



The background of the cover is a map of Dublin, Ireland, showing the proposed Metro North route. The route is indicated by a dotted line with small circular markers at each station. The stations, from north to south, are: Belinstown, Usherhall, Crumay, Seaview, Swords, Fonestown, Airport, Dardicross, Northwood, Ballynua, Dublin City University, Giffchavenue, Drumcondra, Mace, Parnell Square, O'Connell Bridge, and St. Stephen's Green. The map is rendered in shades of blue and green, with the route line in a lighter blue.

ENVIRONMENTAL IMPACT STATEMENT – METRO NORTH

BELINSTOWN TO ST. STEPHEN'S GREEN

ANNEXES

VOLUME 3 – BOOK 2 OF 2

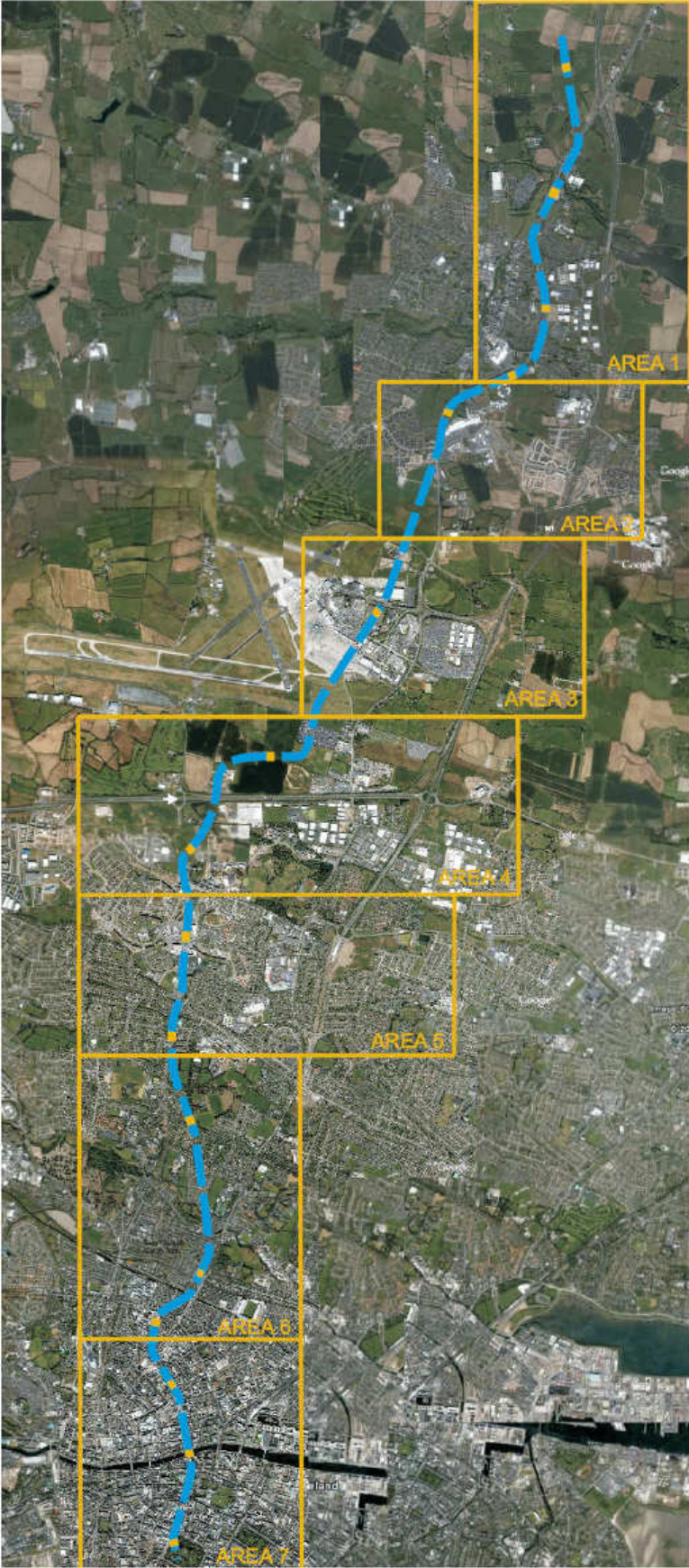
ANNEX I part 2

5 Baseline Traffic Conditions (2006/ 2007)

5.1 Introduction

- 5.1.1 The Metro North scheme is approximately 18 kilometres in length and therefore for clarity the current traffic conditions are described on an area by area basis as well from a strategic overview level. The general traffic conditions are presented from a strategic perspective with key land uses and infrastructure discussed.
- 5.1.2 The local traffic conditions around the area penetrated by the Metro North alignment is discussed in seven assessment areas, these are:
- Area 1: Lissenhall to north of Pinnock Hill Roundabout;
 - Area 2: North of Pinnock Hill Roundabout to south of Naul Road (Dublin Airport);
 - Area 3: Dublin Airport;
 - Area 4: North of Old Airport Road (running parallel to the airport) to north of Ballymun Road/ Santry Avenue junction;
 - Area 5: North of Ballymun Road/ Santry Avenue junction to Ballymun Road at Hampstead Park;
 - Area 6: Griffith Avenue, Drumcondra and Mater stops; and
 - Area 7: Parnell Square, O'Connell Bridge and St. Stephens Green stops.
- 5.1.3 The boundary of these areas is illustrated in Figure 5.1.

Figure 5.1 Metro North transport assessment areas



5.2 Baseline traffic conditions, strategic level

5.2.1 Baseline traffic conditions from a strategic perspective are described in terms of:

- key land uses along the proposed alignment, which generate travel demand; and
- key transport infrastructure, which accommodates this demand.

Swords Town and Environs

5.2.2 Swords has expanded rapidly in the recent years and currently has a population of approximately 34,000². Between 2002 and 2006, the population of the town grew by 25.1%. The development of Swords is constrained by the Green Belt surrounding Dublin Airport to the south and the M1 motorway to the east. Swords and surrounding areas in north Co. Dublin demonstrate a spatially dispersed settlement pattern. In addition, Swords is remotely located with respect to Dublin City, with the town centre located approximately 13km to the north of the City Centre and currently having poor public transport links. As a result of both of these factors, Swords and surrounding areas are currently highly car dependent³.

5.2.3 The key land uses in the vicinity of the Metro North scheme are described in detail below:

Pavillion Shopping Centre

5.2.4 The Pavillion Shopping Centre is located to the west of the R132 adjacent to the Malahide Roundabout. This development has approximately 40,000m² of retail floor space and 1,800 car parking spaces. Access/ egress to this development is provided via a left in, left out arrangement on the northbound carriageway of the R132 or alternatively via the Malahide Road Roundabout.

Airside Retail Park

5.2.5 Airside Retail Park is located to the east of the R132 to the south of Swords. This development has approximately 31,000m² of retail floor space and 1,700 car parking spaces. Access/ egress to this development is provided via an at-grade signal controlled junction on the R132 to the south of the Pinnock Hill roundabout. An additional access point is provided via a roundabout on the M1 to Pinnock Hill link road (Drynam Interchange).

Dublin Airport

5.2.6 Dublin Airport is the largest airport in Ireland and, as such, has a regional and national catchment. In 2006, 21.4 million passengers used the airport, and there are currently 14,000 employees at the airport⁴. As a result, the airport is a major trip attractor in North Co. Dublin and contributes to traffic flows on roads in its vicinity. There are 19,500 long term car

² Census 2006 population statistics. Swords population = 33,398

³ Census 2006 – Principal Socio-economic Results, Percentage of households having at least one car = 86.1 (Average across state = 80.3, average across 4 Dublin local authorities = 73.5)

⁴ Dublin Airport Key Facts: http://www.dublinairportauthority.com/Airport_Development/key_facts.html

parking spaces at the airport in addition to 2,950 short term car parking spaces. Furthermore, there are 5,360⁵ employee car parking spaces at the airport.

Ballymun Town Centre

- 5.2.7 Ballymun Town Centre is located to the south of the M50 and is currently undergoing major redevelopment as part of the Ballymun regeneration process. Key land uses include retail, leisure, commercial and residential. This regeneration is being managed by Ballymun Regeneration Ltd, a company set up by Dublin City Council.

Dublin City University

- 5.2.8 Dublin City University is one of the main universities in Dublin and is located to the east of Ballymun Road and to the south of Collins Avenue. There are approximately 10,000 registered students at DCU, 7,500 of which are full time undergraduate and postgraduate students.

Croke Park

- 5.2.9 Croke Park is the national GAA stadium and is located approximately 400m to the east of the proposed Drumcondra Metro stop. The stadium has a capacity of 82,300 people and is extensively used throughout summer months for GAA football and hurling championship games. It is also being used on a temporary basis by the FAI and IRFU to host football and rugby games while the Lansdowne Road redevelopment is underway.

Mater Hospital

- 5.2.10 The Mater Hospital is a major hospital in Dublin's north inner city, located to the west of Dorset Street. The hospital currently has a substantial number of employees and limited volumes of parking available on site. The site has been designated as the location of the National Children's Hospital.

Dublin City Centre

- 5.2.11 Dublin City Centre is significant a major commercial, retail cultural and tourism centre and is a major destination for trips at a regional and national level. The most significant land uses within this area are:

- The Henry and Grafton Street retail areas;
- The International Financial Services Centre;
- Trinity College Dublin;
- Temple Bar; and
- St. Stephens Green.

⁵ All car parking figures taken from Dublin Airport Authority, Capital Investment Programme, 2006 – 2009:

<http://www.aviationreg.ie/images/ContentBuilder/CP1%202007%20daa%20cip%20text%20-%20final%2012-10-06.pdf>

5.2.12 Key transport infrastructural elements in the vicinity of Metro North are:

M1 Motorway

5.2.13 M1 motorway to the east of Swords town centre is a motorway linking Dublin and Belfast cities. It is a two lane motorway and has interchanges at Lissenhall to the north of Swords and Drynam to the south of Swords.

R132

5.2.14 R132 runs in a north-south direction parallel to the M1 from the Lissenhall Interchange through Swords, to the east of Dublin Airport and through Santry, before terminating at the interchange between the R132 and the N1/ Swords Road at Shantalla Road. Swords QBC bus services operate along the R132, availing of significant levels of bus priority along the R132 to the south of the Malahide Roundabout.

M50 Motorway

5.2.15 The M50 motorway acts as an orbital motorway for Dublin, linking all national primary routes and a number of other radials. It is currently a two-lane motorway, however the motorway is currently being upgraded to provide substantially greater capacity through the addition of extra traffic lanes, a free flow tolling mechanism and the provision of a number of free-flow junctions. The M1/M50 interchange is to be a free-flow interchange facilitating easier movement to and from the M1 to the M50.

Dublin Port Tunnel

5.2.16 The Dublin Port Tunnel is a 5.6km two-lane motorway linking the M1 at Whitehall to Dublin Port. The primary function of the tunnel is to remove through HGV trips from Dublin City Centre. The achievement of this objective was reinforced following the introduction of a ban on 5-axle HGVs in Dublin City Centre in February 2006. HGVs are not tolled for using the tunnel, whereas general traffic is tolled on a varying level depending on the time of day.

R108 / Ballymun Road

5.2.17 The R108/ Ballymun Road between the M50 and Griffith Avenue, has two lanes plus either a hard shoulder or a bus lane in each direction.

N2

5.2.18 The N2 is a national primary road linking Dublin and Derry. To the south of the M50, up to Mellows roundabout the N2 has two lanes of traffic plus a bus lane in each direction. South of here the N2 has one traffic lane and a bus lane in each direction. Finglas QBC bus services operate along the N2, to the south of Finglas Village.

Collins Avenue / Glasnevin Avenue

5.2.19 Collins Avenue Extension and Glasnevin Avenue run in an east-west direction and provide for orbital trips between Dublin City's northern suburbs such as Finglas, Glasnevin, Whitehall and Donnycarney. The roads have one lane of traffic in each direction, with localised widening on the approach to major junctions such as Ballymun Road.

Griffith Avenue

- 5.2.20 Griffith Avenue is located approximately 1km to the south of Collins Avenue and has a similar traffic carrying function and capacity as Collins Avenue.

Swords Road / Drumcondra Road / Dorset Street

- 5.2.21 Swords Road, Drumcondra Road and Dorset Street represent a southern extension of the M1 through the north city. Its alignment varies significantly along its length, however the road carries large general traffic, bus and taxi flows.

Outer Orbital Route

- 5.2.22 Dublin City Council have designated an Outer Orbital Route, which includes North Circular Road, North Wall Quay, East Link Toll Bridge, roads running parallel to the Grand Canal (Grand Parade, Grove Road, Parnell Road) and sections of the South Circular Road. The function of the route is to provide an alternative route for motorists crossing the city centre.

Inner Orbital Route

- 5.2.23 Dublin City Council have designated an Inner Orbital Route which runs around the core inner city area. It stretches from Parnell square in the North to St. Stephens Green in the south, and from Merrion Square in East to Blackhall Place in the west. It serves a similar function to the outer orbital in addition to providing access to city centre multi-story car parks.

Dublin City Centre Quays

- 5.2.24 The North Quays have one or two traffic lanes whereas the South Quays have two lanes of traffic. In addition both quays have significant lengths of bus priority. These roads carry significant volumes of general traffic and bus flows, and, as a result are important from a strategic viewpoint.

Maynooth Rail Line

- 5.2.25 The Maynooth Rail Line intersects with the proposed Metro North alignment at the Drumcondra stop. Suburban rail services from Maynooth and Mullingar operate on this line, in addition to InterCity services from Sligo. Frequency and capacity on suburban rail services has been significantly enhanced in recent years to cater for increased demand from growth in areas to the west of Dublin.

DART Line

- 5.2.26 The DART line connects Howth and Malahide in the north with Bray and Greystones in the south. The city centre DART stations, closest to Metro North stops, are Connolly station, Tara Street station and Pearse Street station.

Green Luas Line

- 5.2.27 The Luas Green Line links Sandyford in south Dublin to Dublin city centre, terminating at St. Stephens Green. Light rail services currently operate at 4-minute headways during peak periods and has a capacity of in excess of 5,000/ hour/ per direction. The line is currently being extended from Sandyford to Cherrywood. The existing Green Line alignment terminates at St. Stephens Green, adjacent to the most southerly Metro North stop.

Red Luas Line

- 5.2.28 The Luas Red Line links Tallaght in west Dublin to Dublin city centre, terminating at Connolly station. Light rail services currently operate at 5-minute headways during peak periods. Tram lengths are currently being lengthened from 30m to 40m, which will result in a substantial increase in capacity on the corridor (in excess of 4,000/ hour/ per direction). The line is currently being extended from Connolly station to the Point Depot. The existing Red Line alignment intersects with the proposed Metro North alignment at O'Connell Street.

5.3 Baseline traffic conditions, Metro North alignment areas

- 5.3.1 Baseline traffic conditions along the full Metro North alignment are detailed for each of the seven sections of the Metro North, as shown in **Figure 5.1**.
- 5.3.2 The local traffic context is outlined for each of the seven Metro North sections. Thereafter, the following road user types are described for each section:
- General Traffic (including cars, light vehicles and heavy goods vehicles);
 - Bus;
 - Taxi;
 - Pedestrians (including Mobility Impaired and Disabled, MID); and
 - Cyclists.
- 5.3.3 Baseline road and street vehicle capacity and baseline (2006/ 2007) traffic flows are detailed in Appendix A1. Where available, these traffic flows have been sourced directly from observed traffic data, and are disaggregated by mode type (i.e., car, bus, hgv etc. etc.). Where traffic survey data is not available, NRA automated traffic counter data was used where available. In the absence of both of these two sources of data, output from the base year MNTM has been used ⁶.

5.4 Area 1: Lissenhall to North of Pinnock Hill Roundabout

Local Context

- 5.4.1 The extent of Area 1 is illustrated in Figure 5.2, overleaf. The area extends from north of the Metro North depot at Lissenhall to north of the Pinnock Hill Roundabout. This area includes the following Metro North stops:
- Lissenhall;
 - Estuary;
 - Seatown; and
 - Swords.

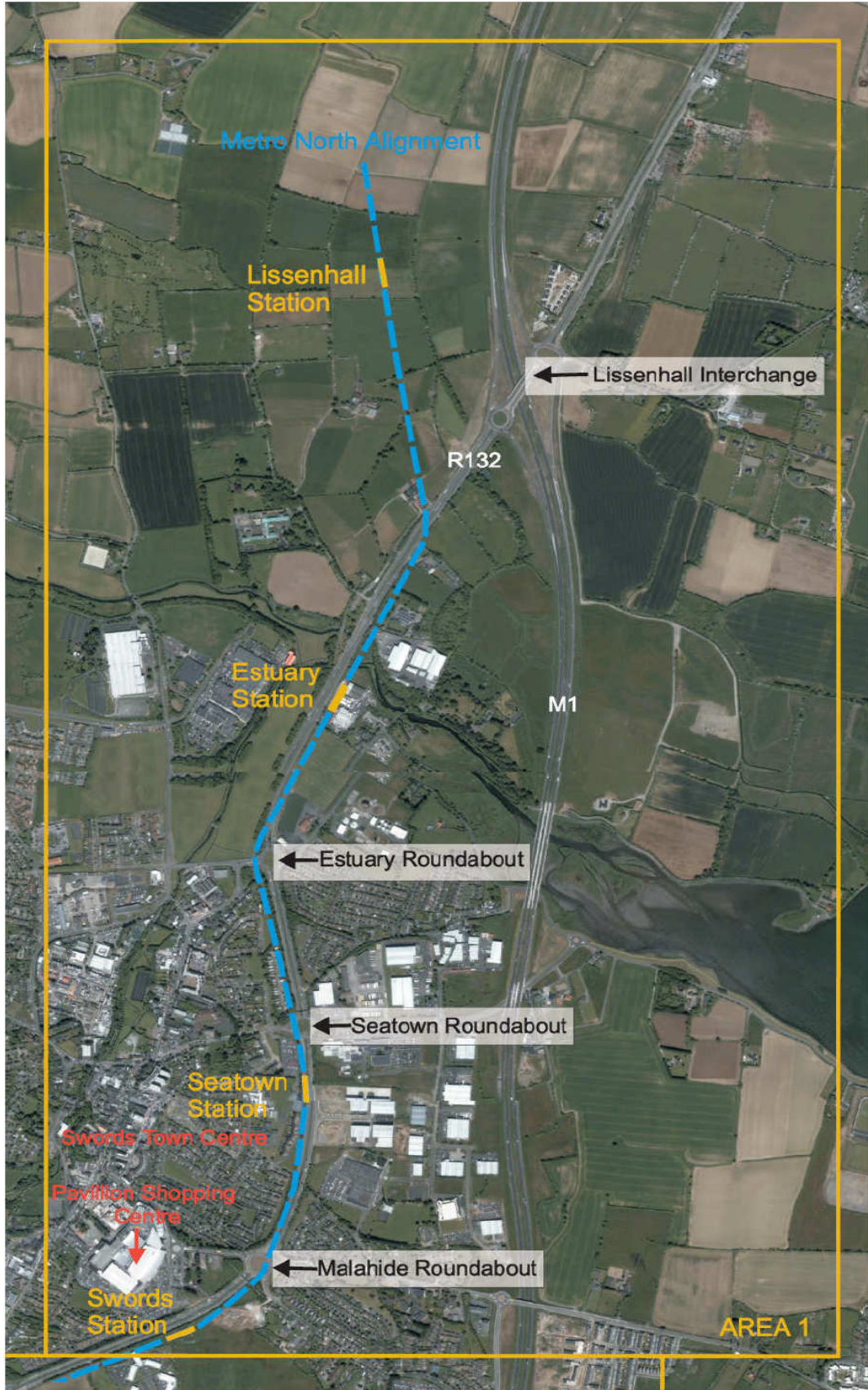
⁶ Using traffic flow data from the MNTM to infill observed Baseline traffic flow data is a logical and reasonable approach as the MNTM is validated to 2006 traffic conditions. The traffic flows taken from the MNTM are therefore representative of Baseline traffic conditions.

- 5.4.2 The population of Swords has increased substantially over the last number of years and the town currently has a population of 34,000⁷.
- 5.4.3 The town centre in Swords is located to the southwest of Area 1, and is a major trip attractor for Swords and surrounding areas. The town centre is a destination for employment, retail and leisure related journeys from the wider Swords area. Fingal Co. Co. offices are located on Main Street, and these offices are also a major destination for employment and business related trips. The area to the east of the R132 has a number of employment centres, including Seatown Business Campus.
- 5.4.4 Malahide is located to the east of the R132 and M1, and currently has a population of approximately 15,000⁸. The most direct road connection between Swords and Malahide is via the Malahide roundabout, which is a five-arm signal controlled roundabout on the R132.
- 5.4.5 The Pavillions Shopping Centre is located at the south of Area 1, to the west of the R132. This development has approximately 40,000m² of retail floor space and 1,800 car parking spaces. Access and egress to this development is provided via a left in left out arrangement on the northbound carriageway of the R132 or alternatively via the Malahide Road Roundabout. The catchment area for the Pavillion centre is extensive and includes Swords, Malahide and a considerable portion of north Co. Dublin and also Northern areas of Dublin City. As a result, the development is a significant generator of general traffic in Swords, and the development is dependent on the R132 to facilitate access and egress requirements.

⁷ Census 2006 population statistics. Swords population = 33,398

⁸ Census 2006 population statistics. Malahide population = 14,937

Figure 5.2 Area 1 Map



General Traffic

General Traffic Infrastructure

- 5.4.6 The M1 and R132 are the principal roads on the north-south axis through Area 1 in Swords.
- 5.4.7 The M1 motorway (detailed in Paragraph 5.1.2) is a two lane motorway with grade separated interchanges located at Lissenhall to the north of Swords and at Drynam to the south of Swords.
- 5.4.8 The Lissenhall Interchange (full interchange) to the north of Swords links the M1 with the R132 and Swords. This interchange caters for journeys between Swords and areas to the north of the town.
- 5.4.9 There are three roundabouts on the R132 within Area 1, located at Estuary, Seatown and Malahide. These junctions provide access from the R132 to areas to the east and west of this road, in addition to connections across the road. The first two of these roundabouts, Estuary and Seatown are priority controlled, whereas the Malahide Roundabout is signal controlled.
- 5.4.10 The Malahide Roundabout is the main crossing point of the R132 for traffic travelling between Malahide and the eastern suburbs of Swords (using either the Malahide Road eastern arm or Drynam Road arm), and Swords Town Centre and the Pavillion Shopping Centre (Malahide Road western arm). As a result, the roundabout carries substantial volumes of traffic crossing the R132.
- 5.4.11 The R132 does not suffer from significant levels of congestion (in comparison to areas to the south of Ballymun), however queuing on the approaches to junctions on the R132 is experienced during peak hours.
- 5.4.12 In general along the R132 there is loading, parking, set-down and pick-up located adjacent to the main road carriageway. These needs are therefore not a requirement of the R132 through Swords.
- 5.4.13 The road network in Swords town centre has limited capacity, and carries significant volumes of through traffic as a result of the limited north-south road links in Swords. As a result, the road network in the town centre experiences significant levels of congestion. Land uses adjoining Main Street in Swords have generated on-street parking requirements on this street, in addition to off-street parking provision.

Utilisation of Infrastructure

- 5.4.14 2006 AM peak hour (08:00 to 09:00hrs) traffic flows for key roads within Area 1 are contained in Appendix A1.

Conditions Experienced

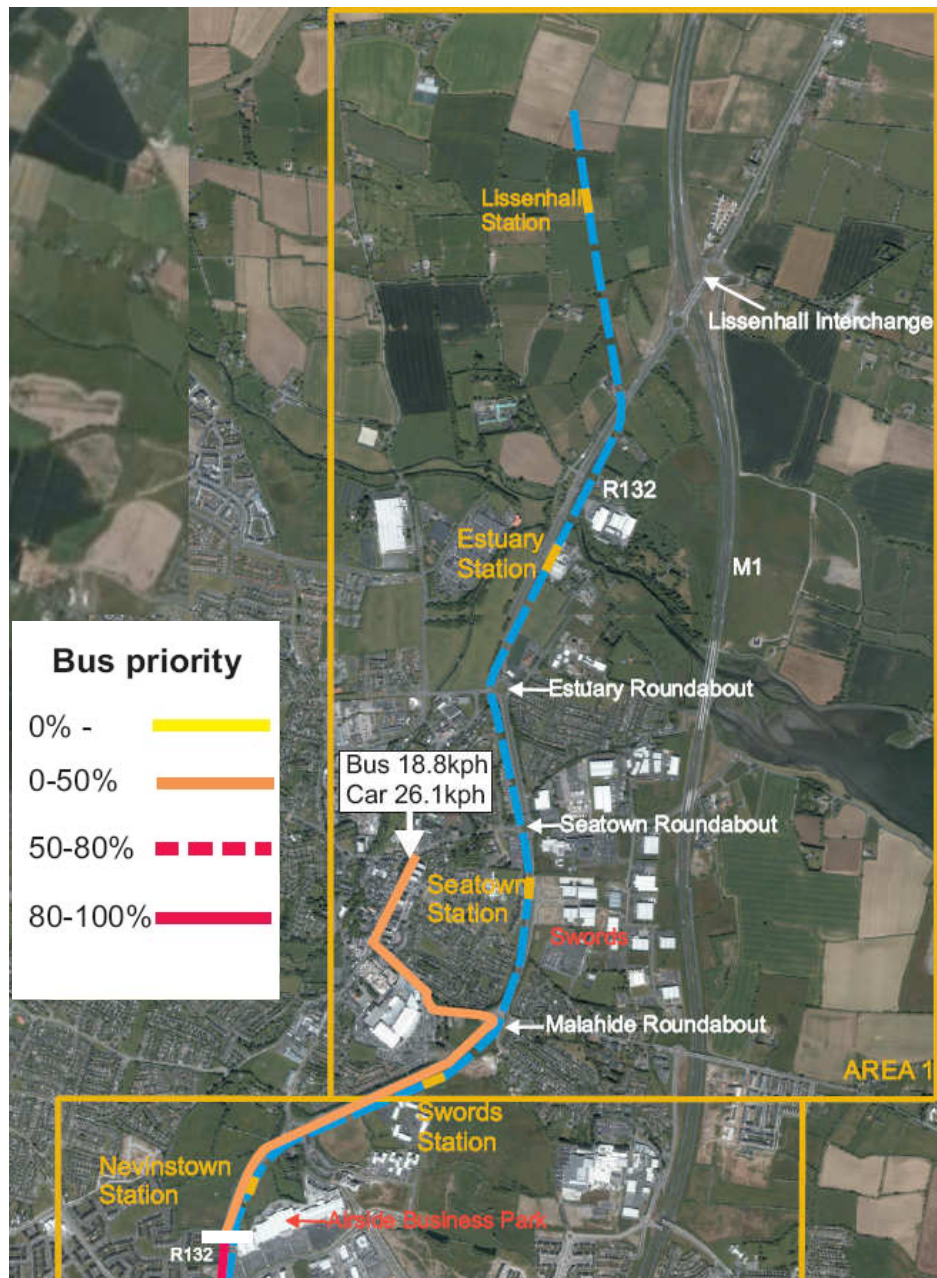
- 5.4.15 Average AM peak hour (08:00 to 09:00hrs) general traffic network speeds in Area 1, as extracted from the validated base year MNTM (2006) are 33.6 km/ hour.

Bus

Bus Infrastructure

5.4.16 Bus is currently the only public transport mode available to residents in Swords and surrounding areas. The Swords QBC commences at Fingal Co. Co. Offices on Main Street and joins the R132 at the Malahide Roundabout. The QBC links Swords, the Airport and the city centre.

Figure.5.3 Swords QBC alignment in Area 1



- 5.4.17 Southbound bus lanes are provided along a third of the route from Swords Main Street to the Airside Retail Park, with the main stretch of southbound bus priority starting south of the Malahide Roundabout on the R132 (see Table 5.1).

Table 5.1 Bus priority measures in Area 1 ⁹

Location	Distance	Bus Lane Length
Swords Main Street (Fingal County Council Offices) to Airside Retail Park	circa 2,300m	Southbound 850m
		Northbound 1,242m

- 5.4.18 Existing bus services operating on the Swords QBC along the R132 link the town to Dublin Airport and the City Centre to the South. Additional bus services link Balbriggan/ Portrane to the north and Portmarnock to the east. Although bespoke local bus services are not operational in the town, the varied routing of radial and orbital bus services accommodates local bus transport needs to some extent.

Utilisation of Infrastructure

- 5.4.19 Dublin Bus is the main bus operator in the area; other services are provided by Bus Éireann, Urbus and the recently launched the Swords Express. In total, there are around 20 bus services an hour linking Swords and the City Centre, many of which also serve the airport. Generally, within Swords, bus services are split between the Main Street and the R132 with a number of routes merging at the Malahide Roundabout.
- 5.4.20 Two dedicated school bus services are operated to Loretto School, River Valley. In addition, a number of dedicated school bus services provide transport for students from Swords to schools in other areas, for example Griffith Avenue.
- 5.4.21 Bus stop facilities on the R132 are generally located close to roundabouts. Access to the bus stops for pedestrians is poor and in some locations there are no footpaths connecting to the bus stops. There are well utilised bus stops along Swords Main Street and at the Pavillion Shopping Centre.

Conditions Experienced

- 5.4.22 The average bus speed from Swords Main Street to the Airside Retail Park (in area 2) is 18kph during the am peak⁹. By comparison, the corresponding average car speed for the same journey is 26kph.

Taxi

- 5.4.23 At present, taxis suffer similar levels of congestion to that experienced by general traffic in Swords town centre, operating on a relatively congested road network at present, with no bus priority in place. There are no bus priority measures in place to the north of the Malahide Roundabout, and, as a result, taxis on this road operate in general traffic lanes.

⁹ Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report.

Pedestrians

Pedestrian Infrastructure

- 5.4.24 Grade separated pedestrian crossing points of the R132 are provided at the following locations:
- Estuary Roundabout;
 - Seatown Roundabout; and
 - Chapel Lane.
- 5.4.25 The pedestrian bridges provide east west access across the R132, connecting the residential estates and employment centres in east Swords with the town centre. In addition, the pedestrian bridges are located in close proximity to the bus stops on the R132 providing pedestrian access for bus passengers.
- 5.4.26 North of the Estuary Roundabout there is a footpath on the southbound carriageway of the R132 which provides pedestrian access to factory buildings and also bus stops located here. However, there is no footpath on the northbound carriageway and pedestrians accessing the northbound bus stops walk along the grass verge.
- 5.4.27 There are no footpaths in either direction on the R132 between the Estuary Roundabout and the Seatown Roundabout. There are no access roads or footpaths along this length of the R132 requiring pedestrian access. Pedestrians accessing the bus stops north of the Seatown Roundabout walk on the grass verge.
- 5.4.28 There are footpaths along the southbound carriageway of the R132 between the Seatown Roundabout and the Malahide Roundabout. These footpaths connect the Chapel Lane Footbridge with Estuary Road and the Malahide Road. St Colmcille's Boys and Girls National Schools are located to the west of the R132 between Chapel Lane and Seatown Terrace. There are over 1000 students attending the schools and the Seatown and Chapel Lane footbridges provide important pedestrian links to the schools.
- 5.4.29 The Malahide Roundabout footbridge provides an important pedestrian link between the residential areas to the east and the Pavilion Shopping Centre and Swords Town Centre. South of the Malahide Roundabout, there are footpaths on both sides of the R132 providing pedestrian access to the bus stops. The footpath along the southbound carriageway continues as far as Airside Retail Park.

Utilisation of Infrastructure

- 5.4.30 Pedestrian activity in the direct vicinity of the Metro North alignment in Swords is generally low, however there are a number of grade separated crossing points on the R132 with more significant pedestrian flows.
- 5.4.31 Pedestrian counts were carried out during October 2006. At the R132/Swords Road/Estuary Road junction 67 pedestrian movements were recorded over the twelve hour period from 7am to 7pm. All of the pedestrians observed were adults. The majority of the pedestrian movements were recorded between 7am and 8am and between 1pm and 2pm.
- 5.4.32 At the R132/Seatown Road junction only 21 pedestrian movements were recorded over the twelve hour period from 7am to 7pm. Almost, all of the pedestrians observed were adults.

The majority of the pedestrian movements were recorded between 7am and 8am and between 2pm and 4pm.

Conditions Experienced

- 5.4.33 Given the width of the R132, and the significant traffic flows in carries; the road acts as a significant barrier for pedestrian movements both along and across the road, i.e. from Swords Town Centre to the eastern suburbs in Swords. This would, in part explain the low pedestrian volumes in the vicinity of the Metro North alignment.

Cyclists

Cyclist Infrastructure

- 5.4.34 There are no dedicated cycle lanes along the R132. The Swords QBC joins the R132 south of the Malahide Roundabout. The shared bus and cycles lanes are roughly 4m wide and generally continuous except at the junctions. There is no cycle infrastructure at the roundabouts and they are difficult for cyclists to navigate.

Utilisation of Infrastructure

- 5.4.35 The highest volume of cyclists on the R132 within Area 1 were travelling across the road heading east on the Estuary Roundabout, where 8 cyclists were recorded during AM peak traffic counts. Only around 3 cyclists per hour use the R132 for any significant length.

Conditions Experienced

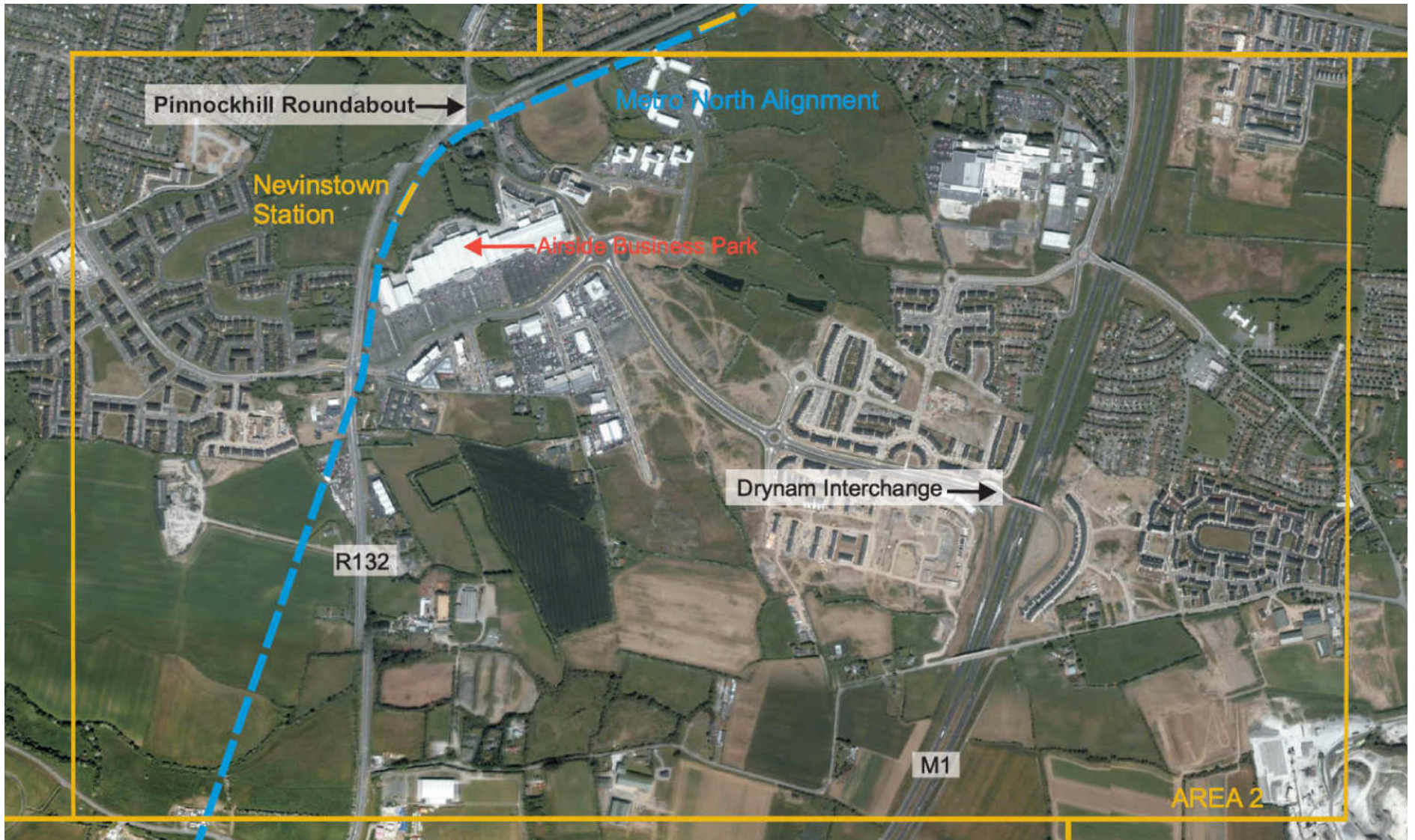
- 5.4.36 The R132 acts as a barrier to cycle movement in a similar manner to that for pedestrians. A combination of the wide road width, high traffic speeds, lack of cycling infrastructure, junction type (i.e. large radii roundabouts) along the R132 all combine to create a very inhospitable cycling environment. As a result, cycle activity in the direct vicinity of the Metro alignment through Swords is low.

5.5 Area 2: North of Pinnock Hill Roundabout to south of Naul Road (Dublin Airport)

Local Context

- 5.5.1 The extent of Area 2 is illustrated in Figure 5.4. The area extends from north of the Pinnock Hill Roundabout to south of Naul Road (Dublin Airport). One Metro North stop, the Nevinstown stop is located within Area 2.
- 5.5.2 Airside Retail Park is located to the east of the R132, approximately 600m to the south of Pinnock Hill Roundabout. This development has approximately 31,000m² of retail floor space and 1,700 car parking spaces. Access and egress to this development is provided via a signal controlled junction on the R132 at Nevinstown.
- 5.5.3 The catchment area for Airside Retail Park is extensive and includes Swords, Malahide and a considerable portion of north Co. Dublin. As a result, the development is a significant generator of general traffic in Swords, and the development is dependent on the R132 to facilitate access and egress requirements. Access and egress to Airside Retail Park from the M1 is also possible via the Drynam Link Road and Drynam Interchange.

Figure 5.4 Area 2 Map



General Traffic

General Traffic Infrastructure

- 5.5.4 The M1 and the R132 are the principal roads in Area 2. The M1 does not have any interchanges along this section. AM peak traffic flows and traffic conditions on the M1 are detailed in Appendix A. The M1 has two lanes of traffic and a hard shoulder in each direction. The R132 has two general traffic lanes in each direction for most of its length, however it narrows to one general traffic lane plus a bus lane in the northbound direction between Nevinstown Lane and Pinnock Hill Roundabout. The southbound R132 carriageway also narrows to one lane in each direction between Nevinstown Lane and Cloghran Roundabout.
- 5.5.5 There are two roundabouts on the R132 in Area 2, at Pinnock Hill and Cloghran and a major at-grade signalised junction at Nevinstown Lane. These junctions provide access from the R132 to areas to the east and west of this road, in addition to connections across the road.
- 5.5.6 The Pinnock Hill Roundabout provides access to Swords, via Dublin Road, and the M1, via the Drynam Link Road.
- 5.5.7 A signalised junction at Nevinstown, between the Pinnock Hill Roundabout and the Cloghran Roundabouts is the main access/ egress point to Airside Retail Park. It also caters for significant volumes of east west traffic between the southwest of Swords to Airside and the M1, via Nevinstown Lane and the Drynam Link Road.
- 5.5.8 An additional access point is available to the east of Airside onto the Drynam Link Road. Access to the M1, via the Drynam Interchange and the R132, via the Pinnock Hill Roundabout is also feasible.
- 5.5.9 Land uses along the R132, in Area 2, do not front directly onto the road and have sufficient space to accommodate non-movement related general traffic requirements, e.g. loading, parking, set-down and pick-up requirements. These needs are therefore not a requirement of the R132 to the south of Swords.

Utilisation of Infrastructure

- 5.5.10 2006 AM peak hour (08:00 to 09:00hrs) traffic flows for key roads within Area 2 are contained in Appendix A1.

Conditions Experienced

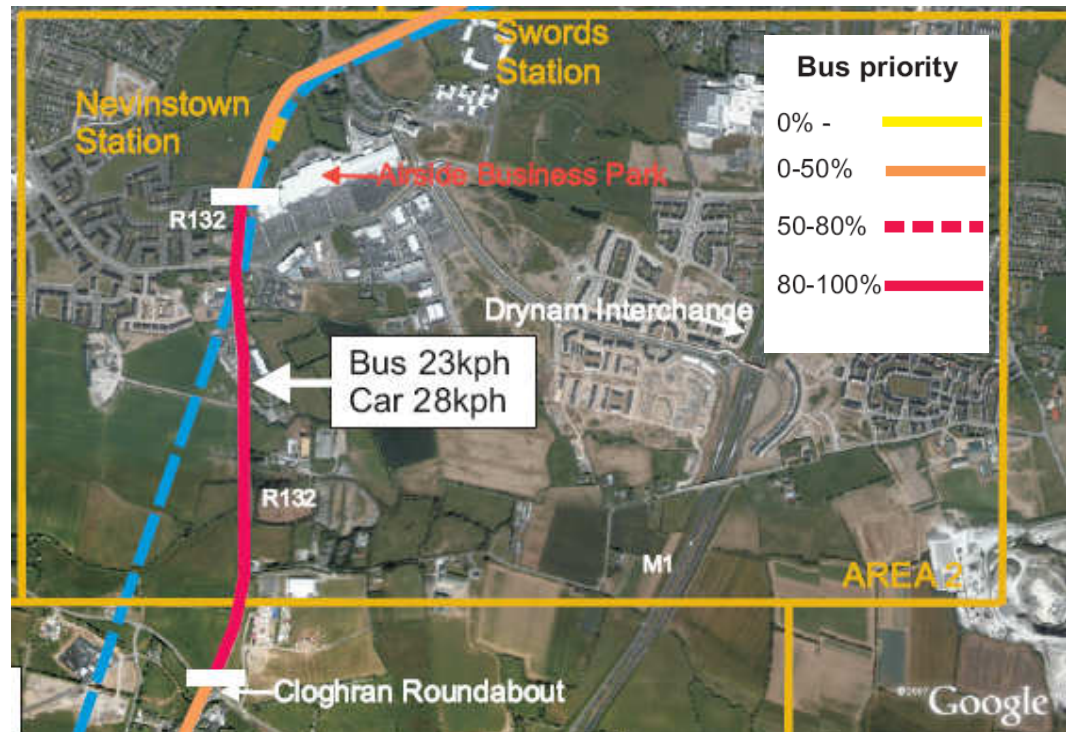
- 5.5.11 Average AM peak hour (08:00 to 09:00hrs) general traffic network speeds in Area 2, as extracted from the validated base year MNTM (2006) are 55 km/ hour.

Bus

Bus Infrastructure

- 5.5.12 The Swords QBC continues along the R132 within Area 2; this is illustrated in Figure 5.5. There are significant levels of bus priority along the R132 within Area 2 where buses benefit from long sections of bus lane infrastructure.

Figure 5.5 Swords QBC alignment in Area 2

**Utilisation of Infrastructure**

- 5.5.13 A high volume of Swords QBC bus services operate along the R132 within Area 2, and southbound bus services avail of significant levels of bus priority along the R132 to the south of the Malahide Roundabout. This is illustrated in Table 5.2. Within area 2, the road network is comparatively un-congested in the baseline. Bus stops are located at frequent intervals along the R132.

Table 5.2 Bus priority measures along R132 in Area 2¹⁰

Location	Distance	Bus Lane Length
R132, Swords, Airside Retail Park to Cloghran Roundabout	circa 1300m	Southbound 1,165m Northbound 0m

Conditions Experienced

- 5.5.14 The average bus speed from Airside Retail Park to the Cloghran Roundabout is 23kph during the am peak¹⁰. By comparison, the corresponding average car speed for the same journey is 28kph.
- 5.5.15 Access to the bus stops for pedestrians is poor and in some locations there are no footpaths connecting to the bus stops. Within Area 2, there are a number of bus stops located in the vicinity of the Airside Retail Park.

Taxi

- 5.5.16 Taxis benefit from bus priority infrastructure on the R132, as detailed above. In all other areas they share road space with general traffic.

Pedestrians

Pedestrian Infrastructure

- 5.5.17 North of the Pinnockhill Roundabout there is a footpath providing pedestrian access to the bus stop on the northbound carriageway of the R132. There are footpaths on both sides of the R132 north and south of the junction with Nevinstown Lane that provide pedestrian access to bus stops and the buildings on either side of the road.
- 5.5.18 Bus stops are located at frequent intervals along the R132 and pedestrian access to the bus stops is provided from adjoining pedestrian networks off the R132.
- 5.5.19 An at-grade signalised pedestrian crossing of the R132 is provided at Airside Retail Park.

Utilisation of Infrastructure

- 5.5.20 In general, pedestrian volumes along and across the R132, within Area 2, are low. Pedestrian activity is centred on movements to and from bus stops along the R132 and to and from Airside Retail Park.
- 5.5.21 Airside Retail Park is the key land use in Area 2 which generates a large volume of pedestrian movements on a regular basis.
- 5.5.22 The National Show Centre is located off Kettles Lane near the junction with the R132. During major events there are likely to be pedestrian movements between the centre and the bus stops on the R132.

¹⁰ Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report.

Conditions Experienced

- 5.5.23 Given the width of the R132, and the significant traffic flows it carries; the road acts as a significant barrier for pedestrian movements both along and across the road, i.e. from Swords Town Centre to the eastern suburbs in Swords.

Cyclists

Cyclist Infrastructure

- 5.5.24 There is no dedicated cycle infrastructure along the R132 within Area 2. The Swords QBC continues along the R132 with wide bus lanes to accommodate both cyclists and buses. The shared bus and cycles lanes are generally continuous in the southbound direction except at the junctions. There are intermittent bus lanes northbound within Area 2. There is no cycle infrastructure at the roundabouts and they are difficult for cyclists to navigate. There are advanced stop areas for cyclists at the signalised junction at Nevinstown Lane.

Utilisation of Infrastructure

- 5.5.25 Traffic counts recorded very low volumes of cyclists within Area 2; the highest number of cyclists on the R132 within Area 2 was 5 per hour, which were recorded heading north between Pinnockhill Roundabout and Fostertown Junction.

Conditions Experienced

- 5.5.26 The R132 acts as a barrier to cycle movement both across and along the road. A combination of the wide road width, high traffic speeds, lack of cycling infrastructure, junction type (i.e. large radii roundabouts) along the R132 all combine to create a very inhospitable cycling environment. As a result, cycle activity in the direct vicinity of the Metro alignment through Swords is low.

5.6 Area 3: Dublin Airport

Local Context

- 5.6.1 The extent of area 3 is indicated in Figure 5.6, below. The area includes one Metro North stop, at Dublin Airport.
- 5.6.2 Dublin Airport is a major trip attractor in North Co. Dublin and, as a result is a significant contributor to traffic flows on roads in its vicinity.
- 5.6.3 In 2006, the airport handled 21.4 million passengers last year, with an average of 60,000 passengers through it every day.
- 5.6.4 The main access mode is car (55.5% of air passengers, 81% of airport employees), with bus (22% of air passengers and 16% of employees) and taxi (22% of air passengers and 1% of employees) catering for the majority of the remaining trip demand. ¹¹ Airport passengers arriving by car, use either of the car drop-off facilities, short term car parking, or a number of long term car parks remotely located and linked to the airport via park and ride bus services.

¹¹ Passenger and Employee Surveys at Dublin Airport in August and November 2001, used as an input to the Short Term Measures for Improved Public Transport Access to Dublin Airport, June 2002 by PTPF

5 Baseline Traffic Conditions (2006/ 2007)

Departures by car are via the short or long term car parks as no formal car pick-up area is provided at the airport.

- 5.6.5 In total, there are 27,810 car parking spaces at Dublin Airport, distributed according to the breakdown Table 5.3 below.

Table 5.3 Car Parking at Dublin Airport ¹²

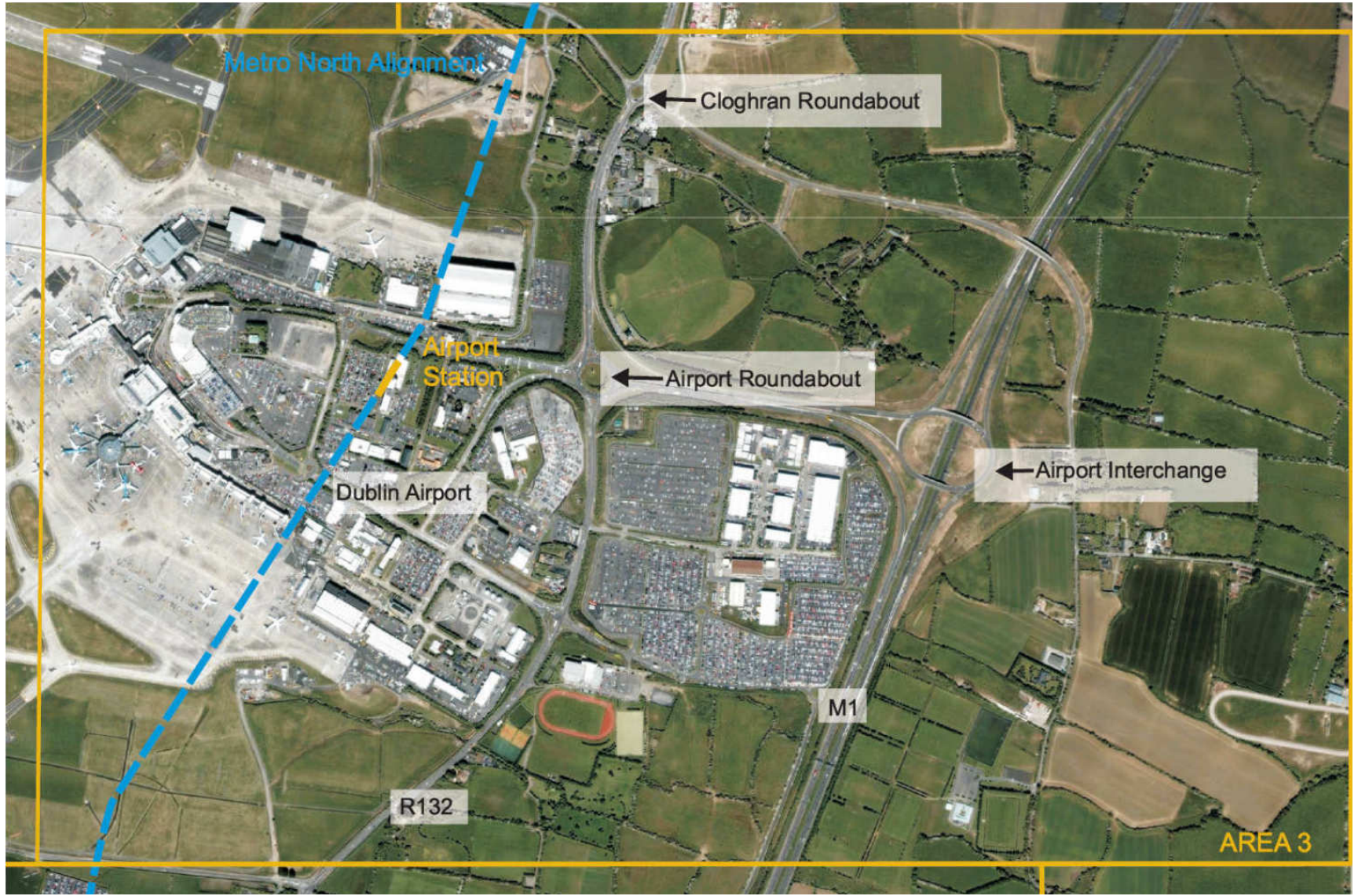
Location	Type	No. of spaces	Sub-total	Total
On Airport	Short Term Car Parks			
	Multistory	2,450		
	Surface	500	2,950	
	Long Term Car Parks			
	Eastlands and Dardistown	10,400		
	Harristown	5,600	16,000	
	Employee Car Parking		5,360	
				24,310
Off Airport	Quickpark ¹³			3,500
Grand Total				27,810

¹² All car parking figures taken from Dublin Airport Authority, Capital Investment Programme, 2006 – 2009:

<http://www.aviationreg.ie/images/ContentBuilder/CP1%202007%20daa%20cip%20text%20-%20final%2012-10-06.pdf>

¹³ Quickpark is located in Area 4, although is referred to under this section, Area 3, as a result of its proximity to Dublin Airport, and functionality as an airport park and ride site

Figure 5.6 Area 3 Map



General Traffic

General Traffic Infrastructure

- 5.6.6 Road capacity on roads in the vicinity of the airport, and within the confines of the airport is significant. The primary access routes to the airport are via the M1 and R132. A full motorway interchange approximately 800m to the east of the Airport on the M1 provides access to the airport from the north and south via a motorway slip road which connects the M1 with the R132 at the Airport Roundabout. Access to the Airport from both the M1 and R132 is via the western arm of that roundabout, which is signal controlled.
- 5.6.7 An additional access and egress route from the south is available via a signalised junction on the R132 to the south of R132/ Airport Roundabout.
- 5.6.8 Access from the west is via the M50 and the M1; or alternatively via the M50, R108, Old Airport Road and R132.
- 5.6.9 The M1 and R132 both experience some levels of congestion in peak periods. In the case of the M1, significant queuing is experienced on the M1 approach to the M1/ M50 interchange.
- 5.6.10 Land uses along the R132, within Area 2, do not front directly onto the road and have sufficient space to accommodate non-movement related general traffic requirements, e.g. loading, parking, set-down and pick-up requirements. These needs are therefore not a requirement of the R132 to the south of Swords.
- 5.6.11 Private car, either as a car driver or a passenger is the main access and egress mode for employee and passenger trips to Dublin Airport, with 55.5% of passengers and 81% of employees using this mode of transport.

Utilisation of Infrastructure

- 5.6.12 2006 AM peak hour (08:00 to 09:00hrs) traffic flows for key roads within Area 3 are contained in Appendix A1.

Conditions Experienced

- 5.6.13 Average AM peak hour (08:00 to 09:00hrs) general traffic network speeds in Area 3, as extracted from the validated base year MNTM (2006) are 42.4 km/ hour.

Bus

Bus Infrastructure

5.6.14 The Swords QBC alignment in the vicinity of Dublin Airport is illustrated in Figure 5.7. The QBC splits on the approach to Dublin Airport from the north and south. Some QBC bus services heading south along the R132 continue on this road, whereas others access Dublin Airport before returning to the R132 to the south of the airport. The airport is a major destination and generates a significant volume of bus trips. The diversion via the airport adds approximately 10 minutes to bus journey times.

Figure 5.7 Swords QBC alignment in the vicinity of Dublin Airport

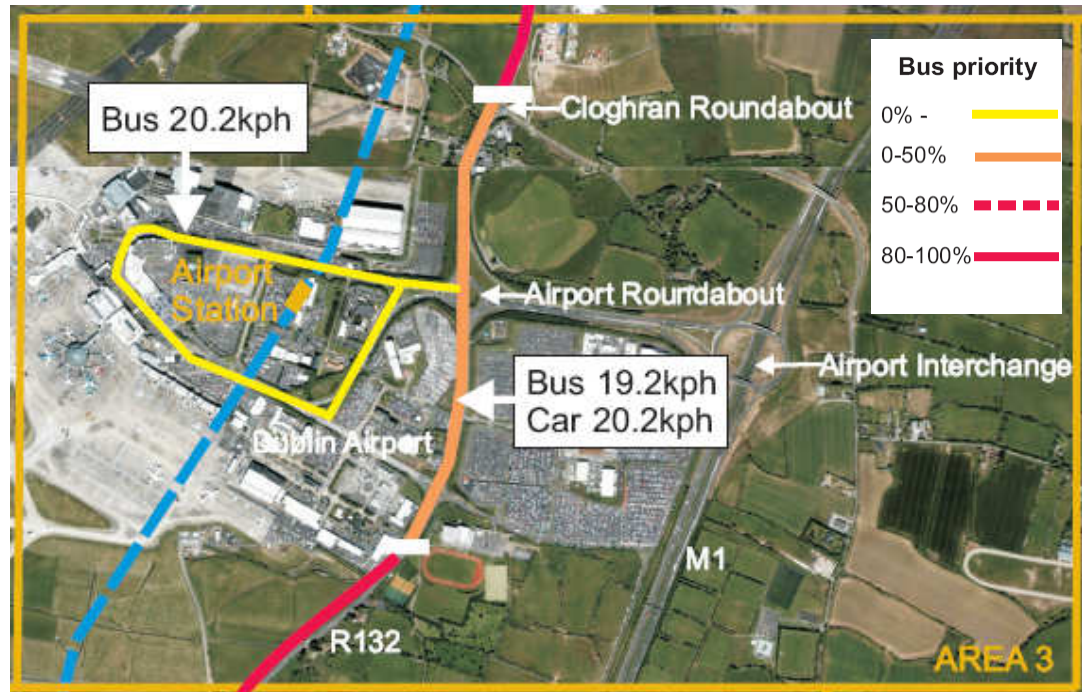


Table 5.4 Bus priority measures in along R132 in Area 3¹⁴

Location	Distance	Bus Lane Length
Cloghran Roundabout to south of Airport	circa 1370m	Southbound 468m Northbound 1210m

5.6.15 Bus stops are located at frequent intervals along the R132.

¹⁴ Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report

Utilisation of Infrastructure

- 5.6.16 Bus is an important access and egress mode to Dublin Airport, with 22% of passengers and 16% of staff using bus services to the airport.
- 5.6.17 A large number of bus services use Dublin Airport as a terminus, in particular dedicated airport bus services such as Dublin Bus No's 746, 747, 748 and Aircoach. While the R132 is used by a large number of scheduled bus services operating between Dublin city centre and the airport, the M1 and Dublin Port Tunnel are also used as a bus route between Dublin city centre and the Airport.
- 5.6.18 In recent years, there has been significant growth in the number of bus services to the airport. The bus stops outside the main terminal building are very heavily used and a new coach and bus pick up and drop off area has been provided beside the short term car park. There are a number of bus operating companies serving the airport. Services are provided by Dublin Bus, Bus Éireann, Aircoach and other private bus operators. In addition to scheduled bus services, there is a significant volume of private hire coaches.
- 5.6.19 There are four main types of bus service in operation at the airport. They are:
- local bus services;
 - express bus services (dedicated airport services);
 - long distance scheduled coach services; and
 - private hire coaches.
- 5.6.20 Apart from the airport, there are low volumes of passengers boarding and alighting at bus stops within Area 3.

Conditions Experienced

- 5.6.21 There are limited lengths of bus priority in the vicinity of the airport with the exception of access restrictions for general traffic to the bus stop areas. Average bus speeds from Cloghran roundabout to south of the airport via the airport are 18kph.
- 5.6.22 Bus services benefit from significant bus priority on the R132, particularly in the northbound direction (see Table 5.4). Aside from the internal road network within the airport, the surrounding roads are relatively uncongested in the am peak. Swords QBC routes that do not serve the airport travel at an average speed of 34kph from the Cloghran Roundabout to south of the airport during the am peak¹⁵. By comparison, the corresponding average car speed for the same journey is 40kph.

¹⁵ Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report.

Taxi

Taxi Infrastructure

- 5.6.23 Taxis benefit from bus priority infrastructure on the R132 to the north and south of the airport, as detailed in previous sections. In all other areas they share road space with general traffic. The M1 and Dublin Port Tunnel are increasingly being used as a route for taxis travelling between Dublin city centre and the airport.
- 5.6.24 At the airport there is a supervised taxi rank outside the arrivals terminal. Generally the same taxis use this rank on a daily basis and it is heavily used.
- 5.6.25 Along the airport access roads, Taxis share the road space with general traffic.

Utilisation of Infrastructure

- 5.6.26 Taxi is an important access/ egress mode to Dublin Airport, with 22% of passengers and 1% of staff using bus services to the Airport.¹⁶

Conditions Experienced

- 5.6.27 During periods of high demand, access to the set down areas becomes congested and taxis suffer delays as a result.

Pedestrians and Cyclists

Pedestrian/ Cyclist Infrastructure

- 5.6.28 Pedestrian/ cycle facilities are provided on the R132 to the north and south of Dublin Airport. The airport is located some distance away from major residential areas, and as a result, there are very low levels of cycle activity in the vicinity of the airport.

Utilisation of Infrastructure

- 5.6.29 Within the airport itself, there are high volumes of pedestrians moving between the terminal buildings and the bus stops, the taxi rank and the short term car parks. There is a major pedestrian crossing between the short term car park and the terminal building.
- 5.6.30 Pedestrian movements between the airport and its environs are negligible.

Conditions Experiences

- 5.6.31 Within the confines of the airport terminal, pedestrian experience a good environment, with high levels of priority afforded to them, at points of conflict with general traffic.

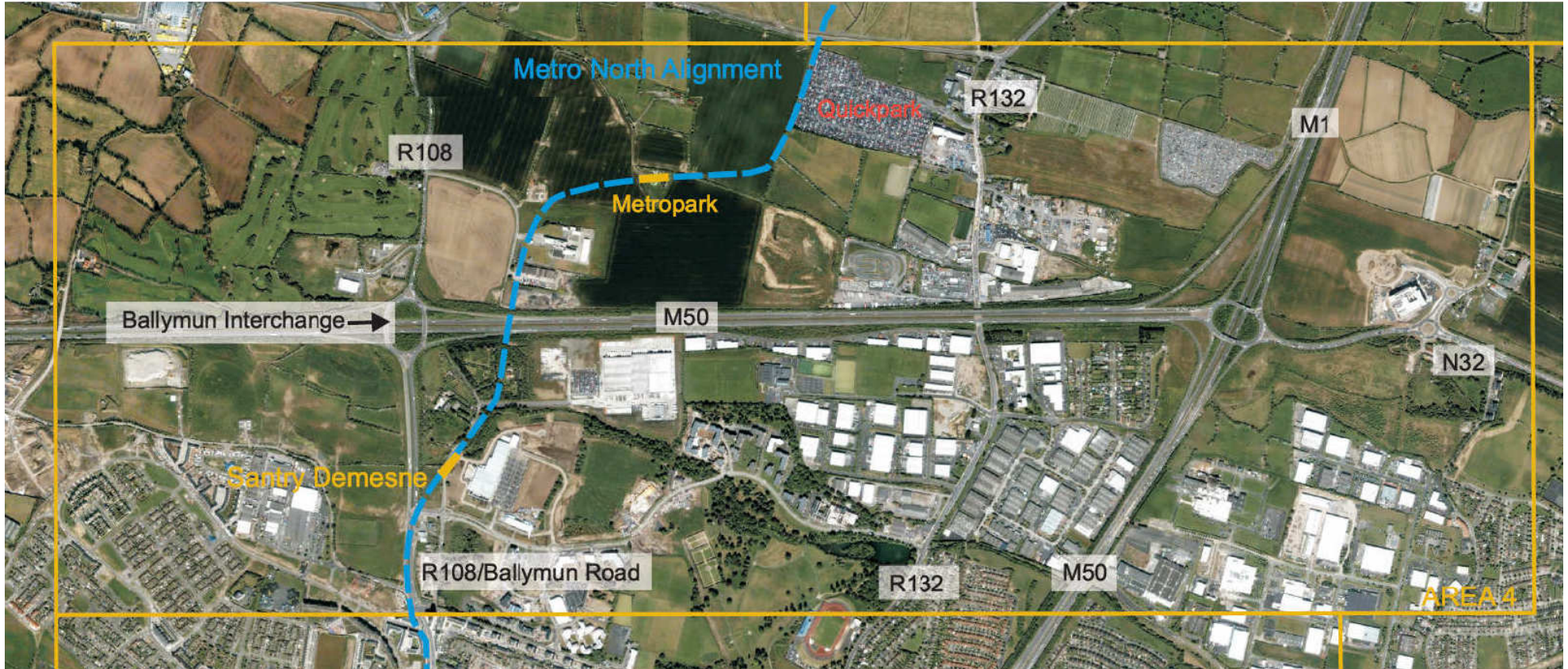
¹⁶ Passenger and Employee Surveys at Dublin Airport in August and November 2001, used as an input to the Short Term Measures for Improved Public Transport Access to Dublin Airport, June 2002 by PTPF

5.7 Area 4: North of Old Airport Road (running parallel to the airport) to north of Ballymun Road/ Santry Avenue junction

Local Context

- 5.7.1 Area 4, as illustrated in Figure 5.8, runs from south of the airport to north of the Ballymun Road/ Santry Avenue/ Balbutcher Lane junction. This area includes two Metro North stops, located at:
- Metropark; and
 - Santry Demesne.
- 5.7.2 To the north of Area 4, the area includes Quickpark, a 3,500 space airport park and ride site served by a bespoke bus service linking the car park to the airport, which is accessed via the R132. The remainder of the area to the north of the M50, including the location of the Metropark metro stop currently consists of greenfield sites.
- 5.7.3 Dublin Airport Authority (DAA) has a 5,600 space long term park and ride site at Harristown, to the north of Area 4. This site is accessed by car via the R108.
- 5.7.4 Dublin Bus opened a bus garage at Harristown Garage in October 2004 and the garage currently accommodates 200 buses. The garage is accessed from the R108 (extension of Ballymun Road) and the R122 (extension of St Margarets Road). It is used for parking, maintaining and servicing of double deck, single deck and articulated buses. Over 450 staff are based at this garage.
- 5.7.5 The area directly to the south of the M50 also consists of greenfield sites. The R108 (Ballymun Road) connects the M50 with Ballymun.
- 5.7.6 A major Tesco Distribution Centre (27,000m²), and the Northwood commercial and residential development are located to the east of the R108 and accessed via a signalised intersection on the Ballymun Road. The adjacent Gullivers Retail Park is under development with some of the retail units occupied including a Homebase Store. The commercial development will comprise offices, retail warehousing, motor showrooms, a local centre and amenity buildings all comprising over 77,000 square metres.
- 5.7.7 A major furniture retailer, IKEA, received planning approval from An Bord Pleanála in June 2007 to construct a major store to the west of the R108, north of Ballymun. The site is located to the southwest of the Ballymun interchange and the proposed development would have a gross floor area of 31,000m² and 1,950 parking spaces. As a result of the conditions attached to the decision to grant approval by An Bord Pleanála, the IKEA development will not open until after completion of the M50 upgrade, i.e. 2010, or later based on the current M50 upgrade programme.

Figure 5.8 Area 4 Map



General Traffic

General Traffic Infrastructure

- 5.7.8 The M50 is the main provider of orbital movement around Dublin City. It has a strategic traffic function, linking a number of national primary roads which intersect with it, namely the M1, N2, N3, N4, N7 and M11. Given the distribution of development along the M50, and the significant number of interchanges with non-national roads, the M50 also serves a local function, by connecting employment, residential and retail centres located in close proximity to the road.
- 5.7.9 Within Area 4, there are two interchanges, located at Ballymun and the M1. The M50 extends southbound from its intersection with the M1 as far as the Dublin Port Tunnel. The N32 connects the North Fringe (Balgriffin) area of Dublin to the M50 via the M1/ M50 interchange.
- 5.7.10 Phase 1 of the M50 upgrade, between the N4 and N81 is currently underway, and is programmed to be completed before the end of 2008. There are two further phases to the M50 upgrade project, which when completed will significantly improve capacity on the M50. The M50 upgrade works are currently programmed to be complete by 2010.
- 5.7.11 The R108 to the north of the M50 is a single two-lane road, which connects the M50 Ballymun Interchange with lands to the north of the M50. This section of the R108 provides access to the Airport from the M50.
- 5.7.12 To the south of the M50, R108 connects the M50 with Main Street, Ballymun. The road is a dual two-lane road with hard shoulders. The Tesco distribution centre and the Northwood development are accessed via a signalised junction on the R108.

Utilisation of Infrastructure

- 5.7.13 2006 AM peak hour (08:00 to 09:00hrs) traffic flows for key roads within Area 4 are contained in Appendix A1.

Conditions Experienced

- 5.7.14 Average AM peak hour (08:00 to 09:00hrs) general traffic network speeds in Area 4, as extracted from the validated base year MNTM (2006) are 28.2 km/ hour.

Bus

Bus Infrastructure

- 5.7.15 The Swords QBC continues along the R132 to the east of Area 4.
- 5.7.16 A Dublin Bus depot is located at Harristown to the south of the R108. Harristown bus garage is the largest Dublin bus depot and has capacity for 240 buses. At present 214 buses are housed in Harristown and they serve the north-west of the city including Finglas, Swords, Ballymun, Blanchardstown, Donabate, Portrane, Dunboyne, Tyrrelstown, and Portmarnock.

Utilisation of Infrastructure

- 5.7.17 The land uses within Area 4 do not generate a significant volume of bus trips and as such there are low numbers of bus passengers within the area.
- 5.7.18 There are approximately 7 north and 19 southbound bus movements on the on the R108 to the north of the M50 in the AM Peak Hour (08:00 to 09:00hrs).
- 5.7.19 A significant portion of bus related movements on the R108 to the north of Ballymun relate to access/ egress to the Harristown Bus Depot.

Conditions Experienced

- 5.7.20 The bus operating environment within Area 4 is quite good with significant elements of bus priority on the R132, and sufficient capacity elsewhere to accommodate bus movements with general traffic.

Taxis

- 5.7.21 Taxis avail of general traffic and bus infrastructure within Area 4, and conditions as regards levels of congestion are considered good.

Pedestrians and Cyclists

Pedestrian Infrastructure

- 5.7.22 The M50 and M1 act as a significant barrier for pedestrian and cycle movements across these roads in Area 4, due to the limited number crossing points available (one in total). In addition, pedestrian and cycle movements along these two roads are prohibited.

Utilisation of Infrastructure

- 5.7.23 There is no major residential development or any significant social infrastructure within area 4, and as a result, there are very low levels of pedestrian and cycle activity in the vicinity.

Conditions experienced

- 5.7.24 The pedestrian and cycle experience within Area 4 is poor as a result of:
- severance associated the M1 and M50 resulting in very limited opportunities to move within the area;
 - prohibition of pedestrian and cycle activity on the M1 and M50; and
 - very low pedestrian and cycle activity generally within the area which acts as a barrier to growth of these modes.

5.8 Area 5: North of Ballymun Road/ Santry Avenue junction to Ballymun Road at Hampstead Park

Local Context

- 5.8.1 Area 5, as illustrated in **Error! Reference source not found.** extends from North of Ballymun Road/ Santry Avenue junction to Ballymun Road at Hampstead Park (Dublin City University). There are two Metro North stops located within Area 5, located at:
- Ballymun; and
 - Dublin City University (DCU).
- 5.8.2 The key features within Area 5 are Ballymun Town Centre, Dublin City University and Omni Park Shopping Centre.
- 5.8.3 Ballymun is located to the north of this area. The R108 (Main Street, Ballymun) passes through the centre of the town. The area has traditionally suffered from high levels of social deprivation and unemployment. As a result, the area has low levels of car ownership and is highly dependent on bus as the main mechanised transport mode.
- 5.8.4 To address the high levels of social deprivation and unemployment (and associated problems) in the area, Ballymun Regeneration Ltd (BRL) was established in 1997 by Dublin City Council, to plan and implement a regeneration programme which will result in a new town with new and improved facilities for 30,000 people. Significant progress in the regeneration of the Ballymun area has taken place since the establishment of BRL, including Ballymun Civic Office Health Centre, Local Office for Dublin City Council, Motor Tax Office, Headquarters for Ballymun Regeneration Ltd, Headquarters for the Regional Health Authority, cafe / restaurant, a 220 seat Theatre, Ballymun Leisure Centre and significant numbers of new apartments.
- 5.8.5 Major elements of the regeneration of Ballymun have yet to be completed. One of the largest of these is the Ballymun Town Centre mixed use development (owned by Treasury Holdings), approval for which was granted in 2003. The total floor area of development is 170,000m². Access/ egress to Ballymun Town Centre will be off Sillogue Avenue.
- 5.8.6 Dublin City University (DCU) is located in the south of Area 5, and is one of the main universities in Dublin and is located to the east of Ballymun Road and to the south of Collins Avenue. There are approximately 10,000 registered students at DCU, 7,500 of which are full time undergraduate and postgraduate students.
- 5.8.7 The main access and egress point to the campus is located on Collins Avenue. An additional (minor) access and egress point is located on Ballymun Road. As can be seen from Table 5.5 below, there are approximately 900 car parking spaces in DCU, all of which are accessed via Collins Avenue.

Figure 5.9 Area 5 Map

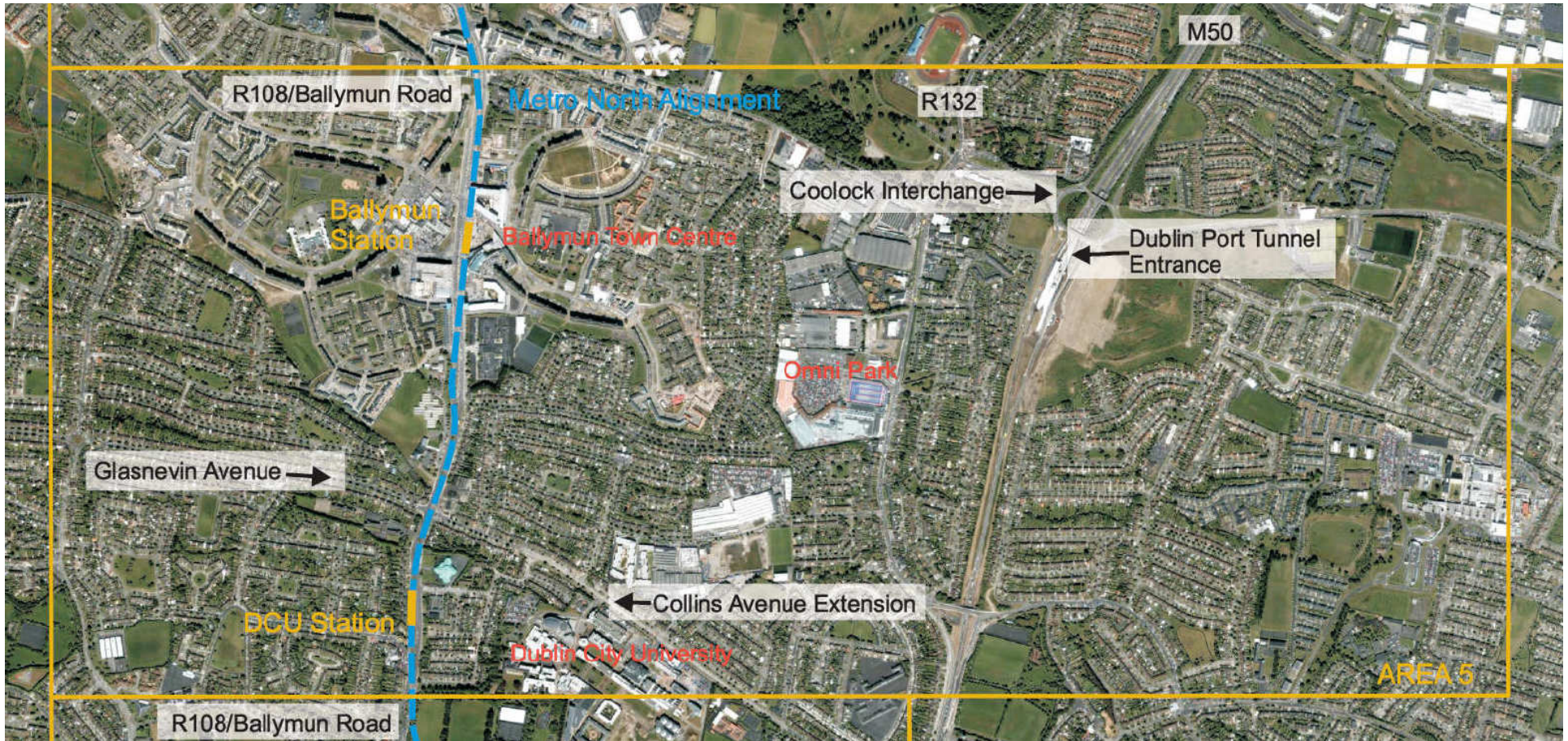


Table 5.5 Main off-street car parking locations in Ballymun¹⁷

Car Park	No. of Spaces	Access/ Egress Arrangements
DCU	800 spaces in multi-story car park + an estimated 100 additional surface spaces	Access/ egress to majority of campus off Collins Avenue. Minor access/ egress point off Ballymun Road

- 5.8.8 Significant levels of pedestrian activity associated with university related trips to and from the campus, or to and from public transport services operating on the Ballymun QBC are experienced on roads in the vicinity of DCU, in particular Ballymun Road and Collins Avenue Extension.
- 5.8.9 There are currently approximately 2,000 pupils attending the 8 primary schools in Ballymun while approximately 850 students are attending Ballymun Junior and Senior Comprehensive schools. The following schools are located in Ballymun in close proximity to the Metro North alignment.

Table 5.6 Area 5 Schools

School	Location	Number of Pupils
St Joseph's Junior School	Balcurris	181
St Joseph's Senior National School	Balcurris	225
Scoil an Tseachtar Laoch	Ballymun Road	211
Na Maighdine Muire	Ballymun	172 boys; 186 girls
St Michael's Special School	Ballymun Road	44
Our Lady of Victories Infant National School	Ballymun Road	227
North Dublin National School Project	Ballymun Road	219
An Spioraid Naiomh	Silloogue Road	354
Trinity Comprehensive School (Secondary School)	Ballymun Road	450

- 5.8.10 Albert College Park is a large public open space to the east of Ballymun Road. There are a number of sports facilities within the park including playing pitches and tennis courts. The park is used by a large number of people for recreational purposes.

¹⁷ No. of car parking spaces from DCU website

- 5.8.11 Omni Park, which is located to the west of the Swords Road (R132) is a major shopping centre in the northside of Dublin. Access and egress to the shopping centre is via the Swords Road (R132). The centre has a mix retail uses and there is approximately 1,700 car parking spaces. The catchment area of Omni Park includes Santry, Ballymun and adjoining areas in Dublin's northside. As a result, the development is a significant generator of general traffic in Santry, and the development is dependent on the R132, R108 and a number of key east-west roads, such as Shanliss Road, Santry Avenue and Coolock Lane to accommodate access and egress requirements.

General Traffic

General Traffic Infrastructure

- 5.8.12 Within Area 5 the principal north south roads are:
- Main Street, which extends into the Ballymun Road to the south of Ballymun has two lanes of traffic and a bus lane in each direction.
 - Swords Road (R132) which is a single lane two-way road with southbound bus lanes at intervals along its length; and
 - The M50 and Dublin Port Tunnel, is a two lane motorway linking the M1/ M50 interchange with Dublin Port.
- 5.8.13 The major east-west roads in Area 5 are:
- Santry Avenue which is a single lane two-way road connecting the R108 and R132; and
 - Glasnevin Avenue/ Collins Avenue Extension which is a single lane two-way road. This road is an important orbital road in the northside of Dublin City.

Utilisation of Infrastructure

- 5.8.14 2006 AM peak hour (08:00 to 09:00hrs) traffic flows for key roads within Area 5 are contained in Appendix A1.

Conditions Experienced

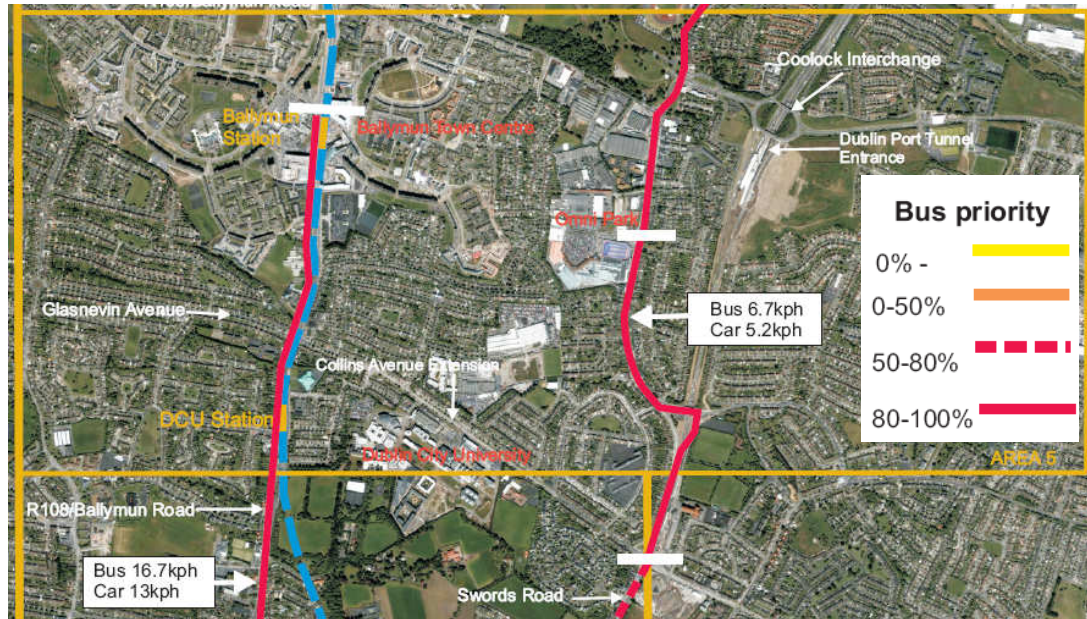
- 5.8.15 Average AM peak hour (08:00 to 09:00hrs) general traffic network speeds in Area 5, as extracted from the validated base year MNTM (2006) are 17.6 km/ hour.

Bus

Bus Infrastructure

- 5.8.16 Bus is currently the only form of public transport available to the residents in Ballymun and the surrounding areas. The Ballymun QBC commences at the Civic offices on the Ballymun Road and extends along the Ballymun Road (R108) towards the city centre as shown in Figure 5.10. A high level of bus priority is provided along the R108 and there is a high frequency of bus services from Ballymun to the city centre.

Figure 5.10 Ballymun QBC and Swords QBC within Area 5



5.8.17 There are significant levels of bus priority in both directions on the R108 as illustrated in

5.8.18 Table 5.7 below.

Table 5.7 Bus priority measures along the Ballymun Road in Area 5¹⁸

Location	Distance	Bus Lane Length
Ballymun Civic Centre to Griffith Avenue	circa 1900m	Southbound 1,650m Northbound 1,683m

5.8.19 Bus stops are located at frequent intervals along the R108, within Area 5. There are significant bus stops in the vicinity of the Ballymun town centre and near the schools in the area. The bus stops are linked to pedestrian infrastructure (footpaths and pedestrian crossings) and there is good pedestrian access to and from bus stops.

Utilisation of Infrastructure

5.8.20 A number of routes terminate within Area 5 and many bus routes are branched off the main Ballymun Road spine. The varied routings of the radial routes provide good access to bus services and, together with a small number of local and orbital routes, the level of bus coverage in Area 5 is high.

5.8.21 A high volume of Ballymun QBC bus services operate along the Ballymun Road, There are medium levels of congestion within area 5. Dublin Bus operate the majority of bus services in

¹⁸ Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report

the area and there are over 30 buses an hour from Ballymun to the city centre during the am peak. In addition, there are a number of dedicated school bus services that connect the Ballymun Road to the schools around Griffith Avenue.

Conditions Experienced

- 5.8.22 The average bus speed on the Ballymun Road from the Civic Offices to the Griffith Avenue is 17kph during the am peak¹⁹. By comparison, the corresponding average car speed for the same journey is 13kph.

Taxi

- 5.8.23 Taxis benefit from the bus priority measures along the Ballymun Road as detailed above. There is a taxi rank facility near the Arts Centre with parking for 10 taxis.

Pedestrians

Pedestrian Infrastructure

- 5.8.24 Footpaths are located on both sides of the road along the length of Area 5. There are signalised pedestrian crossings on the Ballymun Road at the following locations within the area:

- South of the junction with Santry Avenue;
- Adjacent to St Pappin's Church (now a senior citizens residence);
- North and south of the junction with Shangan Road;
- Adjacent to the Ballymun Civic Centre and the Town Centre;
- South of the junction with Gateway Crescent;
- South of the junction with Gateway Avenue;
- North and south of the junction with Glasnevin Avenue/Collins Avenue; and
- South of Albert College Grove.

- 5.8.25 Bus stops are located at frequent intervals on both sides of the R108 between Gateway Avenue and Hampsted Park. These are well connected with pedestrian infrastructure both in terms of footpath provision and pedestrian crossing facilities.

- 5.8.26 Other facilities within Ballymun that are accessed via Ballymun Road by pedestrians include:

- The Civic Offices;
- Ballymun Library;
- Ballymun Town Centre;
- Ballymun Garda Station (adjacent to the Town Centre);
- Riversdale Tennis Club; and
- Our Lady of Victories Church.

¹⁹ Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report.

5.8.27 South of Collins Avenue, the following facilities are accessed by pedestrians via Ballymun Road:

- DCU,
- The Helix Theatre;
- Hampsted Park;
- Hampsted Private Hospital;
- Elmhirst Convalescent Home;
- Glasnevin Lawn Tennis Club; and
- St Michael's House.

Utilisation of Infrastructure

5.8.28 Pedestrian volumes along the Ballymun Road in Area 5 are quite high as a result of the considerable social infrastructure in Ballymun in the vicinity of the R108 and number of schools which are accessed by pedestrians.

Conditions Experienced

5.8.29 The pedestrian environment through Area 5 is typical of the remainder of the built up urban area of Dublin with continuous pedestrian facilities along roads, and numerous locations with pedestrian crossings.

Cyclists

Cyclist Infrastructure

5.8.30 Cycle lanes have been provided in conjunction with the Ballymun QBC. Cycle facilities are integrated with the bus lanes on both north and southbound carriageways for the entire length of the Ballymun Road within Area 5.

Utilisation of Infrastructure

5.8.31 North of the town centre, there are low volumes of cyclists using the R108; traffic counts recorded 7 cyclists and hour heading north and one cyclist heading south on the Ballymun Road between Santry Avenue and Sillogue Road.

5.8.32 The volume of cyclists increases considerably further south. Traffic counts recorded in excess of 30 southbound cyclists in the AM peak (08:00 to 09:00hrs) on the Ballymun Road between Sillogue Road and St Pappins Road.

5.9 Area 6: Griffith Avenue, Drumcondra and Mater stops

Local Context

- 5.9.1 Area 6, as illustrated in Figure 5.11 extends from Hampstead Park, to the south of Dublin City University and Dorset Street in Dublin's north inner city. There are three Metro North stops located within Area 6:
- Griffith Avenue;
 - Drumcondra; and
 - Mater Hospital.
- 5.9.2 The area is largely residential in nature and includes Glasnevin and Whitehall in the north of this area. Drumcondra and Phibsborough are located to the south of Area 6 and are major residential, retail, commercial and entertainment centres in the north city.
- 5.9.3 Griffith Avenue is a low density residential road within Area 6, i.e. from the Ballymun Road to the Swords Road. Corpus Christi Church is located on Griffith Avenue adjacent to Valencia Road and there is a pedestrian entrance to the Church from Griffith Avenue. There are average volumes of pedestrian activity along Griffith Avenue within Area 6. Other social infrastructure that is accessed by pedestrians via Griffith Avenue include:
- Whitehall Garda Station; and
 - Home Farm F.C. Football Grounds.
- 5.9.4 Drumcondra is a major urban centre and there is a large quantity of social infrastructure in the vicinity of Drumcondra Road. There are a number of key destinations in Area 6, including:
- St Patricks College, Drumcondra Road;
 - Tolka Park, Richmond Road;
 - Croke Park, off Clonliffe Road; and
 - Drumcondra Rail Station.
- 5.9.5 The Maynooth Suburban Rail Line runs in an east-west direction through Area 6, and has a station located adjacent to the proposed Metro North Drumcondra Stop.
- 5.9.6 Croke Park is the national GAA stadium and is located approximately 400m to the east of the proposed Drumcondra stop. The stadium has a capacity of 82,300 people and is extensively used throughout summer months for GAA football and hurling championship games. It is also being used on a temporary basis by the FAI and IRFU to host football and rugby games while the Lansdowne Road redevelopment is underway.
- 5.9.7 The Mater Hospital is a major hospital in Dublin's north inner city, located to the west of Dorset Street and to the south of the North Circular Road. The hospital currently has a substantial number of employees and limited volumes of parking available on site. The site has been designated as the location of the National Children's Hospital.

Figure 5.11 Area 6 Map



- 5.9.8 The Swords QBC runs along Drumcondra Road and a large number of bus services operate within Area 6. There are a significant number of pedestrians accessing the bus stops. Overall, the level of pedestrian movement and activity within Drumcondra is high.

General Traffic

General Traffic Infrastructure

- 5.9.9 Within Area 6 the principal north-south road corridors are:
- The R108 corridor, which includes Ballymun Road, St. Mobhi Road and Botanic Road;
 - The Swords Road, Drumcondra Road and Dorset Street corridor which varies from one to two general traffic lanes in each direction. The corridor also has large stretches of bus lane running along its length; and
 - The N2 corridor, which includes Finglas Road, Prospect Road and Phibsborough Road, varies from one to two general traffic lanes in each direction, in addition to significant sections of bus lanes. This corridor merges with the R108 corridor at Prospect Road.
- 5.9.10 The major east-west road corridors in Area 6 are:
- Griffith Avenue, which is a single lane two-way road and is an important orbital road in the northside of Dublin City. Griffith Avenue connects the N2, Ballymun Road, Swords Road and Malahide Road.
 - The North Circular Road in Dublin's inner city links the main arterial roads on their approach to the city, e.g., Old Cabra Road, New Cabra Road, Phibsborough Road, Drumcondra Road, Summerhill Parade and North Strand. At its western most extremity, the road connects with Conyngham Road, and from there to the south city via the South Circular Road. At its eastern most extremity, the road provides access to the south city via the Eastlink Toll Bridge. A new bridge, the Macken Street Bridge, which is currently under construction will provide a more direct connection between the North Circular Road and the South City. North Circular Road generally is a single lane two-way road.
- 5.9.11 There are a number of other important east-west roads in this area, including Homefarm Road, Botanic Avenue, Richmond Road, Clonliffe Road and Whitworth Road.

Utilisation of Infrastructure

- 5.9.12 2006 AM peak hour (08:00 to 09:00hrs) traffic flows for key roads within Area 6 are contained in Appendix A1.

Conditions Experienced

- 5.9.13 Average AM peak hour (08:00 to 09:00hrs) general traffic network speeds in Area 6, as extracted from the validated base year MNTM (2006) are 11 km/ hour.

Bus

Bus Infrastructure

5.9.14 The Ballymun QBC extends along the R108 from Ballymun through Glasnevin, Drumcondra and Phibsboro as shown in Figure 5.12. The Ballymun QBC diverges at Griffith Avenue with some buses continuing along the R108 (Mobhi Road, Botanic Road) and some services routed via the Drumcondra Road. The Swords QBC also operates within area 6 as it extends towards the city centre along the Drumcondra Road.

Figure 5.12 Ballymun QBC within Area 6

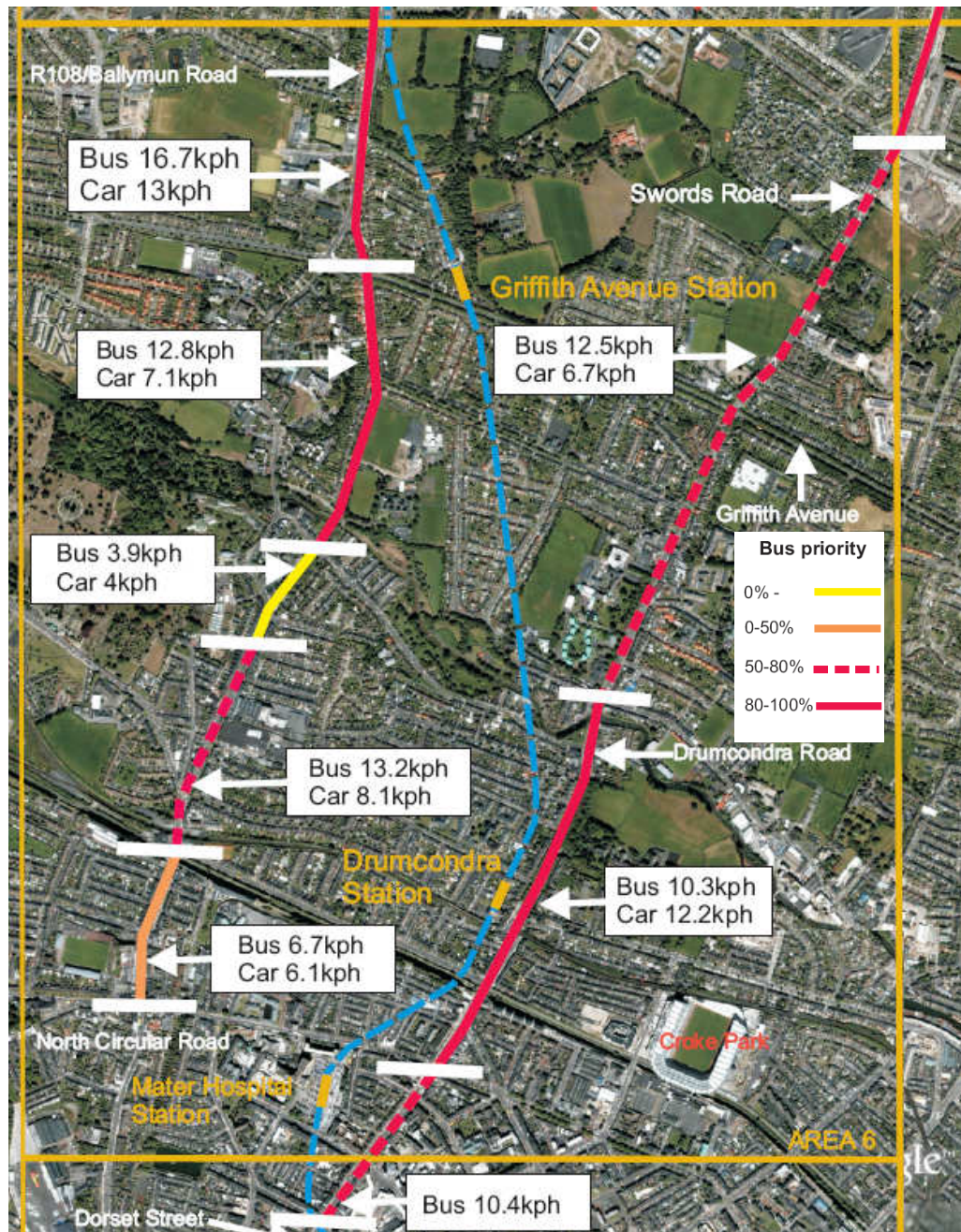


Table 5.8 Bus priority measures along the Swords Road/Drumcondra Road in Area 6²⁰

Location	Distance	Bus Lane Length
N1, Collins Avenue to Richmond Road	Circa 1600m	Southbound 1,183m
		Northbound 471m
Ballymun QBC, Griffith Avenue to Whitworth Road	Circa 1,700m	Southbound 1,211m
		Northbound 0m

Utilisation of Infrastructure

- 5.9.15 There are a high number of dedicated school bus services servicing the schools in the area around Griffith Avenue, including Dominican College, Griffith Avenue; Scoil Chaitrona, Mobhi Road and Sion Hill College, Glandore Road. The majority of the regular scheduled services are operated by Dublin Bus.
- 5.9.16 The bus services using the Drumcondra Road converge as they enter the city centre (Swords, Ballymun and Finglas QBC all operate on Drumcondra Road to the south of Whitworth Road). Around 50 buses an hour access the city centre via the Drumcondra Road during the am peak period. There are also high volumes of bus passengers within Area 6. Almost 8,000 bus passengers cross the Canal Cordon at the Drumcondra Road during the 3 hour am peak period (i.e. 07.00-10.00).²⁰.
- 5.9.17 There are a significant number of bus services in the vicinity of the Mater hospital. Bus passengers can access the hospital via bus stops on Berkeley Road, North Circular Road and Dorset Street in close proximity to the hospital entrances.

Conditions Experienced

- 5.9.18 There are significant levels of bus priority and there are bus lanes in both directions along the Drumcondra Road (see Table 5.7). As a result, bus speeds are considerably faster than general traffic speeds where bus priority is provided. The average bus speed on the N1 (Swords Road and Drumcondra Road) from Collins Avenue to Richmond Road Road is 12kph during the am peak²⁰. By comparison, the corresponding average car speed for the same journey is less than 7kph.

Taxis

Taxi Infrastructure

- 5.9.19 Taxis benefit from the bus priority measures along the Ballymun QBC and Swords QBC as detailed above. Elsewhere taxis share road space with general traffic.

²⁰ Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report.

Utilisation of Infrastructure

- 5.9.20 Given the significant level of bus priority along Drumcondra Road, a large volume of taxis use this road, some of whom use it as their chosen route from the city centre to the airport.
- 5.9.21 There are three Taxi ranks in the vicinity of the Mater Hospital. On the south side of Eccles Street, near the junction with Berkeley Road, there is an 8 taxi stand close to the main entrance of the Mater Hospital. There are also two small taxi ranks, each with space for two taxis on the north side of Eccles Street, near the hospital car park.

Conditions Experienced

- 5.9.22 Taxi operating conditions are generally good within Area 6, as a result of the high levels of bus priority on the key radial routes. Elsewhere, within the area taxis share road space with general traffic, and as a result experience congestion during peak hours.

Pedestrians

Pedestrian Infrastructure

- 5.9.23 All roads within Area 6 have continuous pedestrian facilities along them. Pedestrian crossing points are located at key points across major roads in this area. Signalised pedestrian crossings are integrated within all signalised junctions.

Utilisation of Infrastructure

- 5.9.24 Pedestrian volumes within Area 6 are quite high as a result of the relative compactness of the area, its proximity to the city centre and the considerable social infrastructure in Drumcondra, Glasnevin and Phibsborough town centres.

Conditions Experienced

- 5.9.25 Given the extensive pedestrian facilities within Area 6, the pedestrian environment within this area is considered to be of a high standard.

Cyclists

Cyclist Infrastructure

- 5.9.26 There are extensive lanes are located on the Ballymun Road/ St. Mobhi Road/ Botanic Road corridor.
- 5.9.27 There are a number of schools on Griffith Avenue east of the Swords Road and there are important cycle links along Griffith Avenue connecting these schools with residential areas to the east and west.
- 5.9.28 Drumcondra Road also has extensive cycle infrastructure within Area 6. Cycle lanes are provided in both directions along the road. For much of their length, the cycle lanes are segregated from the roadway and run adjacent to the footpaths. At other locations, the cycle lanes are provided in conjunction with the Swords QBC bus lanes.

Utilisation of Infrastructure

- 5.9.29 Traffic counts recorded 33 cyclists an hour heading east along Griffith Avenue between St Mobhi Road and the Swords Road/ Drumcondra Road during the AM peak hour (08:00 to 09:00hrs).
- 5.9.30 There are very high volumes of cyclists within the Drumcondra area. Given its proximity to the city centre and the level of cycle infrastructure provided, the Drumcondra Road is an attractive route for cyclists. Traffic counts recorded 144 cyclists an hour heading south on the Drumcondra Road between Botanic Avenue and Clonliffe Road.

Conditions Experienced

- 5.9.31 Conditions for cyclists are generally good within Area 6 with cycle facilities located on the principal north-south and east roads within this area. Low traffic speeds, as experienced within this area are also conducive to cycle use.

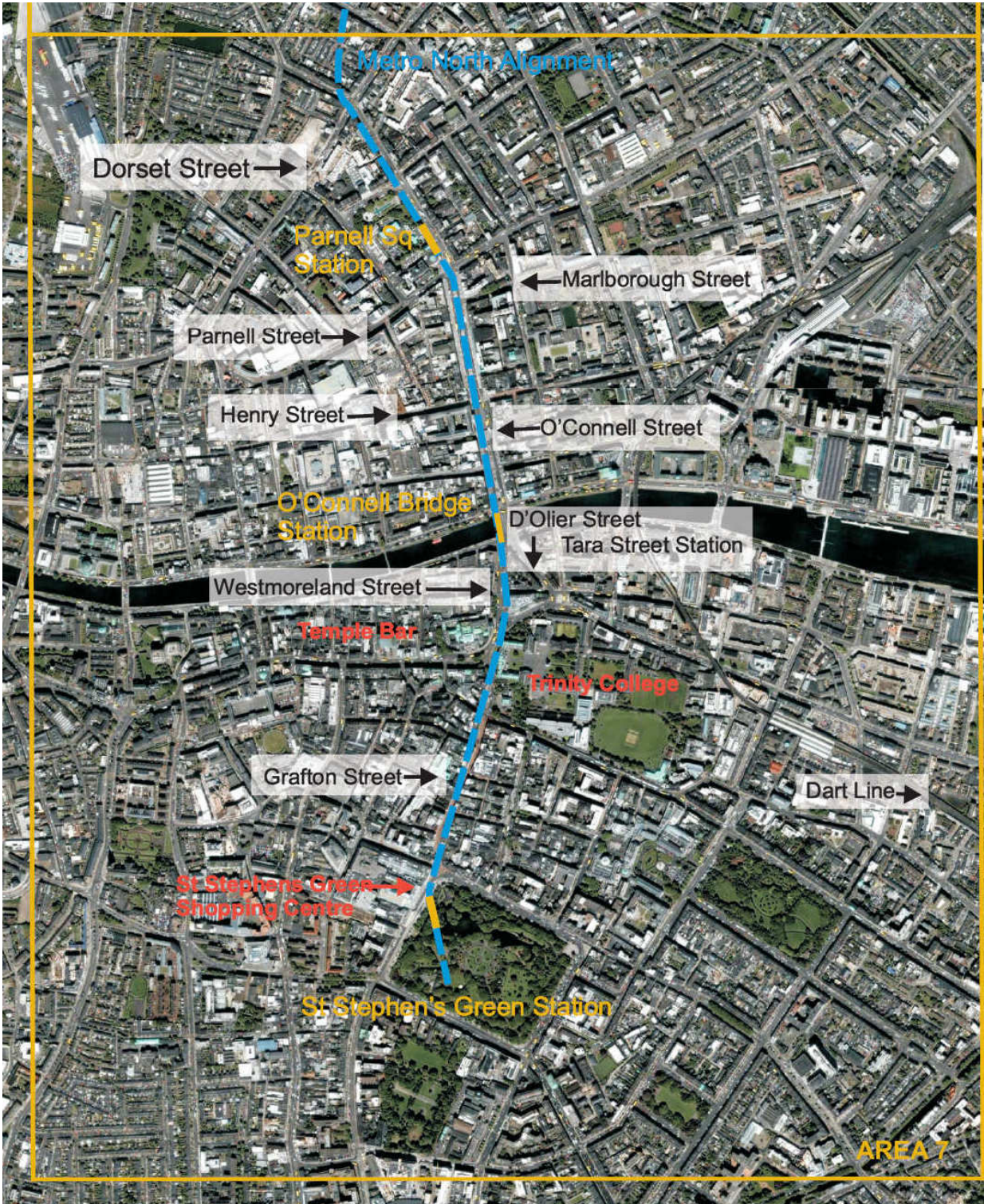
5.10 Area 7: Parnell Square, O'Connell Bridge and St. Stephens Green stops

Local Context

- 5.10.1 Area 7, which extends from Dorset Street in the north to Leeson Street in the south is illustrated in Figure 5.13, overleaf. There are three Metro North stops located in this area, located at:
- Parnell Square;
 - O'Connell Bridge; and
 - St. Stephens Green.
- 5.10.2 Dublin City Centre is a very significant residential, commercial, educational, retail, entertainment and cultural location.
- 5.10.3 The city centre is also significant from a multi-modal transportation perspective in that it has a dense road network which caters for very high flows throughout the day, with distinct peaks in the AM and PM periods. Most public transport services either terminate or run through the city centre, e.g. DART, suburban rail, Luas and a substantial number of bus services. Pedestrian flows are also very significant within the city centre generally.
- 5.10.4 Land uses within the city centre generally front onto adjoining streets. All land uses in the city centre are dependent on streets to accommodate their multi-modal access requirements (Luas, bus, general traffic, LGV, HGV, cyclist, pedestrians etc.).
- 5.10.5 Many businesses within this area are also dependent on streets to accommodate loading/unloading and parking requirements. City centre streets therefore serve a variety of functions, as detailed in Section 4.4.3 of this report.
- 5.10.6 The two main retail areas in the city centre are centred around Grafton Street (including the St. Stephens Green and Powerscourt Shopping Centres), and Henry Street (including the ILAC and Jervis Shopping Centres). Both of these streets are pedestrianised, as are a number of streets in their vicinity.

- 5.10.7 The main educational establishment in the city centre is Trinity College, which has over 12,000 students and 1,200 staff members. Dublin Institute of Technology is another third level educational establishment and has a number of separate campuses, including Bolton Street, Cathal Brugha Street and Kevin Street. Other educational facilities in Area 7 include:
- 1st level: Scoil Chaoimhin, Central Model Senior National School, Cholaiste Mhuire, and Loretto College Junior School.
 - 2nd level: Belvedere College and Loretto College;
 - 3rd level: Dublin School of English, Trinity College, and Royal College of Surgeons; and
- 5.10.8 Employment opportunities are distributed across the full city centre area, however the International Financial Services Area has a concentration of office based employment opportunities. The Kildare Street and Dawson Street areas are also significant, given the large number of Government departments located in their vicinity.
- 5.10.9 Temple Bar is a significant cultural and recreational area in Dublin, and, as such attracts significant numbers of tourist trips. The area consists of a dense network of pedestrianised streets. The Metro North alignment runs along the eastern extent of this area.
- 5.10.10 The city centre has a large number of galleries, museums and other tourist destinations which are accessed throughout the day, including:
- Douglas Hyde Gallery, National Gallery, Hugh Lane Gallery;
 - National Museum, Natural History Museum., Writer's Museum and Joyce Centre; and
 - Government Buildings, Mansion House, Trinity College, General Post Office, and Custom House.
- 5.10.11 These buildings are often accessed by tour groups, and as a result of these significant group sizes, areas in the vicinity of these buildings occasionally experience localised pedestrian congestion.
- 5.10.12 There are a number of major theatres and cinemas in the city centre, e.g.
- Gate Theatre, Ambassador Theatre, Abbey/Peacock Theatre, Gaiety Theatre; and
 - Savoy Cinema, Cineworld, Screen Cinema, and Irish Film Institute.
- 5.10.13 St. Stephen's Green is located at the southern extent of the Metro North alignment. It is a major public park, which is open during daylight hours. The park is significant as a recreational amenity, in addition to functioning as an important through route for pedestrians.
- 5.10.14 Temple Street and Rotunda Hospitals are located within Area 7 and generate significant movements throughout the day. Hospitals generate a large number of trips related to:
- Emergency vehicle access and egress;
 - Staff access and egress; and
 - Patient and visitor related trips.
- 5.10.15 There are two Garda Stations in Area 7, Pearse Street and O'Connell Street Stations.

Figure 5.13 Area 7 Map



General Traffic

General Traffic Infrastructure

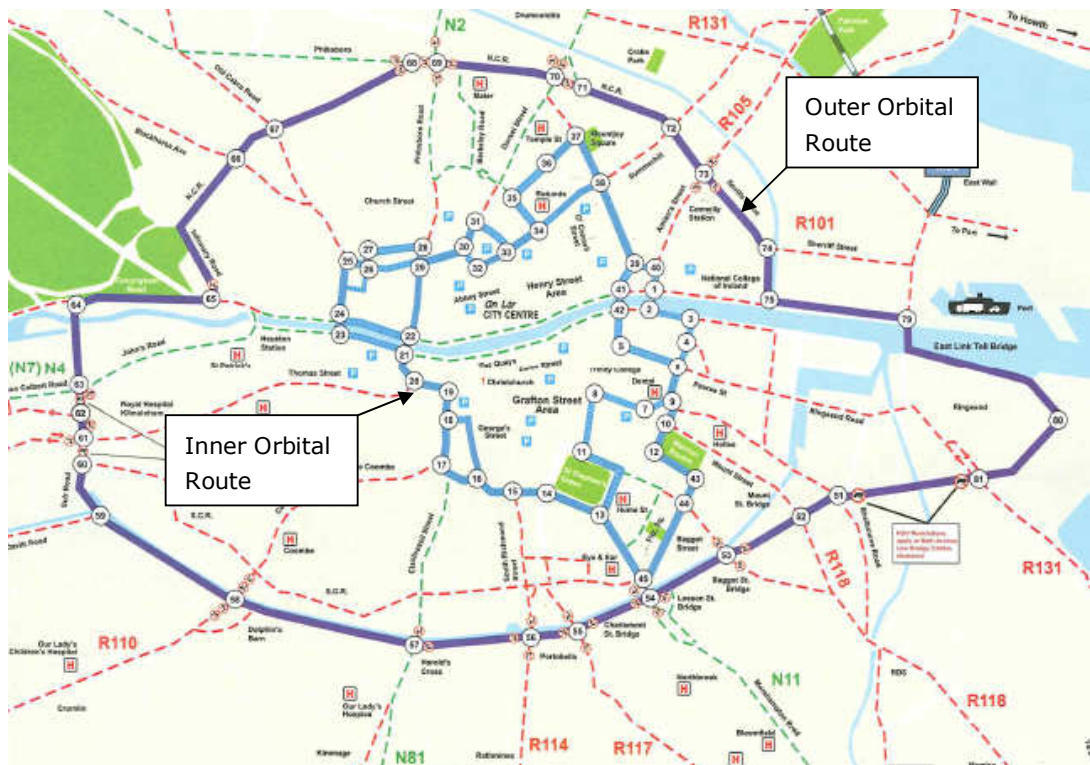
5.10.16 The principal routes within the city centre are the:

- Outer Orbital Route, which includes North Circular Road, North Wall Quay, East Link Toll Bridge, roads running parallel to the Grand Canal (Grand Parade, Grove Road, Parnell Road) and sections of the South Circular Road. The function of the route is to provide an alternative route for motorists crossing the city centre; and
- Inner Orbital Route, which skirts the core inner city area. It stretches from Parnell square in the North to St. Stephens Green in the south, and from Merrion Square in East to Blackhall Place in the west. It serves a similar function to the outer orbital in addition to providing access to city centre multi-story car parks.

5.10.17 The Outer and Inner Orbital Routes are illustrated in Figure 5.14, below.

5.10.18 The north and south quays are also important traffic routes, catering for east-west movement through the city centre. They provide access to and from the Port Tunnel, via Custom House Quay and North Wall Quay. In addition, they provide access to/ from the M50 via St. Johns Road West and Con Colbert Road.

Figure 5.14 Dublin City Centre Outer and Inner Orbital Routes



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5.10.19 Within Area 7, there are approximately 13 multi-story car parks with in excess of 6,700 car parking spaces. These multi-story car parks, their approximate capacity and their current access/ egress arrangements are illustrated in the following table.

Table 5.9 Dublin City Centre car parks affected ²¹

Car Park	No. of Spaces	Access/ Egress Arrangements
Marlborough Street	612 spaces	Access/ egress off Sean McDermott Street.
Parnell Centre	500 spaces	Access/ egress off Loftus Lane
ILAC Centre	1,000 spaces	Entrance off Parnell Street, exit off Chapel Lane.
Arnotts Car Park	350 spaces	Arnotts car park located off Princes St North, access via O'Connell Street, egress via Abbey Street and Liffey Street Lower
Jervis Centre	750 spaces	Access/egress via Jervis Street
Irish Auto Parks		Access/egress via Jervis Street south of Abbey Street Upper junction
Irish Life Mall	350 spaces	Access/egress off lane on Abbey Street Lower.
Fleet Street	393 spaces	Access/egress onto Fleet Street.
Trinity Street	171 spaces	Access from Trinity Street, exit from Andrews Lane onto Exchequer Street.
Clarendon Street	384 spaces	Underground Car Park, access off Clarendon Street, egress onto William Street South.
Setanta Centre	225 spaces	Lane off Nassau Street, between Kildare street and Frederick Street South. Access/egress both via Nassau Street.
Dawson Street	380 spaces	Access via School House Lane East, off Dawson Street, egress from Frederick Street South onto Nassau Street.
St. Stephens Green Centre & Royal College of Surgeons	1,127 spaces	Access either via Glovers Alley off Stephens Green West and via Mercer Street Lower.
Drury Street	480 spaces	Approach via Stephen's Street Lower to Drury Street

²¹ No. of car parking spaces from a variety of sources including Q-Park, Parkrite, DTO, and AA website

Utilisation of Infrastructure

- 5.10.20 Area 7 represents Dublin City Centre, and, as a result the road network is very extensive. Traffic flow data for key roads in Area 7 is included in Appendix A1.

Conditions Experienced

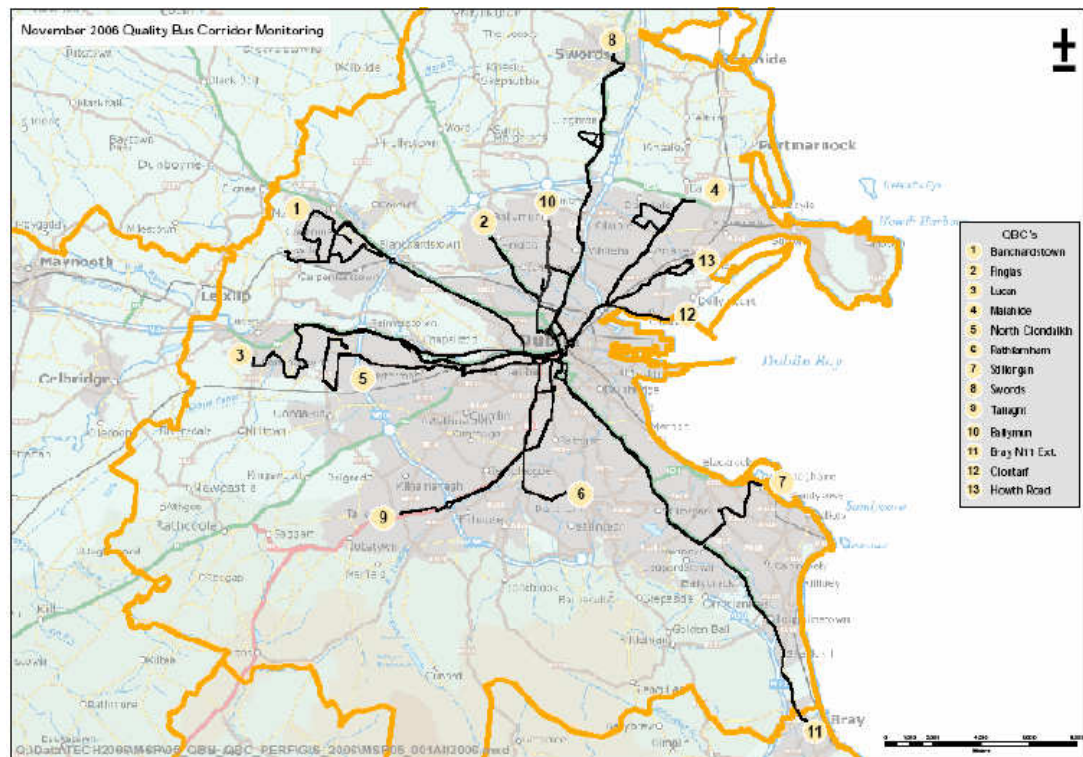
- 5.10.21 Average AM peak hour (08:00 to 09:00hrs) general traffic network speeds in Area 7, as extracted from the validated base year MNTM (2006) are 5.5 km/ hour. The road network in this area during the AM peak period can therefore be described as congested.

Bus

- 5.10.22 Area 7 covers a significant proportion of the city centre. The city centre is a major destination for bus passengers and there are very high volumes of bus services operating within the area.

Bus Infrastructure

- 5.10.23 At present bus operations benefit from general traffic management measures in place in the city centre. These traffic management measures, include bus lane infrastructure, in addition to a number of key general traffic restrictions introduced over the past decade:
- banned right turn from George's Street to Dame Street;
 - banned left turn from Dawson Street to Nassau Street;
 - restricted entry to North Frederick Street from Dorset Street;
 - restricted entry to O'Connell Street from Parnell Square East; and
 - banned right turn to St. Stephens Green East for general traffic on St. Stephens Green North.
- 5.10.24 The east west bus movement through the city centre is facilitated through the provision of significant lengths of bus lanes along the north and south quays. Buses also benefit from continuous bus lane infrastructure on the north quays, which recently been provided.
- 5.10.25 In addition to the local and commuter services, the city centre is a key destination for inter urban coach services. There are a multitude of bus operating companies serving the city centre, the largest of which are Dublin Bus and Bus Éireann. As well as regular scheduled services, there are a large number of tour buses within the city centre with bus stops on O'Connell Street and at Trinity College.

Figure 5.15 2006 QBC Network

5.10.26 City centre bus stops are very heavily used and a significant proportion of Dublin Bus passengers board and alight in the core city centre. There are important groups of stops at the following locations:

- Parnell Square;
- O'Connell Street;
- Eden Quay;
- Aston Quay;
- Westmoreland Street;
- D'Olier Street;
- Dame Street and
- Nassau Street.

5.10.27 The city centre is also an important terminus for bus services. Many of the radial city bus routes terminate within area 1. A number of key streets, including Parnell Square, Marlborough Street and Fleet Street, are used for the turnaround of buses to facilitate the operation of inbound and outbound services. The main terminus and layover locations are:

- Parnell Square West and Parnell Square East;
- Parnell Street;
- Mountjoy Square;

- Marlborough Street;
- Abbey Street;
- Eden Quay;
- Aston Quay;
- Hawkins Street;
- Pearse Street; and
- Ringsend Garage.

5.10.28 The city centre bus stops are important in terms of the integration of bus services. The concentration of bus stops allows for bus to bus transfers. Bus services link with heavy rail services at Heuston, Connolly and Tara Street and with Luas services at O'Connell Street and St Stephen's Green.

5.10.29 In addition to the on street bus stops, Bus Éireann have an off street bus station at Bus Áras, Beresford Place. Bus Éireann also has important bus stops on O'Connell Street, the Quays and Amiens Street. In recent years, there has been a considerable growth in the volume of bus passengers on long distance commuter services operated by Bus Éireann.

Utilisation of Infrastructure

5.10.30 Area 1 has the greatest concentration of bus services and bus passengers in the Greater Dublin Area. A very large proportion of all bus trips start and finish within the city centre. Bus services in the city centre provide access to a very wide catchment area that covers not only Dublin County, but also the outlying counties and connects to all major urban centres in Ireland.

5.10.31 A very high volume of bus passengers want to access the city centre and, consequently, there is very high number of bus services within area 1. The existing QBCs converge within the city centre (see Figure 5.15 2006 QBC Network). Almost 44,000 bus passengers enter the city centre along the QBC corridors during the AM peak (0700-1000hrs). In total 829 buses cross the canal cordon on QBC routes each carrying an average of more than 50 passengers²².

Conditions Experienced

5.10.32 Current bus speeds in the City Centre are low; this is indicated by extracts from the DTO Quality Bus Corridor Monitoring report for the Stillorgan and Ballymun QBC shown in Tables Table 5.10 and Table 5.11 respectively.

²² Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report.

Table 5.10 Stillorgan QBC²³

From	To	Distance (metres)	Bus Priority (metres)	Time Period	Average Bus Speed (kph)	Minimum Bus Speed (kph)	Maximum Bus Speed (kph)
Leeson St	Westmoreland St	1151	570	Am inbound	10.74	6.92	19.12
				Off-peak inbound	9.58	6.60	13.26
D'Olier St	Leeson St	1526	426	PM outbound	10.37	5.58	17.11
				Off-peak outbound	11.37	8.86	13.98

Table 5.11 Ballymun QBC²³

From	To	Distance (metres)	Bus Priority (metres)	Time Period	Average Bus Speed (kph)	Minimum Bus Speed (kph)	Maximum Bus Speed (kph)
Frederick St North	Parnell Square East	390	390	Am inbound	11.8	5.44	43.9
				Off-peak inbound	10.4	6.82	21.93
Parnell Square East	O'Connell St Lower	591	591	Am inbound	6.47	4.47	12.97
				Off-peak inbound	10.4	6.82	21.93
O'Connell St Lower	Parnell Square West	788	450	PM outbound	7.6	5.03	16.49
				Off-peak outbound	8.84	5.21	11.97
Parnell Square West	Dorset St Upper	224	0	PM outbound	2.41	0.52	25.22
				Off-peak outbound	10.75	5.6	26.88

²³ Dublin Transportation Office, 2006 Quality Bus Corridor Monitoring Report

- 5.10.33 The average bus speeds for majority of the existing QBCs in the central area (Parnell Square – O’Connell Street – Westmoreland Street – St Stephen’s Green) are between 7kph and 10kph during the am peak hour. The low bus speeds reflect the congestion experienced within the City Centre and the long dwell time of buses at busy city centre stops due to large number of passengers boarding and alighting.
- 5.10.34 Within the central area, average bus speeds do not vary greatly between the am peak and off peak periods. There are considerable restrictions on general traffic in the central area and the similarity in inbound bus speeds signify the level of priority given to buses in the area.
- 5.10.35 There is a large degree of variation between the minimum and maximum bus speeds. For example the recorded bus speeds from Frederick Street North to Parnell Square East varied from 5.44kph to 43.9kph during the am peak hour period. This high level of variation affects the reliability of bus services. In addition to varying within the peak hours, traffic conditions can change significantly from day to day within the central area. This is as a result of the unpredictable nature of general traffic congestion in this area.

Light Rail (Luas)

Luas Infrastructure

- 5.10.36 There are presently two light rail lines in Dublin City Centre, the Red and Green Lines. The Green Luas line is a light rail line which links Sandyford in south Dublin to Dublin city centre, terminating at St. Stephens Green. The existing Green Line alignment terminates at St. Stephens Green, adjacent to the most southerly Metro North stop. Within Area 7, Luas Green Line services operate on street, however there are only two locations within this area where Luas services interact with general traffic (Harcourt Street/ Adelaide Road and Harcourt Street/ Hatch Street).

The Red Luas line is a light rail line which links Tallaght in west Dublin to Dublin city centre, terminating at Connolly station. Light rail services currently operate at 5-minute headways during peak periods. The line is currently being extended from Connolly station to the Point Depot. The existing Red Line alignment intersects with the proposed Metro North alignment at O’Connell Street.

- 5.10.37 Within Area 7, Luas Red Line services operate on street, and there are a large number of locations within this area where Luas services interact with general traffic. Furthermore, a number of sections of the Luas Red Line in the City Centre are shared with general traffic, which can result in delays to Luas services during congested road conditions.

Utilisation of Infrastructure

- 5.10.38 On the Green Line (Sandyford to St. Stephen’s Green) 40m trams currently operate at 4-minute headways during peak periods and the line has a capacity of in excess of 5,000/ hour/ per direction.
- 5.10.39 On the Red Line (Tallaght to Connolly) tram lengths are currently being lengthened from 30m to 40m, which will result in a substantial increase in capacity on the corridor, i.e. in excess of 4,000/ hour/ per direction.
- 5.10.40 During peak periods, trams on both the Green and Red Lines are operating close to, or at their capacity.

Conditions Experienced

Luas operating conditions in the city centre are generally good in particular for the Luas Green Line. Luas Red Line services operate on a greater length of city streets and have to cross a large number of major junctions. As a result, conditions for Luas passengers on this line within Area 7 are inferior to those of the Green Line.

Taxi

- 5.10.41 The city centre is a major destination for taxi trips and there a large volume of taxis in area 1. There are approximately 11,000 licensed taxis and limos in the Dublin Taximeter area. The peak periods for taxi demand are during the evening peak and Friday and Saturday nights.
- 5.10.42 Details of the main taxis ranks within Area 7 are shown in Table 5.12.

Table 5.12 Main Permanent Taxi Ranks within Area 1

Location	Number of Taxi Stands
Aston Quay	6
Burgh Quay	6
Cathedral Street	8
College Green	6
Dawson Street	4
D'Olier Street	4
Eden Quay	4
Grafton Street Lower	2
Molesworth Street	3
O'Connell Street Upper	24
Sackville Place	14
St Stephen's Green North	31
Westmoreland Street	8

Pedestrians

- 5.10.43 Walking is the dominant mode of transport within Area 7. Pedestrian movements are high within this area as a result of the multitude of pedestrian trip purposes, including:
- Pedestrian related door to door trips;
 - Access/ egress to from public transport nodes (bus stops, luas stops, rail stations) as part of a longer journey;
 - Retail related walking trips, i.e. people moving to from retail areas such as the Grafton and Henry Street and to/from shops within these areas. These pedestrians are very often carrying shopping bags;
 - Recreational walking trips; and
 - Tourist related walking trips.

Pedestrian Infrastructure

- 5.10.44 One of the principal pedestrian corridors is the Parnell Square to St. Stephen's Green corridor. This corridor comprises O'Connell Street, O'Connell Bridge, College Green and Grafton Street, and provides the main north-south pedestrian route through the city.
- 5.10.45 The significance of this corridor is evident when a detailed study of the corridor is performed. There are wide footpaths along its length, and also increased time given to pedestrians at crossings, thus facilitating pedestrian movement to the maximum extent. Furthermore, all footpaths and crossings are of a standard suitable for the mobility impaired.
- 5.10.46 This route crosses the Liffey and the north and south quays at O'Connell Bridge, which is also a major crossing point for general traffic and bus. There are high levels of priority afforded to pedestrians at this point, with very wide footpaths and substantial storage areas along both sides of the bridge, and along the central median. Waiting areas at the crossings are sufficiently large to hold the numbers required, and pedestrians are given sufficient time to allow them to cross in safety.
- 5.10.47 The corridor provides a central spine, off which there is access to other pedestrian routes and amenities. One such corridor is the east-west access along Henry Street, across O'Connell Street, and onto North Earl Street and Talbot Street. Both Henry Street and North Earl Street are pedestrianised, and there are extensive pedestrian priority on Talbot Street. Bus Aras bus station and Connolly Train Station to the east of this corridor.
- 5.10.48 Interchanges to other forms of public transport, are also important to pedestrians. Dublin Bus stops are primarily located along O'Connell Street, Westmoreland Street, D'Olier Street, and adjacent to Trinity College on Nassau Street. Tara Street Dart station generates significant pedestrian volumes, in particular during peak periods.
- 5.10.49 The Luas is the other major mode of transport of interest to pedestrians. There are a number of stops on both the Green and Red Luas. At the stops along both lines, large numbers of passengers alighting at the same time can form local pockets of pedestrian congestion.

5.10.50 There are four large pedestrianised areas in the city centre, all of which are heavily used. They all form part of, or are adjacent to, the main north-south spine from Parnell square to St. Stephen's Green. They are listed below:

- Grafton Street – shopping thoroughfare;
- Trinity College – educational facility;
- Temple Bar – historic area with tourist and retail facilities;
- The Ha'penny and Millennium Bridges – pedestrian bridges across the Liffey; and
- Henry Street/Earl Street - shopping thoroughfare.

5.10.51 The Ha'penny and Millennium Bridges provide pedestrian access from Temple Bar to the south, across the Liffey to Abbey Street with its Luas line, and on to Henry Street shopping area to the north. These north-south corridors compliment that of the Parnell Square to St. Stephen's Green spine, which extends further north and south. These two bridges and the routes to either side of them provide alternative routes for pedestrians moving between the Grafton and Henry Street retail areas.

Utilisation of Infrastructure

5.10.52 There are a number of key Pedestrian destinations in the City Centre. They include all the key destinations detailed under Local context, above. In addition to these key areas, the Disability Retraining: National League of the Blind (on Hill Street), and the National Association for Deaf People (North Frederick Street) will generate pedestrian activity and the requirements of these pedestrians needs to be given careful consideration. A summary of the guidelines issued by the National Disability Authority (NDA) and the Dublin Transportation Office (DTO) to facilitate reduced mobility pedestrians is presented in Appendix B1.

5.10.53 Pedestrian movement surveys were undertaken at the following junctions:

- St. Stephens Green West, Stephens Green North, Grafton Street, South King Street;
- O'Connell Bridge South, Burgh Quay, D'Olier Street, Westmoreland Street, Aston Quay;
- O'Connell Bridge North, Bachelors Walk, O'Connell Street South, Eden Quay;
- O'Connell Street North, Parnell Street West, Parnell Square East, Parnell Street East; and
- Parnell Square East, Parnell Square North, North Fredrick Street, Denmark Street.

5.10.54 Pedestrian movement surveys were performed on the following dates:

- Thursday, 20th September, between 8.00-9.00, 13.00-14.00, and 17.00-19.00; and
- Saturday, 22nd September, during the hours of 13.00-17.00.

5.10.55 To evaluate pedestrian demand and the conditions they experienced, the survey data was analysed according to the guidelines in The Highways Capacity Manual (HCM), which includes analysis of the capacity of pedestrian facilities in terms of Level of Service (LOS), as described in Appendix B1. Full details of the results are included in Appendix B2. The key findings are summarised below for each area:

5.10.56 St Stephen's Green

- On St. Stephen's Green West during the peak hour there were 5,304 pedestrians. This corresponds to 33% of all pedestrians in the area, and highlights the impact of the Luas terminus on the area;
- The percentage of pedestrians that were either carrying luggage or shopping, pushing prams or buggies, or in wheelchairs on the Thursday was 6.4%;
- The busiest hour in terms of pedestrian movement through the area on a Saturday was 16:00 to 17:00hrs. This peak hour flow was 51,310 pedestrians, of which 20,676 walked on Grafton Street;
- The Stephen's Green Shopping Centre is heavily patronised with 6,369 pedestrians either entering or leaving during the peak hour;
- The Stephen's Green Park is also a significant attraction, with 4,059 pedestrians either entering or leaving via the north-west gate during the peak hour; and
- The percentage of pedestrians that are either carrying luggage or shopping, pushing prams or buggies, or in wheelchairs on the Saturday was 7.6%.

5.10.57 O'Connell Bridge

- on the Thursday between 8.00 and 9.00, the movement with the highest pedestrian numbers was in a north-south direction along the east footpath of O'Connell Street South, O'Connell Bridge and D'Olier Street. A key component of this movement is likely to be commuters walking from the Red Luas Line stop on Abbey Street and from bus stops on O'Connell Street and Marlborough Street;
- on the Saturday between 16.00 and 17.00, the movement with the highest pedestrian numbers was in a north-south direction along the west footpath of O'Connell Street South, O'Connell Bridge, Westmoreland Street. A key component of this movement is shoppers moving to/from the Henry St/O'Connell Street area to Grafton Street along the civic spine;
- the movement with the highest pedestrian numbers in an east-west direction was along the south footpath of Burgh Quay, crossing D'Olier Street and Westmoreland Street, and continuing along Aston Quay. A key component of this movement will be passengers accessing Tara Street DART station from the south Quays;
- the percentage of pedestrians that are either carrying luggage or shopping, pushing prams or buggies, or in wheelchairs on the Thursday was 7.4%, and on the Saturday was 10.4%; and
- the highest levels of congestion are experienced at the pedestrian crossings. The waiting areas for most pedestrian crossings have a peak level of service of D. The most congested crossing was recorded on Saturday afternoon at the junction of Westmoreland Street and Aston Quay, which had a peak level of service of E. This level of congestion makes it extremely difficult for cross-flow movements between pedestrians moving north-south along Westmoreland Street, and those going east-west along the Quays.

5.10.58 Parnell Square

- during the Thursday AM peak between 8.00 and 9.00, there were 8,801 pedestrians through the area, of which 1,820 walked on Parnell Square East;
- during the Saturday PM peak between 14.00 and 15.00, there were 16,960 pedestrians through the area, of which 2,549 walked on Parnell Square East;

- the percentage of pedestrians on Parnell Square East that were either carrying luggage or shopping, pushing prams or buggies, or in wheelchairs on the Thursday was 7.1%; this rose to 10.8%;
- the Saturday afternoon peak on Parnell Square East occurs between 14.00 and 15.00 hours, which is earlier than the afternoon peak in retail areas (16.00-17.00). This is probably due to the start of visiting hours for the nearby Rotunda Hospital; and
- from the analysis of peak times and flows, it is clear that special consideration should be given to pedestrians with reduced mobility, who comprise a considerable percentage of pedestrians in the area.

Conditions Experienced

5.10.59 St Stephen's Green

- on weekday mornings, the pavements on St. Stephen's Green West have a reduced Level of Service compared to the rest of the site (see Appendix B2). This corresponds to increased congestion, and is due to the combination of high numbers of passengers alighting at the terminus of the Luas Green line through pedestrian movements; and
- on Saturdays, the greatest congestion occurs on Grafton Street, which is almost at capacity. The connected footpath on St. Stephen's Green North is also heavily congested due to its narrow 2.8m width.

5.10.60 O'Connell Bridge

- the highest levels of congestion are experienced at the pedestrian crossings. The waiting areas for most pedestrian crossings have a peak level of service of D. The most congested crossing was recorded on Saturday afternoon at the junction of Westmoreland Street and Aston Quay, which had a peak level of service of E. This level of congestion makes it extremely difficult for cross-flow movements between pedestrians moving north-south along Westmoreland Street, and those going east-west along the Quays.

5.10.61 Parnell Square

- the footpaths along Parnell Square East are not congested. The eastern footpath is more heavily used than the western on both Thursday and Saturdays. This is probably due to the presence of a school, crèche, café, and numerous offices, as well as several bus stops along the eastern side of the square.

Cyclists

Cyclist Infrastructure

- 5.10.62 There is a bus lane along Parnell Square East which continues on to the northern end of O'Connell Street, before becoming a dedicated cycle lane. This forms a continuous route which facilitates cyclists travelling into the city centre from the north. The north bound carriageway of O'Connell Street also has a bus lane available for cyclists going in the opposite direction. There are also cycle lanes along the north and south quays to aid east-west travel. However, there are no dedicated cycle lanes or bus lanes available to aid travel to the south city centre.

5.10.63 Designated cycle parking facilities are provided at a large number of key destinations in the city centre, including:

- St. Stephen's Green North and West, adjacent to Grafton Street;
- Pearse Street/ Hawkins Street/ Townsend Street junction in front of Pearse Street Garda Station; and
- Lower O'Connell Street, in the central median.

Utilisation of Infrastructure

5.10.64 Traffic counts recorded over 150 cyclists an hour in the College Street / Westmoreland Street area during the AM peak hour (08:00 to 09:00hrs). Factors identified with the very high volumes of cyclists at this location include:

- A funnel effect as routes from the east along Pearse Street, from the west along Dame Street, and from the south via St Stephen's Green all converge;
- The proximity of Trinity College, a destination associated with large numbers of cycle users; and
- The cycle parking facilities available in the immediate vicinity at Pearse Street Garda Station, and within the college grounds.

5.10.65 The Road User Monitoring Report 2006 published by the Dublin Transportation Office also indicated high volumes of cyclists (200 - 300 cyclists between 7.00 and 10.00 am on weekday mornings) along Parnell Square East, O'Connell Street, the north side quays, St. Stephen's Green North and West.

5.10.66 Cycle parking facilities at the key destinations described above is usually heavily over-subscribed. Consequently, there are significant levels of ad-hoc cycle parking due to the lack of capacity in official parking bays.

Conditions Experienced

5.10.67 Dublin city centre does not represent an ideal cycle environment. This is primarily due to the fragmented nature of the cycle network, heavy traffic volumes, significant levels of congestion and extensive bus related kerbside activities.

5.10.68 Furthermore there are large numbers of one-way systems in place, which result in significant detours for cyclists.

5.11 2006 Modelled Traffic Speeds for Full Metro North Alignment

5.11.1 Average AM peak (08:00 to 09:00hrs) corridor speeds for a number of radial and orbital routes for 2006, as extracted from MNTM are contained in Appendix A6 for the following corridors:

- M1, from the Lissenhall Interchange to the North Circular Road;
- R132, from the M1/ Lissenhall Interchange to the N1/ Shantalla Road junction;
- R108, from north of the M50 interchange to the North Circular Road;
- Collins Avenue, from N2 to Howth Road; and
- Griffith avenue, from N2 to Malahide Road.

A map of Dublin, Ireland, showing the proposed Metro North route. The route is indicated by a dotted line connecting various stations. The stations are labeled from north to south: Belinstown, Usherhall, Crumay, Seaview, Swords, Fonestown, Airport, Dardicross, Northwood, Ballymas, Dublin City University, Giffchavenue, Drumcondra, Mace, Parnell Square, O'Connell Bridge, and St. Stephen's Green. The map is overlaid with a blue and purple color scheme.

ENVIRONMENTAL IMPACT STATEMENT – METRO NORTH

BELINSTOWN TO ST. STEPHEN'S GREEN

ANNEXES

VOLUME 3 – BOOK 2 OF 2

ANNEX I part 2

