12. Public Transport

12. Public Transport

12.1 Introduction

12.1.1 The Capacity Dimension

Public transport services operate on a spectrum based on their capacity. A conventional low frequency bus service, such as an hourly service to a regional town, carries a relatively small number of passengers compared to a high-capacity rail service such as Metro or DART. In between these two extremes, there are a wide range of other options, including;

- Standard Bus Service – single route every 15 minutes carrying less than 400 passengers per hour;
- High frequency Bus Services – combined routes every 1 ½ to 2 minutes supported by bus priority, carrying approximately 3,000 passengers per hour;
- Higher Capacity Bus Systems – using larger vehicles or other forms of higher capacity bus, carrying in excess of 3,000 passengers per hour;
- Standard Light Rail – every 3 to 4 minutes which can carry up to about 5,000 passengers per hour
- High Frequency Light Rail – every 2 minutes which can carry up to about 10,000 passengers per hour (assuming long length trams).

"Public transport is essential to a city of Dublin's size and density, because there is simply not room for everyone's car.

"The vast majority of public transport in Dublin is provided by buses and this will remain true, at minimum, for the next ten or more years, and will always be true to some extent.

"Even in cities like Paris, where almost everyone is within 800m of a metro station, enormous numbers of people travel by bus.

"As a result, a study of Dublin's bus network is a study of most of the public transport in Dublin. It is also a study of what can be done soon."

Bus Connects Network Redesign Choices Report, Jarrett Walker & Associates and NTA, 2017

Understanding this concept is critical in understanding the approach of the NTA to the provision of public transport infrastructure and services over the lifetime of this strategy and beyond.

It should be noted that the above capacity bands are not rigid categories and that higher capacities can be provided where larger vehicles are used or higher frequencies can be obtained.

12.1.2 Message from the Covid-19 Pandemic

The period since March 2020 has been an extremely challenging one for public transport providers, operators, regulators and passengers globally. Demand for travel plummeted as lockdowns were enforced, and the only people travelling were primarily essential workers.

As society completes its reopening and as people return to public transport, the permanent changes in travel behaviour arising from the pandemic will emerge. The most important aspect of this, in terms of public transport passenger numbers and long-term strategic transport planning, will primarily be the increased numbers of people working from home. Remote education and online shopping will also have an impact, but the future of the "rush-hour" commute to work will be a major determinant in the level of capacity required to be provided by public transport.

In order to ensure that this Transport Strategy addresses the rapidly changing transport environment arising out of the pandemic, the NTA has developed an Alternative Future Demand Scenario, whereby the likely demand for future travel has been adjusted to account for potential increases in working from home, remote learning and online shopping. Other areas such as a potential decrease in business travel together with an increase in shorter local trips have also been considered. The full details of this scenario are available in the "Alternative Future Scenario for Travel Demand" report available on the NTA website.

The NTA monitors public transport trends on an on-going basis and, combined with annual surveys, traffic counts and the CSO census, this comprises a comprehensive data source for ensuring that any changes in travel behaviour are captured regularly and can input into strategic planning decisions over the period up to 2042, including in the review of this Transport Strategy in 2028.

12.1.3 Overall Approach

The overall approach to public transport provision has been to put in place the appropriate public transport mode to address the transport demand on the relevant link.

Because of the dispersed pattern of land use development across the region, the bus system represents the appropriate public transport solution across much of the GDA, including within the Metropolitan area. Along key corridors with high level of demand, rail-based options have been identified and included within the Transport Strategy.

In a developing region, travel demand patterns don't remain static and will evolve over time. As the forecast population grows, the demand for travel from each part of the city and

region will change. For the light and heavy rail network, this growth will be addressed by increasing the frequency of services or the capacity of the vehicles, or both. In relation to the bus services, a similar approach will be taken where the response to demand growth will be to increase the frequency of service or to use larger bus vehicles or both.

For some of the BusConnects Core Bus Corridors, referenced later, the level of anticipated demand during the strategy period will be matched by using larger capacity vehicles and/or high frequencies. In the longer term, beyond 2042, the forecast demand on a limited number of these corridors may justify the provision of higher capacity modes, in particular light rail, on these routes.

In other words, during the lifetime of this strategy, current forecasts indicate that some bus corridors may need to transition along the public transport capacity spectrum towards a higher capacity bus system, primarily through the introduction of higher capacity vehicles and/or increased frequencies, with the potential for subsequent transition in the longer term, post 2042, to light rail provision.

The optimal arrangement along these particular corridors is to develop a reliable and attractive bus-based transport option to deliver early benefits in terms of mode share and reduced emissions and, as demand increases, introduce higher capacity services. This transition will allow appropriate matching of supply with growth in travel demand in a planned manner, corresponding to the emerging and likely forecast development patterns along each corridor.

12.1.4 The Public Transport Strategy

This chapter sets out the strategy for the implementation of an overall public transport system for the region. Central to that overall provision is the delivery of a comprehensive bus network in the short-term based on significantly enhanced levels of service supported by much greater on-street priority. In the short-term there are also a number of rail lines that will be pursued such as Metrolink and the DART+ programme.

Towards the medium and long term, a number of Luas lines which have been planned for many years, together with other rail projects, will be progressed according to forecast demand. During this period, those bus corridors where demand for travel exceeds that which can be served by high frequency bus services, will have their passenger carrying capabilities increased by transitioning to higher capacity bus systems which will be implemented on an incremental basis.

The alignments and details of proposed transport projects set out in this Chapter are indicative only and are subject to further development as the design and planning processes for individual projects progress.

Accordingly, some of the details of the individual proposals will be subject to amendment as this design development work is undertaken. The design and planning of individual projects will be carried out in accordance with prevailing legislation relating to environmental assessment and public consultation.

12.1.5 Public Transport Interchange

While the Transport Strategy includes various bus and rail schemes along certain corridors, it is the manner in which these schemes interconnect which forms the key strength of the network, as set out in Chapter 9. The Transport Strategy radically increases the potential for interchange across the GDA by providing for several additional high-frequency rail and bus services; connected by high-frequency orbital buses. This approach significantly reduces the time taken to travel where two public transport journeys are required and reduces the cost of the journey through revisions to the fare structure. As such, the options and choices available to people in the GDA to travel conveniently and cost-effectively by public transport are greatly increased.

12.1.6 Maintenance and Renewal

All public transport infrastructure deteriorates over time and needs replacing. Significant investment is required on an on-going basis to replace vehicles, shelters, information signage, station facilities etc. The NTA, with all of the transport operators, must ensure that the infrastructure and fleet is kept up-to-date and that the level of investment to maintain the steady state is available every year, in addition to the level of investment in new infrastructure.

Measure PT1 – Steady-State Maintenance of Public Transport

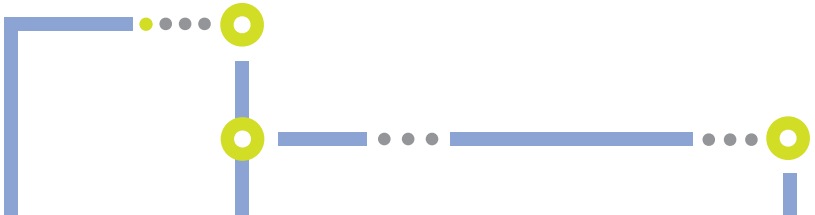
The NTA and transport operators will ensure that existing public transport infrastructure and fleet will be maintained at a high standard and renewed at the appropriate time.

12.1.7 Resilience of the Public Transport Network

Climate change effects have the potential to directly impact on public transport infrastructure. The European Commission's "Technical Guidance on the Climate Proofing of Infrastructure in the period 2021-2027" provides an approach to ensuring that climate change mitigation and adaptation measures are integrated into the development of infrastructure projects. The NTA will incorporate all relevant measures into the implementation of the Transport Strategy.

Measure PT2 – Climate Proofing New Public Transport Infrastructure

The NTA will ensure that all new public transport infrastructure is proofed against the potential impacts arising from climate change.



The on-going operations of our bus and rail services can also be subject to significant disruptions and shocks. These include service disruptions caused by motorists crashing into level crossing or trams; adverse weather conditions; or road traffic collisions. As our reliance on mass transit as a means of addressing the climate crisis and to serve social and economic needs increases, there is a requirement to ensure that the public transport system is resilient and has the capacity to withstand shocks.

Linked to the previous measure, this is of particular relevance in a scenario where extreme weather events, such as flooding – in particular along the Dublin and Wicklow coastline – becomes more frequent. The NTA will, in conjunction with transport operators and Local Authorities, prepare a strategy for ensuring the public transport system is resilient and can withstand unexpected shocks. This strategy include examination of the following:

- Assessment of fleet requirements;
- Identification of alternative routeings for bus services in the event of road closures or rail line suspensions;
- Operational measures such as emergency roadspace reallocation; bus gates; or other bus priority on identified alternative routes;
- Changes to Road Traffic Law in order to deter red-light jumping at level crossings; and
- Assessment of the infrastructural requirements to protect coastal public transport infrastructure.

Measure PT3 – Resilience of the Public Transport Services

The NTA and transport operators will prepare a public transport resilience strategy for the GDA.

12.2 Bus

12.2.1 Introduction

The bus provides the backbone of the regional transport system and will continue to play this pivotal role into the future. The bus will also compliment the significant investment in the GDA rail network by extending the catchment of this system via feeder services and interchange. As such, the adaptability, flexibility and coverage that the bus network can provide means that this mode will always be to the forefront in planning for movement in our cities, towns, villages and rural areas.

In recent years, the NTA has begun a process of implementing a step-change in the quality of the overall bus system in the GDA, through the following programmes:

- BusConnects Dublin;
- Connecting Ireland; and
- Local Link.

Together these programmes, which are described in more detail in subsequent sections, are seeking to significantly improve the image of the bus by providing a radically enhanced level of service, with the objective of increasing the share of people using public transport. This is being achieved through improvements to bus infrastructure, bus fleet, passenger facilities and passenger information. This chapter sets out the objectives of the NTA up to 2042 under these programme headings.

12.2.2 BusConnects Dublin and Additional Investment

BusConnects Dublin was launched in 2017. It is a multi-faceted programme comprising the following elements:

- Core Bus Corridors (CBCs) providing approximately 230km of bus priority and approximately 200km of cycle routes;
- A New Dublin Area Bus Service Network;
- Next Generation Ticketing;
- New Bus Livery;
- New Bus Stops and Shelters;
- A Low / Zero Emissions Bus Fleet;
- New Park & Ride and Interchanges; and
- A Revised Fare Structure.

Some of these elements cut across all transport modes and have been dealt with in Chapter 9.

Core Bus Corridors

As part of the 2016-2035 Transport Strategy, indicative radial and orbital Core Bus Corridors were identified. Over the last 3 years, and with the input of the public at several stages of non-statutory public consultations, the NTA has sought to bring forward the development of the key radial corridors. In doing so, the NTA has refined and altered the proposals across these corridors and have endeavoured to design a new bus system

Bus

16
BusConnects Core Bus Corridors

410 km
of Orbital Routes

>230km
of Radial Bus Priority

Bus Priority
on National Roads
leading to Dublin

100%
Zero Emissions Bus Fleet

Better Interchange
with DART and Luas

Expanded
24hr Bus Services

BusConnects
Higher Frequency and Higher Capacities

Connecting Ireland
New services linking towns, villages and rural areas across the region

that is both efficient and effective, while being cognisant of the needs of local communities.

As these projects progressed, it was decided to combine a number of corridors for the purposes of preparing planning applications. As such, in the early months of this strategy, it is intended to have submitted applications with An Bord Pleanála for 12 schemes as follows:

- Clongriffin to City Centre;
- Swords to City Centre;
- Ballymun/Finglas to City Centre;
- Blanchardstown to City Centre;
- Lucan to City Centre;
- Liffey Valley to City Centre;
- Tallaght/Clondalkin to City Centre;
- Kimmage to City Centre;
- Templeogue/Rathfarnham to City Centre;
- Bray to City Centre;
- Belfield/Blackrock to City Centre; and
- Ringsend to City Centre

These schemes are shows in Figure 12.1

Subject to obtaining statutory planning approvals, the NTA will proceed to construct these key bus arteries within the Dublin area. They will facilitate faster and more reliable bus journeys on the busiest bus corridors in the Dublin region, making the overall bus system more convenient and useful for more people. In addition, key elements of the Cycling Network Plan for the GDA will be delivered as part of these corridors.

Over the period of the strategy, the NTA will implement bus priority additional to that proposed under the current BusConnects Dublin programme. In particular, as demand for bus travel increases and the need for reliable journey times increases, the requirement for further priority on radial corridors will emerge. This may involve extending the current Core Bus Corridors or the identification of new radial corridors which may require priority.

The orbital bus routes proposed as part of the new service network (labelled N, S, W, and O) will also require a high degree of priority to be developed over the lifetime of the Transport Strategy. These routes are shown in Figure 12.2. Additional orbital services are also likely to be required to serve emerging development areas such as the City Edge Masterplan lands.

In providing for unimpeded bus journeys on these corridors, all forms of priority have been, and will be, considered. This includes bus lanes, bus gates, bus only road links and bus priority signalling.

Measure BUS1 – Core Bus Corridor Programme

Subject to receipt of statutory consents, it is the intention of the NTA to implement the 12 Core Bus Corridors as set out in the BusConnects Dublin programme.

Measure BUS2 – Additional Radial Core Bus Corridors

It is the intention of the NTA to evaluate the need for, and deliver, additional priority on radial corridors.

Measure BUS3 – Orbital Core Bus Corridors

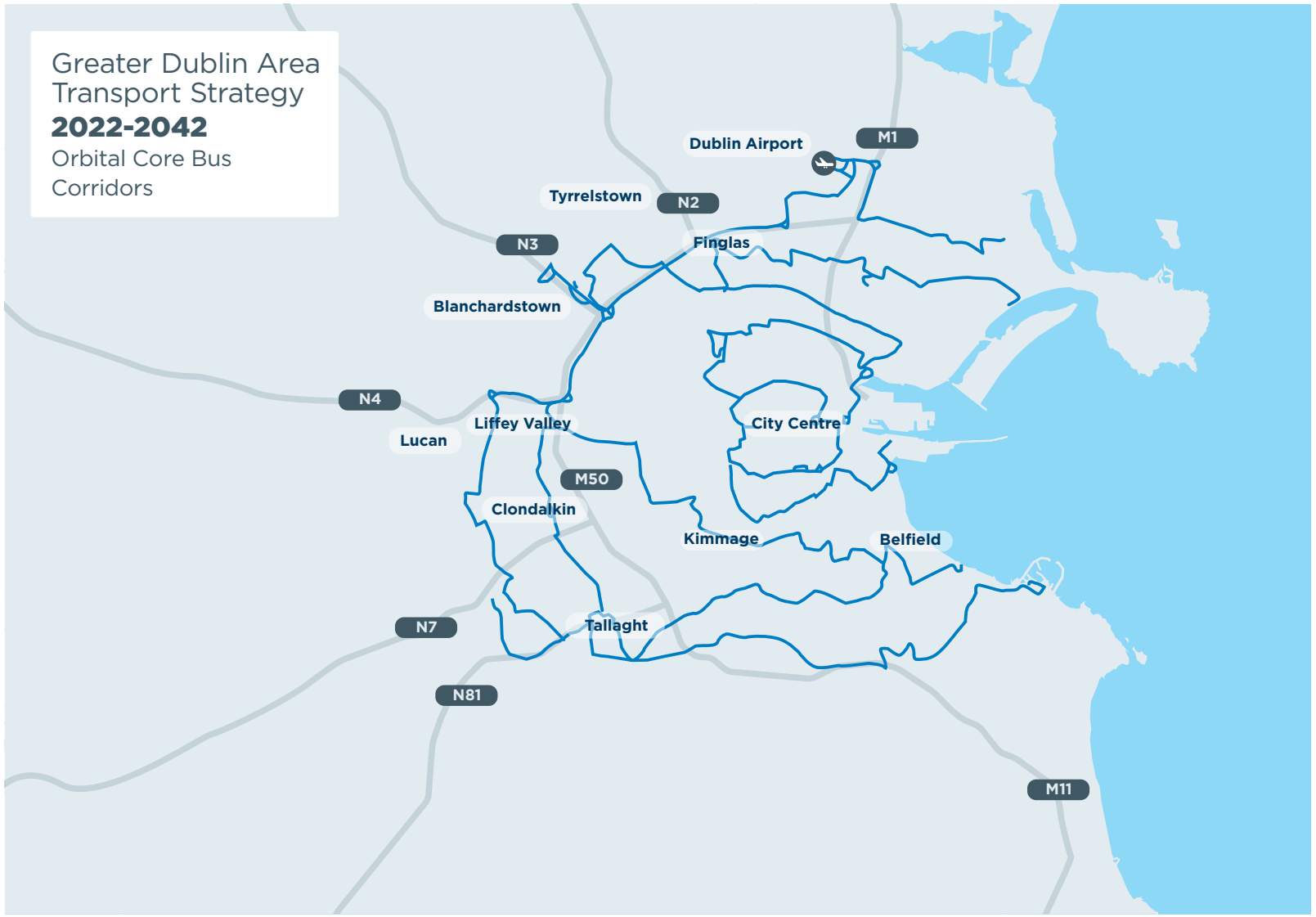
It is the intention of the NTA to provide significant improvements to orbital bus services in the following ways:

1. Increased frequencies on the BusConnects orbital services; and
2. Providing bus priority measures at locations on the routes where delays to services are identified.

Figure 12.1: BusConnects Dublin Core Bus Corridors

1.	Clongriffin to City Centre
2.	Swords to City Centre
3.	Ballymun/Finglas to City Centre
4.	Blanchardstown to City Centre
5.	Lucan to City to Centre
6.	Liffey Valley to City Centre
7.	Tallaght/Clondalkin to City Centre
8.	Kimmage to City Centre
9.	Templeogue/Rathfarnham to City Centre
10.	Bray to City Centre
11.	Belfield/Blackrock to City Centre
12.	Ringsend to City Centre

Figure 12.2: Orbital Core Bus Corridors



New Dublin Area Bus Service Network

Following three rounds of public consultation which began in 2017, the NTA finalised and published the New Dublin Area Bus Network in September 2020. This new bus network plan is the final version emerging from the redesign process, informed by over 72,000 submissions received over three consultation periods.

Implementation of the new bus network has already commenced and, subject to Government funding, will continue on a phased basis over a number of years.

Under the plans, the network will be arranged on the basis of spines radiating from the city centre, supported by other services. The new routes will consist of:

- Spines - frequent routes made up of individual bus services timetabled to work together along a corridor. At the end of the corridor, the individual services branch off to serve different areas;
- Orbitals - services operating around the city. They provide connections between suburbs and town centres, without having to travel into the City Centre. They also provide connections to rail, Luas and other bus routes.
- Other City Bound Routes – services operating into Dublin City Centre. These services are not part of any spine and operate on their own timetable;
- Local Routes – services providing important connections within local areas, linking to local retail centres and to onward transport connections;

- Peak-Only Routes – services operating during the peak travel periods, generally weekday mornings and evenings, providing additional capacity along key bus corridors; and

- Express Routes - direct services from outer suburbs to the City Centre at peak commute hours, operating a limited stop service to get passengers to their destinations faster.

An extract from the New Dublin Area Bus Network is shown on Figure 12.3. Spines and branches are shown in red, Orbitals in light blue and Local Routes in purple.

In addition to the revised network of service, analysis during the preparation of this strategy, identified some locations where demand for bus services in 2042 would require routes additional to those set out in the network review. Accordingly, periodic reviews will be undertaken during the period of the Transport Strategy to evaluate the impacts of changing development and transport patterns, and to implement appropriate additions or adjustments to the overall bus system to accommodate the changing arrangements.

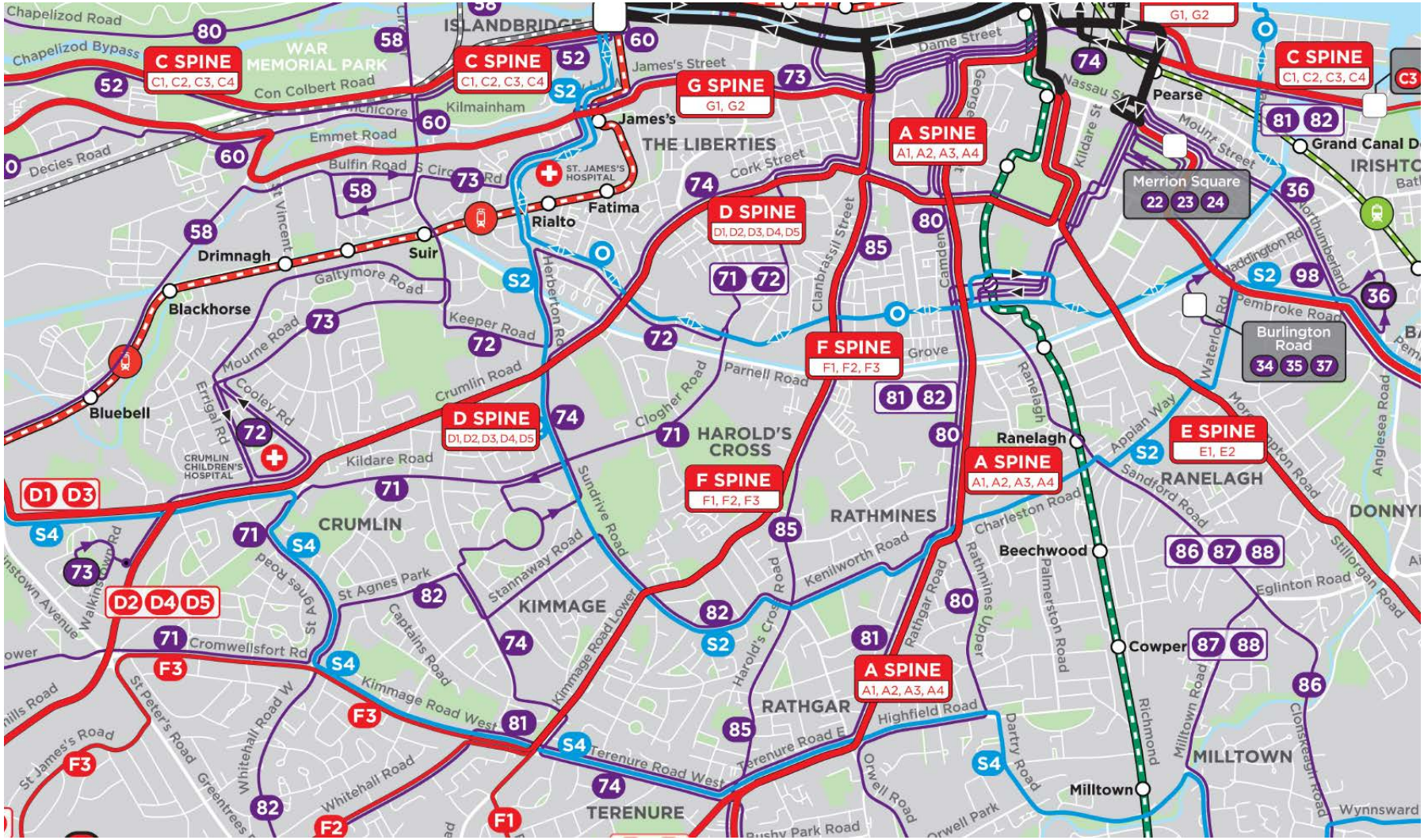
Measure BUS4 – New Dublin Area Bus Service Network

It is the intention of the NTA to deliver the new Dublin Area Bus Service Network starting in 2021 with a target completion date of 2024.

Measure BUS5 – Bus Service Network Monitoring and Review

It is the intention of the NTA to continually monitor the demand for bus services in the Dublin Area as part of the roll-out of the new service network and as part of the monitoring and periodic review of the Transport Strategy, and enhance or amend the service network as appropriate.

Figure 12.3: New Dublin Area Bus Service Network Extract



12.2.3 Higher Capacity Bus Fleet

As referenced in section 12.1.4, it is envisaged that some bus corridors will require increased capacity by transitioning to higher capacity bus systems as demand for travel on those corridors exceeds that which can be served by high frequency bus services,.

Through this approach, these corridors will be provided with a further uplift on the capacity spectrum, with larger vehicles providing higher levels of passenger capacity. As an indicator of the potential of this approach, bi-articulated bus vehicles up to 25 metre long are in operation in various cities across the world, with vehicles having capacity for up to 200 passengers, compared to approximately 90-95 per vehicle in the current double-deck bus fleet.

The precise vehicle to the be introduced will be determined at the appropriate time and the choice will take into account the operating environment including street widths; interactions with Luas; requirements for cyclists and pedestrians; and bus parking and layover considerations.

Measure BUS6 – Higher Capacity Bus Fleet

In the later phases of the Transport Strategy period, it is the intention of the NTA to introduce higher capacity bus vehicles onto select appropriate BusConnects corridors in order to increase passenger carrying capabilities in line with forecast demand.

12.2.4 Zero Emissions Buses

The transition to a zero emissions urban bus fleet for the State operated bus services has begun under BusConnects. Hybrid diesel-electric buses are now visible all across Dublin City and by the end of 2021 there will be a total of 219 of these low emission vehicles on the streets of the capital.

2022 will see the introduction of fully electric single and double deck fleet and the ongoing conversion of bus depots to charge and maintain the new vehicle types. Under the BusConnects Dublin programme, the full Dublin Area urban bus fleet will have transitioned to zero or low emission vehicles by 2030 and will have been converted to a full zero emission bus fleet by 2035.

In relation to the regional and intercity coach fleet, emerging technologies will be closely monitored with a view to their adoption during the lifetime of the strategy once they are deemed reliable and effective for longer-distance travel.

Measure BUS7 – Zero Emission Bus Fleet for Dublin

It is the intention of the NTA to deliver a fully low emission vehicle Bus Fleet for the Dublin Area by 2030 and a Zero Emission fleet by 2035.

Measure BUS8 – Regional and Intercity Coach Fleet

The NTA will monitor emerging fuel technologies for adoption into the regional and intercity services, in order that a low or zero emission coach fleet, in line with available vehicle types, for the GDA is achieved.

The graph shows how the transition to zero emission vehicles for the urban bus fleet in Dublin is currently planned to take place.

Figure 12.4: Transition to Zero Emissions Buses in Dublin

	2021	2025	2030	2032	2033	2035	Total Buses (2035)
Dublin							1489

Diesel Hybrid Zero Emission

12.2.5 Bus Livery

Under the BusConnects Dublin programme, the exterior and interior of buses, known as the bus livery, will be standardised across different operators to give the bus system the feeling of a modern, integrated and effective public transport system. The requirement for the adoption of a uniform brand is set out in legislation.

Initially, the rollout of the new TFI livery will be focused on new buses and coaches entering the Public Service Obligation (PSO) fleet and on routes that are launching as part of the BusConnects new Dublin Area Bus Service Network, but it will eventually also be deployed nationwide.

Measure BUS9 – Bus Livery

It is the intention of the NTA to deliver a consistent livery to all PSO buses in the Greater Dublin Area.

12.2.6 New Bus Stops and Shelters

Under BusConnects Dublin and Connecting Ireland (section 12.2.7) we will enhance bus stops in the Dublin region, with better route and fare information and with timetable information specific to each stop. All operators will adopt this style and the current assortment of poles at multi-operator stops will be removed. This new style has been specifically developed to be consistent with the new bus livery to provide visual consistency. It has commenced rollout and will continue to be progressively installed in the coming years.

We will install more Real Time Passenger Information (RTPI) signs along the new bus corridors and elsewhere across the region, providing accurate next-bus arrival information.

Bus shelter provision will be significantly expanded as part of the BusConnects Dublin programme and Connecting Ireland (section 12.2.7). A large number of additional bus shelters will be provided in new locations, particularly where connecting services are being provided. The potential to incorporate urban design and environmentally beneficial features in new bus stops and shelters will be explored.

Measure BUS10 – New Bus Stops and Shelters

It is the intention of the NTA to continue to roll-out the program of bus stop and shelter provision, and to monitor potential for further expansion and upgrade during the lifetime of the strategy.

12.2.7 Regional Core Bus Corridors

In relation to bus travel originating outside the Metropolitan Area, it is an aim of the NTA to ensure that the reliability and efficiency of regional bus services is maximised. In order to do so, a degree of bus priority will be sought on the national routes where traffic congestion does or could cause delays to

bus/coach services, including on approaches to the M50 and the built-up area of the city. On certain corridors, the priority will then tie-in to that proposed as part of the BusConnects Dublin corridor programme and its expansion.

Seven regional bus corridors have been identified as forming part of the Core Bus Network. These are:

- **M1, via Dublin Port Tunnel**
  - Serving long distance bus routes from Belfast, Dundalk, Derry, Monaghan and Drogheda; and
  - Serving other regional bus routes from Balbriggan, Skerries and East Meath.
- **M2, via Finglas Road**
  - Serving regional bus from Ashbourne and Slane plus other locations to the north and north-west.
- **M3/N3, via Navan Road**
  - Serving regional bus from Cavan, Navan, Trim, Dunshaughlin, Kells; and
  - Serving longer distance bus from Donegal and the north west region.
- **M4/N4, via Chapelizod Bypass**
  - Serving longer distance bus from Galway, Mayo, Sligo and Midlands; and
  - Serving regional bus along M4 corridor.
- **M7/N7, via Long Mile Road**
  - Serving longer distance bus from Cork, Limerick, Waterford; and
  - Serves regional bus from Kildare, Laois and adjacent counties.
- **N81**
  - Serving longer distance bus from south-west Wicklow and east Carlow; and
  - Serving regional bus from Blessington and Baltinglass plus other locations.
- **M11/N11**
  - Serving longer distance bus from Wexford; and
  - Serving regional bus from Arklow, Wicklow and N11 corridor.

These Regional Core Bus Corridors are shown in Figure 12.5.

Measure BUS11 – Regional Core Bus Corridors

It is the intention of the NTA, in collaboration with TII and the relevant local authorities, to continue to provide enhanced levels of bus priority on the Regional Core Bus Corridors, in particular addressing sections where bus delays are caused, or will be caused in the future, by traffic congestion.

Figure 12.5: Regional Core Bus Corridors

Bus Priority in Towns and Villages

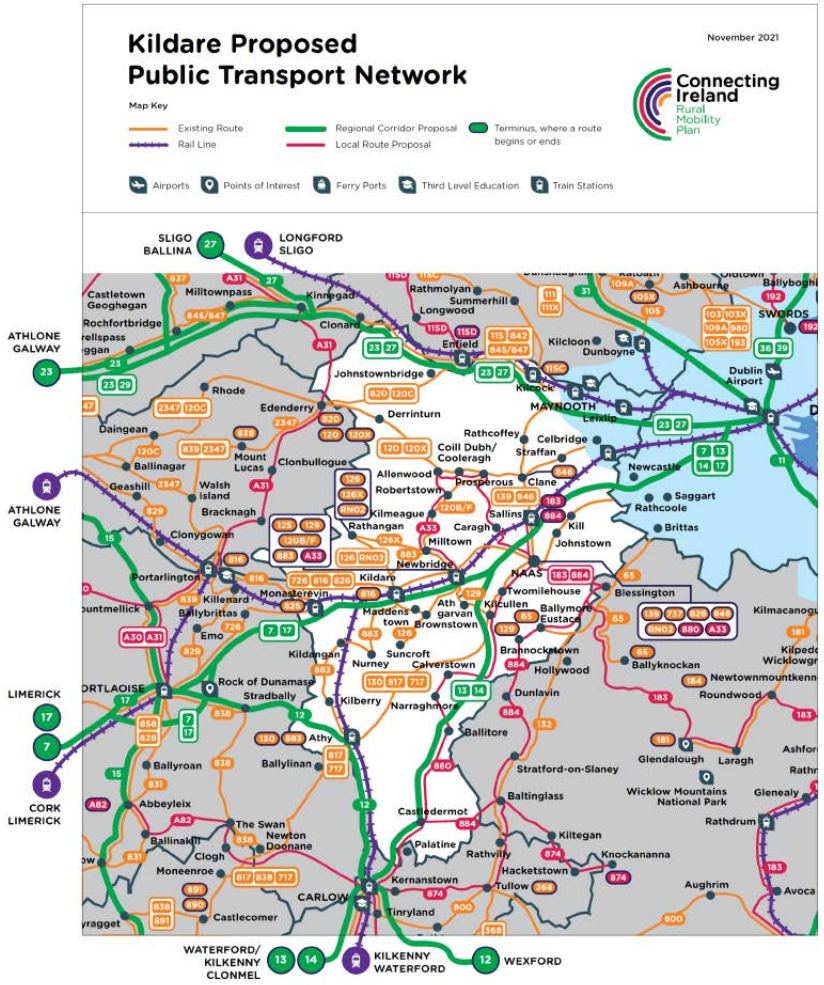
Many regional and long-distance bus services are subject to delay as they travel through towns and villages across the GDA. This has a negative impact on journey time reliability and on the attractiveness of the services as a whole. It is likely that there are opportunities for the delivery of bus priority in many of these urban areas, in the form of bus lanes, bus gates, traffic signalling or other similar arrangements, in particular where the settlement has alternatives for private car traffic such as distributor or relief roads. The NTA, with the local authorities will seek to provide such priority where traffic congestion is, or is likely to, delay bus movement. Such measures will fully take into account any policies and objectives related to the public realm and urban environment in these towns and villages.

Measure BUS12 – Bus Priority in Towns and Villages

The NTA and local authorities will implement bus priority measures in towns and villages in the GDA in order to reduce delays to bus services.

12.2.8 Connecting Ireland and Further Investment

Connecting Ireland is the NTA's programme to address the gaps in connections to local and regional centres in rural Ireland, to allow for the access to local services without the need for a car and to provide the option of more sustainable transport across the region. It is proposed to finalise the network of services on a county-by county basis in consultation with local authorities and to undertake a full public consultation on the proposals commencing by early 2022.



Over the lifetime of the strategy, and in order to ensure that an effective alternative to the private car can be offered in rural parts of the GDA for all trip purposes, the NTA will undertake further service improvements after the initial rollout of Connecting Ireland has been completed, where demand is identified and / or where analysis of travel patterns shows a persistently high dependency on the private car. Over time, it is expected that the services provided under Connecting Ireland will grow and expand to address the need to transition a significant proportion car journeys to public transport in order to reduce greenhouse gas emissions.

Measure BUS13 – Connecting Ireland

It is the intention of the NTA to complete and implement the Connecting Ireland programme in the short term as a means of ensuring that the towns and villages of the GDA are well served by public transport.

Measure BUS14 – Regional and Rural Bus Services

The NTA will continue improving the public transport offer in rural parts of the GDA in order to meet existing and future travel demand and to reduce dependency on the private car for all trip purposes.

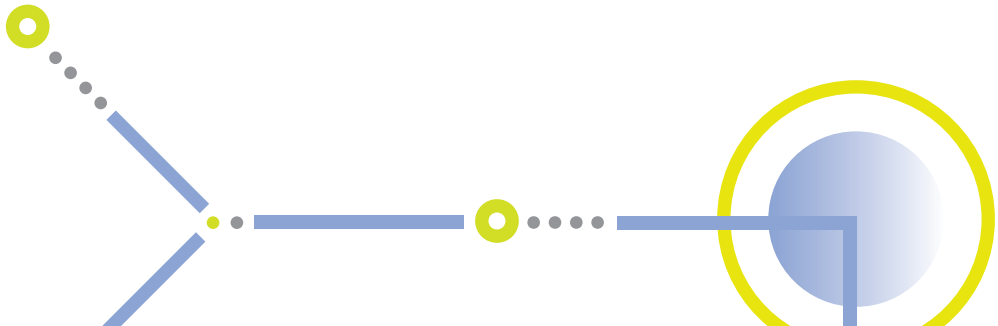
12.2.9 Local Link and Demand Responsive Services

For communities that are not in close proximity to the services operated by the main transport operators, or where more localised routes are required, Local Link can provide that public transport service. These services are managed via the NTA's Local Link Offices, and provide scheduled routes to local communities as well as demand responsive services. Evening services are being developed to further meet the needs of the local community.

This measure will allow people who are not close to the services provided by the larger transport operators to access public transport and the services within their own community.

Measure BUS15 – Local Link and Demand Responsive Transport

It is the intention of the NTA to further develop the Local Link programme as a key element of the regional transport system, in order to ensure that rural areas are adequately served.



12.3 Light Rail

12.3.1 Introduction

Since the inclusion of a light rail network in the Dublin Transport Initiative Strategy in 1994, the reintroduction of tram services into Dublin has been a major element of successive plans and investment programmes for the regional transport system. The construction and expansion of the Luas Red and Green lines, which first opened in 2004, has been regarded as a major success characterised by enhanced connectivity; increased frequencies and capacities relative to bus; and significant positive impacts on their urban environments through which they pass.

Luas lines are significantly more cost-effective to deliver than underground Metro lines or Heavy Rail lines, the cost of which are only justifiable when the level of forecast transport demand in an area exceeds that which can be provided by one or more Luas lines. Furthermore, underground Metro lines function best in serving very high levels of demand, particularly where this occurs throughout the day in both directions such as that which would exist between a city centre and an Airport, while surface tram lines work better when providing high quality public transport connectivity in medium density settings.

As such, a network of multiple high-capacity lines incorporating bus and light rail is a more viable option in serving a city of the scale and density of Dublin in that a much wider population can be served directly with a high quality system than could feasibly be served with a more limited Metro network.

Another key benefit of a this approach is that it can be delivered incrementally, both in terms of transitioning from bus to high-capacity bus and / or light rail along any corridor or, as has been the case on both the Red and Green lines in Dublin extensions have been added to the original lines as and when demand for travel justified them.

In developing this transport strategy, the NTA took all of these issues into account, and tested and appraised several options for high-capacity bus, on-street tram and Underground Metro in several locations in the GDA. In this Dublin context, analyses undertaken for this strategy determined that forecast demand for travel in advance of 2042 could only currently justify the level of investment required for an underground metro system in the Swords-Dublin Airport-City Centre corridor.

Light Rail

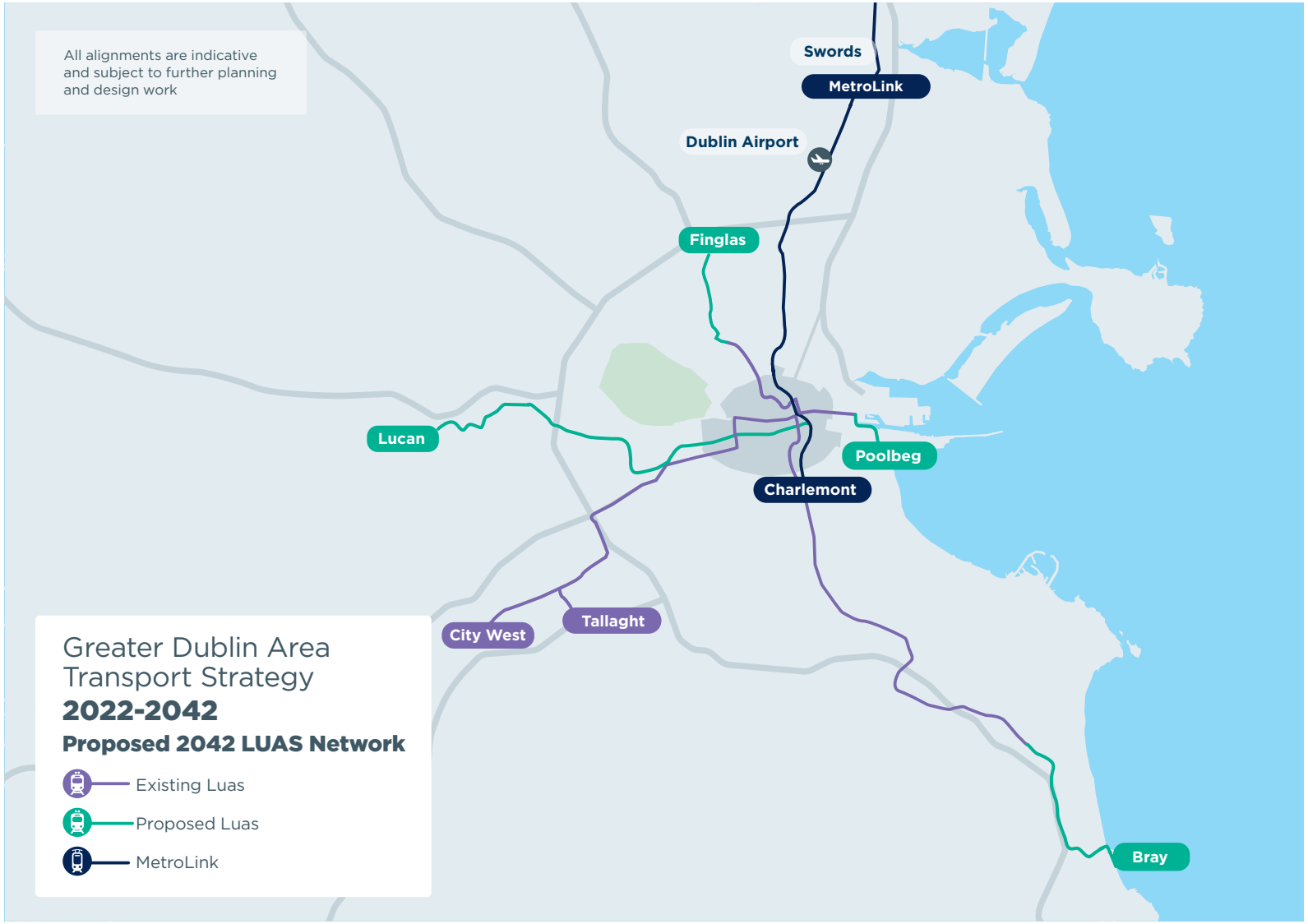

MetroLink
20,000
passengers per hour
Swords to City Centre in
25 minutes
Luas
Planning for
85km
of Additional Luas Lines
Luas
to Lucan, Bray,
Poolbeg and Finglas
Delivery of
30km
of New Luas Lines
Long Term Plan
to Serve Future
Development Areas
Better Interchange
with BusConnects and DART
290,000
additional daily
Light Rail passengers

The strategy therefore proposes that demand on this corridor will be served in part by the provision of MetroLink. Given that the MetroLink infrastructure will be in place for many decades, the strategy seeks to ensure it is future-proofed so that it can be expanded if demand exceeds the current forecast

The analysis also indicated that there are a number of corridors where demand for travel post-2042 is likely to exceed that which can be served by bus and would likely require light rail lines to be developed.

As such, the Transport Strategy maintains the proposed Luas network from the 2016 Transport Strategy, complemented by the introduction of higher capacity bus vehicles as set out in section 12.2.3. The proposed 2042 Light Rail Network is shown in Figure 12.6. Additionally, the Transport Strategy includes a transport network for implementation post-2042 where further light rail lines are likely to be required (Figure 12.7).

Figure 12.6: Proposed 2042 Light Rail Network



12.3.2 Metrolink

In the Transport Strategy, the term Metro is used to describe a fully-segregated light rail system. It has a potential capacity significantly higher than Luas and can run at much greater speeds as there is no interaction with other transport modes. In order to provide this level of service, however, substantial sections of these systems are required to operate underground and are therefore more expensive than Luas.

The proposal to serve the northern suburbs of Dublin City, Swords and Dublin Airport by a direct rail line from the City Centre has been a long-standing objective of transport planning in Dublin. This is based on the forecast travel demand along this corridor. Swords had a population of just under 40,000 in 2016 and is planned to grow significantly. Dublin Airport is Ireland's main international gateway and, post-pandemic, is forecast to grow in terms of passenger numbers and employee numbers. Between the Airport and the South City Centre terminus, there are also major population centres such as Ballymun and Glasnevin, plus the North City Centre defined by its commercial, retail and cultural attractions.

The current Metrolink project has been identified as the most advantageous way to serve the critical levels of transport demand on this corridor. The Preferred Route for MetroLink, which runs from Estuary in North Dublin to its south city terminus at Charlemont was determined following the completion of a comprehensive route options assessment study, which was also informed by the outcome from two rounds of non-statutory public consultation.

MetroLink will provide key interchange with other transport modes at several locations including Dublin Airport, Glasnevin, Tara Street and Charlemont.

The south city terminus at Charlemont offers the optimal location for interchange with the Green Line in response to growing demand in the longer term and is an appropriate location to facilitate any potential future metro extensions to serve the south west, south or south east of the city region should sufficient demand arise.

MEASURE LRT1 - Metrolink

It is intended to seek planning consent for MetroLink in 2022 and, subject to receipt of approval, to proceed with the construction of the project.

12.3.3 Luas

As set out in section 12.1.3, in analysing forecast demand for travel as part of the strategy development work, it emerged that there will be a number of corridors where the level of demand for travel will grow to higher levels than can be catered for by bus at some point beyond 2042. In such cases these corridors will have their passenger carrying capabilities increased by transitioning to higher capacity Luas systems. As such the Luas network in the Transport Strategy can be categorised in the following manner:

1. Existing lines;
2. Lines to be delivered by 2042; and
3. Lines to be delivered after 2042.

In those cases where additional capacity along a bus corridor may be required, it is anticipated that the bus priority delivered under the BusConnects Core Bus Corridors will provide the basis of the higher capacity intervention, with combined services, including combined light rail/bus services, potentially operating on the particular corridor. However, in some cases alternative alignments may be identified following assessment studies.

This section therefore sets out the proposed light rail elements of the comprehensive public transport network for Dublin in 2042, and a suite of further light rail lines that will be planned and designed over the strategy period for delivery after 2042.

12.3.4 Finglas

The Green Line extension to Broombridge (Luas Cross City) was opened to passenger service in 2017. It has long been planned that this line would eventually be extended to serve travel demand from Finglas, inclusive of a potential park and ride facility at or close to its terminal stop. In recent years, the NTA with TII have sought to identify an Emerging Preferred Route for this project and details of this were published in 2020. It is the intention to complete detailed design and planning over the coming years and to progress the scheme to construction.

Measure LRT2 – Luas Finglas

It is intended to extend the Luas Green Line northwards to Finglas, inclusive of a potential park and ride facility at or close to its terminal stop.

12.3.5 Lucan

Based on work carried out previously, and further subsequent analyses, the NTA is satisfied that sufficient demand for a light rail line from the city centre towards Lucan exists and that a project should be pursued to meet this demand.

The alignment and the locations to be served between Lucan and the City Centre have yet to be determined and will be subject to further assessment and analyses.

Measure LRT3 – Luas Lucan

It is intended to develop a light rail line from Lucan to the City Centre, supplementing and complementing the planned bus system, to serve the overall public transport needs in this area.

12.3.6 Bray and Environs

Based on work carried out previously, and further subsequent analyses, the NTA is satisfied that sufficient demand for the extension of the Luas Green Line from Bride's Glen to Bray exists and that a project should be pursued to meet this demand.

The alignment and the locations to be served between Bride's Glen and Bray have yet to be determined and will be subject to detailed design and planning work.

Measure LRT4 – Luas Bray

It is intended to extend the Luas Green Line southwards in order to serve the Bray and Environs area.

12.3.7 Poolbeg

The Poolbeg Strategic Development Zone (SDZ) and potential further growth in its environs will lead to increased demand for travel from this sector of the city. Analysis undertaken on the Transport Strategy indicates that this demand may be catered for by bus, cycling and walking up to 2042, however, depending on the scale and phasing of development, it may be necessary to consider delivering Luas to this area during the later periods of the Transport Strategy.

The alignment and locations to be served between the existing Red Line and Poolbeg have yet to be determined and will be subject to detailed design and planning work. Work undertaken to date in the regard will form a key input into this assessment.

Measure LRT5 – Luas Poolbeg

Subject to the assessment of forecast travel demand arising out of development patterns in the SDZ and its environs, it is intended to extend the Red line to Poolbeg.

12.3.8 Additional Luas Lines Post-2042

As referenced in sections 12.1.3 and 12.3.3, the analysis undertaken for the Transport Strategy indicates that a number of corridors in the GDA will, in the longer term, generate travel demand above that which can be catered for by higher capacity bus systems and are likely to require upgrading to light rail in the period after 2042.

The NTA is of the view that it is prudent to identify these corridors in this Transport Strategy in order to set out a longer-term framework for transport investment in the GDA and to ensure that planning and design work can commence during the strategy period.

The detailed alignments and locations to be served will be subject to these assessments. It is likely, however, that due to capacity constraints on the existing Luas lines, a reconfiguration of both lines will be required to meet additional demand arising from development in locations such as the Naas Road, Cherrywood, and sites to the west of the N/M11.

This network is shown in Figure 12.7.

Measure LRT6 – Post-2042 Luas Lines

The NTA will undertake detailed appraisal, planning and design work for the following Luas lines, with a view to their delivery in the period after 2042:

1. City Centre to Clongriffin;
2. City Centre to Beaumont and Balgriffin;
3. Green Line Extension to Tyrrelstown;
4. City Centre to Blanchardstown;
5. Red Line Reconfiguration to provide the following lines:
    a. Clondalkin-City Centre; and
    b. Tallaght-Kimmage-City Centre.
6. Tallaght to City Centre via Knocklyon; and
7. Green Line Reconfiguration to provide the following lines:
    a. City Centre to Bray via UCD and Sandyford; and
    b. Sandyford to City Centre

Figure 12.7: Post-2042 Light Rail Network

12.3.9 Orbital Luas

The analysis undertaken for the Transport Strategy indicated that demand for orbital public transport in the Metropolitan area during the period of the strategy can be satisfactorily accommodated by bus. These requirements may change in line with land use planning and development patterns as they may emerge over the coming years. As such, the requirement for a higher capacity system will be monitored as part of the periodic review of the Transport Strategy, with a view to identifying and protecting alignments, as required, for delivery after 2042.

Measure LRT7 – Orbital Luas

During the latter half of the period of the Transport Strategy, and subject to assessment, it is intended to identify and protect an alignment or alignments for orbital light rail to meet increased demand in Metropolitan Dublin.

12.3.10 Luas Green Line Upgrade

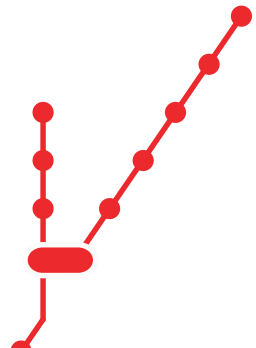
The challenges associated with the upgrading of the Luas Green Line to a metro standard of service have led to the emergence of an alternative proposal which seeks to meet travel demand from south of Sandyford along a new light rail corridor which serves UCD post-2042. As such, the upgrading of the Green Line to metro standard is not required as part of this strategy. Instead, for this strategy period, the capacity and frequency on the current Green Line from Sandyford northwards to the city centre will be incrementally increased through the provision of additional tram fleet and services and associated turnback arrangements to meet forecast passenger demand.

Measure LRT8 – Luas Green Line

During the period of this strategy, it is intended to deliver significant additional capacity on the Luas Green Line through the provision of additional fleet and necessary infrastructure to meet forecast passenger demand.

12.3.11 New Light Rail Stops

In the delivery of light rail lines, the frequency of stops is a critical concern. Generally, Luas stops are more frequent than heavy rail or Metro stops but less frequent than bus stops. On the existing Red and Green Lines, there is limited potential for new stops. However, the NTA and TII will explore options for additional tram stops where demand for travel is identified.



Measure LRT9 – New Light Rail Stops

The NTA, in conjunction with TII, will monitor the changes in demand for travel on the Green and Red lines and consider the development of additional stops where sufficient passenger usage has been identified.

12.3.12 Enhanced Priority for Trams

The Luas, as an on-street system, is subject to interactions with other transport modes. This provides a challenge in achieving competitive and consistent journey times and reliability, in particular as trams travel through the city centre. This is most evident on the Red Line from Heuston to Connolly, where it traverses a number of important bus corridors and the core O'Connell Street bus and Luas corridor, as well as passing Busáras.

This issue leads to "bunching" of trams and ultimately the inefficient use of the available capacity. Often trams which have been subject to delay become overcrowded at peak hours while the next tram which arrives very soon after, is not close to capacity. It also makes it difficult to add capacity to these sections of the line.

The NTA view it as essential that high-capacity public transport services are given sufficient priority on the street network in order to achieve effective operations. This is of increased importance as additional Luas lines are added into the transport environment as proposed in the Transport Strategy. This may require grade separation of some crossing movements, particularly in the City Centre.

Measure LRT10 – Enhance Priority for Trams

The NTA, in conjunction with TII and the local authorities, will explore how best to manage the road and street network to:

- ensure reliable and competitive journey times for Luas;
- maximise service efficiency; and
- enable capacity to expand in line with increase future demand.

12.3.13 Expanded Depots

As services expand, the need for depot space also increases. The extension of the Green Line to Finglas requires an extension to the depot facilities at Broombridge, while Metrolink will include a depot at at Dardistown, south of Dublin Airport. As service capacity increases are sought on the existing Green and Red lines, and as other lines are developed, the requirement for associated depot facilities will also be examined.

Measure LRT11 – Additional Depot Facilities

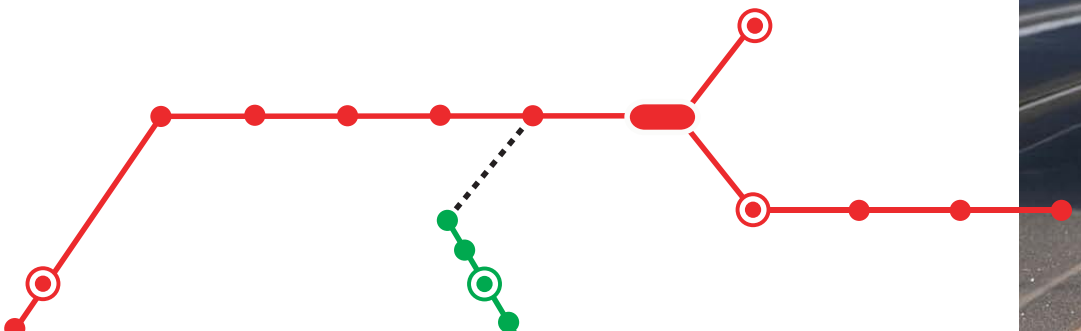
It is intended to provide additional depot facilities as required to cater for an expanded light rail network.

12.3.14 Improved Security

Anti-social behaviour can be an issue both on rail services and at tram stops. There are a number of measures that the NTA, TII and other government agencies can deliver in order to mitigate this issue.

Measure LRT12 – Improved Security on Light Rail

The NTA, in conjunction with TII and An Garda Síochána, will implement, subject to funding, enhanced security measures on the light rail network as appropriate, including CCTV, increased numbers of security personnel, plus additional night time illumination where required.



12.4 DART+ and Rail

12.4.1 Introduction

The spine of the Dublin transport system has historically been provided by the heavy rail network, in particular by the east coast suburban line since its electrification in 1984. In 2019, 35.6 million journeys were undertaken on Dublin Commuter and DART services, up from 25.9 million in 2013. According to the NTA / Dublin City Council Canal Cordon Count in 2019, 17% of all trips into Dublin City Centre in the AM Peak were undertaken by Heavy Rail. As passenger numbers recover from the pandemic, and as further development occurs along heavy rail lines, it is anticipated that this mode will play an increasingly important role in the GDA transport system. The proposed 2042 DART and Commuter Rail shown in Figure 12.8 and the combined DART, Commuter Rail and Light Rail network is shown in Figure 12.9. The potential combined DART, Commuter Rail and Light Rail network post-2042 is shown in Figure 12.10.

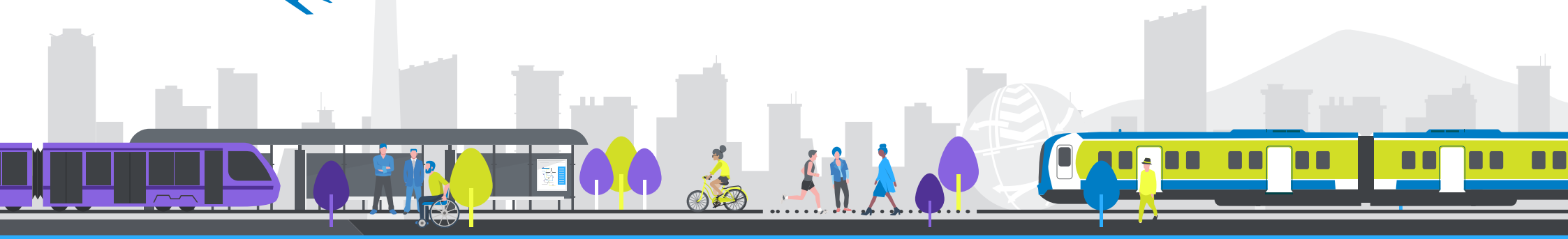
12.4.2 DART+

The current electrified DART network is 50km long, extending from Malahide and Howth in the north to Greystones in the south. The DART+ Programme seeks to increase this electrified network to 150km, in order to facilitate increased train capacity to meet current and future demands which will be achieved through a modernisation of the existing railway corridors. It will also contribute to Ireland's transition to a low carbon and climate resilient society.

Rail

DART Services
on all lines into Dublin

DART Extension
to Kilcock, Naas and Wicklow



Over
100km
of new electrified rail lines

Deliver **Rail Line to**
Navan

8 New Train Stations

Delivering High Quality Rail to serve
Major Housing Development Areas

New MetroLink / DART Interchanges
at Glasnevin and Tara Street

65,000
additional daily
Rail passengers

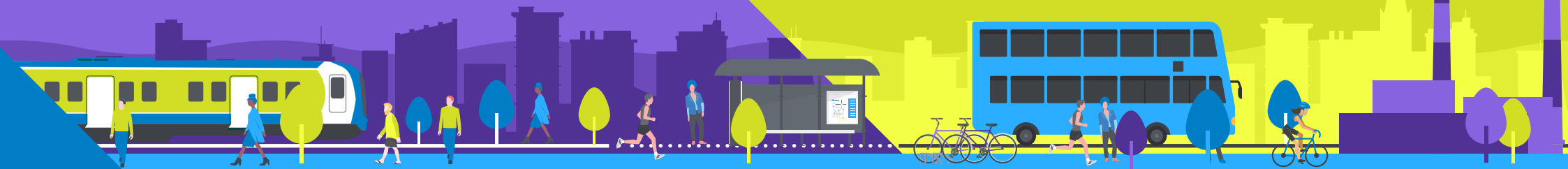


Figure 12.8: Proposed 2042 DART and Commuter Rail Network

Figure 12.9: Proposed 2042 Combined Rail Network

Figure 12.10: Post-2042 Combined Rail Network

The DART+ Programme was launched in 2019 and, in addition to fleet expansion, comprises 4 main projects based on corridors as follows:

12.4.3 DART + West

DART+ West includes the following:

- Electrification of the Maynooth line from City Centre to Maynooth (40km approx.);
- City Centre enhancements at Connolly;
- Construction of a new DART depot facility west of Maynooth Station;
- Integration with a combined metro / rail station to be developed at Glasnevin under the MetroLink project to serve both the Maynooth Line and Kildare Line;
- Elimination of level crossings;
- Relocation of Docklands Station to integrate with Luas and better serve routes entering the City Centre; and
- New grade-separated pedestrian, cycle and vehicle crossings as required.

12.4.4 DART + South West

DART+ South West includes the following:

- Electrification of Kildare Line from Dublin Heuston to Hazelhatch-Celbridge;
- Widening of the railway corridor and completing four-tracking between Park West Station and Dublin Heuston; and
- Addressing constraints within the Phoenix Park tunnel to support increased frequency of trains.

12.4.5 DART+ Coastal North

DART+ Coastal North includes the following:

- Electrification and re-signalling from Malahide to Drogheda;
- Subject to modelling and assessment, station modifications to enhance train service capacity (Howth Junction, Clongriffin, Malahide & Drogheda); and
- Re-configuration and upgrading of existing rail depots at Drogheda & Fairview.

12.4.6 DART+ Coastal South

DART+ Coastal South includes the following:

- Elimination of level crossings to reduce rail/road conflict that limits train capacity;
- Provision of new grade-separated pedestrian, cycle and vehicle crossings as required;
- Subject to modelling and assessment, station modifications at Bray and Greystones to enhance train service capacity; and

12.4.7 Fleet Procurement

The DART+ Programme will be accompanied by a significant investment in rail carriages which will be required to serve these corridors. The new fleet will either be fully electric train sets or battery electric fleet which can operate in advance of full electrification, using terminal charging arrangements.

In addition, the train sets providing the Enterprise service between Dublin and Belfast will be replaced as part of a renewal programme for this service.

Measure RAIL1 – DART+

The DART+ Programme will be implemented, providing electrified services to Drogheda in the north and Maynooth plus Celbridge in the west, in addition to an enhanced level of service to Greystones. The programme will include additional fleet, aligned with higher passenger demand, and a higher frequency of service on all lines.

12.4.8 DART+ Tunnel

"The DART+ Tunnel project is an updated version of DART Underground which received planning consent in 2010. This scheme was not brought forward at that time, primarily due to funding constraints and also due to the potential to utilise the Phoenix Park Tunnel for passenger service.

Since then, the Phoenix Park Tunnel link has been brought into operational service, providing connectivity from the Kildare line to the city centre stations of Connolly, Tara and Pearse. In addition, the NTA and Irish Rail have reviewed the tunnel project in order to further optimise its potential and ensure that its progress would deliver the maximum benefits for transport in the city-region.

The NTA are satisfied that, in the longer term, the requirement for an additional heavy rail line through Dublin City Centre will arise. As such, an alignment for the DART+ Tunnel will be preserved and protected to allow its future delivery subsequent to the strategy period. However, the timing of implementation of the DART+ Tunnel will be reassessed as part of the periodic reviews of the Transport Strategy and its implementation can be brought forward if required by emerging transport patterns.

Measure RAIL2 – DART+ Tunnel

An alignment for the DART+ Tunnel will be preserved and protected to allow its future delivery subsequent to the strategy period, but subject to periodic review to determine whether earlier implementation is required by emerging transport patterns.

12.4.9 Further Extension of DART

Forecast demand for travel, when considered in tandem with the need to reduce transport emissions, has shown that, over the

lifetime of the Transport Strategy, there will be a requirement to extend the DART+ programme to key locations in the GDA. An extension of the DART service on the Kildare Line to Naas / Sallins will provide additional capacity to this area, including to the planned regional Park & Ride site in this vicinity.

Given its location within the Dublin Metropolitan Area and the associated potential for growth, it is considered that it will be necessary in the future to extend some DART services to commence and terminate at Kilcock.

On the South-East Line, the extension of electrified services to Wicklow town would provide a significant enhancement of rail service to this county town, which will alleviate some of the road congestion pressures along this overall transport corridor.

As part of the development process for these projects, the potential for further extension of electrified services on these lines may be considered and may be brought forward for implementation. Accordingly, the proposed terminal points of the DART network may be further broadened as part of the design development process.

Measure RAIL3 – DART Extension

The NTA and Irish Rail will, over the lifetime of the Strategy, extend the DART to deliver electrified rail services to the following towns:

- Sallins / Naas;
- Kilcock; and
- Wicklow

12.4.10 Navan Rail Line

Navan is the administrative centre and largest urban centre in County Meath and has experienced rapid population growth over the last two decades, with its population increasing by 20% between 2006 and 2016 alone, contributing to a projected population for Meath of up to 250,000 by 2040.

A significant proportion of the county's population, particularly along the N3/M3 corridor, travel to and from Dublin City each day for employment and education purposes. Currently, those travel choices are largely limited to car and bus, with some interchange to rail possible at Dunboyne/Pace.

Having regard to the commuting patterns from this area and analysis work undertaken for rail provision along this corridor, it is proposed to extend the rail system from the M3 Parkway terminus station (just west of Dunboyne) to Navan town, serving Dunshaughlin and Kilmessan along its route.

Measure RAIL4 – Navan Rail Line

The existing rail network in the GDA will be extended by the provision of a new rail line from the M3 Parkway terminus station (just west of Dunboyne) to Navan town, serving Dunshaughlin and Kilmessan along its route.

12.4.11 Regional and Intercity Services

The NTA will support the delivery of improved regional and intercity services to enhance connectivity within and to the GDA. The improvement of frequency and capacity of services will help to promote public transport usage between settlements within the GDA. The NTA will continue to work with Irish Rail to make improvements to services within the region.

As part of these improvements, the NTA, in conjunction with Irish Rail, will undertake an assessment of the need for further infrastructural enhancements on the Northern Line to facilitate the combination of intercity and commuter services on this line.

Measure RAIL 5 – Regional and Intercity Services

The NTA will continue to work with Irish Rail to improve regional and intercity services which will benefit connectivity within and to the GDA.

12.4.12 New Rail Stations

As the commuter rail network is electrified under DART+, the benefits in terms of improved and more uniform train speeds and frequencies along these lines can facilitate additional stops. As such, high levels of public transport accessibility can be spread to locations which currently accrue little gains from the presence of a rail corridor. Similarly, as development patterns

evolve within Dublin and in regional towns, there may be merit in considering moving stations to capture new demand, in particular if demand at the existing location is low or access is constrained.

The provision of a new station at Woodbrook, north of Bray, is well advanced and will be delivered in the short-term. Similarly, as development commences at the Clonburris SDZ and demand for travel emerges, Kishoge station will be opened to passenger use. New stations are also planned for Heuston West, Cabra, Glasnevin and Kylemore. In addition to these, a number of stations will be provided which will serve strategic Park and Ride sites, including west of Sallins and west of Louisa Bridge.

Measure RAIL6 – New Rail Stations

The NTA, in conjunction with Irish Rail, will develop new rail stations at Cabra, Glasnevin, Heuston West, Kylemore, Woodbrook, west of Sallins, west of Louisa Bridge and west of Maynooth. Kishoge station will also open in the short term as development of the Clonburris SDZ is realised. Other stations will be considered where development patterns support such provision.

12.4.13 Upgrades to Existing Stations

The maintenance of train stations in terms of general upkeep is a factor in people's choice to use this mode of travel. This can relate to lifts (dealt with under Inclusion), escalators, passenger information signs and literature; toilets; bins and litter; as well as the overall upkeep in terms of visual attractiveness. Many stations in the GDA are in need of investment in order to make them more comfortable for passengers and more attractive. The NTA and Irish Rail will continue to invest in rail station buildings and supporting infrastructure.

In addition, a major upgrade of Tara Station will be undertaken to facilitate enhanced interchange between MetroLink and the DART network.

12.4.14 National Train Control Centre

The development of a new control centre for the national rail network was an objective of the previous transport strategy, as the existing traffic control centre was approaching the limit of its capacity with systems and equipment nearing the end of their useful lives. This project commenced construction in 2020 with the building element intended to be completed in 2022, and the control centre forecast to be fully operational in 2025.

Measure RAIL7 – Station Upgrades

The NTA, in conjunction with Irish Rail, will upgrade, refurbish and maintain train stations across the GDA to ensure that they are of an appropriate standard and provide a good quality experience for passengers.

Measure RAIL8 – National Train Control Centre

The NTA and Irish Rail plan to complete the National Train Control Centre in 2025.

12.4.15 Passenger Information

The provision of clear and concise information to transport users is a critical component of a successful transport system. Accurate and reliable information, such as train arrival / departure times and next stop announcements all form part of the required information for train users. Substantial investment will be undertaken to upgrade and better integrate the various information systems related to the heavy rail services.

12.4.16 Improved Security

Similar to the light rail network, anti-social behaviour can be an issue both on DART, Regional and Intercity rail services, and at stations. There are a number of measures that the NTA, Irish Rail and other government agencies can deliver in order to mitigate this issue.

Measure RAIL9 – Security of Rail System

The NTA, in conjunction with Irish Rail and An Garda Síochána, will implement enhanced security measures on the rail network as appropriate, including CCTV, and increased numbers of security personnel when and where appropriate.