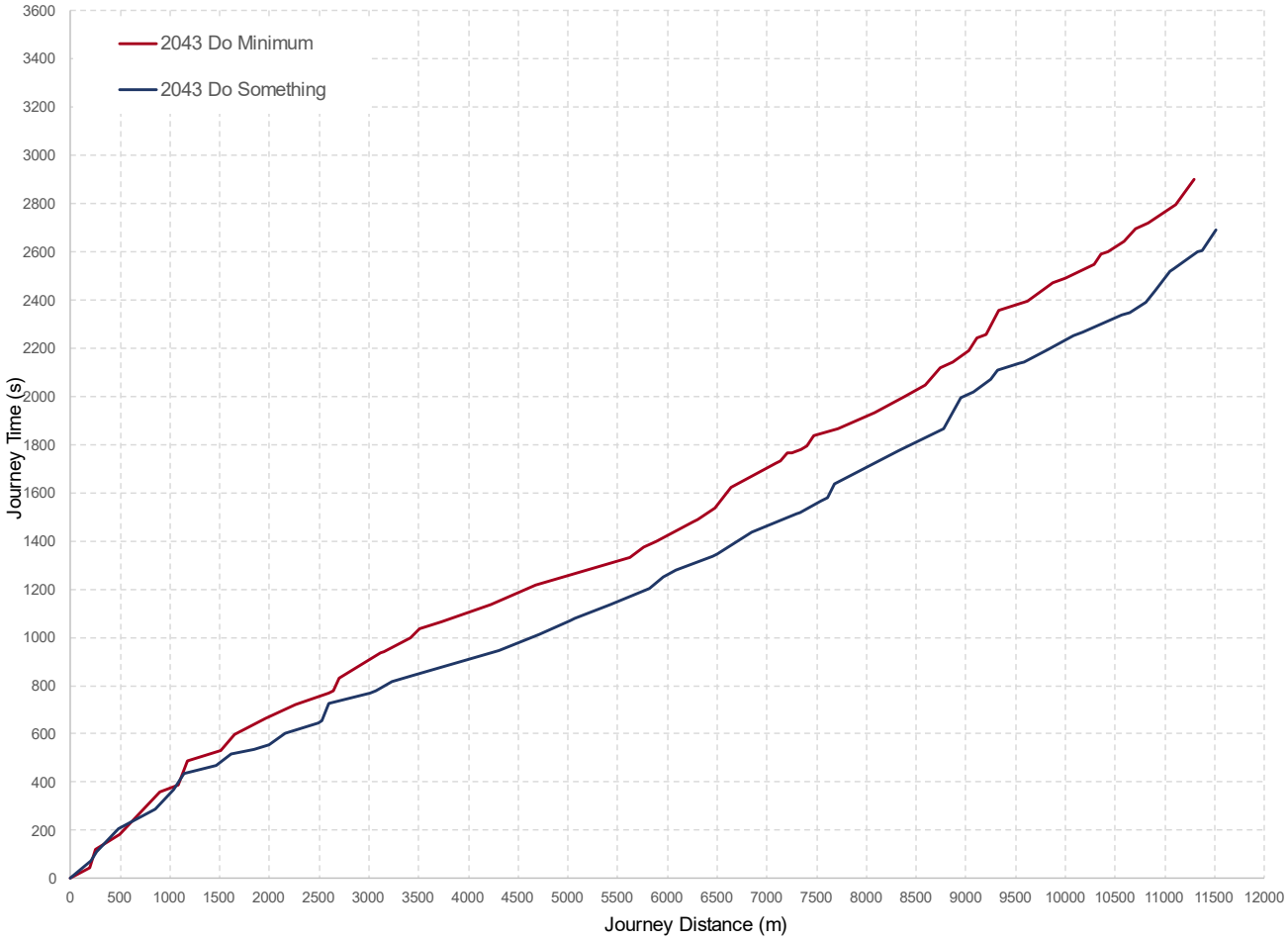

Diagram 6.34: D2 Bus Journey Time (2043 PM, Inbound)

Based on the results presented in Diagram 6.26 to Diagram 6.29, the Proposed Scheme offers average bus journey time savings for the peak period (AM) direction, most notably on the sections of Greenhills Road from Mayberry Road to south of the M50 overpass and the northbound approach to Walkinstown Roundabout. This is due to the introduction of an inbound bus lane along both sections.

In addition, the Proposed Scheme includes the redesign of Greenhills Road north of Mayberry Road to include a fully segregated bus lane running adjacent to the existing Greenhills Road, which bypasses delays originating from Walkinstown Roundabout in the AM peak, and the introduction of bus priority 'hurry calls' signalling where this segregated bus lane connects with the mainline. The bus lane that stops south of the Walkinstown Roundabout allows buses to bypass delays up to this point.

Outbound Direction

Average journey times for the outbound D2 service in 2028 Opening Year and in 2043 Design Year can be seen in Table 6.51. A breakdown of the changes in average journey times for all other bus services using the Proposed Scheme can be found in Appendix A6.4.3 (Average Bus Journey Times).

Table 6.51: D2 Service Bus Journey Times (Outbound Direction)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	47.9	45.3	-2.6	-6%
2028 PM	56.4	47.1	-9.3	-16%
2043 AM	45.5	45.0	-0.5	-1%
2043 PM	56.8	45.7	-11.1	-24%

Additional information regarding the range of journey times (minimum, maximum, average and standard deviation) for outbound D2 buses in the Do Minimum (red) and Do Something (blue) can be seen Table 6.52 and Table 6.53. Each dot represents the journey time for each individual bus in each scenario. A larger range of journey times are an indication of lower levels of reliability.

Table 6.52: D2 Service – Range of Journey Times (Outbound Direction)

Peak Hour	Do Minimum				Do Something			
	MIN	MAX	AVG	STDEV	MIN	MAX	AVG	STDEV
2028 AM	41.7	54.9	47.9	2.9	41.5	49.4	45.3	1.6
2028 PM	50.7	64.0	56.4	3.4	41.3	53.1	47.1	2.6
2043 AM	40.0	53.7	45.5	2.4	41.6	50.3	45.0	1.8
2043 PM	50.1	67.0	56.8	3.9	40.5	50.5	45.7	2.2

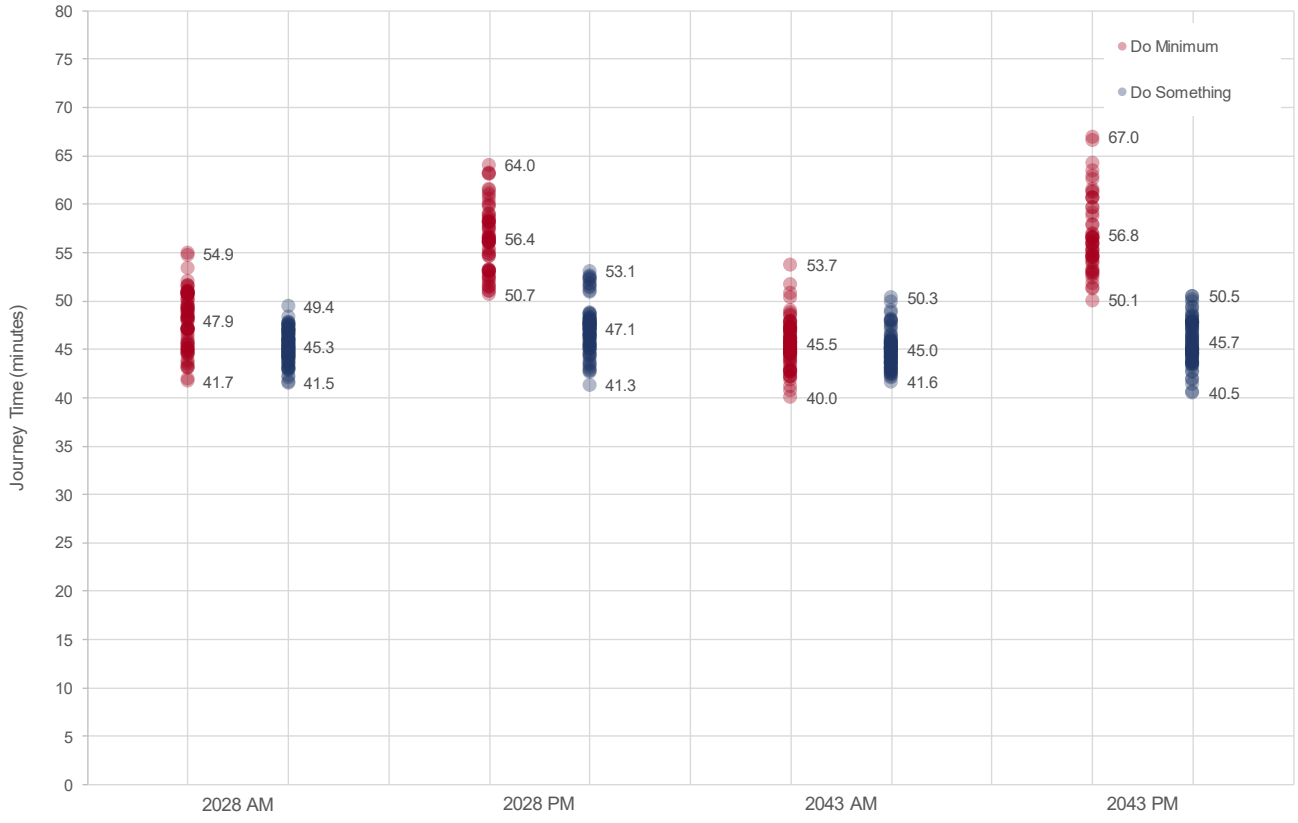

Diagram 6.35: D2 Bus Journey Times (Outbound Direction)

Based on the results presented in Table 6.52, the Proposed Scheme will deliver significant average outbound journey time savings, in the peak direction of travel, for D2 service bus passengers of up to 9.3 minutes (16%) in 2028 (PM) and 11.1 minutes (24%) in 2043 (PM). Furthermore, results presented in Diagram 6.30 suggest an improvement in bus journey time reliability across all 4 core scenarios as indicated by the reduced ranges of journey times achieved with the individual durations focused much closer to the average journey times (lower standard deviation) in the Do Something scenario (blue dots) with the Proposed Scheme in place compared to the more dispersed range in the Do Minimum scenario (red dots).

Note that the variation in journey times shown above are based on one set of predicted flows for the Do Minimum and Do Something scenario. Traffic flows fluctuate daily which would mean that the variation in journey times would be much greater in the Do Minimum with any increases in traffic flows compared to the protection of journey time reliability provided by the bus priority measures that comprise the Proposed Scheme.

A comparison of average Do Minimum and Do Something journey times for the D2 service for the outbound direction of travel illustrated in the cumulative time-distance graphs shown Diagram 6.31 to Diagram 6.34.

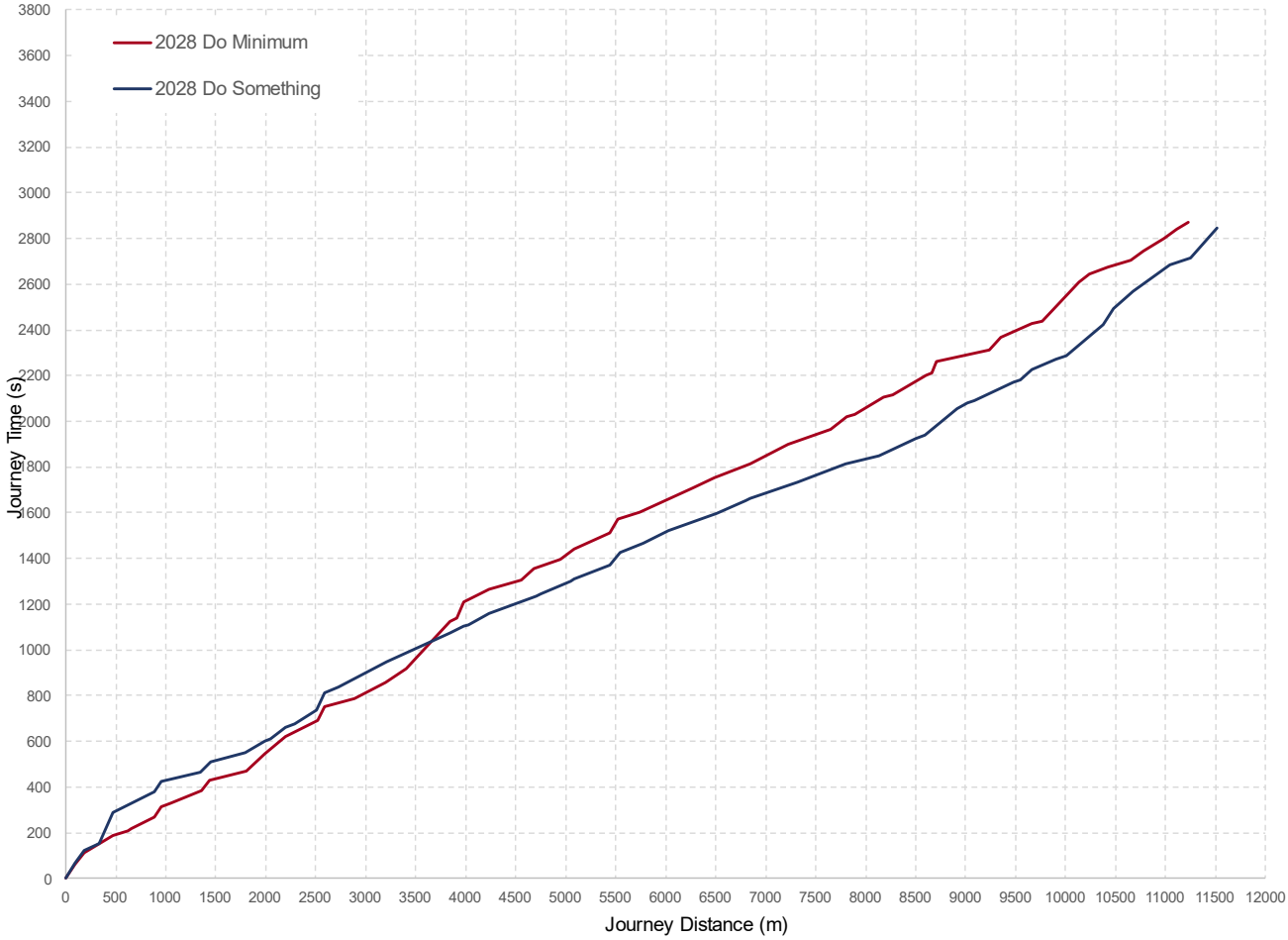

Diagram 6.36: D2 Bus Journey Time (2028 AM, Outbound)

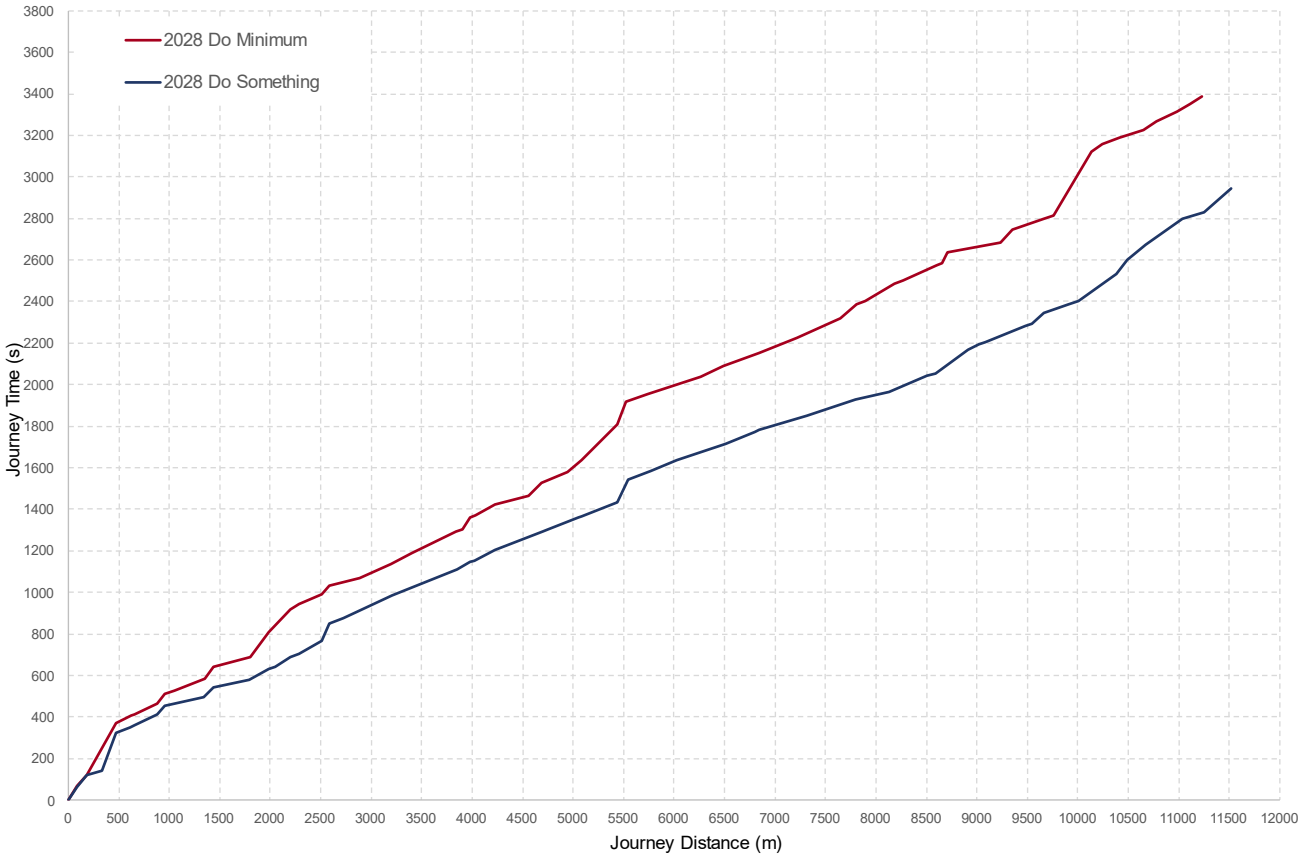

Diagram 6.37: D2 Bus Journey Time (2028 PM, Outbound)

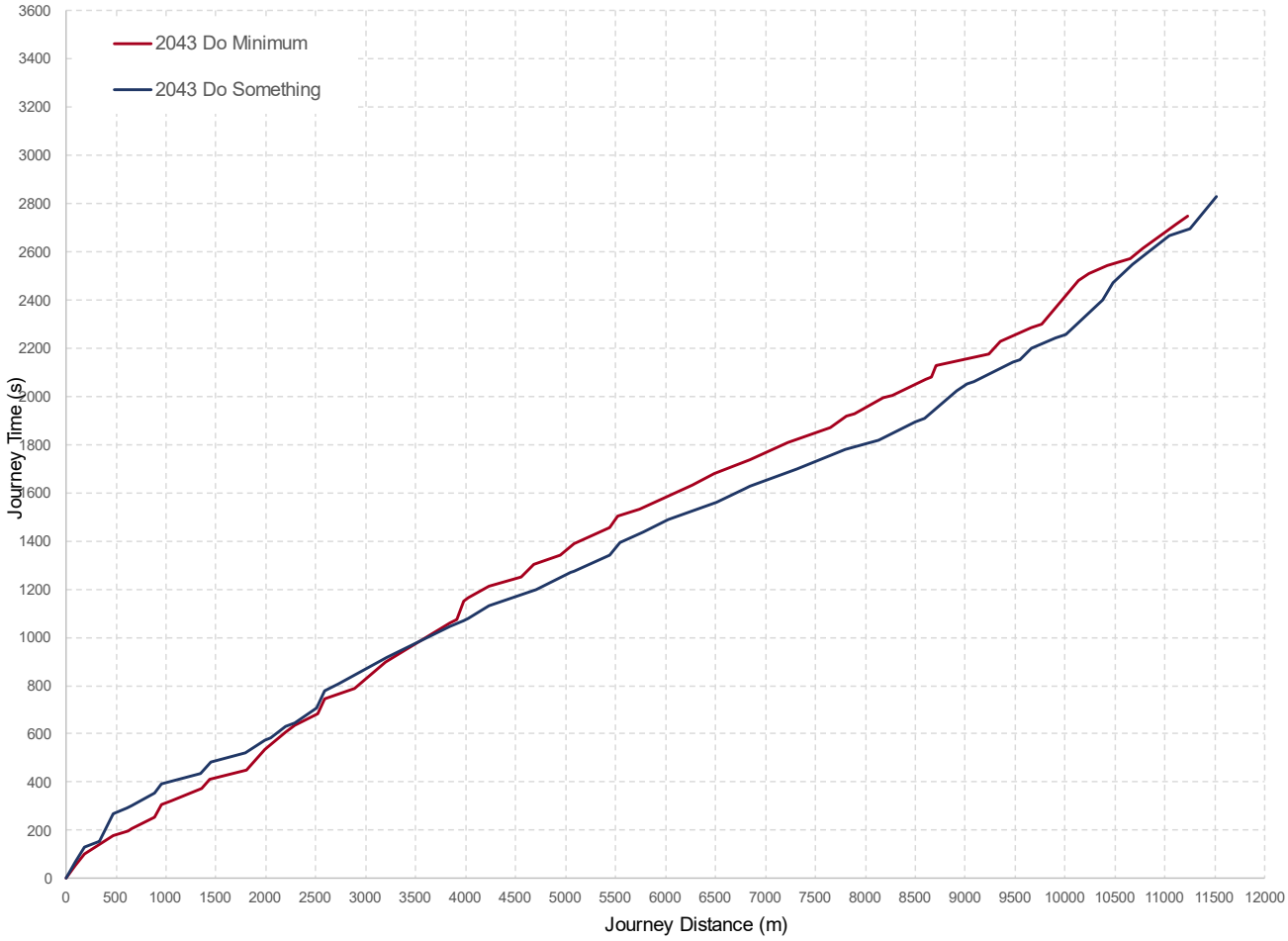

Diagram 6.38: D2 Bus Journey Time (2043 AM, Outbound)

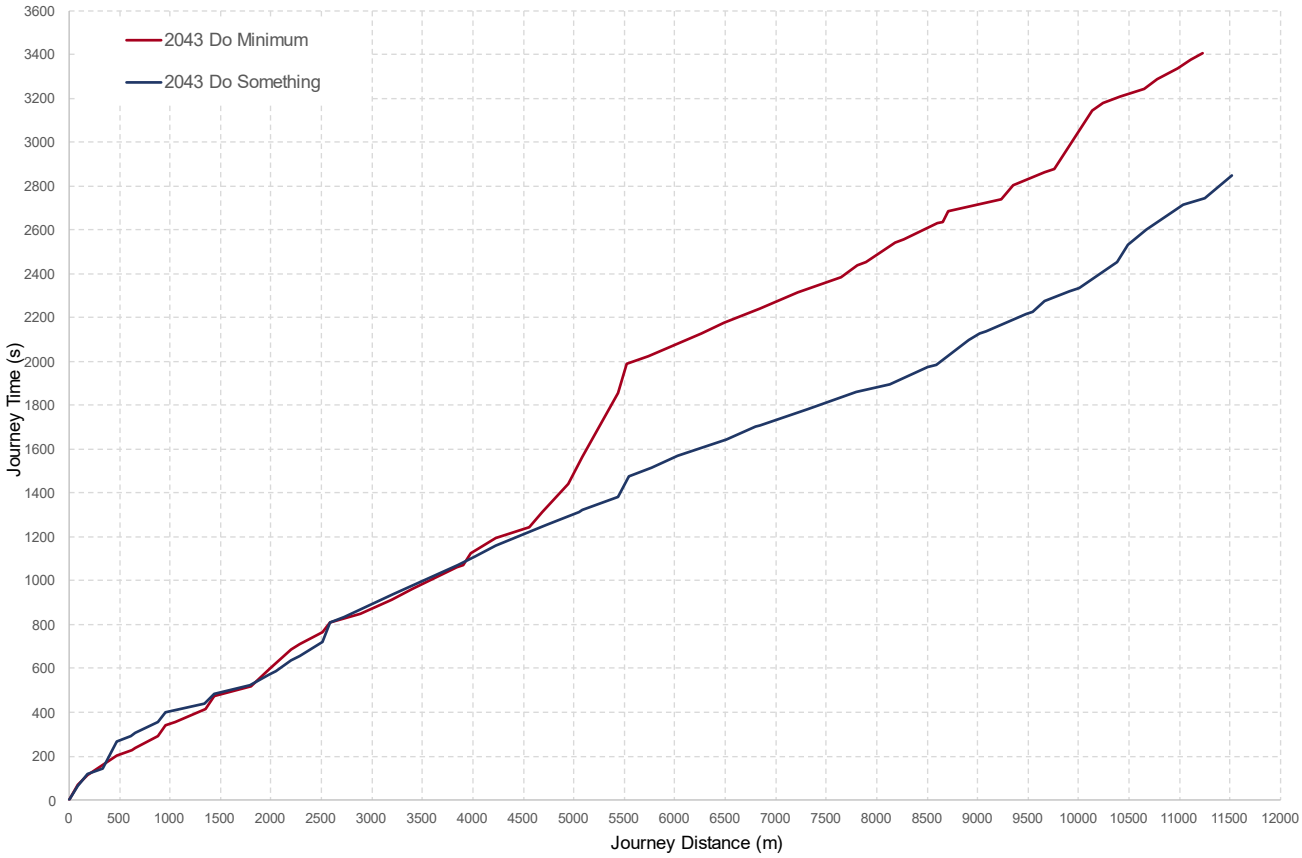

Diagram 6.39: D2 Bus Journey Time (2043 PM, Outbound)

Based on the results presented in Diagram 6.31 to Diagram 6.34 the Proposed Scheme offers considerable outbound average bus journey time savings for the peak period (PM) direction, most notably on Walkinstown Road from Drimnagh Road to north of the Walkinstown Roundabout and at the Mayberry Road and Greenhills Road junction. The Proposed Scheme introduces an outbound bus lane on Walkinstown Road from Drimnagh Road to just short of the Walkinstown Roundabout which contributes greatly to the outbound average bus journey time savings. The Proposed Scheme also introduces a continuous bus lane through the Mayberry Road junction, which along with the bus priority 'hurry calls' signalling leads to further accumulation of average bus journey time savings.

6.3.3.1.5 Total Journey Time Changes for all Proposed Scheme Bus Services

The change in total bus journey time for all buses travelling along both the Clondalkin to Drimnagh and Tallaght to City Centre sections of the Proposed Scheme, is shown in Table 6.53.

Table 6.53: Total Bus Journey Time

Peak Hour	Do Minimum (vehicle.minutes)	Do Something (vehicle.minutes)	Difference (vehicle.minutes)	%Difference
2028 AM	2,072.6	1,845.6	-227.0	-11%
2028 PM	2,107.7	1,843.9	-263.8	-13%
2043 AM	1,929.7	1,830.9	-98.8	-5%
2043 PM	2,073.4	1,811.5	-261.9	-13%

Based on the results presented in Table 6.72 modelling indicates that the Proposed Scheme will reduce total bus journey times along the Proposed Scheme by up to 13% in 2028 and 2043. Based on the AM and PM peak hours alone, this equates to **8.2 hours of savings in 2028 and 6.0 hours in 2043** combined across all buses when compared to the Do Minimum. On an annual basis this equates to approximately 6,150 hours of bus vehicle savings in 2028 and 4,500 hours in 2043, when considering weekday peak periods only.

6.3.3.1.6 Bus Users Assessment Summary

The findings of the Bus User assessment shows that the Proposed Scheme fully aligns with the aims and objectives of the CBC Infrastructure Works, to 'Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements'.

The significance of impact on bus users of the Proposed Scheme has been appraised using a qualitative assessment, taking the changes in journey time and journey reliability metrics presented above into consideration. The Proposed Scheme is considered to deliver a **High Positive Impact** overall.

6.3.3.1.7 Increased Bus Frequency - Resilience Sensitivity Analysis

6.3.3.1.7.1 Background

For the purposes of this EIAR and the transport modelling undertaken in support of the EIAR, no increase in bus service frequency beyond that planned under the current Bus Connects Network redesign proposals was assessed. The bus frequencies used in the modelling are based on the proposed service rollout as part of the BusConnects Network Redesign and are the same in both the Do Minimum and Do Something scenarios. This rollout is currently underway. The rationale for undertaking this approach was that the planning consent being sought and which this EIAR supports is solely for the infrastructural improvements associated with providing bus priority and other sustainable modes measures along the Proposed Scheme.

This analysis, however, is conservative as the bus priority infrastructure improvements and indeed the level of protection it will provide to bus journey time consistency and reliability will provide a significant level of resilience for bus services that will use the Proposed Scheme from implementation into the future. The resilience provided by the Proposed Scheme will allow the service pattern and frequency of bus services to be increased into the future to accommodate additional demand without having a significant negative impact on bus journey time reliability or the operation of cycle and pedestrian facilities. In order to assess this resilience and the potential impacts of this resilience on carbon emissions, an additional analysis has been undertaken, which is detailed below.

6.3.3.1.7.2 Resilience Testing

A key benefit of the provision of a resilient BusConnects Service network, one which can provide reliable and consistent journey times, is that it has potential to cater for further significant transfer from private car travel to more sustainable and environmentally friendly travel via public transport.

To assess the resilience of the Proposed Scheme to cater for additional bus service frequency provision whilst maintaining a high level of bus journey time reliability, a separate analysis was undertaken in the Proposed Scheme micro-simulation model. In this analysis, the service frequency, in both directions of travel, was increased to achieve a 10 buses per hour increase, at the busiest section, to assess whether the Proposed Scheme could cater for this increased service frequency whilst maintaining a high level of journey time reliability. The analysis was undertaken in the 2028 Minimum and Do Something models to assess whether the bus priority infrastructure was having the desired impact of protecting bus journey time reliability.

The bus service frequency, along the busiest section along Drimnagh Road, in the 2028 Do Minimum model and in the 2028 Do Something Resilience testing model is outlined in Table 6.54.

Table 6.54: Resilience Testing Bus Service Frequency Scenario Testing

Scenario	Inbound (Buses per Hour)	Outbound (Buses per Hour)
Do Minimum	33	33
Do Something	33	33
Do Minimum - Additional Services Resilience Test	43	43
Do Something - Additional Services Resilience Test	43	43

Table 6.55 outlines the average journey times for the inbound and outbound D2 service in the 2028 Opening Year scenarios. The D2 service has been chosen for the resilience testing as it represents the bus service which travels the longest distance along the Proposed Scheme.

Table 6.55: D2 Service – Average Bus Journey Times

Direction	Do Minimum (minutes)	Do Minimum (Additional Services) (minutes)	% Difference	Do Something (minutes)	Do Something - Additional Services (minutes)	% Difference
2028 Inbound AM	52.7	59.0	12.0%	45.7	48.0	5.1%
2028 Outbound PM	56.4	62.9	11.5%	47.2	48.3	2.3%

The results of the scenario testing with an additional 10 buses per direction per hour operating along the Proposed Scheme in the 2028 Opening Year are presented graphically in Diagram 6.35. The diagram displays the maximum, minimum and average journey times for each of the D2 bus services modelled.

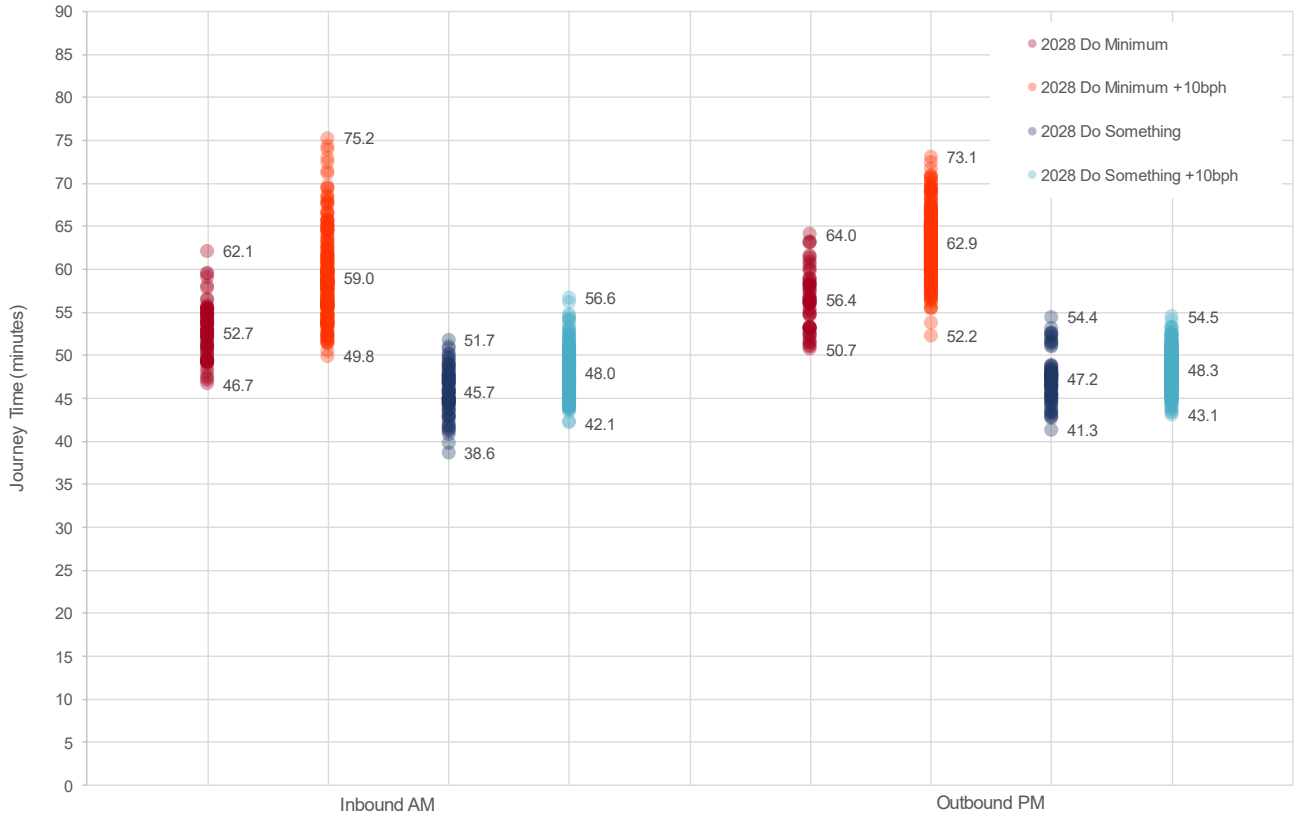

Diagram 6.40: Resilience Testing Bus Journey Time Reliability Indicators - Scenario Testing– Opening Year (2028)

As can be seen from Diagram 6.35 the modelling indicates that even with an additional 10 services operating per direction per hour along the Proposed Scheme, a high level of journey time reliability is maintained in the Do Something scenario, comparable with the 33 buses per direction per hour results. The results indicate limited change in average journey times in the Do Something Resilience sensitivity tests per bus. In the Do Minimum sensitivity test scenario bus journey times are more severely impacted. In the Do Something Resilience sensitivity test bus journey time reliability is maintained with the additional services in place as indicated by the reduced range of journey times compared to the Do Minimum Resilience Test scenario. ***This highlights the benefit that the Proposed Scheme infrastructure improvements can provide in protecting bus journey time reliability and consistency, as passenger demand continues to grow into the future.***

It should be noted that it was assumed the general traffic levels included in each scenario would remain static. If traffic levels were to increase (typical daily variations are in the order of +/- 15%) then the bus priority infrastructure would further protect journey time reliability and resilience in comparison with the Do Minimum scenario.

Further details on the potential additional greenhouse gas (GHG) emissions savings that could occur from this resilience is outlined in Chapter 8 (Climate).

6.3.3.1.8 General Traffic Assessment

6.3.3.1.8.1 Overview

The Proposed Scheme aims to provide an attractive alternative to the private car and promote a modal shift to public transport, walking and cycling. It is however recognised that there will be an overall reduction in operational capacity for general traffic along the direct study area given the proposed changes to the road layout and the rebalancing of priority to walking, cycling and bus. This reduction in operational capacity for general traffic along the Proposed Scheme will likely create some level of trip redistribution onto the surrounding road network.

It should be noted that the Do Minimum and Do Something scenarios are based on the assumption that travel behaviour will remain broadly consistent over time and that car demand, used for this assessment, represents a likely worst-case scenario. It is possible that societal trends in the medium to long term may reduce car demand further due to the ongoing changes to travel behaviours and further shifts towards sustainable travel, flexibility in working arrangements brought on following COVID-19, and delayed car ownership trends that are emerging.

The assessment also assumes that goods vehicles (HGVs and LGVs) continue to grow in line with forecasted economic activity with patterns of travel remaining the same. For example, the assessment assumes a 45% and 77% increase in goods traffic versus the base year in 2028 and 2043 respectively. This is considered a very conservative assumption. It should be noted, however, that the Climate Action Plan (CAP) (2023) includes reference to DoT's Ireland's Road Haulage Strategy 2022-2031 (RHS)(2023) which will seek to further integrate smart technologies in logistics management and may include the regulation of delivery times as far as practicable to off-peak periods to limit traffic congestion in urban areas. Ireland's Road Haulage Strategy 2022-2031 outlines measures to manage the increase in delivery and servicing requirements as the population grows. These measures may include the development of consolidation centres to limit the number of 'last-mile' trips made by larger goods vehicles with plans for higher use of smaller electric vans or cargo bikes for 'last-mile' deliveries in urban areas. The purpose of this section is to assess the overall impact that any redistributed general traffic will have on both the direct and indirect study areas. It should be noted that the impacts presented in this chapter are based on the final Preliminary Design for the Proposed Scheme which includes embedded mitigation to limit environmental and traffic and transport impacts to a minimal level as part of the iterative design development work described previously above.

The purpose of this section is to assess the overall impact that any redistributed general traffic will have on both the direct and indirect study areas. It should be noted that the impacts presented in this chapter are based on the final Preliminary Design for the Proposed Scheme which includes embedded mitigation to limit environmental and traffic and transport impacts to a minimal level as part of the iterative design development work described previously above.

To determine the impact that the Proposed Scheme has in terms of general traffic redistribution on the direct and indirect study areas, the LAM Opening Year 2028 model results have been used to identify the difference in general traffic flows between the Do Minimum and Do Something scenarios and the associated level of traffic flow difference as a result of the Proposed Scheme. The assessment has been considered with reference to both the reductions and increases in general traffic flows along road links.

Reduction in General Traffic: For this assessment, the reductions in general traffic flows have been described as a positive impact to the environment.

The majority of instances where a reduction in general traffic flow occurs are located along or adjacent to the Proposed Scheme (i.e., the direct study area), where there are measures to improve priority for bus, cycle and walking facilities.

Localised junction models have been developed using industry standard modelling packages such as LinSig and Junctions 9 to determine the appropriate staging, phasing, green times and operational capacity at all junctions along the direct study area. These junction models have been developed using consistent traffic flows as predicted and modelled in the ERM / LAM and micro-simulation model using the iterative traffic modelling process described in Section 3 of this TIA. The full outputs of the results are included in TIA Appendix 2 (Junction Design Report).

Increase in General Traffic: To determine the impact that the Proposed Scheme has in terms of an increase in general traffic flows on the direct and indirect study areas, a more robust assessment has been undertaken, with reference to TII's Traffic and Transport Assessment Guidelines (May 2014).

This document is considered best practice guidance for the assessment of transport impacts related to changes in traffic flows due to proposed developments and is an appropriate means of assessing the impact of general traffic trip redistribution on the surrounding road network.

Diagram 6.41 provides a snapshot from the guidance which outlines "Advisory Thresholds for Traffic and Transport Assessment Where National Roads are Affected".

Where applications affect national roads a Transport Assessment should be requested if the thresholds in Table 2.2, below, are exceeded.

Table 2.2 Advisory Thresholds for Traffic and Transport Assessment Where National Roads are Affected

Vehicle Movements	*100 trips in / out combined in the Peak Hours for the proposed development*
	Development traffic exceeds 10% of turning movements at junctions with and on National Roads.
	Development traffic exceeds 5% of turning movements at junctions with National Roads if location has potential to become congested or sensitive.

Diagram 6.41 Extract from the Traffic and Transport Assessments Guidelines (PE-PDV-02045, May 2014)

The basis of the guidance is to assess the impacts of additional trips that have been generated as part of a new development (for example, a new housing estate etc.). Noting that the guidance relates to National Roads only, for the purpose of this assessment, the principles of the guidance have been adapted for the assessment of the Proposed Scheme. This has been achieved by extending the threshold to cover all road types[1] in the vicinity of the Proposed Scheme, not only National Roads. This ensures a robust and rigorous assessment has undertaken and that potential impacts on more localised or residential streets have been captured as part of the assessment.

The impact assessment of increases to the general traffic flows has used the following thresholds based on the above guidelines:

- **Local / Regional Roads:** Traffic redistribution results in an increase above 100 combined flows (i.e. in a two-way direction) along residential, local and regional roads in the vicinity of the Proposed Scheme in the AM and PM Peak Hours;
- The threshold aligns with an approximate 1 vehicle per minute increase per direction on any given road. This is a very low level of traffic increase on any road type and ensures that a robust assessment of the impacts of redistributed traffic has been undertaken.
- **National Roads:** Traffic exceeds 5% of the combined turning flows at junctions with or on national roads in the AM and PM Peak Hours as a result of traffic redistribution comparing the Do Minimum to the Do Something scenario with the Proposed Scheme in place.
- The guidelines indicate that a 10% threshold may be used, however, to ensure a rigorous assessment in this instance the lower 5% threshold for turning movements has been utilised.

[1] Part II of The Roads Act 1993 sets out the current classification of roads as National (National Primary and National Secondary), Regional and Local (Local Tertiary and Local Secondary). The road types are governed by the default speed limit of the road. National Roads are TII owned whilst Regional and Local Roads are owned by the associated Local Authority.

Where road links have been identified as experiencing additional general traffic flow increases which exceed the above thresholds, a further assessment has been undertaken by way of a traffic capacity analysis on the associated junctions along the affected links. This further assessment is outlined in the following sections.

6.3.3.1.9 General Traffic Flow Difference - AM Peak Hour

Diagram 6.42 (extract from Figure 6.7 TIA Appendix 3 (Maps)) illustrates the difference in traffic flows on the road links in the AM Peak Hour for the 2028 Opening Year. Please refer to TIA Appendix 4.7 (General Traffic Assessment) for the full LAM outputs.

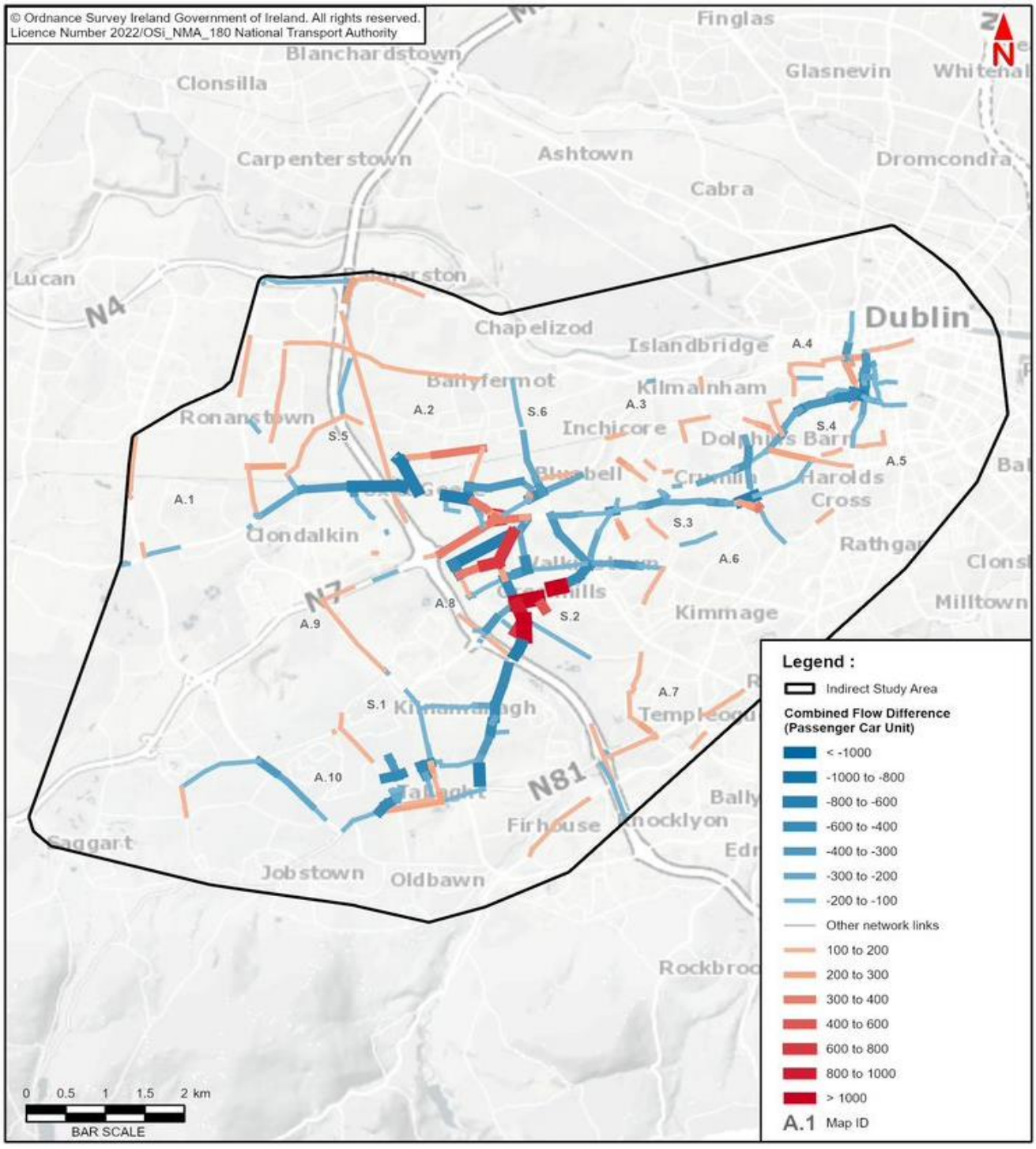

Diagram 6.42: Flow Difference on Road Links (Do Minimum vs. Do Something), AM Peak Hour, 2028 Opening Year

Impact on Direct Study Area (AM Peak Hour)

Direct Reductions in General Traffic: The LAM indicates that, during the 2028 Opening Year scenario, there are reductions in general traffic noted along the Proposed Scheme during the AM Peak Hour, as illustrated by the blue lines in Diagram 6.42, which indicates where a reduction of at least -100 combined traffic flows occur.

The key reductions in traffic flows during the AM Peak Hour are outlined in Table 6.56.

Table 6.56: Road Links that Experience a Reduction of ≥ 100 Combined Flows during AM Peak Hour (Direct Study Area)

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
North of N81, West of M50	S1	Belgard Square East	565	126	-439
	S1	Belgard Square West	403	200	-203
	S1	Belgard Square North	1186	648	-537
	S1	Blessington Road	413	297	-116
	S1	Cookstown Way	1311	832	-479
	S1	Greenhills Road	1650	133	-1516
	S1	Old Blessington Road	692	251	-441
East of M50, South of R110	S2	Ballymount Avenue	1031	531	-500
	S2	Calmount Road	4233	3879	-354
South of R111, West of R817	S3	Clogher Road	641	31	-610
	S3	Crumlin Road	1208	903	-305
	S3	Drimnagh Road	2128	1724	-403
	S3	Kildare Road	825	514	-311
North of R111, West of R137	S4	Cork Street	866	371	-495
	S4	Dean Street	1031	671	-360
	S4	Dolphin's Barn Street	1451	1120	-331
	S4	Nicholas Street	654	207	-448
	S4	Patrick Street	787	323	-464
	S4	Saint Luke's Avenue	711	243	-467
North of N7 and R110	S5	Nangor Road	1741	822	-919
East of M50, North-West of R819	S6	Long Mile Road	900	656	-244
	S6	Naas Road	951	524	-427
	S6	Walkinstown Avenue	2005	853	-1151
	S6	Walkinstown Road	1151	816	-335

The contents of Table 6.56 demonstrate that there is a slight to very significant reduction of between -190 and -690 general traffic flows along the direct study area during the AM Peak Hour, which is attributed to the Proposed Scheme and the associated modal shift as a result of its implementation. This reduction in general traffic flow has been determined as an overall Medium Positive impact on the direct study area.

Direct Increases in General Traffic: The red lines in Diagram 6.42 indicate where the LAM predicts that an increase of at least 100 combined traffic flows will occur. These are presented in Table 6.57.

Table 6.57: Road Links that Experience an Increase of ≥100 Combined Flows during AM Peak Hour (Direct Study Area)

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
East of M50, South of R110	S2	Ballymount Avenue (New Link)	0	987	987
	S2	Calmount Road (New Link)	0	1116	1116
	S2	Greenhills Road (New Link)	0	1462	1462
North of N7 and R110	S5	Nangor Road	932	1546	613

The contents of Table 6.57 demonstrate that there is an increase of between +613 and +1,462 general traffic flows along the direct study area during the AM Peak Hour.

When compared to Table 6.56, Table 6.57 shows that the scheme will generally reduce traffic levels along the corridor, with increases in traffic flow only predicted on four links, three of which relate to the closing off of a section of Greenhills Road, and redirection of traffic along Calmount Road via a new link along Ballymount Avenue. Most of this traffic will be transferred from the existing Greenhill Road.

Overall Impact on Direct Study Area: Overall, the scheme is predicted to have a **Medium** positive impact on traffic flows within the direct study area.

Impact on Indirect Study Area (AM Peak Hour)

Indirect Reductions in General Traffic: In addition to the general traffic flow reductions occurring along the direct study area, there are reductions in general traffic along certain road links within the indirect study area. The key reductions in traffic flows along the indirect study area during the AM Peak Hour are outlined in Table 6.58.

Table 6.58: Road Links that Experience a Reduction of ≥100 Combined Flows during AM Peak Hour (Indirect Study Area)

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
North of N81, West of M50	S1	Blessington Road	692	251	-441
	S1	Belgard Road	1438	648	-790
	S1	Cheeverstown Road	1639	1308	-331
	S1	Citywest Avenue	1446	1310	-136
	S1	Mayberry Road	1072	812	-260
	S1	N81	1624	1473	-151
	S1	Tymonville Crescent	1817	1320	-497
East of M50, South of R110	S2	Ballymount Cross	811	606	-205
	S2	Ballymount Road Lower	811	606	-205
	S2	Ballymount Road Upper	788	677	-111
	S2	Limekiln Green	258	104	-154
	S2	Robinhood Industrial Estate Internal Road	917	374	-543
	S2	Saint Peter's Road	1553	1145	-407
	S2	Western Parkway Business Centre	1767	1415	-351
South of R111, West of R817	S2	Whitechurch Hill	4890	4774	-115
	S3	Armagh Road	1009	895	-114
	S3	Cooley Road	985	710	-276
	S3	Cromwellsfort Road	1722	1262	-460
	S3	Grattan Crescent	796	688	-108
	S3	Herberton Road	958	632	-326
	S3	Inchicore Road	796	688	-108
	S3	Slievebloom Road	282	157	-124
	S3	St Agnes Park	968	861	-107
North of R111, West of R137	S3	Sundrive Road	820	588	-232
	S4	Bride Road	674	461	-213
	S4	Bride Street	474	345	-129
	S4	Bridge Street Lower	2586	2225	-361
	S4	Bridge Street Upper	2218	1968	-250
	S4	Christchurch Place	1130	887	-243
	S4	Church Street	1652	1497	-156

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
	S4	Clanbrassil Street Lower	1175	1023	-152
	S4	Clanbrassil Street Upper	1384	1007	-376
	S4	Cuffe Street	920	810	-110
	S4	Father Mathew Bridge	2163	1858	-305
	S4	Golden Lane	629	519	-110
	S4	High Street	2146	1276	-870
	S4	Kevin Street Lower	949	749	-200
	S4	Kevin Street Upper	966	714	-252
	S4	Longford Street	235	130	-105
	S4	New Street South	1183	929	-254
	S4	Rosedale Terrace	1175	1023	-152
	S4	School Street	613	511	-102
	S4	St Luke's Avenue	674	255	-419
	S4	The Coombe	1025	399	-626
	S4	Werburgh Street	714	552	-162
North of N7 and R110	S4	Winetavern Street	795	450	-344
	S5	Cloverhill Road	1169	1029	-140
	S5	Fonthill Road South	1381	1277	-103
	S5	Knockmitten Lane	500	393	-107
	S5	Lucan Newlands Road	1031	917	-114
	S5	Lucan Road Old	4482	4351	-131
	S5	N4	5286	5068	-218
	S5	N7	5237	5127	-110
	S5	New Nangor Road	1406	1114	-291
	S5	Ninth Lock Road	1516	1384	-132
	S5	Park West Avenue	1495	826	-669
	S5	Peamount Road	538	356	-182
	S5	Turnpike Road	1042	602	-439
	S5	Woodford Walk	731	421	-310
East of M50, North-West of R819	S6	Camac Park	819	564	-255
	S6	John F Kennedy Drive	490	183	-308
	S6	John F Kennedy Road	940	556	-384
	S6	Killeen Road	1250	677	-574
	S6	Kylemore Road	2033	964	-1069
	S6	Lucan Road	5300	5090	-211
	S6	Rafters Lane	513	403	-110
	S6	Robinhood Road	993	233	-760

The contents of Table 6.58 outlines that the traffic reductions within the indirect study area vary between -102 and -1069 combined flows along the surrounding road links.

This reduction in general traffic flow has an average of -285 two-way flows, which has been determined as an overall **Low Positive impact** on the indirect study area. The most significant change occurs along Kylemore Road.

Indirect Increases in General Traffic: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the orange / red lines in Diagram 6.42. These road links have been identified as experiencing traffic volumes above the additional traffic threshold and therefore require further analysis. The

road links and associated flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 6.59.

Table 6.59: Road Links where the 100 Flow Additional Traffic Threshold is Exceeded during AM Peak Hour

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
North of R134, West of M50	A1	Fonthill Road	305	509	204
	A1	Fonthill Road North	1812	1936	124
	A1	Grange Castle Road	2541	2734	193
	A1	Neilstown Road	544	682	138
	A1	Station Road	1214	1335	120
North of R134, East of M50	A2	Ballyfermot Road	1417	1585	167
	A2	Cloverhill Road	1375	1560	185
	A2	Coldcut Road	2000	2196	196
	A2	Killeen Road	607	999	392
	A2	Nangor Road	932	1546	613
	A2	Park West Avenue	1485	1637	152
	A2	Park West Road	679	1063	385
North of R110	A3	Balfe Road	152	392	241
	A3	Benbulbin Road	266	406	140
	A3	Chapelizod Bypass	1987	2185	198
	A3	Cooley Road	423	685	263
	A3	Davitt Road	1315	1508	193
	A3	Knocknarea Road	346	451	106
West of R137	A4	Bridgefoot Street	1474	1604	131
	A4	Cook Street	406	615	209
	A4	Cornmarket	805	1057	252
	A4	Essex Quay	776	961	186
	A4	Francis Street	60	351	291
	A4	Heytesbury Street	564	673	109
	A4	New Row South	42	156	113
	A4	Oliver Bond Street	594	764	170
	A4	Pim Street	473	578	105
	A4	St Augustine Street	118	247	129
	A4	James's Street	1290	1449	159
	A4	Thomas Street	1365	1528	163
	A4	Wellington Quay	648	786	138
	A4	Wood Quay	798	910	112
East of R137	A5	Crumlin Village	197	349	152
	A5	Echlin Street	515	625	110
	A5	Herberton Walk	171	280	109
	A5	James's Street	1290	1449	159
	A5	Kimmage Road Lower	609	712	102
	A5	Parnell Road	661	931	270
	A5	Reuben Street	392	561	169
	A5	South Circular Road	1020	1248	228
	A5	St James's Walk	472	582	110
South of R110	A6	Sundrive Road	326	632	307

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
	A6	Kildare Road	279	589	311
	A6	St Agnes Road	253	422	169
	A6	Whitehall Road West	634	745	111
East of M50, South of R819	A7	Firhouse Road	1016	1150	133
	A7	Orwell Park View	1346	1539	193
	A7	Spawell Roundabout	2049	2217	168
	A7	Tallaght Road	1870	2029	159
	A7	Templeogue Road	1131	1233	102
	A7	Wellington Road	1898	2112	214
East of M50, South of R110	A8	Long Mile Road	469	1100	631
	A8	M50	555	757	203
	A8	Naas Road	604	996	392
	A8	Old Naas Road	570	844	273
	A8	Turnpike Road	1218	1399	181
West of M50, South of A9	A9	Belgard Road	339	636	297
	A9	Katherine Tynan Road	353	521	168
	A9	N7	975	1107	132
West of M50, North N81	A10	Belgard Square South	481	715	234
	A10	Citywest Road	1398	1538	139
	A10	Cookstown Way	648	916	268
	A10	N81	1703	1961	259

The contents of Table 6.59 outline that the additional traffic on the key road links within the indirect study area varies between +102 and +631 combined flows during the AM peak hour. Further junction capacity assessment has been undertaken along these road links to determine whether the above road links have the capacity to cater for the additional traffic volumes as a result of the Proposed Scheme.

Operational capacity outputs have been extracted from the LAM at the associated junctions along the subject road links to determine whether there is reserve capacity to facilitate the uplift in traffic. The results are presented in terms of the significance of the impact to the V / C ratio for each junction based on its sensitivity and magnitude of impact.

It should be noted that the worst performing arm of the junction has been used for the purpose of the assessment to ensure a conservative impact assessment is undertaken.

6.3.3.1.9.1 National Roads – 5% Threshold Impact Assessment

On the basis of the assessment methodology specifically for National Roads, whereby traffic exceeding 5% of the combined turning flows at junctions on or with national roads as a result of traffic redistribution associated with the Proposed Scheme, the junctions and associated flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 6.60.

Table 6.60: National Road Links Traffic Threshold Assessment (AM Peak Hour)

Junction	Total Do Minimum Turning Flows (PCU)	Total Do Something Turning Flows (PCU)	Turning Flow Difference (PCU)	Percentage Difference
M50 J7	5,680	5,747	67	1.2%
M50 J9	8,178	8,406	229	2.8%
M50 J10	4,195	3,964	-230	-5.5%

Junction	Total Do Minimum Turning Flows (PCU)	Total Do Something Turning Flows (PCU)	Turning Flow Difference (PCU)	Percentage Difference
M50 J11	5,106	5,078	-28	-0.6%
M50 J7	5,680	5,747	67	1.2%

The contents of Table 6.60 demonstrate that in the majority of cases, in the AM peak hour, traffic flows at national roads junctions are expected to reduce as a result of the scheme.

The highest impact predicted for total inbound flows between the Do Minimum and Do Something scenarios in the AM peak hour is a 2.8% increase at M50 J9.

Overall, the Proposed Scheme is expected to have a **Low Positive** impact on traffic flows at junctions with National roads in the PM peak hour.

No further assessment into the junctions with national roads during the AM peak hour has been undertaken, except for instances where the 100 vehicle threshold for additional traffic is exceeded, as shown in Table 6.59.

6.3.3.1.9.2 General Traffic Flow Difference – PM Peak Hour

Diagram 6.43 (extract from Figure 6.8 TIA Appendix 3 (Maps)) illustrates the difference in traffic flows on road links in the PM peak hour for the 2028 Opening Year. Please refer to TIA Appendix 4.7 (General Traffic Assessment) for the full LAM outputs.

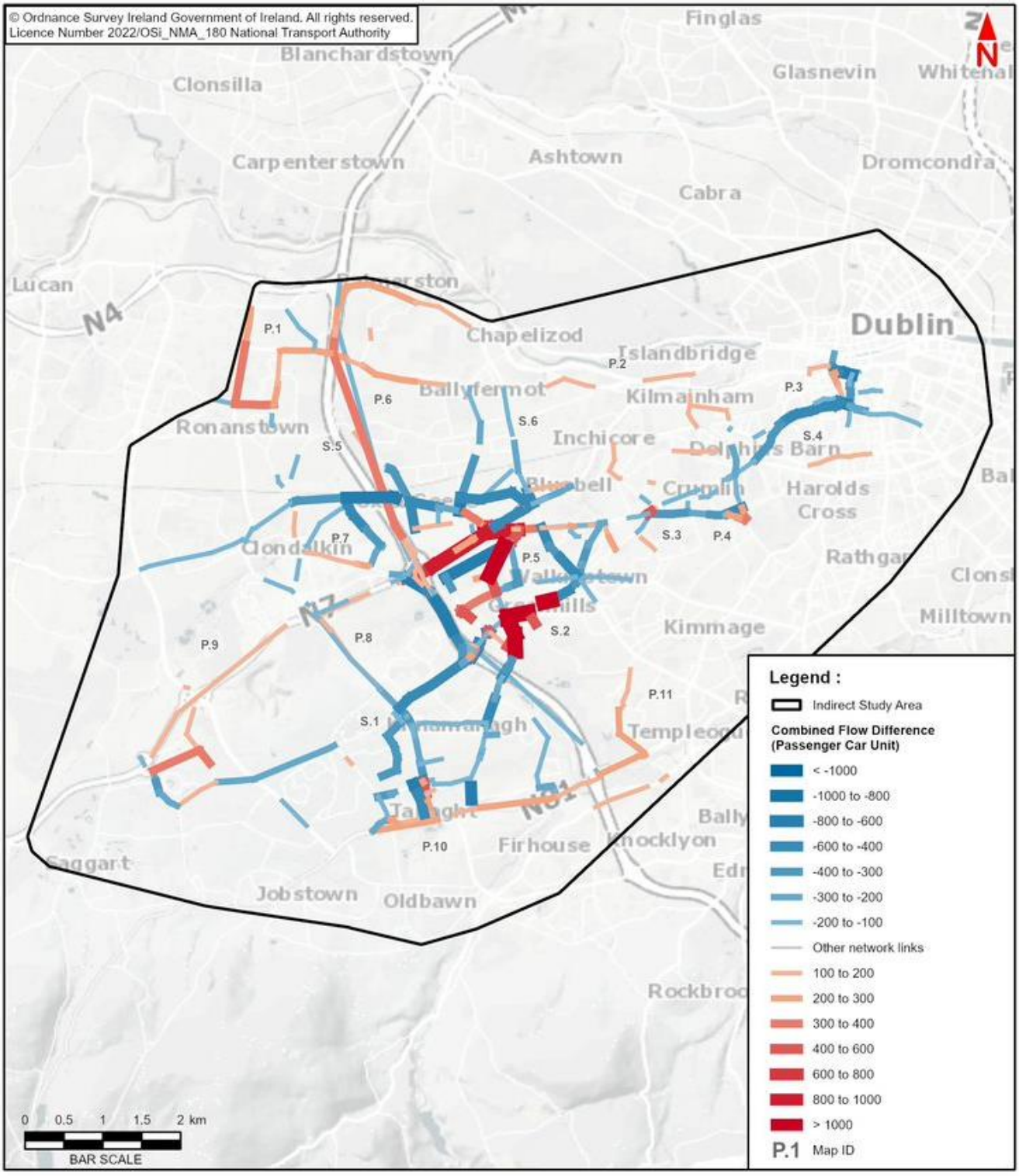

Diagram 6.43: Flow Difference on Road Links (Do Minimum vs. Do Something), PM Peak, 2028 Opening Year

Direct Reductions in General Traffic Flows: The blue lines in Diagram 6.43 indicate where the LAM predicts that a reduction of at least -100 combined traffic flows will occur. These are presented in Table 6.61.

Table 6.61: Road Links that Experience a Reduction of at least -100 Combined Flows during PM Peak Hour (Direct Study Area)

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
North of N81, West of M50	S1	Belgard Square East	565	126	-439
	S1	Belgard Square West	403	200	-203
	S1	Belgard Square North	1186	648	-537
	S1	Blessington Road	413	297	-116
	S1	Cookstown Way	1311	832	-479
	S1	Greenhills Road	1650	133	-1516
	S1	Old Blessington Road	692	251	-441
East of M50, South of R110	S2	Ballymount Avenue	1031	531	-500
	S2	Calmount Road	4233	3879	-354
South of R111, West of R817	S3	Clogher Road	641	31	-610
	S3	Crumlin Road	1208	903	-305
	S3	Drimnagh Road	2128	1724	-403
	S3	Kildare Road	825	514	-311
North of R111, West of R137	S4	Cork Street	866	371	-495
	S4	Dean Street	1031	671	-360
	S4	Dolphin's Barn Street	1451	1120	-331
	S4	Nicholas Street	654	207	-448
	S4	Patrick Street	787	323	-464
	S4	Saint Luke's Avenue	711	243	-467
North of N7 and R110	S5	Nangor Road	1741	822	-919
East of M50, North-West of R819	S6	Long Mile Road	900	656	-244
	S6	Naas Road	951	524	-427
	S6	Walkinstown Avenue	2005	853	-1151
	S6	Walkinstown Road	1151	816	-335

The contents of Table 6.61 demonstrate that there is a reduction of between -116 and -1,516 general traffic flows along the direct study area during the AM Peak Hour, which is attributed to the Proposed Scheme and the associated modal shift as a result of its implementation. This reduction in general traffic flow has been determined as an overall **Medium Positive** impact on the direct study area.

Direct Increases in General Traffic: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the orange / red lines in Diagram 6.43. The road links and associated flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 6.62.

Table 6.62: Road Links that Experience an Increase of ≥100 Combined Flows during PM Peak Hour (Direct Study Area)

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
East of M50, South of R110	S2	Ballymount Avenue (New Link)	0	987	987
	S2	Calmount Road (New Link)	0	1116	1116
	S2	Greenhills Road (New Link)	0	1462	1462
North of N7 and R110	S5	Nangor Road	932	1546	613

The contents of Table 6.62 demonstrate that there is an increase of between +613 and +1,462 general traffic flows along the direct study area during the AM Peak Hour.

When compared to Table 6.61, Table 6.62 shows that the scheme will generally reduce traffic levels along the corridor, with increases in traffic flow only predicted on four links, three of which relate to the closing off of a

section of Greenhills Road, and redirection of traffic along Calmount Road via a new link along Ballymount Avenue. Most of this traffic will be transferred from the existing Greenhill Road.

This increase in general traffic flow has been determined as an overall negligible impact on the direct study area.

Impact on Indirect Study Area (PM Peak Hour)

Reductions in General Traffic Flows: In addition to the general traffic flow reductions occurring along the direct study area, there are reductions in general traffic along certain road links within the indirect study area during the PM Peak Hour. The key reductions in traffic flows along the indirect study area during the PM Peak Hour are outlined in Table 6.63.

Table 6.63: Road Links that Experience a Reduction of ≥100 Combined Flows during PM Peak Hour (Indirect Study Area)

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
North of N81, West of M50	S1	Airton Road	467	352	-115
	S1	Belgard Road	1447	656	-791
	S1	Bóthar Katharine Tynan	738	517	-221
	S1	Castle Road	950	781	-169
	S1	Castletymon Road	786	612	-174
	S1	Citywest Avenue	862	661	-200
	S1	Cookstown Estate Road	431	66	-365
	S1	Cookstown Way	1189	879	-310
	S1	M50	2169	1492	-678
	S1	Main Road	823	607	-216
	S1	Mayberry Road	1236	1043	-192
	S1	N82	192	86	-106
	S1	Old Belgard Road	311	162	-149
	S1	Belgard Walk	740	574	-166
	S1	Cookstown Road	1161	1059	-102
	S1	Fourth Avenue	431	66	-365
	S1	Katherine Tynan Road	1763	1110	-653
East of M50, South of R110	S2	Ballymount Industrial Estate	978	627	-351
	S2	Ballymount Road Lower	1030	882	-149
	S2	Ballymount Road Upper	1671	1081	-589
	S2	St Peter's Road	1143	1039	-103
	S2	Western Parkway Business Centre	1284	1047	-237
	S2	Saint Peter's Road	1128	715	-414
South of R111, West of R817	S3	Cooley Road	543	392	-152
	S3	Cromwellsfort Road	2165	1643	-522
	S3	Herberton Road	1074	777	-297
	S3	Old County Road	592	395	-197
	S3	Sundrive Road	1039	888	-152
	S3	Walkinstown Embankment Road	2493	1977	-517
	S3	Walkinstown Parade	459	274	-185
	S3	Walkinstown Road	893	534	-359
	S3	Windmill Road	512	401	-111
	S4	Bridge Street Lower	2256	1974	-283
	S4	Bridge Street Upper	1514	1090	-424

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
North of R111, West of R137	S4	Christchurch Place	943	824	-119
	S4	Clanbrassil Street Upper	1019	851	-168
	S4	Cuffe Street	1288	1109	-180
	S4	Father Mathew Bridge	1762	1528	-234
	S4	Golden Lane	583	448	-136
	S4	Haroldville Avenue	369	209	-159
	S4	High Street	1599	996	-603
	S4	Kevin Street Lower	998	798	-200
	S4	Kevin Street Upper	1012	638	-375
	S4	Longford Street	437	310	-128
	S4	New Street South	1161	968	-194
	S4	St Stephen's Green	1119	954	-165
North of N7 and R110	S5	Balgaddy Road	1560	1446	-114
	S5	Carpenterstown Road	6221	5988	-232
	S5	Convent Road	472	357	-114
	S5	Earlsfort Green	1196	1085	-111
	S5	Fonthill Road South	932	795	-136
	S5	John F Kennedy Drive	517	106	-412
	S5	John F Kennedy Road	703	191	-512
	S5	Monastery Road	2767	2533	-235
	S5	Monksfield Grove	753	514	-239
	S5	N7	1171	988	-183
	S5	Neilstown Road	322	209	-113
	S5	New Nangor Road	1132	966	-165
	S5	Ninth Lock Road	2508	2315	-193
	S5	Noel Casey Roundabout	2120	1439	-682
	S5	Park West Avenue	902	544	-358
	S5	Turnpike Road	1123	767	-356
	S5	Woodford Downs	577	309	-268
	S5	Woodford Heights	690	457	-233
	S5	Woodford Hill	1080	785	-295
	S5	Woodford Walk	1385	787	-598
	S5	Bothar Na Life	527	421	-106
	S5	Fonthill Road	1836	1719	-116
	S5	Killean Road	856	465	-391
	S5	Lucan Newlands Road	2508	2315	-193
	S5	Oak Road	611	211	-401
	S5	Watery Lane	341	198	-143
East of M50, North-West of R819	S6	Killeen Road	1149	530	-619
	S6	Kilnamanagh Road	245	141	-104
	S6	Kylemore Road	2120	786	-1334
	S6	Le Fanu Road	503	292	-211
	S6	Robinhood Road	807	191	-615
	S6	Bluebell Avenue	244	111	-133

The LAM, as demonstrated by the contents of Table 6.63, indicates that during the 2028 Opening Year, there is a reduction in general traffic travelling in the indirect study area PM peak hour, as illustrated by blue links in Diagram 6.43. The traffic flow reduction varies between -102 and -1,334 combined flows, with peak reductions along Greenhills Road (between Main Road and Old Greenhills Road). This reduction in general traffic flow averages at -290 two-way flows which has been determined as an overall **Low Positive** impact on the indirect study area.

Increases in General Traffic Flows: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the orange/ red lines in Diagram 6.43. These red lines indicate where an increase in at least 100 combined flows are occurring. The key increases in traffic flows along the indirect study area during the PM Peak Hour are outlined in Table 6.64.

Table 6.64: Road Links Where Link Threshold of 100 Combined Flows is Exceeded (PM Peak Hour)

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
North of R134, West of M50	P1	Fonthill Road	1668	2029	361
	P1	Fonthill Road North	1737	2098	361
	P1	Neilstown Road	899	1179	281
North of R110	P2	Chapelizod Bypass	2582	2835	254
	P2	Con Colbert Road	1502	1609	107
	P2	Sarsfield Road	1157	1286	129
	P2	Suir Road	624	761	137
West of R137	P3	Bridgefoot Street	845	1004	160
	P3	Cornmarket	1100	1305	205
	P3	Francis Street	55	286	232
	P3	Wellington Road	2241	2467	227
South of R110	P4	Crumlin Road	1440	1577	137
	P4	Dromore Road	271	470	199
	P4	Kildare Road	265	595	331
	P4	Mourne Road	265	383	118
	P4	South Circular Road	897	1068	171
	P4	Sundrive Road	1256	1537	281
South of R110, East of M50	P5	Balfe Road	121	345	224
	P5	Ballymount Road Lower	113	1165	1052
	P5	Ballymount Road Upper	358	902	544
	P5	Crumlin Village	353	467	114
	P5	Drimnagh Road	1286	1701	415
	P5	Killeen Road	285	711	426
	P5	Naas Road	1922	2805	883
	P5	Long Mile Road	509	2072	1563
	P5	Old Naas Road	154	431	277
	P5	Oliver Bond Street	530	728	198
	P5	St Agnes Road	419	538	120
	P5	Turnpike Road	380	574	194
North of R134, East of M50	P6	Ballyfermot Road	1317	1589	272
	P6	Coldcut Road	1516	1777	261
	P6	M50	6171	6536	365
	P6	Nangor Road	914	1575	661
	P6	Park West Avenue	1035	1225	190

Orientation	Map ID	Road Name	Do Minimum Flows	Do Something Flows	Flow Difference
North of N7, West of M50	P7	Grange Castle Road	2308	2474	166
	P7	Monastery Road	959	1160	201
	P7	Ninth Lock Road	1311	1421	110
West of M50, South of A9	P8	Belgard Road	288	782	494
	P8	Citywest Avenue	436	628	192
	P8	Cookstown Extension	791	893	101
North of N7, West of R136	P9	Kingswood Road	1223	1615	392
	P9	N7	4111	4906	795
South of N81, West of M50	P10	Belgard Square South	292	516	224
	P10	N81	2521	2813	292
	P10	Old Blessington Road	276	382	106
	P10	The Square Link Road	200	516	316
East of M50, South of R819	P11	Firhouse Road	1301	1414	113
	P11	Spawell Roundabout	1471	1688	217

The contents of Table 6.64 outline that the additional traffic on the key road links varies between +101 to +1,563 combined flows during the PM Peak Hour. As described previously, these road links have been identified as experiencing additional traffic volumes over the 100 two-way flow threshold and require further assessment.

6.3.3.1.9.3 National Roads – 5% Threshold Impact Assessment

On the basis of the assessment methodology specifically for national roads, the junctions and associated flow difference between the Do Minimum and Do Something scenarios during the PM Peak Hour are outlined in Table 6.65.

Table 6.65: National Road Links Traffic Threshold Assessment (PM Peak Hour)

Junction	Total Do Minimum Turning Flows (PCU)	Total Do Something Turning Flows (PCU)	Turning Flow Difference (PCU)	Percentage Difference
M50 J7	16,964	17,118	154	0.9%
M50 J9	8,377	8,511	134	1.6%
M50 J10	11,237	10,481	-756	-6.7%
M50 J11	15,624	16,140	516	3.3%

The contents of Table 6.65 demonstrates that the highest impact of increased traffic predicted for total turning flows between the Do Minimum and Do Something scenarios in the PM Peak Hour is 3.3% at the M50 Junction 11, which is considered to have a negligible effect. All other junctions have an increase in flows under the 5% thresholds.

Therefore, no further assessment into the junctions with national roads during the AM Peak Hour has been undertaken, aside from instances where the 100 combined flow of additional traffic threshold is exceeded, as shown in Table 6.64.

Overall, the Proposed Scheme is expected to have a **Low positive** impact on traffic flows at junctions with national roads in the PM peak hour.

6.3.3.1.10 General Traffic Impact Assessment

This section details the magnitude of the impacts as a result of the redistributed general traffic on the indirect study area. Note that further assessment is presented in Chapter 6 of the EIAR which considers the junction sensitivities and the significant of effects.

To understand the magnitude impact of the redistributed traffic, operational capacities have been extracted from the LAM.

The capacity of junctions within the LAM are expressed in terms of Volume to Capacity ratios (VoC ratios). The VoC ratios represent the operational efficiency for each arm of a junction. For the purpose of this TIA, operational capacity outputs of a junction have been identified with reference to the busiest arm which experiences the maximum V/C ratio.

A VoC ratio of below 85% indicates that traffic is operating well, with spare capacity, and does not experience queuing or delays throughout the hour. A value of 85% to 100% indicates that traffic is approaching its theoretical capacity and may experience occasional queues and delays within the hour. A value of over 100% indicates that traffic is operating above its theoretical capacity and experiences queues and delays regularly within the hour. The junctions have been described in the ranges outlined in Table 6.66.

Table 6.66:Junction Volume / Capacity Ranges

VoC Ratio	Traffic Condition
≤85%	Traffic is operating well within theoretical capacity.
85% - 100%	Traffic is approaching theoretical capacity and may experience occasional queues and delays.
≥100%	Traffic is operating above its theoretical capacity and experiences queues and delays regularly.

When comparing the VoC ratios during the Do Minimum and Do Something scenarios for the key junctions, the terms outlined in Table 6.67 have been used to describe the impact.

Table 6.67: Magnitude of Impact for Redistributed Traffic

		Do Something		
		≤85%	85% - 100%	>100%
Do Minimum	≤85%	Negligible	Low Negative	High Negative
	85% - 100%	Low Positive	Negligible	Medium Negative
	>100%	Medium Positive	Low Positive	Negligible

As indicated in Table 6.67, the changes in VoC ratios between the Do Minimum and Do Something scenarios result in either a positive, negative or negligible magnitude of impact.

The above analysis was carried out on the following scenarios:

- 2028 Opening Year – Do Minimum vs Do Something – AM Peak Hour;
- 2043 Design Year (Opening Year + 15 Years) – Do Minimum vs Do Something – AM Peak Hour;
- 2028 Opening Year – Do Minimum vs Do Something – PM Peak Hour; and
- 2043 Design Year (Opening Year + 15 Years) – Do Minimum vs Do Something – PM Peak Hour.

The AM and PM Peak Hour flows are modelled as occurring between 08:00 to 09:00 and 17:00 to 18:00 respectively. The interpeak periods have not been analysed for this impact assessment as the AM and PM Peak Hour flows present an overall worst-case scenario. The full analysis tables for each scenario, demonstrating the Do Minimum and Do Something Peak Hour traffic flows and maximum V / C ratio for each junction assessed is detailed in Table 20 to Table 23 of TIA Appendix 4.4 (General Traffic Assessment).

General Traffic Impact Assessment (2028 Opening Year) – Indirect Study Area - AM Peak Hour

The contents of Table 6.68 outline the maximum V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2028 Opening Year at junctions where the ratio exceeds 100% in the Do Something scenario, or where the impact is assessed as low or higher. The location of these junctions and the V / C ratio comparison between the Do Minimum and Do Something scenarios in the 2028 AM Peak Hour are illustrated in Figure 6.9 in TIA Appendix 3 (Maps).

Table 6.68: Volume over Capacity Ratios at Key Junctions (Do Minimum vs. Do Something), AM Peak, 2028 Opening Year

Road Name	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact
		≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%	
Neilstown Road	Lucan Newlands Road / Neilstown Road	✓				✓		Low
Station Road	R113 / Station Road / Ninth Lock Road			✓			✓	Low
Ballyfermot Road	Clifden Road / Ballyfermot Road / Ballyfermot Road	✓				✓		Low
Cloverhill Road	Cloverhill Road / Cedar Brook Avenue	✓				✓		Low
Killeen Road	Killeen Road / Park West Road / Killeen Road			✓			✓	Negligible
Chapelizod Bypass	Chapelizod Bypass / Kennelsfort Road Lower			✓			✓	Low
Parnell Road	Parnell Road / Grove Road / Harold's Cross Road / Harold's Cross Road	✓				✓		Low
Reuben Street	Reuben Street / Dolphin's Barn Street / Reilly's Avenue	✓				✓		Low
Spawell Roundabout	Spawell Roundabout / Spawell Roundabout / Templeogue Road		✓				✓	Medium
Templeogue Road	Templeogue Road / Cypress Grove Road / Templeogue Road			✓			✓	Negligible
Old Naas Road	Naas Road / Old Naas Road	✓				✓		Low
Citywest Road	Citywest Road / Garter Avenue			✓			✓	Low
N81	Tallaght Bypass / Whitestown Way / Cookstown Way			✓			✓	Negligible

The results of the junction analysis illustrated in Table 6.68 demonstrate that of the total of 190 junctions assessed, 157 junctions are operating with a maximum V / C ratio of below 85% in the Do Something scenarios in the AM Peak Hour in the 2028 Opening Year. A further 26 junctions are operating with a maximum V / C ratio of between 85% - 100%. Therefore, the majority of junctions continue to operate well within capacity with the Proposed Scheme in place.

Overall, the Proposed Scheme is considered to have a **Negligible** impact at 172 out of 190 junctions within the indirect study area. 9 of the 190 junctions assessed are shown to have a **Low Negative** impact and one was shown to have **Medium Negative** impact. Eight junctions were assessed to have a **Low Positive** impact.

Capacity issues are noted at the following seven junctions (i.e. they are predicted to operate with a V / C ratio of above 100% in the Do Something scenario):

- Station Road / Ninth Lock Road (25236[2])

[2] Junction number – refer to TIA Appendix 4 Impact Assessments and Figure 6.9 to 6.12.

- Killeen Road / Park West Road (14214)
- Chapelizod Bypass / Kennelsfort Road Lower (22106)
- Spawell Roundabout (9148)
- Templeogue Road / Cypress Grove Road (9178)
- Citywest Road / Garter Avenue (24298)
- Tallaght Bypass / Whitestown Way / Cookstown Way (24129)

Six out of seven junctions operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something scenarios. The junction analysis contained within the EIAR considers the sensitivity of each of the above junctions and combines this with the predicted magnitude of impact to produce an overall significance of effects.

The results demonstrate that no junctions are predicted to have a significance of effect of significant or higher, therefore, no further assessment of the AM Peak Hour in the 2028 Opening Year is required.

General Traffic Impact Assessment (2028 Opening Year) – Indirect Study Area - PM Peak Hour

The contents of Table 6.69 outline the V / C ratios at the key local / regional road junctions in the PM Peak Hour for the 2028 Opening Year at junctions where the ratio exceeds 100% in the Do Something scenario, or where the impact is assessed as low or higher. The location of these junctions and the V / C ratio comparison between the Do Minimum and Do Something scenarios in the 2028 PM Peak Hour are illustrated in Figure 6.10 in TIA Appendix 3 (Maps).

Table 6.69: Volume over Capacity Ratios at Key Junctions (Do Minimum vs. Do Something), PM Peak, 2028 Opening Year

Road Name	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact
		≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%	
Chapelizod Bypass	Chapelizod Bypass / Kennelsfort Road Lower			✓			✓	Low
Chapelizod Bypass	Chapelizod Bypass / The Oval			✓			✓	Low
Con Colbert Road	Memorial Road / Con Colbert Road			✓			✓	Negligible
Ballymount Road Lower	Ballymount Road Lower / Ballymount Retail Centre			✓			✓	Negligible
Drimnagh Road	Crumlin Road / Kildare Road / Drimnagh Road	✓				✓		Low
Long Mile Road	Walkinstown Avenue / Long Mile Road		✓				✓	Medium
Long Mile Road	Long Mile Road / Walkinstown Parade	✓				✓		Low
Long Mile Road	Drimnagh Road / Long Mile Road	✓				✓		Low
Long Mile Road	Long Mile Road / Robinhood Road	✓				✓		Low
Naas Road	Naas Road / Turnpike Road			✓			✓	Negligible
Ballyfermot Road	Clifden Road / Ballyfermot Road	✓				✓		Low
Ballyfermot Road	Kennelsfort Road Upper / Coldcut Road / Ballyfermot Road	✓				✓		Low
M50	M50 Northbound / J9 Off-slip		✓				✓	Medium
N7	M50 J10 NB off slip to Naas Road			✓			✓	Low
N81	Glenview Roundabout / Tallaght Bypass /		✓				✓	Medium

The results of the junction analysis illustrate that, of a total of 164 junctions assessed, 133 junctions are operating with a maximum V / C ratio of below 85% in the Do Something scenarios in the PM Peak Hour in the 2028 Opening Year. A further 22 junctions are operating with a maximum V / C ratio of between 85% - 100%.

Overall, the Proposed Scheme is considered to have a **Negligible** impact at 149 out of 164 junctions within the indirect study area. Nine of the 164 junctions assessed are shown to have a **Low Negative** impact, three were shown to have **Medium Negative** impact. Three junctions were assessed to have a **Low Positive** impact.

Capacity issues are noted at the following 9 junctions:

- Chapelizod Bypass / Kennelsfort Road Lower (22106)
- Chapelizod Bypass / The Oval (22117)
- Memorial Road / Con Colbert Road (14124)
- Ballymount Road Lower / Ballymount Retail Centre (16166)
- Walkinstown Avenue / Long Mile Road (8196)
- Naas Road / Turnpike Road (16113)
- M50 Northbound / J9 Off-slip (16190)
- M50 J10 NB off slip to Naas Road (16183)
- Glenview Roundabout / Tallaght Bypass (24103)

Six out of 9 junctions operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something scenarios The junction analysis contained within the EIAR considers the sensitivity of each of the above junctions and combines this with the predicted magnitude of impact to produce an overall significance of effects.

The results demonstrate that no junctions are predicted to have a significance of effect of significant of higher, therefore, no further assessment of the PM Peak Hour in the 2028 Opening Year is required.

General Traffic Impact Assessment (2043 Design Year) – Indirect Study Area – AM Peak Hour

The contents of Table 6.70 outline the V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2043 Design Year at junctions where the ratio exceeds 100% in the Do Something scenario, or where the impact is assessed as low or higher. The location of these junctions and the V / C ratio comparison between the Do Minimum and Do Something scenarios in the 2043 AM Peak Hour are illustrated in Figure 6.11 in in TIA Appendix 3 (Maps).

Table 6.70: Volume over Capacity Ratios at Key Junctions (Do Minimum vs. Do Something), AM Peak, 2043 Opening Year + 15

Road Name	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact
		≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%	
Station Road	Station Road / Ninth Lock Road			✓			✓	Negligible
Coldcut Road	Coldcut Road / Coldcut Road / Cloverhill Road	✓				✓		Low
Killeen Road	Killeen Road / Park West Road / Killeen Road		✓				✓	Medium
Chapelizod Bypass	Chapelizod Bypass / The Oval		✓				✓	Medium
South Circular Road	South Circular Road / Clanbrassil Street Lower / Clanbrassil Street Upper / South Circular Road	✓				✓		Low
South Circular Road	South Circular Road / Dolphin's Barn	✓				✓		Low
Spawell Roundabout	Spawell Roundabout / Spawell Roundabout / Templeogue Road		✓				✓	Medium

Road Name	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact
		≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%	
Templeogue Road	Templeogue Road / Cypress Grove Road			✓			✓	Low
Belgard Road	Belgard Road / Cookstown Road			✓			✓	Negligible
Citywest Road	Citywest Road / Garter Avenue			✓			✓	Low
Cookstown Way	Cookstown Way / Maplewood Road	✓				✓		Low
N81	Tallaght Bypass / Whitestown Way / Cookstown Way			✓			✓	Negligible

The results demonstrate that, similar to the AM Peak Hour scenario in the 2028 Opening Year, the majority of junctions continue to operate within capacity with the Proposed Scheme in place (182 out of 190 junctions assessed).

Overall, the Proposed Scheme is considered to have a **Negligible** impact at 180 out of 190 junctions within the indirect study area. Seven junctions assessed are shown to have a **Low Negative** impact and three were shown to have **Medium Negative** impact. Seven junctions were assessed to have a **Low Positive** impact.

The following eight junctions are predicted to operate with a V / C of above 100%:

- Station Road / Ninth Lock Road (25236)
- Killeen Road / Park West Road (14214)
- Chapelizod Bypass / The Oval (22117)
- Spawell Roundabout (9148)
- Templeogue Road / Cypress Grove Road (9178)
- Belgard Road/ Cookstown Road (24178)
- Citywest Road / Garter Avenue (24298)
- Tallaght Bypass / Whitestown Way / Cookstown Way (24129)

Five out of eight junctions operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something scenarios Similarly, the remaining three junctions (Killeen Road, Spawell Roundabout and Chapelizod Bypass / The Oval) operate with a V / C ratio of 85-100% in the Do Minimum. The junction analysis contained within the EIAR considers the sensitivity of each of the above junctions and combines this with the predicted magnitude of impact to produce an overall significance of effects.

The results demonstrate that no junctions are predicted to have a significance of effect of significant of higher, therefore, no further assessment of the AM Peak Hour in the 2043 Design Year is required.

General Traffic Impact Assessment (2043 Design Year) – Indirect Study Area – PM Peak Hour

The contents of Table 6.71 outline the V / C ratios at the key local / regional road junctions in the PM Peak Hour for the 2043 Design Year at junctions where the ratio exceeds 100% in the Do Something scenario, or where the impact is assessed as low or higher. The location of these junctions and the V / C ratio comparison between the Do Minimum and Do Something scenarios in the 2043 PM Peak Hour are illustrated in Figure 6.12 in in TIA Appendix 3 (Maps).

Table 6.71: Volume over Capacity Ratios at Key Junctions (Do Minimum vs. Do Something), PM Peak, 2043 Opening Year + 15

Road Name	Junction Name	DM Max V / C Ratio			DS Max V / C Ratio			Magnitude of Impact
		≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%	
Fonthill Road	Fonthill Road North / Coldcut Road	✓				✓		Low
Chapelizod Bypass	Chapelizod Bypass / Kennelsfort Road Lower			✓			✓	Negligible
Chapelizod Bypass	Chapelizod Bypass / The Oval			✓			✓	Low
Con Colbert Road	Memorial Road / Con Colbert Road			✓			✓	Negligible
Bridgefoot Street	Thomas Street / Bridgefoot Street	✓				✓		Low
Ballymount Road Lower	Ballymount Road Lower / Ballymount Retail Centre			✓			✓	Low
Killeen Road	Killeen Road / Nangor Road / Killeen Road	✓				✓		Low
Long Mile Road	Walkinstown Avenue / Long Mile Road		✓				✓	Medium
Long Mile Road	Drimnagh Road / Long Mile Road	✓				✓		Low
Long Mile Road	Long Mile Road / Naas Road	✓				✓		Low
Naas Road	Naas Road / Turnpike Road			✓			✓	Negligible
Belgard Road	Blessington Road / Belgard Road	✓				✓		Low
N7	N7 J3 On-slip / Naas Road Northbound			✓			✓	Low
N81	Tallaght Bypass / Whitestown Way / Cookstown Way			✓			✓	Negligible

The results demonstrate that, similar to the PM Peak Hour scenario in the 2028 Opening Year, the majority of junctions continue to operate within capacity with the Proposed Scheme in place (156 out of 164 junctions assessed).

Overall, the Proposed Scheme is considered to have a **Negligible** impact at 147 out of 164 junctions within the indirect study area. Nine of the 164 junctions assessed are shown to have a **Low Negative** impact, one junction was shown to have **Medium Negative** impact. One junction was shown to have a **Medium Positive** Impact and six junctions were assessed to have a **Low Positive impact**.

The following seven junctions are predicted to operate with a V / C of above 100%:

- Chapelizod Bypass / Kennelsfort Road Lower (22106)
- Chapelizod Bypass / The Oval (22117)
- Ballymount Road Lower / Ballymount Road Lower / Ballymount Retail Centre (16166)
- Walkinstown Avenue / Walkinstown Avenue / Long Mile Road / Long Mile Road (8196)
- Naas Road / Turnpike Road (16113)
- N7 J3 On-slip / Naas Road Northbound (24110)
- Tallaght Bypass / Whitestown Way / Cookstown Way (24129)

Six out of the seven junctions operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something scenarios. The remaining tone junction, Walkinstown Avenue / Long Mile Road, operates with a V / C ratio of 85-100% in the Do Something

The junction analysis contained within the EIAR considers the sensitivity of each of the above junctions and combines this with the predicted magnitude of impact to produce an overall significance of effects.

The results demonstrate that no junctions are predicted to have a significance of effect of significant or higher, therefore, no further assessment of the PM Peak Hour in the 2043 Design Year is required.

6.3.3.1.10.1 Night-time Traffic Redistribution

The night-time period is defined as between 23:00 and 07:00. An analysis of traffic data during this period indicates that traffic levels are considerably lower and that junctions have a higher capacity for vehicular movement[3]. Automatic Traffic Counter data demonstrates that, typically, within Dublin the night-time period has approximately 19% of the traffic levels compared to the morning peak hour (08:00-09:00). As a result, during the night-time period junctions do not experience flows in excess of capacity which would result in queuing and in turn potential re-distribution of traffic to alternative routes to avoid congestion. Therefore, the effects of traffic redistribution due to any of the Proposed Schemes will be **Negligible** during the night-time period.

6.3.3.1.10.2 General Traffic Impact Assessment Summary

Given the improvements to bus priority, walking and cycling as a result of the Proposed Scheme, there will likely be an overall reduction in operational capacity for general traffic along the direct study area. This may in turn result in some redistribution of general traffic away from the main corridor onto the surrounding road network.

Using the TII guidelines as an indicator for best practice, the LAM Opening Year 2028 model results were used to identify the difference in traffic flows between the Do Minimum and Do Something scenarios. The following thresholds have been used to identify where further assessment is required:

- **Local / Regional Roads:** Traffic redistribution results in an increase above 100 combined flows (i.e. in a two-way direction) along residential, local and regional roads in the vicinity of the Proposed Scheme in the AM and PM peak hours;
- **National Roads:** Traffic exceeds 5% of the combined turning flows at junctions with/ on/or with national roads in the AM and PM peak hours as a result of traffic redistribution comparing the Do Minimum to the Do Something scenario with the Proposed Scheme in place.

The threshold impact assessment identified the following roads that required further traffic analysis:

- **AM Peak Hour:** A total of 63 road links, as listed in Table 6.57.
- **PM Peak Hour:** A total of 48 road links, as listed in Table 6.62

The general traffic impact assessment was undertaken by extracting operational capacities from the LAM at the key junctions along the above road links. To undertake a robust assessment, the outputs for the worst-performing arm at each junction have been assessed.

2028 National Roads Assessment: The highest impact predicted for total inbound flows between the Do Minimum and Do Something scenarios in the AM peak hour is a 2.8% increase at M50 Junction 9, which is below the 5% threshold that has been adopted for further assessment.

The highest impact predicted for total inbound flows between the Do Minimum and Do Something scenarios in the PM peak hour is a 3.3% increase at M50 Junction 11, which is below the 5% threshold that has been adopted for further assessment.

Overall, the Proposed Scheme is expected to have a **Negligible** effect on turning flows at junctions with National roads in both the AM and PM peak hours in 2028.

The overall results of this assessment can be summarised as follows:

- The majority of junctions assessed have V / C ratios of below 85%, i.e. they are operating within capacity for all assessed years in the Do Minimum and Do Something scenarios. This indicates that these junctions will be able to accommodate the additional general traffic volumes redistributed, as a result of the Proposed Scheme and the impact is deemed **Negligible to Low negative**.

[3] Less pedestrian, cycling and bus demand requirements leading to higher level of general traffic green time allocation per typical signal cycle

- At the small number of junctions indicating capacity constraints, the majority of these junctions operate with a maximum V / C ratio of above 100% in both the Do Minimum and Do Something, therefore, the impact is considered to be **Negligible**. This level of congestion is acceptable according to national guidance. Section 3.4.2 of DMURS (2019) recognises that a certain level of traffic congestion is an inevitable feature within urban networks and that junctions may have to operate at saturation levels for short periods of time during the Peak Hours of the day. Chapter 1 of the Smarter Travel Policy Document also acknowledges that it is not feasible or sustainable to accommodate continued demand for car use. It should therefore be considered that the traffic congestion that is outlined in the impact assessment is acceptable with regard to the urban location of the area in the context of the increased movement of people overall and on sustainable modes in particular. Therefore, the proposed impacts are considered acceptable when considered against the Scheme Objectives.

Overall, it is determined that there will be a **Low Negative** impact from the redistributed general traffic as a result of the Proposed Scheme. Given that the redistributed traffic will not lead to a significant deterioration of the operational capacity on the surrounding road network, no mitigation measures have been considered to alleviate the impact outside of the direct study area.

During the night-time lower traffic flows aligned with more vehicular capacity at junctions will reduce or eliminate traffic redistribution from the Proposed Scheme Corridor. Thus, the impact during this period will be **Negligible**.

6.3.3.1.10.3 Network-Wide Performance Indicators for General Traffic (Indirect Study Area)

To further quantify the impact of the Proposed Scheme on the traffic conditions within the indirect study area, additional network-wide performance indicators have been extracted from the LAM.

The following indicators have been provided:

- **Transient Queues** (pcu.hrs) represent delay caused by reduced speeds approaching junctions and by waiting time at junctions. It does not include delay created whilst stopped in queues at over capacity junctions;
- **Over Capacity Queues** (pcu.hrs) measures the time spent queuing as a result of junctions operating over capacity and is a measure of network congestion;
- **Total Travel Time** (pcu.hrs) is the sum of the time spent in transient queues, over capacity queues and link cruise time;
- **Total Travel Distance** (pcu.kms) is the total distance travelled by all the vehicles in the model; and
- **Average Network Speed** (km/hr) is the average speed of all the vehicles in the network over the modelled period. It is calculated by dividing total travel distance by total travel time.

For brevity, the above metrics have been presented in indicative terms of significance, as shown in Table 6.72.

Table 6.72 Supplementary General Traffic Metrics (Indirect Study Area)

Scenario	Metric	Do Minimum	Do Something	% Difference	Impact
2028 Opening Year AM Peak Hour	Transient Queues (pcu hr)	18,753	19,196	2.4%	Negligible
	Over-capacity Queues (pcu hr)	5,096	5,245	2.9%	
	Total Travel Times (pcu hr)	62,131	62,583	0.7%	
	Total Travel Distance (pcu km)	2,022,353	2,015,886	-0.3%	
	Average Speed (km/h)	32.5	32.2	-0.9%	
2028 Opening Year PM Peak Hour	Transient Queues (pcu hr)	18,018	18,472	2.5%	Low Positive
	Over-capacity Queues (pcu hr)	4,781	4,661	-2.5%	
	Total Travel Times (pcu hr)	59,102	59,443	0.6%	
	Total Travel Distance (pcu km)	1,939,403	1,938,743	-0.03%	
	Average Speed (km/h)	32.8	32.6	-0.6%	
	Transient Queues (pcu hr)	16020	16204	1.2%	Negligible

Scenario	Metric	Do Minimum	Do Something	% Difference	Impact
2043 Opening Year AM Peak Hour	Over-capacity Queues (pcu hr)	5113	5105	-0.2%	
	Total Travel Times (pcu hr)	57371	57233.7	-0.2%	
	Total Travel Distance (pcu km)	1996533	1981834	-0.7%	
	Average Speed (km/h)	34.8	34.6	-0.6%	
2043 Opening Year PM Peak Hour	Transient Queues (pcu hr)	16,985	17015	0.2%	Low Positive
	Over-capacity Queues (pcu hr)	5,280	5131	-2.8%	
	Total Travel Times (pcu hr)	57,638	57125.6	-0.9%	
	Total Travel Distance (pcu km)	1,936,806	1,920,733	-0.8%	
	Average Speed (km/h)	33.6	33.6	0.00%	

The results in Table 6.72 demonstrate that the changes to general traffic metrics as a result of the Proposed Scheme are typically in the range -3.3% to +2.6%, which is assessed as an overall **Negligible impact.**

6.3.3.2 Operational Phase Summary

Based on the information and analysis presented within Section 6.3 (Operational Phase), the findings of the assessment are as follows:

Table 6.73:Summary of Predicted Operational Phase Impacts

Assessment Topic	Effect	Predicted Impact
Pedestrian Infrastructure	Improvements to the quality of the pedestrian infrastructure along the Proposed Scheme.	Medium Positive (Sections 1,3,4,5,6), High Positive (Section 2)
Cycling Infrastructure	Improvements to the quality of the cycling infrastructure along the Proposed Scheme.	Low Positive (Section 1,2,4), Medium Positive (Section 3,5,6)
Bus Infrastructure	Improvements to the quality of the bus infrastructure along the Proposed Scheme.	Low Positive (Section 6), Medium Positive (Section 1 and 3), High Positive (Section 2, 4 and 5)
Parking and Loading	A total loss of 540 parking / loading spaces and 3 HGV spaces along the Proposed Scheme.	Negligible (Section 5), Low Negative (Sections 1,2,3,4 and 6)
People Movement	Increases to the total number of people travelling along the Proposed Scheme.	High Positive
Operational Impacts for Bus Passengers and Operators	Improvements to the network performance indicators for bus users along the Proposed Scheme.	High Positive
General Traffic Network Performance Indicators	Reduction in general traffic flows along the Proposed Scheme.	Medium Positive
	Redistributed general traffic along the surrounding road network in the indirect study area as a result of the reduction of reserve capacity along the Proposed Scheme.	Low Negative
	Deterioration to the network-wide queuing capacity, travel times, travel distances and average network speeds beyond the direct and indirect study areas.	Negligible

The Proposed Scheme has been designed and outlined within this assessment to take cognizance in the relevant traffic and transport guidelines outlined in Chapter 9 (References). The assessment demonstrates that the Proposed Scheme will provide significantly enhanced facilities for sustainable modes, helping to provide an attractive alternative to the private car, and promoting a modal shift to walking, cycling and public transport.

Despite some localised impacts, the assessment demonstrates that overall the surrounding road network has the capacity to accommodate the associated traffic and transport impacts.

Accordingly, it is concluded that the Proposed Scheme will deliver strong benefits from a sustainable transport point of view, allowing for greater capacity along the corridor to facilitate the movement of people, and will not result in a significant deterioration to the existing traffic conditions on the local road network during the operational phase.

7. Cumulative Assessment

7.1 Construction Phase Cumulative Effects

The assessment of cumulative effects associated with the Construction Phase of the Proposed Scheme is contained within Chapter 21 (Cumulative Impacts & Environmental Interactions) in Volume 2 of the EIAR.

7.2 Operational Stage Cumulative Impacts

7.2.1 Introduction

This chapter also reports the assessment of cumulative effects associated with the Operational Stage of the Proposed Scheme and other Proposed Core Bus Corridor Schemes. This includes the cumulative impacts of the Proposed Scheme on relevant transport receptors in combination with other existing and/or approved projects including all other Proposed BusConnects Schemes. The transport modelling undertaken as part of the Traffic and Transport assessment informs the cumulative impacts assessment of other environmental topics. Further details on the cumulative impacts of Air Quality, Climate, Noise and Vibration, Population and Human health are detailed within Chapter 21, Volume 2 of this EIAR.

7.2.2 Transport Schemes

As detailed in Section 6.1.3, the core reference case (Do Something) modelling scenarios (Opening year - 2028 and Design year - 2043) are based on the progressive roll-out of the Greater Dublin Area (GDA) Transport Strategy 2022-2042 (GDA Strategy), with a partial implementation by 2028, in line with (National Development Plan (NDP) investment priorities) and the full implementation by 2043. To this end, the modelling scenarios developed for the operational assessment of the Proposed Scheme(s) inherently accounts for the cumulative effects of complementary committed and proposed transport schemes within the GDA region.

The GDA Strategy provides is an appropriate receiving environment for the assessment of cumulative effects for the following reasons:

- The GDA Strategy is the approved statutory transportation plan for the region, providing a framework for investment in transport within the region up to 2042;
- The GDA Strategy provides a consistent basis for the 'likely' future receiving environment that is consistent with Government plans and Policies (National Planning Framework (NPF) and National Development Plan (NDP); and
- Schemes within the GDA Strategy are a means to deliver the set of objectives of the GDA Strategy. The sequencing and delivery of the strategy is defined by the implementation plan, but the optimal outcome of aiming to accommodate all future growth in travel demand on sustainable modes underpins the Strategy.

7.2.3 Transport Demand

Cumulative transport demand for the 2028 and 2043 assessment years have been included in the analysis contained within this chapter, using travel demand forecasting, which accounts for increases in population and economic activity, in line with planned growth contained within the NPF, Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland region and the local development plans for GDA local authorities.

It is envisaged that the population will grow by 11% up to 2028 and 25% by 2043 (above 2016 census data levels). Similarly, employment is due to grow by 22% by 2028 and 49% by 2043 (Source: NTA Reference Case Planning Sheets 2028, 2043).

7.2.3.1 Strategic Trip Demand Assessment

As described previously in section 6.1.3, the GDA Strategy (along with existing supply side capacity constraints e.g., parking availability, road capacity etc.) has the effect of limiting the growth in car demand on the road network into the future.

To limit the growth in car traffic and to ensure that this demand growth is catered for predominantly by sustainable modes, a number of measures will be required, that include improved sustainable transport infrastructure and priority measures delivered as part of the NDP/GDA Strategy. In addition to this, demand management measures will play a role in limiting the growth in transport demand, predominantly to sustainable modes only. The result will be only limited or no increases overall in private car travel demand. The Proposed Scheme will play a key role in this as part of the wider package of GDA Strategy measures.

In general, total trip demand (combining all transport modes) will increase into the future in line with population and employment growth. A greater share of this demand will be by sustainable modes (Public Transport (PT), Walking, Cycling). Private car demand may still grow in some areas but not linearly in line with demographics, as may have occurred in the past.

In terms of the transport modelling scenarios for the cumulative traffic and transport assessment, as per the Strategy proposals, there are no specific demand management measures included in the Do Minimum reference case (receiving environment) scenario in the 2028 Opening year, other than constraining parking availability in Dublin at existing levels. For the design year, 2043 scenario, demand management is included in the Do Minimum in line with the Strategy's Core Demand Management Measures; Reduction of free workplace parking in urban areas, increased parking charges in urban areas and adjustment of traffic signal timings across the metropolitan area to better facilitate movement by sustainable modes. Trip Demand Growth within Study area of the Proposed Schemes

To understand the background levels of demand growth within the study area of the Proposed Schemes in the assessment years (2028, 2043), the 24-hour demand outputs by mode from the NTA ERM have been analysed. A buffer of 500m beyond the extent of the Proposed Schemes has been chosen to capture the population that is most likely to interact with the Proposed Scheme, and which could reasonably be exposed to cumulative effects in combination with other developments. Diagram 7.2 below outlines the changes in total trip demand, comparing car demand with sustainable mode demand (public transport, walking and cycling). The figures are presented for both 2028 and 2043 Do Minimum scenarios (i.e., without the Proposed Schemes in place) in relation to the 2020 ERM demand levels.

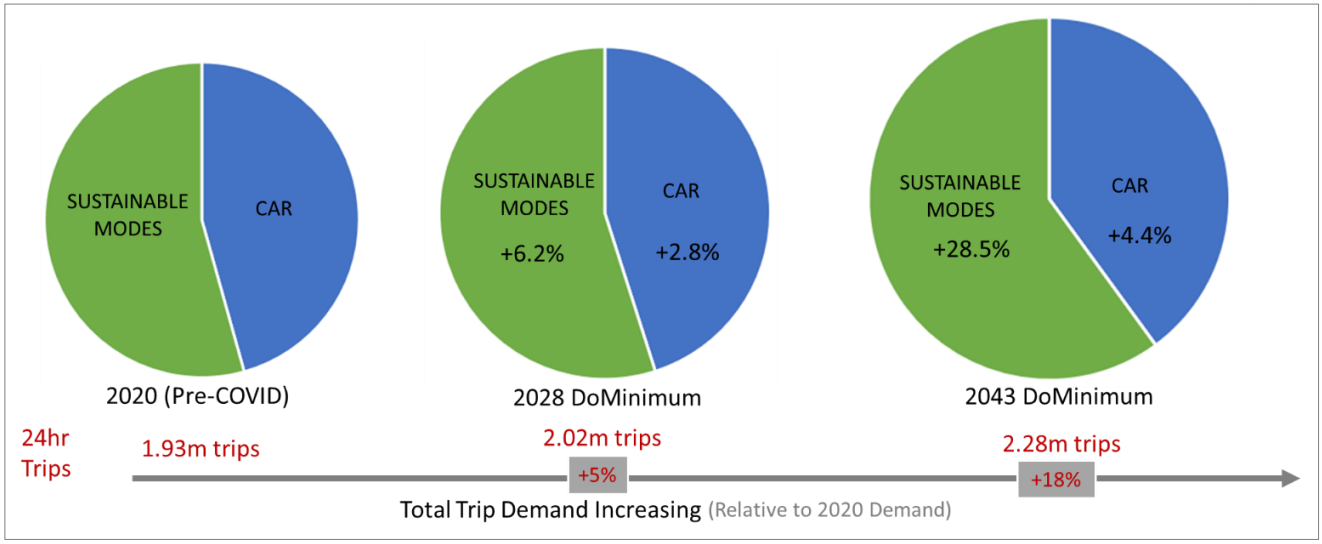

Diagram 7.1: Trip Demand Changes without the Proposed Schemes (in Relation to 2020 Demand)

As shown above, there are 1.93m trips[4] over a 24hr period within 500m of the Proposed Schemes. Total trip demand increases to 2.02m trips (5% increase) in 2028 and to 2.35m trips (+22% increase) in 2043.

[4] Trips to/from ERM zones within a 500m distance from the Proposed Scheme to/from any destination

In terms of the modal composition of the 5% increase in total demand in 2028, there will be a 6.2% increase in sustainable modes (PT, walk, cycle) and a 2.8% increase in private car demand above 2020 levels, without the Proposed Schemes in place. In 2043, the 22% increase in total trip demand (above 2020 levels) will be made up of a 28% increase in sustainable modes demand (PT, walk, cycle) and a 7% reduction in private car demand, compared to 2020 (pre-COVID 19) levels. The analysis indicates that even without the Proposed Schemes in place, other GDA Transport Strategy measures and road network capacity constraints mean that private car demand is not growing at the same rate as overall travel demand, and in fact car traffic levels will reduce below current / 2020 traffic levels.

The overall share of Sustainable modes trips on the network will increase from 49% in 2020, to 58% in 2028 and to 63% in 2043 with corresponding reductions in the private car share of overall travel demand.

7.2.3.1.1 Impacts of BusConnects Proposed Scheme Works on Travel Demand Growth

A similar assessment has been undertaken comparing 24-hour car demand with sustainable mode demand (public transport, walking and cycling) for both the 2028 and 2043 Do Something scenarios (i.e., with all Proposed Schemes in place) in relation to the 2020 ERM demand levels (and is shown in Diagram 7.2 below).

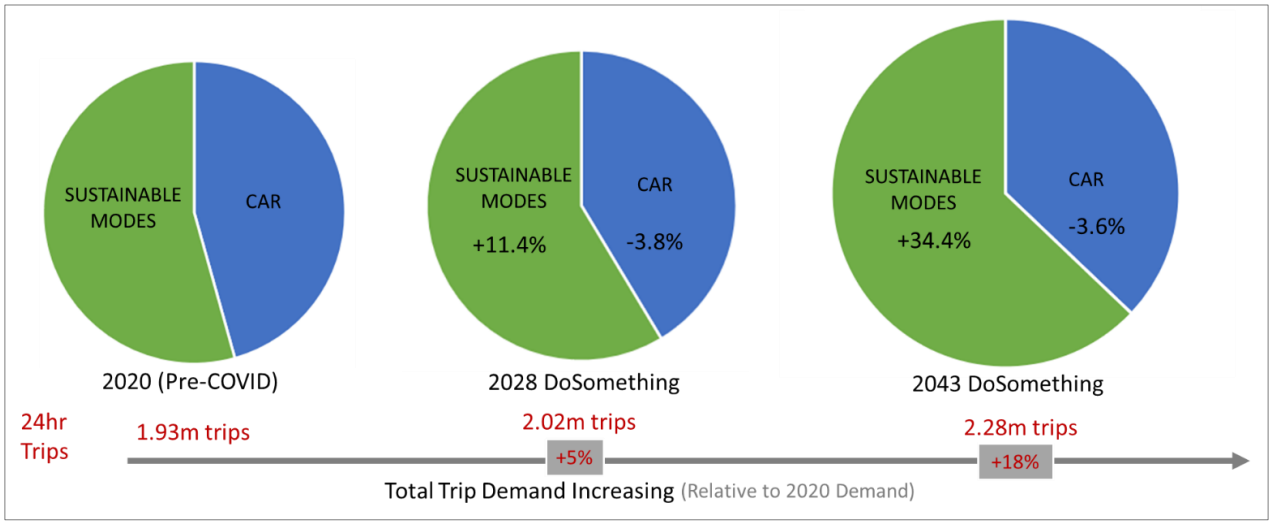

Diagram 7.2: Trip Demand Changes with the Proposed Schemes (in Relation to 2020 Demand)

As shown above, the same level of overall trip demand will occur, however, significantly higher levels of these trips will be made by sustainable modes due to the provision of the BusConnects Proposed Scheme Infrastructure Works. In terms of the modal composition of the 5% increase in total demand in 2028, there will be an 11.4% increase in sustainable modes (PT, walk, cycle) and a 3.8% decrease in private car demand compared to 2020 levels, with the Proposed Schemes in place. In 2043, the 22% increase in total trip demand (above 2020 levels) will be made up of a 33% increase in sustainable modes demand (PT, walk, cycle) and a 14% decrease in private car demand, compared to 2020 levels. The analysis indicates that the Proposed Schemes will have a significant impact on sustainable mode share. The schemes will prevent any increase in private car traffic within the study area and will instead result in a further substantial reduction in car trips below 2020 levels.

With the Proposed Schemes in place, the overall share of Sustainable modes trips on the network will increase from 49% in 2020, to 61% in 2028 and to 66% in 2043 with corresponding reductions in the private car share of overall travel demand.

7.2.4 People Movement Assessment

7.2.4.1 Overview

In order to understand the benefit with regards to the Movement of People following the full implementation of all 12 of the Proposed Schemes, a quantitative People Movement assessment has been undertaken using outputs

of the modelling suite comparing the Do Minimum and Do Something Peak Hour scenarios for each forecast year (2028, 2043).

The assessment of People Movement includes the following metrics:

- Daily Mode share changes within a 500m catchment[5] of the Proposed Schemes comparing the Do Minimum and Do Something scenarios for trips to the City Centre and trips to any destination in the 2028 and 2043 assessment years;
- The average number of people moved by each transport mode (i.e., Car, Bus, Walking and Cycling) along the corridor in the inbound and outbound direction. This metric is compared for the Do Minimum and Do Something scenarios in the AM and PM peak hours for each forecast year (2028, 2043). This metric provides an estimate of the modal share changes on the direct CBC as a result of the Proposed Scheme measures; and
- People Movement by Bus:
    - Total Passengers Boarding Buses on bus routes that use any part of the Proposed Scheme for each forecast year (2028, 2043)

7.2.4.2 Daily People Movement by Mode (Mode Share)

Daily (07:00-19:00 – weekday) mode share data has been extracted from the ERM for zones within a 500m catchment of the Proposed Schemes comparing the Do Minimum and Do Something scenarios for each of the forecast years (2028, 2043).

Diagram 7.4 and Diagram 7.5 illustrate the mode share changes (% increase and absolute) comparing the Do Minimum and Do Something (All Proposed Schemes) scenarios for Car, Public Transport and Cycling for the following:

- People travelling from the catchment area of the Proposed Schemes to any destination within the catchment (inclusive of the City Centre) in the Morning Peak period (AM) (07:00-10:00) and All-day (07:00-19:00) period; and
- People travelling from the catchment area[6] of the Proposed Schemes inbound towards the City Centre (defined as the Canal Cordon) in the Morning Peak period (AM) 07:00-19:00 period.

[5] 500m recommended maximum walking distance to Core Bus Corridors - "Buses In Urban Development", CIHT 2018

[6] The analysis includes only trips from the defined catchment i.e., it does not include trips from external areas outside of the catchment that travel to the city centre

7.2.4.2.1 2028 Demand Changes by Mode

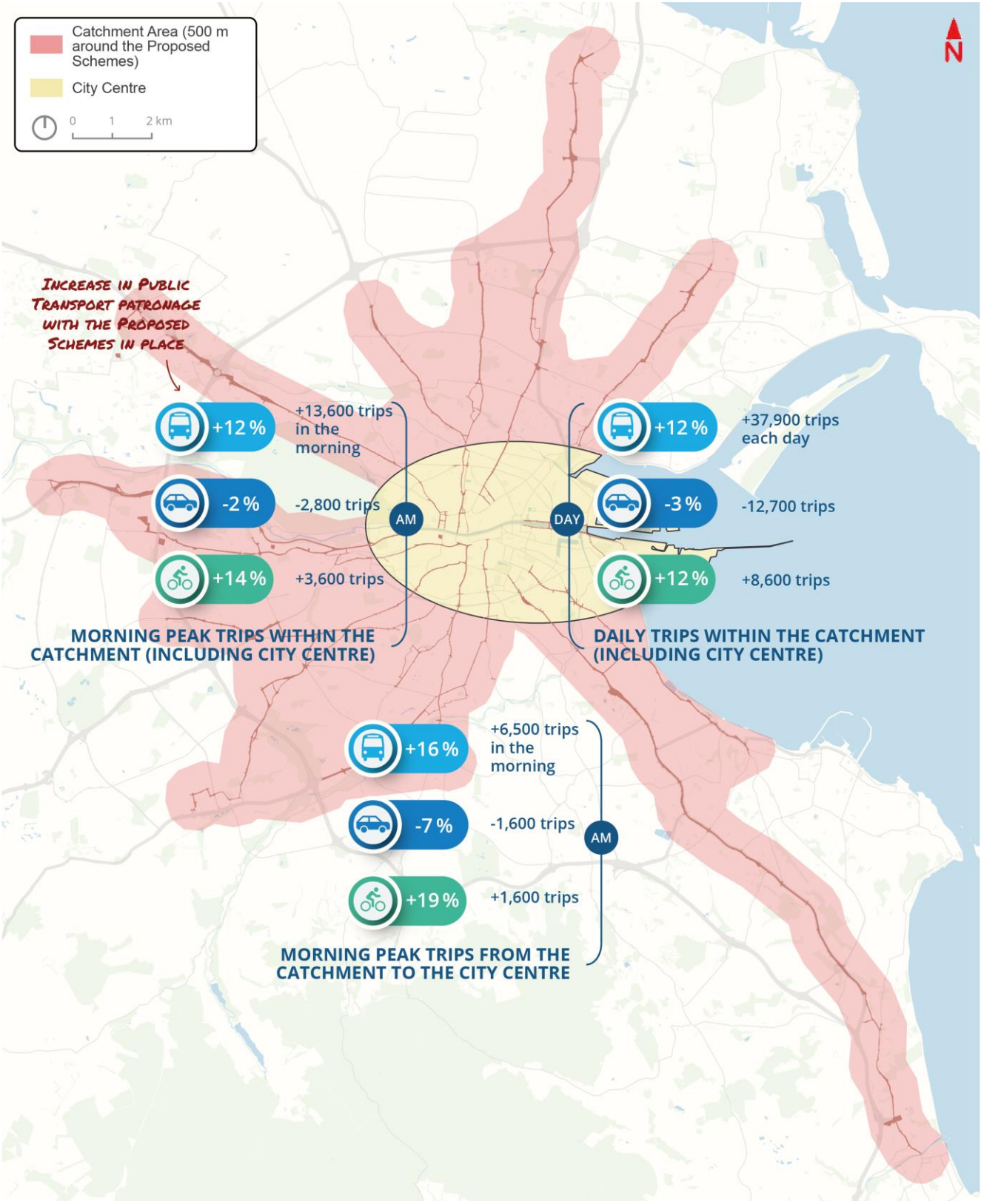

Diagram 7.3: Change in Trips by Mode within a 500m Catchment Area of the Proposed Schemes and the City Centre and Trips Originating from the Catchment Inbound to the City Centre in 2028

As indicated in Diagram 7.4, it is estimated that for people travelling within the 500m catchment area (including City Centre) there will be a 12% increase in public transport trips, 2% decrease in general traffic trips (i.e.

motorists) and a 14% increase in cycling trips in the morning peak period (07:00-10:00). Across the whole day (07:00-19:00), there will be a 12% increase in public transport, 3% decrease in general traffic and a 12% increase in cycling trips.

It is also estimated that for people travelling inbound to the City Centre from the catchment area in the morning peak period there will be 16% increase in public transport trips, 7% decrease in general traffic trips (i.e. motorists) and a 19% increase in cycling trips.

Table 7.1 outlines the difference in trips and modal split between the Opening Year Do Minimum and Do Something scenarios for people travelling within the Catchment Area and the City Centre in the morning peak period and All-Day (07:00-19:00).

Table 7.1: 2028 Modal Share of Trips within a 500m Catchment Area from of the Proposed Schemes and the City Centre

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Daily Trips	Modal Split (%)	Daily Trips	Modal Split (%)	Daily Trips	Difference (%)
Within Catchment Area and City Centre	AM (07:00-10:00)	Public Transport	111,090	25.5%	124,700	27.7%	13,610	12.3%
		General Traffic	145,560	33.4%	142,730	31.7%	-2,830	-1.9%
		Cycling	25,670	5.9%	29,250	6.5%	3,580	13.9%
		Walking	154,000	35.3%	153,160	34.0%	-840	-0.5%
		Total	436,320	100%	449,840	100%	13,520	3.1%
Within Catchment Area and City Centre	Daily (07:00-19:00)	Public Transport	328,800	24.8%	366,730	27.0%	37,930	11.5%
		General Traffic	435,860	32.9%	423,140	31.2%	-12,720	-2.9%
		Cycling	70,680	5.3%	79,270	5.8%	8,590	12.2%
		Walking	487,880	36.9%	487,400	35.9%	-480	-0.1%
		Total	1,323,220	100%	1,356,540	100%	33,320	2.5%

As shown in Table 7.1, it is expected that there will be an approximate 3% (13,500) increase in People Movement within the Catchment Area (including City Centre) as a result of the Proposed Schemes in the morning peak period. The slight net increase in the total number of trips is due to the improved accessibility and reduced congestion for sustainable mode users provided with the Proposed Schemes in place. Over the whole day, approximately 46,000 additional trips will be made by bus and cycling.

It is also estimated that a modal shift will occur in the morning peak period consisting of an increase in Public Transport mode share from 25.5% to 27.7%, a decrease in general traffic share from 33.4% to 31.7% and an increase in the number of cyclists from 5.9% to 6.5%. The modal shift in the daily trips within the 500m catchment area and the City Centre will consist of an increase in Public Transport users from 24.8% to 27%, a decrease in general traffic share from 32.9% to 31.2% and an increase in the number of cyclists from 5.3% to 5.8%.

The number of walking trips is shown to remain broadly similar in the Do Something scenario. This is mainly due to a mode shift from walking to bus, due to the enhanced public transport provision in the Do Something scenario.

Table 7.2 outlines the difference in trips and modal split between the Opening Year Do Minimum and Do Something (All Proposed Schemes) scenarios for people travelling from the Catchment Area inbound towards the City Centre in the morning peak period.

Table 7.2: 2028 Modal Share of Trips Originating from a 500m Catchment Area from of the Proposed Schemes to the City Centre

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Daily Trips	Modal Split (%)	Daily Trips	Modal Split (%)	Daily Trips	Difference (%)
Within Catchment Area and City Centre	AM (07:00-10:00)	Public Transport	40,050	48.4%	46,500	52.5%	6,450	16.1%
		General Traffic	23,180	28.0%	21,540	24.3%	-1,640	-7.1%
		Cycling	8,530	10.3%	10,150	11.5%	1,620	19.0%
		Walking	11,030	13.3%	10,450	11.8%	-580	-5.3%
		Total	82,790	100%	88,640	100%	5,850	7.1%

As shown in Table 7.2, the modelling indicates that there will be an approximate 7% (6,000) increase in total People Movement travelling from the Catchment Area to the City Centre as a result of the Proposed Schemes in the morning peak period.

It is also indicated that a modal shift will occur consisting of an increase in Public Transport users from 48.4% to 52.5%, a decrease in general traffic mode share from 28% to 24.3% and an increase in the cycling mode share from 10.3% to 11.5% with the Proposed Schemes in operation.

7.2.4.2.2 2043 Demand Changes by Mode

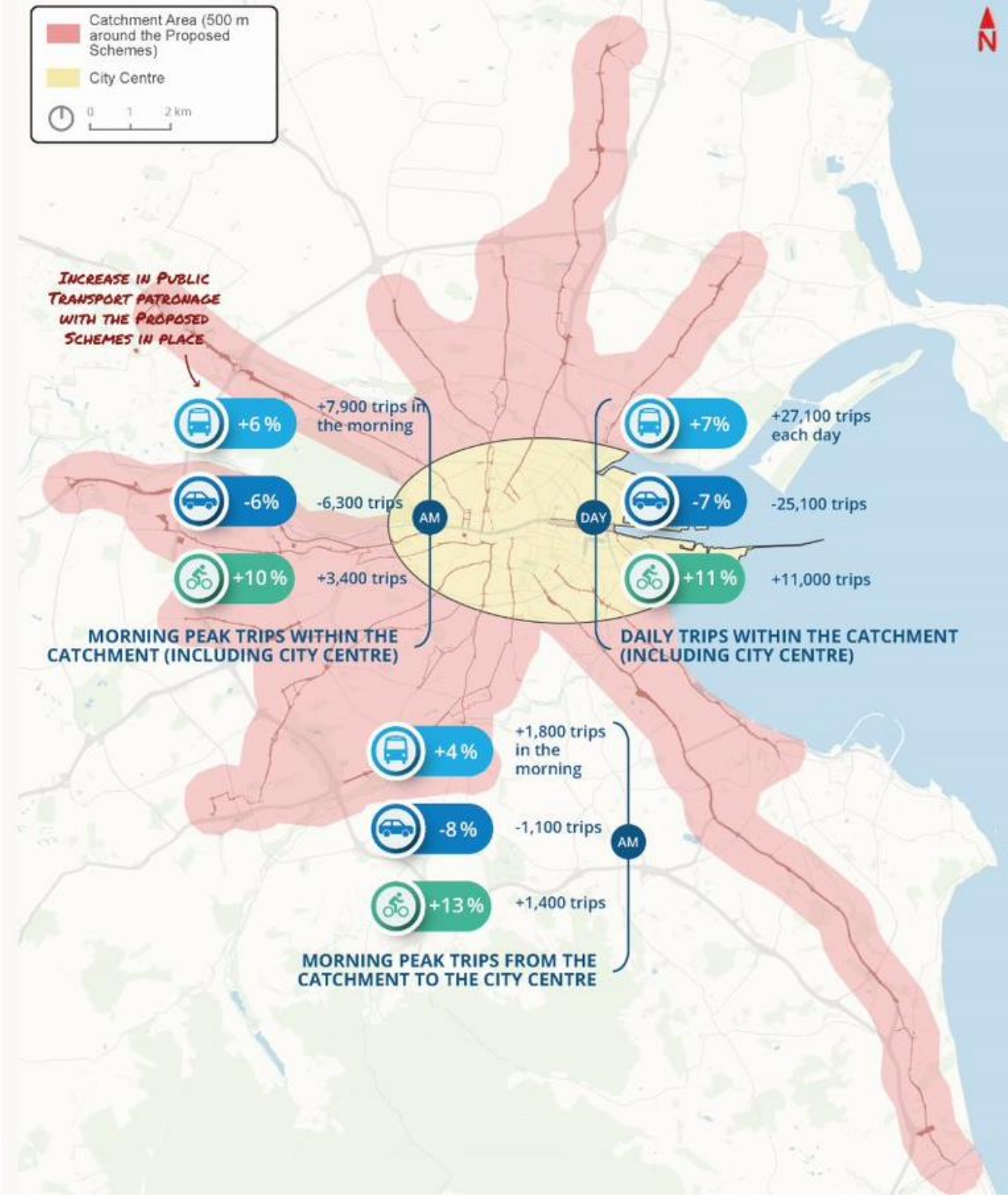

Diagram 7.4: Change in trips by mode within a 500m Catchment Area of the Proposed Schemes and the City Centre and Trips originating from the Catchment inbound to the City Centre in 2043

As indicated in Diagram 7.4, it is estimated that for people travelling within the 500m catchment area (including City Centre) there will be a 6% increase in public transport trips, 6% decrease in general traffic trips (i.e. motorists) and a 10% increase in cycling trips in the morning peak period and a 7% increase in public transport, 7% decrease in general traffic and a 11% increase in cycling trips each day (07:00-19:00).

The modelling shows that for people travelling inbound to the city centre from the Catchment Area in the morning peak period there will be a 4% increase in public transport trips, 8% decrease in general traffic trips (i.e., motorists) and a 13% increase in cycling trips.

Table 7.3 outlines the difference in trips and modal split between the Opening Year Do Minimum and Do Something (All Proposed Schemes) scenarios for people travelling within the Catchment Area and the City Centre in the morning peak period and All Day (07:00-19:00).

Table 7.3: 2043 Modal Shift of Trips within a 500m Catchment Area from of the Proposed Schemes and the City Centre

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Daily Trips	Modal Split (%)	Daily Trips	Modal Split (%)	Daily Trips	Difference (%)
Within Catchment Area and City Centre	AM (07:00-10:00)	Public Transport	129,599	29.4%	137,493	30.8%	7,894	6.1%
		General Traffic	103,586	23.5%	97,233	21.8%	-6,353	-6.1%
		Cycling	36,596	8.3%	40,146	9.0%	3,550	9.7%
		Walking	171,570	38.9%	170,979	38.4%	-591.55	-0.3%
		Total	441,351	100%	445,851	100%	4,500	1.0%
Within Catchment Area and City Centre	Daily (07:00-19:00)	Public Transport	384,759	27.3%	411,921	28.9%	27,162	7.1%
		General Traffic	341,912	24.2%	316,802	22.2%	-25,110	-7.3%
		Cycling	102,803	7.3%	113,894	8.0%	11,091	10.8%
		Walking	582,146	41.2%	585,411	41%	3,266	0.6%
		Total	1,411,619	100%	1,428,028	100%	16,409	1.2%

As shown in Table 7.3, it is expected that there will be an approximate 1% (4,500) increase in People Movement travelling within the Catchment Area (including City Centre) as a result of the Proposed Schemes in the morning peak period. The slight net increase in the total number of trips is due to the improved accessibility and reduced congestion for sustainable mode users provided with all the Proposed Schemes in place. Over the whole day, approximately 38,300 additional trips will be made by bus and cycling, which is a significant increase, when considering that other elements of the GDA Strategy will be place in 2043.

It is also estimated that a modal shift will occur in the morning peak period consisting of an increase in Public Transport share from 29.4% to 30.8%, a decrease in general traffic share from 23.5% to 21.8% and an increase in cycling from 8.3% to 9.0%. The modal shift in the daily trips within the 500m catchment area and the City Centre will consist of an increase in Public Transport users from 27.3% to 28.9%, a decrease in general traffic from 24.2% to 22.2% and an increase in cyclists from 7.3% to 8.0%.

General traffic is seen to have much higher levels of reduction in 2043 than when compared to 2028 due to the increased level of non-bus public transport infrastructure (MetroLink, Luas extensions and DART+ from the GDA Strategy) in tandem with the road capacity reduction measures as part of the Proposed Scheme leading to increased usage on all public transport modes. The number of walking trips is shown to remain broadly similar in the Do Something scenario. This is mainly due to a mode shift from walking to bus, due to the enhanced public transport provision in the Do Something scenario.

Table 7.4 outlines the difference in trips and modal split between the Opening Year Do Minimum and Do Something (All Proposed Schemes) scenarios for people travelling from the Catchment Area inbound towards the City Centre in the morning peak period.

Table 7.4: 2043 Modal Shift of Trips originating from a 500m Catchment Area from of the Proposed Schemes to the City Centre

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Daily Trips	Modal Split (%)	Daily Trips	Modal Split (%)	Daily Trips	Difference (%)
Within Catchment Area and City Centre	AM	Public Transport	45,323	52.4%	47,098	53.4%	1,775	3.9%
		General Traffic	14,881	17.2%	13,761	15.6%	-1,121	-7.5%
		Cycling	11,127	12.9%	12,571	14.2%	1,444	13.0%
		Walking	15,188	17.6%	14,843	16.8%	-344.57	-2.3%
		Total	86,519	100%	88,272	100%	1,754	2.0%

As shown in Table 7.4, the modelling indicates that there will be an approximate 2% increase in total People Movement travelling from the Catchment Area to the City Centre as a result of the Proposed Schemes, in the morning peak period.

It is also indicated that a modal shift will occur consisting of an increase in Public Transport mode share from 52.4% to 53.4%, a decrease in general traffic mode share from 17.2% to 15.6% and an increase in the cycling mode share from 12.9% to 14.2%.

7.2.4.3 Peak Hour People Movement along the Proposed Schemes

To determine the cumulative impact that the Proposed Schemes will have on modal share changes on the direct study areas as a result of their implementation, the weighted average number of people moved by each mode (Car, Bus, Active Modes) has been extracted from the modelling suite. The analysis compares the Do Minimum and Do Something (All Proposed Schemes) scenarios both in the inbound and outbound direction in the AM and PM Peak Hour periods for each forecast years (2028, 2043).

7.2.4.3.1 2028 AM Peak Hour People Movement

Diagram 7.5 illustrates the average People Movement by mode, across all Proposed Schemes, inbound towards the City Centre during the AM Peak Hour in 2028.

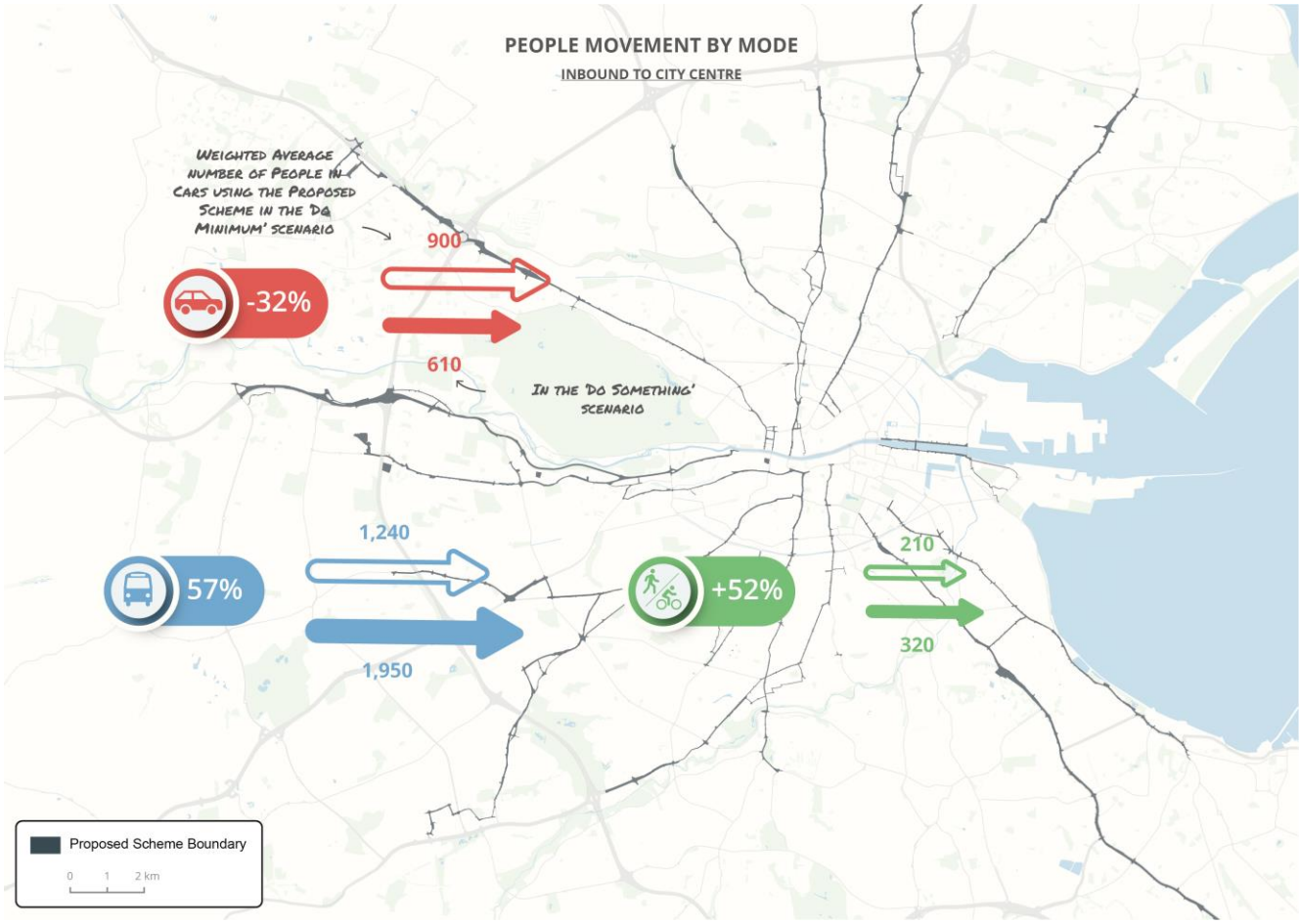

Diagram 7.5: People Movement by Mode during 2028 AM Peak Hour

As indicated in Diagram 7.5, on average across all Proposed Schemes, there is a predicted reduction of 32% in the number of people travelling via car, an increase of 57% in the number of people travelling via bus and an increase of 52% in people walking or cycling along the Proposed Schemes during the AM Peak Hour. It should be noted that the model predicts limited change in total walking trips between each scenario. This is due to the fact that walking trips in the Do Minimum scenario are also transferring to public transport and cycling due to the improved provision with any new walkers transferring from car replacing these trips.

The Proposed Schemes will facilitate a step change in the level of segregated cycling provision in comparison with existing conditions along the entire length of the corridor. The transport modelling undertaken, is therefore conservative in terms of the predicted cycling mode share. The Proposed Schemes have been designed to cater for much higher levels of cycling uptake and this will provide the opportunity for a significant increase in the movement of people travelling sustainably along the corridor, which would otherwise not be achieved in the absence of the Proposed Schemes.

Table 7.5 outlines the difference in modal split between the Do Minimum and Do Something scenarios for each mode of transport in an inbound direction towards the City Centre during the AM Peak Hour. The results indicate a 23% increase in total people moved as a result of the Proposed Schemes and a 57% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 7.5 Modal Shift of 2028 AM Peak Hour along Proposed Schemes

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Inbound towards the City Centre	AM Peak Period	General Traffic	900	38%	610	21%	-290	-32%
		Public Transport	1,240	53%	1,950	68%	710	57%
		Walking	140	6%	140	5%	0	0%
		Cycling	70	3%	180	6%	110	157%
		Sustainable Modes Total	**1,450**	**62%**	**2,270**	**79%**	**820**	**57%**
		Total (all modes)	**2,350**	**100%**	**2,880**	**100%**	**530**	**23%**

7.2.4.3.2 2028 PM Peak Hour People Movement

Diagram 7.6 illustrates the average People Movement by mode, across all Proposed Schemes, travelling outbound from the city centre during the PM Peak Hour.

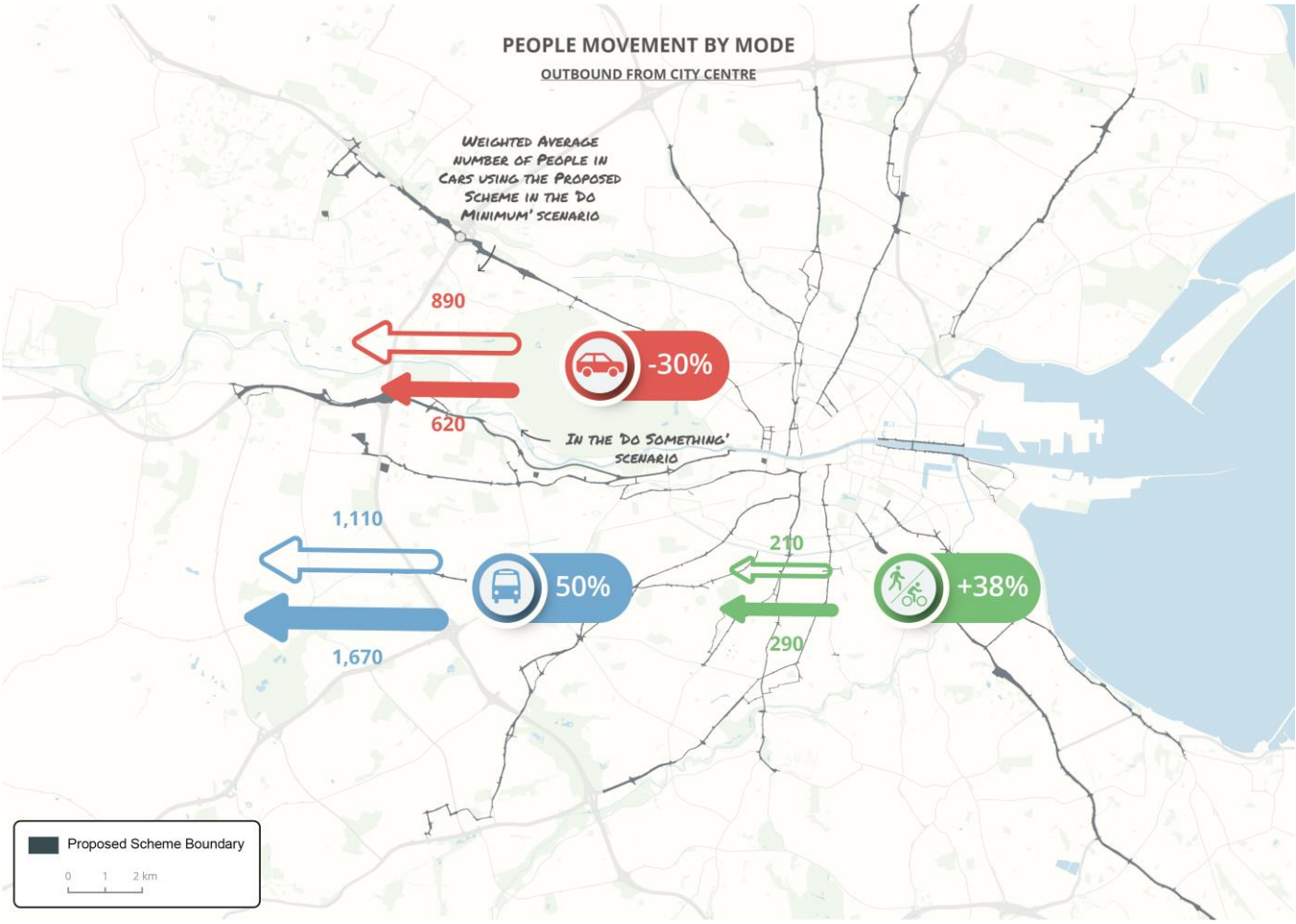

Diagram 7.6: People Movement by Mode during 2028 PM Peak Hour

As indicated in Diagram 7.6, on average across all Proposed Schemes, there is a predicted reduction of 30% in the number of people travelling via car, an increase of 50% in the number of people travelling via bus and an increase in 38% in the number of people walking or cycling along the Proposed Schemes during the PM Peak Hour.

Table 7.6 outlines the difference in modal split between the Do Minimum and Do Something (All Proposed Schemes) scenarios for each mode of transport in an outbound direction from the City Centre during the PM Peak Hour. The results indicate a 17% increase in total people moved as a result of the Proposed Schemes and a 48% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 7.6: Modal Shift of 2028 PM Peak Hour along Proposed Schemes

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Outbound from the City Centre	PM Peak Period	General Traffic	890	40%	620	24%	-270	-30%
		Public Transport	1,110	50%	1,670	65%	560	50%
		Walking	150	7%	140	5%	-10	-7%
		Cycling	60	3%	150	6%	90	150%
		Sustainable Modes Total	**1,320**	**60%**	**1,960**	**76%**	**640**	**48%**
		Total (All modes)	**2,210**	**100%**	**2,580**	**100%**	**370**	**17%**

7.2.4.3.3 2043 AM Peak Hour People Movement

Diagram 7.7 illustrates the average People Movement by mode, across all Proposed Schemes, inbound towards the City Centre during the AM Peak Hour in 2043.

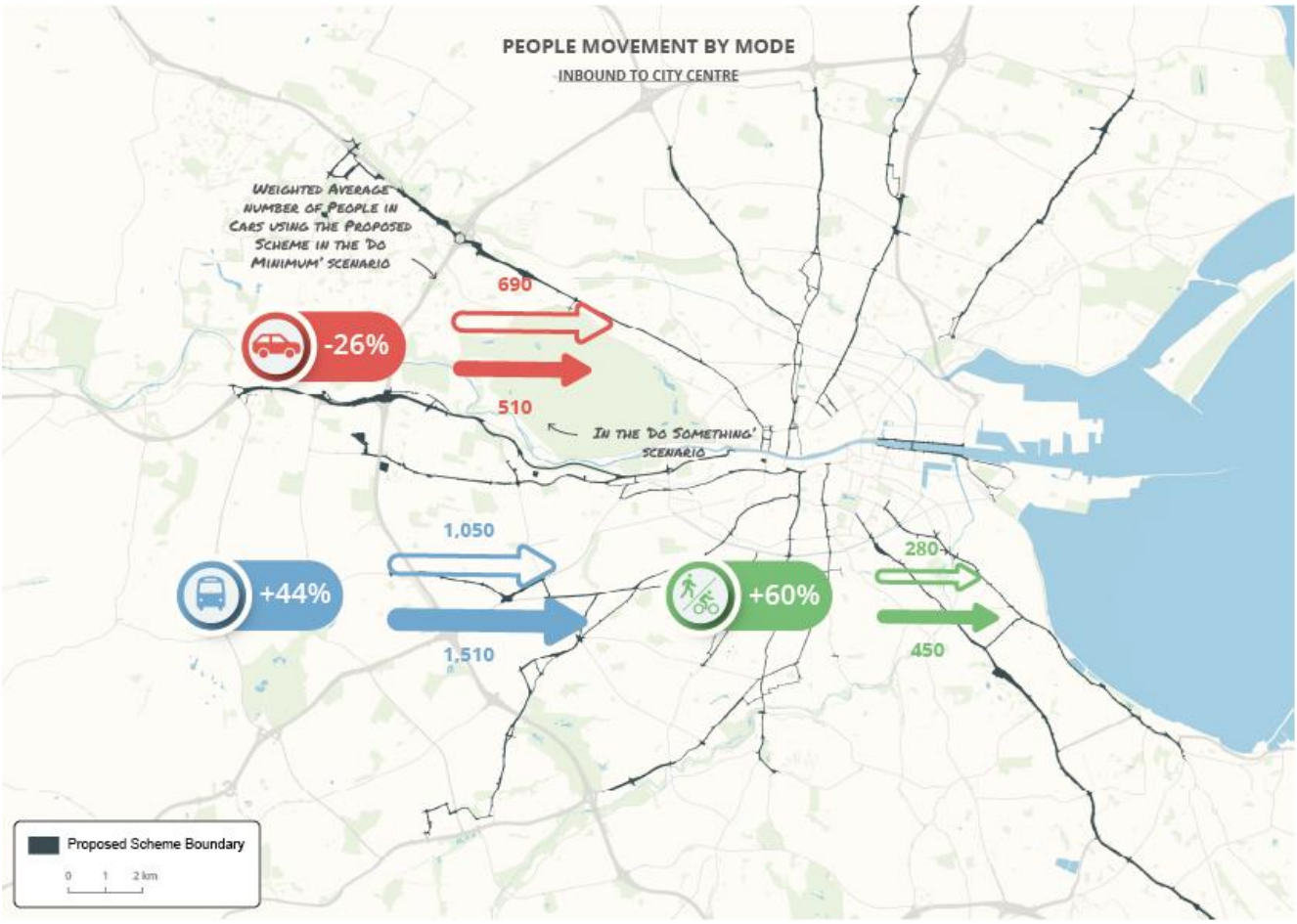

Diagram 7.7: People Movement by Mode during 2043 AM Peak Hour

As indicated in Diagram 7.7, on average across all Proposed Schemes, there is a predicted decrease of 26% in the number of people travelling via car, an increase of 44% in the number of people travelling via bus and an increase of 60% in the number of people walking and cycling along the Proposed Schemes during the AM Peak Hour.

Table 7.7 outlines the difference in modal split between the Do Minimum and Do Something (All Proposed Schemes) scenarios for each mode of transport in an inbound direction towards the City Centre during the AM Peak Hour. The results indicate a 47% increase in total people moved as a result of the Proposed Schemes and 60% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 7.7: Modal Shift of 2043 AM Peak Hour along Proposed Schemes

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Inbound towards the City Centre	AM Peak Period	General Traffic	690	34%	510	21%	-180	-26%
		Public Transport	1,053	52%	1,514	61%	461	44%
		Walking	150	7%	165	7%	16	10%
		Cycling	129	6%	280	11%	151	117%
		Combined Walk / Cycle	**278**	**14%**	**445**	**18%**	**167**	**60%**
		Sustainable Modes Total	**1,332**	**66%**	**1,960**	**79%**	**628**	**47%**
		Total (All modes)	**2,022**	**100%**	**2,469**	**100%**	**448**	**22%**

7.2.4.3.4 2043 PM Peak Hour People Movement

Diagram 7.8 illustrates the average People Movement by mode, across all Proposed Schemes, travelling outbound from the City Centre during the PM Peak Hour in 2043.

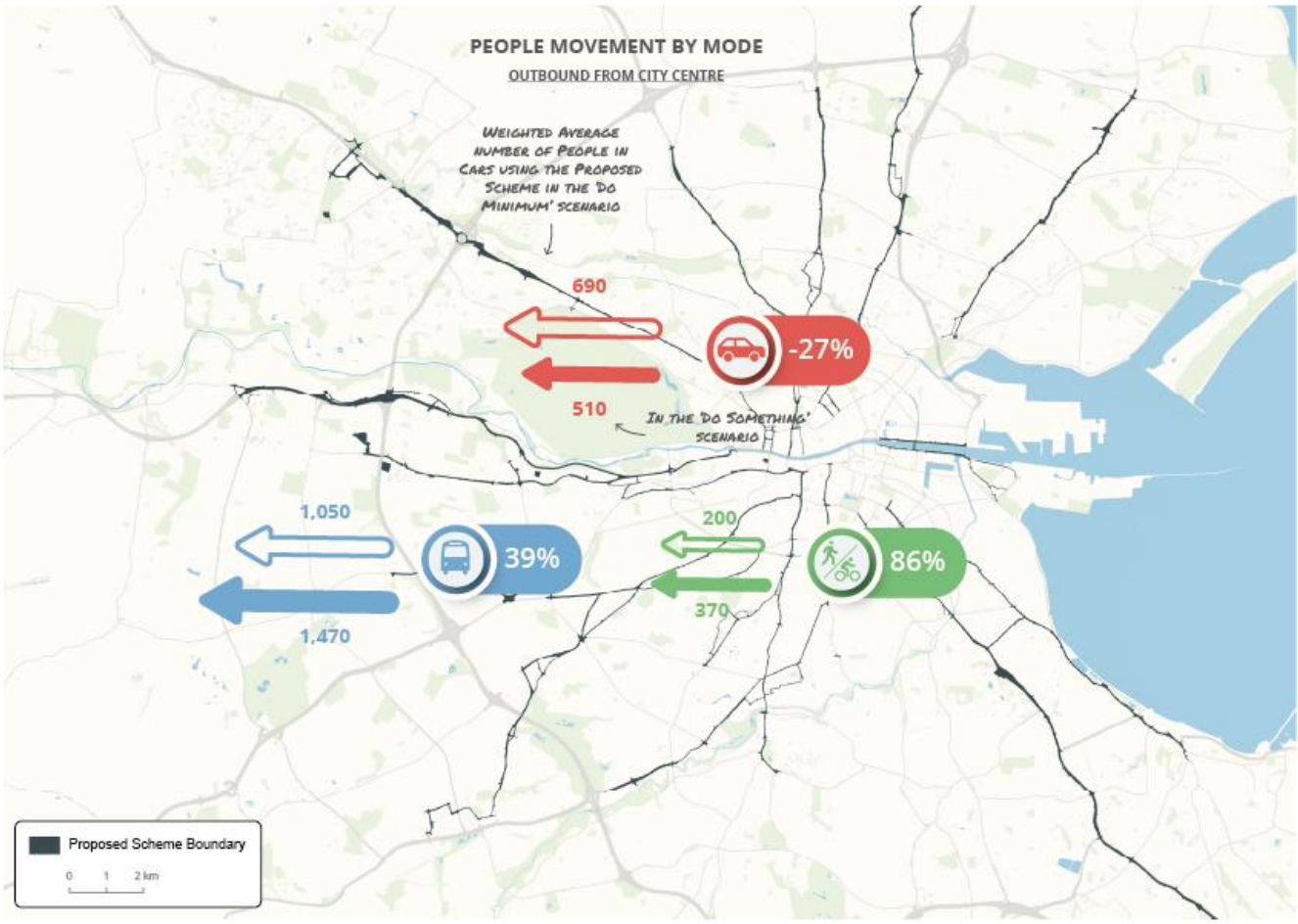

Diagram 7.8: People Movement by Mode during 2043 PM Peak Hour

As indicated in Diagram 7.8, on average across all Proposed Schemes, there is a predicted decrease of 27% in the number of people travelling via car, an increase of 39% in the number of people travelling via bus and an increase of 86% in the number of people walking and cycling along the Proposed Schemes during the PM Peak Hour in 2043.

Table 7.8 outlines the difference in modal split between the Do Minimum and Do Something (All Proposed Schemes) scenarios for each mode of transport in an outbound direction from the City Centre during the PM Peak Hour. The results indicate a 46% increase in total people moved as a result of the Proposed Schemes and a 81% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 7.8: Modal Shift of 2043 PM Peak Hour along Proposed Schemes

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
Outbound from the City Centre	PM Peak Period	General Traffic	694	36%	509	22%	-185	-27%
		Public Transport	1,058	54%	1,470	63%	413	39%
		Walking	86	4%	128	5%	42	49%
		Cycling	113	6%	241	10%	129	114%
		Combined Walk / Cycle	**199**	**10%**	**369**	**16%**	**171**	**86%**
		Sustainable Modes Total	**1,256**	**64%**	**1,840**	**78%**	**583**	**46%**
		Total (All modes)	**1,950**	**100%**	**2,349**	**100%**	**399**	**20%**

7.2.4.4 Movement of People by Bus

The following section presents the modelling outputs for the Movement of People by Bus. The results indicate that the improvements in bus priority infrastructure with the Proposed Schemes in place results in a substantial increase in Bus patronage during the Peak Hours and throughout the day.

Diagram 7.9 to Diagram 7.13 present the difference in passenger loadings (Do Something minus Do Minimum loadings) on the Proposed Schemes in 2028 and 2043, AM and PM Peak Hours.

7.2.4.4.1 2028 AM Peak Hour Bus Passengers

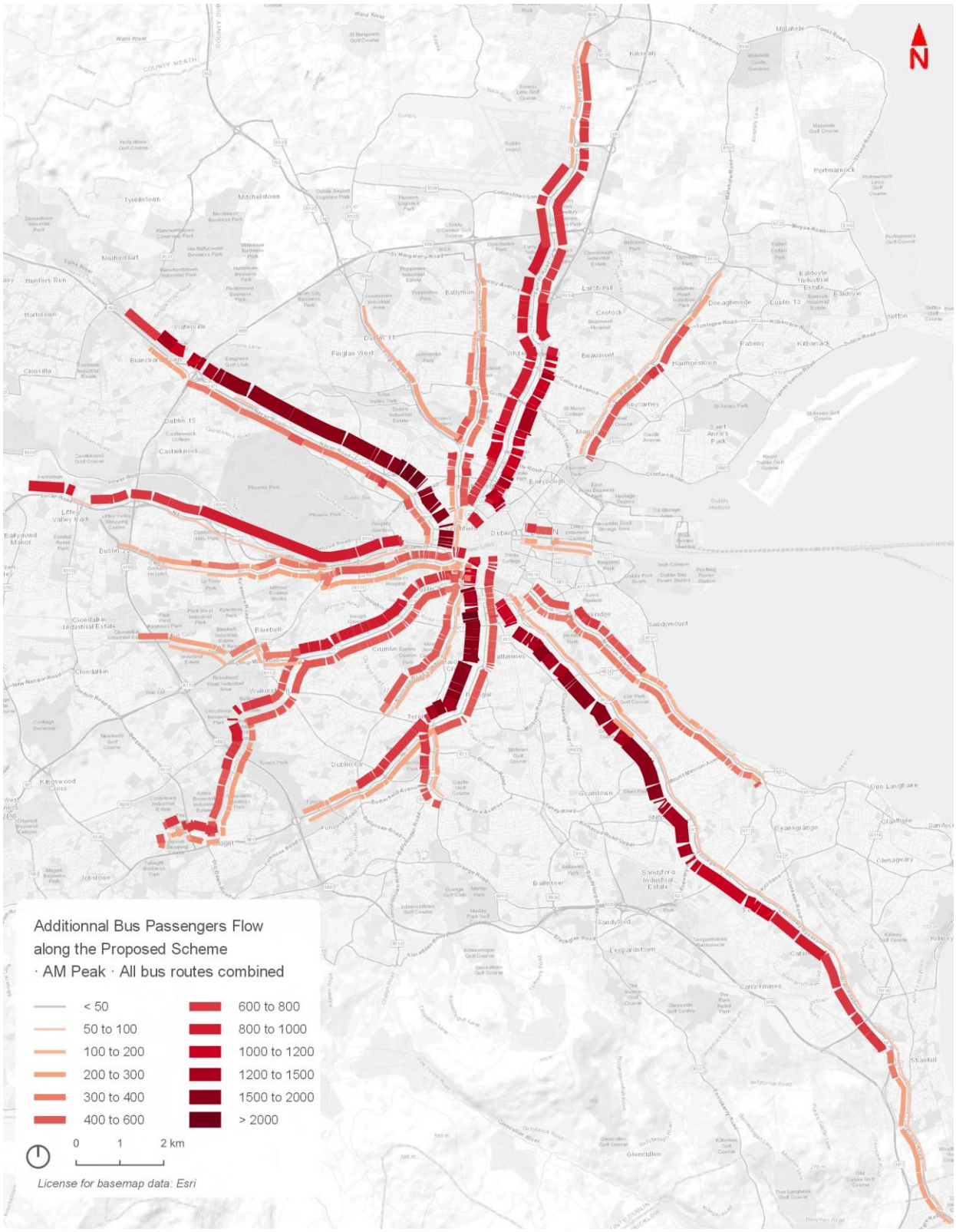

Diagram 7.9: AM Peak Hour Total Bus Passenger Flows Along the Proposed Schemes (All Bus Routes Combined)

As indicated in Diagram 7.9, there is a high growth in bus patronage along all the Proposed Schemes in the AM Peak Hour. Some of the bigger increases occur in the inbound direction on the Blanchardstown to City Centre, the Rathfarnham to City Centre and the Bray to City Centre schemes where the loadings reach more than 2,000 additional passengers per hour compared to the Do Minimum scenario. The Tallaght to City Centre section of the

Proposed Scheme shows an increase of approximately 500-1,000 passengers in the inbound direction in the 2028 AM Peak Hour. The Clondalkin to Drimnagh section of the Proposed Scheme shows an increase of approximately 200-500 passengers in the inbound direction in the 2028 AM Peak Hour.

Since many bus services commence and end further away from the direct alignment of the Proposed Schemes, but still benefit from the improvements provided, an assessment has been undertaken to compare the total passengers boarding bus routes that use any part of the Proposed Scheme (including those stops not directly on the Proposed Scheme) in both 2028 and 2043 forecast years. Table 7.9 below displays the results for the 2028 AM Peak Hour for the Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme as well as for all Proposed Schemes.

Table 7.9: 2028 AM Peak Hour Bus Boardings on Routes using the Proposed Schemes (inc. boarding at stops outside Proposed Schemes)

Scheme	Do Minimum	Do Something	Difference in Boardings	Difference (%)
Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme	20,730	23,070	2,340	11.3%
All Schemes	85,990	101,760	15,770	18.3%

As shown above there will be a 11% increase in people boarding bus routes which form any part of the Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme during the AM Peak Hour. This represents an addition of 2,340 passengers.

There will be a 18% increase in people boarding bus routes which use any part of the Proposed Schemes, representing an additional 15,770 passengers due to the bus priority improvements.

7.2.4.4.2 2028 PM Peak Hour Bus Passengers

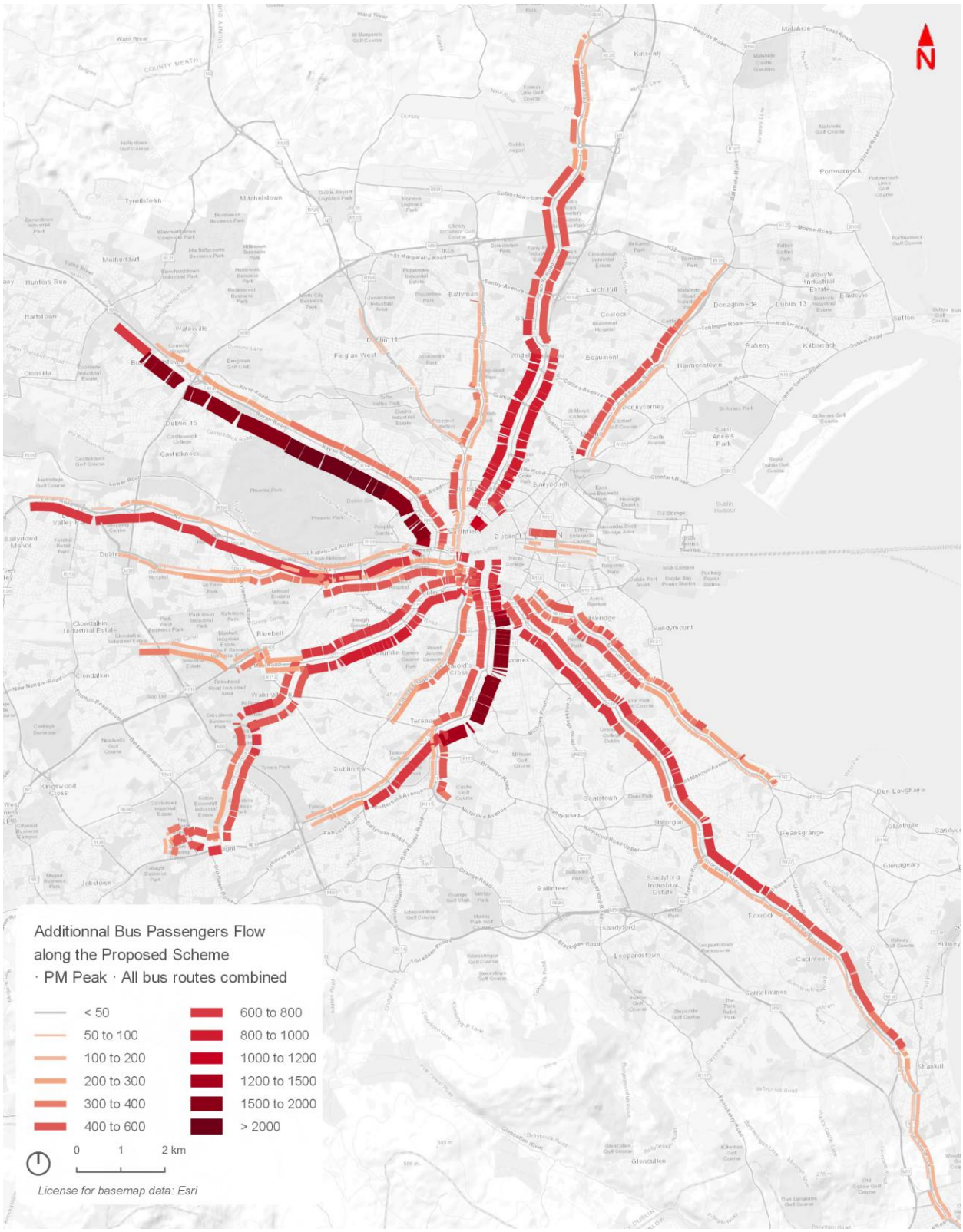

Diagram 7.10: PM Peak Hour Total Bus Passenger Flows Along the Proposed Schemes (All Bus Routes Combined)

As indicated in Diagram 7.10, there is a high growth in bus patronage along all the Proposed Schemes in the PM Peak Hour. Some of the bigger increases occur in the outbound direction on the Blanchardstown to City Centre and the Rathfarnham to City Centre where the loadings reach more than 2,000 additional passengers per hour compared to the Do Minimum scenario. The Tallaght to City Centre section of the Proposed Scheme shows an

increase of approximately 500-900 passengers in the inbound direction in the 2028 AM Peak Hour. The Clondalkin to Drimnagh section of the Proposed Scheme shows an increase of approximately 300-400 passengers in the inbound direction in the 2028 AM Peak Hour.

Table 7.10 presents the total passengers boarding bus routes that use any part of the Proposed Scheme (including those stops not directly on the Proposed Scheme) in the 2028 PM Peak Hour for the Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme as well as for all Proposed Schemes.

Table 7.10: 2028 PM Peak Hour Bus Boardings on Routes using the Proposed Schemes (inc. boarding at stops outside Proposed Schemes)

Scheme	Do Minimum	Do Something	Difference in Boardings	Difference (%)
Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme	17,710	19,710	2,000	11.3%
All Schemes	71,280	85,170	13,890	19.5%

As shown in Table 7.10, there will be a 11% increase in people boarding bus routes which use any part of the Tallaght / Clondalkin to City Centre Core Bus Corridor Scheme during the PM Peak Hour. This represents an addition of 2,000 passengers.

There will be a 19.5% increase in people boarding bus routes which use any part of the Proposed Schemes, representing an additional 13,890 passengers due to the bus priority improvements.

7.2.4.4.3 2043 AM Peak Hour Bus Passengers

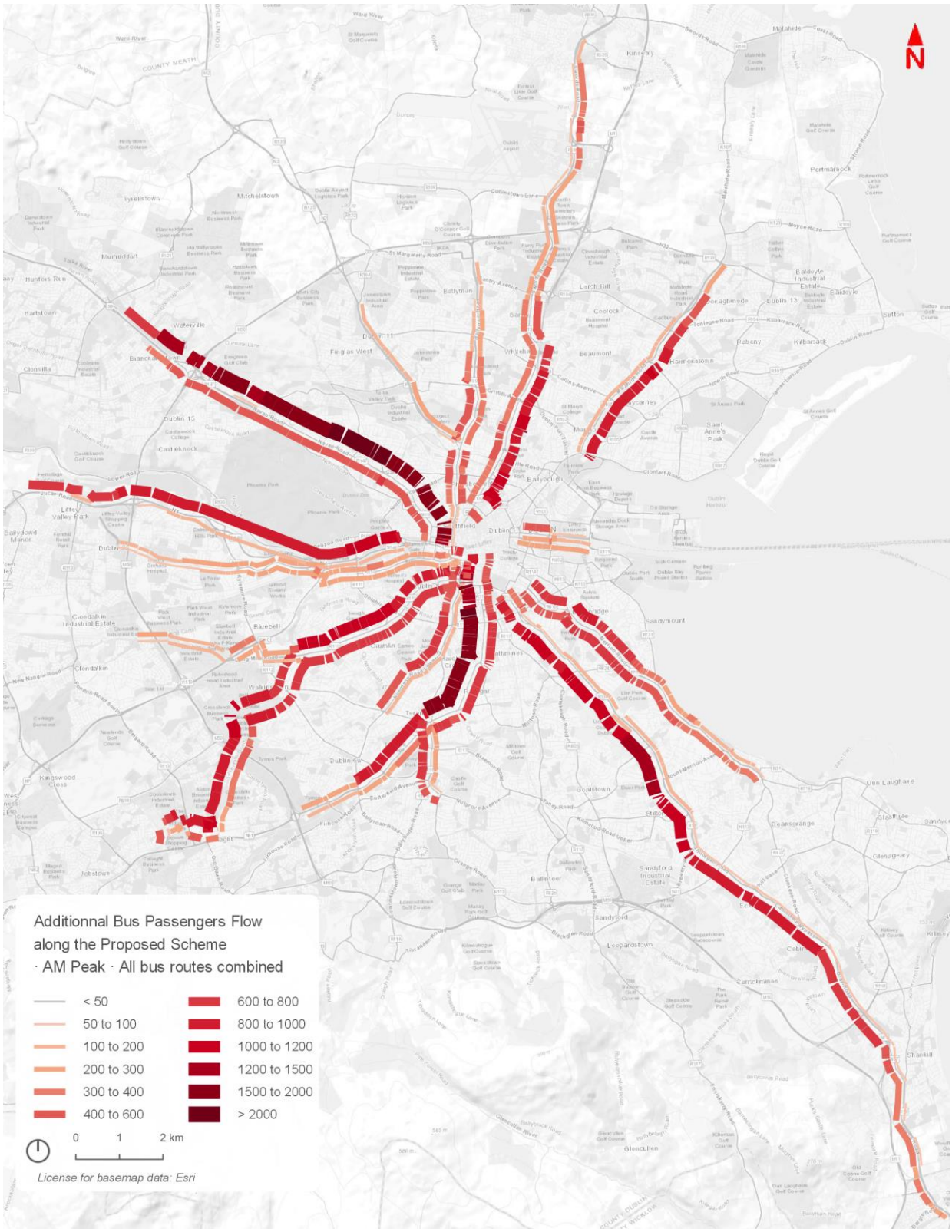

Diagram 7.11: AM Peak Hour Total Bus Passenger Flows Along the Proposed Schemes (All Bus Routes Combined)

As indicated in Diagram 7.11, there is a high growth in bus patronage along all the Proposed Schemes in the 2043 AM Peak Hour. Some of the bigger increases occur in the inbound direction on the Blanchardstown to City Centre and the Rathfarnham to City Centre where the loadings reach more than 2,000 additional passengers per hour compared to the Do Minimum scenario. The Tallaght to City Centre Core section of the Proposed Scheme

shows an increase of approximately 600-1,200 passengers in the inbound direction in the 2043 AM Peak Hour. The Clondalkin to Drimnagh section of the Proposed Scheme shows an increase of approximately 200-400 passengers in the inbound direction in the 2043 AM Peak Hour.

Table 7.11 presents the total passengers boarding bus routes that use any part of the Proposed Scheme (including those stops not directly on the Proposed Scheme) in the 2043 AM Peak Hour for the Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme as well as for all Proposed Schemes.

Table 7.11: 2043 AM Peak Hour Bus Boardings on Routes using the Proposed Schemes (inc. boarding at stops outside Proposed Schemes)

Scheme	Do Minimum	Do Something	Difference in Boardings	Difference (%)
Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme	21,874	23,282	1,409	6.4%
All Schemes	95,030	118,550	23,520	24.8%

As shown in Table 7.11, there will be a 6.4% increase in people boarding bus routes which use any part of the Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme during the AM Peak Hour. This represents an addition of 1,409 passengers in the AM Peak Hour.

There will be a 24.8% increase in people boarding bus routes which use any part of the Proposed Schemes, representing an additional 23,520 passengers due to the bus priority improvements.

7.2.4.4.4 2043 PM Peak Hour Bus Passengers

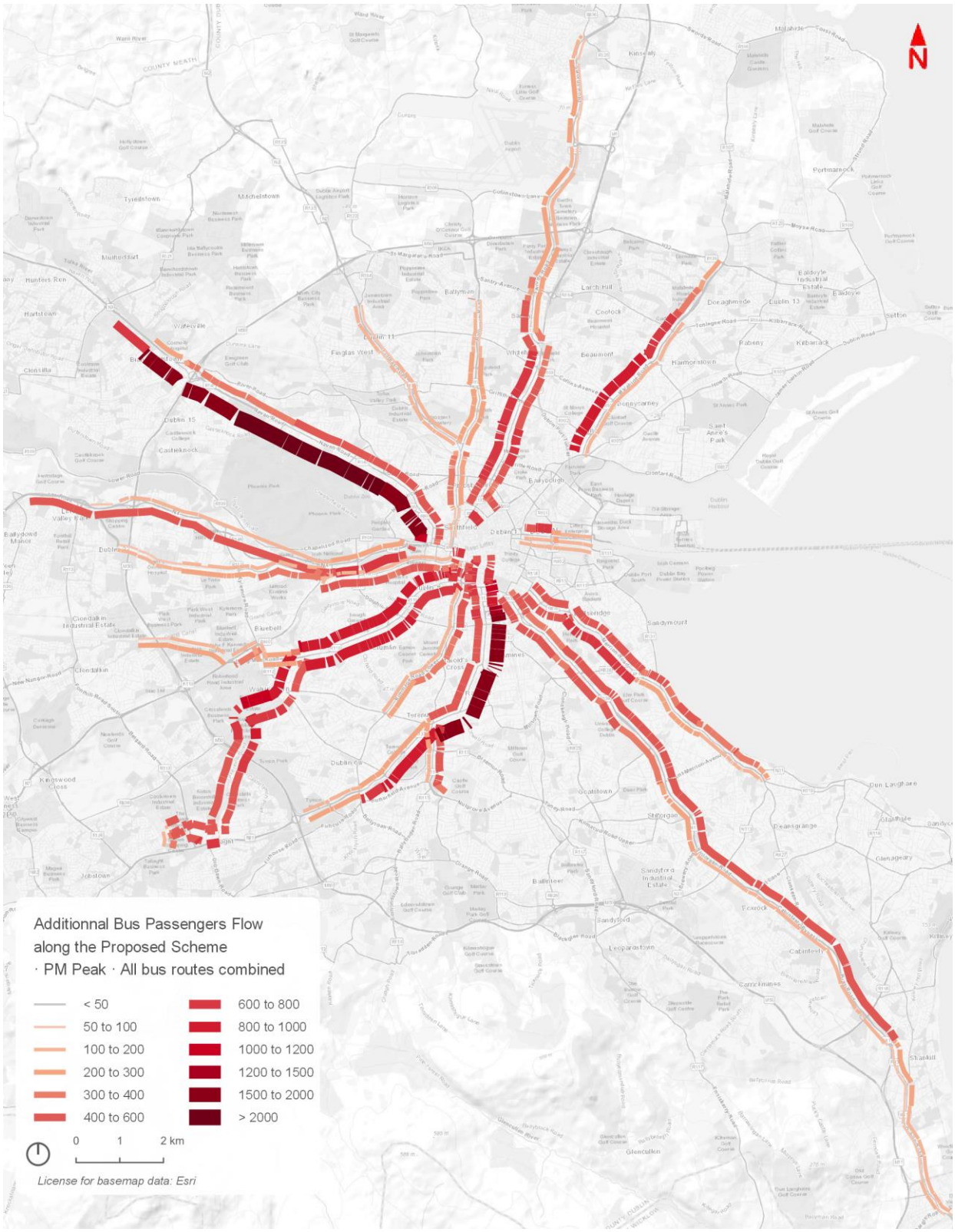

Diagram 7.12: PM Peak Hour Total Bus Passenger Flows Along the Proposed Schemes (All Bus Routes Combined)

As indicated in Diagram 7.12, there is a high growth in bus patronage along all the Proposed Schemes in the PM Peak Hour. Some of the bigger increases occur in the outbound direction on the Blanchardstown to City Centre and the Rathfarnham to City Centre where the loadings reach more than 2,000 additional passengers per hour compared to the Do Minimum scenario. The Tallaght to City Centre section of the Proposed Scheme shows an

increase of approximately 600-1,000 passengers in the inbound direction in the 2043 PM Peak Hour. The Clondalkin to Drimnagh section of the Proposed Scheme shows an increase of approximately 200-300 passengers in the inbound direction in the 2043 PM Peak Hour.

Table 7.12 presents the total passengers boarding bus routes that use any part of the Proposed Scheme (including those stops not directly on the Proposed Scheme) in the 2043 PM Peak Hour for the Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme as well as for all Proposed Schemes.

Table 7.12: 2043 PM Peak Hour Bus Boardings on Routes using the Proposed Schemes (inc. boarding at stops outside Proposed Schemes)

Scheme	Do Minimum	Do Something	Difference in Boardings	Difference (%)
Tallaght / Clondalkin to City Core Bus Corridor Centre Scheme	16,549	22,908	6,360	38.4%
All Schemes	78,120	98,390	20,270	26.0%

As shown in Table 7.12, there will be a 38.4% increase in people boarding bus routes which use any part of the Tallaght / Clondalkin to City Centre Scheme during the PM Peak Hour. This represents an addition of 6,360passengers in the PM Peak Hour.

There will be a 26% increase in people boarding bus routes which use the Proposed Scheme, representing an additional 20,270 passengers.

7.2.5 Integration with Other Public Transport Modes

The aim of the CBC Infrastructure Works is to provide improved walking, cycling and bus infrastructure, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. In tandem with this aim a key objective of the Works applicable to the Proposed Scheme is to:

- Improve accessibility to jobs, education and other social and economic opportunities through the provision of improved sustainable connectivity and integration with other public transport services.

The modelling suite has been used to assess the change in connectivity and integration with other public transport services and the following section presents this assessment based on the following metrics:

- Total Boardings by Public Transport (PT) Mode (including non-bus modes);
- Level of interchange with other public transport services; and
- Average Public Transport Networkwide Travel Speeds.

7.2.5.1 Passenger Boardings by Public Transport Mode

The following section presents the number of passenger boardings by each of the PT sub-modes (Rail, Luas, Bus and Metro) within the Study Area. The results are presented in Table 7.13 for the Do Minimum and Do Something scenarios for the 2028 and 2043 assessment years in the AM and PM Peak Hour periods.

Table 7.13: 2028 AM Peak Hour PT Boardings

Public Transport Mode	Do Minimum	Do Something	Difference in Boardings	Difference (%)
Rail	26,060	25,820	-240	-1%
Luas	25,930	25,070	-860	-3%
Bus	81,790	95,710	13,920	17%
Total	**133,780**	**146,600**	**12,820**	**10%**

As presented in Table 7.13 with the Proposed Schemes in place, there will be an estimated 10% more passenger boardings across all PT services and 17% more boarding on bus services in the AM Peak Hour. The improved

bus infrastructure results in slight reductions in boardings on Rail and Luas services, which will help provide additional resilience for these modes to accommodate future travel demand growth.

Table 7.14: 2028 PM Peak Hour PT Boardings

Public Transport Mode	Do Minimum	Do Something	Difference in Boardings	Difference (%)
Rail	30,150	30,990	840	3%
Luas	21,520	20,740	-780	-4%
Bus	72,370	85,730	13,360	18%
Total	**124,040**	**137,460**	**13,420**	**11%**

As presented in Table 7.14 with the Proposed Schemes in place, there will be an estimated 11% increase in total passengers boarding PT services and 18% more boardings on buses services in the PM Peak Hour in 2028. The improved bus infrastructure results in a slight reduction in boardings on Luas services, which will help provide additional resilience for this mode to accommodate future travel demand growth in the PM peak period. Rail boardings increase due to additional interchange between Rail and bus services.

Table 7.15: 2043 AM Peak Hour PT Boardings

Public Transport Mode	Do Minimum	Do Something	Difference in Boardings	Difference (%)
Rail	33,070	36,200	3,130	9%
Luas	46,370	46,330	-40	0%
Bus	90,110	100,050	9,940	11%
Metro	18,700	18,730	30	0%
Total	**188,250**	**201,310**	**13,060**	**7%**

As presented in Table 7.15, with the Proposed Schemes in place, there will be a predicted 7% increase in total passengers boarding PT services and a 11% increase in boardings on bus services in the AM Peak Hour in 2043. The improved bus infrastructure results in negligible changes in boardings on Luas and MetroLink services. Rail boardings increase due to additional interchange between Rail and bus services

Table 7.16: 2043 PM Peak Hour PT Boardings

Public Transport Mode	Do Minimum	Do Something	Difference in Boardings	Difference (%)
Rail	36,200	34,700	-1,500	-4%
Luas	34,720	38,330	3,610	10%
Urban Bus	78,180	89,500	11,320	14%
Metro	12,660	11,680	-980	-8%
Total	**161,760**	**174,210**	**12,450**	**8%**

As presented in Table 7.16, with the Proposed Schemes in place, there will be an estimated 8% increase in total passengers boarding PT services and a 14% increase in boardings on bus services in the PM Peak Hour 2043. The improved bus infrastructure results in slight reductions in boardings on Rail and MetroLink services, which will help provide additional resilience for these modes to accommodate future travel demand growth. Luas boardings increase due to additional interchange between Luas and bus services

7.2.5.1.1 Public Transport Interchange

To determine the impact the Proposed Schemes will have on the integration and complementarity between the different PT modes, the number of transfers between each PT modes (Bus, Rail, Luas and Metro) has been extracted from the modelling suite. The analysis compares the Do Minimum and Do Something in the AM Peak Hour period for each forecast year (2028, 2043).

Table 7.17: 2028 AM Peak Hour Transfers between PT Modes

	Do Minimum				Do Something			
To:	**Bus**	**Rail**	**Luas**	**Total**	**Bus**	**Rail**	**Luas**	**Total**
Bus	3,840	3,330	6,900	**14,070**	4,500	3,350	7,020	**14,870**
Rail	3,710	60	1,800	**5,570**	4,080	60	1,560	**5,700**
Luas	5,090	450	400	**5,940**	5,280	340	310	**5,930**
Total	**12,640**	**3,840**	**9,100**	**25,580**	**13,860**	**3,750**	**8,890**	**26,500**

As shown in Table 7.17, the total number of transfers between PT modes will increase by 4% from 25,580 in the Do Minimum scenario to 26,500 in the Do Something scenario, Transfers from Rail and Luas to buses will increase by 6% from 8,800 to 9,360 with the Schemes in place. This highlights the increased level of accessibility and transfer opportunities facilitated by the Proposed Schemes.

The contents of Table 7.18 present the predicted AM Peak Hour transfers between each PT Mode (including Metrolink) in 2043.

Table 7.18: 2043 AM Peak Hour Transfers between PT Modes

	Do Minimum					Do Something				
To:	**Bus**	**Rail**	**Luas**	**Metro**	**Total**	**Bus**	**Rail**	**Luas**	**Metro**	**Total**
Bus	4,850	5,740	9,220	3,890	**23,700**	7,000	5,730	10,540	4,430	**27,700**
Rail	4,900	100	3,630	2,480	**11,110**	4,080	90	3,670	2,370	**10,210**
Luas	6,210	1,050	850	500	**8,610**	7,200	930	860	620	**9,610**
Metro	2,450	980	410	0	**3,840**	2,640	870	360	0	**3,870**
Total	**18,410**	**7,870**	**14,110**	**6,870**	**47,260**	**20,920**	**7,620**	**15,430**	**7,420**	**51,390**

As shown above, with the roll out of the GDA Strategy the level of interchange increases substantially in the period from 2028 to 2043 without the Proposed Schemes. The total number of transfers between PT modes is expected to increase by 9% from 47,260 in the Do Minimum scenario to 51,390 in the Do Something scenario (with the Proposed Schemes in place). Transfers to buses predicted to increase by 17% from 23,700 to 27,700. This highlights the increased level of accessibility and transfer opportunities facilitated by the Proposed Schemes.

7.2.5.2 Average Public Transport Network Wide Travel Speeds

In order to assess the travel time and integration efficiencies provided by the Proposed Schemes, an average per passenger PT network-wide travel speed metric has been extracted from the modelling suite[7]. The metric considers the average speed across all public transport modes for the entire Study Area which covers all Proposed Schemes.

Table 7.19: 2028 AM Peak Hour Average Journey Speed per PT Passenger (km/h)

Scenario	Do Minimum	Do Something	Speed Difference (%)
All Schemes Scenario	21.13	23.08	+9.2%

As presented in Table 7.19, with all Proposed Schemes operational, the average speed per PT passenger is expected to grow by 9%, representing a substantial increase in the average travel speeds for all PT users in 2028.

[7] This metric combines Public Transport Passenger Travel Time and Travel Distance and removes the variation in the number of trips between each scenario providing an indication of the overall efficiency of the PT network for each scenario.

Table 7.20: 2043 AM Peak Hour Average Journey Speed per PT Passenger (km/h)

Scenario	Do Minimum	Do Something	Speed Difference (%)
All Schemes Scenario	21.03	22.85	+8.7%

As presented in Table 7.20, with all Proposed Schemes operational, the average speed per PT passenger is expected to grow by 8.7%, representing a substantial increase in the average travel speeds for all PT users in 2043.

7.2.6 General Traffic

7.2.6.1 Overview

The Proposed Scheme and the other proposed Core Bus Corridor schemes aim to provide an attractive alternative to the private car and promote a modal shift to public transport, walking and cycling. As shown in the preceding sections, the transport modelling indicates, that there will be a significant level of modal shift from car to more sustainable modes of travel. It is anticipated there will be a reduction in general traffic (car) trips of approximately 13,000 and 22,500 on a typical weekday (7am-7pm) in 2028 and 2043 respectively. This represents the equivalent of the removal of up to 78km of traffic queues in 2028 and 135km by 2043 across the Dublin road network. For context, the queue reduction corresponds to approximately twice the length of the M50 motorway in 2028 and almost three times the length of the M50 in 2043. This reduction in car demand facilitated by the schemes will provide significant opportunities to manage the road network more effectively and promote greater movement of people by sustainable modes.

It is recognised, however, that there will be an overall reduction in operational capacity for general traffic along the direct study area of each scheme given the proposed changes to the road layout and the rebalancing of priority to walking, cycling and bus. This reduction in operational capacity for general traffic along the Proposed Scheme (and the other Proposed Core Bus Corridor Schemes) will likely create some level of trip redistribution onto the surrounding road network.

When all Core Bus Corridor schemes are operational, however, more people will be able to move in a more effective and efficient manner by sustainable modes.

To demonstrate this effect, a scenario has been modelled whereby the Proposed Scheme as well as all other proposed Core Bus Corridor schemes are operational in both 2028 and 2043.

7.2.6.2 Assessment Considerations

It should be noted that the Do Minimum and Do Something scenarios assume that travel behaviour will remain broadly consistent over the assessment period (2028-2043) and that car demand data used for this assessment, represents a reasonable worst-case scenario. It is anticipated, however, that societal trends in the medium to long term may reduce car demand further due to the ongoing changes to travel behaviour which would include further shifts towards sustainable travel; flexibility in working arrangements brought on following COVID-19 restrictions; and delayed car ownership trends that are emerging.

Goods vehicles

The assessment also assumes that goods vehicles (HGVs and LGVs) continue to grow in line with forecasted economic activity with patterns of travel remaining the same. For example, the assessment assumes a 45% and 77% increase in goods traffic versus the base year in 2028 and 2043 respectively. This is considered a very conservative assumption. It should be noted, however, that the Climate Action Plan (CAP) (2023) includes reference to DoT's Ireland's Road Haulage Strategy 2022-2031 (RHS)(2023) which will seek to further integrate smart technologies in logistics management and may include the regulation of delivery times as far as practicable to off-peak periods to limit traffic congestion in urban areas. Ireland's Road Haulage Strategy 2022-2031 outlines measures to manage the increase in delivery and servicing requirements as the population grows. These measures may include the development of consolidation centres to limit the number of 'last-mile' trips made by larger goods vehicles with plans for higher use of smaller electric vans or cargo bikes for 'last-mile' deliveries in urban areas The purpose of this section is to assess the overall impact that any redistributed general traffic will

have on both the direct and indirect study areas. It should be noted that the impacts presented in this chapter are based on the final Preliminary Design for the Proposed Scheme which includes embedded mitigation to limit environmental and traffic and transport impacts to a minimal level as part of the iterative design development work described previously above.

Cycling

The Proposed Scheme (and the other proposed Core Bus Corridor Schemes) will facilitate a step change in the level of segregated cycling provision in comparison with existing conditions along the entire length of the corridors. The representation of improvements to cycling infrastructure in the transport models follows a standard approach and are appropriate for the strategic nature of the model. Improvements are applied by way of an increase in cycling speed on the network where the improvements have been made, as well as new connectivity by way of new links as part of the proposals. Modelling cycling infrastructure improvements using speeds is a standard approach that means an increase in cycling mode share can be obtained through a reduction in the modelled cost of a journey by bicycle relative to other modes. This has been applied as part of the modelling of the Proposed Scheme to represent improvements with a cycling mode share of approximately 5-6% achieved. The transport modelling undertaken, is therefore conservative in terms of the predicted cycling mode share. This has the effect that predicted traffic levels are on the higher and conservative side in relation to a potential future receiving environment. This is appropriate for EIAR purposes as a reasonable worst-case has been assessed in terms of traffic levels on the road network.

It should be noted, however, that the Proposed Scheme (and the other proposed Core Bus Corridor schemes) has been designed to cater for much higher levels of cycling uptake and the significant segregation and safety improvements to walking and cycling infrastructure. This will provide the opportunity for a significant increase in the movement of people travelling sustainably along the corridor and will therefore cater for higher levels of future population and employment growth and support higher cycling mode share levels, which would otherwise not be achieved in the absence of the proposals. The background environment changes with regards to cycling segregation and safety improvements will encourage more people to cycle in greater numbers.

Demand Management

The GDA Transport Strategy, of which the Proposed Scheme (and the other proposed Core Bus Corridor Schemes) are a key element of, aims to provide for the efficient, effective and sustainable movement of people and goods and to accommodate future travel growth in a managed and balanced way. Increased public transport provision, coupled with enhanced cycling and walking facilities in the urban areas, will enable a transition to more sustainable travel modes for many people in addition to providing the means to cater for much of the increased travel demand. However, without complementary demand management measures the full benefits of the Strategy will not be achieved.

The Proposed Scheme (and the other proposed Core Bus Corridor schemes) will be an enabler to allow for further reductions in car mode share with corresponding transfer to public transport, walking and cycling modes. Sustainable modes capacity is significantly enhanced by the Core Bus Corridors which in turn will support demand management measures which could be applied to meet climate emission targets. This growth in sustainable mode share cannot be accommodated in the absence of the Proposed Scheme (and the other proposed Core Bus Corridor schemes). A greater increase in sustainable mode share can be accommodated by the Core Bus Corridors which would in turn lead to further reductions in traffic levels, beyond those reported in this assessment.

7.2.6.3 General Traffic Flow Changes

To determine the impact that the Proposed Scheme (in combination with the other proposed Core Bus Corridor schemes) will have in terms of general traffic redistribution, the LAM Opening Year (2028) and Design Year (2043) model results have been used to identify the difference in general traffic flows between the Do Minimum and Do Something scenarios i.e., with and without all proposed Core Bus Corridor schemes in place.

The changes in traffic flows have been presented with reference to TII's Traffic and Transport Assessment Guidelines (May 2014) i.e., traffic redistribution resulting in an increase or decrease above 100 combined flows (i.e., in a two-way direction) along roads in the vicinity of the Core Bus Corridors in the AM and PM Peak Hours are presented. The threshold aligns with an approximate 1 vehicle per minute increase or decrease per direction

on any given road. This is a very low level of traffic change on any road type and ensures that a robust assessment of the changes in traffic levels are presented.

Diagram 7.13 and Diagram 7.14 below illustrate the difference in traffic flows (Do Minimum vs Do Something) on roads in the AM Peak Hour for the 2028 Opening Year and 2043 Design Year with the Proposed Scheme and all other proposed Core Bus Corridor schemes in place. The diagrams are extracts from Figure 6.13 and 6.15 in TIA Appendix 3 (Maps). Reductions in traffic flows are indicated by the blue lines with increases in traffic flow indicated by the red lines.

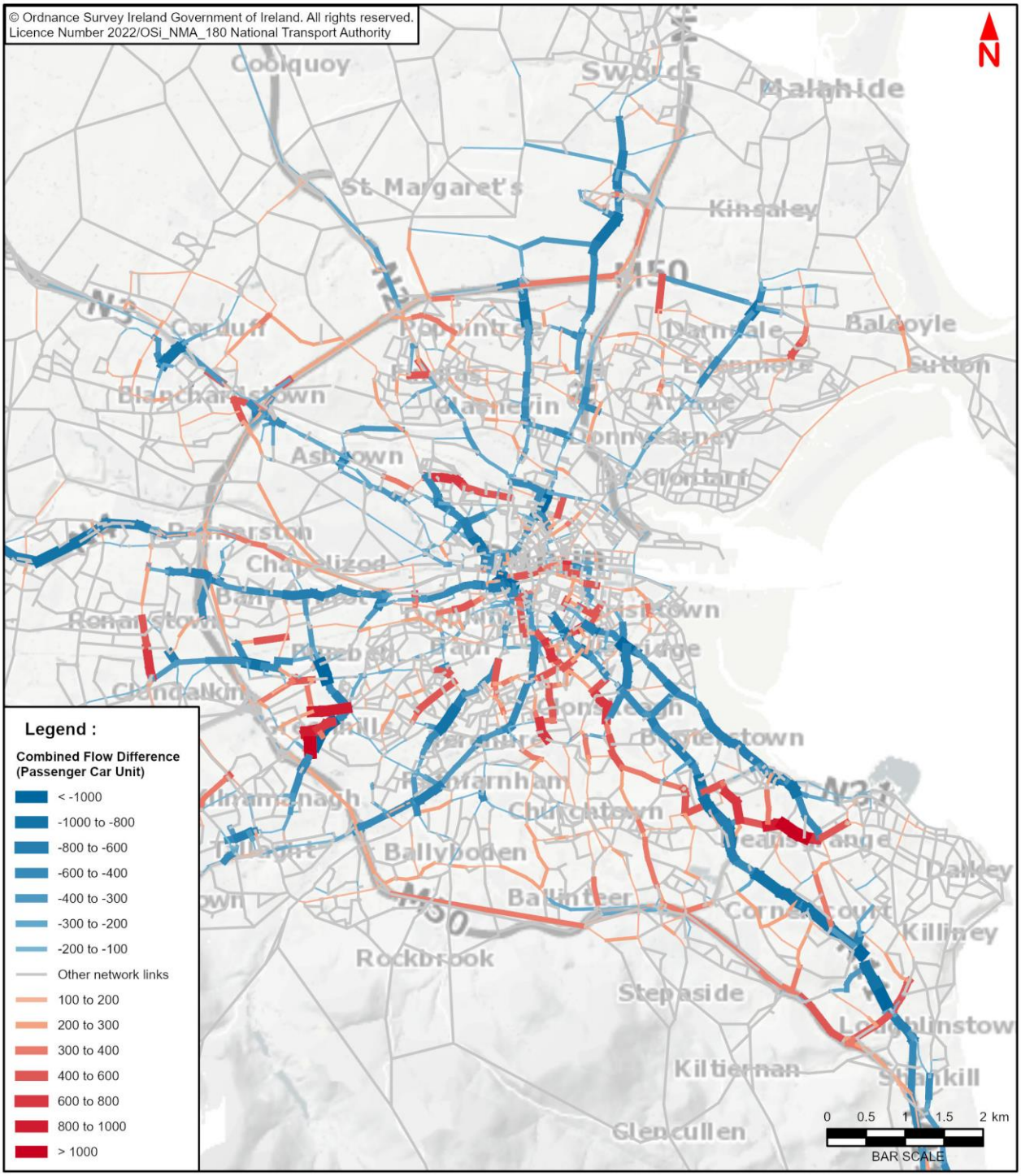

Diagram 7.13:Flow Difference on Road Links (Do Minimum vs. Do Something), AM Peak Hour, 2028 Opening Year – Cumulative Scenario

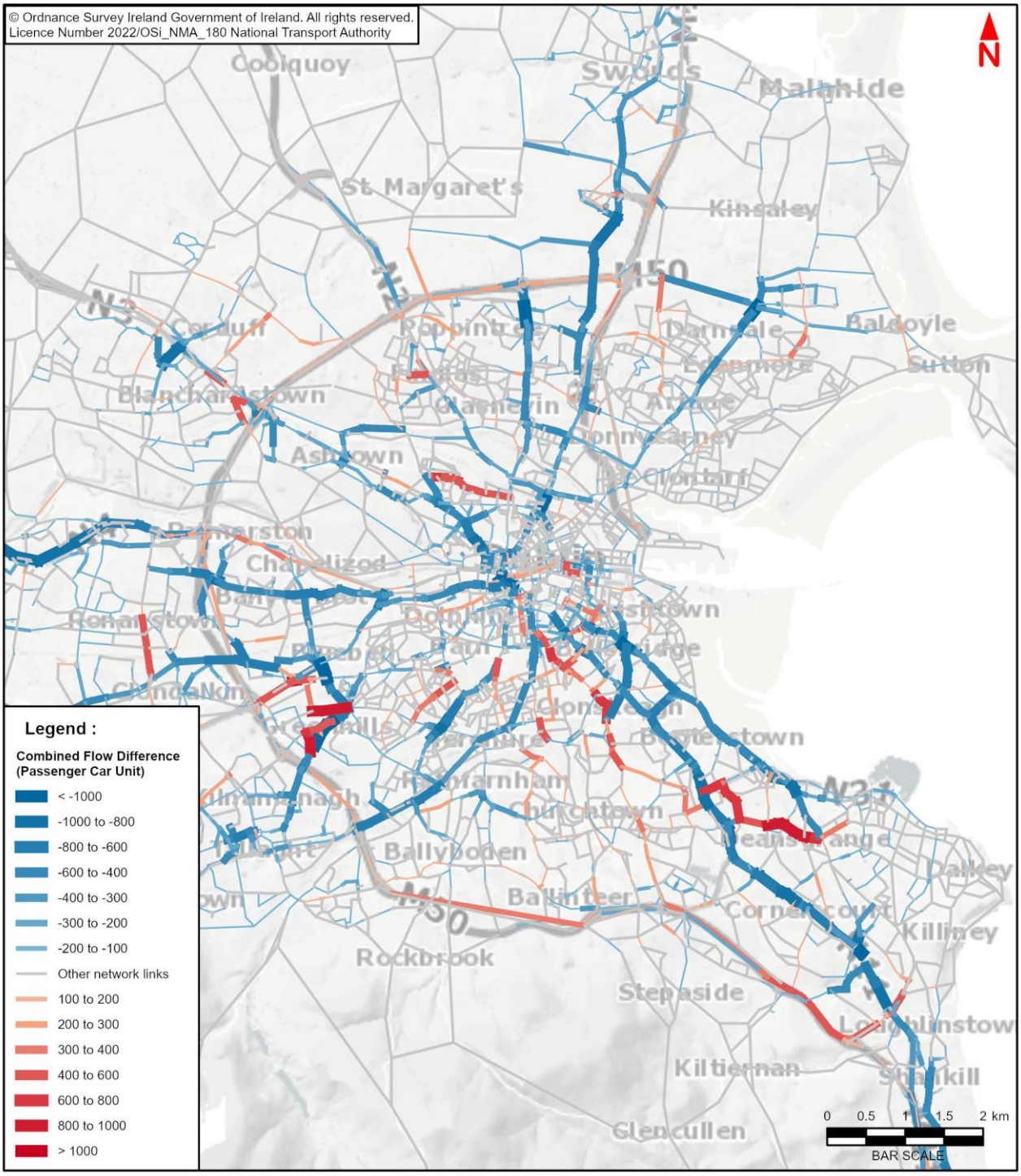

Diagram 7.14: Flow Difference on Road Links (Do Minimum vs. Do Something), AM Peak Hour, 2043 Design Year – Cumulative Scenario

Diagram 7.15 and Diagram 7.16 below illustrate the difference in traffic flows (Do Minimum vs Do Something) on roads in the PM Peak Hour for the 2028 Opening Year and 2043 Design Year with the Proposed Scheme and all other proposed Core Bus Corridor schemes in place. The maps are extracts from Figure 6.14 and 6.16 in TIA Appendix 3 (Maps). Reductions in traffic flows are indicated by the blue lines with increases in traffic flow indicated by the red lines.

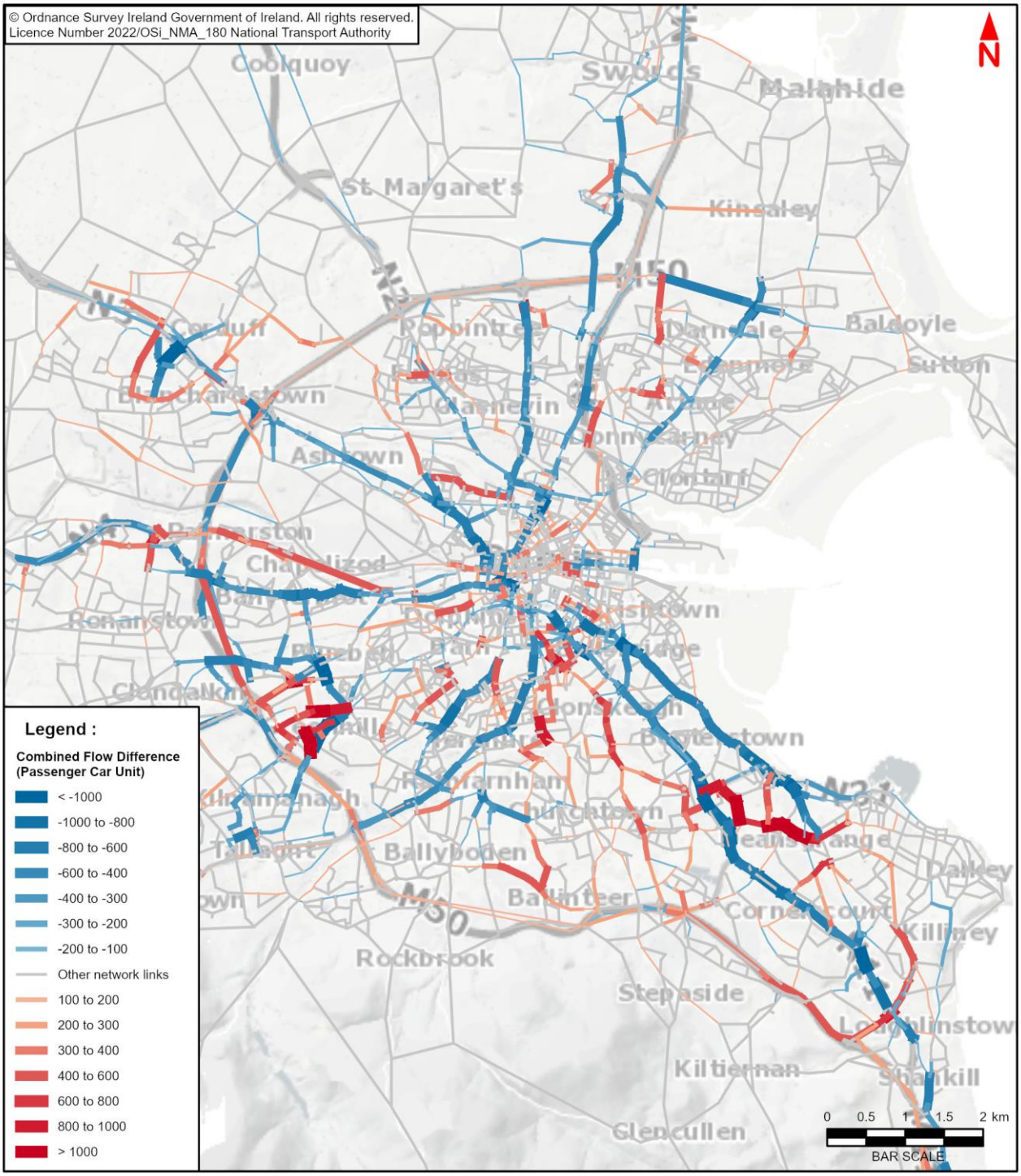

Diagram 7.15: Flow Difference on Road Links (Do Minimum vs. Do Something), PM Peak Hour, 2028 Opening Year – Cumulative Scenario

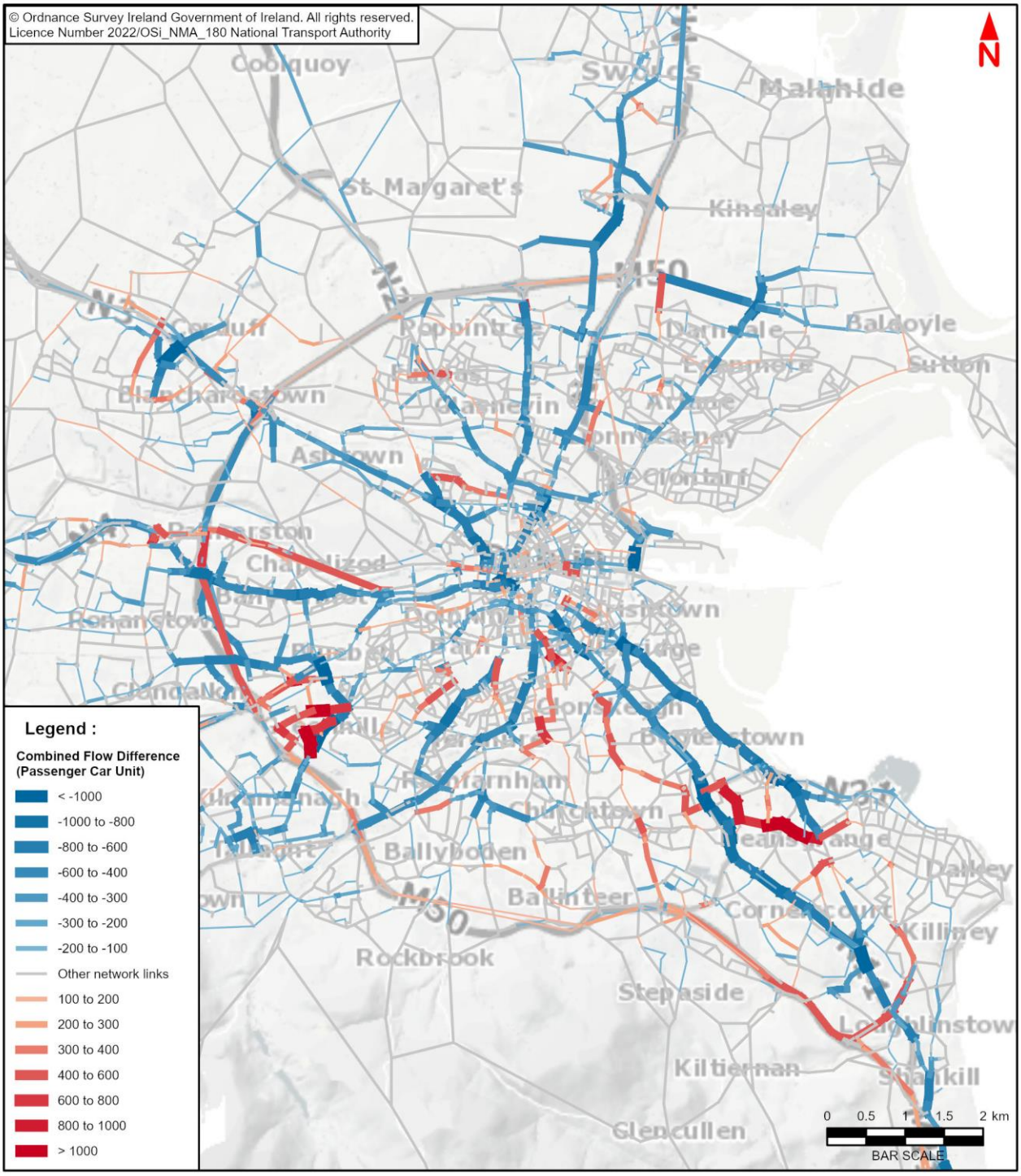

Diagram 7.16: Flow Difference on Road Links (Do Minimum vs. Do Something), PM Peak Hour, 2043 Design Year – Cumulative Scenario

7.2.6.4 Cumulative Traffic Flow Summary

As can be seen in the diagrams above, the level of traffic redistribution is shown to reduce between the Opening and Design years as further modal shift from car to sustainable modes occurs during the period, facilitated by the further roll out of the GDA Transport Strategy measures and, importantly, the sustainable mode capacity provided Core Bus Corridor schemes. As mentioned previously the implementation of all Core Bus Corridor schemes will facilitate the ability of the network to accommodate significant levels of additional travel growth by sustainable modes. It should be noted that higher levels of modal shift from car to sustainable modes are likely to occur either

during or before this period due to the requirement to achieve, for example 2023 Climate Action Plan (CAP) (DCCAE 2021) targets with further policy measures, likely to be implemented. As the specifics of these policy measures have yet to be determined they are, therefore, not included in the transport modelling to ensure a conservative and reasonable worst-case assessment of effects.

7.2.7 People Movement – Cumulative Impact Summary

The cumulative impact for the movement of People Movement by sustainable modes with the Proposed Schemes in place has been appraised as a qualitative assessment, taking into account the changes in mode share, demand changes by mode along the Proposed Scheme (and the other Core Bus Corridors) as well as bus usage and integration with other public transport modes, as presented above. The Proposed Schemes in combination have been adjudged to deliver a **High Positive** overall impact on People Movement by sustainable modes. The Proposed Schemes can be shown to deliver significant improvements in People Movement by sustainable modes along the direct Proposed Scheme alignments, particularly by bus and cycling, with reductions in car mode share due to the enhanced sustainable mode provision. The Proposed Schemes provide for enhanced integration and efficiencies for all public transport modes by facilitating substantial increases in public transport average network wide travel speeds.

8. Summary and Conclusions

The aim of the Proposed Scheme is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the CBC Infrastructure Works, applicable to the Traffic and Transport assessment of the Proposed Scheme, are to:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements;
- Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable;
- Support the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets;
- Enable compact growth, regeneration opportunities and more effective use of land in Dublin, for present and future generations, through the provision of safe and efficient sustainable transport networks;
- Improve accessibility to jobs, education and other social and economic opportunities through the provision of improved sustainable connectivity and integration with other public transport services; and
- Ensure that the public realm is carefully considered in the design and development of the transport infrastructure and seek to enhance key urban focal points where appropriate and feasible.

The Proposed Scheme comprises the development of improved bus priority along the entire route. This TIA provides a robust assessment of the scheme through qualitative assessment and quantitative analysis using a suite of multi-modal transport modelling tools.

The impacts during the Construction Phase are outlined in Table 8.1. During the construction phase, the Proposed Scheme will have temporary **Low Negative** impacts to pedestrian, bus access and parking and loading, with **Moderate Negative** impact to cyclists. General traffic redistribution is not anticipated to be a significant issue during the construction phase, however there will be a requirement for some localised temporary road closures for short durations of the daytime and / or night-time. Therefore, the impact on general traffic redistribution is anticipated to be a temporary **Medium Negative** impact. The impact of construction traffic is anticipated to result in a temporary **Low Negative** impact due to the low numbers of vehicles anticipated which are and below the thresholds set out in the Transport Assessments Guidelines.

Table 8.1: Summary of Potential Construction Phase Impacts

Assessment Topic	Effect	Potential Impact
Pedestrian Access	Restrictions to pedestrians along Proposed Scheme.	Low Negative
Cycling Access	Restrictions to cyclists along Proposed Scheme	Medium Negative
Bus Access	Restrictions to public transport along Proposed Scheme.	Low Negative
Parking and Loading	Restrictions to parking / loading along Proposed Scheme.	Low Negative
General Traffic	Restrictions to general traffic along Proposed Scheme	Medium Negative
	Additional construction traffic flows upon surrounding road network	Low Negative

During the Operational Phase, the Proposed Scheme will deliver strong positive impacts to the quality of pedestrian, cycling and bus infrastructure during the Operational Phase providing for enhanced levels of People Movement in line with the scheme objectives. These improvements will help to provide an attractive alternative to the private car and promote a modal shift to walking, cycling and public transport, allowing for greater capacity

along the corridor to facilitate the sustainable movement of people as population and employment levels grow in the future.

This TIA demonstrates that the Proposed Scheme results in the following impacts:

- **Pedestrian Infrastructure:** The Proposed Scheme consists of measures to enhance the existing pedestrian infrastructure along the direct study area. A Level of Service (LoS) junction assessment was undertaken using a set of five criteria to determine the impact that the Proposed Scheme has for pedestrians. The results of the impacted junctions demonstrate that the LoS during the Do Minimum scenario consists predominantly of the low B/ C /D / E ratings, with the exception of 3 F's and 4 A's. During the Do Something scenario, i.e., following the development of the Proposed Scheme, the LoS consists predominantly of the highest A / B ratings, with the exception of two Cs. Overall, the improvements to the quality of the pedestrian infrastructure will have a **High Positive impac**t in Section 2, **Medium Positive impact** in Section 1, Section 3, Section 4, Section 5 and Section 6.

- **Cycling Infrastructure:** The Proposed Scheme also consists of measures to enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic (and pedestrians) wherever practicable along the direct study area. A LoS assessment was undertaken using an adapted version of the NTA's National Cycle Manual Quality of Service (QoS) Evaluation criteria. The results of the assessment demonstrate that the LoS during the Do Minimum scenario consists of mainly B/C/D ratings. In the Do Something scenario, the LoS consists predominantly of the high ratings, with the exception of four B's and one C. Given the quality of the cycling infrastructure along the Proposed Scheme, the improvements will have a **Medium Positive impact** in Section 2, Section 3, Section 5 and Section 6 and a **Low Positive impact** in Section 1 and Section 4.

- **Bus Infrastructure:** The implementation of the Proposed Scheme will result in improvements in the quality of bus infrastructure provision along the direct study area. All proposed facilities have been designed in accordance with BusConnects Preliminary Design Guidance which has been developed with cognisance to the relevant accessibility guidance. A qualitative impact assessment has been undertaken based on the provision of bus priority, bus stop provision and changes to facilities. The results of the assessment demonstrate that the improvements to the quality of the bus infrastructure will have a **High Positive impact** in Section 2, Section 4 and Section 5, a **Medium Positive impact** in Section 1 and Section 3 and a **Low Positive impact** in Section 6 of the Proposed Scheme.

- **Parking and Loading:** A qualitative impact assessment has been undertaken of the Proposed Scheme impacts on the existing parking and loading. The results of the assessment demonstrate that the changes to the parking and loading provision will result in an overall loss of 534 spaces and 7 HGV spaces within the redline boundary of the Proposed Scheme, however the majority of these are off-street private parking spaces Given the nature of the loss in parking and the availability of alternative spaces in the indirect study area, the impact is expected to have a **Low Negative impact** in Section 1, Section 2, Section 3, Section 4 and Section 6 and a **Negligible impact** in Section 5 of the Proposed Scheme.

- **People Movement:** Given the proposed amendments to the pedestrian, cycling, bus and parking / loading infrastructure outlined above, the Proposed Scheme will have greater capacity to facilitate the sustainable movement of people travelling along the corridor. A quantitative impact assessment has been undertaken using outputs from the NTA's ERM and LAM, comparing the Do Minimum and Do Something peak hour scenarios for each forecast year (2028, 2043). The results of the assessment demonstrate that there will be an increase of 37% and 27% in the number of people travelling along the Proposed Scheme during the 2028 AM and PM Peak Hours respectively. During the 2043 scenario there will be an increase of 49% and 38% in the number of people travelling along the Proposed Scheme during the AM and PM Peak Hours. These increases are all due to the increased levels of people movement by sustainable modes facilitated by the Proposed Scheme. The analysis also shows that there will be an increase of 11% in the number of passengers boarding buses during the AM and PM Peak hours in 2028. During the 2043 scenario there will be an increase of approximately 6.4%% and 38.4% in the number of passengers boarding buses during the AM

and PM Peak hours respectively. Overall, it is adjudged that the Proposed Scheme will have a **High Positive impact** on the sustainable movement of people along the corridor.

- **Bus Network Performance Indicators:** A micro-simulation modelling assessment has been developed and network performance indicators of the bus operations along the 'end to end' corridor. The results of the assessment demonstrate that the total bus journey times on all modelled bus services will improve by between 8% and 12% during the AM and PM Peak hours of the 2028 Opening Year and 2043 Design Year. The Proposed Scheme will reduce total bus journey times along the Proposed Scheme by up to 12% in 2028 and 12% in 2043. Based on the AM and PM peak hours alone, this equates to **7.6 hours of savings in 2028 and 7.2 hours in 2043** combined across all buses when compared to the Do Minimum. On an annual basis this equates to approximately 5,750 hours of bus vehicle savings in 2028 and 5,450 hours in 2043, when considering weekday peak periods only. Journey time variation and reliability are shown to improve in all Do Something scenarios compared to the Do Minimum. Overall, it is anticipated that the improvements in journey times and reliability for bus users along the Proposed Scheme will have a **High Positive impact.**

- **General Traffic Network Performance Indicators:** There will be an overall reduction in operational capacity for general traffic along the direct study area, given the proposed infrastructural changes and rebalancing of priority towards sustainable modes outlined above. This reduction in operational capacity for general traffic will create some level of traffic redistribution away from the Proposed Scheme onto the surrounding road network.

  The LAM Opening Year 2028 model results were used to identify the impact in traffic flows between the Do Minimum and Do Something scenarios. A reduction in general traffic flows along a road link has been described as a positive impact to the environment. An increase in general traffic flows along a road link has been described as a negative impact to the environment. Reference has been given to TII's Traffic and Transport Assessment Guidelines as an indicator for best practice, to determine the key road links that require further traffic analysis due to the increase in traffic. Operational capacities were extracted from the LAM at the associated junctions of the key road links to identify the impact that the Proposed Scheme will have on the Volume / Capacity ratios. The results are presented in terms of the significance of the impact to the Volume / Capacity ratio for each junction based on its sensitivity and magnitude of impact.

  The results of the assessment demonstrate that the surrounding road network largely has the capacity to accommodate the redistributed general traffic as a result of the Proposed Scheme. The majority of assessed junctions that required further traffic analysis have V / C ratios that are broadly similar before and after the Proposed Scheme implementation.

  Overall, it has been determined that the impact of the reduction in general traffic flows along the Proposed Scheme will be a **Medium Positive** impact whilst the impact of the redistributed general traffic along the surrounding road network will have a **Low Negative** impact.

- **Network Wide Performance Indicators:** Given the impacts to the traffic conditions outlined above, there will be a knock-on effect to the operational efficiency of the road network beyond the direct and indirect study areas. A quantitative impact assessment has been undertaken using outputs from the NTA's ERM and LAM to determine the conditions to queuing, travel times, travel distances and network speeds during the Do Minimum and Do Something scenarios. The results of the assessment demonstrate that the impacts to the network performance indicators range between -3.3% to +2.6% and will therefore have a **Negligible impact**.

- **Cumulative Assessment**: In general, total trip demand (combining all transport modes) will increase into the future in line with population and employment growth. A greater share of the demand will be by sustainable modes (Public transport, Walking, Cycling) as facilitated by the GDA Strategy implementation.

The analysis indicates that the 12 BusConnects Proposed Schemes in place, there will be a high positive impact on sustainable mode share. The schemes will prevent any increase in private car traffic within the study area and will instead result in a reduction in car trips below 2020 levels.

In the 2028 Opening Year scenario, it is estimated that for people travelling within the 500m catchment area (including City Centre) there will be a 12% increase in public transport trips, 2% decrease in general traffic trips (i.e. motorists) and a 14% increase in cycling trips in the AM Peak Hour and a 12% increase in public transport, 3% decrease in general traffic and a 12% increase in cycling trips each day (7am-7pm). In the 2043 Design Year scenario, it is estimated that for people travelling within the 500m catchment area (including City Centre) there will be a 6% increase in public transport trips, 6% decrease in general traffic trips (i.e. motorists) and a 10% increase in cycling trips in the morning peak hour and a 7% increase in public transport, 7% decrease in general traffic and a 11% increase in cycling trips each day (7am-7pm).

General traffic levels reduce more in 2043 than when compared to 2028 due to the increased level of additional non-bus public transport infrastructure and services (MetroLink, Luas extensions and DART+ from the GDA Strategy) in tandem with the road capacity reduction measures as part of the Proposed Scheme leading to increased usage on all public transport modes.

The modelling outputs for the 2028 Cumulative Opening Year scenario demonstrate that there is a high growth in bus patronage along all the Proposed Schemes in the AM Peak Hour. The bigger increases occur in the inbound direction on the Blanchardstown to City Centre, the Rathfarnham to City Centre and the Bray to City Centre schemes where the loadings reach more than 2,000 additional passengers per Hour compared to the Do Minimum scenario.

In the 2028 Opening Year AM Peak Hour scenario with the Proposed Schemes in place, there will be an estimated 10% more passenger boardings across all public transport services and 17% more boardings on bus services. In the 2028 Opening Year PM Peak Hour scenario with the Proposed Schemes in place, there will be an estimated 11% increase in total passengers boarding Public transport services and 18% more passengers boarding buses services. In the 2043 Design Year AM and PM Peak Hour scenarios, increase in total passengers boarding all public transport services will be 7% and 8% respectively, and the increase in passengers boarding bus services will increase by 11% and 14% respectively.

Overall, the Proposed Schemes are expected to deliver a **High Positive cumulative impact** on People Movement by sustainable modes.

The impacts of the Proposed Scheme during the Operational Phase are summarised in Table 8.2.

Table 8.2: Summary of Potential Operational Phase Impacts

Assessment Topic	Effect	Potential Impact
Pedestrian Infrastructure	Improvements to the quality of the pedestrian infrastructure along the Proposed Scheme.	Medium Positive (Sections 1,3,4,5,6), High Positive (Section 2)
Cycling Infrastructure	Improvements to the quality of the cycling infrastructure along the Proposed Scheme.	Low Positive (Section 1,4), Medium Positive (Section 2,3,5,6)
Bus Infrastructure	Improvements to the quality of the bus infrastructure along the Proposed Scheme.	Low Positive (Section 6), Medium Positive (Section 1 and 3), High Positive (Section 2, 4 and 5)
Parking and Loading	A total loss of 540 parking / loading spaces and 3 HGV spaces along the Proposed Scheme.	Negligible (Section 5), Low Negative (Sections 1,2,3,4 and 6)
People Movement	Increases to the total number of people travelling along the Proposed Scheme.	High Positive

Assessment Topic	Effect	Potential Impact
Bus Network Performance Indicators	Improvements to the network performance indicators for bus users along the Proposed Scheme.	High Positive
General Traffic Network Performance Indicators	Reduction in general traffic flows along the Proposed Scheme.	Medium Positive
	Redistributed general traffic along the surrounding road network in the indirect study area as a result of the reduction of reserve capacity along the Proposed Scheme.	Low Negative
Network Wide Performance Indicators	Deterioration to the network-wide queuing capacity, travel times, travel distances and average network speeds beyond the direct and indirect study areas.	Negligible
Cumulative Assessment	The Proposed Scheme in tandem with other Core Bus Corridors and GDA Strategy schemes will facilitate substantial mode shift from car to sustainable modes.	High Positive

The Proposed Scheme will address sustainable mode transport infrastructure deficits while contributing to an overall integrated sustainable transport system as proposed in the GDA Transport Strategy. It will increase the effectiveness and attractiveness of bus services operating along the corridor and will result in more people availing of public transport due to the faster, more reliable journey times which the Proposed Scheme provides. This in turn will support the future increase to the capacity of the bus network and services operating along the corridor and thereby further increasing the attractiveness of public transport. In addition to this, the significant segregation and safety improvements to walking and cycling infrastructure that is a key feature of the Proposed Scheme will further maximise the movement of people travelling sustainably along the corridor. All of these changes combined will therefore cater for higher levels of future sustainable population and employment growth.

In the absence of the Proposed Scheme bus services will be operating in a more congested environment, leading to higher journey times for and lower reliability for bus journeys. This limits their attractiveness to users which will lead to reduced levels of public transport use, making the bus system less resilient to higher levels of growth and leading to increased levels of car use and congestion. The absence of walking and cycling measures that the Proposed Scheme provides will also significantly limit the potential to grow those modes into the future.

On the whole, the Proposed Scheme will make a significant contribution to the overall aims of BusConnects, the GDA Transport Strategy and allow the city to grow sustainably into the future, which would not be possible in the absence of the Proposed Scheme.

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