BUS CONNECTS

TRANSFORMING CITY BUS SERVICES



"The average daily traffic at the tolling point on the M50 for example, was almost 18% higher in 2016 than two years earlier in 2014."

Baile Bhlainséir BLANCHARDSTOWN

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BusConnects Transforming City Bus Services

Ireland in 2017 has left behind the worst of the recession caused by the economic crises in 2007/2008. The economy is growing strongly; more and more people are at work; the number of visitors to the country is at record levels. But threats and challenges remain, with traffic and transport among the key problems facing the region.

Congestion is in danger of strangling the life out of our cities, and we need an ambitious public transport plan to get to grips with it.

The number of cars on the roads is increasing. It takes longer to travel to work, to college and to school than last year or the year before. The working day is getting longer as traffic delays force people to leave earlier for work and return later each day.

As a barometer for the region, the average daily traffic at the tolling point on the M50 was almost 18% higher in 2016 than two years earlier in 2014.

Increased traffic means slower speeds and longer journeys. On the M50, the average journey from Junction 3 (at the M1) to Junction 6 (at the N3) took three times longer in 2016 than in 2010.

We see this across all of the major routes in the region. Using data from car navigation units, we know that average traffic speeds on main roads during the 8am to 9am peak hour, across the region, fell by almost 5.5% between 2014 and 2015.

Traffic at the M50 Toll

Annual Average Daily Traffic (Thousands)





"Journeys by car in the morning peak hour take, on average, over 18% longer than just two years ago."

This trend accelerated during 2016 with the average traffic speed across the region in the morning peak decreasing from 39.1 km per hour in 2015 to 33.7 km per hour in 2016, a fall of 13.8%.

As traffic speeds decrease, peoples' journey times by car increase. On average, journeys by car across the region during the morning peak hour take over 18% longer than two years ago.

The situation facing the Dublin region is that:

- without decisive action, traffic congestion will continue to grow;
- it will impact the ability of the region to grow economically;
- longer journey times and increased travel stress will diminish many people's quality of life; and
- environmental emissions targets will not be met.

If we want to make Dublin a better place to live, work and visit, we need a solution.

M1 to N3 Journey Time



Fig 1: Peak Hour Congestion



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Our solution

The Transport Strategy for the Greater Dublin Region 2016-2035 ("Transport Strategy") provides a framework for transport development across the region over the next two decades. It identifies rail, metro and Luas projects that need to be implemented but, significantly, it recognises that the bus system will be the main form of public transport for most people and that the bus system needs to be fundamentally transformed to serve the needs of the region.

Dublin is a low density city - we don't have skyscrapers, and most people live in single house units. This means that very few areas of Dublin have the size and concentration of population to support rail-based public transport. For most corridors in Dublin, bus transport represents the optimum public transport solution.

We now need sweeping changes to our bus system to enable it to fully meet the needs of a modern public transport system; one which enables more people to travel to more places, conveniently and efficiently.

BusConnects is a plan to fundamentally transform Dublin's bus system, so that journeys by bus will be fast, reliable, punctual, convenient and affordable.

It will enable more people to travel by bus than ever before, and allow bus commuting to become a viable and attractive choice for employees, students, shoppers and visitors.

BusConnects aims to overhaul the current bus system in the Dublin region by:

- building a network of "next generation" bus corridors on the busiest bus routes to make bus journeys faster, predictable and reliable;
- introducing Bus Rapid Transit, a higher quality of bus system, on three of the busiest corridors;
- completely redesigning the network of bus routes to provide a more efficient network, connecting more places and carrying more passengers;
- developing a state-of-the-art ticketing system using credit and debit cards or mobile phones to link with payment accounts and making payment much more convenient;
- implementing a cashless payment system to vastly speed up passenger boarding times;
- revamping the fare system to provide a simpler fare structure, allowing seamless movement between different transport services without financial penalty;



- implementing a new bus livery providing a modern look and feel to the new bus system;
- rolling out new bus stops with better signage and information and increasing the provision of additional bus shelters; and
- transitioning starting now to a new bus fleet using lowemission vehicle technologies.

BusConnects represents a reimagining of the bus services for the Dublin region. It encompasses the revamping of all aspects of the bus system: from the ticketing technology to the road infrastructure; from the bus stops to the network of routes; and from the fare structure to the vehicle livery.

It represents a bold solution to a complex problem.

"The bus system needs to be fundamentally transformed to serve the needs of the region."

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A network of "Next generation" bus corridors

At the heart of the **BusConnects** project is the proposal to develop continuous bus lanes, as far as is practicable, along the busiest bus corridors.

The Transport Strategy sets out a network of bus corridors forming the "Core Bus Network" for the Dublin region. There are eleven radial bus corridors planned in addition to the Bus Rapid Transit routes, as well as three orbital bus corridors.

At present, these busy bus routes only have dedicated bus lanes along less than one third of their lengths. This means that for most of the journey, buses are competing for space with general traffic and so are affected by the increasing levels of congestion.

The resultant delays are a source of real frustration for people looking for consistent and predictable journey times. This makes the overall bus system less efficient, less reliable and less punctual. As a result, many people do not see any benefit in choosing bus transport.

Our objective is to develop these eleven radial bus corridors and three orbital bus corridors so that each will have continuous bus priority – in other words, a continuous bus lane in each direction. This "next generation" of bus corridors will deliver a transformation in the performance of these routes, making it easier and quicker for you to come and go by bus, whether your journey is related to your job, your studies, or your social life and family life. We want to remove the current delays and uncertainties, so that in the future, bus journeys will be faster, more punctual and more reliable. Making those changes is an essential part of delivering a vastly improved service for passengers.

Achieving this will, in some instances, require a widening of the road and changes to parking arrangements, but the end result will not just be better services for bus passengers, but will benefit all users of the corridor.

Cyclists will be provided with safe cycling facilities, largely segregated from other traffic, along these routes. Pedestrians will benefit from additional safe pedestrian crossing points and reconstructed footpaths. Car users will have reduced interactions with cyclists and buses as well a resurfaced roadway providing smoother journeys with less wear on vehicles.

We will also take the opportunity of enhancing key local centres on the corridors with additional landscaping and other works aimed at improving the local environment in these centres.

Fig 2: Proposed Radial Bus + BRT Corridors



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Fig 3: Proposed Orbital Bus Corridors





Bus Rapid Transit

Bus Rapid Transit (BRT) is a high-quality bus based transit system that delivers a service with higher speeds and quality of service than traditional bus services.

We're planning to do this by improving road infrastructure and providing specially designed vehicles, with rapid, frequent operations and faster boarding and alighting.

We are proposing that a number of the Core Radial Bus Corridors will be developed as Bus Rapid Transit routes, where the passenger numbers forecast are approaching the limits of conventional bus route capacity. BRT will represent a major step-change in the provision of bus services on some of the busier bus corridors in the Dublin region.

A typical BRT system uses multi-door vehicles, higher platforms for level boarding and stops that are spaced further apart than those that serve conventional buses. Using different vehicles than normal buses, a BRT route can cater for a higher volume of passengers than a normal bus corridor.

In designing the BRT details, we will ensure that it is fully integrated into the overall bus system, providing a coordinated overall network.

Fig 4: Proposed BRT Corridors



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"Under BusConnects we are undertaking a major redesign of the bus network."

Reimagining our network

The current system of bus routes and services in Dublin is complex. With about 130 different bus routes forming the Dublin Bus network, very few people would be able to describe the routes of more than a handful of those services and most users limit themselves to a few familiar routes.

In fact the foundations of much of the bus network dates back to tram routes that first ran in the 19th century! As a result, the bus network in Dublin is very radially focused, with most routes emanating outwards from the City Centre. Orbital bus services – routes that skirt the city – are few and far between. As a result, many bus journeys can only be made by firstly traveling into the City Centre on one radial route, and then taking another radial bus service out. Understandably, many people are not inclined to take the bus in these circumstances

Connecting between one bus route and another as part of the same journey is part and parcel of public transport in cities around the world, but for historic reasons it is not really part of the public transport culture in Dublin. We believe that a system with greater scope for interconnection between routes, and where connecting passengers don't necessarily have to travel to the city centre, is one that would be far more attractive and convenient.

We want to move towards a system that minimises the overall period of time needed for most journeys and focusses transfers onto high frequency routes, cutting down waiting and journey times.

While much has already been achieved by Dublin Bus in making the network more efficient, the bus system across the Dublin region has the potential to operate much more effectively than it currently does. This will require a fundamental reconfiguration of routes and services.

Under **BusConnects** we are undertaking a major redesign of the bus network. As part of this we will establish exactly what people want from their bus service; where they want to go and when they need to get there. In a process of extensive consultation, we will figure out the best way to apply the wide array of resources we have available to us: infrastructure, fleet, staff, road space, subvention funding, etc, in a way that not just meets the expectations of the travelling public, but actually makes shifting to the bus an attractive proposition for more and more people. The proposals that come out of this process are likely to be radical and transformational.



Fig 5: Complexity of current network (high-frequency routes only shown)



"Currently over 70% of fare payments are made by Leap card."

Fares and Ticketing Systems

Without changing the ticketing systems and the bus fares structure, the overall project would not deliver the full benefits that are possible under this transformation.

The second biggest source of bus delays, after traffic congestion, is the payment process at bus stops. Payment of fares by cash is still commonplace, slowing down the boarding time. Even when using the Leap Card, the complexity of payment stages means a high percentage of passengers have to interact with the driver, with resultant delays at bus stops. At busy bus stops these delays can be for several minutes. Multiply by the number of busy stops on a route, and those delays accumulate to add significantly to the overall journey time.

Under **BusConnects** we will simplify and streamline the process of paying for bus journeys. We want to make the fare system simpler, and we also want to make movement between different bus services seamless and easy, without financial penalty. This will require a move to either a "tag-on" and "tag-off" facility, similar to Luas and DART, or a single "flat fare" approach in order to reduce the need to interact with the driver for fare payments.

As part of this process, cashless operation will be introduced on all buses, to remove the delays caused by cash payments. Currently over 70% of fare payments are made by Leap card. As this increases over the next couple of years, the transition to a cashless regime will become easier.

BusConnects will incorporate the latest developments in account-based ticketing technology, potentially allowing use of credit / debit cards or mobile devices as a convenient means of payment. This will also allow integration with other transport payments such as parking facilities and bicycle hire.





Fig 6: Sample Bus Livery Designs

Bus Livery

Legislation requires that the National Transport Authority "shall for the purposes of promoting public transport, design, develop and secure the implementation of a single brand to be used by all public transport operators providing services in accordance with a public transport services contract with the Authority." Under **BusConnects** we are proposing a new, fresh and modern look for the bus system by introducing a redesigned bus livery, which is the painted exterior of the buses. As well as reflecting the overall ambition of transforming the bus system, this will also accommodate the potential of additional operators providing bus services as part of overall network.

We will ensure that the new bus livery is attractive and conveys the image of a modern, effective transit system. We will seek people's views on potential designs before a final bus livery is selected.



Bus Stops

Roadside facilities and roadside information are essential components of a modern bus system. Across the region, the current facilities do not reflect the standard needed to make the overall system attractive and easy to use.

Under **BusConnects** we will introduce a new style of bus stop to be rolled out across all bus stops in the Dublin region, with better route and fare information provided in each case and with timetable information specific to each stop. All operators will adopt this style and the current assortment of poles at multioperator stops will be removed.

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** plan. A large number of additional bus shelters will be provided in new locations, particularly where connecting services are being provided.

Fig 7: New style bus stops already in place in Cork City will be rolled out across the network

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"Complete transition to lowemission vehicles will begin in 2018."

Low Emission Vehicles

Tackling the challenges of climate change is a national priority. **BusConnects** will contribute significantly to that objective.

Moving people from cars onto sustainable transport is essential in reducing CO² emissions and addressing congestion. In addition, we intend to transition to a fleet of low emission vehicles, further enhancing the environmental contribution of the bus system.

The exact low emission technology remains to be determined. Research is currently on-going into electric bus solutions, with the technology evolving rapidly and several manufacturers now bringing different vehicle options to market. Compressed natural gas / biogas are relatively mature technologies which are now extensively available to bus fleets. As part of the **BusConnects** project, a decision on the optimum fleet technology will be made by the end of 2017, and either a single technology or a combination will be selected. A fleet acquisition plan will be developed to transition the bus fleet to low emission vehicle types, with the first vehicles under that strategy to go into service during 2018.

By 2023 half of the bus fleet, approximately 500 buses, will be converted to low emission vehicles. Full conversion will be completed by 2030.



Cycling facilities

The implementation of "next generation" bus corridors as part of **BusConnects** doesn't just address the bus requirements along those routes – it also allows the creation of a "next generation" network of cycling facilities.

The major bus corridors also represent the major cycling arteries for the city. The reconstruction of these roads to provide the essential bus lanes that are needed for **BusConnects** also provides the opportunity to similarly transform the cycling infrastructure.

On each of the Core Bus Network corridors, we will provide high quality cycling facilities, segregated from the bus lanes and general traffic lanes as far as is practicable. When implemented, this will mean that inexperienced cyclists, as well experienced cyclists, will be able to use these routes safely. A typical planned layout is shown above. This benefits the bus system as well. It avoids cyclists sharing bus lanes with buses, where the bus speed can be limited to the speed of the slowest cyclist in the lane, and removes many of the conflicts that bus drivers have to deal with.

Accordingly, the implementation of **BusConnects** will also see the delivery of a network of key cycle routes, which form the foundation of the overall cycle network that has been planned for the Greater Dublin Area.



Park and Ride Facilities

Maximising the potential of the **BusConnects** project means enabling more people to use the bus services instead of private cars.

For those travelling longer distances, the optimum strategy is a park and ride arrangement, where they can make part of the journey by car, then leave the car in a dedicated car park and complete the journey by bus.

Bus-based Park and Ride needs careful siting of the car parks, coupled with a high frequency of bus service, to operate successfully. Ideally, the location of the parking facilities should be just outside the area of congestion and conveniently located for car users on the particular corridor. As part of **BusConnects**, a network of park and ride facilities will be developed at key locations along the radial road network. Indicative locations are shown in Figure 8 - these will be subject to more detailed assessment as part of the project's delivery and may change. Additional locations may be added.

At each location, we are planning a high frequency bus service, primarily availing of the redesigned bus network. Where supplementary services are needed to ensure a comprehensive operation, these will be provided.

Parking charges and bus fares will be integrated, ensuring a seamless connection between the parking facility and the bus system.



Fig 8: Indicative Locations of Park and Ride Facilities

Overall Benefits

BusConnects is a plan to transform Dublin's bus system so that journeys by bus will be fast, reliable, punctual, convenient and affordable. It will enable more people to travel by bus than ever before, and allow bus commuting to become a viable and attractive choice for employees, students, shoppers and visitors.

For passengers **BusConnects** will deliver:

- reliable and punctual bus services;
- faster journey times for passengers;
- comfortable, modern vehicles;
- high frequency service on busy routes;
- an easy to understand network;
- universal passenger information at roadside, on apps and on vehicles;
- simpler fare structures and easier payment; and
- seamless integration with other transport types.

For businesses BusConnects will:

- by improving transport, make Dublin a more attractive location for employers;
- increase potential employment catchment areas by providing new transport links;
- reduce commuting time for employees; and
- reduce car congestion and enhance the attractiveness of urban centres for shopping and social purposes.



For cyclists BusConnects will:

- deliver a step-change in cycling facilities on the key radial routes into the city centre;
- provide safe cycling facilities, largely segregated from other traffic, along these corridors; and
- provide the opportunity for more people to cycle to work, school, college or for recreational purposes.

For visitors BusConnects will:

- ensure a simpler and more understandable bus transport system;
- enable easy use of the bus system, without the need to purchase advance tickets or payment cards;
- make more places accessible for visitors and tourists; and
- reduce the impacts of traffic congestion in urban centres.

For the environment **BusConnects** will:

- enable more people to use sustainable transport;
- transition the bus fleet to low emission vehicles;
- assist Ireland to meet its climate change targets; and
- provide a greener transport system for everyone.

Costs and Delivery

Transforming the bus system requires investment. Delivering all of the elements of **BusConnects**, inclusive of bus lanes, BRT and ticketing systems, will cost over €1 billion. The exact cost will be finalised when the designs of the various components of the project have been progressed.

Delivering **BusConnects** will take a number of years, with the exact time period dependent on the level of funding each year.

But implementation can start quickly. The bus network redesign is already underway and the rollout of the revised network can commence in 2018. Early stage engineering designs have been advanced on some of the Core Bus Network corridors and on the BRT routes. Following receipt of planning consent, construction of each of these corridors could be completed over two to two and a half years, with several of the corridors able to be constructed concurrently.

Other elements of the overall **BusConnects** project can also be quickly progressed subject to the availability of the necessary funding. With sufficient investment and subject to the appropriate planning approvals, the benefits of the **BusConnects** project can start coming on-stream from 2019. *"Journeys by bus will be fast, reliable, punctual, convenient and affordable."*



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