

# Cycle Network Plan



# Draft Greater Dublin Area Cycle Network Plan

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## INTRODUCTION

The National Transport Authority (NTA) commissioned AECOM Roughan & O'Donovan (AECOM-ROD) to prepare a Cycle Network Plan, comprising the Urban Network, Inter-Urban Network and Green Route Network, for each of the seven Local Authority areas comprising the Greater Dublin Area (GDA), being:

- Dublin City Council (DCC)
- South Dublin County Council (SDCC)
- Dun Laoghaire Rathdown County Council (DLRCC)
- Fingal County Council (FCC)
- Meath County Council (MCC)
- Kildare County Council (KCC)
- Wicklow County Council (WCC)

The Brief for the project requires the Cycle Network Plan to identify and determine in a consistent, clear and logical manner the following cycle networks within the GDA:

- The Urban Cycle Network at the Primary, Secondary and Feeder level;
- The Inter-Urban Cycle Network linking the relevant sections of the Urban Network and including the elements of the National Cycle Network within the GDA. It shall also include linkages to key transport locations outside of urban areas such as airports and ports; and
- The Green Route Network being cycle routes developed predominately for tourist, recreational and leisure purposes.

Unlike area-based plans prepared previously by Local Authorities, this Cycle Network Plan is to be consistent across county boundaries such that there is continuity of route networks across these administrative boundaries.

### Context for this Study

The Irish Government, the NTA and various State Agencies are committed to ensuring that cycling as a transport mode is supported, enhanced and exploited, in order to achieve strategic objectives and reach national goals. Current policy is set out in various documents produced by the Department of Transport, Tourism & Sport and its Agencies. However, the National Cycle Policy Framework (NCPF) is the key document that sets out 19 specific objectives, and details the 109 individual but integrated actions, aimed at ensuring that a cycling culture is developed in Ireland to the extent that, by 2020, 10% of all journeys will be by bike. This document proposes a comprehensive package of planning/infrastructure and communication/education measures, and emphasises the need for stakeholder participation and adequate funding of the required initiatives. The NCPF requires that cycle-friendly planning principles be incorporated in all national, regional, local and sub-local plans. These ambitious targets can only be achieved if a much higher proportion of trips by bicycle is undertaken in urban areas, in particular within the GDA, where the use of bicycle for many types of trips is already much more common.

In order to ensure that national resources are applied in an efficient manner that will help in reaching these ambitious targets, the NTA and the Local Authorities within the GDA need to know what bicycle facilities are currently available, where they are missing sections, what is their condition and what improvements are likely to be required. In addition, a strategic cycle network map of the GDA needs to be prepared which will help the NTA in allocating funding towards the implementation of strategically important schemes. Information outlined in this report will allow cycle infrastructure projects to be prioritised in terms of the importance to the strategic network and the likely cycle demand for such a scheme.

## Background

The National Cycle Manual (NCM) defines a cycle network as:

*'a collection of connected routes. Routes are a set of connected links and junctions that follow logical corridors between zones or urban centres. The purpose of the cycle network is to connect the main zones of origin and destination within an urban area and should provide effective through-movement for cyclists. A well-planned cycle network will carry the vast majority of cycle journeys.'*

Urban Cycle Networks are generally presented as a hierarchy of corridors that provide differing levels of importance for cyclists and they are:

- Primary Network: Main cycle arteries that cross the urban area, and carry most cycle traffic;
- Secondary Network: Links between the principal cycle routes and local zones; and
- Feeder:, Connections from zones to the network levels above and/or cycle routes within local zones.

These facilities provide the backbone of cycle infrastructure in the GDA. This report also deals with National and Inter-Urban Cycle Routes which have not been addressed in previous studies.

The National Cycle Manual outlines a seven step method of designing a Cycle Network which must be followed to ensure that the investment in infrastructure is justified. These steps are listed below:

- Step 1: Inventory of Existing Cycling Regime;
- Step 2: Understanding Trip Demand and the Potential for Cycling Trips;
- Step 3: Trip Assignment to the Network;
- Step 4: Trip Forecast;
- Step 5: Urban and Transport Planning;
- Step 6: Prioritising Improvements; and
- Step 7: Programme, Consultation, Budgets.

This project comprises Steps 1 to 5 for the GDA area, with Steps 6 and 7 to be addressed as part of a separate investment funding process.

### Study Methodology

The development of this Cycle Network Plan has followed a series of logical steps, which are outlined on the graphic below.

The identified 'needs' of cyclists (outlined in the NCM) and key principles of functionality, homogeneity, legibility, forgivingness and self-awareness have been taken into account by the Project Team, in preparing this Cycle Network.

### Data Collection & Management

Information on existing and proposed cycle facilities was provided by all the Local Authorities within the GDA, through their representative who sat on the Joint Project Team for this study. This information was provided in various formats and has been converted to GIS-based mapping in a common format which can be updated into the future as the cycle network changes and grows. All mapping has been undertaken using a GIS process which is INSPIRE-compliant, thus this mapping will be the basis for many future NTA applications far beyond the scope of this project.

In order to confirm data and to undertake Quality of Service Assessments, site visits were undertaken throughout the existing cycle network by the Project Team, although it is acknowledged that not every facility was visited, due to the size of the study area.

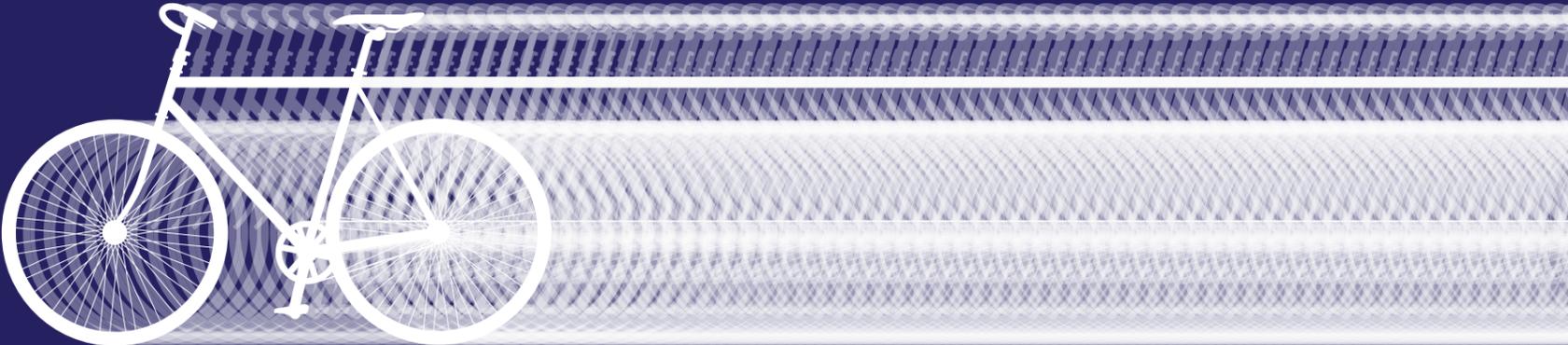


*Cycle Network Plan - Study Methodology*

**Consultation with the Local Authorities**

The Project Team met with representatives of each of the seven Local Authorities on a number of occasions during the lifetime of the project. The Local Authorities were the primary stakeholders for the project. This group was consulted on an ongoing basis throughout the project in order to provide information, confirm proposals and contribute to the development of the future Cycle Network Plan.

**(Note on Source of Images:** Some of the photographs contained in this report were obtained from *Google Streetview* but were cropped to best suit the presentation of the image. The *Google* trademark does not therefore appear on all such images, and the authors hereby acknowledge the source).



## CHAPTER 1 EXISTING CYCLE ROUTE NETWORK

In this chapter a summary is presented of the existing cycle route network within each Local Authority area. This chapter should be read in conjunction with the maps E1 to E25 in Part 6 of this Volume 1. The cycle route network for each Local Authority is summarised in the following sections.

### 1.1. Quality of Service Assessments

The National Cycle Manual describes the five needs of a cyclist.

- (i) Road Safety
- (ii) Coherence
- (iii) Directness
- (iv) Attractiveness
- (v) Comfort

Quality of Service (QoS) is a measurement of the degree to which these needs of the cyclist are met. In order to attract risk-averse cyclists, Quality of Service should increase as cycle routes approach main destinations.

The National Cycle Manual provides guidance on the criteria that input into the QoS assessment. This study involved one of the first major applications of the QoS evaluation process since the Manual was published. The methodology was adapted slightly with the agreement of the NTA so as to enable practical application on a large scale basis, with the following criteria utilised:

- (i) Pavement Condition by visual assessment;
- (ii) Width: ranging from <1.5m for single file at the lower end to wider routes of up to 2.5m that cater for cycling two abreast and/or overtaking;
- (iii) Conflict frequency due to parking, accesses and other interferences with cycling progress;
- (iv) Junction time delay on a qualitative basis ranging from none to significant; and
- (v) Comfort Factor to describe the proximity to other traffic and the associated sense of safety.

QoS scores were assigned on a 5 point scale between A+ and D.

Quality of Service was assessed for several of the main cycle routes in each local authority area and details of the scores are included on the tables and maps in Volume 2.

### 1.2. Existing Cycling Facilities in the Dublin City Council Area

The administrative area of Dublin City Council has a population of 506,211 (2011 Census) and is the most densely populated county in the state. The city centre has a dense, mixed use, urban character between the Royal and Grand Canals. Outside the city centre, there are urban villages and residential areas to the north including Clontarf, Raheny, Drumcondra, Cabra, Glasnevin, Ballymun, Santry and Finglas and to the south Ringsend, Sandymount, Donnybrook, Ranelagh, Rathmines, Terenure, Crumlin and Ballyfermot.

The city area has an extensive existing network of cycling facilities, mainly in the form of on-street cycle lanes and bus lanes. Elements of the existing network are well connected and link key origins and destinations. However, there are significant gaps in certain areas of the network where, historically, road space has been prioritised for general traffic and buses.

There are several recent schemes in the city area that have been very well received by cyclists such as the Grand Canal Cycle Route from Guild Street to Portobello, which has delivered a significant increase in cyclists along the canal since its opening in 2011. A summary of the main types of provision for cyclists in the City Council area is provided below.

#### On Street Cycle Lanes in Dublin City Council Area

The predominant provision for cycling in the City Council area is by means of either on street cycle lanes (both advisory and mandatory) or bus lanes. These facilities are generally of a low Quality of Service in the city area mainly due to the lack of width for cyclists and the discomfort caused by large volumes of vehicular traffic sharing the road space. Typically the cycle lanes achieve a QoS score of C or D. Recent improvements in the pavement quality in the city centre have lifted the Quality of Service from D to C on several of these routes.

There has been difficulty in providing for cycle lanes in the city centre, where there is considerable competition for street space and provisions for the bus and on street parking are often prioritised. The recent application of a 30 km/h speed limit in the core of the city centre shopping districts has contributed to improved conditions for use of these streets by cyclists and traffic. There remains, however, an extensive network of streets between the core and the canal cordon where cycling facilities are limited to a few radial routes.



Cycle lanes in Ranelagh Village

#### Bus Lanes in Dublin City Council Area

A significant portion of the City Council cycle network consists of bus lanes which are shared by cyclists, buses and taxis, with many lanes only operational in peak periods or for 12 hours of the day. Issues such as inadequate widths for buses to safely pass cyclists in bus lanes, conflicts at bus stops and left turns (where bus lanes end temporarily), and the volume of taxis in the city centre and on main radial routes, diminish the quality of these routes for cycling. Most city bus lanes achieve a QoS score of D as they poorly serve the needs of cyclists.

### 1.8. Existing Cycling Facilities in Wicklow

The population of County Wicklow, according to Census 2011, is 136,640. This study focused on establishing an inventory of the cycling facilities within the larger towns and villages, which accommodate approximately 55% of Wicklow’s population.

**Table 1.8 Urban Populations in Wicklow**

TOWN	POPULATION*
Bray	31,900
Greystones	17,500
Arklow	13,000
Wicklow	10,400
Blessington	5,000
Kilcoole	4,100
Newtownmountkennedy	2,400

\*Source: Census 2011 rounded to the nearest 100

#### Bray

Within Bray, dedicated facilities for cyclists are provided on the R119/R761 Dublin Road, the Killarney Road, Vevay Road, Boghall Road, Church Road and Herbert Road. The majority of these facilities include cycle lanes but there are also some cycle tracks that are separated from and immediately adjacent to the road.



*Existing Cycling Facilities along the R761 and the Killarney Road, Bray*

#### Greystones

Within Greystones, facilities are provided on the newer roads at the southern end of the town at Charlesland. These facilities generally consist of cycle tracks separated from the road by grass verges. Recently cycle lanes are being retro-fitted along older roads in the town and a coastal cycle track is being provided.

#### Wicklow Town

Within Wicklow Town, dedicated facilities for cyclists are provided on the Town Relief Road, Port Access Road, R750 Dublin Road, Dunbur Road, Broomhall Court and Seaview Heights. These facilities include cycle tracks that are separated from and immediately adjacent to the road, and cycle lanes.



*Existing Cycling Facilities in Wicklow Town*

#### Arklow



*Existing Cycling Facilities on the R772 Wexford Road, Arklow*

Within Arklow, there are cycle lanes provided along a short section of the R772 Wexford Road.

#### Rural Cycling Links between Towns in Wicklow

There are no cycling facilities outside the towns in the rural areas of Wicklow, even though some are closely clustered such as Bray and Greystones.

## CHAPTER 2 FUTURE CYCLE NETWORK PLANNING

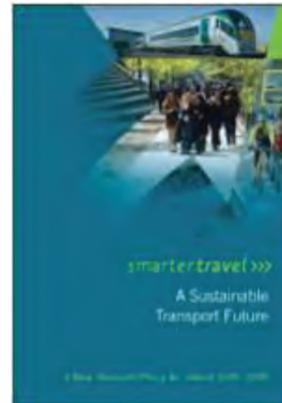
### 2.1. Strategic Urban and Transport Planning

The proposed Cycle Network Plan for the Greater Dublin Area has been developed having regard to various other plans and policies that will affect the outcome of the strategy. The following policies, studies, guidelines, plans and schemes are relevant to the cycle network:

- (i) The Government's Smarter Travel initiative;
- (ii) The National Cycle Policy Framework;
- (iii) The National Cycle Network Scoping Study;
- (iv) The National Cycle Manual;
- (v) The Regional Planning Guidelines;
- (vi) The Draft GDA 2030 Strategy; and
- (vii) The Development Plans of the Local Authorities in the GDA.

#### Smarter Travel: A Sustainable Transport Future 2009 – 2020

In 2009, the Department of Transport unveiled Smarter Travel as the new national transport policy document for Ireland. The document was developed as an umbrella document under which all other transport policy in the state would be guided. One of the main aims of the policy is to develop walking and cycling as viable commuter modes in the short to medium term with the long term aim of fostering a lasting walking and cycling culture in Ireland.



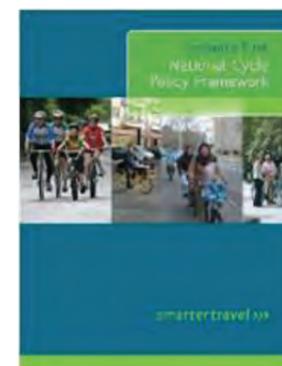
The government has set a key national target for a reduction in the levels of those commuting by private car from 65% to 45% by 2020 with the remainder of trips made up of sustainable travel modes such as cycling, walking and public transport.

The document acknowledges that:

*“pedestrian and cycle facilities will be most successful where they form a coherent network, place an emphasis on safety, directly serve the main areas where people wish to travel, provide priority over vehicular traffic at junctions, are free from obstruction and have adequate public lighting.”*

#### National Cycle Policy Framework

The National Cycle Policy Framework (NCPF) 2009-2020, uses the targets outlined in Smarter Travel and focuses more specifically on cycling as a sustainable transport mode. The document sets out with the stated aims of creating a strong cycling culture in Ireland and making cycling the norm, rather than an exception, for all short trips undertaken in Ireland.



The vision is that all cities, towns, villages and rural areas will be bicycle friendly. Next to walking, cycling will be the most popular means of getting to school, university, college and work. The bicycle will be the transport mode of choice for all ages. We will have a healthier and happier population with consequent benefits for the health service. We will all gain economically as cycling helps in easing congestion and providing us with a fitter and more alert work force.

The NCPF recognises the potential of cycling to significantly improve various aspects of people’s lives through the obvious personal benefits of improved health and finance but also, in a more communal

sense, it benefits society in terms of lower CO<sub>2</sub> emissions and also has positive social impacts in that it gets people out walking and cycling together.

The overarching objective of the NCPF is that 10% of all trips in Ireland will be made by bike by 2020.

#### National Cycle Network Scoping Study

The National Cycle Network Scoping Study was an objective contained within the National Cycle Policy Framework, which saw the establishment of a specialist advisory group whose primary objective was to develop an indicative network of rural cycling corridors throughout Ireland. These routes would primarily focus on recreation and tourism and would in turn connect into the major urban hubs around the country, Dublin being the primary one.

This GDA Cycle Network Plan has taken account of the emergent proposals for a National Cycle Network (NCN) and has integrated them into the metropolitan area network. These routes are likely to encourage tourist and local leisure and amenity cycling, which can in turn lead to greater commuter use of the bicycle.

In the Dublin area the NCN will comprise 3 key routes:

- East Coast Route from Rosslare to Northern Ireland through Dublin;
- Galway to Dublin (also part of EuroVelo Route 2 extending eastwards across Europe to Moscow), which follows the Royal Canal within the GDA; and
- Cork to Dublin via Kilkenny and probably along the Grand Canal.

#### National Cycle Manual

The National Cycle Manual was published by the NTA in 2011. It is based on the Five Principles of Sustainable Safety. It aims to bring a standardised and more logical approach to the design of cycling facilities in Ireland, which have traditionally being designed haphazardly where space allowed with very little consistency or coherence. Another concept introduced by the Cycle Manual was Quality of Service (QoS), which is ranked from A+ to D, with A+ being a route which is designed to the highest possible standard. The development of this approach meant that designers or local authorities could target a particular Quality of Service, which would then need to be met through the fulfilment of certain criteria.

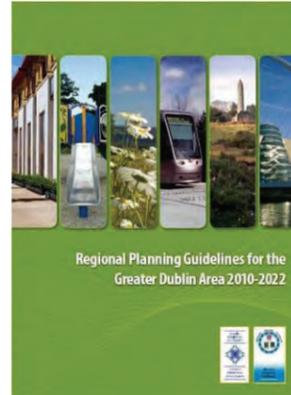


The GDA Cycle Network Plan has established appropriate target QoS levels for various routes to best cater for the anticipated level of demand along each route.

### Regional Planning Guidelines (RPGs) for the Greater Dublin Area 2010 - 2022

The Regional Planning Guidelines for the Greater Dublin Area (GDA) set out the macro planning context for the area covered by this study. The RPGs identify the National Transport Authority as the principal agency having responsibility for the planning and implementation of transport infrastructure.

In terms of physical infrastructure, the RPGs place considerable emphasis on future settlement patterns and the integration of land use and transportation policy in the GDA. Emphasis is placed on these settlement patterns as they will effectively decide the modal split for the region in the future. The RPGs also state that it is vitally important that any transport strategy developed dovetails closely with objectives for employment, sustainability, environment and climate change in the region.



The Guidelines envisage a population increase for the GDA from 1.73m to 2.1m inhabitants by 2022.

In terms of walking and cycling, the RPGs set ambitious targets regarding cycling as a viable and mainstream transport mode in a “relatively compact urban form” such as Dublin. It targets the 10% modal split for cycling as set out in the NCPF as one which should not just be met but should be exceeded. The RPGs acknowledge the potential of walking and cycling as tourism generators in the GDA, which can be facilitated through improvements to the local walking and cycling network.

The continued development and delivery of the regional and local cycle network is listed as a proposed strategic transport investment for the GDA.

### Greater Dublin Area: Draft Transportation Strategy 2011 – 2030

The GDA draft transportation strategy was prepared by the NTA to provide guidance on the development of transport strategy and policy within the GDA up until 2030.

Potential measures for the encouragement of cycling in the GDA include improvements to the cycling environment and facilities, bike parking and more public bike rental stations. As part of the preferred strategy, cyclists and pedestrians are ranked 1 and 2 on the hierarchy for the public domain.

The strategy envisages Dublin and the other large towns in the region becoming a walking and cycling city-region with *“a street environment that is attractive, safe and designed with the pedestrian and cyclist in mind at all times”*.

Some of the softer measures specified, which are proposed to increase the walking and cycling modal share in Dublin city centre, include the closure of certain streets to general traffic and access only for motorised vehicles on other streets. Other measures which are proposed, though not stated objectives of the strategy, include improving the cycling environment in Dublin city centre, new or enhanced leisure facilities for cycling, the expansion of dublinbikes, and greater provision of cycle parking. The strategy further acknowledges that **to produce a quality cycling environment, an emphasis needs to be placed on measures for central areas and inner approaches first**.

The strategy recognises that for a culture of cycling to be embraced within the GDA, it is not just commuter cyclists who need to be accommodated. Recreational cyclists need to be provided for also and one of the measures outlined is to provide cycle tracks of high amenity value along coastal, canal and riverside routes.

### Local Authority Development Plans

Each of the local authority development plans were reviewed and the relevant proposals for cycling facilities are included in the cycle route network proposed in this report.

### Other Relevant Studies and Schemes

#### Luas Cross City Tram Line

The cross city Luas line commenced construction on site in June 2013 and will link the two existing Luas lines and connect beyond to Grangegorman and Broombridge. The scheme will involve considerable revisions to the city centre traffic circulation network. Luas Cross City Line will run along:

- Dawson Street;
- Nassau Street West;
- Lower Grafton Street;
- College Green;
- Westmoreland Street (northbound) / Hawkins Street (southbound);
- O Connell Street (northbound) / Marlborough Street (southbound);
- Parnell Street; and
- Dominick Street.

The scheme will make use of the new public transport bridge from Marlborough Street to Hawkins Street.

Cyclists can experience problems in crossing tram lines where there is a risk of a bicycle wheel becoming caught in the groove of the embedded rail. Such difficulties are likely to increase as the tram system is further expanded in the city centre where the streets are shared by a variety of transport modes. This study will assess where main cycle routes will cross the tram lines and where the safety issue will be most acute.

#### dublinbikes Expansion Plans

dublinbikes currently has 44 bicycle stations located throughout Dublin City with approximately 550 bicycles available for rent. Due to the success of this scheme since it was launched in 2009 an expansion is now underway, which will treble the existing provision of bicycles to 1,500 and increase the number of bicycle stations to 100. Many of these stations will also be strategically located in areas of high demand such as Heuston Station and the Docklands area.

There is also a longer term plan to further increase the number of dublinbikes to 5,000, which may include the construction of dublinbikes stands as far out as UCD (Belfield). This has the potential to significantly increase the number of cyclists in Dublin.

### NTA Bus Rapid Transit (BRT) Report

The NTA published a report in October 2012 outlining emerging proposals for the introduction of BRT schemes in Dublin. The initial schemes to be developed are:

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

BRT generally requires segregation from other modes and the introduction of BRT facilities along a road might involve the displacement of other road users. The schemes are still at feasibility stage and are not developed to a level of detail sufficient to fully establish the extent of impacts on cyclists. Nevertheless, the proposed routings need to be considered in the formulation of a Cycle Network Plan for Dublin City.

### Other Future Transport Schemes

The following schemes are longer term and while they have not been considered in terms of their impact on the cycle network plan, it is envisaged that, at the development stage of these projects, their impact on the cycle network will be considered and appropriately addressed. These schemes include:

- Metro North;
- Metro West;
- Rathfarnham Luas Line;
- Lucan Luas Line;
- DART Underground; and
- Other rail schemes.

## **2.2. Cycling Trip Demand Analysis**

This section sets out the methodology for a demand assessment of current and future cycling patterns in the Greater Dublin Area (GDA). It sets out the data used to develop a base year cycling model for the GDA and also outlines the assumptions used to derive forecasts for growth in cycling demand throughout the region over a 10 year horizon period. This process comprises Steps 2 to 4 of the seven step method of planning a cycle network as outlined in the NTA National Cycle Manual.

### **Sources of trip demand data used**

To develop a detailed understanding of cycling demand in the GDA, data was collated from the following sources:

- Place of Work, School & College Census Anonymised Records (POWSCAR) from the 2011 Census;
- NTA 2006 & 2030 Demand data (all modes) by time period and journey purpose;
- 2006 NTA Household Survey; and
- 2011 NTA Canal Cordon Report.

### **Work and Education Trips**

The Census POWSCAR database was released in August 2012, and reports all journeys to work and education by District Electoral Division (DED) for 2011. This information can be extracted for input to traffic models, thereby giving good Origin-Destination information without the necessity for widespread Roadside Interview Surveys. The POWSCAR information also provides travel mode and time of departure, thereby allowing journeys by bicycle during the AM period to be isolated.

### **Other Journey Purposes**

Data for other journey purposes including shopping, business and leisure trips is not included in the 2011 Census results. However this information is available from the 2006 NTA Demand Model (total for all modes) and was extracted for addition to the work and education trips.

### **Trip Assignment**

The cycling demand matrices were assigned onto the existing road network supplemented by cycling network links that are not part of the road network. In the assignment procedure, the route choice in the model was based on the network distance alone. Therefore no delay or congestion is modelled and the model does not account for complex cycling route choice decisions based on cycle provision and Quality of Service or gradient.

### **Cycle Model Calibration**

An assignment of the cycle matrix to the base year model enabled a comprehensive check of the network to be undertaken.

The accuracy of the base year model has been checked using the GEH statistic. The GEH statistic is a measure of comparability that takes account of not only the difference between the observed and modelled flows, but also the significance of this difference with respect to the size of the observed flow.

When comparing assigned volumes with observed volumes a GEH parameter of 5 or less indicates an acceptable fit whilst a value greater than 10 requires closer attention. The base year model check involved comparing modelled flows against observed counts on 27 no. links. A GEH statistic of less than 5 was achieved at 70% of these links, with no links having a GEH value in excess of 10. This level of accuracy is consistent with that achieved for other NTA transport models for the other modes.

In addition, cycle count data on the 'Canal Cordon' (i.e. entry points into Dublin City) was used to compare the modelled flows to observed data. A comparison of observed two-way cycle flows across the major canal cordon crossing points to the modelled cycle flow is presented in Table 2.1. An exact match would not be expected between the model and the measured flows, but the degree of variation is low and within the acceptable range for a strategic transport model.

While the radial demand is well modelled, orbital trip demand at the city centre differs considerably from the actual flows recorded on the streets. The peak two way daily flows recorded at the Grove Road cycle counter on the Grand Canal near Rathmines were just under 3,000 on Tues June 4, 2013; the 2 way flow is usually over 2000, and very tidal (800+ in morning peak period from 7am to 10am). This difference arises because model is based around shortest distance movement and cannot account for other factors that can significantly affect route choice such as quality of cycling facility. The under-representation of the orbital Canal cycle numbers reflects the fact that cyclists who might otherwise cycle through the city are attracted to and diverted to the canal route by virtue of its high quality, flat topography and moderately low traffic flows in the adjoining single lane in each direction compared to alternative routes on wider and busier streets with one-way systems in various places.

**Table 2.1: Comparison of Observed and Modelled 2-way Cyclist Flows across Canal Cordon (3 hour AM peak period two-way flow)**

ROAD	OBSERVED	MODELLED
Conyngnam Road	136	124
Chesterfield Avenue	292	301
North Road	72	57
Blackhorse Avenue	84	101
Old Cabra Road	148	146
New Cabra Road	169	127
Phibsborough Road	387	351
Dorset Street	652	715
Summerhill	227	283
North Strand	<b>907</b>	854
Sheriff Street	61	46
North Wall Quay	468	367
Ringsend Road	413	295
Grand Canal Street	338	272
Northumberland Road	390	548
Baggot Street	344	489
Leeson Street	491	665
Ranelagh Road	523	577
Rathmines Road	<b>762</b>	1011
Clanbrassil Street	<b>676</b>	627
Clogher Road	147	216
Crumlin Road	152	229
Herberton Road	184	127
South Circular Road	104	25
Old Kilmainham Road	50	55
Kilmainham Lane	77	116
St. John's Road West	118	175

The flows in Table 2.1 show North Strand Road as the busiest cycle route in Dublin with existing flows of over 900 cyclists in the morning peak period. Rathmines Road is the next busiest at over 700 cyclists, with Clanbrassil Street not far behind. These high cyclist flows are despite the poor Quality of Service on these busy radial routes where cyclists must share bus lanes or be confined to narrow cycle lanes.

A plot of the assigned base year cycling matrix to the network in VISUM is shown in Figure 2.1 and in larger scale on Sheet DD2 in Part 7 of this volume.

The 2011 Census data for cycling trips, when transposed onto the route network through the cycle model as plotted on the map in Figure 2.1, is very revealing of the true scale and extent of cycling traffic in Dublin. The data shows higher than expected volumes of cyclists on the longer radial routes to the city centre from the north-eastern areas of Sutton, Malahide Road and Swords Road, from Blanchardstown in the northwest and from the south-eastern corridors through Stillorgan and Blackrock.



Figure 2.1: Plot of base year GDA Cycle Model assignment

### Forecasting Future Cycle Demand

This aim of this project is to propose a cycle network for the GDA for a 10 year horizon period. Therefore the forecast year for the GDA Cycle Model is 2021. Over this 10 year period, the demand for cycling in the GDA is forecast to increase due to two factors - population growth and changes to cycling mode share.

The methodology employed to forecast the growth in cycling due to these factors is outlined below.

### Population Growth

The NTA strategic model for the GDA was used to forecast growth in cycling demand due to projected new development. As part of the development of this model, assumptions on future population and employment growth in the GDA were developed by the NTA, in consultation with the seven local authorities and with reference to the Regional Planning Guidelines.

The NTA demand data was analysed and a set of origin and destination trip ends for each DED zone was output for 2006 and 2030. Using these forecasts, an annualised growth factor was calculated for the trip totals of each zone. Following checks between the 2006 NTA demand data and the 2011 POWSCAR data, it became evident that the 2011 transport demand in a number of zones had exceeded the 2030 projections. In these cases the development growth was capped at 2011 levels and no further growth was applied to these zones.

The adjusted annualised growth factors were then applied to the 2011 base year cycling matrix over the 10 year horizon period to produce a forecast 2021 cycling demand matrix. Table 2.2 outlines the overall matrix growth factors applied to the base year matrices to account for development growth only to 2021.

**Table 2.2: Overall Matrix Growth Factors due to Development Growth (2011-2021)**

PURPOSE	FACTOR
Work	1.13
Education	1.09
Other	1.14
Total	1.11

**Cycling Modal Share by Distance**

The vision of the 2009 ‘National Cycle Policy Framework’ (NCPF) is that “a culture of cycling will have developed in Ireland to the extent that, by 2020, 10% of all trips will be by bike”. For this study, it was necessary to examine mode shift targets in further detail by analysing a combination of journey purpose, trip distance and area types.

The first stage in developing target mode shifts for cycling in the Greater Dublin Area was to examine the baseline data from the 2011 GDA Cycle Model. This provides data for work, education and other journey purposes. To analyse the data in further detail the following distance bands were set:

- 0–5 km;
- 6–10 km;
- 11-15 km and;
- greater than 15 km.

The 2011 base year cycling mode share is presented in Table 2.3.

**Table 2.3: 2011 Cycling Mode Share by Area Type, Distance and Journey Purpose**

Distance Band	Dublin City				Dublin Suburban			
	Work	Education	Other*	All	Work	Education	Other*	All
0-5 km	6.7%	3.4%	0.7%	3.6%	5.6%	4.1%	0.7%	3.6%
6-10 km	5.0%	5.1%	0.7%	3.5%	4.7%	3.4%	0.7%	3.6%
11-15 km	2.0%	1.9%	0.7%	1.7%	2.4%	1.8%	0.7%	2.1%
> 15 km	1.6%	1.3%	0.0%	1.0%	0.9%	0.9%	0.0%	0.7%
ALL	<b>5.8%</b>	<b>3.6%</b>	<b>0.7%</b>	<b>3.4%</b>	<b>4.1%</b>	<b>3.8%</b>	<b>0.7%</b>	<b>3.3%</b>

Distance Band	GDA Satellite Towns				Rural Areas			
	Work	Education	Other*	All	Work	Education	Other*	All
0-5 km	1.8%	1.8%	0.7%	1.6%	1.3%	1.1%	0.7%	1.1%
6-10 km	1.6%	0.6%	0.7%	1.2%	1.2%	0.6%	0.7%	0.9%
11-15 km	1.4%	0.7%	0.7%	1.2%	1.1%	0.2%	0.7%	0.8%
> 15 km	0.3%	0.4%	0.0%	0.3%	0.2%	0.5%	0.0%	0.3%
ALL	<b>1.1%</b>	<b>1.4%</b>	<b>0.6%</b>	<b>1.1%</b>	<b>0.7%</b>	<b>0.8%</b>	<b>0.5%</b>	<b>0.7%</b>

\* 2011 data for ‘Other’ journey purposes developed from 2006 Household Survey data

The cycling mode share for commuting trips below 5km in the Dublin City and Dublin Suburban areas is on track for achieving a 10% mode share by 2020. However, commuting trips outside the M50 in both

the satellite towns and rural areas is some way off the 10% target. The analysis also shows that as trip distance increases cycling mode share decreases, which is to be expected.

Therefore, for this study, it was necessary to develop more focused targets for cycling mode share in the 2021 forecast year. There is scope to achieve high cycling mode share targets for short trips within urban areas. However, there are significant challenges to achieving a shift to cycling for other trip types such as long distance trips in rural areas. Considering the above, a set of mode share targets has been developed for the GDA. The target in the Dublin City and Suburban areas is an increase in the overall cycling mode share (for all purposes and distances) from approximately 3% to 10% over the 10 year horizon of this study. Targets have been set for all journey purposes for trips less than 15km in length.

**Intra-Zonal Trip Movements**

Intra-Zonal trips are trips that originate and end in the same transport zone and usually represent short distance local trips. In a strategic transport model such as the GDA Cycling Model, intra-zonal trips are not loaded on to the transport network. The level of intra-zonal cycling trips will be higher than traditional vehicular traffic models due to the shorter trip lengths. In addition, as the transport zone system is consistent with Census Electoral Divisions, the size of the zones increases outside urban areas. Therefore the level of intra-zonal trips outside the Dublin Metropolitan Area is greater where a transport zone could represent the entire area of a town and its environs. The cycle model is therefore only properly applicable in the main urban area of Dublin where it represents 80% to 90% of cycle trips.

**Interpretation of Cycle Traffic Model Results**

The GDA Cycle model provides a comprehensive representation of existing and projected future cycling demand patterns in the Greater Dublin Area. The modelled link flow data presented in this report represents a typical 3 hour morning peak period demand between 07:00 and 10:00.

Trip assignment and route choice in the model is based on trip distance alone to provide a strategic plot of cycling desire lines on the network. As the complex decisions involved in cycling route choice are not taken into account in the model, the interpretation of results from the model at a local level should be carefully considered.

### 2.3. Strategic Cycle Route Network Proposals

#### Network Categorisation

The National Cycle Manual (Section 3.2) contains advice on network categorisation as shown in the table below:

#### Cycle Route Network Categorisation

NETWORK	ROUTE CATEGORY	DESCRIPTION
Urban Cycle Network	Primary	Main cycle arteries that cross the urban area and carry most cycle traffic
	Secondary	Link between principal cycle routes and local zones
	Feeder	Cycle routes within local zones and/or connections from zones to the network levels above
Inter Urban Cycle Network		Links the towns and city across rural areas and includes the elements of the National Cycle Network within the GDA
Green Route Network		Cycle routes developed predominately for tourist, recreational and leisure purposes but may also carry elements of the utility cycle route network above. Many National Cycle Routes will be of this type.

#### Target Quality of Service

Targets for the appropriate Quality of Service were selected on the basis outlined in the following Table. There are two facets to the QoS that require to be considered separately. These are:

- In terms of conflicts, level of comfort, junction time delays and pavement quality, a minimum Quality of Service Level B should be provided on all cycle routes, regardless of the volume of demand; and
- The width factor depends on the peak volume of cyclist demand. Above 500 cyclists per hour it is desirable to provide Width Level A+/A, with 2+1 conditions for social cycling and passing. Where the peak volume is less than 500 cyclists per hour, Level A/B will provide sufficient capacity with room for overtaking by faster cyclists.

#### Basis for Target Quality of Service

ROUTE TYPE	PRIMARY / NATIONAL	PRIMARY	SECONDARY
Cycle Volume Existing (3 hour peak period)	n/a	200 -1000	100-500
Target QoS - Width Factor	A+ 2+1	A+/A 2+1	A/B 1+1
Target QoS - Other Factors	A	B	B

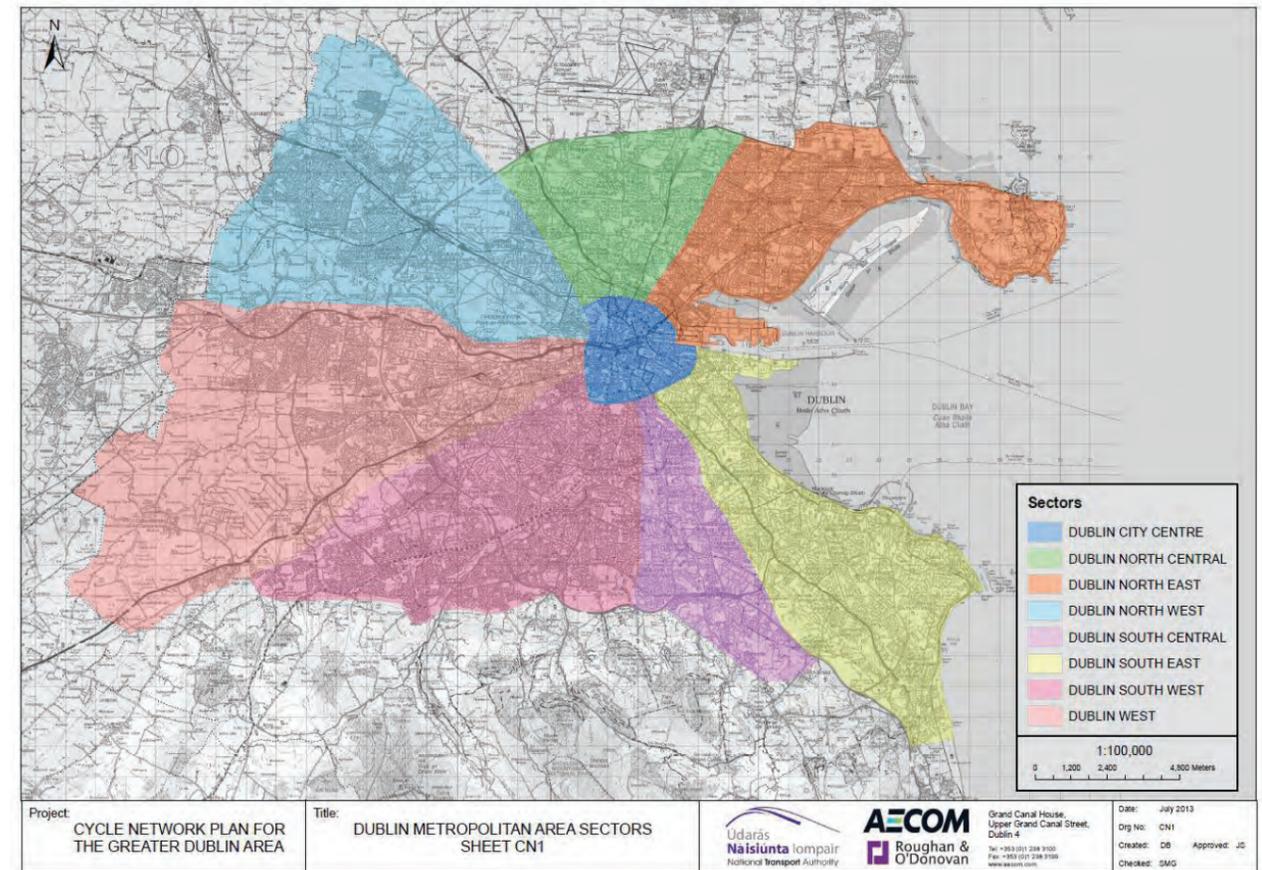


2+1 Width: Two-abreast cycling with room for overtaking

### Proposed Radial Routes to Dublin City Centre

From an analysis of cycling demand, 13 primary radial cycle routes have been identified that link the city centre to the seven sectors comprising key suburban areas shown on the following map, as follows:

- Route 1: Beresford Place to the North East Sector via Amiens Street, North Strand and Fairview;
- Route 2: Parnell Square to the North Central Sector via Dorset Street and Drumcondra, with variant or alternative routes proposed within the same general corridor;
- Route 3: Parnell Square to the North Central Sector via Blessington Street, Royal Canal Bank and Phibsborough, where it branches towards Ballymun and Finglas;
- Route 4: Bolton Street to the North West Sector via King's Inns, DIT campus in Grangegorman and Old Cabra Road;
- Route 5: Docklands to the North West Sector along the Liffey Quays to Heuston Station, and then through the Phoenix Park to Castleknock and Blanchardstown;
- Route 6: Parkgate Street to the West Sector via the River Liffey valley to Chapelizod and Lucan. Joins Route 5 for the connection to the City Centre;
- Route 7: College Green to the West Sector via Dame Street and Thomas Street;
- Route 8: Patrick Street to the South West Sector via Cork Street and then through Crumlin, Greenhills and Walkinstown towards the Tallaght and Clondalkin areas with various branches;
- Route 9: Patrick Street to the South West Sector via Harold's Cross;
- Route 10: Camden Street to the South West Sector via Rathmines, Rathgar and Terenure to Rathfarnham;
- Route 11: Camden Street to the South Central Sector via Ranelagh;
- Route 12: St. Stephen's Green to the South East Sector via Leeson Street and Donnybrook; and
- Route 13: College Green to the South East Sector via Merrion Square and Ballsbridge.



Dublin Metropolitan Area Sectors Map

In addition a series of 6 orbital routes have been identified to link the radial corridors and suburban centres around the city. Of these routes, three are considered to merit categorisation as primary routes:

- Orbital Route 1: following the Grand Canal and Royal Canal around the edge of the City Centre between Harold's Cross on the south side and Phibsborough on the north side;
- Orbital Route 4: on the north side from Killester to Ballymun to Finglas; and
- Orbital Route 5: on the south side from Lucan via Clondalkin, Tallaght and Dundrum to Dun Laoghaire.

### National Cycle Route Network in the Dublin Area

Proposals for the National Cycle Network (NCN) are at an early stage, with a general network outlined in the "Scoping Study" prepared by the National Roads Authority on behalf of the Department of Transport in August 2010.

The NCN study identified a network of 13 national cycle routes, 3 of which connect to Dublin as follows:

**NCN Route 1** along the East Coast from Rosslare through Dublin to the border with Northern Ireland and onward to Belfast and Larne. This route has been described in this study as the *East Coast Trail* and will incorporate other local amenity cycle routes such as the *Sutton to Sandycove* promenade;

**NCN Route 8** from Galway to Dublin as part of the longer distance trans-European *EuroVelo Route 2*. This route is currently at design stage and will approach Dublin along the Royal Canal through Maynooth. The exact route through the Dublin area remains to be confirmed. The Dublin cycle route network will provide various route options along suitably high-quality cycle tracks into the city area to various destinations including the main railway stations, the airport and ferry port. Perhaps the Phoenix Park route will provide the most impressive approach to the city centre that will best suit the tourism purpose; and

**NCN Route 9** from Cork to Dublin via Kilkenny. This route will most likely follow the Grand Canal into Dublin city.

In relation to the type of cycling facility to be provided on these routes, the NCN Scoping Study states the following:

*"The length of the network that is off road or of greenway standard should be maximised with the aim of minimising the interaction with motorised vehicles. The network should use existing cycle routes if appropriate. Special attention should be given to the opportunities of using both the disused rail network and canal / river towpath networks as cycling / walking routes."*

This key objective has been taken into account in this GDA Cycle Network Plan, which proposes that the national cycle routes would mostly follow greenways and high-quality cycle tracks.



### EuroVelo International Cycle Route Network

There is an international dimension to the long-distance cycle route network in Ireland as part of the *EuroVelo* network across the European continent as shown on the map below.

Two of these routes are in Ireland:

**EV1** from Norway to Portugal along the west coast of Europe, which extends in Ireland from Larne, County Antrim in the northeast, around the northern, western and southern coasts to Rosslare, County Wexford in the southeast; and

**EV2** from Galway through Dublin to London, Berlin, Warsaw and Moscow.



*EuroVelo International Cycle Routes Network Map*

### Proposed Greenway Route Network

There are numerous natural corridors through the Dublin metropolitan area that provide opportunities for greenway routes, and these have been identified in this study. By and large these routes follow rivers, streams, canals and the coastline. While many such greenways may be of local interest only, there are several that are of strategic value in terms of their length as an amenity, provision of access to

major recreational areas in the mountains, on the coast or in significant public parks, and also as part of long-distance national and international routes. These strategic greenways are set out below.

In a few cases there may be significant environmental sensitivities where a greenway might pass along the edge of or through an area with designated environmental protections. Careful environmental assessment will be required at such locations through a staged process to determine if the suggested route is actually viable or if an alternative route is necessary and preferable. These possible issues are noted where relevant in this report and on the maps with a dashed green line instead of a solid green line.

#### East Coast trail

This route is part of National Cycle Route No.1 and would extend within the Greater Dublin Area from Arklow in the south to Drogheda in the north. This study has identified an indicative route for the trail, mostly along greenways separated from traffic, and with some localised use of quiet minor roads in the areas most removed from the city. It avoids busy road corridors such as the R132 route north of Dublin, which would not achieve the objective for a high-quality and attractive cycle route. Each section is described in detail in the relevant chapter for the area in question along the route.

#### Grand Canal way / Barrow way

A high quality cycling facility is already in place on the canal towpath over a length of 8.5km from Adamstown south of Lucan to Blackhorse at Inchicore, with a further 1.5km of reasonably good but undesignated cycle track extending to Suir Road at Rialto. This is identified as Primary Radial Route 7B in the city network. In addition there is a further section of segregated cycle track along the canal bank from Portobello at Rathmines to the Docklands, which is part of Orbital Route SO1. The gap between these two sections of cycle route is the subject of a current design study to complete a high-quality cycleway connection.

#### Royal Canal way

There is no formal cycle route along the Royal Canal at present, apart from the very short section at Spencer Dock in the Dublin Docklands. The canal towpath is paved from North Strand Road as far as Ashtown, with a good quality gravel surface from there to Blanchardstown. This path is in use by cyclists as a de-facto cycleway at present. A number of design studies are underway to develop a high-quality cycle track along the canal westward to Maynooth. From there onward the NRA is currently managing a project for the NCN Route 8 from Dublin to Galway along the canal to Mullingar and beyond.

#### River Liffey way

The geographic centrepiece of Dublin City is the River Liffey, which provides the main access corridor on the western side. There are design projects currently underway to develop a high-quality segregated cycle route along the river corridor from Dublin Port in the east to the Phoenix Park and Heuston Station in the west and onward to Chapelizod village. This would serve Primary Radial Cycle Route 5 to Blanchardstown and Route 6 to Lucan and Leixlip. Cross-connections are proposed at Islandbridge to the adjoining Phoenix Park and Royal Canal way to the north and to the Grand Canal way to the south, so as to enable loop recreational cycle routes within the city.

#### Dodder Valley way

A feasibility study was completed in 2012 for a greenway route along the River Dodder from the city at Grand Canal Dock through Ballsbridge, Milltown, Templeogue and Firhouse to the Dublin Mountains at Bohernabreena Reservoirs. Apart from a strong recreational function, this route would also serve as a commuter cycle route to the significant employment district at Ballsbridge from the south-western suburbs. In the area from Ballsbridge to Milltown, it will also form part of Orbital Route SO3.

Other Greenways in Dublin

Several other greenways have been identified in various sectors as follows:

- Tolka Valley way across the inner northern suburbs between Fairview and Ashtown;
- Santry River way across the outer northern suburbs from the coast at Bull Island, through Raheny and Coolock to Santry; and
- River Poddle way from Harold's Cross to Greenhills and Tymon Park as an alternative route to the poor facilities along Radial Route 9A.

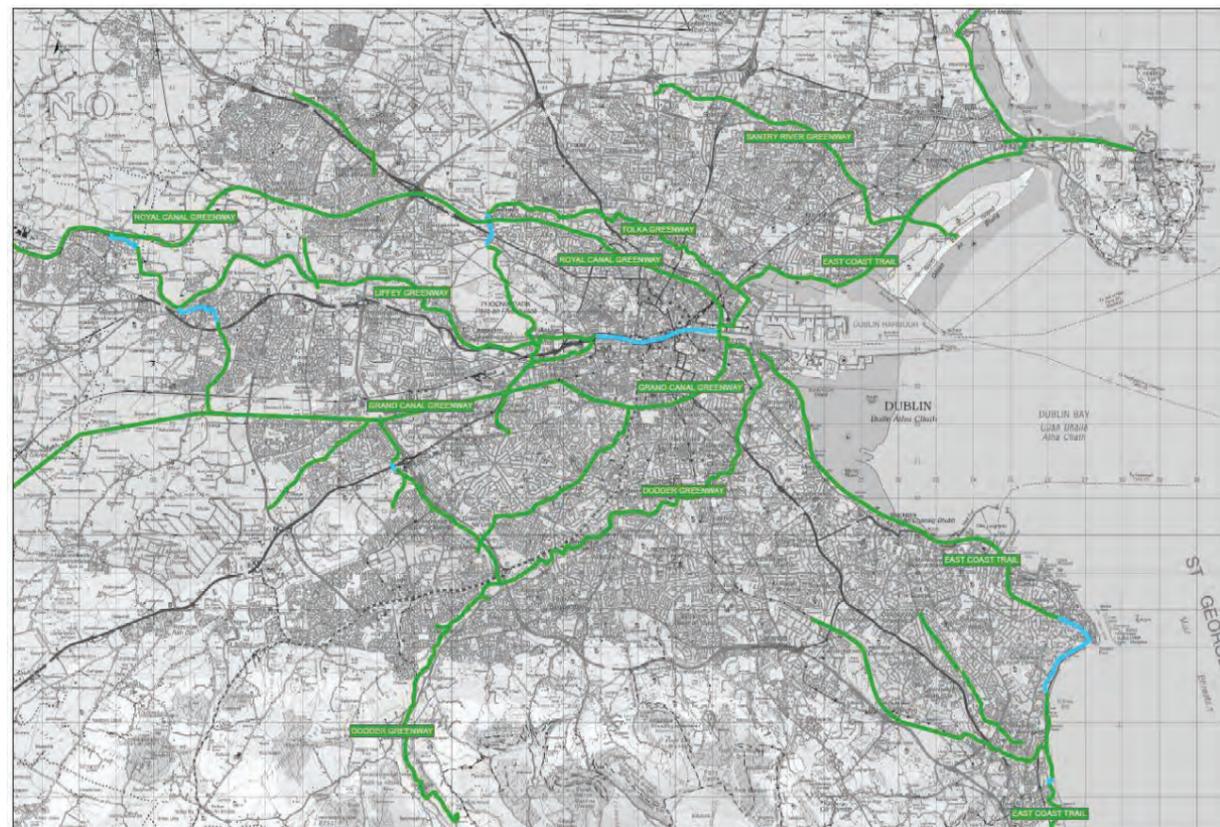
River Boyne way

This 50km long route is identified as Corridor 13 in the National Cycle Network, and will link between Corridor 5, *East Coast Trail* at Drogheda, and Corridor 8 from Dublin to Galway & Clifden on the Royal Canal near Longwood southwest of Trim.

Meath County Council is developing this cycle route along the River Boyne from Drogheda upstream through Navan to Trim. This will provide access for walkers and cyclists to numerous important tourist sites such as the *Battle of the Boyne* visitor centre at Oldbridge near Drogheda, *Brú na Bóinne* visitor centre for the ancient sites of Newgrange, Knowth and Dowth, Hill of Tara, Bective Abbey and Trim Castle. A feasibility study for the greenway was completed in 2010, and the project is now progressing through design and planning for the first phases from Drogheda to *Brú na Bóinne* visitor centre. The greenway will largely follow the old towpath of the River Boyne Navigation Canal upstream to Navan. Further upstream the route may follow suitable local roads as an interim measure pending an off-road route across agricultural lands along the river bank.

Green Route Network Map

The following Map DGN shows the proposed Green Route Network in the Dublin Metropolitan area. (A full A3 size version is included in Part 8a of this report).



*Proposed Green Route Network in the Dublin Metropolitan area*

A few non-greenway links are shown in key locations to complete connections within this element of the cycle route network. Loop trips could be devised using this network with varying lengths.

**Local Cycle Route Network Factors**

This plan proposes a cycle route network at a strategic level across the large study area. It is assumed that short distance trips are cycleable within each local zone. Most local streets and roads within the urban areas and towns should be suitable for shared use by cyclists and traffic due to low-speed and low-volume traffic conditions in accordance with the National Cycle Manual.

*Cycle Routes to Schools*

Many schools are located within neighbourhoods with access via local roads and streets, which may be more or less suitable for cycling according to the local conditions. A high Quality of Service is required on routes to schools so as to encourage as many pupils and staff as possible to cycle. In some cases there may be no suitable cycle network route directly to the school and it may be necessary to develop local infrastructure on link routes that have not been identified on the cycle network maps in this report.

*Permeability Links / Shortcuts*

Traditionally there has been good permeability in our towns and urban areas that allows for direct and convenient walking and cycling trips. However, for a period of several decades from the 1970s to the end of the 20th century, many suburban residential areas were developed on a cellular basis with restricted connectivity to surrounding areas. Distributor roads are provided in these areas and carry most of the local traffic, with associated cycle tracks provided in many cases. In these areas cycling and walking trips are longer than necessary and must follow busy traffic routes, with the result that many short local trips tend to be by car.

It is desirable to tip the balance back in favour of local trips by bike and walking through provision of permeability links within neighbourhoods. In this report a number of such potential links have been identified and are shown on the proposed cycle network maps with a "P" symbol. In certain locations the proposed permeability link may unlock a strategic cycle route that can deviate away from busy traffic corridors. There is likely to be greater scope for such permeability links that should be identified through local cycle network plans as much of the network will depend on them.

*Future Road Proposals*

Some of the cycle route proposals shown on the network maps may follow the planned routes of future roads as indicated on local authority Development Plans. Such a proposed cycle route should not be taken as justification for the overall road proposal, which should be subject to independent assessment according to suitable criteria.

### Cycle Route Networks in Towns

Chapter 4 describes the cycle network proposals for the towns in each of the rural counties within the Greater Dublin Area.

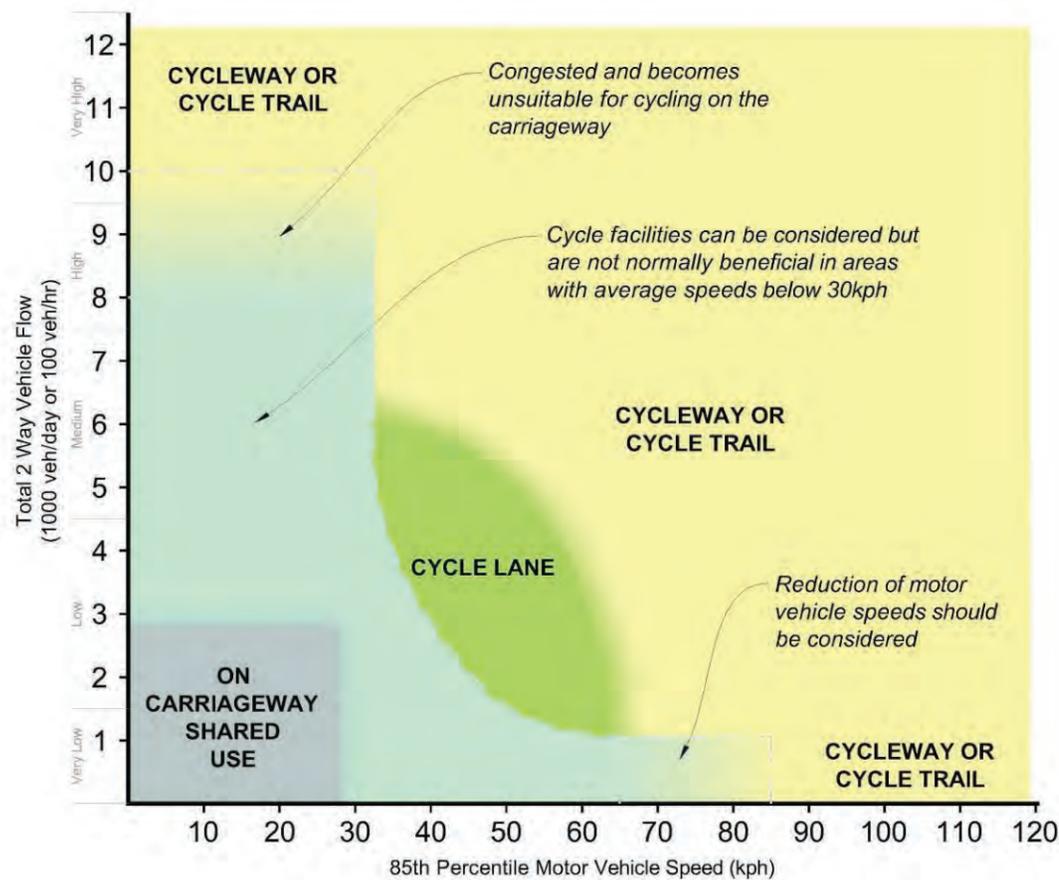
### Inter-Town Cycle Routes in Rural Areas

The final set of cycle route proposals consists of links between towns across rural areas and these are described in detail in Chapter 4 for each county, with an associated numbering system for ease of reference.

The rural sections of these routes, which are remote from main towns (>5km), would mostly serve for recreational cycling on rural roads, which is a fast growing leisure activity despite the lack of formal identification of suitable cycle routes. In many cases there is considerable risk involved for cyclists along busy and narrow regional roads, especially on the main access routes into towns.

Within 5km to 10km of the main towns the rural cycle routes should also cater for utility cycling trips for employment, education or other social and commercial purposes. In certain areas there are clusters of towns and villages that generate close inter-action, and greater potential demand for cycling trips would be expected along the connecting routes.

The chart below is based on the internationally accepted principles established in the Dutch cycle manual (CROW), which indicates that a suitable rural road for cycling typically carries fewer than 1,000 vehicles per day with average traffic speeds of 70 km/h or less.



Selection Chart for Type of Cycling Facility (based on the Dutch CROW Manual)

This study has generally selected minor rural roads with low volumes of traffic and moderate speeds for identification as suitable cycle routes that can be promoted through cycle directional signs, similar to the current provisions in the tourist cycling hubs around the country. In some cases there may be several suitable route options available and further study will be required at local level to select the preferred route.

This proposed rural cycle route network is comprehensive and links all towns in the study area, as well as major towns beyond the study boundary such as Drogheda, Mullingar and Portlaoise. The rural cycle routes interconnect with the town cycle networks and with the strategic long-distance greenways described earlier.

Unfortunately not all cycle routes can be directed along low-volume and low speed roads due to the limitations of the local road network. An example is between Celbridge and Clane in County Kildare, where the only route available is partially along the busy and fast R403 regional road. In such cases it will be necessary to provide a rural cycle track along the road verge as is standard practice in Denmark, Germany and other European countries. Such cycling facilities have been provided on a number of recent national secondary route improvements in Galway, Mayo and Donegal as shown in the following example.



Cycle Track alongside the N59 at Newport, County Mayo

Where rural roads are proposed for designated cycle routes, it may be appropriate to provide some measures to maximise safety for cyclists. Measures that could be considered include:

- Warning signs for drivers of the likelihood they will encounter cyclists;
- Visibility improvements at sharp bends through localised verge widening; and
- Special speed limit of 60 km/h on wider roads that could encourage higher speeds.

Each route would need to be assessed to identify the particular safety issues involved.

## 2.4. Strategic Environmental Assessment

The development of the GDA Cycle Network Plan has been accompanied by consideration of environmental issues through, in particular, the Strategic Environmental Assessment process and the Habitats Directive Assessment process. These have identified impacts and, where appropriate, mitigation, to address these issues (See SEA Environmental Report Chapter 10 and the Natura Impact Statement.). However it should be noted that the mitigation presented in these reports has been compiled at a strategic level where the particulars of each project are not yet fully known. The process of environmental assessment and more specific site level mitigation will continue through the project development stage for individual schemes forming part of the plan.

In delivering the plan, the Authority will, in collaboration with the relevant agencies, actively address the protection and enhancement, where practical, of the natural, built and historic environment associated with these schemes. Projects which are taken forward to development consent stage will be supported by environmental appraisal, Habitats Directive Assessment and Environmental Impact Assessment (EIA) where appropriate. All cycle routes will be constructed in accordance with applicable design standards and environmental regulations and mitigation measures in accordance with good practice will be incorporated into the design and construction of these schemes.

The Authority, in conjunction with other agencies and the local authorities, will not pursue any schemes arising out of this plan, or in-combination with other plans, which will adversely affect the integrity of a Natura 2000 site, unless there are no alternative solutions and that it has been demonstrated that the project is of overriding public interest. In all cases where a potential impact has been identified in the plan, the Authority will seek to avoid the impact by means of mitigation. Mitigation measures are proposed in the Natura Impact Statement and these will be incorporated into the final plan prior to adoption. At detailed project-level appropriate assessment, further measures are likely to emerge and these will also be implemented. For schemes whose impacts cannot be mitigated, the Authority will seek alternative ways to meet the strategic objectives of the plan. Further information is contained in the accompanying Natura Impact Statement.

## 4.4 County Wicklow Cycle Route Network

The cycling network proposals for County Wicklow are presented in the following sectors:

- North Wicklow: Bray, Greystones, Kilcoole;
- South Wicklow: Wicklow Town & Arklow;
- West Wicklow: Blessington & Baltinglass; and
- Rural Cycle Routes in Wicklow.

Refer to Maps E19 to E24 in Part 6 for illustration of the existing cycle routes in this sector, with the Quality of Service ratings shown on Q9-Q24 of Volume 2.

### 4.4.1 North Wicklow Sector Town Cycle Networks

The North Wicklow Sector extends from the County Boundary in the north to Roundwood, Newtownmountkennedy and Newcastle in the south, and from the East Coast inland to the edge of the Wicklow Mountains. It includes the towns of Bray and Greystones, and the large villages of Kilcoole, Newtownmountkennedy and Roundwood. There are several smaller villages such as Enniskerry, Kilmacanogue and Delgany that are satellites of the larger population centres and are included with them in the analysis of cycle route requirements.

Refer to Map E20 in Part 6 for illustration of the existing cycle routes in this sector.

The proposed cycle route network is shown on Map N20 for Bray and N21 for Greystones in Part 8 and as described below.

- Bray** (Map N20)
- B1 Continuation of Route 12 from Dublin from Little Bray along Main Street and Vevay Road towards Greystones (W4).
  - B1a Old Connaught Avenue spur westwards from Dublin Road.
  - B2 Bray DART Station - Quinsborough Road / Florence Road - Main Street - Killarney Road to N11.
  - B3 Church Road.
  - B4 Vevay Road - Boghall Road - Kilbride Lane - Herbert Road to N11
  - B5 R768 Southern Cross Road.
  - B6 Putland Road from Vevay Road to Headlands.
  - B7 N11 from Fassaroe to Kilmacanogue where there is no alternative route for cyclists on the busy dual carriageway.
  - B7a Potential greenway link from Kilmacanogue to Bray Retail Park on Southern Cross Road.

#### Local Greenways in Bray

- W11 *Bray Promenade Greenway*: part of the *East Coast Trail* with continuation southward to Greystones around the western slopes of Bray Head at Newcourt to Windgates.
- BG1 *River Dargle Greenway*.
- BG2 *Swan River Greenway*.

#### **Greystones** (Map N21)

- G1 R761 from Bray at Windgate Hill (W4) - R762 Rathdown Road - Church Road - Mill Road – Delgany.
- G1a Victoria Road - Greystones Harbour.
- G2 From the R762 Mill Road along the R774 Charlesland Road dual carriageway as far as

the N11 and Kilpedder.

- G3 R761 Kindlestown Road.
- G4 Bellevue Road.
- G5 Greenway from the GAA and Rugby clubs on Mill Road southwards through Charlesland towards Kilcoole via the Charlesland Sports Centre.
- W11 *East Coast Trail Greenway* from the Bray Head Cliff Walk to South Beach via Greystones Harbour.

#### **Kilcoole** (Map N21)

- K1 Greenway from Charlesland along Lott Lane as an alternative to the busy R761 road.
- K2 R761 Coast Road.
- K3 Sea Road to railway station.
- K4 Newtown Road.

#### **Newtownmountkennedy** (Map RN10))

- N1 R765 Roundwood Road.
- N2 R772 Main Street.
- N3 Rossmore Road (southern ring route).

There are also potential local cycle links shown on the maps such as from Newtownmountkennedy to Kilpedder along the western side of the N11, or less directly via a back road.

#### **Bike & Ride to the DART and East Coast Railway Line**

The cycle route network maps have identified cycle routes to both Bray and Greystones DART stations in this sector. Most of these routes in Bray are along suitable quiet roads and do not require cycling facilities. In Greystones, existing cycle tracks provide access from the South. The potential greenway along the East Coast would also provide an alternative off-road route for cyclists to both DART stations. There is extensive sheltered cycle parking provided at both DART stations, but additional capacity may be required if demand increases significantly through active promotion to avail of the expanded local cycle networks. At all locations, cycle parking quantum and security will need to be assessed.



High quality and well located cycle parking shelter at Greystones DART station

#### 4.4.2 South Wicklow Sector Town Cycle Networks

The South Wicklow Sector extends from Laragh and Ashford in the north to Carnew in the far south of the county, and inland from the East Coast to Auhgrim. It includes Wicklow Town, Rathnew, Ashford, Rathdrum, Arklow, Auhgrim, and Tinahely.

Refer to Maps E22 and E23 in Part 6 for illustration of the existing cycle routes in this sector.

The proposed cycle route network for the major towns is shown on Map N22 for Wicklow and N23 for Arklow in Part 8.

##### Wicklow Town

- WT1 R750 - Rathnew - Dublin Road - The Mall - Dunbur Road.
- WT2 Wicklow Port Access Road - Station Road with new bridge over railway line at Wicklow Station and spur to the coast at The Murrough.
- WT3 Wicklow Western Ring Road.
- WT4 Rockey Road.
- WT5 R751 Marlton Road - Fitzwilliam Street - Bridge Street - Harbour.
- W11 *East Coast Trail from The Murrough to Wicklow Port and town centre.*

##### Arklow

- Ar1 R772 Dublin Road to Wexford Road through Main Street.
- Ar2 R750 Sea Road from Route Ar1 northwards towards Brittas Bay and Wicklow Town.
- Ar3 Lower Main Street, Tinahask Road and Dock Road to South Quay.
- Ar4 R747 Vale Road to the edge of town but not further towards Auhgrim as the road is too narrow and busy and there is a better alternative on north bank of the Avoca River.
- Ar5 Station access from Main Street along St.Mary's Road to Wexford Road (Ar1).
- Ar6 North Quay from Ferrybank by Bridgewater Shopping Centre with new bridge across to South Quay and link to Ar3 at South Green. (This will need to avoid the boat moorings in the river).

#### 4.4.3 West Wicklow Sector Town Cycle Networks

Refer to Map E24 in Part 6 for illustration of the existing cycle routes in Blessington. The town is quite small with a simple street network and quite wide streets that can accommodate cycling facilities on the approaches from the outlying residential areas to the town centre on the main roads from Dublin, Naas and Baltinglass.

In Baltinglass the approach roads are too narrow for cycling facilities and traffic flows are moderate on the main routes into the town centre from Blessington (N81), Arklow (R747), and Tullow (N81). Traffic calming will be sufficient to ensure suitable road conditions for cycling.

#### 4.4.4 Rural Cycle Routes in Wicklow

##### East Coast Trail Greenway in Wicklow

There is an opportunity to develop a major greenway along the East Coast, between Bray and Newcastle, with links to Kilcoole and Newcastle villages. This route would form part of the National Cycle Network Route No.5 between Dublin and Wexford.

Between Bray and Greystones the greenway cycle route will need to overcome the significant obstacle of Bray Head that rises steeply to an elevation of 240m above sea level. There is a narrow coastal

footpath, *the Cliff Walk*, which skirts along the eastern side of the hill at low to mid-level above the railway line. This is a very popular walking route that can be crowded at weekends. It is too narrow and rugged to accommodate shared use with cyclists. There would be excessive costs and environmental impacts involved in widening this route to make it suitable for cycling. The existing route available for cyclists between Bray and Greystones is along the busy R761 road over Windgates Hill that rises to an elevation of 150m above sea level. It is desirable and feasible to make provision for commuting cyclists on this main road as a link between the two towns, while also providing a suitable facility to meet the objectives of the National Cycle Network for a largely traffic-free and enjoyable amenity. A feasibility study has been commissioned by Wicklow County Council for this route, and this has identified an option for a segregated two-way cycleway along the eastern side of the R761 road. This route would link to the Bray Promenade at the northern end via Newcourt, and then could connect from Windgate to the Cliff Walk south of Bray Head and then follow the coastal route into Greystones.

Southward from Greystones towards Wicklow Town there is a well established coastal walking route along the back of the beach beside the railway line. This route could possibly be upgraded to suit cycling through provision of a flexible mattress type structure laid on top of the beach material. This type of construction would be light-weight and suitable for a sensitive marine environment where coastal erosion is an issue and access for heavy machinery would be very difficult and inappropriate. There are environmental sensitivities in certain places where bird life is concentrated in swamp lands inland from the beach. There will also be a need for small bridges across river-mouths at a few locations. If environmental considerations rule out this coastal route, then an alternative route will be required further inland.



*Existing rugged coastal path beside the railway line at Kilcoole*

Feeder routes are proposed from the East Coast Trail inland to the nearby villages of Kilcoole and Newcastle that are about 1km off the route, as well as at a few rural locations where local roads reach the coast. In some cases these feeder routes also serve as access routes to the railway stations, such as Sea Road in Kilcoole.

In Wicklow Town the coastal cycle route can follow the promenade at the harbour and into the town centre along a proposed cycling facility that was the subject of a feasibility study by Wicklow County Council in 2012. A section of the promenade, to the North of Castle View has recently been upgraded and widened.



Coastal Promenade in Wicklow Town

South of Wicklow Town towards Arklow the East Coast Trail can follow the R750 coast road past Brittas Bay, which is lightly trafficked, but should have a 60 km/h speed limit applied for safety of cyclists and warning signs provided to alert motorists that they are sharing the road with a designated national cycle route.

Routes Ar2 and Ar1 will carry the *East Coast Trail* through Arklow. It is not feasible to follow the coastline directly from the South Beach past Arklow Head due to a major quarry and industrial harbour. Instead the trail can take local roads from the southern edge of the town on the Wexford Road to Clogga Beach. From there southwards there is a quiet rural road near the coast past Kilmichael Point towards Courtown in County Wexford.

#### Rural Cycle Routes in South Wicklow

The rural cycle routes are shown on Maps RN6, RN7, RN8 and RN9 and follow suitable roads between the main towns in Wicklow, as well as providing recreational cycling routes in the Wicklow Mountains and to major tourist sites such as Glendalough.

- W1/D1 Dublin - Kiltiernan - The Scalp - Enniskerry - Djouce: the main access route from Dublin to the Wicklow Mountains for recreational cyclists. (See the Dublin South Central section in Chapter 3 for discussion of the improvements required in the Dun Laoghaire-Rathdown County area on this route as far as the northern edge of Enniskerry.) Joins Route W3 at Ballybawn near Powerscourt.
- W2 Bray - Enniskerry - Glencree - Military Road: There are several possible routes between Bray and Enniskerry. The route shown is via Ballyman Road (in DLRCC). The main R117 Cookstown Road is busy with traffic although slow due to many bends, but probably best avoided.
- W2a Bray to Enniskerry via Berryfield Lane to the south (partly private road) connecting to Fassaroe.
- W2b Bray to Enniskerry via local road at Cookstown near River Dargle and avoiding the main R117 Cookstown Road.
- W3 Bray & Enniskerry to Roundwood along the eastern edge of the Wicklow Mountains. This route avoids the busy R755 main road from Bray to Roundwood and instead follows a much quieter local road via Ballinastoe about 1km to the west. It also provides access the Ballinastoe Wood Mountain Biking Centre.
- W4 Bray to Wicklow via Greystones and Kilcoole along the R761 Regional Road with suitable cycling facilities on the busier sections north of Kilcoole.
- W5 Kilcoole to Roundwood via Newtownmountkennedy past the Druid's Glen Golf Club, linking the Wicklow Mountains to the East Coast Trail along quiet roads.
- W6/D2 *Military Road* from Dublin to Laragh via Rathfarnham and the Sally Gap: the highest and one

of the wildest cycle routes in Ireland reaching an altitude of 530m above sea level.

- W7 Roundwood to Blessington via Sally Gap, with a spur to Manor Kilbride and Route W18 to Dublin.
- W8 Roundwood to Laragh via Oldbridge on local roads west of the busy R755.
- W9 Roundwood to Wicklow via Ashford on R764 with quiet alternative from Ashford to Route W4 at Hunter's Hotel north of Rathnew.
- W10 Laragh/Glendalough to Blessington over the Wicklow Gap and through Valleymount, with a spur W10a westward to Hollywood and the rural cycle network in Kildare through Ballymore-Eustace.
- W11 *East Coast Trail* from Wicklow to Arklow and County Wexford. Greenway north of Wicklow Town and quiet coastal roads south of there.
- W12 Wicklow to Rathdrum via The Beehive and Kilmanoge, with a spur northwards to Glenealy through the *Deputy's Pass*.
- W13 Laragh to Rathdrum along the east side of the Avonmore Valley instead of the busy R755 road on the west bank of the river, with a shortcut section through forest lands south of Clara. This route then continues on the west bank by Avondale House and Forest Park to the Meetings of the Waters. It then switches back to the east bank of the river to Avoca on local roads. From Avoca to Arklow there are forest trails along the east side of the valley through private lands to Shelton Abbey. It should be possible to secure permissive access for cyclists along these tracks, which would need to be paved with gravel. This route is better than the busy R747 road on the west bank of the river from Woodenbridge to Arklow.
- W14 A circuit around the southern end of the Wicklow Mountains. It follows the Military Road from Laragh to Glenmalure and Aughavanagh over two high mountain passes. The route then continues around to Glen of Imaal in West Wicklow and the villages of Donard and Hollywood. Extends to Blessington and Dublin via Kildare Routes K21 and K22.
- W15 Aughavanagh to Auhgrim to Baltinglass: Overlap with Route W14.
- W16 *Old Auhgrim Railway Line*: a greenway from Route W13 at Woodenbridge on the former railway line to Auhgrim, Tinahely and Shillelagh, with local roads continuing the route southward via Coolattin Woods to Carnew and into County Wexford.
- W17 / K22 Baltinglass to Blessington, via Dunlavin and Ballymore Eustace, along local roads west of the N81. Potentially the old railway line from Naas through Dunlavin could also be developed as a greenway. (See Kildare Route K17).
- W18 Blessington to Dublin via Manor Kilbride, Ballinascorney Gap and Bohernabreena instead of the busy N81 main road.

#### Potential for Cycling Tourism in Wicklow

Given the proximity to the major population centre of Dublin and the spectacular mountain and coastal scenery available in County Wicklow, there is great potential for cycling tourism (both national and international) in the county. This is partially reflected at present in the large numbers of recreational cyclists that can be seen at weekends on the roads in North Wicklow in and around Enniskerry and Roundwood on the eastern side. However, most such cyclists are of the hardy road-biker type that is not discouraged by busy roads and steep hills.

This report has identified an extensive network of pleasant and quiet roads that can be promoted as touring cycle routes in North Wicklow. These routes have been selected to link to the main tourist attractions and to facilitate a wide range of route options in terms of length and difficulty. The rural routes connect into all of the main towns using suitable urban cycling facilities that are justified in any case for utility trips in those locations. The investment cost required would be very low to provide a top-class cycle route network in Wicklow based on a number of "Cycle Hubs" in the main coastal towns that have excellent transport connections by rail and main road. This concept is already working successfully in over a dozen locations around the country such as Clifden, Westport and Doolin. All

that is needed are direction signs for numbered cycle loops radiating from each town, occasional information sign boards and some special maps. Such a new tourism network would provide great economic potential for the existing communities in the towns and villages in Wicklow, many of which are bypassed by car and coach tourists that head quickly to hot-spots such as Glendalough that are over-subscribed.

## CHAPTER 5

## SUMMARY AND CONCLUSIONS

This report presents the *National Transport Authority Cycle Network Plan* for the Greater Dublin Area. When completed, the cycle route network will comprise urban cycle routes in the full urban area of Dublin and the major towns in the surrounding counties, as well as rural cycle routes and greenways across the region consisting of 7 local authority areas and with a population of 1.7 million people. This Cycle Network Plan will provide for a consistent network across the local authority boundaries.

### Policy Context for the Cycle Network

Policy at national and local government level is committed to ensuring that cycling as a transport mode is supported, enhanced and exploited to a much greater degree than heretofore. The key goal is aimed at ensuring that a cycling culture is developed in Ireland to the extent that by 2020 10% of all journeys will be by bike. A high quality and extensive cycle route network will be central to the realisation of this objective.

### Cycle Network Planning

In accordance with the *National Cycle Manual* the cycle network consists of a hierarchy of corridors that provide differing levels of importance for cyclists:

- Primary Network: Main cycle arteries that cross the urban area, and carry most cycle traffic;
- Secondary Network: Links between the principal cycle routes and local zones; and
- Feeder: Cycle routes within local zones, and/or connections from zones to the network levels above.

The cycle network in the Greater Dublin Area will also include a number of long-distance cycle routes as part of the *National Cycle Network* and the *EuroVelo* system of trans-European cycle routes.

While this report sets out certain proposals in respect of individual network links, these proposals have been developed at a strategic level. Accordingly, these individual link proposals are subject to possible refinement and amendment as part of the planning and development process of each scheme, while maintaining the overall intent of the proposal.

### Study Methodology

The development of this Cycle Network Plan followed a series of logical steps:

- (i) Mapping of the existing and planned cycle network;
- (ii) Assessment of the Quality of Service of the existing main cycle routes;
- (iii) Identification of gaps between existing and planned routes to serve the key destinations throughout the GDA area;
- (iv) Development a cycle demand model for the GDA;
- (v) Identification of potential alignments and design solutions for each route; and
- (vi) Preparation of a consolidated future cycle network plan for the Greater Dublin Area.

### National and Trans-National Cycle Routes

In the Greater Dublin area the National Cycle Network will comprise 3 key routes:

- East Coast Route from Rosslare to Northern Ireland through Dublin;
- Galway to Dublin (also part of EuroVelo Route 2 extending eastwards across Europe to Moscow) along the Royal Canal to the edge of Dublin; and
- Cork to Dublin via Kilkenny along the Grand Canal.

These routes are included in the proposed GDA Cycle Network insofar as feasibility assessments and route planning to date has indicated their likely alignments. The final routes may vary following more detailed route studies.

### Cycling Trip Demand Forecasts

A cycling demand model of the Greater Dublin Area was developed for a 2011 base year using Census 2011 POWSCAR data for work and education trip purposes, and the NTA 2006 Household Survey for other trip purposes such as retail and leisure. The input data was adjusted to reflect a typical weekday and recorded approximately **22,000 cycling trips in the GDA during the weekday morning peak period (07:00-10:00)**. This equates to a modal share by bike that varied up to a high of 6.7% for work trips of less than 5km length in the Dublin City area. The cycle model allowed estimation of volumes of cyclists on each route in the study area. Cycle traffic counts validated the model flows on the main city routes and indicated volumes of 800 cyclists or more in the peak period on several streets including North Strand and Rathmines Road.

Future cyclist volume forecasts were developed in line with the Government policy objectives and targets. To achieve a national average mode share of 10% will require a higher mode share in the urban areas to compensate for a likely lower mode share in rural areas. For this plan a range of variable mode share targets were applied for the future year cycle traffic forecasts taking account of trip type, distance and location. The highest future cycling mode share target assumed was up to 18% for short distance city trips to work, which is the trip type most amenable to cycling.

The future forecasts estimated an increase by 2021 to **75,000 cycling trips in the GDA during the weekday morning peak period**. On this basis the maximum flows on certain streets could well exceed 2,000 cyclists which would require substantial additional capacity in wider cycle facilities.

### Cycle Route Network Summary Lengths

The existing cycle route network in the Greater Dublin Area is **500km in length**, of which 400km is in the metropolitan area and 100km in the hinterland towns.

The proposed cycle route network will consist of the following key elements:

- (i) 235 km of Primary Cycle Route in the Dublin metropolitan area;
- (ii) 400 km of Secondary Cycle Route in the Dublin metropolitan area;
- (iii) 300 km of Primary/Secondary Cycle Route in the towns within the GDA hinterland;
- (iv) 110 km of Greenway routes in the metropolitan area;
- (v) 1,485 km of strategic cycle route in urban areas (excluding extensive local feeder routes);
- (vi) 1,355 km of rural cycle routes (including greenways) between towns; and
- (vii) 2,840 km Overall Total Network Length of urban and rural cycle routes.

The completed network will facilitate safe and comfortable cycling between all origins and destinations in the Greater Dublin Area.

### SUMMARY OF PROPOSED CYCLE NETWORK LENGTHS

Route Category	Length of Proposed Cycle Network (km)							
	Greater Dublin Area	Dublin CC	Fingal CC	South Dublin CC	Dun Laoghaire Rathdown CC	Meath CC	KCC	WCC
Primary (Metropolitan area)	235	109	23	47	55	0	0	0
Secondary (Metropolitan area)	383	149	56	124	55	0	0	0
Cross-City Link	19	19	0	0	0	0	0	0
Feeder (Metropolitan area)	434	114	59	119	142	0	0	0
Greenway - Metropolitan Area	110	67	0	27	15	0	0	0
Greenway - Hinterland	458		83			126	166	83
Inter-Urban	897	0	82	24	9	264	183	335
Primary/Secondary (Hinterland Towns)	303	0	78	1	0	75	78	70
<b>Total</b>	<b>2,840</b>	<b>460</b>	<b>381</b>	<b>341</b>	<b>277</b>	<b>466</b>	<b>427</b>	<b>488</b>
<b>Existing Routes</b>	501	169	84	58	90	22	38	39
<b>New Routes</b>	2,339	291	298	283	187	443	389	449