Improved Bus Service is Essential for the Continued Prosperity of Dublin

Dublin can only grow and prosper if the role of public transport dramatically expands. Any other option will strangle the city with traffic congestion, because in a dense city, there is simply not enough room for everyone’s car. The National Transport Authority is making numerous improvements to public transport. The bus element of this effort, called BusConnects, includes three parallel strands of activity:

- **Infrastructure and bus priority measures**, such as new bus lanes, to expedite the flow of buses through Dublin.
- **Improvements to fares and ticketing**, including making it possible to interchange without paying an additional fare.
- **A redesign of the bus network** – the pattern of routes and schedules that buses follow.

This report is about the recommended bus network redesign. It represents the culmination of a year-and-a-half long effort of study, analysis, consultation, and iterative thinking to develop a new network design for Dublin’s buses.

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1 Cycling also plays an important complementary role to public transport. While there is a large overlap in the role of the two modes, they are useful in different situations. Cycling is more competitive for shorter trips, and public transport for longer ones. That’s why the Transport Strategy of the Greater Dublin Region includes a cycling element as well public transport elements such as BusConnects, of which this study is a part.
Why Rethink the Bus Network?

Changing a bus network is always controversial. Existing customers are used to the bus routes as they are, and some may be unhappy with any change to their routine. However, NTA has also received many comments asking for a more useful network, and in fact, the network has obvious problems that only a redesign can repair:

- **The network is very complex**, which makes it hard to remember and thus to use spontaneously. You can remember a bus route you take every day, but if you want to feel free to move about the city, you need to be able to remember the structure of a network, just as most people remember the structure of the street network.

- **The network is good for many radial trips** – taking people into Dublin’s core – but not for orbital trips. For example, a trip from Blanchardstown to Lucan, or from DCU to the Malahide Road, usually requires going into the city centre and back out, which takes far too long and puts more buses into crowded city streets than need to be there.

- **Many routes overlap for long distances**. While lots of buses go down some streets, they are not evenly spaced to create the most frequent possible service.

- **Rail and tram network improvements require changes to the bus services**. Buses, trams and trains are not competitors. They are meant to work together to create the most useful possible network. Rail and tram upgrades (such as the recent Luas Green Line extension and the planned frequency improvement on DART) therefore change the role that buses should play in the affected areas.

- **The city is growing and changing**, in ways that the bus network must adapt to serve. New communities and job centres are appearing on the fringes, while the City Centre continues to grow denser, especially in and near the Docklands.

All of these factors tell us that while any change in bus routes will raise objections, it is time to consider a substantial redesign.

Figure 3: The three main types of public transport line are called radials, orbitals and feeders.

Figure 4: The city centre network is so complex that it is impossible to draw a clear map of it. A more useful network would have fewer overlapping routes, but those routes would run much more frequently, so that they are coming whenever you need them.
How the Plan Was Developed

Figure 5 shows how the plan was developed.

The Choices Report, released in June 2017, shared the consultant team’s analysis of the existing situation and described several high-level strategies that could guide a network redesign.

The public was asked to comment on these strategies, to guide us on whether, and how strongly, to pursue them. Based on the very positive response to the strategies, NTA choose to proceed.

In July 2017, the consultant team facilitated a two-week intensive retreat with NTA, Dublin Bus, and local government officials. The proposed network was designed collaboratively, to about 80% completion in these workshops.

The plan then went through further cycles of iteration, including an additional workshop focused on the peak-only services, leading to the final recommendation presented in this report.

During the workshops we repeatedly checked how the new network would improve where people could get to quickly, and used that feedback to continuously improve the design.

To Increase Patronage, Make Service Useful and Liberating

The goal of the proposed network is to make public transport useful to more people to reach more destinations all over Dublin.

Dubliners have already shown that they use public transport when it is useful. But there are many purposes for which the service is not useful, and this is what the plan aims to change.

Later in this summary, we quantify this expansion of usefulness. For example, under the proposed network, the average Dubliner can access 18% more jobs and schools within 30 minutes\(^1\), compared to the existing system.

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\(^1\) Technically, the measure here is the change in the number of jobs, and the number of enrolled students at post-secondary colleges and universities, within 30 minutes by walking and public transport.
Changing Buses Can Get You There Faster

The plan is based on a geometric principle that sounds wrong when people first hear it. A network that assumes you are willing to change buses can often get you to your destination sooner.

In the proposed network, some trips that are now direct will require changing buses; but because the frequency is so much higher, waiting time is reduced so much that the total trip is faster.

While a tolerance of interchange is thus an essential feature, there is still an inconvenience. Thus, the proposed network seeks to minimize the number of cases where multiple interchanges are required to complete a trip. Under the plan:

- Within the M50, almost all of Dublin still has direct service to the city centre.
- All of Dublin is no more than one interchange away from the City Centre.
- With few exceptions, trips between any two points in Dublin can be completed with no more than two interchanges, and often with zero or one.
- Three interchanges is the maximum needed to travel between any two points, but in practice that situation affects a very small number of trips.

Key Strategies

The table on this page shows four key strategies identified to address the major issues with the current network. These strategies are described in detail on the following pages.

<table>
<thead>
<tr>
<th>Problem Addressed</th>
<th>Poor orbital service</th>
<th>Complexity</th>
<th>Low frequency</th>
<th>Buses in City Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Standardize Service Categories</strong></td>
<td>Yes. Categories make planning efficient services easier.</td>
<td>Yes. Frequency and span are apparent from the category, without looking at timetables.</td>
<td>Yes. Service categories make frequencies predictable and consistent.</td>
<td>Yes. Categories make planning efficient services easier, reducing excess bus trips.</td>
</tr>
<tr>
<td><strong>2 Simplify Radial Service</strong></td>
<td>Yes. Releases resources for orbital use.</td>
<td>Yes. Vast reduction of complexity, especially in City Centre.</td>
<td>Yes. Much higher frequency for travel to, from and through the City Centre.</td>
<td>Yes. Consolidating service to the centre on fewer routes means frequency can be optimized, reducing surplus trips.</td>
</tr>
<tr>
<td><strong>3 Build Frequent Orbitals</strong></td>
<td>Yes.</td>
<td>Yes. The intersection of frequent orbitals and radials produce a pattern that is easy to grasp.</td>
<td>Yes. Increased orbital frequency.</td>
<td>Yes. Fewer passenger trips are forced through City Centre, reducing loads.</td>
</tr>
<tr>
<td><strong>4 Grow Suburban Feeder Networks</strong></td>
<td>Yes. Improves market for both orbital and radial services to regional centres.</td>
<td>Yes. Fewer overlapping routes in suburban markets.</td>
<td>Yes. Improved local frequency for travel within suburban area.</td>
<td>Yes. Feeder networks support consolidating service to City Centre on fewer routes.</td>
</tr>
</tbody>
</table>
**Strategy 1: Clearer Service Categories**

Strategy 1 is to develop a clearer set of service categories to which all services would be assigned.

Service categories mark clear distinctions in usefulness. For example, they clearly distinguish frequent services from infrequent ones, and peak-only services from all-day services. These categories improve the clarity of the network, and can form the basis for clearer mapping and public information.

A key idea is that the network of higher frequency services (every 15 minutes or better) should be easy to identify, because these services are so useful for a diversity of purposes.

**Strategy 2: Simplify Radial Services Using Spines**

Figures 6 and 7 show a schematic of the existing and proposed radial networks.

In the existing system, most radial corridors are served by a pile of overlapping lines, each of which goes to a different corridor on the opposite side of the city. This provides direct service between many places, but each of the individual routes is not very frequent, so wait times are long.

The proposed strategy would put just a single line, called a spine, on each radial corridor, but would run this service very frequently. Service would come every 4 to 8 minutes all day, so that the next bus is coming whenever you need it. This also means you could change from any spine to any other with little delay, so that trips across the city would still be easy. Again, total travel times are faster because the waiting time saved by the high frequency is greater than the time spent on the interchange.

Figure 6: Montréal, Canada presents a simple map of just its high frequency services, so that people can see where they can go without waiting long.

Figure 7: Existing Network. Multiple lines from each corridor cross the City Centre in different directions.

Figure 8: Proposed Network. Each corridor has a single frequent line crossing the City Centre on a single path.
Strategy 3: Build Frequent Orbitals

The lack of good orbital service is a major gap in the current network. To build this orbital service while avoiding service duplication, it is necessary to remove some radial routes that are inefficient and circuitous. Figure 8 shows the trade-off.

Strategy 4: Replace Infrequent Radials with Frequent Locals

On the outermost edges of Dublin, long and infrequent routes from the city centre can be replaced by more frequent local routes feeding into a spine.

As in the other strategies, the result is a faster travel time due to reduced waiting, even though an interchange is required. Local routes are also very short, which makes them much more reliable.

Figure 9: A faster and more useful network arises from replacing minor radial lines with frequent orbitals, at the same cost.

Red = Every 10 minutes or better.
Purple = Every 20 minutes or worse.

**Existing Network Structure**

**Proposed Network**
The NTA carried out an initial public consultation on the general principles of the bus network redesign in June 2017. An online and paper survey seeking public input on Strategies 2 and 3, and more generally on the willingness to interchange, was answered by almost 1% of the population of Dublin, a very high rate by the standards of public transport surveys.

The overwhelming majority of over 11,000 respondents strongly favoured the strategies presented. 89% agreed with pursuing the spine strategy, and 85% were positive about the orbital strategy. 81% agreed that it is reasonable to ask people to change buses if it gets them to their destination sooner.

Following on this positive feedback, NTA decided to proceed with the development of this plan, based on the strategies outlined above.
The Proposed Network

The two following pages show a big-picture look at the existing and proposed network. These provide a general illustration of the network, but are not meant to be legible in detail. The complete network report features detailed maps of every part of Dublin.

Subsequent pages illustrate two of the network’s most important “big ideas”: the creation of very frequent spines, and the significant expansion of the network of frequent routes.

To read most maps in this report, note that red is used to indicate high frequency service, every 15 minutes or better all day. Thick red is used for very high frequency, every 8 minutes or better, and dark red is used for extremely high frequency, every 5 minutes or better. Other colours indicate lower frequencies, as shown below.

Figure 10: Legend of colours used on the Network Map.

![Legend of colours used on the Network Map](image)

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The Big Ideas

The proposed network builds on the four strategies described above through the following actions:

- **Spines A-G would extend across the city, providing very high frequency** running through from a corridor on one side of the city to one on the other side.

- **A complete set of orbital lines would be added so that far more trips can be made without going into the centre.** These orbitals serve many trips that are almost impossible today in any reasonable amount of time, such as from Blanchardstown to Lucan.

- **The all-day frequent network (red lines) would be much expanded.** The number of people and jobs on the frequent network rises by about 1/3, from about 750,000 today to almost 1 million under the plan.

- **The frequent network would become a web-shaped grid, with many interchange opportunities to reach more destinations.** Everywhere that two red lines cross, a fast interchange is possible. Today’s network provides few of these high-frequency interchanges outside of the centre. The proposed network introduces many of them, all over the city.

- **More routes would converge on major suburban centres** – such as Tallaght, Dun Laoghaire, Liffey Valley and Blanchardstown – increasing local access and interchange opportunities at each centre. NTA would work with local governments to ensure these capacity expansions for these facilities.

- **Travel within the city centre (between the canals) would become easier.** The proposed network provides the extreme frequency that these short trips require, and offers many new direct links within this area. A very frequent inner orbital (Line 0) also makes it easier to travel to and from major destinations on the edges of the centre.

- **Additional service would be provided at peak hours to limit overcrowding.** The proposed network features additional peak-hour frequencies on most routes, and also includes several peak-only routes to meet extremely high demand at specific hours to locations such as the City Centre or University College Dublin.

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Key Assumptions

At the direction of NTA, the plan is built on the following assumptions:

- **Fare penalties for interchanging are removed.** A passenger’s fare would not depend on whether an interchange is required. No second fare would be required upon boarding a second vehicle. A parallel BusConnects planning effort is working to achieve this.

- **Rail frequencies are increased in 2019**, including 10-minute frequency all day on DART between Howth Junction and Bray, per current NTA plans.

- **Reliability continues to improve**, through added bus lanes and other tools that reduce disruption and delay, that will be developed under the parallel BusConnects project on speed and reliability.

- **Adequate shelters and information are found at every interchange stop**, and any walk required for the interchange is safe, efficient, and short.

As part of implementation, NTA would work with the local governments to improve stop locations and pedestrian facilities, as needed, to ensure easy connections between major lines.

- **Key interchange facilities can be developed and expanded as needed.** The plan requires only one entirely new interchange, located at Liffey Valley Shopping Centre on the north perimeter roadway, adjacent to the pedestrian bridge to the bus stops on the N4 national road. Several other interchanges (e.g. in Tallaght and at Blanchardstown) would need modest expansion.

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1 Furthermore, due to the extreme complexity of the existing network, we have omitted peak-only services, and a small number of routes that operate very infrequently, less than every 60 minutes in the middle of the day. These are existing routes 40b, 41b, 47, 56a, 65, 161, 220 and 239.
Figure 11: Map of the existing public transport network showing weekday midday frequencies.

A larger version of this map is available to download on www.busconnects.ie
Proposed Network: Big Picture

Figure 12: Map of the proposed public transport network showing weekday midday frequencies.

Additional Routes will be provided during peak hours. See map on www.busconnects.ie

A larger version of this map is available to download on www.busconnects.ie
Existing Network: Big Picture

**North Area:**
(Swords/Malahide)

**West Area:**
(Maynooth/Celbridge)

**South Area:**
( Bray)

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Proposed Network: Big Picture

**North Area:**
(Swords/Malahide)

**West Area:**
(Maynooth/Celbridge)

**South Area:**
( Bray)

Larger versions of these maps are available to download on www.busconnects.ie
Big Idea: Super-Frequent Spines

Simple Routes Across the Core
In the proposed network, most of the existing bus routes that flow into the centre of Dublin would be reorganized into seven simple spines.

Spines are very frequent lines. **With a bus coming every 4 to 8 minutes all day, and even more frequently at peak hours, there is always a bus coming soon.**

This high frequency makes it very fast to connect from one spine to another, as well as to other frequent lines like DART, Luas, and the frequent orbitals.

Spines are designated by the letters A to G, which separate into branches further out from the city. Each bus would be designated by a letter followed by a digit (e.g. “A1”) where the letter indicates the spine and the digit indicates the specific branch the bus follows.

A customer would be able to navigate much of inner Dublin by treating the letter as identifying a line, and ignoring the number. Signs and information in this area should use a term like “all A buses,” to reinforce this simplicity.

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**Figure 13:** Spines in the proposed network, with service every 4 to 8 minutes all day. Spines would divide into branches in suburban areas (e.g. A1, A2, A3…), with no interchange required. Most branches would operate every 15 minutes or better, with higher frequencies at peak times.

**Figure 14:** Possible design for a bus stop sign for the A spine southbound. This shows that all A buses go to Terenure, and which specific buses (A1, A2, A3, or A4) to board if one is travelling beyond Terenure.
Big Idea: Expanding the Frequent Network

The images on this page show the existing and proposed high-frequency networks — the network where the bus comes every 15 minutes or better all day. Darker red means still higher frequency.

When service comes very frequently, you no longer plan your life around a timetable. Without high frequency, the market for public transport is limited to the small number of people who have the spare time and patience to bear long waits, or understanding the timetable.

Where frequent lines cross, fast connections are available. The new web-shaped grid makes it easier to travel between places outside the city centre. This is partly due to the new frequent orbitals, but also because these orbitals intersect other lines and allow travel in many different directions.

Fast connections mean that any frequent line is useful to reach places on any other frequent line it meets. These frequent connections are the essence of how the plan expands where people can go in a reasonable amount of time.

Access to frequent service would expand dramatically under the plan:

- Nearly 1 million Dublin-area residents would have service coming every 15 minutes or better within 400m, compared to about 750,000 today.
- Over 650,000 residents would have service coming every 10 minutes or better within 400m, compared to about 480,000 today.
- 90% of jobs and student enrollments near any public bus, rail or tram service in Dublin would have service every 10 minutes or better all day.

Excluding areas served only by Bus Éireann.

Figure 15: These maps compare existing frequent service to proposed frequent service.
The Result: More Useful and Liberating Service

If you can’t go places, you can’t do many things. Your freedom to pursue life’s opportunities depends on your transport options.

If the goal is for public transport to carry more people, thus limiting congestion and enhancing sustainability and prosperity, the best way to do that is to make public transport more useful, and thus more liberating.

The image across shows an example of what this means, from the point of view of someone at the south end of Finglas. In this image, purple is the area that someone can reach today in 45 minutes or less, and could still reach under the plan. Red is the area they could no longer reach in that time. Blue is the area that they can’t reach now but could reach in the new network. There is clearly far more blue than red, which is true across almost all of the city.

In the upper left of the image, we quantify this impact. For someone living at this location, 40% more jobs can be reached in 45 minutes. For a business at this location, 57% more residents (customers or employees) can reach them in 45 minutes.

The plan would dramatically increase the range of places Dubliners can reach in a short amount of time. On average:

- Dubliners within the canals could reach 20% more jobs and 18% more residents in 30 minutes or less by walking and public transport.
- Those in the inner suburbs (between the canals and the M50) could access 24% more jobs and 26% more residents in 30 minutes or less.
- Those beyond the M50 could reach 26% more jobs and 31% more residents in 45 minutes or less.

Figure 16: 45-minute isochrone from Finglas Village.
How Far Can You Go?

In the course of developing the proposed network, the NTA and consultant team tracked how many jobs and student enrolments could be reached within 20, 30, 45 and 60 minutes of any area.

Other activities, such as shopping and social opportunities, are harder to measure, but an improvement in access to jobs is a signal that access to those activities will improve as well.

The map across shows how the number of jobs that can be reached in 45 minutes changes from any part of Dublin. Green means that the number increases, and darker green means a bigger increase. Brown indicates a decrease in the number of jobs that can be reached.

Note that:

- **The impact is overwhelmingly positive.** The few zones where the number of jobs that can be reached goes down are mostly sparsely populated – or special cases such as Chapelizod Village where the existing system provides far more service than the village by itself can support.

- **The positive impact happens all over Dublin, and is generally higher in suburban areas.** This is largely due to the expansion in orbital services, and higher frequencies for local suburban services.

Next Steps

This report launches a public consultation occurring during the summer of 2018. All Dubliners are encouraged to review the proposed network and submit their comments.

- Further information on the plan, including the complete report and detailed maps, can be found at [www.busconnects.ie](http://www.busconnects.ie)

- Let us know what you think! We invite submissions through an online survey at: [www.busconnects.ie](http://www.busconnects.ie)

Submissions and public comment will guide final decisions about the plan, which could then be implemented as early as late 2019. Remember, this plan is not inevitable.

The NTA has proposed this following overwhelmingly positive feedback on the general principles, but needs to hear from you to proceed further.

**If you agree this would be an improvement for Dublin, it’s important to speak up. And if you don’t like the plan, please let the NTA know how it can be improved.**