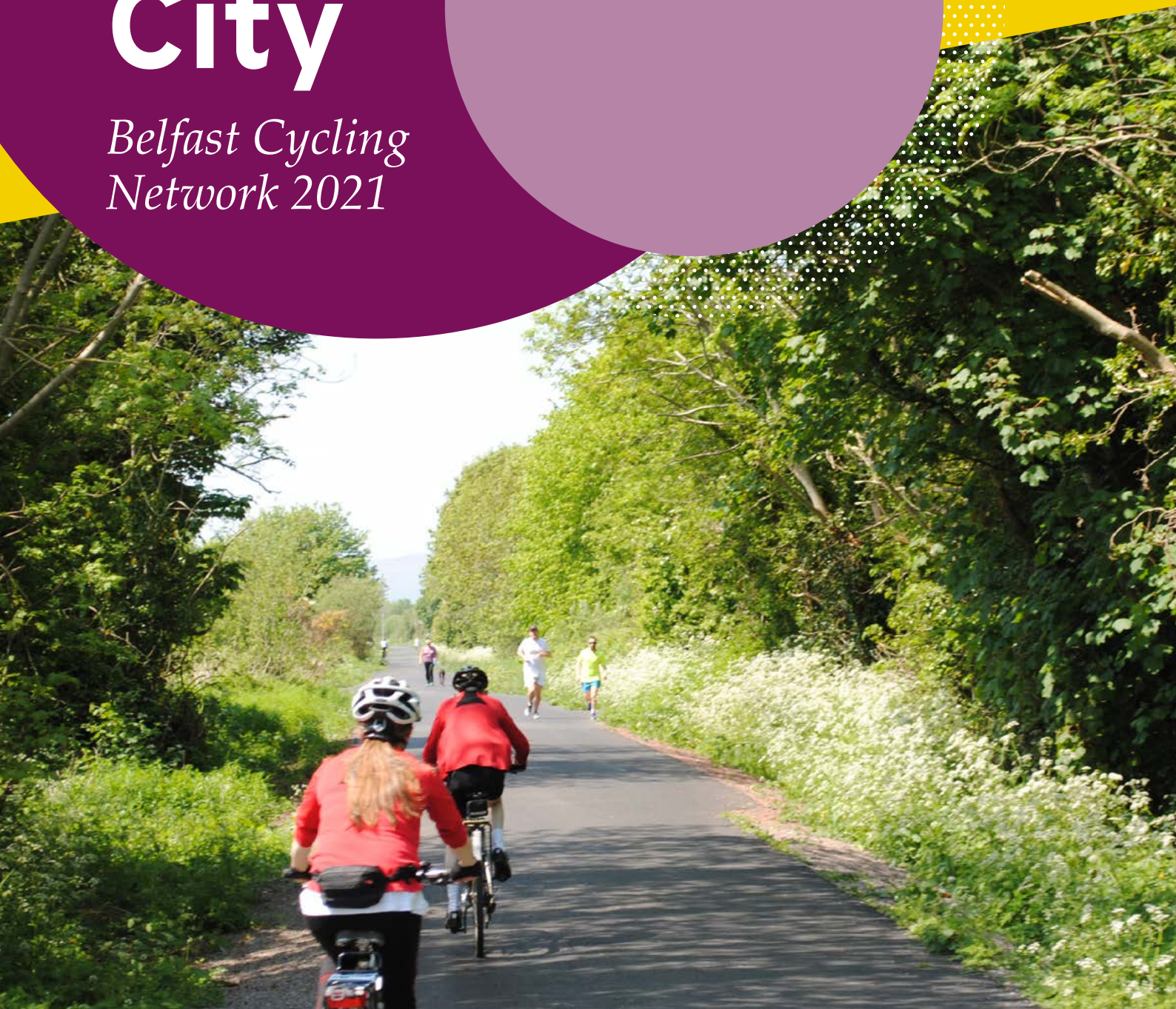
Department for Infrastructure
An Roinn Bonneagair
www.infrastructure-ni.gov.uk

Making Belfast an Active City

Belfast Cycling Network 2021



My ambition is to make Belfast a more cycle friendly city - and that means a more friendly city for everyone.

Nichola Mallon

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Ministerial Foreword

Nichola Mallon MLA

/ Minister for Infrastructure

The world is changing and we must change with it.

Right across the world, towns and cities are being transformed into vibrant, healthy liveable places where the needs of citizens are placed front and centre, public spaces are being used to better effect for the physical and mental health and wellbeing of their people and climate change is being addressed through carbon reduction.

The wellbeing outcomes in the Programme for Government draft Outcomes Framework focus on the citizen. As part of that focus we need to provide access to safe, active and sustainable transport modes to encourage people to make environmentally responsible choices about travel. Alongside this, the Bolder Vision for Belfast provides an ambitious blueprint to explore a shared approach to creating a more attractive, accessible, safe and vibrant city centre – to transform Belfast to create sustainable, attractive, liveable places where people and businesses thrive. Within that approach I have an ambition to significantly increase opportunities for active and sustainable travel, to give everyone – yes, everyone – the freedom and confidence to be able to walk, wheel or cycle in our city.

As we emerge from COVID, and all the changes that this has forced upon us, the Belfast Cycling Network sets out my ambition to make Belfast a more cycle friendly city – and that means a more friendly city for everyone. By creating a network of safe cycling infrastructure over the next ten years we can make the city better for walking, wheeling, public transport and even the minority of people who really do have to drive. And not only Belfast – I want to set a direction that will deliver active travel networks in our towns and cities right across the North. By travelling more sustainably we can reclaim road space to use for better things that will transform our places – and I want to work with local communities and Councils to make it happen.

It is said that an organisation's priorities are not set out in its strategies but in its budget. So once again, I am committing £20 million of capital investment in 2021/22 to my Blue / Green Infrastructure Fund to step up the work that is needed to begin the delivery of these routes next year, to start the £100 million investment that will be needed over the next ten years and to initiate a real transformation in travel habits that will be delivered by the end of 2030.

Thank you to everyone who responded to the 2017 consultation and to all those from my Walking and Cycling Advisory Group who provided input to this document. It has all been very welcome.

Réamhrá an Aire

Nichola Ní Mhealláin CTR
/ An tAire Bonneagair

Tá an saol ag athrú agus caithfidh muid féin athrú leis.

Ar fud fad na cruinne, tá bailte agus cathracha á n-athrú ó bhonn mar áiteanna beoga, folláine inar féidir cónaí ina dtugtar tús áite do riachtanais saoránach, ina mbaintear feidhm as spásanna poiblí le tionchar níos fearr a imirt ar shláinte is fholláine fhisiceach is mheabhrach na ndaoine iontu agus ina dtugtar aghaidh ar athrú na haeráide fríd laghdú carbóin.

Díríonn na torthaí fá dtaobh d'fholláine i ndréacht Chreat na dTorthaí i gClár an Rialtais ar an tsaoránach. Mar chuid den díriú sin, caithfidh muid rochtain a chur ar fáil ar mhodhanna taistil atá sábháilte, gníomhach agus inbhuanaitheach le daoine a spreagadh le roghanna atá freagrach ó thaobh na timpeallachta de fá dtaobh de thaisteal a dhéanamh. Chomh maith leis seo, cuireann an Fhís Níos Fearr do Bhéal Feirste treoirphlean uaillmhianach ar fáil le cur chuige i bpáirt a iniúchadh le lár na cathrach a dhéanamh níos tarraingtigh, inrochtana, sábháilte agus beoga – le Béal Feirste a athrú le áiteanna inbhuanaithe, tarraingteacha inar féidir cónaí ina rathaíonn daoine agus gnólachtaí. Taobh istigh den chur chuige seo, is mian liom méadú mór a thabhairt ar dheiseanna fá choinne taistil atá gníomhach agus inbhuanaithe, an tsaoire agus an misneach a thabhairt d'achan duine – sea, achan duine – a bheith ábalta siúl nó rothaíocht sa chathair s'againn.

Agus muid ag teacht amach as COVID, agus na hathruithe ar fad a thug seo orainn, leagan amach Líonra Rothaíochta Bhéal Feirste mo mhian Béal Feirste a dhéanamh mar chathair atá níos cairdiúla do rothaíocht – agus ciallaíonn sin cathair níos cairdiúla d'achan duine. Fríd líonra bonneagair shábháilte rothaíochta a chruthú sa deich mbliana romhainn thig linn an chathair a dhéanamh níos fearr fá choinne siúil, rothaíochta, iompair phoiblí agus fiú don mhionlach daoine a mbíonn orthu tiomáint. Agus ní hamháin i mBéal Feirste – is mian liom treoir a leagan a chuirfidh líonraí gníomhacha taistil ar fáil san bailte agus sna cathracha s'againn ar fud an Tuaiscirt. Fríd thaisteal níos inbhuanaithe thig linn spáis bóithre a ghabháil ar ais le feidhm a bhaint as fá choinne rudaí níos fearr a thabharfaidh athrú ar na háiteanna s'againn – agus is mian liom oibriú le pobail agus Comhairlí áitiúla chun go dtarlóidh seo.

Deirtear nach ina cuid straitéisí a leagtar amach tosaíochtaí eagraíochta ach sa bhuiséad s'aici. Arís eile mar sin, tá mé ag tiomnú £20 million d'infheistíocht chaipitil in 2021/22 Don Chiste Gorm / Glas Bonneagair s'agam le cur leis an obair atá de dhíth le tús a chur le seachadadh na mbealaí seo an bhliain seo chugainn, le tús a chur leis an infheistíocht £100 milliún a bheas de dhíth sna deich mbliana amach romhainn agus tús a chur le hathrú dáiríre ar nósanna taistil a dhéanfar a sheachadadh fá dheireadh 2030.

Buíochas d'achan duine a thug freagra ar chomhairliúchán 2017 agus dófa siúd uilig as Grúpa Comhairleach Siúil agus Rothaíochta s'agam a chabhraigh leis an cháipéis seo. Is mór an fháilte a cuireadh roimhe uilig.

1.0 Overview

1.1 The publication of this Belfast Cycling Network fulfils a commitment set out in 'Northern Ireland Changing Gear – a Bicycle Strategy for Northern Ireland' which was published in August 2015[1]. This document follows a public consultation in 2017 (the main points from the consultation are provided in Appendix A) and sets out a blueprint for the development and operation of the cycling infrastructure in the city for the next ten years. 'Planning for the Future of Transport – Time for Change', which was published by the Department in June 2021, places active travel and sustainable travel modes at the very heart of the Department's transport programme, in support of the Programme for Government draft Outcomes Framework. Accordingly, the 'Belfast Cycling Network' commits the Department to reimagining and reshaping our spaces to make proper provision for cycling, to help build a better future that delivers more for our citizens, socially and economically, delivering cleaner, greener and healthier communities.

1.2 The publication of the Belfast Cycling Network in maps provides clarity as to which roads, streets or off-road routes will be amended or adopted as cycle routes. These maps will provide a reference point for the design of the individual legs of the network and other subsequent processes.

Active travel and sustainable travel modes are at the very heart of the Department's transport programme, in support of the Programme for Government draft Outcomes Framework.

1.3 **Section 2** sets out the rationale for developing a cycling city and gives shape to fulfilling outstanding active travel commitments given by this Department (and its predecessor Department) over the past twenty years.

1.4 **Section 3** sets out the vision and objectives of the Network highlighting that it is aimed at providing safe infrastructure which will benefit both the large cohort of the population who are interested in cycling but are concerned about doing so and also those other vulnerable road users who do not cycle. It also summarises the core design principles to be adopted in delivering the quality routes set out in the Network in keeping with the most up-to-date guidance (Local Transport Note 1/20 – LTN 1/20[2]).

1.5 **Section 4** presents proposals for the city centre area, consolidating the principles in the Belfast Metropolitan Transport Plan, Belfast Streets Ahead and, more recently, a Bolder Vision for Belfast. It is focussed on improving the city centre for people rather than vehicles.

1.6 **Section 5** sets out the primary network. This includes the proposals in the draft Belfast Bicycle Network plus some additional arterial routes to take account of both consultation responses and previous proposals from the Belfast Metropolitan Transport Plan. The proposed Network will bring good quality cycling infrastructure within reach (i.e. within 400m) of around three quarters of all Belfast City Council residents.

1.7 **Section 6** addresses 'quiet streets' as the basis for the secondary network and presents the model of 'low traffic neighbourhoods' as used in London and elsewhere as an effective way of giving people a better environment in which they can walk, wheel or cycle.

1.8 **Section 7** sets out the way forward and next steps in the implementation of better cycling infrastructure.

1 A bicycle strategy for Northern Ireland (infrastructure-ni.gov.uk)

2 Cycle Infrastructure Design (publishing.service.gov.uk)

2.0 Delivering a Cycling City

2.1 One of the major changes in society over the past one hundred years is that people have become considerably more mobile as a result of improvements in travel infrastructure and transport services. One of the results of this is that for decades transport infrastructure has been developed in such a way that it has suppressed walking and cycling across all sectors of society[3]. Until recently, transport appraisal favoured motorised traffic by not considering the wider value of cycling which is now known to contribute to better health and communities, less congestion, and better quality of life, all of which yield an economic return[4]. A 2014 Department for Transport report highlighted that the mean benefit to cost ratio (BCR) for walking and cycling interventions in GB was in excess of 5.5: 1[5] – considerably higher than for large road and rail schemes. A subsequent study on the 'Value of cycling' by the University of Birmingham, indicated that cycling schemes can achieve benefit-to-cost ratios in the range of 5:1 to 19:1 – some as high as 35.5:1[6].

2.2 In addition, a landmark study carried out over five years involving over a quarter of a million individuals was published by the University of Glasgow in the British Medical Journal in 2017. This research highlighted that commuters who cycled to work were associated with a 41% lower risk of premature death. Those walking to work were associated with 27% lower risk of developing cardiovascular disease and a 36% lower risk of dying from cardiovascular disease[7].

'A city can be friendly to people or it can be friendly to cars, but it can't be both'

Enrique Penalosa
(Mayor of Bogota, Colombia 1998 – 2001)

2.3 In order to secure the substantial health and economic benefits of active travel, it is important that transport infrastructure is developed which not only facilitates but encourages active travel. Yet despite the known health and wellbeing benefits, not enough has been done to reverse the downward trend in these modes of travel.

2.4 A wide range of literature highlights the societal and individual benefits that increased cycling measures can bring to an area. For example, a variety of studies warn that sedentary lifestyles are likely to be causing as many deaths as smoking[8]. An Australian study in 2010 involving over 27,000 individuals demonstrated that excessive driving was a road to unhealthy lifestyles and poor health outcomes[9].

2.5 Other studies indicate that one of the best ways to endow children with lifelong health is to leave them an environment which encourages healthy, active travel. To do so villages, towns and cities must be made more people-friendly[10].

Provision of infrastructure to facilitate sustainable transport and the associated promotion of active travel (i.e. walking, wheeling and cycling) are therefore key activities for the Department for Infrastructure as it also seeks to make a significant contribution to the alleviation of traffic congestion and reduction in CO2 transport-related emissions.

2.6 Alongside this, the issue of 'liveable cities' is coming more to the forefront globally. As car ownership has grown in the western world and travel has become more ubiquitous, towns and cities have been greatly impacted by car-oriented development. While this has been done in the name of mobility it has had significant effects upon the liveability of urban areas: in spatial terms, the provision of roads and car parks can dominate the surroundings and create barriers within and between communities. Together with the environmental and health impacts from high levels of transport related air pollution (particularly in congested areas) and the disincentive to the physical activity associated with active travel, the way we travel has acted as a barrier to good place making. A key ingredient of most successful urban places is good streets. Quite different from roads, streets not only act as important movement routes for people and traffic, they also serve as vital public spaces used by us all[11].

3 Take_action_on_active_travel.pdf (bettertransport.org.uk), page 2.
4 http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2011/regional-development/15411.pdf, page 1
5 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/371096/claiming_the_health_dividend.pdf, page 5
6 The value of cycling (publishing.service.gov.uk), page 3
7 https://www.gla.ac.uk/news/archiveofnews/2017/may/headline_522765_en.html
8 http://www.getbritainstanding.org/health-risks.php.
9 https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0094602
10 Take_action_on_active_travel.pdf (bettertransport.org.uk), page 4
11 Living Places - An urban Stewardship and Design Guide for Northern Ireland (infrastructure-ni.gov.uk), page 8.

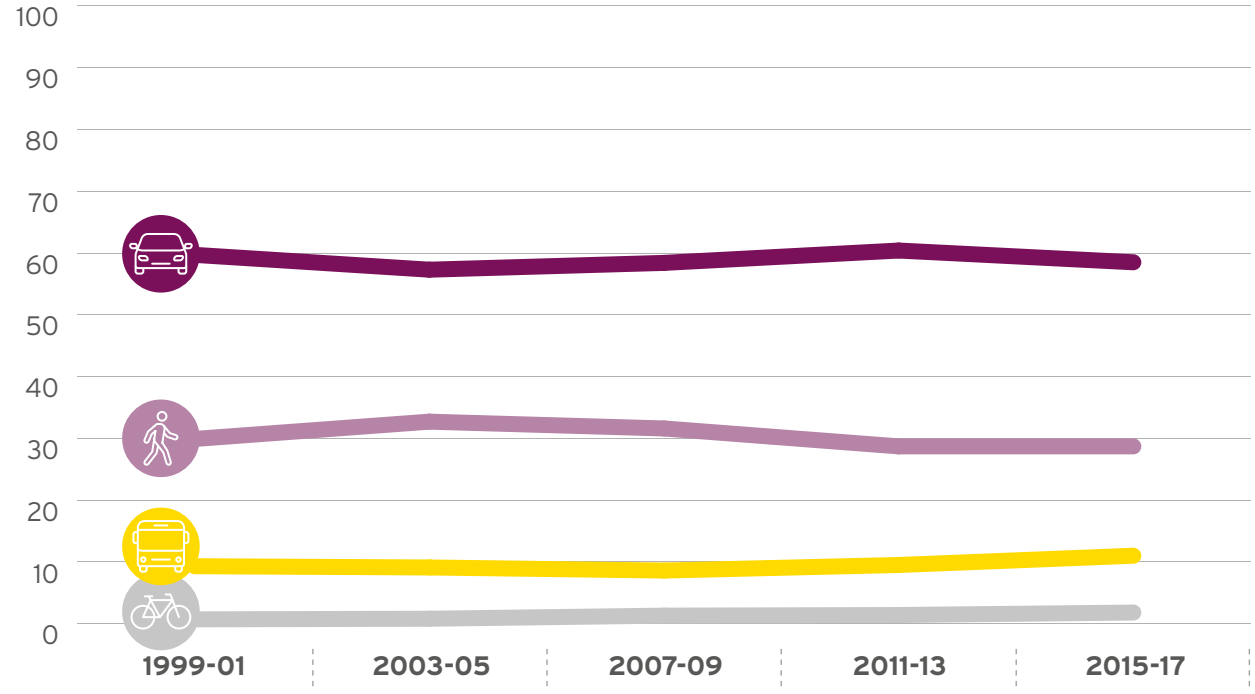
A key ingredient of most successful urban places is good streets. Quite different from roads, streets not only act as important movement routes for people and traffic, they also serve as vital public spaces used by us all[11].

2.7 The pandemic has had a considerable affect upon how many people travel for everyday purposes. One of the great 'unknowns' is to what extent people, who have been forced to change their travel habits during various 'lockdowns', will make these short term changes part of their ongoing travel arrangements. A significant ongoing reduction in peak travel levels, even if there is little reduction in overall travel levels, is one of the factors that would allow a radical change in the reallocation of road space to more active and sustainable modes.

Progress

2.8 Northern Ireland Government policies since 1999 have been focussed on delivering a change in habits to more active and sustainable modes of travel (see Appendix B). Yet levels of walking, wheeling and cycling and public transport remain stubbornly low. Figure 1 illustrates journey mode share for walking, cycling, public transport and motor vehicles in Belfast over the period 1999-2017[12]. The latest figures (for 2017 - 19) show little change in levels of walking and cycling compared to 1999 – 2001.

Figure 1: Percentage of Journeys By Main Mode
Belfast Travel Survey for Northern Ireland 1999-2017



12 Taken from the Travel Survey for Northern Ireland: https://www.infrastructure-ni.gov.uk/articles/travel-survey-northern-ireland

13 Copenhagen City of Cyclists – the Bicycle Account 2016, page 14.

14 https://www.sustrans.org.uk/media/2940/2940.pdf

2.9 These statistics show that we must invest in creating active travel networks and better public transport services to reverse the trend. The successful introduction of the Glider service has demonstrated what can be achieved when road space is dedicated to more sustainable ways of travelling rather than filling our roads with single occupancy private vehicles – the most inefficient, uneconomical and unsustainable use of limited road space. It is no coincidence that the success of Copenhagen, in terms of developing a cycling culture, has been greatly assisted by reallocating road space to dedicated cycle lanes and investing in dedicated infrastructure such as bridges and underpasses which remove conflict with heavy motor traffic. The benefits of this are remarkable: the 2016 Copenhagen Bicycle Account reveals that while 29% of all trips in the city are made by cycle (34% by private car) only 7% of road space is taken up by cycle tracks (54% is taken up by traffic lanes)[13]. Yet typically a cycle track can transport 2½ times as many people as a traffic lane.

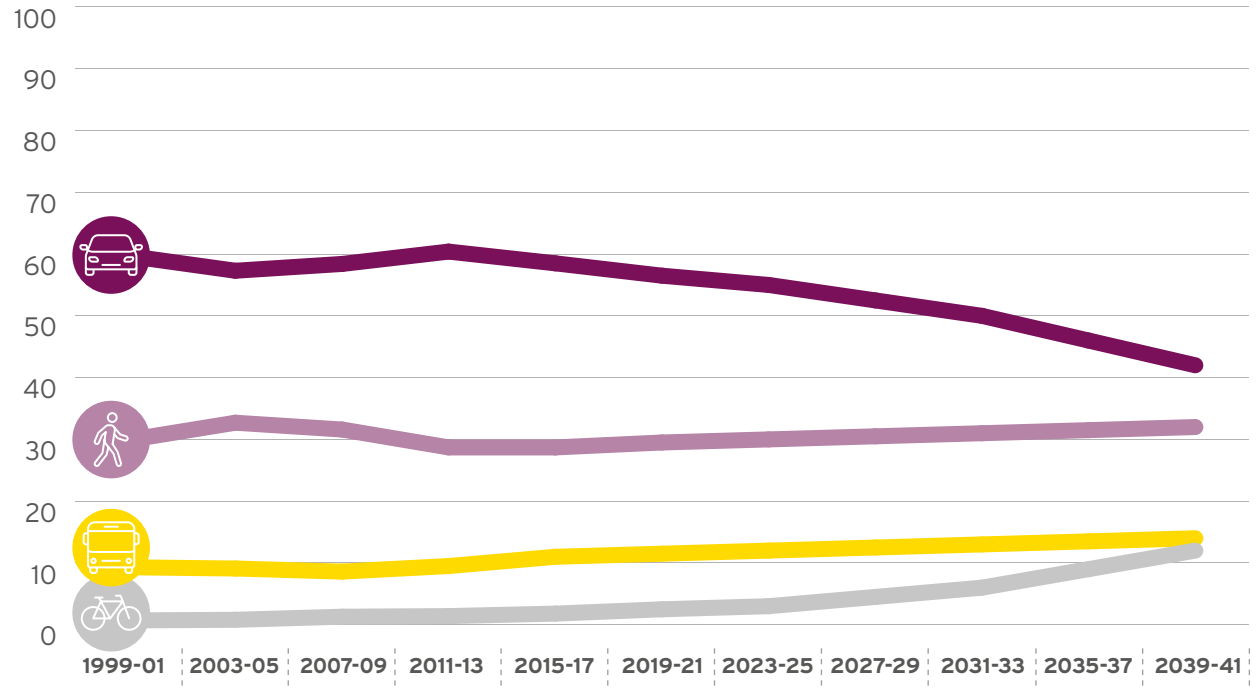
2.10 The draft Programme for Government 2016 committed us to improving health and wellbeing and increasing the percentage of all journeys made by walking, cycling and public transport can help to achieve this. Currently, in Belfast, around 35% of all journeys are by these sustainable modes. From a very low base of around 1%, cycling presents the greatest potential for increase (as outlined above) and this is reflected in the ambitions set out in the 2015 Bicycle Strategy. The refreshed Programme for Government draft Outcomes Framework, on which consultation closed on 22 March 2021, reflects a similar commitment to improve the health of our citizen and to monitor progress in achieving this outcome.

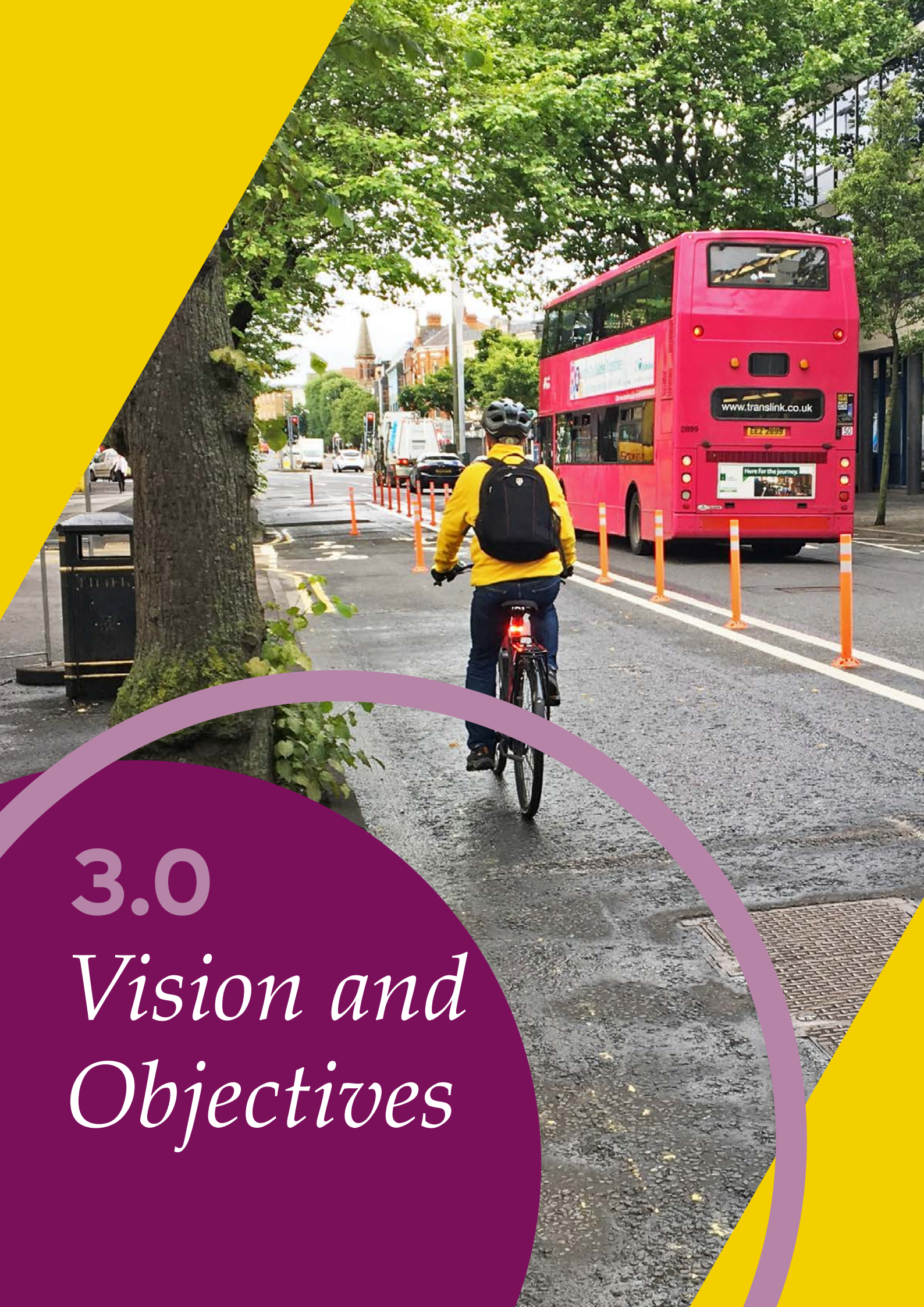
2.11 The sustainable transport charity Sustrans published a study called 'Bike Life: Transforming Cities – the potential of everyday cycling' in January 2019. This report set out a vision for doubling the level of cycling in the seven original Bike Life cities every seven or eight years – raising it to a level of 56 million cycling trips annually in Belfast by 2040 – that is 3 trips per person each week[14]. The report also estimates that achieving this modal shift would result in a total economic benefit of £1.1 billion for the city, the removal of 172 miles of cars from the roads daily and a reduction of 20,000 tonnes of greenhouse gas emissions annually by 2040.

2.12 Taking the data from the Travel Survey, the ambition in the Bicycle Strategy and the vision in this Sustrans report, the following figure illustrates a possible mode share shift scenario for Belfast between now and 2040. The figure illustrates the important point that increasing all sustainable modes of travel (the two green lines and the yellow line) will reduce the proportion of journeys made by motor vehicle (red line). However, it also recognises that motor vehicle use will continue to be an important method of travel for many citizens for certain necessary journeys.

2.13 The Belfast Cycling Network is about providing dedicated infrastructure for people who wish to cycle (including the large proportion of the population who are interested in cycling but concerned about their safety) and for ensuring that conflicts with other road users are minimised. Our commitment to building this infrastructure will provide a safe environment which will encourage people to cycle with confidence without undermining safety for more vulnerable road users. A key aspect of this is developing all transport interventions in line with the road user hierarchy – ensuring that the most vulnerable users are considered first, starting with pedestrians and then people cycling. As a result of implementing these routes, we will develop a cycling culture within Belfast that will grow cycling levels in line with the Bicycle Strategy (2015) and 'Bike Life: Transforming Cities – the potential of everyday cycling' (paragraph 2.21).

Figure 2: Journeys by MainMode
Belfast 1999-2040





3.0 *Vision and Objectives*

3.1 Active travel provides people with a healthy, cost-effective and enjoyable means of incorporating physical activity into their daily routine. The number of people who can benefit from this is considerably greater than the number who currently do. Accordingly, the Bicycle Strategy sets out the vision of 'a community where people have the freedom and confidence to cycle for everyday journeys'. This articulates the Department's commitment to enable modal shift.

3.2 The idea behind this vision stems from a study called 'Four types of cyclists' which was carried out in Portland, Oregon, USA. The idea was taken up in the Sustrans Bike Life project where residents of the participating cities (including Belfast) were asked to classify themselves as one of the following five groups (the percentages relating to Belfast from the 2019 report are also indicated):

- People who *regularly cycle* (7%)
- People who *occasionally cycle* (14%)
- People who are *starting to cycle* or starting to cycle again (4%)
- People who *do not cycle* but would like to (31%)
- People with *no intention* of cycling (44%)

3.3 The vision for cycling set out in the current Bicycle Strategy has this large cohort of the population in mind. The proposal to develop a Belfast Cycling Network aims to give this large section of the population the freedom and confidence to cycle, with the associated physical and mental health and wellbeing, environmental and economic benefits making real improvements to the quality of life of the people of Belfast.

Objectives

3.4 As envisaged in previous documents, we believe the provision of a network of coherent, accessible and comfortable cycle routes with high quality consistent design will be successful in helping a significantly larger number of citizens to cycle in the city as part of their everyday activities. In other words, the objectives of the network would be:

- To develop a comprehensive cycling network for commuter, amenity and recreational cycling through the expansion of cycling infrastructure and cycling facilities;
- To bring good quality cycle routes within the reach of most people in the city;
- To ensure a consistent quality in the design of safe infrastructure – providing dedicated infrastructure where there are large volumes of higher speed vehicles and shared facilities such as quiet streets where the volume and speed of motor traffic is low;
- To encourage cycling and promote safe cycling through increasing the amount of cycle parking, providing more cycling education programmes for both young people and adults, supporting events to promote cycling;
- To provide infrastructure and routes which are accessible to all regardless of age, gender, ethnicity or disability and which do not create hazards for vulnerable pedestrians.

Developing a Network for Belfast

3.5 For Belfast to become a city where sustainable travel accounts for over half of the everyday journeys made in the city (see paragraph 2.23) and where cycling is normalised as part of that picture, we need a two stage approach:

i. To develop high quality safe space for cycling and routes that will significantly increase the number of people cycling to make their journeys;

ii. To reduce accessibility for private motor vehicles in the core city centre area, provide separated cycling routes on the key arterial routes into the city and develop a wider network of quiet routes across the city.

3.6 This will help deliver on the Programme for Government draft Outcomes Framework commitment to improve health and wellbeing. Increasing the percentage of all journeys made by walking, cycling and public transport means reducing the percentage of journeys made by unsustainable means such as the private car (and in particular, low occupancy private cars). This network sets out ways of reducing motor traffic volumes and using road space more efficiently in order to reduce congestion and civilise our city at the same time. It identifies ways to make Belfast a low traffic city. We cannot maintain levels of motor traffic and prioritise motor traffic progression and deliver modal shift at the same time.

Active travel provides people with a healthy, cost-effective and enjoyable means of incorporating physical activity into their daily routine.

Core Design Principles

3.7 There are five core design principles for the design of this network which were adopted for the development of the Belfast Metropolitan Transport Plan (BMTP) and which are restated in LTN 1/20[15]. In addition, to these this Cycling Network also recommends that infrastructure should have adaptability to provide an element of future proofing. The objective of these design principles is to take cycling infrastructure beyond the general level of existing provision and raise it to the level of what is commonly provided in established cycling societies such as those in northern Europe. The six design principles are opposite (in alphabetical order).

Guiding Principles

3.8 There are 22 good design principles that should guide the design of the infrastructure set out in this Network which are found in LTN 1/20[16]. These principles are fundamental to achieving the Bicycle Strategy Vision and in encouraging more cycling journeys. They have been developed having taken into account the main shortcomings of the existing infrastructure – shortcomings which have worked against the achievement of a significant increase in cycling. These principles are set out in Appendix C.

15 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/906344/cycle-infrastructure-design-ltn-1-20.pdf, pages 7 and 8.

16 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/906344/cycle-infrastructure-design-ltn-1-20.pdf, Section 1.6, pages 9 – 14.

Core Design Principles

Adaptable

Cycling infrastructure should be designed to accommodate users of all types of cycle and also increasing numbers over time. The routes also need to be able to provide continuity with public transport modes including the Belfast Bike Share Scheme.

Safe

Not only must cycle infrastructure be safe, it should also be perceived to be safe so that more people feel able to cycle. Safety and environmental improvements for all road users can be achieved by reducing motor traffic volumes and speeds, for example by introducing filtered permeability or traffic calming. Reducing motor traffic may also release space to enable the construction of separate facilities for cyclists on links and at junctions.

Attractive

Walking, wheeling and cycling provide a more sensory experience than driving. People are more directly exposed to the environment they are moving through and value attractive routes through parks, waterfront locations, and well-designed streets and squares. Cycling is a pleasurable activity, in part because it involves such close contact with the surroundings, but this also intensifies concerns about personal security and traffic danger. Cycling infrastructure should help to deliver public spaces that are well designed and finished in attractive materials and be places that people want to spend time using.

Coherent

Cycle networks should be planned and designed to allow people to reach their day to day destinations easily, along routes that properly connect, are simple to navigate and are of a consistently high quality – just as they currently are for motor vehicles. Abrupt reductions in the quality of cycling provision – such as a busy high-speed roundabout without facilities – will mean that an otherwise serviceable route becomes unusable by most potential users. Sections that do not meet accessibility standards, such as steps on a cycle route, will render a whole journey inaccessible for some people.

Direct

Directness is measured in both distance and time, and so routes should provide the shortest and fastest way of travelling from place to place. This includes providing facilities at junctions that minimise delay and the need to stop. Minimising the effort required to cycle, by enabling cyclists to maintain momentum, is an important aspect of directness. Cycle routes should be at least as direct – and preferably more direct – than those available for private motor vehicles.

Comfortable

Comfortable conditions for cycling require routes with good quality, well maintained, even surfaces, adequate width for the volume of users, minimal stopping and starting and avoiding steep gradients. The need to interact with high speed or high-volume motor traffic also decreases user comfort by increasing the level of stress and the mental effort required to cycle. Designers should consider comfort for all users including children, families, older and disabled people using three or four-wheeled cycles.

4.0 City Centre

4.1 This section sets out the Belfast Cycling Network for the city centre. It is informed by: A Bolder Vision for Belfast which was developed by the Department in partnership with Belfast City Council and the Department for Communities; the Belfast Metropolitan Transport Plan (BMTP) published in 2004 (and the forthcoming BMTP under development); and, specific cycling routes for the city centre.

Vision

4.2 Throughout the twentieth century, in most of the west, cities have been adapted and changed to accommodate motor vehicles. Public space has increasingly given over to both the movement and parking of motor vehicles. The social and community life of the city has been compromised by efforts to improve traffic progression. In recent decades, this has been increasingly recognised and many cities have taken steps to reverse this trend and create more liveable cities which are focussed on designing around people rather than private transport. In Denmark and the Netherlands, a set of rules has evolved over a century which have been successful and popular. These include making protected cycle lanes that are not shared by cars, buses, or pedestrians; designing streets to limit the number and speed of cars in city centres; and, making public spaces safe and welcoming for everyone.

4.3 The Department for Infrastructure, Belfast City Council and the Department for Communities completed a joint study in 2020 which resulted in A Bolder Vision for Belfast. This document outlines a progressive and wide-reaching vision to significantly reimagine Belfast city centre with the focus moving to a greener, walkable and connected core that is more people and family-focussed.

4.4 A Bolder Vision looks at ways of reimagining the city's heart and key connections to local communities, where streets and open spaces are designed to meet the changing needs of a diverse range of users – as well as supporting existing businesses and encouraging inclusive growth. It combines elements of active travel, connectivity, place-making and investing in green spaces with a view to transforming the heart of Belfast to create sustainable, attractive, liveable places where people and businesses thrive.

4.5 In view of this agreed vision, the first element of the Belfast Cycling Network relates to the city centre. The city centre is a key journey attractor / destination. If those journeys are made preferentially by private car, it is inevitable that the dense inner part of the city and routes leading to it will become congested. One of the keys to making a liveable city is to make a city centre work efficiently and safely for walking, wheeling, cycling and public transport – an approach to the inner area of the city which is common in other European cities. The central area (within the Inner Ring – an area of one third of a square mile) should not provide traffic progression priority for private car travel. It should facilitate and maximise priority and permeability for walking, wheeling, cycling and public transport. At the same time, access could be maintained for essential motor vehicle use: delivery of goods (perhaps restricted to light goods vehicles at certain times of the day); access for disabled people; collection of goods. The streets of the city centre could be reconfigured to significantly increase the amount of public (non-carriageway) space by removing most on street car parking (excluding accessible parking) and to eliminate opportunities to traverse the city centre by private car. A focus on this would make a more attractive city for people – both in terms of attracting customers to more people orientated retail areas with better civic spaces and for hospitality and entertainment.

One of the keys to making a liveable city is to make a city centre work efficiently and safely for walking, wheeling, cycling and public transport.

4.6 Whilst details will be confirmed in subsequent work, it is expected that the promotion of walking, wheeling and cycling in the city centre would be achieved principally by the following means:

- Reduce car parking progressively (particularly on-street car parking and footway parking) over several years;
- Re-organise traffic flows to eliminate through traffic in the city centre (except for sustainable travel and emergency services);
- Reduce speed limits in high pedestrian footfall areas or streets;
- Prioritise pedestrian crossings to minimise waiting time for pedestrians and maximise crossing time;
- Re-allocate road space for uses other than traffic.

Belfast Metropolitan Transport Plan 2004

4.7 These concepts are not new. In 2004, the Belfast Metropolitan Transport Plan (BMTP) identified the City Centre Ring (the A12 Inner Ring Road) as providing the primary means of accessing different parts of the core area. It proposed traffic management measures within the core city centre area to discourage or prevent through traffic – i.e. traffic that did not have an origin or destination in the core of the city centre – within this area. It proposed that within the City Centre Ring priority would be given to pedestrians, cyclists and public transport and that non-essential road traffic would be discouraged[17].

17 https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/09%20-%20Belfast%20Metropolitan%20Transport%20Plan%202015%20-%20Chapter%208%20-%20Proposals%20by%20Council%20Area.pdf, paragraph 8.18.

Case Study

Pontevedra is a small city in north west Spain with a population of 83,000 (2018) where it rains a lot. In 1999, the newly elected mayor began a process of transforming the city into a liveable public space. Within a month, the medieval centre of the city had been pedestrianised. Measures were introduced to prevent cars from crossing the city and on-street car parking was removed (people looking for a place to park caused most congestion). Surface car parks in the city centre were closed and replaced by underground car parks and car parks on the periphery (with almost 2,000 free spaces). In process of time, the car-free zone was extended from the old city to the 18th-century area. Traffic calming was introduced in outer areas and the speed limit reduced to 20mph.

Benefits included a significant reduction in road fatalities. Thirty people had died in traffic collisions between 1996 and 2006. This fell to three in the following ten 10 years. CO2 emissions have reduced by 70%. There has been a substantial reduction in journeys made by private car – around three-quarters of what were car journeys are now made on foot or by cycling. Central Pontevedra has also gained 12,000 new residents.

4.8 The BMTP proposed that there would be a network of routes within the city centre area and better links across the River Lagan in the form of additional walking / cycling bridges (see Appendix D). Some of this has been implemented but more remains to be done.

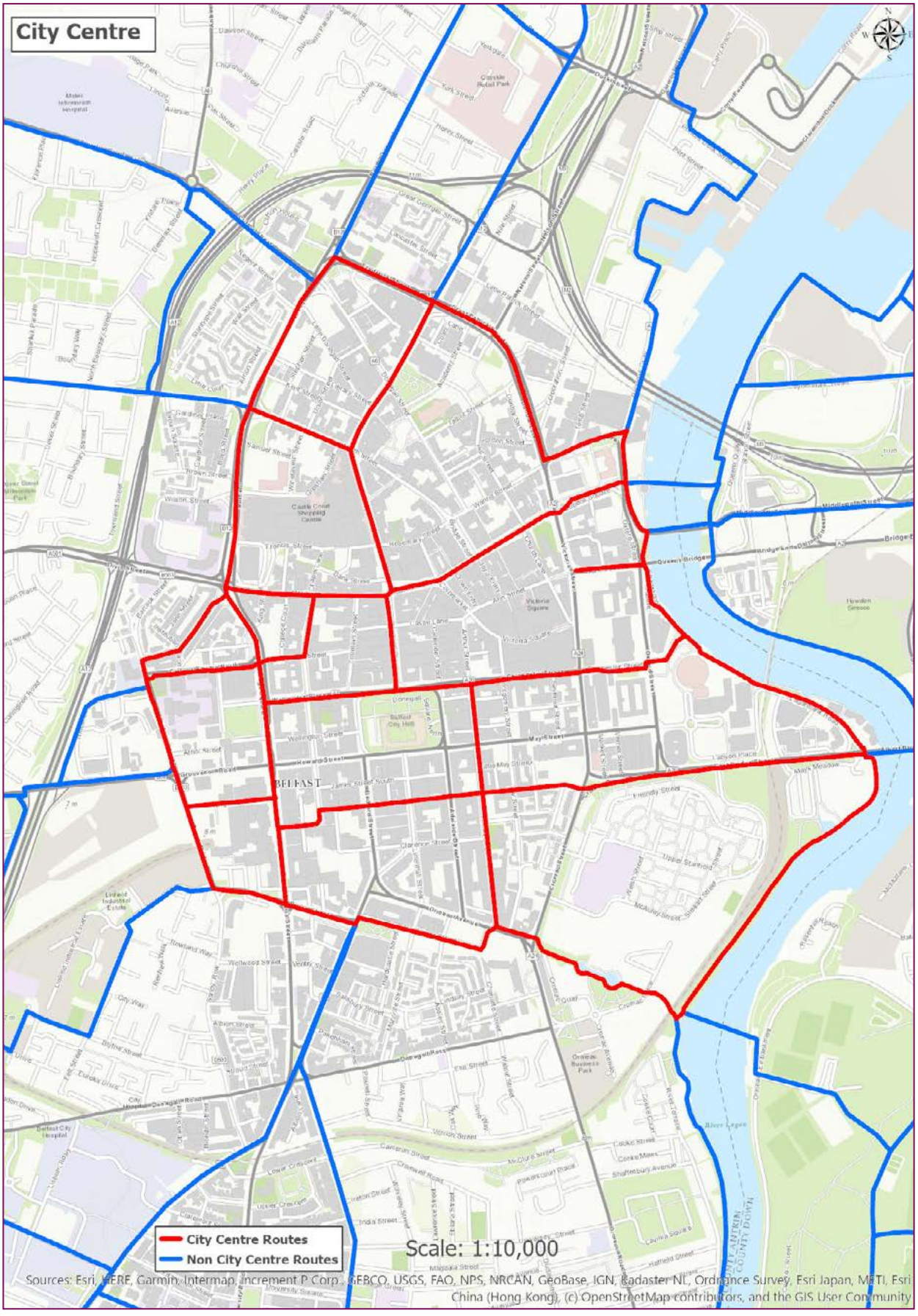
4.9 Elements of the BMTP proposals were incorporated in the 'Belfast on the Move' project because of a recognition that a thriving city centre needed a high quality transport system. The former Department for Regional Development (DRD) developed a more sustainable transport system to serve the central area with a focus on improved public transport services, better facilities for walking, wheeling and cycling and a reduction in the dominance of travel by private car. One of the objectives of the initiative was to remove vehicles that had no origin or destination in the central area from the streets and it was successful in delivering a notable reduction – by 2016 there were around 11,000 fewer vehicles travelling through the core city centre streets each day. Furthermore, the 'Belfast Streets Ahead' project, promoted by the former Department for Social Development (DSD), also sought to improve the environment of the city centre and create a momentum to quality public environments. Its focus was on improving those areas with the highest footfall in the city centre to encourage people to dwell longer in the city centre. This complemented the objective of encouraging sustainable transport while at the same time reducing congestion, noise and the real dangers associated with high volumes of motorised transport.

4.10 This document commits the Department to plan, design and implement a re-imagined Belfast city centre which prioritises sustainable transport over private vehicles and hence makes specific provision for cycling. The new BMTP currently under development in conjunction with the Belfast City Council LDP Local Policies Plan will be key to this planning. The new BMTP will take account of changes in land use and travel demand to ensure that the city centre remains accessible whilst meeting the wider objectives of a modern successful city. The new BMTP will be presented in draft for consultation and will include maps presenting proposals for pedestrian and shared space, segregated cycleways, bus priority lanes, parking and servicing, and general traffic.

Cycling routes

4.11 However, as noted above, the full range of measures adopted in city centre area will not be confirmed for some time and are likely to be progressively implemented over several years. Accordingly, there remains a need to make provision for a number of key cycling routes within the Inner Ring area: this includes a north-south route from Dublin Road (the site of a current pop-up cycle lane) through to the new Ulster University site; and several east-west routes. These routes are illustrated in the figure below where it will be seen that the proposals broadly follow the proposals that are currently adopted from the Belfast Metropolitan Transport Plan (see above).

4.12 The routes presented below for the city centre will be adopted as a commitment in the BMTP under development and their design advanced independently.


City Centre
City Centre Routes
Non City Centre Routes
Scale: 1:10,000
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

5.0 Primary Network

5.1 Alongside enhancing provision in the city centre, the second element of the Belfast Cycling Network is the primary network and this will be key in providing good quality safe cycling routes for people to be able to cycle into and out of the city centre and to cycle around the city. The route corridors that are identified in this section will achieve this. Further detail on the individual proposed routes is set out in the Appendices.

Principles in the Belfast Metropolitan Transport Plan (BMTP) 2004

5.2 The proposals set out in this network are a development of the principles and proposals in the Belfast Metropolitan Transport Plan which have already been adopted by the Department and its predecessor Department (DRD) so broadly these are routes that have already been agreed.

5.3 The central principle of the BMTP was the development of a preferred cycling network to deliver continuous cycle routes between key locations. It proposed different provision dependent upon specific local circumstances. For example, on heavily trafficked roads, the expectation was that provision for cycle routes would include fully segregated facilities (such as the recently completed Middlepath Street scheme). The BMTP envisaged that cycle routes would be implemented on the main arterial routes into the city (see Appendix D). This was a far-sighted proposal because it indicated a commitment to an entirely different way of travelling on the busy commuter routes which would require a reallocation of road space in order to provide the segregated cycling facilities specifically identified in the Regional Transportation Strategy and the BMTP. These are the slow moving traffic routes at peak times – routes where the need for a more efficient use of road space is obvious. In 2015, the former Department for Regional Development commissioned a number of videos which compared a cycling commute with a driving commute on four main routes into the city. The route from the south of the city (from the Rosetta area to the city centre) took sixteen minutes to cycle and 42 minutes to drive via the Ormeau Road[18].

5.4 The network presented in this document reiterates the BMTP proposal that fully segregated cycling infrastructure is needed on the main arterial routes[19] and that these, in time, would form the basis of the primary cycling network – together with the other key off-road or traffic free routes identified in the draft Belfast Bicycle Network.

5.5 Over the past 10 – 15 years DRD (subsequently DfI) has implemented advisory cycle lanes on part of most of these arterial routes. This has indicated a level of intent in terms of the delivery of arterial cycle routes but it could only be seen as a first step towards delivering the segregated paths promoted in BMTP. Advisory cycle lanes have no statutory basis and operate on a 'grace and favour' basis. Cars can be driven in them and parked in them (outside of clearway operating hours). It is generally understood that they are not a solution for giving adults and children the 'freedom and confidence' to cycle[20]. We have no plans to remove the existing advisory lanes but we do not propose to add to them as part of this network.

5.6 Delivering segregated cycle lanes on the main arterial roads in Belfast will require the reallocation of road space. It will also have to be balanced with the need to allocate road space to other forms of sustainable transport such as buses. However, road space is an expensive public good (both in terms of its capital cost and its maintenance) and we cannot afford to continue to use it in the most inefficient way (single occupant motoring).

5.7 The Bike Life report highlighted that almost two thirds of Belfast people would find on-road infrastructure, physically separated from motor traffic or traffic-free routes very useful for increasing levels of cycling in the city[21]. Indeed, some four-fifths of residents supported building more protected cycle routes, even when this can mean less room for other road traffic.

5.8 The proposed primary network is set out below. As in the draft Belfast Bicycle Network, it is made up of eight arterial (or radial) routes with their associated sub-routes and three orbital routes. We have made a number of changes to the proposed routes, in light of responses made during the public consultation, to bring the network more in line with the routes identified in the BMTP. There are approximately 180km of proposed routes and it is estimated that around one third of these already exist on the ground (although some of this will require improvement). Details of the individual routes are set out in the rest of this section of the document.

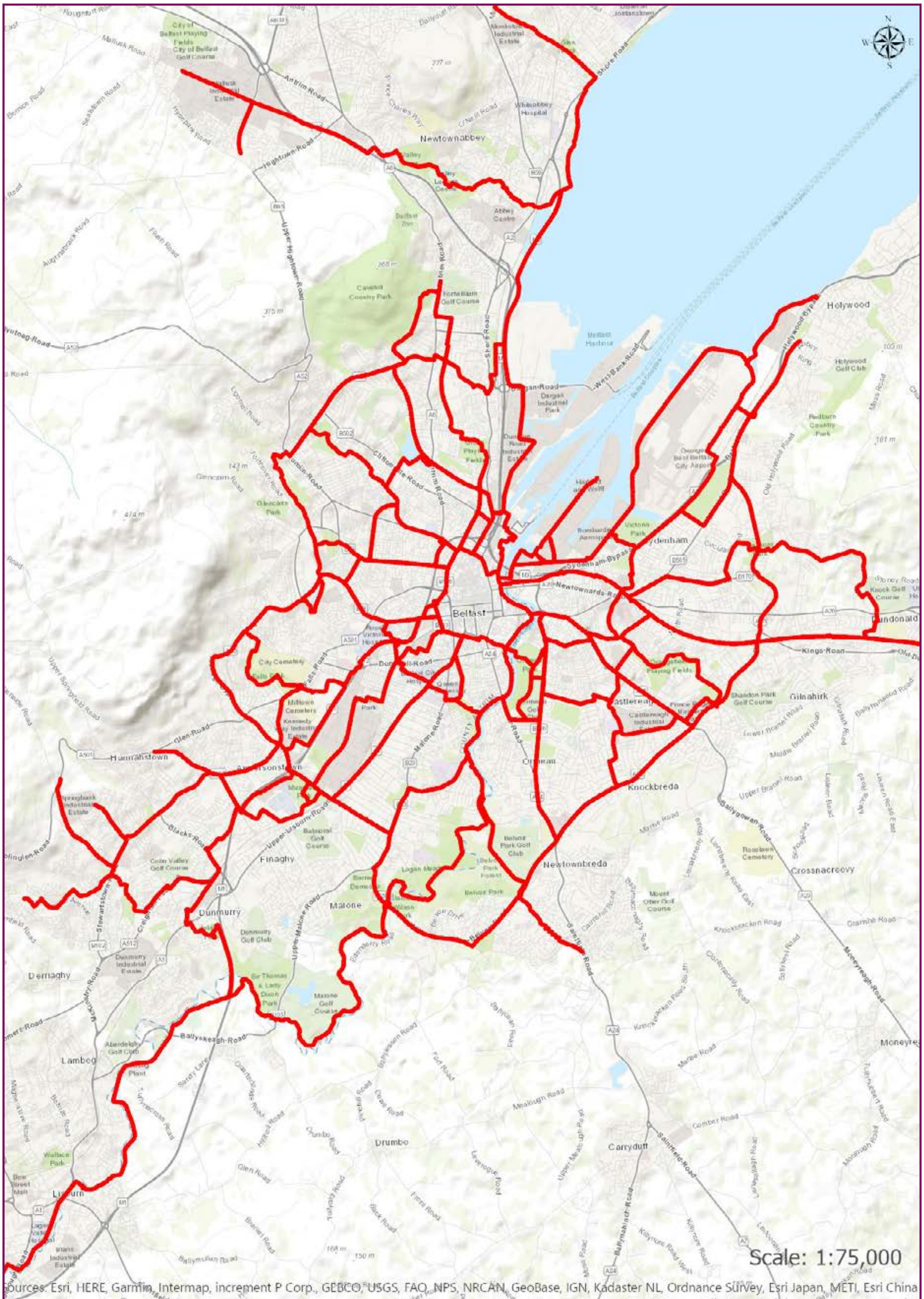
5.9 When complete, it is estimated that the network would be accessible to (i.e. within 400m of) around three quarters of all Belfast City Council residents. Beyond this primary network, the secondary plan will ensure that all communities have even closer access to cycling infrastructure (and this is set out in the following section of this document).

18 https://www.youtube.com/watch?v=b9wm75NSxzI

19 https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/05%20-%20Belfast%20Metropolitan%20Transport%20Plan%202015%20-%20Chapter%204%20-%20Walking%20and%20Cycyling.pdf, page 4-5.

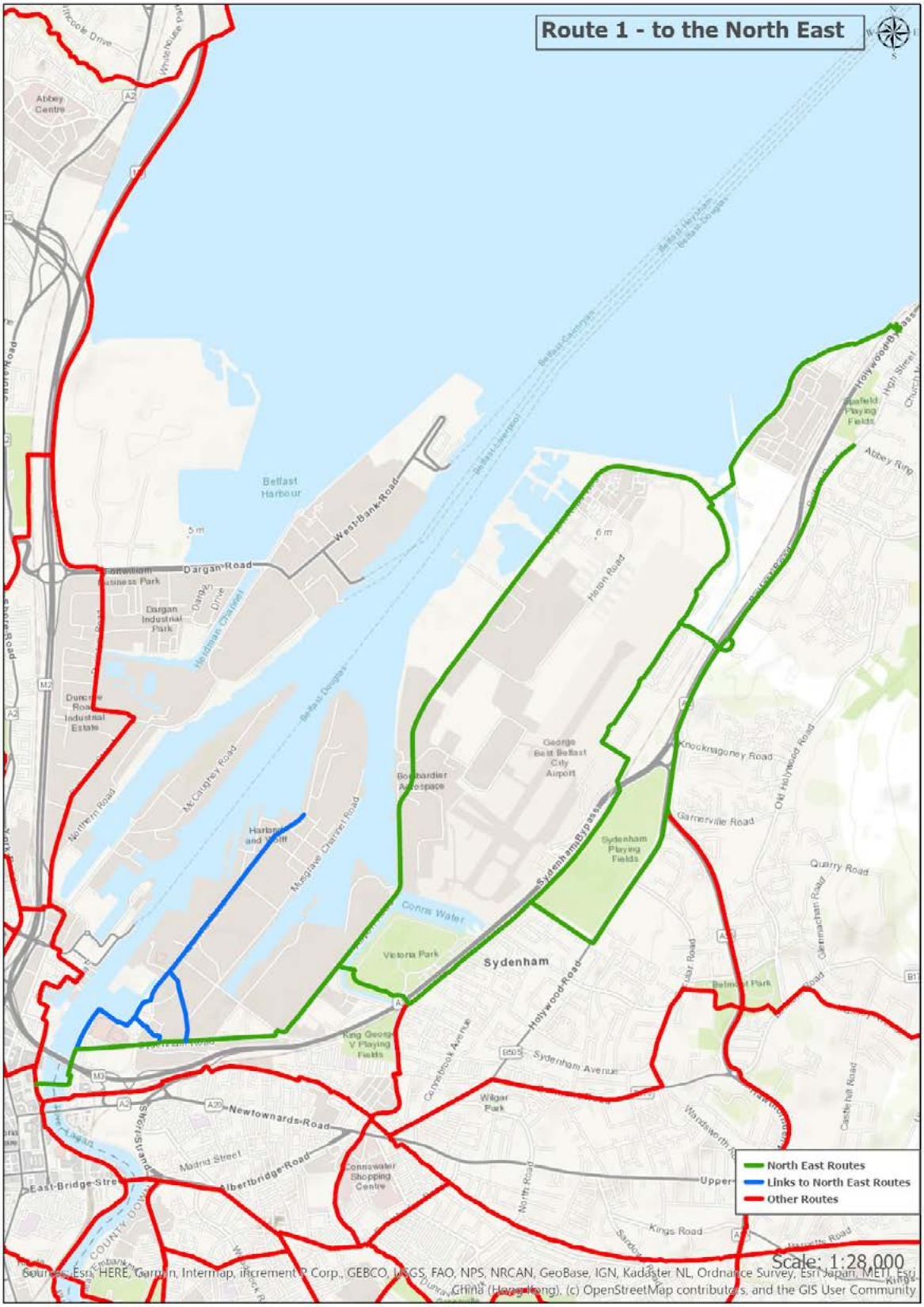
20 https://www.cyclinguk.org/campaigning/views-and-briefings/cycle-lanes-tracks-and-shared-use-footways

21 https://www.sustrans.org.uk/media/2952/bike-life-belfast-2017.pdf, page 14.



Newtownabbey
Holywood
Belfast
Dundonald
Gilnahirk
Knockbreda
Newtownbreda
Crossnacreevy
Finaghy
Dunmurry
Malone
Derriaghy
Lambeg
Drumbo
Carryduff
Hannahstown
Andersonstown
Ormeau
Castlereagh
Sydenham
Moneyreagh
Lisburn
Antrim Road
Shore Road
Glen Road
Kings Road
Upper Malone Road
Ballyskeagh Road
Scale: 1:75,000
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

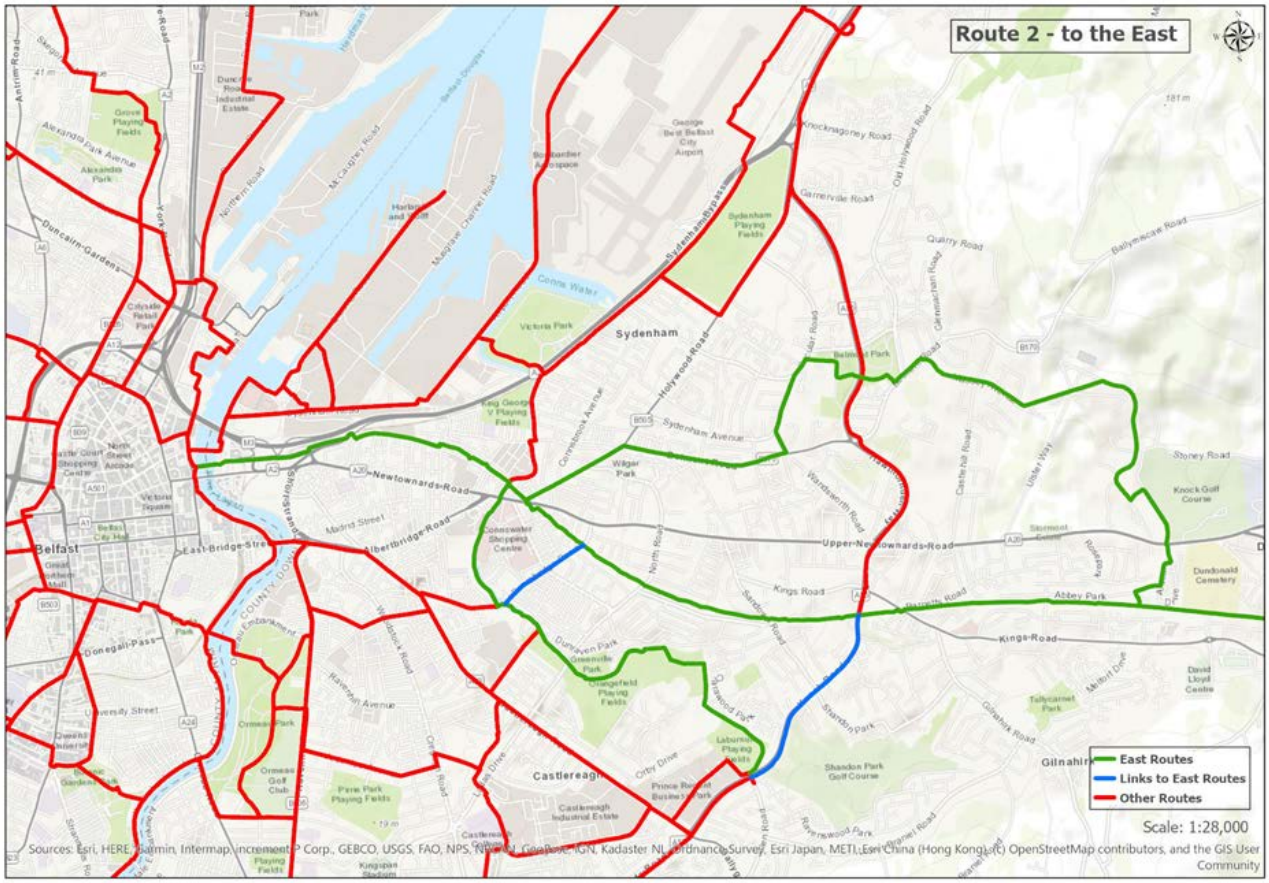
ROUTE 1 – *to the North East*



ROUTE 1 – *to the North East*

Routes to the north east start in Belfast city centre at Castle Place and continue east down High Street, past the Albert Clock into Queen's Square. After crossing Donegall Quay they proceed across the Lagan Weir bridge, turn north and follow Queen's Quay onto Sydenham Road. After the roundabout at Dee Street, they join Airport Road. The northern arm continues north along the coast to the Esplanade (Holywood) where it joins the North Down Coastal Path. There is a link via the pedestrian path under the railway and the subway (with ramps) to Redburn Square. The eastern arm crosses Sam Thompson bridge, enters Victoria Park, passes Sydenham Railway station and on to Millennium Park. There are a number of possible routes from there to Holywood Exchange and Belfast Road, Holywood. Also included are other links into the harbour estate.

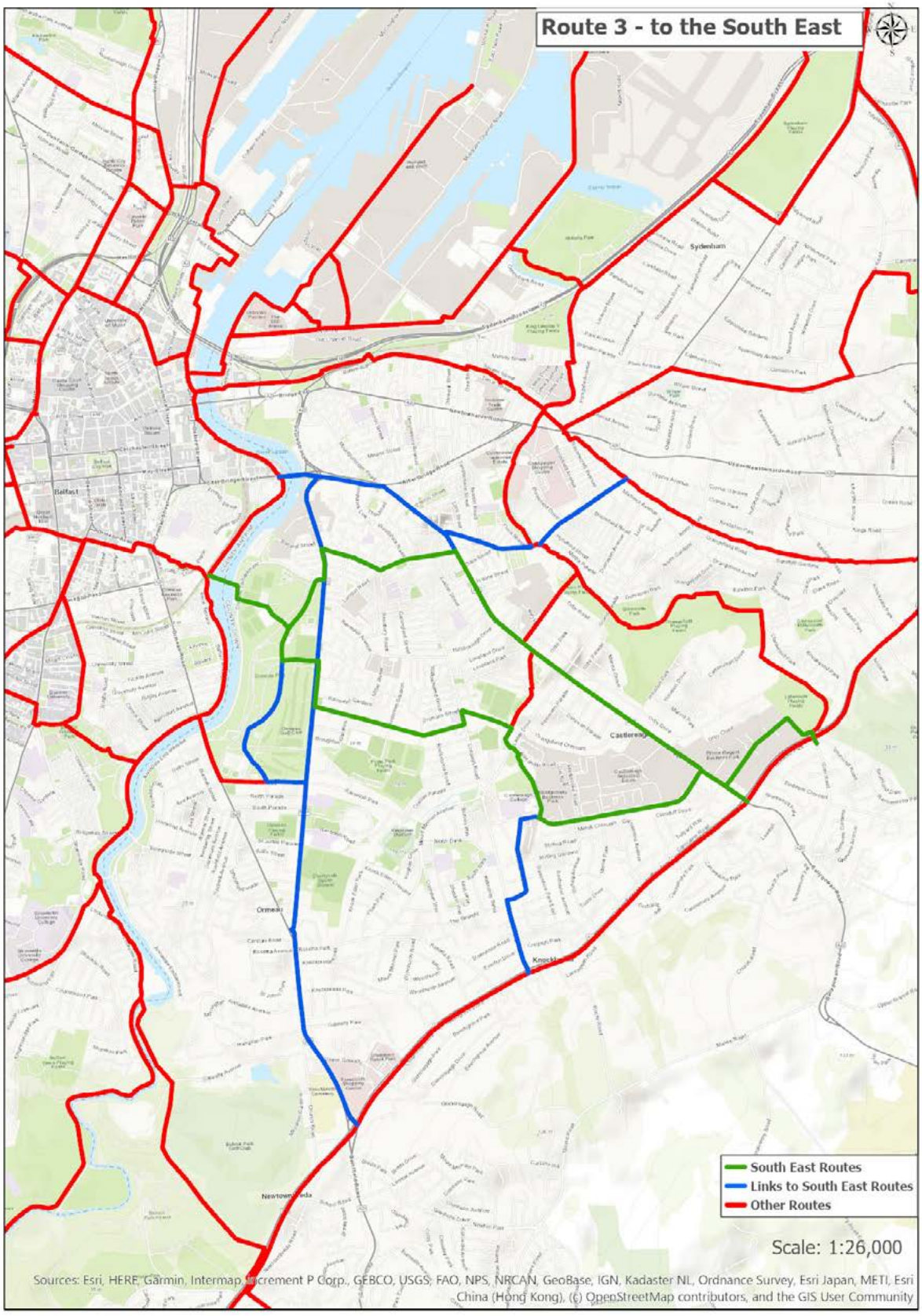
ROUTE 2 – *to the East*



ROUTE 2 – *to the East*

Routes to the east start in Belfast city centre and continue east down High Street, past the Albert Clock into Queen's Square. After crossing Donegall Quay they use the new separated cycle lane in Middlepath Street to Titanic Quarter railway station where they enter an underpass to Ballymacarrett Road (and Island Street). At Dee Street, they follow the Ballymacarrett Walkway to C S Lewis Square. Via the Ravenscroft Avenue car park the main route joins the Comber Greenway. At the end of the greenway it continues into Comber town centre. Another arm diverges at C S Lewis Square via Holywood Road and Belmont Road, Belmont Park (where there is a bridge which crosses the A55 Outer Ring) and Massey Avenue to reach Parliament Buildings. At C S Lewis Square a third route follows the Connswater Community Greenway where it links with communities throughout east Belfast.

ROUTE 3 – *to the South East*

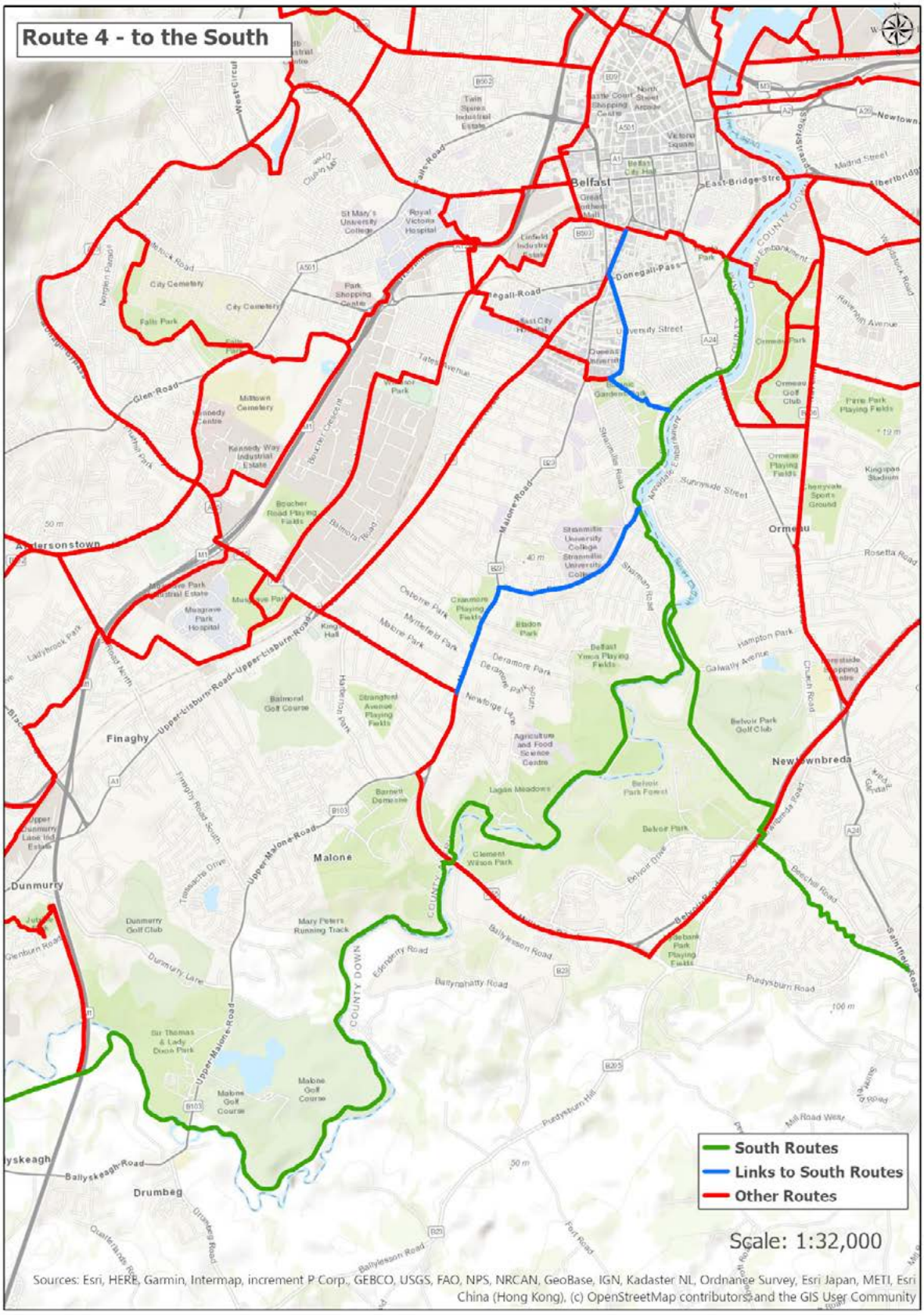


ROUTE 3 – *to the South East*

Routes to the south east start in Belfast city centre and proceed south along Upper Arthur Street, Alfred Street and Ormeau Avenue to the Gasworks site. Passing under the railway bridge leads to the site for the proposed Lagan pedestrian and cycle bridge. Crossing the River Lagan, the routes enter Ormeau Park. The left arm links with My Lady's Road and Castlereagh Road. The right arm crosses Ravenhill Road into Ardenlee Avenue. It follows Ardenlee Avenue to the Cregagh Road, Gibson Park Avenue and Ladas Way where it joins the Connswater Community Greenway.

Following the Greenway to Montgomery Road it continues to Castlereagh Road and Prince Regent Road. At the end of Prince Regent Road it crosses waste ground to the junction of Knock Road and Glen Road, and finishes in Whincroft Road. This section of the network includes links to the Connswater Community Greenway via Beersbridge Road, Cregagh Glen and the southern end of Ravenhill Road and the Saintfield Road where it finishes at Forestside Shopping Centre.

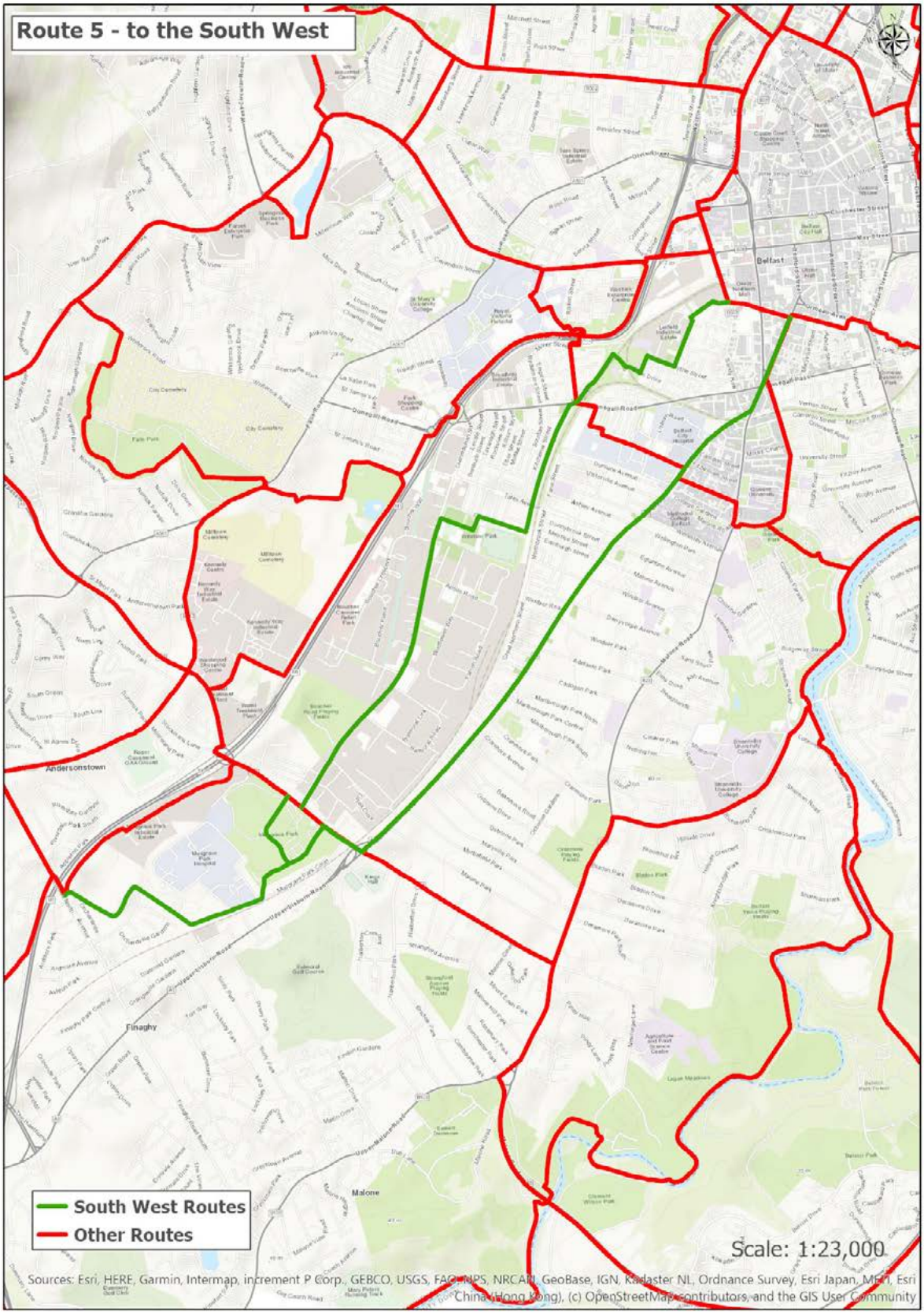
ROUTE 4 – *to the South*



ROUTE 4 – *to the South*

Routes to the south start in Belfast city centre and proceed south along Upper Arthur Street, Alfred Street and Ormeau Avenue to the Gasworks site. Passing under the railway bridge they head south along the riverside walk and follow the Stranmillis Embankment to Governor's Bridge, the cycle path to Lockview Road and join the Lagan towpath. The new pedestrian and cycle bridge would carry the eastern arm across to the east bank of the River Lagan and a new path would skirt Belvoir Park Forest and join Belvoir Road at the footbridge. The route would cross the bridge, and follow a strip of ground to the west of Beechill Road to Cairnshill Park and Ride where it would join with the proposed Carryduff Greenway. The western arm would follow the Lagan towpath to the Civic Centre in Lisburn. Included are links to the city centre via the university area and via Stranmillis to Malone Road.

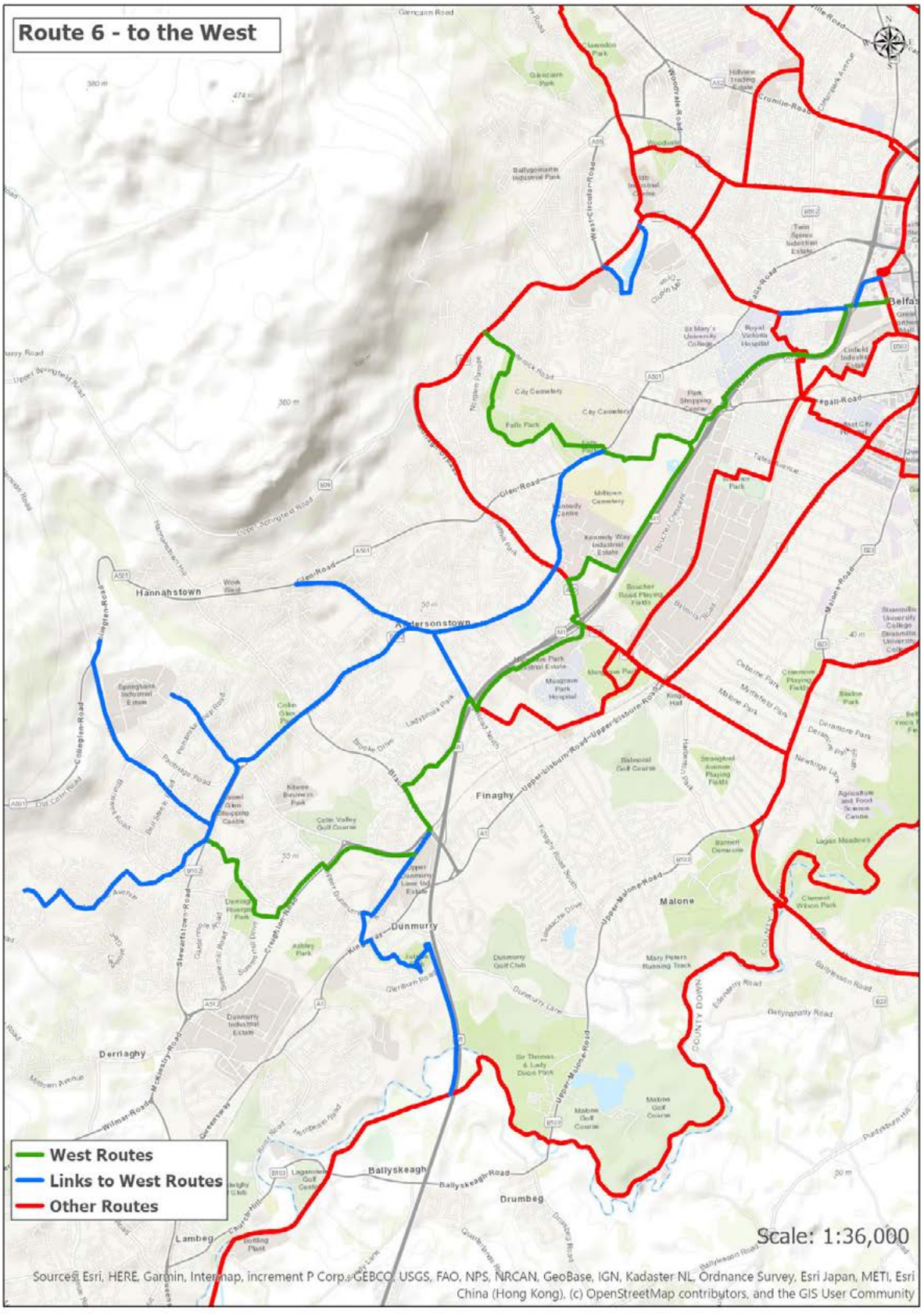
ROUTE 5 – *to the South West*



ROUTE 5 – *to the South West*

Routes to the south west start in Belfast city centre and proceed south via Dublin Road, Bradbury Place and Lisburn Road as far as the Kings Hall. Another route would start from the new Belfast Transport Hub and follow Linfield Road and quiet streets to Blythefield Park and the railway path which links with Donegall Road. It would continue along Donegall Avenue, turn west into Olympia Drive, through the grounds of Olympia Leisure Centre and continue along Boucher Road to Stockman's Lane and Musgrave Park. Passing through the park it could connect to Musgrave Park Hospital and follow the connecting road past the site of the former Malone College finishing on Finaghy Road North where it would link with the west routes.

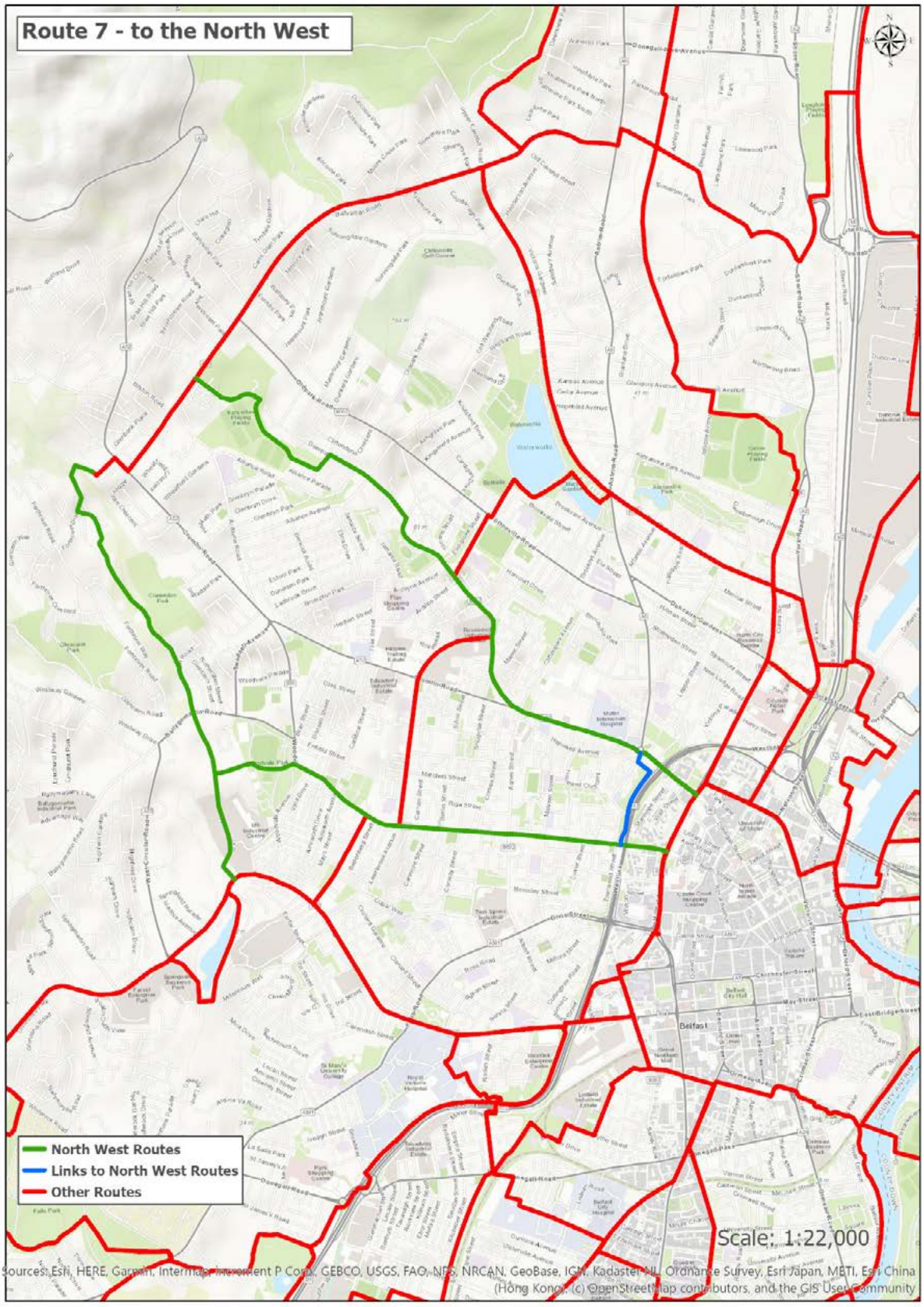
ROUTE 6 – *to the West*



ROUTE 6 – *to the West*

Routes to the west start in Belfast city centre and continue west via Castle Street into Queen Street and College Street where they enter College Square North. They follow Durham Street to Grosvenor Road and the shared pedestrian / cycle path alongside the northbound carriageway of the Westlink. Crossing Broadway and Donegall Road (west of the roundabout) the northern arm would proceed through Bog Meadows to Milltown Row, Falls Road and Falls Park to Whiterock Leisure Centre and join Whiterock Road to the junction with Springfield Road. This route links with the proposed Forth Meadow Community Greenway. The southern arm would proceed alongside the M1 motorway across Kennedy Way to the south side of the M1 motorway where it would follow Stockman's Way and the playing fields to the east of Finaghy Road North. Passing back to the northern side of the M1 it would traverse the Visteon development site to Black's Road. From there via Old Golf Course Road, Cherry Road and Summerhill Road the route could finish at Colin town centre. This section of the network includes possible routes along Andersonstown Road, Shaws Road and Stewartstown Road where it would link with a network of proposed routes for the Colin area. It is also proposed to explore a link to the Lagan towpath through Dunmurry.

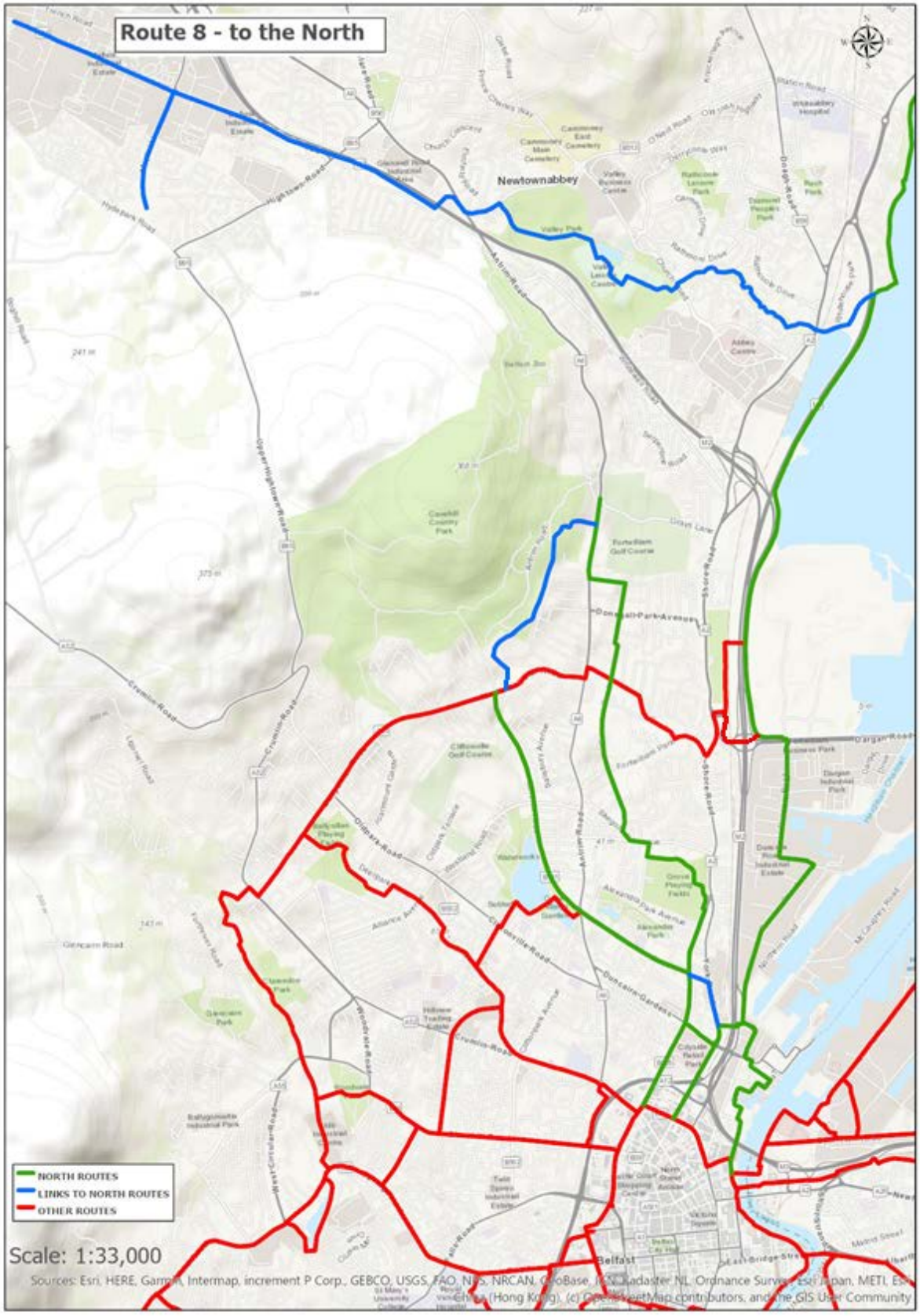
ROUTE 7 – *to the North West*



ROUTE 7 – *to the North West*

Routes to the north west start in Belfast city centre and head north via Royal Avenue. Turning into North Street and Peter's Hill the southern arm would join the main artery of the proposed Greater Shankill Greenway. It would follow Shankill Road and Woodvale Road, through Woodvale Park and join the Forth Meadow Community Greenway and emerge on Ballygomartin Road opposite Cairnmartin Road where it would continue along upgraded paths that run north eastward through Somerdale Park and Clarendon Park. The Northern arm would use a dedicated walking and cycling bridge over the Westlink parallel to Clifton Street, join Crumlin Road at Carlisle Circus and continue to Oldpark Road and Deerpark Road, passing through the grounds of Ballysillan Leisure Centre to Ballysillan Road. Another link into the city centre could be provided by a path along the west side of the Westlink to Peter's Hill.

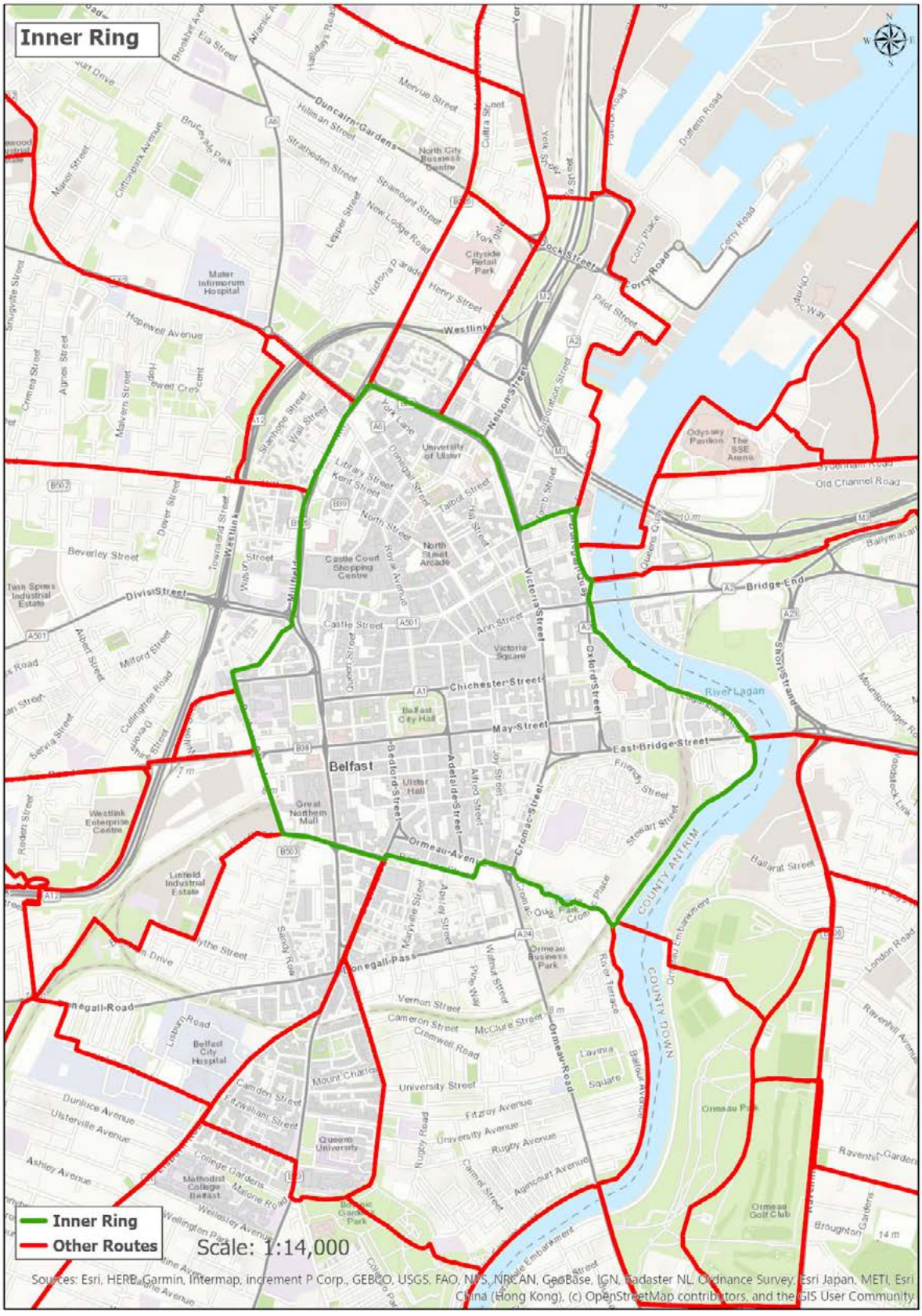
ROUTE 8 – *to the North*



ROUTE 8 – *to the North*

Routes to the north start in Belfast city centre and head north via Royal Avenue to Frederick Street. The western arm follows Frederick Street into North Queen Street and veers left into Limestone Road and Cavehill Road. The middle arm proceeds along North Queen Street as far as the Grove Playing Fields to Jellicoe Avenue, Skegoneill Avenue, Somerton Road and Innisfayle Road. After a left turn into Downview Avenue in emerges on to Antrim Road. The eastern arm continues along York Street to Yorkgate station, through the M2 underpass to Whitla Street, north on to Duncrue Street and Duncrue Road where it joins the North Foreshore pedestrian / cycle path after crossing Dargan Road. It continues to Whiteabbey and on to Carrickfergus. North of the city it would link with both the Newtownabbey Way (at Whiteabbey) and a proposed walking and cycling path to Glengormley and Mallusk (via Valley Park) at Gideon's Green.

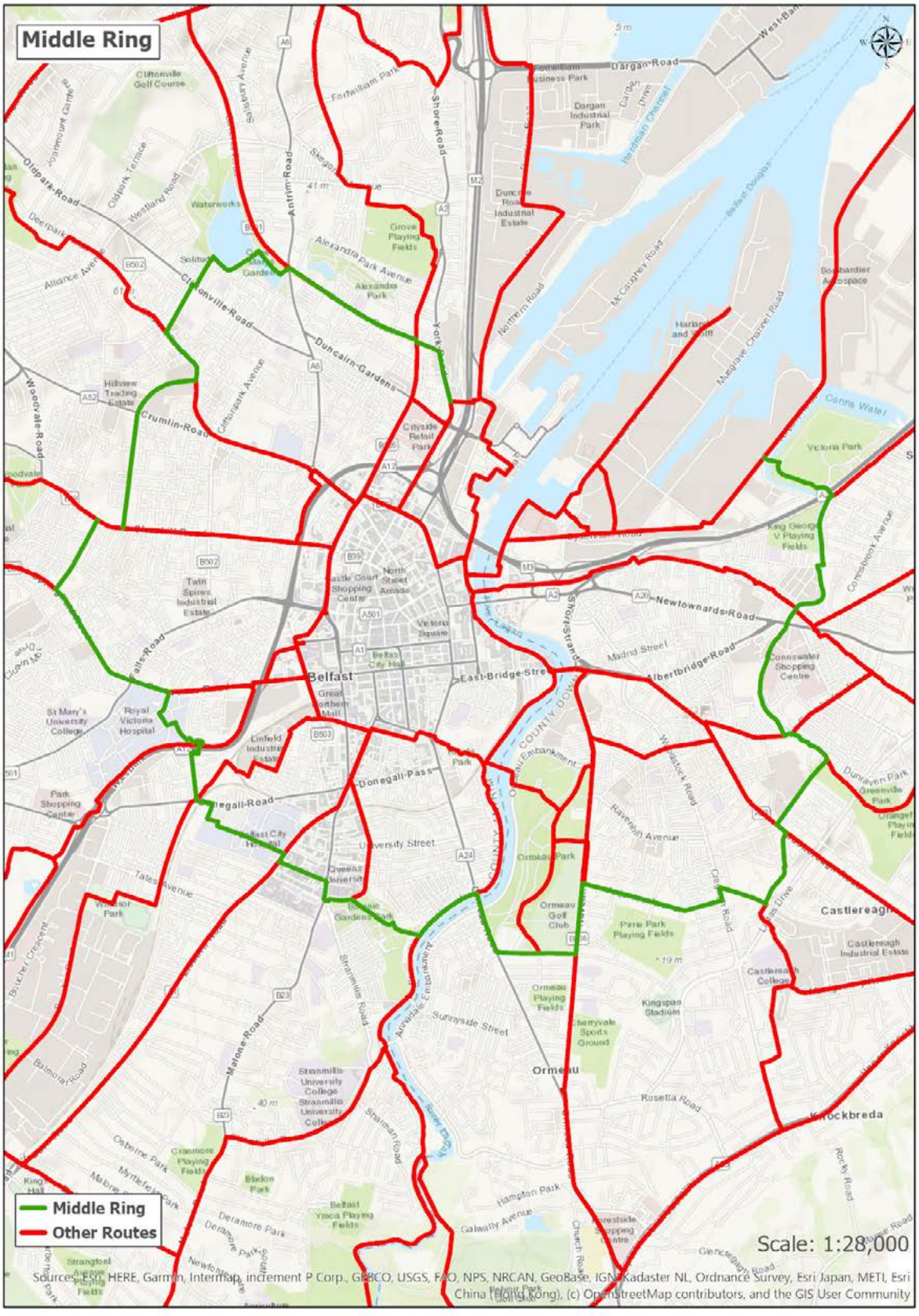
ROUTE 9 – *the Inner Ring*



ROUTE 9 – *the Inner Ring*

This orbital route, in a clockwise direction, includes Durham Street (where it would provide access to the proposed Belfast Transport Hub), Millfield, Carrick Hill, Frederick Street (providing access to the Ulster University campus), Great Patrick Street, Dunbar Link, Albert Square / Queen's Square, Donegall Quay (with access to the Laganside Bus Centre), the old Sand Quay, the Riverside Path (with access to Lanyon Place Station), the Gasworks, Bankmore Street, Bruce Street and back to the Transport Hub.

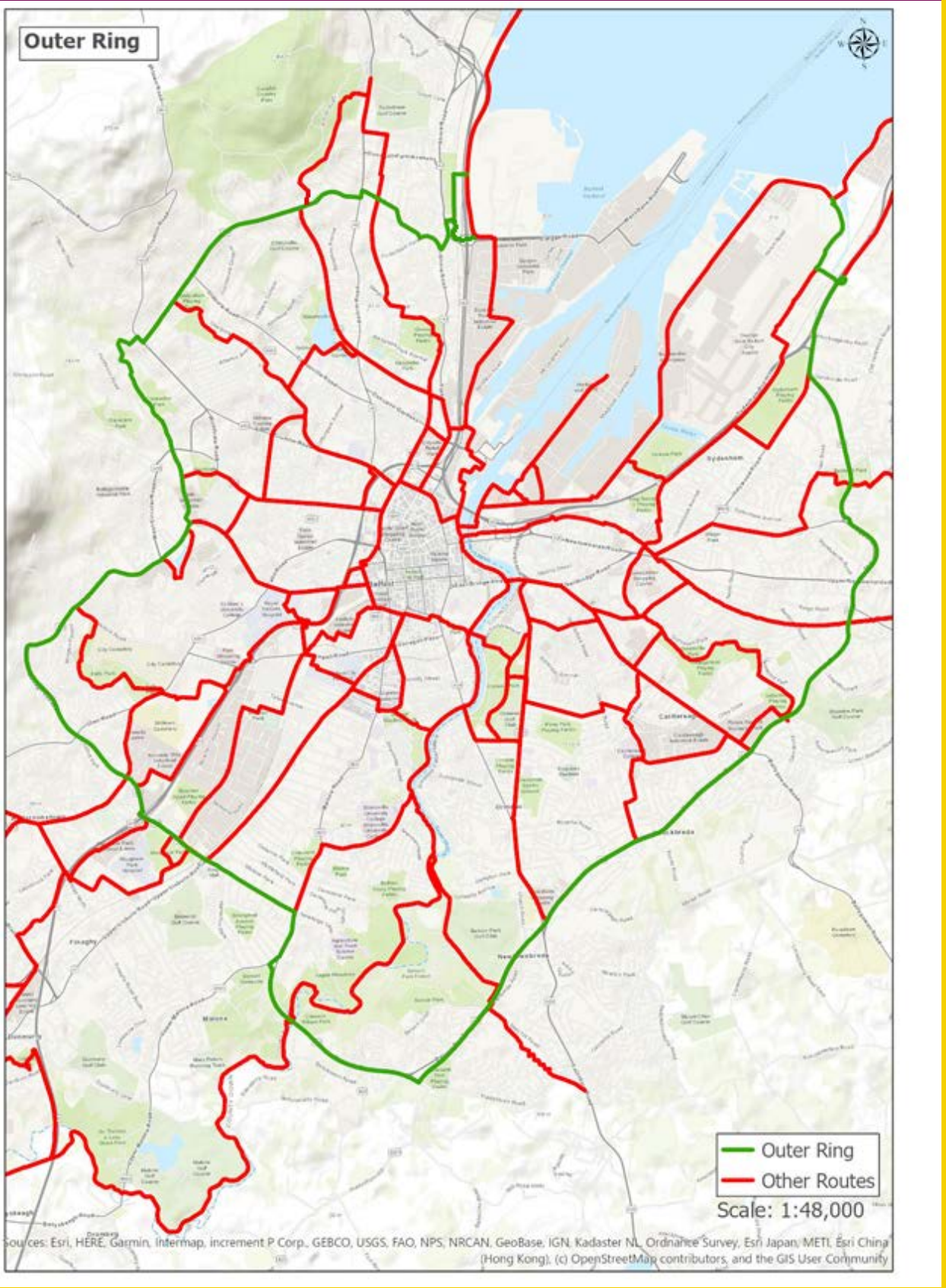
ROUTE 10 – *the Middle Ring*



ROUTE 10 – *the Middle Ring*

This orbital route starts at Sam Thompson bridge where the two north east routes diverge and follows the Connswater Community Greenway through C S Lewis Square (the east routes) to Ladas Way. It continues along Ardenlee Avenue (the south east route), through Ormeau Park to the Ormeau Bridge and Stranmillis Embankment (the south routes). Passing through Botanic Gardens it follows Elmwood Avenue to Belfast City Hospital (the south west route) and traverses the hospital site on to Donegall Road and Roden Street. Continuing along Roden Street it crosses the Westlink where it intersects the west routes. From there is passes through the Royal Victoria Hospital site to Grosvenor Road, Springfield Road, Lanark Way and Shankill Road (the north west route). Following Tennent Street and Hillview Road it emerges on to Oldpark Road. A right turn into Oldpark Avenue brings the route to the side entrance of Waterworks Park (the north routes). Through the park to the Antrim Road junction and Limestone Road where it joins to the southern end of what becomes the North Foreshore path.

ROUTE 11 – *the Outer Ring*



ROUTE 11 – *the Outer Ring*

This orbital route starts at Holywood Exchange on the north east route and follows A55 Parkway via Hawthornden Way (the east routes), Knock Road (the south east routes), Upper Knockbreda Road, Belvoir Road (the south route east), Milltown Road (the south route west), Balmoral Avenue, Stockman's Lane (south west route), Kennedy Way (west routes), Springfield Road, the Forth Meadow Community Greenway (Mackies site), Clarendon Park (north west routes), to join the footpath linking Forthriver Road to Glenside Park. It continues along Ballysillan Road to North Circular Road (north routes) and via Lansdowne Road and Fortwilliam Park finishes by joining the North Foreshore Path at the proposed Giant's Park. Ideally, this would be by grade-separation at the motorway junction or by means of a dedicated bridge across the railway and motorway.

6.0 Quiet Streets

6.1 While this Cycling Network identifies a primary network, this does not suggest that these would be the only routes where segregated or traffic-free infrastructure would be put in place. The objective of this document is to develop the roads and streets within the city in such a way that they will be comfortable and safe to cycle on. Where segregated infrastructure provides the confidence that users need in order to cycle, it should be provided but such interventions will not be required in every street.

6.2 The third aspect of the network proposed is the development of a secondary network which would provide links from key trip generators to the primary network – destinations through the city in local areas where people will want to travel relatively short distances: schools, shops, workplaces, services and community facilities. These are the short journeys that we all make every day and this is an important aspect of the network if we are to provide infrastructure that will be used. The purpose of the network is to give people the freedom and confidence to cycle for everyday journeys. This is an inclusive vision as it includes all ages – both younger and older citizens – and all abilities – and is aimed at getting people to incorporate physical activity into their daily routine.

6.3 The Department's transport policy remains focused on the movement of people, rather than vehicles, at peak times. Following 'Belfast on the Move' (BOTM), half of people were travelling into Belfast by private car or taxi in the morning peak and half by sustainable means (2016 figures): walking, cycling and public transport. Furthermore, the introduction of the Belfast Rapid Transit Glider service in September 2018 has delivered an additional 45,000 public transport journeys each week. Both of these statistics demonstrate the importance of allocating road space to sustainable modes rather than the private car (which is the most inefficient way of transporting people – particularly at peak times).

6.4 Quiet streets are streets where the volume and speed of motor traffic is reduced to a level where it presents a minimal risk to other road users. Part of this process involves developing 'family friendly neighbourhoods' (usually known as 'low traffic neighbourhoods') where the volume of traffic is reduced by preventing through motor traffic – sometimes known as 'rat running' – to make the environment more attractive and less threatening for people to use the streets for walking, wheeling and cycling or simply to enjoy them. Guidance on the development of family friendly neighbourhoods and quiet streets is set out in 'An Introductory Guide to Low Traffic Neighbourhood Design'[22].

6.5 The principles of the design are to work with communities in the development of their area in a way that retains necessary access to the neighbourhood but removes traffic that is simply using the area as 'a way through'. At the same time it includes measures to encourage walking, wheeling and cycling for those shorter journeys that generally should not be driven and in so doing redresses the imbalance between 'space for people' and 'space for vehicles'. The main tools available to achieve this include:

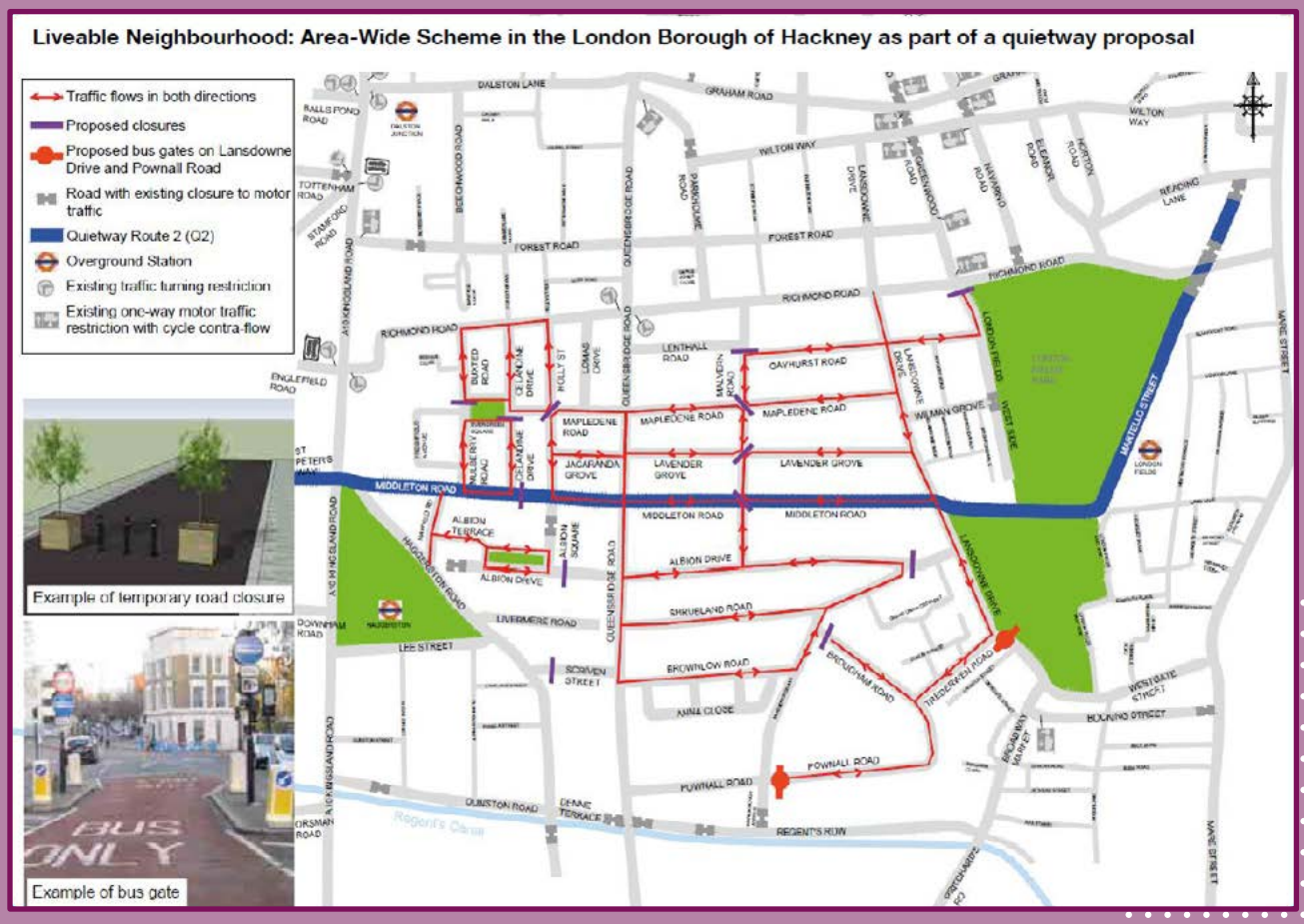
- **Modal filters:** a simple bollard or planter through which people can travel by walking, wheeling or cycling, but not by car;
- **Pocket parks:** these are two sets of filters, spaced slightly apart to create a new area through which people can only travel by walking, wheeling or cycling;
- **Diagonal filters:** bollards or planters diagonally through a cross-roads – these minimise the need for reversing, facilitating refuse collection or other large vehicle movements;
- **Bus gate:** a modal filter, through which buses can travel. This is usually camera-enforced, and its operation can be timed;
- **Banned turns** (including point no entry or point no exit): removing the possibility of motorised vehicles to perform certain turns.
- **One-way streets:** these can be effective in combination with banned turns or when introducing conflicting one-ways but can lead to increased speeding.

22 An introductory guide to low traffic neighbourhood design - Sustrans.org.uk

Quiet streets are streets where the volume and speed of motor traffic is reduced to a level where it presents a minimal risk to other road users.

6.6 The principles of family friendly neighbourhood and quiet street design are illustrated below from a low traffic scheme in London:

6.7 In each neighbourhood, the secondary quiet network will be shaped by individual projects, community input, and the goals of this document. The key concept of the quietway is maintaining necessary vehicular access while at the same time enhancing the area to encourage more use by people and more everyday active travel journeys – to schools, shops, local destinations and for visiting friends and relatives.




M3
ONLY

7.0 *The Way Forward*

7.1 The development of the Belfast Cycling Network is aimed at providing good quality routes throughout the city so that the majority of the population will have the freedom and confidence to cycle for everyday travel. Ultimately, we want a city where it will be comfortable and safe for anyone to cycle on any road or street which is not restricted to motor vehicles only (such as motorways). The network is not proposed simply for the benefit of those who are currently cycling, but as a means of achieving substantial modal shift among the significant cohort of the population that would like to cycle but is concerned about doing so. It is about reducing the dominance of motor vehicles throughout the city and the creation of a liveable city for the benefit of all our citizens – in line with the ambition set out at paragraph 2.11 to 2.12 – which reflects the ambitions in the Bicycle Strategy (2015).

7.2 The publication of the Belfast Cycling Network in maps provides clarity as to which roads, streets or off-road routes will be amended or adopted as cycle routes. These maps will provide a reference point for the design of the individual legs of the network and other subsequent processes including:

- the development of the Belfast Metropolitan Transport Plan;
- the development of the Belfast City Council Local Development Plan – Local Policies Plan;
- DfI road maintenance planning;
- planning applications for developments in the vicinity of the network;
- other local community initiatives relating to the built environment.

7.3 The restructuring of the city centre will work in step with the implementation of A Bolder Vision for Belfast. The Primary Network, which will serve as a trunk system from the suburbs to the city centre, will be developed over the next ten years – with the aim of including quality infrastructure in the areas of the city where there are lower levels of cycling in a way that contributes to a reduction in inequalities of access to active travel infrastructure. As the primary network is rolled out, work will be carried out, in parallel, on developing quiet streets in the surrounding areas – using trial and experimental schemes as part of the stakeholder consultation process. This will increase network density, improve access to the network and provide more connections to services for local areas.

7.4 The more consistent design guidelines set out in LTN 1/20 have already been adopted to ensure that cycle infrastructure is coherent and a consistent level of service is provided across the city and across Northern Ireland. To date, the London Cycling Design Standards have been used for the design of the most recent cycling schemes in Belfast and it is proposed that both LTN 1/20 and these standards will be adopted for developing the routes in this network.

7.5 The cycling infrastructure in the city must be effectively integrated with other sustainable transport modes, including bus priority measures, and the wider cycling infrastructure across the region. Furthermore, every road and transport intervention will be considered through the lens of the road-user hierarchy – particularly in new developments and in undertaking roads maintenance. As well as specific cycling schemes, opportunities to develop routes as part of other upgrades to the transport network will also be undertaken, such as part of Route 8 (the north route) with the proposed upgrade to York Street Interchange and part of Route 9 (the inner route) with plans to develop the Belfast Transport Hub at Weavers' Cross.

7.6 As part of an enhanced programme to accommodate cycling, facilities such as cycle-friendly gates, cycle parking, maintenance of cycleways and priority at traffic signals will be pursued.

The development of the Belfast Cycling Network is aimed at providing good quality routes throughout the city so that the majority of the population will have the freedom and confidence to cycle for everyday travel.

Funding

7.7 The need for sufficient funding to deliver increased levels of cycling has been the subject of extensive debate and was given a statutory basis in GB in Section 21 of the Infrastructure Act (2015). This acknowledgment of the need for sufficient resources followed on from the influential report from the All Party Parliamentary Group on Cycling 'Get Britain Cycling'. Published in April 2013, that report recommended a cycling budget of at least £10 per person per year, increasing to £20. The announcement of a £2 billion package of funding for England in 2020, however, indicates a level of around £7 per head of population.

7.8 In Northern Ireland, the current Minister established a Blue / Green Infrastructure Fund of £20 million in 2020/21 (approximately £11 per head or population in Northern Ireland). This has provided funding for a range of active and sustainable travel and other green recovery projects.

7.9 The Bicycle Strategy, published by the former Department for Regional Development in August 2015, suggests cycling investment of £12.5 million capital per annum within five years (split 2:1 between capital and resource) and £18 million per annum within ten years across the region in order to achieve the ambitions set out in the strategy (a little less than £10 per head). Delivering this network is predicated on funding at that level.

7.10 The proposed primary network identified in Section 5 is estimated at around 180km of safe separated and traffic-free routes. It is also estimated that around one third of this network already exists, although that may not all be of sufficient standard (for example, in relation to width and lighting). In addition to developing new routes, the enhancement of these existing routes will also be undertaken – as in the case of widening the Comber Greenway around 2017 and 2018. Taking this into account, and basing projected costs on the cost of schemes constructed in

recent years (such as Alfred Street and Middlepath Street) the overall outline cost of the proposed primary network is of the order of £100 million over ten years. Investment in the earlier years is likely to be lower as schemes are developed and designed but is projected to increase progressively year on year as the network is built. However, the funding allocations to deliver the Network will be dependent on Ministerial decisions and future budget allocations.

Delivery Plan

7.7 The Department has established a dedicated team to lead in the delivery of this Belfast Cycling Network. This team will have a central role in ensuring that this network is built within the ten year timeframe indicated. That delivery team will have responsibility for setting out a delivery plan for the entire network. This will identify key schemes throughout the city, with a particular focus on those areas where there is currently little separated or traffic-free infrastructure. It will also focus on linking pieces of isolated infrastructure into a more coherent network of routes. It is expected that this delivery plan will be completed by December 2021.

7.8 The routes in this network include paths through land that is owned by other organisations, such as Belfast City Council and the Department for Communities. The delivery team will work with those other bodies to assist them in improving their walking and cycling paths as part of the network.

7.9 This network aims to provide safe and attractive space which will give people the freedom and confidence to cycle whether by providing segregated infrastructure on the public road, traffic-free paths through parks or quiet streets where motor traffic volumes are very low and the speed of traffic is appropriate to the quiet nature of the area. It should not be seen as the limit to our ambition for active travel but as a means of shaping it and delivering better travel options and a key part of a more liveable city for the communities and citizens of Belfast.

APPENDIX A

2017 PUBLIC CONSULTATION

The 2017 consultation exercise indicated overwhelming support for a Belfast Cycling Network as an important element in developing a cycle friendly city, particularly in giving those who would like to cycle freedom and confidence to do so.

An almost twelve week public consultation on the draft Belfast Bicycle Network was held between 23rd January and 13th April 2017[23]. Nine public consultation events were held at various locations around Belfast. The first eight events were held in the neighbourhoods closest to the proposed main routes into the centre of Belfast with the final event held in the city centre.

There were over 200 written responses to the consultation document. While the number of people attending the consultation events was low, the comments received were useful.

A consultation report was published in February 2018[24]. Following this a workshop was held in April 2018, involving a number of key respondents who had gone into considerable detail in their consultation responses. In light of the lack of active travel infrastructure in north and west Belfast, the Department also commissioned an active travel feasibility study in those areas. This was carried out by Sustrans, the sustainable transport charity, and the report was completed in December 2019 and submitted to the Department in early 2020.

The responses received in the consultation exercise, comments from those attending consultation events, the contributions from those attending the workshop and the subsequent North and West Belfast Active Travel Feasibility Study have all been taken into consideration in drawing up, what is now called, the Belfast Cycling Network.

Among those who responded to the consultation exercise, there was overwhelming support for a Belfast Cycling Network as an important element in developing a cycle friendly city, particularly in giving those who would like to cycle freedom and confidence to do so.

23 Draft Belfast Bicycle Network 2016 - Consultation (infrastructure-ni.gov.uk)

24 Consultation Report Report on the consultation exercise on draft Bicycle Strategy (infrastructure-ni.gov.uk)

There was also overwhelming support for the proposal that routes should be planned and facilities designed with the achievement of increasing numbers of people cycling in mind and that the network should be based on the following five core design criteria (in alphabetical order):

Attractive: cycle infrastructure should help to deliver public spaces that are well designed and finished in attractive materials and be places that people want to spend time using;

Coherent: cycling networks should be planned and designed to allow people to reach their day to day destinations easily, along routes that connect, are simple to navigate and are of a consistently high quality;

Comfortable: comfortable conditions for cycling are smooth, well-maintained surfaces, adequate width for the volume of users, minimal stopping and starting, gentle gradients and regular sweeping. Routes need to be convenient to use and avoid complicated manoeuvres and interruptions;

Direct: cycling routes should be based on desire lines and at least as direct – and preferably more direct – than those available for private motor vehicles; and

Safe: not only must cycle infrastructure be safe, it should also be perceived to be safe by those people who would like to cycle more.

There was also a very high level of support for the addition of 'adaptability' (i.e. to accommodate all kinds of users and increasing numbers over time) to the five criteria above and for the following objectives set out in consultation document:

- To develop a comprehensive cycling network for commuter, amenity and recreational cycling through the expansion of cycling infrastructure and cycling facilities;
- To bring good quality cycle routes within the reach of most people within the city;
- To ensure a consistent level of service in the design of safe infrastructure – providing dedicated infrastructure where there are large volumes of higher speed vehicles and other types of safe interventions where the volume and speed of traffic is low, taking account of the safety of both pedestrians and other vulnerable road users;
- To encourage cycling and promote safe cycling through increasing the amount of cycle parking, providing more cycling education programmes for both young people and adults, supporting events to advocate cycling and promoting the '***One Path***' ethos of '***Share – Respect – Enjoy***' on our traffic-free paths.

Finally, there was a high level of support for the concept of arterial and orbital routes; for developing the network in primary and secondary stages; and, for tailoring routes on a scheme by scheme basis, taking account of the anticipated predominant use (if any) of the area by certain groups of users.

APPENDIX B

NORTHERN IRELAND GOVERNMENT POLICIES SINCE 1999

The Framework for Preventing and Addressing Overweight and Obesity in Northern Ireland 2012-2022: 'A Fitter Future for All'[25] aims to empower the population of Northern Ireland to make healthy choices, reduce the risk of overweight and obesity related disease and improve health and wellbeing, by creating an environment that supports and promotes a physically active lifestyle and a healthy diet.

The Economic Strategy: Priorities for sustainable growth and prosperity: 'Building a Better Future' sets out the objective, among others, to deliver higher productivity and increase social inclusion[26]. This ties in with 'A Fitter Future for All' as there is a demonstrable link between a more physically active lifestyle and economic productivity[27].

Commitments set out in the 'Cycling Strategy 2000' were echoed in the 'Regional Development Strategy 2001 – 25' (RDS). In setting the scene, the strategy advocated a fresh approach to future transport which meant giving more priority to:

- public transport improvement,
- walking and cycling,
- gradually changing the travel culture,
- extending choice and reducing reliance on the car, particularly for the school run and journeys to work in the Belfast Metropolitan Area and larger urban centres.

One of the objectives set out in the strategy was to give greater priority to encouraging more walking and cycling[28]. It included a commitment to implement the earlier Cycling Strategy to provide for the progression of cycling networks where the needs and safety of those cycling would be given greater priority[29].

'The Regional Transportation Strategy 2002 – 12' (RTS)[30] reflected the wider transportation policy of the earlier document including 'a shift in emphasis away from the car towards more sustainable modes such as walking, cycling and public transport'[31]. The RTS envisaged a modern, efficient and effective transportation system which could have (as one of its principal characteristics) 'safe and extensive walking and cycling networks, used regularly for travel to work, shops, education centres and leisure'[32]. It was envisaged that infrastructure improvements would provide a safer and more attractive environment for cyclists[33].

The '***Belfast Metropolitan Transport Plan***' (BMTP)[34], published in 2004, proposed wide-ranging initiatives to improve facilities for people walking and cycling so that these modes could become a more significant element of overall travel in the Belfast metropolitan area where around 45% of journeys are less than two miles in length. BMTP proposed two key targets:

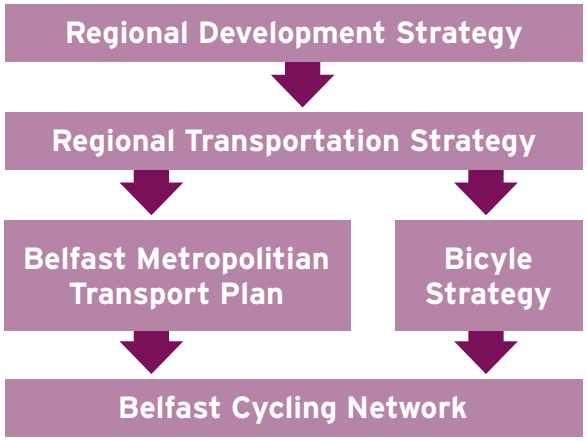
i. the number of short walking trips (less than 2 miles) would increase by 20% by 2012; and,

ii. the number of cycling trips would be quadrupled by 2015.

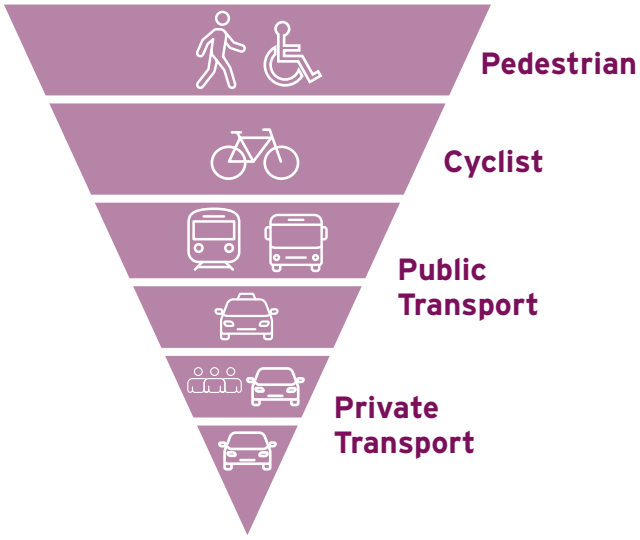
25 A Fitter Future for All (health-ni.gov.uk).
26 Northern Ireland Economic Strategy revised 1303012, page 10.
27 http://www.brookings.edu/research/opinions/2012/10/24-exercise-productivity-pozen.
28 http://www.righttoride.co.uk/virtuallibrary/strategies/shaping_ourfurtureni.pdf, page 171.
29 Ibid, page 172.
30 Regional Transportation Strategy for Northern Ireland 2002-2012 (infrastructure-ni.gov.uk)
31 Ibid, page 19.
32 Ibid, page 48 and 50.
33 Ibid, page 100.
34 https://www.infrastructure-ni.gov.uk/publications/belfast-metropolitan-transport-plan, page 4-2.

The desire to promote an increased mode shift to public transport, walking and cycling was repeated in the 2012 revised Regional Transportation Strategy – '***Ensuring a Sustainable Transport Future: a New Approach to Regional Transportation***'[35]. This approach underlined the fact that good quality, affordable public transport, together with a safe and secure pedestrian and cycling environment could deliver health and social benefits and were important factors to social inclusion. It also highlighted the point that to make public transport, walking and cycling attractive options, infrastructure needed to be safe, clean, well maintained and well lit. It proposed that active travel should be a viable alternative for many short to medium journeys.

It was following on from these documents that the '***Northern Ireland Changing Gear – a Bicycle Strategy for Northern Ireland***' was published in August 2015. The relationship between these various transport plans and strategies and how the '***Belfast Cycling Network***' relates to them is illustrated below.



Dfl's '***Living Places: an Urban Stewardship and Design Guide for Northern Ireland***' (published in 2014 by the former Department of the Environment), proposes a number of ways in which Government Departments and agencies and other stakeholders could work together to find ways to improve the planning, design and management of our urban places. This document promotes the sustainable transport hierarchy where the travel needs of pedestrians and cyclists are the first to be considered and the travel needs of single occupant car drivers are last. The hierarchy is illustrated below[36].



'Living Places' points out that the dominance of the motor car has become a defining feature of many urban places, rarely contributing positively to their overall quality. It advocates prioritising pedestrians, cyclists and then public transport to help keep our urban centres dominated by people instead of vehicles through a network of permeable routes to limit walking and cycling distances in order to make them more attractive than car travel.

35 Ensuring a Sustainable Transport Future - A New Approach to Regional Transportation (infrastructure-ni.gov.uk), page 14

36 Living Places - An urban Stewardship and Design Guide for Northern Ireland (infrastructure-ni.gov.uk), page 35.

APPENDIX C

LTN 1/20 SUMMARY PRINCIPLES OF CYCLING DESIGN

The following summary principles are taken from section 1.6 of LTN1/20. Full details of the principles can be found by accessing the following link: Cycle Infrastructure Design (publishing.service.gov.uk)

1. *Cycle infrastructure should be accessible to everyone from 8 to 80 and beyond: it should be planned and designed for everyone. The opportunity to cycle in our towns and cities should be universal.*

   The ability to deliver a right to cycle requires infrastructure and routes which are accessible to all regardless of age, gender, ethnicity or disability and does not create hazards for vulnerable pedestrians. Improvements to highways should always seek to enhance accessibility for all.

2. *Cycles must be treated as vehicles and not as pedestrians. On urban streets, cyclists must be physically separated from pedestrians and should not share space with pedestrians. Where cycle routes cross pavements, a physically segregated track should always be provided. At crossings and junctions, cyclists should not share the space used by pedestrians but should be provided with a separate parallel route.*

   Shared use routes in streets with high pedestrian or cyclist flows should not be used. Instead, in these sorts of spaces distinct tracks for cyclists should be made, using sloping, pedestrian-friendly kerbs and/ or different surfacing. Shared use routes away from streets may be appropriate in locations such as canal towpaths, paths through housing estates, parks and other green spaces, including in cities. Where cycle routes use such paths in built-up areas, you should try to separate them from pedestrians, perhaps with levels or a kerb.

3. *Cyclists must be physically separated and protected from high volume motor traffic, both at junctions and on the stretches of road between them.*

   Protection can be achieved either by creating physically separated cycle facilities, or by the closure of roads to through motor traffic using bollards, planters or other physical barriers (with access, Blue Badge holders, buses and so on still allowed). Segregated facilities can be implemented with full kerb segregation or light segregation (for example with wands, stepped kerbs, planters etc.). On roads with high volumes of motor traffic or high speeds, cycle routes indicated only with road markings or cycle symbols should not be used as people will perceive them to be unacceptable for safe cycling.

4. *Side street routes, if closed to through traffic to avoid rat-running, can be an alternative to segregated facilities or closures on main roads – but only if they are truly direct.*

   For directness it will often be necessary to mix the two, with stretches of routes on back streets joined to segregated routes on main roads and across junctions where there is no sufficiently direct side street. Routes that are not direct or that see significant volumes of rat-running traffic will not be used and should not be provided.

5. *Cycle infrastructure should be designed for significant numbers of cyclists, and for non-standard cycles. Our aim is that thousands of cyclists a day will use many of these schemes.*

We also want to see increasing numbers of cargo bikes to replace some van journeys. Cycle routes must be accessible to recumbents, trikes, handcycles, and other cycles used by disabled cyclists. Many current tracks and lanes are too narrow or constrained to meet these objectives. To allow faster cyclists to overtake, and make room for non-standard bikes, cycle tracks should ideally be 2 metres wide in each direction, or 3 to 4m (depending on cycle flows) for bidirectional tracks though there may have to be exceptions.

6. *Consideration of the opportunities to improve provision for cycling will be an expectation of any future local highway schemes funded by Government.*

To receive Government funding for local highways investment where the main element is not cycling or walking, there will be a presumption that schemes must deliver or improve cycling infrastructure to the standards in this Local Transport Note, unless it can be shown that there is little or no need for cycling in the particular highway scheme. Any new cycling infrastructure must be in line with this national guidance. The approach of continuous improvement is recognised in both the National Planning Policy Framework and Local Cycling and Walking Infrastructure Plan Guidance. Cycle infrastructure requirements should be embedded in local authority planning, design and highways adoption policies and processes.

7. *Largely cosmetic interventions which bring few or no benefits for cycling or walking will not be funded from any cycling or walking budget.*

Too many schemes badged as being for cycling or walking do little more than prettify the status quo, such as installing nicer-looking pavements and road surfaces but doing little or nothing to restrict through traffic or provide safe space for cycling. Schemes whose main purpose and/or effect is aesthetic improvement of the public realm must be funded from other budgets.

8. *Cycle infrastructure must join together, or join other facilities together by taking a holistic, connected network approach which recognises the importance of nodes, links and areas that are good for cycling.*

Routes should be planned holistically as part of a network. Isolated stretches of provision, even if it is good are of little value. Developing a connected network is more than lines on a map. It is about taking local people on a journey with you in order to understand who currently cycles, where they go and why they go there and, more importantly, who does not currently cycle and why.

9. *Cycle parking must be included in substantial schemes, particularly in city centres, trip generators and (securely) in areas with flats where people cannot store their bikes at home. Parking should be provided in sufficient amounts at the places where people actually want to go.*

Cycle parking should be pleasant, sufficient and convenient to allow people to cycle for commuting and utility journeys and to know that there will be both short or long-term parking at their destinations. Cycle parking should consider the needs of all potential users and the range of cycles which will use the facilities. The provision of other services such as maintenance facilities will improve the experience for users and deter cycle theft.

10. *Schemes must be legible and understandable.*

Cyclists, pedestrians and motorists alike must be in no doubt where the cycle route runs, where the pedestrian and vehicle space is and where each different kind of user is supposed to be. Some schemes deliberately create confusion or ambiguity with, for instance, only minimal signs in a paved area to show that cycling is permitted. This is another way of managing cyclist-pedestrian interactions that inhibits cycling and is not suitable for places with large numbers of cyclists and pedestrians.

11. *Schemes must be clearly and comprehensively signposted and labelled.*

Users must feel like they are being guided along a route. They should not have to stop to consult maps or phones. Directions should be provided at every decision point and sometimes in between for reassurance. Signs should be clear, easily visible and legible.

12. *Major 'iconic' items, such as overbridges must form part of wider, properly thought-through schemes.*

There is sometimes a temptation to build costly showpiece structures in isolation without thinking enough about the purpose they truly serve and the roads and routes which lead to them. We will only support such things when they overcome a major barrier on a desire line which cannot safely be crossed in other ways, and where they form an essential, properly-connected part of a wider network of good, safe routes.

13. *As important as building a route itself is maintaining it properly afterwards.*

Road markings get dug up by utility contractors, ignored in repaints or just worn away; tarmac is allowed to crack and part; tracks and lanes are seldom or never swept, leaving them scattered with debris and broken glass. In winter, cycle lanes are usually the last place to be cleared of snow and ice, if they are cleared at all. Routes must be properly maintained and swept frequently for debris and broken glass. Route proposals should always include a clear programme of maintenance.

14. *Surfaces must be hard, smooth, level, durable, permeable and safe in all weathers.*

Surface materials should be easy to maintain, for example asphalt and other materials highlighted in Chapter 15. Materials such as brick and stone should generally be avoided on cycle routes. They are expensive, yet often quickly become dirty, ugly, broken and rough to ride on under the impacts of vehicles and can be slippery in wet weather. Exceptions will be allowed for streets of special heritage value. Level changes on the main route such as raised tables and humps are not necessary if the guidance on reducing traffic volumes and/or creating separated space has been properly followed. Side road entry treatments such as raised tables across the mouth of side roads can reduce the speed of vehicles turning in and out of the junction improving safety for cyclists and can help pedestrians. Materials such as loose gravel should also be avoided.

15. *Trials can help achieve change and ensure a permanent scheme is right first time. This will avoid spending time, money and effort modifying a scheme that does not perform as anticipated.*

If there is dispute about the impact of a road change, we recommend trialling it with temporary materials. If it works, it can be made permanent through appropriate materials. If it does not, it can be easily and quickly removed or changed. However, it is important that the scheme is designed correctly at the beginning, to maximise the chances of it working.

16. *Access control measures, such as chicane barriers and dismount signs, should not be used.*

They reduce the usability of a route for everyone, and may exclude people riding nonstandard cycles and cargo bikes. They reduce the capacity of a route as well as the directness and comfort. Schemes should not be designed in such a way that access controls, obstructions and barriers are even necessary; pedestrians and cyclists should be kept separate with clear, delineated routes as outlined in the principles above.

17. *The simplest, cheapest interventions can be the most effective.*

Perhaps the single most important tool to promote cycling may be the humble bollard, used to prevent through traffic. It is relatively inexpensive and can be erected quickly. With a Traffic Order in place to restrict use of the road by motor traffic, such low-cost modal filters can increase safety by reducing through traffic, while retaining cycle and pedestrian access. Provided they have real effect, swift, pragmatic interventions are preferred over elaborate and costly ones.

18. *Cycle routes must flow, feeling direct and logical.*

Users should not feel as if they are having to double back on themselves, turn unnecessarily, or go the long way round. Often, cycling schemes – when crossing a main road, for instance – require cyclists to make a series of ninety-degree turns to carry out a movement that a motor vehicle at the same location could do without turning at all. Schemes should be based on a proper understanding of how people actually behave rather than how they might be expected to behave.

19. *Schemes must be easy and comfortable to ride.*

Cycling is a physical effort. Schemes should not impose constant stopping and starting or unnecessary level changes. Traffic calming measures such as road humps are mainly installed to reduce traffic speeds, but if through traffic is no longer present on the street or in the segregated lane, they are not necessary. If traffic calming measures are needed, they should always be designed so that they are not inaccessible to people on tandems and tricycles.

20. *All designers of cycle schemes must experience the roads as a cyclist.*

Ideally, all schemes would be designed by people who cycle regularly. But in every case, those who design schemes should travel through the area on a cycle to understand how it feels – and experience some of the failings described above, to understand why they do not work. The most effective way to gain this understanding is to get out and cycle the route and observe users' behaviour.

21. *Schemes must be consistent.*

A scheme is only as good as its weakest point. Strenuous efforts should be made to avoid inconsistent provision, such as a track going from the road to the pavement and then back on to the road, or a track which suddenly vanishes.

22. *When to break these principles.*

In rare cases, where it is absolutely unavoidable, a short stretch of less good provision rather than jettison an entire route which is otherwise good will be appropriate. But in most instances it is not absolutely unavoidable and exceptions will be rare.

The world is changing and we must change with it.

APPENDIX D

EXTRACTS FROM THE BELFAST METROPOLITAN TRANSPORT PLAN 2004

Figure 8.4 Belfast City Centre Cycle Routes

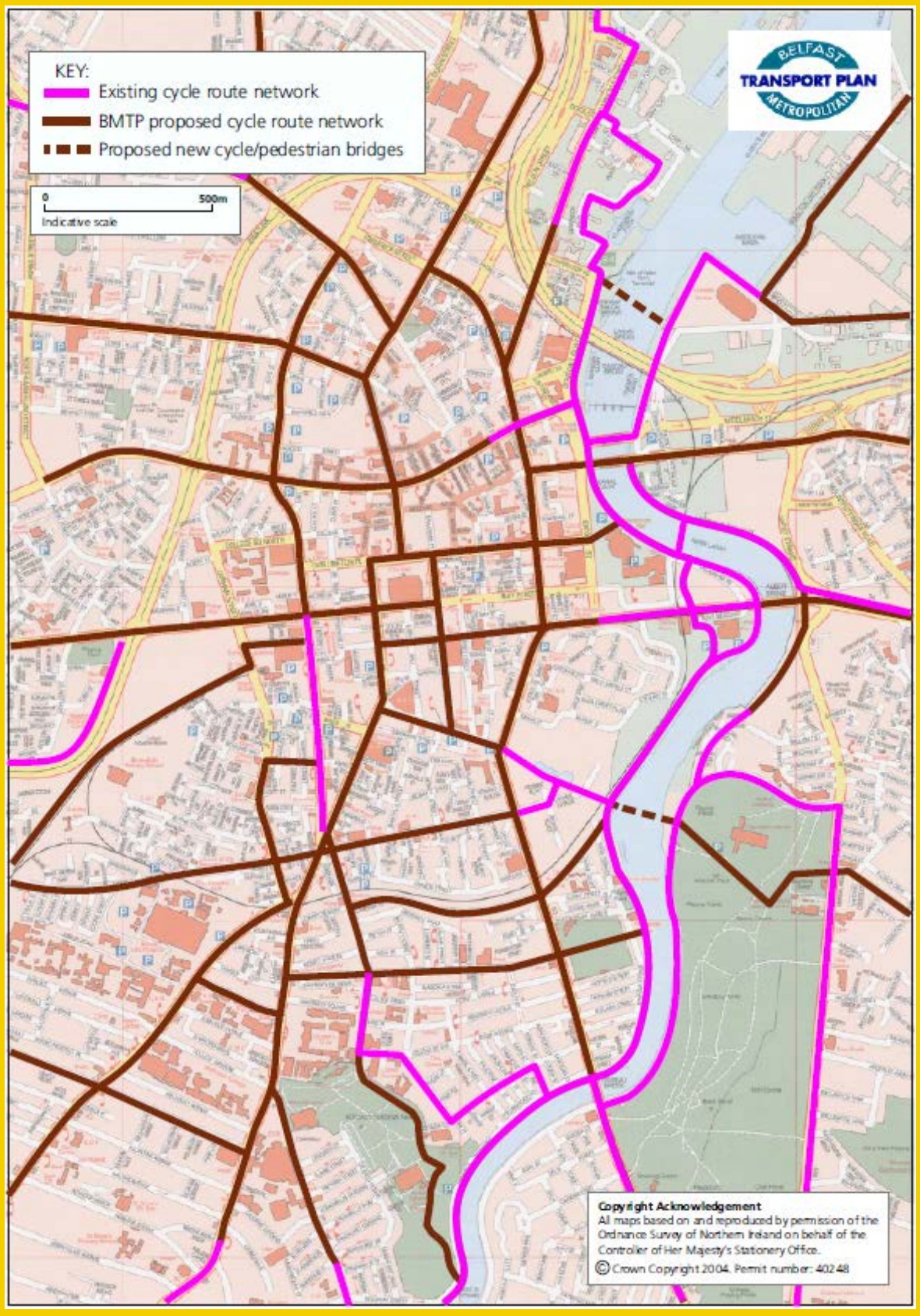
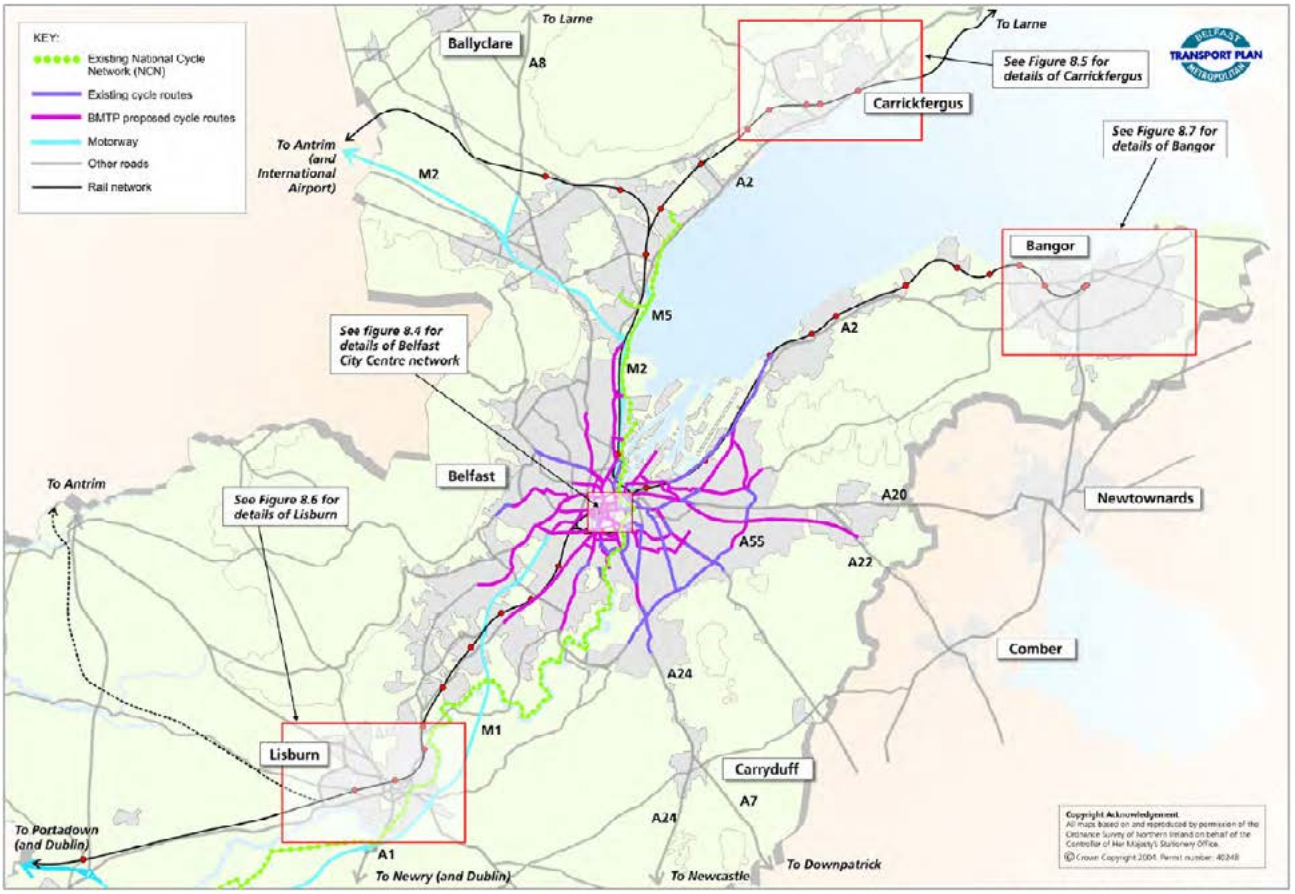


Figure 4. 1 Proposed Cycle Routes



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