

# **Draft Transport Strategy for the Greater Dublin Area**

## **Core Bus Network Report**



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## 1. Purpose of Report

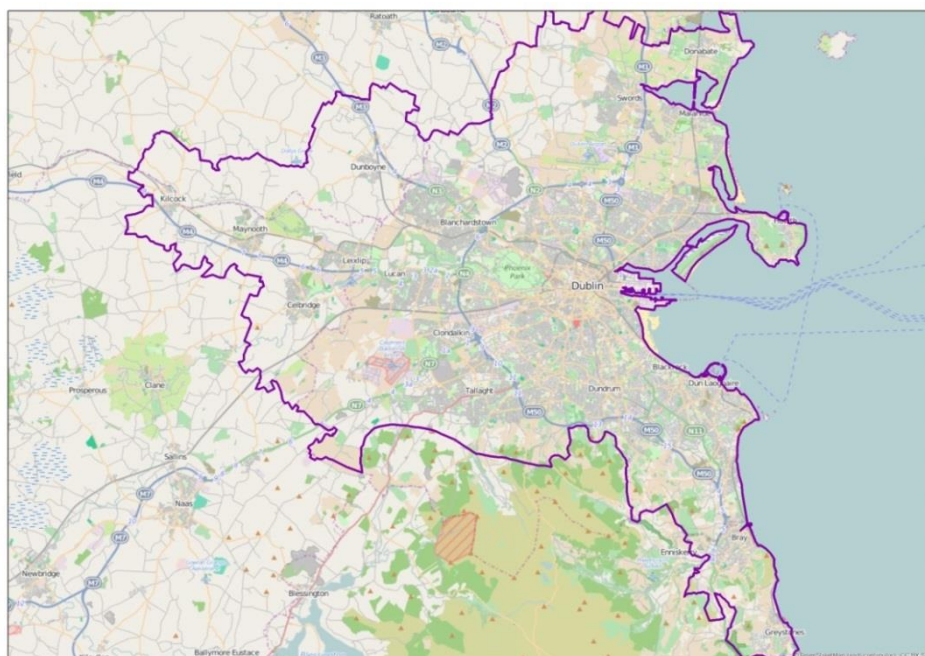
## 1.1 Introduction

The purpose of this report is to identify the core bus infrastructure network in the Dublin Metropolitan Area<sup>1</sup>, define an expected service level that will operate on this network to optimise its benefit and to maximise the efficiency of bus services operating on the core bus infrastructure network. This core network will be consistent with the Authority's Implementation Plan and overall general objectives. The core bus network will complement the additional public transport infrastructure measures that are planned for the Dublin Metropolitan Area, including Luas Cross City and Bus Rapid Transit.

The core bus infrastructure network is defined as a set of primary orbital and radial bus corridors which operate between the larger settlement centres in the Dublin Metropolitan Area. This will take into account the pedestrian, cycling, general vehicular network and other public transport networks, such that they complement each other.

Future investment will be prioritised on improving the core bus infrastructure network, to ensure that delays on this core network are minimised, reliability is improved through peak and off peak periods and mode shift from the private car is facilitated. The current problems with the overall network will be identified in this report, focused on locations where the bus network is not operating efficiently.

**Figure 1.1 – Map of Dublin Metropolitan Area**



The next section outlines the role of the Authority in the planning of bus infrastructure:

<sup>1</sup> The Dublin Metropolitan Area is defined as Dublin City Centre, its immediate suburbs and the built up areas outside of Dublin City centre, including a number of proximate major existing towns which are strongly integrated and connected with the built up area of Dublin.



## 1.2 Role of Authority

The principal functions of the Authority are to, inter alia:

- (a) undertake strategic planning of transport; and
- (b) promote the development of an integrated, accessible public transport network,

The DTA Act 2008 provides that an integrated implementation plan shall comprise:

- (a) an infrastructure investment programme, identifying the key objectives and outputs to be pursued by the Authority over the period of the plan,
- (b) the actions to be taken by the Authority to ensure the effective integration of public transport infrastructure over the period of the plan,
- (c) an integrated service plan, identifying the key objectives and outputs to be pursued by the Authority in relation to the procurement of public passenger transport services over the period of the plan.
- (d) the actions to be taken by the Authority to ensure the effective integration of public passenger transport services over the period of the plan, and
- (e) such other matters as the Authority considers appropriate or as may be prescribed by the Minister.

## 1.3 Integrated Implementation Plan 2013-2018

The Authority's Implementation Plan provides for bus service reviews, whereby the bus network will continue to be reviewed on an on-going basis over the Plan Period. The service measures that the Authority will focus on in such reviews will incorporate the following:

- Examination of potential for further improvement of the bus network, achieving greater bus network efficiencies and facilitating the introduction of BRT;
- Introduction of changes that need to be made as a result of traffic management changes/ public realm initiatives in the city centre;
- Investigation of further potential for cross city routes;
- Assessment of scope for further reductions in terminating buses in the City Centre;
- Provision for alternative bus routings through Dublin City Centre;
- The rationalisation of underperforming routes and amalgamation of services;
- Review of the orbital bus network, to achieve more reliable and frequent services;
- Extension of bus routes to areas where there is new passenger demand; and
- More focus on major centres outside Dublin City Centre, where there is potential that existing patronage could be raised substantially.

The following outlines the high level key objectives for the review of the bus network in the Dublin Metropolitan area. These objectives are extracted from the Authority's Integrated Implementation Plan 2013-2018.

1. Provide for a well-designed and effective bus network that optimises routes to meet passenger demand, commensurate with the resources allocated;
2. Ensure the efficient use of resources in delivering bus services;
3. Improve overall journey times and reliability for buses in the GDA;
4. Develop greater interchange with other transport modes;



## 2. Policy Review

### 2.1 Strategic Urban and Transport Planning

The core bus network infrastructure network for the Dublin Metropolitan Area takes into account regional and national plans, policies and studies. . The following are relevant to this report.

#### 2.1.2 Smarter Travel – A Sustainable Transport Future 2009- 2020

Smarter Travel is the national transport policy document for Ireland, which is the overarching document that all other transport policy in the state would be guided. The five key goals of the document are:

- (i) to reduce overall travel demand;
- (ii) to maximise the efficiency of the transport network;
- (iii) to reduce reliance on fossil fuels;
- (iv) to reduce transport emissions; and
- (v) to improve accessibility to transport.

Smarter Travel provides that car drivers will be accommodated on other modes such as walking, cycling, public transport and car sharing (to the extent that commuting by these modes will rise to 55% by 2020) or through other measures such as e-working. Furthermore, this provides for the implementation of more radical bus priority and traffic management measures to improve the punctuality and reliability of bus services and to support more efficient use of bus fleets.

#### 2.1.3 Infrastructure and Capital Investment 2012-2016: Medium Term Economic Framework

The Government published its Infrastructure and Capital Investment 2012-2016: Medium Term Economic Framework in November 2011, setting out the funding priorities for the five year period covered by this plan. In the Framework, funding was provided the upgrade of existing QBCs with emphasis on the Ballymun/Airport/Swords corridor.

#### 2.1.4 Regional Planning Guidelines for the Greater Dublin Area 2010-2022

The Regional Planning Guidelines for the Greater Dublin Area set out the macro planning context for the Dublin Metropolitan Area.

This document provides that investment in bus services in the development of inter-regional intercity links and between the growth towns of the GDA is ... important and should complement and link with existing and planned transport corridors. There is a need to strengthen the public transport connections between identified key growth town in the Mid-East region with those of the nearest hubs and gateways, with within the GFA and the adjoining regions outside the GFA to ensure ease of access to avail of labour pools, education, regional and acute health, facilities, goods and services and tourism development.

#### 2.1.7 Draft Dublin City Centre Transport Assessment Study

Dublin City Council and the National Transport Authority are currently preparing the Draft Dublin City Centre Transport Assessment Study. The city centre is critically important to the overall effectiveness of the public transport offer in the Dublin Metropolitan Area and to the efficient operation of the bus network. The study examines the issues relating to the management and



movement of people and goods to, from and within Dublin city centre, and to propose potential solutions. It proposes outline traffic management proposals, public transport infrastructure improvements, and specific measures to encourage walking and cycling to, from and within the city centre. The study was motivated by a number of key issues and concerns regarding the city centre, including the need to:

- Develop a framework for infrastructural investment in the city centre;
- Improve accessibility to the city centre;
- Improve the integration and utilisation of public transport in the city centre – in particular, addressing poor journey times, bus congestion (especially around bus stops) and the negative impact of bus activities on the public realm;
- Improve the quality of service for walking and cycling, with a particular emphasis on movement within the city centre;
- Ensure the future development of the city centre and to improve confidence in the ability of the city centre to be the key focus of future investment both in transport infrastructure, and for key land uses; and
- Move away from incremental traffic changes towards a strategic plan that will be the basis for future planned decisions.

In broad terms the objectives for bus are:

- to maximise the benefits for bus based public transport by utilising additional street space, and alternative route options made available following the rerouting of vehicular traffic onto orbital routes around the city centre;
- to re-coordinate the bus network by identifying and prioritising those cross-links that support the largest actual or potential cross-city passenger demand;
- to ensure that adequate penetration and coverage of the city centre is obtained from all suburbs of the city;
- to reduce the dependency on particular streets by identifying a number of corridors for routing bus services through the city centre; and
- to identify and develop key interchange points on the public transport network at a smaller number of high quality locations.

#### **2.1.6 Cost and Efficiency Review of Dublin Bus and Bus Eireann (Deloitte) – January 2009**

This review assessed whether the resources currently available to Dublin Bus and Bus Eireann were used in the most effective and efficient way possible to deliver an optimum public transport service. In relation to Dublin Bus, the report recommended the development of a simpler and more efficient network incorporating the following principles:

- Redesign network based on most recent patterns of demand/ demographics.
- Simplify the network and reduce the number of variations of bus routes.
- Eliminate unnecessary duplication of services, maximising the return from deployed services.
- Create even headways between departures and introduce intermediate running times to improve reliability/ reduce bus bunching.
- Provide additional direct routes into and out of the city/ key destinations.
- Develop and market easy to understand routes and timetables.



### 2.1.5 Dublin Bus Network Review (MVA) – 2006

This review was commissioned by Dublin Bus in 2005. The aim of this study was to produce a strategy for developing the bus network over the five year period 2005-2010 and at a strategic level for the period to 2015.

**The core elements of this review was to introduce additional buses to the Dublin Bus fleet, significantly enhance the existing Quality Bus Corridors, progressive reshaping of the bus network, with a substantial increase in cross city services, limited stop/express services from outside the M50 and a number of high frequency orbital services. However, this was conditional on the implementation of radical additional traffic management measures in the City Centre to allow reliable cross linking of services and tackling congestion outside the QBC corridors.**

### 2.2 Proposed Schemes

The following are public transport proposals for Dublin City that will influence the design of the bus network:

#### 2.2.1 Luas Cross City Light Rail Line

The cross city Luas line commenced construction in June 2013 and will link the two existing Luas lines and connect further northbound to Grangegorman and Broombridge. The scheme will involve existing considerable revisions to the city centre traffic circulation network. The scheme will make use of the new public transport bridge from Marlborough Street to Hawkins Street.

#### 2.2.2 Bus Rapid Transit (BRT)

The NTA published the report “Bus Rapid Transit – Core Dublin Network” in October 2012 outlining emerging proposals for the introduction of BRT schemes in Dublin. The initial schemes to be developed are:

- Swords to South City;
- Blanchardstown to UCD (Belfield); and
- Clongriffin to Tallaght.

BRT generally includes segregation from other vehicular modes and the introduction of BRT facilities along a road might involve the displacement of other road users. The schemes are still at various stages of development. The Swords to South City is the most advanced of these three proposals and is currently in consultation stage on the emerging preferred route further to the completion of a route selection study.



### 3. Bus Network Infrastructure Planning

#### 3.1 Introduction

As stated in the previous chapter, the purpose of this report is to identify the core bus infrastructure network for the Dublin Metropolitan Area, define an expected service level that will operate on this network to optimise the benefit and to maximise the efficiency of bus services operating on the core bus infrastructure network. The reason for focussing on the core network is to maximise the return on future investment in bus infrastructure and to facilitate efficient operation of bus services. This will reduce the operating costs for operators and improve the attractiveness of public transport for a large proportion of the population of the Dublin Metropolitan Area and beyond.

#### 3.2 Current Structure of Bus Network

The current bus network in Dublin is characterised by a dominant, city centre focused radial network, supplemented by low frequency orbital and local bus routes serving larger destinations outside the city centre core. While there is reasonable public transport access to Dublin city centre from suburban locations, access between large destinations outside the city centre is weak and unattractive relative to the private car.

There are many potential structures for the design of the public transport network in Dublin. This includes:

- Radial – Most public transport services focussed on operating to the city centre;
- Web - This is a combination of orbital and radial routes. The orbital routes are at a fixed distance spreading out from the core;
- Mesh - A series of east west parallel routes intersecting with north-south perpendicular routes. This relies on heavily on interchange to get from one point to the other;
- Hub and spoke – In this network, the focus of public transport services is on the city centre and on a small number of key destinations in suburban locations. Within the catchment of the key destinations, public transport services operate into the centre (hub) and high frequency services operate between this hub and other destinations; and
- Point to point - This is where public transport services operate from point to point (Taxi, demand responsive services).

Given the relative scale of the city centre core relative to other destinations in the Dublin Metropolitan Region, it is not intended to radically change the radial structure of services operating to the city centre. However, there is a need to strengthen the orbital links between destinations such as Dundrum, Tallaght and Blanchardstown.

There is a case for improving local links to the Metropolitan Consolidation towns of Swords, Blanchardstown, Lucan, Clondalkin, Tallaght, Dundrum, Dun Laoghaire and Bray. Public transport services would then operate from the catchment of these areas into a central interchange and high frequent, direct and quick public transport services would operate to the city centre and other proximate orbital hubs.



Taking this into account, the core bus infrastructure network in the Dublin Metropolitan Area is defined as set of primary orbital and radial bus corridors which operate between the larger centres in the Dublin Metropolitan Area, including interchange hubs.

At the beginning of this report, it was stated that it was necessary to define an expected service level that will operate on the core bus network to optimise its benefit. For the purposes of this report, a core bus corridor will have a minimum of 10 minutes during the peak hour and 15 minute frequencies during the off peak period. This will ensure that there is a high quality service operating at all times of the day, facilitating trips made outside peak times, including leisure and retail trips

It is expected that on the busiest core bus corridors that this could increase to a maximum of 2 minute frequency in the peak hour. This will ensure that there is sufficient capacity during peak hours.

### 3.3 Methodology

The following methodology was followed in deriving the future core bus infrastructure network:

- 1) The existing bus network and bus infrastructure in the Dublin Metropolitan Area was analysed, including the identification, mapping and categorising the existing bus infrastructure. This identifies all roads that have dedicated road space for bus and other bus priority infrastructure, such as bus gates, junction bus priority and bus only through routes;
- 2) The journey time delays across a sample of the bus network in the Dublin Metropolitan area has been derived and mapped. This data will be extracted from Dublin Bus Automatic Vehicle Location data from across the bus network;
- 3) The frequency of bus services between stops during the peak period was defined. This shows where the highest volume of bus traffic is on the network;
- 4) A demand analysis has been undertaken, include a broad understanding of trip demand; and
- 5) Using the above analysis, the specific corridors where investment will be prioritised in the network has been identified and mapped.

### 3.4 Resolving Issues

Once the specific core radial and orbital corridors have been identified, each individual bus corridor needs to be assessed to ascertain the main causes of unreliability. This will be done as a separate exercise to this report. There are many variable factors that influence the journey time on a corridor, including, inter alia:

- General traffic congestion;
- Turbulence;
- Level of bus priority;
- Taxi / bus congestion;
- Capacity;
- Ramps and traffic calming measures;
- Interaction between merging and turning traffic;
- Quantity of patronage along corridor; and
- Persistent bad driver behaviour.



Once these problems are clearly understood, mitigation measures can be identified. The following are a sample of solutions that can be used to reduce delays on a bus corridor:

- 1) Traffic management measures;
- 2) Changing signal priority for buses;
- 3) Restriction to some or all other road vehicles;
- 4) Dedicated provision of road space;
- 5) Increasing the distance between bus stops.



## 4. Existing Bus Infrastructure Network in the Dublin Metropolitan Area

### 4.1 Overview

This chapter outlines the existing bus infrastructure in the Dublin Metropolitan Area. The bus infrastructure network is made up of the following elements:

- Bus Lanes;
- Bus Gates;
- Bus Priority Signals; and
- Bus Stops.

There will also be a high level evaluation of the bus network speeds on a number of corridors.

As part of this process the bus infrastructure network in the Dublin Metropolitan area was mapped. The purpose of this map was to identify all roads that have dedicated road space for bus and to describe the extent of the existing infrastructure.

### 4.2 Methodology

A desktop exercise was undertaken using online mapping resources such as Google Earth and Bing Maps. Much of this mapping data originates from July 2013. This examination was supplemented with an assessment of bus schemes that the Authority has funded over the past few years<sup>2</sup>. In addition, there may be bus lanes that have reverted to general traffic lanes. In general, they have not been mapped if they have lapsed over the last few years.

The map identifies inbound and outbound lanes. Inbound lanes are lanes that have bus lanes where the majority of buses are operating towards the city and outbound lanes are lanes that have bus lanes where the majority of buses are operating from the city.

This map also identifies other bus priority infrastructure, such as bus gates, junction bus priority and bus only through routes. These are discussed below:

#### 4.2.1 Bus Lanes

Overall, there are approximately 213 kilometres of dedicated bus lanes in the Greater Dublin Area, of which 93 kilometres can be roughly categorised as outbound and 120 kilometres can be categorised as inbound (city centre or lower order centre as destination).

Bus lanes can vary by quality, level of continuity, quality of treatment at junctions and operational times. Generally, all lanes will at least be operational for their peak hours – morning peak for inbound and evening peak for outbound. Many will be operational in both directions at both peak periods, some from 7am to 7pm and others operate on a 24 hour basis.

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<sup>2</sup> For the purposes of mapping bus lanes, the RRM 024 (Continuous Bus Lane Line) from the Traffic Signs Manual is defined as a bus lane and has been digitised onto GIS. Where there is a direct continuation of an M129 (Broken Bus Lane Line) between two RRM 024 lines, this has been defined as a bus lane and has been digitised onto GIS. The mapping of bus lanes did not include operational times of the bus lane. The purpose of this exercise was to broadly map infrastructure and not when this infrastructure operates.



Some corridors benefit from a high degree of continuity whereby bus lanes are present for long sections and are not truncated at all junctions. This occurs mostly in scenarios where a full lane of traffic or a pre-existing hard shoulder has been designated as a bus lane.

Alternatively, the N81 to Tallaght is an example of the sporadic provision of bus lanes, due mainly to the absence of available traffic lanes. Contra-flow bus lanes, such as that on St. Stephen's Green East and Camden Street, provide additional priority whereby buses can travel in the opposite direction to general traffic. In these cases, taxis are not permitted to enter the bus lane, meaning such traffic does not disrupt buses.

#### **4.2.2 Bus Gates**

Bus gates allow for priority for bus through areas by restricting entry to other vehicles using a moveable physical barriers or traffic control measures. Bus gates can come in many forms. Physical bollards may be present which lower only when a bus approaches. One such intervention has been implemented inside the UCD Campus. In other cases, simple "No entry except for buses, taxis and cyclists" controls can be put on certain streets. Such restrictions are in place on College Green and Suffolk Street in Dublin city centre. In these cases, right or left-hand turn bans are also in place elsewhere on the local network which diverts private car traffic away from the streets in question. There are also examples of bus signals in Tallaght.

#### **4.2.3 Bus Priority Signals**

Bus priority signals can be useful, particularly in scenarios where bus lanes cannot be implemented. In these cases, the traffic signals change to green for the bus as it arrives at the junction, minimising delay. In other cases, where a bus lane ends, a set of signals can be introduced whereby the general traffic is held to allow a bus go through on a dedicated "Bus" green light in order to avoid delay from being caught in general traffic. Such an arrangement is present on the Templeogue Road in Terenure.

### **4.3 Bus Lanes - Analysis**

The bus lanes in the Metropolitan Area are mapped below. Following each section map, there will be a broad description of the bus infrastructure and broad assessment in each of the areas.

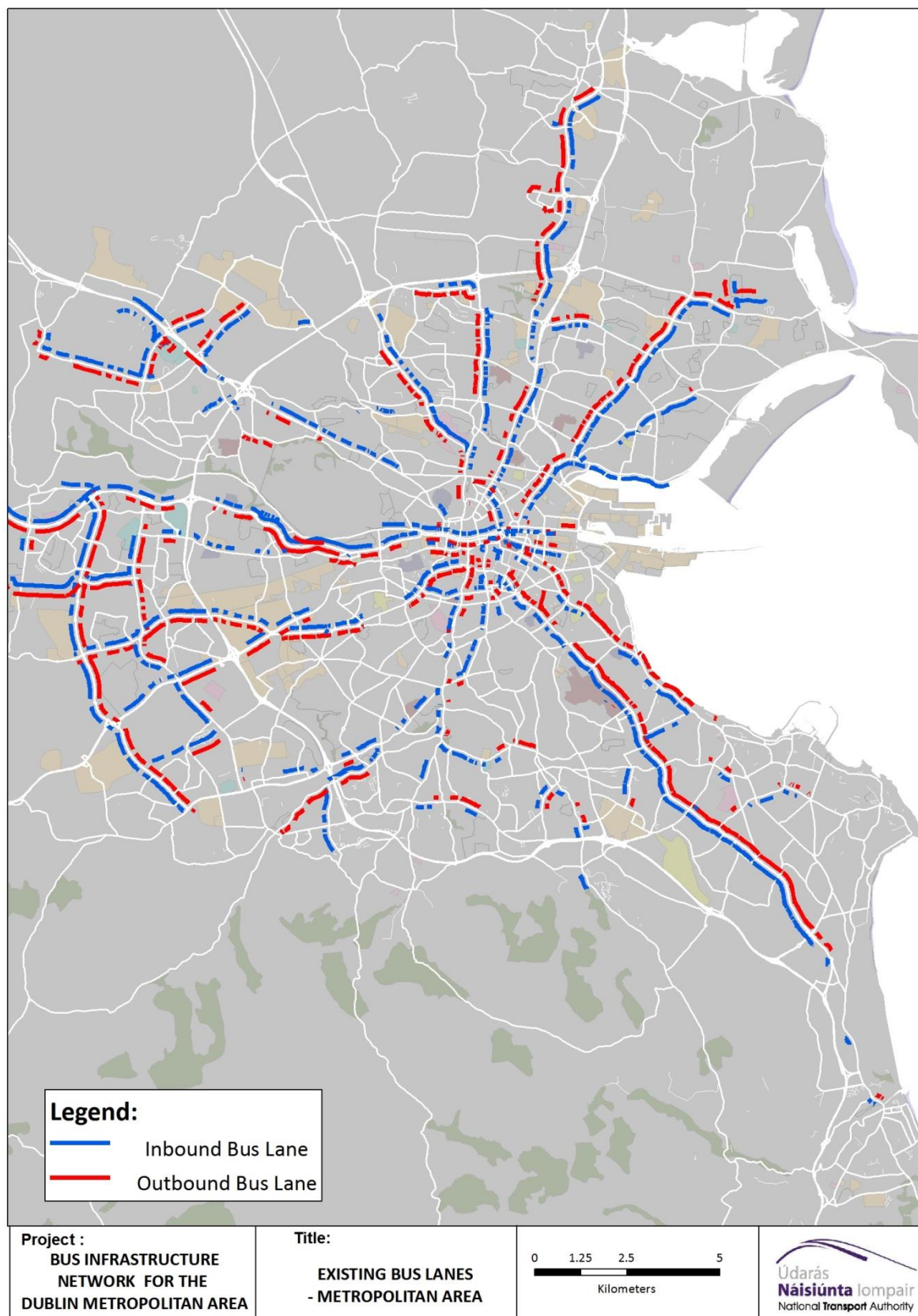
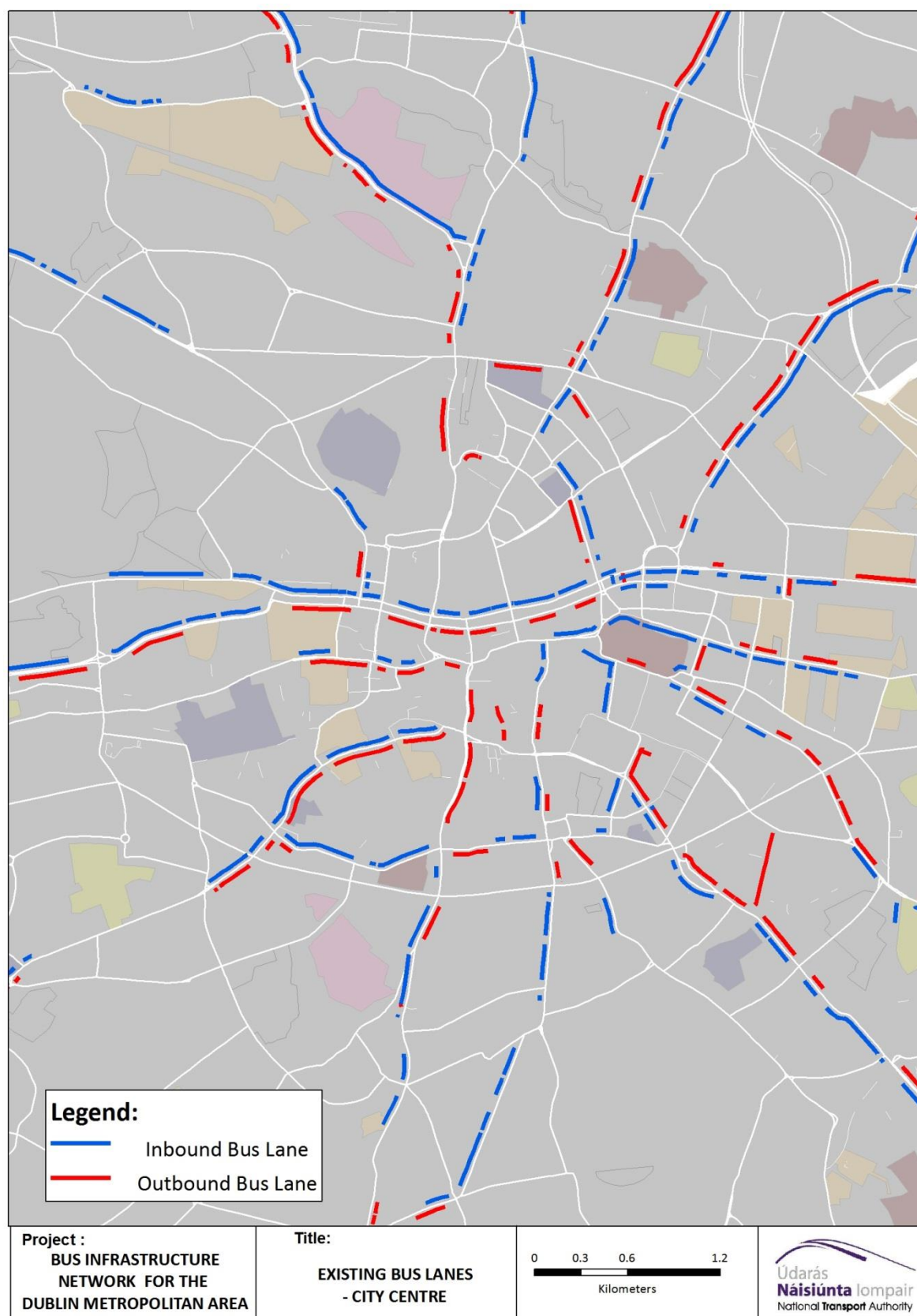
**Figure 4.1 – Existing Bus Infrastructure – Metropolitan Area**



Figure 4.2 – Existing Bus Infrastructure – City Centre Area





## 4.4 City Centre

### 4.4.1 Description

There is a significant concentration of bus infrastructure in the city centre. Between the Royal Canal and the River Liffey, on the northside of the city centre, there are short stretches of bus lanes on Manor Street/ Blackhall Place, Phibsborough Road/ Western Way and North Circular Road. There are longer sections on Dorset Street, Parnell Square, O'Connell Street and Amiens Street. Between the Customs House and the Point Village, there are sections of outbound bus priority. There is inbound priority along the north quays, with some pinch points at key locations which delays the bus.

Between the Grand Canal and the River Liffey, on the southside of the city centre, there are newly constructed inbound and outbound bus lanes on Thomas Street. In the south west of the city centre, there are continuous inbound and outbound bus lanes through Dolphins Barn/ Cork Street. There is a continuous outbound bus lane on Patrick Street/ Clanbrassil Street and Bride Street. On Aungier Street/ Camden Street/ Georges Street there are small sections of inbound and outbound bus lanes. There are long sections of bus priority on both sides of Leeson Street, Mount Street and Ringsend Road. There is a continuous inbound bus lane along Pearse Street inbound as far as the College Green bus gate at Tara Street. There are also smaller sections on Earlsfort Terrace and Samuel Beckett Bridge. There is a continuous contra bus lane on Stephens Green East. There are long sections of inbound bus priority along the South Circular Road, with limited sections of outbound priority.

There are five principal bus gates in the city centre, where general traffic is restricted from entering at certain times of the day. These include the following:

- Dawson Street/ Nassau Street
- College Green
- O'Connell Street (from southbound from Parnell Square)
- Blessington Street
- Pearse Street/ College Street
- Georges Street/ Dame Street

Since its introduction in 2009, the College Green bus gate has a significant impact on bus reliability and journey times in the city centre.

### 4.4.2 Evaluation

The gradual introduction of general traffic restrictions and bus gates in the city centre has improved the flow and operation of bus services through the centre of the city. There are still a number of pinch points in the city centre where large amounts of bus converge and create delays for bus services. This will be looked at in more detail in the analysis of AVL data section later on in this report.

On most of the main bus corridors into the city there are significant levels of bus priority infrastructure, including Amiens Street, Dorset Street, O'Connell Street, Leeson Street, Cork Street and on the quays. However, there are small gaps in infrastructure which has the potential to delay services significantly. There are also gaps in infrastructure where dedicated bus infrastructure is not required such as Talbot Street where through movement for general traffic has been curtailed.



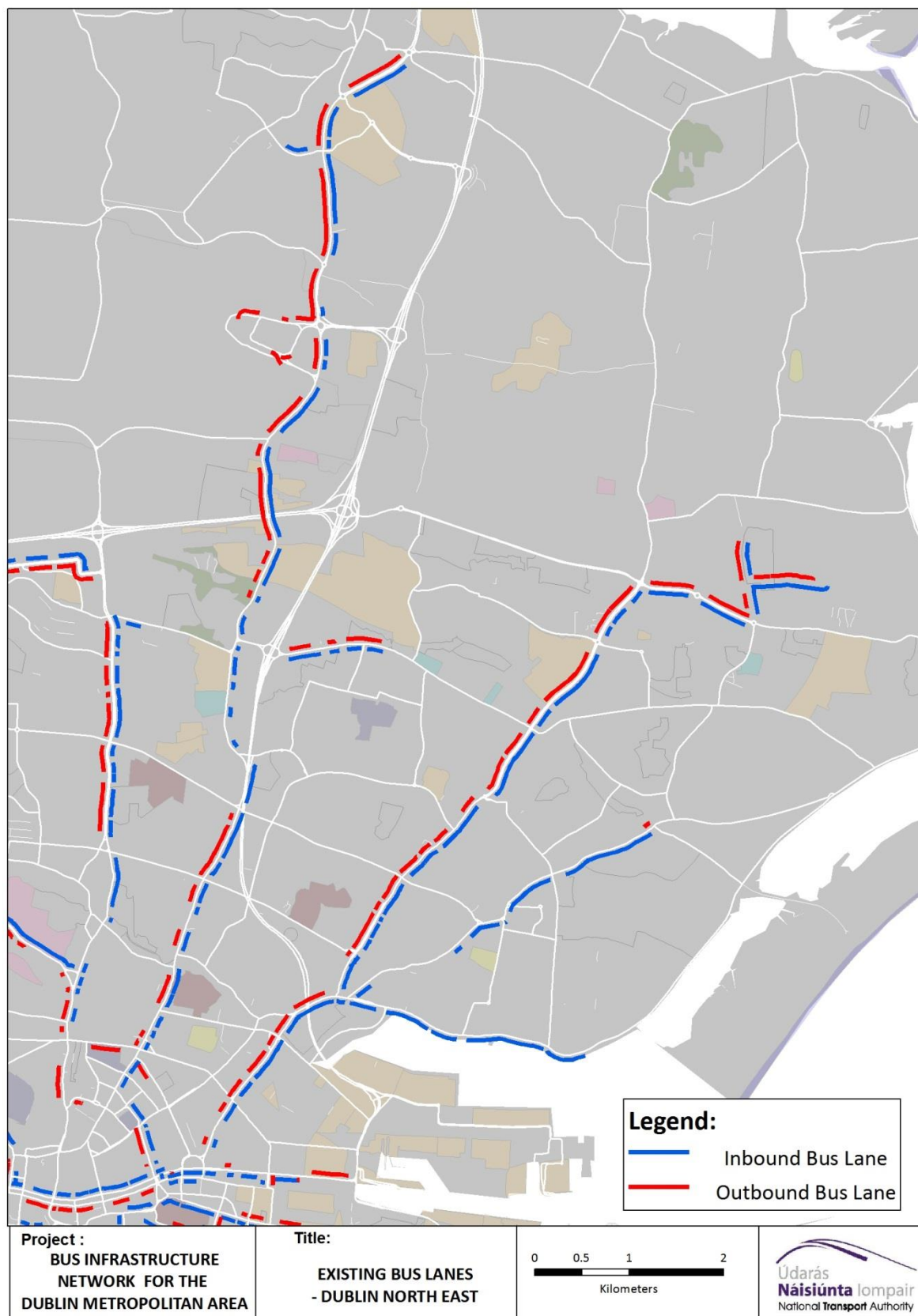
There are some corridors where there is very limited bus infrastructure and the bus does not get any priority over general traffic. This results in significant delays for bus movements and impacts on bus timetables, particularly during peak hours. For example, there is limited infrastructure in the north west of the inner city, particularly for outbound bus movements.

For northside orbital movement, there is no bus infrastructure priority, except for a small section of outbound bus lanes on the North Circular Road. On the southside, there is bus infrastructure on the southwest of the city centre on the South Circular Road. However, there is almost no orbital bus infrastructure to the southeast of the city centre.

Overall, there is significant scope to improve the bus infrastructure network in the city centre whether through the provision of bus lanes, bus gates or other bus network infrastructure.



Figure 4.3 – Existing Bus Infrastructure – North East Dublin





## 4.5 North East Dublin

### 4.5.1 Description

On the Clontarf Road, there is a continuous inbound bus lane from the junction at Conquer Hill Road (the location of the Dublin Bus Garage) as far as Marino where it joins the Howth Road. There is no outbound bus lane on this section. On the Howth Road, there is an inbound bus lane provided along most of the route from Raheny to Clontarf Road. Apart from a short section of outbound bus lane approaching Raheny crossroads, there are no outbound bus lanes on the Howth Road. There is no bus priority for a long section north of Charlemont Road.

On the Malahide Road, there is continuous bus lane provision from Amiens Street to Clongriffin along the North Strand and Malahide Road in both inbound and outbound directions. There are some gaps outbound at Marino and Donnycarney, due to physical spatial constraints. There is a short section of bus lane on the Oscar Traynor Road eastbound and westbound between Clonshaugh Road and the M1.

On the Swords Road, there are varying levels of bus infrastructure along the entire corridor. From Dorset Street outbound, there are gaps in bus infrastructure provision, particularly along Dorset Street, Drumcondra Road and through Santry. The inbound route is more effectively served, but there are gaps in bus provision in Santry and Drumcondra. There is significant inbound and outbound bus priority between Swords, the Airport and North Santry.

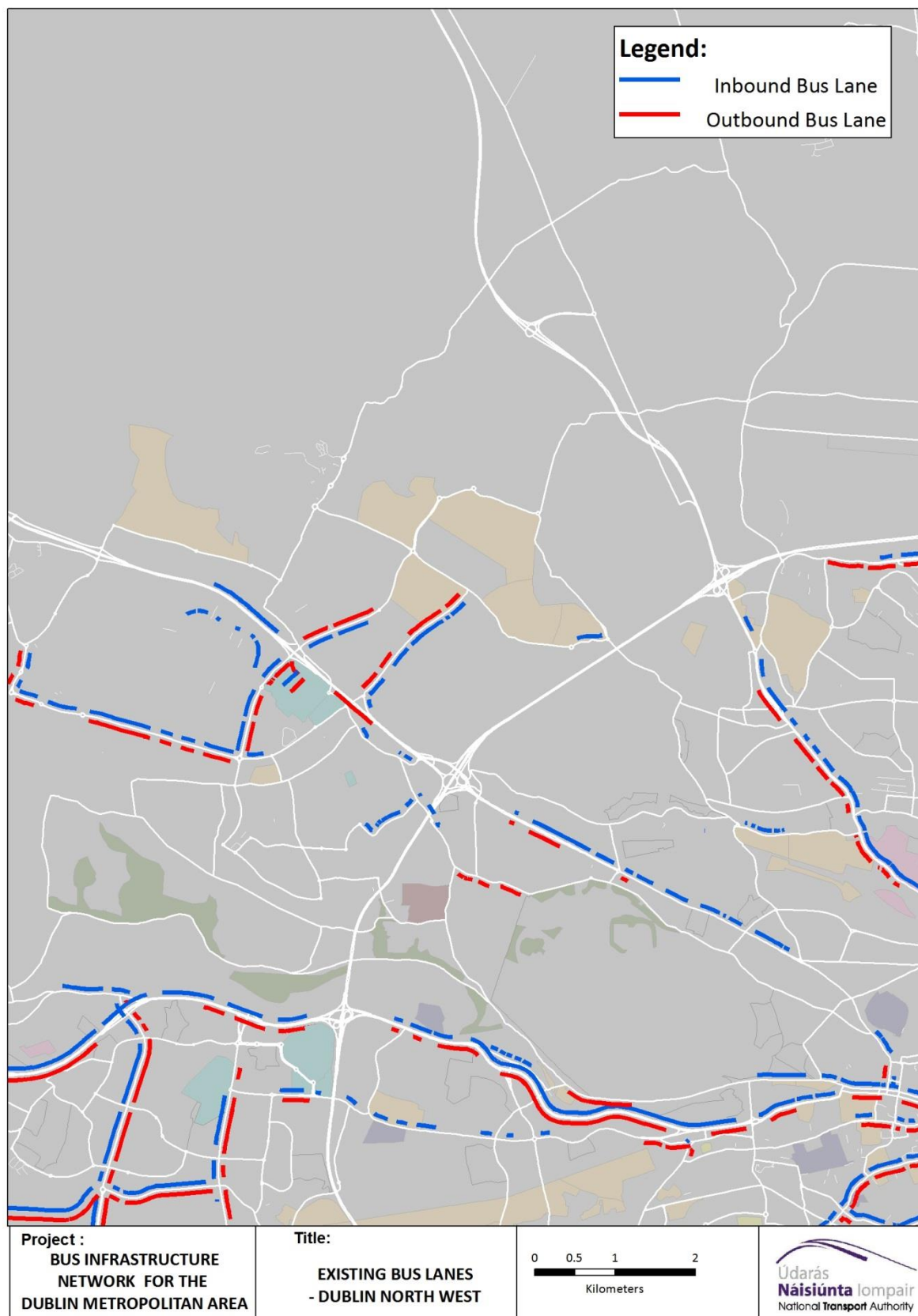
On the Ballymun Road, there is no outbound bus lane from Prospect Road as far as Collins Avenue. There is one additional stretch on the inbound side south of Collins Avenue. There is continuous inbound and outbound provision from Collins Avenue as far as St. Margaret's Road.

### 4.5.2 Evaluation

There are different levels of bus infrastructure in the north east of Dublin. The Malahide Road corridor has continuous stretches of inbound and outbound bus infrastructure with short stretches where infrastructure is not provided. On the Clontarf and Malahide Road corridors, there is significant inbound bus infrastructure but no outbound infrastructure. The Ballymun and Swords Road corridors have significant lengths of both outbound and inbound infrastructure, although there are large sections of both corridors where there is no protection for bus services. Overall, there are significant variances in the level and quality of bus infrastructure provision and scope to improve provision through different measures.



Figure 4.4 – Existing Bus Infrastructure – North West Dublin





## 4.6 North West Dublin

### 4.6.1 Description

On Finglas Road, there is a continuous inbound bus lane from Finglas as far as Prospect Road. A largely continuous outbound bus lane is provided with some gaps at Glasnevin Cemetery and south of Ballybogan Road. The Finglas and Ballymun bus corridors converge just north of Phibsborough at Prospect Road. There is no provision from this point inbound, while there is a stretch of bus lane outbound at Constitution Hill.

There is a short stretch of bus lane westbound along Ballyboggan Road. There is intermittent bus lane provision inbound along the N3 Navan Road from the M50 to the Liffey Quays, with several significant gaps, most notable through Prussia Street / Manor Street / Stoneybatter. There are a small number of short stretches of outbound bus lane.

Within Blanchardstown, there are bus lanes along Snugborough Road North and Blanchardstown Road North in both directions linking the N3 to Ballycoolin. There is some bus provision within Blanchardstown Shopping Centre and in both directions along Blanchardstown Road South and Ongar Road. Huntstown Way inbound has some discontinuous bus lanes. There is sporadic bus lane provision in Castleknock in both directions.

There are a number of bus gates/ bus only corridors in Blanchardstown, including Ballycoolin Industrial Estate bus gate and north of Blanchardstown Interchange.

### 4.6.2 Evaluation

The Finglas bus corridor has reasonable bus priority north of Phibsborough Village. The bus lane provision becomes more sporadic through Phibsborough and south of the village.

The N3 Navan Road inbound corridor has reasonable bus priority in sections. However, there is very limited bus priority south of the junction of Cabra Road. There are short sections of bus lanes on the outbound corridor. Overall, the existing N3 Navan Road bus corridor has limited quantity of bus priority infrastructure.

Blanchardstown has large sections of good quality inbound and outbound infrastructure. There are small gaps near the Blanchardstown bus interchange. North of the Ongar Road, there is limited bus priority serving the large population areas of West Blanchardstown.

There is almost no orbital bus infrastructure between Blanchardstown and North Dublin.



Figure 4.5 – Existing Bus Infrastructure – Dublin West





## 4.7 West Dublin

### 4.7.1 Description

With the exception of the N4/M50 junction, there is a substantially continuous bus lane in both directions from Lucan as far as O'Connell Bridge. There are some gaps outbound near Heuston Station and along Con Colbert Road. Some further gaps occur in both directions around Palmerstown. There is some inbound bus lane provision along Ballyfermot Road but limited outbound infrastructure. There are continuous inbound and outbound bus lanes on the Nangor Road / Long Mile Road corridor from Grange Castle as far as Crumlin Road, before resuming south of the canal onto Dolphin's Barn and Cork Street as far as Patrick Street. There are intermittent, but significant stretches of bus lane in both directions on the Naas Road from the Kingswood Interchange as far as Drimnagh. There is more bus lane provision inbound than outbound.

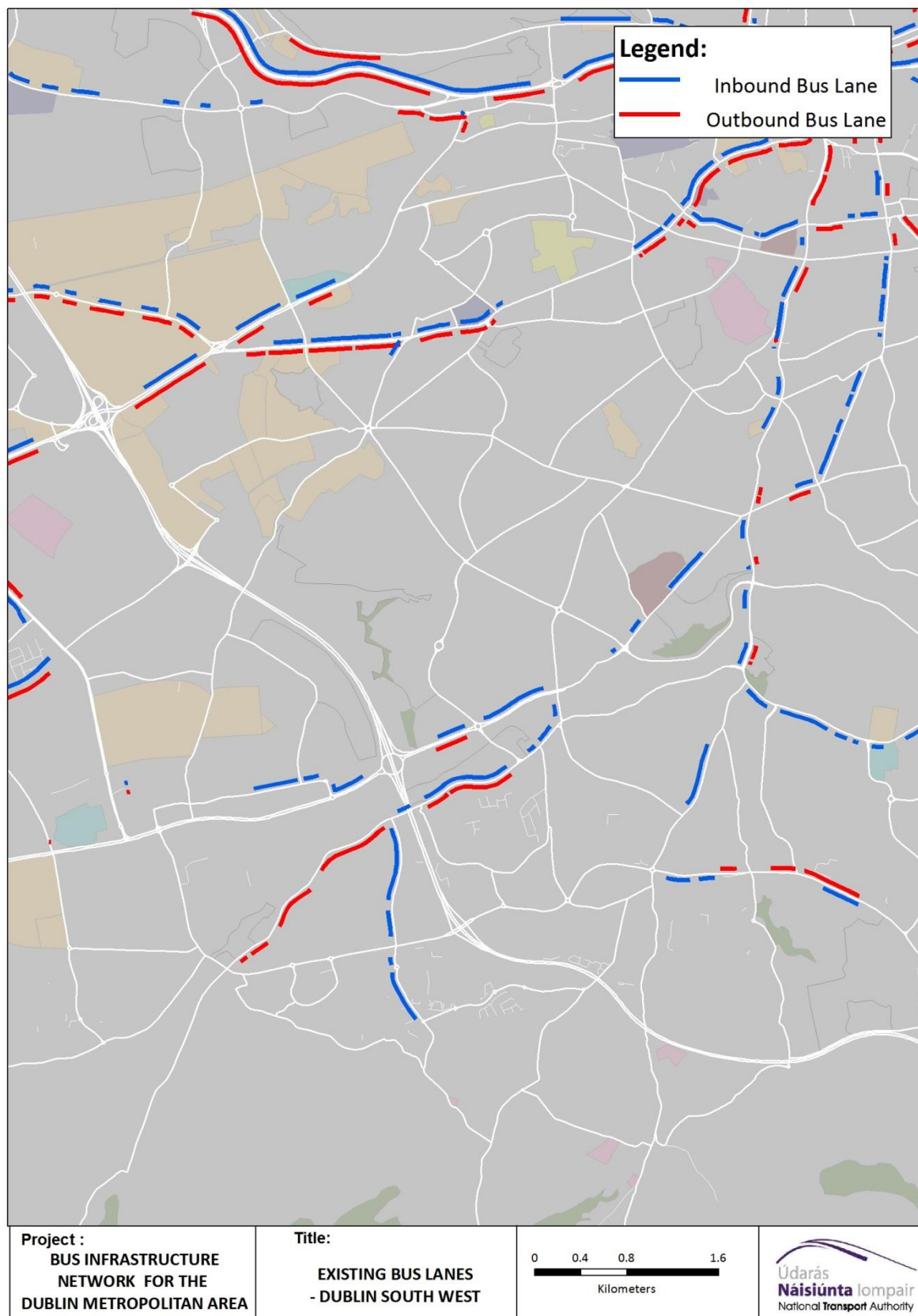
Within Lucan and Clondalkin themselves there is an extensive network of bus lanes. The Fonthill Road southbound has substantially continuous provision from Coldcut Road to the N7, but sporadic stretches northbound. The Outer Ring Road has a continuous bus lane all the way from the N81 in West Tallaght to the N4 in Lucan. Continuous bus lanes in both directions are present on the Adamstown link road as far as Fonthill Road. There is also a small stretch of bus lane on the Newcastle Road south of Lucan Shopping Centre in both directions.

### 4.7.2 Evaluation

Overall, there is a high quality, extensive orbital and radial bus infrastructure network in West Dublin, with long stretches of inbound and outbound bus lanes on the main distributor roads. There are some notable gaps in bus network provision in Clondalkin Village and Liffey Valley. Outside the main distributor roads (Outer Ring Road, Fonthill Road), there is almost no bus lane provision.



Figure 4.6 – Existing Bus Infrastructure – Dublin South West





## 4.8 South West Dublin

### 4.8.1 Description

In the Tallaght area, there is a substantially continuous inbound bus lane from the Outer Ring Road to Belgard Road along Katherine Tynan Road and a short stretch outbound. There is no comprehensive bus lane provision from Tallaght to Dublin city centre, with limited provision on the N81 through Templeogue, as far as Rathgar, where there is substantially continuous provision of inbound inbound through Rathmines. There is very little outbound provision.

Along the Firhouse Road, there are significant lengths of outbound bus lanes and between the M50 and Old Bridge Road, there is good inbound bus priority. There are long stretches of inbound bus lanes along Ballycullen Road, Tallaght town centre, Nutgrove Avenue and through Harold's Cross. There is also inbound and outbound bus infrastructure on Taylors Lane/ Grange Road.

Within Tallaght town centre, there is a bus gate near the bus terminus to the west of the shopping centre and bus only route connecting the Square to Tallaght Village.

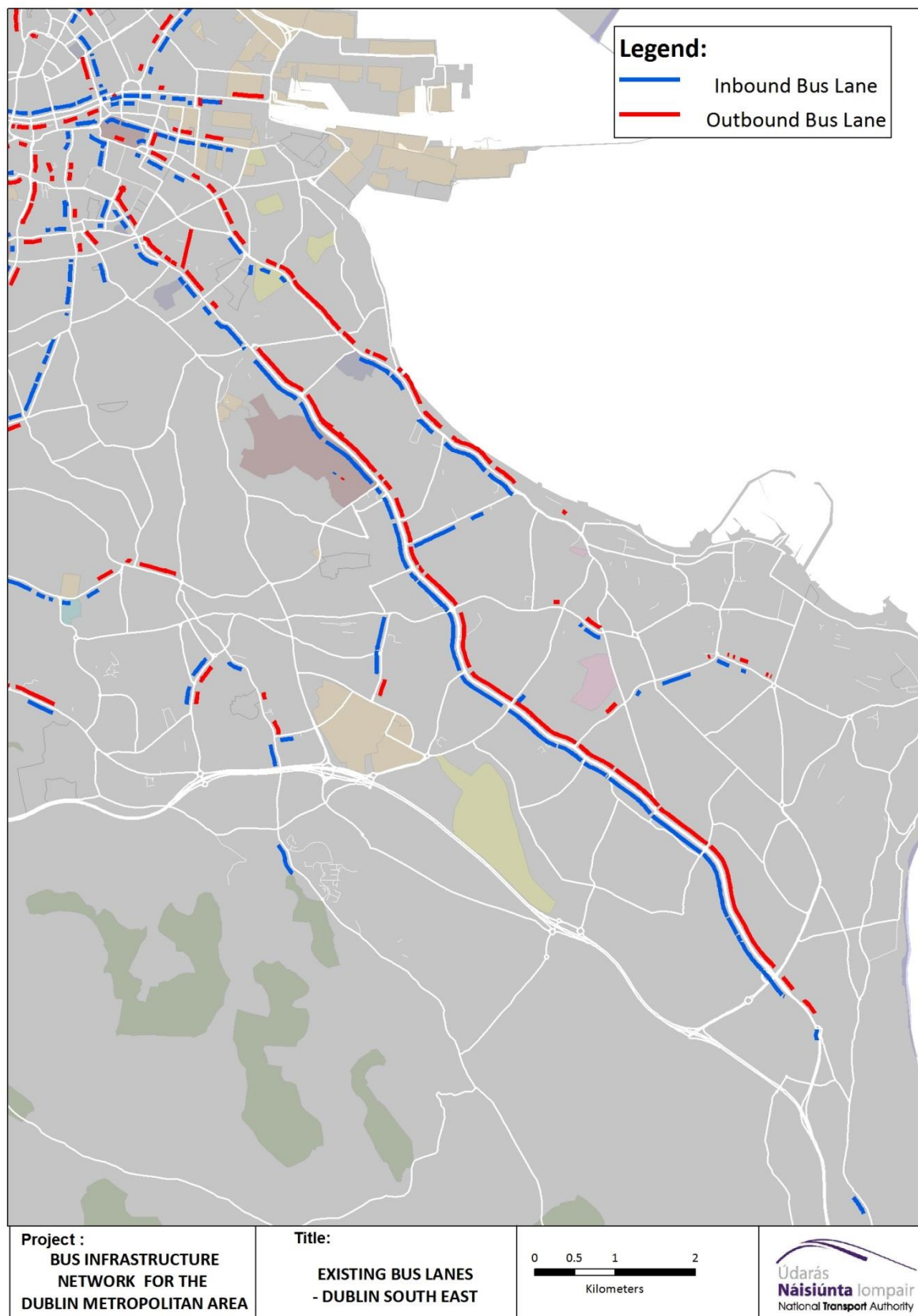
### 4.8.2 Evaluation

The bus infrastructure network in the south west of Dublin is sporadic and disjointed. There is reasonable inbound priority through Templeogue, Rathmines and Harolds Cross. The outbound bus priority is very limited in these areas and there are only short sections of outbound bus priority. There are large areas of south west Dublin that do not have any bus infrastructure including areas south of Crumlin, Walkinstown, Greenhills and West Tallaght.

There is limited orbital bus infrastructure, including Taylors Lane/ Grange Road and in the environs of the Nutgrove Shopping Centre.



Figure 4.7 – Existing Bus Infrastructure – Dublin South East





## 4.9 South East Dublin

### 4.9.1 Description

There is a continuous bus lane northbound and southbound along the N11 from St. Stephen's Green to Shankill, with only one significant outbound gap to the south of Donnybrook. There is also some bus lane provision along Waterloo Road outbound, Upper Kilmacud Road in both directions, for a short stretch along the Monkstown Ring Road and along Kill Lane, Kill Avenue and Glenageary Road Upper.

On the Rock Road, there is a substantially continuous outbound bus lane from Merrion Square to Blackrock. Inbound there is a significant gap along the Merrion Road and along Northumberland Road. There is also a bus lane westbound at the N11 end of Mount Merrion Avenue

There are also stretches of bus lanes along Churchtown Road, Wyckham Way, Sandyford Road south of Dundrum and Kilmacud Road Lower.

### 4.9.2 Evaluation

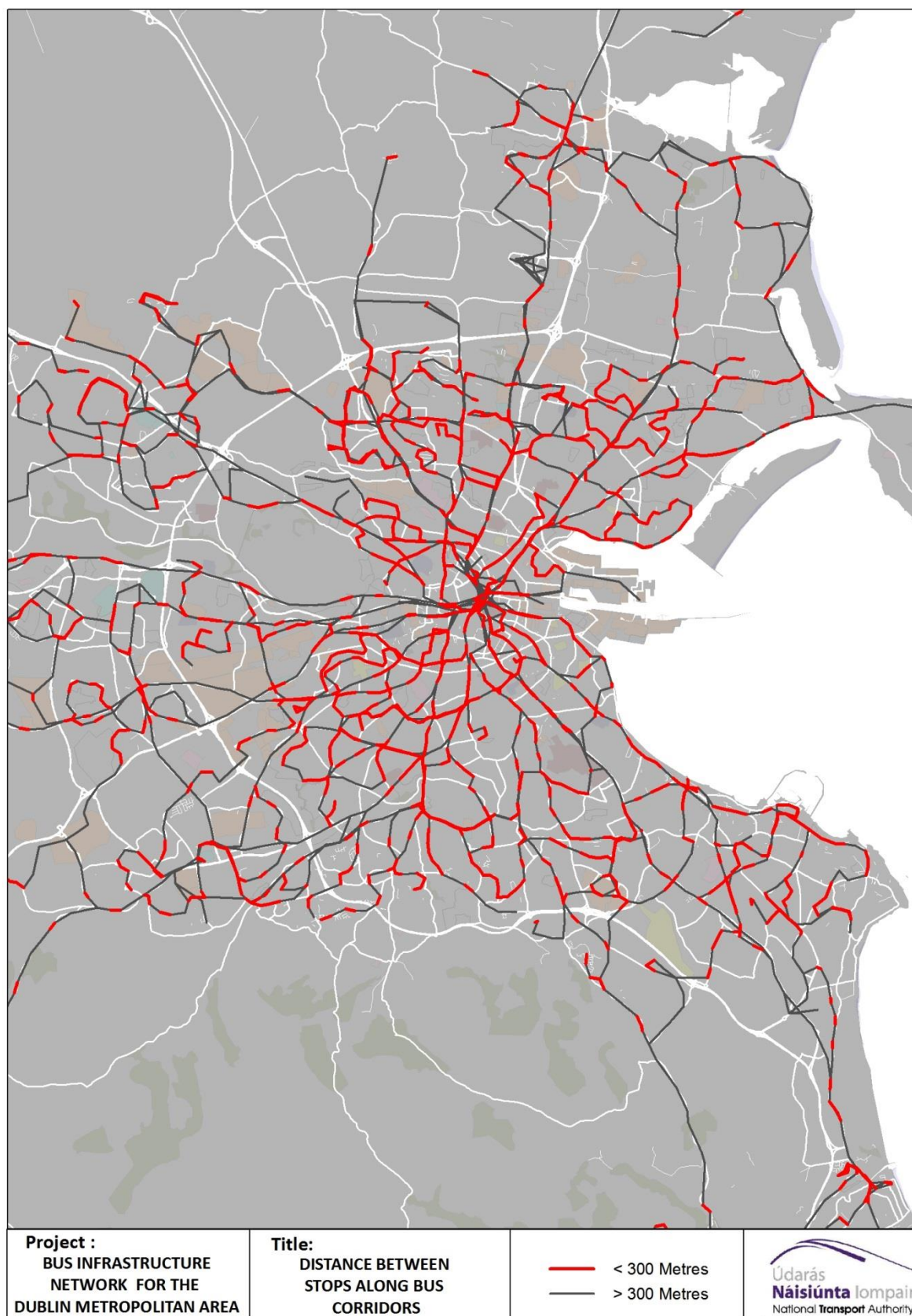
There are two main bus corridors in the south east of Dublin. There is high quality inbound and outbound bus infrastructure on much of the N11. While there are small gaps in bus infrastructure provision, it represents the longest and most complete bus corridor in the Dublin Metropolitan Area.

On the Rock Road and Merrion Road, there are long sections of outbound bus lanes and shorter sections of inbound bus lanes. Beyond Blackrock Village, there is almost no bus infrastructure along this corridor.

Apart from sections in Dundrum, Sandyford and Glenageary, there is minimal bus infrastructure outside of the two corridors described above in South Dublin. There is also very limited orbital bus infrastructure, Mount Merrion road and the Monkstown Ring Road being the exception.

## 4.10 Bus Stops Distances

The distances between bus stops influence the efficiency of the bus network. In general, the lower the distances between stops along a corridor, the higher the delay that is incurred for buses. This delay is caused through acceleration and deceleration and delays associated with pulling in and out of bus stops. Much of the literature on bus stop spacing recommends a distance of between 300 and 500m between stops in suburban areas is recommended. In order to calculate the distances between bus stops in the Dublin Metropolitan Area, data was extracted from DIVA which has information on the location of stops in the bus network. The distances calculated were based on a direct line between bus stops. It needs to be noted that the distances within the city centre are typically shorter because of multiple bus stops serving different bus routes located proximate to each other. Below is a map of bus stops distances in the Metropolitan Area. For the purposes of this project and to highlight the issues with short bus stop gaps, the bus stop distance range is 0-300 metres and 300+.

**Figure 4.8 – Distances between bus stops – Metropolitan Area**



#### 4.11 Bus Speeds Evaluation

Below is a concise evaluation of average inbound bus speeds on a sample of corridors in the Dublin Metropolitan Area. The objective of this is to highlight the variation in speeds on certain corridors and to illustrate the link between good bus priority and bus journey speeds and reliability. This assessment is not meant to be a comprehensive analysis of all bus routes operating in the Dublin Metropolitan Area.

As can be seen below, there is significant variation in bus journey speeds across the bus network. There are bus corridors where the average speed is high, such as Lucan. However, there are a small number of bus routes which demonstrate very low average bus speeds, such as the Rathfarnham corridor.

<b>Bus Corridor Sample Inbound Speeds 2012- 2013</b>		
<b>Corridor</b>	<b>Bus Speeds (km/h) AM Peak</b>	
	<b>2012</b>	<b>2013</b>
Blanchardstown	12.3	11.9
Finglas	11.7	11.5
Lucan	23.1	22.6
Malahide	12.3	13.5
North Clondalkin	11.9	10.5
Rathfarnham	9.3	9.0
Stillorgan	14.0	13.9
Swords	16.4	15.6
Tallaght	12.1	11.9
<b>Average</b>	<b>13.7</b>	<b>13.3</b>

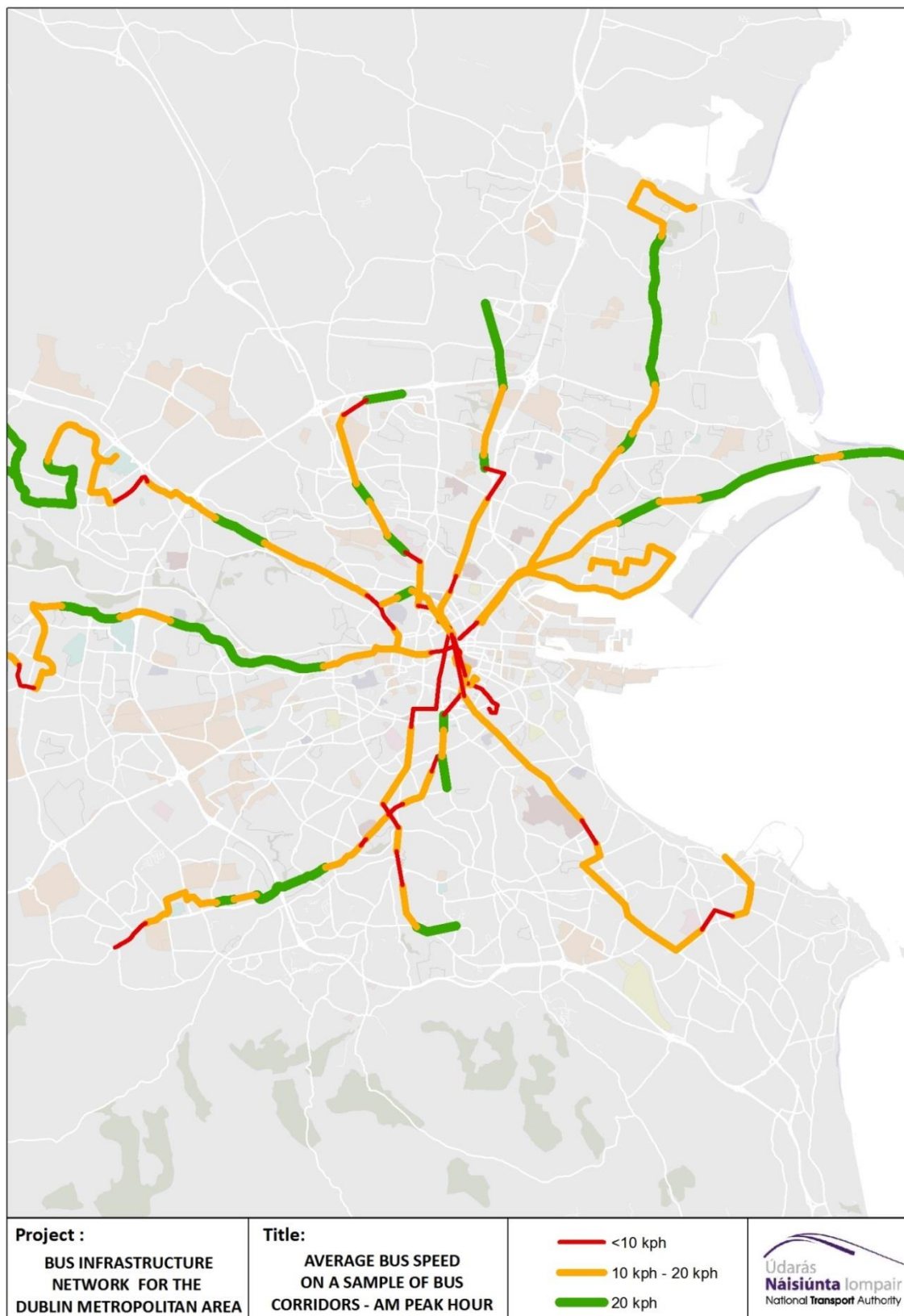
These section times for these routes have been mapped below. This highlights the variation in journey speeds across a sample of the bus network. In general, the closer the corridor gets to the city centre, the slower the average speed of bus routes. In particular, there is significant reduction in average speeds in certain parts of the bus network in the central city centre area. There are a number of reasons for this including the following:

- Delays due to boarding and alighting in the city centre;
- Convergence of bus routes on key routes, such as Westmoreland Street/ O'Connell Street, resulting in bus congestion and turbulence around city centre stops;
- Delays due to buses queuing to access bus stops in the city centre;
- Delays due to the movement of other vehicles, such as loading vehicles, taxis, cyclists etc.
- Delays on parts of the city centre bus network, where general traffic is not restricted and congestion is an issue. This is particularly prevalent on the peripheral road network approaching the city centre; and
- Traffic signal delays, including Luas signalling.



There are also hotspots where there are constraints in the road network and limited bus priority constructed. This includes areas such as Terenure and Deansgrange.

**Figure 4.9 – Average Bus Speed – Metropolitan Area - Inbound**





#### 4.12 Overall Evaluation

Overall, there is a large variation in bus infrastructure in the Dublin Metropolitan Area. The issues are listed as follows:

- Large differences in bus infrastructure provision on bus corridors. There is high quality bus priority on long sections of certain bus corridors. On other corridors, there limited or no bus priority measures;
- On the most complete bus corridors, such as the N11 and Malahide Road, there are small gaps in bus infrastructure that impacts on the efficiency, reliability and speed of services operating on these corridors;
- On the bus corridors where there is no or limited bus priority, bus is subject to significant delay. This includes corridors such as the Navan Road (outbound) and the Greenhills Road;
- There are a number of roads with excellent bus infrastructure where limited or no buses operate. This arises particularly in the west of the city, in Lucan and Clondalkin;
- There are bus corridors where there is limited need for new infrastructure because there are no significant issues with congestion;
- Within the city centre, there is bus priority through the centre of the city. Bus gates and bus only routes allow for buses to operate through the heart of the city with limited congestion. However, there are sections of bus corridors on the periphery of the city centre which have gaps in provision or no bus priority. This undermines the operation of bus services accessing to and exiting from city centre;
- Notwithstanding the provision of bus priority infrastructure in the city centre, there are significant delays in the city centre due to a variety of reasons discussed above; and
- Throughout the bus network, there are short distances between stops (<300) which undermine the performance and efficiency of the bus services operating along bus corridors.



## 5. Bus Trip – Demand Analysis

This section sets out the methodology for the broad demand assessment of current and future bus patronage patterns in the Dublin Metropolitan Area.

### 5.1 Methodology

As this report focusses on the core bus network, it is necessary to only concentrate on the corridors with the greatest demand. This is measured by reviewing the different types of trips that occur on the network within the Dublin Metropolitan Area. This includes all employment, retail, educational and leisure trips. In order to extract these trips, the demand data was extracted for 2011 for the 7am to 10am time period. This produced a set of demand matrices. These were then “flooded” onto the existing road network and the demand follows the shortest path between origins and destinations.

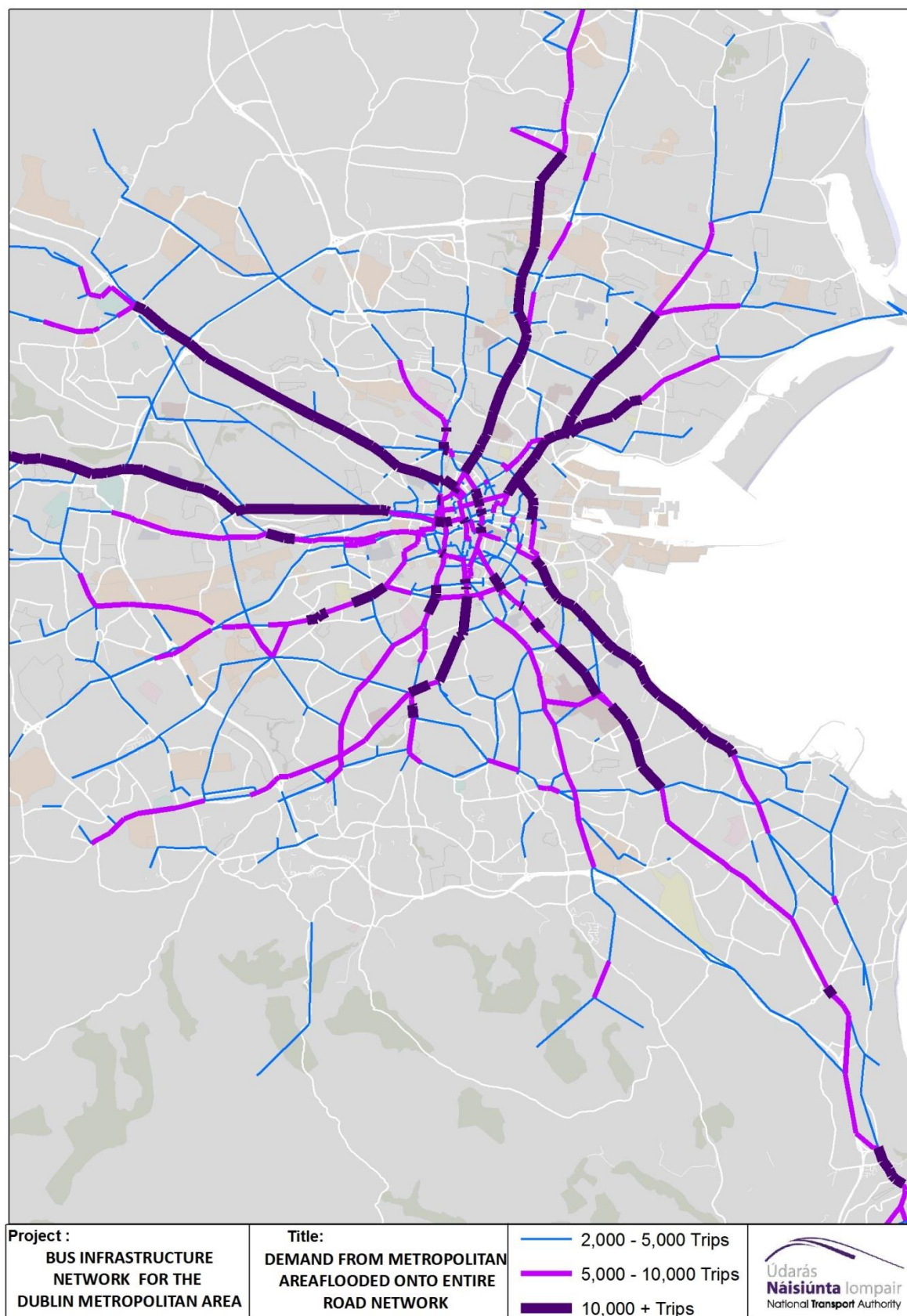
This allows the visualisation of all trips on the road network and facilitates a very broad estimation of which corridors have the largest potential demand. It also allows the broad prioritisation of different routes and the identification of core public transport corridors.

### 5.2 Outcome

Within the Dublin Metropolitan Area, the corridors with greater than 5,000 trips (both directions) in the AM 3 hour peak period are as follows (in no particular order):

- Northern Dart Line/ Raheny/ Clontarf;
- Malahide Road;
- Swords Road/ M1;
- Finglas Road;
- Blanchardstown Road/ M3;
- Lucan Road/ N4;
- Ballyfermot/ Kilmainham;
- Cork Street/ Clondalkin;
- Harolds Cross/ Terenure/ Tallaght;
- Rathmines/ Terenure;
- Luas Green Line/ Clonskeagh Road;
- N11; and
- Southern Dart Line/Rock Road.

These corridors form the basis for the core public transport corridors, including heavy rail, light rail, BRT and bus modes.

**Figure 5.1 – Metropolitan demand flooded onto the road network**

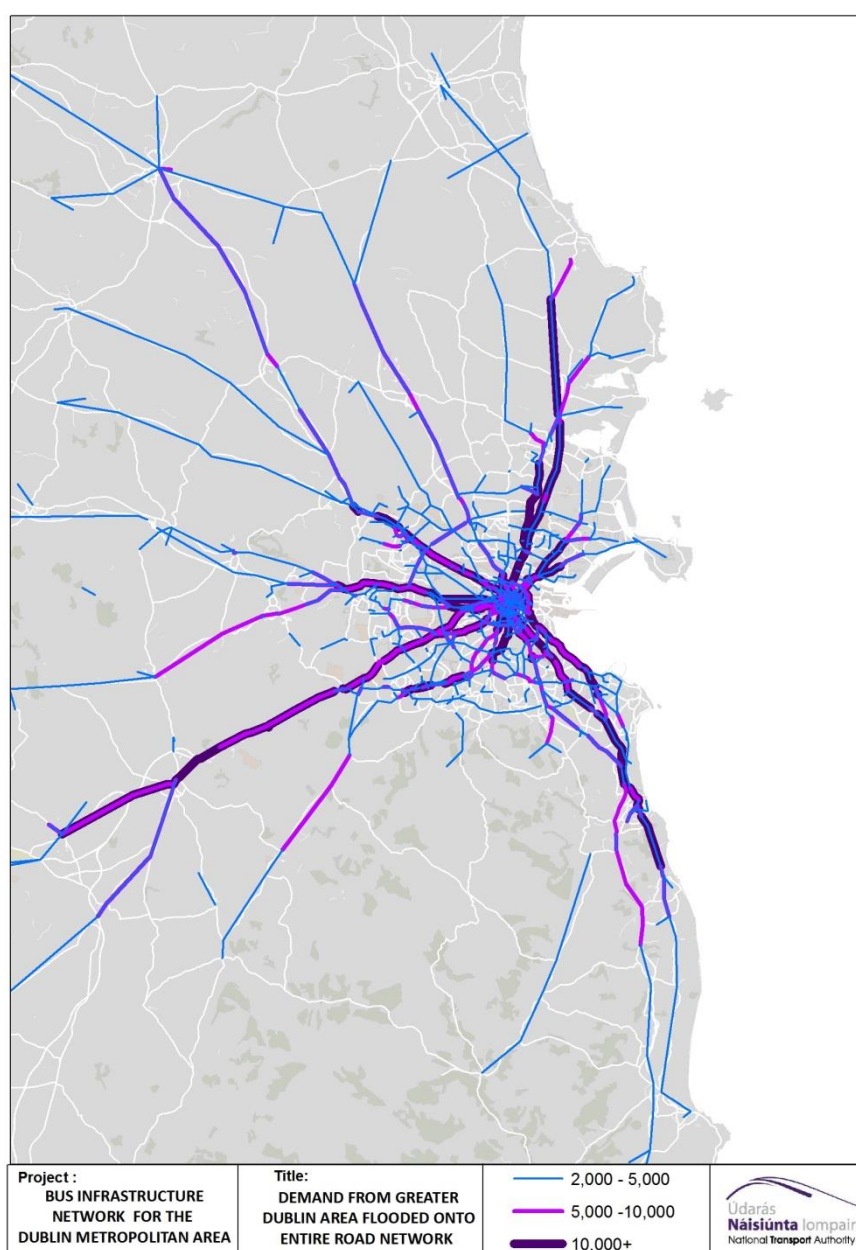


Outside the Dublin Metropolitan Area, the corridors with the largest number of trips from the Greater Dublin Area are the following:

- M1 Corridor
- M4 Corridor
- M7/N7 Corridor
- M11/N11 corridor
- M2 Corridor
- M3 Corridor

These corridors form the basis for the core regional public transport corridors, including heavy rail and bus modes.

**Figure 5.2 – Demand flooded onto the road network**





In addition, the Authority has identified demand between the Metropolitan Consolidation Towns of Dun Laoghaire, Dundrum, Tallaght, Clondalkin, Lucan and Blanchardstown. Demand between Blanchardstown and the north inner city is at a lower scale.

Of the corridors above, the following have associations with rail or proposed BRT routes. These include:

- Northern Dart Line/ Raheny/ Clontarf – Northern Dart Line;
- Malahide Road – Proposed Bus Rapid Transit;
- Swords Road/ M1 – Proposed Bus Rapid Transit;
- Blanchardstown Road/ M3 - Proposed Bus Rapid Transit/ Maynooth Line;
- Harolds Cross/ Terenure/ Tallaght - Proposed Bus Rapid Transit;
- Luas Green Line/ Clonskeagh Road – Light Rail Line;
- N11 – Proposed Bus Rapid Transit (Partial);
- Southern Dart Line/Rock Road – Southern Dart Line;
- M11/N11 corridor – Southern Rail Corridor;
- M3 Corridor – Dunboyne Rail Corridor (Partial); and
- Clondalkin (north) – Kildare Line

Of the corridors above, the following do not have, or have weak, associations with rail or BRT routes. These include:

- Lucan Road/ N4;
- Cork Street/ N7;
- Rathmines/ Terenure;
- Ballyfermot/ Kilmainham;
- Finglas/ N2;
- Ballymun/ R108;
- Tallaght – Dundrum;
- Clondalkin South;
- M1 Corridor;
- M4 Corridor;
- M2 Corridor; and
- Orbital Bus Routes.

These corridors form the basis of the core bus network outside of the rail or BRT corridors.



## 6. Existing Bus Supply Analysis

### 6.1 Introduction

The assessment of existing bus routes is key element for determining the future core bus infrastructure network for the Dublin Metropolitan Area. In order to assess the existing network, there is a need to extract data for the main bus routes operating throughout the Dublin Metropolitan Area. This assessment will be taken at a very broad level and will not focus on individual bus routes.

When deciding upon the designation core radial corridors, it was necessary to consider where the most frequent corridors are currently located. This is a critical consideration, as it is necessary to focus investment on corridors with the highest public transport movement. This should ensure that there would be a high return for investment, by reducing costs for bus operators and increasing revenue on each corridor by providing an improved public transport offer and reducing the overall cost of travel, particularly in comparison to travelling by car. It will also ensure that in locations where there is low amount of bus activity, that investment in bus infrastructure is deprioritised.

### 6.2 Methodology

Data was extracted from the DIVA database which contains route data for Dublin Bus services operating in the Dublin Metropolitan Area. This data contains the timetable data for each route. The average amount of buses operating at each stop during the three hour am peak period was extracted. Each adjacent stop was linked along a corridor and the value at the stop was applied to the route corridor. This created a links with the amount of busses operating along particular corridor.

### 6.3 Analysis

In the Dublin Metropolitan Area, the corridors with the most Dublin Bus services operating on them (average 12 or more in an hour) are the following:

- Malahide Road;
- Swords Road;
- Ballymun Road;
- Finglas Road;
- Navan Road/ N3;
- N4 Road;
- Ballyfermot Road;
- Cork Street/ Crumlin Road;
- Harolds Cross/ Templeogue Road;
- N11; and
- Kill Avenue/ Mountdown Road Lower/ York Road.

There are a number of other radial bus corridors which have a significant amount of buses operating on them (5-11 per hour). There are listed as follows:



- Clontarf Road;
- Howth Road;
- N7;
- Rock Road; and
- Ringsend Road.

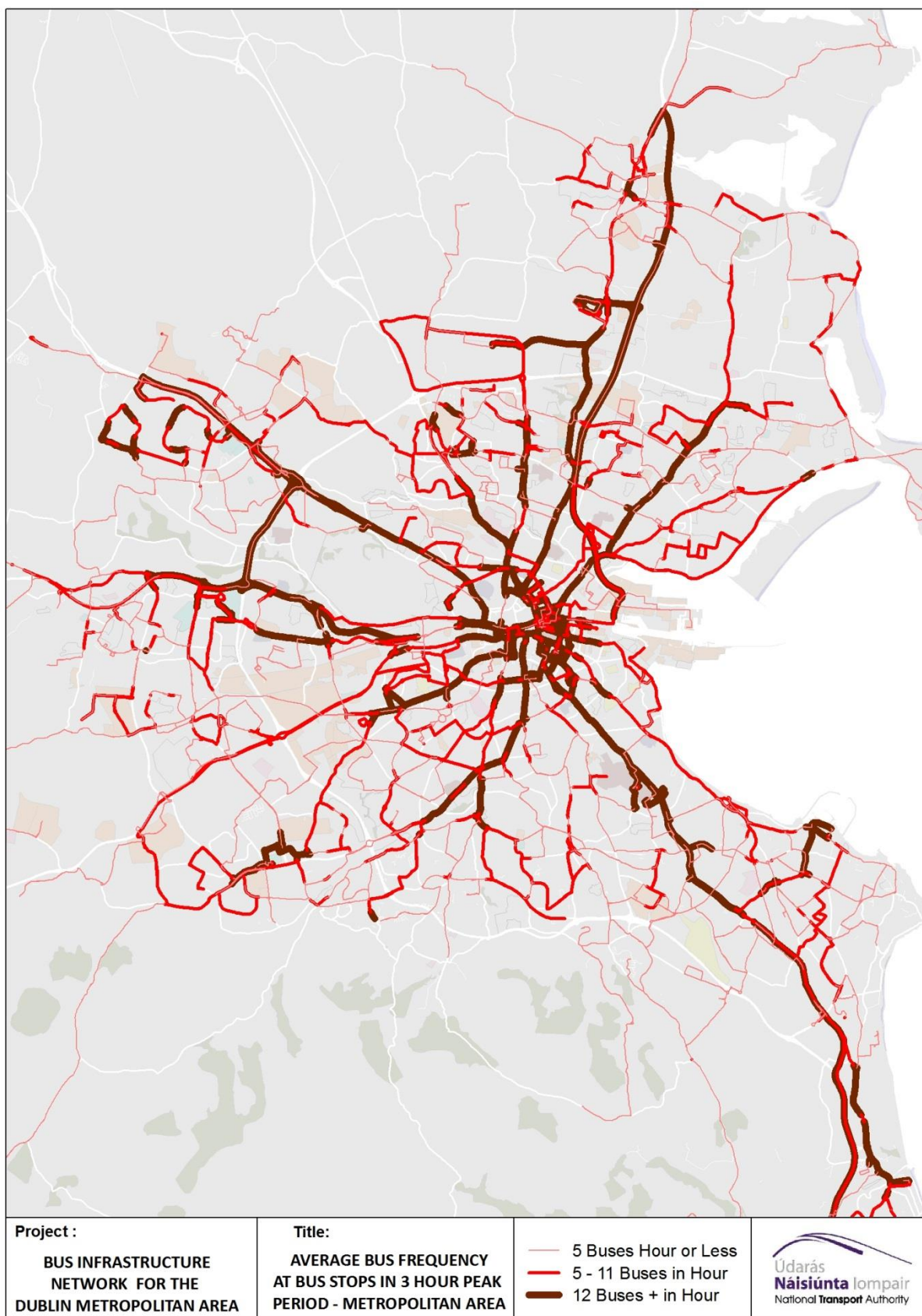
Currently, there are no orbital route corridors that operate at a 5 buses an hour or more.

In relation to regional bus routes, there are six main corridors where most regional buses operate on. These are listed as follows:

- M1;
- M2/ N2;
- M3/ N3;
- M4/ N4;
- M7/N7; and
- M11/N11.

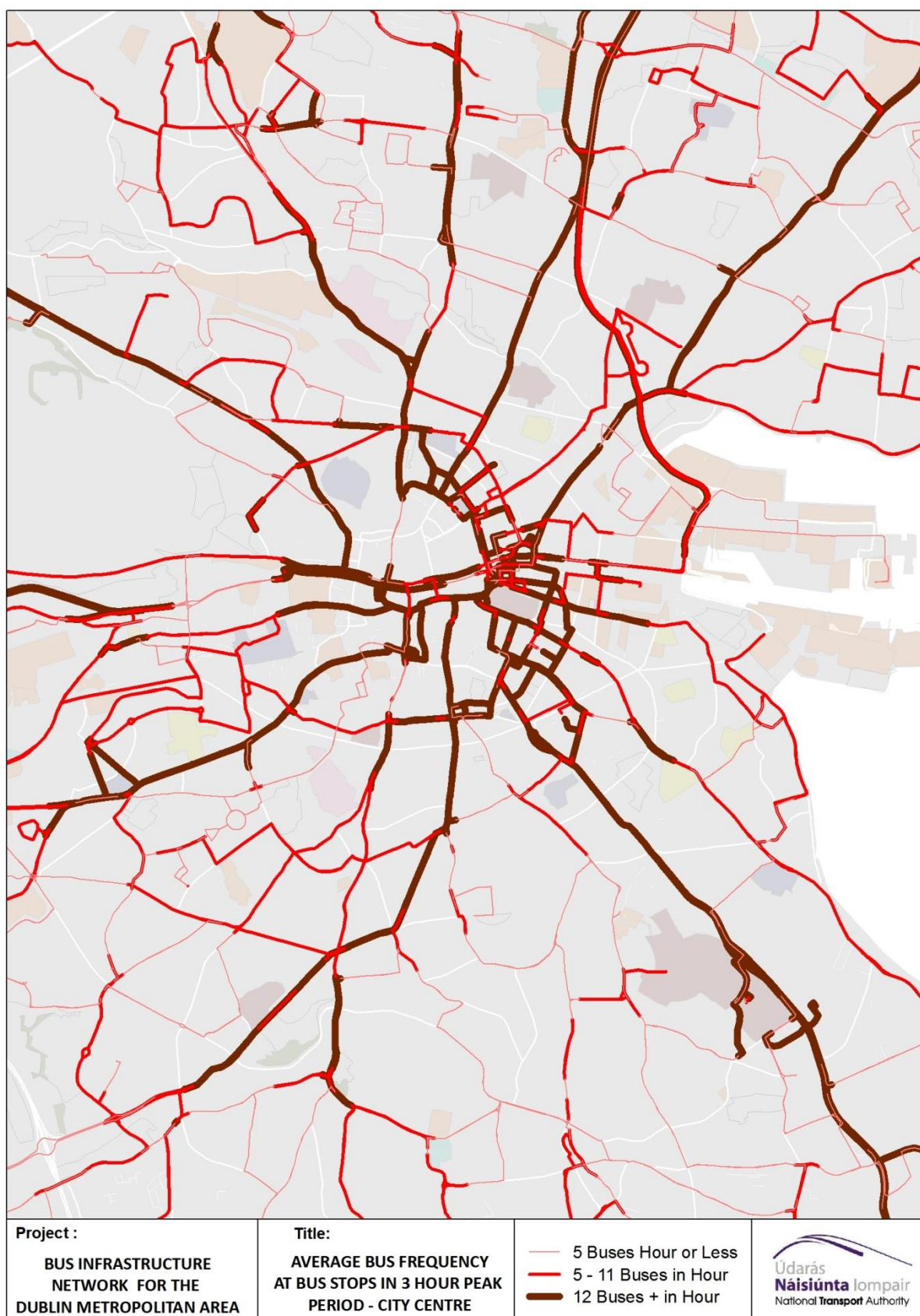


Figure 6.1 – Dublin Bus Frequency in the Dublin Metropolitan Area





**Figure 6.2 – Dublin Bus Frequency in the Dublin Metropolitan Area (City Centre)**





## 7. Proposed Core Bus Routes

### 7.1 Proposal

It was stated earlier that the purpose of this report is to identify the core bus infrastructure network in the Dublin Metropolitan Area, define an expected service level that will operate on this network to optimise its benefit and to maximise the efficiency of bus services operating on the core bus infrastructure network. It was further stated that the core bus infrastructure network is defined as a set of primary orbital and radial bus corridors which operate between the larger settlement centres and destinations in the Dublin Metropolitan Area. To identify the core bus network, this report looked at the following areas:

- 1) Policy Analysis / Network Proposals;
- 2) Existing bus infrastructure/ Issues;
- 3) Metropolitan Area Demand Analysis; and
- 4) Metropolitan Area Supply Analysis.

The main principles behind the core bus network are listed as follows. These have been extracted from NTA policy documents and bus studies mentioned earlier in this report:

1. Direct and coherent bus corridors;
2. Facilitates interchange with other public transport services;
3. Complements the proposed network structure;
4. Serve areas of significant demand;
5. Have potential to provide reliable and timely bus services;
6. Potential space/ traffic management measures to allow for significant bus priority;
7. Operate between larger RPGs centres in the Greater Dublin Area;
8. Integrate with proposals in the Dublin City Centre Transport Assessment Study;
9. Consider existing and planned bus infrastructure;
10. Consider existing and planned bus services;
11. Integrate with existing public transport proposals (BRT & Luas);
12. Integrate with other transport modes (Rail/cycling/ car/ walking); and
13. Allow for targeted, prioritised location for future investment, by restricting the amount of corridors that require investment.

Taking all the issues above into account, 16 bus core radial bus corridors were identified. These are listed as follows:

- M1/ M50 - Dublin Port Tunnel – North Wall;
  - Links the M50 direct to the City Centre;
  - Large demand along this corridor;
  - Facilitates regional bus route, intercity and city bus services;
  - Large volumes of private coach and scheduled long distance services currently use the this route and;
  - Port Tunnel facilitates direct, quick and reliable access to the city centre.



- Clontarf – East Wall – North Wall;
  - Serves two areas of significant demand proximate to the city centre, East Wall and Clontarf; and
  - Fills gap in geographical gap in bus network.
- Clongriffin – City Centre (BRT);
  - Identified BRT alignment along Malahide Road;
  - Serves significant demand along this entire corridor; and
  - High volume of scheduled bus services operating along this corridor.
- Swords – City Centre (BRT);
  - Identified BRT alignment along Malahide Road;
  - Serves significant demand along this entire corridor;
  - Connects with significant destinations, including the Airport and large centres of education; and
  - High volume of scheduled bus services operating along this corridor.
- Ballymun – City Centre;
  - Serves significant demand along this entire corridor;
  - Connects with significant destinations, including Ballymun town centre and DCU; and
  - High volume of scheduled bus services operating along this corridor.
- Finglas – City Centre;
  - Serves significant demand along this entire corridor;
  - Facilitates regional bus route, intercity and city bus services;
  - Connects with significant destinations, including Finglas town centre and Phibsborough town centre; and
  - High volume of scheduled bus services operating along this corridor.
- Blanchardstown – City Centre (BRT);
  - Identified BRT alignment along Navan Road;
  - Serves significant demand along this entire corridor;
  - Connects with significant destinations, including Blanchardstown, Connolly Hospital and Mater Hospital; and
  - High volume of scheduled bus services operating along this corridor.
- Lucan – City Centre;
  - Serves significant demand along this entire corridor;
  - Facilitates regional bus route, intercity and city bus services;
  - Connects with significant destinations, including Liffey Valley town centre, Lucan and Heuston Station; and
  - High volume of scheduled bus services operating along this corridor.
- Liffey Valley – Ballyfermot - City Centre;
  - Serves significant demand along this entire corridor;



- Connects with significant destinations, including Liffey Valley town centre, Ballyfermot town centre, St James Hospital and Heuston Station; and
  - High volume of scheduled bus services operating along this corridor.
- N7/Clondalkin – City Centre;
  - Serves significant demand along this entire corridor;
  - Facilitates regional bus route, intercity and city bus services;
  - Connects with significant destinations, including Liffey Valley town centre, Ballyfermot town centre, Crumlin and Heuston Station; and
  - High volume of scheduled bus services operating along this corridor.
- Tallaght – City Centre (via Walkinstown);
  - Serves significant demand along this entire corridor;
  - Connects with significant destinations, including Tallaght town centre, Crumlin Hospital; and
  - High volume of scheduled bus services operating along this corridor.
- Tallaght – City Centre (via Templeogue) (Part BRT);
  - Route part identified as BRT route;
  - Serves significant demand along this entire corridor;
  - High volume of scheduled bus services operating along this corridor.
- Marley Park – Rathmines – City Centre;
  - Serves significant demand along this entire corridor;
  - High volume of scheduled bus services operating along this corridor;
- Bray – City Centre (Part BRT);
  - Route part identified as BRT route;
  - Serves significant demand along this entire corridor;
  - High volume of scheduled bus services operating along this corridor.
  - Facilitates regional bus route, BRT and city bus services
- Dun Laoghaire – City Centre;
  - Serves significant demand along this entire corridor, albeit on a similar catchment to the Dart Line; and
  - High volume of scheduled bus services operating along this corridor.
- Ringsend – City Centre
  - Serves significant demand along this short corridor;
  - Facilitates future growth within the Poolbeg peninsula;

Overall, the length of the core bus network (two-way) is 350 kilometres. There are c.102 kilometres of bus lanes along this core bus network (two-way).

These are mapped below.



Figure 7.1 – Core Radial Bus Corridors – Metropolitan Area

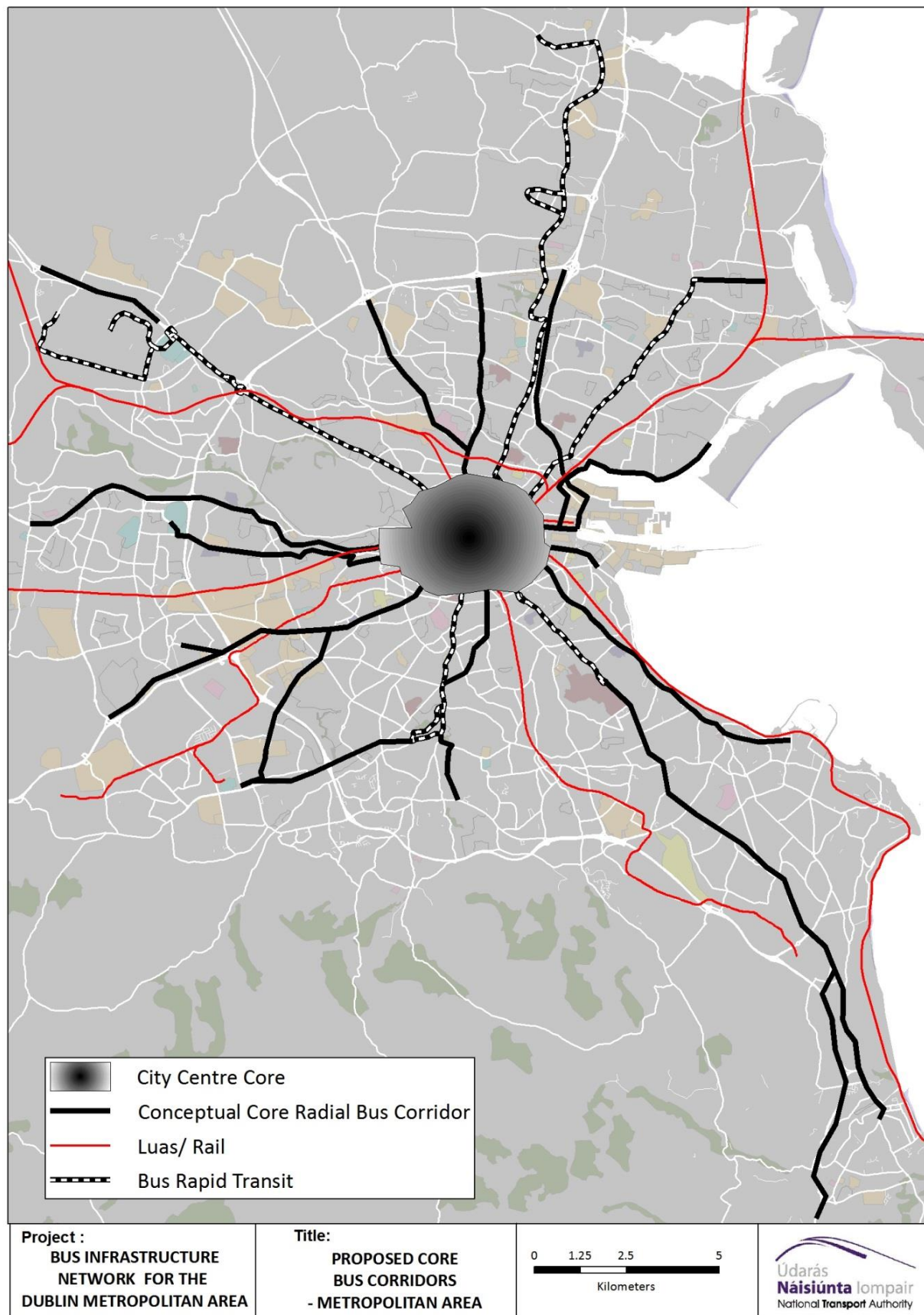
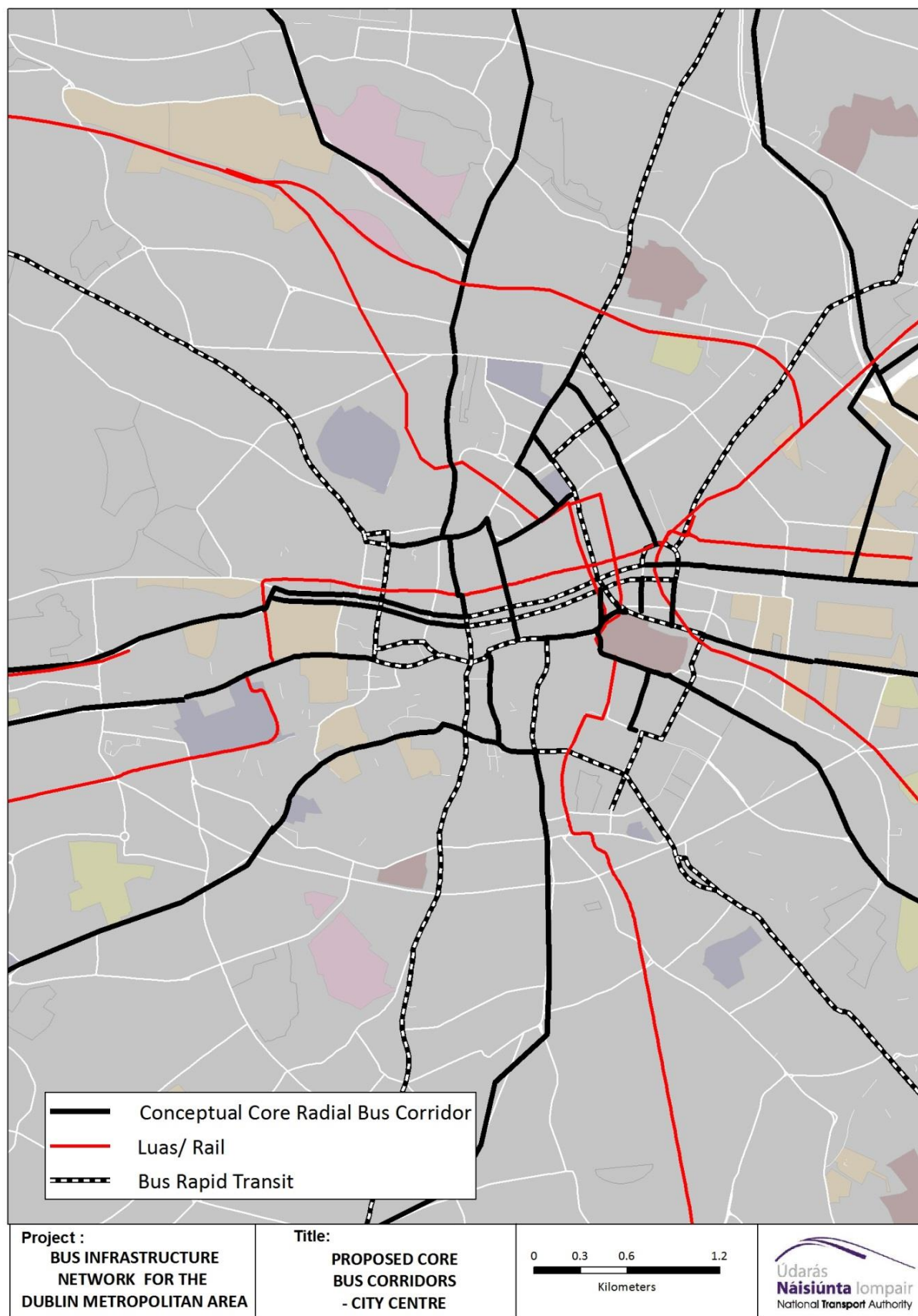




Figure 7.1 – Core Radial Bus Corridors – City Centre Area



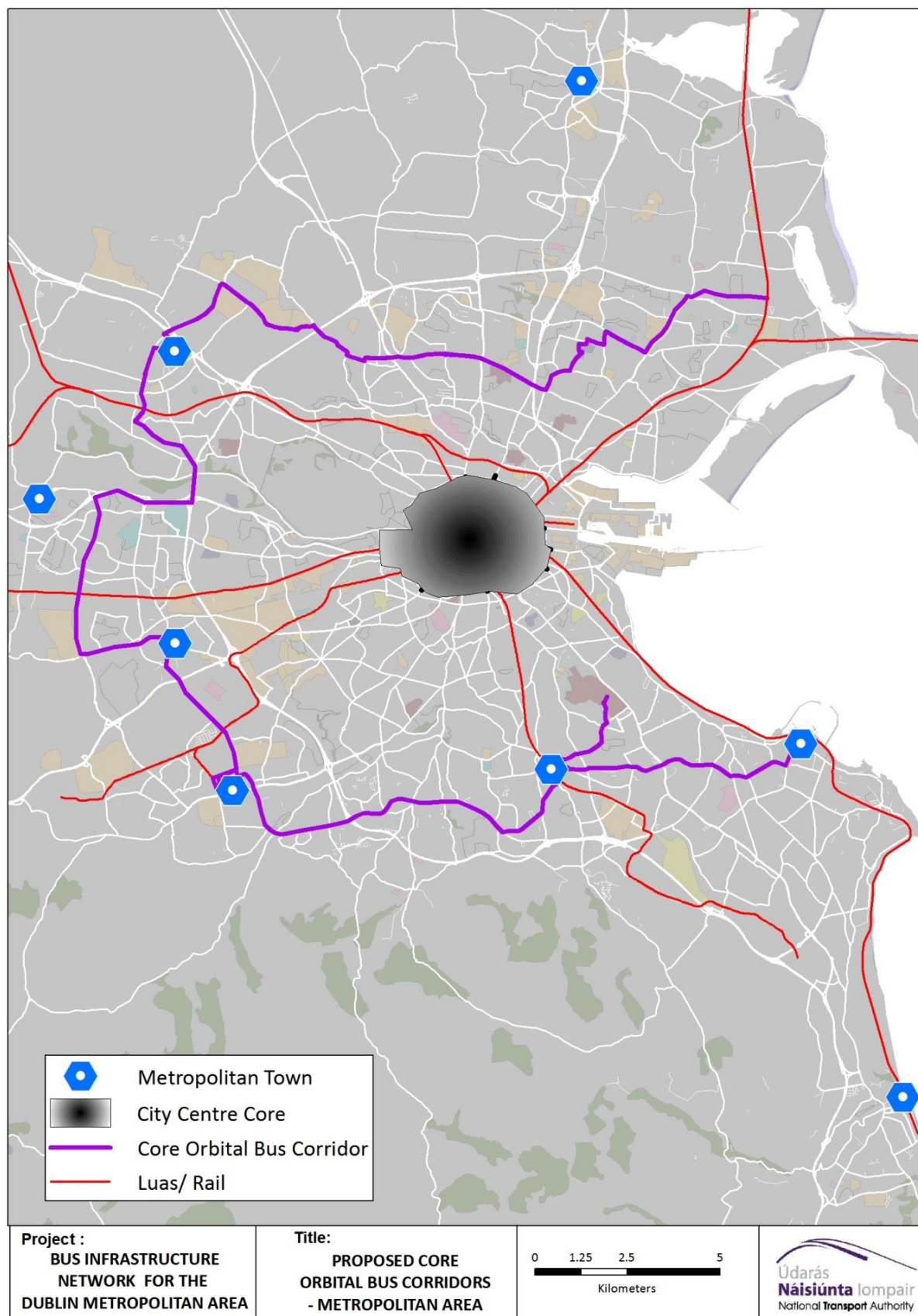


Three orbital routes have been identified. These are listed as follows:

- Clongriffin – DCU – Blanchardstown
  - Serves significant destinations, including Blanchardstown Shopping Centre, Connolly Hospital, Finglas, DCU, Beaumont and Clongriffin;
  - Serves orbital demand along route; and
  - Allows for quicker public transport journeys to other destinations via interchange, such as the Airport to/from the catchment.
- Blanchardstown – Liffey Valley – Clondalkin – Tallaght
  - Serves 4 large retail centres;
  - Services significant level of orbital demand, particularly between Liffey Valley and Tallaght;
  - Allows for quicker public transport journeys to other destinations via interchange, such as the City West/ Intel/ Maynooth College to/from the catchment.
- Tallaght – UCD/ Dun Laoghaire
  - Serves significant destinations, including Tallaght town centre, Dundrum town centre, UCD, Stillorgan and Dun Laoghaire;
  - Services significant level of orbital demand, particularly between Tallaght and Dundrum;



Figure 7.3 – Core Orbital Bus Corridor – Metropolitan Area



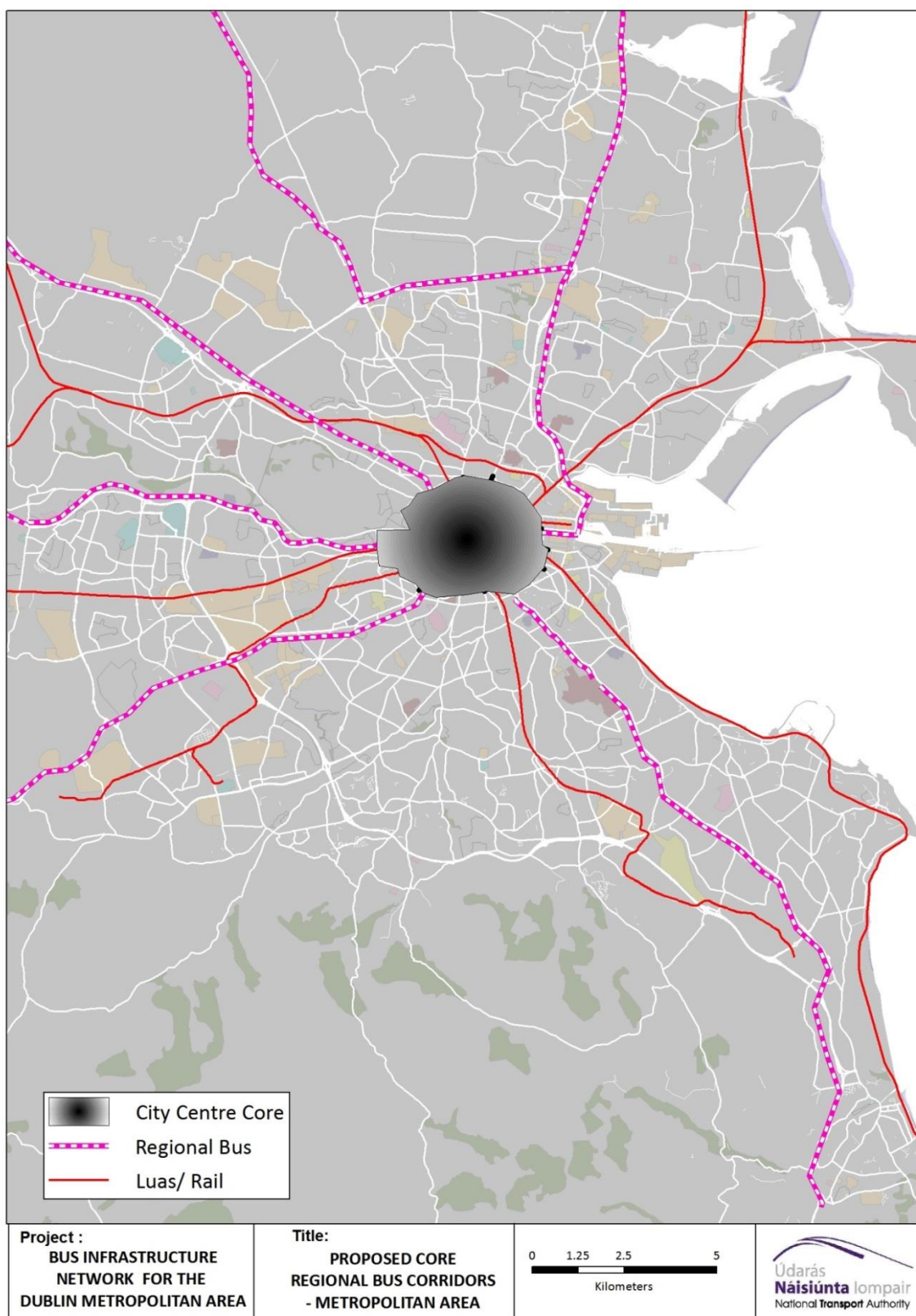


Six regional routes have been identified. These are listed as follows:

- M1, via Port Tunnel
  - Serves long distances bus routes from Belfast, Dundalk, Derry, Monaghan and Drogheda; and
  - Serves other regional bus routes from Balbriggan, Skerries and East Meath.
- M2, via Port Tunnel
  - Serves regional bus from Ashbourne and Slane.
- M3/ N2, via Navan Road
  - Serves regional bus from Cavan, Navan, Trim, Dunshaughlin, Kells; and
  - Serves longer distance bus from Donegal.
- M4/ N4, via Chapelizod Bypass
  - Serves longer distance bus from Galway, Mayo, Sligo and Midlands; and
  - Serves regional bus along M4 corridor.
- M7/ N7, via Long Mile Road
  - Serves longer distance bus from Cork, Limerick, Waterford; and
  - Serves regional bus from Kildare.
- M11/ N11
  - Serves longer distance bus from Wexford; and
  - Serves regional bus from Arklow, Wicklow and N11 corridor.



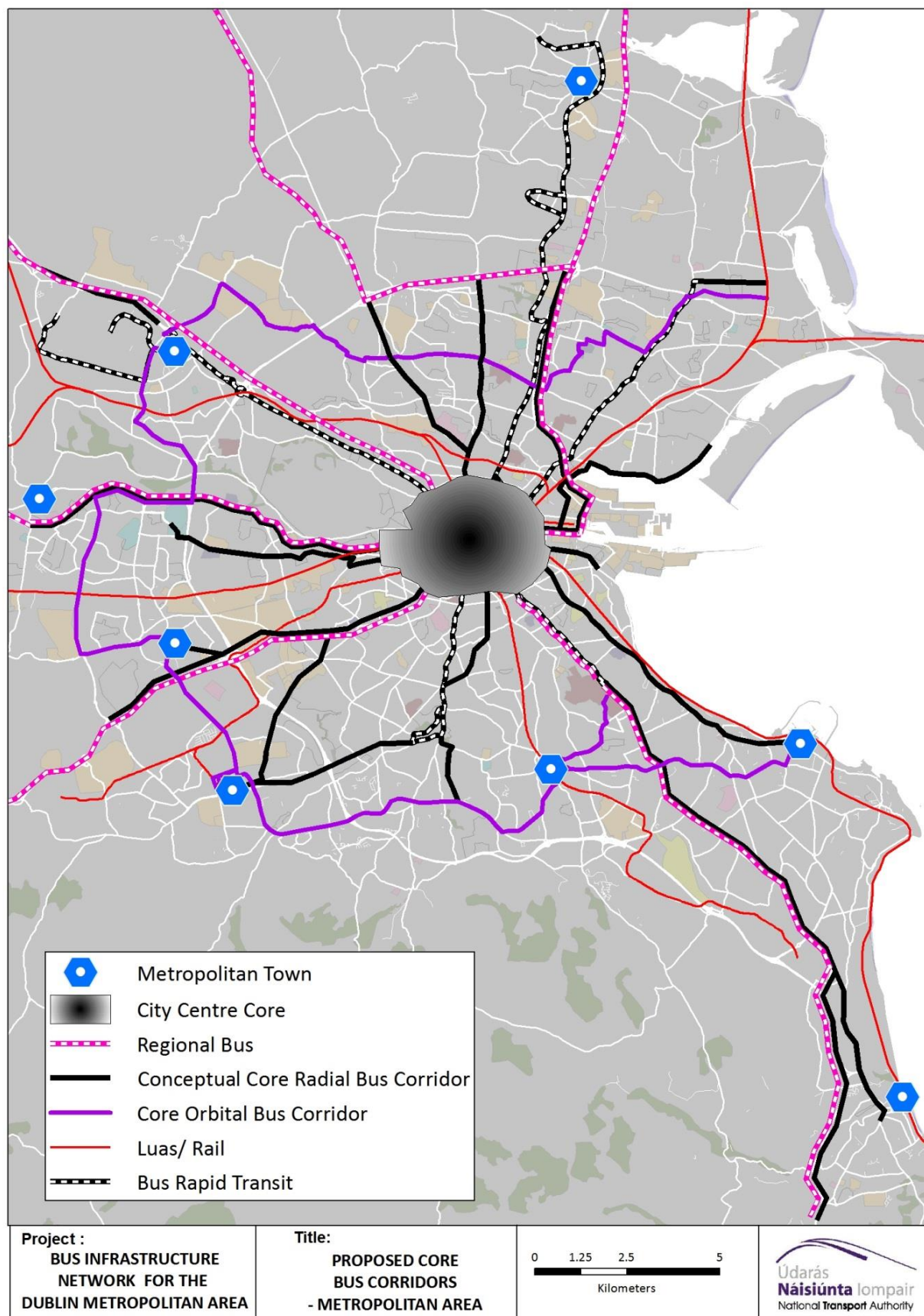
**Figure 7.3 – Core Regional Bus Corridor – Metropolitan Area**



Below is a composite map of the proposed core radial, orbital and regional network in the Dublin Metropolitan Region:



Figure 7.4 - Core Radial, Orbital and Regional Network





## 7.2 Implementation:

The recommendations contained in this report have been incorporated into the Draft Transport Strategy for the Greater Dublin Area. It is intended to implement these recommendations by focusing on how to improve the performance on each of the individual corridors (excluding those where BRT is proposed). Detailed reports with specific local interventions will be done for each corridor, guided by the following principles:

- That the proposed interventions will facilitate average bus speeds along the core network which would confer a significant advantage to the bus over the private car along each route;
- That the proposed interventions will facilitate a frequency of up to 1 bus every 2 minutes at peak hours; and
- That the spacing of stops along the core network will balance the need to maximise access to public transport for those living in the Metropolitan Area, while ensuring that the service itself is sufficiently fast and reliable;