Appendix A6.1
Transport Impact Assessment Report

Contents

Executive Summary

The purpose of this document is to provide a comprehensive Transport Impact Assessment (TIA) of the proposed Swords to City Centre 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 has assessed the impacts and significance of those impacts in relation to the receiving environment of the Proposed Scheme.

The Proposed Scheme is being planned to enable and deliver efficient, safe and integrated sustainable transport movement along the corridor. To achieve this overall objective, the National Transport Authority (NTA) has identified the following objectives:

- 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 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 of 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) has an overall length of approximately 12km and will commence south of Swords at Pinnock Hill Junction and travels in a southerly direction along the R132 Swords Road past Airside Retail Park, Dublin Airport and Santry Park. The route continues on the R132 past Santry Demesne, where the Swords Road joins the R104 at Coolock Lane. The route continues on the R132 in a southerly direction through Santry village. It continues along the Swords Road past Whitehall to Griffith Avenue. The route follows Drumcondra Road Upper past the Dublin City University (DCU) St Patrick's Campus to the river Tolka. It continues through Drumcondra, on Drumcondra Road Lower to Binns Bridge on the Royal Canal. From there it continues on Dorset Street Lower as far as Eccles Street, from where it continues on Dorset Street Upper to North Frederick Street. The Proposed Scheme also includes Parnell Square East, Parnell Square West and Granby Row.

The Proposed Scheme includes an upgrade of the existing bus priority and cycle facilities associated with the corridor. The Proposed Scheme includes a substantial increase in the level of bus priority provided along the corridor, including the provision of additional lengths of bus lane, resulting in improved journey time reliability. 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.

Moreover, pedestrian facilities will be upgraded and additional signalised crossings will be 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 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.

Overall segregated cycling infrastructure provision (including quiet streets) is currently provided for 28% of the corridor.

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

- **Section 1 -** Pinnock Hill Junction to Airside Junction;
- **Section 2 -** Airside Junction to Northwood Avenue;
- **Section 3 -** Northwood Avenue to Shantalla Road;
- **Section 4 -** Shantalla Road to Botanic Avenue; and

- **Section 5 -** Botanic Avenue to Granby Row.

Section 1 begins south of Swords along the R132 Dublin Road at Pinnock Hill Roundabout for 150m. The route continues south along the R132 through the signalised junction at Airside for 650m, after which it enters Section 2.

Section 2 is approximately 4.8km in length, beginning south of Airside Junction and continuing along the R132 to Cloghran Roundabout followed by Dublin Airport Roundabout. At the southern access to Dublin Airport, the route moves through the R132 / Corballis Road South signalised Junction and continues south, passing under the M50. The route passes the Old Airport Road signalised junction and the R132 / Turnapin Lane Junction, terminating at the R132 / Northwood Junction, after which it enters Section 3.

Section 3 of the Proposed Scheme begins north of the R132 / Northwood Avenue Junction. The route passes through R132 / Northwood Avenue Junction, the R132 / Coolock Lane Junction and the R132 / Santry Avenue Junction. At the R132 / Santry Avenue Junction, the route intersects with the R104 and continues along the R132 through to Shantalla Road Junction via the N1 / M50 bridge, after which it enters section 4. This section also comprises a connecting route between the R132 / Lorcan Road Junction and R132 / Shanrath Junction via Lorcan Road, Lorcan Drive, and Shanrath Road.

Section 4 of the Proposed Scheme is approximately 2.5km in length, beginning at the Shantalla Road Junction along the R132 Swords Road. The route moves along the R132 through the R132 / Collins Avenue Junction, the R132 / Griffith Avenue Junction, the R132 / Richmond Road Junction before terminating on the approach to the R132 / Botanic Avenue Junction, after which it enters Section 5.

Section 5 of the Proposed Scheme is approximately 2.5km in length. The section extends from north of the R132 Drumcondra Road Lower / Botanic Avenue Junction to the Dorset Street Upper / R132 Frederick Street North Junction where it continues along Dorset Street Upper to the Dorset Street Upper / Granby Row junction. The section also includes R132 Frederick Street North, R132 Parnell Square East, and R132 Cavendish Row, from the R132 Dorset Street Upper / R132 Frederick Street North Junction to the R132 Cavendish Row / Parnell Street Junction and Parnell Square West and Granby Row, from Dorset Street Upper / Granby Row Junction to the Parnell Street / Parnell Square West Junction.

Potential Impacts

Construction Phase

The impacts during the construction phase are outlined in Table 0.1.During the construction phase, the Proposed Scheme will have temporary **Low Negative** impacts to pedestrian access, bus access and parking and loading whilst it will have **Medium Negative** and temporary impacts to cyclist access.

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 0.1 Summary of Construction Phase Predicted Impacts

Assessment Topic	Effect	Predicted 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

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.

The assessment demonstrates the following:

- **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 has been undertaken using a set of five criteria to determine the impact that the Proposed Scheme has for pedestrians. The assessments demonstrate in the Do Minimum scenario, 72% of the junctions assessed had LoS ratings of D or below, 23% had a C rating, and just 5% had a B rating. In the Do Something scenario, i.e. following the development of the Proposed Scheme, 90% of the assessed junctions had the highest A / B LoS ratings, and 10% C ratings. The impact of the improvements to the quality of the pedestrian infrastructure will be **Medium Positive** across all sections of the Proposed Scheme.
- **Cycling Infrastructure:** The Proposed Scheme also consists of measures to enhance the existing cycling infrastructure 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 assessments demonstrate in the Do Minimum scenario, 64% of the route sections assessed had LoS ratings of D or below, 32% had a C rating, with 4% having a B rating. In the Do Something scenario, 82% of the assessed route sections had A or B LoS ratings, 14% had C ratings and 4% had D ratings. The impacts of the improvements to the quality of the cycling infrastructure will be **High Positive** in Section 1, **Medium Positive** in Section 3, 4 and 5 and **Low Positive** in Section 1.
- **Bus Infrastructure:** The implementation of the Proposed Scheme will result in improvements in the quality of bus infrastructure provision along the direct study area. A qualitative impact assessment has been undertaken based on the provision of bus priority, pedestrian accessibility and changes to the bus stop facilities. The results of the assessment demonstrate that the impact of the improvements to the quality of

the bus infrastructure will be **Low Positive** in Sections 1 and 2, **Medium Positive** in Section 5 and **High Positive** in Section 3.

- **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 58 spaces (-27 spaces in Section 2, -8 spaces in Section 3, -4 spaces in Section 4, and -19 spaces in Section 5). Given the nature of the loss in parking and the availability of alternative spaces in the indirect study area, the impact is expected to be **Negligible** in Section 1 and a **Low Negative** impact in Sections 2, 3, 4 and 5.
- **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 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 27% and 28% 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 in 19% in the number of people travelling along the Proposed Scheme during the AM Peak Hour and an increase of 10% during the PM Peak Hour.

  The analysis also shows that there will be an increase of 6.9% in passengers boarding buses during both the 2028 AM and PM Peak Hours. During the 2043 scenario there will be an increase in 4.2% and 4.0% in the number of people travelling by bus 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 established for 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 19% during the AM and PM Peak hours of the 2028 Opening Year and 2043 Design Year. Based on the AM and PM peak hours alone, this equates to **10.1 hours of savings in 2028 and 9.8 hours in 2043**, when compared to the Do Minimum combined across all buses. On an annual basis this equates to approximately 7,660 hours of bus vehicle savings in 2028 and 7,400 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 to the network performance indicators for bus users along the Proposed Scheme will be 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 to the existing road layout outlined above. This reduction in operational capacity for general traffic will create some level of traffic redistribution 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 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 **Medium 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 range -8.31% to +2.9% and will therefore have a **Negligible impact**.

- **Cumulative Summary:** 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)

  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, between Swords and the city centre, 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 **Low Negative** and temporary impacts to pedestrian access, bus access and parking and loading whilst it will have **Medium Negative** and temporary impacts to cyclist access. 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 **Medium Negative** and temporary impact. The impact of construction traffic is anticipated to result in a **Low Negative** and temporary 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 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 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 Chapter 6 (Traffic and Transport) within the EIAR.

The Proposed Scheme, as described in detail in Chapter 4 of the EIAR (Proposed Scheme Description) commences south of Swords at Pinnock Hill Junction and travels in a southerly direction along the R132 Swords Road past Airside Retail Park, Dublin Airport and Santry Park. The route continues on the R132 past Santry Demesne, where the Swords Road joins the R104 at Coolock Lane. The route continues on the R132 in a southerly direction through Santry village. It continues along the Swords Road past Whitehall to Griffith Avenue. The route follows Drumcondra Road Upper past the Dublin City University (DCU) St Patrick's Campus to the river Tolka. It continues through Drumcondra, on Drumcondra Road Lower to Binns Bridge on the Royal Canal. From there it continues on Dorset Street Lower as far as Eccles Street, from where it continues on Dorset Street Upper to North Frederick Street. The Proposed Scheme also includes Parnell Square East, Parnell Square West and Granby Row.

The Proposed Scheme includes an upgrade of the existing bus priority and cycle facilities associated with the corridor. The Proposed Scheme includes a substantial increase in the level of bus priority provided along the corridor, including the provision of additional lengths of bus lane, resulting in improved journey time reliability. 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.

Moreover, pedestrian facilities will be upgraded and additional signalised crossings will be 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 experience. The contents of 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	12km	
Bus Priority	**Existing (km)**	**Proposed Scheme (km)**
Bus Lanes		
Inbound	9.3	11.3
Outbound	8.0	11.8
Bus Priority through Traffic Management		
Inbound	0	0.33
Outbound	0	0.3
Total Bus Priority (both directions)	17.3	23.7 (+39%)
Bus Measures		
Proportion of Route with Bus Priority Measures	72%	100%
Cycle Facilities – Segregated		
Inbound	2.7	9.4
Outbound	4.1	9.4
Cyclist Facilities – Non-segregated		
Inbound	3.1	1.3 (Quiet Street)
Outbound	4.2	1.3 (Quiet Street)
Cyclist Facilities - Overall		
Total Cyclist Facilities (both directions)	14	21.4 (+53%)
Proportion Segregated (including Quiet Street Treatment)	28%	89%
Other Features		
Number of Pedestrian Signal Crossings	86	125

The Proposed Scheme is shown in 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
BCIDC-JAC-GEO_GA-0002_XX_00-DR-CR-9001	General Arrangement
BCIDC-JAC-GEO_CS-0002_XX_01-DR-CR-9001	Typical Cross Sections
BCIDC-JAC-TSM_GA-0002_XX_00-DR-CR-9001	Traffic Signs and Road Markings
BCIDC-JAC-TSM_SJ-0002_XX_00-DR-TR-9001	Junction Systems 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 Core Bus Corridor (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;
- 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.

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. 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 corridor. 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 TIA 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. 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.

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.

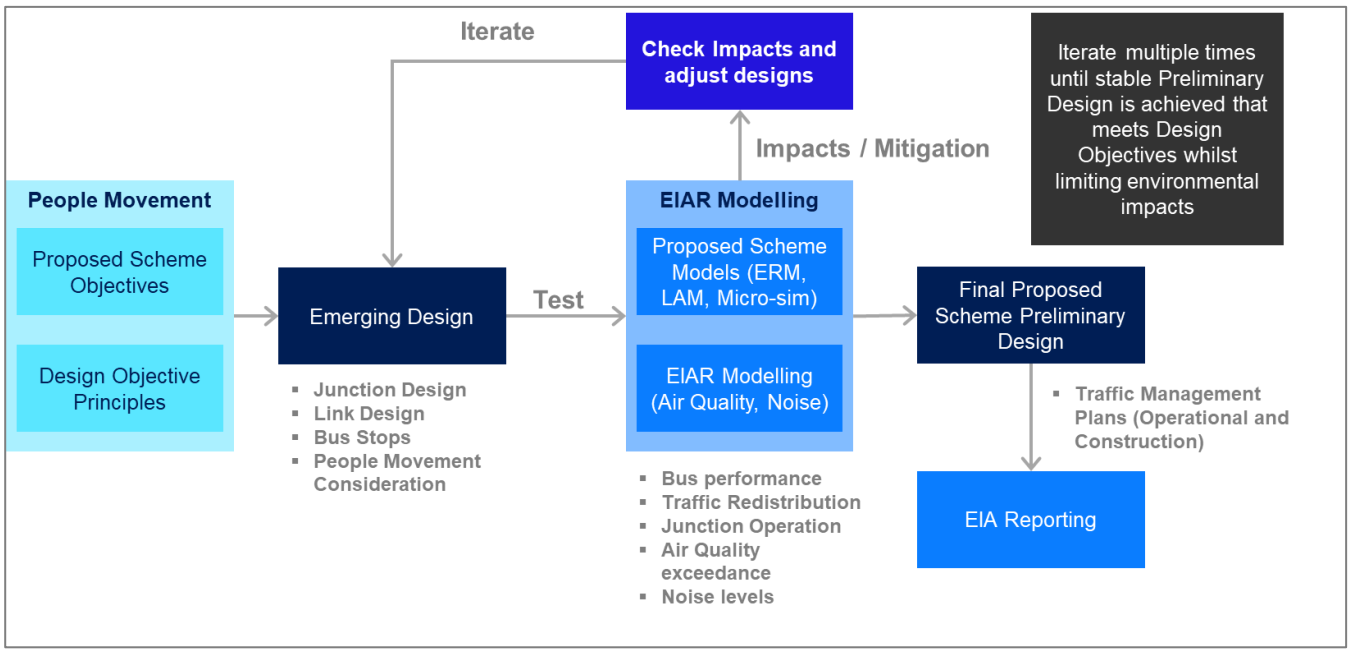

Diagram 1.1: Proposed Scheme Impact Assessment and Design Interaction

The impacts presented in this TIA 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 6.3.
- **'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.

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 **Error! Reference source not found.** for further details on the threshold applied in relation to traffic volume changes used in the definition of the indirect study area).

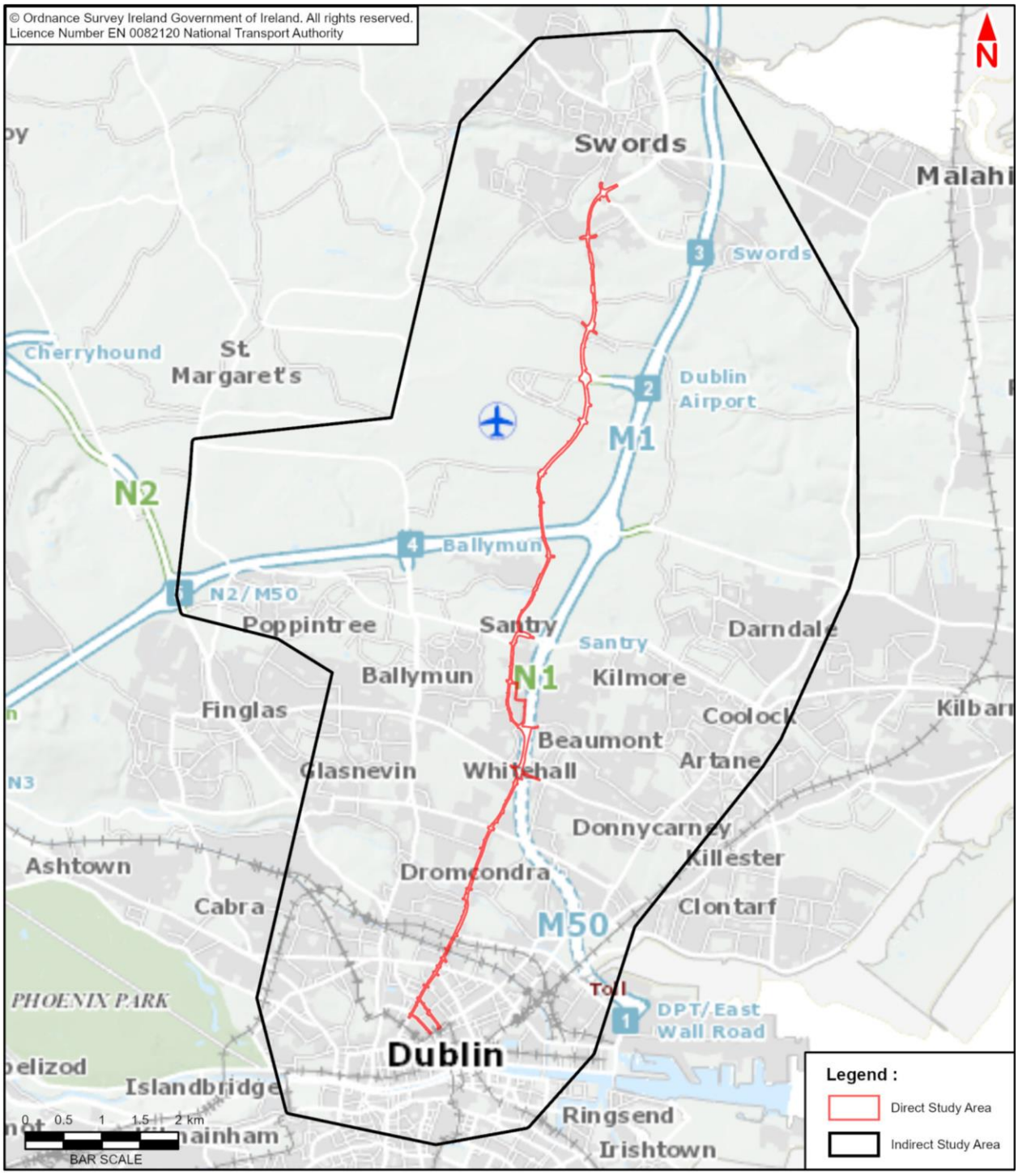

Diagram 2.1: Proposed Scheme Indirect Study Area

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) (DTTAS 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, characterized 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) (2021-2030)

The National Development Plan (NDP) (2021- 2030) (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 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 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.

As outlined in this Chapter, 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 number least three of the NIFTI investment priorities, including; protecting and renewing Dublin's public transport network, enabling better mobility for people across the Dublin City-region, and supporting the decarbonization of Dublin's transport network. Smarter Travel: A Sustainable Transport Future (2009 – 2020)

Smarter Travel: A Sustainable Transport Future (2009 – 2020) (Department of Transport, 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.

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

Smarter Travel: A Sustainable Transport Future (2009 – 2020) (Department of Transport, 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 Proposed Scheme are set out in Chapter 4 and 5, as follows:

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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) (Department of Transport, 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 (DTTAS), 2019) is the DTTAS'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.'*

DTTAS'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 (2021 – 2030)

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 Department of Transport, Tourism and Sport (DTTaS) 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
- Maximize 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 DTTAS 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 industrialization 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 and the BusConnects proposals overall.

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 Transport Strategy for the Greater Dublin Area (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.

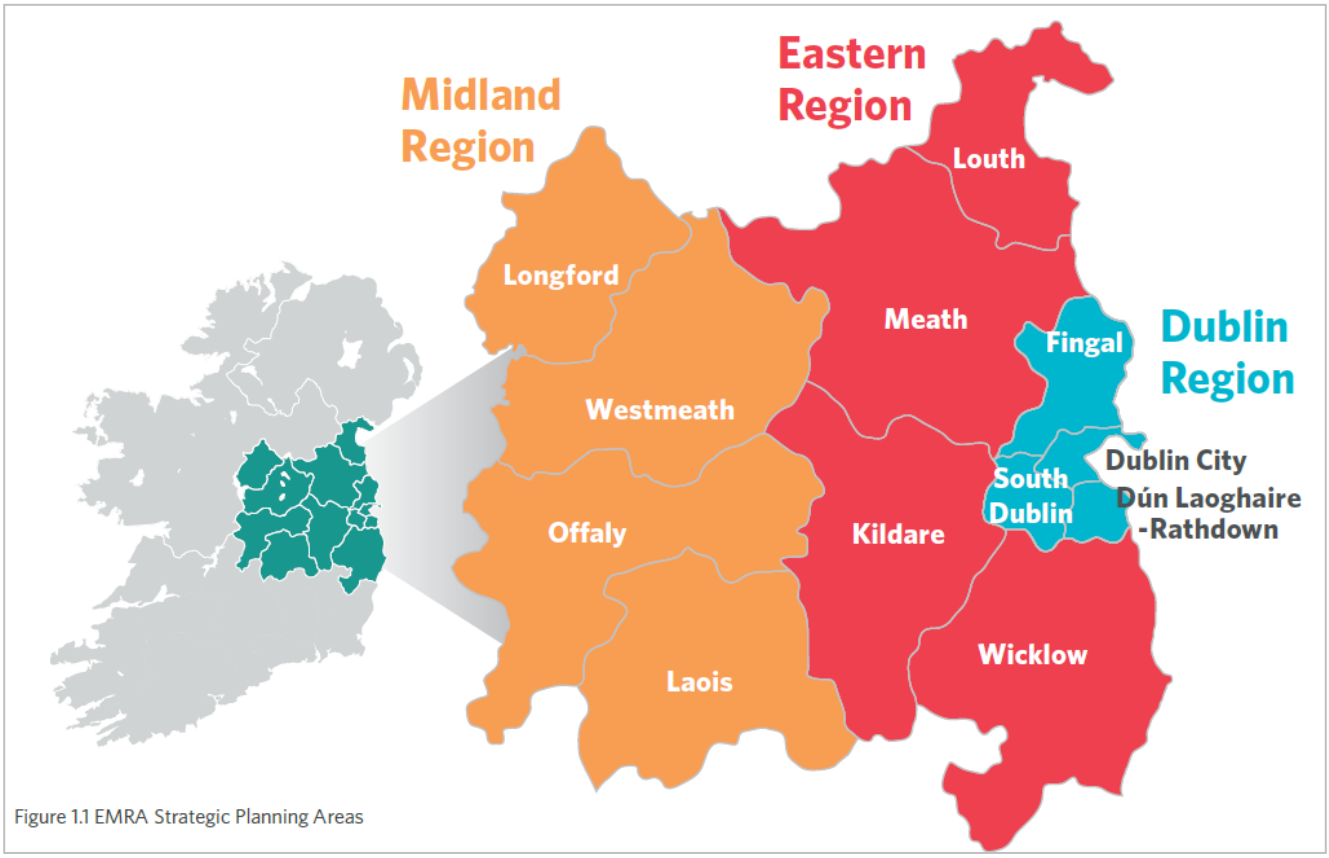

Diagram 3.2: RSES Planning Areas

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 maximizes 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

Extract from RSES RPO8.9 (Table 8.3: Bus Projects for the Region)
Review of bus services between settlements
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 Dublin Airport Local Area Plan 2020

The Planning and Development Act 2000-2012 introduced the concept of local area plans (LAP) within the framework of higher-level plans (such as Regional Planning Guidelines and City and County Development Plans). Local area plans provide more detailed planning policies for areas where significant development and change is anticipated.

Follow its adoption, The Dublin Airport Local Area Plan (2020) will be in effect for six years, unless otherwise extended; this LAP succeeds the Dublin Airport Local Area Plan (2006). It provides an updated framework for the sustainable growth of Dublin Airport in accordance with relevant national, regional, and local aviation, planning and environmental policies and takes cognisance of strategic transport schemes including the BusConnects Programme. Section 3 of the Proposed Scheme (Airside Junction to Northwood Avenue Junction, approximately 4.8km in length) routes through the Dublin Airport LAP boundary via the R132 Dublin Road, with Dublin Airport to the west and Dublin Airport car parks to the east.

The following strategic aims are intended to be realised by the LAP:

- Support for airport safeguarding.
- Support the continued sustainable growth of Dublin Airport and connectivity as a hub airport whilst ensuring protection of the environment.
- Support the timely delivery of required infrastructure to facilitate airport growth.
- Support the growth of the Airport as a major economic driver for the region.

- Support continued communication between the Airport and neighbouring communities to protect community amenity and mitigate potential impact from airport growth in the interests of long-term sustainability.

A review undertaken by Department of Transport, Tourism and Sport (DTTAS), a 'Review of Future Capacity Needs at Ireland's State Airports' (2018), identified the need for a third terminal to facilitate anticipate growth and address existing issues around constrained capacity. Three locations have been identified as potential locations for the third terminal (T3): North-East of T1, North-West of T1 and West of runway 16/34. The cited target date for the provision of T3 is 2031.

The LAP recognises BusConnects as a strategic transport improvement scheme that can support the targets outlined in the plan. In particular, Swords CBC is acknowledged as a sustainable-mobility scheme which can support the LAP in achieving targets around improved modal shift in favour of sustainable modes, and in turn secure reductions in transport-induced carbon emissions.

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 baseline environment.

The assessment of the Proposed Scheme in relation to the baseline transport environment comprises 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 requires an approach which can provide 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 requires 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 possible 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 methods which are based upon traffic 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 and photographs used to record locations of particular importance. This ensures 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 orthophotography 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 TIA 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 hierarchical classification of roads based on reality, used to determine a logical and efficient route for a traveller. 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. The source of this data was 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 February 2020 (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 Traffic 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	IDASO LTD	60	Thursday 6/2/2020, Thursday 13/2/2020
ATC	IDASO LTD	8	Wednesday 5/2/2020 - Tuesday 11/2/2020

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. In some cases, the ATC counts were repeated for a second week to account for data-collection issues. 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 within the study area of the Proposed Scheme;
- 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 5.2.

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 anonymised Custom Area Analysis dataset through

the TomTom TrafficStats portal. The NTA has an agreement with TomTom to provide 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, 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 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 strategic and micro-simulation models 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 projected volume of people moving along the Proposed Scheme 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 using the following scenarios:

- **Do Minimum** – This scenario represents the likely conditions of the road network with all major committed transportation schemes in place that will impact on the use of public transport and private car, without the Proposed Scheme.
- **Do Something** – This scenario represents the likely conditions of the road network with all major committed transportation schemes in place that will impact on the use of public transport and private car, with the Proposed Scheme (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 typically applied in the United States, as well as Australia and New Zealand, 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.

4.2.3.2 Movement of People

To support the 'Objective' led approach to the design of junctions along the Proposed Scheme (i.e. with a focus on the movement of people rather than vehicles), a People Movement at Signal (PMS) Calculator has been developed from first principles based on TRL guidance[1].

The 'Objective' led approach involves the prioritisation of people movement, focussing 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) movements at junctions.

The PMS calculator was developed to provide an initial estimate of green time allocation for all movements at a typical junction, as proposed in the design guidelines used for the Proposed Scheme Infrastructure Works, 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 are underpinned by:

- The number of buses required to be accommodated along the Proposed Scheme;
- An estimate of Peak Hour cycling demand based on 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 PMS calculator is based on the junction arrangements as proposed in the design guidelines used for the Proposed Scheme Infrastructure Works, for both 3 and 4-arm variations. The outputs of the calculator provided the designer with an initial estimate of the green times and vehicle capacity movements based on designer 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 by the designer to adjust their proposals with a view to maximising the total person throughput at each junction along the Proposed Scheme.

The Movement of People Calculation and vehicular capacity from this initial exercise was enhanced further by the Proposed Scheme Transport Models described below.

4.3 Transport Modelling Methodology

A multi-tiered transport modelling approach has been adopted. 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[2] corridor-wide, road (motorised vehicle only) based Local Area Model (LAM) in combination with a multi-modal

[1] UK – Department of Transport Research Report 67 - THE PREDICTION OF SATURATION FLOWS FOR ROAD JUNCTIONS CONTROLLED BY TRAFFIC SIGNALS https://trl.co.uk/sites/default/files/RR067.pdf

corridor micro-simulation model and local junction models have been used which work in tandem with the NTA's East Regional Model (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) 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 has been passed to the cordoned local area model, micro-simulation models and junctions 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 East Regional Model (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 proposed 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.

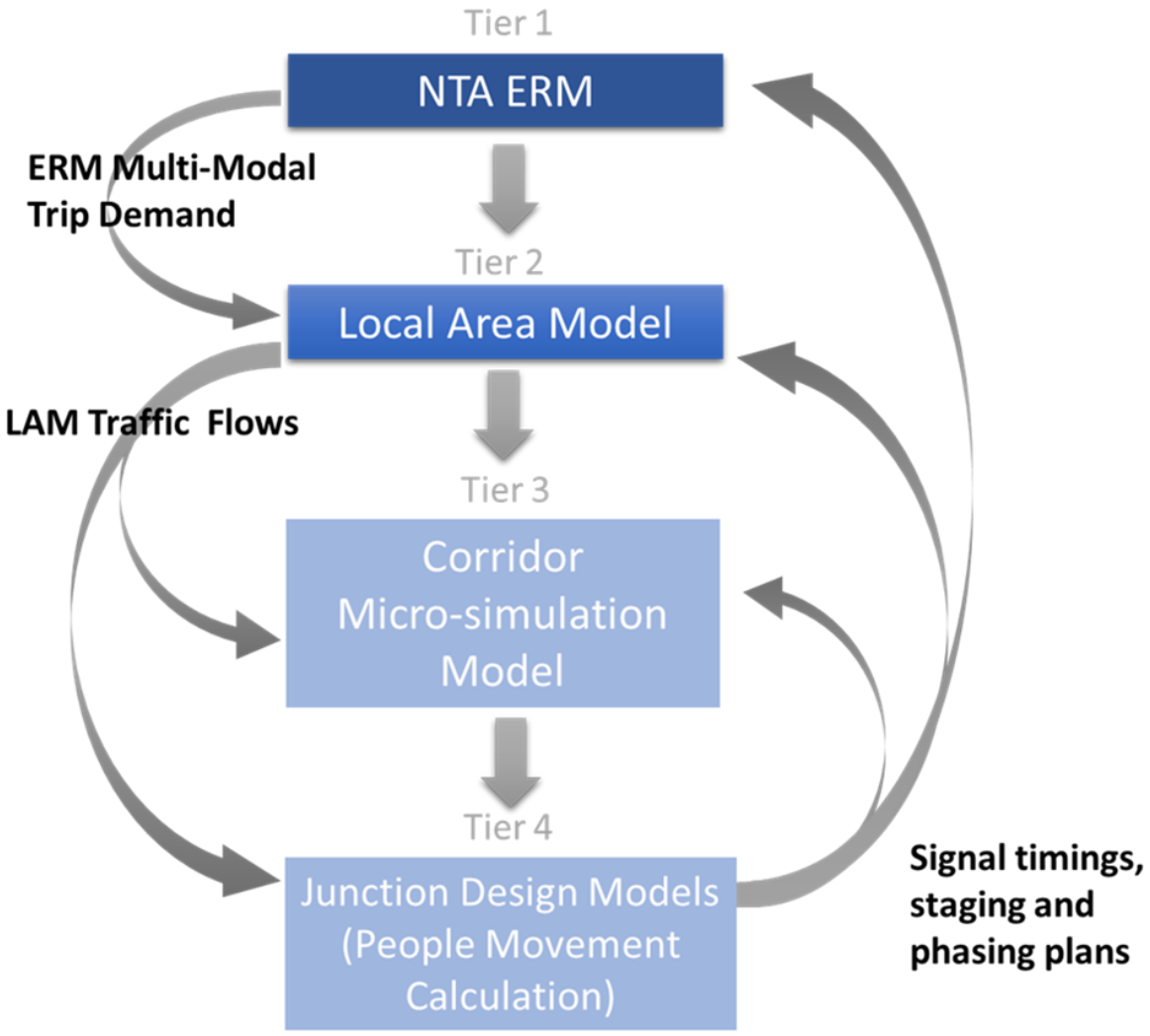

Diagram 4.1: Proposed Scheme Modelling Hierarchy

Further detail on the transport model development process, the traffic data inputs used, the calibration, validation and forecast model development for the suite of transport models can be found in the Transport Modelling Report, in TIA Appendix 1 (Transport Modelling Report) and TIA Appendix 2 (Junction Design Report) in Volume 4 of the EIAR.

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	Traffic surveys Journey time data ERM forecast matrices Proposed Scheme designs

Tool	Purpose	Inputs
	Construction Strategy and Traffic Management measure testing Donor network for Proposed Scheme Micro-sim model	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[3] 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 Transport Impact Assessments (TIA) and EIAR.

4.3.1.3 Local Area Model (LAM)

To support the detailed assessment of the Proposed Scheme a more disaggregate urban area traffic model, the Local Area Model (LAM) has been developed, as a cordoned model from the ERM, that could incorporate 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.

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 Infrastructure Works 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 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 and as such were not included in the model inputs. PCL counts are 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 SATURN network as shown in Diagram 4.2.

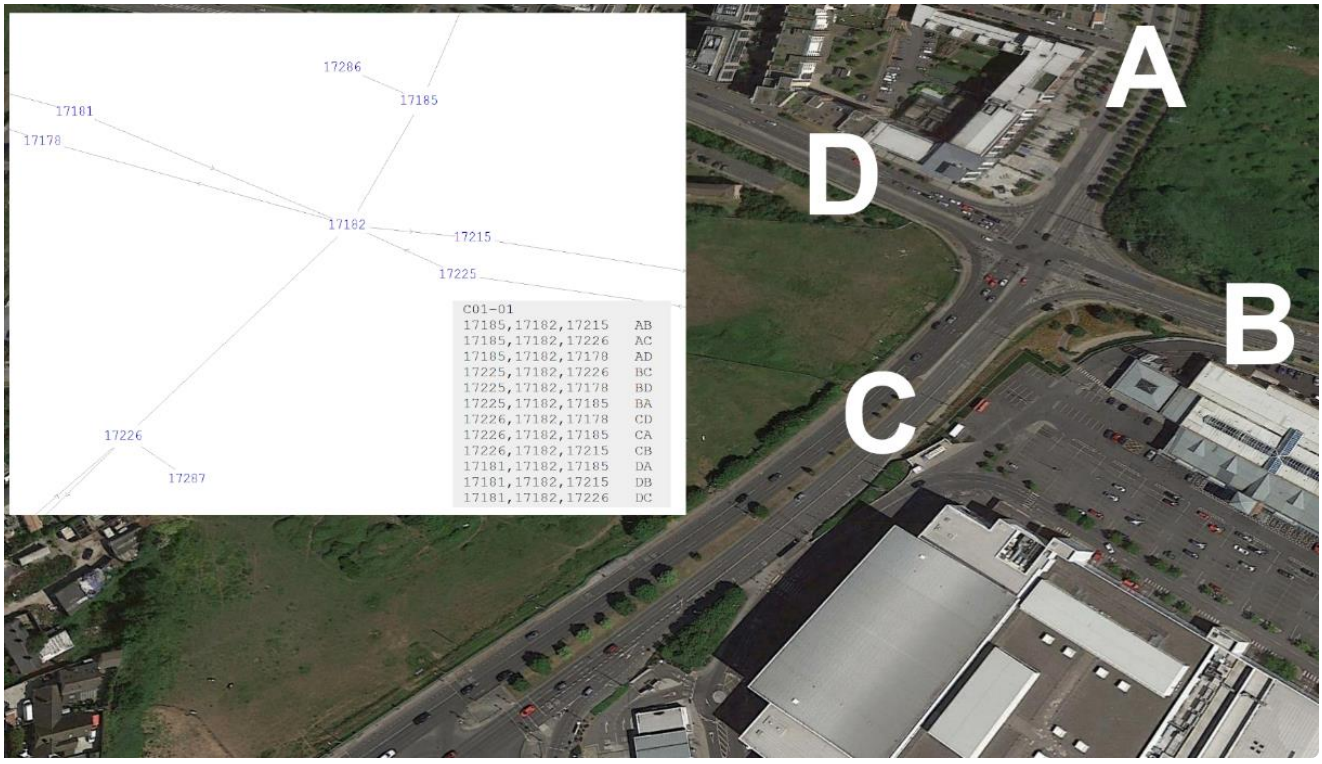

Diagram 4.2: Bus Connects LAM Node Matching (Junction C01-01)

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

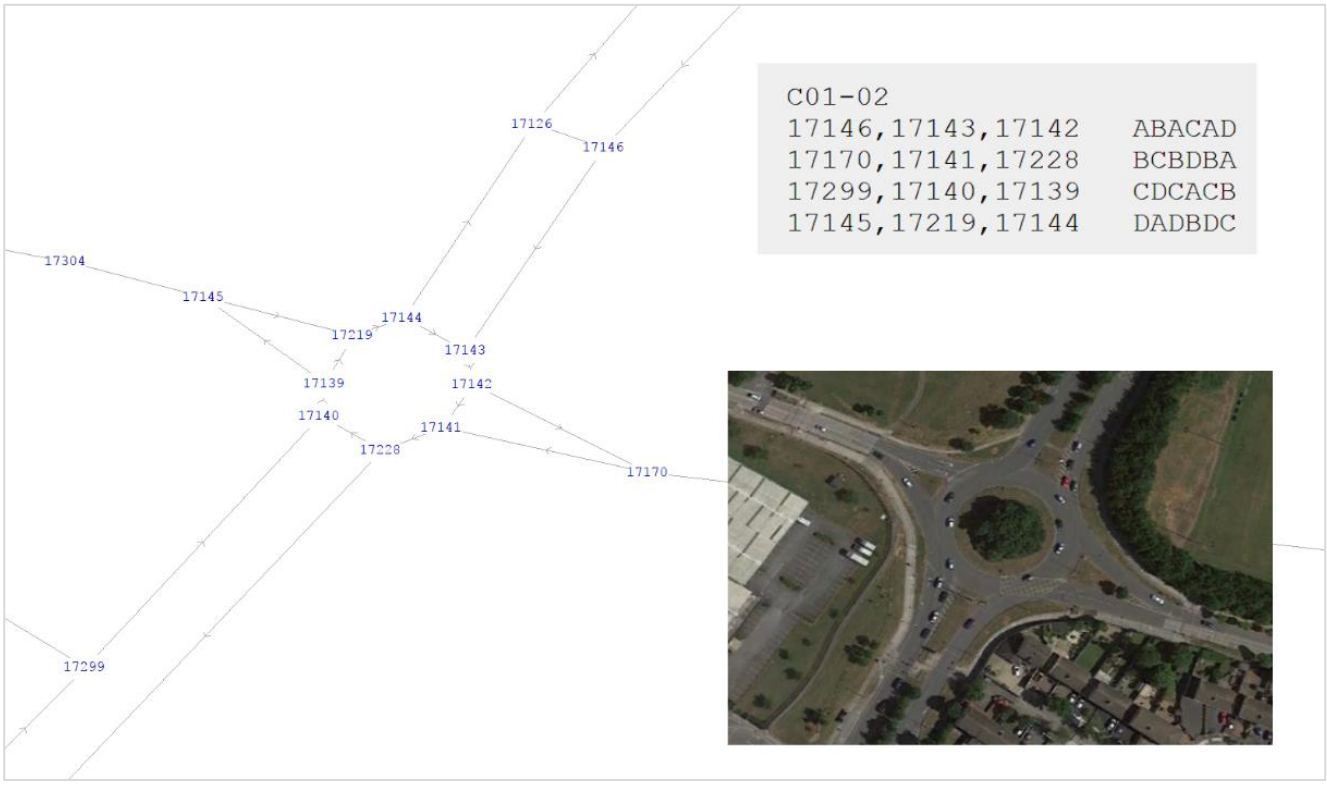

Diagram 4.3: Bus Connects LAM Node Matching (Junction C01-02)

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 Micro-simulation 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 comprises of 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, Corridor 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 Preliminary Designs for the Proposed Scheme. The junction models have been developed for standalone junction assessments and for combinations of secondary (off-line) junctions. The junction models are used in combination with the micro-simulation model at 'hot-spot' locations for operational testing and 'proof of concept' demonstration of the preferred design for the Proposed Scheme.

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

The resultant scheme designs have been modelled in the ERM, LAM and corridor models to understand the strategic and corridor specific issues and inform the preparation of the TIAs and EIARs and the planning submissions 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.

Overall segregated cycling infrastructure provision (included quiet street treatment) is provided along 28% of the corridor.

5.1 Bus Journey Times

Bus services along the Proposed Scheme currently operate within a constrained and congested environment, with bus priority provided along 72% of the corridor.

An examination of Automatic Vehicle Location (AVL, collected by the NTA) data indicates that the current standard deviation for journey times of buses on the corridor is varies by up to 10 minutes. With any further increases in traffic levels, these issues are expected to be exacerbated.

While impacting upon bus passengers, longer and less reliable bus services also require operators to use additional buses to maintain headways to fill gaps created in the timetable.

Aligned to this, the remaining sections of unprioritised 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 5.1. The busiest junction in the study area is the Dublin Airport Access roundabout (72,726 daily movements). The next busiest junctions are:

- Collins Avenue (62,383 daily movements);
- M1 Interchange (57,592 daily movements);
- North Circular Road (54,681 daily movements); and
- Whitworth Road (50,985 daily movements).

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

Junction Identifier	Junction Name	Type	Daily Movements (vehs)	AM Movements (vehs)	PM Movements (vehs)
2-1	R132/Dublin Road	Priority	43359	3300	3321
2-2	R132/Boroimhe Road	Signals	36682	2697	2921
2-3	R132/ Naul Road/Stockhole Lane	Signals	38529	2911	3065
2-4	R132/Dublin Airport Access	Signals	72726	4843	4342
2-5	R132/Green Long-Term Car Park	Signals	28340	2241	1925
2-6	R132/Corballis Road	Signals	38063	2543	2721
2-7	R132/Old Airport Road	Signals	33181	2456	2567

Junction Identifier	Junction Name	Type	Daily Movements (vehs)	AM Movements (vehs)	PM Movements (vehs)
2-8	R132/Quick Park at Dublin Airport	Signals	21749	1773	1658
2-9	R132/Turnapin Lane	Priority	22547	1886	1755
2-10	R132/Coolock Lane	Signals	34854	2451	2694
2-11	R132/Santry Avenue	Signals	31109	2203	2214
2-12	R132/OmniPark Shopping Centre	Signals	29896	1741	2192
2-13	R132/Shanowen Road	Signals	24884	1876	1962
2-14	R132/Larkhill Road/Shanrath Road	Signals	21315	1709	1728
2-15	R132/Collins Avenue	Signals	62383	3417	3681
2-16	R132/Iveragh Road	Signals	39304	1995	2258
2-17	R132/Griffith Avenue	Signals	49084	2955	2804
2-18	R132/Home Farm Road	Signals	36824	1994	2042
2-19	R132/Richmond Road	Signals	42880	2525	2438
2-20	R132/Botanic Avenue	Signals	43855	2646	2551
2-21	R132/Clonliffe Road	Signals	48379	3283	2874
2-22	Drumcondra Road Lower/Whitworth Road	Signals	50985	3404	3183
2-23	Dorset Street Lower/Belvedere Road	Signals	49625	3258	3081
2-24	Dorset Street Lower/North Circular Road	Signals	54681	3573	3434
2-25	Dorset Street Lower/Gardiner Street Upper	Signals	47855	3112	2810
2-26	Dorset Street Lower/Frederick Street North	Signals	34916	2311	2069
2-27	Gardiner Street/Parnell Street	Signals	31966	2330	2276
2-28	Dorset Street Upper/Granby Row	Signals	30638	1940	2005
2-29	Gardiner Street Upper/Mountjoy Square North	Signals	22962	1582	1630
2-30	Mountjoy Square West/Mountjoy Square South	Signals	23321	1637	1690
2-31	Gardiner Street Lower/Sean Macdermott Street	Signals	27167	1799	1978
2-32	Gardiner Street Lower/Talbot Street	Signals	24991	1684	1727
2-33	R132/Kettle's Lane	Priority	26152	1946	2018
2-34	Dorset Street Lower/Eccles Street	Signals	39331	2527	2400

Junction Identifier	Junction Name	Type	Daily Movements (vehs)	AM Movements (vehs)	PM Movements (vehs)
2-35	M1/R125 Drinan Link Road Interchange	Priority	30551	2557	2440
2-36	M1/Airport Interchange	Priority	57592	3580	3528
2-37	R132/Northwood Avenue	Priority	23883	1743	1897
2-38	R132/Schoolhouse Lane	Priority	23477	1658	1773
2-39	R132/Magenta Crescent	Priority	23276	1655	1744
2-40	R132/Griffith Downs	Priority	39100	2039	2237
2-41	N1/Seven Oaks	Signals	39714	2000	2269
2-42	Drumcondra Road/Grattan Parade	Priority	40692	2561	2371
2-43	Drumcondra Road/St Alphonsus Road	Priority	42923	2769	2397
2-44	Drumcondra Road/Dargle Road	Priority	40857	2617	2187
2-45	Drumcondra Road/Carlingford Road	Priority	40302	2538	2168
2-46	Drumcondra Road/Hollybank Road	Priority	41823	2695	2364
2-47	Drumcondra Road/Clonturk Park	Priority	37322	2027	1940
2-48	Drumcondra Road/Ormond Park	Signals	37740	2101	2057
2-49	Drumcondra Road/Church Avenue	Signals	36954	1983	1995
2-50	Gardiner Street/Beresford Place	Priority	39467	2409	2936
2-51	Beresford Place/Amiens Street	Signals	26074	2212	1522
2-52	Amiens Street/Store Street	Signals	27687	1644	1974
2-53	Abbey Street/Beresford Place	Signals	28436	1462	2269
2-54	Swords Rd/Dublin Port Tunnel	Priority	16386	1371	1364
2-55	Frederick Street/Gardiner Row	Signals	14914	927	926
2-56	Cavendish Row/Parnell St	Signals	24187	1383	1432
2-57	Parnell Street/Parnell Square	Signals	19445	1044	1298
2-58	Grany Row/Parnell Square	Priority	10702	473	685
2-59	North Circular/Belvedere Place	Signals	25568	1670	1867
2-60	M50, Kilmore	Priority	44765	2643	3246

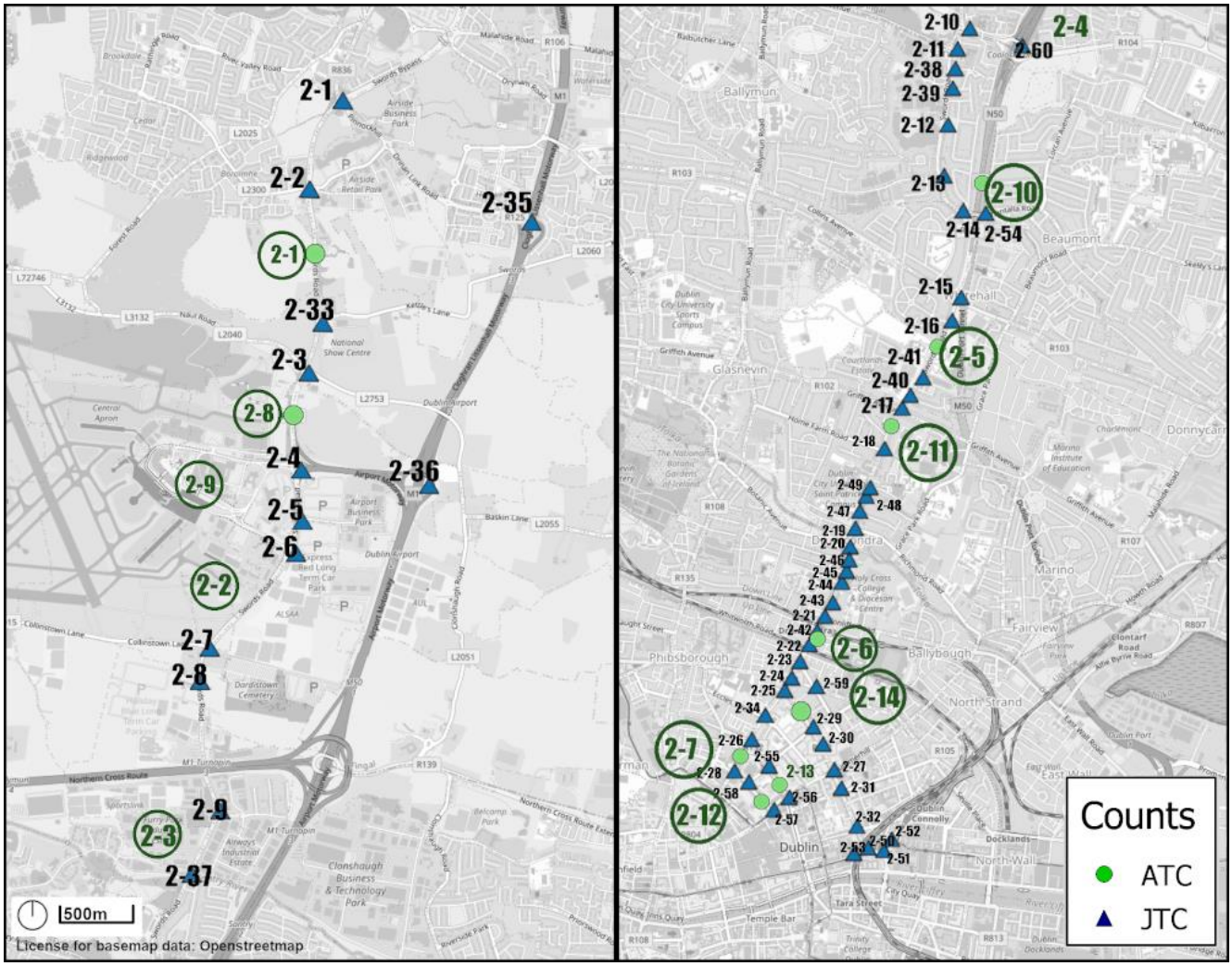

Diagram 5.1: ATC and JTC Traffic Count Locations

5.2.2 Automatic Turning Counts (ATCs)

Table 5.2Table 5.2 displays the ATCs collected for the Proposed Scheme, the locations of which are shown in in Diagram 5.1.

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

ATC identifier	ATC location	Direction	Daily movements (vehs)	AM movements (vehs)	PM movements (vehs)
2.1A	R132, Nevinstown East	Northbound	11795	954	831
2.1B		Southbound	11318	762	901
2.2A	R132, Stop 5053	Northbound	11950	664	945
2.2B		Southbound	13585	1221	919
2.3A	R132, Turnapin Lane	Northbound	7711	596	491
2.3B		Southbound	9927	737	814

ATC identifier	ATC location	Direction	Daily movements (vehs)	AM movements (vehs)	PM movements (vehs)
2.4A	R132, Santry	Northbound	10554	823	754
2.4B		Southbound	10758	647	816
2.5A	R132, Whitehall	Northbound	17678	831	940
2.5B		Southbound	18352	809	985
2.6A	Drumcondra Road north of Whitworth Road	Northbound	19370	954	1071
2.6B		Southbound	18067	1192	911
2.7A	Dorset Street Upper	Northbound	excluded	excluded	excluded
2.7B		Southbound	excluded	excluded	excluded
2.8A	R132, Cloghran	Northbound	13309	710	1262
2.8B		Southbound	13951	1297	794
2.9A	R132, Corballis	Northbound	10129	354	908
2.9B		Southbound	14841	1648	679
2.10A	R132, Whitehall	Northbound	8162	604	641
2.10B		Southbound	8691	670	632
2.11A	Drumcondra Road Upper	Northbound	excluded	excluded	excluded
2.11B		Southbound	excluded	excluded	excluded
2.12A	Parnell Square West	Northbound	excluded	excluded	excluded
2.12B		Southbound	excluded	excluded	excluded
2.13A	Parnell Square East	Northbound	excluded	excluded	excluded
2.13B		Southbound	excluded	excluded	excluded
2.14A	Mountjoy Square West	Northbound	7404	333	528
2.14B		Southbound	8134	609	473

5.3 Baseline Conditions

5.3.1 Overview

In describing the baseline conditions, the Proposed Scheme has been divided into five sections which are outlined as follows and illustrated in Figures 6.2a to 6.2e in Volume 3 of the EIAR:

- Section 1 - Pinnock Hill Junction to Airside Junction;
- Section 2 - Airside Junction to Northwood Avenue;
- Section 3 - Northwood Avenue to Shantalla Road;
- Section 4 - Shantalla Road to Botanic Avenue; and
- Section 5 - Botanic Avenue to Granby Row.

5.3.2 Section 1 – Pinnock Hill to Airside Junction

This Section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 1 of the Proposed Scheme, from Pinnock Hill to Airside Junction along the R132 Dublin Road to the Airside junction.

The Proposed Scheme commences to the south of Swords along the R132 Dublin Road at Pinnock Hill Roundabout for 150m. The route continues south along the R132 through the signalised junction at Airside for 650m, after which it enters Section 2.

5.3.2.1 Pedestrian Infrastructure

North of Pinnock Hill Roundabout, there is a footpath of approximately 1.5m width on the northbound side, which extends from the roundabout to bus stop 5073 (Pinnockhill), approximately to the 90m north. There are no footpaths in the northbound direction from this point. There are no footpaths in the southbound direction on the north side of Pinnock Hill Roundabout. Between Pinnock Hill Roundabout and Airside Junction there are footpaths on both sides of the R132, with widths ranging from 1.0m to 2.0m.

Along the R132, street lighting columns are situated along both sides of the carriageway within close proximity to the footpaths.

A signalised crossing facility which benefits from tactile paving and dropped kerbs can be found at the following location:

- Across the northern, eastern, and western arms of Airside Junction (pelican crossings, staggered across the northern and western arms, with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on splitter islands).

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 Volume 3 of the EIAR.

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

5.3.2.2 Cycling Infrastructure

Along the R132 north of Pinnock Hill Roundabout, in the southbound direction, there is a combined bus and cycle lane of approximately 3.5m width, which terminates approximately 75m on the northern approach to the roundabout. In the northbound direction, a combined bus and cycle lane of approximately 3.5m width starts approximately 75m after the northern exit from the roundabout and continues to the extents of this section. There are no dedicated cycle facilities going through Pinnock Hill Roundabout.

Between Pinnock Hill Roundabout and Airside Junction, there are combined bus and cycle lanes of approximately 3.5m width along both sides of the R132. There are advance stop lines for cyclists on all arms of the Airside signalised Junction.

At the existing roundabouts and junctions between Pinnock Hill Roundabout and Airside Junction, cyclists and vehicular traffic share green time.

There are limited cycle parking facilitates along Section 1 of the Proposed Scheme. Within the red line boundary of the Proposed Scheme, there are five Sheffield Stands (able to accommodate up to 10 bicycles) located along R836 Dublin Road westbound carriageway.

Six Sheffield stands (able to accommodate 12 bicycles) along R125 Swords Road eastbound carriageway (outside Frank McGowan store) are provided in the vicinity of the Section 1 of the Proposed Scheme, albeit, outside of the redline boundary.

There is no designated cycle hire scheme parking racks within Section 1 of the Proposed Scheme.

The existing cycle facilities along Section 1 of the Proposed Scheme are illustrated in Figure 6.4a in Volume 3 of the EIAR.

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 Appendix A6.4.2 (Cycling Infrastructure Assessment).

5.3.2.3 Bus Infrastructure

5.3.2.3.1 Bus Priority Measures

Bus lanes are provided along Section 1 of the Proposed Scheme at the following locations (aside from intermittent breaks and junctions):

- Northbound and Southbound bus lanes on R132 north of Pinnock Hill Roundabout for approximately 670m, operating 24 hours a day, Monday to Sunday;
- Northbound bus lane on R132 south of Pinnock Hill Roundabout for approximately 420m, operating between 07:00 and 19:00, Monday to Saturday; and
- Southbound bus lane on R132 south of Pinnock Hill Roundabout for approximately 375m, operating between 07:00 and 19:00, Monday to Saturday.

5.3.2.3.2 Bus Stop Facilities

There are currently five bus stops along Section 1 of the Proposed Route – two ‘inbound’ stops towards the city centre and three ‘outbound’ stops towards Swords. The existing bus facilities along Section 1 of the Proposed Scheme are illustrated in Figure 6.5a in Volume 3 of the EIAR.

The inbound stops are as follows:

- Stop 3694 on R132 Dublin Road, south of Pinnock Hill Roundabout; and
- Stop 3695 on R132 Dublin Road, adjacent to Airside Retail Park.

The outbound stop is:

- Stop 5073 on R132 Dublin Road, north of Pinnock Hill Roundabout;
- Stop 3676 / 100161 on R132 Dublin Road, adjacent to Boroimhe Willows; and
- Stop 7115 on L2305 Nevinstown Lane.

The contents of Table 5.3 outline the availability of bus stop facilities at the existing five bus stops along Section 1 of the Proposed Scheme.

Table 5.3: Section 1 - Availability of Bus Stop Facilities (of a total 5 Bus Stops)

Bus Stop Facility	Number of Bus Stops in Baseline with Facility	Percentage of Bus Stops in Baseline with Facility
RTPI (Real Time Passenger Information)	0	0%
Timetable information	4	80%
Shelter	2	40%
Seating	2	40%
Accessible Kerbs	5	100%
Indented Drop Off Area	0	0%
Total Stops	**5**	

There are two bus stops with shelter and seating on the R132 Dublin Road, serving the town of Swords. The remaining bus stops in the area do not have shelter nor seating.

The bus stops cater for 19 Dublin Bus, Go-Ahead Ireland and Transport for Ireland routes linking Swords with local and regional destinations. The services available from these stops are outlined in Table 5.4

Table 5.4: Section 1 - Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
33	Balbriggan - Skerries Strand Street – Rush – Lusk – Swords – Dublin City Centre	50 minutes	1.5 hours
33a	Balbriggan - Skerries Strand Street – Rush – Lusk – Swords – Dublin Airport	1.5 hours	1.5 hours
33e	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Airport Roundabout - Swords Village - Lusk - Rush - Skerries	Daily	No Services
33n	Westmoreland Street - Drumcondra- Santry- Dublin Airport Atrium Road- Boroimhe- Rivervalley- Swords Village- Lusk- Rush- Skerries- Balbriggan	No Services	Four times daily
41	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Dublin Airport - Swords Village - Swords Manor	20 minutes	30 minutes
41b	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Swords Rd. (ALSAA) - Swords Village - Rolestown	Five times daily	Four times a day
41d	Dublin City Centre – Drumcondra – Whitehall – Santry - Dublin Airport – Rathingle - Swords, Pinnockhill - Swords, Swords Business Park	Two times daily	No Services
41x	UCD Belfield – Montrose - Donnybrook Village - Custom House Quay - St. Stephen's Green North - Pinnock Hill - Knocksedan	Three times daily	No Services
101	Dublin Busáras - Drumcondra Rail Stn - Whitehall Church - Airside Stop - Swords Pavilions - Grooms Stop - Whitecross Ns - Moorehall Lodge - Drogheda Bus Station	20 minutes	30 minutes – 1 hour
197	Airside - Swords Pavillions SC - Glasmore Park - Rathbeale Cottages - Ninemile Stone – Alderbrook - Ashbourne Retail Park	Hourly	Hourly
500	Abbeyvale – Swords Manor – Laurelton - Swords Bypass - Pavilions Shopping Centre – Pinnock Hill r/about – Swords b/pass opp Texaco – River Valley Lawn - Boroimhe Maples - Merrion Square	45 minutes	Hourly
500-X	Knocksedan – Broadmeadow – Swords - Airside, Pinnock Hill – Rathingle – Airside – Drinan -Tolka Quay – Docklands - Dublin, Eden Quay	Six times daily	No Services
501	Swords Pavilions - Airside, Pinnock Hill – Boroimhe – Airside – Drinan - Tolka Quay – Docklands - Dublin, Eden Quay	Four times daily	No Services
501-X	Swords Pavilions - Airside, Pinnock Hill - Tolka Quay – Docklands - Dublin, Eden Quay	Two times daily	No Services
502	Highfields - Boroimhe Maples - Eden Quay	Hourly	N/A
503	Abbeyvale – Swords Manor – Laurelton - Swords Bypass - Pavilions Shopping Centre – Pinnock Hill r/about – Swords b/pass opp Texaco – River Valley Lawn - Boroimhe Maples - Merrion Square	Two times daily	N/A
504	Boroimhe Laurels - Nevinstown Lane - Tolka Quay East Wall Road - Dublin, Marlborough Street	Once daily	N/A

Service	Route	Typical Service Frequency	
		Weekday	Weekend
505	River Valley Lawn – Cherry Avenue – Boroimhe Maples – Airside Central – East Wall Road - Eden Quay	Five times daily	Two times daily
506X	Miller's Glen - Jugback Lane - Swords Bypass - Pavilions Shopping Centre - Pinnock Hill Roundabout – Airside Central - M1 Drinan - Convention Centre - Dublin, Eden Quay	Three times daily	No Services

5.3.2.4 General Traffic

5.3.2.4.1 R132 Dublin Road between Pinnock Hill Roundabout and Airside Junction

The R132 Dublin Road, between Pinnock Hill Roundabout and Airside Junction, is a two-way single carriageway with three lanes travelling in a south-westerly direction and two lanes travelling in a north-easterly direction. Opposing flows are separated by a double solid white line along the entirety of this section, with hatched road markings delineating the approaches to Pinnock Hill Roundabout and Airside Junction. The nearside lanes are combined bus and cycle lanes, and the remainder are general traffic lanes. Along most of the length of the R132 on the southbound side of this section, the highway is bounded by grass verges, which provides separation to pedestrian routes, behind which are trees, separating the highway from Airside Retail Park carpark.

This section is subject to a 60km/h speed limit and has no bridges either above or below the road. The alignment of the carriageway is a long continuous curve on the northern end, transiting to a straight alignment on the southern end. The carriageway width varies between 17.5m and 26m (where left-turn slips are present). Bus lanes are present along both eastern and western sides of the R132 on this section, measuring between 3.0m and 3.5m in width.

The existing major junction arrangements along R132 Dublin Road from Pinnockhill Roundabout to Airside Junction are as follows:

- Pinnock Hill four-arm roundabout; and
- Airside Junction 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 Volume 3 of the EIAR.

Pinnock Hill four-arm roundabout: Pinnock Hill Roundabout is a four-arm roundabout.

The north-western arm consists of two approach lanes and one exit lane. The north-eastern arm has three approach lanes and two exit lanes. A combined bus and cycle lane starts approximately 75m after the exit on the north-eastern arm. The south-eastern arm consists of two approach lanes and one exit lane. The south-western arm consists of three approach lanes, including a left-turn flare of approximately 150m length on the nearside of the R132. The south-western arm has two exit lanes. There is a vehicular access between the south-eastern and south-western arms serving Swords Veterinary Hospital.

There are three uncontrolled pedestrian crossings at the junctions. One across the north-western arm consisting of a hard standing across the grass verge on both sides of the carriageway which does not have dropped kerbs. A second is located across the south-eastern arm consisting of dropped kerbs and buff tactile paving. There is a third uncontrolled pedestrian crossing across the south-western arm consisting of a hard standing across the grass verge on the eastern side of the carriageway and across the grassed splitter island. There are no dropped kerbs on the south-western arm.

The characteristics are shown in Image 5.1

Image 5.1 Pinnock Hill Roundabout Arrangement

Airside Junction four-arm signalised Junction: Airside Junction is a four-arm signalised junction at the intersection of Swords Road and Boroimhe Road.

The northern arm approach consists of a left-turn slip and flare of approximately 75m length, a bus lane, a straight-ahead lane, and a right-turn. There is an advance stop line for cyclists. The northern arm exit consists of one lane; a bus lane is introduced approximately 25m from the junction.

The eastern arm approach consists of a left-turn and straight-ahead lane, and a right-turn lane. There is an advance stop line for cyclists. The eastern arm exit consists of one lane.

The southern arm approach consists of a left-turn lane which replaces a bus lane approximately 65m in advance of the junction, a straight-ahead lane, and a right-turn flare of approximately 55m length. There is an advance stop line for cyclists and an advisory cycle lane alongside the bus lane which also ends approximately 65m in advance of the junction. The southern arm exit consists of one traffic lane; a bus lane is introduced approximately 30m from the junction.

The western arm approach consists of one left-turn flare of approximately 50m length, and one straight-ahead and right-turn lane. These two lanes are separated by a streaming cycle lane, and there is an advanced stop lane for cyclists. There is a bus lane on the approach of the western arm which ends approximately 70m in advance of the junction. The western arm exit consists of one lane.

There are staggered signalised pedestrian crossings on the northern, eastern, and western arms. The splitter islands on the northern and western arms contain pedestrian guard rails.

The characteristics are shown in Image 5.2

Image 5.2 Airside Junction Arrangement

5.3.2.5 Existing Parking / Loading

Along Section 1 of the Proposed Scheme there is a total of 15 existing adjacent parking spaces located along the northbound side of the R836 Dublin Road.

There are currently no on-street loading bays along Section 1 of the Proposed Scheme. Loading of vehicles takes place in formal off-street loading areas. There are approximately 1,400 free parking spaces at the Airside Retail Park, which are associated with the shops located there. There are approximately 50 parking spaces at Lidl, which are restricted to customers of the shop premises located there.

Table 5.5 presents a summary of the existing parking and loading spaces

Table 5.5: Section 1 – Existing Parking / Loading Spaces

Street	Parking Type	Number of Existing Parking Spaces
R836 Dublin Road	Adjacent Parking	15
Total		**15**

5.3.3 Section 2 – Airside Junction to Northwood Avenue

This Section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 2 of the Proposed Scheme, between Airside Junction and Northwood Avenue Junction along the R132 Swords Road.

Section 2 is approximately 4.8km in length, beginning south of Airside Junction and continuing along the R132 to Cloghran Roundabout followed by Dublin Airport Roundabout. At the southern access to Dublin Airport, the route moves through the R132 / Corballis Road South signalised Junction and continues south, passing under the M50. The route passes the Old Airport Road signalised junction and the R132 / Turnapin Lane Junction, terminating at the R132 / Northwood Junction, after which it enters Section 3.

5.3.3.1 Pedestrian Infrastructure

Between Airside Junction and Cloghran Roundabout, there are footpaths on both sides of the R132, with widths ranging from 1.0m to 2.0m. However, the footpath on the southbound side is discontinued for a length of approximately 530m between Kilronan House and Kettles Lane (L20600). Footpaths on both sides of the R132 change to pedestrian and cyclist segreagted facilities at Cloghran Roundabout. On the southbound side, delineated pedestrian and cyclist segregated facility of approximately 3.5m width begins 50m north of Cloghran Roundabout and terminates approximately 25m after the southern exit. On the northbound side, pedestrian and cyclist segregated facility of approximately 2m continues from beyond the south of Cloghran Roundabout and terminates approximately 15m north of the roundabout. The segregated facility on the northbound side is delineated along the section north of Cloghran Roundabout, but not along the section south of the roundabout.

Between Cloghran Roundabout and Dublin Airport Roundabout, the southbound side, has a footpath of approximately 2m width beginning approximately 25m south of Cloghran Roundabout. The footpath extends for a length of around 180m and terminates at the access to McMonagle Stone. On the northbound side, a segregated pedestrian and cyclist facility of around 4m width extends from approximately 10m on the southern approach to Airport Roundabout, to approximately 100m after the northern exit from the roundabout. The segregated facility then narrows to 1.5m and extends to Cloghran Roundabout. This section of the shared facility is not delineated between pedestrians and cyclists.

A pedestrian and cyclist shared facility, approximately 3.5 to 4.5m in width, is present south of Dublin Airport Roundabout to the R132 / Old Airport Road Junction. Footpaths, varying in width from 1.5 to 2.5m, are present on both sides of the carriageway between the R132 / Old Airport Road Junction and Northwood Avenue Junction.

On this section, there are street lighting columns situated along both sides of the R132 within close proximity to the footpaths.

There are several controlled crossings along Section 2 of the Proposed Scheme which benefit from tactile paving and dropped kerbs. These can be found at the following locations:

- Approximately 150m south of the Cloghran Roundabout, at The Coachman's Inn (staggered pelican crossing, with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the refuge island); and
- Across the western arm of Airport Roundabout (staggered toucan crossing with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the splitter island).
- Across the northern and eastern arms of Swords Road / Airport Business Park Junction (toucan crossings, staggered on northern arm, with dropped kerbs, tactile paving, pedestrian road markings, and pedestrian guard rails on traffic islands);
- Across all arms of the R132 / Corballis Road South Junction (toucan crossings, staggered on north-eastern and south-western arms, with dropped kerbs, tactile paving, pedestrian road markings, and pedestrian guard rails on traffic islands);
- Across the northern and eastern arms of the R132 / Old Airport Road Junction (staggered pelican crossings, with dropped kerbs, tactile paving, pedestrian road markings, and pedestrian guard rails on traffic islands);

- Across the western arm of the R132 / Old Airport Road Junction (staggered toucan crossing, with dropped kerbs, tactile paving, pedestrian road markings, and pedestrian guard rails on traffic islands);
- Across the western arm of the R132 / Quick Park Car Park Junction (pelican crossing, with dropped kerbs and pedestrian road markings between traffic islands); and
- Across the northern, eastern, and western arms of the R132 / Turnapin Lane Junction (pelican crossings, staggered on the northern arm, with dropped kerbs, tactile paving, pedestrian road markings, and pedestrian guard rails on the northern arm traffic islands).

The locations of the pedestrian crossings are illustrated in Figure 6.3b in Volume 3 of the EIAR.

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 are included in Appendix A6.4.1 (Pedestrian Infrastructure Assessment).

5.3.3.2 Cycling Infrastructure

Between Airside junction and Cloghran Roundabout, there is a mix of cycle facilities. Southbound provision ranges from a combined cycle and bus lane, an advisory cycle lane and a segregated pedestrian and cycle route. Northbound has similar provision for part of the section with either an advisory cycle lane or combined bus and cycle lane. However there is not provision just south of Airside junction to its northern side other than an advance stop line on the approach to the junction.

Between Cloghran Roundabout and Airport Roundabout the southbound direction has a mix of an advisory cycle lane, a two-way shard pedestrian andcycle facility on the northern side which is connected by a toucan crossing. There are no dedicated cycle facilities from here to southbound cycle facilities on the south side of the roundabout. In the northbound direction, a shared or segregated pedestrian and cyclist facility is present

Between the southern arm of Dublin Airport Roundabout and the R132 / Old Airport Road Junction, in the southbound direction, a pedestrian and cyclist shared facility which transitions to an on street mandatory cycle lane is present. Similar provision is present in the northbound direction.

Between the R132 / Old Airport Road Junction and the R132 / Carlton Dublin Airport Hotel Junction, in the southbound direction, cycle facilities consist of a mandatory on street cycle lane, a shared cycle and bus lane and a shared pedestrian and cycle facility. In the northbound direction, provision varies between an advisory cycle lane, a mandatory cycle lane, and a shared/segregated pedestrian and cycle facility.

Between the R132 / Carlton Dublin Airport Hotel Junction and the the R132 / Northwood Avenue Junction in both directions, there are sections of advisory cycle lane, a combined cycle and bus lane and a shared /segregated pedestrian and cycle facility. Some parts of the combined cycle and bus lanes along this section are in operation between 07.00-19.00 Monday to Saturday, as signposted.

There are limited cycle parking stands along Section 2 of the Proposed Scheme.

There is no designated cycle hire scheme parking racks within Section 2 of the Proposed Scheme.

The existing cycle facilities along Section 2 of the Proposed Scheme are illustrated in Figure 6.4b in Volume 3 of the EIAR.

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 Appendix A6.4.2 (Cycling Infrastructure Assessment).

5.3.3.3 Bus Infrastructure

5.3.3.3.1 Bus Priority Measures

Bus lanes are provided along Section 2 of the Proposed Scheme to Northwood Avenue at the following locations (aside from intermittent breaks and junctions):

- Northbound and Southbound on R132 between Airside Junction and Cloghran Roundabout for approximately 1.2km, operating between 07:00 and 19:00, Monday to Saturday;
- Northbound on R132 from Dublin Airport Roundabout to Cloghran Roundabout for approximately 580m, operating 24 hours a day, Monday to Sunday;
- Southbound on R132 from Cloghran Roundabout to Dublin Airport Roundabout for approximately 180m, operating between 07:00 and 19:00, Monday to Saturday;
- Northbound and Southbound on R132 between Dublin Airport Roundabout and the R132 / Old Airport Road for approximately 1.3km, operating 24 hours a day, Monday to Sunday; and
- Northbound and Southbound on R132 between R132 / Old Airport Road Junction and Northwood Avenue Junction for approximately 2.9km, operating from 07.00 - 19.00 from Monday to Saturday.

5.3.3.3.2 Bus Stop Facilities

There are currently 22 bus stops along Section 2 of the Proposed Route – 12 ‘inbound’ stops towards the city centre and 10 ‘outbound’ stops towards Swords. The existing bus facilities along Section 2 of the Proposed Scheme are illustrated in Figure 6.5b in Volume 3 of this EIAR.

There are currently 22 bus stops along Section 2 of the Proposed Scheme. All three bus stops within the redline boundary are located along the R132. The inbound stops are as follows:

- Stop 3696, opposite Boland Car Dismantler;
- Stop 3697, outside Kilronan Equestrian Centre;
- Stop 3698, adjacent to National Show Centre;
- Stop 3699, north of Cloghran Roundabout;
- Stop 3885, adjacent to Green Parking Dublin Airport;
- Stop 1631, outside ALSAA Sports Club;
- Stop 5053, north of Old Airport Road Junction;
- Stop 1633, north of Old Airport Road Junction;
- Stop 1634, outside Trade Connection;
- Stop 1635, outside Dimpco;
- Stop 1636, north of R132 Swords Road / Turnapin Lane Junction; and
- Stop 1637, north of R132 Swords Road / Northwood Avenue Junction.

The outbound stops are as follows:

- Stop 3675, adjacent to Boland Car Dismantler;
- Stop 3674, adjacent to Kilronan Equestrian Centre;
- Stop 3672, opposite The Coachmans Inn;
- Stop 3671, north of Dublin Airport Roundabout.
- Stop 3670, outside Cloghran Guest House;
- Stop 1630, opposite ALSAA Sports Club;
- Stop 1629, adjacent to ParkMagic Airport Parking Reservations;
- Stop 1628, opposite Collins Travel Luxury Coach Hire;
- Stop 1627, north of R132 Swords Road / Furry Road Junction; and
- Stop 1626, north of R132 Swords Road / Northwood Avenue Junction.

The contents of Table 5.6 outline the availability of bus stop facilities at the existing 22 bus stops along Section 2 of the Proposed Scheme.

Table 5.6 Section 2 - Availability of Bus Stop Facilities (of a Total 22 Bus Stops)

Bus Stop Facility	Number of bus stops in baseline with Facility	Percentage of Bus Stops in baseline with Facility
RTPI (Real Time Passenger Information)	8	36%
Timetable information	15	68%
Shelter	7	32%
Seating	6	27%
Accessible Kerbs	22	100%
Indented Drop Off Area	5	23%
Total Stops	**22**	

There are seven bus stops with shelters that serve Dublin Airport and Santry. The remaining bus stops in the area do not have shelters.

The bus stops cater for 12 Dublin Bus, Go-Ahead Ireland and Transport for Ireland bus services to local and regional destinations. The services available from these stops are outlined in Table 5.7

Table 5.7 Section 2 – Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
16	Dublin Airport - Santry - Skylon Hotel - Drumcondra Rail Station - O'Connell St. - Kelly's Corner - Harold's Cross - Terenure -Grange Rd. - Ballinteer (Kingston)	12 minutes	12 minutes
16c	Dublin Airport - Santry, Turnapin Lane – Beaumont – Whitehall – Drumcondra – Ballybough – Phibsborough - Dublin, O'Connell St Upper	Three times daily	Three times daily
16d	Dublin Airport - Santry, Turnapin Lane – Whitehall – Drumcondra – Phibsborough - Dublin, O'Connell - Dublin City South - Harolds Cross – Terenure – Rathfarnham - Marlay Park - Ballinteer	Six times daily	No Services
27b	Eden Quay - Fairview - Donnycarney Church - Artane Roundabout - Beaumont Hospital - Harristown	10 – 20 minutes	20 minutes
33	Balbriggan - Skerries Strand Street – Rush – Lusk – Swords – Dublin City Centre	50 minutes	1.5 hours
33e	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Airport Roundabout - Swords Village - Lusk - Rush - Skerries	Daily	No Services
33n	Westmoreland Street - Drumcondra- Santry- Dublin Airport Atrium Road- Boroimhe- Rivervalley- Swords Village- Lusk- Rush- Skerries- Balbriggan	No Services	Four times daily
41	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Dublin Airport - Swords Village - Swords Manor	20 minutes	30 minutes
41b	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Swords Rd. (ALSAA) - Swords Village - Rolestown	Five times daily	Four times a day
41c	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Kealy's Pub - Boroimhe - River Valley - Swords Village - Swords Manor	20 minutes	30 minutes
41d	Dublin City Centre – Drumcondra – Whitehall – Santry - Dublin Airport – Rathingle - Swords, Pinnockhill - Swords, Swords Business Park	Two times daily	No Services
H1	Dublin Airport – Rathingle – Swords – Airside – Drinan	30 minutes	30 minutes

5.3.3.4 General Traffic

5.3.3.4.1 R132 Dublin Road between Airside Junction and Cloghran Roundabout

The R132 Dublin Road, between Airside Junction and Cloghran Roundabout, is a two-way single carriageway with two lanes travelling in a southbound direction and two lanes travelling in a northbound direction. Opposing flows are separated by a double solid white line along the entirety of this section, with hatched road markings delineating the approaches to Airside Junction and Cloghran Roundabout. The carriageway width varies between 12.5m and 30.0m (where left-turn slips are present). Bus lanes are present along both southbound and northbound sides of the R132 on this section, measuring between 3.0m and 3.5m in width.

The major junction arrangements along this section are as follows:

- Swords Road / Kettles Lane three-arm priority Junction; and
- Cloghran four-arm Roundabout.

The characteristics of each major junction is described in turn below, alongside satellite images which are extracts from Figure 6.6 in Volume 3 of the EIAR.

Swords Road / Kettles Lane three-arm priority Junction: This is a three-arm priority junction, where Kettles Lane is the minor arm. The major arm of the junction, Swords Road, consists of an advisory cycle lane along bus lane, a bus lane, and a general traffic lane in both directions. Left-turning traffic is permitted on the southbound bus lane approximately 75m in advance of the junction. The cycle lanes continue through the junction in both directions. Right turns are not permitted from the northbound traffic lane onto Kettles Lane. The minor arm, Kettles Lane, consists of one lane in each direction. Although there are no road markings on this approach to the junction, a stop sign is in place at the mouth of the junction. Right turns are not permitted from Kettles Lane onto the northbound traffic lane on Swords Road.

The characteristics are shown in Image 5.3

Image 5.3 R132 / Kettles Lane Arrangement

Cloghran four-arm roundabout: Cloghran Roundabout is a four-arm roundabout with an inscribed circle diameter of approximately 50m and two circulating lanes. There are splitter islands and hatched road markings separating the approach and exit lanes on the north-east, south-east, and north-west arms of the roundabout, and the south-west arm contains a raised median and vehicle guardrail along its length.

The north-western arm, Naul Road, consists of one approach lane and one exit lane. The north-eastern arm has two approach lanes and two exit lanes with a combined bus and cycle lane begining approximately 30m after the

exit. The south-eastern arm consists of two approach lanes and one exit lane. The south-western arm has two approach lanes and two exit lanes with a combined bus and cycle lane which ends approximately 50m in advance of the junction, and a yellow box is introduced in the middle lane to facilitate buses merging with general traffic.

There is a southbound advisory cycle lane on the north-eastern arm which diverts away from the carriageway approximately 50m in advance of the junction, linking to an uncontrolled crossing with a dropped-kerb across the south-eastern arm, then continues off carriageway for approximately 40m after the roundabout, at which point it re-joins the southbound carriageway as an advisory cycle lane on the south-western arm. The northbound pedestrian and cyclist shared facility on the south-western arm leads to an uncontrolled crossing with a dropped-kerb across the north-western arm, then continues off-stream for approximately 30m after the roundabout, at which point it re-joins the northbound carriageway as a cycle lane on the north-eastern arm.

There are uncontrolled pedestrian crossings across the north-western, south eastern arms consisting of dropped kerbs on each side of the carriageway. There are no pedestrian crossings on the south-western and north-eastern arms of the roundabout.

The characteristics are shown in Image 5.4

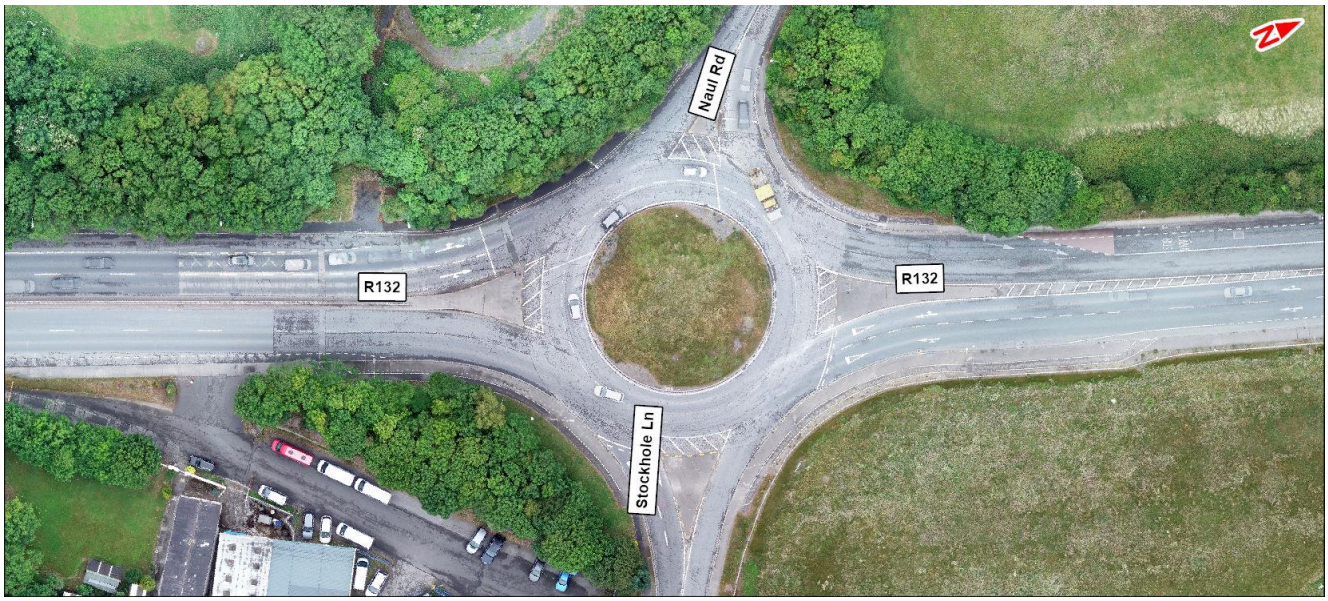

Image 5.4 Cloghran Roundabout Arrangement

5.3.3.4.2 R132 Dublin Road between Cloghran Roundabout and Dublin Airport Roundabout

The R132 Dublin Road, between Cloghran Roundabout and Dublin Airport Roundabout, is a dual carriageway with three lanes travelling in a northbound direction and two lanes travelling in a southbound direction. Opposing flows are separated by a kerbed median strip and vehicular guardrails along the entirety of this section, with hatched road markings delineating the approach to the left slip road for the M1 and to Dublin Airport Roundabout.

This section is subjected to a 60km/h speed limit while its width varies between 18.0m and 30.0m (where left-turn slips are present). Bus lanes, measuring between 3.0m and 3.5m in width, are present on both sides.

Approximately 50m in advance of Cloghran Roundabout, the northbound bus lane terminates and a yellow box is introduced in the middle lane to facilitate buses merging with general traffic. Approximately 200m in advance of Dublin Airport Roundabout, a bus lane is introduced on the eastern side of the R132, resulting in three lanes: two southbound lanes towards the roundabout and one left slip towards the M1 motorway.

The major junction arrangement along this section is the Dublin Airport four-arm Roundabout.

The characteristics of the junction is described in turn below, alongside a satellite image which is extracted from Figure 6.6 in Volume 3 of the EIAR.

Dublin Airport four-arm Roundabout: This is a four-arm spiral roundabout with an inscribed circle diameter of approximately 90m and two circulating lanes. Splitter islands are present on all arms separating the approach and exit lanes.

The northern arm consists of two approach lanes and two exit lanes. Traffic bound for Santry, M1, and M50 are permitted into the southbound bus lane approximately 45m in advance of the junction. The nearside traffic lane on the R132 mainline starts diverging approximately 300m in advance of the roundabout, forms a left-slip exiting on the eastern arm, and joins the carriageway linking to the nearby M50 junction as an extra lane approximately 200m after the roundabout.

The eastern arm consists of three approach lanes and two exit lanes. A fourth lane located on the nearside starts diverging approximately 65m in advance of the roundabout, forms a left-slip exiting on the southern arm, and joins the carriageway of the R132 approximately 80m south of the roundabout, with a merging lane approximately 50m in length.

The southern arm consists of two approach lanes and two exit lane. A nearside bus lane terminates approximately 70m in advance of the roundabout, and a yellow box is introduced in the middle lane to facilitate buses merging with general traffic

The western arm consists of three approach lanes and two exit lanes. Another two lanes, a general traffic lane and a bus lane, start diverging approximately 45m in advance of the roundabout, forming a left-slip exiting on the northern arm, and joins the carriageway of the R132 approximately 60m north of the roundabout. The bus lane continues as an additional lane on the R132 northbound carriageway.

There is a staggered toucan crossing on the western arm of the roundabout. There are no crossing facilities on other arms of the roundabout.

There are off carriageway cycling facilities at the roundabout. The northbound pedestrian and cyclist shared facility on the southern arm ends at the entrance to the roundabout, cyclists and pedestrians are directed to a staggered toucan crossing with dropped kerbs across the western arm. The pedestrian and cyclist facility continues off carriageway north of the roundabout and joins the pedestrian and two-way cyclist segregated facility on western side of the R132, approximately 100m after the Roundabout. A southbound shared cycle and pedestrian path begins approximately 100m south of the roundabout on the southern arm.

The characteristics are shown in Image 5.5

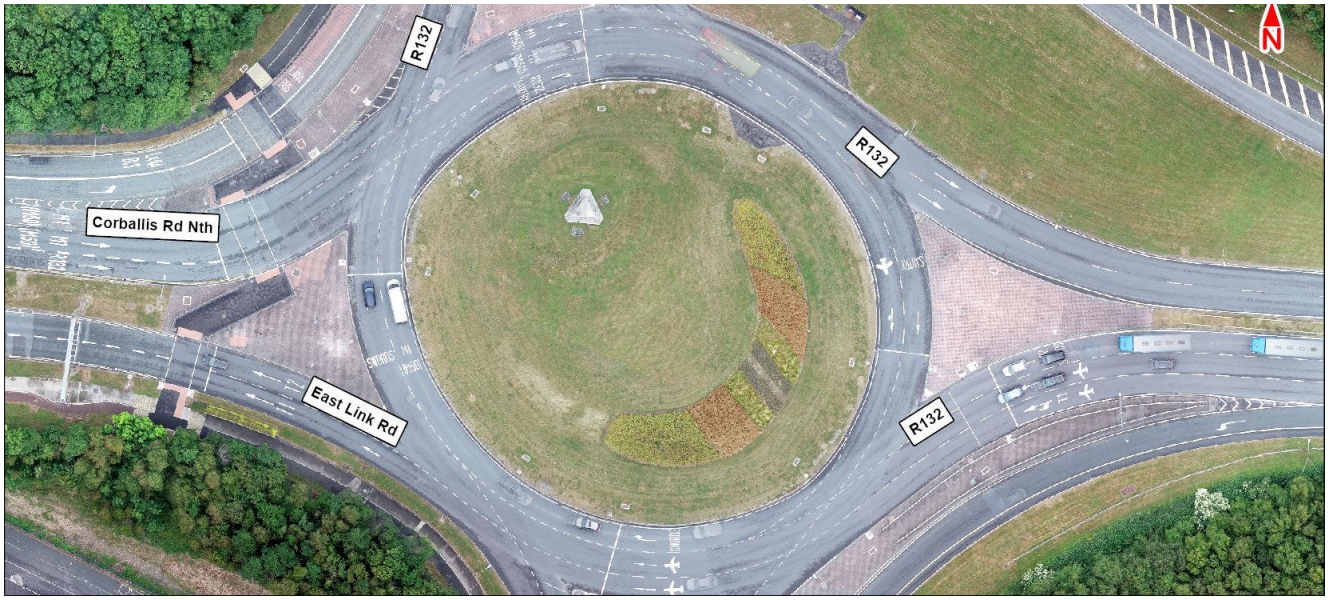

Image 5.5 Dublin Airport Roundabout arrangement

5.3.3.4.3 R132 Swords Road between Dublin Airport Roundabout and Old Airport Road Junction

The R132 Swords Road, between Dublin Airport Roundabout and Old Airport Road Junction, is a dual carriageway with two general traffic lanes and a bus lane on the nearside in each direction. Opposing flows are separated by a kerbed median strip, with openings at two signalised junctions:

- Access to Airport Business Park and Dublin Airport Green Carpark; and
- R132 / Corballis Road South Junction.

The road is subject to a speed limit of 60km/h. From outer edge to outer edge, the carriageway width varies between 23m and 34m (where bus lanes and left-turn slips are present). The major junction arrangements along this section are as follows:

- R132 / Corballis Road South four-arm signalised Junction; and
- R132 / Old Airport 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 Volume 3 of the EIAR.

R132 / Corballis Road South four-arm signalised Junction: This is a large signalised junction providing access to airport ancillary business such as car parks.

The north-eastern arm approach consists of a bus lane, two straight-ahead lanes, and a right-turn flare of approximately 50m length. There is a left-turn slip with the bus lane terminating prior to the junction to allow traffic to access it. The north-eastern arm exit consists of a bus lane and two general traffic lanes.

The south-eastern arm approach consists of a bus lane of approximately 70m length, a straight-ahead lane, and a right-turn flare of approximately 70m length. There are broken white line road markings delineating the curvature of the right-turn through the junction. There is a left-turn slip with the bus lane terminating prior to the junction to allow traffic to access it. The south-eastern arm exit consists of one lane.

The south-western arm approach consists of a bus lane, two straight-ahead lanes, and a right-turn flare of approximately 35m length. There is a left-turn slip with a short break in the bus lane prior to the junction to allow traffic to access it. The south-western arm exit consists of a bus lane and two general traffic lanes.

The north-western arm approach consists of a straight-ahead lane and a right-turn lane. There are broken white line road markings delineating the curvature of the right-turn through the junction. There is a left-turn slip which breaks away from the straight-ahead lane approximately 10m in advance of the junction. The north-western arm exit consists of two lanes.

There are toucan crossings on all arms. Crossings on the north-eastern and south-western arms are staggered, and the splitter islands here contain pedestrian guard rails.

The characteristics are shown in Image 5.6

Image 5.6 R132 / Corballis Road South Junction

R132 / Old Airport Road four-arm signalised Junction: This is a four-arm signalised junction which allows interchange between the R132 and Old Airport Road while also providing access to Dardstown Cemetery to the east.

The northern arm approach consists of a cycle lane, a bus lane, a straight-ahead lane, and a right-turn lane. There are broken white line road markings delineating the curvature of the right-turn and straight-ahead movements through the junction. The bus lane terminates prior to the junction to allow left turning vehilces to make their maneuver. There is an advance stop line for cyclists and the cycle lane continues through the junction. There is a box turn for right-turning cyclists, located at the mouth of the eastern arm. The northern arm exit consists of two general traffic lanes. A bus lane is introduced approximately 50m after the junction. A cycle lane from the western arm left-turn slip lane enters the northern arm, extends for a length of approximately 35m, and transitions onto the pedestrian and cyclist shared facility along the northbound side of the R132.

The eastern arm, which gives access to Dardstown Cemetery, consists of one lane only on both the approach and exit.

The southern arm approach consists of a left-turn and straight-ahead lane, and a right-turn and straight-ahead lane. There is a bus lane on the south-western arm which terminates approximately 35m in advance of the junction. There is an advance stop line for cyclists which is access from the shared pedestrian and cycle facilty approximately 5m prior to the stop line. There is a right-turn dwell box for vehicles located after the stop line, in line with the offside lane. The southern arm exit consists of a cycle lane, a bus lane, and one general traffic lane.

The western arm approach consists of a left-turn slip and flare of approximately 85m length, and one traffic lane for all other movements which also has an advance stop line for cyclists. There are broken white line road markings delineating the curvature of the right-turn through the junction. A mandatory cycle lane starts north of the pedestrian crossing on the left-turn slip, extends for a length of approximately 35m, and transitions onto the

pedestrian and cyclist shared facility along the northbound side of the R132. The western arm exit consists of one lane.

There are staggered pelican crossings on the northern and eastern arms; and toucan crossings on the western arm. Splitter islands on these arms contain pedestrian guard rails.

The characteristics are shown in Image 5.7

Image 5.7 R132 / Old Airport Road Junction

5.3.3.4.4 R132 Swords Road between Old Airport Road Junction and Turnapin Lane Junction

The R132 Swords Road, between Old Airport Road Junction and Turnapin Lane Junction, is a two-way single carriageway with a general traffic lane and a bus lane in each direction. Opposing flows are separated by continuous and broken white line road markings.

The road is subject to a speed limit of 60km/h. The road goes under a bridge for the M50 approximately 810m south of the Old Airport Road Junction. From outer edge to outer edge, the carriageway width varies between 11.5m and 18m (where bus lanes and left-turn slips are present).

The major junction arrangement along this section is the R132 / Turnapin Lane four-arm signalised Junction.

R132 / Turnapin Lane four-arm signalised Junction: This junction provides access to nearby businesses and a small number of residential properties.

The northern arm approach consists of two straight ahead lanes, a right-turn flare of approximately 30m length, a left slip and flare lane which replaces a bus lane approximately 30m in advance of the junction, and a straight-ahead advisory cycle lane. There is an advance stop line for cyclists and the advisory cycle lane continues through the junction. The northern arm exit consists of two lanes, including combined bus and cycle lane which measures approximately 3.5m in width.

The southern arm approach consists of a left-turn lane which replaces a bus lane approximately 25m in advance of the junction, a straight-ahead lane, and a right-turn flare of approximately 45m length. An advisory cycle lane is present alongside the bus lane and left flare lane for approximately 80m in length. The cycle lane does not extend across the junction. The southern arm exit consists of a traffic lane approximately 7.0m wide. A combined bus and cycle lane, approximately 3.0m wide, is introduced approximately 45m after the exit on the southern arm.

The eastern arm approach consists of a straight ahead and right-turn lane, and a left-turn slip onto the nearside of the R132. The eastern exit consists of one lane.

The western arm approach consists of a single lane in both directions.

There are pelican crossings on the northern, eastern, and western arms.

The characteristics are shown in Image 5.8

Image 5.8 R132 / Turnapin Lane Junction

5.3.3.4.5 R132 Swords Road between Turnapin Lane Junction and north of Northwood Avenue Junction

The R132 Swords Road, between Turnapin Lane Junction and Northwood Avenue Junction, is a two-way single carriageway with a general traffic lane and either a bus lane or a cycle lane in each direction. Opposing flows are separated by continuous and broken white line road markings.

The road is subject to a speed limit of 50km/h. The road crosses over the Santry River approximately 480m south at the R132 / Northwood Avenue Junction. From outer edge to outer edge, the carriageway width varies between 13m and 20m (where bus lanes and left-turn slips are present).

The only major junction arrangement along this section is R132 / Northwood Avenue three-arm signalised Junction.

The characteristics of this junction is described in turn below, alongside a satellite image which is an extract from Figure 6.6 in Volume 3 of the EIAR.

R132 / Northwood Avenue three-arm signalised Junction: There are hatched road markings and a traffic island separating the approach and exit lanes on the northern arm. A traffic island with a decorative pillar on it, paving setts, and continuous white line road marking separate the approach and exit lanes on the western arm. Traffic islands and broken white line road markings separate the approach and exit lanes on the southern arm.

The northern arm approach consists of a straight-ahead lane, a right-turn flare of approximately 55m length, and a bus lane. The bus lane, measuring approximately 3.2m in width, continues through the junction. The northern arm exit consists of one general traffic lane, and a nearside bus lane measuring approximately 3.0m in width. An advisory cycle lane, measuring 1.0m in width, extends from across the junction until approximately 10m after on the exit, then transitions to a pedestrian and cyclist segregated facility.

The western arm approach consists of one lane. The western arm exit consists of one lane.

The southern arm approach consists of a straight-ahead lane, a left-turn lane which replaces the combined bus and cycle lane approximately 45m in advance of the junction, and a nearside advisory cycle lane which is introduced approximately 25m in advance of the junction. The advisory cycle lane extends straight through the junction at the R132 / Northwood Junction, until approximately 10m north of the junction. The southern arm exit consists of a straight-ahead lane, and a nearside bus lane which extends from across the junction. Vehicles turning left into Santry Close are permitted to enter the bus lane approximately 10m after the signalised junction exit.

The characteristics are shown in Image 5.9

Image 5.9 R132 / Northwood Avenue Junction

5.3.3.5 Existing Parking / Loading

Along Section 2 of the Proposed Scheme there is a total of 166 existing parking / loading spaces. These comprise:

- 42 informal parking spaces located on the southbound side of R132 Dublin Road, south of the R132 Dublin Road / Old Stockhole Road Junction. These spaces are located on the forecourt and side of The Coachman's Inn;
- 78 adjacent parking spaces located on the southbound side of R132 Dublin Road, south of the R132 Dublin Road / Old Stockhole Road Junction. These spaces are located at the back of The Coachman's Inn; and
- 46 commercial display parking spaces located south of the R132 Swords Road / Old Airport Road Junction, at Paddy Shanahan's Car Services.

There are approximately 18,600 parking spaces at the Dublin Airport, from short stay to long stay spaces. There are approximately 388 free parking spaces along Northwood Avenue, outside Crowne Plaza Dublin Airport / Holiday Inn Express Dublin Airport. Along this section, vehicles are discouraged from parking on-street. There are no on-street loading bays between Airside Junction and Northwood Avenue. It can be assumed that loading activities occur within adjacent premises, or outside bus lane regulation hours.

Table 5.8 presents a summary of the existing parking and loading spaces.

Table 5.8: Section 2 – Existing Parking / Loading Spaces

Street	Parking Type	Number of Existing Parking Spaces
R132 Swords Road / Old Stockhole Road	Informal Parking	42
	Adjacent Parking	78
Paddy Shanahan Cars, Swords Road / Old Airport Road	Commercial vehicles parked for display	46
Total		**166**

5.3.4 Section 3 - Northwood Avenue to Shantalla Road

This section outlines the baseline environment for walking, cycling, bus services, general traffic and parking / loading facilities along Section 3, between Northwood Avenue and Shantalla Road along the R132 Swords Road for approximately 2km.

Section 3 of the Proposed Scheme begins north of the R132 / Northwood Avenue Junction. The route passes through R132 / Northwood Avenue Junction, the R132 / Coolock Lane Junction and the R132 / Santry Avenue Junction. At the R132 / Santry Avenue Junction, the route intersects with the R104 and continues along the R132 through to Shantalla Road Junction via the N1 / M50 bridge, after which it enters section 4. This section also comprises a connecting route between the R132 / Lorcan Road Junction and R132 / Shanrath Junction via Lorcan Road, Lorcan Drive, and Shanrath Road.

5.3.4.1 Pedestrian Infrastructure

There are footpaths provided on both sides of the R132, with widths ranging between 1.5 and 2.5m. Along this section, there are street lighting columns situated along both sides of the R132 within close proximity to the footpaths.

There are several controlled pedestrian crossings along Section 3 of the Proposed Scheme which benefit from tactile paving and dropped kerbs which can be found at the following locations:

- Across the northern and western arms of the R132 / Northwood Avenue Junction (staggered toucan crossings, with dropped kerbs, tactile paving, and pedestrian road markings between the refuge islands);
- Across the northern and western arms of the R132 / Northwood Avenue Junction (staggered toucan crossings, with dropped kerbs, tactile paving, and pedestrian road markings between the refuge islands);
- Across the northern and eastern arms of Coolock Lane Junction (staggered pelican crossings along northern and eastern arms, with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on splitter islands);
- Across the southern and westerns arms of the R132 / Santry Avenue Junction (pelican crossings with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the splitter island);
- Across the R132, approximately 10m north of the R132 / Magenta Crescent Junction (pelican crossing with dropped kerbs, tactile paving, and pedestrian road markings);
- Across northern, western and southern arms of the R132 / Lorcan Road Junction (pelican crossings, staggered across the western and southern arms, with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on splitter islands);
- Across the northern, southern and western arms of the R132 / Shanowen Road Junction (pelican crossings, with dropped kerbs, tactile paving, and pedestrian road markings); and
- Across north-eastern, eastern, south-eastern and south-western arms of the R132 / Shanrath Road Junction (staggered pelican crossings with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on splitter islands).

The locations of the pedestrian crossings are illustrated in Figure 6.3c in Volume 3 of the EIAR.

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 are included in Appendix A6.4.1 (Pedestrian Infrastructure Assessment).

5.3.4.2 Cycling Infrastructure

Between the R132 / Northwood Avenue Junction and the R132 / Magenta Crescent Junction, in both directions, there is a mix of combined cycle and bus lanes, advisory and mandatory cycle lanes. However, there are no northbound facilities between the R132 / Santry Avenue Junction and the R132 / Magenta Crescent Junction.

Between the R132 / Magenta Crescent Junction and the R132 / Lorcan Road Junction, in the southbound direction, provision consists of a combined bus and cycle lane, which transitions to a mandatory cycle lane at the

Omni Shopping Centre Junction before becoming an advisory cycle lane. In the northbound direction, an advisory cycle lane which transitions to a mandatory cycle lane is present, although there are no facilities in the vicinity of the R132 / Magenta Crescent Junction.

Between Lorcan Road and Shanrath Road via Lorcan Drive, a length of approximately 425m through a residential area, no dedicated cycling facilities are present in either direction. Cyclists must share the road with general traffic, with no road markings present to separate the opposing flows.

Between the R132 / Lorcan Road Junction and the R132 / Shanowen Road Junction, in the southbound direction, cycle provision consists of short lengths of mandatory cycle lanes linked by either a combined bus and cycle lane or advisory cycle lane. However, there are no southbound cycle facilities are present for approximately 120m just north of the R132 / Shanowen Road Junction. In the northbound direction, there is a mandatory cycle lane which becomes advisory after a short distance.

Between the R132 / Shanowen Road Junction and the R132 / Shanrath Junction, cycling facilities are intermittent in the southbound direction. Although a combined bus and cycle lane is present for part of this length there are no dedicated southbound cycle facilities present from the end of this lane here to the R132 / Shanrath Junction. In the northbound direction, there is an advisory cycle lane which leads to a pedestrian and cyclist shared facility which then and transitions to a mandatory cycle lane on the R132. This lane terminates in the vicinity of the R132 / Shanowen Road Junction, no dedicated northbound cycle facilities are present.

Between the R132 / Shanrath Junction and the Shantalla Road Junction, no cycle facilities are present.

Between the R132 / Lorcan Road Junction and the R132 / Shanrath Junction via Lorcan Road, Lorcan Drive, and Shanrath Road, no dedicated cycle facilities are present.

Between the R132 / Santry Avenue Junction and the R132 / Shanrath Junction, the combined cycle and bus lanes are in operation between 07.00-10.00 and 12.00-19.00 Monday to Saturday.

There are cycle parking stands along Section 3 of the Proposed Scheme at the following locations:

- Six Sheffield stands (able to accommodate 12 bicycles) along R132 Swords Road southbound carriageway (outside Magner's Pharmacy);
- Seven Sheffield stands (able to accommodate 14 bicycles) along R132 Swords Road northbound carriageway (outside Omni Shopping Centre);
- One Sheffield stand (able to accommodate 2 bicycles) along R132 Swords Road southbound carriageway (outside Smith and Butler Properties); and
- Three Sheffield stands (able to accommodate 6 bicycles) along Shantalla Road westbound carriageway (outside Nail Systems International Training Centre).

There are cycle parking stands along within the vicinity of Section 3 of the Proposed Scheme, albeit outside the red line boundary, at the following locations:

- Eight Sheffield stands (able to accommodate 16 bicycles) outside Lidl;
- 10 Sheffield stands (able to accommodate 20 bicycles) at the left main entrance to Omni Shopping Centre;
- Eight Sheffield stands (able to accommodate 16 bicycles) along Shanowen Road (outside St Kevins Boys Club);
- Three Sheffield stands (able to accommodate 6 bicycles) along Lorcan Avenue (outside Supervalue); and
- Four Sheffield stands (able to accommodate 8 bicycles) along Lorcan Avenue (outside Kilmardinny Inn).

There is no designated cycle hire scheme parking racks within Section 3 of the Proposed Scheme.

The existing cycle facilities along Section 3 of the Proposed Scheme are illustrated in Figure 6.4c in Volume 3 of the EIAR.

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 are included in Appendix A6.4.2 (Cycling Infrastructure Assessment).

5.3.4.3 Bus Infrastructure

5.3.4.3.1 Bus Priority Measures

Bus lanes are provided along Section 3 of the Proposed Scheme at the following locations (aside from intermittent breaks and junctions):

- Southbound on R132 Swords Road from Northwood Avenue to Coolock Lane for approximately 440m, operating between 07.00 and 19.00 Monday to Saturday;
- Northbound on R132 Swords Road from north of Morton Stadium to Northwood Avenue for approximately 150m, operating 24 hours a day Monday to Sunday; and
- Southbound on R132 Swords Road from Coolock Lane to Shantalla Road for approximately 1.1km, operating between 07.00 and 10.00 and between 12.00 and 19.00 Monday to Saturday.

There is currently no bus priority infrastructure along Section 3 of the Proposed Scheme in the northbound direction along R132 Swords Road between Shantalla Road and Northwood Avenue.

5.3.4.3.2 Bus Stop Facilities

There are currently ten bus stops along Section 3 of the Proposed Scheme – five 'inbound' stops towards the city centre and five 'outbound' stops towards Santry and Dublin Airport. The existing bus facilities along Section 3 of the Proposed Scheme are illustrated in Figure 6.5c in Volume 3 of this EIAR.

The inbound stops are as follows:

- Stop 1638, opposite Morton Stadium;
- Stop 973, along R104 Coolock Lane;
- Stop 1639, north of Schoolhouse Lane;
- Stop 1640, opposite Omni Shopping Centre; and
- Stop 231, outside Studio 254 Hair & Beauty Salon.

The outbound stops are as follows:

- Stop 1625, outside Morton Stadium;
- Stop 1624, opposite Schoolhouse Lane;
- Stop 1623, outside Omni Shopping Centre;
- Stop 1622, north of Shanowen Road; and
- Stop 220, outside Flyover B&B.

The contents of Table 5.9 outline the availability of bus stop facilities at the existing ten bus stops along Section 3 of the Proposed Scheme.

Table 5.9 Section 3 - Availability of Bus Stop Facilities (of a Total 10 Bus Stops)

Bus Stop Facility	Number of bus stops in baseline with Facility	Percentage of Bus Stops in baseline with Facility
RTPI (Real Time Passenger Information)	5	50%
Timetable information	10	100%
Shelter	8	80%
Seating	5	50%
Accessible Kerbs	5	50%

Indented Drop Off Area	1	10%
Total Stops	**10**	

There are eight bus stops with shelters that serve the Santry suburb. The remaining bus stops in the area do not have shelters.

The bus stops cater for 15 Dublin Bus, Go-Ahead Ireland and Transport for Ireland bus services to local and regional destinations. The services available from these stops are outlined in Table 5.10

Table 5.10 Section 3 - Bus Service Frequency

Service	Route	Typical Service Frequency	
		Weekday	Weekend
1	Santry - Drumcondra - Parnell Sq. - Ringsend - Sandymount (St. John's Church)	10 – 15 minutes	20 minutes
104	Clontarf Station– Killester – Beaumont Hospital – Santry – DCU Helix	1 hour	1 hour
N6	Finglas – Howth Junction via Beaumont Hospital	10 minutes	10-15 minutes
16	Dublin Airport - Santry - Skylon Hotel - Drumcondra Rail Station - O'Connell St. - Kelly's Corner - Harold's Cross - Terenure -Grange Rd. - Ballinteer (Kingston)	12 minutes	12 minutes
16c	Dublin Airport - Santry, Turnapin Lane – Beaumont – Whitehall – Drumcondra – Ballybough – Phibsborough - Dublin, O'Connell St Upper	Three times daily	Three times daily
16d	Dublin Airport - Santry, Turnapin Lane – Whitehall – Drumcondra – Phibsborough - Dublin, O'Connell - Dublin City South - Harolds Cross – Terenure – Rathfarnham - Marlay Park - Ballinteer	Six times daily	No Services
27b	Eden Quay - Fairview - Donnycarney Church - Artane Roundabout - Beaumont Hospital - Harristown	10 – 20 minutes	20 minutes
33	Balbriggan - Skerries Strand Street – Rush – Lusk – Swords – Dublin City Centre	50 minutes	1.5 hours
33a	Balbriggan - Skerries Strand Street – Rush – Lusk – Swords – Dublin Airport	1.5 hours	1.5 hours
33n	Westmoreland Street - Drumcondra- Santry- Dublin Airport Atrium Road- Boroimhe- Rivervalley- Swords Village- Lusk- Rush- Skerries- Balbriggan	No Services	Four times daily
41	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Dublin Airport - Swords Village - Swords Manor	20 minutes	30 minutes
41b	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Swords Rd. (ALSAA) - Swords Village - Rolestown	Five times daily	Four times a day
41c	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Kealy's Pub - Boroimhe - River Valley - Swords Village - Swords Manor	20 minutes	30 minutes
41d	Dublin City Centre – Drumcondra – Whitehall – Santry - Dublin Airport – Rathingle - Swords, Pinnockhill - Swords, Swords Business Park	Two times daily	No Services
101	Dublin Busáras - Drumcondra Rail Stn - Whitehall Church - Airside Stop - Swords Pavilions - Grooms Stop - Whitecross Ns - Moorehall Lodge - Drogheda Bus Station	20 minutes	30 minutes – 1 hour

5.3.4.4 General Traffic

5.3.4.4.1 R132 Swords Road between the R132 / Northwood Avenue Junction and the R132 / R104 Coolock Lane Junction

The R132 Swords Road, between Northwood Avenue Junction and R104 Coolock Lane Junction, is a two-way single carriageway with a general traffic lane and either a bus lane or a cycle lane in each direction. Opposing flows are separated by continuous and broken white line road markings.

The road is subject to a speed limit of 50km/h, it road crosses over the Santry River at the R132 / Northwood Avenue Junction. From outer edge to outer edge, the carriageway width varies between 13m and 20m (where bus lanes and left-turn slips are present).

The only major junction arrangement along this section is the R132 / R104 Coolock Lane four-arm signalised Junction

The characteristic of the junction is described below, alongside a satellite image which is an extract from Figure 6.6 in Volume 3 of the EIAR.

R132 / R104 Coolock Lane four-arm signalised Junction: This junction provides an interchange between the two regionally important routes of the R132 and R104

The northern arm approach consists of a straight ahead and right-turn lane, a straight-ahead lane which replaces a bus lane approximately 50m in advance of the junction, a left-turn slip lane, a straight-ahead mandatory cycle lane which changes to an advisory cycle lane approximately 20m in advance of the junction where the slip lane is located, and a left-turn mandatory cycle lane. There is an advanced stop line for cyclists, and the straight-ahead cycle lane continues through the junction. The northern arm exit consists of one lane for traffic and a mandatory cycle lane.

The southern arm approach consists of two right-turn lanes, one straight ahead and, a nearside mandatory cycle lane, and a turning cycle lane which starts approximately 60m in advance of the junction. There is an advance stop line for cyclists, and the advisory cycle lane continues through the junction. The southern arm exit consists of two lanes, including a 3.5m wide nearside bus lane which is introduced approximately 45m after the exit of the junction. The advisory cycle lane transitions to a mandatory cycle approximately 25m after the exit of the junction and is present alongside the bus lane on the southbound side of the R132.

The eastern arm approach consists of one straight ahead and right-turn lane, two left-turn slip lanes, and a left-turn mandatory cycle lane. The cycle lane from the eastern arm left-turn slip lane joins the cycle lane on the southern arm of the junction. The eastern arm exit consists of two lanes.

The western arm approach consists of one lane on both its approach and exit.

There are pelican crossings on the northern and eastern arms, with pedestrian guard rails on nearly all traffic islands. The crossing on the northern arm is staggered. There is an uncontrolled crossing on the western arm with dropped kerbs and tactile paving.

Image 5.10 R132 / Coolock Lane Junction

5.3.4.4.2 R132 Swords Road between R132 / R104 Coolock Lane Junction and R132 / R104 Santry Avenue Junction

The R132 Swords Road, between R132 / R104 Coolock Lane Junction and R132 / R104 Santry Avenue Junction, is a two-way single carriageway with two general traffic lanes, a combined bus and cycle lane, and a cycle lane in the southbound direction; and three general traffic lanes and a cycle lane in the northbound direction. Opposing flows between the two signalised junctions are separated by raised kerbed median, approximately in 150m length.

The road is subject to a speed limit of 50km/h and from outer edge to outer edge, the carriageway width varies approximately between 20m and 24m. A bus lane is present along the southbound side of the R132 on this section, measuring approximately 3.0m in width.

The only major junction arrangement along this section is the R132 / R104 Santry Avenue four arm signalised junction

The characteristic of the junction is described below, alongside a satellite image which is an extract from Figure 6.6 in Volume 3 of the EIAR.

R132 / R104 Santry Avenue four-arm signalised Junction: This four arm junction had three main arms with the fourth providing access to a small number of businesses only.

The northern arm approach consists one right -turn lane, one straight ahead lane, and one left-turn lane which replaces the southbound bus lane approximately 20m in advance of the junction. There is an advance stop line for cyclists, and a mandatory cycle lane on the nearside of the approach. The northern arm exit consists of two traffic lanes alongside a mandatory cycle lane.

The southern arm approach consists of one straight ahead and right-turn lane which of approximately 130m in length, one straight ahead lane and one left-turn flare of approximately 30m length There is a broken white line road marking delineating the slight curvature of the straight-ahead movements through the junction. The northern arm exit consists of lane approximately 7m wide. A bus lane which is introduced approximately 30m after the junction exit on the southern arm.

The western arm approach consists of one straight ahead and right-turn lane, and one left-turn slip lane. The western arm exit consists of one lane.

Both the eastern arm approach and exit have a single lane in each direction.

There are pelican crossings on the southern and western arms, with traffic island refuges and pedestrian guard rails on the traffic islands. An uncontrolled crossing with dropped kerbs is present on the eastern arm.

The characteristics are shown in Image 5.11

Image 5.11 R132 / Santry Avenue Junction

5.3.4.4.3 R132 Swords Road between R132 / R104 Santry Avenue Junction and R132 / Lorcan Road Junction

The R132 Swords Road, between R132 / R104 Santry Avenue Junction and R132 / Lorcan Road Junction, is a two-way single carriageway with a general traffic lane in each direction, and a bus lane in the southbound direction. Opposing flows are separated by continuous and broken white line road markings.

The road is subject to a speed limit of 50km/h and has no bridges either above or below the road. From outer edge to outer edge, the carriageway width varies between 8.5m and 17.5m (where bus lane, parking, and flares are present). The carriageway follows a broadly straight alignment. Bus lanes are present along the southbound side of the R132 on this section, measuring between 3.0m and 3.5m in width.

The major junction arrangement along this section is the R132 / Lorcan Road four-arm signalised Junction.

The characteristic of the junction is described below, alongside a satellite image which is an extract from Figure 6.6 in Volume 3 of the EIAR.

R132 / Lorcan Road four-arm signalised Junction: This four-arm junction provides the main access to the Omni Shopping Centre as well as a residential area to the east.

The northern arm approach consists of one right-turn lane, and one straight and left-turn lane which replaces the southbound bus lane approximately 90m in advance of the junction. A nearside mandatory cycle lane is introduced approximately 90m on the approach to the junction which links to an advance stop line for cyclists. There is a right-turn dwell box for vehicles located after the stop line, in line with the offside right-turn lane. An advisory cycle lane is present through the junction to the southern arm. The northern arm exit consists of one lane for general traffic, and a cycle lane.

The southern arm approach consists one right-turn lane and one straight ahead which are created from a single lane 70m south of the junction and one left-turn slip and flare of approximately 35m length. An advisory cycle lane is present between the left-turn flare and the straight-ahead lane; it continues through the junction to the northern arm via an advance stop line for cyclists. There is a right-turn dwell box for vehicles located after the stop line, in line with the offside right-turn lane. The southern arm exit consists of one for general traffic and one mandatory cycle lane. The cycle lane extends for a length of approximately 70m. A combined bus and cycle lane is introduced approximately 10m after the junction exit on the southern arm. The combined bus and cycle lane is in operation from 07.00 to10.00 and 12.00 to 19.00 Monday to Saturday.

The western arm approach consists of one left-turn slip lane, one straight ahead and right-turn lane, and one right-turn lane. The western arm exit consists of two lanes.

The eastern arm consists of a single lane on both entrance and exit.

There are pelican crossings on the northern, western and southern arms; and pedestrian guard rails on traffic islands. An uncontrolled crossing with dropped kerbs is present on the eastern arm, and across the left-turn slip lane on the western arm.

The characteristics are shown in Image 5.12

Image 5.12 R132 / Lorcan Road Junction

5.3.4.4.4 R132 Swords Road between Lorcan Road Junction and Shantalla Road Junction

The R132 Swords Road, between Lorcan Road Junction and Shantalla Road Junction, is a two-way single carriageway with one lane of general traffic and intermittent sections of bus lanes or cycle lanes, in each direction. Opposing flows are separated by solid and broken white line road markings along most of this section; and by hatched road markings between the R132 / Shanrath Road Junction and R132 / Shantalla Road Junction.

This section is subject to a 50km/h speed limit and from outer edge to outer edge, the carriageway width varies between 9m and 18m (where left-turn slips are present). Bus lanes are present intermittently along the southbound side of the R132 on this section, measuring between 3.0m and 3.5m in width.

The major junction arrangements along this section are as follows:

- R132 / Shanowen Road three-arm signalised Junction;
- R132 / Shanrath Road five-arm signalised Junction and;
- R132 / Shantalla Road three-arm priority Junction.

The characteristics of each major junction is described in turn below, alongside satellite images which are extracts from Figure 6.6 in Volume 3 of the EIAR.

R132 / Shanowen Road three-arm signalised Junction: This junction provides access to residential areas to the west of Swords Road.

The northern arm approach consists of one straight-ahead lane and one right-turn flare lane, which is approximately 40m in length. There is an advance stop line for cyclists and a nearside advisory cycle lane on the

approach, which is approximately 30m in length. The northern arm exit consists of one general traffic lane and a mandatory cycle lane.

The southern arm approach consists of two lanes, including one straight-ahead lane and one left-turn flare which is approximately 30m in length. The southern arm exit consists of one lane.

The western arm approach consists of one right-turn lane and one left-turn flare of approximately 60m length. There is an advance stop line for cyclists. The western arm exit consists of one lane.

A yellow box is present in the middle of the junction. There are pelican crossings on all arms of the junction, with dropped kerbs, road markings and tactile paving.

The characteristics are shown in Image 5.13

Image 5.13 R132 / Shanowen Road three-arm signalised Junction

R132 / Shanrath Road five-arm signalised Junction: This junction provides links to the M50 via a slip road and overbridge. As well as surrounding residential areas.

The north-western arm approach consists of a straight-ahead lane and a left-turn lane which replaces the combined bus and cycle lane on the north-western approach approximately 40m in advance of the junction. Right-turn movements are not permitted from this arm to the south-western arm (Larkhill Road). The north-western arm exit consists of one lane. An advisory cycle lane extends from the south-eastern arm to the north-western arm lining two off carriageway cycle tracks. The cycle lane immediately transitions onto a pedestrian and cyclist shared facility at the north-western exit, which extends for a length of approximately 20m, and then transitions to a mandatory cycle lane.

The north-eastern arm approach consists of two lanes both of which turn right only alongside a short left turn flare. The north-eastern arm exit consists of one lane, a vehicular weight restriction of 3.5 tonnes.

The eastern arm approach consists of one straight-ahead lane and one right-turn flare which is approximately 60m in length. No left-turn movements are permitted from this arm to the south-western arm (Larkhill Road) and south-eastern arm. The eastern arm exit consists of one lane. Approximately 120m from the junction exit a yellow box is present to facilitate right-turn movements onto the R132 slip road.

The south-eastern arm approach consists of one lane widening to two at the stop line. This arm is the off-ramp exiting from the northbound side of the N1 single carriageway. A street from the residential area west of the old N1 single carriageway joins this arm approximately 30m in advance of the R132 / Shanrath Road Junction. No

left-turn movements are permitted from this arm to the south-western arm (Larkhill Road). This length of carriageway in one way so does not have a corresponding exit.

The south-western arm approach consists of one right-turn slip and one left-turn slip, with a traffic island separating them. An advisory cycle lane is present across the south-western arm, connecting from the south-eastern arm to the pedestrian and cyclist shared facilities on the north-western arm exit.

There are pelican crossings across the eastern, south-eastern and south-western arms of the junction, and across the left-turn slip from the north-eastern arm, with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on traffic islands. The pelican crossing across the eastern arm is staggered. An uncontrolled crossing with dropped kerbs is present on the north-eastern arm.

The characteristics are shown in Image 5.14

Image 5.14 Shanrath Road five-arm signalised Junction

R132 / Shantalla Road three-arm priority Junction: This junction provides direct access to the southbound M50 from the surrounding area.

The western approach has a single lane for traffic alongside a right turn lane for vehicles entering the M50, the exit is also a single lane.

The eastern approach has a single lane in each direction.

The characteristics are shown in Image 5.15.

Image 5.15 Shantalla Road three-arm priority Junction

5.3.4.4.5 Lorcan Drive, Lorcan Road, and Shanrath Road

Lorcan Road is a two-way single carriageway with one lane in each direction. From outer edge to outer edge, the carriageway ranges between 5.5m and 6.0m. Opposing flows are not separate by road markings. Three speed humps are present along this section which is subject to a speed limit of 30km/h.

Lorcan Road and Shanrath Road are also a single carriageways with speed hump and subject to a 30km/h speed limit although are generally wider than Lorcan Road with widths of approximately 6.0m to 7.0m.

There is a vehicular 3.5 tonne weight restriction on the route, signposted at the R132 / Lorcan Road Junction and R132 / Shanrath Road Junction.

5.3.4.5 Existing Parking / Loading

Along Section 3 of the Proposed Scheme there is a total of 165 existing parking / loading spaces. These comprise:

- 50 parking spaces located within Santry Park Car Park, adjacent to the northbound side of the R132 Swords Road;
- 34 commercial parking spaces located outside and opposite from the retail premises along Oak Avenue, adjacent to the R104 Coolock Lane;
- 8 informal parking spaces located on the southbound side of R132 Swords Road, in front of commercial sites at Schoolhouse Mews and Schoolhouse Lane;
- 7 adjacent spaces at Magner's Pharmacy and The Industry on Schoolhouse Lane
- 15 commercial parking spaces located on the southbound side of R132 Swords Road, adjacent to the R132 Swords Road / Schoolhouse Lane Junction, in the forecourt of Trade Electric Group (TEG);
- 12 informal on-street parking spaces on Church Lane, adjacent to St Pappan's Church.
- 7 informal residential parking spaces north of the R132 Swords Road, close to the R132 Swords Road / Shanowen Road Junction;
- 11 adjacent commercial parking spaces along the southbound side of R132 Swords Road, south of the R132 Swords Road / Shanowen Road Junction in the forecourt of The Comet retail premises; and
- 36 adjacent commercial parking spaces along the southbound side of R132 Swords Road; 12 on the southbound side of R132 Swords north of The Comet and 24 on the southbound side of R132 Swords Road opposite The Comet.

There are no on-street loading bays between Northwood Avenue and Shantalla Road. It can be assumed that loading activities occur within adjacent premises, or outside bus lane regulation hours.

Table 5.11 presents a summary of the existing parking and loading spaces

Table 5.11: Section 3 – Existing Parking / Loading Spaces

Street	Parking Type	Number of Existing Parking Spaces
Santry Park Car Park	Adjacent Parking	50
Oak Avenue	Adjacent Parking	34
Swords Road / Schoolhouse Lane	Informal Parking	8
	Adjacent Parking	22
	Informal Parking	12
Swords Road / Shanowen Road	Informal Parking	7
	Adjacent Parking	11
Comet Swords Road	Adjacent Parking	36
Total		**180**

5.3.5 Section 4 - Shantalla Road to Botanic Avenue

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 the Shantalla Road Junction and Botanic Avenue Junction along the R132.

Section 4 of the Proposed Scheme is approximately 2.5km in length, beginning at the Shantalla Road Junction along the R132 Swords Road. The route moves along the R132 through the R132 / Collins Avenue Junction, the R132 / Griffith Avenue Junction, the R132 / Richmond Road Junction before terminating on the approach to the R132 / Botanic Avenue Junction, after which it enters Section 5.

5.3.5.1 Pedestrian Infrastructure

There are footpaths on both sides of the R132 along this section, with widths generally measuring between 2m and 3.5m in width; however, this increases up to 5m where pedestrian and cyclist shared or segregated facilities are present. Footpaths on the northbound side of the R132 are discontinuous for a length of approximately 330m along the off-ramp from the old N1 single carriageway to Swords Road, from the staggered pelican crossing at Whitehall Holy Child Church until approximately 40m south of the R132 / Shanrath Road Junction. However, there is a quiet parallel route along this length, through the residential area on the western side of the R132.

There are several controlled pedestrian crossings along Section 4 of the Proposed Scheme which benefit from tactile paving and dropped kerbs which can be found at the following locations:

- Approximately 355m south of the R132 Swords Road entry slip road, at the Whitehall Holy Child Church (staggered pelican crossing with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails);
- Across all arms of R132 / Collins Avenue Junction (staggered pelican crossings with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails);
- Across the R132, directly north of priority junction at Iveragh Road (pelican crossing with traffic island refuge, dropped kerbs, tactile paving, and pedestrian road markings);
- Across the R132, directly north of access to Highfield Hospital and access to Plunkett College (pelican crossing with dropped kerbs, tactile paving and pedestrian road markings);
- Across the northern, eastern and western arms of R132 / Griffith Avenue Junction (staggered pelican crossings with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on traffic islands);
- Across the R132, directly north of priority junction at Homefarm Road (pelican crossing with traffic island refuge, dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the traffic island);
- Across the R132, approximately 20m south of access to Skylon Hotel, outside Lidl (pelican crossing with dropped kerbs, tactile paving and pedestrian road markings);
- Across the R132, approximately 50m south of the above crossing, outside DCU St. Patrick's Campus Cregan Library (pelican crossing with dropped kerbs, tactile paving and pedestrian road markings);
- Across the R132, approximately 15m north of priority junction at Ormond Road and approximately 50m north of main access to DCU St. Patrick's Campus (staggered pelican crossing with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the traffic island); and
- Across the northern and eastern arms of the R132 / Richmond Road / Millmount Avenue Junction (pelican crossings, with traffic island refuge on northern arm, dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the traffic island).

Uncontrolled crossings between Shantalla Road Junction and Botanic Avenue benefit from dropped kerbs and tactile paving, however refuge islands are limited at the uncontrolled crossings on this section. The locations of the pedestrian crossings are illustrated in Figure 6.3d in Volume 3 of the EIAR.

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 are included in Appendix A6.4.1 (Pedestrian Infrastructure Assessment).

5.3.5.2 Cycling Infrastructure

Between the Swords Road slip road and the R132 / Collins Avenue Junction, cycle facilities are intermittent and include a combined bus and cycle lane and an advisory cycle lane although some sections do not have any bespoke facilities for cyclists. In the vicinity of the R132 / Collins Avenue Junction cyclists are directed onto a quieter parallel route through the housing area along the western side of the R132

Between the R132 / Collins Avenue Junction and the R132 / Iveragh Road Junction, there is a combined bus and cycle lane, an advisory cycle lane and a pedestrian and cyclist segregated facility The combined bus and cycle lanes in the both directions are in operation between 07.00-10.00 and 12.00-19.00, Monday to Saturday.

Between the R132 / Iveragh Road Junction and the R132 / Seven Oaks Junction, southbound there are advisory cycle lanes, combined bus and cycle lanes which operate between 07.00-10.00 and 12.00-19.00, Monday to Saturday. Northbound there is a pedestrian and cyclist segregated facility, from the R132 / Seven Oaks Junction alongside a combined bus and cycle lane. The segregated facility and the combined bus and cycle lane terminate concurrently, the cycle facility transitions to an on-street advisory cycle lane. The combined bus and cycle lane in the northbound direction is in operation between 07.00-10.00 and 12.00-19.00, Monday to Sunday.

Between the R132 / Seven Oaks Junction and the R132 / Griffith Avenue Junction, in the southbound direction, there is a segregated pedestrian and cyclist facility which terminates at the R132 / Griffith Avenue Junction. This sits alongside a combined bus and cycle lane.

In the northbound direction, a 1.5m wide on-street advisory lane is present which transitions to a pedestrian and cyclist segregated facility. A combined bus and cycle lane of approximately 3.0m width is also present from the R132 / Griffith Avenue Junction. The combined bus and cycle lanes along this section are in operation between 07.00-10.00 and 12.00-19.00, Monday to Sunday.

Between the R132 / Griffith Avenue Junction and the R132 / Richmond Road Junction, in the southbound direction, there is a mix of provision which is comprised of a combined bus and cycle lane, a mandatory cycle lane, and an advisory cycle lane. The combined bus and cycle lane in the southbound direction is in operation between 07.00-10.00 and 12.00-19.00 Monday to Sunday, with the exception of the section between the R132 / Church Avenue Junction and the R132 / Ormond Road Junction, which is in operation between 07.00-10.00 and 12.00-19.00 Monday to Saturday. In the northbound direction, provision is similarly mixed although there is also a section of segregated pedestrian and cycle provision. The northbound combined bus and cycle lane in the northbound direction is in operation between 07.00-10.00 and 12.00-19.00, Monday to Saturday.

Between the R132 / Richmond Road Junction and the R132 / Botanic Avenue Junction, in the southbound direction, there are no dedicated cycle facilities on the Drumcondra Bridge (Frank Flood Bridge) up to the R132 / Botanic Avenue Junction. In the northbound direction, an advisory cycle lane is present though there are no cycling facilities across the Drumcondra Bridge (Frank Flood Bridge).

All signalised junctions from Shantalla Road Junction to Botanic Avenue Junction require cyclists to share green time with traffic.

There are cycle parking stands along Section 4 of the Proposed Scheme at the following locations:

- Four Sheffield stands (able to accommodate 8 bicycles) along R132 Swords Road southbound carriageway (along the N1 Ramp Road);
- Five Sheffield stands (able to accommodate 10 bicycles) along R132 Swords Road northbound carriageway (along the N1 Ramp Road);
- Three Sheffield stands (able to accommodate 6 bicycles) along R132 Swords southbound carriageway (outside Church of the Holy Child);
- Two Sheffield stands (able to accommodate 4 bicycles) along R103 Collins Avenue eastbound carriageway (outside EBS Whitehall);
- Five Sheffield stands (able to accommodate 10 bicycles) along R103 Collins Avenue eastbound carriageway (outside Shay's Costcutter);

- Three Sheffield stands (able to accommodate 6 bicycles) along R132 Swords Road southbound carriageway (south of R132 / Swords Road / R103 Collins Avenue Junction);
- Four Sheffield stands (able to accommodate 8 bicycles) along R132 Swords Road northbound carriageway (outside The Viscount);
- Three Sheffield stands (able to accommodate 6 bicycles) along R132 Swords Road northbound carriageway (outside Whitehall College of Further Education);
- Five Sheffield stands (able to accommodate 10 bicycles) along R132 Drumcondra Road Upper southbound carriageway (outside Scribbles);
- Three Sheffield stands (able to accommodate 6 bicycles) along R132 Drumcondra Road Upper southbound carriageway (outside Insomnia Coffee Company);
- Four Sheffield stands (able to accommodate 8 bicycles) along R132 Drumcondra Road Upper eastbound carriageway (outside Insomnia Coffee Company); and
- Four Sheffield stands (able to accommodate 8 bicycles) along Botanic Avenue westbound carriageway (outside Fagans Bar and Restaurant).

There are cycle parking stands along within the vicinity of Section 4 of the Proposed Scheme, albeit outside the red line boundary, at the following locations:

- Two Sheffield stands (able to accommodate 4 bicycles) along Shantalla Road southbound carriageway (outside The Beaumont House);
- Three Sheffield stands (able to accommodate 6 bicycles) along Shantalla Road northbound carriageway (outside Circle K);
- Five Sheffield stands (able to accommodate 10 bicycles) along Seven Oaks westbound carriageway (outside Leisure Club & Spa);
- Five Sheffield stands (able to accommodate 10 bicycles) along Grace Park Road northbound carriageway (outside All Hallows Missionary College Lodge);
- Five Sheffield stands (able to accommodate 10 bicycles) along Millmount Avenue westbound carriageway (outside Drumcondra Public Library); and
- Three Sheffield stands (able to accommodate 6 bicycles) directly outside Drumcondra Public Library.

There is no designated cycle hire scheme parking racks within Section 4 of the Proposed Scheme.

The existing cycle facilities along Section 4 of the Proposed Scheme are illustrated in Figure 6.4d in Volume 3 of the EIAR.

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 are included in Appendix A6.4.2 (Cycling Infrastructure Assessment).

5.3.5.3 Bus Infrastructure

5.3.5.3.1 Bus Priority Measures

The existing bus facilities along Section 4 of the Proposed Scheme are illustrated in Figure 6.5d in Volume 3 of the EIAR.

Bus lanes are provided along Section 4 of the Proposed Scheme at the following locations (aside from intermittent breaks and junctions):

- Southbound along R132 from Swords Road ramp road to Collins Avenue Junction for approximately 500m, operating between 24 hours, Monday to Sunday; and
- Northbound and Southbound along R132 from Collins Avenue Junction to Botanic Avenue for approximately 1.6km, operating between 07.00 and 10.00 and between 12.00 and 19.00, Monday to Sunday.

There is currently no bus priority infrastructure along Section 4 of the Proposed Scheme along the R132 northbound carriageway between Collins Avenue Junction and Swords Road ramp road, and along the Drumcondra Bridge (Frank Flood Bridge).

5.3.5.3.2 Bus Stop Facilities

There are currently 19 bus stops along Section 4 of the Proposed Scheme – 11 inbound stops, and 8 outbound stops. The existing bus facilities along Section 4 of the Proposed Scheme are illustrated in Figure 6.5d in Volume 3 of this EIAR.

The inbound stops are as follows:

- Stop 1641, outside Ellenfield Park;
- Stop 1642 / 104331, outside Holy Child Roman Catholic Church;
- Stop 237, along R103 Collins Avenue;
- Stop 212, along R103 Collins Avenue West;
- Stop 213, on the approach to R132 Swords Road / Iveragh Road iunction;
- Stop 214, outside Highfield Healthcare;
- Stop 4432, north of Seven Oaks priority iunction;
- Stop 119, adjacent to The Village priority iunction;
- Stop 44, outside Baldara House;
- Stop 7603, south of Clonturk Avenue; and
- Stop 45, opposite DCU St, Patrick's Campus.

The outbound stops are as follows:

- Stop 1620 / 100141, north of R132 / R103 Collins Avenue Junction;
- Stop 215, along R103 Collins Avenue;
- Stop 205, north of Iveragh Road;
- Stop 204, outside Rosmini Gaels GAA Club;
- Stop 203 / 104351, outside Fledglings Early Years Education & Care;
- Stop 85, outside ABC House Bed and Breakfast;
- Stop 7602, south of Cregan Library DCU; and
- Stop 21, outside DCU St, Patrick's Campus.

The contents of Table 5.12 outline the availability of bus stop facilities at the existing 19 bus stops along Section 4 of the Proposed Scheme.

Table 5.12 Section 4 - Availability of Bus Stop Facilities (of a Total 19 Bus Stops)

Bus Stop Facility	Number of bus stops in baseline with Facility	Percentage of Bus Stops in baseline with Facility
RTPI (Real Time Passenger Information)	9	47%
Timetable information	18	95%
Shelter	17	89%
Seating	16	84%
Accessible Kerbs	18	95%
Indented Drop Off Area	4	21%
Total Stops	**19**	

There are 17 bus stops with shelters that serve Whitehall. The remaining bus stops in the area do not have shelters.

The bus stops cater for 26 Dublin Bus, Go-Ahead Ireland and Transport for Ireland bus services to local and regional destinations. The services available from these stops are outlined in Table 5.13

Table 5.13 Section 4 - Bus Service Frequency

Service	Route	Typical Frequency	
		Weekday	Weekend
1	Santry - Drumcondra - Parnell Sq. - Ringsend - Sandymount (St. John's Church)	10 – 15 minutes	20 minutes
11	Wadelai Park - O'Connell St. -Ranelagh - Clonskeagh - Sandyford Business District (Blackthorn Rd.)	15 – 30 minutes	30 minutes
13	Harristown - Main St. Ballymun (Ballymun Shopping Centre) - Drumcondra Rail Station - O'Connell St. - St. James's Hospital - Tyrconnell Rd. (Blacklion) - Naas Rd. (John Sisk and Sons) - Clondalkin Village - Grange Castle	10 - 15 minutes	15 minutes
16	Dublin Airport - Santry - Skylon Hotel - Drumcondra Rail Station - O'Connell St. - Kelly's Corner - Harold's Cross - Terenure -Grange Rd. - Ballinteer (Kingston)	12 minutes	12 minutes
16c	Dublin Airport - Santry, Turnapin Lane – Beaumont – Whitehall – Drumcondra – Ballybough – Phibsborough - Dublin, O'Connell St Upper	Three times daily	Three times daily
16d	Dublin Airport - Santry, Turnapin Lane – Whitehall – Drumcondra – Phibsborough - Dublin, O'Connell - Dublin City South - Harolds Cross – Terenure – Rathfarnham - Marlay Park - Ballinteer	Six times daily	No Services
33	Balbriggan - Skerries Strand Street – Rush – Lusk – Swords – Dublin City Centre	50 minutes	1.5 hours
33e	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Airport Roundabout - Swords Village - Lusk - Rush - Skerries	Daily	No Services
33n	Westmoreland Street - Drumcondra- Santry- Dublin Airport Atrium Road- Boroimhe- Rivervalley- Swords Village- Lusk- Rush- Skerries- Balbriggan	No Services	Four times daily
41	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Dublin Airport - Swords Village - Swords Manor	20 minutes	30 minutes
41b	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Swords Rd. (ALSAA) - Swords Village - Rolestown	Five times daily	Four times a day
41c	Lwr. Abbey St. - Upr. Gardiner St. - Drumcondra Rail Station - Omni Shopping Centre - Kealy's Pub - Boroimhe - River Valley - Swords Village - Swords Manor	20 minutes	30 minutes
41d	Dublin City Centre – Drumcondra – Whitehall – Santry - Dublin Airport – Rathingle - Swords, Pinnockhill - Swords, Swords Business Park	Two times daily	No Services
44	DCU – Larkhill - O'Connell St – Dundrum – Stepaside - Enniskerry	Hourly	Hourly
101	Dublin Busáras - Drumcondra Rail Stn - Whitehall Church - Airside Stop - Swords Pavilions - Grooms Stop - Whitecross Ns - Moorehall Lodge - Drogheda Bus Station	20 minutes	30 minutes – 1 hour
104	Clontarf Station– Killester – Beaumont Hospital – Santry – DCU Helix	1 hour	1 hour
180	The Diamond Clones – Carrickmacross – Ardee – Whitehall – Drumcondra - Dublin City - Belfield, UCD	Two times daily.	Daily
740	Wexford –Belfield, UCD - Dublin City – Drumcondra – Whitehall - Dublin Airport	Hourly	Hourly
740-A	Wexford –Belfield, UCD - Dublin City – Drumcondra – Whitehall - Dublin Airport	Hourly	2 hours
842	Newcastle (Longford) – Edgeworthstown – Ballinalack – Mullingar - Trinity College - Merrion Square - Drumcondra – Whitehall - Dublin Airport	Four times daily	Two times daily
900	Marshes Shopping Centre – Dundalk - Whitehall - Drumcondra - Dublin City	30 minutes	Five times daily
901	Marshes Shopping Centre – Dundalk - Whitehall - Drumcondra – Trinity College - Belfield, UCD	30 minutes – 1 hour	1 hour
901m	Silloge – City North Business Campus – Collins Avenue – Griffith Park – Temple Street – O'Connell Street Upper	Four times daily	No Services

Service	Route	Typical Frequency	
		Weekday	Weekend
904	UCD Campus-Leeson Street-Georges Street-North Road-Dundalk Hospital-Marshes Shopping Centre	Three times daily	Three times daily on Saturday; no Sunday service
910	UCD Campus-Leeson Street-City North Bus Campus-Whitecross-Laytown Train Station-Donacarney School-Southgate Bus Stop	Twice daily	Twice daily on Saturday; no Sunday service
N4	Blanchardstown SC – Point Village via Collins Avenue	10 minutes	15-20 minutes

5.3.5.4 General Traffic

5.3.5.4.1 R132 and R132 Swords Road between Shantalla Road and R102 Griffith Avenue

R132 Swords Road continues south from the R132 Swords Road / Shantalla Road Junction to the R132 Swords Road / R102 Griffith Avenue, a total length of approximately 1.4km. The northern section comprises the R132 between Shantalla Road and R103 Collins Avenue, a length of approximately 580m. The southern section consists of the R132 Swords Road between R103 Collins Avenue and R102 Griffith Avenue, a length of approximately 840m.

The first section, the R132, in the southbound direction, commences at the start of the ramp from the R132 Swords Road / Shantalla Road onto the R132. It extends for a length of approximately 230m along the ramp from Shantalla Road down to the R132. The ramp starts with two general traffic lanes; the nearside lane merges with the offside lane after a length of approximately 50m, and a combined cycle and bus lane commences along the nearside. At the bottom of the ramp, vehicles on the offside general traffic lane yield to and join traffic on the R132 single carriageway; while the combined lane continues along the nearside of the R132 single carriageway. The combined lane is separated from the adjacent general traffic lane by permanent flexible bollards, for a length of approximately 130m. In the northbound direction, the exit ramp extends from the nearside lane on the R132 and consists of one general traffic lane approximately 6m wide. The northbound exit ramp extends for 195m before meeting a give-way lane coming from Swords Road, along the west side of the ramp, approximately 30m in advance of the R132 / Shanrath Road five-arm signalised Junction. A retaining wall, kerbs, and raised traffic island separate the R132 northbound exit ramp and the Swords Road. Traffic along Swords Road must yield to traffic on the northbound exit ramp.

The R132 single carriageway, between the ramps and R103 Collins Avenue, comprises of a two-way single carriageway with two northbound lanes and three southbound lanes. The nearside southbound lane is a combined bus and cycle lane and is separated from the adjacent general traffic lane by permanent flexible bollards, for a length of approximately 130m. The carriageway is approximately 19m in width, with the opposing flows separated in its centre by white hatched road markings.

Between the R132 / R103 Collins Avenue Junction and the three-arm R132 Swords Road / Iveragh Road signalised Junction, the R132 Swords Road carriageway reduces in width, to approximately 12.0m. There are two lanes in each direction (one combined bus and cycle lane and one general traffic lane) and the opposing flows are separated by a broken white line. This road layout continues south until the four-arm R132 Swords Road / R102 Griffith Avenue signalised Junction.

The major junction arrangements along this section are as follows:

- R132 Swords Road / R103 Collins Avenue Junction four-arm signalised Junction; and
- R132 Swords Road / R102 Griffith Avenue four-arm signalised Junction.

R132 Swords Road / R103 Collins Avenue Junction four-arm signalised Junction: This junction provides an interchange between the north, south N1 and the east, west Collins Avenue

The northern arm approach consists of four lanes two straight ahead lanes, a left-turn lane which replaces the nearside bus lane approximately 50m in advance of the junction, and a right-turn flare of approximately 55m

length. An advisory cycle lane extends from the pedestrian crossing at this approach, straight ahead across the junction to the southern arm exit. The northern arm exit consists of two lanes.

The eastern arm approach consists of one left-turn flare and slip lane approximately 50m in length, one advisory cycle lane approximately 50m length, one straight ahead lane, and two right-turn lanes approximately 80m length. An advisory cycle lane extends from the pedestrian crossing at this approach, straight ahead across the junction to the western arm exit. The eastern arm exit consists of one lane approximately 6.0m wide which narrows moving away from the junction.

The southern arm approach consists of one mandatory cycle lane, one left-turn and straight-ahead lane which replaces the combined bus and cycle lane approximately 45m in advance of the junction, a straight-ahead lane, and a right-turn lane of approximately 110m length. The cycle lane extends straight ahead across the junction in an advisory fashion. The southern arm exit consists of two traffic lanes, which merge shortly after the junction and a combined bus and cycle lane.

The western arm approach consists of one left-turn slip lane, one advisory cycle lane approximately 20m length, one straight ahead lane, and one right-turn lane of approximately 30m length. The cycle lane extends straight ahead across the junction in an advisory fashion. There is an advance stop lane for cyclists. The western arm exit consists of one lane.

A yellow box is present in the middle of the junction. There are staggered signalised pedestrian crossings (pelicans) on all arms, and pedestrian guard rails on all traffic islands.

The characteristics are shown in Image 5.16

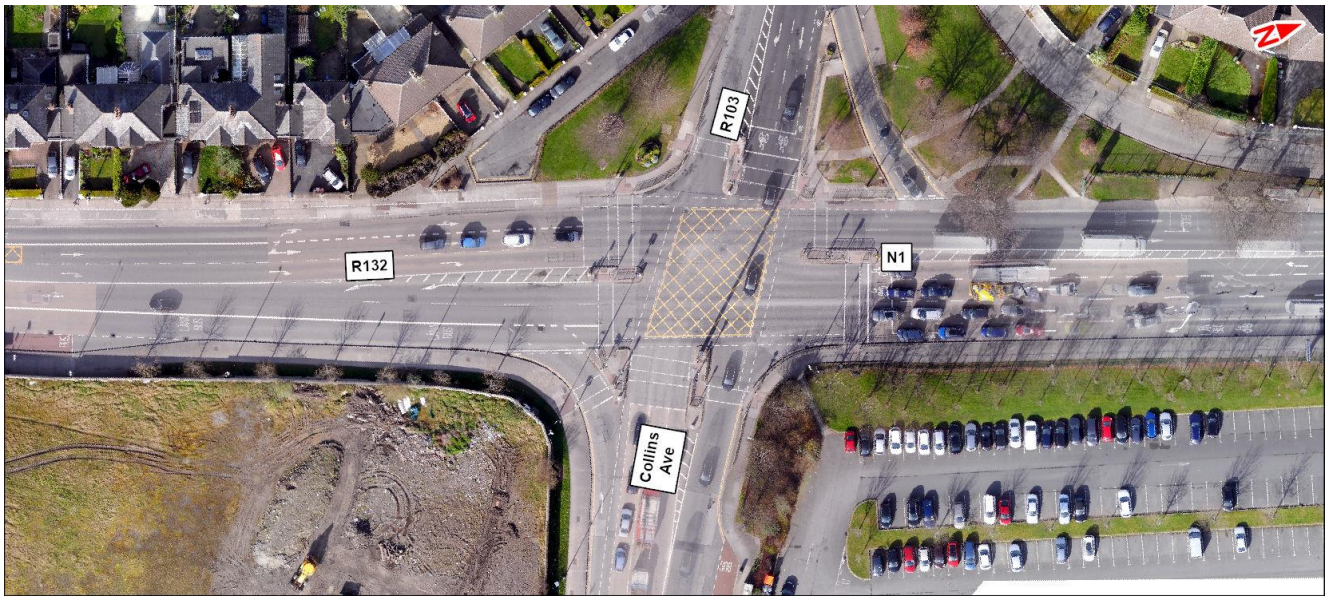

Image 5.16 R132 / Collins Avenue Junction Arrangement

R132 Swords Road / R102 Griffith Avenue four-arm signalised Junction: There are traffic islands and hatched road markings separating the approach and exit lanes on the northern, eastern and western arms.

The northern arm approach consists of one left-turn lane which replaces the combined bus and cycle lane approximately 50m in advance of the junction, one straight ahead lane, and one right-turn lane approximately 55m length. The northern arm exit consists of an advisory cycle lane within a bus lane, and one general traffic lane.

The eastern arm approach consists of one straight ahead and left-turn lane, and a right-turn lane for around 50m prior to the junction before which it has a single lane. The eastern arm exit consists of one lane and introduces a vehicular weight restriction of 3.5 tonnes.

The southern arm approach consists of one straight ahead and left-turn lane which replaces the combined bus and cycle lane approximately 65m in advance of the junction, one straight ahead lane, and a right-turn lane of approximately 45m length. The southern arm exit consists of one combined bus and cycle lane and one general traffic lane.

The western arm approach consists of one straight ahead and left-turn lane, and one a right-turn lane of approximately 70m length. The western arm exit consists of one lane.

A yellow box is present in the middle of the junction. There are staggered pedestrian crossings across the northern, eastern and western arms of the junction, and pedestrian guard rails on all traffic islands.

The characteristics are shown in Image 5.17

Image 5.17 R132 / Griffith Avenue Junction Arrangement

5.3.5.4.2 R132 Drumcondra Road Upper between R102 Griffith Avenue and Richmond Road / Millmount Avenue Junction

The R132 Drumcondra Road Upper, between the R132 Drumcondra Road Upper / R102 Griffith Avenue Junction and the R132 Drumcondra Road Upper / Richmond Road / Millmount Avenue Junction, is approximately 850m in length. The road on this section has one combined bus and cycle lane and one general traffic lane in each direction. Opposing flows are separated by broken white lines. Between Church Avenue Junction and Richmond Road / Millmount Avenue Junction, for a length of approximately 270m, there is a hatched median with intermittent right-turn lanes to facilitate traffic on the northbound side turning into Church Avenue, Ormond Road, and Clonturk Park.

The road on this section is subject to a speed limit of 50km/h. The typical carriageway width varies between 14.0m and 19.0m (where bus lanes, cycle lanes, and street parking are present).

The existing major junction arrangement is the R132 Drumcondra Road Upper / Richmond Road / Millmount Avenue four-arm signalised Junction.

R132 Drumcondra Road Upper / Richmond Road / Millmount Avenue four-arm signalised Junction: This junction provides access to the mainly residential areas surrounding the N1.

The northern arm approach consists of one straight ahead and left-turn lane which replaces the combined bus and cycle lane approximately 35m in advance of the junction, and one straight ahead and right-turn lane. An advisory cycle lane extends from the pedestrian crossing at this approach, straight ahead across the junction to

the southern arm exit. There is also an advance stop line for cyclists. The northern arm exit consists of one advisory cycle lane, and one traffic lane approximately 5.8m wide. A combined bus and cycle lane is established approximately 45m north of the junction.

The eastern arm approach consists of one straight ahead lane and a left-turn lane for approximately 25m in advance of the junction, before which it is a single lane. Vehicles from this approach are not permitted to turn right. The eastern arm exit consists of one traffic lane.

The southern arm approach consists of one straight ahead and left-turn lane, one straight ahead lane, and one offside right-turn lane of approximately 20m length. An advisory cycle lane extends from the pedestrian crossing at this approach, straight ahead across the junction to the northern arm exit. There is also an advance stop line for cyclists. The southern arm exit consists of two traffic lanes. The advisory cycle lane extending across the junction from the northern arm leads into the nearside traffic lane at this exit.

The western arm comprises of a single lane although left turns onto the N1 are not permitted. The western arm exit consists of one traffic lane.

A yellow box is present in the middle of the junction. There are pedestrian crossings across the northern and eastern arms of the junction, and pedestrian guard rails on northern arm traffic island.

The characteristics are shown in Image 5.18

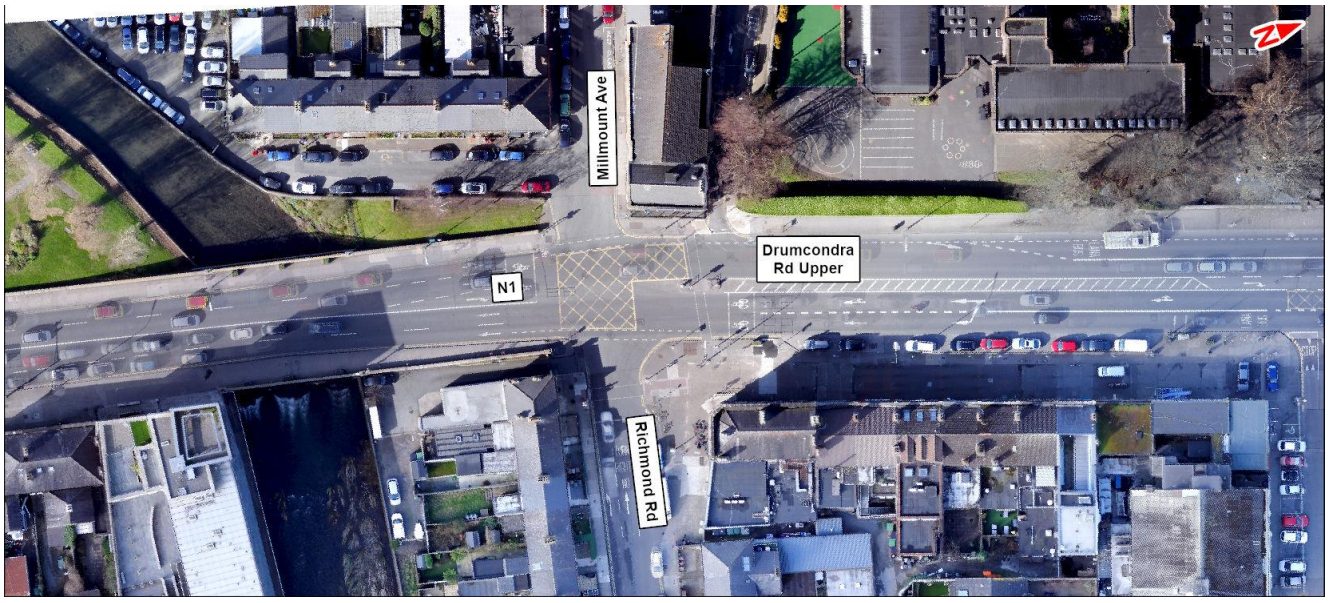

Image 5.18 R132 Drumcondra Road Upper / Richmond Road / Millmount Avenue four-arm signalised Junction

5.3.5.4.3 R132 Drumcondra Road Lower between Richmond Road / Millmount Avenue Junction and north of Botanic Avenue / Cian Park Junction

The R132 Drumcondra Road Lower, between R132 Drumcondra Road Lower / Richmond Road / Millmount Avenue Junction and north of the R132 Drumcondra Road Lower / Botanic Avenue / Cian Park Junction, is approximately 110m in length. For the majority of its length, it comprises of two general traffic lanes in each direction. Opposing flows are separated by broken white lines.

This section goes over the River Tolka, on Frank Flood Bridge. The road is subject to a speed limit of 50 km/h and varies in width between 12.0m (on bridge) and 17.0m (where cycle lanes are present).

5.3.5.5 Existing Parking / Loading

Along Section 4 of the Proposed Scheme there is a total of 293 existing parking / loading spaces. These comprise:

- 28 adjacent parking spaces outside retail premises along the eastern arm of the R103 Collins Avenue;
- Four 'Pay and Display' parking spaces along the northbound side of R132 Swords Road, immediately south of the R132 Swords Road / Iveragh Road Junction;
- Two informal parking spaces along the northbound side of R132 Swords Road, immediately north of the R132 Swords Road / Iveragh Road Junction;
- 17 adjacent parking spaces both sides of Iveragh Road;
- 20 adjacent parking spaces along Homefarm Road;
- One disabled permit parking space along southbound side of the R132 Drumcondra Road Upper, opposite Lidl;
- 40 adjacent parking spaces along the eastbound side of Church Avenue;
- 34 adjacent parking spaces along both sides of Ormond Road;
- 12 adjacent parking spaces along the westbound side of Clonturk Park;
- 10 informal parking spaces along the R132 Drumcondra Road Upper southbound side, immediately south of Clonturk Park access;
- Four adjacent parking spaces along Millbourne Avenue;
- 56 adjacent parking spaces along both side of Millmount Road;
- 20 adjacent parking spaces along the eastbound side of Richmond Road; and
- 20 adjacent parking spaces along the westbound side of Botanic Avenue..

There are approximately 1,400 free parking spaces Omni Shopping Centre, which are associated within the shops located there. There are no on-street loading bays between Shantalla Road and Botanic Avenue. It can be assumed that loading activities occur within adjacent premises, or outside bus lane regulation hours.

Table 5.14 presents a summary of the existing parking and loading spaces

Table 5.14 Section 4 – Existing Parking / Loading Spaces

Street	Parking Type	Number of Existing Parking Spaces
R103 Collins Avenue	Adjacent Parking	28
R132 Swords Road / Iveragh Road	Pay and Display	4
	Informal	2
	Adjacent Parking	17
Homefarm Road	Adjacent Parking	20
R132 Drumcondra Road Upper	Disabled Permit Parking	1
Church Avenue to Botanic Avenue	Adjacent Parking	186
Clonturk Park / R132 Drumcondra Road Upper Junction	Informal Parking	10
Total		**268**

5.3.6 Section 5 - Botanic Avenue to Granby Row

This section outlines the baseline environment for walking, cycling, bus services, general traffic, and parking / loading facilities along Section 5 of the Proposed Scheme, between north of Botanic Avenue Junction up to and including Granby Row Junction, where the Swords to City Centre CBC terminates.

This section is approximately 2.5km in length and it comprises of:

- R132 Drumcondra Road Lower, R132 Dorset Street Lower, and Dorset Street Upper, from north of the R132 Drumcondra Road Lower / Botanic Avenue Junction to the Dorset Street Upper / R132 Frederick Street North Junction, approximately 1.5km;
- Dorset Street Upper, between Dorset Street Upper / R132 Frederick Street North Junction and the Dorset Street Upper / Granby Row junction, approximately 225m;
- R132 Frederick Street North, R132 Parnell Square East, and R132 Cavendish Row, from the R132 Dorset Street Upper / R132 Frederick Street North Junction to the R132 Cavendish Row / Parnell Street Junction, approximately 455m length; and
- Parnell Square West and Granby Row, from Dorset Street Upper / Granby Row Junction to the Parnell Street / Parnell Square West Junction, approximately 375m length.

5.3.6.1 Pedestrian Infrastructure

Between Botanic Avenue and Granby Row, there are footpaths along both sides of the carriageway, with widths generally measuring between 2m and 3.5m in width. Along Frederick Street North, Parnell Square East, Cavendish Row, Parnell Square West, and Granby Row, footpaths are present on both sides of the carriageway, ranging between 1.5m and 4.5m in width.

There are several controlled pedestrian crossings along Section 5 of the Proposed Scheme which benefit from tactile paving and dropped kerbs which can be found at the following locations:

- Across the R132, directly south of priority junction at Botanic Avenue (pelican crossing with traffic island refuge, dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the traffic island);
- Across the northern and eastern arms of the R132 / Clonliffe Road Junction (pelican crossings, staggered across the northern arm, with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the traffic island);
- Across the northern and western arms of the R132 / Whitworth Road Junction (pelican crossings, staggered across the northern arm, with dropped kerbs, tactile paving, pedestrian road markings and pedestrian guard rails on the traffic island);
- Across the eastern and southern arms of the R132 / Belvidere Road Junction (pelican crossings with traffic island refuges, dropped kerbs, tactile paving, and pedestrian road markings);
- Across the northern, eastern, and western arms of the R132 / North Circular Road Junction (pelican crossings, staggered across the northern arm, with dropped kerbs, tactile paving, and pedestrian road markings. There is a traffic island with pedestrian refuge on the eastern arm. Guard rails are present on the northern arm traffic island);
- Across the eastern, western and southern arms of the R132 / Gardiner Street Upper Junction (pelican crossings, staggered across the southern arm, with dropped kerbs, tactile paving, pedestrian road markings, and pedestrian guard rails on the traffic island);
- Across all arms of the R132 / Eccles Street Junction (pelican crossing, with traffic island refuge on southern arms, with dropped kerbs, tactile paving, and pedestrian road markings, and pedestrian guard rails on the traffic island);
- Across the northern, eastern and western arms of the R132 / Frederick Street North Junction (pelican crossings, with traffic island refuges on the northern and eastern arms, dropped kerbs, tactile paving, and pedestrian road markings);
- Across all arms of the Parnell Square East / Parnell Square North Junction (pelican crossings with dropped kerbs, tactile paving, and pedestrian road markings);

- Across all arms of the Cavendish Row / Parnell Street Junction at Parnell Monument (pelican crossing across all arms, staggered on the north-western and south-eastern arms, with pedestrian refuges for north-western and south-western arms on Parnell Monument traffic island, pedestrian refuges for south-eastern arm on O'Connell Street median which is split by Luas tracks, traffic island with refuge on north-eastern arm, dropped kerbs, tactile paving, and pedestrian road markings);
- Across the north-western arm and the south-west bound side of the south-western arm of the Parnell Street / Parnell Square West Junction (pelican crossings with dropped kerbs, tactile paving, pedestrian road markings);
- Across the north-western arm of Parnell Square North / Granby Row Junction (pelican crossing with dropped kerbs, and pedestrian road markings); and
- Across the north-eastern, north-western and south-eastern arms of the Dorset Street Upper / Granby Row Junction (pelican crossing with dropped kerbs, tactile paving and pedestrian road markings).

Uncontrolled crossings on the roads in this section feature dropped kerbs, tactile paving and raised tables, however refuge islands are limited along this section. The locations of the pedestrian crossings are illustrated in Figure 6.3a in Volume 3 of this EIAR.

Further details of the baseline pedestrian facilities (i.e. routing, directness, accessibility, crossing and footpath widths) at each junction along Section 5 of the Proposed Scheme are included in Appendix A6.4.1 (Pedestrian Infrastructure Assessment).

5.3.6.2 Cycling Infrastructure

Between the R132 / Botanic Avenue Junction and the R132 / Clonliffe Road Junction, cycle facilities consist of a mix of advisory cycle lanes, combined bus and cycle lanes and cycle tracks. The combined bus and cycle lane in the southbound direction is in operation between 07.00-10.00 and 12.00-19.00, Monday to Saturday

Between the R132 / Clonliffe Road Junction and the R132 / North Circular Road Junction, much of the southbound provision comprises a combined bus and cycle lane which operates between 07.00-10.00 and 12.00-19.00, Monday to Sunday. Where a combined lane is not available an advisory cycle lane is present. Northbound provision also consists of a combined cycle and bus lane is part although also has a noteworthy length of advisory cycle lane. The combined bus and cycle lanes in the northbound direction are in operation between 07.00-10.00 and 12.00-19.00, Monday to Sunday.

Between the R132 / North Circular Road Junction and the Dorset Street Upper / Granby Row Junction, cycle provision is intermittent with some lengths where it is absent altogether. Where cyclists benefit from provision it is mainly in the form of a combined bus and cycle lane which operates between 07.00-10.00 and 12.00-19.00, Monday to Sunday or an advisory cycle lane.

There are no other dedicated cycle facilities between the R132 / Frederick Street North Junction and the Parnell Square East / Gardiner Row Junction.

Between the Parnell Square East / Gardiner Row Junction and the Rae Cavendish / Parnell Street Junction, only southbound movements are permitted. A combined bus and cycle lane is present for a length of 215m; this facility is in operation 24 hours a day. No cycle facilities are present at the Rae Cavendish / Parnell Street Junction or between the Parnell Square West / Parnell Street Junction and the Dorset Street Upper / Granby Row Junction

Between the R132 / Frederick Street North Junction and the Dorset Street Upper / Granby Row Junction via Parnell Street and Parnell Square West, a 30km/h slow zone is in operation.

There are cycle parking stands along Section 5 of the Proposed Scheme at the following locations:

- Five Sheffield stands (able to accommodate 10 bicycles) along R132 Drumcondra Road Lower southbound carriageway (outside Take Time Hand and Foot Spa);
- Five Sheffield stands (able to accommodate 10 bicycles) along R132 Drumcondra Road Lower southbound carriageway (opposite Permanent TSB Drumcondra);

- Two Sheffield stands (able to accommodate 4 bicycles) along R132 Drumcondra Road Lower northbound carriageway (outside Permanent TSB Drumcondra);
- Two Sheffield stands (able to accommodate 4 bicycles) along Hollybank Road eastbound carriageway (outside Permanent TSB Drumcondra);
- Five Sheffield stands (able to accommodate 10 bicycles) along R132 Drumcondra Road Lower northbound carriageway (outside BoyleSports Bookmaker);
- Two Sheffield stands (able to accommodate 4 bicycles) along R132 Drumcondra Road Lower southbound carriageway (outside Bank of Ireland);
- Nine Sheffield stands (able to accommodate 18 bicycles) along St Anne's Road westbound carriageway (adjacent to Independent Pizza Co);
- Three Sheffield stands (able to accommodate 6 bicycles) along R132 Drumcondra Road Lower northbound carriageway (outside Define Barbers);
- Five Sheffield stands (able to accommodate 10 bicycles) along R132 Drumcondra Road Lower northbound carriageway (outside Diep Takeaway);
- Five Sheffield stands (able to accommodate 10 bicycles) along R132 Dorset Street Lower southbound carriageway (outside GAA Ticket Office);
- Three Sheffield stands (able to accommodate 6 bicycles) along R132 Dorset Street Upper southbound carriageway (outside Abelia Salon);
- Three Sheffield stands (able to accommodate 6 bicycles) along North Frederick Street eastbound carriageway (outside Medipharm);
- Four Sheffield stands (able to accommodate 8 bicycles) along R132 Dorset Street Upper northbound carriageway (outside Gala off license);
- Four Sheffield stands (able to accommodate 8 bicycles) along R132 Dorset Street Upper northbound carriageway (outside Dorset Point);
- Five Sheffield stands (able to accommodate 10 bicycles) along R132 Dorset Street Upper southbound carriageway (opposite the Wishbone);
- Three Sheffield stands (able to accommodate 6 bicycles) along North Frederick Street eastbound carriageway (outside PCHouse);
- Five Sheffield stands (able to accommodate 10 bicycles) along North Frederick Street westbound carriageway (outside IBAT College Dublin);
- Two Sheffield stands (able to accommodate 4 bicycles) along North Frederick Street eastbound carriageway (outside Marka Cadey);
- Three Sheffield stands (able to accommodate 6 bicycles) along North Frederick Street eastbound carriageway (outside The Candy Café);
- Ten Sheffield stands (able to accommodate 20 bicycles) along Parnell Square North (opposite the Irish Writers Centre);
- Two Sheffield stands (able to accommodate 4 bicycles) along Parnell Square East (outside Parnell House);
- Nine Sheffield stands (able to accommodate 18 bicycles) along Cavendish Row (outside Cassidy's Hotel);
- Eight Sheffield stands (able to accommodate 16 bicycles) along Cavendish Row (outside Ambassador Cinema);
- Six Sheffield stands (able to accommodate 12 bicycles) along Parnell Square West (outside Pharmacy Department);
- Eight Sheffield stands (able to accommodate 16 bicycles) along Parnell Square West (outside the parking entrance for Rotunda Hospital staff); and
- Four Sheffield stands (able to accommodate 8 bicycles) along Parnell Square West (opposite the Irish National Teachers' Organisation).

There are cycle parking stands along within the vicinity of Section 5 of the Proposed Scheme, albeit outside the red line boundary, at the following locations:

- Five Sheffield stands (able to accommodate 10 bicycles) along Carlingford Road westbound carriageway (opposite Anderson's Creperie);
- Two Sheffield stands (able to accommodate 4 bicycles) along Drumcondra Road Lower northbound carriageway (opposite Permanent TSB Drumcondra);
- 11 Sheffield stands (able to accommodate 22 bicycles) along Clonliffe Road eastbound carriageway (adjacent Aramark Croke Park);
- Five Sheffield stands (able to accommodate 10 bicycles) along Clonliffe Road eastbound (adjacent Aramark Croke Park);
- Five Sheffield stands (able to accommodate 10 bicycles) along Innisfallen Parade westbound carriageway (opposite Dublin Hearing Aid Centre);
- Five Sheffield stands (able to accommodate 10 bicycles) along R101 North Circular Road eastbound carriageway (outside Sampa Food);
- Five Sheffield stands (able to accommodate 10 bicycles) along R101 North Circular Road westbound carriageway (outside Sampa Food);
- Three Sheffield stands (able to accommodate 6 bicycles) along Belvedere Road southbound carriageway (outside Parcel Motel Mater Hospital);
- Two Sheffield stands (able to accommodate 4 bicycles) along North Circular Road eastbound carriageway (outside Carolan's Corner Off License);
- 10 Sheffield stands (able to accommodate 20 bicycles) along Temple Street North southbound carriageway (opposite Belvedere College);
- Nine Sheffield stands (able to accommodate 18 bicycles) along Temple Street North northbound carriageway (opposite Belvedere College);
- Seven Sheffield stands (able to accommodate 14 bicycles) along R135 Blessington Street eastbound carriageway (outside The Dublin Central Hostel);
- Five Sheffield stands (able to accommodate 10 bicycles) along R135 Blessington Street eastbound carriageway (outside Mini Burger House);
- Four Sheffield stands (able to accommodate 8 bicycles) along R135 Blessington Street eastbound carriageway (outside Clement & Pekoe Stores); and
- 4 Sheffield stands (able to accommodate 8 bicycles) along Parnell Square North (outside the Garden of Remembrance).

Cycle hire scheme stands are provided at the following points along / in the vicinity of Section 5 of the Proposed Scheme, including e-bike hire. The locations are outlined below:

- 30 stands available located on R101 North Circular Road eastbound carriageway (outside Dublin One Hotel);
- 30 stands available located on R101 North Circular Road eastbound carriageway (outside Edmund Rice Development);
- 40 stands available located on R1010 North Circular Road westbound carriageway (outside Parcel Motel Mater Hospital);
- 40 stands available located on Mountjoy Square East northbound carriageway (outside Mountjoy Playground);
- 30 stands available located on Mountjoy Square West southbound carriageway (outside Mountjoy Playground);
- 27 stands available located on Eccles Street East eastbound carriageway (at the approach to Euro Car Park);
- 20 stands available located on Eccles Street East eastbound carriageway (at the approach of the Eccles Street / Berkeley Road Junction);
- 30 stands available located on Denmark Street Great southbound carriageway (outside Mc Nally's Newsagents);
- 20 stands available on Blessington Street westbound carriageway (outside Don Bosco House);
- 16 stands available on Hardwicke Street northbound carriageway (outside PC House);

- 20 stands available on Cathal Brugha Street northbound carriageway (outside Guud Day); and
- 19 bike stands available on Parnell Square North carriageway (outside Amharclann Cholaiste Mhuire).

The existing cycle facilities along Section 5 of the Proposed Scheme are illustrated in Figure 6.4e in Volume 3 of this EIAR.

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 5 of the Proposed Scheme is included in Appendix A6.4.2 (Cycling Infrastructure Assessment).

5.3.6.3 Bus Infrastructure

5.3.6.3.1 Bus Priority Measures

Bus lanes are provided along Section 5 of the Proposed Scheme between Botanic Avenue and Granby Row at the following location (aside from intermittent breaks and junctions):

- Northbound and southbound on R132 between Botanic Avenue Junction and R101 North Circular Road for approximately 950m, operating between 07.00 and 10.00 and between 12.00 and19.00, Monday to Sunday;
- Northbound on R132 between Granby Row and R802 Gardiner Street Upper for approximately 620m, operating between 07.00 and 10.00 and between 12.00 and19.00, Monday to Sunday;
- Southbound on R132 between R802 Gardiner Street Upper and Frederick Street North for approximately 350m, operating between 07.00 and 10.00 and between 12.00 and19.00, Monday to Sunday; and
- Westbound on Granby Row for approximately 100m, operating 24 hours a day, Monday to Sunday.

5.3.6.3.2 Bus Stop Facilities

There are currently 25 bus stops along Section 5 of the Proposed Scheme – 11 inbound stops and 14 outbound stops. The existing bus facilities along Section 5 of the Proposed Scheme are illustrated in Figure 6.5e in Volume 3 of this EIAR.

The inbound stops are as follows:

- Stop 46, opposite Kennedy's Pub;
- Stop 47, adjacent to St Alphonsus' Avenue entrance;
- Stop 48/ 100861, United Medical Centre;
- Stop 49, outside Tops in Pops;
- Stop 51, outside Natural's;
- Stop 52, outside An Post Dorset Street;
- Stop 261, opposite Garden of Remembrance;
- Stop 262, outside Youthreach Transition Centre;
- Stop 263, outside Hotel St. George by Nina;
- Stop 264, outside Delfin English School Dublin; and
- Stop 265, outside Parnell Adult Learning Centre CDETB.

The outbound stops are as follows:

- Stop 19, outside AIB Bank;
- Stop 18, outside Arranmore House;
- Stop 17 / 100121, under Drumcondra Station Rail bridge;
- Stop 15, outside Car Insurance Companies Ireland;
- Stop 14, opposite The Bike Institute;
- Stop 11, outside Dua Caffe;

- Stop 2, opposite Pharmacy Department;
- Stop 3, outside Parnell Square Apartments;
- Stop 4, outside Christian Congregation In Ireland – Dublin;
- Stop 7615, outside Sinn Féin;
- Stop 6, outside Dominican Publications;
- Stop 7, outside The Childrens Place Nursery & Montessori;
- Stop 8, outside Irish National Teachers' Organisation; and
- Stop 10, outside Comhar Linn INTO Credit Union Limited.

Table 5.15 outlines the availability of bus stop facilities at the existing 25 bus stops along Section 5 of the Proposed Scheme.

Table 5.15 Section 5 - Availability of Bus Stop Facilities

Bus Stop Facility	Number of bus stops in baseline with Facility	Percentage of Bus Stops in baseline with Facility
RTPI	18	72%
Timetable information	24	96%
Shelter	10	40%
Seating	8	32%
Accessible Kerbs	12	48%
Indented Drop Off Area	6	24%
Total Stops	**25**	

There are 10 bus stops with shelters that serve Drumcondra. The remaining bus stops in the area do not have shelters.

The bus stops cater for 42 Dublin Bus, Go-Ahead Ireland, Bus Éireann, McConnon Travel, Aircoach, and Transport for Ireland bus services to local and regional destinations. The services available from these stops are outlined in Table 5.16

Table 5.16 Section 5 - Bus Service Frequencies

Service Route	Route	Typical Frequency	
		Weekday	Weekend
1	Santry - Drumcondra - Parnell Sq. - Ringsend - Sandymount (St. John's Church)	10 – 15 minutes	20 minutes
4	Harristown - Ballymun - Botanic Ave- Phibsboro Shopping Centre - City Centre - Pembroke Rd. - Blackrock - Monkstown Ave.	12 minutes	15 minutes
9	Charlestown - Beneavin Rd - Botanic Rd. - O'Connell St. - South Circular Rd. - Limekiln Ave.	15 minutes	15 minutes
11	Wadelai Park - O'Connell St. -Ranelagh - Clonskeagh - Sandyford Business District (Blackthorn Rd.)	15 – 30 minutes	30 minutes

Service Route	Route	Typical Frequency	
		Weekday	Weekend
13	Harristown - Main St. Ballymun (Ballymun Shopping Centre) - Drumcondra Rail Station - O'Connell St. - St. James's Hospital - Tyrconnell Rd. (Blacklion) - Naas Rd. (John Sisk and Sons) - Clondalkin Village - Grange Castle	10 - 15 minutes	15 minutes
16	Dublin Airport - Santry - Skylon Hotel - Drumcondra Rail Station - O'Connell St. - Kelly's Corner - Harold's Cross - Terenure -Grange Rd. - Ballinteer (Kingston)	12 minutes	12 minutes
16c	Dublin Airport - Santry, Turnapin Lane – Beaumont – Whitehall – Drumcondra – Ballybough – Phibsborough - Dublin, O'Connell St Upper	Three times daily	Three times daily
16d	Dublin Airport - Santry, Turnapin Lane – Whitehall – Drumcondra – Phibsborough - Dublin, O'Connell - Dublin City South - Harolds Cross – Terenure – Rathfarnham - Marlay Park - Ballinteer	Six times daily	No Services
38	Burlington Rd. - O'Connell Bridge - Berkeley Rd. - Navan Rd. Garda Station - Ashtown - Castleknock - Blanchardstown Village - Damastown	30 minutes	30minutes
38a	Burlington Rd. - O'Connell Bridge - Berkeley Rd - Navan Rd. Garda Station - Ashtown – Castleknock - Blanchardstown Village - Damastown	30 minutes	30 minutes
38b	Burlington Rd. - O'Connell Bridge - Berkeley Rd. - Navan Rd. Garda Station – Ashtown - Damastown	Inbound seven times daily; outbound six times daily	No Services
38d	Dublin City – Phibsborough - Cabra East – Ashtown - Phoenix Park – Castleknock – Mulhuddart - The Mayne	Daily	No Services
39n	Phibsboro (St. Peter's Church) – Cabra – Ashtown Roundabout – Castleknock – Blanchardstown Village – Clonsilla Road – Hartstown – Huntstown – Blakestown – Corduff – Tyrrelstown	No Services	Six times daily
40	Charlestown Shopping Centre - Finglas Village - St. Helena's Rd. (Tolka Valley) - Dorset St. Lwr. (North Circular Rd.) - O'Connell St. – Inchicore - Ballyfermot Rd. (Markievicz Park) - Neilstown Rd. (Finches) - Liffey Valley Shopping Centre	10 – 12 minutes	10 – 15 minutes
40b	Parnell St. – Finglas - Toberburr	Five times daily	Four times daily
40d	Parnell St. - Finglas Rd. (Tolka Vale) - Mellowes Rd.- Tyrrelstown	15 – 30 minutes	30 – 40 minutes
44	DCU – Larkhill - O'Connell St – Dundrum – Stepaside - Enniskerry	Hourly	Hourly
46a	Phoenix Park - Phibsboro (Doyle's Corner) - City Centre – Donnybrook- Foxrock Church - Dun Laoghaire	8 minutes	10 minutes

Service Route	Route	Typical Frequency	
		Weekday	Weekend
46e	Blackrock Rail Station - Stillorgan bypass - Donnybrook - City Centre - Mountjoy Sq.	Two times daily	No Services
88n	Phibsboro Road – Botanic Road – Ballygall Road East – Glasnevin Avenue – Ballymun Road Civic Office – Poppintree – Finglas Village – Seamus Ennis Road – Finglas West – Finglas South – Finglas Village (Finglas Road – opposite Finglas Place) – Ashbourne	No Services	Three times daily
103	Dublin City – Drumcondra – Finglas – Coolquoy – Bullstown – Ashbourne - County Meath – Ratoath – Ashbourne	20 minutes	20 – 30 minutes
109-x	Dublin Busaras – Drumcondra – Finglas – Navan – Carnaross - Whitegate Cross – Virginia – Cavan	Hourly	Hourly
111-x	Dublin City – Ballybough – Batterstown – Tullaghmedan - County Meath – Athboy - Clonmellon	Three times daily	No Services
116	Sussex Road. (Burlington Road) – Stillorgan – Sandyford – Dundrum – Whitechurch	Daily	No Services
120	Parnell St. – Dowth Ave. (Cabra Rd.) – Ratoath Rd. – Ashtown Rail Station	30 minutes	30 minutes
122	Ashington - St. Peter's Church (Cabra Rd.) - O'Connell St. - Kelly's Corner - Drimnagh Rd. (Our Lady's Hospital)	10 – 20 minutes	20 minutes
140	Ballymun (IKEA) - St. Margaret's Rd. - Finglas Rd. (Finglas Bypass) - Phibsboro - O'Connell St. - Rathmines (Palmerston Park)	15 minutes	15 minutes
155	IKEA (Ballymun) - Ballymun Rd. - Botanic Ave. - Phibsboro Shopping Centre - O'Connell St. - Donnybrook - Cabinteely - Bray Rail Station	20 minutes	20 minutes
179	Market Street Cootehill – Kingscourt – Wilkinstown – Proudstown - Troytown Navan – Navan – Dunshaughlin – Blanchardstown – Phibsborough – Dublin - Belfield, UCD	Eleven times daily	Two times daily
180	The Diamond Clones – Carrickmacross – Ardee – Whitehall – Drumcondra - Dublin City - Belfield, UCD	Two times daily.	Daily
700	Dublin Airport -Drumcondra -Dublin City Centre-Ballsbridge - Donnybrook-University College Dublin	30 minutes	30 minutes
740	Wexford –Belfield, UCD - Dublin City – Drumcondra – Whitehall - Dublin Airport	Hourly	Hourly
740-A	Wexford –Belfield, UCD - Dublin City – Drumcondra – Whitehall - Dublin Airport	Hourly	2 hours
747	Heuston Rail Station – O'Connell St. – BusÁras (Central Bus Station) – Dublin Airport	2 hours	2 hours
836	Dublin, Millennium Spire – Rotunda, Granby Place –Mountjoy Street – Phibsborough, Cabra Road (North Circular Road) – Corduff (Fingal), Annagh Court – Cloghran, Business Park – Cloghran, Cruiserath Road – Corduff (Fingal), Cruiserath Road	Four times daily	No Services

Service Route	Route	Typical Frequency	
		Weekday	Weekend
870	Dublin, Millennium Spire – Rotunda, Granby Place – Mountjoy Street – Phibsborough, Cabra Road (North Circular Road) – Ashtown, Ashtown Roundabout – Blanchardstown, Blanchardstown Main – Mulhuddart, I.B.M Industries	Five times daily	No Services
900	Marshes Shopping Centre – Dundalk - Whitehall - Drumcondra - Dublin City	30 minutes	Five times daily
901	Marshes Shopping Centre – Dundalk - Whitehall - Drumcondra – Trinity College - Belfield, UCD	30 minutes – 1 hour	1 hour
901m	Silloge – City North Business Campus – Collins Avenue – Griffith Park – Temple Street – O'Connell Street Upper	Four times daily	No Services
910	UCD Campus-Leeson Street-City North Bus Campus-Whitecross-Laytown Train Station-Donacarney School-Southgate Bus Stop	Twice daily	Twice daily on Saturday; no Sunday service
933	Main Street Moville – The Diamond Carndonagh – Cockhill Road – Derry, Water Street – Asda – Omagh – Ballygawley Park and Ride – Killybrone, Aughnacloy – Dublin Airport – Gate Theatre	Two times daily	Two times daily
Nx	Navan – Blanchardstown N3 Slip – Phibsborough – O'Connell Street – Pearse Station – Wilton Terrace	20 minutes	20 – 30 minutes

5.3.6.4 General Traffic

5.3.6.4.1 R132 Drumcondra Road Lower between Botanic Avenue and Binn's Bridge (Royal Canal)

The R132 Drumcondra Road Lower, between the R132 Drumcondra Road Lower / Botanic Avenue / Cian Park Junction and Binn's Bridge, is approximately 670m in length. For most of its length, it comprises of one combined bus and cycle lane and one traffic lane in each direction. Between the junction with Clonliffe Road and Binn's Bridge, the road comprises two traffic lanes in each direction, and either a cycle lane or combined bus and cycle lane in the southbound direction, and an advisory cycle lane in the northbound direction.

Between the R132 Drumcondra Road Lower / Botanic Avenue / Cian Park Junction and the R132 Drumcondra Road Lower / R131 Clonliffe, Road Junction, opposing flows are separated by broken white lines, and white hatched marking delineate the approach to the signalised junctions. Between the R132 Drumcondra Road Lower / St Anne's Road Junction and the R132 Drumcondra Road Lower / Whitworth Place / Whitworth Road Junction, opposing flows are separated by a landscaped median strip.

The road is subject to a speed limit of 50km/h and varies in width between approximately 13.0m and 19.0m (where combined bus and cycle lanes are present). The road travels under an Iarnrod Eireann railway bridge, which has a height restriction of 5.32m, approximately 50m south of R131 Clonliffe Road Junction.

The existing major junction arrangements are as follows:

- R132 Drumcondra Road Lower / Botanic Avenue / Cian Park four-arm signalised Junction;
- R132 Drumcondra Road Lower / R131 Clonliffe Road three-arm signalised Junction; and
- R132 Drumcondra Road Lower / Whitworth Place / Whitworth Road four-arm signalised Junction.

R132 Drumcondra Road Lower / Botanic Avenue / Cian Park four-arm signalised Junction: This staggered, signalised junction links east west to the R108.

The northern arm approach consists of one ahead lane and one ahead and right-turn lane with a right-turn pocket beyond the stop lane. An advisory cycle lane extends from the advance stop line at this approach, straight ahead across the junction to the southern arm exit. The northern arm exit consists of two lanes.

The eastern arm has a two-way vehicular carriageway approximately 3.5m wide, leading to Cian Park residential estate.

The southern arm approach consists of one advisory cycle lane, and one straight ahead and left-turn lane, and one straight ahead and right-turn lane. The cycle lane continues straight ahead across the junction. White hatched road markings separate the approach and exit lanes. The southern arm exit consists of a single lane of approximately 7.5m width. A nearside combined bus and cycle lane is introduced approximately 10m south of the junction.

The western arm consists of a single lane approach and a single lane exit. There is a vehicular weight restriction of 3.5 tonnes on this road.

A yellow box is present in the middle of the junction. There is a signalised pedestrian crossing (pelican) on the southern arm, with a traffic island refuge and pedestrian guardrails on the traffic island.

The characteristics are shown in Image 5.19

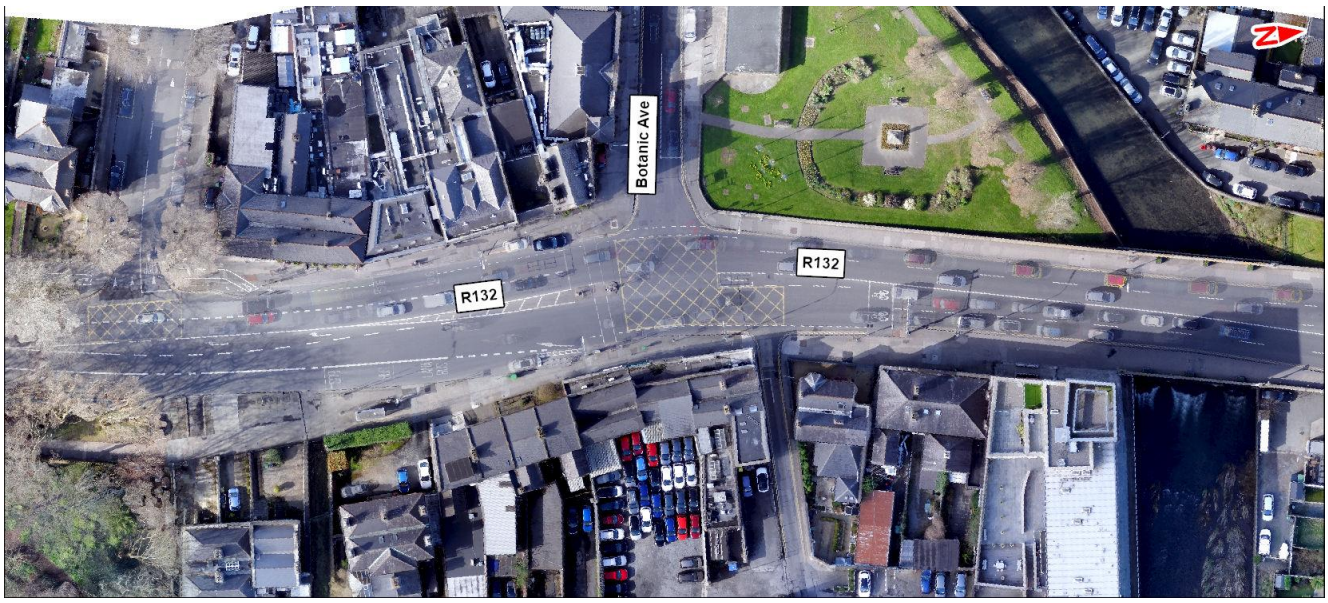

Image 5.19 Drumcondra Road Lower / Botanic Avenue / Cian Park Junction

R132 Drumcondra Road Lower / R131 Clonliffe Road three-arm signalised Junction: The northern arm approach consists of two straight ahead lanes, one straight ahead and left-turn lane which replaces the combined bus and cycle lane approximately 30m in advance of the junction, and one advisory cycle lane. Where the combined bus and cycle lane changes to a traffic lane, a yellow box is present. The advisory cycle lane extends straight ahead across the junction to the southern arm exit. The northern arm exit consists of one traffic lane approximately 6.0m wide.

The eastern arm approach consists of one left-turn lane and one right-turn lane. The eastern arm exit consists of one traffic lane.

The southern arm approach consists of one advisory cycle lane, two straight-ahead lanes, and one right-turn flare of approximately 35m length. The advisory cycle lane extends straight ahead across the junction and leads to a pedestrian and cyclist segregated facility on the northern arm exit. There is a box turn of vehicles turning right.

The southern arm exit consists of one advisory cycle lane, and two traffic lanes with a total width of approximately 8m.

A yellow box is present in the middle of the junction. There are signalised crossings (pelicans) on the northern and eastern arms. The crossing on the northern arm is staggered, with pedestrian guard rails on the traffic island.

The characteristics are shown in Image 5.20

Image 5.20 Drumcondra Road Lower / R131 Clonliffe Road three-arm signalised Junction

R132 Drumcondra Road Lower / Whitworth Place / Whitworth Road four-arm signalised Junction: The northern arm approach consists of two straight ahead lanes, and one combined bus and cycle lane which also permits left-turning and straight-ahead traffic approximately 15m in advance of the junction. Vehicles on this approach are not permitted to turn right. The combined bus and cycle lane continues straight ahead across the junction to the southern arm exit. The northern arm exit consists of two traffic lanes and one advisory cycle lane.

The eastern arm permits only exit from the junction. The eastern arm exit consists of one traffic lane.

The southern arm approach consists of two straight ahead lanes, and one left-turn lane which replaces the nearside combined bus and cycle lane approximately 35m in advance of the junction. Vehicles on this approach are not permitted to turn right. The southern arm exit consists of one combined bus and cycle lane, and two traffic lanes.

The western arm consists of a single lane approach and a single lane exit.

A yellow box is present in the middle of the junction. There are signalised crossings (pelicans) on the northern and western arms. The crossing on the northern arm is staggered, with pedestrian guard rails on the traffic island.

The characteristics are shown in Image 5.21.

Image 5.21 Drumcondra Road Lower / Whitworth Place / Whitworth Road four-arm signalised Junction

5.3.6.4.2 R132 Dorset Street Lower between Binn's Bridge (Royal Canal) and Frederick Street North

R132 Dorset Street Lower, between Binn's Bridge and Eccles Street / Hardwicke Place Junction, is a dual carriageway with a landscaped median strip. The road here consists of two traffic lanes and a combined bus and cycle lane in each direction. Between Eccles Street / Hardwicke Place Junction and Frederick Street North Junction, the road is a two-way single carriageway with a hatched median, which consists of one traffic lane and one combined bus and cycle lane in each direction.

This section is subject to a 50km/h speed limit. There are no bridges either above or below the road. The road travels in a relatively straight alignment in a south-western / north-eastern direction. From outer edge to outer edge the carriageway width varies between 13.5m and 23.0m.

The existing major junction arrangements are as follows:

- R132 Dorset Street Lower / Belvedere Road four-arm signalised Junction;
- R132 Dorset Street Lower / R101 North Circular Road Junction four-arm signalised Junction;
- R132 Dorset Street Lower / R802 Gardiner Street Upper four-arm signalised Junction; and
- R132 Dorset Street Lower / Eccles Street / Hardwicke Place four-arm signalised Junction.

R132 Dorset Street Lower / Belvedere Road four-arm signalised Junction: The northern arm approach consists of three straight ahead lanes, with the nearside lane replacing a combined bus and cycle lane approximately 25m in advance of the junction. Vehicles on this approach are not permitted to turn right. An advisory cycle lane starts at after the stop line at this approach and extends straight ahead across the junction to the southern arm exit. The northern arm exit consists of two traffic lanes, and one combined bus and cycle lane.

The eastern arm approach consists of one straight ahead lane and one right-turn lane. Vehicles on this approach are not permitted to turn left. An advisory cycle lane is present on the nearside of the carriageway but ends approximately 6m in advance of the stop line at this approach. The eastern arm exit consists of one traffic lane and an advisory cycle lane.

The southern arm approach consists of two straight ahead lanes, and one combined bus and cycle lane which also permits left-turning traffic approximately 25m in advance of the junction. Vehicles on this approach are not permitted to turn right. The combined bus and cycle lane continues through the junction to the northern exit arm. The southern arm exit consists of one combined bus and cycle lane, and two traffic lanes.

The western arm approach consists of one traffic lane. Vehicles on this approach are not permitted to turn right. The western arm exit consists of one traffic lane, approximately 2.0m wide. There is street parking present on the nearside at the exit. A 3.5 tonne weight restriction and a 30km/h slow zone is in operation on this arm.

A yellow box is present in the middle of the junction. There are signalised crossings (pelicans) on the eastern and southern arms.

The characteristics are shown in Image 5.22

Image 5.22 Dorset Street Lower / Belvedere Road Four-Arm Signalised Junction

R132 Dorset Street Lower / R101 North Circular Road Junction four-arm signalised Junction: The northern arm approach consists of one combined bus and cycle lane, and two straight ahead lanes. Vehicles on this approach are not permitted to turn left or turn right. An advisory cycle lane extends from the pedestrian crossing at this approach, straight ahead across the junction to the southern arm exit. The northern arm exit consists of one combined bus and cycle lane, and two traffic lanes.

The eastern arm approach consists of one advisory cycle lane, one left-turn lane, and one straight ahead lane. Vehicles on this approach are not permitted to turn right. The eastern arm exit consists of one traffic lane. A mandatory cycle lane starts approximately 10m after the exit.

The southern arm approach consists of one left-turn lane, two straight ahead lanes, and one right-turn pocket of approximately 25m length. The southern arm exit consists of three traffic lanes.

The western arm consists of a single lane approach and a single lane exit.

A yellow box is present in the middle of the junction. There are signalised crossings (pelicans) on the northern, eastern, and western arms. The crossing on the northern arm is staggered, with pedestrian guard rails on the traffic island.

The characteristics are shown in Image 5.23.

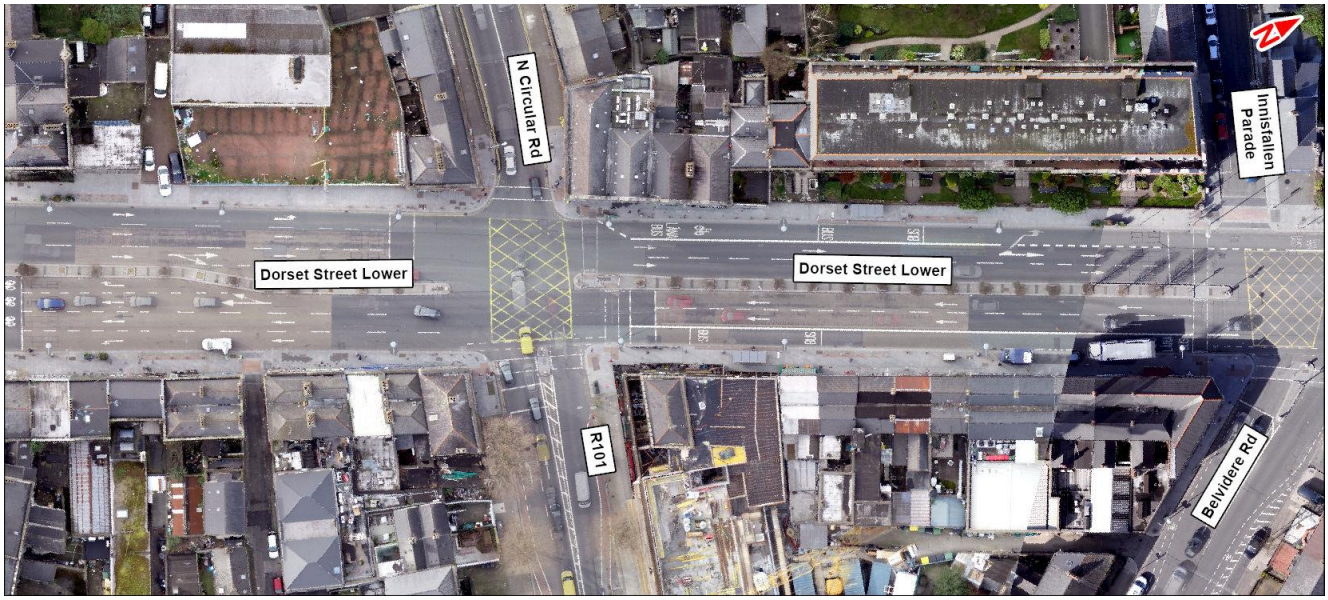

Image 5.23 R132 / North Circular Road Junction Arrangement

R132 Dorset Street Lower / R802 Gardiner Street Upper four-arm signalised Junction: The northern arm approach consists of one left-turn lane, two straight ahead traffic lanes, and one right-turn flare of approximately 25m length. The northern exit arm consists of three traffic lanes.

The eastern arm approach consists of one advisory cycle lane of approximately 6m length, one straight ahead and left-turn traffic lane, and one right-turn traffic lane. An advance stop line for cyclists is present. The eastern arm exit consists of one traffic lane.

The southern arm approach consists of two straight ahead lanes, and one left-turn and straight-ahead traffic lane which replaces the combined bus and cycle lane approximately 25m in advance of the junction. Vehicles on this approach are not permitted to turn right. The southern arm exit consists of two straight ahead traffic lanes, and one combined bus and cycle lane.

The western arm consists of a single lane approach and a single lane exit. There is a vehicular weight restriction of 3.5 tonnes on this road.

The junction has a yellow box road marking in its centre. There are signalised pedestrian crossings (pelicans) on the eastern, western and southern arms. The crossing on the southern arm is staggered, with pedestrian guard rails on the traffic island.

The characteristics are shown in Image 5.24.

Image 5.24 Dorset Street Lower / R802 Gardiner Street Upper Four-Arm Signalised Junction

R132 Dorset Street Lower / Eccles Street / Hardwicke Place four-arm signalised Junction: The northern arm approach consists of one straight ahead traffic lane, one right-turn flare of approximately 25m length, and one straight ahead and left-turn lane which replaces the combined bus and cycle lane approximately 20m in advance of the junction. An advance stop line for cyclists is present. The northern exit arm consists of one combined bus and cycle lane, and one traffic lane.

The eastern arm approach consists of two traffic lanes. The eastern arm exit consists of one traffic lane. A 30mph speed limit is in operation on this arm.

The southern arm approach consists of one straight ahead traffic lane, and one straight ahead and left-turn lane which replaces the combined bus and cycle lane approximately 30m in advance of the junction. Vehicles on this approach are not permitted to turn right. The southern arm exit consists of one combined bus and cycle lane, and one traffic lane.

The western arm approach consists of one straight ahead and left-turn lane, and one straight ahead and right-turn lane. An advance stop line for cyclists is present. The western arm exit consists of one traffic lane. A 30mph slow zone is in operation on this arm.

The junction has a yellow box road marking in its centre. There are signalised pedestrian crossings (pelicans) on all the arms.

The characteristics are shown in Image 5.25.

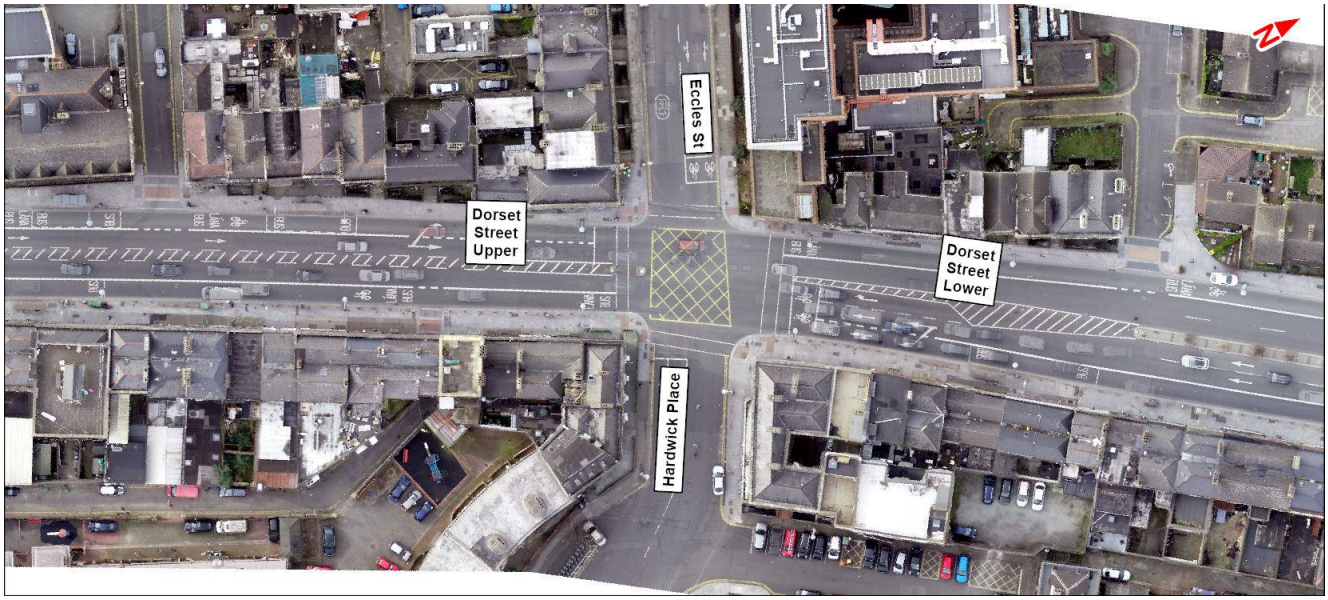

Image 5.25 Dorset Street Lower / Eccles Street / Hardwicke Place Four-Arm Signalised Junction

5.3.6.4.3 Dorset Street Upper between R132 Frederick Street North and Granby Row

Dorset Street Upper is a two-way single carriageway. Between R132 Frederick Street North Junction and Granby Row Junction, the carriageway consists of one traffic lane and one advisory cycle lane going southbound, and one traffic lane and one combined bus and cycle lane going northbound. Opposing flows are separated by a solid white line road marking.

This section is subject to a 50km/h speed limit and has no bridges either above or below the road. The road travels in a relatively straight alignment in a south-western / north-eastern direction. The carriageway width varies between 13.0m and 15.5m.

The existing major junction arrangements are as follows:

- R132 Dorset Street Upper / Frederick Street North / R135 Blessington Street four-arm signalised Junction; and
- Dorset Street Upper / Granby Row / R135 St. Mary's Place North four-arm signalised Junction.

R132 Dorset Street Upper / Frederick Street North / R135 Blessington Street four-arm signalised Junction: The northern arm approach consists of one left-turn and straight-ahead traffic lane which replaces the combined bus and cycle lane approximately 25m in advance of the junction, and one straight ahead traffic lane. Vehicles on this approach are not permitted to turn right. An advisory cycle lane extends from the pedestrian crossing at this approach, straight ahead across the junction to the southern arm exit. The northern arm exit consists of one combined bus and cycle lane, and one traffic lane. Hatched road markings separate opposing flows on this arm.

The eastern arm approach consists of one left-turn traffic lane. Vehicles on this approach are not permitted to turn right or go straight ahead. The eastern arm exit consists of one traffic lane, and one mandatory cycle lane of approximately 20m.

The southern arm approach consists of one combined bus and cycle lane and one general traffic lane. Vehicles on this approach are not permitted to turn right or turn left. The southern arm exit consists of one traffic lane approximately 5.0m wide, and one advisory cycle lane on the nearside of the carriageway.

The western arm approach consists of one left-turn lane, one straight-ahead lane, one right-turn lane, and one streaming cycle lane located between the left-turn and straight-ahead lane. There is an advance cycle lane on this approach. The western arm permits only entry to the junction.

The junction has a yellow box road marking in its centre. There are signalised pedestrian crossings (pelicans) on the northern, eastern and western arms, with traffic island refuges on the northern and eastern arms.

The characteristics are shown in Image 5.26.

Image 5.26 R132 Dorset Street Upper / Frederick Street North / R135 Blessington Street Four-Arm Signalised Junction

Dorset Street Upper / Granby Row / R135 St. Mary's Place North four-arm signalised Junction: The northern-eastern arm approach consists of two straight ahead traffic lanes, and an advisory cycle lane. Vehicles on the approach are not permitted to turn left or turn right. The advisory cycle lane extends straight ahead across the junction. The northern arm exit also consists of one combined bus and cycle lane, and one general traffic lane.

The south-eastern arm approach consists of one straight ahead lane, one right-tun bus lane (middle lane), and one right-turn lane. Vehicles on this approach are not permitted to turn left. The south-eastern arm permits only entry to the junction.

The south-western arm approach consists of one left-turn traffic lane and one straight head lane. Vehicles on this approach are not permitted to turn right. The south-western arm exit consists of one advisory cycle lane and one traffic lane.

The north-western arm permits only vehicles exiting the junction. This exit-only arm consists of two traffic lanes.

A yellow box is present in the middle of the junction. There are signalised crossings (pelicans) on the south-eastern, south-western, and north-western arms.

The characteristics are shown in Image 5.27

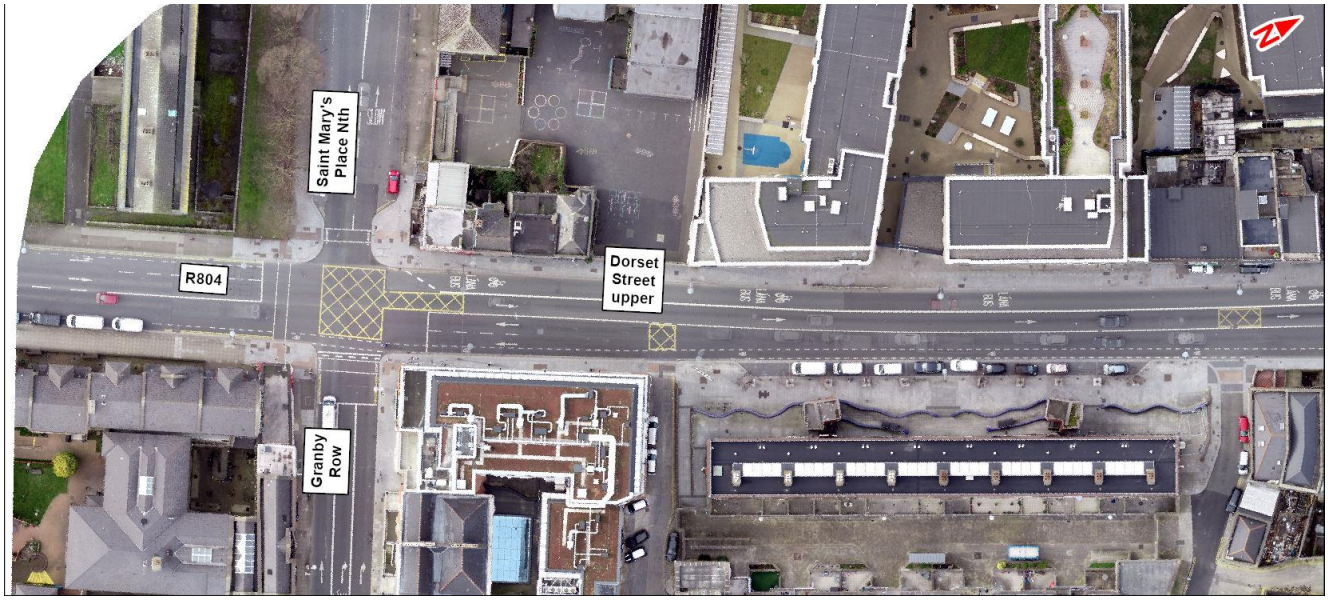

Image 5.27 Dorset Street Upper / Granby Row Junction Arrangement

5.3.6.4.4 R132 Frederick Street North, R132 Parnell Square East, and R132 Cavendish Row

R132 Frederick Street North is a two-way single carriageway with one lane in both directions, and either broken or solid white line road markings along the middle. The carriageway is approximately 10m in width. From the R132 Dorset Street Lower Junction, the road travels in a straight north-west / south-east direction for approximately 200m and becomes R132 Parnell Square East after the junction with Gardiner Row and Parnell Square North.

R132 Parnell Square East continues in the same direction, north-west / south-east, for approximately 180m, and becomes R132 Cavendish Row after the junction with Rutland Place. R132 Parnell Square East is a one-way single carriageway consisting of one combined bus and cycle lane, and one general traffic lane going south-east. There is a row of indented bus stops on this road, which takes up a strip of approximately 2.8m wide on the nearside of the carriageway. The carriageway width ranges between approximately 10.5m to 12.5m (where there are bus stops and street parking).

R132 Cavendish Row also continues in the same direction, north-west / south-east, for approximately 65m, and terminates at the junction with R803 Parnell Street and O'Connell Street Upper. R132 Cavendish Row is a one-way single carriageway consisting of one combined bus and cycle lane approximately 6.0m wide, and one general traffic lane approximately 4.7m wide, going south-east.

R132 Frederick Street North, R132 Parnell Square East, and R132 Cavendish Row are all subject to a speed limit of 30km/h.

The existing major junction arrangements are as follows:

- R132 Parnell Square East / Gardiner Row / Parnell Square North four-arm signalised; and
- R132 Cavendish Row / R803 Parnell Street / O'Connell Street Upper four-arm signalised Junction.

R132 Parnell Square East / Gardiner Row / Parnell Square North four-arm signalised Junction: The north-western arm consists of a single lane on the approach and a single lane on the exit. Vehicles on this approach are not permitted to turn right.

The north-eastern arm consists of a single lane on the approach and a single lane on the exit. Vehicles on this approach are not permitted to go straight ahead.

The south-eastern arm permits only vehicles exiting the junction. This exit-only arm consists of one traffic lane approximately 8.0m wide. A combined bus and cycle lane starts approximately 20m after the exit.

The south-western arm permits only vehicles entering the junction. The approach on this arm consist of a left-turn and straight-ahead lane approximately 4.3m wide, and a right-turn slip lane approximately 7.0m wide. A large traffic island, approximately 26m in length and 250m2 in area, separates the right-turn slip lane from the left-turn and straight-ahead lane.

A yellow box is present in the middle of the junction. There are signalised pedestrian crossings (pelicans) across all arms.

The characteristics are shown in Image 5.28

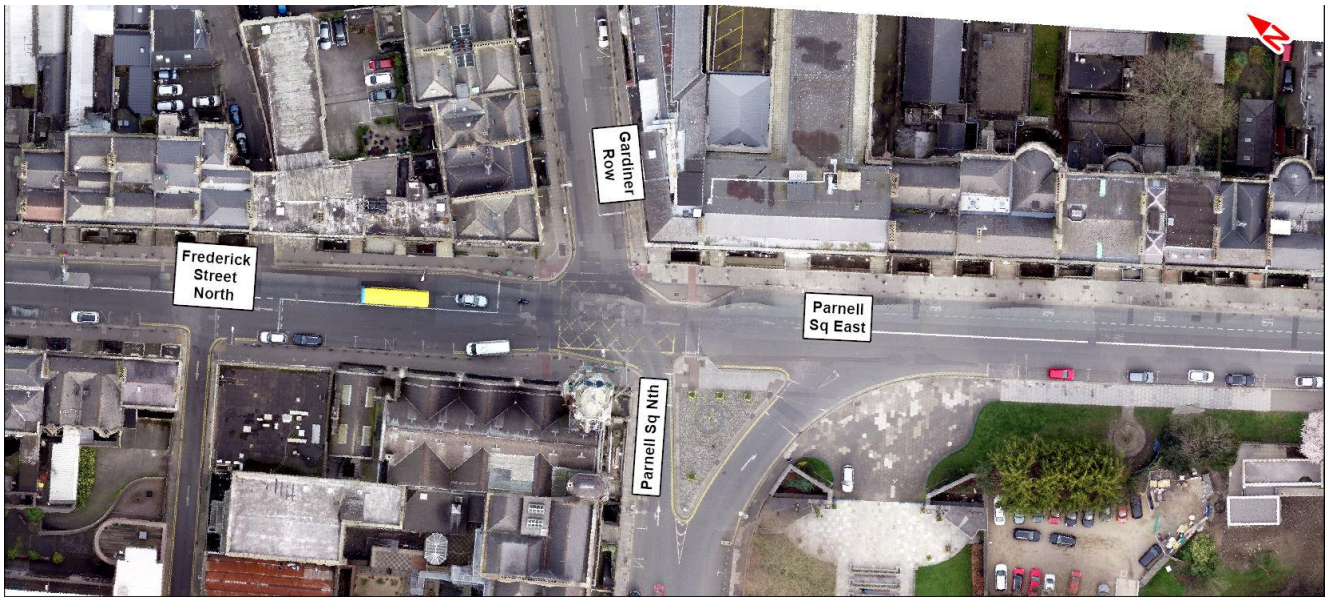

Image 5.28 Parnell Square East / Gardiner Row / Parnell Square North Junction

R132 Cavendish Row / R803 Parnell Street / O'Connell Street Upper four-arm signalised Junction: The Proposed Scheme extends to the end of Cavendish Row, and ties in with existing infrastructure on the R803 Parnell Street. The north-western arm (R132 Cavendish Row) permits only vehicles entering the junction. The approach on this arm consists of one left-turn and straight-ahead combined bus and cycle lane, one straight ahead combined bus and cycle lane, and two right-turn slip lanes. The two right-turn slip lanes are separated from the straight ahead and left-turn lanes by a large traffic island, on which the Parnell Monument is located. Vehicles from this approach are not permitted to go straight ahead, except for buses, taxis, cyclists and vehicles accessing properties on O'Connell Street Upper. Vehicles turning right from Cavendish Row into Parnell Street must yield to vehicles coming from O'Connell Street Upper and R803 Parnell Street.

Yellow boxes are present after the approach from Cavendish Row, on both sides of the Parnell Monument traffic island. There is a staggered pedestrian crossing across Cavendish Row, with pedestrian refuge on the Parnell Monument traffic island. Luas tracks run through this Junction, between O'Connell Street Upper and R803 Parnell Street.

The north-eastern arm exit consists of a single traffic lane approximately 7.0m wide. A combined bus and cycle lane starts approximately 10m after the exit.

The south-eastern arm exit consists of one advisory cycle lane, one bus lane, and traffic lane.

The south-western arm permits only vehicles exiting the junction. This exit-only arm consists of two traffic lanes, and one offside bus and tram lane. An advisory cycle lane starts approximately 10m after the exit.

The characteristics are shown in Image 5.29.

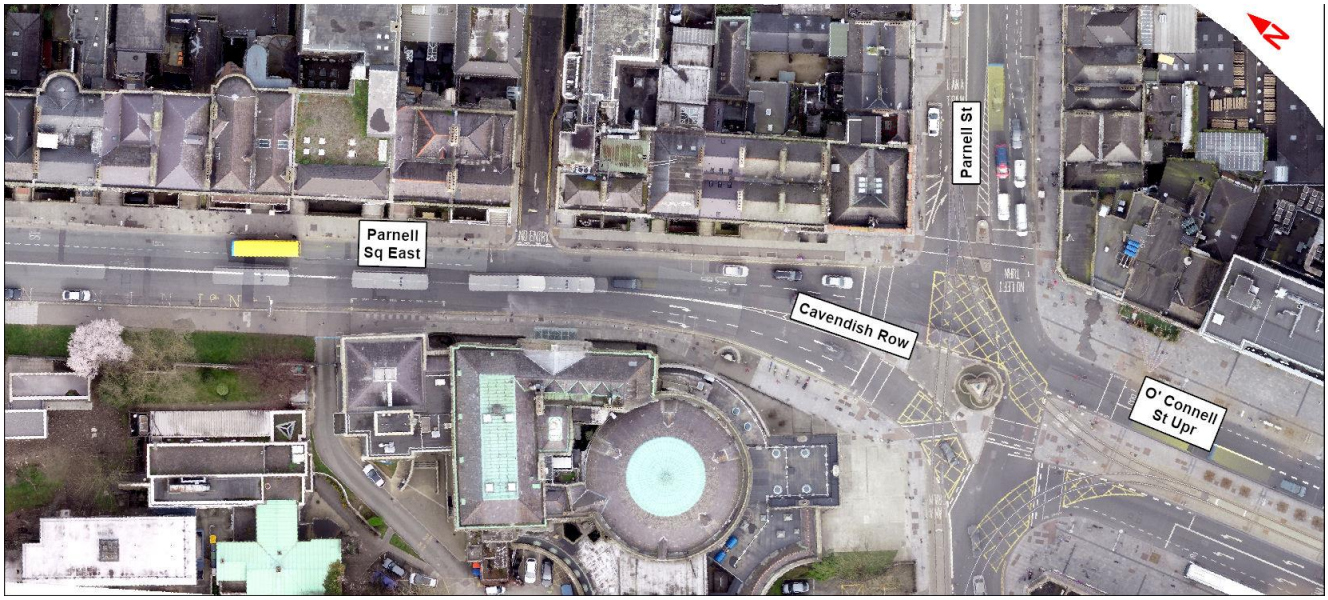

Image 5.29 Rae Cavendish / Parnell Street Junction

5.3.6.4.5 R132 Parnell Square West and Granby Row

R132 Parnell Square West is a one-way single carriageway with two traffic lanes. The carriageway is approximately 13m in width. From the R803 Parnell Street Junction, the road travels in a straight south-east / north-west direction for approximately 250m and becomes Granby Row after the junction with Parnell Square North.

Granby Row continues in the same direction, south-east / north-west, and terminates at the junction with Dorset Street Upper. The road is a one-way single carriageway approximately 9.0m wide, with two general traffic lanes, and a bus lane located in the middle.

R132 Parnell Square West and Granby Row are subject to a speed limit of 30km/h.

The existing major junction arrangement is the R132 Parnell Square West / R803 Parnell Street three-arm signalised Junction.

R132 Parnell Square West / R803 Parnell Street three-arm signalised Junction: The Proposed Scheme extends to the end of R132 Parnell Square West and ties in with existing infrastructure on the R803 Parnell Street.

The north-western arm (R132 Parnell Square West) permits only vehicles exiting the junction. This exit-only arm consists of two traffic lanes. There is a signalised pedestrian crossing (pelican) across this arm. Two yellow boxes are present at the mouth of the junction, between R803 Parnell Street and the pedestrian crossings, to keep this location clear for the Luas trams.

The north-eastern arm is one-way, only permitting vehicles entering the junction. The approach on this arm consists of one nearside straight-ahead advisory cycle lane, one straight ahead traffic lane, one right-turn general traffic lane, and one offside bus and tram lane for right-turning buses and straight-ahead trams. A kerbed traffic island separates the straight-ahead lanes from the right-turn lanes. The advisory cycle lane continues across the junction. A signalised pedestrian crossing (pelican) is present across the north-eastern arm.

The south-eastern arm approach consists of left-turn lane travelling towards the north western arm only. The traffic island in the middle of the junction prevents vehicles on this approach from going straight ahead. The Luas tracks runs along the north-western side of the carriageway and is separated from the north-eastbound traffic by a landscaped median strip. The south-eastern arm exit consists of one advisory cycle lane and one traffic lane. A signalised pedestrian crossing (pelican) is present across the south-eastern arm.

Vehicles coming from the north-eastern arm must observe two stop lines at this junction. First one is at the approach from the north-eastern arm, before entering the junction. Second one is at the south-eastern arm signalised pedestrian crossing, before exiting at the south-eastern arm.

The characteristics are shown in Image 5.30

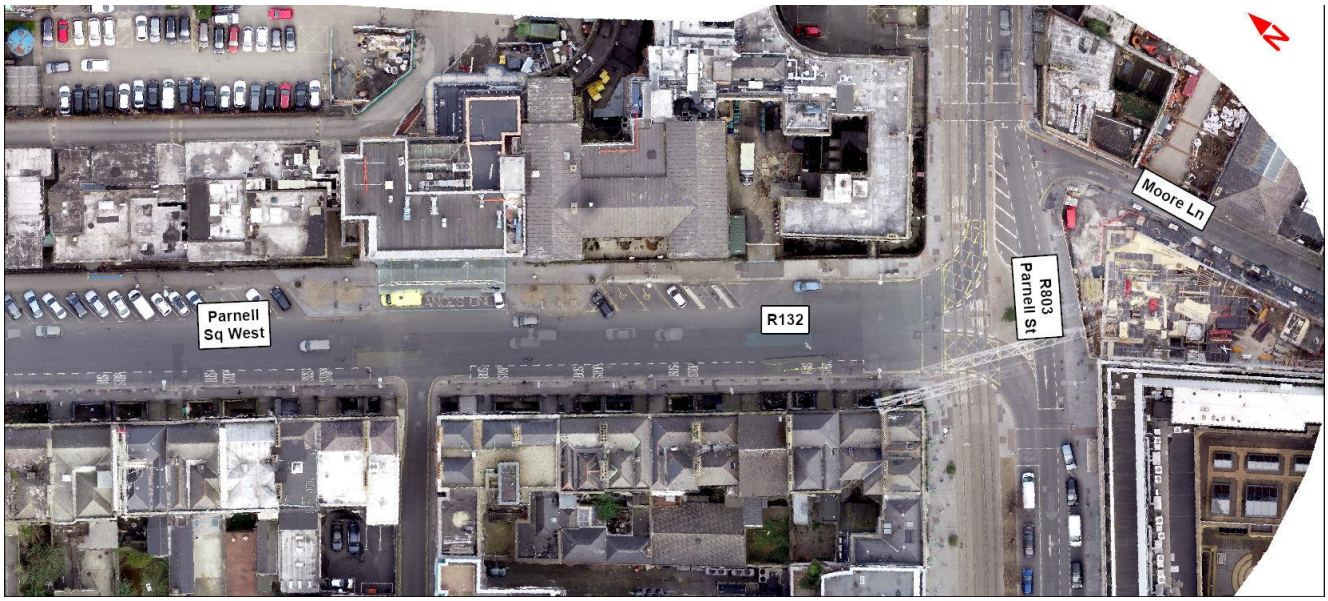

Image 5.30 Parnell Street / Parnell Square West Junction

5.3.6.5 Existing Car Parking / Loading

Along Section 5 of the Proposed Scheme there is a total of 725 existing parking / loading spaces. These comprise:

- 156 adjacent parking spaces between Hollybank Road and St Alphonsus' Road Lower;
- 14 'Pay and Display' spaces along R132 Drumcondra Road Lower, with 6 located along the northbound side of R132 Drumcondra Road Lower / Clonliffe Road Junction, and 8 located on the southbound side of R132 Drumcondra Road Lower / Clonliffe Road Junction;
- Nine loading bays along R132 Drumcondra Road Lower between Clonliffe Road to Whitworth Road, with seven located along the northbound side of R132 Drumcondra Road Lower and two located along the southbound side of R132 Drumcondra Road Lower;
- 196 adjacent parking spaces between St Anne's Road and Belvedere Road;
- Three loading bays along the southbound side of the R132 Dorset Street Lower, immediately south of the Belvedere Road access;
- 51 adjacent parking spaces between R101 North Circular Road and Gardiner Street Upper;
- Two 'Pay and Display' parking spaces along the R132 Dorset Street Lower northbound side, immediately south of Synnott Place access;
- One disabled permit parking space along the R132 Dorset Street Lower northbound side, immediately south of Synnott Place access;
- 169 adjacent parking spaces between Eccles Place and R135 St Mary's Place North;
- Six adjacent parking spaces along R132 Dorset Street Upper, immediately south of the R135 St Mary's Place North access;
- 19 'Pay and Display' parking spaces and 2 disabled permit parking spaces along Frederick Street North;
- 22 'Pay and Display' parking spaces and 6 disabled permit parking spaces along Parnell Square West; and
- 48 adjacent 'Pay and Display' parking spaces along Parnell Square North.

Table 5.17 presents a summary of the existing parking and loading spaces

Table 5.17 Section 5 – Existing Parking / Loading Spaces

Street	Parking Type	Number of Existing Parking Spaces
Hollybank Road to St Alphonsus' Road Lower	Adjacent	156
Drumcondra Road Lower / Clonliffe Road to Whitworth Road	Pay and Display	14
	Loading Bays	9
St Anne's Road to Belvedere Road	Adjacent	196
R132 Dorset Street Lower / Belvedere Road Junction	Loading Bays	3
North Circular Road to Gardiner Street Upper	Adjacent	51
R132 Dorset Street Lower / Synnott Place Junction	Pay and Display	2
	Disabled Permit Parking	1
Eccles Place to R135 St Mary's Place North	Adjacent	169
R132 Dorset Street Upper / R135 St Mary's Place North Junction	Adjacent	6
Frederick Street North / Parnell Square East / Parnell Square West	Pay and Display	41
	Disabled Permit Parking	8
	Adjacent Parking	48
		704

6. Potential Impacts

6.1 Characteristics of the Proposed Scheme

The characteristics of the Proposed Scheme are described in detail in Chapter 4 (Proposed Project Description) of the EIAR.

6.2 Do Nothing Scenario

With regards to this TIA, 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.

6.3 '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 include 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.

6.3.1.1 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 including the 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, 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.

6.3.1.2 Do Minimum Transport Demand

The transport demand changes for the 2028 and 2043 assessment years have been included in the analysis contained within this TIA, 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, 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, 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.

6.4 '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.

6.5 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 the 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.

6.5.1 Description of Construction Works

The Proposed Scheme has been divided into five primary Construction Phase sections. These have been further subdivided into 10 sub-sections, according to the types of construction works required. These sections and subsections are outlined below.

- **Section 1:** Pinnock Hill Junction to Airside Junction.
- **Section 2:** Airside Junction to Northwood Avenue:
    - **Section 2a:** Airside Junction to Airport Roundabout;
    - **Section 2b:** Airport Roundabout to Old Airport Road; and
    - **Section 2c:** Old Airport Road to Northwood Avenue.
- **Section 3:** Northwood Avenue to Shantalla Road:
    - **Section 3a:** Northwood Avenue to Omni Park Shopping Centre; and
    - **Section 3b:** Omni Park Shopping Centre to Shantalla Road.
- **Section 4:** Shantalla Road to Botanic Avenue:
    - **Section 4a:** Shantalla Road to Griffith Avenue; and
    - **Section 4b:** Griffith Avenue to Botanic Avenue.
- **Section 5:** Botanic Avenue to Granby Row:
    - **Section 5a:** Botanic Avenue to North Fredrick Street;
    - **Section 5b:** North Fredrick Street to Granby Row; and
    - **Section 5c:** Parnell Square including North Frederick Street.

The location of each section along the Proposed Scheme is shown in Diagram 6.1.

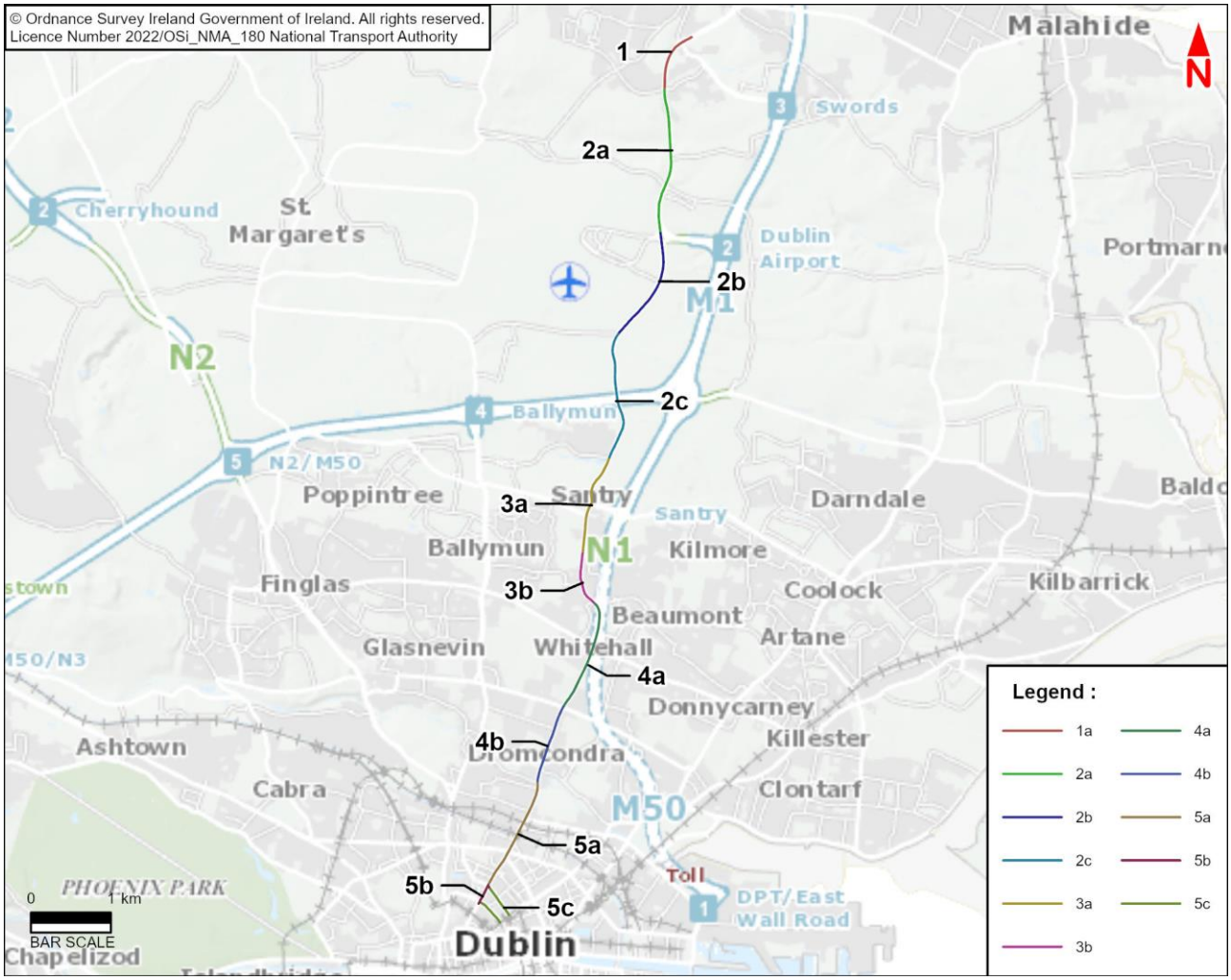

Diagram 6.1: Locations of Proposed Subsections of Construction

6.5.2 Construction Programme

An outline, indicative programme for the construction of the Proposed Scheme is provided in EIAR Chapter 5 (Construction). The Construction Phase of 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.

6.5.3 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 along the National roads such as the close-by M50 and from the local Regional road network. It is assumed that all National and Regional roads including the Regional routes in the immediate vicinity of the Proposed Scheme will be used to supply / remove this material.

The following national roads are expected to be used as construction vehicle access routes during the Construction Phase of the Proposed Scheme:

- M1 Motorway;
- M50 Motorway; and
- N1.

The following regional roads will be utilised as construction vehicle routes during the construction period:

- R102;
- R106; and
- R125.

Given the length and varying nature of each subsection it is proposed to establish five construction compounds for the duration of the works. These are:

- **Construction Compound SW1:** Cloghran Roundabout;
- **Construction Compound SW2:** Collinstown Cross;
- **Construction Compound SW3:** Coolock Lane;
- **Construction Compound SW4:** Collins Avenue; and
- **Construction Compound SW5:** Drumcondra Bridge.

In addition to the construction compounds, welfare facilities will be provided along the Proposed Scheme. The Contractor, when appointed, may identify other (or additional) construction compound locations, subject to gaining all necessary approvals.

Diagram 6.2 illustrates the proposed construction route to and from the main construction compounds.

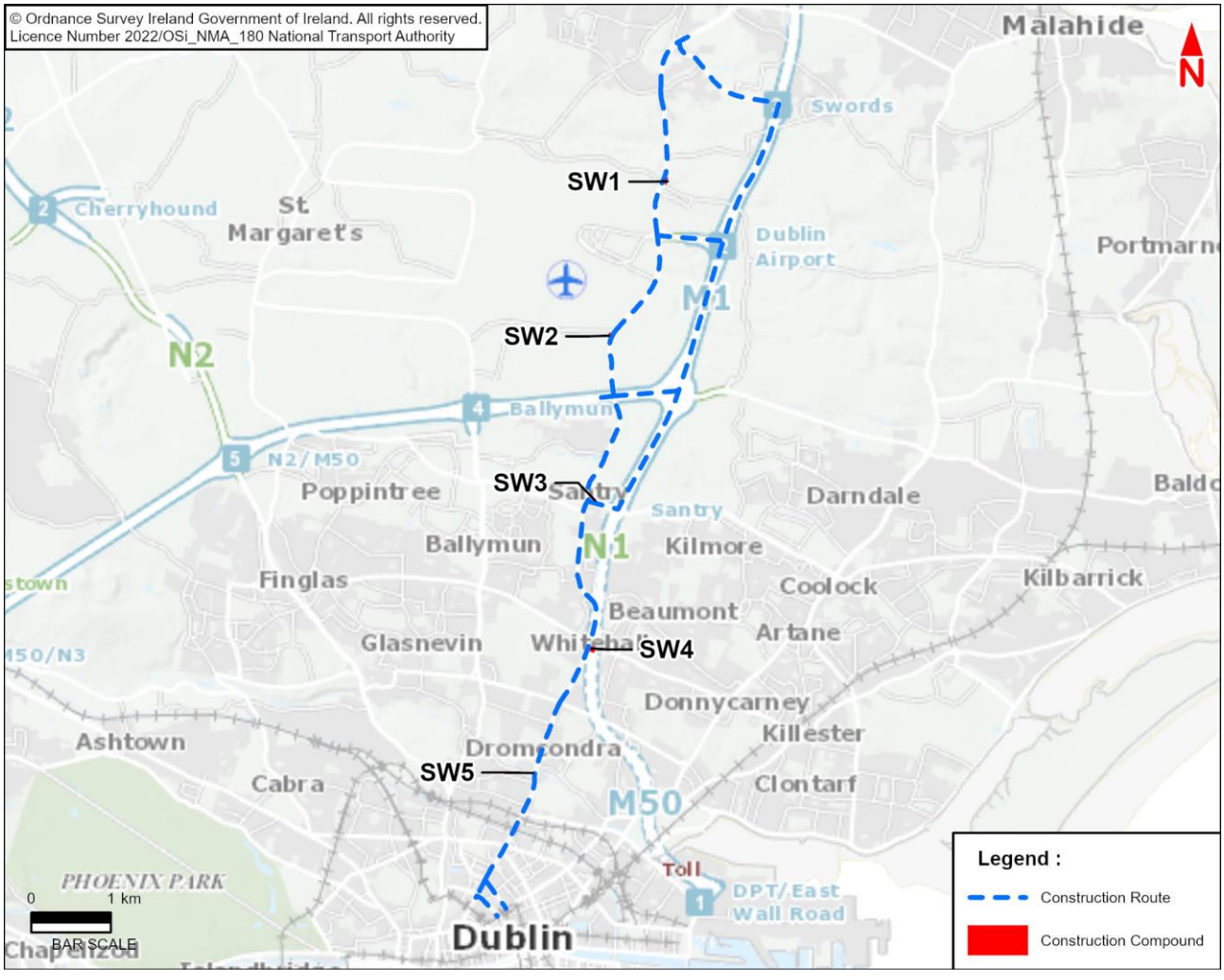

Diagram 6.2: Proposed Construction Route and Construction Compound Locations

6.5.4 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 to 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.

6.5.4.1 Pedestrian Provisions

As described in Chapter 5 (Construction) of this report, pedestrians will be temporarily impacted by construction activities along the direct study area. Pedestrian diversions and temporary surface footpaths will be used to facilitate pedestrian movements around construction activities. Access to local amenities, such as 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 footpaths 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 footpath diversions. Entrance points to the construction zone will be controlled as required.

6.5.4.2 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.

6.5.4.3 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.

6.5.4.4 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.

6.5.4.5 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 indicative temporary traffic management measures to facilitate construction of the Proposed Scheme are included in Chapter 5 (Construction). 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.

6.5.4.5.1 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 are to be maintained in both directions. There may be a requirement for some localised temporary lane closures for short durations of 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.

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 effect 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 **Error! Reference source not found.**, **Error! Reference source not found.** and **Error! Reference source not found.** 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 1e, 1i, 1g, 1j, 1l, 2b, 2f, 3b, 4a, 4b, 4c, 5b, 5c and 5d were under construction concurrently. Further details on the impact assessment can be found within these chapters.

6.5.4.5.2 Construction Traffic Generation

Site Operatives: As described in Chapter 5 (Construction) of the EIAR, there will typically be 250 staff directly employed across the Proposed Scheme, rising to 300 staff at peak construction.

Typical work hours on site are between 07:00 and 23:00 with staff working across early and late shifts. 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 the 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 36 vehicles. This occurs during Q2 and Q3 of construction when sections 1, 2b, 3a, 3b, 4b and 5c are all operational.

In a typical hour during peak haulage activity of the Proposed Scheme, 40% of HGVs are anticipated to be in operation, which equates to 14 HGVs in operation total.

Overall Peak Hour Impacts: 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 (veh)		Departures (veh)		Total Two-Way Traffic Flows (vehicles)
	Car / Van	HGV	Car / Van	HGV	
AM Peak Hour	10	32	0	32	74
PM Peak Hour	0	32	10	32	74

Given that the above impacts are below the thresholds set out in TII's Guidelines for Transport Assessments, it is considered appropriate to define the potential significance of traffic impacts of the Construction Phase to be **Low Negative and Short-term.** 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. An outline CTMP can be found in Appendix A (Construction Traffic Management Plan) of Appendix A5.1 (Construction Environmental Management Plan) in Volume 4 of the EIAR.

6.5.5 Construction Phase Summary

Table 6.2 presents a summary of the predicted impacts of the Proposed Scheme during the Construction Phase.

Table 6.2 Summary of Construction Phase Predicted Impacts

Assessment Topic	Effect	Predicted 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

6.6 Operational Phase

6.6.1 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.

6.6.2 Qualitative Assessment

6.6.2.1 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 five 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.

6.6.2.1.1 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 footpaths 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 4. 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 (or raised table treatment) and road markings for pedestrians (including able-bodied, wheelchair users, mobility impaired and pushchairs)?
Widths	Are there adequate footpath 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

6.6.2.1.2 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	Crossings at signalised junctions for cyclists along Proposed Scheme / 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

6.6.2.1.3 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 (containment Kassel 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.

6.6.2.1.4 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.

Note that the parking and loading assessment has been undertaken as a qualitative analysis based on the above criteria and does not generate a resulting LoS rating.

6.6.2.2 Section 1 – Pinnock Hill Junction to Airside Junction

This section of the TIA assesses the impacts of the proposals along Section 1 of the Proposed Scheme during operation. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in Appendix A6.5.1 (Pedestrian Infrastructure Assessment).

6.6.2.2.1 Pedestrian Infrastructure

The key infrastructural changes to pedestrian facilities along Section 1 of the Proposed Scheme are the following:

- Provision of a new signalised pedestrian crossing on the northern arm (R836 Dublin Road) of the Pinnock Hill roundabout junction;
- Conversion of the Pinnock Hill roundabout junction to a signalised junction, providing signalised pedestrian crossing facilities where none currently exist; and
- The provision of raised crossings on the minor arm on the majority of minor priority junctions.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 1 of the Proposed Scheme is 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

Junction	Chainage	Do Minimum LoS	Do Something LoS	Impact
Pinnock Hill four-arm Roundabout	A0 - A200	E	A	High Positive
R836 Dublin Road Mid-Link Crossing	A150	N/A	A	High Positive
R132 Swords Road / Airside / Boroimhe Road	A780 - A820	E	B	Medium Positive
Section Summary		**E**	**A**	**High Positive**

The contents of Table 6.9 demonstrate that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure at junctions within Section 1.

The LoS during the Do Minimum scenario ranges between E and F (N/A) for the three junctions being assessed. In the Do Something scenario, there are improvements in the assessed LoS at all of the junctions, with all three being brought up to the highest A or B ratings. 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 footpath 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** 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.

6.6.2.2.2 Cycling Infrastructure

The following section sets out the qualitative impacts on the cycling receptor for Section 1 of the Proposed Scheme. The results are summarised in Table 6.10.

The key cycling improvements along Section 1 of the Proposed Scheme can be summarised as follows:

- Proposed minimum 2.0m wide cycle tracks in both directions along R132 Dublin Road between Pinnock Hill Roundabout and Airside Junction to replace the existing combined bus and cycle lanes along the main corridor;

- Proposed cycle lanes on all arms of Pinnock Hill Roundabout and Airside Junction; and
- Proposed provision of continuous cycle bypasses at all bus stops.

Along Section 1, the Proposed Scheme will provide a 60mm set down kerb segregation between the footpath 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 tracks 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. TIA Appendix 4.2 (Cycling Infrastructure Assessment) 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

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132 Dublin Road: North of Pinnock Hill Roundabout to Airside Junction	A 0 - A 820	D	A	High Positive
Section Summary		**D**	**A**	**High Positive**

The contents of Table 6.10 demonstrate that the Proposed Scheme will have a **High Positive** impact on the cycling environment along Section 1.

The LoS in the Do Minimum scenario has been assessed as a D, indicating that the existing facilities are not of a particularly high standard. The LoS in the Do Something scenario show improvements through being brought up to a LoS of A by the Proposed Scheme. In Section 1, the improvements arise from the provision of dedicated cycle facilities on links where there are either shared pedestrian / cycle facilities, or no cycle facilities currently exist.

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’.

6.6.2.2.3 Bus Infrastructure

This assessment outlines the changes to bus stop infrastructure along Section 1 of the Proposed Scheme. It assesses any changes in the number or location of stops, and any changes to bus stop facilities.

There are currently five bus stops along this section of the Proposed Route – two ‘inbound’ stops towards the City Centre and three ‘outbound’ stops towards Swords along R132 Dublin Road.

Under the proposals, there will be a total of five stops – one ‘inbound’ and four ‘outbound’. An existing inbound bus stop (3695) will not be utilised by the BusConnects Scheme, so will not be assessed as part of the Swords CBC Proposed Scheme. Outbound, a new stop will be provided along L2300 Boroimhe Road, close to Stop 5030.

Table 6.11 summarises the proposed changes to bus stop facilities in Section 1 of the Proposed Scheme.

Table 6.11 Overview of Changes in Bus Stop Facilities Along the Proposed Route

Bus Stop Facility	Do Minimum		Do Something		Comment
	Number of stops	Percentage of stops	Number of stops	Percentage of stops	
RTPI (Real Time Passenger Information)	0	0%	5	100%	RTPI added to all bus stops.
Timetable information	4	80%	5	100%	Timetable information added to be provided at all bus stops.
Shelter	2	40%	5	100%	Shelters to be provided at all bus stops.
Seating	2	40%	5	100%	Seating to be provided at all bus stops.
Accessible Kerbs	5	100%	5	100%	Accessible kerbs added to all bus stops.
Indented Drop Off Area	0	0%	0	0%	Three out of the five stops will be located within bus lanes, meaning that general traffic will not be delayed by stationary buses.
Total number of stops	5		5		The same number of stops in the Do Minimum and Do Something.

The contents of Table 6.11 shows that there is currently varied provision at existing stops, with less than half having shelters and seating. As part of the Proposed Scheme, all of the new and existing bus stops will have shelters with seating, real-time bus information and accessible kerbs. Bus lanes will be provided along the entirety of the R132 Dublin Road for this section, replacing current intermittent provision.

The improvements in the provision of real-time information, shelters, and seating, throughout Section 1 is assessed as providing a **Low Positive** impact for bus passengers.

6.6.2.2.4 Parking and Loading

The Proposed Scheme will not impact on existing parking and loading along Section 1.

6.6.2.3 Section 2 – Airside Junction to Northwood Avenue

6.6.2.3.1 Pedestrian Infrastructure

The key infrastructural changes to pedestrian facilities along Section 2 of the Proposed Scheme are the following:

- Provision of two new toucan mid-link crossings on R132 Swords Road, one located to the south of the N1 Business Park and one to the north of Collinstown Business Park;
- Relocation of one existing pelican crossing to south of R132 Swords Road / Coachman's Inn access to increase proximity to bus stops and conversation of the crossing to a toucan crossing;
- Conversion of the R132 Swords Road / Naul Road / Stockhole Lane roundabout junction to a signalised junction, providing signalised pedestrian crossing facilities where none currently exist;
- Upgrades to existing junctions (to increase the number and / or directness of pedestrian crossings R132 Swords Road / Kettles Lane junction, R132 Swords Road / Old Airport Road junction, R132 Swords Road / Quick Park junction, R132 Swords Road / Turnapin Lane / Dublin Airport Business junction and R132 Swords Road / Northwood Avenue junction); and
- The provision of raised crossings on the minor arm on the majority of minor priority junctions.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 2 of the Proposed Scheme are summarised in Table 6.12. 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 6.12: Section 2 –Pedestrian Impact During Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132 Swords Road / N1 Business Park Access	A1070 - A1100	E	B	Medium Positive
R132 Swords Road Mid-Link Crossing	A1120- A1150	N/A	A	High Positive
R132 Swords Road / Kettles Lane three-arm Junction	A1660 - A1680	F	B	High Positive
R132 Swords Road / Naul Road / Stockhole Lane four-arm junction (Cloghran Roundabout)	A1970 - A2060	D	B	Medium Positive
R132 Swords Road / Old Stockhole Road	A2120 - A2150	E	B	Medium Positive
R132 Swords Road / Coachman's Inn access	A2250 - A2300	F	B	High Positive
Dublin Airport four-arm Roundabout	A2600 - A2800	E	C	Medium Positive
R132 Swords Road / Kealy's Junction	A3050 - A3070	F	B	High Positive
R132 Swords Road / Old Airport Road four-arm Signalised Junction	A4070-A4110	E	B	Medium Positive
R132 Swords Road / Quick Park three-arm Priority Junction	A4300-A4330	E	B	Medium Positive
R132 Swords Road / Carlton Dublin Airport Hotel three-arm Priority Junction	A4350-A4380	E	B	Medium Positive
R132 Swords Road / Collinstown Business Park Junction	A4500 - A4550	D	B	Medium Positive
R132 Swords Road mid-link crossing (Collinstown Business Park)	A4550 - A4570	N/A	A	High Positive
R132 Swords Road / North Ring Business Park three-arm Priority Junction	A4950-A4970	D	B	Medium Positive
R132 Swords Road / Turnapin Lane / Dublin Airport Business Park Four-arm Signalised Junction	A5200 - A5250	E	A	High Positive
R132 Swords Road / Furry Park Industrial Estate three-arm Priority Junction	A5480-A5510	D	B	Medium Positive
R132 Swords Road / Northwood Avenue three-arm Signalised Junction	A5700-A5750	E	A	High Positive
Section Summary		**E**	**B**	**Medium Positive**

The contents of Table 6.12 demonstrate that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure at junctions within Section 2. The LoS during the Do Minimum scenario ranges between D and F, with 13 of the 17 junctions being assessed as E or lower. In the Do Something scenario, there are improvements in the assessed LoS at all of the junctions, with 16 of the 17 being brought up to the highest A or B ratings. 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 footpath 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 **Medium Positive impact** to 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.

6.6.2.3.2 Cycling Infrastructure

The following section sets out the qualitative impacts on the cycling receptor for Section 2 of the Proposed Scheme.

The key cycling amendments along Section 2 of the Proposed Scheme can be summarised as follows:

- Proposed 2.0 wide cycle tracks in both directions along R132 Dublin Road and R132 Swords Road between Airside Junction and north of Dublin Airport Roundabout to replace the existing cycle lanes and combined bus and cycle lanes along the main corridor;
- Proposed 3.3m wide two-way segregated facility along the northbound side between north of Dublin Airport Roundabout and South Corballis Road Junction along R132 Swords Road to replace the existing pedestrian / cyclist facilities;
- Proposed 1.5m cycle track adjacent to each side of R132 Swords Road between South Corballis Road Junction and north of Old Airport Road Junction to replace the replace the existing shared pedestrian / cyclist lanes;
- Proposed 2.0m cycle track adjacent to each side of R132 Swords Road between Old Airport Road Junction and Northwood Lane to replace the existing cycle lanes and combined bus and cycle lanes along the main corridor;
- Proposed signal priority for cyclists at the majority of signalised junctions and cycle lane / track provides priority at the majority of priority junctions along Section 2; and
- Proposed toucan crossings proposed south of the N1 Business Park Access and south of Collinstown Business Park and at junctions with South Corballis Road and Northwood Avenue.

Along Section 2, the Proposed Scheme will provide a 60mm set down kerb segregation between the footpath 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 tracks will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.13 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 can be found in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

Table 6.13: Section 2 Cycling Impact during Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132 Dublin Road: Airside Junction to Cloghran Roundabout	A820 - A2050	D	A	High Positive
R132 Dublin Road: Cloghran Roundabout to Dublin Airport Roundabout	A 2050 - A2750	D	A	High Positive
R132 Swords Road: Dublin Airport Roundabout to Old Airport Road Junction	A2750 - A4120	B	B	Negligible
R132 Swords Road: Old Airport Road Junction to Carlton Dublin Airport Hotel Junction	A4120 - A4360	C	B	Low Positive
R132 Swords Road: Carlton Dublin Airport Hotel Junction to Turnapin Lane Junction	A4360 - A5200	C	B	Low Positive

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132 Swords Road: Turnapin Lane Junction to Northwood Avenue Junction	A5200 - A5700	C	A	Medium Positive
Section Summary		**C**	**B**	**Low Positive**

The contents of Table 6.13 demonstrate that the Proposed Scheme will have a **Low Positive** impact on the cycling environment along Section 2.

The LoS across the six sub-sections in the Do Minimum scenario has been assessed as ranging from B to D with five of the six being assessed as a C or lower indicating that generally the existing facilities are not of a particularly high standard.The LoS in the Do Something scenario show improvements on every sub-section with the exception of between Dublin Airport Roundabout to Old Airport Road Junction where the LoS is assessed as B in both the Do Minimum and Do Something scenarios. Three of the sub sections are brought up to a LoS of A by the Proposed Scheme, and the remaining three are assessed as a B. In Section 2, the improvements arise from the provision of dedicated cycle facilities on links where there are either shared pedestrian / cycle facilities, or no cycle facilities currently exist.

The findings of the cycling assessment 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’.

6.6.2.3.3 Bus Infrastructure

This assessment outlines the changes to bus stop infrastructure along Section 2 of the Proposed Scheme. It assesses any changes in the number or location of stops, and any changes to bus stop facilities. There are currently 22 bus stops along Section 2 of the Proposed Route – 12 ‘inbound’ stops towards the City Centre and 10 ‘outbound’ stops towards Swords.

Under the proposals, there will be a total of 20 stops – 11 ‘inbound’ and 9 ‘outbound’, with one new stop being added and three removed. Inbound, a new outbound stop will be provided north of Kettles Lane, close to Stop 3698.

Table 6.14 summarises the proposed changes to bus stop facilities in Section 2 of the Proposed Scheme.

Table 6.14 Overview of Changes in Bus Stop Facilities Along the Proposed Route

Bus Stop Facility	Do Minimum		Do Something		Comment
	Number of stops	Percentage of stops	Number of stops	Percentage of stops	
RTPI (Real Time Passenger Information)	8	36%	20	100%	RTPI added to all bus stops.
Timetable information	15	68%	20	100%	Timetable information added to be provided at all bus stops.
Shelter	7	32%	20	100%	Shelters to be provided at all bus stops.
Seating	6	27%	20	100%	Seating to be provided at all bus stops.
Accessible Kerbs	22	100%	20	100%	Accessible kerbs added to all bus stops.
Indented Drop Off Area	5	23%	5	25%	Most stops will be located within bus lanes, meaning that general traffic will not be delayed by stationary buses. The bus stops that will be located in indented drop-off areas (lay-bys) are those that serve longer distance services where buses may need to remain stationary for longer.
Total number of stops	22		20		Two fewer bus stops than the Do Minimum

The contents of Table 6.14 show that there is currently varied provision at existing stops, with less than half having shelters and seating. As part of the Proposed Scheme, all of the new and existing bus stops will have shelters with seating, and real-time bus information. Five of the proposed 20 bus stops will have indented drop off areas. Bus lanes will be provided along the entirety of the R132 corridor, replacing current intermittent provision.

The improvements in the provision of real-time information, shelters, and seating throughout Section 2 is assessed as providing a **Low Positive** impact for bus passengers.

6.6.2.3.4 Parking and Loading

The Proposed Scheme will impact on existing parking along Section 2. The main areas of parking changes are as follows:

- There are currently 42 informal parking spaces south of the R132 Dublin Road / Old Stockhole Road Junction, located within a commercial car parking area. It is proposed to remove 13 of the informal parking spaces on the forecourt of The Coachman's Inn, to facilitate the implementation of a cycle track along the R132 southbound link, which will provide enhanced cyclist facilities. 78 dedicated adjacent parking spaces to the side and back of The Coachman's Inn will be retained.

- There are currently 46 commercial display parking spaces south of the R132 Swords Road / Old Airport Road Junction, located within a commercial car parking area. It is proposed to remove 14 spaces on the forecourt of Paddy Shanahan's Car Services, to facilitate the implementation of a cycle track along the R132 northbound link, which will provide enhanced cyclist facilities.

Table 6.15 presents a summary of the parking and loading spaces during the Do Minimum and Do Something scenarios and the resulting loss in parking along Section 2.

Table 6.15 Section 2 Parking Provision

Street	Parking Type	Number of Parking Spaces		
		Do Minimum	Do Something	Change
R132 Swords Road / Old Stockhole Road	Informal Parking	42	29	-13
	Adjacent Parking	78	78	0
Paddy Shanahan Cars, Swords Road / Old Airport Road	Commercial vehicles parked for display	46	32	-14
Total		**166**	**139**	**-27**

With the change in parking provisions at the locations specified, the Proposed Scheme will be able to provide significant improvements to walking, cycling and bus facilities, and encourage the use of sustainable modes of transport, which will ultimately reduce the demand for public parking spaces. Considering the overall retention of 139 parking spaces compared to a loss of 27 spaces and the potential shift to sustainable modes, the impact to parking along Section 2 is considered to be a **Low Negative** impact**.**

6.6.2.4 Section 3 – Northwood Avenue to Shantalla Road

6.6.2.4.1 Pedestrian Infrastructure

The key infrastructural changes to pedestrian facilities along Section 3 of the Proposed Scheme are the following:

- Provision of a new pelican crossings on R132 Swords Road south of the Shanowen Road junction;
- Upgrades to existing junctions to increase the number and / or directness of pedestrian crossings (R132 Swords Road / Morton Stadium access (north), R132 Swords Road / Coolock Lane junction, R132 Swords Road / Santry Avenue / Church Lane junction, R132 Swords Road / Magenta Crescent junction, R132 Swords Road / Lorcan Road / Omni Park Shopping Centre junction, R132 Swords Road / Larkhill Road / Shanrath Road junction and R132 Swords Road / Shantalla Road junction); and
- The provision of raised crossings on the minor arm on the majority of minor priority junctions.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Section 3 of the Proposed Scheme are summarised in Table 6.16. 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 6.16: Section 3: Significance of Effects for Pedestrian Impact During Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132 Swords Road / Santry Close three-arm Priority Junction	A5760-A5780	E	B	Medium Positive
R132 Swords Road / Morton Stadium access (north)	A6030 - A6050	C	B	Low Positive
R132 Swords Road / Morton Stadium access (south)	A6110 - A6130	C	B	Low Positive
R132 Swords Road / Morton Stadium access (south)	A6180 - A6200	C	B	Low Positive
R132 Swords Road / Coolock Lane four-arm Signalised Junction	A6320-A6360	F	C	Medium Positive
R132 Swords Road / Santry Avenue / Church Lane four-arm Signalised Junction	A6470-A6500	E	B	Medium Positive

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132 Swords Road / Schoolhouse Lane Priority Junction	A6600-A6640	C	B	Low Positive
R132 Swords Road / Magenta Crescent three-arm Priority Junction	A6740-A6760	E	A	High Positive
R132 Swords Road / Santry Hall Industrial Estate three-arm Priority Junction	A6780 - A6800	C	B	Low Positive
R132 Swords Road / Lorcan Road / Omni Park Shopping Centre four-arm Signalised Junction	A6970 - A7010	E	C	Medium Positive
R132 Swords Road / Shanowen Road three-arm Signalised Junction	A7330 - A7350	B	A	Low Positive
R132 Swords Road Mid-Link Crossing (Santry Village)	A7420- A7460	N/A	A	High Positive
R132 Swords Road / Larkhill Road / Shanrath Road five-arm Signalised Junction	A7600 - A7650	F	A	High Positive
Swords Road (R132) / Shantalla Road three-arm Priority Junction	A7750 - A7800	E	C	Medium Positive
Section Summary		**D**	**B**	**Medium Positive**

The contents of Table 6.16 demonstrate that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure at junctions within Section 3.

The LoS during the Do Minimum scenario ranges between B and F (N/A), with eight of the 14 junctions being assessed as D or lower. In the Do Something scenario, there are improvements in the assessed LoS at all of the junctions, with 11 of the 14 being brought up to the highest A or B ratings. 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 footpath 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 **Medium Positive impact** to the quality of the pedestrian infrastructure along Section 3 of the Proposed Scheme, during the Operational Phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor.

6.6.2.4.2 Cycling Infrastructure

This assessment outlines the changes to the quality of cycling provision along Section 3 of the Proposed Scheme.

The key cycling improvements along Section 3 of the Proposed Scheme can be summarised as follows:

- Proposed 1.5m – 2.0m wide cycle tracks in both directions along R132 Swords Road between Northwood Avenue Junction and Lorcan Road Junction to replace the existing cycle lanes and combined bus and cycle lanes along the main corridor;
- Proposed cycle track for approximately 80m on both sides Lorcan Road to divert cyclists away from R132 Swords Road onto the quieter route along Lorcan Road and Shanrath Road;
- Proposed quiet cycle route between the R132 Swords Road / Lorcan Road Junction and the R132 / Shanrath Junction via Lorcan Road, Lorcan Drive, and Shanrath Road, where cyclists share carriageway priority with local traffic in both directions. Existing intermittent bus and cycle lanes along R132 Swords Road between Lorcan Road and Shanrath Junction are proposed to be removed and replaced by combined bus and cycle lanes;

- Proposed provision of continuous cycle bypasses at all bus stops between Northwood Avenue Junction and Lorcan Road Junction;
- Proposed signal priority for cyclists at the majority of signalised junctions between Northwood Avenue Junction and Magenta Crescent Junction and cycle lane / track provides priority at the majority of priority junctions; and
- Proposed toucan crossings proposed south of the Morton Stadium access and at junctions with Magenta Crescent Junction, Lorcan Road Junction and Shanrath Road Junction.

Along Section 3, the Proposed Scheme will provide a 60mm set down kerb segregation between the footpath 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 tracks will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.17 present the overall Do Minimum LoS and Do Something LoS ratings for each segment within Section 3, along with the resultant impact assessment. A detailed breakdown of the assessment can be found in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

Table 6.17: Section 3 – Cycling Impact during Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132 Swords Road: Northwood Avenue Junction to Coolock Lane Junction	A5700 - A6350	C	B	Low
R132 Swords Road: Coolock Lane Junction to R132 / Santry Avenue Junction	A6350 - A6520	C	B	Low
R132 Swords Road: Santry Avenue Junction to Magenta Crescent Junction	A6520 - A6750	D	A	High
R132 Swords Road: Magenta Crescent Junction to Lorcan Road Junction	A6750 - A7000	D	B	Medium
R132 Swords Road: Lorcan Road Junction to Shanowen Road Junction	A7000 - A7350	D	C	Low
R132 Swords Road: Shanowen Road Junction to Shanrath Junction	A7350 - A7650	D	C	Low
R132 Swords Road: Shanrath Junction to Shantalla Road Junction	A7650 - A7750	D	D	Negligible
Quiet Route *Between the R132 / Lorcan Road Junction and the R132 / Shanrath Junction via Lorcan Road, Lorcan Drive, and Shanrath Road*	A7000 - A7650	D	B	Medium
Section Summary	**-**	**D**	**B**	**Medium**

The contents of Table 6.17 demonstrate that the Proposed Scheme will have an overall long-term positive impact on the quality of the cycling infrastructure along Section 3, delivering an improved LoS on both of the assessed sections.

The LoS across the eight sub-sections in the Do Minimum scenario has been assessed as ranging from C to D with six of the eight being assessed as a D indicating that generally the existing facilities are not of a high standard. The LoS in the Do Something scenario show improvements on the majority of sub-sections along Section 3 with one of the sub-sections being brought up to a LoS of A by the Proposed Scheme, four to a B and two to a C. The exception to this is the short section of R132 Swords Road between Shanrath Junction and Shantalla Road Junction which is assessed as having a LoS of D in both the Do Minimum and Do Something. Improvements to westbound cycling facilities are proposed along this section however there is no improvement to provision proposed for eastbound cyclists or westbound cyclists on the M50 over bridge and hence the D LoS is retained. Overall, the Proposed Scheme is considered to have a **Medium Positive impact** along Section 3.

The findings of the cycling assessment fully align 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'.

6.6.2.4.3 Bus Infrastructure

This assessment outlines the changes to bus stop infrastructure along Section 3 of the Proposed Scheme. It assesses any changes in the number or location of stops, and any changes to bus stop facilities. There are currently ten bus stops along Section 3 of the Proposed Scheme – five 'inbound' stops towards the City Centre and five 'outbound' stops towards Santry and Dublin Airport.

Under the proposals, there will be a total of 12 stops – six 'inbound' and six 'outbound', with one new inbound stop and one new outbound stop. Inbound, a new stop will be provided south of the R132 / Coolock Lane Junction, close to stop 1624. Outbound, a new stop will be provided north of the R132 / Santy Avenue Junction, close to stop 1624.

Table 6.18 summarises the proposed changes to bus stop facilities in Section 3 of the Proposed Scheme.

Table 6.18 Overview of Changes in Bus Stop Facilities Along the Proposed Route

Bus Stop Facility	Do Minimum		Do Something		Comment
	Number of stops	Percentage of stops	Number of stops	Percentage of stops	
RTPI (Real Time Passenger Information)	5	50%	12	100%	RTPI added to all bus stops.
Timetable information	10	100%	12	100%	Timetable information added to be provided at all bus stops.
Shelter	8	80%	11	92%	Shelters to be provided at the majority of bus stops.
Seating	5	50%	11	92%	Seating to be provided at the majority of bus stops.
Accessible Kerbs	5	50%	12	100%	Accessible kerbs added to all bus stops.
Indented Drop Off Area	1	10%	0	0%	The majority of stops will be located within bus lanes, meaning that general traffic will not be delayed by stationary buses.
Total number of stops	10		12		Two more stops than Do Minimum.

The contents of Table 6.18 show that there is currently varied provision at existing stops, with the majority having shelter, however only half have seating and real time passenger information screens. As part of the scheme, all of the new and existing bus stops will have shelters with seating, real-time bus information screens and accessible kerbs. Bus lanes will be provided along the majority of the R132 corridor.

The provision of two new stops along with the improvements in the provision of real-time information, shelters, seating and accessible kerbs throughout Section 3 is assessed as providing a **High Positive** impact for bus passengers.

6.6.2.4.4 Parking and Loading

The Proposed Scheme will impact on existing parking along Section 3. The main areas of parking changes are as follows:

- There are currently 15 commercial parking spaces adjacent to the R132 Swords Road / Schoolhouse Lane Junction at Trade Electric Group. It is proposed to remove seven of the adjacent commercial parking spaces, to facilitate the implementation of a footpath and cycle track, which will provide enhanced pedestrian and cyclist facilities. The loss of these spaces may be mitigated by consulting with the landowner to reconfigure the parking provision within the car park;
- There are currently six informal parking spaces available in front of commercial sites at Schoolhouse Mews and two adjacent spaces at Magner's Pharmacy. It is proposed to remove five parking spaces, to facilitate the implementation of a cycle track and bus lane, which will provide enhanced bus and cyclist facilities. The loss of these spaces may also be mitigated by relocating the existing parking on the side street at Santry Villas, to integrate with the existing parking facilities at this location. However, there may not be a like-for-like replacement at Santry Villas due to space constraints;
- There are seven informal residential parking spaces north of the R132 Swords Road, close to the R132 Swords Road / Shanowen Road Junction. It is proposed to remove all these spaces to facilitate the implementation of a bus lane and footpath provision, which will provide enhanced bus and pedestrian facilities respectively. The loss of these spaces could be mitigated by the parking facilities within the front gardens of the adjacent houses, which can accommodate at least one car; and
- There are 47 adjacent commercial parking spaces south of the R132 Swords Road / Shanowen Road Junction in the forecourt of retail premises, with 11 on the northbound side of R132 Swords and 36 on the southbound side of R132 Swords Road. It is proposed to remove one of the adjacent commercial parking spaces on the northbound, to facilitate the implementation of the bus lanes..

Table 6.19 presents a summary of the parking and loading spaces during the Do Minimum and Do Something scenarios and the resulting loss in parking along Section 3.

Table 6.19 Section 3 Parking Provision

Street	Parking Type	Number of Parking Spaces		
		Do Minimum	Do Something	Change
Santry Park Car Park	Adjacent Parking	50	50	0
Oak Avenue	Adjacent Parking	34	34	0
Swords Road / Schoolhouse Lane	Informal Parking	20	17	-3
	Adjacent Parking	22	13	-9
Swords Road / Shanowen Road	Informal Parking	7	12	+5
	Adjacent Parking	11	10	-1
Comet Swords Road	Adjacent Parking	36	36	0
Total		**180**	**172**	**-8**

With the change in parking provisions at the locations specified, the Proposed Scheme will be able to provide significant improvements to walking, cycling and bus facilities, and encourage the use of sustainable modes of transport, which will ultimately reduce the demand for public parking spaces. Considering the overall retention of 172 parking spaces compared to a loss of 8 spaces and the potential shift to sustainable modes, the impact to parking along Section 3 is expected to be a **Low Negative**.

6.6.2.5 Section 4 – Shantalla Road to Botanic Avenue

6.6.2.5.1 Pedestrian Infrastructure

The key infrastructural changes to pedestrian facilities along Section 4 of the Proposed Scheme are the following:

- Upgrades to existing junctions to increase the number of pedestrian (pelican or toucan) crossings provided (R132 Swords Road / Collins Avenue junction, R132 Swords Road / Iveragh Road junction, N1 Drumcondra Road Upper / Home Farm Road junction, R132 Swords Road / Seven Oaks junction and N1 Drumcondra Road Upper / Griffith Downs);

- Upgrades to existing crossings to increase the provision of toucan crossings along Section 4 (Drumcondra Road Upper / Ormond Road junction, mid-link crossing on N1 Drumcondra Road Upper adjacent to the Skylon Hotel, R132 Swords Road / Highfield Hospital / Plunket College junction, Drumcondra Road Lower / Botanic Avenue / Cian Park junction, mid-link crossing on R132 Swords Road adjacent to Holy Child Church and Drumcondra Road Upper / Millmount Avenue / Richmond Road junction);
- Upgrades to existing crossing facilities to increase the directness of pedestrian crossings (Drumcondra Road Upper / Ormond Road junction, N1 Drumcondra Road Upper / R102 Griffith Avenue junction and the mid-link crossing on R132 Swords Road adjacent to Holy Child Church); and
- The provision of raised crossings on the minor arm on the majority of minor priority junctions (where not currently present).

The assessment of the qualitative impacts on the pedestrian infrastructure for Section 4 of the Proposed Scheme is summarised in Table 6.20. 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 6.20: Section 4 – Significance of Effects for Pedestrian Impact During Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132 Swords Road Mid Link Toucan Crossing (Holy Child Church)	A8000-A8030	D	B	Medium Positive
R132 Swords Road / Collins Avenue four-arm Signalised Junction	A8200 - A8280	F	C	Medium Positive
Collins Avenue/ The Thatch Road	B200 - B150	D	B	Medium Positive
R132 Swords Road / Iveragh Road three-arm Signalised Junction	A8390 - A8410	D	A	Medium Positive
R132 Swords Road / Highfield Hopsital / Plunket College	A8640 - A8680	C	B	Low Positive
R132 Swords Road / Seven Oaks three-arm Priority Junction	A8810-A8830	D	C	Low Positive
N1 Drumcondra Road Upper / Griffith Downs three-arm Priority Junction	A8950-A8970	D	B	Medium Positive
N1 Drumcondra Road Upper / R102 Griffith Avenue four-arm Signalised Junction	A9050 - A9100	F	A	High Positive
N1 Drumcondra Road Upper / Home Farm Road three-arm Signalised Junction	A9350-A9370	C	A	Medium Positive
Drumcondra Road Upper / Ormond Road three-arm Priority Junction	A9690-A9710	C	B	Low Positive
Drumcondra Road Upper / Clonturk Park three-arm Priority Junction	A9800-A9810	C	B	Low Positive
Drumcondra Road Upper / Millmount Avenue / Richmond Road four-arm Signalised Junction	A9900- A9930	D	B	Medium Positive
Drumcondra Road Lower / Botanic Avenue / Cian Park four-arm Signalised Junction	A10030 - A10070	D	B	Medium Positive
Section Summary	**-**	**D**	**B**	**Medium Positive**

The contents of Table 6.20 demonstrate that the Proposed Scheme will have a long-term positive impact on the quality of the pedestrian infrastructure at junctions within Section 4.

The LoS during the Do Minimum scenario ranges between C and F, with nine of the 13 junctions being assessed as D or lower. In the Do Something scenario, there are improvements in the assessed LoS at all of the junctions, with 11 of the 13 being brought up to the highest A or B ratings. 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 footpath 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 4 of the Proposed Scheme, during the operational phase, which aligns with the overarching aim to provide enhanced walking infrastructure on the corridor.

6.6.2.5.2 Cycling Infrastructure

The key cycling improvements along Section 4 of the Proposed Scheme can be summarised as follows:

- Proposed minimum 1.8m wide cycle tracks for southbound cyclists between the R132 Swords Road / Shantalla Road junction and Collins Avenue Junction to replace the current combined bus and cycle lane provision;
- Proposed minimum 1.5m wide cycle tracks for northbound and southbound cyclists between the R132 Swords Road / Collins Avenue Junction and Millmount House to replace the existing cycle lanes and / or combined bus and cycle lane;
- Proposed 2.5m wide cycle track on a pedestrain / cyclists bridge between Millmount Avenue and Botanic Avenue;
- Proposed signal priority for cyclists at the majority of signalised junctions and cycle lane / track provides priority at the majority of priority junctions along Section 4; and
- Increased provision of toucan crossings proposed (Drumcondra Road Upper / Ormond Road junction, mid-link crossing on N1 Drumcondra Road Upper adjacent to the Skylon Hotel, R132 Swords Road / Highfield Hospital / Plunket College junction, Drumcondra Road Lower / Botanic Avenue / Cian Park junction, mid-link crossing on R132 Swords Road adjacent to Holy Child Church and Drumcondra Road Upper / Millmount Avenue / Richmond Road junction); and
- Proposed provision of continuous cycle bypasses at the majority of bus stops.

Along Section 4, the Proposed Scheme will provide a 60mm set down kerb segregation between the footpath 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 tracks will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.21 present the overall Do Minimum LoS and Do Something LoS ratings for each segment within Section 4, along with the resultant impact assessment. A detailed breakdown of the assessment can be found in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

Table 6.21: Section 4 Cycling Impact During Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132: Swords Road slip road and Collins Avenue Junction	A7650 - A8250	D	B	Medium Positive
R132: Collins Avenue Junction and Iveragh Road Junction	A8250 - A8420	C	A	Medium Positive
R132: Iveragh Road Junction and Seven Oaks Junction	A8420 - A8830	C	B	Low Positive

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132: Seven Oaks Junction and Griffith Avenue Junction	A8830 - A9100	D	A	High Positive
R132: Griffith Avenue Junction and R132 / Richmond Road Junction	A9100 - A9900	D	B	Medium Positive
R132: Richmond Road Junction and Botanic Avenue Junction	A9900 -A10050	D	A	High Positive
Section Summary		**D**	**B**	**Medium Positive**

The contents of Table 6.21 demonstrate that the Proposed Scheme will have an overall long-term positive impact on the quality of the cycling infrastructure along Section 4.

The LoS across the six sub-sections in the Do Minimum scenario has been assessed as ranging from C to D with four of the six being assessed as a D indicating that generally the existing facilities are not of a high standard. The LoS in the Do Something scenario show improvements on every sub-section of the Proposed Scheme with three of the six sub-sections being brought up to a LoS of A by the Proposed Scheme, and the remaining three being scored as a B. The significant improvement in the section between the junctions with Richmond Road and Botanic Avenue stems from the provision of a new pedestrian and cycle bridge across the River Tolka running broadly parallel with the existing infrastructure.

Overall, it is anticipated that there will be **Medium 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 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'.

6.6.2.5.3 Bus Infrastructure

There are currently 19 bus stops along Section 4 of the Proposed Scheme – 11 'inbound' stops, and 8 'outbound' stops.

Under the proposals, there will be a total of 17 stops – '10 inbound stops', and 7 'outbound' stops, with one 'outbound' stop removed and one 'inbound' stop rationalised with existing 'inbound' stop, which will offer more bus services.

Table 6.22 summarises the proposed changes to bus stop facilities in Section 4 of the Proposed Scheme.

Table 6.22 Overview of changes in bus stop facilities along the Proposed Route

Bus Stop Facility	Do Minimum		Do Something		Comment
	Number of stops	Percentage of stops	Number of stops	Percentage of stops	
RTPI (Real Time Passenger Information)	9	47%	17	100%	RTPI added to all bus stops.
Timetable information	18	95%	17	100%	Timetable information added to be provided at all bus stops.
Shelter	17	89%	17	100%	Shelters to be provided at all bus stops.
Seating	16	84%	17	100%	Seating to be provided at all bus stops.
Accessible Kerbs	18	95%	17	100%	Accessible kerbs added to all bus stops.
Indented Drop Off Area	4	21%	0	0%	The majority of stops will be located within bus lanes, meaning that general traffic will not be delayed by stationary buses.
Total number of stops	19		17		Two fewer stops than the Do Minimum.

The contents of Table 6.22 shows that there is currently varied provision at existing stops, with the majority having shelter and seating, however less than half have real time passenger information screens As part of the Proposed Scheme, all of the existing bus stops will have shelters with seating, real-time bus information and accessible kerbs. Bus lanes will be provided along the entirety of the corridor, replacing current intermittent provision.

The improvements in the provision of real-time information, shelters, seating, accessible kerbs and continuous bus lane provision throughout Section 4 is assessed as providing a **High Positive** impact for bus passengers.

6.6.2.5.4 Parking and Loading

The Proposed Scheme will impact on existing parking along Section 4. The main area of parking changes is as follows:

- There are currently five “Pay and Display” spaces along the northbound side of R132 Swords Road, immediately south of the R132 Swords Road / Iveragh Road Junction. It is proposed to remove two of these spaces, to facilitate the implementation of a bus stop island, footpath, and cycle track, which will provide enhanced pedestrian, bus, and cyclist facilities. The loss of these spaces may be mitigated by the availability of 17 parking spaces along Iveragh Road; and
- There are currently two informal spaces along the northbound side of R132 Swords Road, immediately north of the R132 Swords Road / Iveragh Road Junction. It is proposed to remove both these spaces, to facilitate the implementation of a bus stop island, footpath, and cycle track, which will provide enhanced pedestrian, bus, and cyclist facilities. The loss of these spaces may be mitigated by the availability of 17 parking spaces along Iveragh Road.

Table 6.23 presents a summary of the parking and loading spaces during the Do Minimum and Do Something scenarios and the resulting loss in parking along Section 4.

Table 6.23 Section 4 Parking Provision

Street	Parking Type	Number of Parking Spaces		
		Do Minimum	Do Something	Change
R103 Collins Avenue	Adjacent Parking	28	28	0

Street	Parking Type	Number of Parking Spaces		
		Do Minimum	Do Something	Change
R132 Swords Road / Iveragh Road	Pay and Display	5	3	-2
	Informal	2	0	-2
	Adjacent Parking	17	17	0
Homefarm Road	Adjacent Parking	20	20	0
R132 Drumcondra Road Upper	Disabled Permit Parking	1	1	0
Church Avenue to Botanic Avenue	Adjacent Parking	186	186	0
Clonturk Park / R132 Drumcondra Road Upper Junction	Informal Parking	10	10	0
Total		**269**	**265**	**-4**

With the change in parking provisions north of R132 Swords Road / Iveragh Road Junction, the Proposed Scheme will be able to provide significant improvements to walking, cycling and bus facilities, and encourage the use of sustainable modes of transport, which will ultimately reduce the demand for public parking spaces. Considering the overall retention of 265 parking spaces compared to a loss of 4 spaces and the potential shift to sustainable modes, the impact to parking along Section 4 is expected to be **Low Negative**.

6.6.2.6 Section 5 – Botanic Avenue Junction to Granby Row Junction

6.6.2.6.1 Pedestrian Infrastructure

The key infrastructural changes to pedestrian facilities along Section 5 of the Proposed Scheme are the following:

- Upgrades to existing junctions to increase the number of pedestrian (pelican or toucan) crossings provided (Drumcondra Road Lower / St. Anne's Road junction, Dorset Street Lower / Belvidere Road / Innisfallen junction, and Dorset Street Upper / St. Mary's Place North / Granby Row junction);
- Provision of a new mid-link toucan crossing on Drumcondra Road Lower to the south of Whitworth Place;
- Upgrades to existing crossings to increase the provision of toucan crossings along Section 5 (Drumcondra Road Lower / Whitworth Road / Whitworth Place junction, Dorset Street Lower / Belvidere Road / Innisfallen Parade junction, Dorset Street Lower / Synott Place / Gardiner Street Upper junction, Dorset Street Lower / Eccles Street Hardwicke Place junction and Dorset Street Upper / Blessington Street / North Frederick Street junction); and
- Upgrades to existing crossing facilities to increase the directness of pedestrian crossings Drumcondra Road Lower / Conliffe Road junction, Drumcondra Road Lower / Whitworth Road / Whitworth Place junction, Dorset Street Lower / North Circular Road junction, Dorset Street Lower / Synott Place / Gardiner Street Upper junction, Dorset Street Lower / Eccles Street / Hardwicke Place junction, Dorset Street Upper / Blessington Street / North Frederick Street junction and North Frederick Street / Parnell Square East / Gardiner Row / Parnell Square North junction).

The assessment of the qualitative impacts on the pedestrian infrastructure for Section 5 of the Proposed Scheme is 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 5 – Significance of Effects for Pedestrian Impact During Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
Drumcondra Road Lower /Conliffe College Seminary access three-arm Priority Junction	A10440-10450	D	B	Medium Positive
Drumcondra Road Lower / Conliffe Road three-arm Signalised Junction	A10540-A10560	D	B	Medium Positive

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
Drumcondra Road Lower / St. Anne's Road three-arm Priority Junction	A10610-A10630	C	B	Low Positive
Drumcondra Road Lower / Whitworth Road / Whitworth Place four-arm Signalised Junction	A10750-A10780	D	B	Medium Positive
Drumcondra Road Lower Mid-Link Crossing (Binns Bridge)	A10800- A10810	F	A	High Positive
Dorset Street Lower / North Circular Road four-arm Signalised Junction	A11000-A11030	D	B	Medium Positive
Dorset Street Lower / Synott Place / Gardiner Street Upper four-arm Signalised Junction	A11100-A11130	D	B	Medium Positive
Dorset Street Lower / Eccles Street Hardwicke Place four-arm Signalised Junction	A11300-A11330	C	A	Medium Positive
Dorset Street Upper / Blessington Street / North Frederick Street four-arm Signalised Junction	A11500-A11530	D	A	Medium Positive
Dorset Street Upper / St. Mary's Place North / Granby Row four-arm Signalised Junction	A11720-A11764	B	A	Low Positive
North Frederick Street / Frederick Lane North three-arm priority junction	C140-C150	C	B	Low Positive
North Frederick Street / Parnell Square East / Gardiner Row / Parnell Square North four-arm Signalised Junction	C190 - C230	C	A	Medium Positive
Parnell Square East / Rutland Place three arm priority junction	C380 - C400	C	B	Low Positive
Section Summary		**D**	**B**	**Medium Positive**

The contents of Table 6.24 demonstrate that the Proposed Scheme will have a long-term significant positive impact on the quality of the pedestrian infrastructure at road junctions within Section 5.

The LoS during the Do Minimum scenario ranges between C and F, with seven of the 13 junctions being assessed as D or lower and a further five being assessed as a C. In the Do Something scenario, there are improvements in the assessed LoS at all of the junctions, with 13 of the 13 being brought up to the highest A or B ratings. 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 footpath 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 **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.

6.6.2.6.2 Cycling Infrastructure

The key cycling improvements along Section 5 of the Proposed Scheme can be summarised as follows:

- Proposed minimum 1.5m to 2.0m wide cycle tracks in both directions along R132 between Botanic Avenue Junction and Frederick Street North Junction to replace intermittent provision of advisory cycle lanes, combined lanes and segregated facilities;
- Proposed minimum 2.0 wide southbound cycle track along R132 between Dorset Street Lower / R135 Blessington Street / Frederick Street North Junction and Dorset Street Upper / Granby Row Junction;
- Proposed minimum 1.5m wide cycle tracks in both directions along Frederick Street North between Dorset Street Upper and Parnell Square North. South-east of Parnell Square North (along Parnell Square East) a two way cycle track is proposed.;
- Proposed combined bus and cycle lane along Parnell Square West between Parnell Street and the Dorset Street Upper / Granby Row Junction;
- Proposed signal priority for cyclists at the majority of signalised junctions along R132 and cycle lane / track provides priority at the majority of priority junctions along Section 5; and
- Increased provision of toucan crossings proposed (Drumcondra Road Lower / Whitworth Road / Whitworth Place junction, Dorset Street Lower / Belvidere Road / Innisfallen Parade junction, Dorset Street Lower / Synott Place / Gardiner Street Upper junction, Dorset Street Lower / Eccles Street Hardwicke Place junction and Dorset Street Upper / Blessington Street / North Frederick Street junction); and
- Proposed provision of continuous cycle bypasses at the majority of bus stops.

Along Section 5, the Proposed Scheme will provide a 60mm set down kerb segregation between the footpath 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 tracks will also be raised 120mm from the carriageway to provide segregation from vehicles.

The contents of Table 6.25 present the overall Do Minimum LoS and Do Something LoS ratings for each segment within Section 5, along with the resultant impact assessment. A detailed breakdown of the assessment can be found in TIA Appendix 4.2 (Cycling Infrastructure Assessment).

Table 6.25: Section 5 Cycling Impact During Operational Phase

Location	Chainage	Do Minimum LoS	Do Something LoS	Impact
R132: Botanic Avenue Junction and Clonliffe Road Junction	A10050 - A10560	C	A	Medium Positive
R132: Clonliffe Road Junction and North Circular Road Junction	A10560 - A11030	D	A	High Positive
R132 North Circular Road Junction and Dorset Street Lower / R135 Blessington Street / Frederick Street North Junction	A11030 - A11550	D	A	High Positive
Dorset Street Lower / R135 Blessington Street / Frederick Street North Junction and Dorset Street Upper / Granby Row Junction	A11550 - A11770	D	C	Low Positive
Frederick Street North Junction and Parnell Square East / Gardiner Row Junction	A11500 - C200	D	A	High Positive
Parnell Square East / Gardiner Row Junction and Rae Cavendish / Parnell Street Junction	C200 - C450	D	A	High Positive
Parnell Square West and the Dorset Street Upper / Granby Row Junction	D374 - D0	D	C	Low Positive
Section Summary		**D**	**B**	**Medium Positive**

The contents of demonstrate that the Proposed Scheme will have an overall long-term positive impact on the quality of the cycling infrastructure along Section 5.

The LoS across the seven sub-sections in the Do Minimum scenario has been assessed as ranging from C to D with six of the seven being assessed as a D indicating that generally the existing facilities are not of a high standard. The LoS in the Do Something scenario show improvements on every sub-section of the Proposed Scheme with five of the seven sub-sections being brought up to a LoS of A by the Proposed Scheme, and the remaining two being scored as a C.

Overall, it is anticipated that there will be a **Low 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 align 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'

6.6.2.6.3 Bus Infrastructure

This assessment outlines the changes to bus stop infrastructure along Section 5 of the Proposed Scheme. It assesses any changes in the number or location of stops, and any changes to bus stop facilities. There are currently 25 bus stops along Section 5 of the Proposed Scheme – 11 'inbound stops' and 14 'outbound' stops.

Under the proposals, there will be a total of 24 stops – 10 'inbound' and 14 outbound, with one inbound bus stop removed.

Table 6.26 summarises the proposed changes to bus stop facilities in Section 5 of the Proposed Scheme.

Table 6.26 Overview of Changes in Bus Stop Facilities Along the Proposed Route

Bus Stop Facility	Do Minimum		Do Something		Comment
	Number of stops	Percentage of stops	Number of stops	Percentage of stops	
RTPI (Real Time Passenger Information)	18	72%	24	100%	RTPI added to all bus stops.
Timetable information	24	96%	24	100%	Timetable information added to be provided at all bus stops.
Shelter	10	40%	24	100%	Shelters to be provided at all bus stops.
Seating	8	32%	24	100%	Seating to be provided at all bus stops.
Accessible Kerbs	12	48%	24	100%	Accessible kerbs added to all bus stops.
Indented Drop Off Area	6	24%	1	4%	The majority of stops will be located within bus lanes, meaning that general traffic will not be delayed by stationary buses.
Total Stops	25		24		One fewer stops than the Do Minimum.

The contents of Table 6.26 shows that there is currently varied provision at existing stops, with less than half having shelters and seating. As part of the Proposed Scheme, all of the existing bus stops will have shelters with seating, real-time bus information and accessible kerbs. Bus lanes will be provided along the entirety of the corridor, replacing current intermittent provision.

The improvements in the provision of real-time information, shelters, seating and accessible kerbs throughout Section 5 is assessed as providing a **Medium Positive** impact for bus passengers.

6.6.2.6.4 Parking and Loading

The Proposed Scheme will impact on existing parking along Section 5. The main areas of parking changes are as follows:

- There are 14 'Pay and Display' spaces along R132 Drumcondra Road Lower, with six located on the northbound side of R132 Drumcondra Road Lower / Clonliffe Road Junction, and eight located on the southbound side. It is proposed to remove three of the spaces on the northbound side, to facilitate the implementation of a cycle track and footpath provision, which will provide enhanced cyclist and pedestrian facilities. The loss of these spaces is mitigated by the availability of 68 'Pay and Display' adjacent parking spaces along St Anne's Road and Grattan ParadeThere are nine loading bays along R132 Drumcondra Road Lower between Alphonsus Road and Whitworth Road, with seven located along the northbound side of R132 Drumcondra Road Lower and two located along the southbound side. Two Loading bays at St Alphonsus Road are to be removed to facilitate the implementation of a cycle track and footpath provision, which will provide enhanced cyclist and pedestrian facilities. It is proposed to add two of the loading bay spaces north of Whitworth Road;
- There are 19 'Pay and Display' spaces along Frederick Street. It is proposed to remove 15 'Pay and Display' spaces, to facilitate the implementation of a cycle track and footpath provision, which will provide enhanced cyclist and pedestrian facilities. The loss of these spaces may be mitigated due to the availability of 'Pay and Display' spaces along Hardwick Street, and the availability of informal parking 100m to the north along Blessington Street and Wellington Street Lower;

There are two Disabled Permit Parking spaces between Frederick Street North. It is proposed to remove one Disabled Permit Parking space to facilitate the implementation of a cycle track and footpath provision, which will provide enhanced cyclist and pedestrian facilities. The loss of this spaces may be mitigated due to the remaining availability of disabled permit parking spaces along Parnell Square NorthTable 6.27 presents a summary of the parking and loading spaces during the Do Minimum and Do Something scenarios and the resulting loss in parking along Section 5.

Table 6.27 Section 5 Parking Provision

Street	Parking Type	Number of Parking Spaces		
		Do Minimum	Do Something	Change
Hollybank Road to St Alphonsus' Road Lower	Adjacent	156	156	0
Drumcondra Road Lower / Clonliffe Road to Whitworth Road	Pay and Display	14	11	--3
	Loading Bays	9	9	0
St Anne's Road to Belvedere Road	Adjacent	196	196	0
R132 Dorset Street Lower / Belvedere Road Junction	Loading Bays	3	3	0
North Circular Road to Gardiner Street Upper	Adjacent	51	51	0
R132 Dorset Street Lower / Synnott Place Junction	Pay and Display	2	2	0
	Disabled Permit Parking	1	1	0
Eccles Place to R135 St Mary's Place North	Adjacent	169	169	0
R132 Dorset Street Upper / R135 St Mary's Place North Junction	Adjacent	6	6	0
Frederick Street North / Parnell Square East / Parnell Square West	Pay and Display	41	26	-15
	Disabled Permit Parking	8	7	-1
	Adjacent Parking	48	48	0
Total		**704**	**685**	**-19**

With the change in parking provisions at the locations specified, the Proposed Scheme will be able to provide significant improvements to walking, cycling and bus facilities, and encourage the use of sustainable modes of

transport, which will ultimately reduce the demand for public parking spaces. Considering the overall retention of 686 parking spaces compared to a loss of -19 spaces and the potential shift to sustainable modes, the impact to parking along Section 5 is expected to be **Low Negative.**

6.6.2.7 Summary of Corridor-Wide Infrastructure Works

6.6.2.7.1 Pedestrian Infrastructure

. The Proposed Scheme will increase the number of controlled pedestrian crossings from 86 in the Do Minimum to 125 in the Do Something scenario, equating to a 45% increase.

6.6.2.7.2 Cycling Infrastructure

The Proposed Scheme will provide 10.7km of inbound and outbound segregated cycle facilities which is an increase from only 2.7km and 4.1km respectively in both directions 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.

Overall, total cycle facilities (segregated and non-segregated) will be increased to 100% of the whole route as part of the Proposed Scheme. The proportion of the corridor with segregated facilities (including quiet street treatment) will increase from 48% in the Do Minimum to 100% in the Do Something scenario.

6.6.2.7.3 Bus Priority Infrastructure

The Proposed Scheme will provide 11.3km inbound and 11.8km outbound of bus lanes across the corridor. This is an increased from 9.3km inbound and 8.0km outbound in the Do Minimum scenario. In conjunction with signal controlled bus priority, this contributes to an increase of 39% 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 the entirety of the corridor.

6.6.3 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 Movements
    - 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:
    - Reductions in general traffic flows on the Direct Study Area; and
    - Redistributed flows and Junction Capacity Outputs on the Indirect Study Area.
- Overall Network-Wide Performance Indicators
    - Queueing;
    - Total Travel Times;
    - Total Travel Distance; and
    - Average Network Speed.

6.6.3.1 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 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:

- The average number of people moved by each mode (Car, Bus, Walking and Cycling) comparing the Do Minimum and Do Something scenarios both in the inbound and outbound direction in the AM and PM peak periods for each forecast year (2028, 2043). This provides an estimate of the modal share changes on the direct study area 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)
    - Total Passengers Boarding Buses on bus routes that use any part of the Proposed Scheme for each forecast year (2028, 2043).

6.6.3.1.1 Peak Hour People Movement along the Proposed Scheme

To determine the impact that the Proposed Scheme has on modal share changes on the direct CBC as a result of its implementation, the modelled number of people moved by each mode (Car, Bus, Active Modes) has been extracted from the ERM / LAM. The analysis compares the 2-way movement of people across both north and south quays in the Do Minimum and Do Something scenarios at a central point on the Proposed Scheme. The analysis has been produced for the AM and PM peak periods 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 are 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.

6.6.3.1.1.1 <u>2028 AM Peak Hour People Movement</u>

Diagram 6.3 illustrates the People Movement by mode inbound towards the city centre during the AM Peak Hour in 2028.

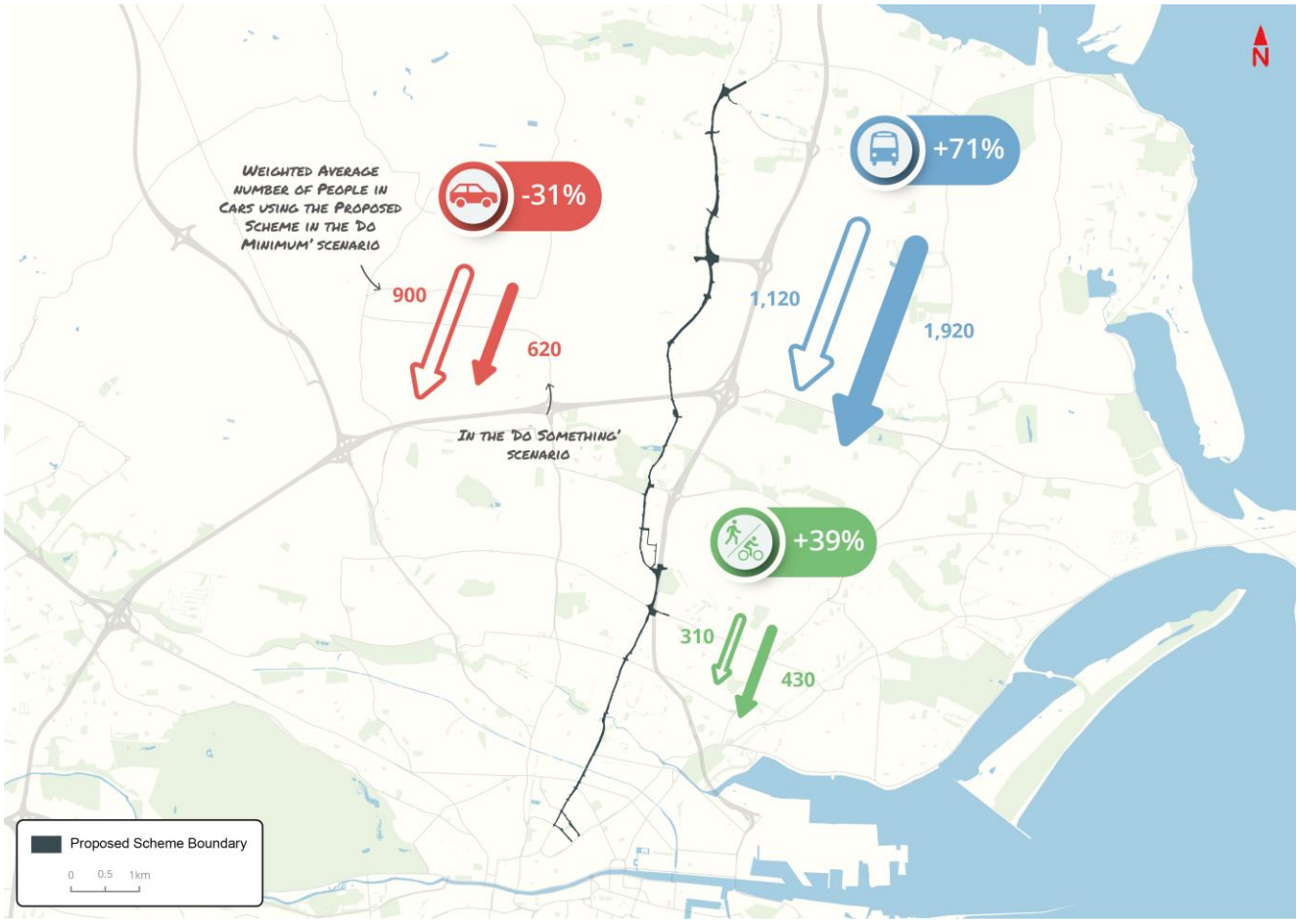

Diagram 6.3 People Movement by Mode travelling Along the Proposed Scheme During 2028 AM Peak Hour

As indicated in Diagram, there is a reduction of 31% in the number of people travelling via car, an increase of 71% in the number of people travelling via bus and an increase of 39% in people walking or cycling along the Proposed Scheme during the AM Peak Hour. Table 6.28 outlines the difference in modal split between the Do Minimum and Do Something scenarios for each mode of travel in an inbound direction towards the City Centre during the AM Peak Hour. The results indicate a 27% increase in people moved as a result of the Proposed Scheme and 64% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.28 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	900	39%	620	21%	-280	-31%
		Public Transport	1,120	48%	1,920	65%	800	71%
		Walking	210	9%	180	6%	-30	-14%
		Cycling	100	4%	250	8%	150	150%
		Combined Walking/Cycling	310	13%	430	14%	120	39%
		Sustainable Modes Total	**1,430**	**61%**	**2,350**	**79%**	**920**	**64%**
		Total (All modes)	**2,330**	**100%**	**2,970**	**100%**	**640**	**27%**

6.6.3.1.1.2 2028 PM Peak Hour People Movement

Diagram 6.4 illustrates the People Movement by mode travelling outbound from the city centre during the PM Peak Hour.

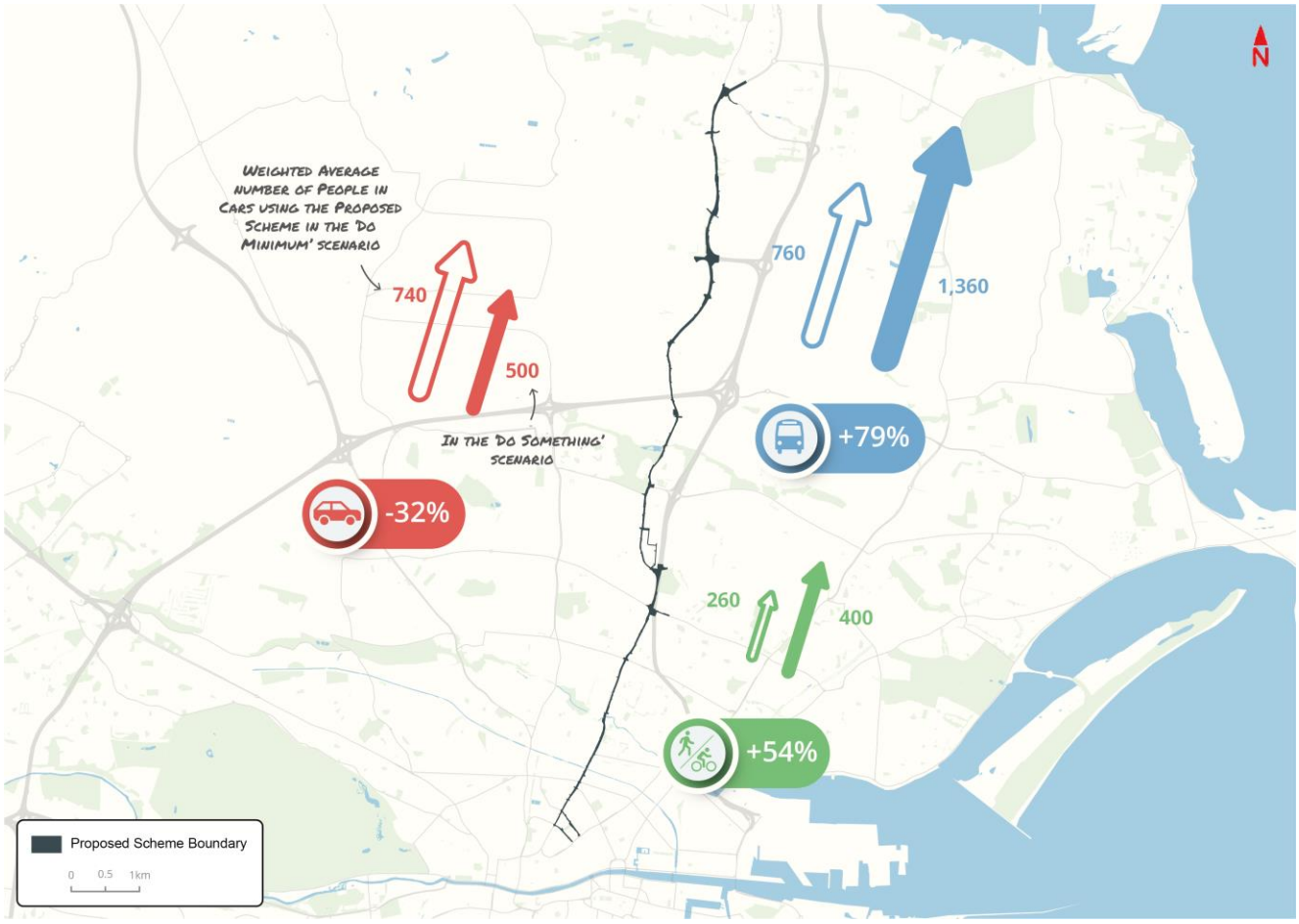

Diagram 6.4 People Movement by Mode travelling Along the Proposed Scheme During 2028 PM Peak Hour

As indicated in Diagram 6.4 there is a reduction of 32% in the number of people travelling via car, an increase of 79% in the number of people travelling via bus and an increase in 54% in the number of people walking or cycling along the Proposed Scheme during the PM Peak Hour. Table 6.29 outlines the difference in modal split between the Do Minimum and Do Something scenarios for each mode of travel in an outbound direction from the City Centre during the PM Peak Hour. The results indicate 28% increase in people moved as a result of the Proposed Scheme and 73% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.29 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	740	42%	500	22%	-240	-32%
		Public Transport	760	43%	1,360	60%	600	79%
		Walking	180	10%	160	7%	-20	-11%
		Cycling	80	5%	240	11%	160	200%
		Combined Walking/Cycling	260	15%	400	18%	140	54%
		Sustainable Modes Total	**1,020**	**58%**	**1,760**	**78%**	**740**	**73%**

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
		Total (All modes)	**1,760**	**58%**	**2,260**	**78%**	**500**	**28%**

6.6.3.1.1.3 2043 AM Peak Hour People Movement

Diagram 6.5 illustrates the People Movement by mode inbound towards the city centre during the AM Peak Hour in 2043.

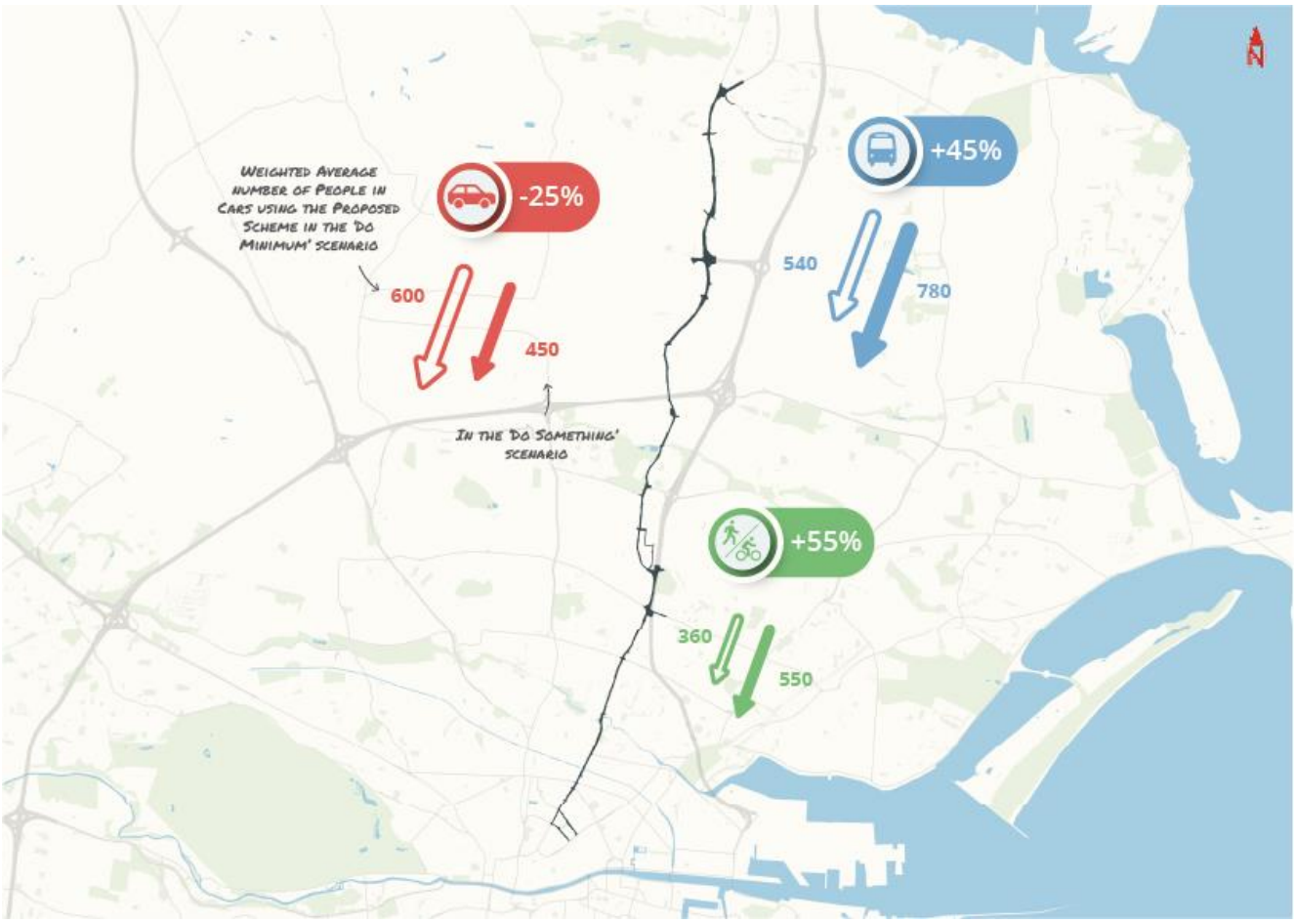

Diagram 6.5 People Movement by Mode Travelling Along the Proposed Scheme During 2043 AM Peak Hour

As indicated in Diagram 6.5 there is a decrease of 25% in the number of people travelling via car, an increase of 45% in the number of people travelling via bus and an increase of 55% in the number of people walking and cycling along the Proposed Scheme during the AM Peak Hour. Table 6.30 outlines the difference in modal split between the Do Minimum and Do Something scenarios for each mode of travel in an inbound direction towards the City Centre during the AM Peak Hour. The results indicate a 19% increase in people moved as a result of the Proposed Scheme and 49% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.30 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 (%)
		General Traffic	597	40%	449	25%	-148	-25%

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	Public Transport	537	36%	777	44%	240	45%
		Walking	183	12%	175	10%	-8	-4%
		Cycling	172	12%	375	21%	203	118%
		Combined Walking/Cycling	355	24%	550	31%	195	55%
		Sustainable Modes Total	**892**	**60%**	**1,327**	**75%**	**435**	**49%**
		Total (All modes)	**1,489**	**100%**	**1,776**	**100%**	**287**	**19%**

6.6.3.1.1.4 2043 PM Peak Hour People Movement

Diagram 6.6 illustrates the People Movement by mode travelling outbound from the city centre during the PM Peak Hour in 2043.

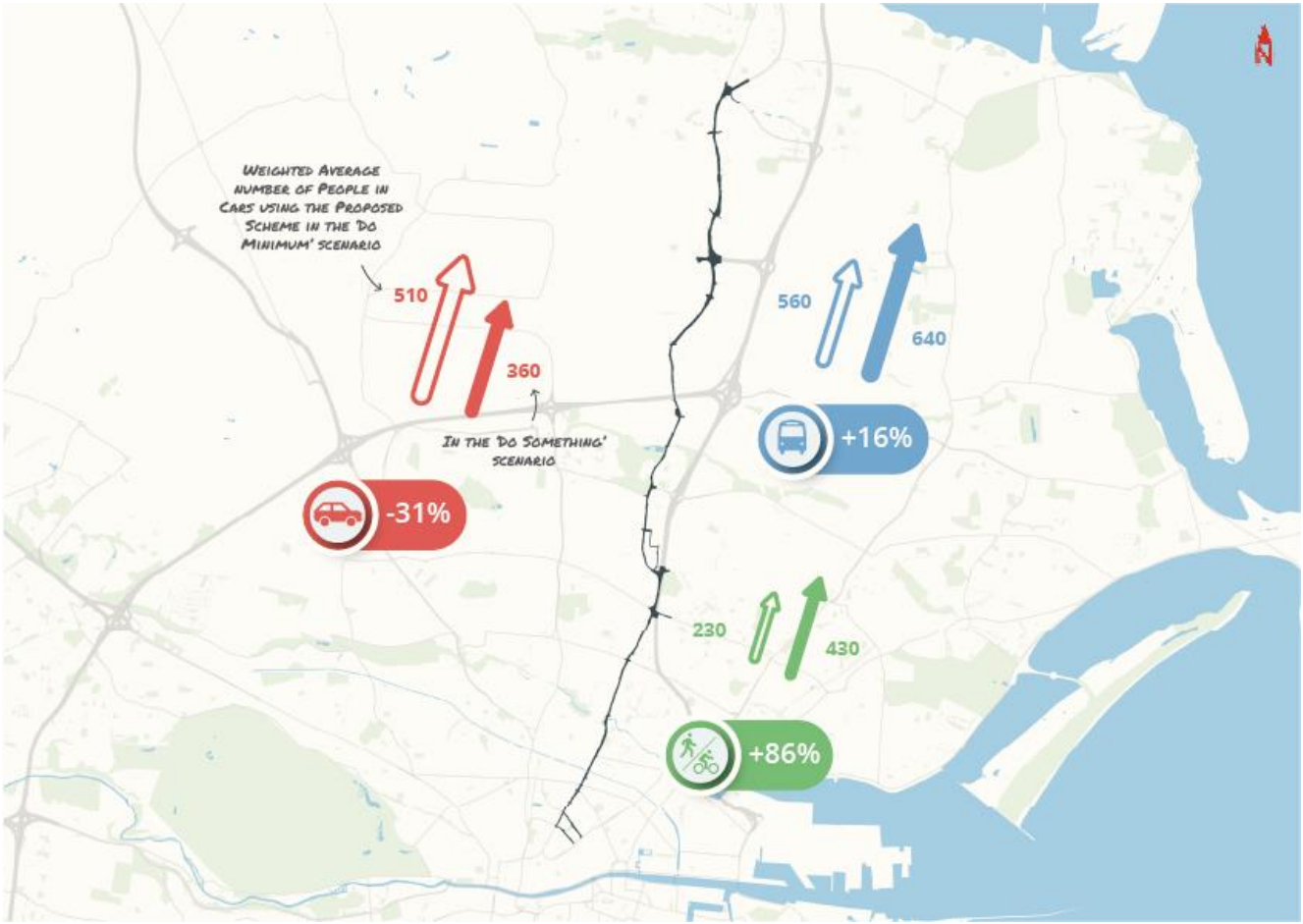

Diagram 6.6 People Movement by Mode Travelling Along the Proposed Scheme During 2043 PM Peak Hour

As indicated in Diagram 6.6 there is a decrease of 31% in the number of people travelling via car, an increase of 16% in the number of people travelling via bus and an increase of 36% in the number of people walking and cycling along the Proposed Scheme during the PM Peak Hour. Table 6.31 outlines the difference in modal split between the Do Minimum and Do Something scenarios for each mode of travel in an outbound direction from the

City Centre during the PM Peak Hour. The results indicate 10% increase in people moved as a result of the Proposed Scheme and 36% increase in people moved by sustainable modes (Public Transport, Walk, Cycle).

Table 6.31 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	513	39%	355	25%	-158	-31%
		Public Transport	557	43%	644	45%	87	16%
		Walking	86	7%	122	9%	37	43%
		Cycling	146	11%	308	22%	163	112%
		Combined Walking/Cycling	231	18%	431	30%	199	86%
		Sustainable Modes Total	**789**	**61%**	**1,075**	**75%**	**286**	**36%**
		Total (All modes)	**1,302**	**100%**	**1,430**	**100%**	**128**	**10%**

6.6.3.1.2 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.

6.6.3.1.2.1 2028 AM Peak Hour Bus Passengers

Diagram 6.7 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the AM Peak Hour in the inbound direction in 2028.

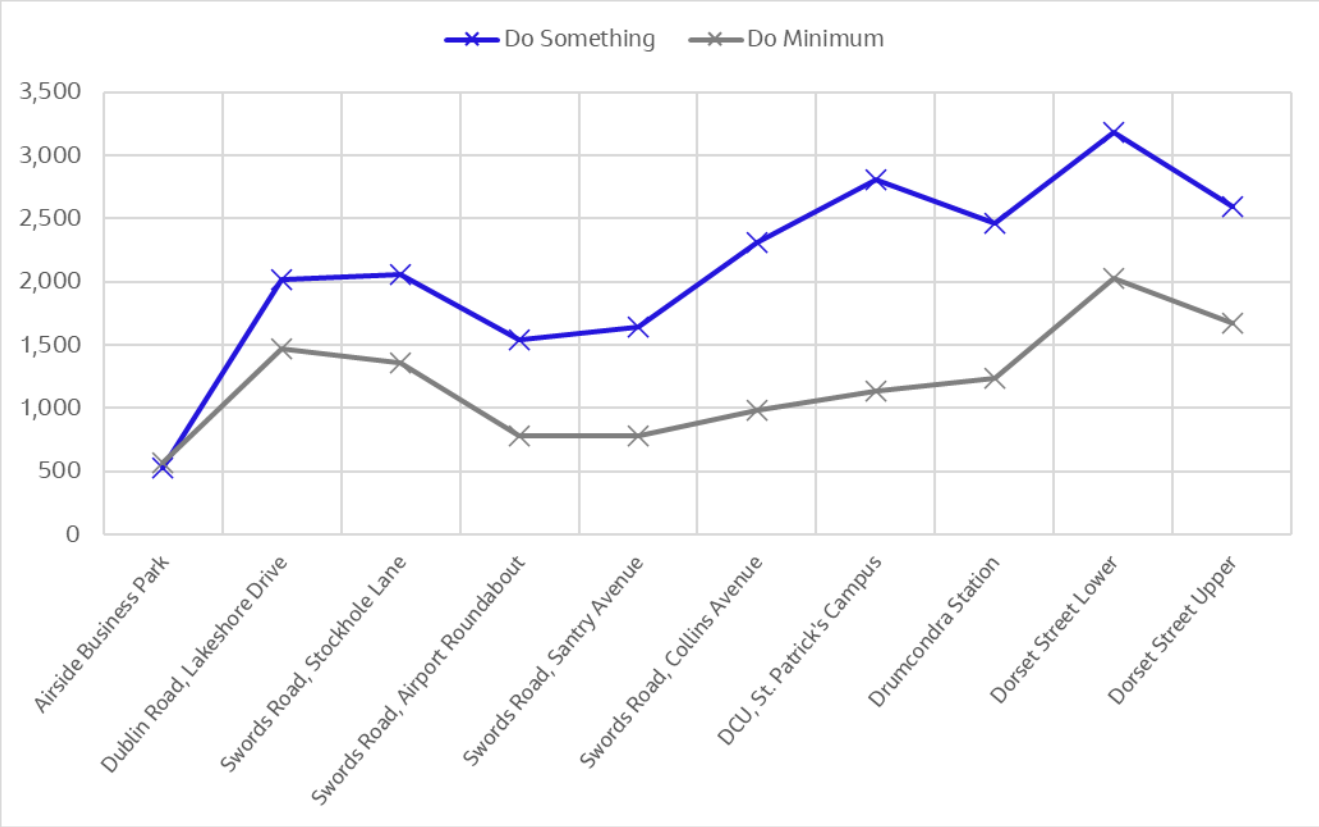

Diagram 6.7 2028 AM Peak Hour Passenger Volume Along Proposed Scheme (Inbound Direction)

Diagram 6.7 shows higher levels of bus passenger loadings along the Proposed Scheme with a peak on Dorset Street Lower where the volume of passengers reaches 3,200 passengers in the AM Peak hour, compared to approximately 2,000 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along the Proposed Scheme with approximately 500 additional users on the northern part of the corridor and up to 1,600 additional users on the southern part, compared to the Do Minimum scenario.

6.6.3.1.2.2 2028 PM Peak Hour Bus Passengers

Diagram 6.8 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the PM Peak Hour in the outbound direction in 2028.

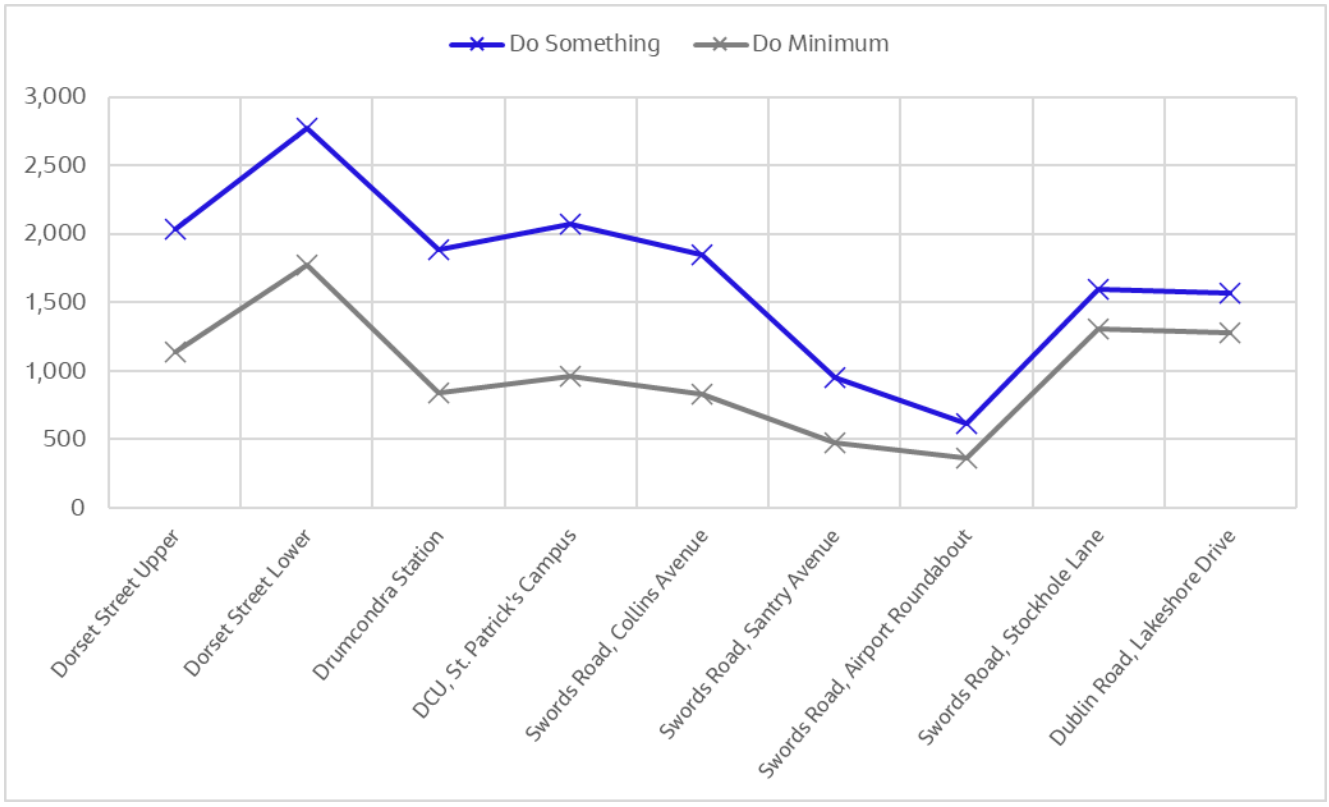

Diagram 6.8 2028 PM Peak Hour Passenger Volume Along Proposed Scheme (Outbound Direction)

Diagram 6.8 shows higher levels of bus passenger loadings along the Proposed Scheme with a peak on Dorset Street Lower where the volume of passengers reaches 2,800 in the PM Peak hour, compared to approximately 1,800 in the Do Minimum scenario.

The increase in bus passengers is higher on the southern part of the Proposed Scheme with approximately 1,000 additional users on the corridor, compared to the Do Minimum scenario.

6.6.3.1.2.3 2043 AM Peak Hour Bus Passengers

Diagram 6.9 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the AM Peak Hour in the inbound direction in 2043.

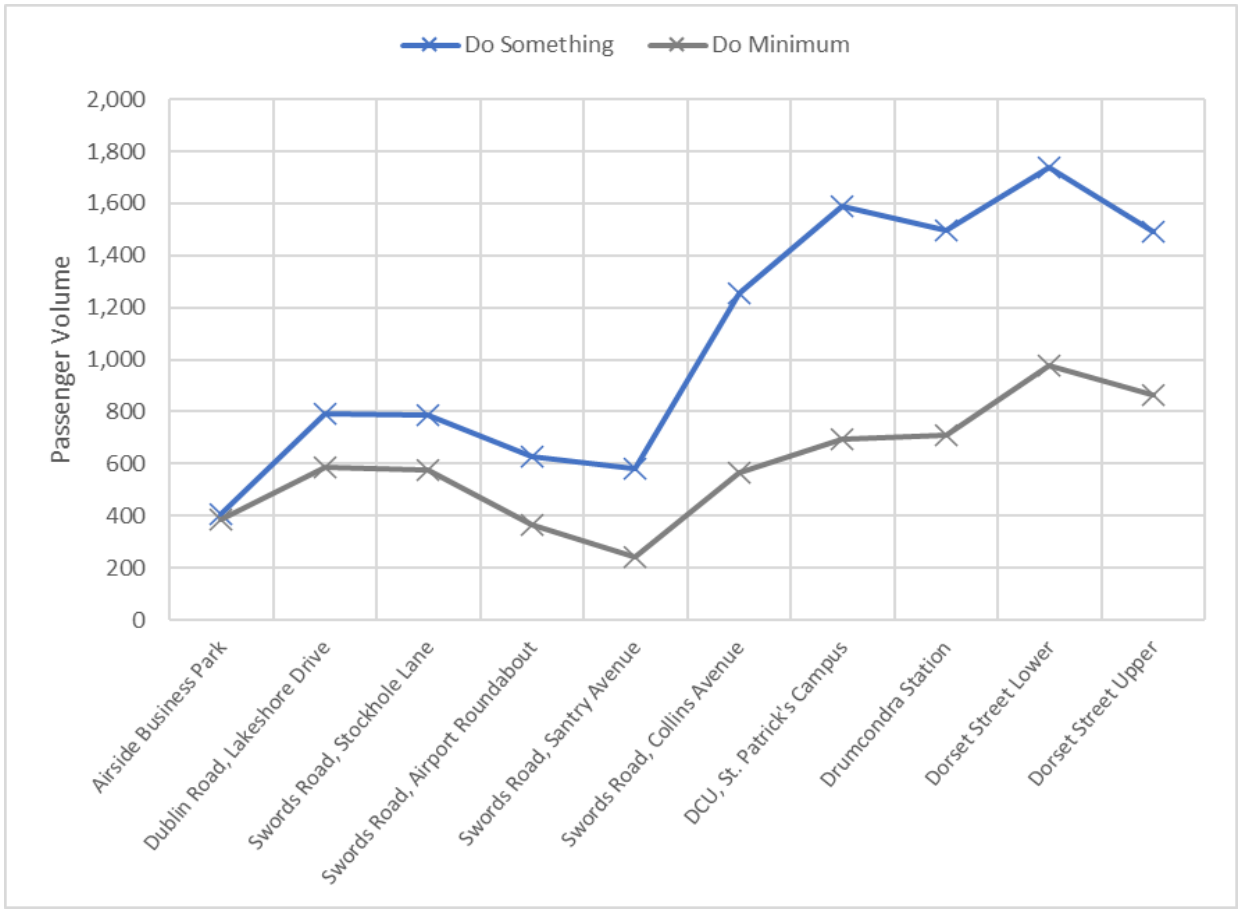

Diagram 6.9 2043 AM Peak Hour Passenger Volume Along Proposed Scheme (Inbound Direction)

Diagram 6.9 shows higher levels of bus passenger loadings along the Proposed Scheme with a peak Dorset Street Lower, where the volume of passengers reaches approximately 1,700 in the AM Peak Hour compared to approximately 800 in the Do Minimum scenario.

The increase in bus passengers remains at a high level along the Proposed Scheme with approximately 200 additional users on the northern part of the corridor and up to 800 additional users on the southern part, compared to the Do Minimum scenario.

6.6.3.1.2.4 2043 PM Peak Hour Bus Passengers

Diagram 6.10 presents the passenger loading profile comparing the Do Minimum and Do Something scenarios in the PM Peak Hour in the outbound direction in 2043.

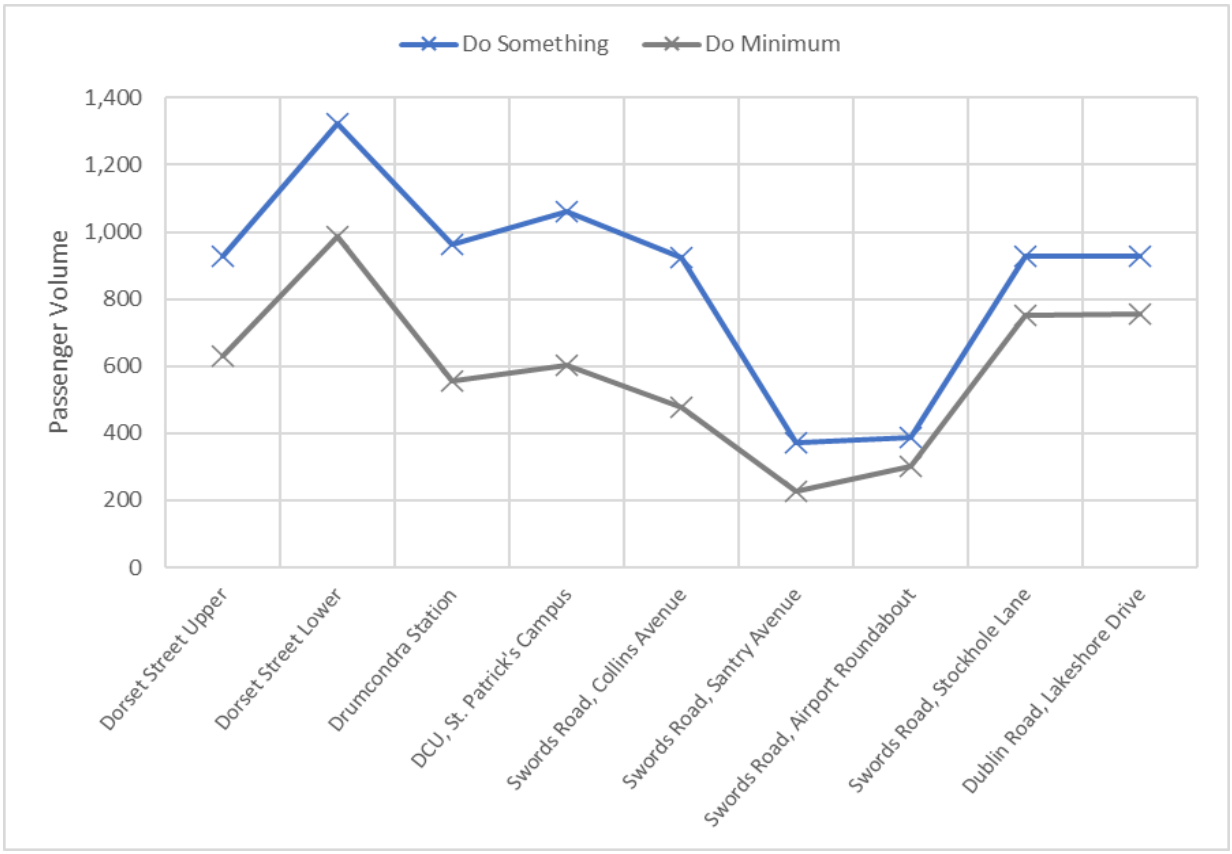

Diagram 6.10 2043 PM Peak Hour Passenger Volume Along Proposed Scheme (Outbound Direction)

Diagram 6.10 shows higher levels of bus passenger loadings along the Proposed Scheme with peaks on Dorset Street Lower and at DCU- St. Patrick's Campus where the volume of passengers reaches 1,300 and 1,050 respectively in the PM Peak hour, compared to approximately 1,000 and 600 in the Do Minimum scenario.

The increase in bus passengers is higher on the Southern part of the Proposed Scheme with approximately 350 additional users on the corridor, compared to the Do Minimum scenario.

6.6.3.1.2.5 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 total boardings 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.

Table 6.32 2028 Peak Hour Bus Boardings on Routes Using the Proposed Scheme (Inc. Boarding at Stops Outside Proposed Scheme)

Time Period	Do Minimum	Do Something	Difference in Boardings	Difference (%)
AM Peak Hour	35,370	37,820	2,450	6.9%
PM Peak Hour	27,280	29,150	1,870	6.9%

The content of Table 6.32 shows that there will be a 6.9% increase in people boarding bus routes which use the Proposed Scheme during the AM Peak Hour. This represents an addition of 2,450 passengers in the AM Peak hour.

In the PM Peak hour, there will be a 6.9% increase in people boarding bus routes which use the Proposed Scheme, representing an additional 1,870 passengers.

Table 6.33 2043 Peak Hour Bus Boardings on Routes Using the Proposed Scheme (Inc. Boarding at Stops Outside Proposed Scheme)

Time Period	Do Minimum	Do Something	Difference in Boardings	Difference (%)
AM Peak Hour	32,168	33,507	1,339	4.2%
PM Peak Hour	28,073	29,203	1,130	4.0%

The content of Table 6.33 shows that there will be a 4.2% increase in people boarding bus routes which use the Proposed Scheme during the AM Peak Hour. This represents an addition of 1,339 passengers in the AM Peak hour.

In the PM Peak hour, there will be a 4.0% increase in people boarding bus routes which use the Proposed Scheme, representing an additional 1,130 passengers.

6.6.3.2 People Movement – Summary of Impact

Taking into account the changes in mode share, demand changes by mode along the Proposed Scheme and bus usage, the Proposed Scheme will have a **High Positive** impact on people movement by sustainable modes along the direct study area.

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'

6.6.3.3 Operational Impacts for Bus Passengers and Operators

6.6.3.3.1 Overview

The impacts of the Proposed Scheme for bus users have been assessed based on journey times and reliability metrics extracted from the micro-simulation model of the Proposed Scheme 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.

6.6.3.3.2 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 A4 service, which traverses the entire length of the Proposed Scheme, have been extracted from the model. 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.

Inbound Direction

Average journey times for the inbound A4 service in 2028 Opening Year and in 2043 Design Year can be seen in Table 6.34. 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 6.34: A4 Service Bus Average Journey Times (Inbound Direction)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	43.8	35.6	-8.2	-19%
2028 PM	41.7	37.8	-3.9	-9%

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2043 AM	43.4	35.5	-7.8	-18%
2043 PM	41.8	38.4	-3.4	-8%

Additional information regarding the range of journey times (minimum, maximum, average and standard deviation) for inbound A4 buses in the Do Minimum (red) and Do Something (blue) can be seen in Table 6.35 and Diagram 6.11. 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 6.35: A4 Service – Range of Journey Times (Inbound Direction)

Peak Hour	Do Minimum				Do Something			
	MIN	MAX	AVG	STDEV	MIN	MAX	AVG	STDEV
2028 AM	37.7	50.2	43.8	3.0	32.0	40.0	35.6	1.7
2028 PM	35.8	49.2	41.7	2.4	31.8	43.2	37.6	2.0
2043 AM	38.0	51.7	43.4	2.6	31.0	40.6	35.5	2.1
2043 PM	36.7	47.1	41.8	2.3	33.9	42.0	38.1	1.7

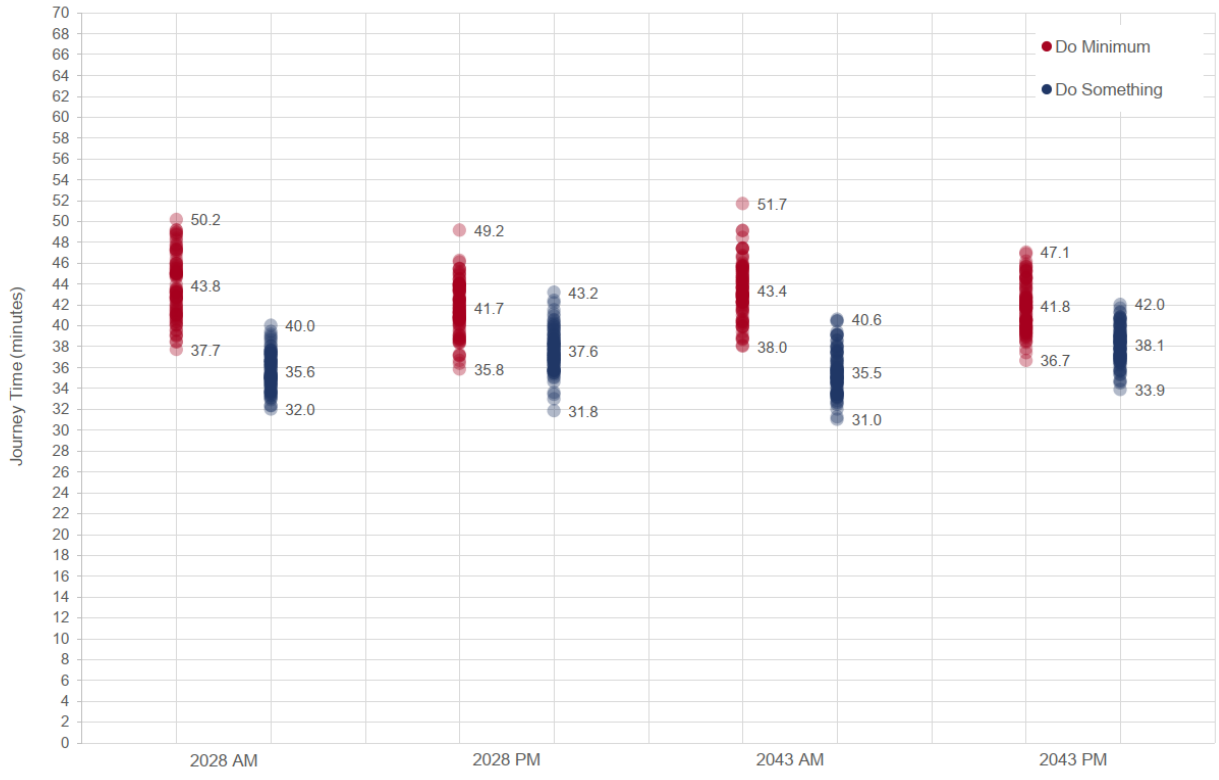

Diagram 6.11: A4 Bus Journey Times (Inbound Direction)

Based on the results presented in Table 6.34, the Proposed Scheme will deliver average inbound journey time savings for A4 service bus passengers of c8.2 minutes (19%) in 2028 (AM) and c7.8 minutes (18%) in 2043 (AM). Furthermore, results presented in Diagram 6.11 suggest an improvement in bus journey time reliability in all four 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 inbound A4 service are also illustrated in the cumulative time-distance graphs shown in Diagram 6.12 to Diagram 6.15.

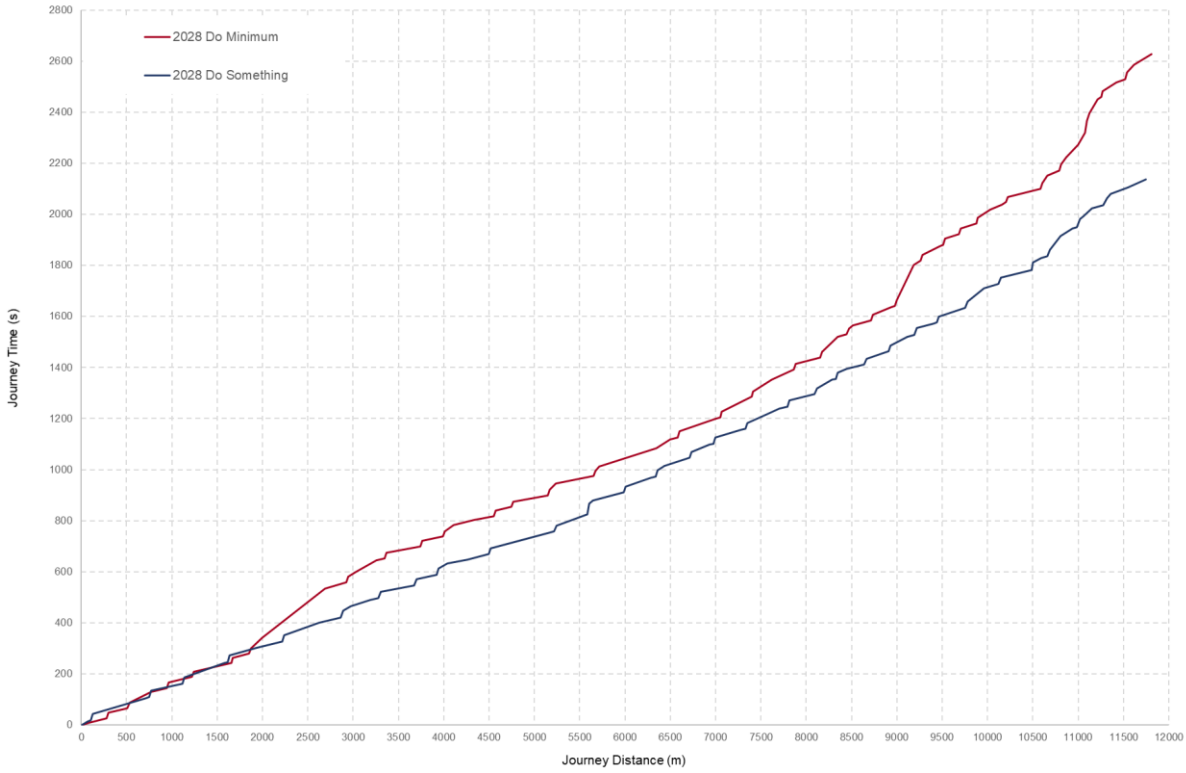

Diagram 6.12: A4 Bus Journey Time (2028 AM, Inbound)

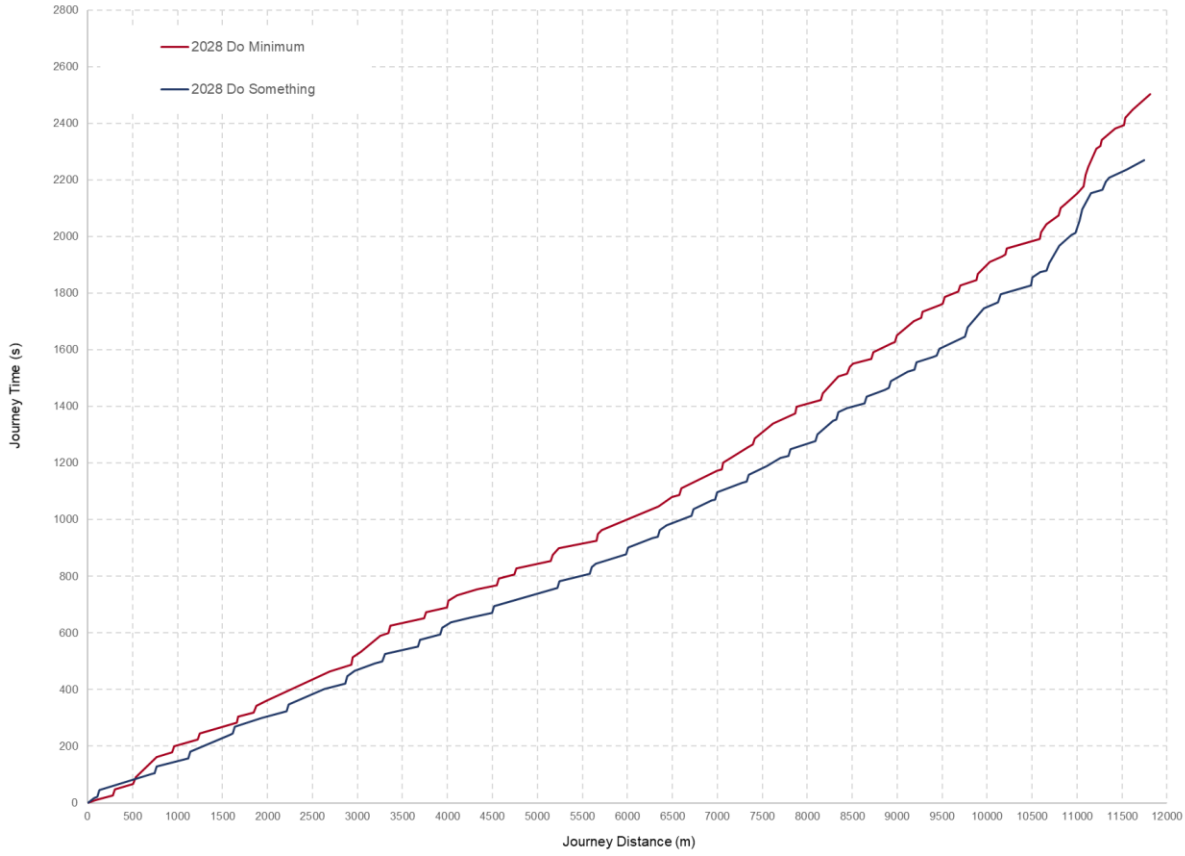

Diagram 6.13: A4 Bus Journey Time (2028 PM, Inbound)

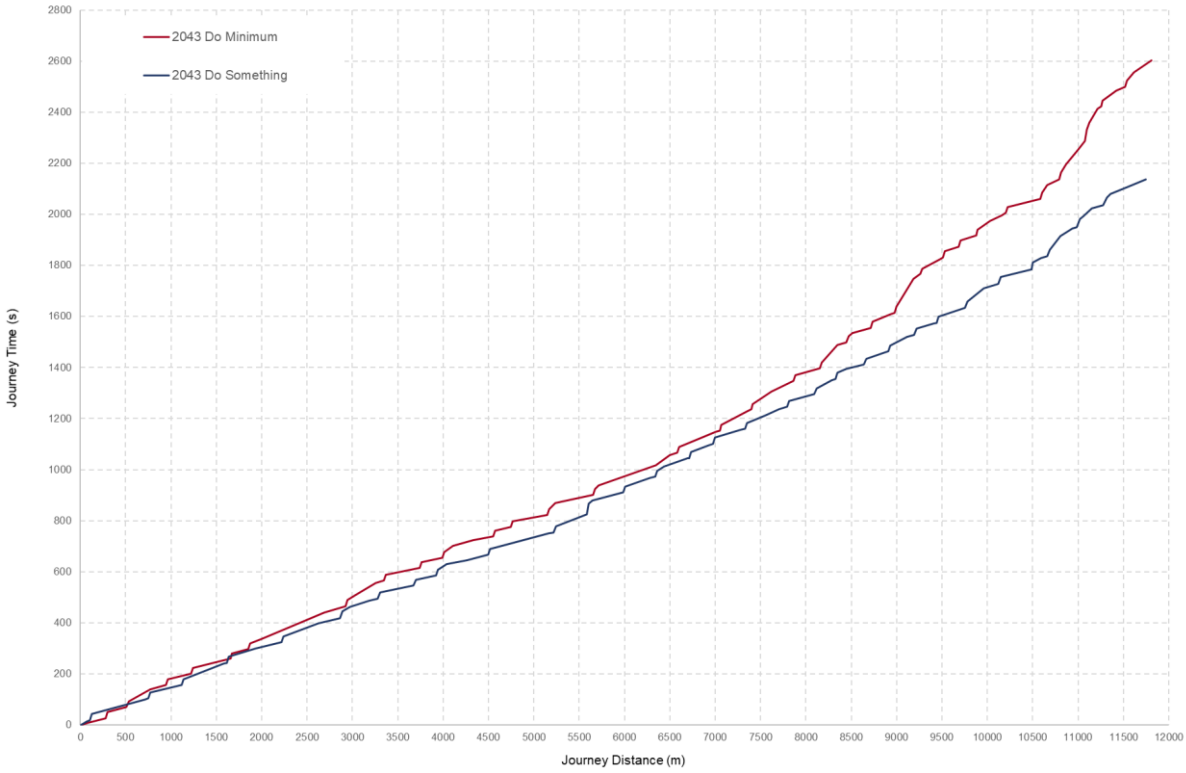

Diagram 6.14: A4 Bus Journey Time (2043 AM, Inbound)

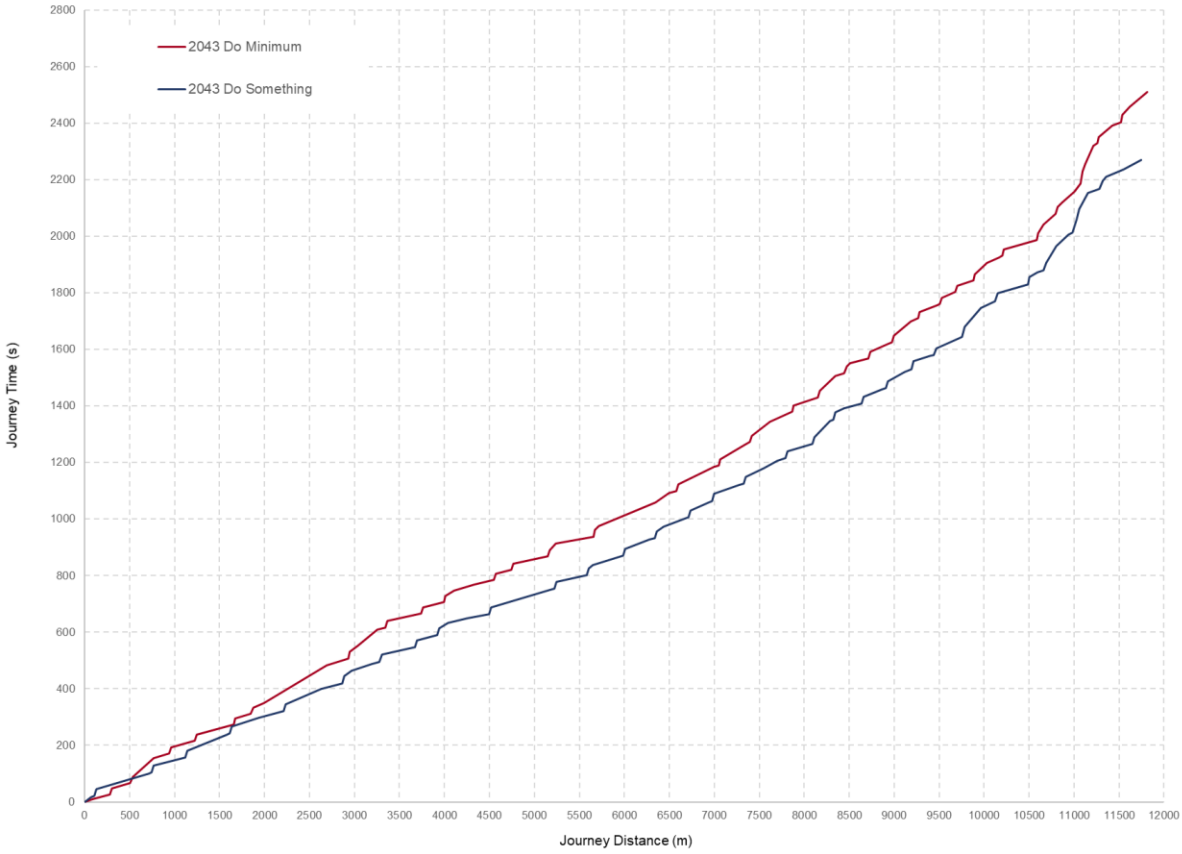

Diagram 6.15: A4 Bus Journey Time (2043 PM, Inbound)

Based on the results presented in DiagramDiagram 6.12 to Diagram 6.15, the Proposed Scheme is expected to deliver inbound bus journey time savings in both the AM and PM peaks. The most notable savings can be seen in the AM peak on the Dublin Road approach to Airport Roundabout, the Swords Road approaches to Collins Avenue and Griffith Avenue as well as the section of Drumcondra Road Lower/Dorset Street Lower between Clonliffe Road and Blessington Street. Apart from Griffith Avenue (which retains curtailed bus lanes on both sides of the junction as per the existing), bus journey time savings can be attributed to the introduction of bus lanes up to the stop line which then recommence immediately after the junction. In the case of Griffith Avenue, the introduction of virtual bus detection, inbound hurry calls as soon as buses leave the upstream bus stop followed by green time extensions, can be shown to clear downstream left turning vehicles out of the way prior to the arrival of buses at the junction. Due to the prioritisation of traffic signal coordination through the Drumcondra Road Lower/Dorset Street Lower section in the peak period direction of travel, smaller inbound bus journey time savings can be seen in the PM peak.

Outbound Direction

Average journey times for the outbound A4 service in 2028 Opening Year and in 2043 Design Year can be seen in Table 6.36. 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 6.36: A4 Service Bus Journey Times (Outbound Direction)

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2028 AM	37.8	35.2	-2.6	-7%
2028 PM	40.0	35.2	-4.9	-12%
2043 AM	38.2	35.0	-3.2	-8%

Peak Hour	Do Minimum (minutes)	Do Something (minutes)	Difference (minutes)	% Difference
2043 PM	40.5	34.8	-5.7	-14%

Additional information regarding the range of journey times (minimum, maximum, average and standard deviation) for outbound A4 buses in the Do Minimum (red) and Do Something (blue) can be seen in Table 6.37 and Diagram 6.16. 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 6.37: A4 Service – Range of Journey Times (Outbound Direction)

Peak Hour	Do Minimum				Do Something			
	MIN	MAX	AVG	STDEV	MIN	MAX	AVG	STDEV
2028 AM	34.8	43.5	37.8	1.5	30.9	38.7	35.2	1.7
2028 PM	33.9	45.9	40.0	2.0	31.2	41.9	35.2	2.2
2043 AM	34.6	42.5	38.2	1.6	30.5	39.7	35.0	1.9
2043 PM	35.9	44.5	40.5	2.1	31.5	40.0	34.7	1.6

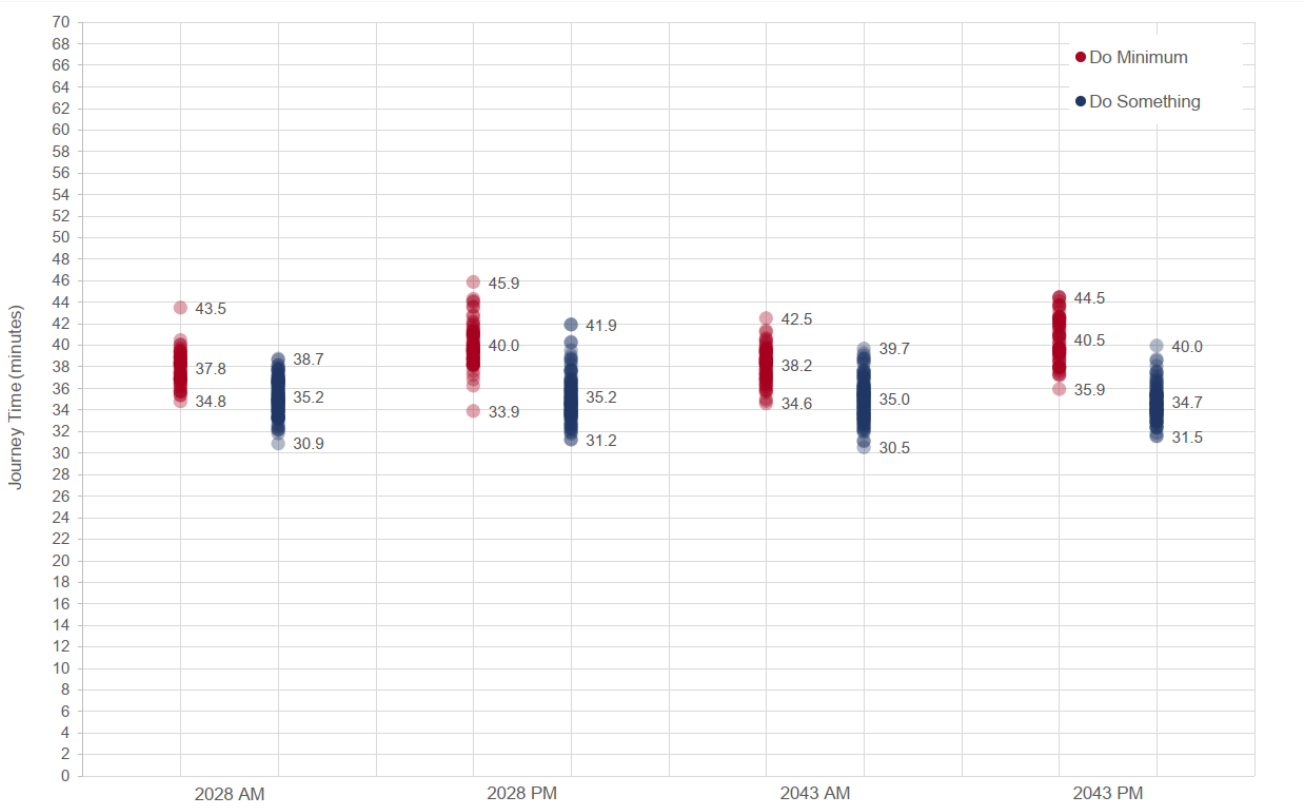

Diagram 6.16: A4 Bus Journey Times (Outbound Direction)

Based on the results presented in Table 6.37, the Proposed Scheme will deliver average outbound journey time savings for A4 service bus passengers of up to c4.9 minutes (12%) in 2028 (PM) and 5.7 minutes (14%) in 2043 (PM). Furthermore, results presented in Diagram 6.16 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 journey times for the A4 service for the outbound direction of travel is illustrated in the cumulative time-distance graphs shown in Diagram 6.17 to Diagram 6.20.

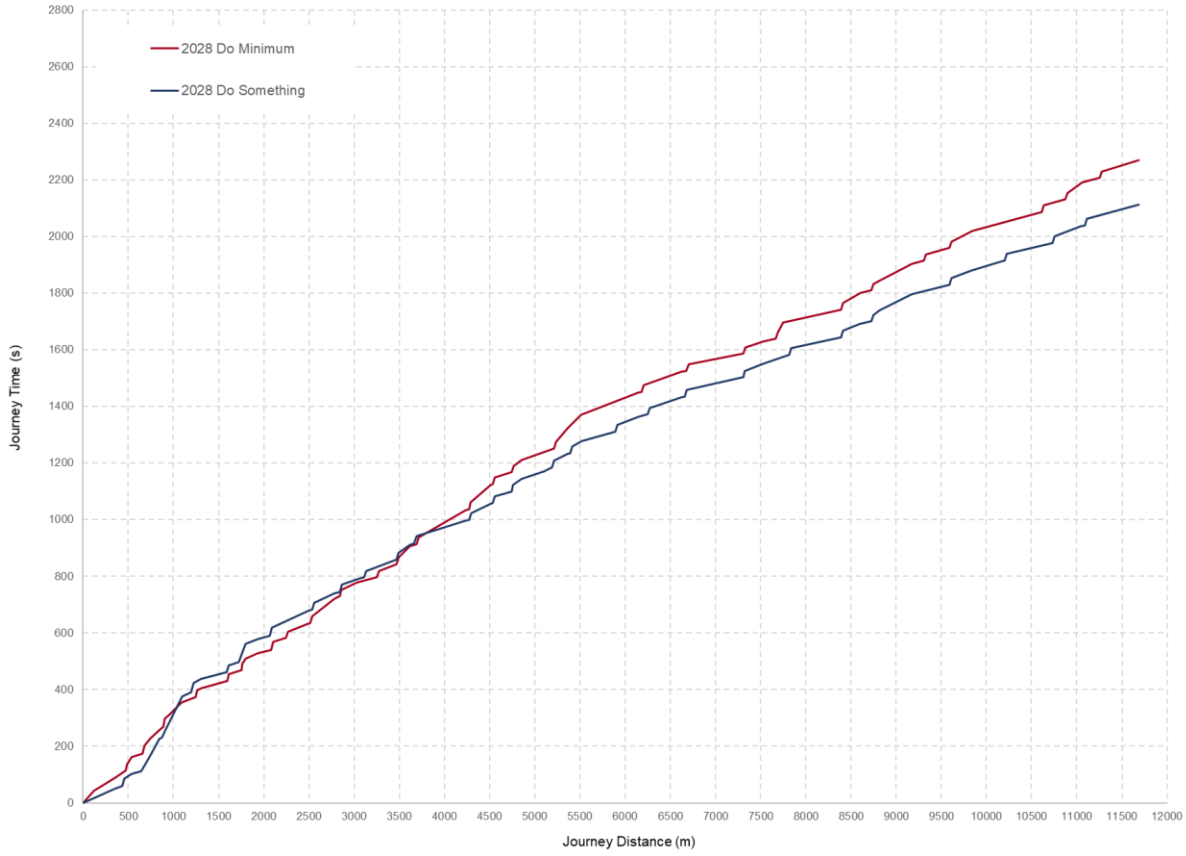

Diagram 6.17: A4 Bus Journey Time (2028 AM, Outbound)

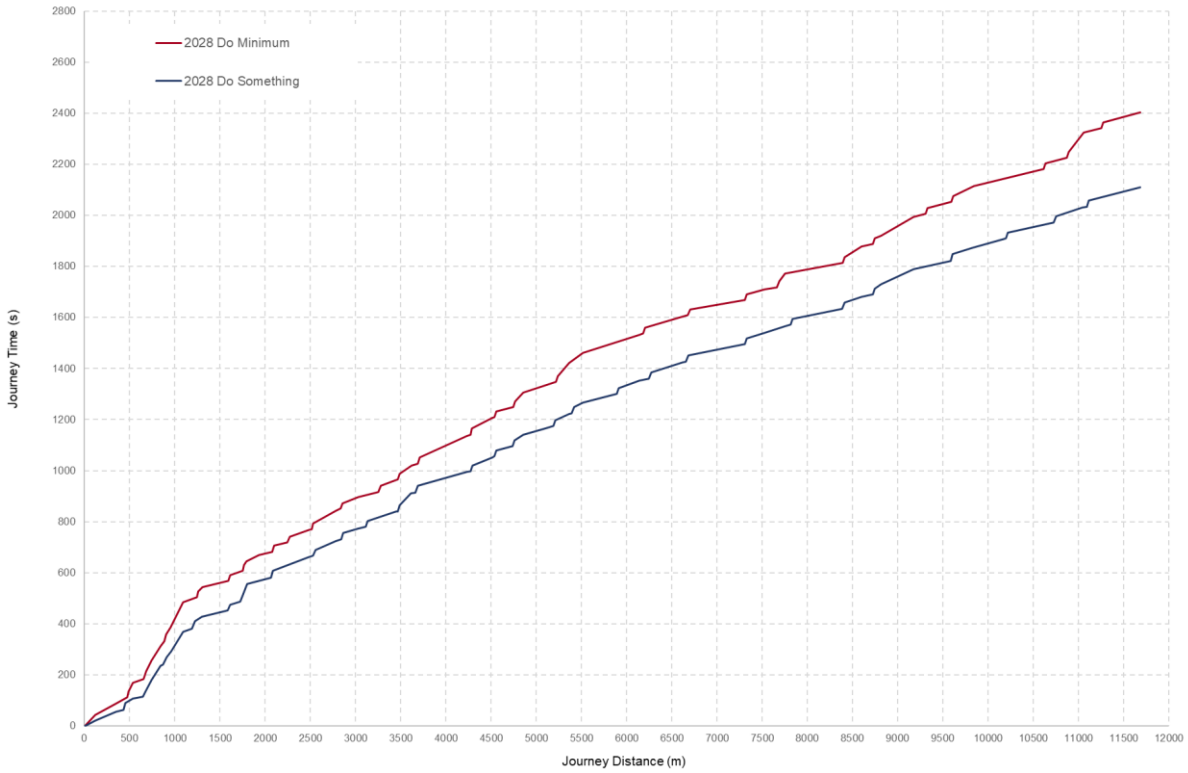

Diagram 6.18: A4 Bus Journey Time (2028 PM, Outbound)

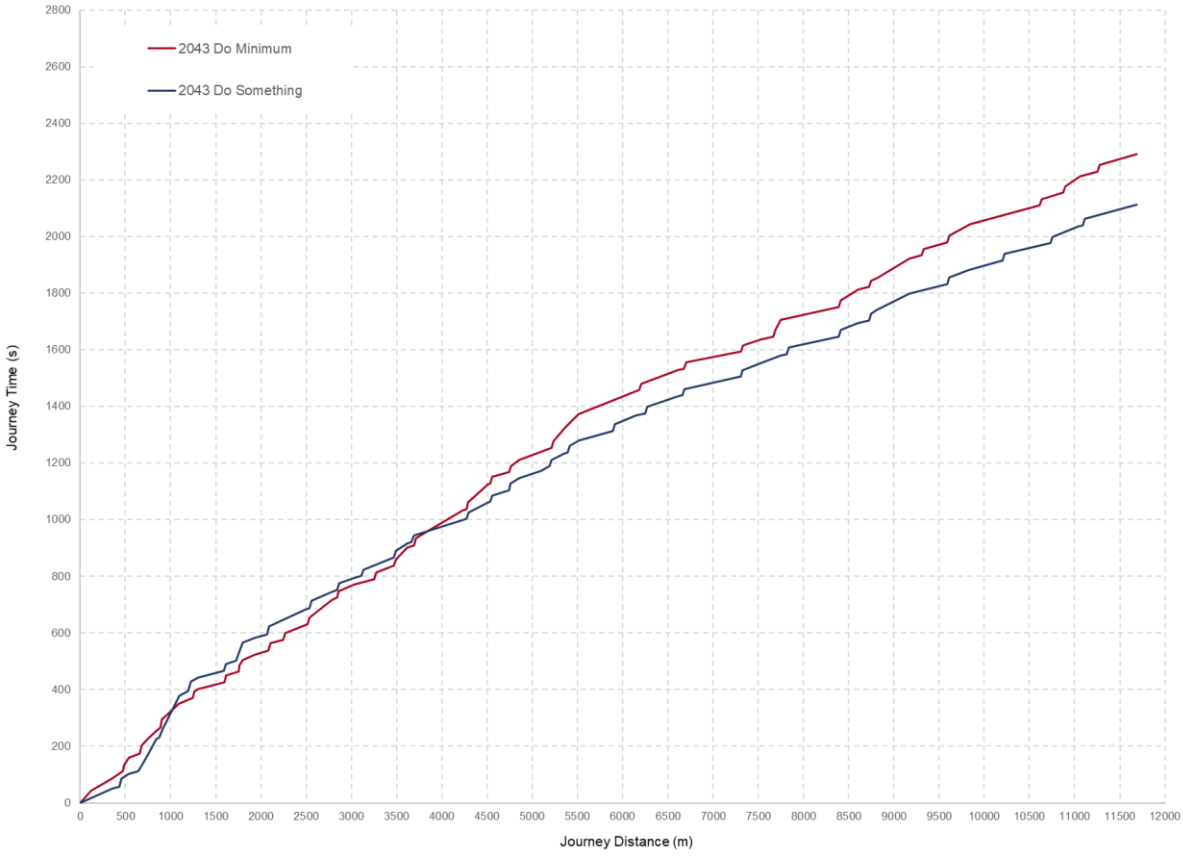

Diagram 6.19: A4 Bus Journey Time (2043 AM, Outbound)

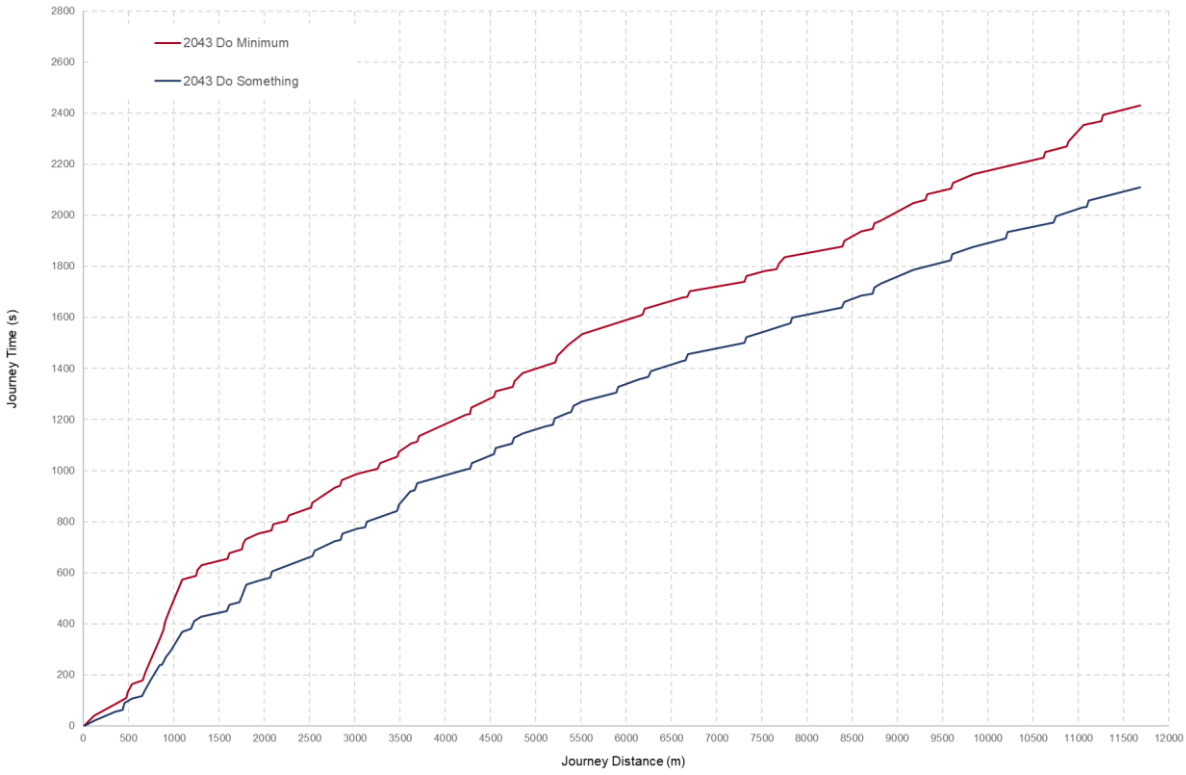

Diagram 6.20: A4 Bus Journey Time (2043 PM, Outbound)

Based on the results presented in Diagram 6.17 to Diagram 6.20, the Proposed Scheme is expected to deliver outbound bus journey time savings in both the AM and PM peaks. The most notable savings can be seen in the PM peak on the Swords Road approaches to Santry Avenue and Coolock Lane and the section of Drumcondra Road Lower/Dorset Street Lower between Blessington Street and Clonliffe Road. Bus journey time savings can be attributed to the introduction of bus lanes up to the stop line which then recommence immediately after the junction. Due to the prioritisation of traffic signal coordination through the Drumcondra Road Lower/Dorset Street Lower section in the peak period direction of travel, smaller outbound bus journey time savings can be seen in the AM peak.

6.6.3.3.2.1 Total Journey Time Changes for all Proposed Scheme Bus Services

The change in total bus journey time for all buses travelling along the Proposed Scheme, is shown in Table 6.38 in vehicle minutes.

Table 6.38: Total Bus Journey Time

Peak Hour	Do Minimum (vehicle.minutes)	Do Something (vehicle.minutes)	Difference (vehicle.minutes)	%Difference
2028 AM	2156.6	1802.5	-354.1	-16%
2028 PM	2055.2	1798.8	-256.4	-12%
2043 AM	2116.8	1810.5	-306.3	-14%
2043 PM	2088.6	1805.7	-282.8	-14%

Based on the results presented in Table 6.38, modelling shows that the Proposed Scheme will reduce total bus journey times along the Proposed Scheme by up to 16% in 2028 and 14% in 2043. Based on the AM and PM peak hours alone, this equates to **c10.1 hours of savings in 2028 and c9.8 hours in 2043** combined across all buses when compared to the Do Minimum. On an annual basis this equates to approximately 7,660 hours of bus vehicle savings in 2028 and 7,400 hours in 2043, when considering weekday peak periods only.

6.6.3.3.3 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 an overall **High Positive** impact.

6.6.3.3.4 Increased Bus Frequency - Resilience Sensitivity Analysis

6.6.3.3.4.1 Background

For the purposes of the 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 the EIAR supports is solely for the infrastructural improvements associated with providing bus priority 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.

6.6.3.3.4.2 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, in the 2028 Do Minimum model and in the 2028 Do Something Resilience testing models is outlined in Table 6.39.

Table 6.39: Resilience Testing Bus Service Frequency Scenario Testing

Scenario	Inbound (Buses per Hour)	Outbound (Buses per Hour)
Do Minimum	55	49
Do Something	55	49
Do Minimum - Additional Services Resilience Test	65	59
Do Something - Additional Services Resilience Test	65	59

Table 6.40 outlines the average journey times for the outbound A4 service in the 2028 Opening Year.

Table 6.40: A4 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	43.8	44.6	1.8%	35.6	35.8	0.6%
2028 Outbound PM	40.0	40.6	1.4%	35.2	35.5	1.0%

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 6.21. The diagram displays the maximum, minimum and average journey times for each of the A4 bus services modelled.

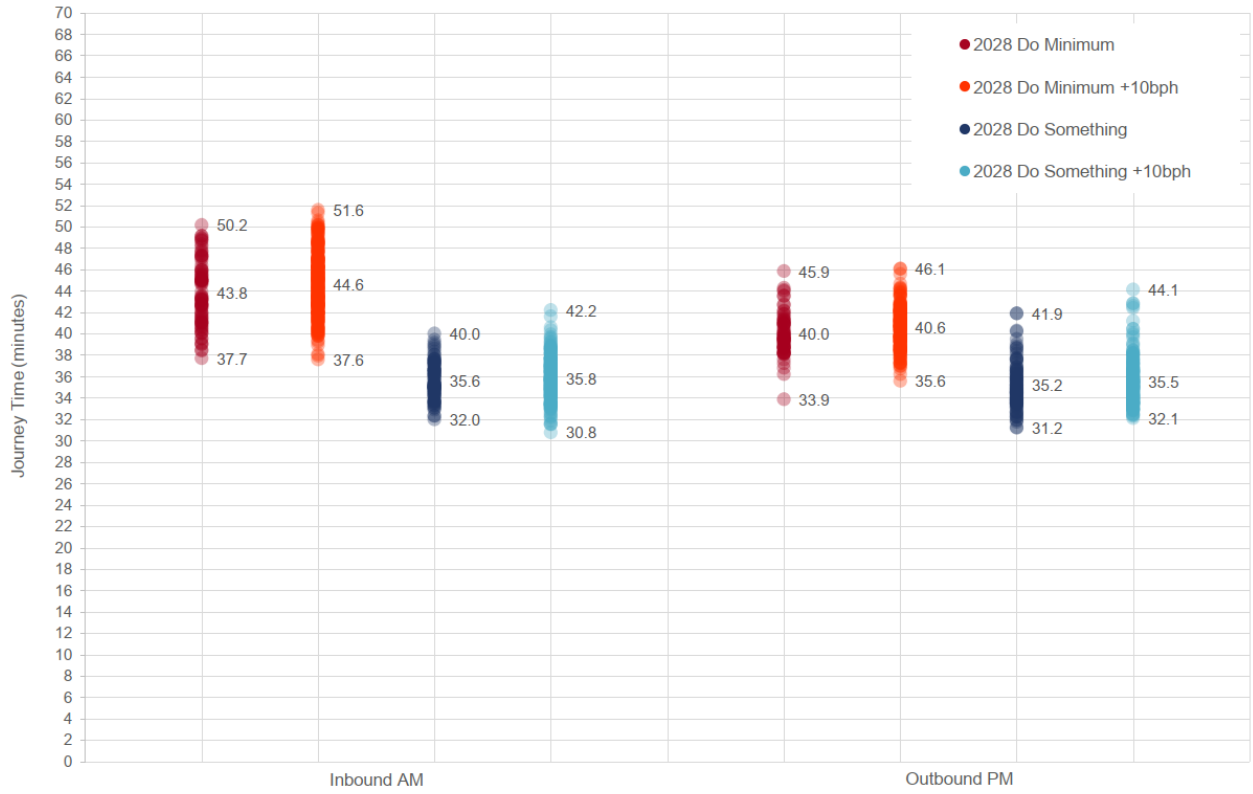

Diagram 6.21: Resilience Testing Bus Journey Time Reliability Indicators - Scenario Testing– Opening Year (2028)

As can be seen from Table 6.40 and Diagram 6.21 the results indicate a negligible change in Do Minimum and Do Something bus journey times even with an additional 10 services operating per direction per hour along the corridor. ***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 must 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 are outlined in Chapter 8 (Climate) of the EIAR.

6.6.3.4 General Traffic Assessment

6.6.3.4.1 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 proposed measures to improve priority for bus, cycle and walking facilities.

Localised junction models have been developed using industry standard modelling packages such as LinSig (a software tool by JCT Consultancy which allows traffic engineers to model traffic signals) and Junctions 9 (a software tool by TRL for the modelling and analysis of roundabout and priority junctions) 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 models using the iterative traffic modelling process described in Section 1.1 of the EIAR. The full outputs of the results are available in the TIA Appendix 2 (Junction Design Report) which accompanies this application.

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 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 6.22 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 6.22 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 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 one 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.

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.

6.6.3.4.1.1 General Traffic Flow Difference – AM Peak Hour

Diagram 6.23 illustrates the difference in traffic flows on the road links within the indirect study area in the 2028 AM peak. TIA Appendix 4.4 (General Traffic Flow) provides further details of the LAM outputs.

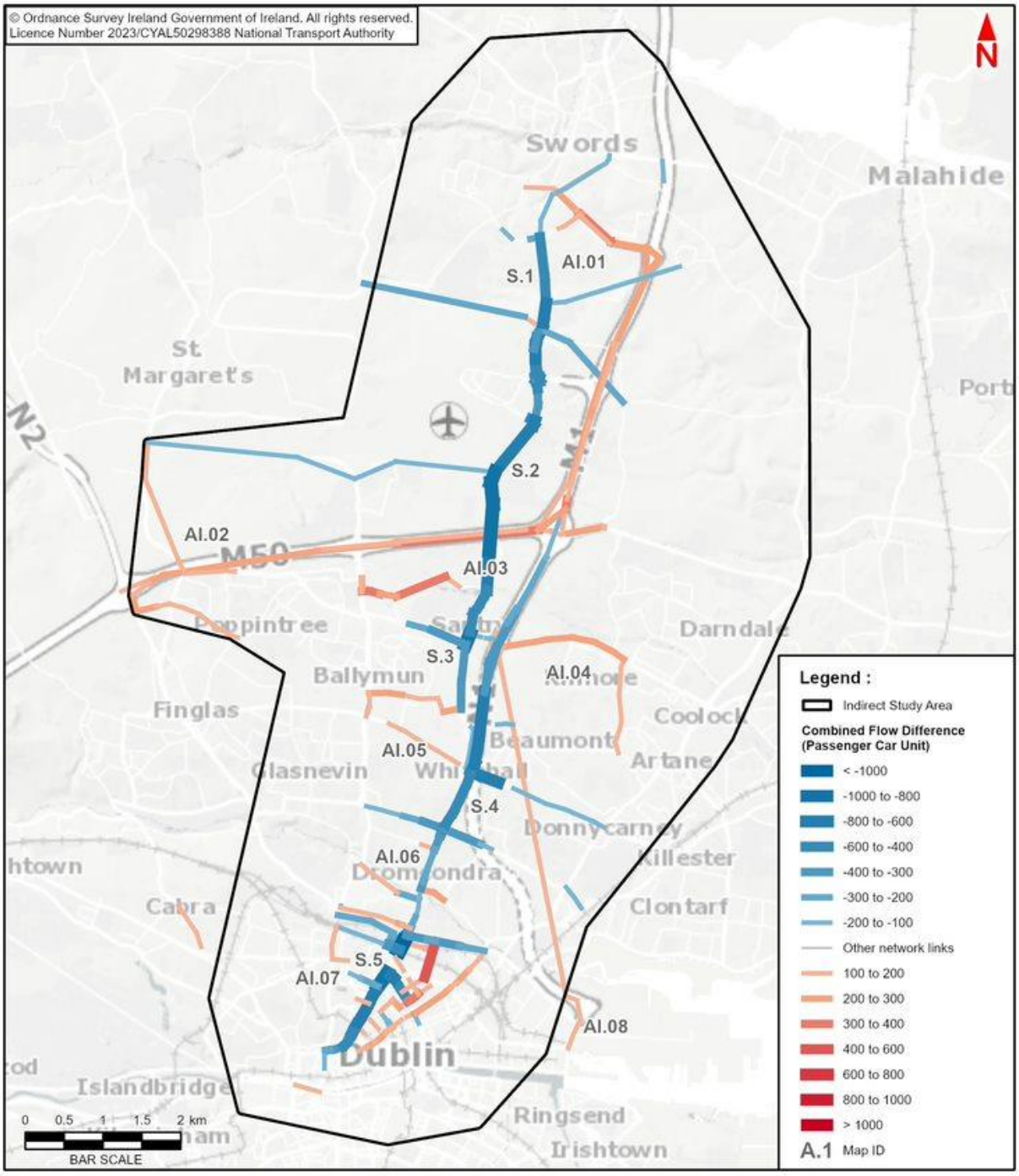

Diagram 6.23: Flow Difference on Road Links (Do Minimum vs. Do Something), AM Peak Hour, 2028 Opening Year

Impact on Direct Study Area (AM Peak Hour)

Direct Reductions in General Traffic: The blue lines in Diagram 6.23 indicate where the LAM predicts that a reduction of at least 100 combined traffic flows will occur. These are presented in Table 6.41.

The key reductions in traffic flows during the AM Peak Hour are outlined in Table 6.41.

Table 6.41 Road Links that Experience a Reduction of ≥ 100 Combined Flows During AM Peak Hour (Direct Study Area)

Section	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Section 1	Airport Roundabout	2948	2365	-583
	Pinnock Hill Roundabout	1296	1119	-177
	Swords Road	2263	1561	-702
	Swords Road	2174	1383	-791
Section 2	Collinstown Lane	1009	880	-129
	Swords Road	2000	1015	-986
Section 3	Coolock Lane	1603	1429	-174
	R132	1658	1271	-387
	Swords Road	1970	1162	-807
Section 4	Drumcondra Road Lower	1616	1434	-182
	Drumcondra Road Upper	1734	1195	-539
	Swords Road	2983	2186	-797
Section 5	Cavendish Row	338	128	-210
	Dorset Street Lower	2610	966	-1644
	Dorset Street Upper	1775	1047	-728
	Drumcondra Road Lower	2046	963	-1083
	Frederick Street North	279	114	-165
	Parnell Square East	279	114	-165

The contents of Table 6.41.demonstrate that there is a slight to profound reduction of between -129 and – 1,644 in 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 **High Positive** impact on the direct study area.

Direct Increases in General Traffic: The red lines in Diagram 6.23 indicate where the LAM predicts that an increase of at least 100 combined traffic flows will occur. There are no increases in traffic flows along the direct study area during the AM Peak Hour of the 2028 Opening Year.

Overall Impact on Direct Study Area: Overall, the scheme is predicted to have a **High Positive** impact on traffic flows within the direct study area in the AM Peak Hour of the 2028 Opening Year.

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 6.42.

Table 6.42 Road Links That Experience a Reduction of ≥100 Combined Flows During AM Peak Hour (Indirect Study Area)

Section	Road Name	Do Minimum Flows (Pcus)	Do Something Flows (Pcus)	Flow Difference (Pcus)
Section 1	Eastlink Road	2316	2105	-211
	Naul Road	1779	1535	-243
	Boroimhe Road	1493	1287	-205

	Stockhole Lane	1128	864	-264
	Atrium Road 1	1183	1013	-170
	Corballis Road North	1765	1654	-111
	Corballis Road South	1233	1063	-169
	Holywell Link Road	1540	1425	-114
	Kettles Lane	512	316	-196
	Malahide Road Roundabout	882	730	-152
	Mountgorry Way	1477	1376	-101
	R132	882	730	-152
Section 2	South Parallel Road	647	524	-124
	Collinstown Lane	1009	880	-129
	Corballis Road South	1026	585	-441
	Old Airport Road	871	741	-129
Section 3	Ballymun Road	918	817	-101
	Coolock Lane	1603	1429	-174
	Dublin Port Tunnel	1384	985	-399
	R132	2848	2081	-767
	Santry Avenue	1362	965	-397
	Shantalla Road	770	667	-103
	Tonlegee Road	667	491	-175
Section 4	Botanic Avenue	499	213	-286
	Collins Avenue	1770	1105	-666
	Collins Avenue West	2983	2186	-797
	Copeland Avenue	524	375	-149
	Griffith Avenue	1166	773	-393
	Santry Bypass	2848	2081	-767
	Sherkin Gardens	1166	773	-393
Section 5	Church Street	1914	1789	-125
	Bolton Street	1843	1204	-639
	Botanic Road	1270	1157	-114
	Clonliffe Road	968	654	-314
	Eccles Street	754	472	-282
	Father Mathew Bridge	2261	2152	-109
	Gardiner Street Lower	1288	1158	-130
	Gardiner Street Middle	1446	1118	-327
	Gardiner Street Upper	1228	592	-636
	King Street North	2161	1727	-434
	Lindsay Road	659	448	-211
	Mountjoy Square West	1314	801	-514
	St Patricks Parade	704	461	-243
	St Patricks Road	645	327	-318
	Whitworth Road	885	447	-438
	Father Mathew Bridge	2261	2152	-109
	Hardwicke Place	701	558	-143

The contents of Table 6.42. demonstrate that there is a traffic reduction within the indirect study area which varies between -101 and -797 combined flows along the surrounding road links. This reduction in general traffic flow has been determined as an overall **Medium Positive** impact on the indirect study area.

Indirect Increases in General Traffic: The key road links which experience additional traffic volumes are illustrated by the red lines in Table 6.43.

Table 6.43: Road Links That Experience an Increase of at Least +100 Combined Flows (AM Peak Hour)

Location	Map ID	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Swords	AI.01	Drinan Interchange	1479	1696	+216
		M1	5385	5618	+232
		M50	4057	4384	+327
		R132	383	508	+124
		Naul Road	618	795	+178
Charlestown	AI.02	R122	1028	1205	+178
		R104 St Margaret's Road	646	794	+148
		R108	2305	2549	+244
		Charlestown Place	1772	1973	+201
		Melville Road	646	793	+146
		Poppintree Park Lane	892	1045	+153
Santry	AI.03	Shanliss Road	322	512	+190
		Northwood Avenue	721	1051	+330
		Shanowen Road	337	554	+217
Kilmore	AI.04	Malahide Road	1693	1837	+144
		R104 Oscar Traynor Road	1507	1768	+261
		Beaumont Road	918	1023	+105
Whitehall	AI.05	R108 Ballymun Road	1314	1496	+183
		R103 Collins Avenue Ext	938	1069	+131
		R103 Collins Avenue West	937	1053	+117
Drumcondra	AI.06	Botanic Avenue	301	428	+127
		Richmond Road	489	754	+265
		Church Avenue	331	444	+113
		Prospect Road	1309	1486	+177
		St. Alphonsus Road Lower	247	441	+194
		St. Alphonsus Road Upper	257	469	+213
City Centre	AI.07	Iona Road	205	387	+183
		Bolton Street	50	151	101
		R108 / R135 Phibsborough Road	1391	1568	+177
		R101 North Circular Road	1627	1734	+107

Location	Map ID	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
		Wellington Street Lower	94	212	+118
		Parnell Street	244	473	+229
		Parnell Square West	513	685	+171
		Gardiner Row	394	554	+160
		Denmark Street Great	297	445	+148
		Hill Street	409	628	+219
		Dominick Street Lower	122	239	117
		Grenville Street	245	407	+162
		Mountjoy Square North	87	233	+146
		Mountjoy Square South	363	686	+323
		Mountjoy Square East	143	285	+141
		Belvedere Place	145	286	+141
		Belvedere Road	388	550	+162
		Fitzgibbon Street	148	332	+185
		Charles Street Great	280	455	+175
		Russell Street	542	1015	+473
		Jones's Road	429	920	+491
		Dublin Port Tunnel	846	1027	181
		R803 Summerhill	1058	1331	+273
		R803 Summerhill Parade	2043	2230	+187
		R803 Ballybough Road	1957	2162	+206

As presented in Table 6.43, the additional traffic on the key road links varies between +101 and +491 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. This assessment is presented in Section 6.6.3.4.3.

6.6.3.4.1.2 National Roads – 5% Threshold Impact Assessment (AM Peak Hour)

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 6.44.

Table 6.44: National Road Links Threshold (AM Peak Hour)

Junction	Total Do Minimum Turning Flows (vehicles)	Total Do Something Turning Flows (vehicles)	Turning Flow Difference (vehicles)	Percentage Difference
M1 Junction 3	9,486	9,840	354	4%
M1 Junction 2	12,388	12,727	339	3%

Junction	Total Do Minimum Turning Flows (vehicles)	Total Do Something Turning Flows (vehicles)	Turning Flow Difference (vehicles)	Percentage Difference
M1 Junction 1 / M50 Junction 3	16,477	16,732	254	2%
M50 Junction 4	13,420	13,848	428	3%
M50 Junction 5 / N2	16,008	16,223	215	1%
M50 Junction 2	7,025	6,454	-571	-8%

The contents of Table 6.44 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 or are below the 5% threshold for assessment.

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 6.43.

6.6.3.4.1.3 General Traffic Flow Difference – PM Peak Hour

Diagram 6.24 illustrates the difference in directional traffic flows on road links in the PM peak hour for the 2028 Opening Year. Appendix A6.5.7 (General Traffic Flow) provides further details of the LAM outputs.

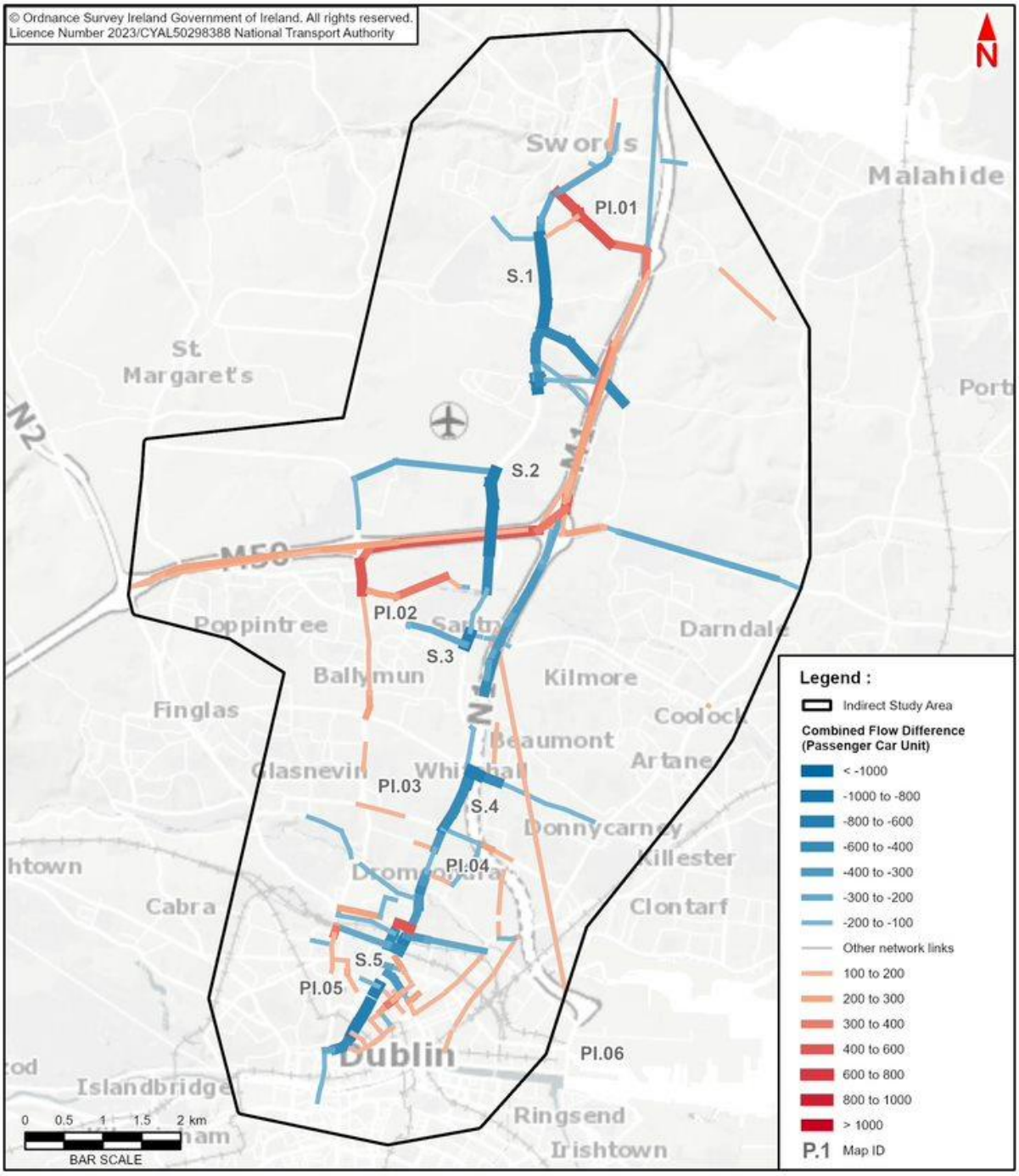

Diagram 6.24: Flow Difference on Road Links (Do Minimum vs. Do Something), PM Peak, 2028 Opening Year

Impact on Direct Study Area (PM Peak Hour)

Direct Reductions in General Traffic Flows: The blue lines in Diagram 6.24 indicate where the LAM predicts that a reduction of at least -100 combined traffic flows will occur. The key reductions in traffic flows during the PM Peak Hour are outlined in Table 6.45.

Table 6.45: Road Links That Experience a Reduction of ≥ 100 Combined Flows During PM Peak Hour (Direct Study Area)

Section	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Section 1	Airport Roundabout	3505	2519	-986
	Pinnock Hill Roundabout	823	607	-215
	Swords Road	1292	422	-870
Section 2	Swords Road	1577	654	-566
Section 3	Swords Road	1954	1238	-548
Section 4	Drumcondra Road Lower	1882	1495	-223
	Drumcondra Road Upper	1562	1061	-308
	Swords Road	3254	2383	-582
Section 5	Cavendish Row	274	93	-181
	Dorset Street Lower	2458	984	-804
	Dorset Street Upper	1419	618	-475
	Drumcondra Road Lower	1880	1121	-483
	Frederick Street North	297	135	-161
	Parnell Square East	297	135	-161

The contents of Table 6.45 demonstrate that there is a reduction of between -161 and -986 general traffic flows along the direct study area during the PM 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 6.24 indicate where the LAM predicts that an increase of at least -100 combined traffic flows will occur. There are no increases to general traffic flows along the direct study area during the PM Peak Hour of the 2028 Opening Year.

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 in the PM Peak Hour of the 2028 Opening Year.

Impact on Indirect Study Area (PM Peak Hour)

Indirect Reductions in General Traffic Flows: In addition to the traffic flow reductions occurring along the direct study area, there are key reductions in traffic flows noted 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 of the 2028 Opening Year are outlined in Table 6.46.

Table 6.46: Road Links that Experience a Reduction ≥ 100 Combined Flows during PM Peak Hour (Indirect Study Area)

Section	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Section 1	Boroimhe Road	1023	851	-113
	Cloghran	1496	651	-845
	Cloghran Roundabout	1429	651	-778
	Corballis Road North	2500	2196	-304
	Drinan Link Road	1068	966	-102
	Malahide Road Roundabout	767	551	-215
	R132	767	551	-215
	Seatown Road	4425	4231	-194

	Stockhole Lane	1263	854	-231
	Swords Shopping Centre	914	805	-149
	Toberbunny	338	169	-168
Section 2	Collinstown Lane	997	714	-194
	Northwood Avenue	745	632	-203
	Old Airport Road	854	570	-194
	R139	3439	3199	-153
Section 3	Coolock Lane	1416	1259	-178
	Dublin Port Tunnel	1586	1299	-288
	Montrose Grove	206	78	-124
	R132	1529	950	-579
	Santry Avenue	1059	794	-176
Section 4	Botanic Avenue	863	671	-165
	Collins Avenue	1797	1179	-402
	Collins Avenue West	3254	2383	-582
	Fairview	621	514	-107
	Fairview Strand	1089	931	-107
	Glasnevin Hill	909	795	-106
	Grace Park Road	1275	1133	-101
	Griffith Avenue	759	609	-118
	Larkhill Road	219	79	-139
	Lorcan Park	3115	2248	-579
	Old Finglas Road	751	640	-107
Section 5	Bolton Street	1586	918	-448
	Botanic Road	1384	1237	-147
	Church Street	1834	1645	-175
	Clonliffe Road	752	475	-222
	Crawford Avenue	208	58	-148
	Eccles Street	799	601	-106
	Father Mathew Bridge	1998	1815	-167
	Gardiner Street Middle	1548	1435	-134
	Gardiner Street Upper	1170	816	-344
	Hardwicke Lane	1365	686	-429
	Hollybank Road	191	42	-147
	King Street North	2119	1686	-293
	Lindsay Road	572	395	-170
	Mountjoy Square West	1468	1278	-171
	North Circular Road	832	643	-219
	St Annes Road	322	25	-297
	St Patricks Parade	571	377	-178
	St Patricks Road	1042	546	-326
	Whitworth Road	975	524	-265
	Church Street	1812	1638	-152

The contents of Table 6.46 demonstrate that there is a traffic reduction within the indirect study area which varies between -101 and -845 combined flows along the surrounding road links. This reduction in general traffic flow has been determined as an overall **Medium Positive** impact on the indirect study area.

Indirect Increases in General Traffic Flows: The key road links which experience additional traffic volumes are presented in Table 6.47.

Table 6.47: Road Links That Experience an Increase of at Least +100 Combined Flows (PM Peak Hour)

Location	Map ID	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
Swords	PI.01	M1	4679	5063	+383
		M50	3894	4317	+422
		North Street	636	774	+137
Santry	PI.02	Beaumont Road	926	1181	255
		Northwood Avenue	617	985	+368
		R139	3610	3854	+243
		R122	910	1061	+150
		R104	516	667	+150
		Old Ballymun Road	555	910	+355
		R105	2037	2166	+128
		Northwood	723	1022	299
Whitehall	PI.03	R108 Ballymun Road	1196	1407	+210
		R102 Griffith Avenue	929	1129	+200
		Ellenfield Road	182	303	+120
		R108	1069	1488	+420
Drumcondra	AI.04	Prospect Road	1370	1634	264
		Richmond Road	717	848	131
		Church Road	602	726	+124
City Centre	PI.05	Iona Road	517	721	+204
		R108 / R135 Phibsborough Road	1636	1938	+302
		R101 North Circular Road	1858	2033	+175
		Berkeley Road	916	1115	+200
		Berkeley Street	298	457	+159
		Ryder's Row	853	984	+131
		Eccles Street	922	1137	+215
		Annesley Bridge Road	2057	2183	+126
		R105 North Strand Road	1767	1935	+167
		R105 Amiens Street	1676	1823	+147
		R803 Ballybough Road	2139	2269	+130
		R803 Summerhill Parade	2220	2354	+134
		R803 Summerhill	775	964	+189
		Gardiner Street Middle	1618	1765	+147

Location	Map ID	Road Name	Do Minimum Flows (PCUs)	Do Something Flows (PCUs)	Flow Difference (PCUs)
		Mountjoy Square South	318	575	+257
		Mountjoy Square North	100	235	+136
		Belvedere Place	172	349	+177
		Belvedere Road	451	733	+282
		Gardiner Place	453	728	+274
		Philipsburgh Avenue	521	660	+139
		Temple Street North	697	845	+148
		Hill Street	326	525	+199
		Denmark Street Great	164	477	+313
		Gardiner Row	267	547	+281
		Parnell Square North	319	435	+116
		Parnell Square West	418	554	+136
		Parnell Street	458	600	+142
		King's Inns Street	240	4376	+136
City Centre	PI.05	Dublin Port Tunnel	765	892	127

The contents of Table 6.47 outline that the additional traffic on the key road links within the indirect study area varies between +101 and +699 combined flows during the PM 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, this is presented in Section 6.6.3.4.3.

6.6.3.4.1.4 National Roads – 5% Threshold Impact Assessment (PM Peak Hour)

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 PM Peak Hour are outlined in Table 6.48.

Table 6.48: National Road Links Threshold (PM Peak Hour)

Junction	Total Do Minimum Turning Flows (vehicles)	Total Do Something Turning Flows (vehicles)	Turning Flow Difference (vehicles)	Percentage Difference
M1 Junction 3	9,766	10,013	248	3%
M1 Junction 2	13,134	13,294	161	1%
M1 Junction 1 / M50 Junction 3	16,674	16,991	318	2%
M50 Junction 4	12,934	13,538	604	5%
M50 Junction 5 / N2	16,309	16,421	112	1%
M50 Junction 2	7,580	6,843	-737	-10%

The contents of Table 6.48 demonstrate that in the PM peak hour, traffic flows at national roads junctions are expected to be below the 5% threshold for assessment.

No further assessment into the junctions with national roads during the PM peak hour has been undertaken, except for instances where the 100-vehicle threshold for additional traffic is exceeded as outlined in Table 6.47.

6.6.3.4.2 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 significance 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 (V/C ratios). The V/C 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 V/C 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 6.49.

Table 6.49 Junction Volume / Capacity Ranges

V/C 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 V/C ratios during the Do Minimum and Do Something scenarios for the key junctions, the terms outlined in Table 6.50 have been used to describe the impact.

Table 6.50 Magnitude of Impact for Redistributed Traffic

		Do Something		
		≤85%	**85% - 100%**	**≥100%**
Do Minimum	**≤85%**	Negligible	Low Negative	High Negative
	85% - 100%	Negligible	Negligible	Medium Negative
	≥100%	Medium Positive	Negligible	Low Negative

As indicated in Table 6.50, the changes in V/C ratios between the Do Minimum and Do Something scenarios result in either a positive, negative or negligible magnitude of impact.

General Traffic Impact Assessment (2028 Opening Year) – Indirect Study Area- AM Peak Hour

Table 6.51 presents the road links which have been identified in the General Traffic threshold assessment with reference to the capacity at their associated junctions during the 2028 AM Peak Hour. Table 6.51 shows only those junctions with a predicted impact of Low or higher. A table of results containing all of the assessed junctions is provided in TIA Appendix 4.4.

Table 6.51: 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			Description of Impact
		≤85%	85% - 100%	>100%	≤85%	85% - 100%	>100%	
R108	R108 / R108	✓				✓		Low Negative
Gardiner Row	Frederick Street North / Frederick Street North / Parnell Square North / Gardiner Row	✓				✓		Low Negative
Grenville Street	Grenville Street / Mountjoy Square West / Gardiner Street Middle	✓				✓		Low Negative
Mountjoy Square South	Gardiner Street Middle / Mountjoy Square South / Gardiner Street Middle	✓				✓		Low Negative
Phibsborough Road	Phibsborough Road	✓				✓		Low Negative
Richmond Road	Drumcondra Road Upper / Millmount Avenue / Drumcondra Road Upper / Richmond Road	✓				✓		Low Negative

The results of the junction analysis shown in Table 6.51 and TIA Appendix 4.4 demonstrate that of the 121 junctions assessed:

- Seven are predicted to experience Low Negative impacts;
- 109 are expected to experience Negligible impacts (not shown in Table 6.51); and
- Five are expected to experience Low Positive impacts (not shown in Table 6.51).

No further assessment into potential mitigation measures is deemed to be required for junctions in the 2028 AM Peak Hour scenario.

General Traffic Impact Assessment (2028 Opening Year) – Indirect Study Area- PM Peak Hour

Table 6.52 presents the V / C ratios at the road junctions along the identified links in the PM Peak Hour for the 2028 Opening Year. Table 6.52 shows only those junctions with a predicted impact of Low or higher. A table of results containing all of the assessed junctions is provided in TIA Appendix 4.4.

Table 6.52: 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			Description of Impact
		<85%	85% - 100%	>100%	<85%	85% - 100%	>100%	
R108	R108 / R108	✓					✓	High Negative
R108	R108	✓				✓		Low Negative
North Strand Road	North Strand Road / North Strand Road / Ossory Road	✓				✓		Low Negative
Prospect Road	Prospect Road / Prospect Road / Whitworth Road		✓				✓	Medium Negative
Prospect Road	Phibsborough Road / Royal Canal Bank / Prospect Road	✓				✓		Low Negative
Griffith Avenue	Griffith Avenue / Griffith Walk / Calderwood Road / Griffith Avenue	✓				✓		Low Negative

The results of the junction analysis shown in Table 6.52 demonstrate that of the 145 junctions assessed:

- One is predicted to experience a High Negative impact;

- One is predicted to experience a Medium Negative impact;
- Four are expected to experience Low Negative impacts;
- 137 are expected to experience Negligible impacts (not shown in Table 6.52); and
- Two are expected to experience Low Positive impacts (not shown in Table 6.52).

Capacity issues (>100% V/C) are noted at the following junctions:

- R108 Ballymun Road / M50 Off-Slip Road (18276) – operates below 85% during the Do Minimum scenario and increases to operate above 100% during the Do Something scenario;
- Prospect Road (R108 & R135) / Whitworth Road / Phibsborough Road (R108 & R135) (3523) – operates between 85% and 100% during the Do Minimum scenario and increases to operate above 100% during the Do Something scenario;

The R108 Ballymun Road / M50 Off-Slip Road junction is predicted to experience a High impact as a result of the scheme. This is a large, signalised junction that is designed for higher volumes of traffic, and it is considered to be of a negligible sensitivity. This localised High impact is considered to be acceptable in the wider context of the scheme.

No further assessment into potential mitigation measures is deemed to be required for junctions in the 2028 PM Peak Hour scenario.

General Traffic Impact Assessment (2043 Design Year) – Indirect Study Area – AM Peak Hour

Table 6.53 presents the V/C ratios at the road junctions along the identified links in the AM Peak Hour for the 2043 Design Year. Table 6.53 shows only those junctions with a predicted impact of 'Low' or higher. A table of results containing all of the assessed junctions is provided in TIA Appendix 4.4.

Table 6.53: Volume Over Capacity Ratios at Key Junctions (Do Minimum vs. Do Something), AM Peak, 2043 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%	
Grenville Street	Grenville Street / Mountjoy Square West / Gardiner Street Middle	✓				✓		Low Negative
Mountjoy Square South	Gardiner Street Middle / Mountjoy Square South / Gardiner Street Middle	✓				✓		Low Negative
Parnell Street	R132 / Parnell Street / Parnell Street / O'Connell Street Upper	✓				✓		Low Negative
Prospect Road	Prospect Road / Prospect Road / Whitworth Road		✓				✓	Medium Negative

The results of the junction analysis shown in Table 6.53 demonstrate that that of the 120 junctions assessed:

- One is predicted to experience a Medium Negative impact;
- Three are expected to experience Low Negative impacts;
- 111 are expected to experience Negligible impacts (not shown in Table 6.53); and
- Five are expected to experience Low Positive impacts (not shown in Table 6.53).

Capacity issues (>100% V/C) are noted at the following junctions:

- Prospect Road (R108 & R135) / Whitworth Road / Phibsborough Road (R108 & R135) (3523) – operates between 85% and 100% during the Do Minimum scenario and increases to operate above 100% during the Do Something scenario;

No further assessment into potential mitigation measures is deemed to be required for junctions in the 2043 AM Peak Hour scenario.

General Traffic Impact Assessment (2043 Design Year) – Indirect Study Area – PM Peak Hour

Table 6.54 presents the V/C ratios at the road junctions along the identified links in the PM Peak Hour for the 2043 Design Year. Table 6.54 shows only those junctions with a predicted impact of 'low' or higher. A table of results containing all of the assessed junctions is provided in TIA Appendix 4.4.

Table 6.54: Volume Over Capacity Ratios at Key Junctions (Do Minimum vs. Do Something), PM Peak, 2043 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%	
North Circular Road	North Circular Road / Berkeley Road / North Circular Road	✓				✓		Low Negative
Parnell Street	R132 / Parnell Street / Parnell Street / O'Connell Street Upper	✓				✓		Low Negative

The results of the junction analysis illustrated in Table 6.54 demonstrate that that of the 145 junctions assessed:

- Two are expected to experience Low Negative impacts;
- 138 are expected to experience Negligible impacts (not shown in Table 6.54); and
- Five are expected to experience Low Positive impacts (not shown in Table 6.54).

No further assessment into potential mitigation measures is deemed to be required for junctions in the 2043 PM Peak Hour scenario

6.6.3.4.3 Night-time Traffic Redistribution

The night-time period is defined as between 23:00 and 07:00. Analysis of traffic data during this period indicates that traffic levels are considerably lower and that junctions have a higher capacity for vehicular movement. Less pedestrian, cycling and bus demand requirements leading to higher level of general traffic green time allocation per typical signal cycle.

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.

6.6.3.4.4 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 roads that required further traffic analysis:

- AM Peak Hour: A total of 61 road links, as listed in Table 6.43
- PM Peak Hour: A total of 50 road links, as listed in Table 6.47

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 Local / Regional Roads Assessment

The majority of assessed junctions 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 for the additional general traffic volumes redistributed, as a result of the Proposed Scheme and the impact is deemed **Negligible.**

The junction analysis contained within the EIAR considers the sensitivity of each of the junctions, and combines this with the predicted magnitude of impact to produce an overall significance of effects. A summary of the EIAR findings is provided below. In the 2028 AM peak hour:

- 11 junctions are anticipated to have an Imperceptible and Long-term effect;
- 100 junctions are anticipated to have a Not Significant and Long-term effect;
- Five junctions are anticipated to have a Negative, Moderate and Long-term effect; and
- Five junctions are anticipated to have a Positive, Slight and Long-term effect.

In the PM peak hour:

- 27 junctions are anticipated to have an Imperceptible and Long-term effect;
- 114 junctions are anticipated to have a Not Significant and Long-term effect;
- Two junctions are anticipated to have a Negative, Slight and Long-term effect; and
- Two junctions are anticipated to have a Positive, Slight and Long-term effect.

The R108 Ballymun Road / M50 Off-Slip Road junction is predicted to experience a High impact as a result of the scheme. This is a large, signalised junction that is designed for higher volumes of traffic, and it is considered to be of a low sensitivity. This localised High impact is considered to be acceptable in the wider context of the scheme.

No mitigation measures are deemed to be required in either the AM or PM 2028 peak hours.

2028 National Roads Assessment

The assessment of National Roads junctions has shown in that all cases junctions within the study area are predicted to experience reductions in flows or increases below the 5% threshold for assessment. Overall, the Proposed Scheme is expected to have a **Negligible impact** on turning flows at junctions with national roads in both the AM and PM peak hours in 2028.

2043 Local / Regional Roads Assessment

The majority of assessed junctions 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 for the additional general traffic volumes redistributed, as a result of the Proposed Scheme and the impact is deemed **Negligible.**

In the 2043 AM peak hour:

- 11 junctions are anticipated to have an Imperceptible and Long-term effect;
- 101 junctions are anticipated to have a Not Significant and Long-term effect;
- Three junctions are anticipated to have a Negative, Moderate and Long-term effect; and
- Five junctions are anticipated to have a Positive, Moderate and Long-term effect.

In the PM peak hour:

- 31 junctions are anticipated to have an Imperceptible and Long-term effect;
- 103 junctions are anticipated to have a Not Significant and Long-term effect;
- One junction is anticipated to have a Negative, Moderate and Long-term effect; and
- Five junctions are anticipated to have a Positive, Moderate and Long-term effect.

No mitigation measures are therefore deemed to be required in either the AM or PM 2043 peak hours.

Overall Summary

Overall, it has been determined that the impact of the reduction in general traffic flows along the Proposed Scheme will be **Medium to High Positive** whilst the impact of the redistributed general traffic along the surrounding road network will be **Low Negative.**

It should be noted that while some high impacts have been identified, these are at a small number of individual junctions, and effects will be short-lived and localised. 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 and in the context of the increased movement of people overall and by sustainable modes in particular. Therefore, the proposed impacts are considered acceptable when considered against the Scheme Objectives.

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.

6.6.3.4.5 Network-Wide Performance Indicators for General Traffic (Indirect Study Area)

The traffic and transport analysis considers the impact that the Proposed Scheme will have on the road network, within the direct and indirect study areas. To further quantify the impact of the Proposed Scheme on the traffic and transport conditions, network-wide performance indicators have been extracted for the general traffic conditions beyond the defined study areas, covering the full LAM modelled area.

The following indicators have been provided for both scenarios:

- **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's calculated by dividing total travel distance by total travel time.

The contents of Table 6.55 outline the impact that the Proposed Scheme will have on the wider transport network, both within and beyond the defined study areas.

Table 6.55 Network-Wide Performance Indicators with Proposed Scheme in Place

Scenario	Metric	Do Minimum	Do Something	% Difference	Impact
2028 Opening Year AM Peak Hour	Transient Queues (pcu hr)	19777.1	20283.1	2.56%	Negligible
	Over-capacity Queues (pcu hr)	7641.5	7006.7	-8.31%	
	Total Travel Times (pcu hr)	67603.9	67376.3	-0.34%	
	Total Travel Distance (pcu km)	2143223.3	2139657.5	-0.17%	
	Average Speed (km/h)	31.7	31.8	0.32%	
2028 Opening Year PM Peak Hour	Transient Queues (pcu hr)	19055.3	19611.0	2.92%	Negligible
	Over-capacity Queues (pcu hr)	7882.9	7791.7	-1.16%	
	Total Travel Times (pcu hr)	64802.9	65179.1	0.58%	
	Total Travel Distance (pcu km)	2035496.1	2028349.9	-0.35%	
	Average Speed (km/h)	31.4	31.1	-0.96%	
2043 Opening Year AM Peak Hour	Transient Queues (pcu hr)	16976.6	17351.3	2.21%	Negligible
	Over-capacity Queues (pcu hr)	7843.6	7444.3	-5.09%	
	Total Travel Times (pcu hr)	62947.1	62861.8	-0.14%	
	Total Travel Distance (pcu km)	2121715.8	2120029.8	-0.08%	
	Average Speed (km/h)	33.7	33.7	0.00%	
2043 Opening Year AM Peak Hour	Transient Queues (pcu hr)	18051.3	18314.3	1.46%	Low Positive
	Over-capacity Queues (pcu hr)	9733.5	9803.8	0.72%	
	Total Travel Times (pcu hr)	64882.5	65071.8	0.29%	
	Total Travel Distance (pcu km)	2049703.5	2043737.5	-0.29%	
	Average Speed (km/h)	31.6	31.4	-0.63%	

The contents of Table 6.55 demonstrate that the changes to general traffic metrics as a result of the Proposed Scheme are typically in the range -4.5 to +2.3%, which is assessed as an overall **Negligible impact.**

6.6.4 Operational Phase Summary

The contents of Table 6.56 present a summary of the potential impacts of the Proposed Scheme during the Operational Phase.

Table 6.56: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
Cycling Infrastructure	Improvements to the quality of the cycling infrastructure along the Proposed Scheme.	Low to High Positive
Bus Infrastructure	Improvements to the quality of the bus infrastructure along the Proposed Scheme.	Low to High Positive

Assessment Topic	Effect	Predicted Impact
Parking and Loading	A total loss of 58 parking / loading spaces along the Proposed Scheme.	Negligible to Low Negative
People Movement	Increases to the total number of people travelling through 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.	Medium Negative
	Deterioration to the network-wide queuing capacity, travel times, travel distances and average network speeds beyond the direct and indirect study areas	Negligible
Cumulative Impact	Higher mode share for sustainable modes of travel (walking, cycling and buses), improvements in bus travel speeds.	High Positive

As outlined within Section 6.6 (Operational Phase) and summarised in Table 6.56 above, 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 movement of people.

Although it is recognised that there will be some negative impacts for general traffic and parking / loading availability, the Proposed Scheme has been designed and outlined within this assessment to take cognisance in the relevant traffic and transport guidelines outlined in Section 9 (References). The assessment demonstrates that the Proposed Scheme can be readily utilised by sustainable modes and that 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 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 Stage 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 Phase of the Proposed Scheme. 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 the EIAR.

7.2.2 Transport Schemes

As detailed in Section 6.3 and 6.4, 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) (Government of Ireland 2021) 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) (Government of Ireland 2018) 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 GDA 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 TIA, 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 6.3, 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 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 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 cumulative traffic and transport assessment, as per the GDA Strategy proposals, there are no specific demand management measures included in the Do Minimum reference case (receiving environment) scenario in the Opening Year (2028), 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.

7.2.3.1.1 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 Schemes, and which could reasonably be exposed to cumulative effects in combination with other developments.

Diagram 7.1 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.

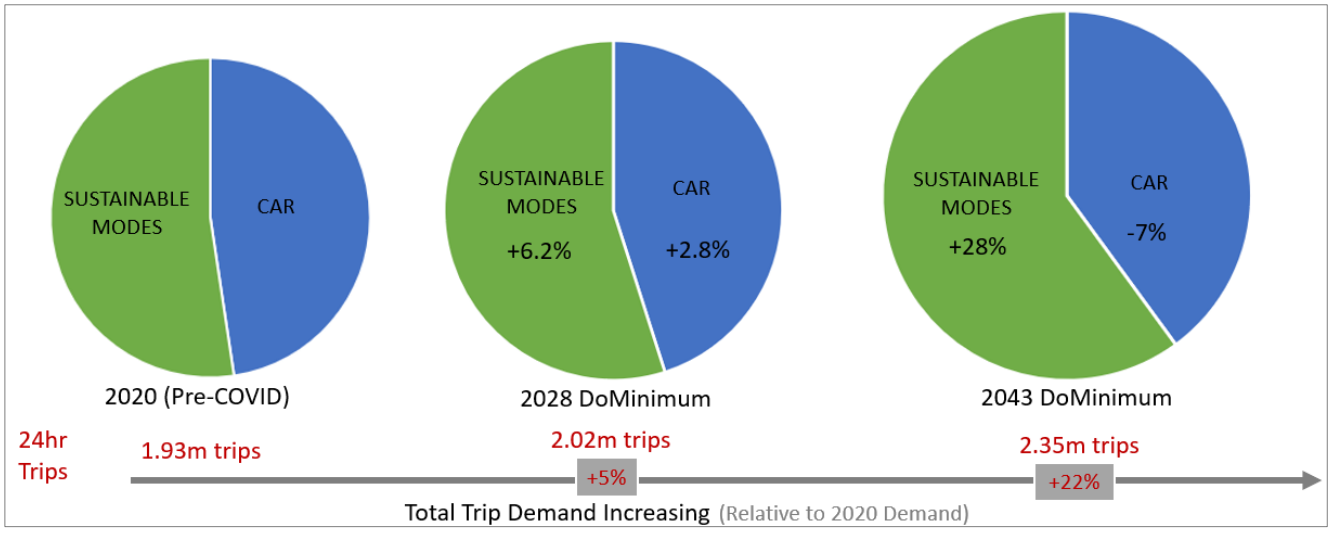

Diagram 7.1: Trip Demand Changes without the Proposed Schemes (in Relation to 2020 Demand)

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.

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.

7.2.3.1.2 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).

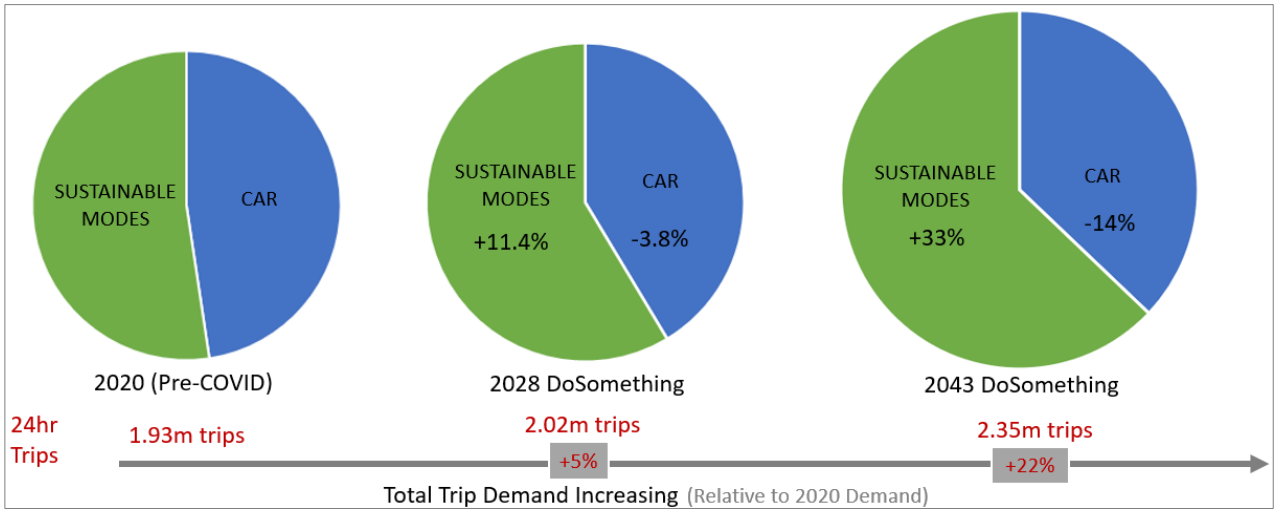

Diagram 7.2: Trip Demand Changes with the Proposed Schemes (in Relation to 2020 Demand)

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.

[4] Trips to/from ERM zones within a 500m distance from the Proposed Scheme to/from any destination

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 corridor 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 Schemes 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 7.3 and Diagram 7.4 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 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

7.2.4.2.1 2028 Demand Changes by Mode

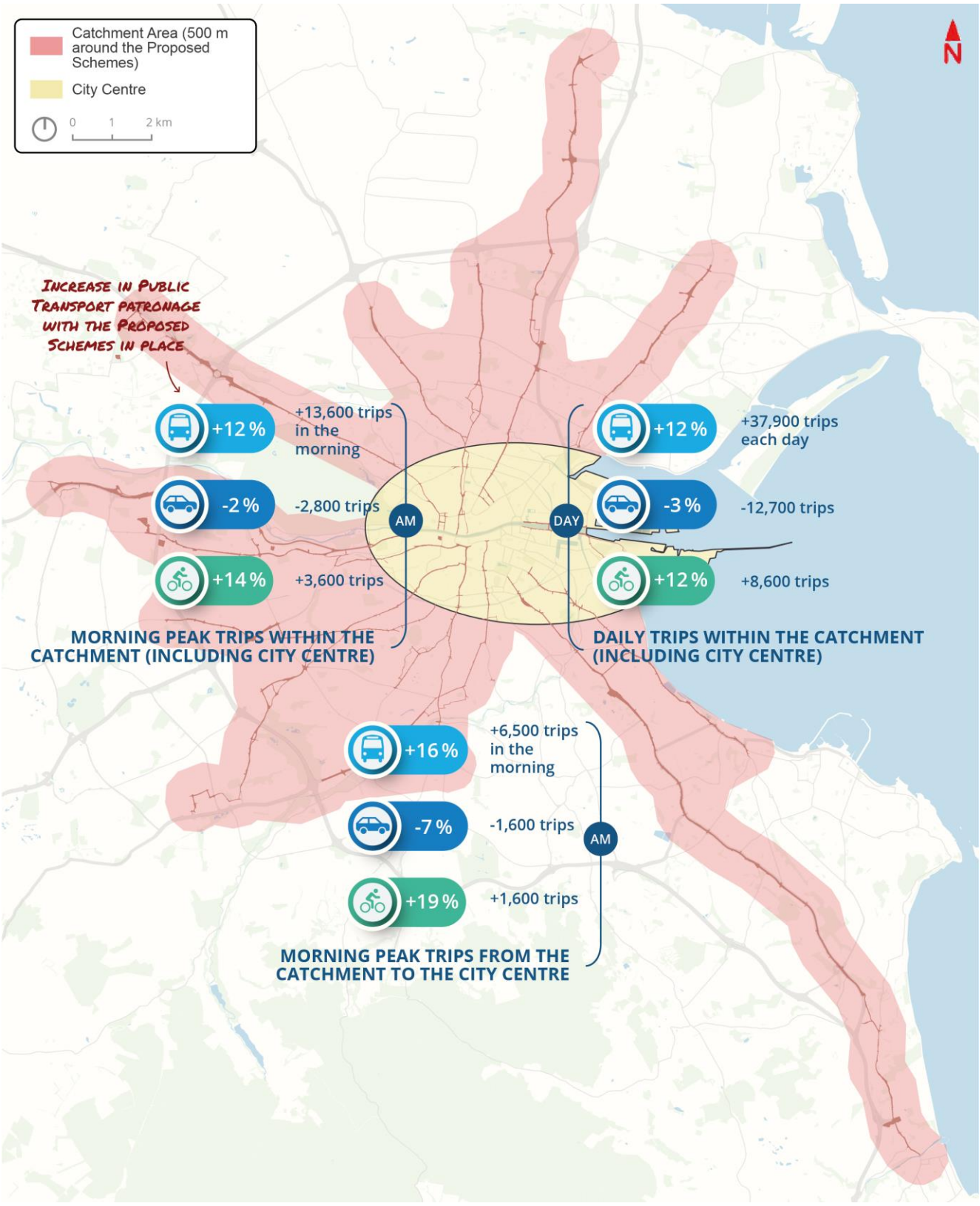

Diagram 7.3: Change in Trips by Mode Within a 500m Catchment Area of the Proposed Schemes and the City Centre and Trips Originating from the Catchment Inbound to the City Centre in 2028

As indicated in Diagram 7.3, 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

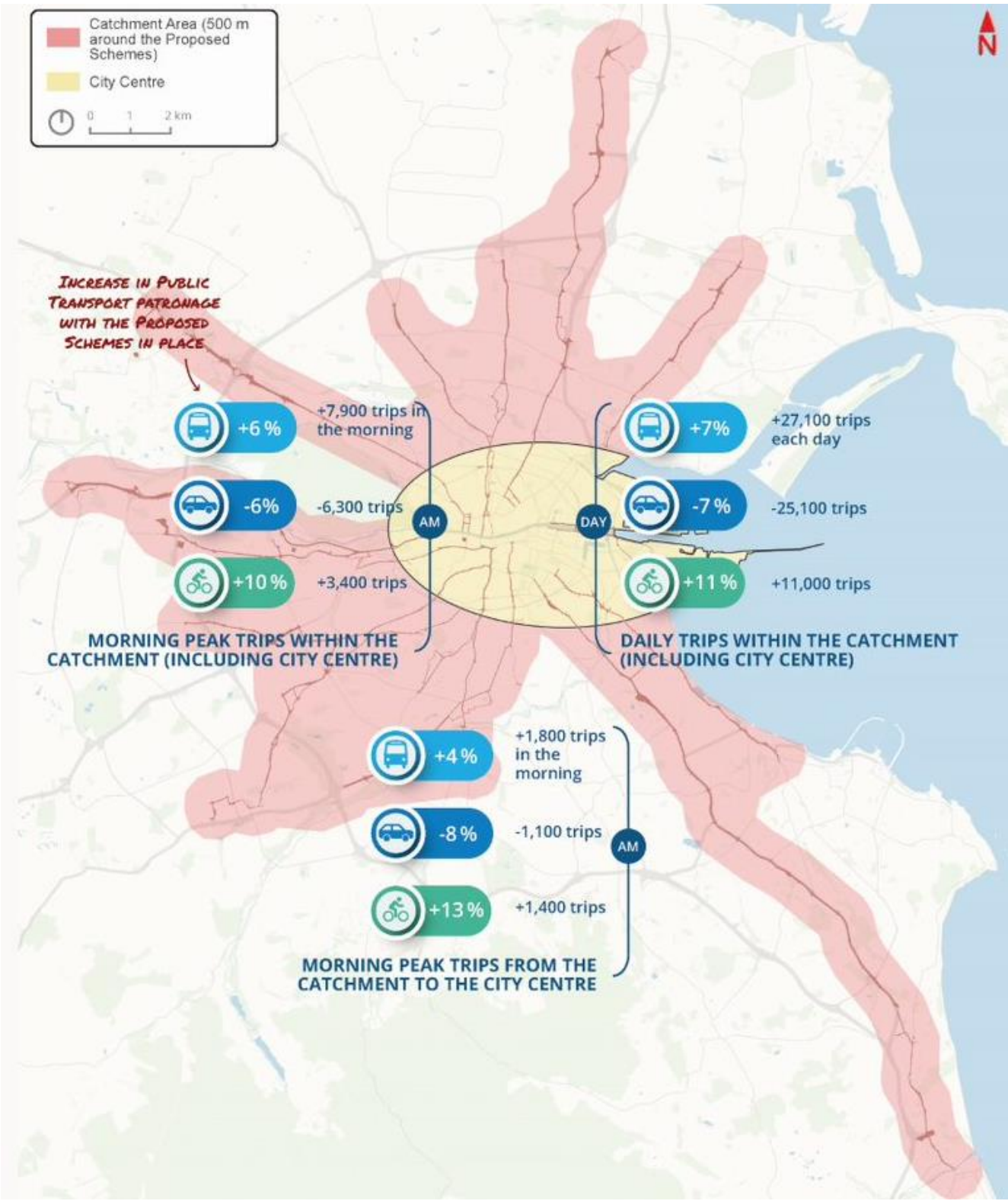

Diagram 7.4: Change in Trips by Mode Within a 500m Catchment Area of the Proposed Schemes and the City Centre and Trips Originating from the Catchment Inbound to the City Centre in 2043

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 implementation of the Proposed Schemes will have on modal share changes on the direct study areas, 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.

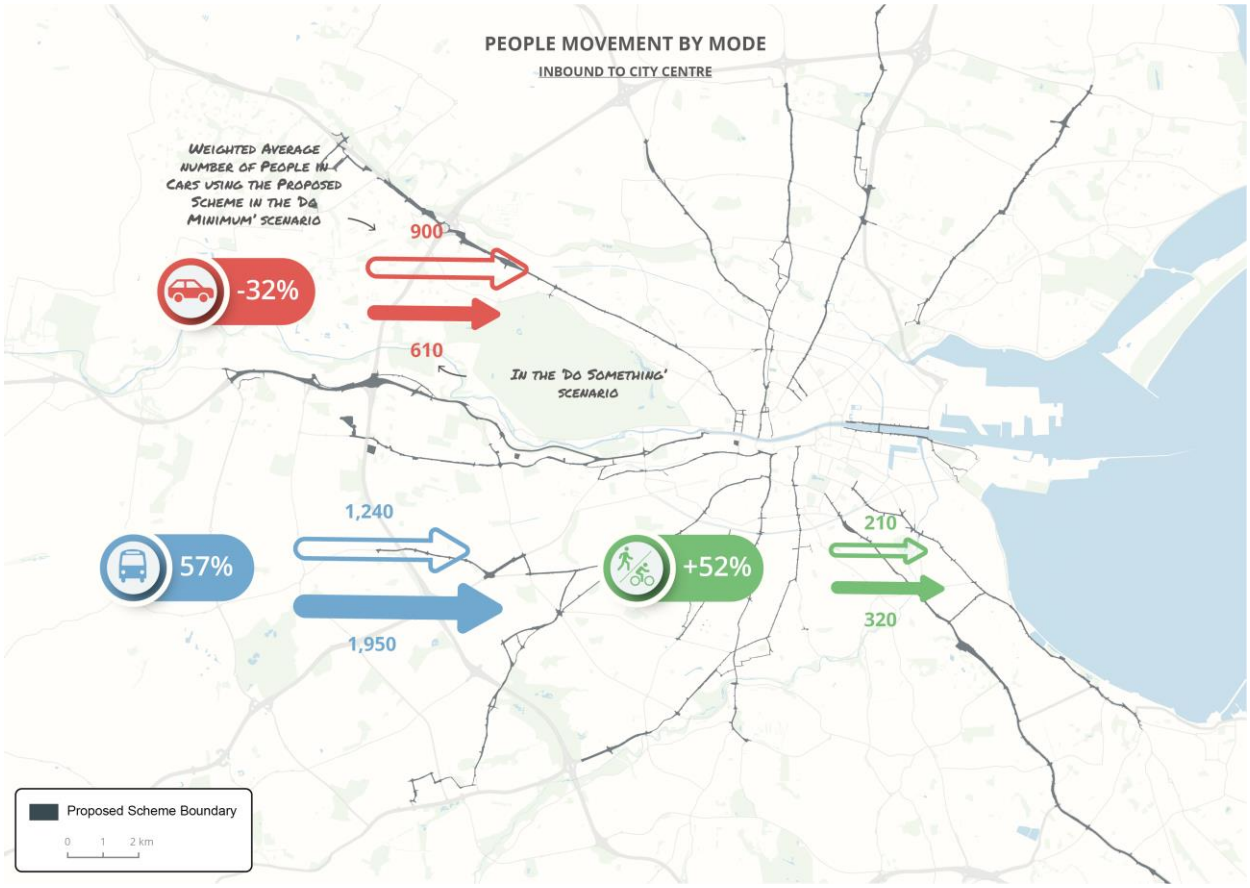

Diagram 7.5: Weighted Average People Movement by Mode During 2028 AM Peak Hour

As indicated in Diagram 7.5, on average across all Proposed Schemes, there is a predicted reduction of 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 7.5 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%

Direction	Time Period	Mode of Transport	Do Minimum		Do Something		Difference	
			Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)	Hourly Trips	Difference (%)
		Combined Walking/Cycling	210	9%	320	11%	110	52%
		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.

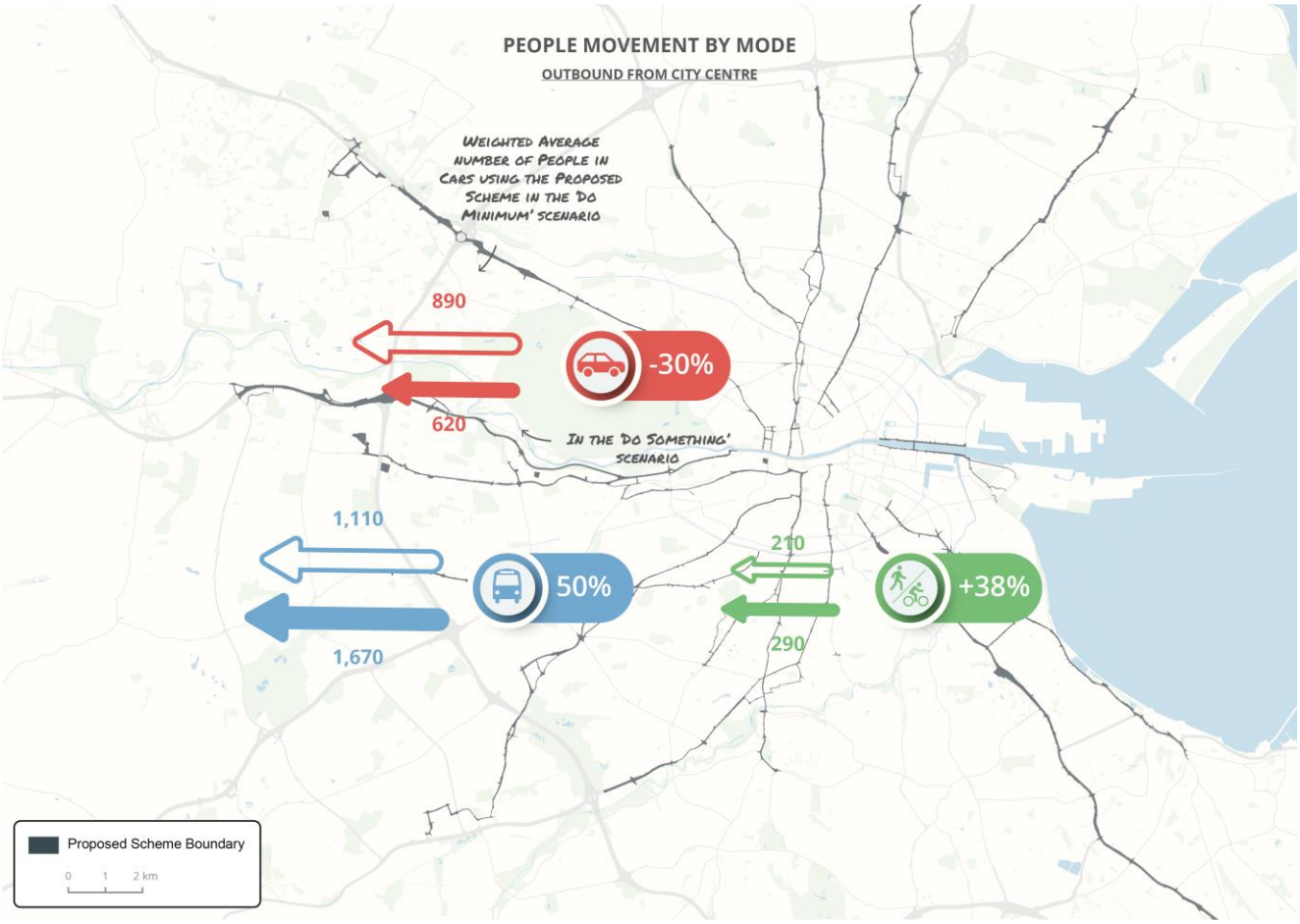

Diagram 7.6: Weighted Average People Movement by Mode during 2028 PM Peak Hour

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%
		Combined Walking/Cycling	210	10%	290	11%	80	38%
		Sustainable Modes Total	**1,320**	**60%**	**1,960**	**76%**	**640**	**48%**
		Total (All modes)	**2,210**	**60%**	**2,580**	**76%**	**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.

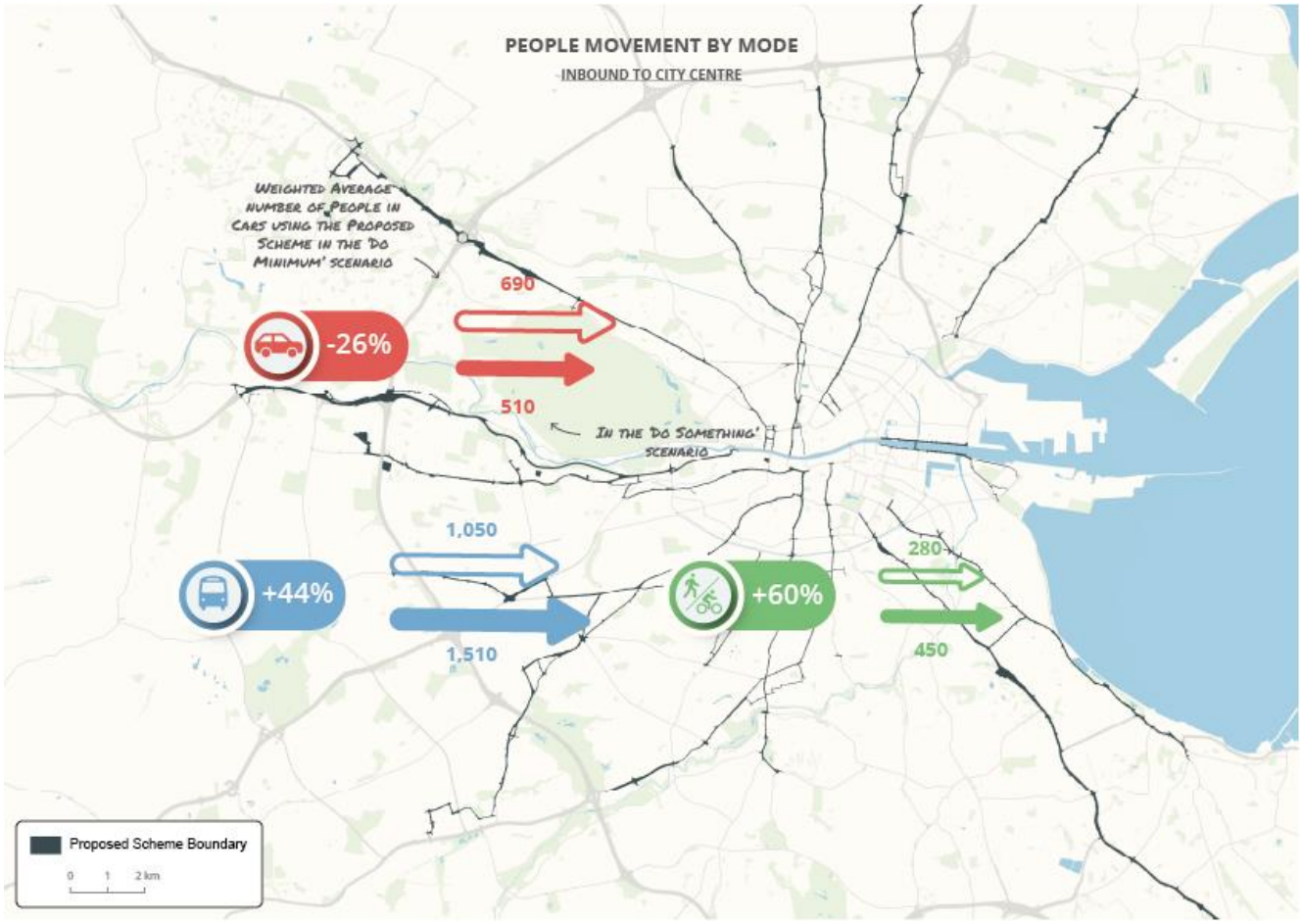

Diagram 7.7: Weighted Average People Movement by Mode During 2043 AM Peak Hour

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 Walking/Cycling	**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.

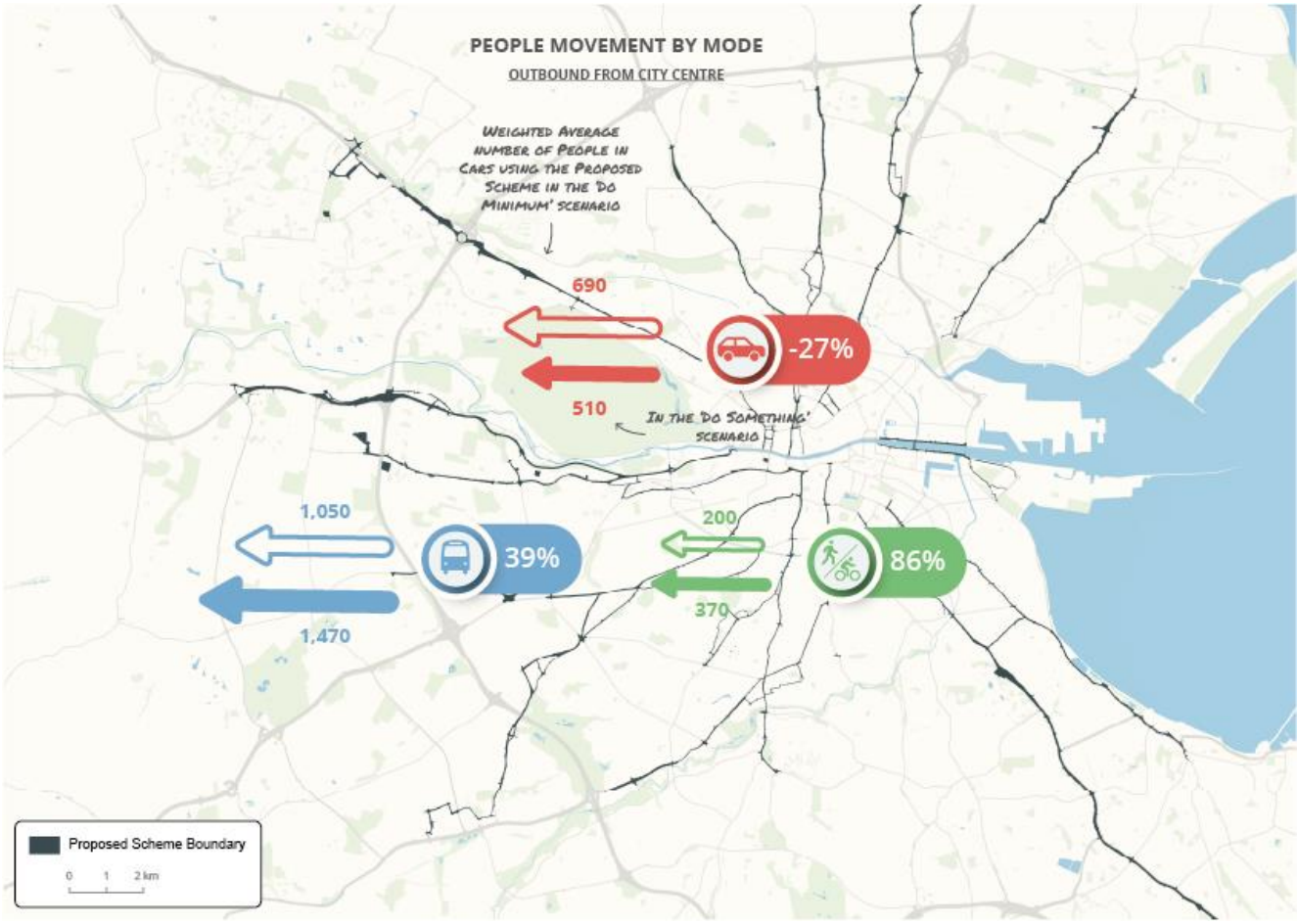

Diagram 7.8: Weighted Average People Movement by Mode During 2043 PM Peak Hour

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 20% increase in total people moved as a result of the Proposed Schemes and a 46% 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 Walking/Cycling	**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 7.12 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

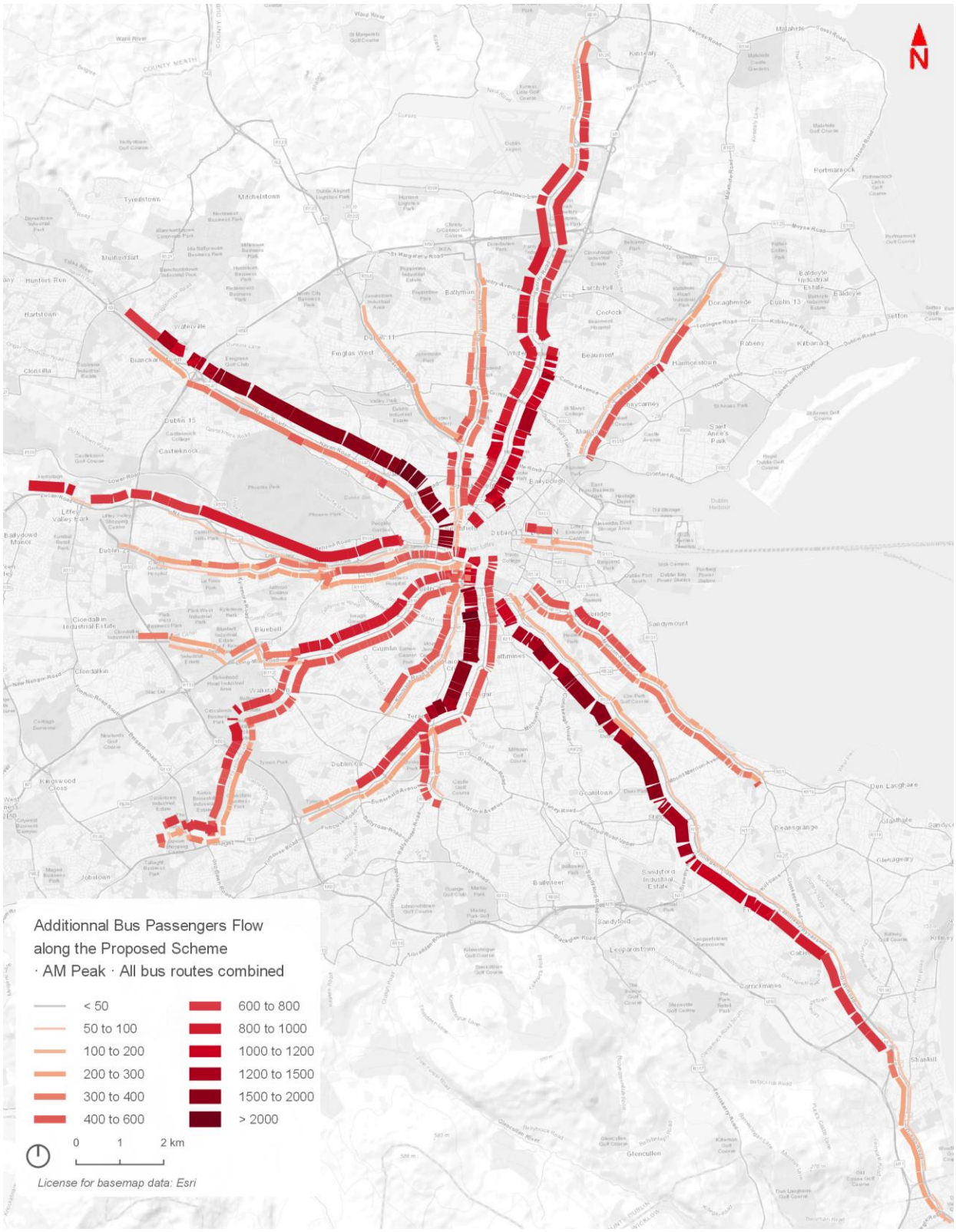

Diagram 7.9: AM Peak Hour Total Bus Passenger Flows Along the Proposed Schemes (All Bus Routes Combined)

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 Swords to City Centre Scheme shows an increase of approximately 1,400 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 Swords to City 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 (%)
Swords to City Centre Scheme	35,370	43,190	7,820	22.1%
All Schemes	85,990	101,760	15,770	18.3%

As shown above there will be a 22.1% increase in people boarding bus routes which use any part of the Swords Scheme during the AM Peak Hour. This represents an addition of 7,820 passengers.

There will be a 18.3% 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

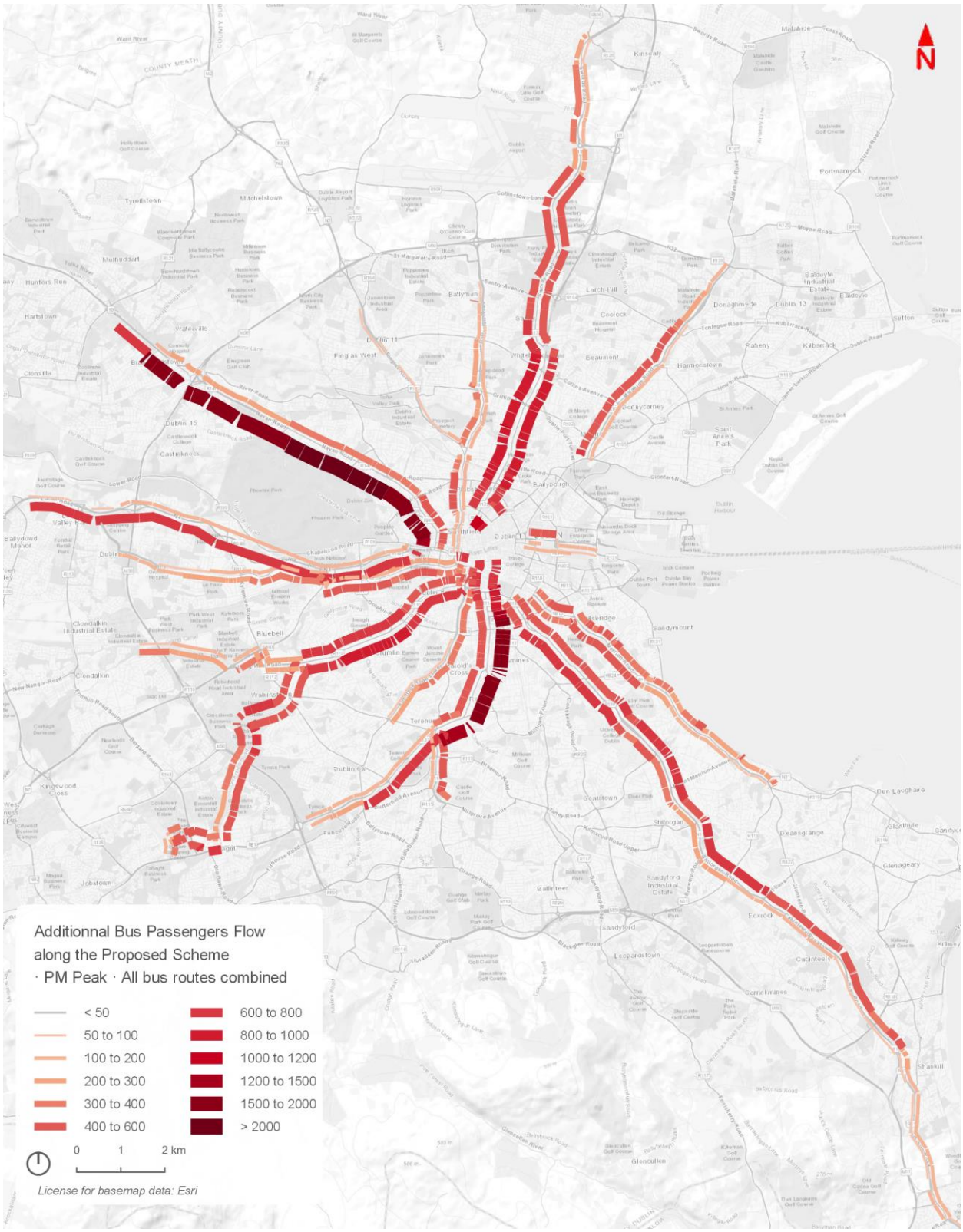

Diagram 7.10: PM Peak Hour Total Bus Passenger Flows Along the Proposed Schemes (All Bus Routes Combined)

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 Swords to City Centre Scheme shows an increase of approximately 1,000 passengers in the outbound direction.

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 Swords to City 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 (%)
Swords to City Centre Scheme	27,280	33,450	6,170	22.6%
All Schemes	71,280	85,170	13,890	19.5%

As shown in Table 7.10, there will be a 22.6.% increase in people boarding bus routes which use any part of the Swords to City Centre Scheme during the PM Peak Hour. This represents an addition of 6,170 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

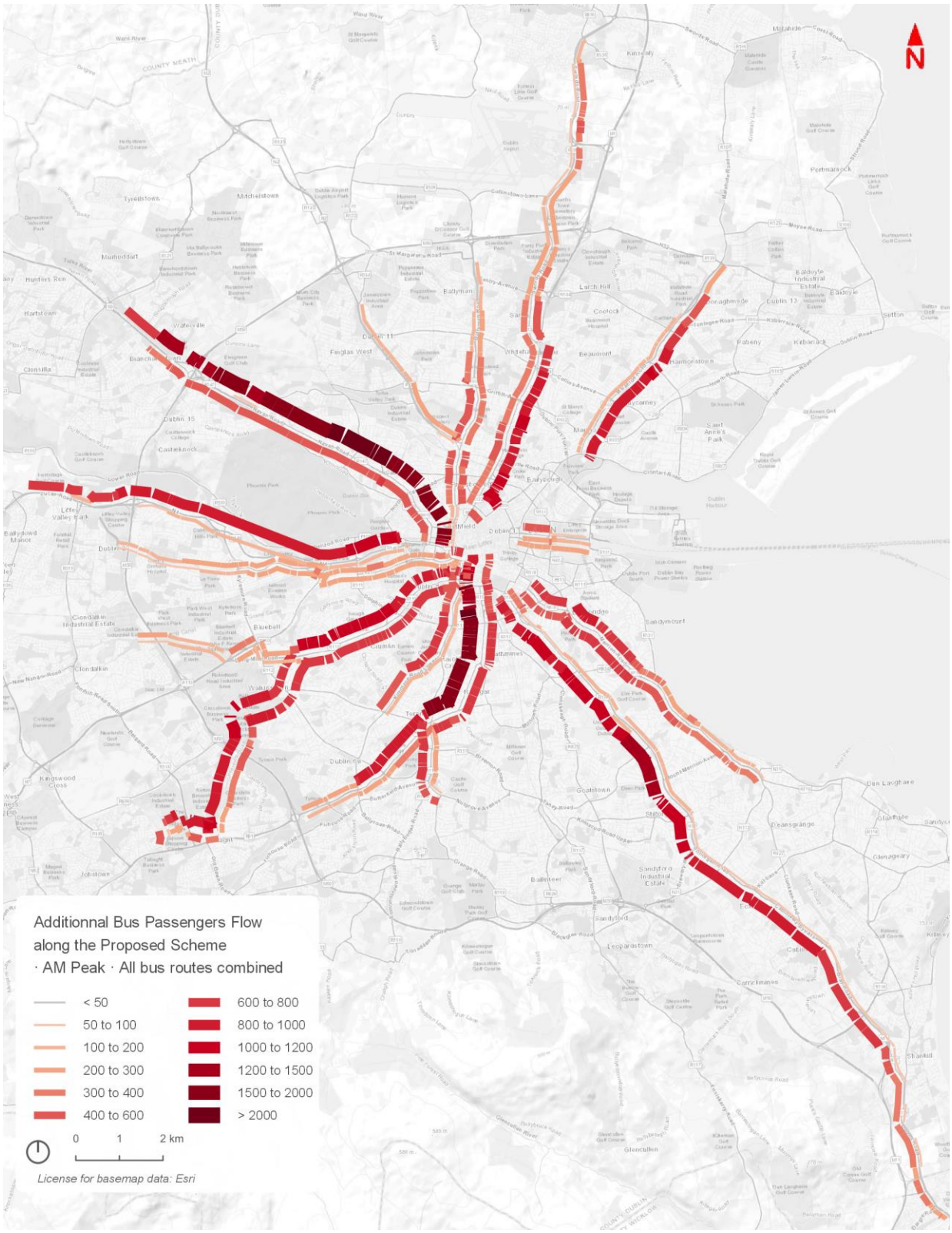

Diagram 7.11: AM Peak Hour Total Bus Passenger Flows Along the Proposed Schemes (All Bus Routes Combined)

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 Swords to City Centre Scheme shows an increase of approximately 1,100 passengers in the inbound direction.

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 Swords to City 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 (%)
Swords to City Centre Scheme	32,168	42,975	10,807	33.6%
All Schemes	95,030	118,550	23,520	24.8%

As shown in Table 7.11, there will be a 33.6% increase in people boarding bus routes which use any part of the Swords to City Centre Scheme during the AM Peak Hour. This represents an addition of 10,807 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

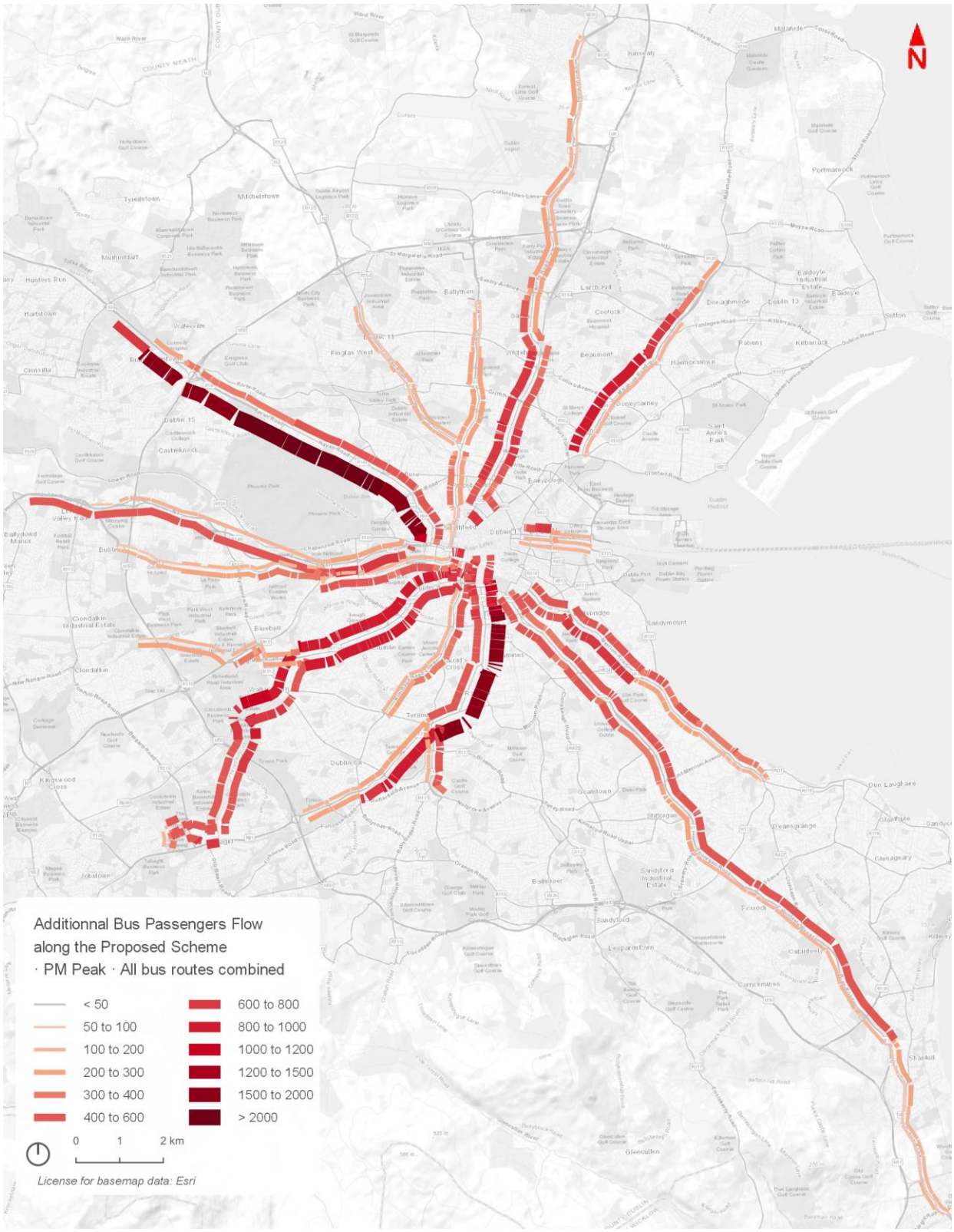

Diagram 7.12: PM Peak Hour Total Bus Passenger Flows Along the Proposed Schemes (All Bus Routes Combined)

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 Swords to City Centre Scheme shows an increase of approximately 700 passengers in the outbound direction.

Table 7.12 presents the total boardings on 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 Swords to City Centre Scheme as well as 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 (%)
Swords to City Centre Scheme	28,073	37,082	9,008	32.1%
All Schemes	78,120	98,390	20,270	25.9%

As shown in Table 7.12 there will be a 32.1% increase in people boarding bus routes which use any part of the Swords to City Centre Scheme during the PM Peak Hour. This represents an addition of 9,008 passengers in the AM Peak Hour.

There will be a 25.9% increase in people boarding bus routes which use any part of the Proposed Schemes, representing an additional 20,270 passengers due to the bus priority improvements.

7.2.5 Integration with Other Public Transport Modes

The aim of the Proposed Scheme 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.

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. 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

The Swords to City Centre Scheme has significant interaction with heavy rail at Drumcondra Station in 2043. At this station, it is estimated that there will be approximately 850 transfers between Metrolink, representing an 122% increase, with the Scheme in place in 2043, compared to the Do Minimum scenario.

The Proposed Scheme will also interface with a number of Metrolink stations, although the transfers between them are expected to be limited as they both serve radial routes towards the City Centre.

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[6]. The metric

[6] 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.

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 9.2%, representing a substantial increase in the average travel speeds for all PT users in 2028.

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 25,000 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 150km 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 four 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.

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 5-7% 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 6.16 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.

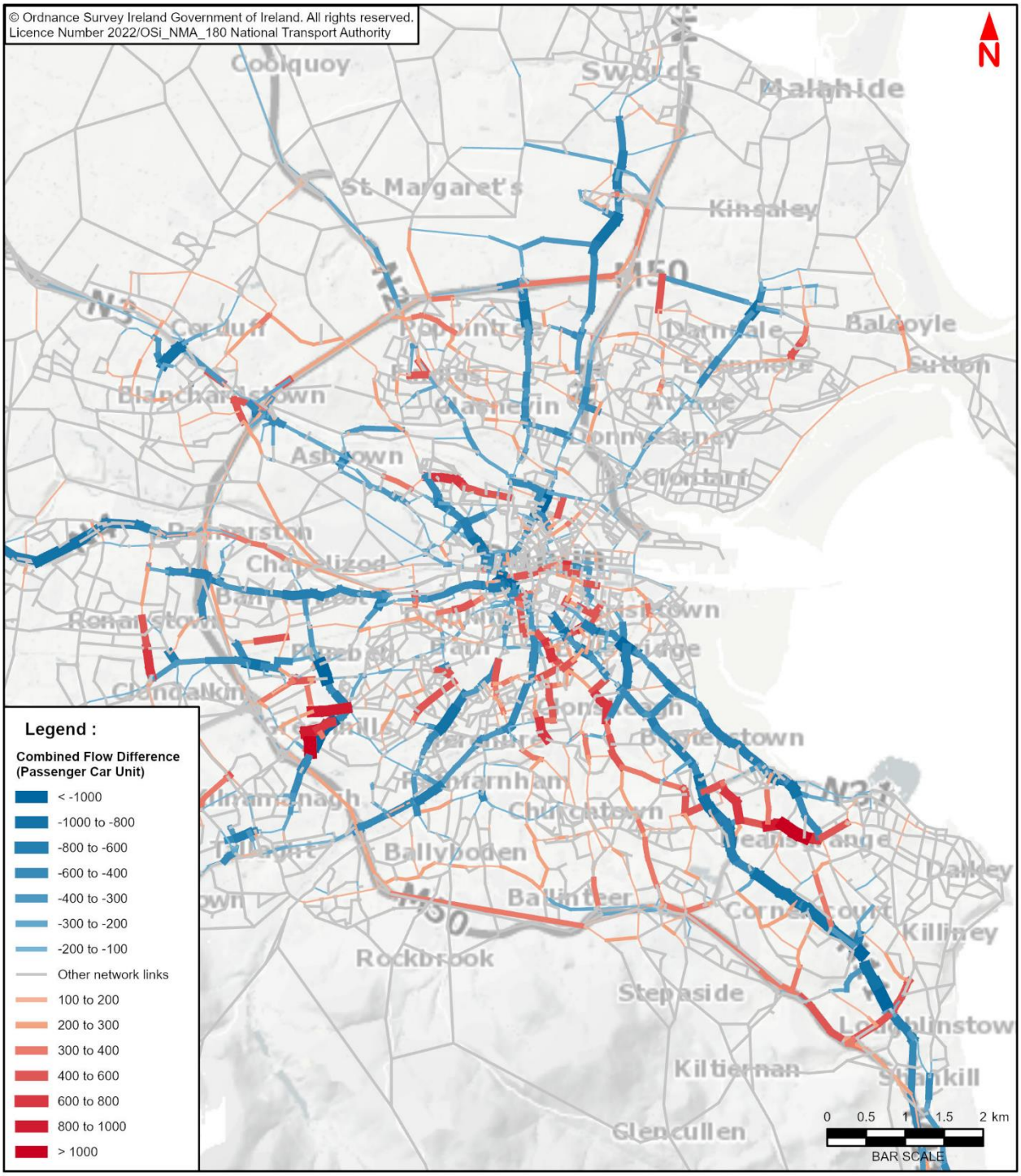

Diagram 7.13: Flow Difference on Road Links (Do Minimum vs. Do Something), AM Peak Hour, 2028 Opening Year – Cumulative Scenario

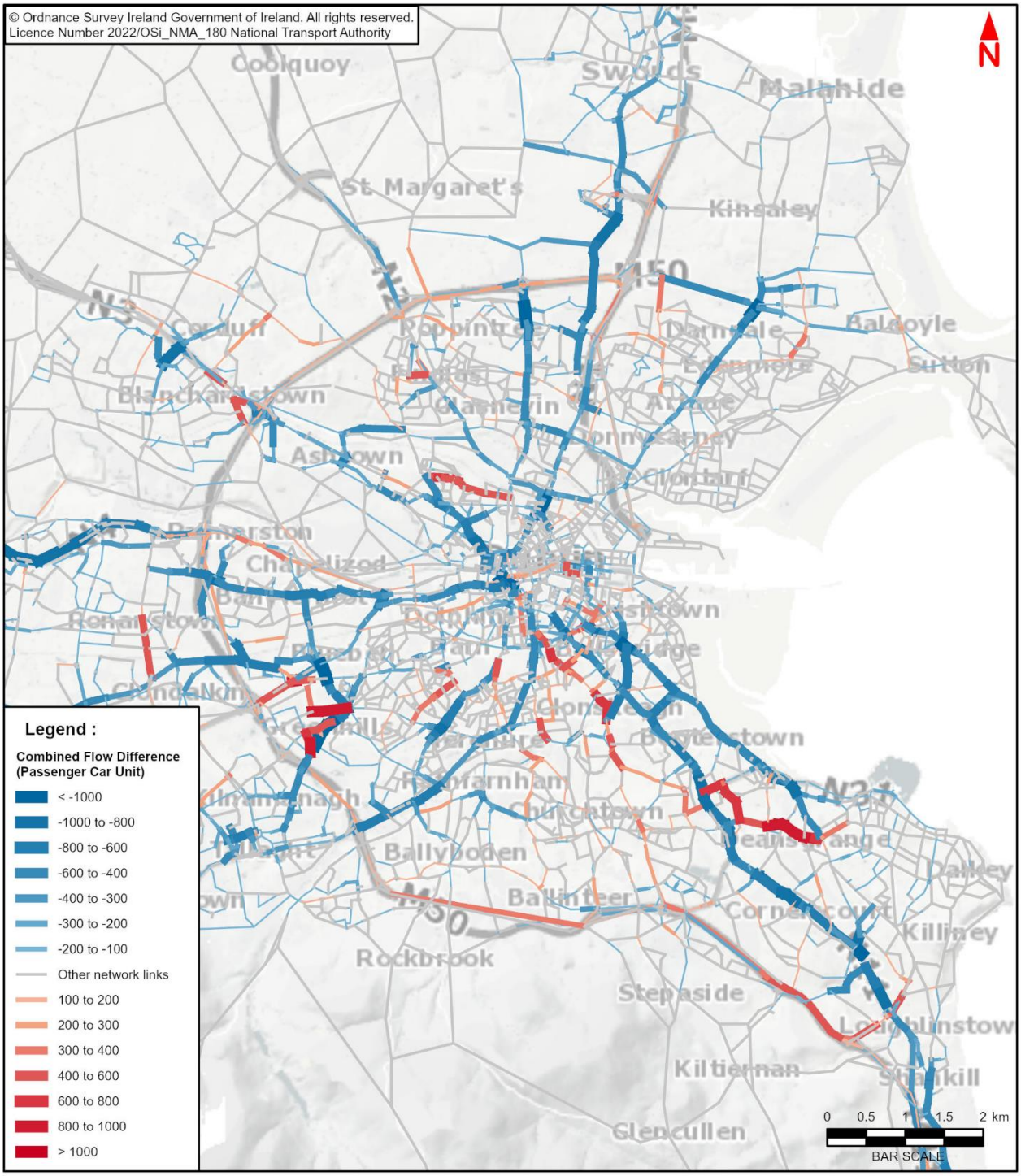

Diagram 7.14: Flow Difference on Road Links (Do Minimum vs. Do Something), AM Peak Hour, 2043 Design Year – Cumulative Scenario

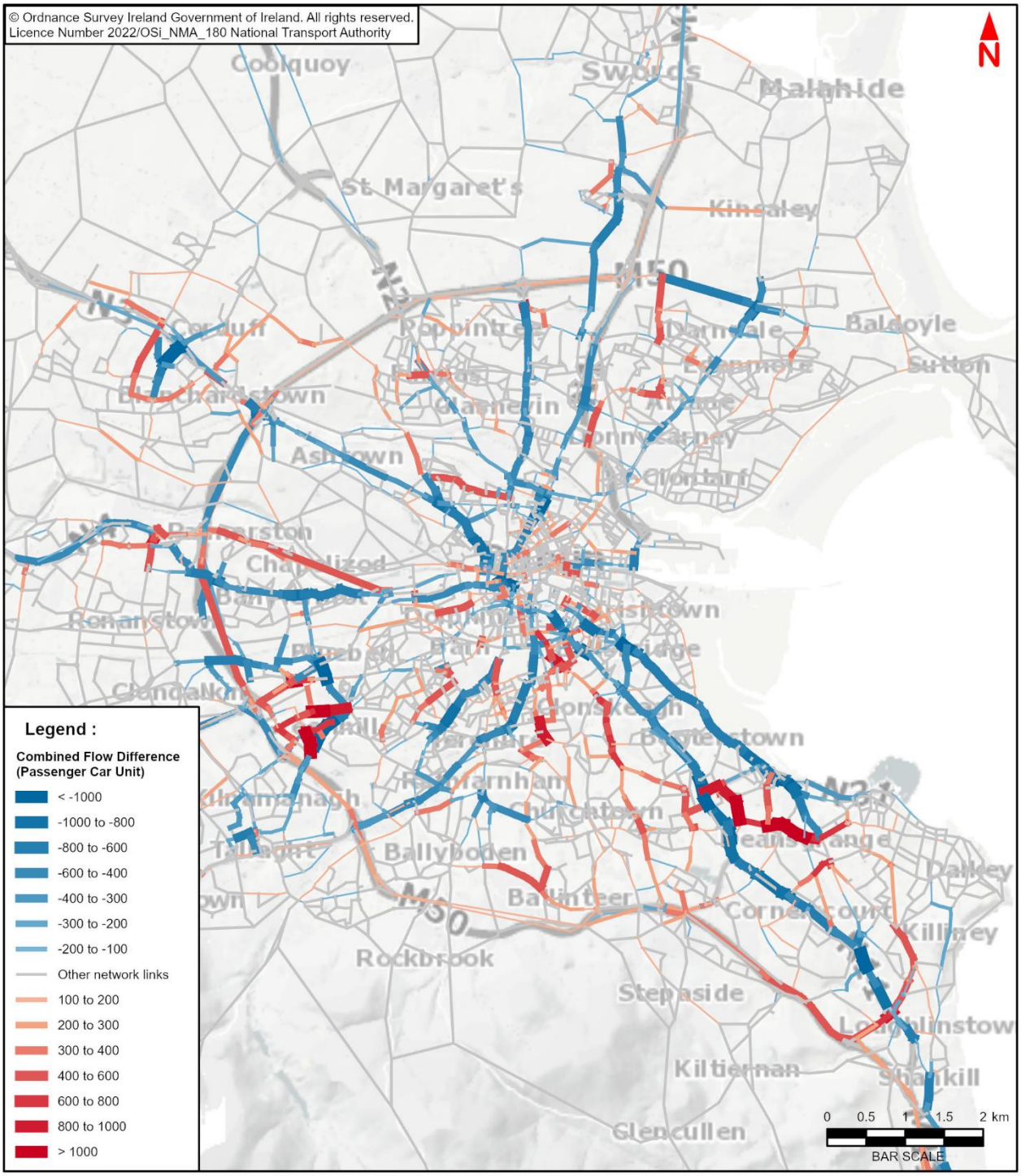

Diagram 7.15 and Diagram 7.17 below illustrate the difference in traffic flows (Do Minimum vs Do Something) on roads in the PM Peak Hour for the 2028 Opening Year and 2043 Design Year with the Proposed Scheme and all other proposed Core Bus Corridor schemes in place. The maps are extracts from Figure 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.

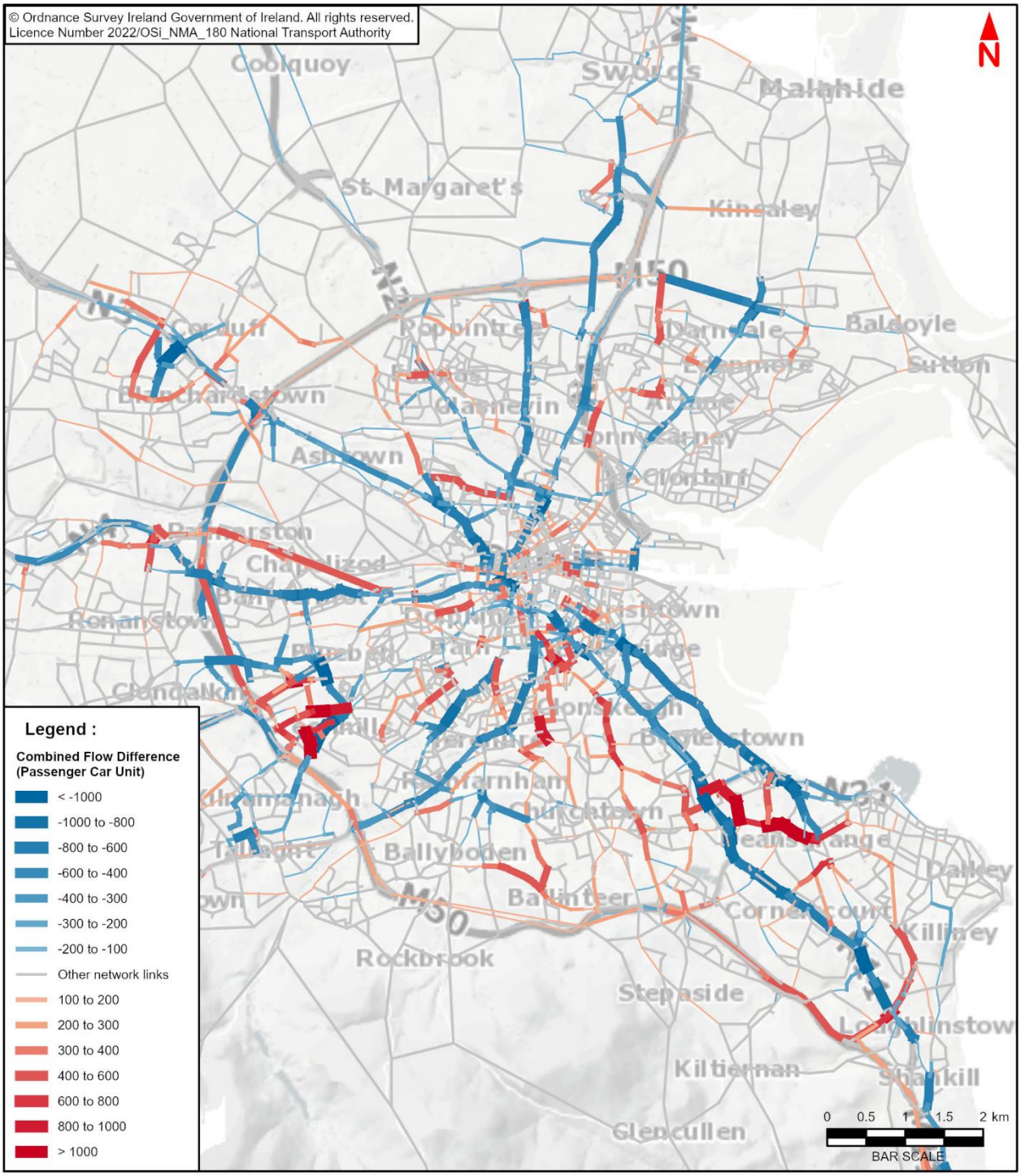

Diagram 7.15: Flow Difference on Road Links (Do Minimum vs. Do Something), PM Peak Hour, 2028 Opening Year – Cumulative Scenario

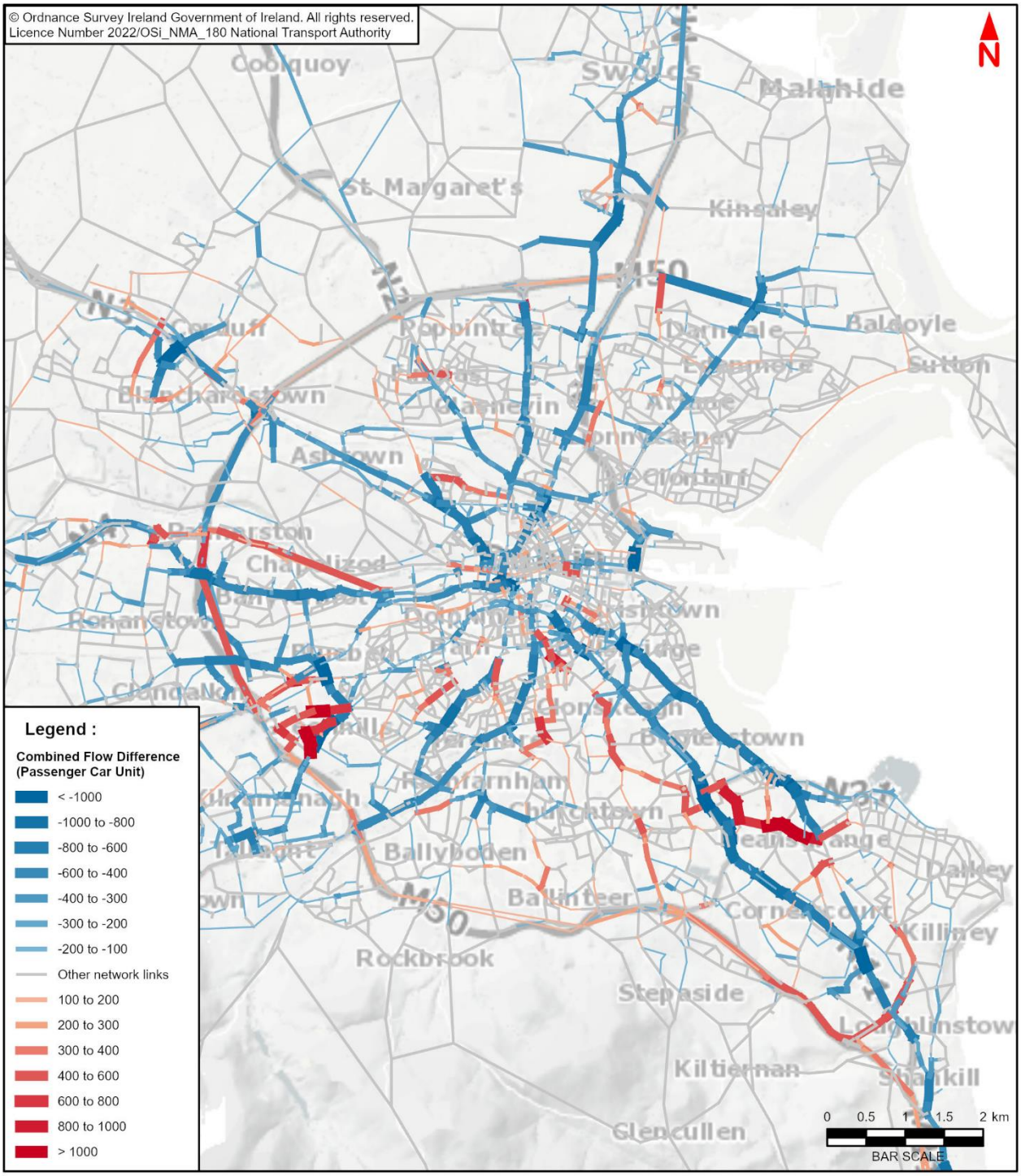

Diagram 7.16: Flow Difference on Road Links (Do Minimum vs. Do Something), PM Peak Hour, 2043 Design Year – Cumulative Scenario

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. It is acknowledged that a certain level of residual traffic redistribution is likely, however, these increases are largely constrained to new road infrastructure (as part of the Proposed Schemes) and regional and distributor roads that are designed to cater for high volumes of traffic. 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, from Swords to the city centre, 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 have been outlined. During the construction phase, the Proposed Scheme will have temporary **Low Negative** impacts to pedestrian bus access and parking and loading.

The Proposed Scheme will have temporary **Medium Negative** impacts on cycle access. 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.

The impact on general traffic is anticipated to be a **Medium Negative** and temporary impact due to the short-term nature of any restrictions. It is anticipated that traffic flows along the scheme will 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. Access for general traffic to existing residential and commercial units immediately adjacent to the Proposed Scheme is to be accommodated throughout the Construction Phase.

The impact of construction traffic is anticipated to result in a **Low Negative** and temporary 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 Predicted Construction Phase Impacts

Assessment Topic	Effect	Predicted Impact
Pedestrian Access	Restrictions to pedestrians along Proposed Scheme.	Low Negative and Short-term
Cycling Access	Restrictions to cyclists along Proposed Scheme	Medium Negative and Short-term
Bus Access	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

During the Operational Phase, the Proposed Scheme will deliver positive impacts in terms of People Movement, pedestrian, cycling and bus infrastructure. 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 movement of people. Some negative impacts for parking / loading availability are anticipated. The assessment demonstrates that the Proposed Scheme supports travel by sustainable modes and that the surrounding road network has the capacity to accommodate the associated traffic and transport impacts.

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 has been undertaken using a set of five criteria to determine the impact that the Proposed Scheme has for pedestrians. The assessments demonstrate in the Do Minimum scenario, 72% of the junctions assessed had LoS ratings of D or below, 23% had a C rating, and just 5% had a B rating. In the Do Something scenario, i.e. following the development of the Proposed Scheme, 90% of the assessed junctions had the highest A / B LoS ratings, and 10% C ratings. The impact of the improvements to the quality of the pedestrian infrastructure will be **Medium Positive** across all sections of the Proposed Scheme.
- **Cycling Infrastructure:** The Proposed Scheme also consists of measures to enhance the existing cycling infrastructure 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 assessments demonstrate in the Do Minimum scenario, 64% of the route sections assessed had LoS ratings of D or below, 32% had a C rating, with 4% having a B rating. In the Do Something scenario, 82% of the assessed route sections had A or B LoS ratings, 14% had C ratings and 4% had D ratings. The impacts of the improvements to the quality of the cycling infrastructure will be **High Positive** in Section 1, **Medium Positive** in Section 3, 4 and 5 and **Low Positive** in Section 1.
- **Bus Infrastructure:** The implementation of the Proposed Scheme will result in improvements in the quality of bus infrastructure provision along the direct study area. A qualitative impact assessment has been undertaken based on the provision of bus priority, pedestrian accessibility and changes to the bus stop facilities. The results of the assessment demonstrate that the impact of the improvements to the quality of the bus infrastructure will be **Low Positive** in Sections 1 and 2, **Medium Positive** in Section 5 and **High Positive** in Section 3.
- **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 58 spaces (-27 spaces in Section 2, -8 spaces in Section 3, -4 spaces in Section 4, and -19 spaces in Section 5). Given the nature of the loss in parking and the availability of alternative spaces in the indirect study area, the impact is expected to be **Negligible** in Section 1 and a **Low Negative** impact in Sections 2, 3, 4 and 5.
- **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 27% and 28% 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 19% and 10% in the number of people travelling along the Proposed Scheme during the AM and PM Peak Hours respectively. These increases are all due to the increased sustainable modes people movement facilitated by the Proposed Scheme.

  The analysis also shows that there will be an increase in 6.9% of passengers boarding buses during the 2028 AM and PM Peak hours. During the 2043 scenario there will be an increase in 4.2% and 4.0% 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 established for 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 19% during the AM and PM Peak hours of the 2028 Opening Year and 2043 Design Year. Based on the AM and PM peak hours alone, this equates to **10.1 hours of savings in 2028 and 9.8 hours in 2043**, when compared to the Do Minimum combined across all buses. On an annual basis this equates to approximately 7,660 hours of bus vehicle savings in 2028 and 7,400 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 to the network performance indicators for bus users along the Proposed Scheme will be 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 to the existing road layout outlined above. This reduction in operational capacity for general traffic will create some level of traffic redistribution 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 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 **Medium 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 range -8.31% to +2.9% 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.

Table 8.2 presents a summary of the predicted impacts of the Proposed Scheme during the Operational Phase.

Table 8.2: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
Cycling Infrastructure	Improvements to the quality of the cycling infrastructure along the Proposed Scheme.	Low to High Positive
Bus Infrastructure	Improvements to the quality of the bus infrastructure along the Proposed Scheme.	Low to High Positive
Parking and Loading	A total loss of 88 parking / loading spaces along the Proposed Scheme.	Negligible to Low Negative
People Movement	Increases to the total number of people travelling through 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.	Medium Negative
	Deterioration to the network-wide queuing capacity, travel times, travel distances and average network speeds beyond the direct and indirect study areas	Negligible
Cumulative Impact	Higher mode share for sustainable modes of travel (walking, cycling and buses), improvements in bus travel speeds.	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 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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