



Naas Road Gateway Urban Design Masterplan - Traffic and Transport

Sustainable Transport Strategy

Draft Report

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JMP Consultants Limited
Audrey House
16-20 Ely Place
London EC1N 6SN

T 020 7405 2800
F 020 7430 9049
E london@jmp.co.uk

www.jmp.co.uk

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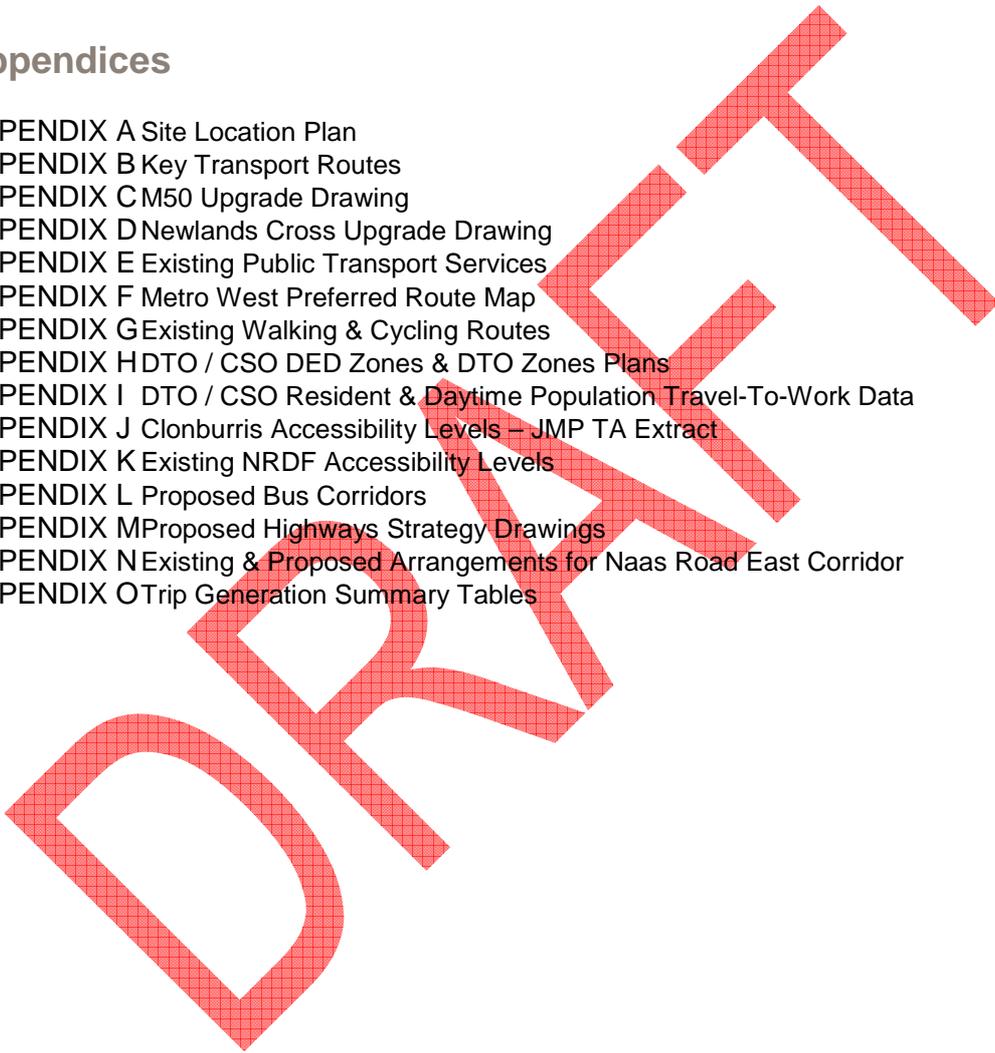
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1 Executive Summary

General

- 1.1 JMP Consultants Limited (JMP) has been commissioned by South Dublin County Council (SDCC) to provide traffic and transport consultancy advice and services in support of a new masterplan scheme (the 'Masterplan'), for an area in the vicinity of the Naas Road and Red Cow motorway junction, in South Dublin (the 'County'), known as the Naas Road Gateway Masterplan area (the 'Site').
- 1.2 The Masterplan is being developed by KCAP Architects & Planners (KCAP) and McGarry Ni Éanaigh Architects (McGNiE).
- 1.3 This report looks at the current baseline conditions for traffic and transport in the Masterplan study area. It considers the current levels of accessibility and connectivity for the surrounding population in terms of transport and services.
- 1.4 The potential traffic and transport impacts of the development proposals are assessed in terms of level of trip generation that would arise and the mode split that is feasible for the development period 2010 – 2016.
- 1.5 Sustainable transport mitigation measures are set out in **Section 8** of this report. These mitigation measures cover new junction provision and additional public transport provision; through to mobility management.

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2 Introduction

General

- 2.1 JMP Consultants Limited (JMP) has been commissioned by South Dublin County Council (SDCC) to provide traffic and transport consultancy advice and services in support of a new masterplan scheme (the 'Masterplan'), for an area in the vicinity of the Naas Road and Red Cow motorway junction, in South Dublin (the 'County'), known as the Naas Road Gateway Masterplan area (the 'Site').
- 2.2 The Masterplan is being developed by KCAP Architects & Planners (KCAP) and McGarry Ní Éanaigh Architects (McGNiE).

Report Scope

- 2.3 JMP has prepared a Sustainable Transport Strategy (the 'Strategy') for the Site to support and encourage travel to / from, and within, the Site by various sustainable (i.e. non-car based) travel modes. This Strategy reviews, outlines and develops appropriate measures to encourage increased access to, from and within the Site by foot, bicycle, and by public transport modes (such as bus, Luas, Metro West, and also mainline rail).
- 2.4 JMP recognises the National Roads Authority's (NRA's) policy objective to minimise the potential impact of vehicular-based trips on the National Road Network (NRN), namely the M50 motorway and the N7 Naas Road west of the M50. The Strategy seeks to ensure that this aspiration is met in order to allow the redevelopment of the Site.
- 2.5 The Strategy also recommends a walking and cycling strategy for the Site as a whole; remaining sensitive to potential road safety issues. The Strategy also investigates and proposes, where appropriate, ways of transferring existing vehicular-based trips within the Site onto sustainable travel modes.
- 2.6 The proposed Masterplan and this supporting Strategy is for the County's Development Plan period 2010 to 2016. This Strategy recognises the potential future impacts of schemes contained within the Government's *Transport 21* agenda; and it is therefore assumed that these schemes will be in place post-2016.
- 2.7 The Strategy set out within this report includes proposals for improving the road infrastructure, including the provision of new junctions, in order to support the mobility management plan for the Site.

3 Policy Context

National Policy

National Spatial Strategy 2002-2020

- 3.1 The *National Spatial Strategy (NSS) 2002-2020* recognises the need to enhance the competitiveness of the Greater Dublin Area at an international level and in order to achieve this; the Strategy identifies key areas within South Dublin County as an area for consolidation. This consolidation includes the public transport system and notes that investment in public transport will assist in promoting a more efficient and competitive Dublin area.

National Roads Authority

- 3.2 The National Roads Authority (NRA) *Policy Statement on Development Management and Access to National Roads*, published in May 2006, sets out the national policy with regards to access to the national road network (including motorways). Sub-section 1.4 of the document summarises the NRA objectives to protect and maintain the intended transport function of the network of national roads. This is a key consideration in the development of a Masterplan for the Naas Road Gateway, given the proximity of the Site to the National Road Network (NRN); and the potential to draw vehicle traffic into the area as a result of additional development.

Regional Policy

Regional Planning Guidelines – Greater Dublin 2004-2016

- 3.3 At a regional level, the *Regional Planning Guidelines (RPG) for the Greater Dublin Area 2004-2016* states, “In the Metropolitan Area, public transport and other sustainable modes should be given precedence over the requirements of the private car in all relevant policy and decision making” (Recommendation 7.1). This RPG has been upheld in the development of the transport strategy for the subject site. It will be important for the Masterplan to support such planning policy guidelines.

Dublin Transportation Office – Platform for Change and Transport 21

- 3.4 The Dublin Transportation Office (DTO) Strategy 2000-2016 *Platform for Change*; and *Transport 21*, the successor to Platform for Change; have provided the public transport context to the assessment of the public transport proposals for the proposed development. The major infrastructure plans contained in *Transport 21* for rail, light rail, metro bus and road have formed the underlying assumptions for public transport improvements for the site and all relevant schemes as they apply to the area have been supported in the development's transport strategy.

Dublin Transportation Office – Greater Dublin Area Transport Strategy 2010-2030

- 3.5 The *Greater Dublin Area (GDA) Transport Strategy 2010-2030* sets out the DTO's vision and objectives for promoting sustainable travel across the region. The DTO has set out mode split targets for the GDA as a whole; which clearly demonstrate the DTO's objective to promote and encourage the use of sustainable travel modes (e.g. walking, cycling, public transport including bus and Luas), as far as possible, within the region.

- 3.6 The *GDA Transport Strategy 2010-2030*'s vision is, "for a competitive, sustainable city-region with a good quality of life for all". It's five key objectives are, to:
- *Build and Strengthen Communities;*
 - *Improve Economic Competitiveness;*
 - *Improve the Built Environment;*
 - *Respect and Sustain the Natural Environment;* and
 - *Reduce Personal Stress.*
- 3.7 The first objective, to build and strengthen communities, includes sub-objectives to improve accessibility to work, education, retail, leisure and other activities; to improve access for disadvantaged people (including physical access for mobility impaired people; to improve links between communities within the region; and to improve links with the rest of the island of Ireland.
- 3.8 The fifth objective, to reduce personal stress, includes sub-objectives, to:
- *Improve journey time reliability for personal travel;*
 - *Reduce overall journey times for personal travel;*
 - *Improve travel information;*
 - *Improve ease of use of public transport system;*
 - *Promote healthier forms of travel and use of public space;*
 - *Improve travel safety;* and
 - *Improve travel comfort and the sense of personal security.*

Dublin Transportation Office – Mobility Management Plans

- 3.9 The Dublin Transport Office (DTO) document, *The Route to Sustainable Commuting: An Employer's Guide to Mobility Management Plans*, published in March 2001, sets out regional guidance that promotes and encourages the use of sustainable modes of transport as alternatives to the private car.

Local Policy

SDCC Development Plan until 2010

- 3.10 At a local policy level, the *South Dublin County Council (SDCC) Development Plan* which came into effect in 2004 contains a key aim (7.0) – "To promote ease of movement within and access to South Dublin, by integrating land use planning with high quality, sustainable and integrated transport systems for people and goods within the County".

4 Connectivity & Baseline Conditions

General

- 4.1 This section of the document outlines the existing, or baseline, conditions currently prevalent at the Site and in the immediate surrounding area. It also presents the Site, as it currently is, in the context of the wider walking, cycling, public transport and highway networks.
- 4.2 The baseline studies reported in this document are supported by an initial Site visit organised by SDCC and attended by JMP, which took place on 15th September 2008.

Site Location & Description

- 4.3 The Site is located in the vicinity of the Naas Road and Red Cow motorway junction within South Dublin County. The Site extends to the east and west of the M50 motorway, and also to the north and south of the N7 / R110 Naas Road, west and east of the M50 respectively. It encompasses the Red Cow and Kylemore Luas stops, the Red Cow park and ride (P&R) facility, parts of south-east Clondalkin village, and also areas extending northwards towards the Grand Canal and Park West.
- 4.4 A Site location plan identifying the location of the Masterplan Site in the context of the surrounding area is included at **Appendix A** for information.

Site Accessibility

- 4.5 The Masterplan Site is of strategic importance and can be accessed by a range of travel modes, including sustainable modes, at present. For vehicular traffic, the Site is served by the M50 motorway which provides an orbital route around Dublin city. It is also served in an east-west direction by the N7 Naas Road (to / from the west) and the R110 Naas Road and Long Mile Road (to / from the east). In addition, to the east of the Site, the R112 Kylemore Road / St Peter's Road provides a north-south orbital link; and to the west of the Site, the R113 Fonthill Road / Belgard Road also provides a north-south orbital link; providing strategic local connections to Clonburris and Liffey Valley to the north, and Belgard, Cookstown and Tallaght to the south.
- 4.6 In addition to the Red Cow motorway junction (Junction 9), the Site is also served by the Ballymount junction (Junction 10) a short distance south. The Nangor Road / New Nangor Road provides a connection to / from the north-west of the Site.
- 4.7 A plan illustrating the key transport routes into and out of the Site is included at **Appendix B** for information.

National & Local Road Networks

National Road Network

- 4.8 The M50 motorway and N7 Naas Road are part of the National Road Network (NRN), which are the responsibility of the NRA. The M50 motorway provides an orbital link to the north, west and south of the Dublin city; connecting the M1 and Dublin Airport to the north, the east-west N4 at Liffey Valley, the N7 / R110 at Red Cow, and areas further south.

- 4.9 The M50 is currently undergoing a major upgrade as part of the National Development Plan and Transport 21 investment programme. The upgrade programme is being carried out in phases; and the part of the motorway in the vicinity of the Site is part of the phase one works. The upgrade programme has included major investment in upgrading the existing grade-separated junction at Red Cow, whereby the Naas Road was interrupted by a signalised roundabout with slip lanes leading to / from the M50 below. In addition, the Luas Red Line tram route crossed the signalised roundabout at-grade. This existing junction has now been replaced by a fully grade-separated free-flow arrangement, which has included full grade-separation of the Luas Red Line.
- 4.10 There is also provision for pedestrians and cyclists across the new junction. As is discussed in **Paragraph 4.34** further on in this section, it is noted that, as part of the ongoing upgrade to the Red Cow junction, a new pedestrian and cycle link will be provided, running alongside the new Luas track at grade-separation from road traffic.
- 4.11 A three dimensional visualisation, looking west, of the now completed free-flow arrangement at Red Cow is shown in **Figure 4.1** below.

Figure 4.1 M50 Red Cow Junction Upgrade 3D Visualisation



Source: National Roads Authority, by e-mail, September 2008.

- 4.12 A drawing included within the M50 Environmental Impact Statement (EIS), provided by the NRA, showing the proposed upgrade to the Red Cow junction, is included at **Appendix C** for information.
- 4.13 The N7 provides a strategic link between the M50 motorway and Greater Dublin area; and the west and south-west of Ireland. It is a National Primary Road and is constructed to dual carriageway standard in the vicinity of the Site.
- 4.14 It is noted that there are proposals to upgrade the existing at-grade signalised crossroads at Newlands Cross, to the west of the Site, with a grade-separated solution. This will allow east-west traffic on the N7 Naas Road to travel through the junction uninterrupted. Traffic flow on the R113 Fonthill Road / Belgard Road travelling north-south will be interrupted by traffic signals and a crossroads arrangement beneath the flyover. The proposed upgrade at Newlands Cross was the subject of an EIS. Three associated drawings prepared by

Arup Consulting Engineers (Arup) and provided by the NRA, showing the proposed upgrade to the Newlands Cross junction are included at **Appendix D** for information.

Local Road Network

- 4.15 The NRN is supported by a network of regional and local roads that are the responsibility of SDCC or Dublin City Council (DCC). Regional roads include the R110 Naas Road (the portion of the Naas Road east of the Red Cow junction); the R112 Kylemore Road / St Peter's Road; and the R113 Fonthill Road / Belgard Road.
- 4.16 Other local roads of significance include the Long Mile Road, which diverges from the R110 Naas Road at the 'Hamburger Junction' just west of the Naas Road's junction with Kylemore Road; the Nangor Road, which connects with the R110 Naas Road at the Hamburger Junction and provides a link to / from the north-west of the Site; Ballymount Road, which connects to the Ballymount motorway junction to the south of the Site; and Greenhills Road, which provides a connection from the south of the Site towards Cookstown and Tallaght to the south.

Public Transport

Buses

- 4.17 There are a number of bus services that serve the Masterplan Site. These are presented in the drawing included at **Appendix E** for information. Bus services provided by Dublin Bus are set out in **Table 4.1** below.

Table 4.1 Dublin Bus Services

Number	Destination	Via	Frequency		
			Mon-Fri 08:00- 09:00	Sat	Sun
18	Sandymount to Palmerstown cemetery/Old Lucan road	Donnybrook-Ballsbridge-Rathmines-Larkfield Gardens-Crumlin- Long Mile Rd.-Ballyfermot-Palmerstown Cemetery	15-23 mins	30-40 mins	30-45 mins
51	From Clondalkin (Neilstown) to City Centre (Aston Quay)	Inchicore-Naas Road	60 mins	-	-
51B	Aston Quay to Grange Castle Business Park	Thomas St., James's St.-Kilmainham-Inchicore-Naas Rd.-Woodford- Clondalkin Village-Bawnogue	25-30 mins	20-25 mins	30-45 mins
51C	City Centre	Grange Castle	25-30 mins	20-25 mins	30-45 mins
51D	City	Watery Lane	15 mins	60 mins	60 mins
51X	UCD Belfield	Dunawley	30 mins	60 mins	60 mins
68	City Centre (Aston	Conyngham Rd.-	Nothing	60-70 mins	60-80

	Quay) to Newcastle (Ballynakelly, Co Dublin)	Islandbridge- Inchicore- Naas Rd.-Woodford- Clondalkin Village-New Nangor Rd.	between 8 and 9 (one bus at 7:50 and another at 9:10)		mins
69	City Centre (Aston Quay) to Rathcoole	Conyngham Rd.- Islandbridge-Inchicore- Naas Rd.-Monastery Rd.-Clondalkin Village- St. John's Meadows- Saggart	60 mins	60 mins	60-70 mins
69X	Aston Quay	Rathcoole	60 mins	60 mins	60 mins
76 / 76A / 76B	Ballyfermot	Tallaght	15 mins	60 mins	60 mins
210	From Tallaght (The Square) to Liffey Valley Centre	via Bawnogue- Clondalkin Village	60 mins	60 mins	60-80 mins
151	From Docklands to Adamstown	Adamstown-Parkwest- Drimnagh Road- Dolphins Barn-Ormond Quay- Docklands Station	9-11 mins	25-35 mins	60 mins
210	Liffey Valley	Tallaght	30 mins	30 mins	60 mins

Source: Dublin Bus (<http://www.dublinbus.ie>), March 2009.

4.18 It can be seen from Table 4.1 above that the frequency of bus services during the weekday morning peak hour (08:00 to 09:00 hours) varies significantly, with some bus services operating a 15 minute frequency (such as the 76 / 76A / 76B), whilst other routes such as the 51, for example, operate only a 60 minute frequency. It is also noted that, as illustrated at Appendix E, the majority of bus routes run east-west along the Naas Road and otherwise generally remain on key corridors. The Masterplan Site therefore suffers from a lack of frequent bus services penetrating the Site, limiting accessibility in some areas.

4.19 Local, rural and commuter services provided by Bus Eireann are set out in **Table 4.2** below.

Table 4.2 Bus Eireann Services

Number	From	To	Number of Buses Mon-Fri 08:00-09:00
123	Newbridge (Naas)	Busaras	1
124	Mountmellick	Busaras	2
126	Kildare (Boyle's)	Busaras	8
130	Kilkenny Rail Station	Busaras	4

Source: Bus Eireann (<http://www.buseireann.ie>), March 2009.

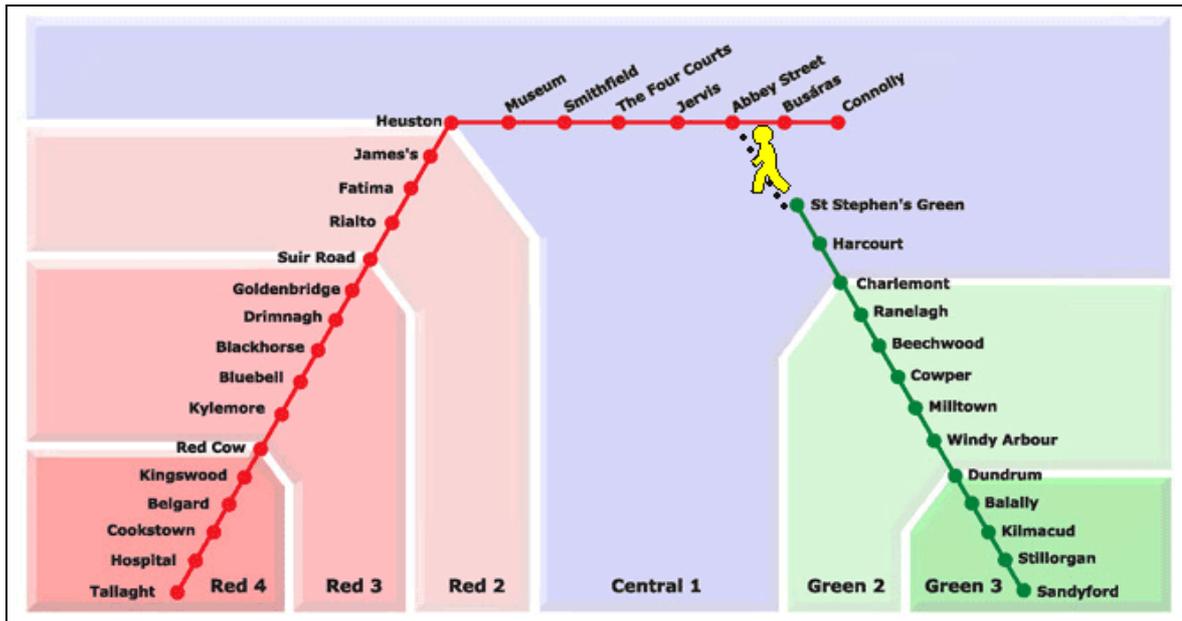
4.20 It can be seen from Table 4.2 above that the frequency of longer distance services provided by Bus Eireann also varies quite significantly, from one bus per hour on the route

123 to eight buses per hour on the route 130; in the weekday morning peak hour (08:00 to 09:00 hours).

Luas

- 4.21 The Luas Red Line runs along the Naas Road between the eastern boundary of the Site and the Red Cow P&R facility, situated south-west of the M50 Red Cow junction. The Red Line runs between Connolly Station in Dublin City Centre, via Abbey Street and Jervis (a short walk distance from O'Connell Street) and Heuston Station to the east; and to Tallaght via Belgard and Cookstown to the west. Both the Kylemore and Red Cow Luas stops are within the Masterplan Site boundary. The Kylemore stop is located within zone 'Red 3' of the Luas network; and the Red Cow stop is located between zones 'Red 3' and 'Red 4' of the Luas network.
- 4.22 There are currently generally trams at four to five minute intervals between 08:00 to 09:00 hours, Monday to Friday, on the Red Line. It is noted that, particularly during peak periods, demand for Luas Red Line services is generally high, with services generally running close to capacity. This Strategy recognises the limited potential future capacity of the Luas Red Line and the relative importance of improving bus services as an alternative.
- 4.23 To facilitate the ongoing motorway / junction upgrade at Red Cow, works have been carried out on the Luas Red Line and the Red Cow tram stop (including the associated P&R). Subsequently the Luas line over the Red Cow junction has been realigned so that it is now grade separated from road traffic; in order to allow the implementation of an unsignalised free-flow interchange. A new section of Luas line has been constructed that connects the existing Red Line, allowing the original section of the line through the Red Cow interchange to be removed.
- 4.24 In addition to the recent improvements at Red Cow, the Railway Procurement Agency (RPA) has published details of a proposed branch extension of the Red Line from Cookstown to Citywest. Stops on the Luas 'Line A1' are proposed at Fettercarin, Cheeverstown, Citywest Campus, Fortunestown and Saggart; with a new P&R facility proposed at the proposed Cheeverstown stop. The branch line will terminate at the proposed Saggart Stop, east of Garter Lane.
- 4.25 A schematic map of the Luas Red and Green lines is shown in **Figure 4.2** below.

Figure 4.2 Luas Red & Green Lines Schematic Map

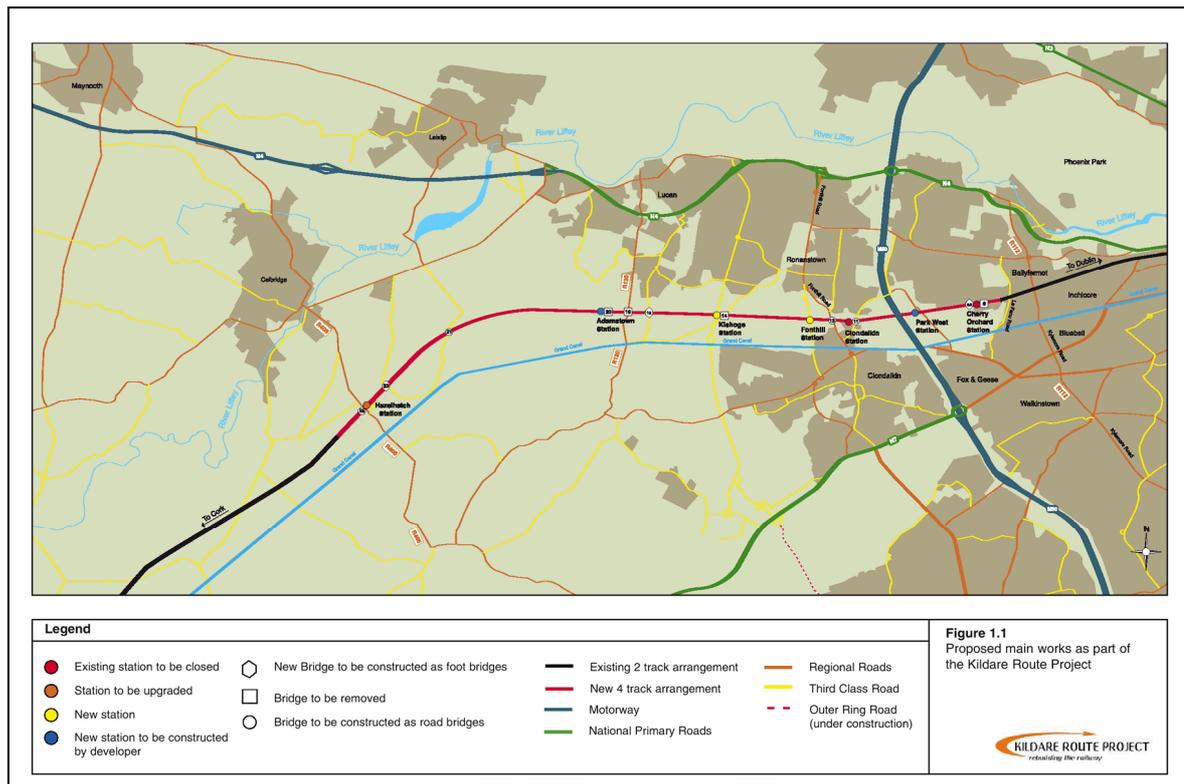


Source: Luas (<http://www.luas.ie>), March 2009.

Mainline Rail

- 4.26 The Kildare line runs east-west a short distance north of the Site, north of the Grand Canal. The nearest mainline rail station to the Site is Park West, which recently replaced the Cherry Orchard Station in mid-2008. There is currently one train per hour between the hours of 08:00-09:00, Monday to Friday, calling at Park West and heading towards Heuston Station. Given that there is no mainline rail station situated within the Masterplan Site, it is not expected that many people who travel to / from the Masterplan Site at present; or indeed in the future, will; make use of mainline rail services. This is considered the case particularly as once arriving at Heuston Station in Dublin, the majority of passenger would then have to transfer onto the Luas Red Line to reach the city centre.
- 4.27 The Kildare Route Project (KRP), being undertaken by Iarnrod Eireann (IE), is a major capital investment programme designed to increase the frequency of commuter and other rail services along the key Kildare to Heuston corridor – the Kildare line; to allow a significant increase in passenger capacity.
- 4.28 The KRP will be achieved through increasing the number of tracks from two to four along the route from Park West / Cherry Orchard to west of Hazelhatch, providing two dedicated lines for commuter services and two dedicated lines for Intercity and regional services. Other major works covered by the KRP include the replacement or alteration of a number of existing road overbridges to facilitate the four-tracking; new and relocated stations (such as Park West); enhancement of existing stations; and associated signalling works between Inchicore and Cherryville Junction and other works.
- 4.29 A map showing the extent of the KRP upgrade on the Kildare line is shown in **Figure 4.3** below.

Figure 4.3 Kildare Route Project Map



Source: Transport 21 (<http://www.transport21.ie>), March 2009.

Metro West

- 4.30 Metro West, proposed by the RPA, will provide a light rail orbital link around Dublin, linking Dublin Airport and the proposed Metro North, to the north; and Tallaght, to the south. There are proposed interchanges between Metro West and the Luas Red line at Cookstown and Tallaght. Metro West is part of the Transport 21 package of measures.
- 4.31 Metro West would start at the proposed Tallaght East stop on Belgard Road, close to the junction with Blessington Road. It will serve the Tallaght Institute of Technology, The Square and Tallaght town centre. The option of existing the Luas Red Line eastwards beyond the existing Tallaght terminus stop, in order to better connect to the proposed Metro West Tallaght East stop, are to be examined. The line and stops would be located in the middle of Belgard Road at this point.
- 4.32 From Tallaght, the route follows the Belgard Road northbound, crossing over the Luas Red Line on a new structure at Embankment Road, to the proposed Belgard Stop, in the west of the Masterplan Site. This stop will provide an interchange between Metro West and Luas Red Line services; and also with the proposed Luas Red Line branch extension to Citywest.
- 4.33 A map showing the preferred route for Metro West from the *Transport 21* website (<http://www.transport21.ie>), March 2009, in the context of Metro North and the Luas network, is included at **Appendix F** for information.

Walking & Cycling

- 4.34 There is currently a lack of suitable walking and cycling provision in and immediately surrounding the Masterplan Site. The Site is effectively split into four quadrants due to the significant barriers to movement from the Naas Road, M50 and Luas line. However, it is noted that, as part of the ongoing upgrade to the Red Cow junction, a new pedestrian and cycle link will be provided; running alongside the new Luas track at grade-separation from road traffic.
- 4.35 A drawing showing the existing walking and cycling routes in the within and immediately surrounding the Site is included at **Appendix G** for information.

Baseline Travel Patterns

- 4.36 In order to understand the existing travel patterns within the Masterplan study area, baseline data has been obtained from a number of different sources. As a first step, 2006 Census data for the County was used to establish an understanding of the existing travel to work mode split across the County. This has since been refined with the use of data obtained from the Dublin Transportation Office (DTO).
- 4.37 Origin-destination statistical data has been obtained from the DTO, sourced from the Central Statistics Office (CSO) 'POWCAR 2006' database (Place of Work – Census of Anonymised Records). This data is derived from the POWCAR database which disaggregates data into 250m x 250m area zones. The data provided by the DTO is summarised at two levels; by District Electoral Divisions (DEDs) and by lower level DTO zones. The extent of the Masterplan study area broadly falls into three DED zones and broadly falls into ten DTO zones at the lower level. A plan showing the extent of the Masterplan study area and how it relates to the DTO zones is included at **Appendix H** for information.
- 4.38 In summary, the DTO data provides information on the origin of trips heading into the Masterplan study area. This is the daytime population travel-to-work data (i.e. showing where people live who work within the study area). The DTO data also provides information on the destination of trips heading out of the Masterplan study area. This is the resident population travel-to-work data (i.e. showing where people work who live within the Masterplan study area).
- 4.39 With the exception of South Dublin County and Dublin City, the numbers of trips to / from the Masterplan study area have been summarised by county. This is for all counties across Ireland. Given that the vast majority of counties are a significant geographical distance from the Masterplan study area, an assumption can be made as to which key transport route trips between each of these counties and the study area will use. For example, for Cork County, it is assumed that all trips originating from, or destined for here will access / egress the Masterplan study via the N7 Naas Road.
- 4.40 The total numbers of travel-to-work trips (for the resident population, heading out of the Masterplan study area) are summarised in the tables below. More detailed tables are included at **Appendix I** for information. The total numbers of travel-to-work trips (for the daytime population, heading into the Masterplan study area) are summarised in the table also included at Appendix I for information. Given that the Masterplan study area is within

both South Dublin County and Dublin City, in order to establish from which direction travel-to-work trips come into the Site / leave the Site, a more detailed analysis is required.

4.41 **Table 4.3** below summarises the Site's resident population travel-to-work trips by destination (i.e. where the outbound trips are headed to), as derived from the DTO / CSO 2006 Census data:

Table 4.3 DTO / CSO 2006 Census Data Resident Population Travel-to-Work Trips

Place of Work	Average
Dublin City	43%
South Dublin	43%
Fingal	4%
Dun Laoghaire-Rathdown	5%
Kildare	2%
Meath	1%
Wicklow	1%
Other Counties	1%
Total	100%

Source: DTO / CSO 2006 Census POW-CAR data, by e-mail, October 2008.

4.42 It can be seen from Table 4.3 above that the majority of trips made by residents of the Masterplan Site area are to either Dublin City or the rest of South Dublin County. The majority of the remaining trips are to neighbouring counties (i.e. Fingal, Dub Laoghaire-Rathdown and Kildare), with only 3% of trips further afield.

4.43 **Table 4.4** below summarises the Site's daytime population travel-to-work trips by origin (i.e. where the inbound trips have come from), as derived from the DTO / CSO 2006 Census data.

Table 4.4 DTO / CSO 2006 Census Data Resident Population Travel-to-Work Trips

Place of Work	Average
Dublin City	22%
South Dublin	41%
Fingal	7%
Dun Laoghaire-Rathdown	6%
Kildare	11%
Laoighis	1%
Louth	1%
Meath	3%
Westmeath	1%
Wicklow	3%
Other Counties	4%
Total	100%

Source: DTO / CSO 2006 Census POW-CAR data, by e-mail, October 2008.

4.44 It can be seen from Table 4.4 above that the majority of those people that work within the Masterplan Site area live in either Dublin City or South Dublin County. Almost twice as

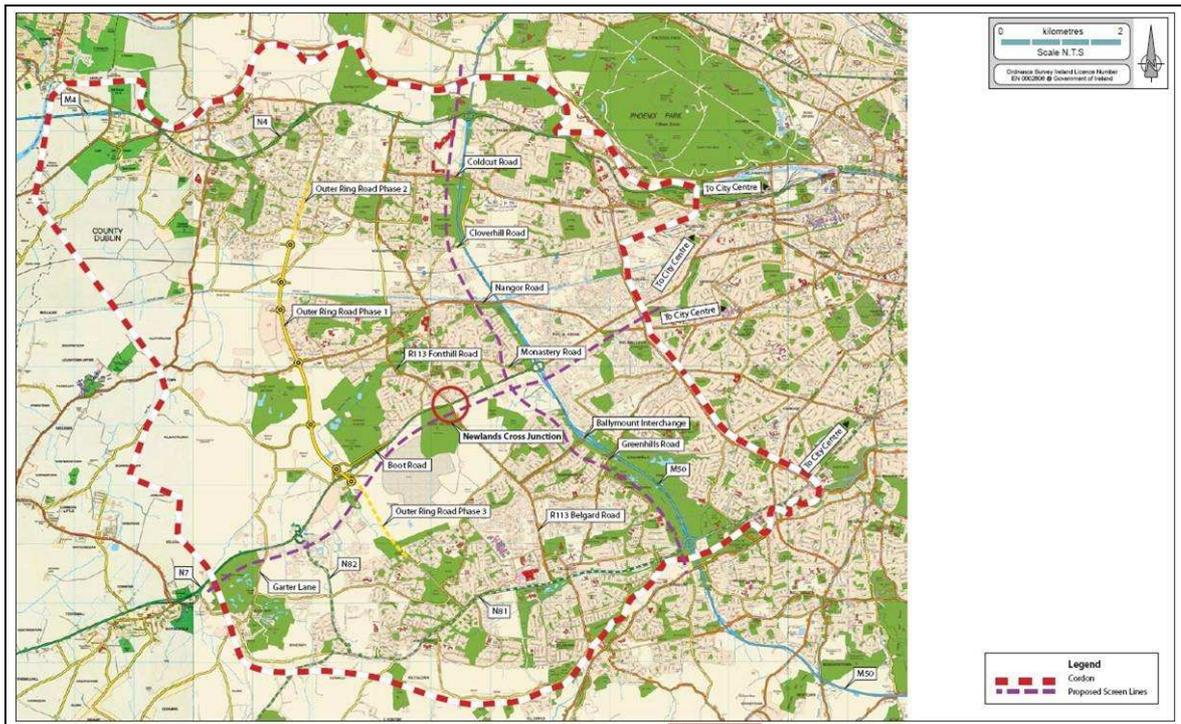
many people (41%) live in South Dublin compared to Dublin City (22%). The majority of the remaining trips originate from neighbouring counties, such as Fingal, Dun Laoghaire-Rathdown and Kildare. A relatively small proportion of inbound trips originate from further afield.

- 4.45 For both South Dublin County and Dublin City, both administrative areas have been subdivided into a number of 'sectors', labelled 1 to 14. For sector 1, for example, it is assumed that all travel-to-work trips to / from the Masterplan study area will be via the Fonthill Road to the north-west of the study area. For sector 3, for example, it is assumed that all travel-to-work trips to / from the Masterplan study area will be via the M50 (N), to the north of the study area.
- 4.46 From carrying out the analysis detailed above, it is possible to identify the proportion of trips which remain internal to the study area (i.e. how many trips are from one of the DTO zones within the study area to another DTO zone within the study area); how many trips are external (i.e. are to / from another part of South Dublin County or Dublin City, or are to / from another county in Ireland); and also how many of the external trips are likely to use each of the key transport routes leading into / out of the Site.

Modelling Review – Baseline Year

- 4.47 In addition to the review of the DTO / CSO 2006 Census data as set out in the paragraphs above, JMP has also undertaken review of the respective Red Cow and Newlands Cross Environmental Impact Statements (EISs). A review of the EIS documents has highlighted that they present only limited information regarding expected future traffic conditions in and immediately surrounding the Naas Road study area, despite considering similar geographical areas within their investigations. In order to better understand baseline and expected future traffic flow patterns and behaviour, JMP has therefore reviewed the SATURN model, prepared by Arup, which was included in the Newlands Cross EIS. This is a morning peak (08:00 to 09:00 hours) model.
- 4.48 It is acknowledged that a similar SATURN model has been previously prepared by WSP for South Dublin County. However, it was decided to review and extract traffic flow data from the Arup SATURN model instead as the Arup model covers all of the Masterplan Site area (which extends into Dublin City to the east), whilst the WSP model only covers South Dublin County. Furthermore, the Arup model was prepared to assess specifically the proposed Newlands Cross interchange upgrade, which is adjacent to the study area. The geographical focus of the Arup SATURN model therefore heavily coincides with the Masterplan Site area.
- 4.49 A review of the Arup SATURN Model Validation and Forecasting Report revealed that the SATURN model for the scheme originated from the 2002 DTO strategic model. The DTO model was then cordoned to a more manageable size, shown by **Figure 3.4** below. The cordoned model was then recalibrated to a 2005 base year, using matrix estimation.

Figure 4.4 Newlands Cross SATURN Modelling Area



Source: Arup Consulting Engineers, by e-mail, January 2009.

- 4.50 The model forecast years are 2009 and 2024, with Do Minimum (without Newlands Cross) and Do Something (with Newlands Cross) scenarios prepared for each year. In terms of committed schemes the 2009 scenario assumes opening of the M50 upgrade between the N4 and N7, together with Phases 1, 2 and 3 of the Dublin Outer Ring Road. The 2024 future year scenario assumes the transport improvements associated with the DTO's Platform for Change and the Government's Transport 21 Strategy. Both forecast year matrices were produced by the DTO, based on their assumptions regarding population growth.
- 4.51 It should be noted that the Do Something scenarios represent the situation that the NRDF should consider as committed development; those changes that will happen irrespective of the Masterplan.
- 4.52 In order to determine the traffic impact of the proposals, the NRA's consultants Arup were contacted regarding the availability of further data not presented in the reporting to date. As a result of this enquiry a series of further plots have been supplied, providing flow information for the 2009 Do Something scenario.
- 4.53 Whilst similar flow plots are not currently available for the 2005 base model, it is possible to compare data presented in the Model Validation Report with 2009 Do Something flows at 5 locations within the study area.
- 4.54 Review of the results in **Table 4.5** below highlights that flows on 9 of the 10 links compared increase for the 2009 Do Something Scenario. The maximum increase in flows is on the N7 eastbound, with over 1,150 additional vehicles forecast from the 2005 base. The greatest percentage increase in flows was westbound on the Nangor Road at 113 percent.
- 4.55 Consideration of flows on the Naas Road east of the M50 and in the vicinity of the Long Mile / Naas Road "hamburger" junction suggests that they are likely to have risen by 25-

30%. Just under 3,000 vehicles an hour are expected to use the eastbound Naas Road to the east of the M50.

Table 4.5 Comparison of 2005 Base & 2009 Do Something Flows

Location	Direction	2005 Base Flow	2009 DS Flow	Difference (no)	Difference (%)
M50	NB	4,565	4,660	95	2.0
	SB	3,943	4,467	534	13.2
Long Mile	NB	1,190	1,455	265	22.3
	SB	1,476	1,932	456	30.9
N7 (between R7 and M50)	EB	2,715	3,876	1,161	42.8
	WB	2,158	2,677	519	24.0
Monastery Road	EB	602	947	345	57.3
	WB	411	838	427	103.9
Nangor Road	EB	1,295	932	-363	-28.0
	WB	635	1,354	719	113.2

Source; Arup Newlands Cross SATURN Models.

4.56 Whilst the 2009 Do Something modelling results have shown considerable increases in traffic flows, it is not possible from the information presented to determine whether the changes are the result of background traffic growth or the implementation of the infrastructure upgrades. Further work was commissioned from Arup to provide information on the base 2005 and intermediate 2009 Do Minimum scenarios to understand the causes of the increases. This additional work will also provide valuable information on predicted routing patterns of traffic accessing the study area, such that zonal information from the DTO can be calibrated.

Consequences of Traffic Model Review

4.57 The model forecasts that current traffic flows will increase as a result of committed developments, and hence environmental conditions will worsen. The forecast morning peak hour flows of almost 3,000 vehicles per hour eastbound on Naas Road east of the M50 suggest that the carriageway would need to be retained at 3 lanes wide in either direction to accommodate the anticipated volume of traffic. TRANSYT testing has shown the “hamburger” junction of Naas Road and Long Mile could operate just within capacity with the forecast flows.

4.58 Measures to deliver environmental improvements whilst retaining this level of flow are limited. The width of carriageway necessary to accommodate the flows results in a considerable barrier to movement by non vehicular modes, both in terms of the physical crossing distance and the psychological barrier of heavy traffic flows. It is not considered that an environmental enhancement converting Naas Road to an urban character could be delivered with the forecast flows, without a substantial mitigation strategy.

5 Baseline Accessibility Criteria

Accessibility Criteria

- 5.1 To inform the development of the Masterplan, and to ensure that development is proposed in the most accessible areas, accessibility criteria can be used to identify the most accessible parts of the Masterplan Site. Accessibility is measured both in terms of access to public transport (e.g. relative distance from a bus stop or light rail / tram / Metro stop, for instance); and also in terms of access to key local services and facilities (e.g. relative distance, and time taken to reach, places of employment, education, retail, healthcare (e.g. doctors' surgery, pharmacy, hospital, for instance). A development can only be sustainable if the population has good access to these services and facilities. Indeed, one of the DTO's objectives for its Transport Strategy 2010-2030 is to build and strengthen communities by meeting such criteria.

JMP Accessibility Criteria

- 5.2 JMP was previously commissioned by SDCC to carry out a Transport Assessment (TA) of, and develop a Sustainable Transport Strategy / Mobility Management Framework (MMF) for, the now approved Clonburris Local Area Plan (LAP) / Strategic Development Zone (SDZ) development within the County. As part of the development of the transport strategy for Clonburris, JMP developed a set of Accessibility Criteria to determine the potential future relative accessibility for parts of the Clonburris site.
- 5.3 It was decided to use the existing Clonburris Accessibility Criteria, rather than develop a new set of criteria, for the following key reasons:
- The Clonburris Accessibility Criteria have been scrutinised and examined by key stakeholders and also by An Bord Pleanála at an Oral Hearing – they are accepted as a robust means of measuring and testing an area's overall levels of accessibility;
 - The Accessibility Criteria meet policy requirements at a national and regional level and accord with the DTO's vision and objectives as part of its own Transport Strategy for 2010-2030; and
 - The Accessibility Criteria are applied to ensure that the most sustainable and accessible parts of an area are developed; this was a key objective of the Clonburris Masterplan and is also a key objective of the NRDF Sustainable Transport Strategy for this Masterplan Site.

Accessibility Levels

- 5.4 In applying the accessibility criteria, which takes account of relative accessibility to key local services and facilities (e.g. education, community facilities, places of employment), as well as accessibility to public transport provision, JMP was able to determine how accessible certain parts of the site were, on a scale of 1 to 5. Accessibility Level 1 indicates an area of lowest accessibility, and Accessibility Level 5 indicates an area of highest accessibility. These criteria were agreed at the subsequent Oral Hearing for Clonburris which took place in May 2008.

5.5 In order to determine the relative accessibility of all parts of the Naas Road Masterplan Site, JMP has applied these accessibility criteria. The accessibility criteria, extracted from the JMP Clonburris Transport Assessment (TA) Report, are summarised below and are included at **Appendix J** for information.

5.6 Accessibility criteria were developed for the Clonburris site in order to inform appropriate development density on the site as well as allowing the transport impacts of future development of the site to be appropriately assessed. The accessibility thresholds used to consider the minimum and desirable levels of access to local services, as set out in Table 7.1, p. 47, of the JMP Clonburris TA Report, are summarised in **Table 4.1** below.

Table 5.1 Accessibility Indicators

Accessibility Indicator	Lower Accessibility (access time in mins)	Higher Accessibility (access time in mins)
Access to primary school for all pupils of compulsory school age by public transport	30 minutes	15 minutes
Access to secondary school for all pupils of compulsory school age by public transport	40 minutes	20 minutes
Access to further education establishments for 16-19 year olds by public transport	60 minutes	30 minutes
Access to work for all people of working age (16-74) by public transport	40 minutes	20 minutes
Access to a hospital for households by public transport	60 minutes	30 minutes
Access to a GP for all households by public transport	30 minutes	15 minutes
Access to a district centre for all households by public transport	30 minutes	15 minutes

Source: JMP Clonburris TA Report, Table 7.1, p. 47.

5.7 As set out on page 47 of the JMP Clonburris TA Report, the accessibility threshold times are based on the times developed by the UK Department for Transport (2004). The indicators have been developed based on the public's need to access these services. The quoted accessibility times would include travel by public bus services, flexibly routed bus services which are available to the general public and, where appropriate, walk and cycle modes.

5.8 A hospital in this context is defined as a health-care facility which has both inpatient and outpatient services and also has an accident and emergency (A&E) department

5.9 A district centre in this context is comprised of retail outlets comprising a supermarket and/or fresh food sales as well as community facilities which would appropriately serve the local community needs.

5.10 These indicators were combined with criteria based on proximity to public transport facilities to establish the five accessibility levels proposed for the Clonburris site. These accessibility levels, asset out in Table 7.2, p. 48, of the JMP Clonburris TA Report, are summarised in **Table 5.2** below. It is noted that an area must satisfy all of the criteria within an accessibility level in order to achieve that ranking.

Table 5.2 Accessibility Level Criteria

Level of Accessibility	Number of Accessibility Indicators Satisfied (1)	Walking Distance Proximity to Public Transport Stops/Stations	Accessibility to Dublin City Centre by Public Transport
Level 1	Satisfies all lower accessibility indicators	Bus stop < 400m	< 70 minutes
Level 2	Satisfies all lower accessibility indicators	Bus stop < 400m Mainline rail station < 800m	< 60 minutes
Level 3	Satisfies all lower accessibility indicators Exceeds at least two of seven higher accessibility indicators	Bus stop < 400m Mainline rail station < 400m (or Rail & Metro station < 600m)	< 50 minutes
Level 4	Satisfies all lower accessibility indicators Exceeds at least three of seven higher accessibility indicators	Bus stop < 400m Rail & Metro station < 400m (or mainline rail station with > 8 services / hr and less than 200m)	< 40 minutes
Level 5	Satisfies all lower accessibility indicators Exceeds at least four of seven higher accessibility indicators	Mainline rail station & Metro station < 200m	< 30 minutes

Source: JMP Clonburris TA Report, Table 7.2, p. 48.

- 5.11 In summary, the Naas Road Site ranges from Accessibility Level 1 for most of the Site (areas within 400m of an existing bus route), Accessibility Level 2 for areas within 400m of an existing bus route and 800m of an existing Luas tram stop, and Accessibility Level 3 for area within 400m of an existing bus route and 400m of an existing Luas tram stop.
- 5.12 The criteria also stipulates that in addition to being within a specific distance from a public transport node (e.g. a bus stop of Luas / rail stop), an area must also be within certain journey times from key services and facilities (e.g. places of education, employment, health, community facilities). The criteria therefore measure overall accessibility and not only public transport accessibility. The criteria also takes account of walking and cycling and recognises the importance of ensuring that key local services and facilities are provided within the context of walkable and cyclable neighbourhoods; therefore removing the need to travel by other modes if services and facilities are within acceptable walking or cycling distances.
- 5.13 The baseline accessibility levels of all areas of the Masterplan Site are presented in a figure included at **Appendix K** for information.

6 Development Proposals

Areas Identified for Development

6.1 Based upon application of the accessibility level criteria to the Naas Road Site, JMP proposes that development is restricted to areas which achieve an accessibility level of at least 3. JMP therefore recommends that the development is concentrated in four discrete areas, for a number of reasons. All of these areas either have already, or are considered able to achieve, an accessibility level of 3.

6.2 These areas, and the reasons behind these recommendations, are discussed below:

North of the Site

6.3 The area to the far north of the Site, to the east of the M50 motorway, currently has an accessibility level of between 1 and 2, depending upon relative distance from Park West Station and existing bus services which run along Nangor Road. This potential new route is illustrated in the figure included at **Appendix L** for information.

6.4 In the future, it is proposed that a new north-south route be opened up which would run from Park West Station, across the Nangor Road, south towards the Naas Road, and then further south linking up with the existing street network to the south of the Masterplan Site. It is proposed that new bus services would run along this route, providing additional accessibility and increased choice of destination to passengers.

6.5 It is also recommended that additional bus services could serve the Nangor Road, increasing connectivity to the east of the Site and Dublin city centre, also to the east; and also towards Clondalkin and Clonburris to the west. It is also noted that this area is within walking distance of the proposed Luas Line F Park West tram stop. Line F would provide a connection between Liffey Valley to the west and the Luas Red Line and Dublin city centre to the east.

6.6 This area of the Site is within walking distance of the existing Park West employment area, which is continuing to expand and be developed. It would therefore be considered appropriate to encourage a higher proportion of residential development in this area, which would benefit from employment opportunities immediately to the north, at Park West, and good access by public transport to Dublin city centre.

East of the Site

6.7 The area to the far east of the Site, that falls within South Dublin County, currently has an accessibility level of between 2 and 3, depending upon relative distance from Kylemore Luas tram stop and existing bus services on the Naas Road and Long Mile Road. It is also noted that bus route 18 runs north-south along the Kylemore Road, providing direct accessibility to areas immediate north of the Site.

6.8 Dublin City Council (DCC) are currently promoting a proposed large-scale mixed-use development in the vicinity of the Kylemore Luas stop. New residential development in the vicinity of the DCC development could help support it. It is also expected that the DCC development could provide many essential services to residents, including retail and employment.

Naas Road / Junction A

- 6.9 The area to the east of the Red Cow junction, in the vicinity of the proposed Junction A, currently has an accessibility level of between 1 and 2, depending upon relative distance to the Red Cow and Kylemore Luas stops and existing east-west bus services along the Naas Road.
- 6.10 In addition to the proposed new north-south route (with associated bus services) intersecting the Naas Road at this point, it is also proposed that a new Luas stop be introduced at this point. These two infrastructure improvements would increase accessibility to level 3; also taking account of accessibility (in terms of journey time) to key places of employment, existing education and community facilities etc). This area of development would enable a significant change to the nature and character of the Naas Road to take place. Active frontage could be promoted along the Naas Road.
- 6.11 In order to facilitate the downgrading of the Naas Road east of the Red Cow, and to facilitate the movement of traffic off the Naas Road and onto the new north-south link so that it no longer has to travel east on the Naas Road, it is proposed to create a new 'Hamburger' junction east of the Red Cow junction. The majority of eastbound traffic at present heads south-east along Long Mile Road, performing a right turn at the existing Hamburger junction at Kylemore. The creation of a new Hamburger junction further west will also allow for the downgrading of the existing Hamburger junction.
- 6.12 Development close to the Naas Road would benefit from good accessibility to the Luas Red Line and also north-south and east-west bus services. The area would also benefit from a good walking and cycling network as part of the changes to the Naas Road, including cycle lanes and wide footways on either side.

Monastery Road / West of Red Cow

- 6.13 The area immediately to the west of the Red Cow motorway junction currently has an accessibility level of between 2 and 3, due to its relative proximity to the Red Cow Luas stop / Park & Ride (P&R) facility and the number of bus services running east-west along the N7 Naas Road and northbound along Monastery Road into Clondalkin village.
- 6.14 The area immediately to the north of the N7 Naas Road would benefit from good pedestrian and cycle linkages to Clondalkin village (existing residential, retail and community facilities) and access to the Red Cow Luas stop via the new Monastery Road overbridge, over the N7 Naas Road.
- 6.15 It is noted that the area immediately to the south of the N7 Naas Road is relatively isolated and, notwithstanding the Monastery Road overbridge, suffers from relatively poor accessibility to existing community facilities, retail etc.
- 6.16 It is also apparent that there are capacity issues at key junction in the vicinity of this quadrant of the Masterplan Site; for example at the Monastery Road roundabouts both north and south of the new Monastery Road overbridge, over the N7, just west of the Red Cow junction. The existing capacity issues at these junctions, notwithstanding any improvements to links between the junctions, therefore limits the development potential of this area of the Masterplan Site.
- 6.17 It is noted that any development in this area would have to take place in the form of intensification of existing development; given this area's relatively isolated nature.

Person Trip Rates & Mode Splits

- 6.18 The numbers of person trips generated by each land use, within the proposed development, are expected to be the same irrespective of each area's accessibility level. However, the mode split associated with each land use will be influenced by each area's relative level of accessibility because as access to good walking, cycling and public transport networks improves, the ability of people to travel by these modes increases. Person trip rates and mode splits are complimentary and are used alongside one another to determine the potential future impact of the proposed development.
- 6.19 It is noted that the use of person trip rates, which inherently take account of general improvements to walking, cycling and public transport infrastructure over time, are acceptable as the person trip rates are used to model a future scenario whereby sustainable transport strategy measures are put into place.
- 6.20 The residential and commercial / office mode splits, by accessibility level, applicable to Naas Road are summarised in tables below. These mode splits accord with the DTO *Transport 21* future mode split objectives.

Residential Mode Splits

- 6.21 The residential mode splits by accessibility level applicable to Naas Road are summarised in **Table 6.1** below:

Table 6.1 Residential Mode Splits by Accessibility Level

Accessibility Level	Public Transport	Vehicle Trips	Cycling	Pedestrians	Total
1	28.00%	45.00%	7.00%	20.00%	100.00%
2	32.00%	39.50%	7.00%	21.50%	100.00%
3	36.00%	34.00%	7.00%	23.00%	100.00%

Source: JMP Clonburris Transport Assessment, p. 56, Table 7.8.

Commercial / Office Mode Splits

- 6.22 The commercial / office mode splits by accessibility level applicable to Naas Road are summarised in **Table 6.2** below:

Table 6.2 Office Mode Splits by Accessibility Level

Accessibility Level	Public Transport	Vehicle Trips	Cycling	Pedestrians	Total
1	34.00%	44.00%	5.00%	17.00%	100.00%
2	41.00%	35.25%	5.25%	18.50%	100.00%
3	48.00%	26.50%	5.50%	20.00%	100.00%

Source: JMP Clonburris Transport Assessment, p. 56, Table 7.8.

- 6.23 As discussed earlier in this file note, it is proposed that development of the 6,000 dwellings plus 100,000m² Gross Floor Area (GFA) commercial area is concentrated, where possible, in areas with higher levels of accessibility. It is noted that the highest level of accessibility in the Masterplan Site is 3.

Public Transport Demand

6.24 **Table 6.3** below sets out the number of person trips that would be generated by 6,000 dwellings across the Masterplan Site, assuming that all of these dwellings are situated within areas within accessibility level of 3.

Table 6.3 Two-Way Person Trips for Accessibility Level 3 (6,000 Dwellings)

Mode	AM Peak Hour (0800-0900)		AM Peak Period (0700-1000)		PM Peak Hour (1700-1800)		PM Peak Period (1600-1900)		Mode Split
	In	Out	In	Out	In	Out	In	Out	
Public Transport	397	1,272	1,015	2,681	862	637	2,706	2,242	36.00%
Vehicle	375	1,202	959	2,532	814	602	2,556	2,118	34.00%
Cycling	77	247	197	521	168	124	526	436	7.00%
Pedestrians	254	813	649	1,713	551	407	1,729	1,432	23.00%

6.25 With reference to the above, and assuming a bus capacity of 50 passengers per bus, it is derived that the following numbers of buses will be required for each peak hour, as set out in **Table 6.4** below.

Table 6.4 Number of Buses Required for Accessibility Level 3 (6,000 Dwellings)

Mode	AM Peak Hour (0800-0900)		AM Peak Period (0700-1000)		PM Peak Hour (1700-1800)		PM Peak Period (1600-1900)	
	In	Out	In	Out	In	Out	In	Out
Number of buses required	6	17	13	35	12	9	35	29
Bus frequency (mins)	10	4	14	5	5	7	5	6

Education & Community Facilities

Crèches

6.26 SDCC educational requirements specify that one child care facility (i.e. crèche) of 20 places is required per 150 residential units (dwellings). Assuming a development of 6,000 dwellings, 40 crèches would therefore be required.

Primary Schools

6.27 SDCC data also identifies that 11.3% of the total population will be of primary school age. Therefore, assuming a development of 6,000 dwellings, and a total of 2.5 occupants per dwelling, there would be a total population of 15,000 people. This would result in a primary school age population of 1,695 children.

6.28 Assuming 25 children per classroom, and a minimum school size of 16 classrooms (up to 32 maximum was also assumed), there will be a minimum of 400 children per primary school. Therefore, assuming a minimum of 400 children per primary school and 1,695 primary school age children as part of the total population, approximately 4 primary schools would be required to support the overall residential development.

Secondary Schools

- 6.29 SDCC data further identifies that 8.5% of the total population will be of secondary school age. Therefore, assuming a development of 6,000 dwellings, a total of 2.5 occupants per dwelling, therefore a total population of 15,000 people, this would result in a secondary school age population of 1,275 pupils.
- 6.30 Assuming a minimum school size of 800 pupils per secondary schools, it is derived that at least one secondary school will be required to support the overall residential development

Proposed Quantum of Development

Initial Analysis (5,000 dwellings plus 5,000 jobs)

- 6.31 Further to initial trip generation analysis and accessibility / sustainability considerations, a quantum of development of approximately 5,000 residential units (dwellings) was initially considered appropriate for the Masterplan Site in the shorter term. This would mean that, in the shorter term, development must be concentrated within specific areas of the Site, in order to create sufficient density to encourage a sense of community within these areas.
- 6.32 JMP notes that an average household occupancy of 2.5 persons per dwelling has been assumed. This would result in a total population of approximately 12,500 people. It has also been assumed that for 5,000 dwellings there would be 5,000 associated jobs, assuming one employed person per dwelling. Assuming an employee to floor area ratio of 1 employee per 25m² GFA, there would therefore be a total employment floor area of approximately 125,000m² GFA.
- 6.33 This is assuming a 50/50 split between residential (5,000 dwellings) and commercial (5,000 jobs).

Further Analysis (6,000 dwellings plus 4,000 jobs)

- 6.34 After further analysis, and given the proximity of the Masterplan Site to existing adjacent employment areas, and therefore the more likely need for additional housing, rather than employment, in the area, it is proposed that a 60/40 split is adopted. This would result in 60% residential (6,000 dwellings) and 40% commercial (4,000 jobs).
- 6.35 Assuming an average household occupancy of 2.5 persons per dwelling, the total population for 6,000 dwellings would be 15,000 people.
- 6.36 Assuming the same employee to floor area ratio of 1 employee per 25m² GFA, there would therefore be a total employment floor area of approximately 100,000m² GFA.

Residential Split between Houses & Flats

- 6.37 It is suggested that there is a proportion of houses and flats for zones based on accessibility level. This is summarised in **Table 6.5** below. It is proposed that the same proportions are adopted for the Naas Road Masterplan.

Table 6.5 Proportion of Flats & Houses for Zones Based on Accessibility Levels

Accessibility Level	Proportion of Houses	Proportion of Flats
1	100.00%	0.00%
2	100.00%	0.00%
3	55.00%	45.00%
4	30.00%	70.00%
5	0.00%	100.00%

6.38 As is noted earlier within this file note, it is proposed that development is restricted to areas with an existing or potential future accessibility level of at least 3. Therefore, the split between houses and flats for new residential development would be 55% houses (equal to 3,300 houses) and 45% flats (equal to 2,700 flats). There should be a proportional 55%/45% mix between houses and flats throughout areas within the whole development.

DRAFT

7 Maximum Parking Standards

General

- 7.1 This section of the report sets out recommended maximum residential and commercial / office parking standards that should be applied to proposed developments within the Masterplan Site area. It is noted different maximum parking standard are proposed for areas of different levels of accessibility. Where a particular area of the Masterplan Site has a relatively high level of accessibility, a more restrictive standard should be imposed; and where the relative accessibility of an area is lower, there should be a lower level of parking restraint. This approach accepts that different areas of the Masterplan Site will have varying levels of accessibility, and therefore the potential need for access to a car will vary also.
- 7.2 It is noted that parking standards applicable to this area of South Dublin County are generally more relaxed than is set out below. However, as stated above, improvements to walking, cycling and public transport networks will occur alongside car parking restraint.

Residential Maximum Parking Standards

- 7.3 The Clonburris accessibility criteria set out proposed parking standards for development. These are summarised in **Table 7.1** below:

Table 7.1 Proposed Maximum Residential Parking Standards

Accessibility Level	Parking Spaces per Household
1	1.5
2	1.5
3	1
4	1
5	0.75

- 7.4 It is noted from the above that, for accessibility level 3, which is applicable to the key areas for development within the Naas Road Site, the maximum parking standard would be 1 space per 1 dwelling. It is noted, however, that the adjacent DCC development is looking to restrict parking beyond this. It would therefore not be appropriate to apply a parking standard of 1:1 for the area (accessibility level 3) immediately adjacent to the DCC development.
- 7.5 The area to the far east of the Masterplan Site, adjacent to the proposed DCC development, also benefits from the best public transport provision in the area at present; namely the Luas Red Line and existing bus services along Naas Road, Long Mile Road and Kylemore Road. Journey times to Dublin city centre from this location are also significantly shorter than from areas further west within the Masterplan Site, increasing the relative accessibility of this area. It is therefore noted that this area to the furthest east of the Masterplan Site has the highest level of accessibility, and therefore the maximum parking standards recommended for this area should reflect this higher accessibility.

7.6 In light of the above, it is proposed that the maximum residential parking standards set out below area adopted. The proposed parking standards for each accessibility level / area of the Masterplan Site are set out in **Table 7.2** below:

Table 7.2 Proposed Maximum Residential Parking Standards for Naas Road Masterplan

Accessibility Level	Parking Spaces per Household
1	1.5
2	1.5
3 (other areas)	1
3 (east of Site)	0.75

7.7 With reference to the above, however, it is noted that, in the first phase of development, only areas with an accessibility level of 3 should be developed. Therefore, all of the proposed 6,000 dwellings plus 100,000m² GFA commercial area should be concentrated in areas which already have, or can achieve, an accessibility level of 3.

Commercial / Office Maximum Parking Standards

7.8 In addition to residential development, it is recommended that the Masterplan standards for non-residential development, including office development, also follows accessibility criteria. Parking provision is advocated as:

- Accessibility Level 1 = 1 space per 60m² GFA
- Accessibility Level 2 = 1 space per 70m² GFA
- Accessibility Level 3 = 1 space per 100m² GFA
- Accessibility Level 4 = 1 space per 150m² GFA
- Accessibility Level 5 = 1 space per 300m² GFA

7.9 It is noted, however, that the area of development to the far east of the Masterplan Site, in the vicinity of Kylemore Luas stop and the proposed DCC development, will have Accessibility Level 5 parking standards applied to it, to more closely adhere to DCC parking standards.

7.10 Therefore, for office development within the vicinity of Kylemore, with an Accessibility Level 3, the office parking standard of 1 space per 300m² GFA will be applied.

8 Sustainable Transport Mitigation Measures

Sustainable Transport Strategy

- 8.1 The overall aspirations of the NRDF transport strategy are to encourage sustainable travel patterns and movements within the area and mitigate the transport impacts of the proposed development. By making the NRDF area more conducive to travel by walking, cycling and public transport a sense of community can be developed, such that the area becomes an attractive place.
- 8.2 It is expected that the focus of environmental improvements and development is primarily to the east of the M50, where greatest potential exists to restructure the existing urban environment, creating a more permeable, legible space. It would be expected that the built form would develop such that the Naas Road would become the hub of a new community. The changes would lead to a change in travel behaviour for existing and new employees and residents. To the west of the M50, where the Red Cow and Newlands Cross infrastructure works will influence the character of the area, the strategy would seek to resolve issues regarding existing substandard access arrangements.
- 8.3 The Masterplan has been designed to take advantage of improvements such that travel by public transport can be an attractive option for journeys beyond the Site. It is anticipated that these improvements will help create a high quality integrated transport network with all modes complimenting one another. By providing easy access to public transport, people wishing to travel have a choice of transport options, which reduces dependency on the car and helps to ease congestion and pollution problems. Public transport makes facilities and development within the area accessible for people who do not have access to a car, those choosing not to drive or those not able to drive.

Mobility Management

- 8.4 The success of the NRDF as a sustainable urban settlement is predicated on achieving a high level of accessibility by both public transport and non-motorised modes. The Sustainable Transport Strategy seeks to achieve the mode split targets as set out in Tables 6.1 and 6.2 of **Section 6: Development Proposals**, and as summarised again below. The accessibility of the development proposals will therefore be paramount in promoting this Site as a sustainable development.
- 8.5 The residential mode split targets for Naas Road are summarised in **Table 8.1** below:

Table 8.1 Residential Mode Splits by Accessibility Level

Accessibility Level	Public Transport	Vehicle Trips	Cycling	Pedestrians	Total
1	28.00%	45.00%	7.00%	20.00%	100.00%
2	32.00%	39.50%	7.00%	21.50%	100.00%
3	36.00%	34.00%	7.00%	23.00%	100.00%

- 8.6 The commercial / office mode splits targets for Naas Road are summarised in **Table 8.2** below:

Table 8.2 Office Mode Splits by Accessibility Level

Accessibility Level	Public Transport	Vehicle Trips	Cycling	Pedestrians	Total
1	34.00%	44.00%	5.00%	17.00%	100.00%
2	41.00%	35.25%	5.25%	18.50%	100.00%
3	48.00%	26.50%	5.50%	20.00%	100.00%

8.7 Improvements are proposed for the wider Dublin public transport network, a number of which will provide benefits to the public transport network that will serve the NRDF. The development Masterplan has been designed to take advantage of these improvements such that travel by public transport can be an attractive option for journeys beyond the Site.

Developing the Mobility Management Plan

8.8 Key targets and indicators for the mobility management plan have been derived to reflect the trip rates established for the zones in the masterplan. The development density of each zone of the masterplan is closely related to accessibility, which in turn determines the level of parking to be provided. The design codes within the masterplan support the introduction of the mobility management plan measures.

8.9 Mode split targets have been derived for each land use and accessibility level. These targets relate to all transport improvements outlined within the strategy being implemented, full build out of the NRDF to 2016 and implementation of the mobility management measures outlined below. It is noted that any changes to the NRDF development such as revised development densities or the level of transport infrastructure will affect these targets and revision would need to be made to these targets.

8.10 Development applications for individual sites should provide a travel plan detailing how specific mode split targets for each land use will be met which will include a timetable for implementation of measures as well as monitoring.

8.11 An effective monitoring and review strategy will be one of the key components for the success of the mobility management plan.

8.12 A fee to review the results of the travel plan monitoring and attend review meetings should be included with individual development applications.

8.13 An area wide travel demand manager should be employed to oversee the mobility management measures proposed for the Site. This demand manager will be a key component to promote sustainable travel for trips to and from the Site.

Mobility Management Measures

8.14 Mobility Management measures that should be considered for the NRDF are detailed below. Implementation of these measures is essential to achieve the sustainable mode split targets set for the Site.

Walking

- Showers, changing facilities and lockers for storage of clothes for people that wish to walk/jog to and from work;

- Logical, high quality walking network that encourages residents to minimise unnecessary car trips to local facilities such as education facilities and health service providers (doctors, dentists, pharmacy);
- The Masterplan for the area has created pedestrian routes permeating through the neighbourhoods as well as maximising exposure to attractive features of the Site such as frontage onto green spaces;
- As well as designing a permeable pedestrian environment within the NRDF it is also planned to provide good connections to surrounding areas;
- At-grade crossings are proposed wherever practicable. Footbridges and subways have been avoided wherever possible except where local topography has made this necessary. Level changes and increases in distance are inconvenient and can be difficult for people to use;
- Good quality walking facilities are proposed to public transport stations and where practicable direct pedestrian desire lines are followed;
- The street network has been designed to permeate the Site which results in easier navigation, a more even spread of traffic and to minimise walk distances;
- Appropriate levels of lighting should be provided for both perceived and real safety along pedestrian paths which may help to encourage pedestrian activity; and
- Pedestrian routes should be well signposted with key destinations such as public transport nodes, educational facilities, recreational facilities, town centre locations as well as links to surrounding areas.

Cycling

- Secure, well-lit, convenient and covered cycle storage at Luas stops to encourage commuters to travel to the stations by bicycle rather than car;
- Cycle parking will be provided at key locations throughout the Site and in areas that have good natural surveillance. Parking provided on the street should allow the bicycle frame and wheels to be easily locked to the stand;
- Employers should be encouraged to include interest-free loans for the purchase of bicycles as part of staff benefit packages;
- Showers, changing facilities and lockers should be provided at employment locations for people that cycle to work;
- A bicycle users group could be formed to promote cycling;
- Provide information to staff and local residents about local cycling routes and connections with other cycle routes in surrounding areas;
- Pool bikes could be provided at office developments;
- Integration of cycle routes with major public transport provision;
- The NRDF cycle network has been designed to connect directly with a number of cycle routes in surrounding areas to encourage travel to other areas by bicycle;
- Cycling routes should be signposted with key destinations such as public transport nodes, educational facilities, recreational facilities, town centre locations as well as links to surrounding areas; and

- Cycle parking provision in residential areas.

Public Transport

Bus

- A new bus network will be created through the Site which would comprise of diverting and increasing headway on existing bus routes as well as development of potential new routes;
- Real-time bus information should be provided in all-weather bus shelters at key locations in the Site;
- Bus stops should be located near key destinations such as schools, public transport stations and key retail and employment centres;
- Installation of bus ticket machines in appropriate locations to reduce cash handling and hence stopping times for buses;
- Maps of local bus routes and bus timetables should be provided at all stops to inform commuters of the bus options as well as interchange possibilities with other public transport modes;
- Parking restrictions should ensure bus stops are kept free of car parking.; colouring the bus stop road pavement would help to define the length of the bus stop and discourage parking, etc that may affect bus services;
- Pedestrian access paths to bus stops should be in good condition and of a suitable quality for disabled people to access the stop;
- Security should also be considered at stops and appropriate lighting should be provided for the real and perceived safety of commuters;
- Low floor buses should ideally travel through the Site;
- Fares and ticketing should be integrated with the train and Metro network;
- High quality information should be provided on bus routes and services on the internet and paper leaflets should be easily accessible to commuters that would like information in leaflet format; and
- Priority measures to ensure bus journey reliability.

Luas

- Interest free loans for local employees to purchase season tickets;
- Frequent bus services that permeate into the residential areas so that the shortest walk trips to public transport can be provided;
- Enhancement of the integrated transport network by providing high quality facilities that provide easy and efficient interchange between different public transport modes;
- Integrated ticketing for the rail, metro and bus services will be very important to encourage increased usage of the public transport system and help to facilitate fast and easy interchange between modes;
- Easy to understand and up-to-date information should be provided at stations on services, fares and local amenities; this should include information on other travel modes such as walking and cycling as well as location of other nearby public transport nodes;

- High quality information should be provided on Luas and rail services both on the internet and on leaflets at the public transport nodes; and
- Provide commuters with reassurance when they are walking to and from the public transport stations by giving them the information they need at each decision point. The information should be comprehensive without being confusing.

Reduce the Need to Travel

- Promotion of flexible working practices including working from home; and
- Construction of mixed-use development, with facilities located throughout the Site, by its own design means that people have good access to key facilities and services in their local community.

Managing & Reducing Car Use

- Introduction of a car sharing scheme. The database(s) could be managed initially by the on-Site travel plan co-ordinator;
- Development and implementation of a residential car club scheme in the higher accessible parts of the Site to provide a vehicle accessible to all for a small hourly fee, as well as reducing the demand for parking and discourage people from using cars for non-essential trips. A range of vehicles could be provided to support different activities; and
- Implementation of the car parking strategy proposed for the NRDF area in this strategy.

Travel Plan Coordinator

- 8.15 The provision of a Travel Demand Manager on-Site; prior to on-Site occupation; to manage and deliver travel management measures e.g. car clubs, travel information.

Marketing

- 8.16 Provision of individual travel planning advice and travel information to residents prior to occupation to assist in influencing their travel behaviour and supporting the travel demand management measures;
- 8.17 Initiatives such as providing free public transport travel for the first month of occupancy for residents should be considered – research indicates that travel behaviour is most heavily influenced when people live or work in a new area.
- 8.18 Development of a comprehensive travel plan website for the NRDF area which provides clear and concise links to transport information internet sites as well as local travel information such as the cycle network, updates on local travel information, etc
- 8.19 Considerable improvements could be made to the Dublin public transport information internet sites to improve the quality and clarity of information regarding travel by public transport and thus better inform people of their various travel options.

Monitoring Exercise

- 8.20 Following the implementation of a MMP, it is recommended that an interim assessment which involves the collection of key data sets is carried out one year post occupation and a full monitoring assessment is carried out in year 2 of the Site occupation.
- 8.21 The interim assessment will present the progress that the MMP is making towards reaching the targets and highlight any issues which may have arisen.
- 8.22 It is important that this data is analysed against accurate background data. This means that any traffic growth experienced due to land use development is captured to ensure that the transport efficiency of a site is established.
- 8.23 The data collected should mirror the baseline data sets to ensure that no seasonal variations impact on the data and the subsequent evaluation.
- 8.24 The monitoring report should be prepared by the Travel Coordinator for the Site and approved by South Dublin County Council.

Public Transport Improvements

Bus Improvements

- 8.25 A series of bus routes for the NRDF area are outlined below, including considerations as to how to integrate with existing bus facilities.
- 8.26 The suggested bus routes for the Masterplan development area include:
- Diversions and increase headways on existing bus routes; and
 - Development of potential new routes.
- 8.27 The figure included at Appendix L illustrates each of the recommended routes through the NRDF area, in the context of improved accessibility. Details of these routes are provided below.

Route A – Clondalkin to Long Mile East

- 8.28 A recommended new route between Clondalkin and Long Mile East that passes through the NRDF in an east-west direction along Monastery Road, Naas Road East and Long Mile Road. It would pass the new tram stop at Naas Road East as well as the new community. Thus it would provide excellent opportunities for integration with other services as well as pass through the retail and employment core of the NRDF area.
- 8.29 The route could be extended to provide access to Adamstown, Clonburris and or Liffey Valley to the west, and southern city centre locations to the east.
- 8.30 This new route would provide an improvement to existing bus services that run along this route, providing a direct connection and enhancing the Naas Road bus corridor

Route B – Naas Road West to Long Mile East

- 8.31 This route would run west-east along the Naas Road and Long Mile, diverting if required into the potential development site to the west of Red Cow. It could therefore potentially interchange with the Luas at both Red Cow and Naas Road East. Thus it would provide

excellent opportunities for integration with other services as well as pass through the retail and employment core of the NRDF area.

- 8.32 This route could be extended to provide access into the study area from City West and beyond to the west, and to southern areas of the city centre to the east.
- 8.33 This route would differ from existing bus services in the area as it could potentially divert from the N7 into the Red Cow lands, south-west of the Red Cow junction, to support any development in that quadrant of the Masterplan Site.

Route C – Cherry Orchard Hospital to Walkinstown Cross

- 8.34 This route would run north-east along the Kileen Road, Nangor Road, Long Mile Road, Robinhood Road and Ballymount Drive. It could therefore interchange with the Luas at Naas Road East, and would improve accessibility in the eastern section of the NRDF for both existing occupiers and new development.
- 8.35 This route could be extended to provide access into the study area from Park West and or Liffey Valley to the north, and Dundrum to the east.

Route D – Ninth Lock to Ballymount

- 8.36 This route would run north – south east along the new bus corridor via Oak Road, through the new intersection at Naas Road and hence Ballymount Drive. This would improve accessibility through the existing areas just east of the M50, including the Red Cow Hotel development site.
- 8.37 This route could be extended to provide access into the study area from Park West and or Liffey Valley to the north, and Dundrum to the east.

Other Bus Network Measures

- 8.38 In addition to development of a revised local bus network, a number of other measures are recommended including:
- Real-time bus information should be provided in all-weather bus shelters at key locations in the Site;
 - Bus stops should be located near key destinations such as schools, public transport stations and key retail and employment centres;
 - Construction of designated bus lanes as specified in the Clonburris Masterplan;
 - Installation of bus ticket machines in appropriate locations to reduce cash handling and hence stopping times for buses;
 - Maps of local bus routes and bus timetables should be provided at all stops to inform commuters of the bus options as well as interchange with other public transport modes;
 - Parking restrictions should ensure bus stops are kept free of car parking. Colouring the bus stop road pavement would help to define the length of the bus stop and discourage parking, etc that may affect bus services;
 - Pedestrian access paths to bus stops should be in good condition and of a suitable quality for disabled people to access the stop;
 - Bus stops should be sited to minimise walking distance to allow easy and efficient interchange with other transport modes;

- Bus stops should ideally be located close to junctions to allow more direct access from more than one street. However they should not be located where they will affect road safety or junction operation;
 - Bus stops should also be sited so as to optimise accessibility for commuters but not so closely spaced that the efficiency of the bus service is significantly affected;
 - Security should also be considered at stops and appropriate lighting should be provided for the real and perceived safety of commuters;
 - Low floor buses should ideally travel through the Site;
 - Fares and ticketing should be integrated with the train and Metro network; and
 - High quality information should be provided on bus routes and services on the internet.
- 8.39 The phasing of development will affect the viability of different routes and the frequencies of those services. Bus services should be introduced as early as possible as behavioural change is more difficult to achieve once people have developed their travelling patterns to work, school, etc.

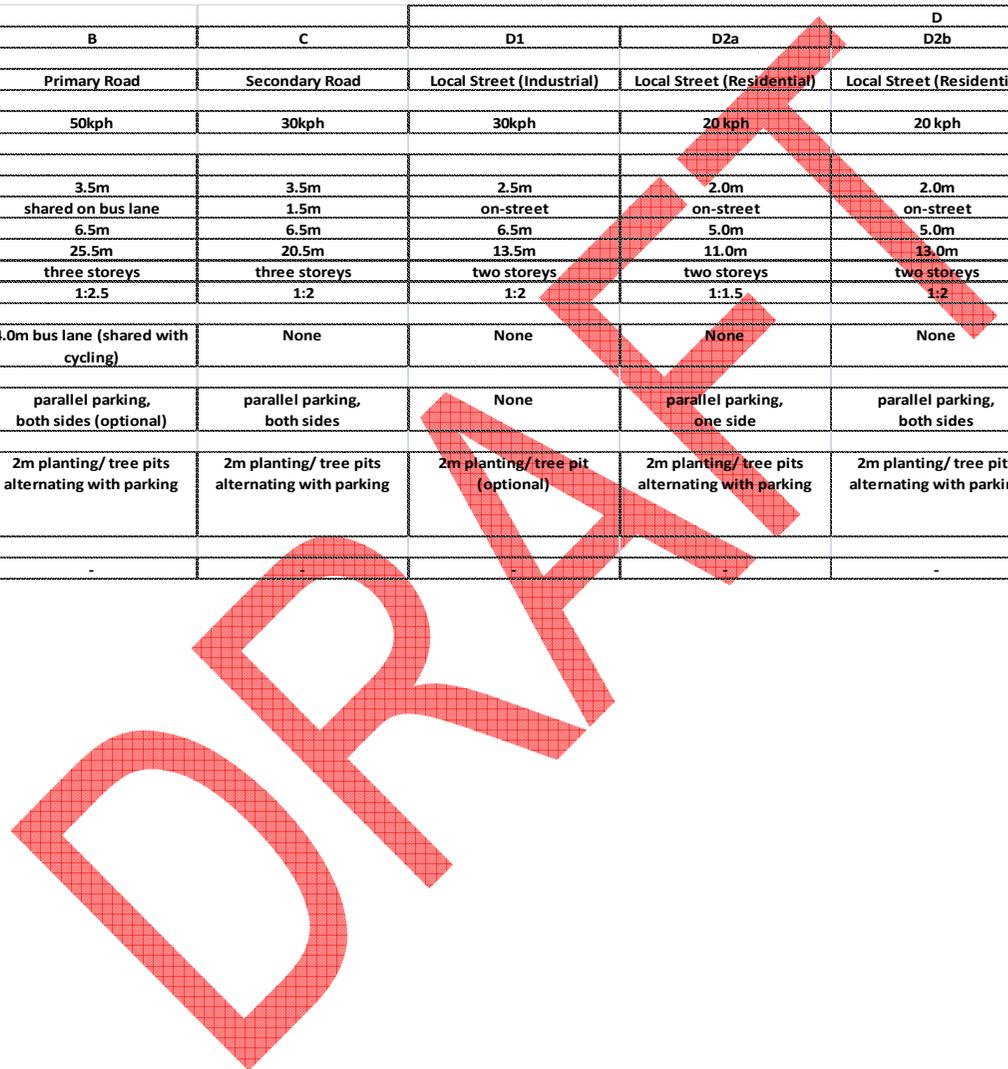
Street Typographies

8.40 The Urban Movement grid that is identified in the masterplan organises the various street types on the basis of their function in the street hierarchy. A key objective is the connectivity within the Site. This philosophy supports the mobility management plan aims and objectives of supporting walkable and cyclable neighbourhoods.

8.41 **Table 8.1** below describes the design criteria for the different street types proposed within the NRDF.

Table 8.3 Street Type Design Criteria

	A	B	C	D				
				D1	D2a	D2b	D2c	D2d
Street Category	Naas Road East	Primary Road	Secondary Road	Local Street (Industrial)	Local Street (Residential)	Local Street (Residential)	Local Street (Residential)	Local Street (Residential)
Design Speeds	50kph	50kph	30kph	30kph	20 kph	20 kph	20 kph	20 kph
Dimensions and Character								
Footway	3.0m	3.5m	3.5m	2.5m	2.0m	2.0m	2.0m	2.0m
Cycling	2.0m	shared on bus lane	1.5m	on-street	on-street	on-street	on-street	on-street
Carriageway	6.5m	6.5m	6.5m	6.5m	5.0m	5.0m	5.0m	5.0m
Overall width	40.0m	25.5m	20.5m	13.5m	11.0m	13.0m	14.0m	16.0m
Building heights	four storeys	three storeys	three storeys	two storeys	two storeys	two storeys	two storeys	two storeys
Height/Width ratio	1:3	1:2.5	1:2	1:2	1:1.5	1:2	1:2	1:2.5
Public Transport	3.5m bus lane; 12.5m tram corridor	4.0m bus lane (shared with cycling)	None	None	None	None	None	None
On-street parking	parallel parking, both sides (optional)	parallel parking, both sides (optional)	parallel parking, both sides	None	parallel parking, one side	parallel parking, both sides	perpendicular parking, one side	one side parallel, one side perpendicular parking
Planting	2m planting/ tree pits alternating with parking; planting within tram corridor; optional greened	2m planting/ tree pits alternating with parking	2m planting/ tree pits alternating with parking	2m planting/ tree pit (optional)	2m planting/ tree pits alternating with parking			
Comments	-	-	-	-	-	-	-	-



- 8.42 The urban movement grid that is included in the Masterplan organises the various street types on the basis of their function in the street hierarchy. A key objective is the connectivity within the Site as well as connections to surrounding networks.
- 8.43 All modes are considered in the development of this grid starting with the slowest – pedestrians and working through to the quickest – strategic highway routes.
- 8.44 Street layouts have generally been designed to encourage natural surveillance by ensuring streets are overlooked by developments and that they are well used by virtue of good design.
- 8.45 Speed limits should be set on all minor roads within the Site to encourage low vehicular speeds which in turn increases pedestrian and cycling safety as well as improving the amenity of an area as a public space. These speed limits should be supported by traffic management and natural traffic-calming measures such as speed tables, vegetation, regular pedestrian crossings, etc that do not significantly impact on the aesthetic quality of the street environment.
- 8.46 Streets should be designed to ensure public transport vehicles can negotiate junctions with relative ease. Swept path analysis should be used to ensure buses and servicing vehicles can be accommodated.
- 8.47 A number of bicycle and bus lanes are proposed through the Site in the Masterplan in order to promote travel by these modes.

Connectivity and Access to Surrounding Areas

- 8.48 Well connected street design allows for good access throughout the Site. It creates a more easily navigable street environment, encourages more even spreading of traffic on parallel routes and also minimises travel distances. It is also important to allow the timely response of emergency vehicles as well as providing easier access for service and waste collection vehicles.
- 8.49 Internal permeability within the Site is important but so too are linkages via sustainable modes to surrounding areas. A development with poor cycle, pedestrian and public transport links to surrounding areas encourages movement to and from the Site by car. It is important to ensure that the Masterplan Site has good walking and cycling linkages with surrounding areas such as Clondalkin, to the north-west; Belgard, to the south-west; Park West, to the north; and Dublin City to the east; for example. Existing and proposed future bus routes will also ensure good connectivity with surrounding areas.

Network Interventions

Strategic Highway Interventions

- 8.50 Consultation with the NRA has highlighted their concerns that the proposals for the Naas Road do not increase traffic flows or congestion on their network (i.e. the M50 and the N7 to the west of the M50). The NRA can direct refusal of proposals that have negative impacts upon their network; thus the Masterplan has to take account of their concerns.
- 8.51 In order to deliver proposed environmental improvements of the eastern section of Naas Road, within the M50, sufficient highway capacity has to be maintained to ensure queues

and delays are not experienced upon the NRA network. Likewise rerouting of traffic from the Naas Road onto other strategic corridors should be avoided, as this could also increase pressure on the NRA's network.

8.52 To take account of the NRA's concerns a highways strategy has been developed, with key elements shown schematically within **Appendix M** for information. The key aspects of this strategy are:

- Proposed major new junction to east of Red Cow Interchange;
- Proposed new north-south route linking Oak Road and Robin Hood Road;
- Proposed new east-west link to south from north-south link to Long Mile Road;
- Downgrade of Naas Road to east of Oak Road to create a more pedestrian and cyclist friendly environment; and
- Downgrade of existing Naas Road / Long Mile Road / Nangor Road junction.

8.53 The above strategy has been developed in order to maintain capacity whilst reducing the volume of traffic on Naas Road, such that environmental improvements can be delivered. The new junction to the east of the Red Cow has been positioned such that it is more than the 240m desirable spacing specified within NRA TD 9. However it should be noted that there is a short weaving section from the southbound M50 off slip and the new junction. It is likely that the new junction would be of a similar 'hamburger' configuration as the existing Long Mile Road / Nangor Road junction in order to accommodate the volume of turning movements that would be anticipated.

8.54 It would be expected that the new north south link would transfer strategic movements from the sections of Nangor Road / Long Mile to the east. Likewise the new east west route to the south of the Naas Road would accommodate existing movements from the northernmost section of Long Mile Road. These two new links would result in a significant reduction in trips on Naas Road to the east of the new junction, thus allowing narrowing of the carriageway and downgrading of the existing junction with Nangor Road and Long Mile Road.

8.55 The drawing included at **Appendix N** show the existing and proposed arrangements of the Naas Road East corridor. The combination of the measures proposed, together with frontage development along the route should substantially change the character of the area, such that traffic speeds and volumes are reduced, and pedestrian and cycle activity increases.

Physical Interventions

N7 Naas Road to West of Red Cow

8.56 To the west of the M50 it is proposed to facilitate a level of development, which could be achieved by resolving the current substandard access to sites north of the N7 between Red Cow and Monastery Road. At present, access to this area is via a 'left-in / left-out' junction with minimal diverging / merging lengths onto the N7. These arrangements will worsen with the construction of the grade separated intersection at Newlands Cross, whereupon the access falls immediately to the east of the diverge for Belgard Road.

- 8.57 To resolve this safety issue it is proposed to provide two alternative accesses into this area. To the west, it is proposed to provide a link to the Belgard Road, connecting to the proposed signalised junction. A further connection is proposed to the east, linking the area with the Monastery Road bridge. The combination of these two routes would create an additional route between Clondalkin and the Belgard Road, effectively bypassing Newlands Cross. In order to remove the potential for encouraging through movements on this route it is proposed that a bus gate be provided, such that the through route would be available for all modes except private vehicles.
- 8.58 Careful consideration would have to be given as to the level of development within this area, such that existing and forecast highway congestion is not exacerbated.

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9 Accessibility Objectives

Mapping of Accessibility Levels

9.1 In order to support the objectives of the Sustainable Transport Strategy and to promote and encourage walking, cycling and travel by public transport modes (particularly by bus), future accessibility levels have been mapped. These are included at Appendices K and L for information. It should be noted that these figures are based on direct distance from public transport provision (i.e. a radius is measured from public transport nodes such as bus stops and Luas stops). This methodology has been applied on the basis that redeveloped areas would have a fine grain of pedestrian and cycling routes.

Future Accessibility Levels

9.2 The expected future accessibility levels of all areas of the Masterplan Site, based on the implementation of a proposed north-south bus corridor and additional Luas Red Line stop on the Naas Road, are presented in a figure included at Appendix L for information.

Areas of Highest Accessibility within, and in close proximity to, the Masterplan Site

9.3 It is noted that the highest Accessibility Level within the Site does not increase beyond Accessibility Level 3; as in order to achieve an Accessibility Level of 4 or 5, an area must have access to mainline rail services with a specific distance as well as light rail (e.g. Metro or Luas tram) must be achieved. It is important that the same criteria is used to measure accessibility in both the baseline and future scenarios to ensure that a 'like for like' comparison is made.

9.4 Areas identified as having an Accessibility Level of 3 are:

- **Area in the vicinity of Park West Station, to the north of the Site, beyond the Site boundary** – This area is also in the vicinity of the Grand Canal and existing bus services which run along Nangor Road. It is noted that, at present, the area of highest accessibility is outside of the Site red line boundary, but with future improvements to bus services, including potential north-south bus routes, and also taking account of its proximity to employment opportunities at Park West, this area is indeed very accessible.
- **Area to the far east of the Site, in the vicinity of the Kylemore Luas stop** – There are also a large number of existing bus services running east-west along Naas Road and on Long Mile Road. Journey times to Dublin city centre are also shorter from this location. It is also noted that this area is where the proposed Dublin City mixed-use development is proposed; any additional commercial-led development in this area would increase accessibility to employment and support new residential development surrounding it.
- **Area to the west of the Red Cow junction, in the vicinity of the Red Cow Luas stop** – It is noted that there are also a large number of existing bus services running east-west along the N7 Naas Road and also northbound via Monastery Road. This area of the Site is located within close proximity to Clondalkin village and can benefit from existing community facilities and places of employment. Good accessibility to employment opportunities in Tallaght to the south, via the Luas Red Line, is also noted.

- **Area to the east of the Red Cow junction and the proposed Junction 'A', subject to the inclusion of a new Luas stop in this vicinity** – Accessibility to existing east-west bus services on Naas Road and northwest-bound bus services on Nangor Road is noted.

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10 Development Scenarios & Modelling Methodology

Development Scenarios

10.1 There are four specific scenarios, which are set out in the paragraphs and **Table 10.1** below.

Scenario 1: Baseline Scenario

10.2 This scenario represents the baseline situation at the Site. Background traffic is taken from the Arup SATURN model '2009 Do Minimum' scenario, which assumes that committed developments are built out, but does not include the proposed Newlands Cross interchange upgrade. With regards to the Masterplan Site, it assumes that the existing land use remains unchanged and that there is no new development. The number of person trips generated are derived from the DTO / Census 'Place of Origin – Census Anonymised Records' (POW-CAR) database, as is the mode split.

Scenario 2: Future Do Minimum Scenario

10.3 This scenario represents a future year scenario without any redevelopment of the Masterplan Site. Background traffic is taken from the Arup SATURN model '2009 Do Something' scenario, which again assumes that committed developments are built out, and also includes the proposed Newlands Cross interchange upgrade. Background traffic within the SATURN model is factored up from 2009 levels to forecasted 2016 levels. As with the Baseline Scenario, the Future Do Minimum Scenario assumes that the existing land use within the Masterplan Site remains unchanged and that there is no new development. Also, as with the Baseline Scenario, the Future Do Minimum Scenario derives the number of person trips and also the mode splits from the DTO / Census POW-CAR database.

Scenario 3: Future Do Something Scenario

10.4 This scenario represents the same future year scenario as the Future Do Minimum Scenario, albeit with part of the Masterplan Site redeveloped. This allows a direct comparison in the future year. As with the Future Do Minimum Scenario, background traffic is taken from the Arup SATURN model '2009 Do Something' scenario, which again assumes that committed developments are built out, and also includes the proposed Newlands Cross interchange upgrade. Background traffic within the SATURN model is factored up from 2009 levels to forecasted 2016 levels. This scenario assumes that part of the Masterplan Site is redeveloped – up to approximately 5,000 dwellings and employment space for approximately 5,000 jobs (or equivalent e.g. 6,000 dwellings plus 4,000 jobs). It assumes that the remaining parts of the Masterplan Site will remain undeveloped.

10.5 With regards to the existing land use at the Site, the number of person trips and the mode splits will be derived from the DTO / Census POW-CAR database. (as there are no interventions). With regards to the new development, the number of person trips will be derived from Clonburris trip rates (as set out in the JMP Clonburris Transport Assessment). The mode splits for the new development will be taken from the Clonburris TA (related to determined existing Accessibility Levels).

Scenario 4: Future Do Something + Interventions Scenario

10.6 This scenario represents the same future year scenario as the Future Do Something Scenario, again with part of the Masterplan Site redeveloped. This allows for direct

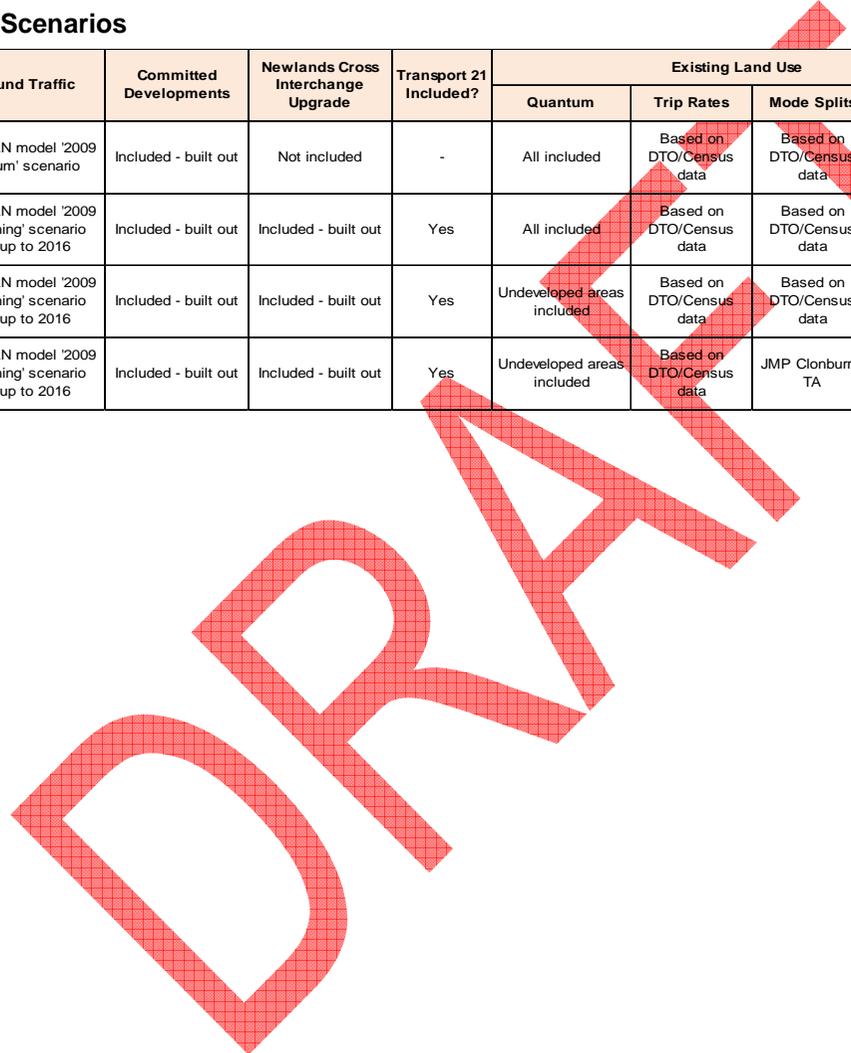
comparison in the future year with and without interventions. As with the Future Do Something Scenario, background traffic is taken from the Arup SATURN model '2009 Do Something' scenario, which assumes that committed developments are built out, and also that the proposed Newlands Cross interchange upgrade is built out. Background traffic within the SATURN model is factored up from 2009 levels to forecasted 2016 levels. As with the Future Do Something Scenario, the Future Do Something + Interventions Scenario assumes that part of the Masterplan Site is redeveloped (up to approximately 5,000 dwellings and 5,000 jobs or equivalent). It assumes that the remaining parts of the Masterplan Site will remain undeveloped.

- 10.7 With regards to the existing land use at the Site, the number of person trips will be derived from the DTO / Census POW-CAR database (as the actual type of development and thus the number of overall person trips will not change). However, as interventions will be implemented across the entire Masterplan Site, potentially improving the Accessibility Level of areas that are not being redeveloped, the mode split of some undeveloped areas may be altered. The mode splits for the existing land use at the Site will therefore be taken from the Accessibility Levels.

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Table 10.1 Development Scenarios

Scenario Ref No	Scenario Name	Scenario Year	Background Traffic	Committed Developments	Newlands Cross Interchange Upgrade	Transport 21 Included?	Existing Land Use				Proposed Development			
							Quantum	Trip Rates	Mode Splits	Interventions?	Quantum	Trip Rates	Mode Splits	Interventions?
1	Baseline	2009	Arup SATURN model '2009 Do Minimum' scenario	Included - built out	Not included	-	All included	Based on DTO/Census data	Based on DTO/Census data	-	-	-	-	-
2	Future Do Minimum	2016	Arup SATURN model '2009 Do Something' scenario factored up to 2016	Included - built out	Included - built out	Yes	All included	Based on DTO/Census data	Based on DTO/Census data	-	-	-	-	-
3	Future Do Something	2016	Arup SATURN model '2009 Do Something' scenario factored up to 2016	Included - built out	Included - built out	Yes	Undeveloped areas included	Based on DTO/Census data	Based on DTO/Census data	-	5,000 dwellings/jobs	TRICS	TRICS	-
4	Future Do Something + Interventions	2016	Arup SATURN model '2009 Do Something' scenario factored up to 2016	Included - built out	Included - built out	Yes	Undeveloped areas included	Based on DTO/Census data	JMP Clonburris TA	Yes	5,000 dwellings/jobs	TRICS	TRICS	Yes



Development Potential

Area to the West of the M50

- 10.8 To the west of the M50 it is proposed to facilitate a limited amount of development by resolving the current substandard access to sites north of the N7 between Red Cow and Monastery Road. At present access to this area is via a left in left out junction with minimal diverging / merging lengths onto the N7. These arrangements will worsen with the construction of the grade separated intersection at Newlands Cross, whereupon the access falls immediately to the east of the diverge for Belgard Road.
- 10.9 To resolve this safety issue it is proposed to provide two alternative accesses into this area. To the west, it is proposed to provide a link to the Belgard Road, connecting to the proposed signalised junction. A further connection is proposed to the east, linking the area with the Monastery Road bridge. The combination of these two routes would create an additional route between Clondalkin and the Belgard Road, effectively bypassing Newlands Cross. In order to remove the potential for encouraging through movements on this route it is proposed that a bus gate be provided, such that the through route would be available for all modes except private vehicles.
- 10.10 Consideration of the transport strategy elements necessary to relieve the impact of such a development location highlights the difficulty in achieving direct mitigation. The only large traffic generator in the direct vicinity is the Red Cow P&R site, the demand for which could not be transferred onto other modes, nor would it be appropriate to suppress. Given that the areas to the south-west of Red Cow have low existing traffic generation, there is limited scope to reduce existing vehicular trips in the vicinity to offset the increase in vehicular trips likely to result from the development. Thus any mitigation measures would have to relate for areas either to the north of the N7 (primarily Clondalkin), or the industrial areas to the east of the M50. Given that it is unlikely that many of these measures would directly benefit the development site itself (for instance improved pedestrian or cycle links, or bus service provision), it is questionable how these could be delivered through planning conditions.
- 10.11 Furthermore it should be noted that as the development is close to the Park and Ride site the potential to restrain parking to control traffic generation within the scheme may be limited, due to the potential for excess parking to occur at Red Cow. Whilst parking charges apply at Red Cow it is open to debate whether these charges would be sufficient to deter local commuter parking, as they are set to encourage transfer to LUAS.
- 10.12 Based on the above, and given the limited capacity of the transport network to accommodate further trips, it is suggested that areas to the east of the M50 are prioritised for redevelopment over areas west of Red Cow.

Modelling Approach

- 10.13 JMP has developed a bespoke Excel spreadsheet model to assess quantify the potential impact of the proposals. This model will be developed to undertake the multi-modal trip generation calculations and will be used to enable the assignment and distribution of multi-modal person trips onto the existing and proposed public transport and highway networks respectively.

- 10.14 The model will be constructed with a zoning pattern reflecting the key land parcels within the Masterplan study area, and potential access routes into these zones. It will also show key transport linkages outside the Masterplan study area e.g. N7 west, Luas south etc.
- 10.15 Each zone within the model will reflect existing / proposed land use(s), floor areas and / or number of dwellings. The accessibility of each zone to local and public services will also be considered, such that the impact of improvements to services can be considered.
- 10.16 Approximately 80 zones have been developed for the Masterplan area.
- 10.17 This approach will be discussed and agreed with the DTO, NRA and SDCC Roads.
- 10.18 It should be acknowledged that the current DTO is being updated, recalibrated and revalidated. The anticipated timescales for completing this revalidation is Spring 2009. Early discussions with Barry Colleary of the DTO has revealed that the DTO Commercial section would be unable to offer technical updates to the existing DTO model at this time but would be happy to work with SDCC and JMP on developing and assessing the inputs into the multi modal spreadsheet model in order to ascertain preliminary findings to the potential range of impacts and necessary transport measures.

Accessibility Criteria

- 10.19 A set of accessibility indicators and accessibility level criteria has being developed. This approach influenced the trip generation and trip rates across the Site. The approach is predicated on the proposed urban form and the potential public transport provision, walking and cycling facilities.
- 10.20 The accessibility criteria also seeks to inform density and thresholds of density. The criteria covers access to education (all levels), access to employment, access to health care and access to public transport.
- 10.21 The criteria will be used to assess access time in minutes to key trip attractors.

Data Sets, Assignment & Distribution

- 10.22 District Electoral Division (DED) origin-destination statistical data has been obtained from the DTO to assist with the assignment of person trips on the public transport and highway networks. This information also provides the breakdown of walking and cycling trips for the base year.
- 10.23 The distribution of person trips includes proposed public transport networks (e.g. proposed bus routes, Luas Red line, walking and cycling routes) and also includes scenarios with and without the proposed Metro West route. It is also expected that a proportion of public transport trips will be distributed onto the mainline rail network (potentially via bus services to Park West Station).
- 10.24 Residual car-based person trips has been distributed onto the proposed local highway network has subsequently identified internal trips within the Site, and also trips to / from the external highway network. The expected number of trips on key routes into / out of the Masterplan area has therefore been determined, including the M50 North / M50 South / N7 Naas Road West and R110 Naas Road East.

- 10.25 The total number of person trips by mode has then been assigned onto the public transport and highway networks, as appropriate. The total number of walking and cycling person trips has also been assigned onto the respective networks.
- 10.26 The M50 EIS traffic data for year of opening 2008 has been used as the base year for the model. Future year development scenarios has developed separately in discussion with the SDCC, DTO and NRA.

Public Transport Capacity Assessment

- 10.27 In order to assess the impact of the expected future person trips onto the expected future public transport network, information on future capacity passenger forecasts for Metro West has been obtained.

Highway Capacity Assessment

- 10.28 In order to assess the impact of residual car-based person trips on the future highway network (taking account of the ongoing M50 motorway and M50 / N7 Red Cow junction upgrade works), baseline traffic flow data for each of the key roads and junctions in the vicinity of the Masterplan area will need to be obtained. This includes traffic flows for the M50 motorway north and south of the Red Cow junction, for the N7 Naas Road west of Red Cow, the R110 Naas Road east of the junction, and other key local roads, as required. Baseline traffic flows are also required for the Naas Road / Long Mile Road junction, in the eastern part of the Masterplan area, and also the Belgard Road north and south of the Newlands Cross junction with the N7 Naas Road. It is noted that the M50 Environmental Impact Statement (EIS) includes traffic flow data (e.g. AADT) for the M50 motorway north and south of the Red Cow junction, and will have used Naas Road traffic flow data to undertake a capacity assessment of the existing / proposed Red Cow junction.
- 10.29 It is understood that the M50 EIS will have assumed a certain level of development within the local area surrounding the Red Cow junction. It is necessary to determine the level of development that has been assumed and whether the Masterplan development (or part of it) was included within the M50 EIS assumptions.

Trip Rates

- 10.30 The proposed Masterplan development will comprises a number of different land uses, shared between the different parcels of land in the study area. Trip rates have been obtained from the industry standard TRICS® trip rate database by selecting survey sites in accordance with criteria set out in the *TRICS® Good Practice Guide 2008*.
- 10.31 The appropriate trip rates for each land use type have been applied to the quantum of development for each Masterplan zone, giving the total number of person trips by land use type for each zone. Total person trips have been derived for weekday AM and PM peak periods (e.g. 07:00-10:00 and 16:00-19:00 hours).

Mode Splits

- 10.32 Modal splits for each land use type has been determined by zone, based upon accessibility criteria developed by JMP and agreed by SDCC, and also using the latest Census data.

Deriving Person Trips

10.33 There are two methods for deriving the number of person trips for an existing land use or proposed development which are applicable to the Masterplan scheme. These are the first principles approach or taking trip rates from a trip rate database such as TRICS. As will be discussed, there are advantages of using both methods. The initial trip generation assessment was initially undertaken using both methods, although as potential future scenarios have been assessed, the TRICS approach has been adopted. This is considered appropriate in assessing future year development scenarios with improvements to walking, cycling and public transport infrastructure.

First Principles Approach

10.34 The first method is to take the expected number of residents, or employees, and to make assumptions, based on site-specific surveys (if available) or professional judgement, as to when those residents or employees are expected to travel to and from home or work; and also how many of those residents or employees are likely to travel from home / to work on any one day.

Future Development Scenarios TRICS Approach

10.35 The second method is to take the proposed employment / office GFA, and using pre-calculated trip rates taken from the TRICS database, for example, derive the number of person trips. The TRICS database provides trip rates that identify the number of person trips per 100m² GFA (or per dwelling for residential land use).

10.36 The total number of expected person trips for the whole development is derived by calculating the trip rate by the total proposed GFA. Existing TRICS trip rates assume 1 employee per 18m² GFA whilst the proposed development at the Masterplan Site is for 1 employee per 25m² GFA. Therefore, TRICS will inherently overestimate the number of person trips per 100m² GFA.

10.37 Trip rates based on GFA are typically used when the number of employees for a proposed development is not known.

10.38 The alternative methodology is to derive trip rates, and thus the number of person trips, from a first principles approach. For example, if we assume that 4,000 jobs will be generated by the proposed Masterplan development, and all employees arrive between 07:00 and 10:00 hours (the AM peak period) and all employees depart between 16:00 and 19:00 hours (the PM peak period), and only 80% of the total employees travel to work on any one day (80% occupancy), accounting for staff illness, annual leave, meetings off-site and working from home, it is derived that 3,200 employees will arrive between 07:00 and 10:00 hours (80% of 4,000) and 3,200 employees will depart between 16:00 and 19:00 hours (80% of 4,000).

10.39 An analysis of the TRICS office trip rates suggests that approximately 40% of all staff arriving at work on any one day will arrive between 08:00 and 09:00 hours (the AM peak hour). It is therefore assumed that 40% of 3,200 employees, equal to 1,280 employees, will arrive at work between 08:00 and 09:00 hours. It is further assumed that 40% of 3,200 employees, equal to 1,280 employees, will depart from work between 17:00 and 18:00 hours (the PM peak hour).

- 10.40 If it is assumed that there is 1 employee per 25m² GFA, this equates to 100,000m² GFA for 4,000 employees. This equates to 4 employees per 100m² GFA, or 3.2 employees per 100m² GFA arriving between 07:00 and 10:00 hours and 1.28 employees per 100m² GFA arriving between 08:00 and 09:00 hours.

Calculating Person Trips for Existing Land Uses

- 10.41 It is noted that the TRICS trip rates are not appropriate when considering existing land uses within Ireland, and should therefore only be considered as valid when applying to proposed future development, where accessibility to retail, places of employment, education, services, community facilities and public transport is to be improved as part of a Mobility Management Plan or Sustainable Transport Strategy.
- 10.42 In order to overcome the lack of suitable sites within Ireland which can be used as a proxy for the existing land uses at Naas Road, it is proposed to make use of the DTO / Census POW-CAR 'travel-to-work' database. This database provides the total number of trips, by mode, to and from each DTO Zone within the Masterplan area. An assumption can be made as to within what time periods these trips occur.
- 10.43 The TRICS trip rate database is not currently representative of existing travel patterns at developments in Ireland, although in the near future it is expected that Irish survey sites will be uploaded to the TRICS database. The inclusion of Irish survey sites within the TRICS database will make TRICS more relevant and representative of developments in Ireland, and will strengthen the argument in support of using TRICS to derive trip rates for existing Irish developments. Should this new data become available within TRICS within the timeframe of this project, JMP can review and update the existing land use trip rates, as appropriate.

Transport Impact

- 10.44 **Appendix O** includes a summary table of the initial trip generation for 5 different scenarios, namely:
- JMP 50-50;
 - JMP 60-40;
 - KCAP Scenario A;
 - KCAP Scenario B; and
 - KCAP Scenario C.
- 10.45 All scenarios detailed include the same trip rate assumptions, varied only by consideration of the accessibility levels of the different development areas. All trip rates are based on the Clonburris TA, which include a significant shift toward sustainable travel compared with the existing situation.
- 10.46 From Appendix N it is apparent the 5 scenarios result in increasing levels of trip generation, ranging from 6,845 to 15,164 person trips in the morning peak hour. In addition to varying levels of overall trip generation, the balance between inbound and outbound trip generation varies between scenarios. Scenarios 1, 2 and 3 have a net outflow of trips in the morning peak, whereas scenarios 4 and 5 result in a net inflow of trips.

- 10.47 Comparison of the scenarios also reveals an increasing number of vehicular trips. Whilst scenarios 1 and 2 generate 2,127 and 2,332 vehicular trips respectively, scenario 3 generates 4,351 vehicular trips (i.e. almost double scenarios 1 or 2), with scenario 5 generating 5,499 vehicular trips.
- 10.48 It should be noted that even scenarios 1 and 2 include significantly more traffic generation than the existing situation, i.e. these will still require considerable negotiation to be agreed with the NRA.
- 10.49 Comparison of modal splits reveals that scenarios 1 and 2 have significantly higher percentage of travel by non car modes than scenarios 3, 4 and 5. Review of scenarios 3, 4 and 5 reveals that these scenarios propose some levels of development in areas with lower levels of accessibility, which results in a greater level of car usage, as the proportion of person trips occurring by private car will be greater. In order to minimise the level of private car usage, and to achieve the highest mode share for walking, cycling and sustainable transport modes, all development should be concentrated in areas with an Accessibility Level of 3.

Impact of Highways Proposals

- 10.50 Review of the transport modelling forecasts received to date suggests that there are substantial through movements on the eastern section of Naas Road, which make a routing decision at the Naas Road / Nangor Road / Long Mile Road 'Hamburger' junction. In order to reduce the flows on the eastern section of the Naas Road, to improve environmental quality and hence create a sense of place it is proposed to create a new intermediate junction on the Naas Road. The Naas Road east of the new intermediate junction will be a pedestrian and cyclist friendly environment, with reduced vehicle speeds and an active frontage encouraging pedestrian activity and enforcing the sense of a walkable neighbourhood.
- 10.51 It is likely that the intermediate junction would take a similar form to the existing hamburger junction, providing equivalent capacity such that forecast movements could be accommodated. This would minimise the potential for trips to divert onto alternative routes, which could lead to objections from the NRA. Diversion of turning movements from the Long Mile junction onto the new intermediate junction would lead to a substantial reduction in trips on Naas Road. It would also allow for a considerable reduction in the scale of existing Long Mile junction.
- 10.52 The positioning of the new junction requires a balancing of the competing demands of the NRA to ensure it does not impact upon their network, and the aspiration of the masterplan to reduce flows and severance. The proposed location of the junction ties in with the natural extension of Oak Road to the north. A similar link to the south would also be created to allow trips to Long Mile to also divert at the new junction.
- 10.53 In terms of link capacity, the weekday morning peak 2024 forecast flows on Naas Road eastbound are approximately 3,300 PCUs per hour. It is anticipated that the intermediate junction would result in a substantial reduction in flows to the east, with remaining flows on the Naas Road of the order of 1,000 to 1,500 PCUs per hour. By reference to UK Department for Transport Note TA 79/99 this would suggest that a two lane dual carriageway of 6.75m width would have sufficient capacity to accommodate the residual flows. It is likely that a kerbside bus lane could be provided along the majority of the street.

10.54 [NOTE – SECTION ON TRANSPORT PROPOSALS TO THE WEST TO BE COMPLETED]

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11 Summary & Conclusions

Key Points

11.1 A Sustainable Transport Strategy has been proposed by JMP for the Masterplan Site area, which aims to encourage the transfer of existing car-based trips onto more sustainable travel modes, such that the released highway capacity could be made available for the proposed development at the Site. However, this modal transfer will need to be focussed on additional walking, cycling and bus based trips, given the existing and expected future capacity constraints of the Luas Red Line; and distance from the Site of mainline rail services.

11.2 Sustainable Transport Strategy measures include:

- Providing suitable pedestrian and walking facilities within and to the Masterplan area; including a logical, high quality walking network that encourages residents to minimise unnecessary car trips to local facilities such as education facilities and health service providers (i.e. doctors, dentists, pharmacy);
- Providing a permeable pedestrian environment within the NRDF and good connections to surrounding areas; including providing at-grade crossings wherever practicable;
- Providing good quality walking facilities to public transport hubs and where practicable following pedestrian desire lines;
- Providing suitable cycling facilities including secure, well-lit, convenient and covered cycle storage at stations to encourage commuters to travel to the stations by bicycle rather than car;
- Providing a cycle network that is designed to connect directly with a number of cycle routes in surrounding areas to encourage travel to other areas by bicycle;
- Providing enhancements to the integrated transport network by providing high quality facilities that provide easy and efficient interchange between different public transport modes;
- Understanding the importance of integrated ticketing for rail, metro and bus services to encourage increased usage of the public transport system and helping to facilitate fast and easy interchange between modes;
- Providing commuters with reassurance when they are walking to and from the public transport stations by giving the information they need at each decision point. The information should be comprehensive without being confusing;
- Creating a new bus network through the Site which would comprise of diverting and increasing headway on existing bus routes as well as development of potential new routes;
- Ensuring that bus stops are located near key destinations such as schools, public transport stations and key retail and employment centres;
- Reducing the need to travel through promoting flexible working practices including working from home; and construction of mixed-use development, with facilities located throughout the Site, by its own design meaning that people have good access to key facilities and services in their local community; and

- Managing and reducing car usage and implementation of the car parking strategy proposed for the NRDF area in this overall strategy.
- 11.3 Key targets and indicators for the mobility management plan have been derived to reflect the trip rates established for the zones in the masterplan. The development density of each zone of the masterplan is closely related to accessibility, which in turn determines the level of parking to be provided. The design codes within the masterplan support the introduction of the mobility management plan measures.
- 11.4 Mode split targets have been derived for each land use and accessibility level. These targets relate to all transport improvements outlined within the strategy being implemented, full build out of the NRDF to 2016 and implementation of the mobility management measures outlined below. It is noted that any changes to the NRDF development such as revised development densities or the level of transport infrastructure will affect these targets and revision would need to be made to these targets.
- 11.5 Consideration of the mitigation measures necessary to result in a 'nil detriment' outcome suggests that the areas of the Site with the greatest development potential are those with a relatively high existing traffic generation, plus a larger surrounding area where existing highway trips can be transferred onto other modes to allow some additional highway trips from the new Masterplan development.

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Site Location Plan

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Key Transport Routes

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M50 Upgrade Drawing

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Newlands Cross Upgrade Drawing

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Existing Public Transport Services

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Metro West Preferred Route Map

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Existing Walking & Cycling Routes

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DTO / CSO DED Zones & DTO Zones Plans

DTO / CSO Resident & Daytime Population Travel-To-Work Data

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Clonburris Accessibility Levels – JMP TA Extract

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Existing NRDF Accessibility Levels

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Proposed Bus Corridors

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Proposed Highways Strategy Drawings

Existing & Proposed Arrangements for Naas Road East Corridor

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Trip Generation Summary Tables