

Dublin Area Bus Network Redesign Revised Proposal

OCTOBER 2019

**BUS
CONNECTS**
TRANSFORMING CITY BUS SERVICES

NTA
Údarás Náisiúnta Iompair
National Transport Authority

National Transport Authority



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Revised Network Proposal Executive Summary

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.¹ 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 (NTA) is making numerous improvements to public transport. The bus element of this effort, called BusConnects, includes several parallel strands of activity:

- Infrastructure and bus priority measures, such as the Core Bus Corridors project, to expedite the flow of buses and improve pedestrian and cycling conditions through Dublin.
- Improvements to fares and ticketing, including making it possible to interchange without paying an additional fare.
- Changes to the buses themselves, including moving the fleet toward cleaner technology and establishing an updated single livery under the Transport for Ireland brand.
- 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 three-year long effort of study, analysis, consultation, and iterative thinking to develop a new network design for Dublin's buses.

- In June 2017, the NTA released the Choices Report, an examination of the existing bus network, the levels of demand and need for public transport services throughout the Dublin area, and possible paths forward to improve service.
- The Choices Report release was followed by a public survey which gathered the priorities of over 11,000 respondents.
- In July 2018, the Public Consultation Report detailed the initial network proposal. The key inputs to this proposal were the priorities established in the survey, and the technical expertise of the NTA, Dublin Bus, and the consultant team.
- An public consultation followed from July to September 2018. This consultation yielded over 30,000 comments and submissions. **This report covers the revised network proposal, taking into account the results of the 2018 consultation.**

Figure 1: Public transport and cycling require far less space to move the same number of people than cars, as shown in the photo below.

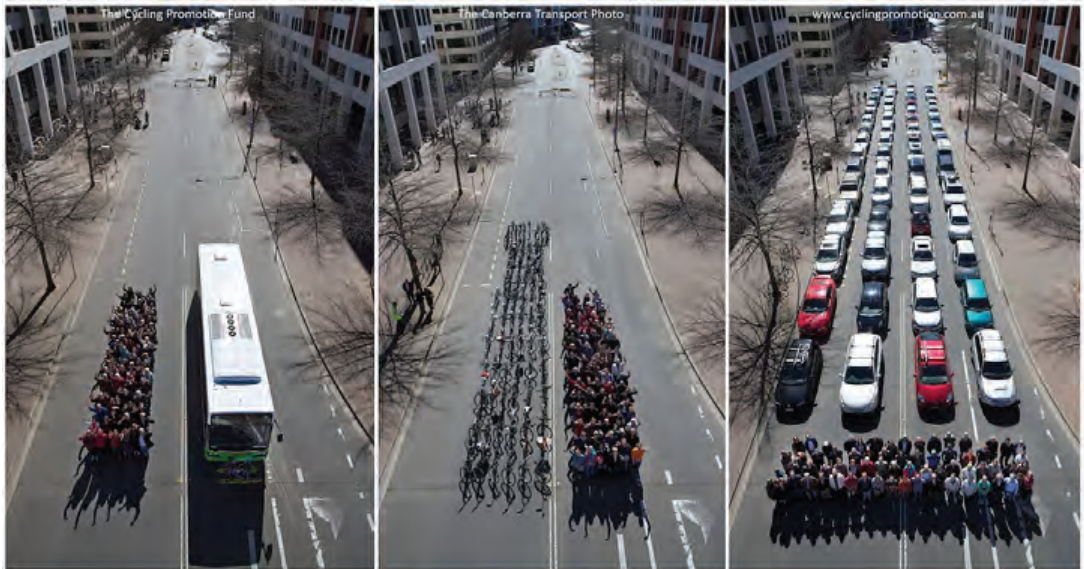
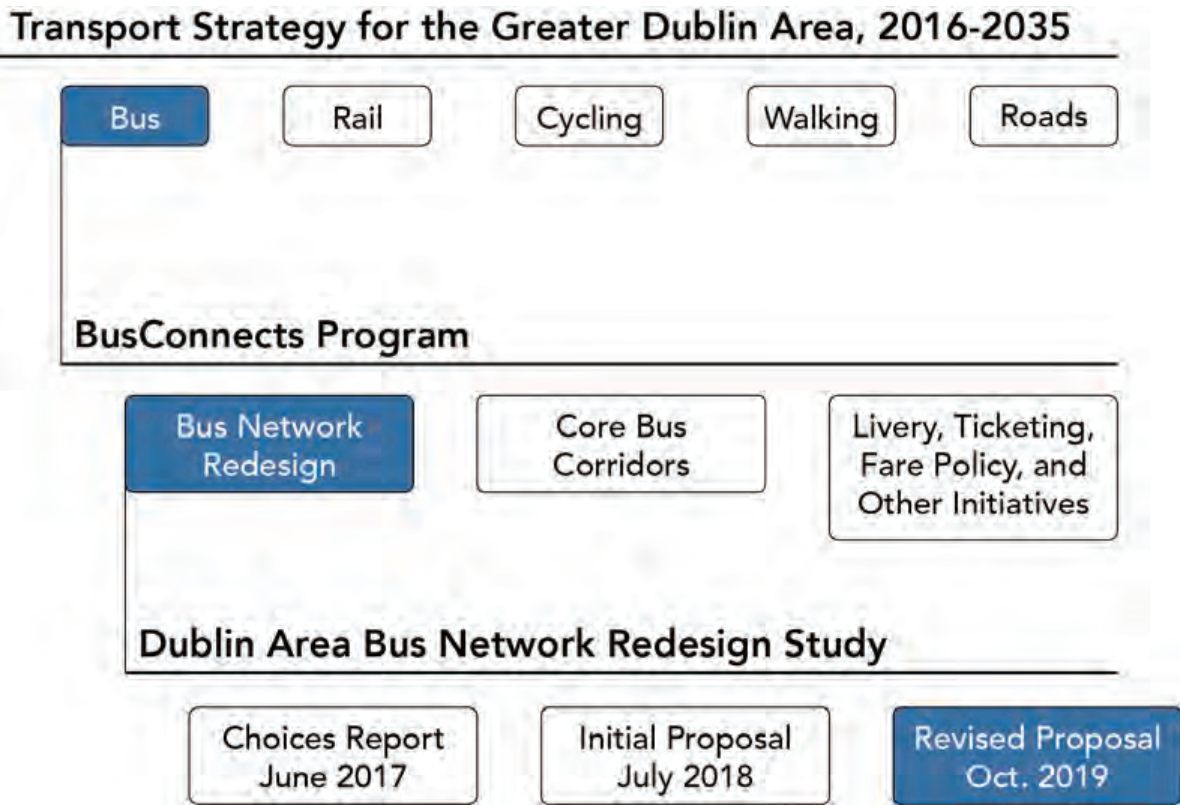


Photo Credit: (c) We Ride Australia

Figure 2: The bus network redesign is part of the BusConnects program, which is itself part of NTA's broader efforts at improving transport under the Transport Strategy of the Greater Dublin Region, as shown in the chart below.



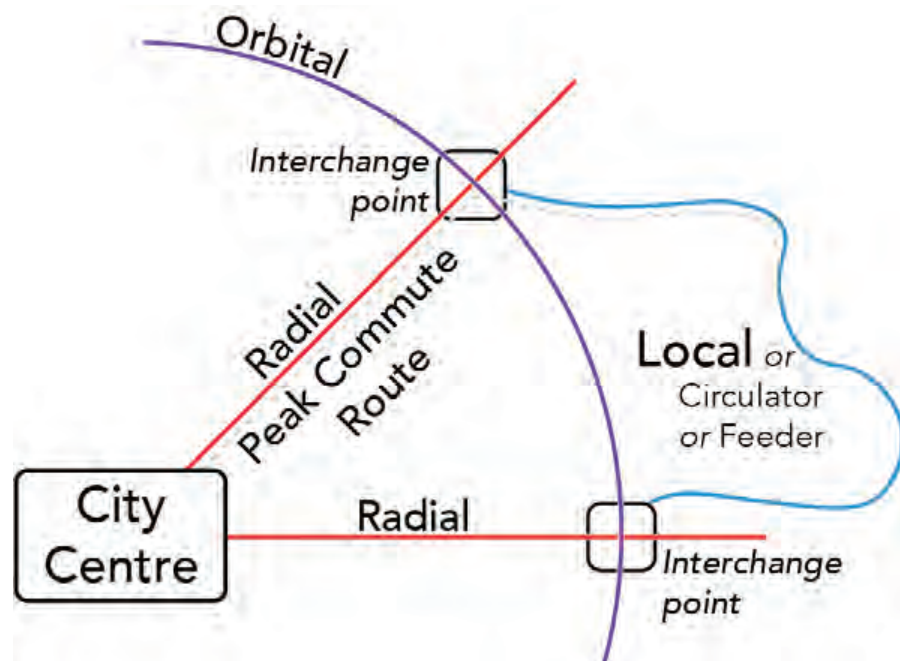
¹ Cycling also plays an important complementary role to public transport. While there is a large overlap in the role of the two modes, they are useful in different situations. Cycling is more competitive for shorter trips, and public transport for longer ones. That's why the Transport Strategy of the 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 means changing people's lives and habits. As such, this process is inevitably controversial. The NTA has received many submissions asking for a more useful network, and many others expressing dismay at proposed changes. Nonetheless, 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 use spontaneously. You can remember a bus route you take every day, but 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.

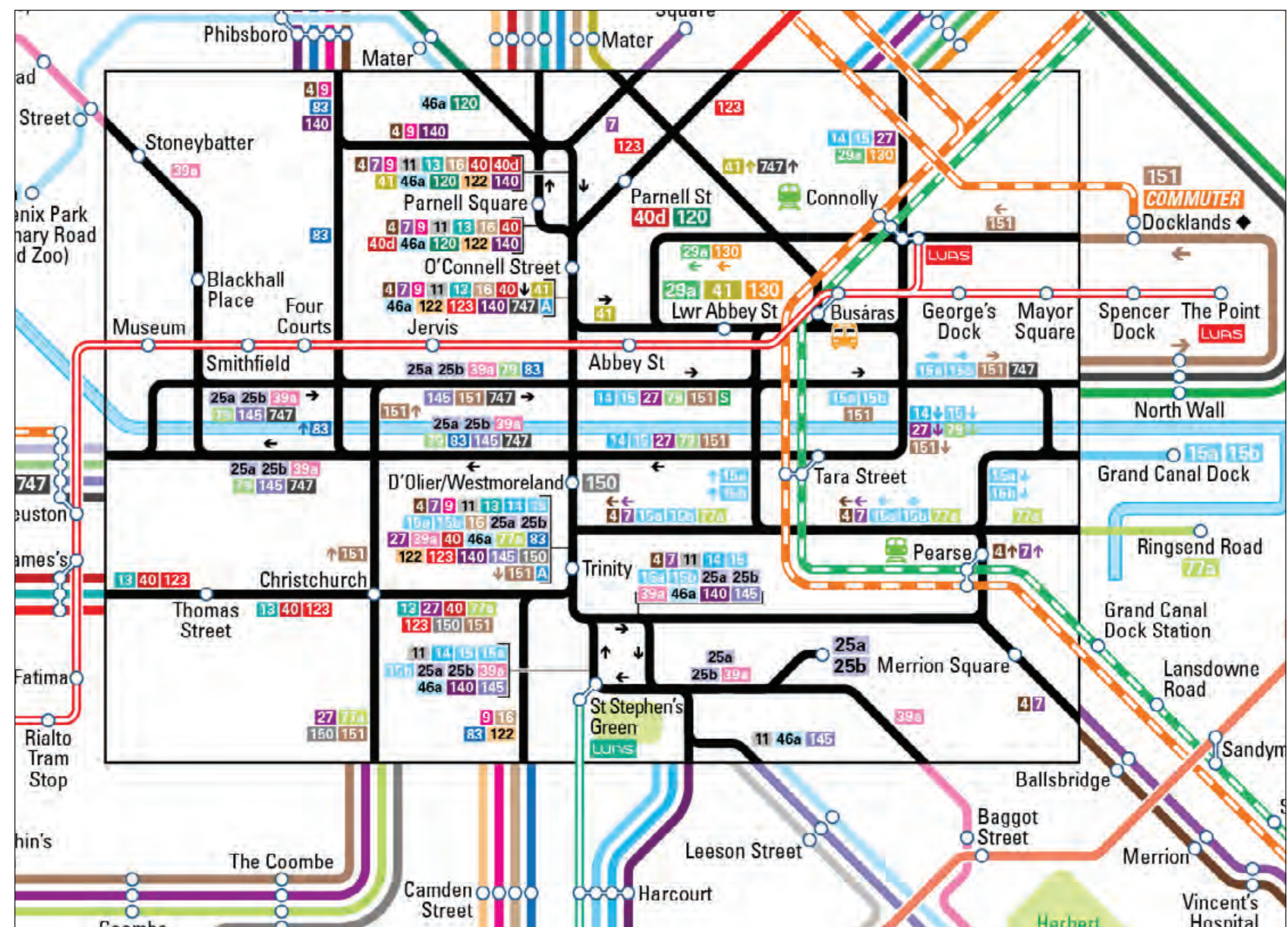
Figure 3: The three main types of public transport route are radials, orbitals, and local feeders, as shown below. Radials connect neighbourhoods and suburbs to the City Centre. Orbitals connect neighbourhoods and suburbs to each other, avoiding the City Centre. Local feeders connect outer suburban areas to suburban centres.



- **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. Recent rail and tram upgrades (such as the Luas Green Line extension and the 10-minute DART) 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 fringe, 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 4: The city centre bus network is so complex that it is impossible to draw a clear map of it. The diagram below shows one of the best attempts to date. A more useful and legible network would have fewer overlapping routes, but those routes would run much more frequently, so that they are coming whenever you need them.



What's Included

This plan deals only with the public bus services contracted by the NTA that operate primarily within the Dublin Metropolitan Area¹.

As of September 2019, approximately 90% of these services are operated by Dublin Bus, and 10% (mostly orbital and suburban local routes) are operated by Go-Ahead Ireland, following their successful bid in a tender competition.

Services that operate for profit – including airport express services, the Swords Express (and a range of others) are not covered by the plan. Intercity and longer-distance commuter services provided by Bus Éireann and other operators are also not included.

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.

Dublin-area residents 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 would be able to access 27% more jobs and educational opportunities within 30 minutes², compared to the existing system.**

¹ Consisting of Dublin City, the adjacent built-up areas of South Dublin, Dun Laoghaire-Rathdown and Fingal, and nearby towns in Meath (Dunboyne), Kildare (Celbridge, Maynooth, Leixlip) and Wicklow (Bray, Greystones), and all other areas currently served by Dublin Bus or Go-Ahead Ireland.

² 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 door-to-door, by walking and public transport. The 30 minutes includes all walking, waiting, riding and interchange time.

Process

Figure 5 shows how this plan was developed. Many of these steps correspond to chapters in this report.

Chapters 1 to 5 are from the original Choices Report, which was released early in June 2017. The Choices Report 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 in June 2017, to guide us on whether, and how strongly, to pursue them. The initial public response is described in Chapter 6.

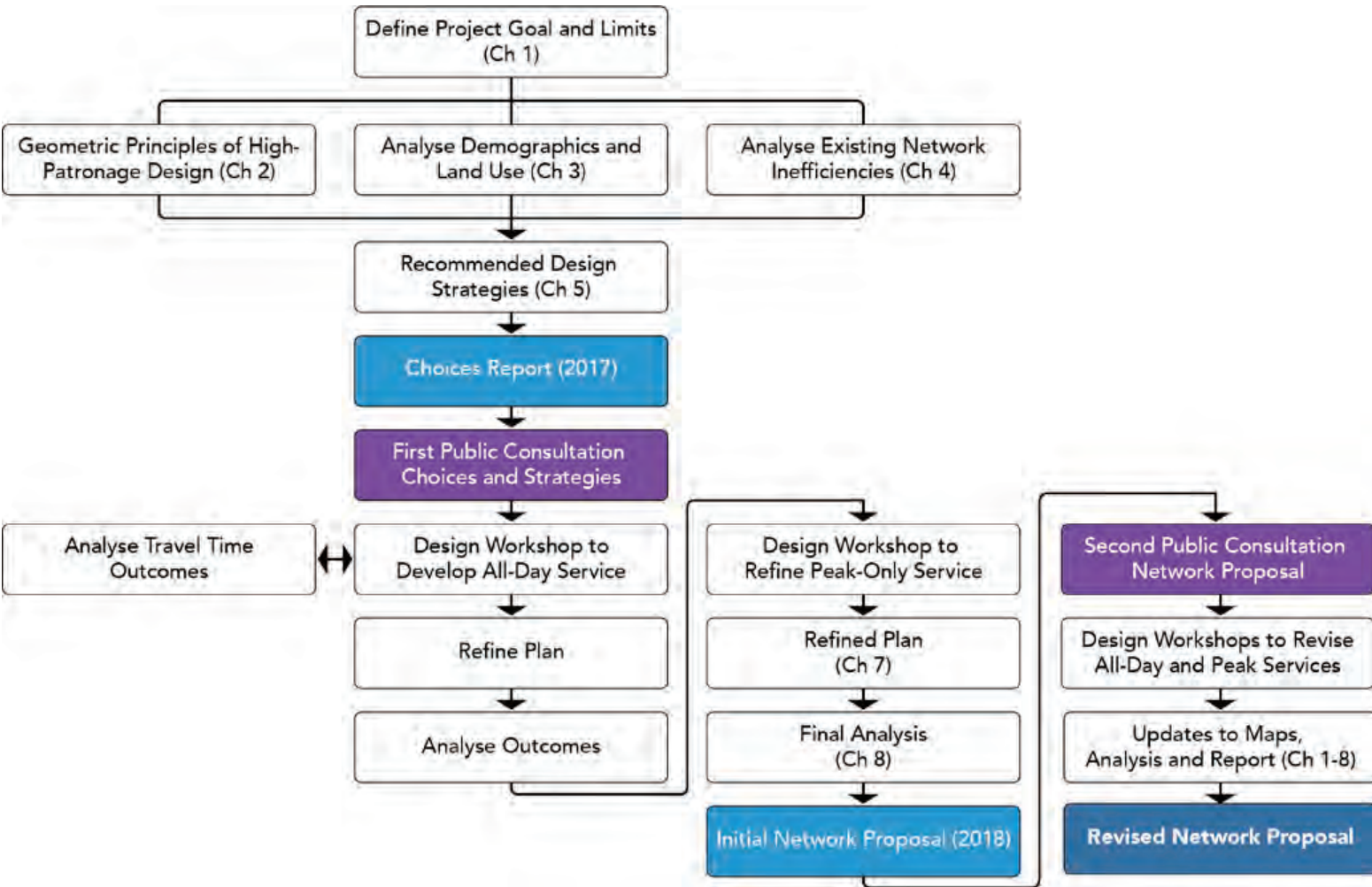
In July 2017, the consultant team facilitated a two-week intensive retreat with NTA, Dublin Bus, and local council officials. The proposed network was designed collaboratively, to about 80%

completion in these workshops. The plan then went through further cycles of iteration with NTA and Dublin Bus, including an additional workshop focused on the peak-only services, leading to the July 2018 initial network proposal.

Following the second public consultation in summer 2018 (also described in Chapter 6), the consultant team facilitated further design workshops with NTA and Dublin Bus to take into account public input and submissions. This has led to the network now described in Chapter 7.

During the design workshops and subsequently we repeatedly checked how the new network would improve where people could get to quickly, and used that feedback to continuously improve the design. Network coverage, travel time and job access impacts are described in Chapter 8.

Figure 5: The chart below shows the process used to develop the network redesign proposal, and how each step relates to the chapters in the report. The revised network proposal comes on the heels of a comprehensive design process and two rounds of public consultation, in 2017 and 2018.



The plan is based on a geometric principle that may sound wrong when you first hear it: **a network that assumes you are willing to change buses can get you to your destination sooner.**

This is because reducing the number of bus routes allows each remaining route to operate more frequently. **In a network with relatively few but very frequent routes, getting from any point A to B can require changing vehicles at least once, but waits are very short.** So it's usually much faster than waiting for a direct route that may only come every 20, 30 or 60 minutes. We describe this principle in more detail in Chapter 5.

Following this principle, if the network redesign is implemented, a number of trips in Dublin that are now direct may require changing buses. However, most of those trips will still be much faster, as evidenced by the increase in access to jobs and educational opportunities shown in Chapter 8.

While a tolerance of interchange is thus an essential feature, there is still an inconvenience to getting off one bus, walking to a different bus stop, and getting on a different bus.

Thus, **the revised network redesign seeks to minimize the number of cases where multiple interchanges are required to complete a trip.** Under the plan:

- Within the M50, almost all areas retain all-day direct service to the City Centre. And nearly all areas with peak-hour direct service to or from City Centre retain a similar service, including in outer suburbs.
- 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.
- In very limited instances, three interchanges may be required between two points, but in practice that situation affects a very small number of trips going from one extremity of the network to another (e.g. Blessington to Skerries).

Taking into account public feedback after the initial proposal, **the revised network redesign also now includes many more peak-only and lifeline routes whose purpose is to maintain occasional direct trips to the City Centre** for commuter needs and to meet the needs of people with less ability to walk long distances to reach service.

Figure 6: Table explaining how the four main strategies behind the bus network redesign help solve known issues with the existing bus network in Dublin.

TOOL	PROBLEM ADDRESSED				
		Poor orbital service	Complexity	Low frequency	Buses in City Centre
	1 STANDARDIZE SERVICE CATEGORIES	Yes. Categories make planning efficient services easier.	Yes. Frequency and span are apparent from the category, without looking at timetables.	Yes. Standard categories make frequencies predictable and consistent.	Yes. Categories make planning efficient services easier, reducing excess bus trips.
	2 SIMPLIFY RADIAL SERVICE	Yes. Releases resources for orbital use.	Yes. Reduction of complexity, especially in city centre	Yes. Higher frequency for travel to, from and through the city centre	Yes. Consolidating service to the centre on fewer routes means frequency can be optimized, reducing surplus trips.
	3 BUILD FREQUENT ORBITALS	Yes.	Yes. The intersection of frequent orbitals and radials produce a pattern that is easy to grasp.	Yes. Increased orbital frequency.	Yes. Fewer passenger trips are forced through city centre, reducing loads.
	4 GROW SUBURBAN FEEDER NETWORKS	Yes. Improves market for both orbital and radial services to regional centres.	Yes. Fewer overlapping routes in suburban markets	Yes. Improved local frequency for travel within suburban areas.	Yes. Feeder networks support consolidating service to city centre on fewer routes.

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

Figure 8 and Figure 9 show a schematic of the existing and proposed radial networks.

In the existing system, most radial corridors are served by a pile of overlapping routes, each of which goes to a different corridor on the opposite side of the city. This provides direct service

between many places, but many individual routes are not very frequent, so wait times can be long.

The proposed strategy would put a single line (the “spine”) on each radial corridor, but would run this service very frequently. Service would come every 3 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 usually faster because the waiting time saved by the high frequency is greater than the time spent on the interchange.

Note that **each spine (e.g. A) would be composed of several branches (e.g. A1, A2, A3, A4), each of which would provide direct access to City Centre and points beyond.** No interchange would be required at the point where the branches peel off.

For example, heading from City Centre to a point on the A spine (e.g. DCU St. Patrick’s College), one would board any A bus (A1, A2, A3 or A4). Travelling from City Centre to a point beyond the “spine” segment such as Beaumont Hospital, one would board the appropriate bus (A1) for a direct trip.

Figure 8: Existing Network. Multiple routes from each corridor cross the city centre in different directions.

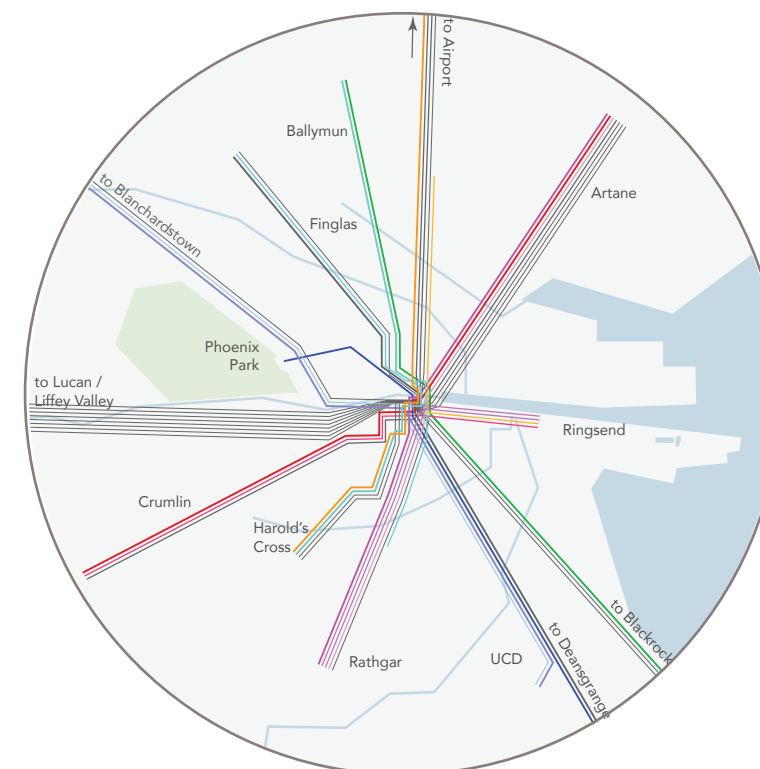


Figure 9: Proposed Network. Each corridor has a single frequent line crossing the city centre on a single path.



Figure 7: Montréal, Canada presents a simple map of just its high frequency services, so that people can see where they can go without waiting long.



Strategy 3: Build Frequent Orbitals

The lack of frequent orbital service is a major gap in the current network. As of late 2019, there are relatively few orbital routes, none of which operate more frequently than every 20 minutes in the middle of the day.

The network redesign would replace the existing orbital services with multiple frequent orbitals including:

- An inner orbital (O) operating two-way on the North and South Circular roads, every 8 minutes all day.
- Two northern orbitals operating every 10 minutes, serving key locations such as Beaumont Hospital, DCU, Charlestown, Finglas Village and Blanchardstown.
- One southern orbital operating every 10 minutes and two operating every 15 minutes, serving key locations like Ballsbridge, Rathmines, Heuston, UCD, Crumlin Hospital, Liffey Valley, Blackrock, Dundrum, and Tallaght (The Square).
- One western orbital operating every 15 minutes between Liffey Valley, Clondalkin Village and Tallaght (The Square).

The network redesign also would include several other less frequent orbitals along paths with fewer major destinations.

In some locations, existing radial routes would not be replaced, and frequent orbital service would be provided to the nearest radial instead, as shown in Figure 10.

Strategy 4: Replace Infrequent Radials with Frequent Locals

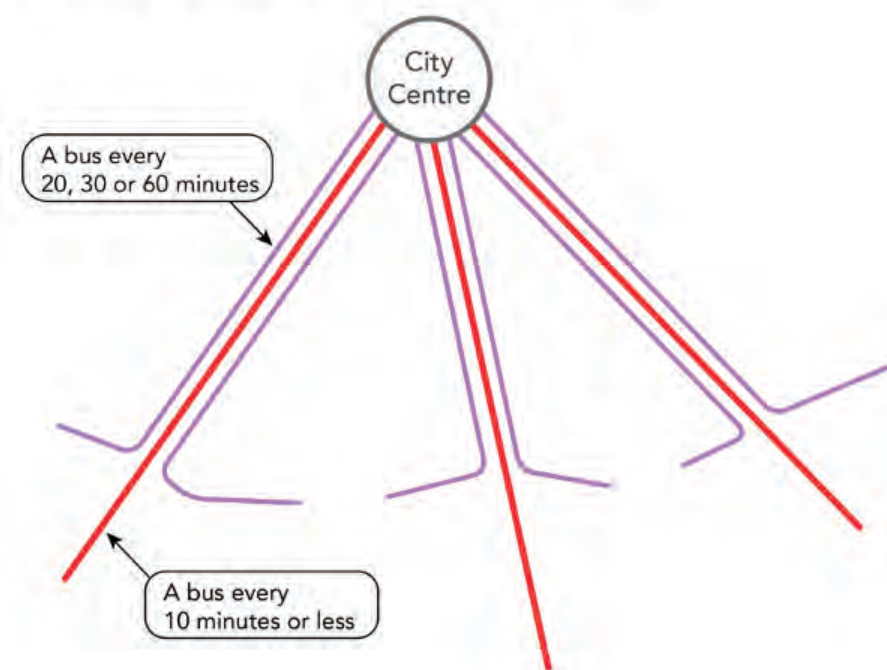
On the outermost edges of Dublin, long and infrequent routes from the city centre can be replaced by more frequent local routes feeding into a spine.

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.

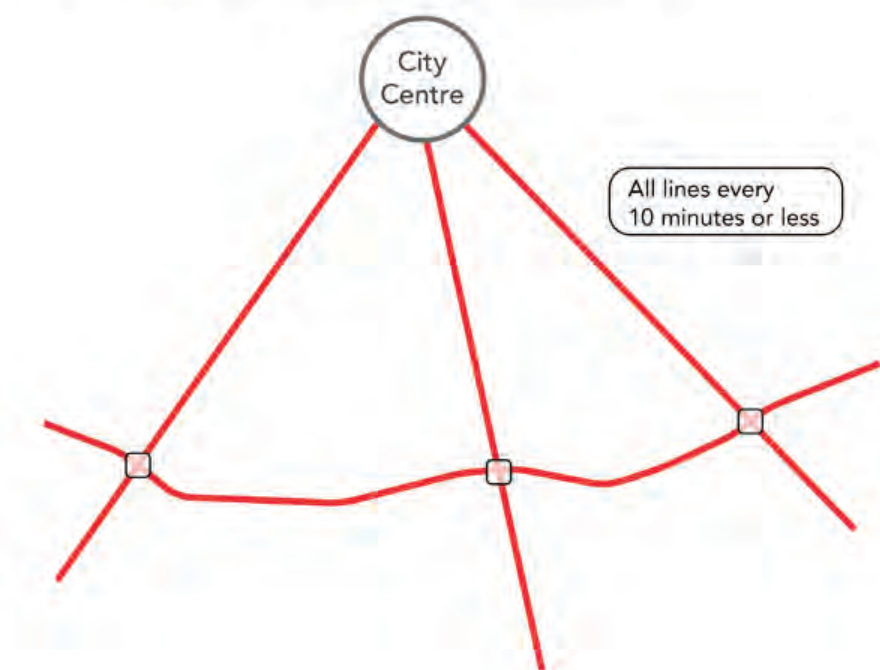
In certain cases, these feeder routes would be complemented by peak-only express routes providing direct access to City Centre at morning and afternoon commute hours.

Figure 10: In the existing network, many infrequent radial routes reach in areas far from main roads. For most travellers, a faster and more useful network arises from replacing such minor radial routes with frequent orbitals.

EXISTING NETWORK STRUCTURE



PROPOSED NETWORK STRUCTURE



Public Response to the Network Design Strategies Was Highly Favourable

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.

The survey received over 11,000 responses, a very high number by the standards of any opinion poll. For context, national political opinion polls in Ireland are typically carried out on samples of fewer than 1,000 people, and almost never on samples larger than 3,000 people.

The overwhelming majority 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.

This positive feedback gave NTA the necessary direction to proceed with the development of a network redesign, based on the strategies outlined above.

Figure 11: Public survey responses on openness to interchange for faster individual trips. (June 2017)

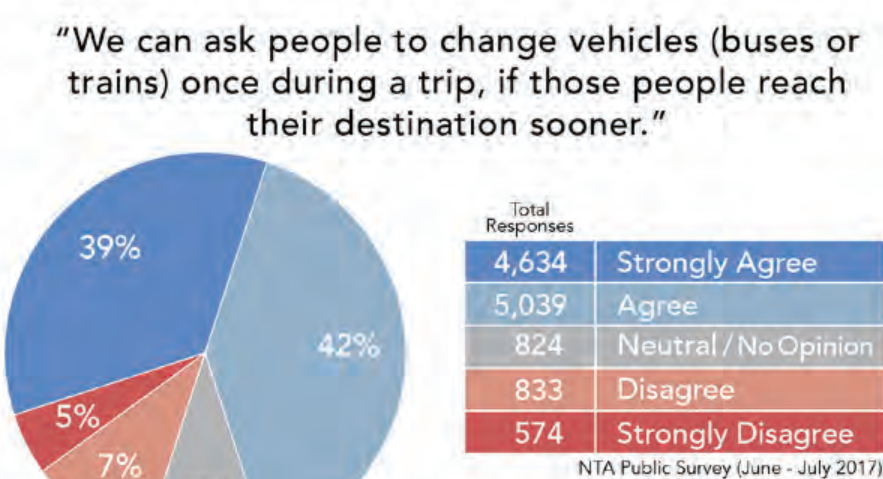


Figure 12: Public survey responses on the spine strategy. (June 2017)

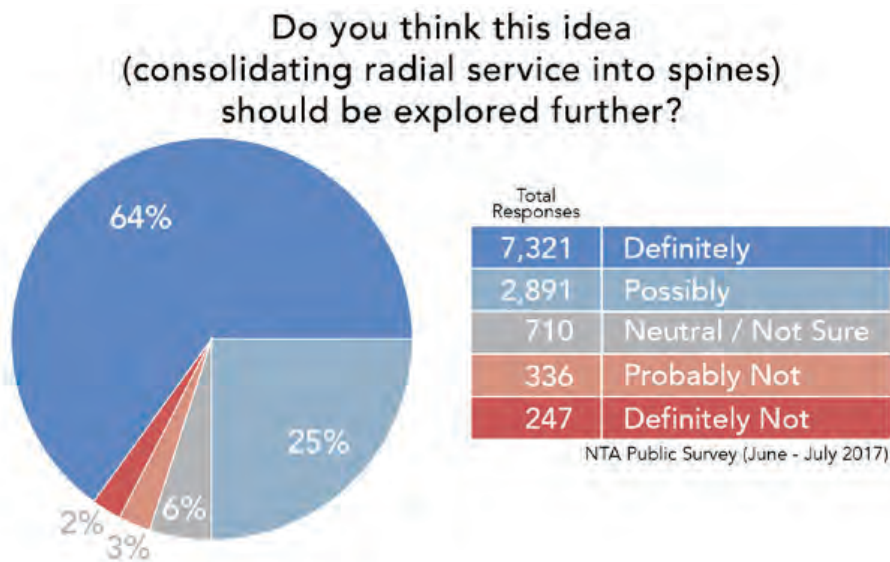
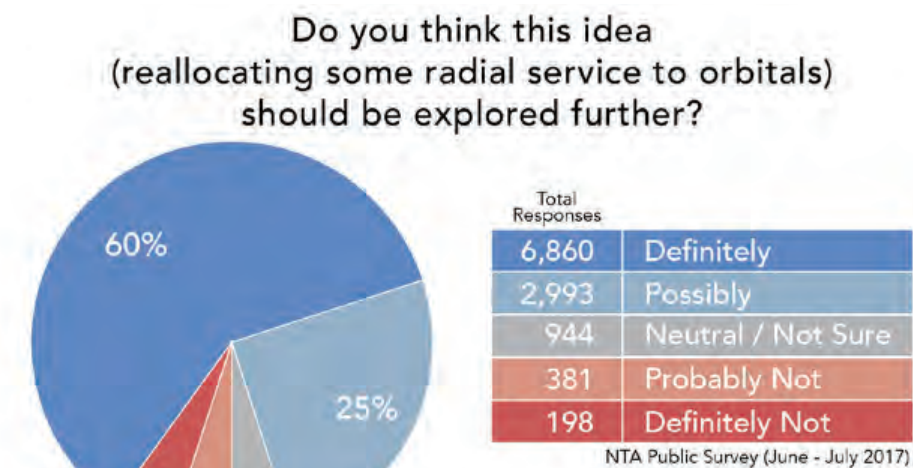


Figure 13: Public survey responses on the orbital strategy. (June 2017)



Consultation and Response

The NTA released the Public Consultation Report for the initial network proposal in July 2018, and carried out a three-month public consultation. This consultation included many opportunities for public comment, such as:

- An online and paper survey and comment form
- 33 public information sessions throughout Dublin
- E-mail and in-person (hard copy) letter submissions.

In addition, many unofficial local meetings were organized by politicians and community groups of all stripes. In total, the NTA received 20,751 responses to the survey, 7,780 written submissions, and 65 petitions with a total of 20,209 signatures. This represents an unprecedented level of response to a public consultation on public transport in Ireland.

Based on the comments received, the overall response to the initial proposal was negative. Nearly 60% of survey respondents said that the proposed network would be “worse” or “much worse” for Dublin than existing service; only 24% said it would be “better” or “much better”. The relative proportions of positive and negative responses varied slightly by age, geographic location and how often people ride public transport, but not in a way that changes this general conclusion.

This response reflects a wide variety of concerns. Some of the main ones include:

- People in many areas would be required to interchange to travel to or from the City Centre.
- Proposed peak routes and frequencies may not provide sufficient passenger capacity, causing overcrowding.
- Many proposed routes take different paths than existing service. Some could result in longer in-vehicle travel times.
- Changes to the network may be difficult for the elderly, as well as people who are physically and intellectually disabled.
- Established travel patterns to schools and hospitals would change, in many cases requiring more interchange.
- Existing conditions (mostly crowding) on Luas and DART do not favour additional interchange.
- Certain interchange locations require significant improvements to infrastructure.
- Potential loss of transport service in semi-rural areas.

Patterns of Response

The NTA read and analysed all received comments, and summarized the issues encountered by area of Dublin¹. The consultant team analysed patterns in survey comments, to help establish a hierarchy of concerns. Based on this analysis, the team noted that:

- Comments on the overall network proposal were in many cases positive, but comments citing specific situations and locations tended to be negative.
- Although some concerns were expressed from nearly all parts of Dublin, the levels of concern are very uneven from one area to another. For example:
 - » Half of survey comments citing specific areas came from 22 areas (of 147)².
 - » Half of survey comments citing specific routes related to 19 existing routes (of 115).

This helps explain the discrepancy between the results of the first and second consultation. The June 2017 consultation suggested that the vast majority of people approve the general ideas behind the network redesign, and the case was made in the Public Consultation Report that most people’s lives would be positively impacted.

However, in a comprehensive redesign of an entire bus network, there are many people who may in some way be negatively affected, and who will express legitimate concerns. **Many of these concerns were considered grounds to make revisions to the network proposal, as described in the following pages.**

¹ See *BusConnects: Dublin Area Bus Network Redesign, Public Consultation 2018, Key Issues Report*.

² A further example of how concentrated comments are in certain areas: Rush and Lusk, which together account for about 1.3% of the population of County Dublin, provided nearly 8% of comments identified by area in the survey. Similarly, nearly 8% of all comments identified by existing route mentioned Routes 33 and 33x, which serve northern Fingal.

The Revised Network Proposal

The two following pages show a big-picture look at the existing network and the revised network proposal. These maps are not meant to be legible in detail. Chapter 7 provides a complete atlas showing the proposed network for each sub-area of the city, also including rural edges that are not on this big-picture map.

Subsequent pages illustrate two of the network's most important "big ideas": the creation of spines and orbitals, 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 6 to 8 minutes** or better, and **dark thick red** is used for extremely high frequency, **every 5 minutes** or better. Other colours indicate lower frequencies, as shown below.

Figure 14: Legend of colours used on the maps of the proposed network



The Big Ideas

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

- **Spines A to H would provide very high frequency on the main roads to and from City Centre.** Each spine is composed of several branches (e.g. A1, A2, A3, A4) which provide service beyond the main roads into neighbourhoods and suburbs. The branch timetables would be staggered to ensure regular frequency between buses on the main trunk. **All branches on spines A to G would operate cross-city,** to allow direct travel between the different sides of Dublin.
- **Frequent orbital routes would be added on the north, west, and south sides of the city so that far more trips can be made without going into the centre.** These orbitals would serve many trips that are very difficult to achieve by public transport in a reasonable amount of time today.
- **The all-day frequent network would be much expanded.** Nearly 200,000 more residents would be within 400m of the frequent network. About 125,000 more residents would be within 400m of frequent direct service to City Centre.
- **The frequent network would become a web-shaped grid, with many opportunities to reach more destinations.** Everywhere two red lines cross, a fast interchange between two high-frequency services would be possible. Today's network provides few of these high-frequency interchanges outside City 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 is working to plan suitable capacity expansions for these facilities.
- **Travel within the City Centre would also become easier.** The proposed network provides the extreme frequency that short trips within the canals require, and offers many new direct links. A very frequent inner orbital route (Line O) would also make it easier to travel on the edges of the centre.
- **Significant additions to evening and weekend service.** On weekdays, all frequent routes would operate every 15 minutes or better from 6 AM to 11 PM. All frequent routes would retain service every 15 minutes or better on Saturday, and most would have this on Sunday as well.

Key Revisions and Updates

Following on the input received in public consultation, the revised proposal introduces significant revisions:

- **More direct frequent services to City Centre,** reflecting a significant expansion of the spine-and-branch system.
- **Additions to proposed peak-hour services.** Proposed peak frequencies match the latest data on observed demand and likely short-term growth. The vast majority of existing peak-only routes are reproduced in the proposed network
- **More direct lifeline services to City Centre** in areas that would be further from frequent main lines. Service every 30 to 60 minutes ensures a minimum level of service for people who are not able to walk longer distances.
- **More direct services to hospitals,** schools and other important community, health and social service destinations.
- Every route in the proposed network was reviewed; nearly all show some routing or frequency adjustment, or both.

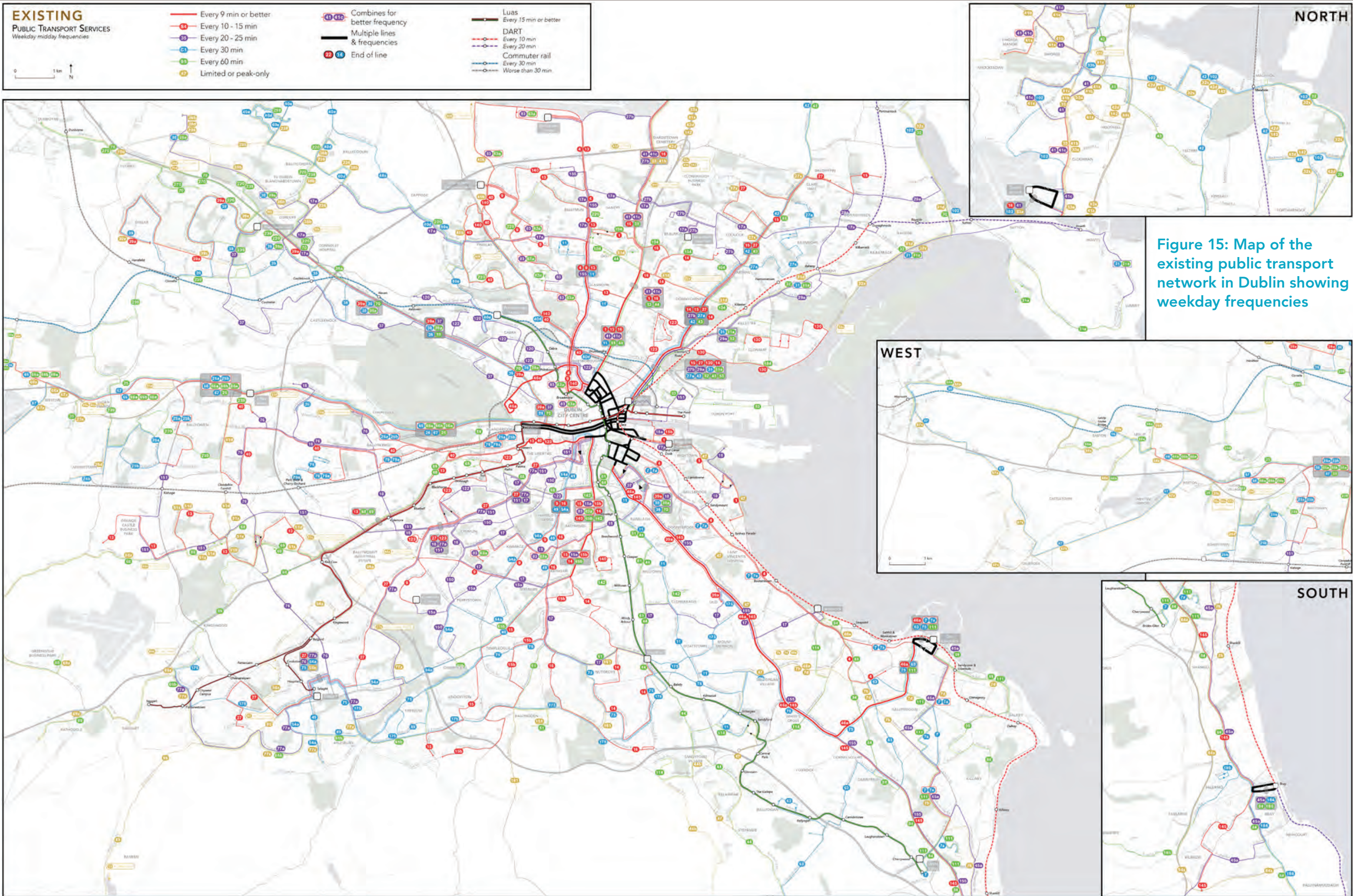
All told, **the revised proposal includes 22% more service hours than are currently provided** on an annual basis, and over 50% more service than was provided in 2016.

Assumptions

The revised proposal is still built on the following assumptions:

- **Fare penalties for interchanging are removed.** Any fare paid getting on the bus would be valid for 90 minutes throughout the Dublin public transport network. No second fare would be required upon boarding a second vehicle.
- **Progressive improvements in reliability** as the Core Bus Corridors project and other initiatives increase bus priority on Dublin's main roads.
- **Information is available at every interchange stop, and any walk required for the interchange is safe.** NTA would work with local councils to improve stop locations and pedestrian facilities to ensure short and easy connections. A program of improvements would progressively bring better shelter and lighting to all interchange stops.
- **Key interchange facilities can be developed and expanded.** The plan requires only one entirely new interchange, at Liffey Valley Shopping Centre. Several other interchanges (e.g. in Tallaght, Blanchardstown, Dundrum) would need expansion.

Existing Network: Big Picture



Revised Proposed Network: Big Picture

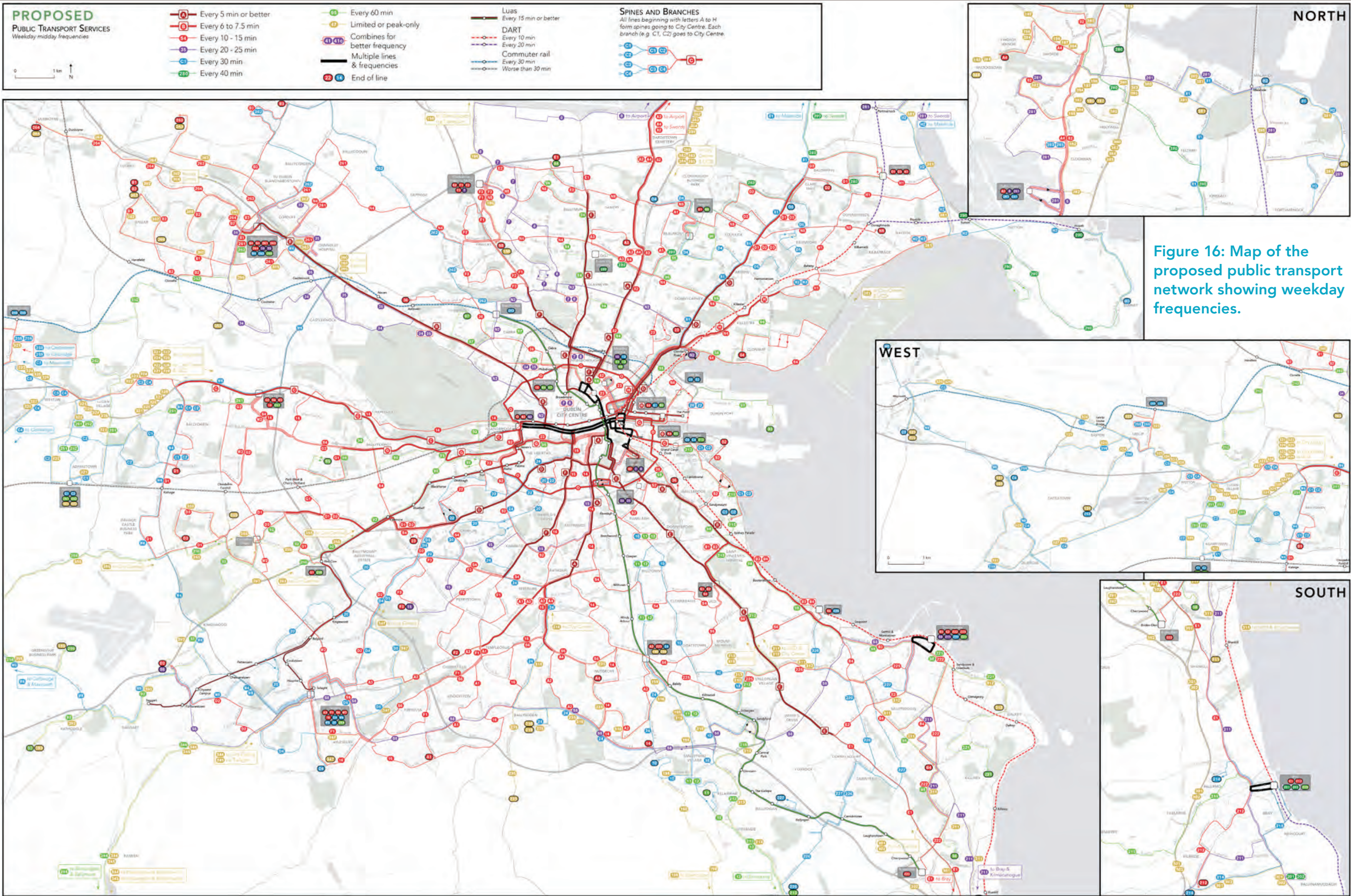


Figure 16: Map of the proposed public transport network showing weekday frequencies.

PROPOSED NETWORK

Big Idea: Spines and Frequent Orbitals

Simple, Frequent Routes Across the Core

In the proposed network, most of the bus routes that flow into the centre of Dublin would be reorganized into eight spines.

Spines are very frequent bus lines, designated by a letter (from A to H). Each spine is composed of several numbered branches (e.g. A1, A2, A3, A4), whose timetables would be staggered to provide extremely high frequency on the main trunk. No interchange would be required at the point where the branches peel off.

With service every 3 to 8 minutes all day on every spine, a bus would always be coming soon. This high frequency would make it very fast to connect from one spine to another, as well as to other frequent lines like DART, Luas, and the frequent orbitals.

A person could navigate much of inner Dublin paying attention only to the spine letter, and ignoring the number. Signage and information in this area should use a term like "all A buses," to reinforce this simplicity.

Frequent Orbitals

The proposed network includes seven orbital lines that would operate every 8 to 15 minutes. These would serve the growing number of suburb-to-suburb trips, and provide additional interchange locations outside City Centre for those travelling cross-city.



Figure 18: This image shows a possible design for a bus stop sign for the A spine and branches 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.

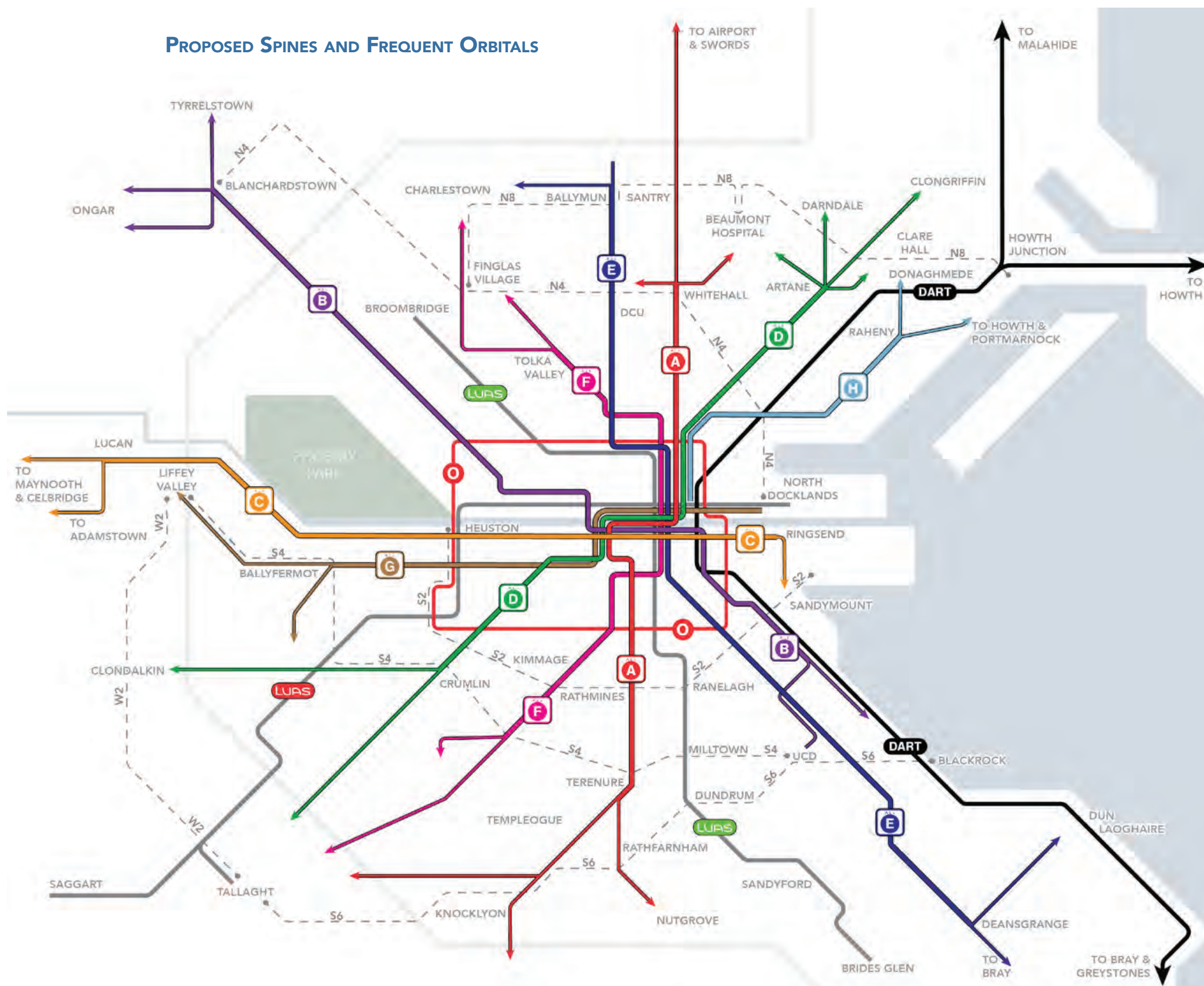


Figure 17: The image above is a simplified diagram of spines and frequent orbitals in the proposed network. Spines would have buses every 3 to 8 minutes, and divide into branches (e.g. A1, A2, A3, A4) with no interchange required. Most branches would operate every 15 minutes or better, with higher frequencies at peak times. The orbitals shown in grey on this map would operate every 10 to 15 minutes. The O would run every 8 minutes, almost like a spine.

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 understand the timetable. The NTA has recognized the considerable benefits of frequent all-day service, and many of the new service investments made in 2017 and 2018 serve to reinforce the existing frequent network.

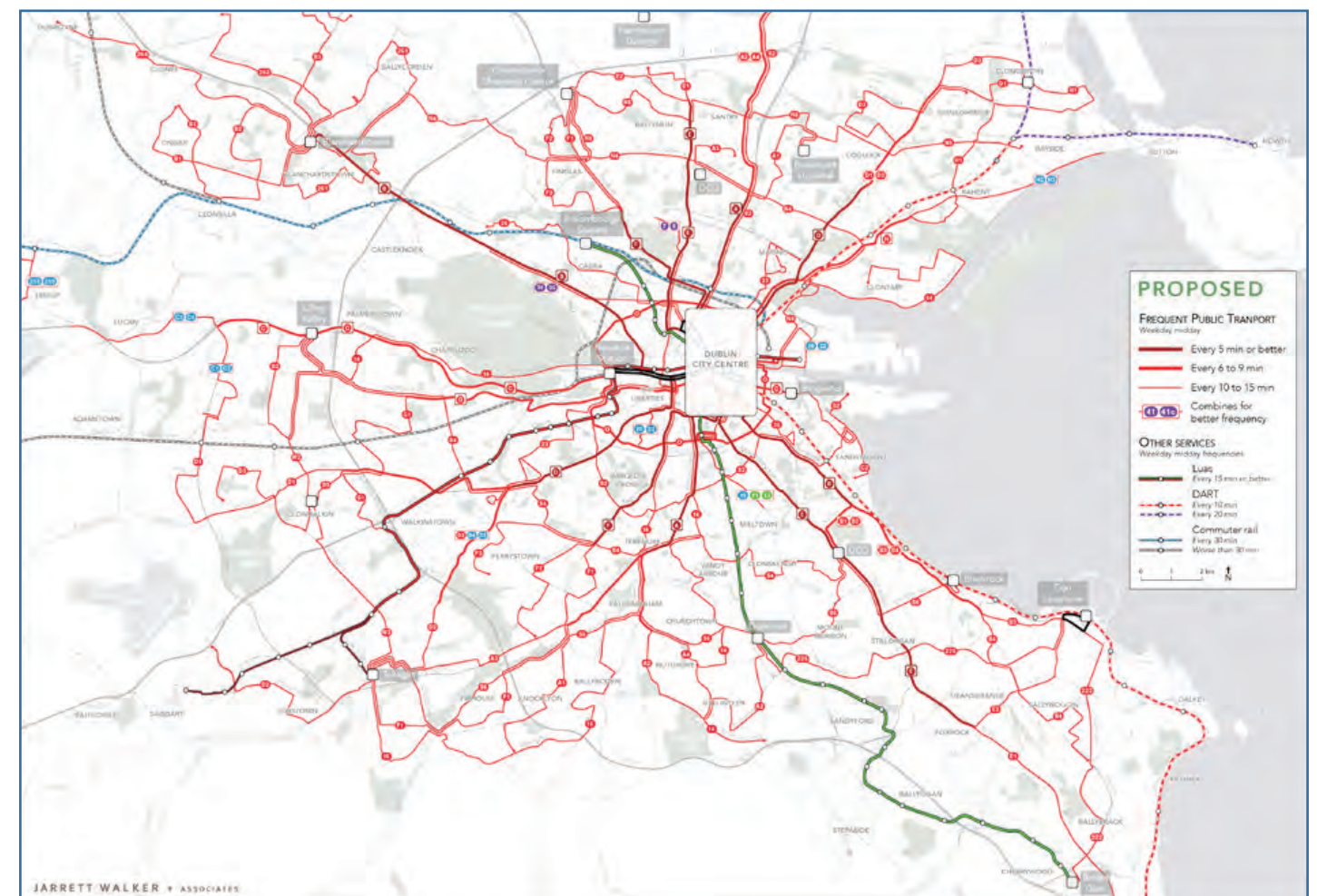
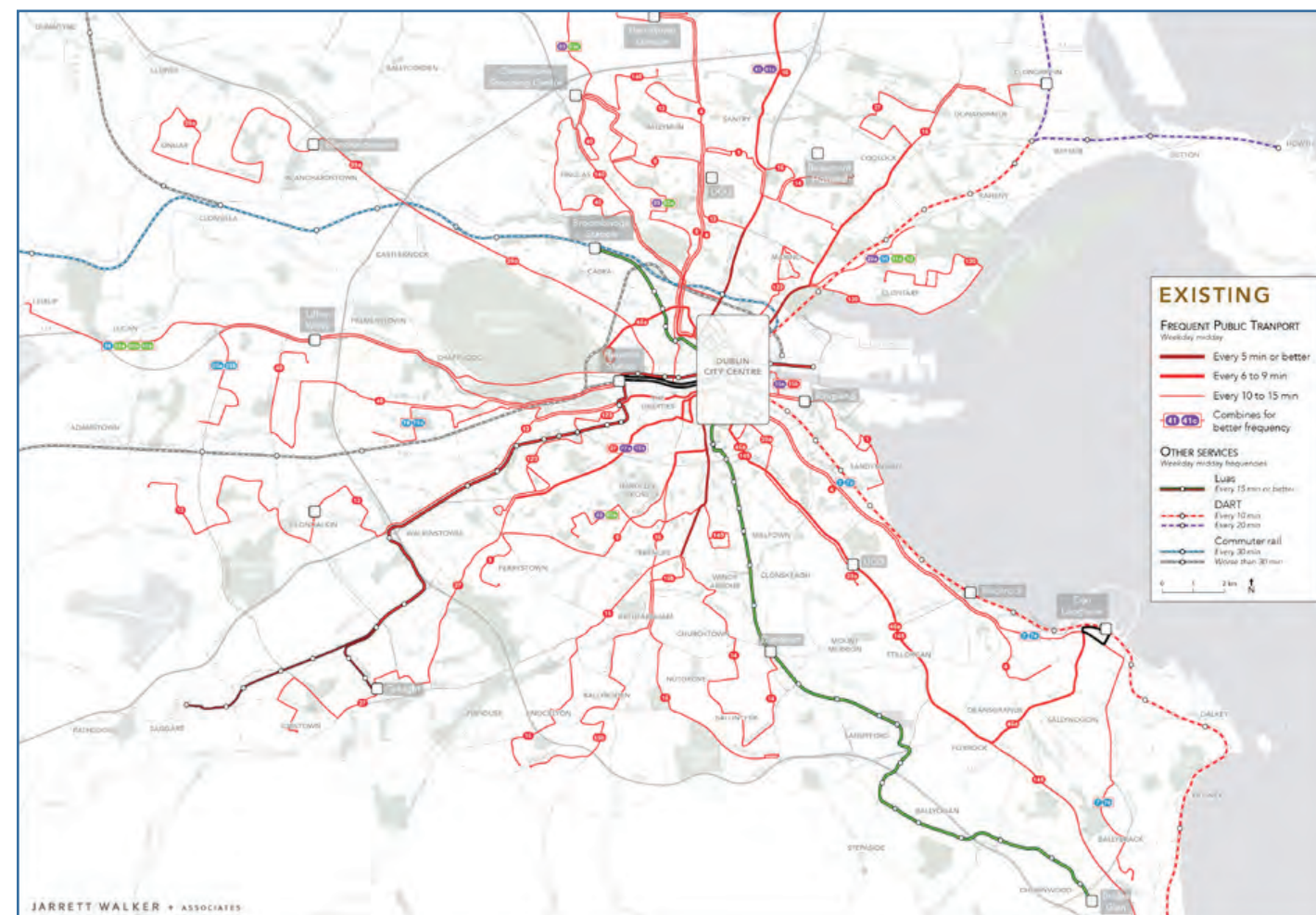
Where frequent lines cross, fast connections are available.

The existing bus network remains overwhelmingly focused on service to and from the City Centre. In contrast, the web-shaped grid of frequent services in the proposed network would also make it easier to travel between places outside the city centre. The many intersections between radial and orbital lines would allow faster and more convenient 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.

- The number of Dublin-area residents within 400m of weekday service every 10 minutes or better would increase by 15%, from 570,000 to 670,000.
- The number of Dublin-area residents within 400m of weekday service every 15 minutes or better would increase by 25%, from 830,000 to over 1 million.

Figure 19: The maps below compare existing frequent routes (i.e. service every 15 minutes or better on weekdays, as of late 2019) to the frequent service in the revised network proposal. The frequent network would be significantly expanded in the revised network proposal.



The Result: More Useful and Liberating Service

Your freedom to pursue life's opportunities depends in large part on your transport options. If you can't go many places in a reasonable amount of time, you can't do many things.

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

The image across shows an example of what this means, from the point of view of someone at Dublin City University (DCU). In this image,:

- **Purple** is the area that **someone can reach today in 45 minutes or less, and could still reach in 45 minutes** under the plan.
- **Red** is the area they **could no longer reach in 45 minutes** 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: if this network were implemented, more than twice as many residents (+120%) would be located within 45 minutes of DCU by public transport than are today. And the average student at DCU could access over twice as many jobs within 45 minutes than they can now.

- **The average Dublin-area resident could reach 27% more jobs and student enrolments in 30 minutes or less.**
- **Benefits would extend far beyond the urban core. The average residents living beyond the M50 could reach 26% more jobs and student enrolments in 45 minutes or less.**

How far can I travel in 45 minutes from Dublin City University - Main Campus on weekdays at 12 pm?

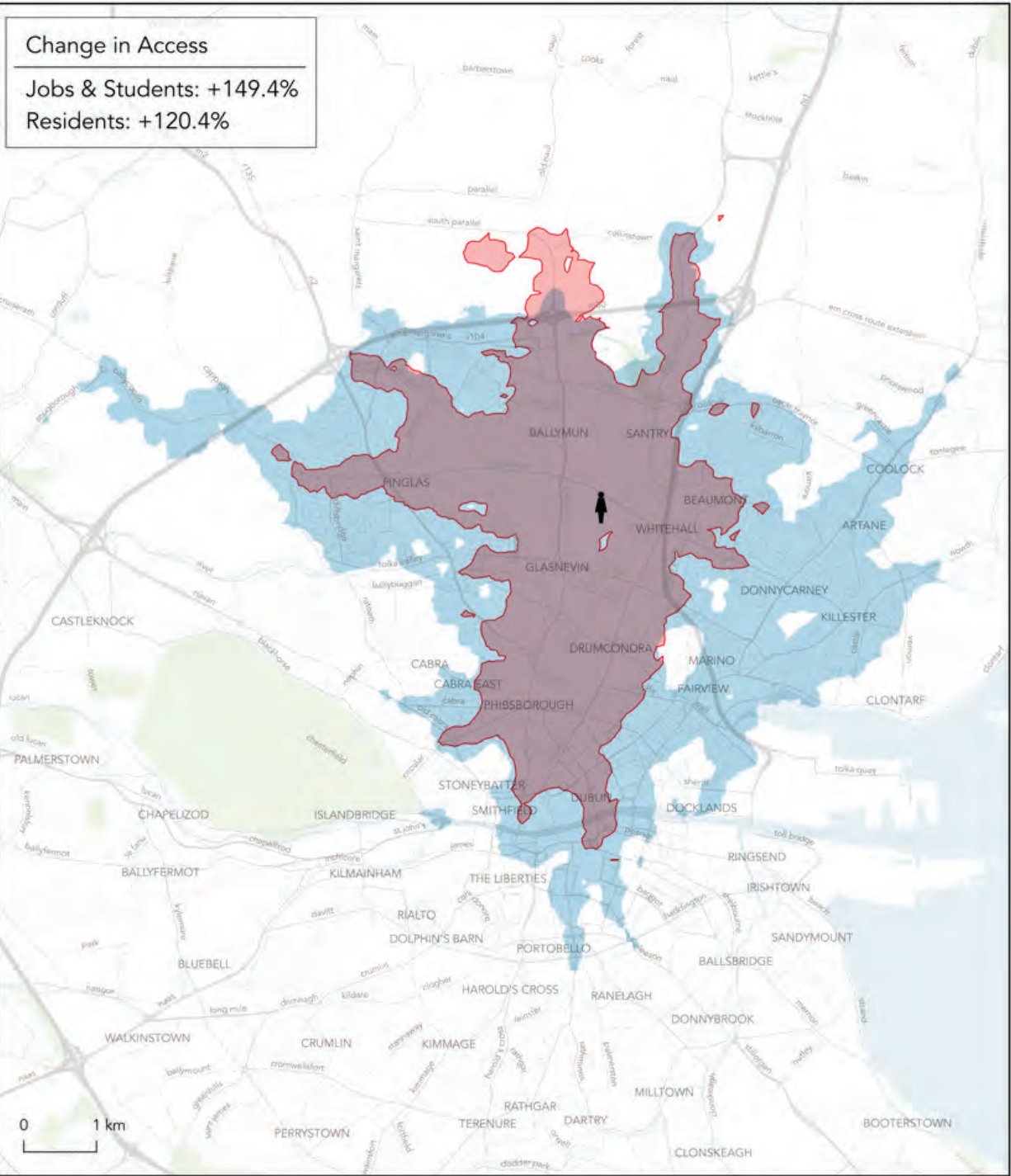


Figure 20: The map above shows how far one could travel by walking, waiting and public transport in 45 minutes, starting from the middle of the Dublin City University's main campus. It shows that many more places would become reachable if the network proposal were implemented.

How Far Can You Go?

In the course of developing the proposed network, the NTA and consultant team tracked how many jobs and third-level (university) student enrolments could be reached within 30, 45 and 60 minutes of any part of the Dublin metropolitan area.

It's more difficult to measure access to other opportunities, like shopping and socializing, but an improvement in access to jobs and universities is a signal that access to many other activities will improve as well.

The map across shows the change in the number of jobs and student enrolments that could 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.

The impact would be overwhelmingly - but not universally - positive. This reflects the impact of adding more service, of making that service more frequent, and ensuring that frequent radial and orbital lines connect in a web-like grid.

The overwhelming majority of trips on public transport in Dublin would take less time. Nonetheless, certain areas would experience a reduction in access, and there will still be examples of trips that would take longer in the proposed network than with existing service.

Overall, we estimate that about:

- 65% of Dublin-area residents will experience a measurable increase¹ in job access within 45 minutes.
- 5% of Dublin-area residents will experience a measurable decrease² in job access within 45 minutes.

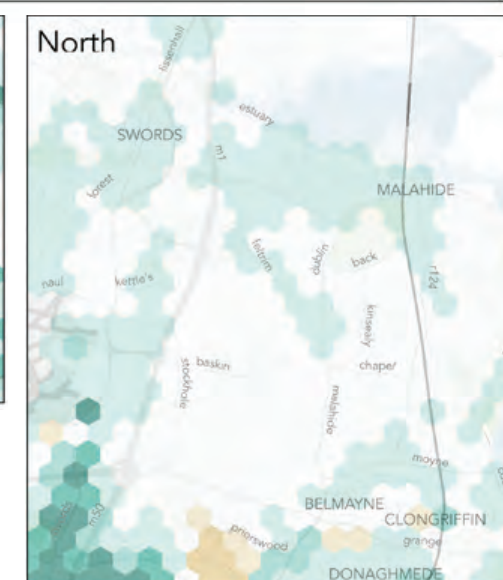
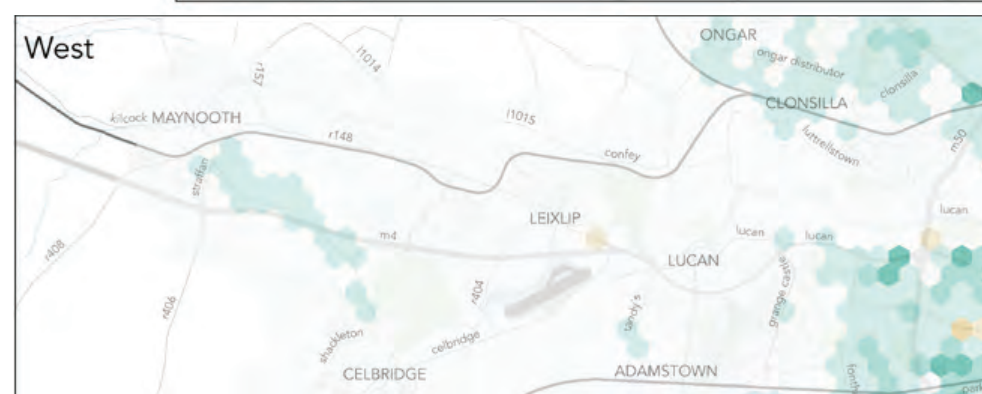
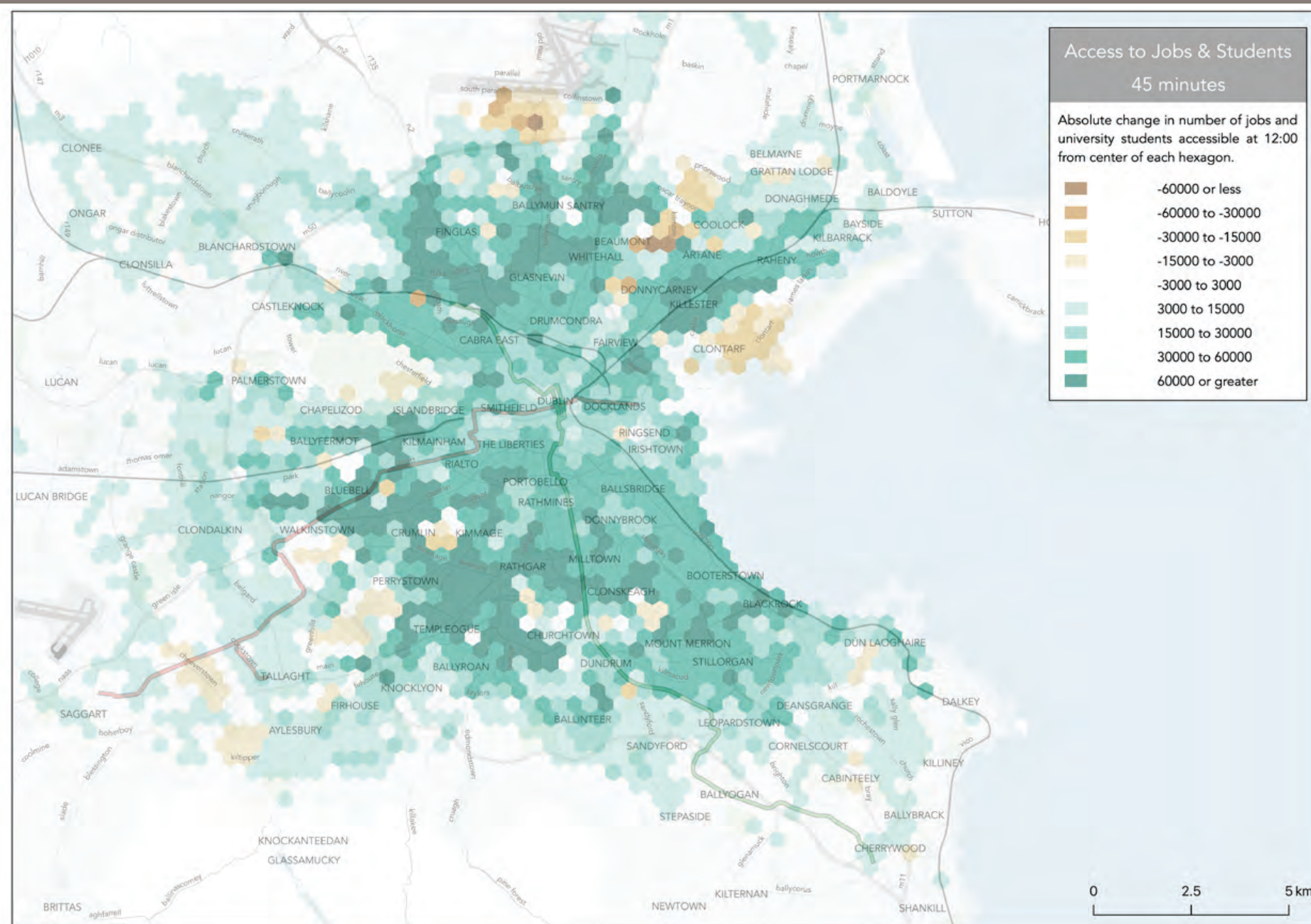


Figure 21: The maps above and to the right show the change in the number of jobs accessible in 45 minutes or less by walking, waiting and public transport from different parts of Dublin on weekdays.

¹ +10% or better.

² -10% or worse.

Public Consultation

This report launches a public consultation starting in October 2019. All residents are encouraged to review the proposed network and submit their comments.

- Further information on the plan, including the complete report and detailed maps and other information, can be found at busconnects.ie
- Let us know what you think! You can also provide a submission online at busconnects.ie.

Submissions and public comment will help guide final decisions about the plan.

1

What is the Bus Network Redesign?

What Services Constitute the Bus Network?

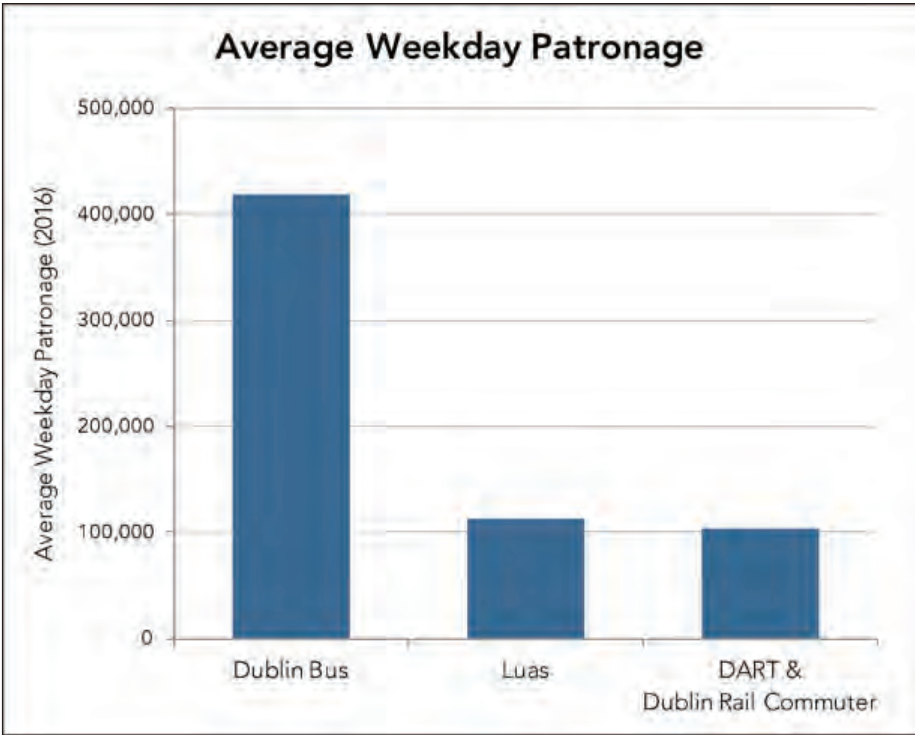
Buses are the backbone of Dublin’s public transport system

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. Because it takes a very long time to plan and build new rail lines, 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, because buses are the only public transport technology whose services are easy to revise.

Figure 22: The chart below shows average weekday patronage on the three primary public service transport operators in the Dublin area (2016). Buses carry approximately 2/3 of total patronage. Patronage has continued to grow through 2017 and 2018.



How buses are regulated and funded

Public transport throughout Greater Dublin, including bus and rail, falls under the jurisdiction of the National Transport Authority (NTA). NTA’s task is to make all service work together as a single coordinated regional network.

NTA is the *regulator* for all public transport services, but it is also the *planner and purchaser* of almost all of them.

Services planned and purchased by NTA are called the Public Service Obligation (PSO) network. As of late 2019, approximately 90% of the bus portion of the PSO network is operated by Dublin Bus, and 10% is operated by Go-Ahead Ireland. Both Dublin Bus and Go-Ahead Ireland operate this service under contract to NTA.

Outside the PSO network are a small number of *commercial* services. This term means that the operating company expects to make a profit without public subsidy.

Because they serve specialised markets, most commercial services are not considered part of the coordinated regional network. A good example of commercial service is the set of airport express lines (including those operated by Dublin Bus), which charge higher fares and have special space for luggage.

With that exception, a study of the PSO network is a study of all services designed for a diverse public, and intended to work together to provide mobility across all of Greater Dublin.

Introducing the Network

The PSO network covers the built-up areas in Dublin City, South Dublin, Dun Laoghaire-Rathdown, and southern Fingal.

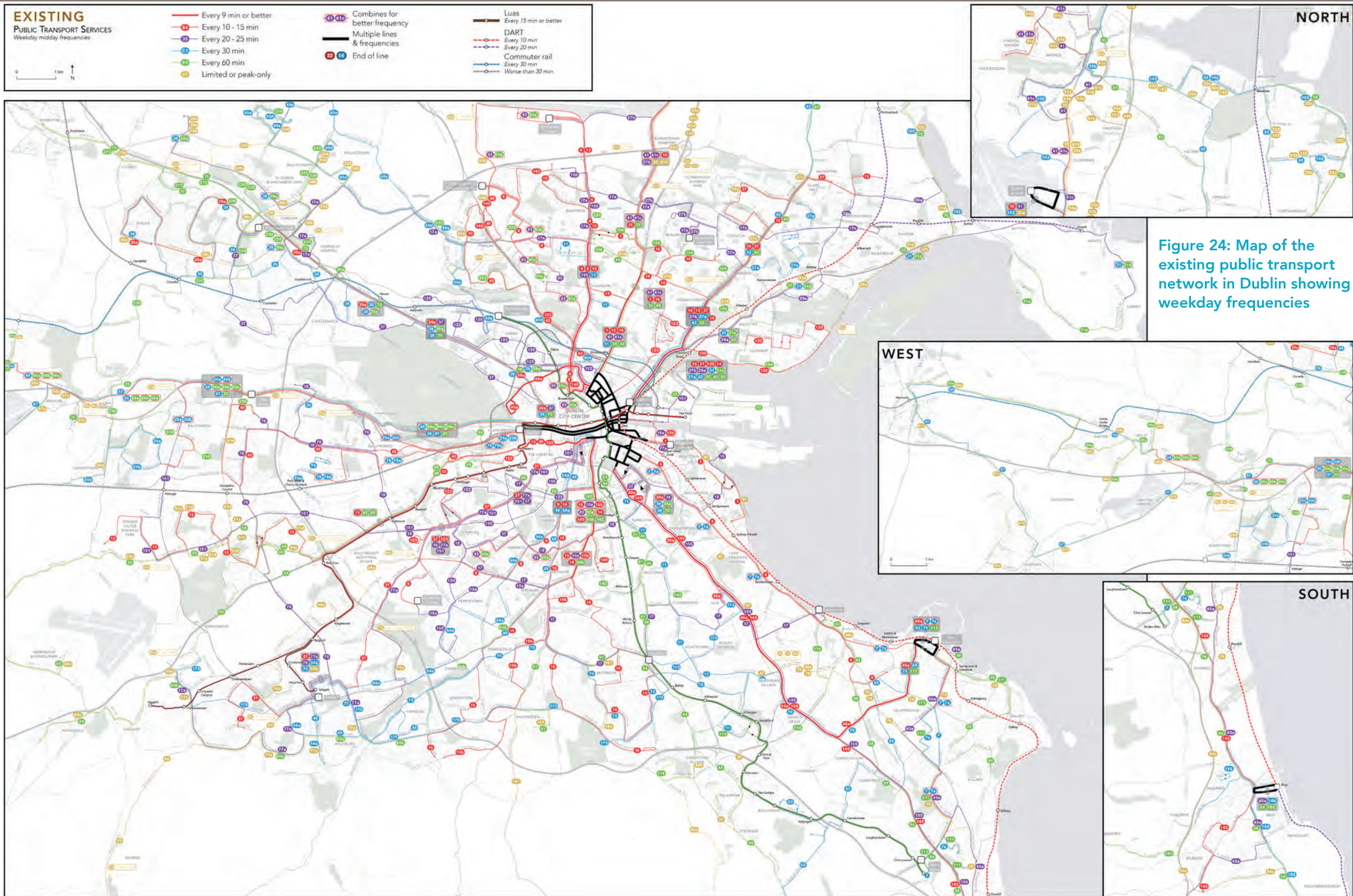
A few routes extend further out, reaching as far as Blessington, (Wicklow), Newcastle (Wicklow), Maynooth and Celbridge (Kildare), Dunboyne (Meath), and Balbriggan (northern Fingal).

The maps on the following page introduce a style used throughout this report, in which colours mostly represent frequency of service. **Red** is used to indicate high frequency service, **every 15 minutes** or better all day. **Thick red** is used for very high frequency, **every 6 to 8 minutes** or better, and **dark thick red** is used for extremely high frequency, **every 5 minutes** or better. Other colours indicate lower frequencies, as shown below.

Figure 23: Legend of colours used on bus network maps in this report



Existing Network: Big Picture



Why Redesign the Bus Network?

Redesigning Dublin's bus network is an opportunity to review the evidence for public transport demand, and to design a network that meets those demands most efficiently. Redesign does not necessarily seek massive change, but it can have that outcome.

The key point is that thinking is not constrained by the existing network. Where the analysis suggests that existing service patterns make sense, those elements are retained. Ultimately, the goal is to provide a network designed around the needs of Dublin today and tomorrow, rather than one based on the past.

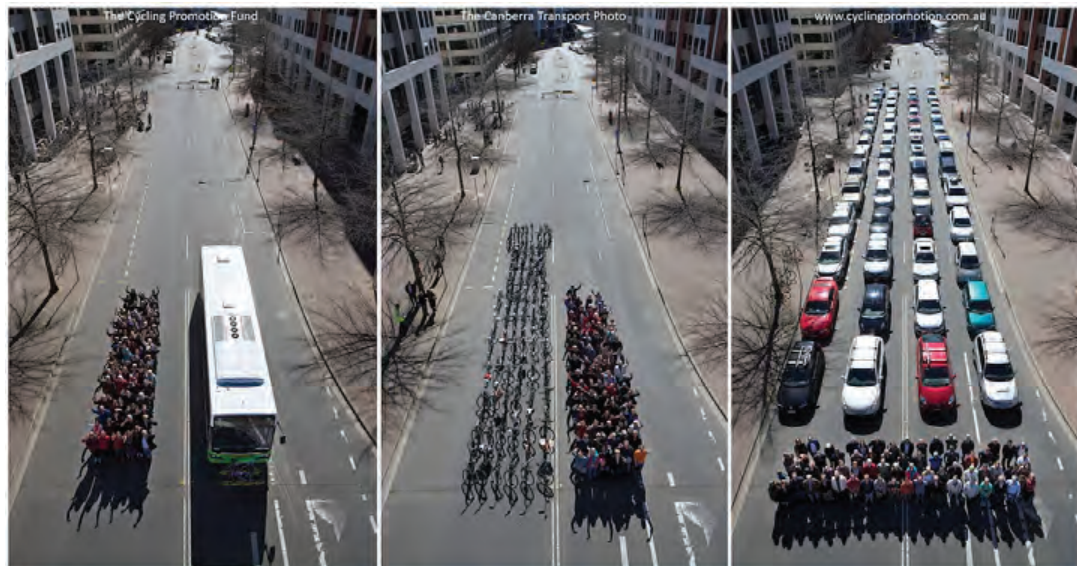
Limitations in Space

Like most European cities, Dublin presents features that make public transport essential, and require that it be highly efficient:

- **Severe road space limitations.** Across large parts of Dublin, especially in the older core, street width is constrained and can be costly and problematic to expand.
- **Intensification of land use.** In response to growing demands for housing and commercial space, both central and outlying areas are growing more dense. More and more people are living within the same limited area.

These two factors combined mean that more and more people are trying to use a fixed amount of road space. If they are all in their cars, they simply do not fit in the space available. The result is congestion, which cuts people off from opportunity and strangles economic growth.

Figure 25: Public transport and cycling require far less space to move the same number of people than cars, as shown in the photo below.



The only alternative to congestion is for a larger share of the public to rely on public transport and other non-car modes.

This requires services that most efficiently respond to the city's changing needs, as well as corridor improvements – also being pursued by NTA – to give buses a level of priority over cars that reflect the vastly larger numbers of people on each bus.

Emerging Patterns in the City Centre and Regional Centres

Meanwhile, several other types of changes are challenging the structure of the existing network:

- City centre street space is increasingly constrained. There are increasing demands to devote more space to bikes, pedestrians, and other aspects of civic life, in addition to catering for vehicle traffic and bus movements. All of these competing needs put increasing pressure on the limited road space available.
- Regional centres such as Blanchardstown, Tallaght and Swords are growing larger and denser. And other major destinations, such as the employment hub of Cherrywood, are emerging around the edges of the region. The growing number and importance of these suburban centres will trigger more demand for orbital travel that bypasses the city centre.

These two factors are interrelated. The most efficient way to grow the bus network without growing bus volumes in the city centre is to vastly improve orbital services, so that fewer people are forced through the city centre when it is not their destination.

In this report, we will refer frequently to the three main kinds of public transport route:

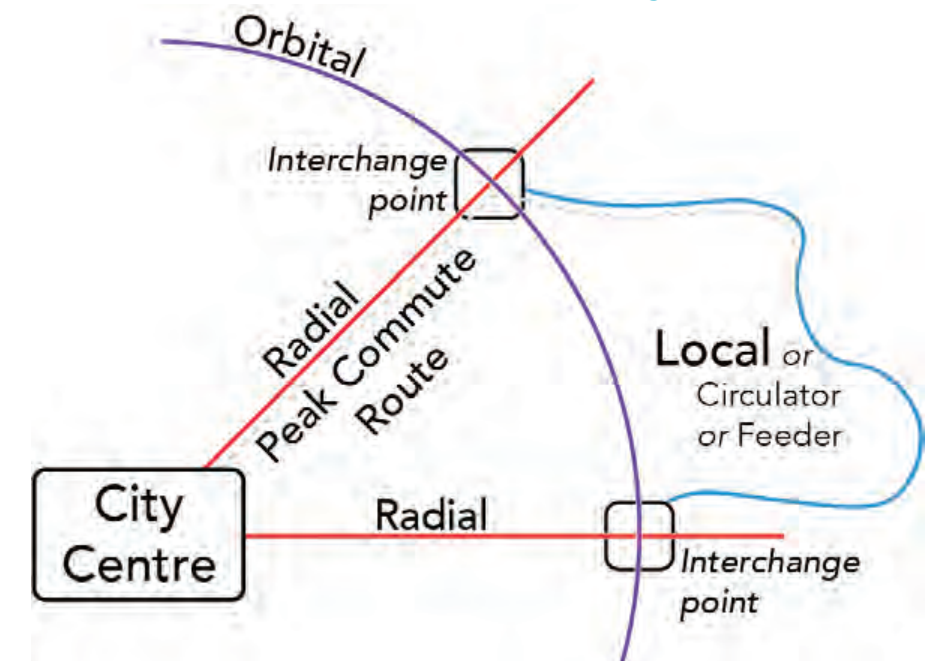
Radial routes connect the City centre to neighbourhoods and suburban areas. (Radial routes that continue across the city centre, serving radial paths on opposite sides, are called **cross city** routes in Dublin.)

Orbital routes connect key neighbourhoods and suburban centres to each other, without traversing the city centre.

Local or Feeder routes travel shorter distances within neighbourhoods and suburbs, typically connecting to radial and orbital service at an interchange point.

A fourth type, the **Express** route, may have any shape but typically runs nonstop for a long segment going to or from a major destination. In Dublin, most express routes provide direct service from outer suburbs to the City Centre at peak commute hours.

Figure 26: The three main types of public transport (radials, orbitals, and feeders, as shown in the diagram below.



Network Redesign: Study Year 2019

This network design study focuses on changes that could be implemented quickly, some as early as 2020.

This short-term focus is not in conflict with rational long-term planning. Through the Transport Strategy for the Greater Dublin Area, NTA has already established the long term pattern of core transit services, and also many of the key permanent bus corridors. This study builds on the intentions of the Strategy, and considers how short term changes can move in the direction that they define.

In addition, this study identifies new frequent bus corridors and infrastructure needs that may have long-term impact. The study recommends that these findings be considered in the next round of long-range planning. In this way, long term and short term planning support one another.

Medium Term: the BusConnects Program

The Bus Network Redesign is the first step in a series of transformative changes to Dublin's bus network over the coming years. The next steps in achieving this transformation include:

- building a network of **Core Bus Corridors** on the busiest bus lines to make bus journeys faster, predictable and reliable;
- 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;
- a **simpler fare structure**, allowing seamless movement between different bus services without financial penalty;
- a network of **park and ride facilities** at key locations on national roads.
- a **new bus livery** to integrate bus vehicles of different operators and types, and providing a modern look and feel to the new bus system;
- **new bus stops** with better signage and information and increasing the provision of additional bus shelters; and
- transitioning to a new bus fleet using **low-emission vehicle technologies**.

Long Term: Transport Strategy for the Greater Dublin Area

The NTA's long term strategy for Greater Dublin provides direction on four layers of the network:

- The most important Core Orbital and Core Radial corridors are slated to receive significant infrastructure and service improvements.
- A new Metrolink line is envisioned connecting the City Centre to Dublin Airport. In a second phase, this project may be extended south, replacing much of the current Luas Green Line south of the city centre.

- Further Luas lines are contemplated, including a new line to Liffey Valley and Lucan, an extension of the Green Line to Bray, an extension of the Luas Cross City to Finglas, and an extension of the Red Line to Poolbeg.
- High frequency DART service is expected to grow with the addition of western lines, to Dunboyne, Maynooth and Celbridge.

The bus network redesign study has been guided by these ideas, with the goal of moving the redesigned bus network in the direction they indicate. However, new considerations arising in this study have also suggested refinements to the details of the core bus services

Figure 27: BusConnects includes improvements to bus corridors, fare and ticketing systems, bus stops and vehicles, and park and ride facilities, portrayed in the graphic below.



Figure 28: Map showing Dublin-area public transport infrastructure improvements targeted for 2027. These include significant upgrades to all the radial Core Bus Corridors; Metrolink from the Airport to Cherrywood, DART extensions to Dunboyne, Maynooth and Celbridge; and potential Luas extensions to Finglas, Lucan and Bray.



Strategic Choices

Starting in late 2016, the NTA, Dublin Bus and consultant team embarked on a comprehensive analysis of the existing public transport network. This analysis was detailed in the Choices Report, released in June 2017. The content of the Choices Report is reflected in Chapters 1 to 5 of this report. The Choices Report presented four key strategies for updating Dublin’s bus network.

- Standardize bus service into clear categories based on frequency.
- Simplify radial service into very frequent cross-city spines.
- Build more frequent orbitals, in some cases replacing infrequent radial service with frequent orbital service.
- Replace infrequent radial routes with frequent local service to major suburban centres.

These strategies were overwhelmingly approved in an initial public consultation (see Chapter 6), providing the NTA with a mandate to proceed with developing a network proposal.

Initial Network Proposal

In July 2018, the NTA released a proposal for the complete redesign of the bus network. This proposal was developed collaboratively by the NTA, Dublin Bus, local councils and the consultant team.

The proposed redesign reflected the four strategies, and a major expansion of evening and weekend service. The proposed network was designed to provide significant improvements in travel times for the majority of residents, while also requiring more interchange. Public consultation revealed significant public concerns; some of the most cited included:

- Concern about the higher level of interchange in general, the quality of interchange facilities, and the need for many to interchange to travel to or from the City Centre.
- Concern about whether proposed peak services would provide sufficient passenger capacity to avoid overcrowding.
- Concern about the impact of network changes on populations such as schoolchildren, the elderly, as well as people with mobility impairments or intellectual disabilities.
- Concerns about crowding on Luas and rail services, and its impact on the viability of certain required interchanges.

Revised Network Proposal

In a series of design workshops held over Autumn 2018 and Winter 2019, the NTA, Dublin Bus and consultant team have made significant revisions to the network proposal. The goal of these revisions has been two-fold:

- Maintain and expand the significant access and travel time gains made possible by restructuring the bus network.
- Address as many public comments and concerns as possible. This includes numerous changes to the network: all but eight of about 100 proposed routes have been revised in some form.

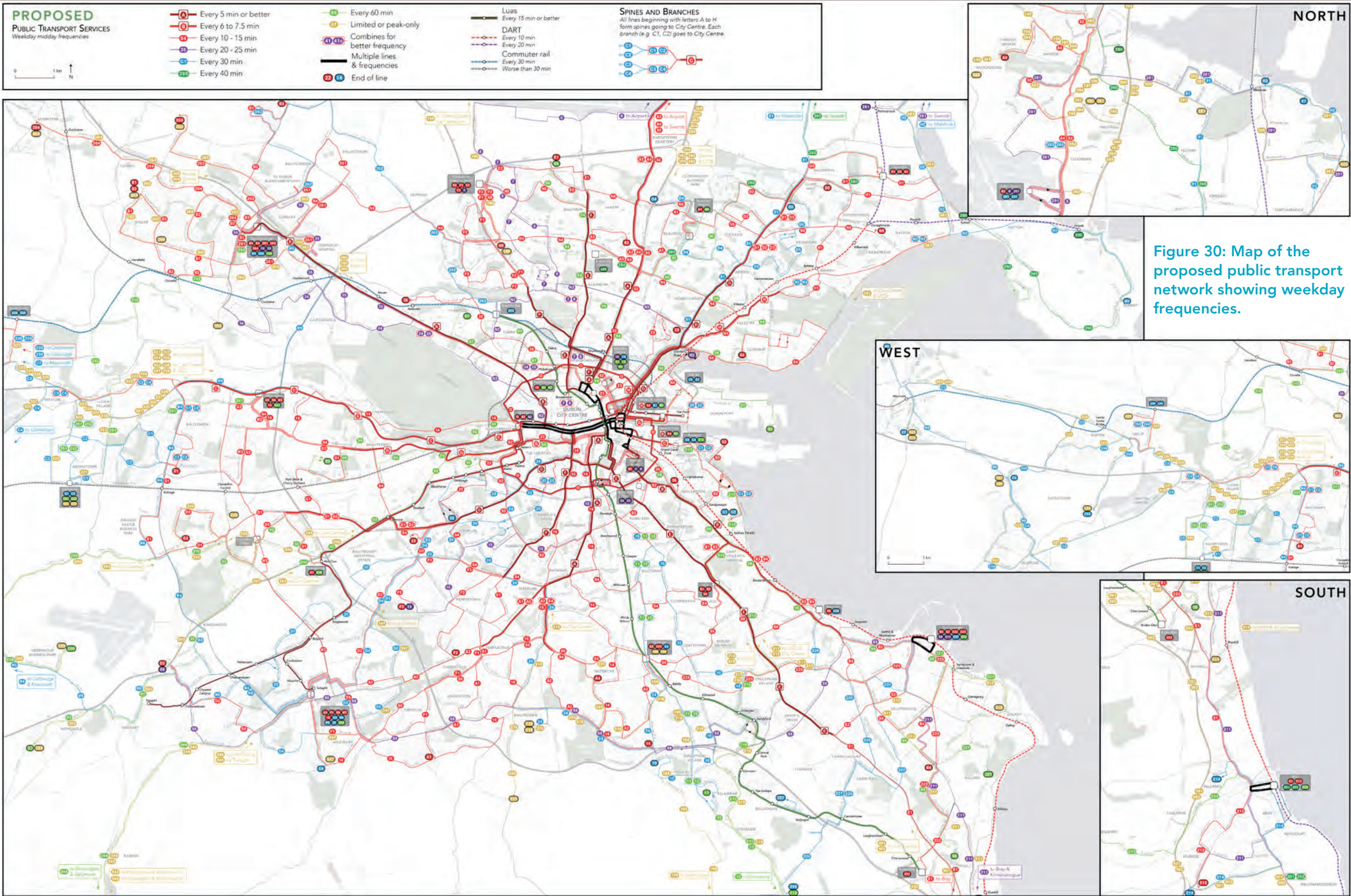
Addressing many of these concerns required increasing the total level of service provided. The revised network proposal includes approximately 22% more bus service (on an annual basis) than is provided today, which would be over 50% more than what was provided at the start of this study, in 2016 (see table below and Chapter 7, page 90 for details).

The following page shows a big-picture representation of the proposed network over most of the Dublin area. The full set of revisions to the network is described in Chapter 6. The full revised network proposal is described with detailed maps, tables and text in Chapter 7 of this report.

Figure 29: The table below shows existing levels of bus service in Dublin as of 2016 and 2019, and compares those to proposed levels of bus service in the initial and revised network proposals.

	Existing Service		Proposed Network	
	2016	2019	Initial	Revised
In-Service Kilometres	47.6 mln.	54.4 mln. + 14%	55.1 mln. + 16%	64.3 mln. + 35%
In-Service Hours	3.03 mln.	3.78 mln. + 25%	3.86 mln. + 27%	4.61 mln. + 52%

Revised Proposed Network: Big Picture



2

The Geometry of Useful Public Transport

Patronage Arises from Usefulness

The Dublin Area Bus Network Redesign intends to produce a bus network that can achieve significantly increased patronage over time, and increases the overall regional mode share for public transport and other sustainable transport modes.

Patronage is an important goal for many reasons other than fare revenue. It measures how many people benefit from the service, and how effective it is at providing alternatives to the private car.

Public transport patronage arises from service that is useful to as many people as possible, for as many trips as possible. There are some geometric facts about how networks do this, which this chapter briefly reviews.

A helpful way to illustrate the usefulness of public transport is to look at a map of where one could get to, from a particular point, on public transport plus walking. This type of map, called an isochrone (see below), is a simple example.

From a given starting point, the map shows a shape that includes all the places someone could be in 30, 45, or 60 minutes, by walking, waiting and using public transport.

A bigger shape means on the map means it's possible to reach more places in a reasonable amount of time, which means people are more likely to find public transport useful for more purposes. We can roughly measure the level of usefulness of the service not just by the size of the shape but by looking at how many useful destinations – jobs, shopping, etc. – are inside each shape, and how that number grows or shrinks depending on the network design.

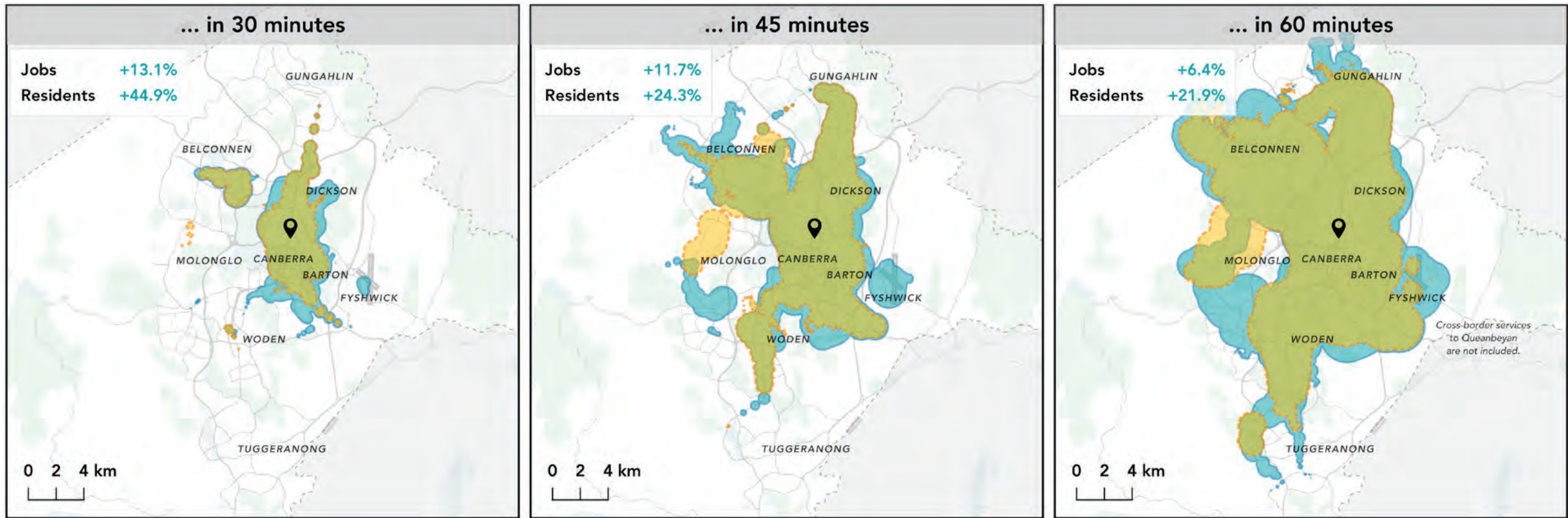
Beyond usefulness, these diagrams show the level of personal freedom afforded by the public transport network. The potential to expand personal freedom and opportunity is the foundation for the increases in patronage that a network design can achieve. This does not strictly predict patronage, because patronage also varies with many external factors including economic conditions, the costs of car ownership, petrol prices, and others.

Nonetheless, calculating freedom and opportunity in terms of the numbers of people, places and jobs that can be reached in a certain amount of time provides the foundation for why patronage might increase. And the result is true regardless of our assumptions about culture, behaviour or economics, whose effects are not reliably predictable.

To **maximise freedom and opportunity** for the greatest possible number of people, a public transport network must:

- deploy **frequent service**,
- with optimal **speed and reliability**,
- following **favourable patterns in the built environment**.

Figure 31: The maps below are examples of isochrones. They compare how far one can travel using an existing network (yellow) versus a proposed network (blue) in the indicated amount of time (30, 45 or 60 minutes). In this case the proposed network would increase the number of destinations reachable. As such, it's likely the proposed network will be more useful and attract higher patronage.



Why Frequency Comes First

Patronage is influenced by many service features, including speed and reliability, but the dominant factor is frequency. Frequency is the number of minutes between buses (or trains) on a route, which determines waiting time.

High frequency means public transport is coming soon, which means that it approximates the feeling of liberty you have with your private vehicle – namely that you can go anytime. Frequency has three independent benefits for the passenger:

- **Frequency reduces waiting**, which is everyone’s least favourite part of a trip. The basic sensation of being able to go when you want to go is the essence of frequency. A smartphone can tell you when the bus is coming, but it does not reduce the amount of time you are not on the move.
- **Frequency makes connections easy**, which makes it possible for a cluster of public transport routes to become a

network. A route without good connections is useful only for travel along that route. A network of frequent routes can make it easy to travel all over the city.

- **Frequency is a backup for some problems of reliability.** If a vehicle breaks down or is late, frequency means another will be along soon.

We can see the positive effect of frequency by looking at how existing services perform.

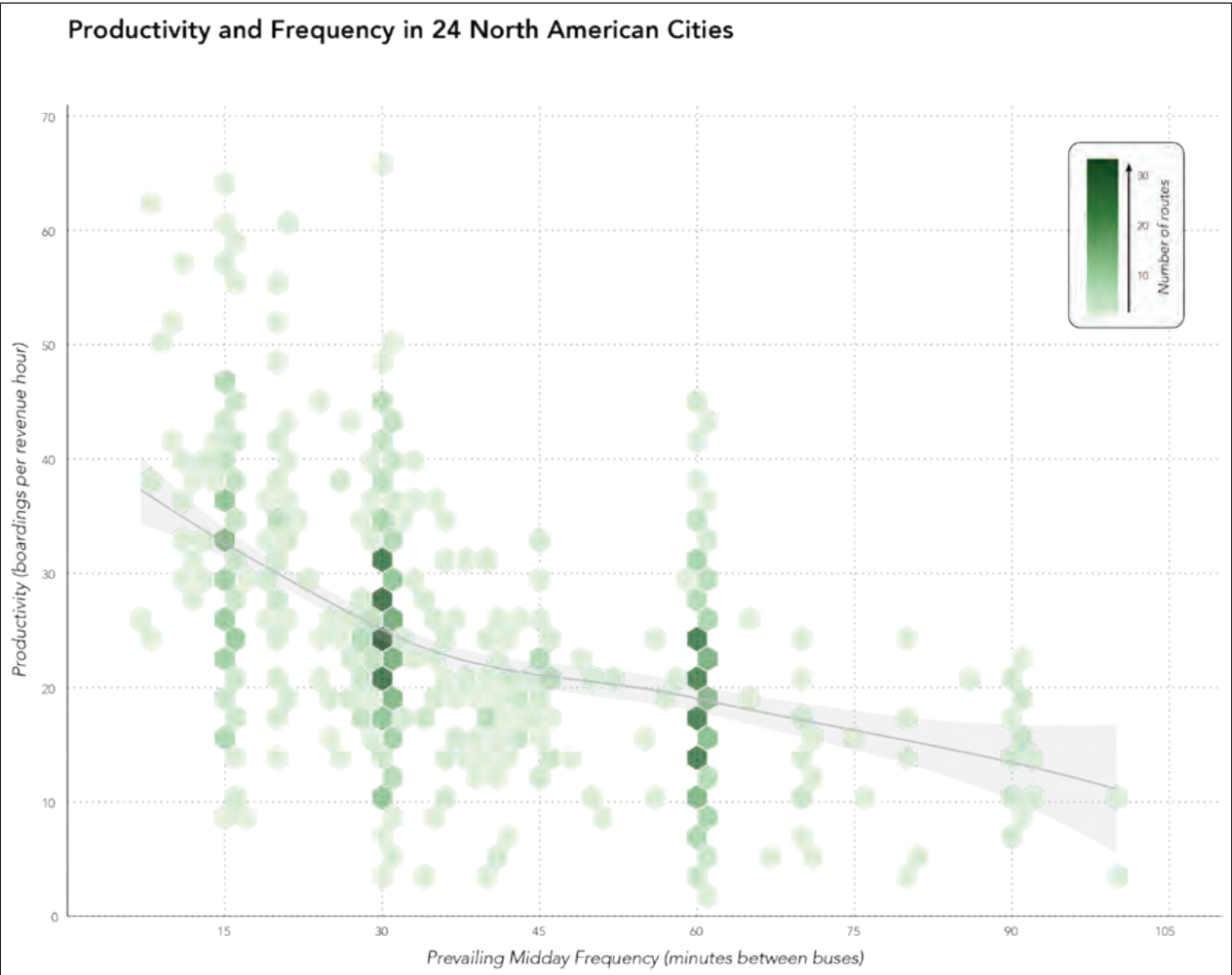
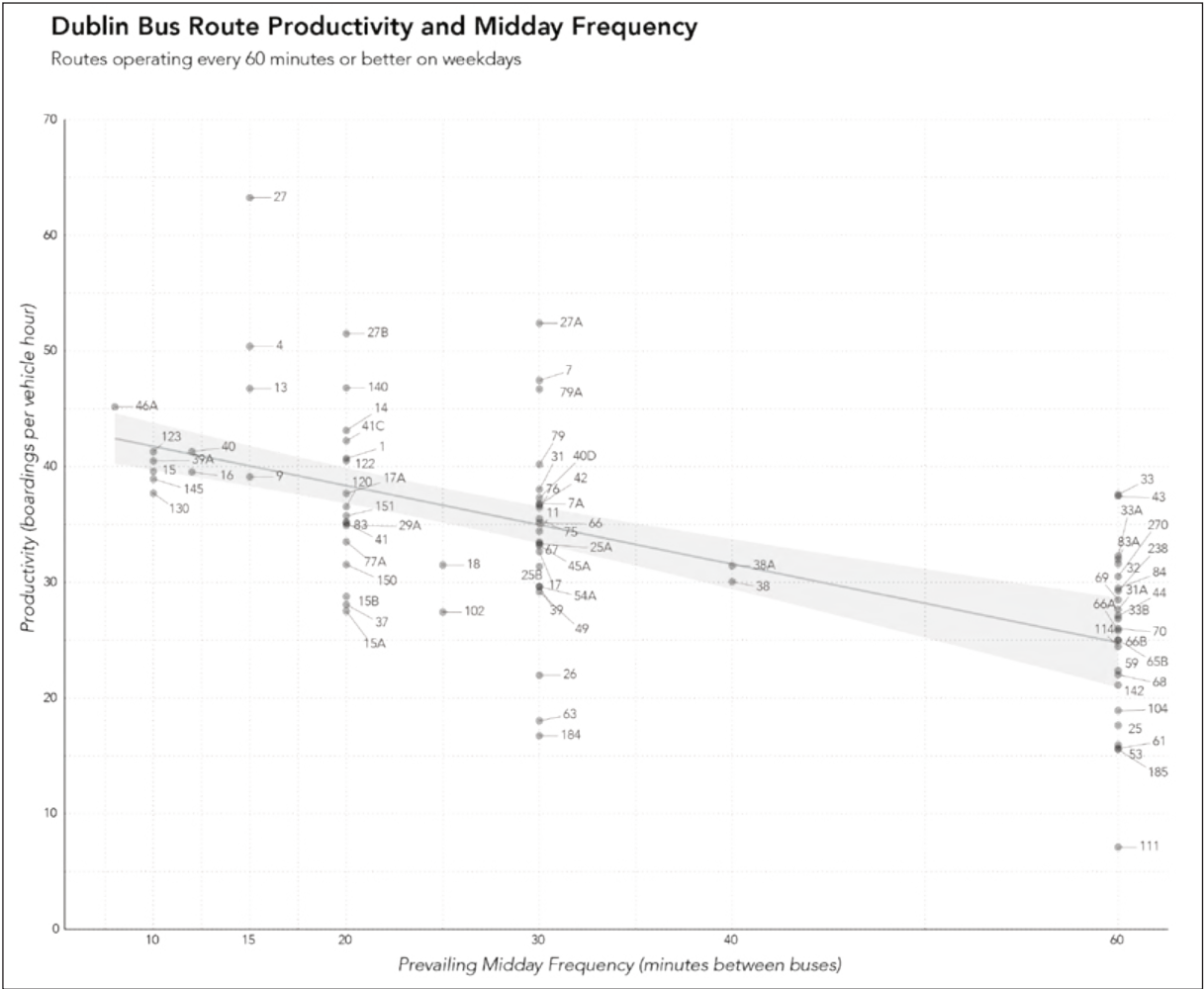
The graph below to the left shows a dot for each Dublin Bus route, with the x-axis indicating frequency and the y-axis indicating productivity (i.e. the number of bus boardings divided by the number of bus hours on the road). High frequency means a low elapsed time between consecutive trips, so it is shown to the left. The graph below to the right shows the same relationship for routes in 24 North American cities.

In both cases, **higher frequency is generally associated with higher productivity**. In other words, this is not a feature that is specific to Dublin or any particular place, but it is observable in a wide variety of cities.

The effect is slightly less obvious in the Dublin data. This is likely because many infrequent routes begin in more isolated areas and then join a main road to City Centre where service is overall very frequent. On the main road, people often take whichever bus comes first. As a result, there is less difference between frequent and infrequent routes than one might otherwise notice.

These graphs are more remarkable than they first look, because higher frequency means a higher quantity of service. So one might expect the curve to be flat or even descending as frequency increases. **This shows that higher frequency tends to deliver more patronage than would be expected just by the increase in service hours.**

Figure 32: The graphs below compare the frequency of bus routes to their productivity (number of people getting on the bus in the average hour of service). The graph on the left shows this relationship in Dublin, and the graph on the right shows the relationship in 24 other cities. In both cases, services that are more frequent are more productive, meaning they experience much higher patronage.



Note: darker shades of green indicate more routes, i.e. most routes at 30 minute frequencies in this sample of 24 cities have a productivity between 20 and 35 boardings per revenue hour. The grey line shows the midpoint at different frequencies.

Patronage Depends on the Built Environment

Service quantity and quality are necessary but not sufficient to create a high-patronage network. To achieve sustained high patronage while making efficient use of public resources, a public transport service must also focus on places that are geometrically favourable to its success.

The following factors are critical:

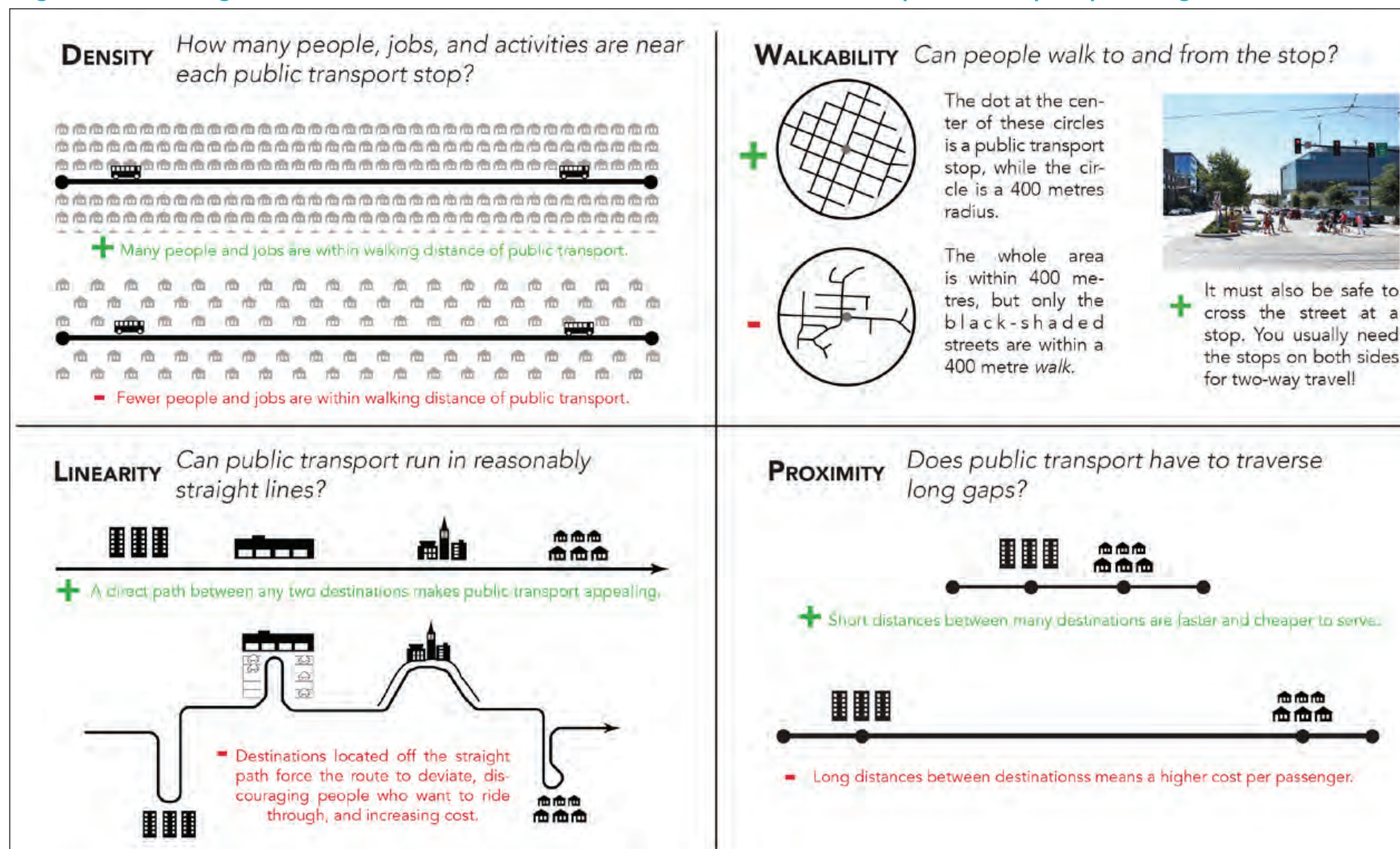
- **Density.** Density determines the number of people and destinations near any public transport stop, which is the primary determinant of how many people might possibly use the service.
- **Walkability.** If more people can safely and comfortably walk to a bus stop (and cross the street to access both directions of service), the service becomes useful to more people. This depends primarily on both the shape of the pedestrian network (are many connections available, making it easy to walk from place to place?). It also depends on the condition of the pedestrian network, including but not limited to the availability and quality of footpaths, lighting, and cross-walks.
- **Linearity.** Where a bus can reach major destinations by running in straight lines (rather than weaving into and out of various estates, shopping malls and other major destinations located off of main roads), bus service is faster and more efficient. It's also less frustrating for through-riders, whose journeys are otherwise delayed by each deviation.
- **Proximity/Continuity.** Where there are fewer gaps in demand, more people will use the service per hour and per kilometre of service provided.

The next pages show how these patterns operate in Dublin.

These geometric facts present us with potential conflict between goals, because the optimal way to maximise patronage could be to provide less service where the geometry is unfavourable.

However, in this study, we stipulate that all areas now covered will continue to be, though not necessarily on the same exact street or at the same exact stop. We have focused on maximising patronage within that constraint.

Figure 33: The diagrams below show how the built environment contributes to public transport patronage.



Note: Walkability and Linearity are both associated with **permeability**, the notion that direct travel paths are available through neighbourhoods.

- **Lack of pedestrian permeability reduces walkability.** If there are no walking paths connecting neighbouring estates, people must take longer walks to reach a public transport stop, reducing the area with access to that stop.
- **Lack of road network permeability impacts linearity of bus service.** To serve certain areas, buses are required to make long deviations in and out of cul-de-sacs.

Examples from Dublin: Density and Walkability

Because dense areas often support multiple land uses in close proximity, density and walkability often go hand in hand. The aerial imagery shown here contrasts two areas with very different density and walkability characteristics.

- **Higher density and walkability:** The vicinity of Drumcondra Station features a mix of terraced houses and apartment buildings, as well as small commercial and large institutional uses. The area is connected by a dense network of narrow streets and alleys that make it easy to walk to stops on Drumcondra Road from any point.
 - » This means that many people are likely to be present near any bus stop, and that it is likely to be a relatively short distance from any point to the nearest bus stop.
- **Lower density and walkability:** The area between Terenure and Rathfarnham village is dominated by semi-detached and detached houses, with almost no commercial uses present. The blocks are long, with relatively few street intersections, and the street network is bisected by the much wider floodplain of the River Dodder. This makes it relatively inconvenient to walk to Rathfarnham Road.
 - » This means that far fewer people are likely to be near any bus stop, and that walks from any point to the nearest bus stop are probably longer and more circuitous.

*Because of the inherent **density** and **walkability** of these two areas, any public transport service going through Drumcondra will attract higher patronage than a comparable service between Terenure and Rathfarnham, even if those two services operate at the same frequency, for the same hours, and serve all of the same other places.*

Figure 34: The aerial photo below shows the area around Drumcondra Station, which is dense and highly walkable.

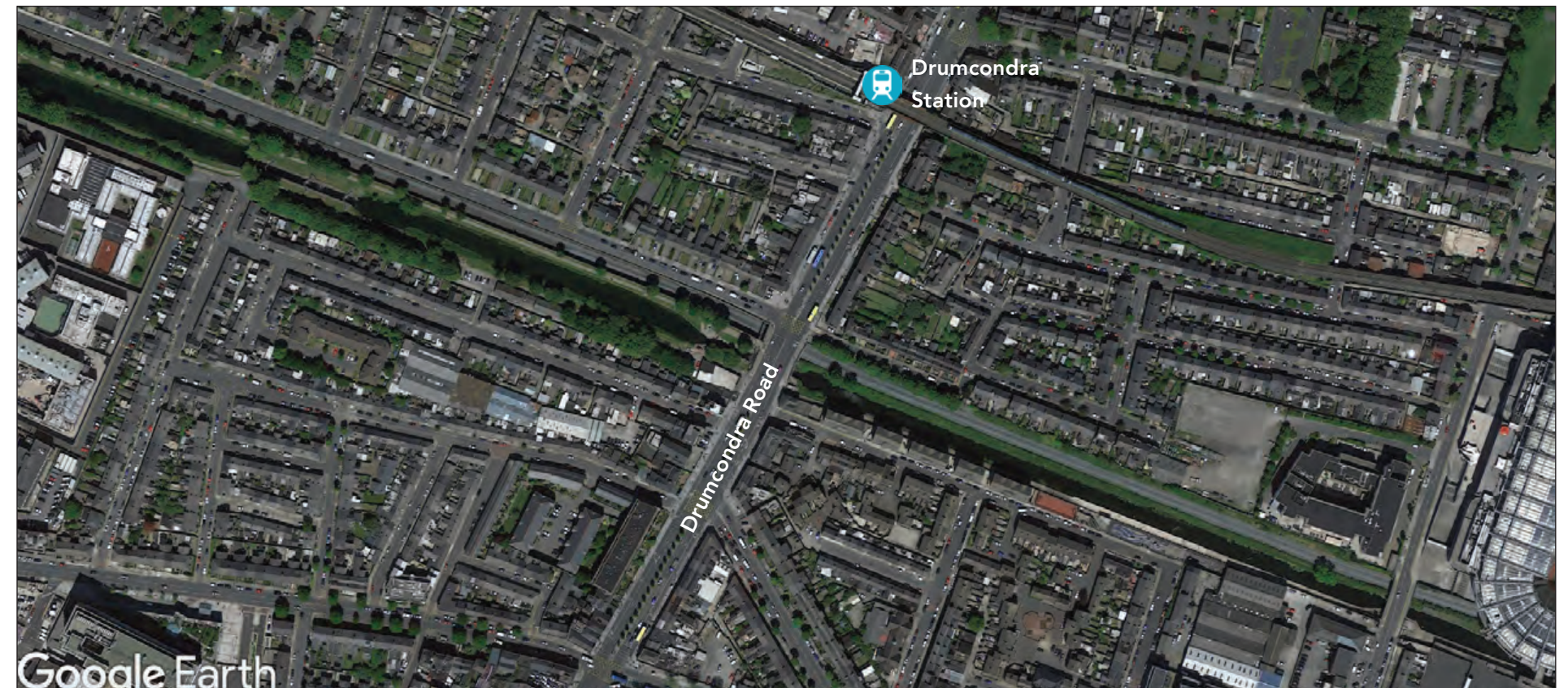


Figure 35: The aerial photo below shows the area between Terenure and Rathfarnham village, with relatively low density and limited walkability.



Examples from Dublin: Linearity

Because of differences in historic land use and road network decisions, some parts of Dublin are served by much more linear radial bus services than others. The following examples illustrate this:

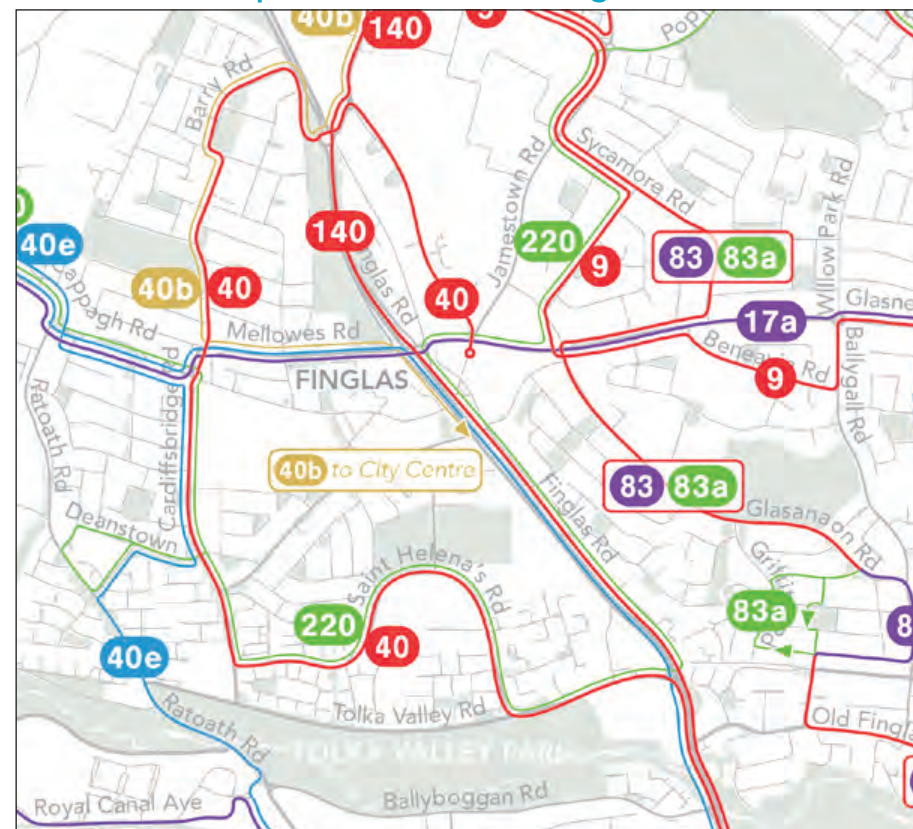
- **More Linearity:** southeast Dublin is served by long, straight radial roads and rail right-of-ways that allow for very linear service on corridors such as Merrion Road, Stillorgan Road, the Harcourt light rail right-of-way.
 - » This means it is possible to operate public transport services that are both fast and direct, and as a result are both convenient and cost-effective. And, in fact, the frequent Dublin Bus routes in this area (and the Luas Green Line as well) have some of the highest levels of patronage observed in Dublin.

Figure 36: In southeast Dublin, straight roads allows main bus routes to be linear while serving all neighbourhoods.



- **Less Linearity:** the vicinity of Finglas is much more complicated to serve with public transport, due to the geometric facts of the road network and development pattern.
 - » The configuration of the N2 as the Finglas Bypass means that the most direct radial path skips past the area's central destination at Finglas Village. This means any route that focuses primarily on serving the bypass will be fast, but less accessible, like Route 140 today.
 - » Finglas has developed into neighbourhoods oriented away from the bypass. Serving each one of these neighbourhoods requires reaching off of the bypass to the local network of secondary roads.
 - » This means any route that tries to solve the bypass problem by entering the neighbourhoods is confined to a slower and far more circuitous path, as Route 40 is today.

Figure 37: In Finglas, the road network forces bus routes off the most direct path to serve each neighbourhood.



Because of the linearity of the arterial street network, any radial bus route in southeast Dublin is likely to be relatively direct and conveniently accessible.

In Finglas, however, the most direct path to the city centre is taken by the pedestrian-unfriendly Finglas Bypass. This means Finglas' main radial bus routes are constrained to operate on circuitous paths through neighbourhoods, or to skip many important places to go fast on the bypass..

As a result, achieving an equivalent level of service will always require more resources in Finglas than in southeast Dublin.

Examples from Dublin: Proximity/Continuity

Whereas certain travel corridors in Dublin are continuously developed and generate demand throughout, others force public transport to traverse large gaps of lower demand. The following examples illustrate this:

- **More Continuity:** Based on the measured number of week-day bus boardings, the Malahide Road exhibits a steady level of demand from Fairview to Clare Hall Road. Few of the areas in this corridor have extremely high demand, but there is consistent and significant demand throughout.

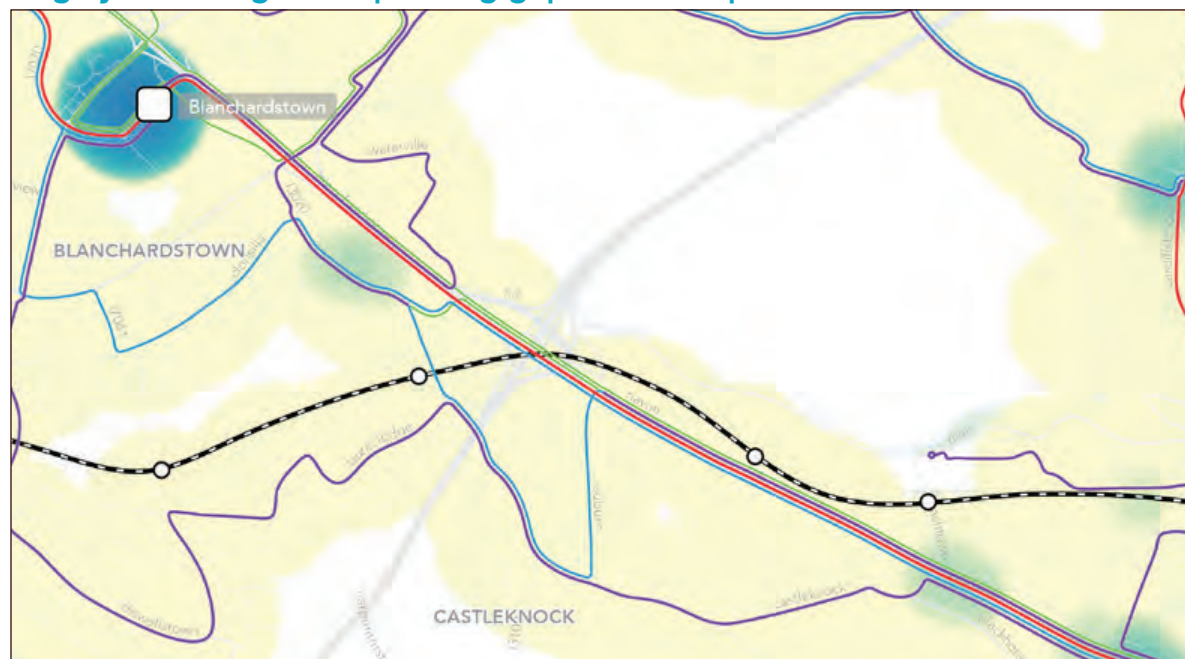
Figure 38: The blue dots indicate continuous demand along Malahide Road, based on a count of bus boardings.



Because of the continuous development and steady demand throughout the corridor, any bus route on the Malahide Road will serve a higher number of boardings per kilometre than a comparable service on Navan Road, which connects high-demand centres through a long area of low demand.

- **Less Continuity:** On the other hand, the Navan Road corridor connects strong anchor points with extremely high demand (city centre and Blanchardstown Shopping Centre), but the local development pattern between those two (low-density residential neighbourhoods that don't extend far from the main road, and far more empty land) means that bus routes traverse long stretches with weak demand in between.

Figure 39: The same measure shows long gaps in demand along Navan Road, largely reflecting corresponding gaps in development.



An effective network planning effort cannot simply be data-driven. As we explore the data over the next chapters, it is important to remain mindful of the purely geometric facts about public transport.

For example, frequency and speed on each segment of the network determines the degree of freedom and opportunity a person in a particular place will experience, and it does so based on purely geometric calculations.

In addition, measures of the built environment such as density, walkability, linearity and proximity are also geometric facts that determine the efficiency with which public transport can provide useful service.

It is always helpful, when thinking about public transport, to distinguish purely geometric facts – which are true always and everywhere – from data-driven arguments about human behaviour that constitute most measurements of public transport outcomes.

Rich data is essential for planning, but observations derived from data are always less certain, and more debatable, than geometric facts. Our focus on geometry in this report is intended to help people see what cannot be changed, so that they can have clearer conversations about what can.

3

Patterns of Demand

Chapter 2 of this report observed some geometric facts about how and where public transport can provide useful service to many people, efficiently. This chapter looks at Dublin’s development pattern and demographics in greater detail.

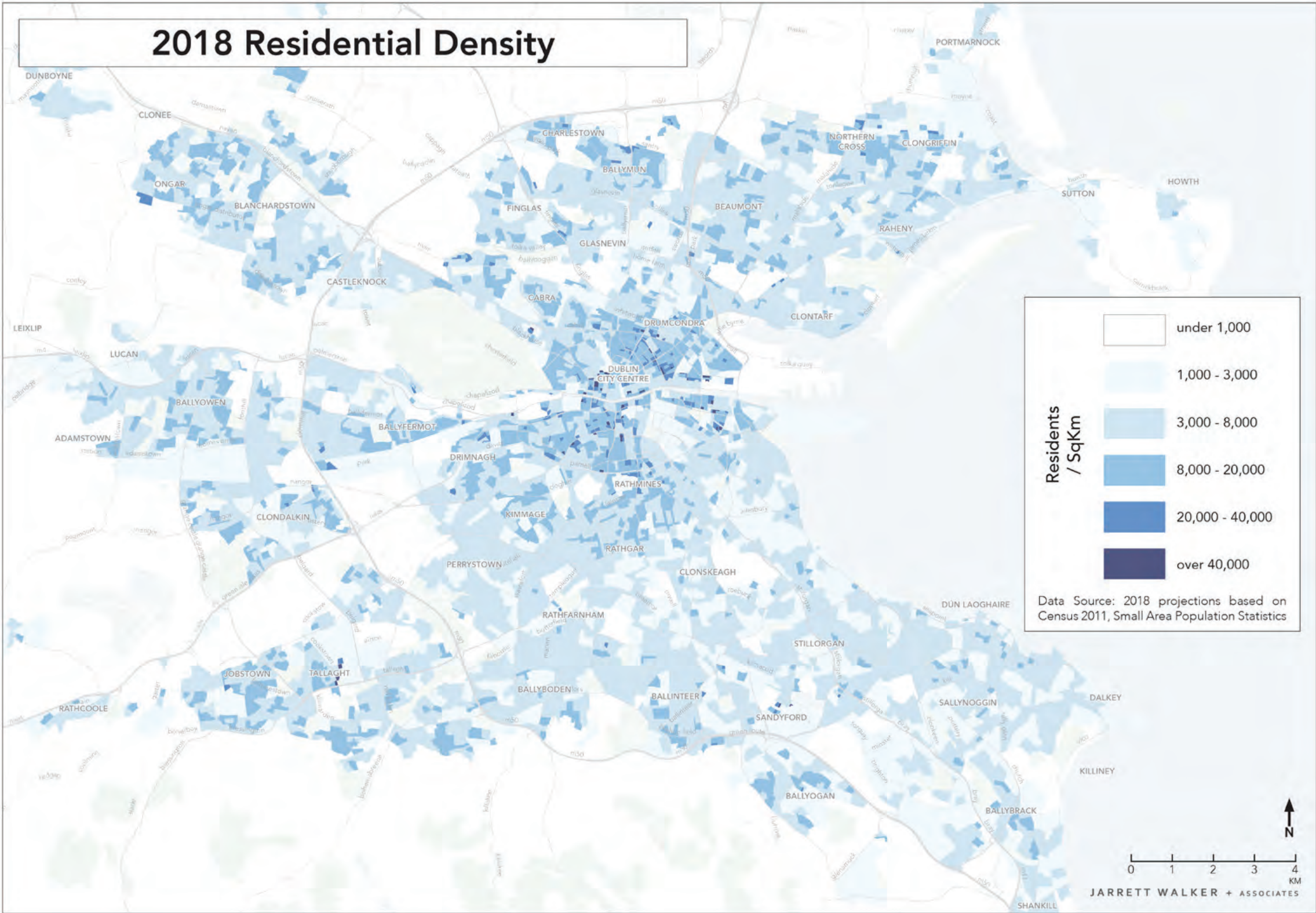
Residential Population Density

As we observed previously, density determines how many people or jobs are within walking distance of any public transport stop. As a result, density is the most critical first-order measure of patronage potential.

The adjacent map of residential population density shows the number of people per square kilometre residing in different parts of Dublin¹. It is based on the Census Small Area data, projected to expected population in 2018. All other things being equal, the higher the number, the higher the likely demand for public transport.

Note that maps such as this one are sometimes distorted by the shapes and patterns of zones used in the Census Small Area data. For example, if a dense area happens to share a zone with a low-density or empty area, the high-density area may not appear because we see only the average area of the entire zone. This is an important caution in interpreting all of these demographic maps.

Figure 40: Map of residential population density in Dublin (2018 projection) by Census Small Area.



¹ Due to space constraints, the demographic maps in this chapter focus specifically on the area bounded by the Airport to the north, Shankill to the south, Lucan to the west, and the Howth peninsula to the east. This covers the vast majority of the population and jobs in the Dublin metropolitan area, but not its totality. However, in designing the proposed network, we considered the demographics of all areas served by the public bus network beyond this map extent.

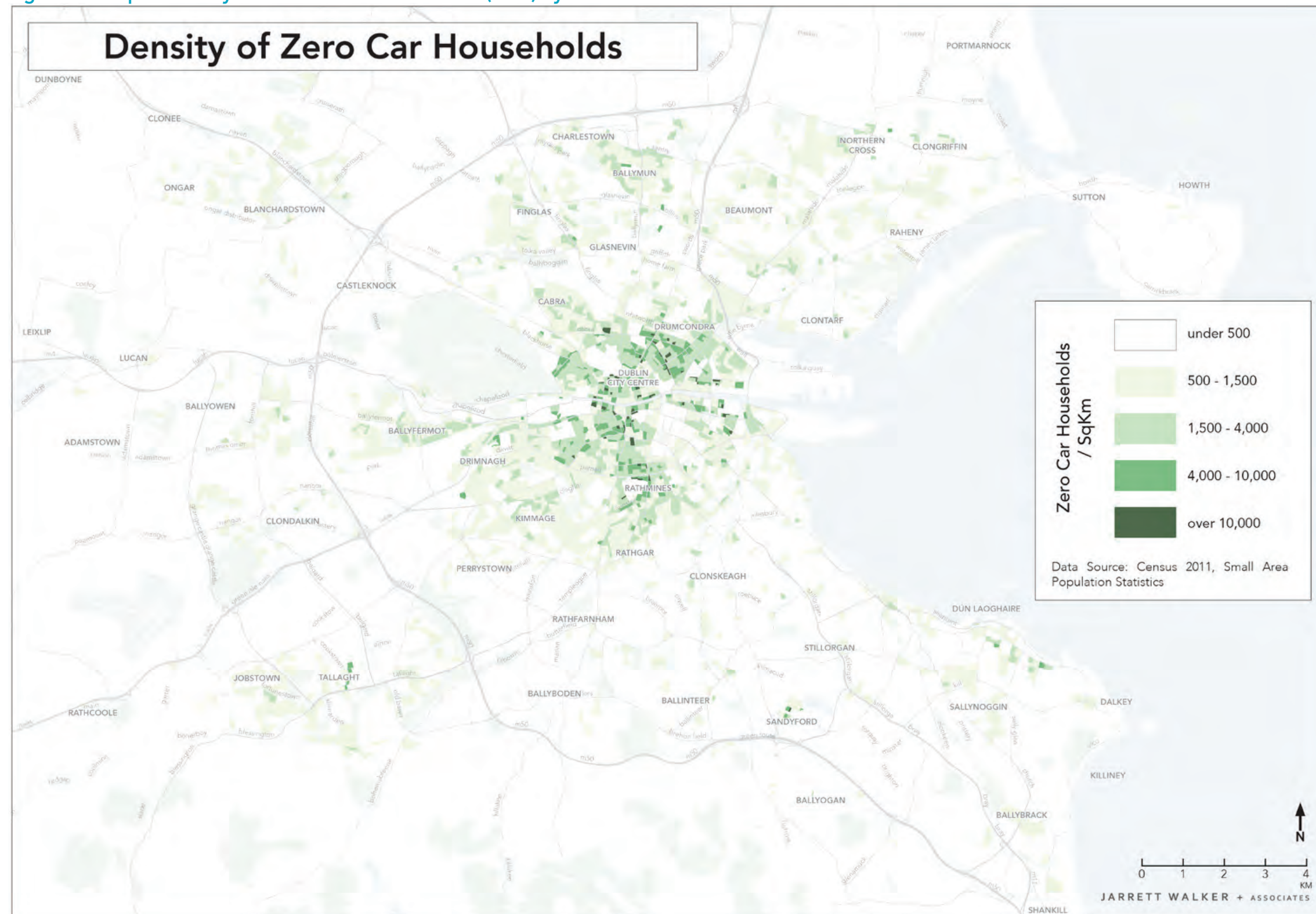
Density of Households with No Vehicles

People with less access to a private car are less likely to rely on a private car for their daily travels, and more likely to rely on public transport.

This is true of anyone living in a household with fewer vehicles than adults, but even more so in households that own no vehicles at all.

The adjacent map shows the density of those with the least access to a car. Although there is clearly a higher concentration of such households in and near the city centre, certain suburban areas also figure prominently such as Ballymun, Finglas, Ballyfermot, and parts of Tallaght and Dun Laoghaire.

Figure 41: Map of density of households without a car (2011) by Census Small Area.



Household Deprivation Index

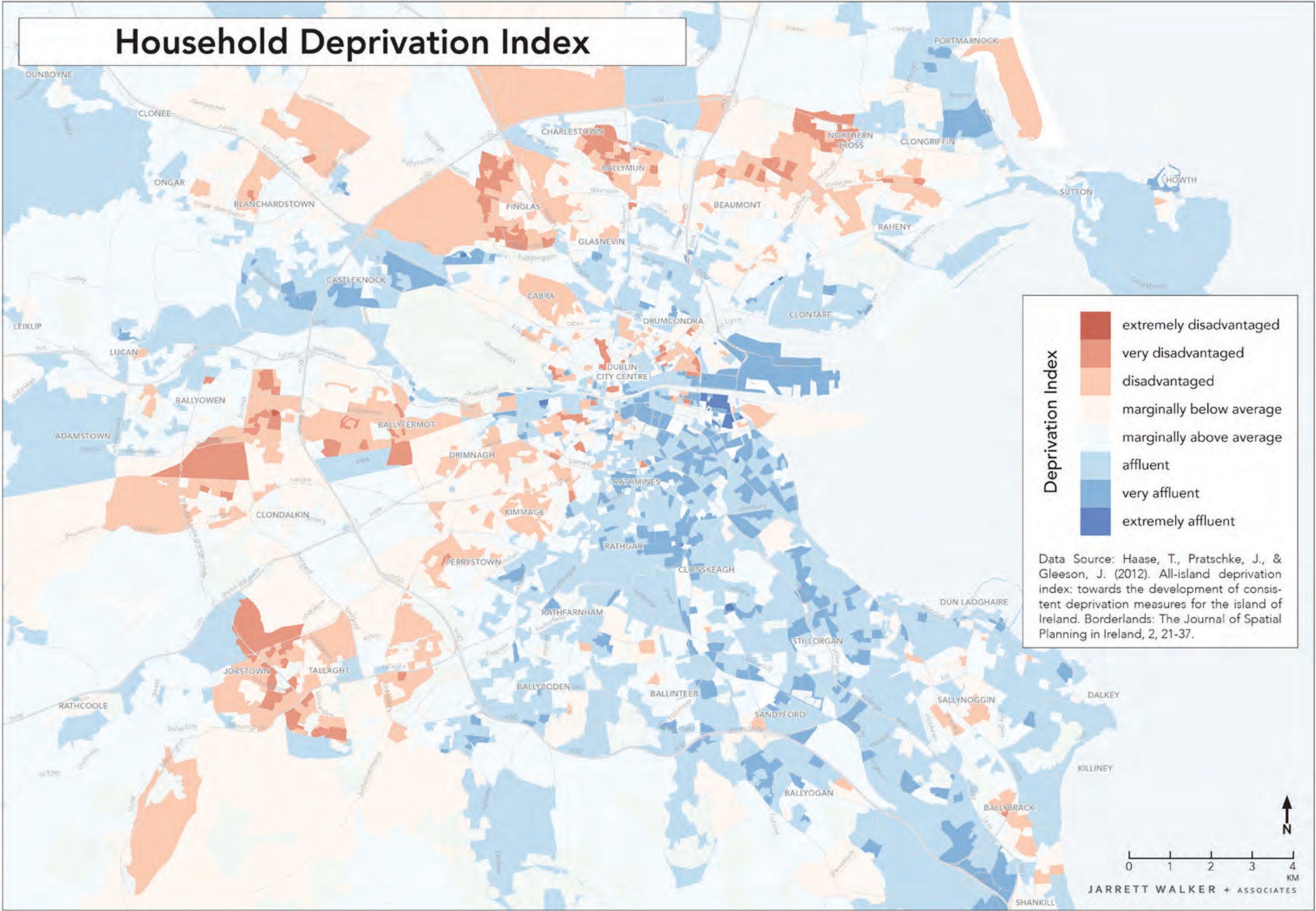
The adjacent map shows a measure of average level of deprivation in different parts of Dublin, or the degree to which poverty is present.

Unlike the other maps in this chapter, this data is available to us as a rate, rather than a density. Zones that show up here as having high deprivation may have few people, so the effect may be exaggerated.

Deprivation is at best a marginal indicator of public transport demand, with significantly less power to predict patronage than other factors presented in this report. However, deprivation does suggest areas where public transport service is more important in meeting people's basic needs.

In suburban areas, deprivation is correlated with relatively low vehicle ownership (e.g. Ballymun, Darndale, Jobstown, parts of Finglas). This is less the case in areas that are more central, dense and walkable, where people of many levels of income and wealth choose not to own a car.

Figure 42: Map of household deprivation by Census Small Area, based on an index of several Census measures.



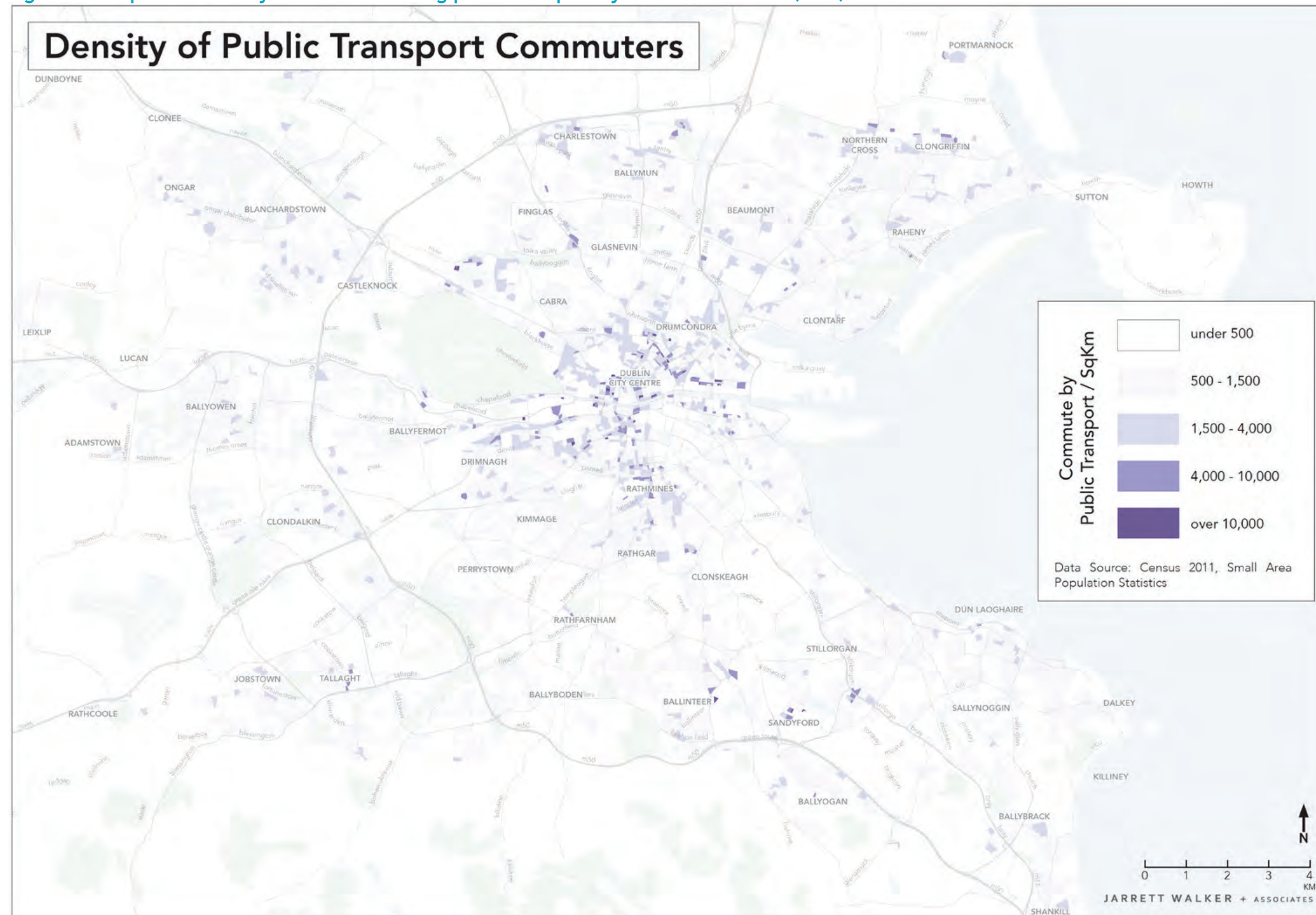
Density of Public Transport Commuters

This map shows the density of persons who indicated that they commute to work by public transport in response to Census 2011.

Although existing commute behaviour can be a good indicator of demand for public transport service, this data should not be construed as an absolute measurement of public transport use, for a variety of reasons:

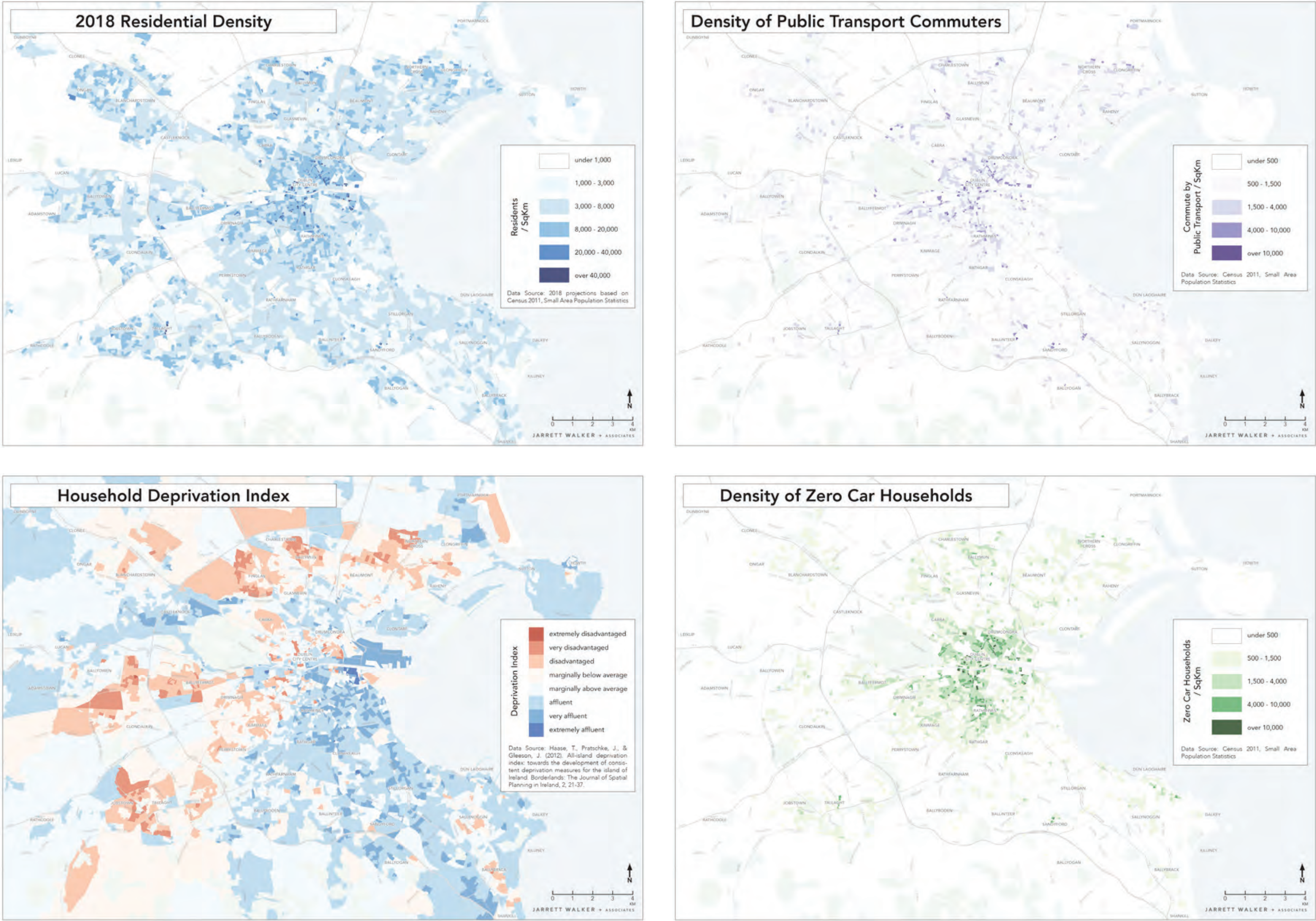
- This map shows only the home end of work commute trips: the commuters captured by this data are all headed to work somewhere else, and will also generate demand there.
- The journey to work is only one of the average person's daily trips, and not everyone takes this trip. Commute-related trips may be as few as 20% of total trips.
- Many people combine their commute with a variety of different purposes such as shopping, appointments, socializing, school, and many others. Public transport can be useful for all of these.
- Existing public transport riders are people for whom the existing network works well. There may be others for whom public transport could be a viable option if the network were different.

Figure 43: Map of the density of commuters using public transport by Census Small Area (2011).



Where there are more people, there is higher demand – Part 1

Figure 44: Comparing the four maps presented shows us that sheer residential density is the strongest indicator of the density of public transport commuters in Dublin. In other words, how many people there are near a bus stop matters more than the details of their situations.



Identifying Regional Centres of Demand

Employment and Student Enrolment Density

The measures we have examined so far focus on the location of people’s residences.

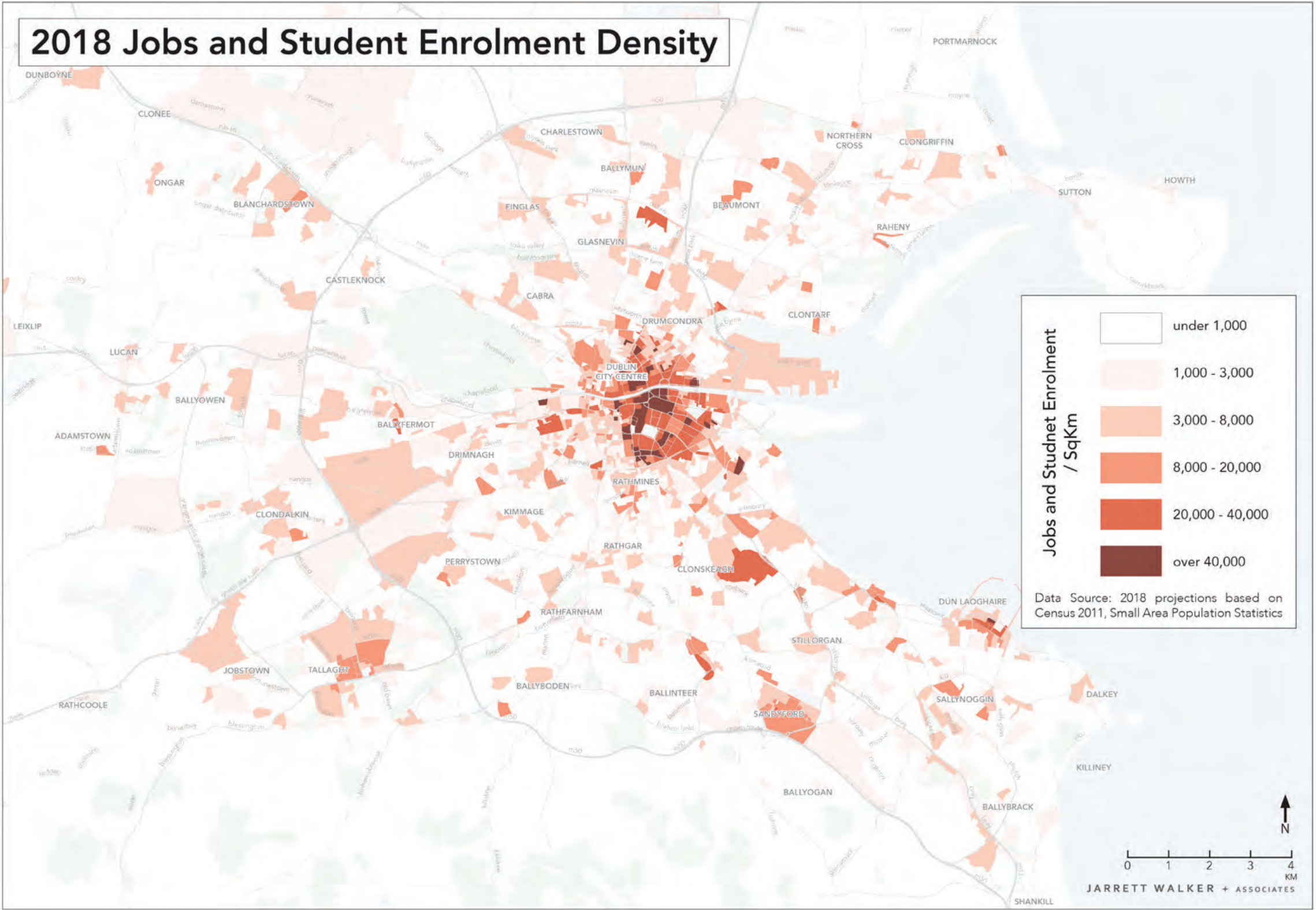
From a transport perspective, this means we have only examined the beginning and end of everyone’s day. To understand what is happening in the middle of the day, it is useful to map the density of jobs and student enrolment, as we have done in the adjacent map.

This map shows that locations of employment and student enrolment are much more geographically concentrated than people’s residences.

The greatest concentration of employment by far is found in the city centre. Nonetheless, there are strong suburban centres at Dun Laoghaire, Sandyford, Dundrum, Tallaght, and (beyond this map) at Dublin Airport and Swords.

Concentrations of students identify all the major universities throughout the Dublin area, but especially Trinity College, University College Dublin (UCD), Dublin City University (DCU), and (beyond this map) Maynooth University².

Figure 45: Map of the density of jobs and student enrolment (2018 projection) by Census Small Area.



² Note that the consolidation of several TU Dublin (formerly the Dublin Institute of Technology) campuses at Grangegorman may not be fully reflected in these data.

Combined Activity Density

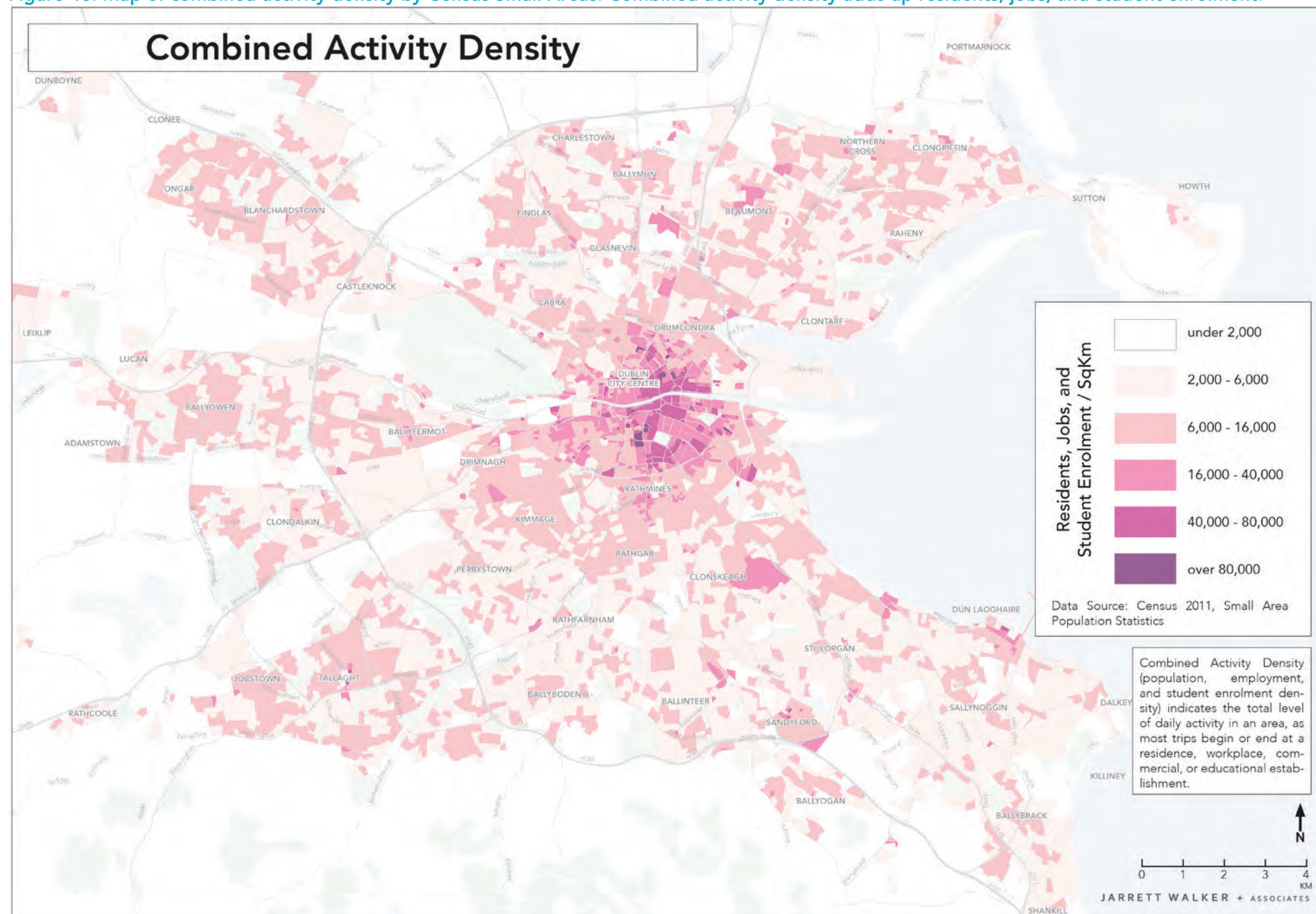
The adjacent map combines residential, employment, and student enrolment densities to approximate the total effect of all densities in representing potential demand for public transport.

Because they are so much more concentrated than residences, centres of employment and student enrolment dominate this map.

Note that employment density is also a proxy for many non-commute trips. Retail jobs, for example, also imply customers.

In the end, public transport is useful because it connects places where people live to places where people do other activities. So while residential density is less prominent in this image, it remains a critical element of the best public transport markets.

Figure 46: Map of combined activity density by Census Small Areas. Combined activity density adds up residents, jobs, and student enrolment.

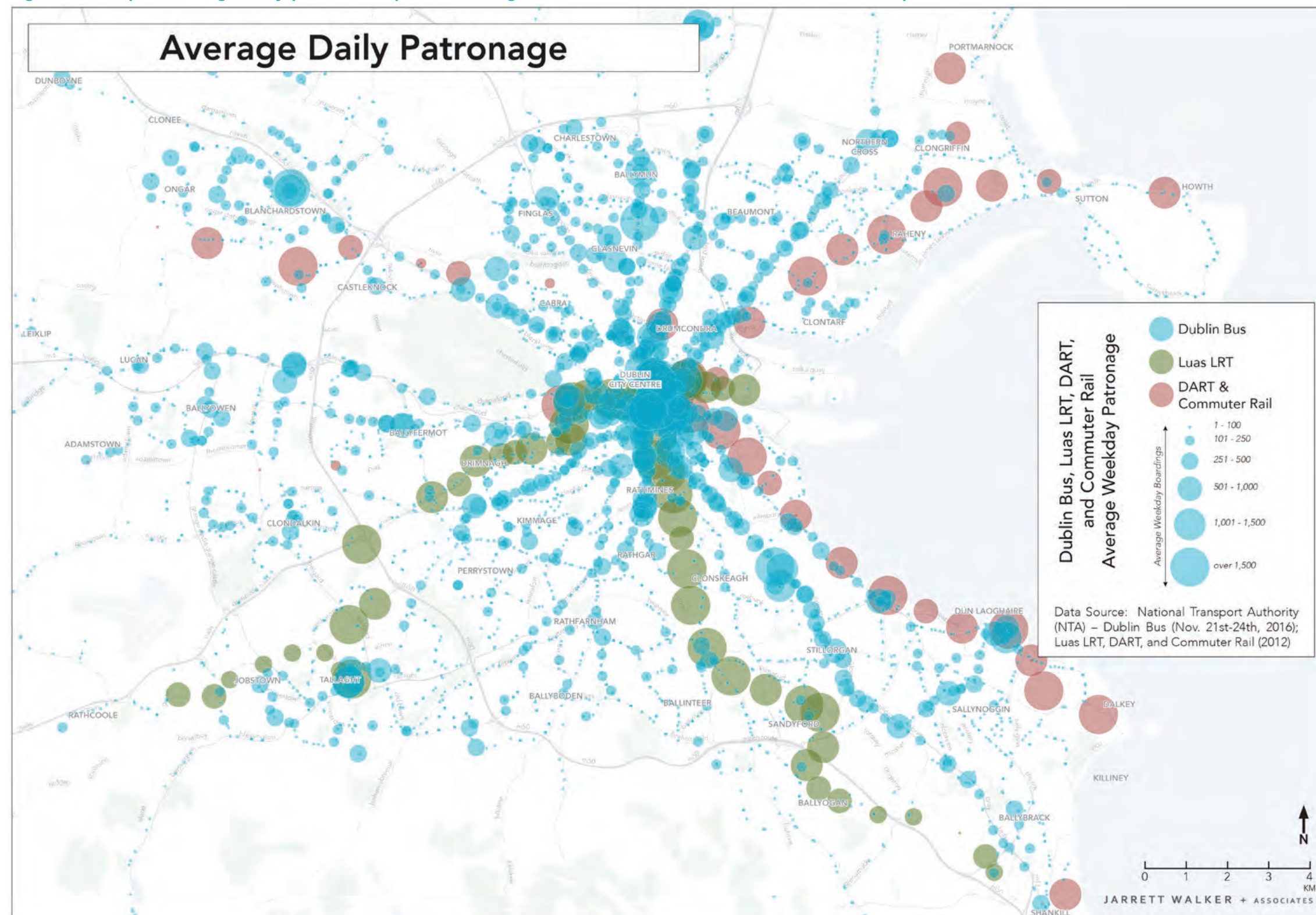


Observed Demand – Weekday Boardings on Public Transport

The adjacent map shows observed average 2016 weekday patronage at every public transport stop in Dublin, including locations served by Dublin Bus, Luas, DART and Commuter Rail.

Larger dots on this map are indicative of location where more people board buses and trains. The highest boarding locations tend to be in the City Centre, near major universities (UCD, DCU), and at DART and Luas (especially Green Line) stops.

Figure 47: Map of average daily public transport boardings at bus, Luas, DART and Commuter Rail stops (2016).



Observed Demand – Bus Patronage Heatmap

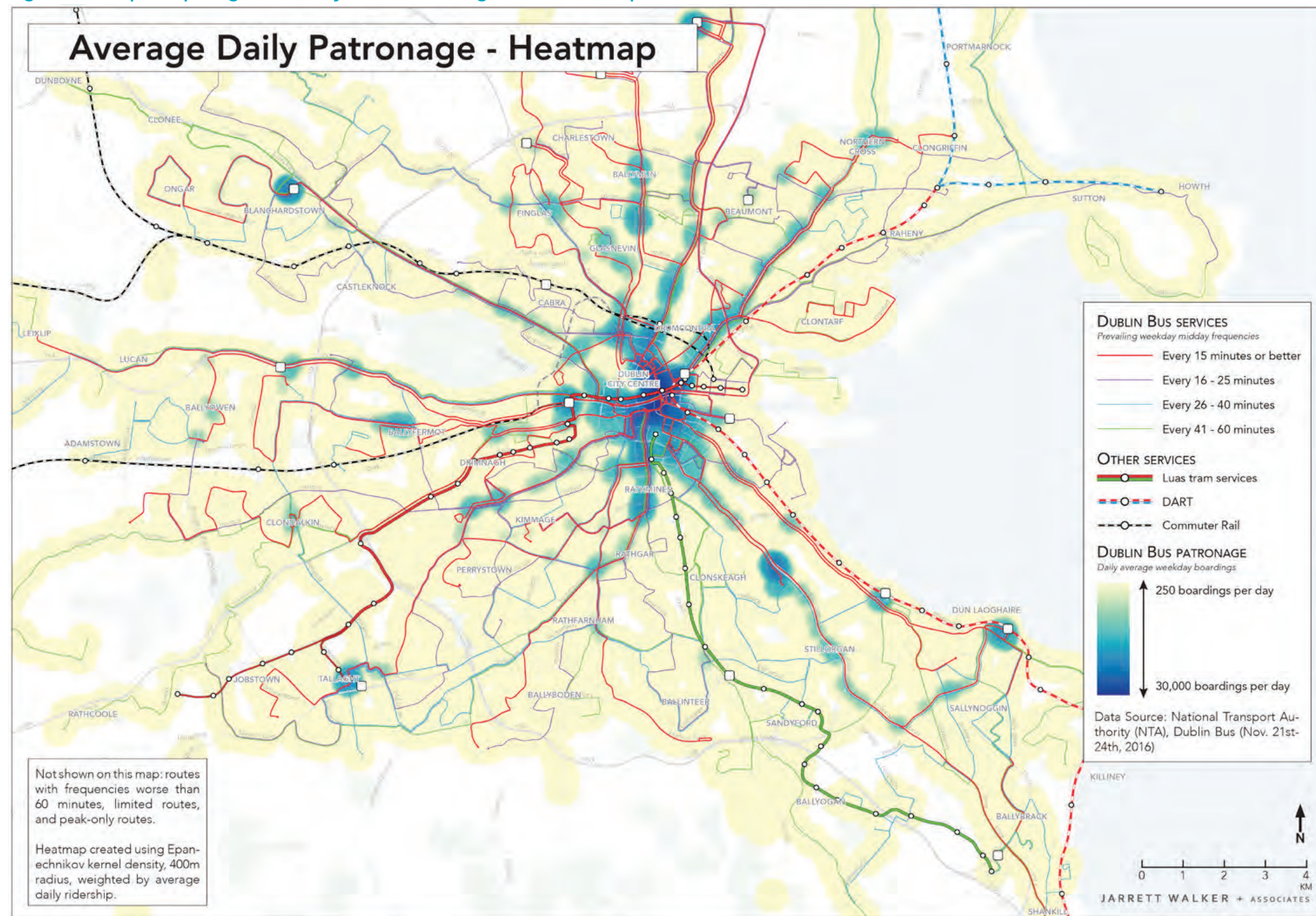
The map on the previous page, showing bus boardings by exact location, is useful for detailed planning but not ideal for seeing a bigger picture.

To show the patterns of patronage more vividly, and remove distractions arising from the number and scale of stop-by-stop dots, we can show the same data as a heatmap, as in the adjacent map

Heatmaps aggregate stop-level data by showing the number of boardings in each unit of area. As a result, the larger geographical patterns of patronage become clear. The heatmap also enables us to make a direct comparison between observed demand and combined activity density, as is done on the following page.

This map also shows the routes of the existing bus network according to their typical frequencies in the middle of the day. The data show the extent to which existing patronage is driven both by frequency of service and density of demand.

Figure 48: Map comparing the density of bus boardings to the level of public transit service available.



Where there are more people, there is higher demand – Part 2

Comparing the activity density map to the bus boardings heatmap shows that the **patterns of observed demand for bus services are very close to the patterns of demand suggested by density.**

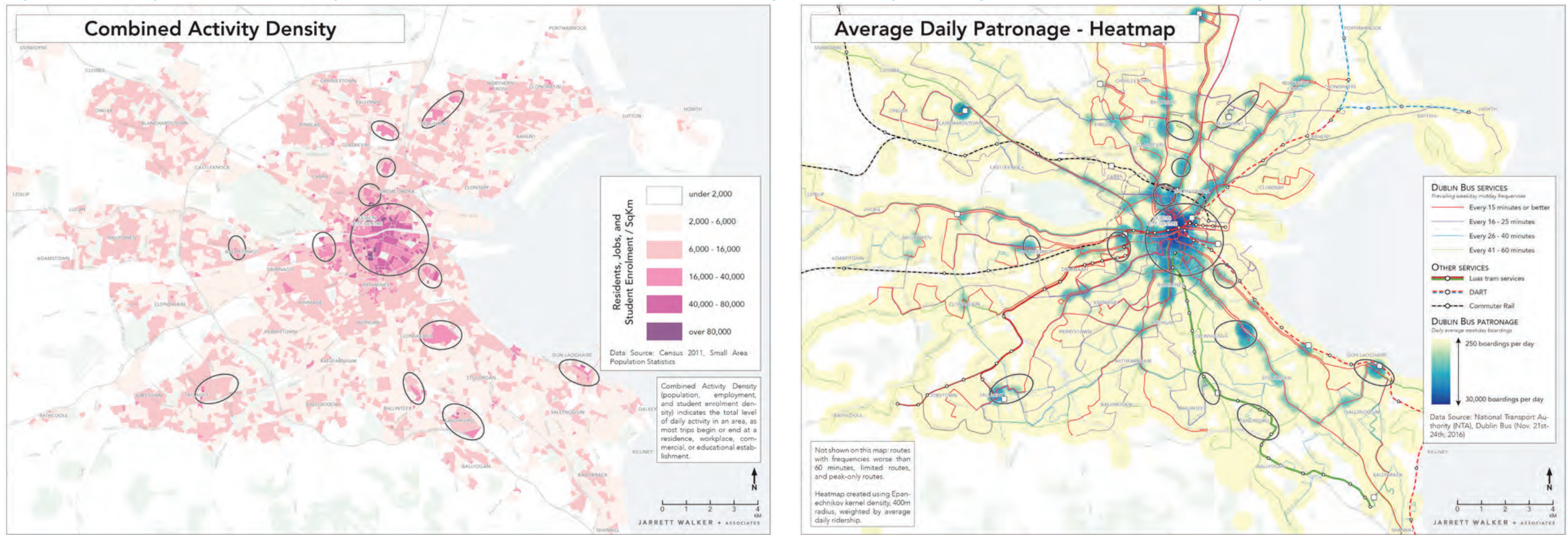
Note that the heatmap does not show patronage on the DART and Luas routes. This explains why certain major public transport boarding locations and known suburban centres around those corridors do not show up on the patronage heatmap, e.g. at Sandyford and Dundrum.

In general, though, the disparities between the two maps illustrate problems of linearity in the development pattern.

For example, Dublin City University's main campus generates patronage mostly 700m to the west of Ballymun Road. This reflects the fact that the campus faces onto an orbital road (Collins Ave) rather than a radial one, and the current service design does not emphasise frequent orbital service. As a result, the most frequent services, which are logically following linear radial corridors, skirt the far edges of the campus instead of passing the main gate.

Beaumont Hospital is a dramatic example of a major destination where public transport service is hampered by extremely poor permeability. Serving this location requires threading circuitous roads, and it is relatively isolated from other centres of demand. As a result, Beaumont Hospital has only medium-frequency services, and patronage is lower than the site's high employment density would suggest.

Figure 49: The map on the left shows the expected centres of demand based on combined density while the map on the right shows how the network attempts to meet that demand.



On weekdays, service is proportional to patronage

In Dublin, as in many cities, public transport patronage is strongest during the morning peak, when the school and work commutes occur simultaneously. Patronage then drops in the middle of the day, before rising again in mid-afternoon when schools let out.

The afternoon peak is both less intense and longer than the morning peak, as people leave schools, universities and work at different times, and then spend the afternoon and evening embarking on multiple trips to socialize, complete various errands, and return home.

This pattern expresses itself very clearly in daily patronage on Dublin Bus, as is shown in the chart below to the left. The charts below to the middle and right show that this pattern of peaking holds largely true on Luas and DART/Commuter Rail as well.

Although the pattern of peaks and troughs in demand throughout the day is not unique to Dublin, the intensity of both the morning and evening peaks is notable. The chart to the right shows us that existing Dublin Bus services ramp up considerably during these peaks to meet demand. Because peak-only service is expensive to provide, the service peak does not fully match the boardings peak.

Figure 50: This chart shows that bus service responds to the morning and afternoon patronage peaks with extra service.

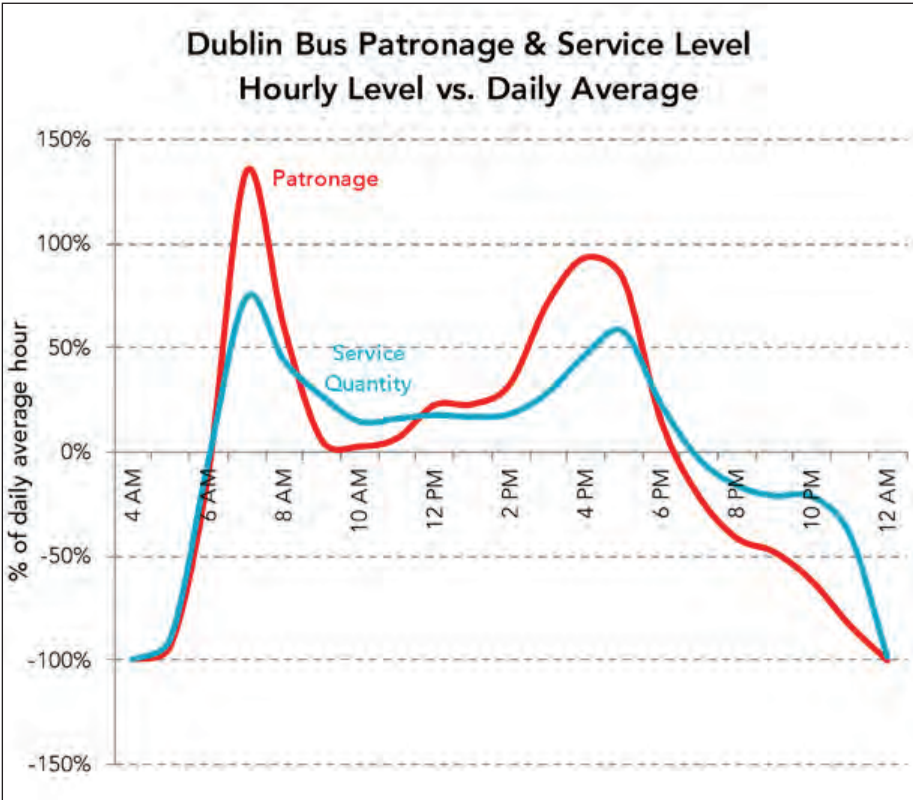


Figure 51: Chart of average daily patronage by hour for Dublin Bus (2016)

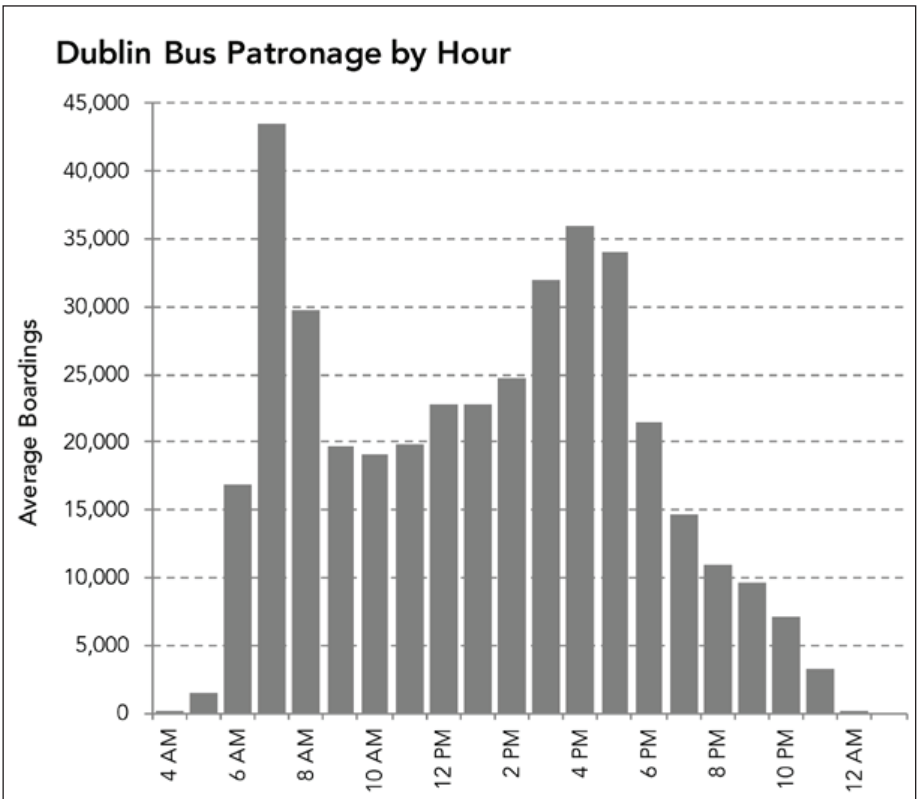


Figure 52: Chart of average daily patronage by hour on the Luas lines (2016)

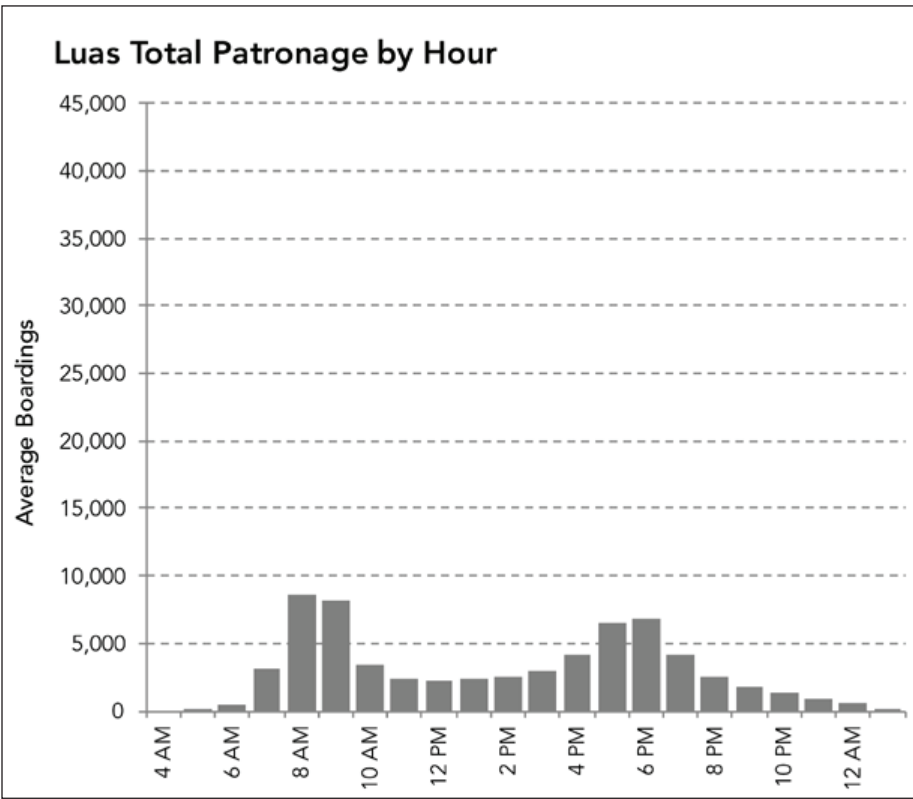
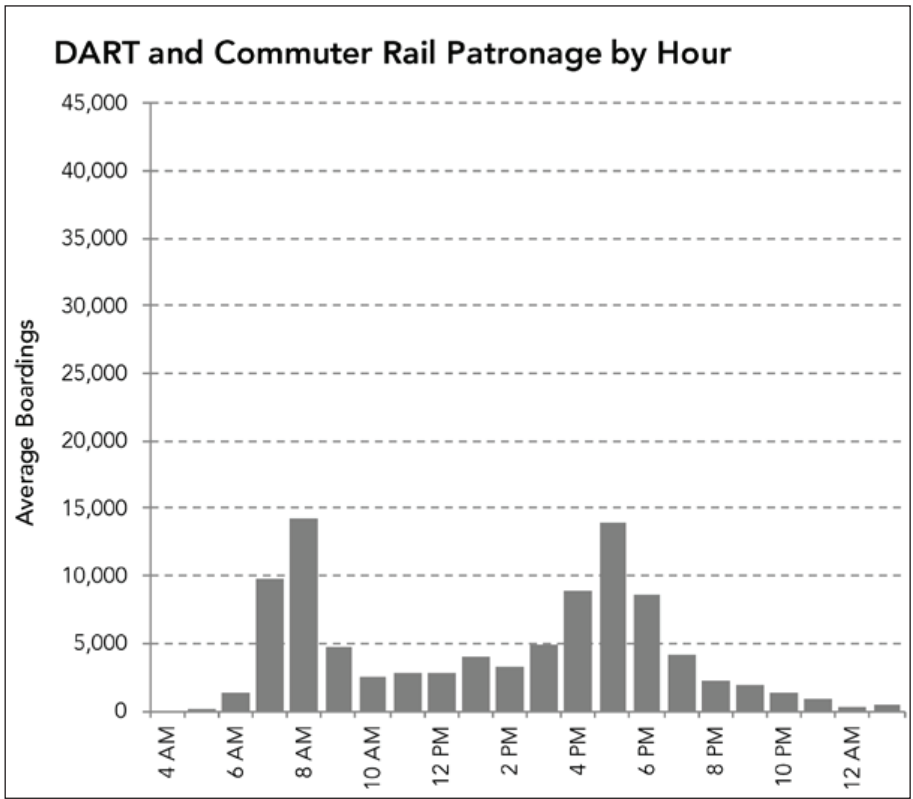


Figure 53: Chart of average daily patronage by hour on DART and commuter rail (2016)



On weekends, levels of patronage may be suppressed by low service

In the existing bus network, weekday patronage is higher than Saturday patronage, which is much higher than Sunday patronage.

On the surface, this could appear to be lower demand reflected in lower service quantity. As of late 2016, Dublin Bus operated approximately 11,000 vehicle hours on weekdays, but only 7,400 vehicle hours on Saturdays, and 4,500 vehicle hours on Sundays. This number has since increased, but the proportion of weekday to weekend hours remains similar.

Higher levels of service typically generate higher productivity in terms of boardings per hour. In this case, **system productivity is similar on Saturdays and on Sundays as it is on weekdays, despite much lower levels of service.** Some routes even have distinctly higher productivity on weekends.

While this is not decisive, this finding is consistent with the idea that there might be some suppressed demand on weekends. Over recent decades, the level of activity on weekends has increased considerably, so existing service may reflect vestiges of out of date assumptions about weekend demand.

Figure 54: Chart showing patronage by day of week

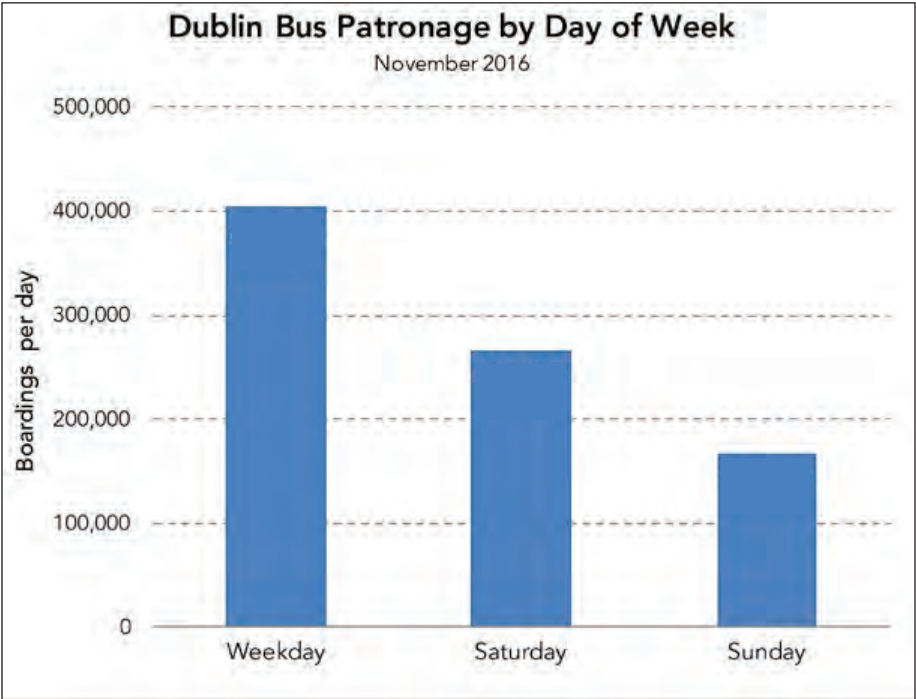


Figure 55: Chart comparing productivity by day of week

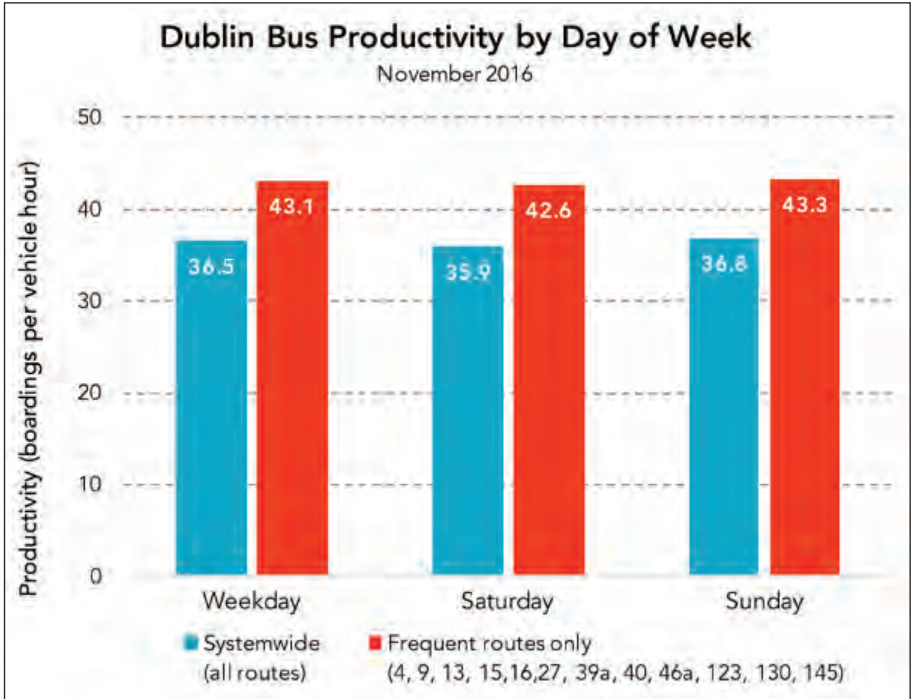
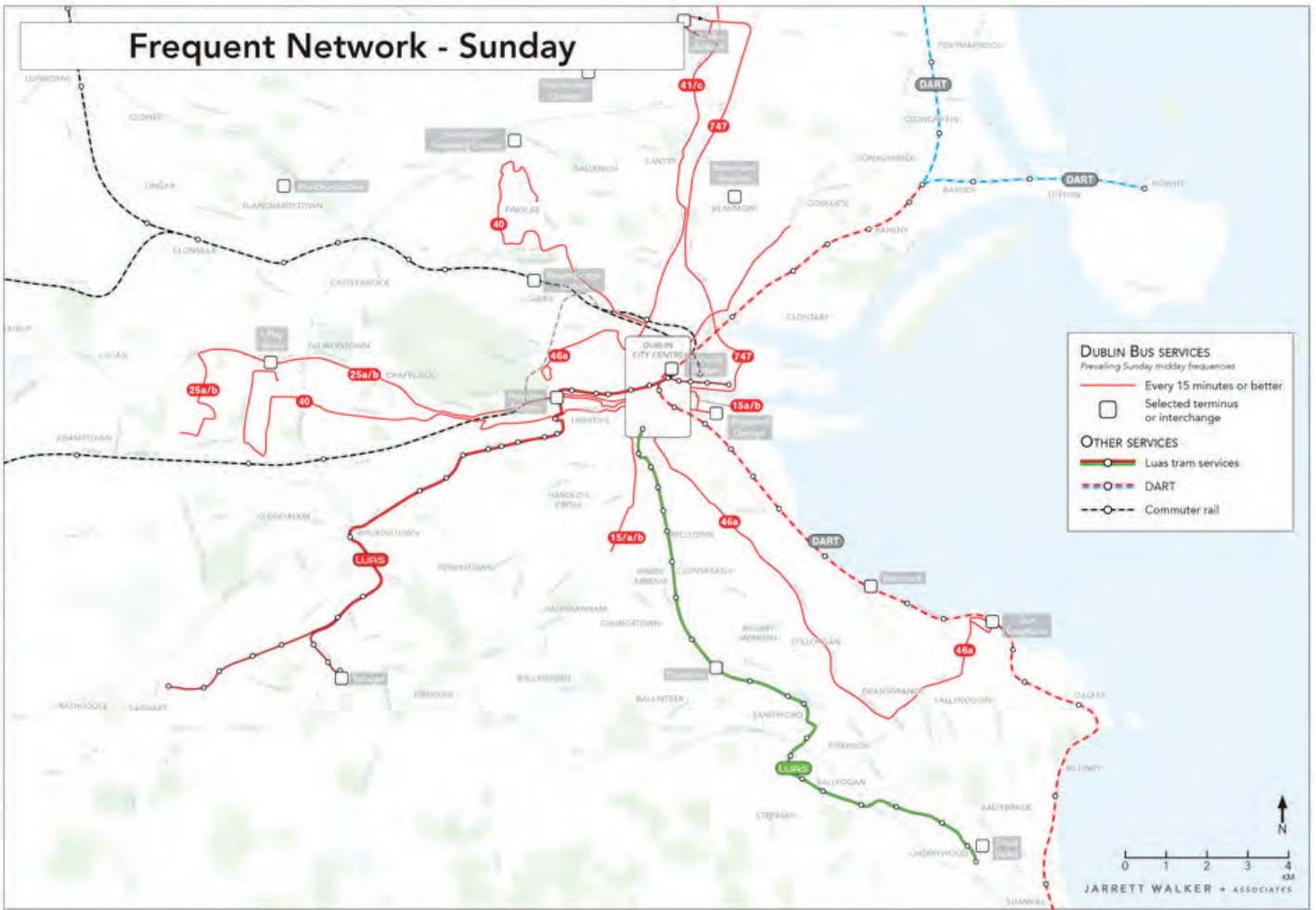
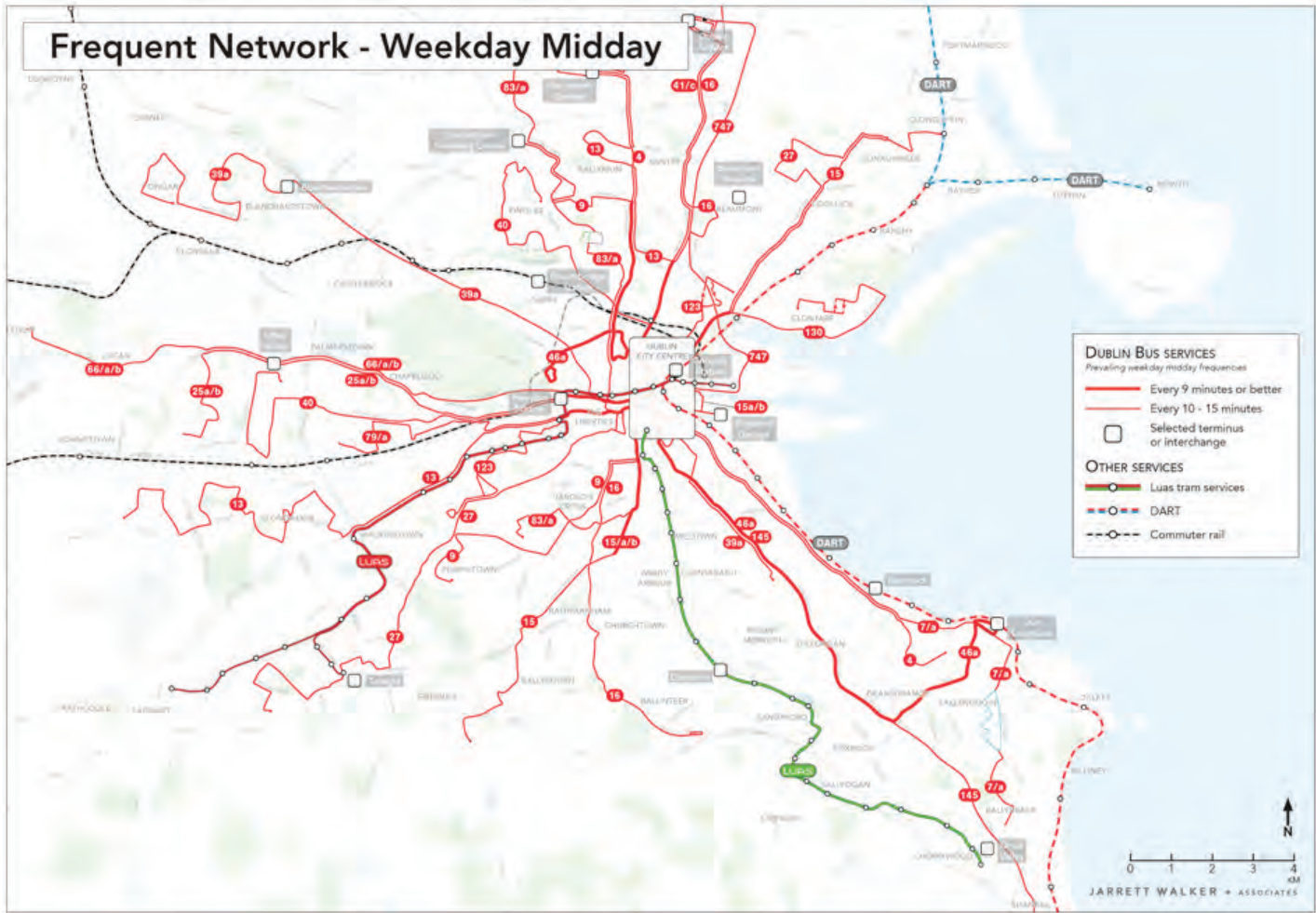


Figure 56: These maps compare the routes offering frequent service (every 15 minute or better) on the weekdays vs. Sundays, as of late 2016. The smaller number of frequent routes on Sunday reflects lower service overall. Service increases in 2017 and 2018 have increased frequencies, but the weekday vs. weekend contrast remains.



4

Structure of the Existing Bus Network

Underlying Conditions – Regional Transport Infrastructure

An effective public transport network requires both service and infrastructure. The bus network redesign is focused on service, and proposes service changes that could mostly take place with existing infrastructure. It is therefore useful to understand the general state of infrastructure underlying the bus network today.

The underlying infrastructure is significant, with known gaps and plans for improvement.

In Dublin, buses rely entirely on roads for rights-of-way. There are no rights-of-way fully reserved for buses. However, the amount of bus space reserved for buses on public roads may increase, with the improvements to the Core Bus Corridors.

Nonetheless, even today, a combination of measures taken by the National Transport Authority and local councils have resulted in a regional network of bus lanes and shared bus/bike lanes.

Although the network of bus lanes still has many gaps, there are bus lanes in every major radial corridor and on some orbital roads as well. This is shown in the map at bottom left.

Some outer orbital roads have bus lanes but not much bus service. This is not necessarily a problem, as these lanes help create the conditions for effective orbital services in the future.

One issue potentially impacting the effectiveness of bus lanes is the number of vehicles that are allowed to use them. For example, in Dublin, taxis are allowed to use most bus lanes. This may exacerbate speed and reliability problems in central areas where many bus routes converge.

The bus network is mutually supportive with the regional network of high-capacity all-day rail lines, mostly Luas and DART. The service on these rail lines relieves pressure in some of the highest-demand corridors, and in the City Centre.

Previously, the most pressing gap in the rail system was the termination of the Luas Green Line at St. Stephen's Green, before it connected with the Red Line, DART or regional rail. This problem has been addressed by the Luas Cross City project. One of the most pressing current issues with most rail services is extremely high peak-hour demand leading to overcrowding, which limits the amount of bus-to-rail interchange that the public transport network can support.

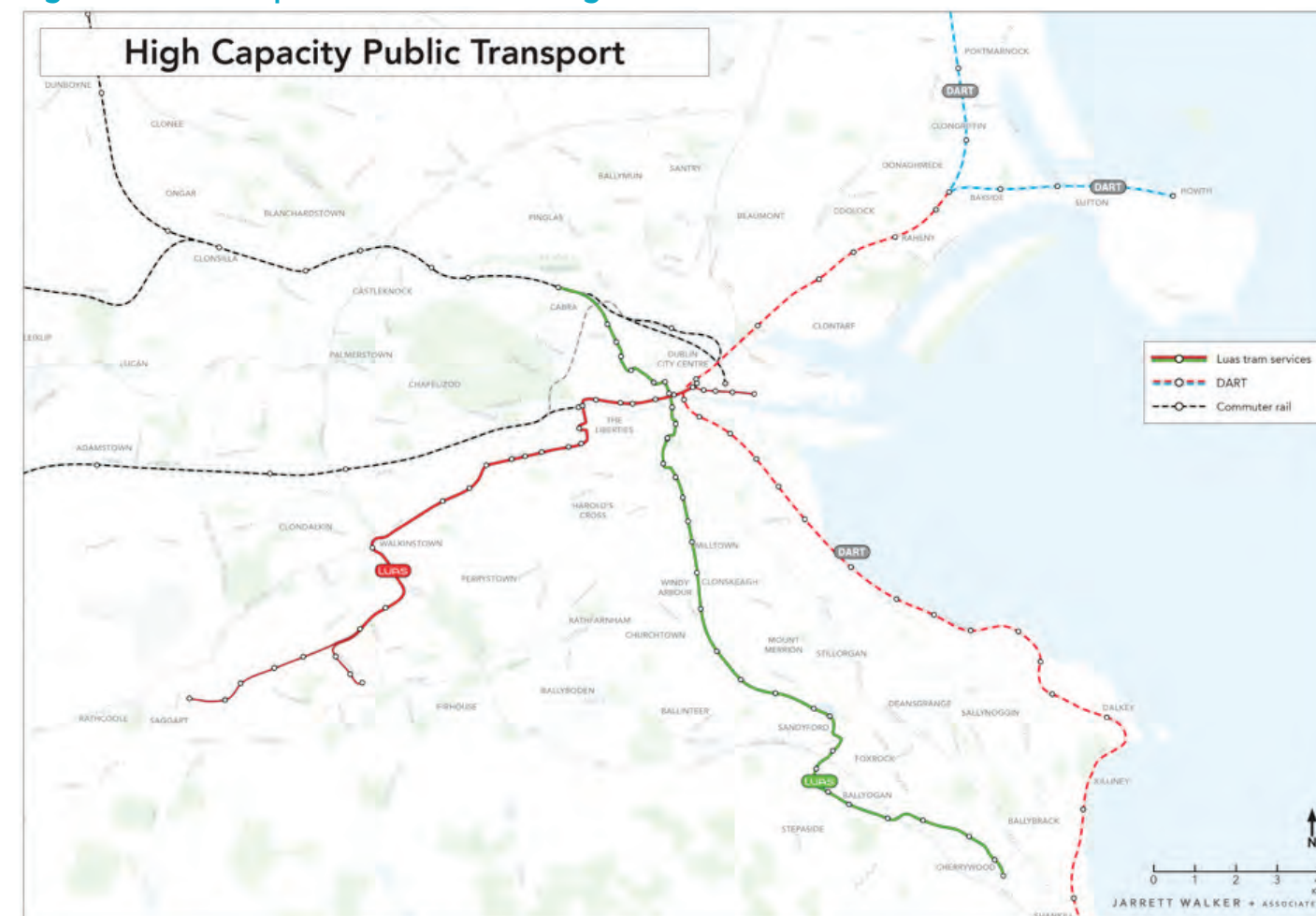
Service extends throughout the Dublin Metropolitan Area

As can be seen by the series of maps on the next page, existing PSO bus service reaches into all developed parts of the Dublin Metropolitan Area. Beyond the extent shown, several other bus routes extend its reach further into Fingal, as well as Counties Wicklow, Kildare and Meath.

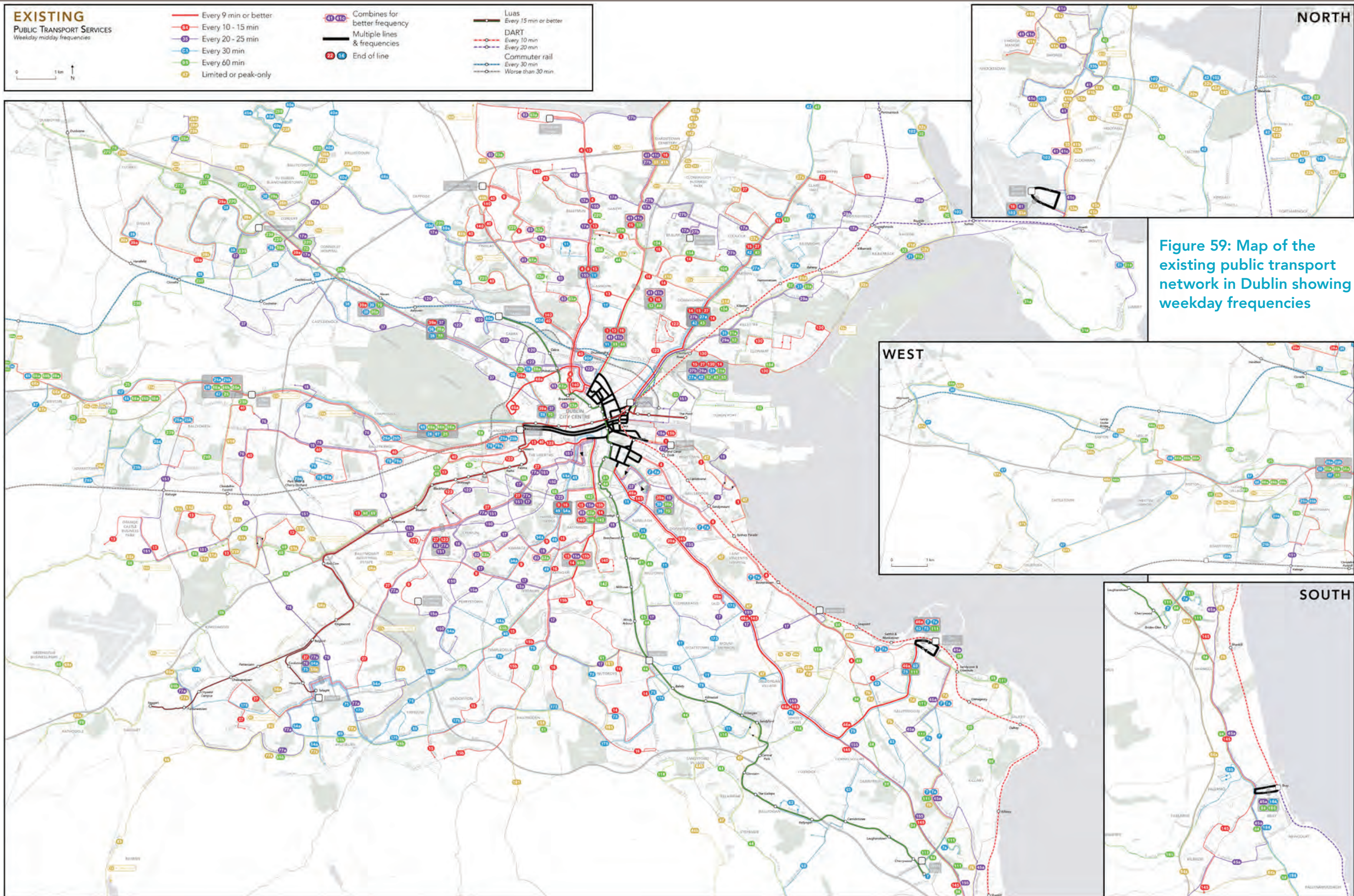
Figure 57: The map below shows bus lanes in the Dublin area, as of 2016.



Figure 58: The map below shows existing tram and rail lines - Luas, DART, and Commuter Rail



Existing Network: Big Picture



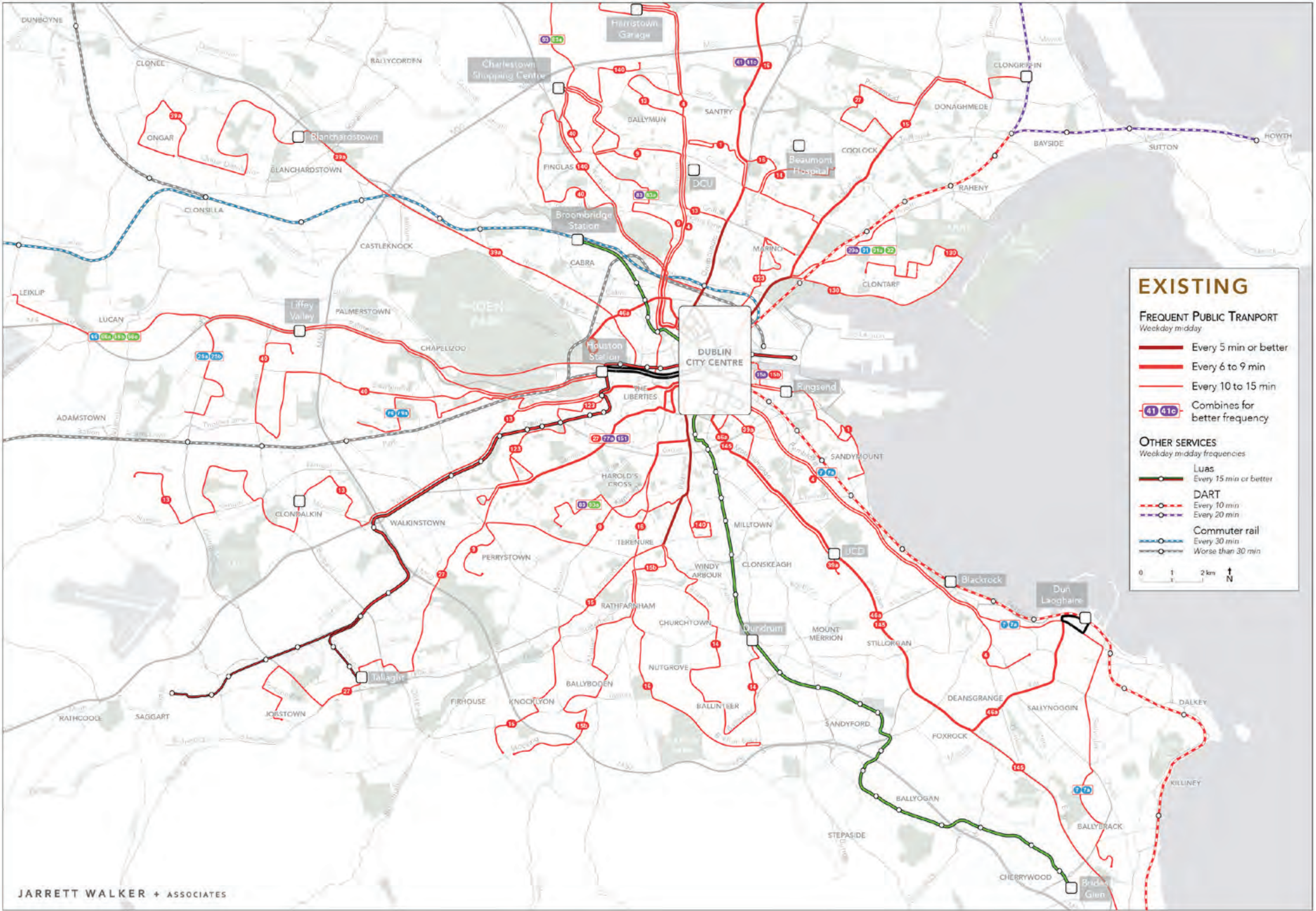
The frequent bus network is entirely radial

The adjacent map¹ shows the extent of Dublin Bus routes that provide all-day service every 15 minutes or more often on weekdays. Every single route meeting this standard is radial, i.e. it connects outlying areas to the city centre.

Many of these are cross city routes, which connect different suburban locations by traversing the city centre. Cross city routes were significantly expanded by the Network Direct initiative², and have improved suburb-to-suburb connections between areas on different sides of the River Liffey.

Nonetheless, this pattern means that travel between areas on the same side of the city – e.g. Crumlin to Dundrum – requires either long waits or travelling to City Centre and back out. As suburban centres grow, the absence of high-frequency orbital service is becoming an increasing barrier to serving Dublin-area residents.

Figure 60: The map below shows the frequent network, i.e. routes that operate every 15 minutes or better during weekdays at midday (2019).



¹ Due to space constraints, several of the maps in this chapter focus on the area bounded by the Airport to the north, Shankill to the south, Lucan to the west, and the Howth peninsula to the east. This covers the vast majority of public transport service in the Dublin metropolitan area, but not all of it. In designing the proposed network, we considered existing service in all areas served by the public bus network beyond this map extent.

² Network direct was an initiative carried out by Dublin Bus from 2011 to 2013 which sought to simplify bus services in the Dublin area. In the course of Network Direct, many routes were eliminated, and many radial routes were combined into cross city routes. Network Direct was, however, also a severely constrained effort as it reflected the need to make significant cuts in service due to recession-era drops in patronage and subsidy.

Orbital bus routes are few and infrequent

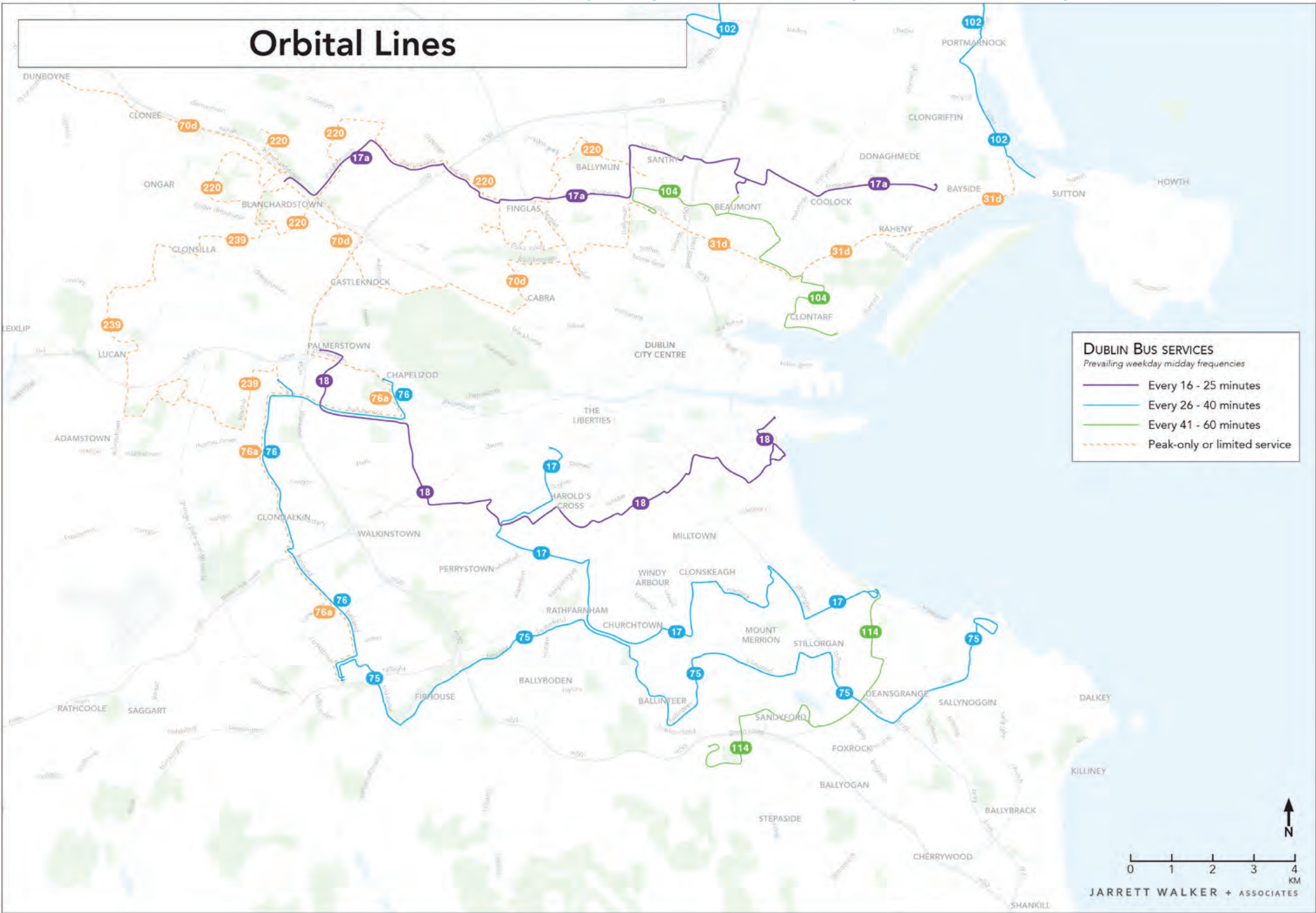
Radial bus networks like Dublin’s tend to develop in cities with strong centres. They are also a natural consequence of the outward growth of cities. When cities grow outward, the tendency is to extend existing transport routes to newly developed areas.

Radial networks tend to have weak orbital service, which is service that connects outlying or suburban areas to each other, bypassing the city centre.

As shown in the adjacent maps, this is also the case in Dublin, where there are relatively few orbital bus routes, and none of them are frequent outside the peak commute period.

NTA has previously undertaken studies of frequent orbital services; some of the ideas in those studies have been incorporated into the proposed network.

Figure 61: The map below shows orbital bus routes in Dublin, as of early 2016. There have been some additions (175, 236) and upgrades to orbital service (17, 76, 220, 239) since, but there remain no orbital routes operating more often than every 20 minutes on weekdays.



The radial network was highly efficient, up to a point

A radial network, with the possibility of passenger interchange in the Centre, can be a very efficient way to distribute trips throughout a city. This is because:

- Radial routes generally follow the most concentrated paths of demand (suburb to City via suburban centres).
- When all routes meet in one central area, a passenger can travel from any point A to any point B with a single interchange.

This is most true in small and mid-size cities, and was true for most of the 20th century in Dublin. However, when an urban area expands beyond a certain size, radial networks start encountering a variety of issues:

- Radial routes get more distant from each other as they get farther from the city centre. In large cities like Dublin, this means that frequent bus routes are spaced too far apart to serve the middle of outer neighbourhoods.
- As new suburban centres develop, passengers on suburb-to-suburb trips must travel further and further out of direction through the city centre.
- The radial network of streets and roads that characterizes the city may not reach the farthest suburbs. Where the street network itself is not radial, it is hard to create and maintain efficient radial bus routes.

Two notable but problematic patterns of bus routing have arisen in the face of these issues: Orbital Compensation and Radial Distortion.

Orbital Compensation

Orbital compensation is a process of trying to use radial bus routes to serve places where the street pattern is more orbital than radial. There are many examples in Dublin, but here are two:

- In **Beaumont**, Routes 14 and 16 deviate through the middle of the neighbourhood, ensuring residents access to both Swords Road and Malahide Road. This makes both routes somewhat circuitous for traveling to points further out. (While Route 14 ends just beyond Beaumont, Route 16 proceeds all the way to the airport.)

Figure 63: Map of Routes 14 and 16 near Beaumont

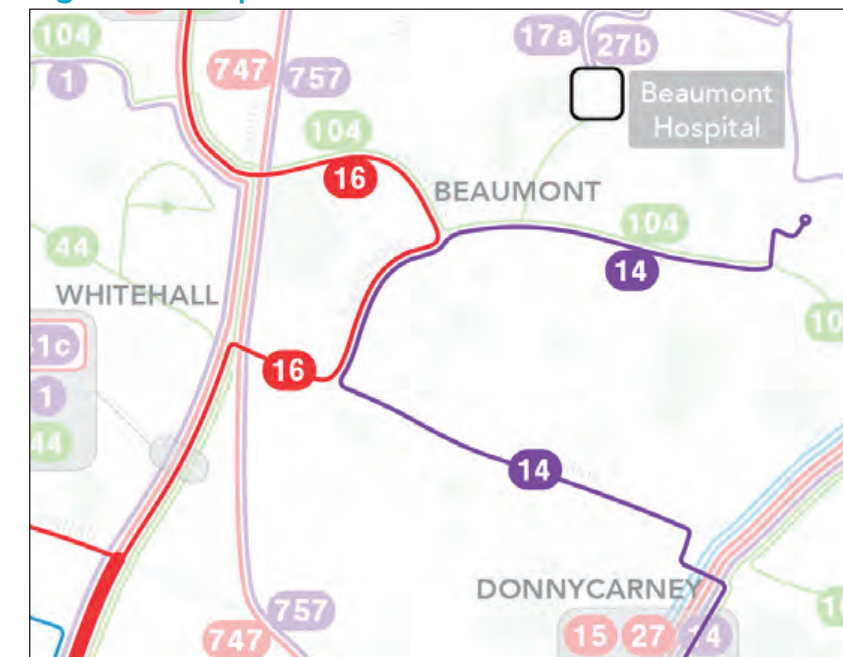
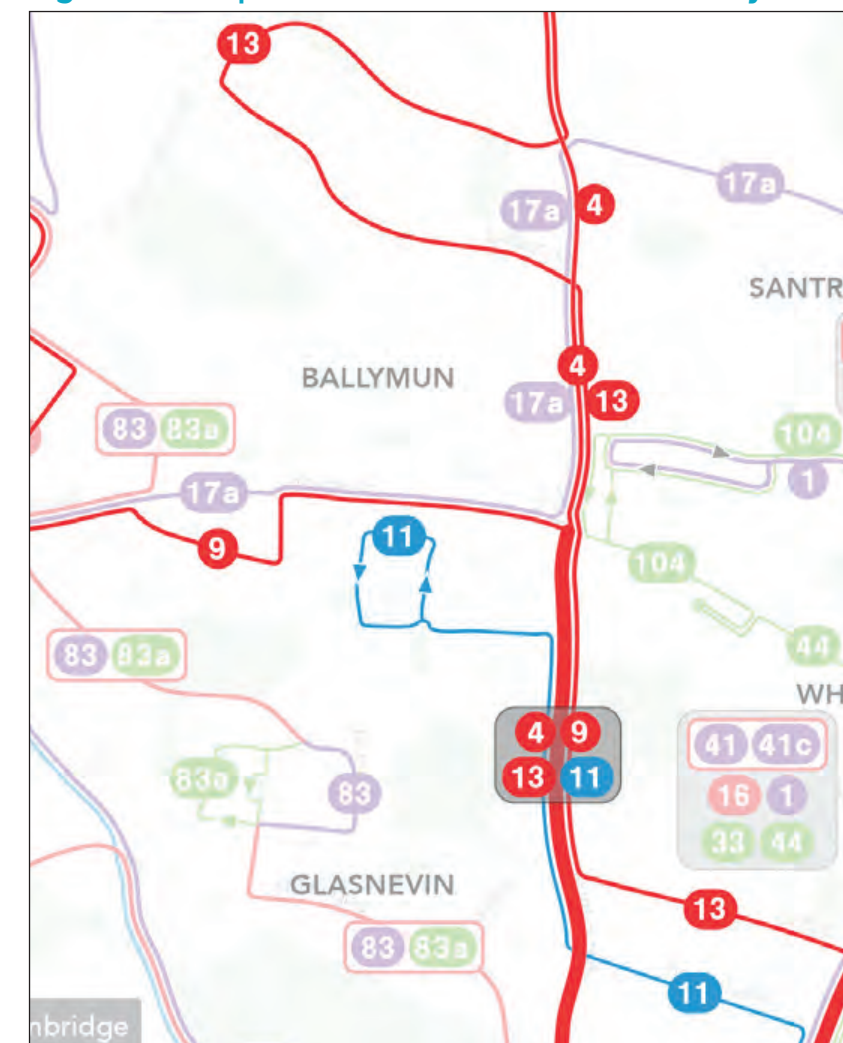


Figure 62: Map of Routes 9, 11, and 13 near Ballymun Rd



- Multiple radial routes weave on and off of **Ballymun Road** to provide orbital access to Balbutcher Lane (Route 13), Finglas (Route 9) and Drumcondra Road (Routes 11 and 13).

Because service is spread out among multiple orbital movements, the frequency of the radial mainline service on Ballymun Road (Route 4) is limited to a bus every 15 minutes on weekdays, when the corridor as a whole might support service every 5 minutes, particularly if complemented by orbital services.

In each case, frequent orbital services, running east-west in these images, would not need to twist and turn as much as radials must do to serve the same areas.

Radial Distortion

In most areas inside the M50, the arterial road network is oriented to draw traffic into and out of the city centre. This road network structure works well with the radial bus network structure.

In outer suburban areas, the street network operates differently, drawing traffic out of suburban neighbourhoods and onto motorways that eventually feed into the M50.

As a result, there are very few bus-operable roads connecting neighbourhoods. In some cases, there are in fact direct and deliberate obstructions to traffic from one neighbourhood to another, often meant to reduce "cut-through" car traffic.

This is a massive problem of linearity (see Chapter 2). When buses cannot run in straight lines, they must make long, frustrating and expensive deviations.

In addition, it is also in some cases an issue of permeability, where the road network is specifically designed to avoid connecting adjacent neighbourhoods to each other, preferring to connect them only to the nearest distributor road.

All this means the road network works against a radial bus network, because it forces radial routes to find circuitous paths to serve people. Circuitous paths make for longer travel, which reduces the attraction of public transport relative to other modes.

One approach to this problem is to focus more on connecting these areas to major suburban centres, on orbital routes or in a local feeder pattern, and then connect those centres to the city.

Some examples of this phenomenon in Dublin are the following:

- Blanchardstown: Routes 39 and 39a** travel from Ongar through most of the length of Blanchardstown in highly circuitous patterns, largely because the most direct paths between neighbourhoods are blocked to vehicular traffic.
- Clondalkin:** Frequent **Route 13** takes a highly circuitous path through the highest demand areas, causing major delay to passengers further out. The less frequent Route 151 has a direct path on the new Nangor Road, but there is much less demand directly along this road, so it cannot support as high a frequency.
- Lucan/Ballyowen: Routes 25a/b** deviate and split to reach all the areas in the vicinity of Grange Castle Road.
- Liffey Valley:** As **Route 40** approaches Liffey Valley Shopping Centre from the east, it actually turns away from it to ensure service to Neilstown Road and Fonthill Road. This creates a frustrating journey to the shopping centre from the high-density areas just to the east, such as Ballyfermot.

Figure 64: Map of Routes 39 and 39a through Blanchardstown.

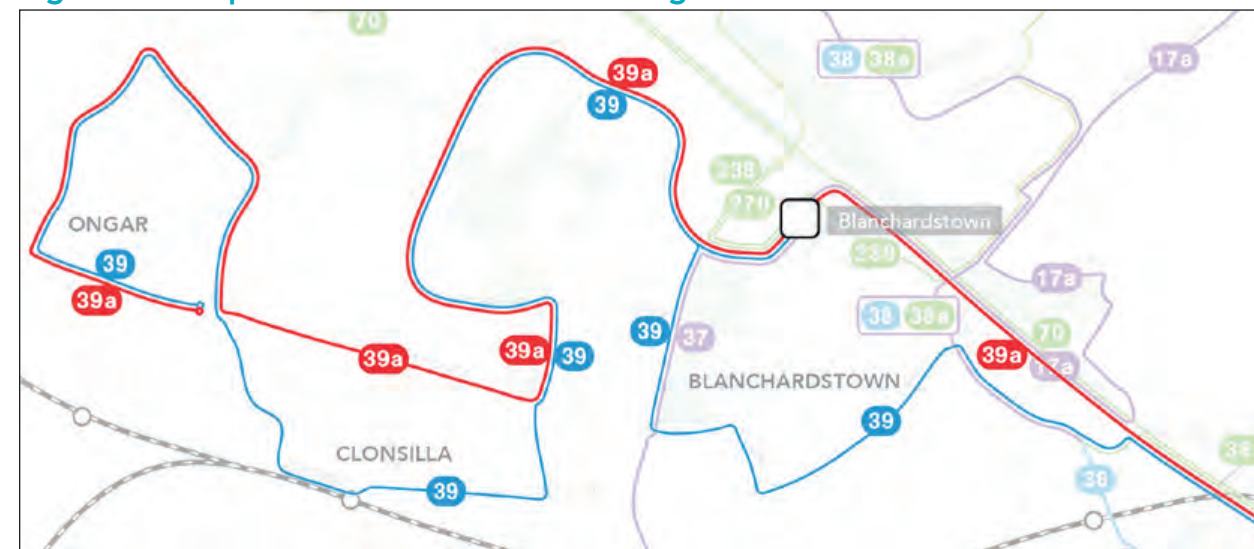


Figure 65: Map of Route 13 near Clondalkin

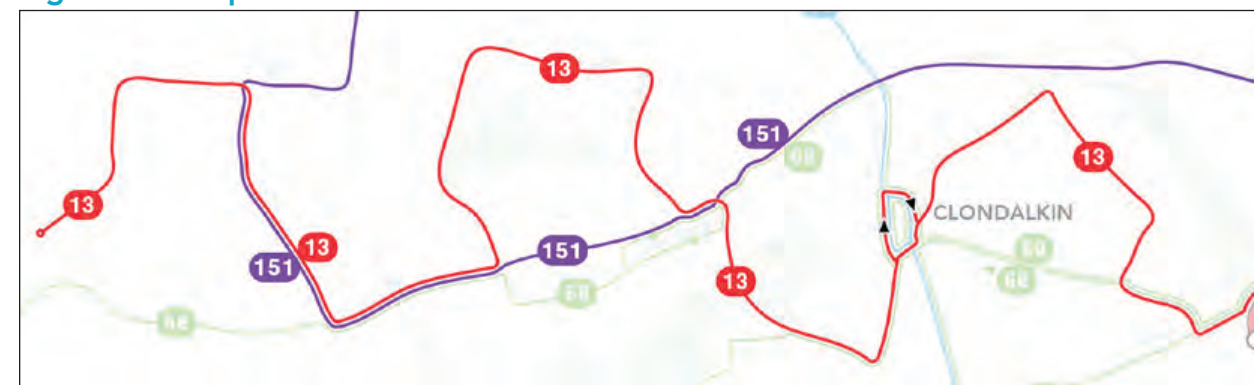
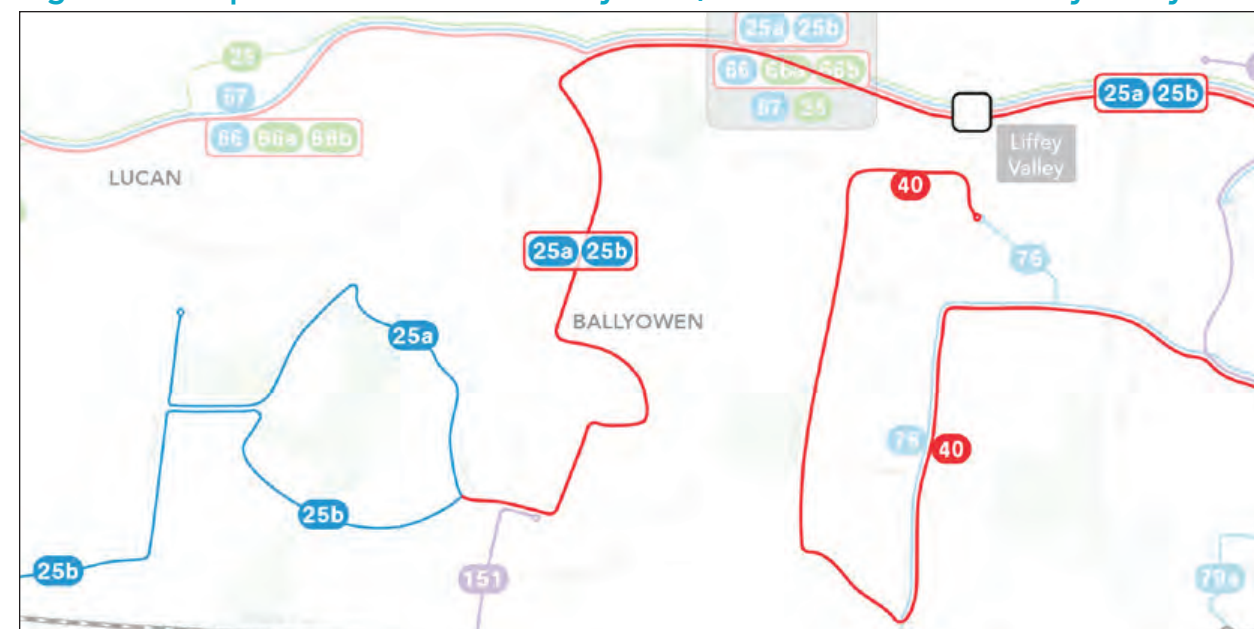


Figure 66: Map of Routes 25a/b in Ballyowen, and Route 40 near Liffey Valley SC



The radial network makes buses converge in the centre

The adjacent map displays the geographic pattern of bus volumes during the AM peak period³.

Because Dublin’s bus network is so radial, bus routes converge on a limited number of key roads as they approach the city centre.

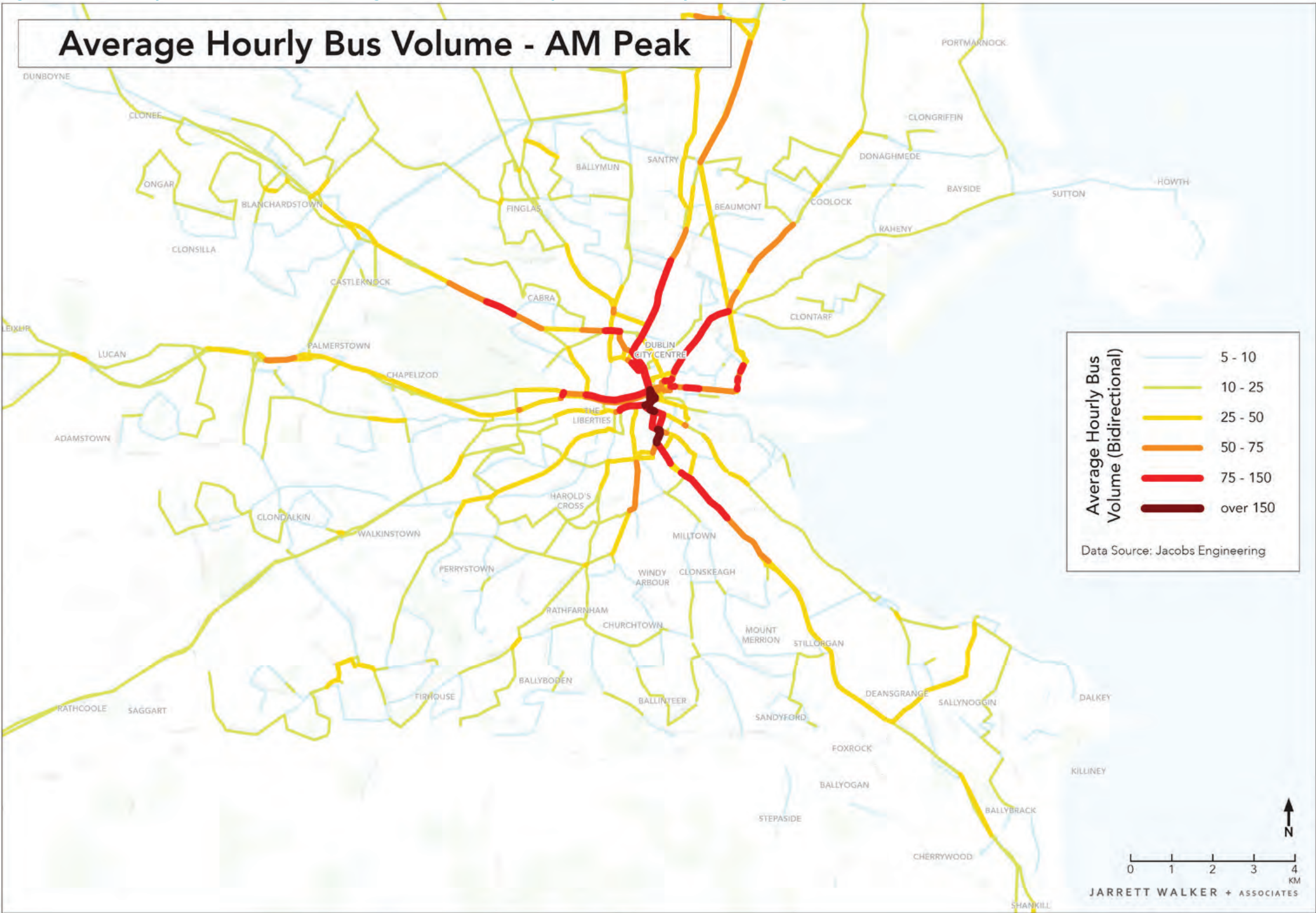
This pattern is even stronger in the city centre itself, where a very limited number of paths is available to traverse from north to south, or east to west.

Up to a certain point, this is a good thing, as the result is very high frequencies that are very attractive to customers.

But in some places, the bus volumes are so high, and the paths so constrained, that buses start being significantly delayed even in bus-only lanes, due in part to taxis but even to buses delaying other buses due to congestion.

Dublin’s city centre will always be the convergence point of many extremely frequent public transport corridors, so ample bus-only facilities are needed, but it may be possible to more actively manage the volume of buses on critical segments.

Figure 67: The map below shows the average number of buses per hour on major road segments in Dublin in 2016.

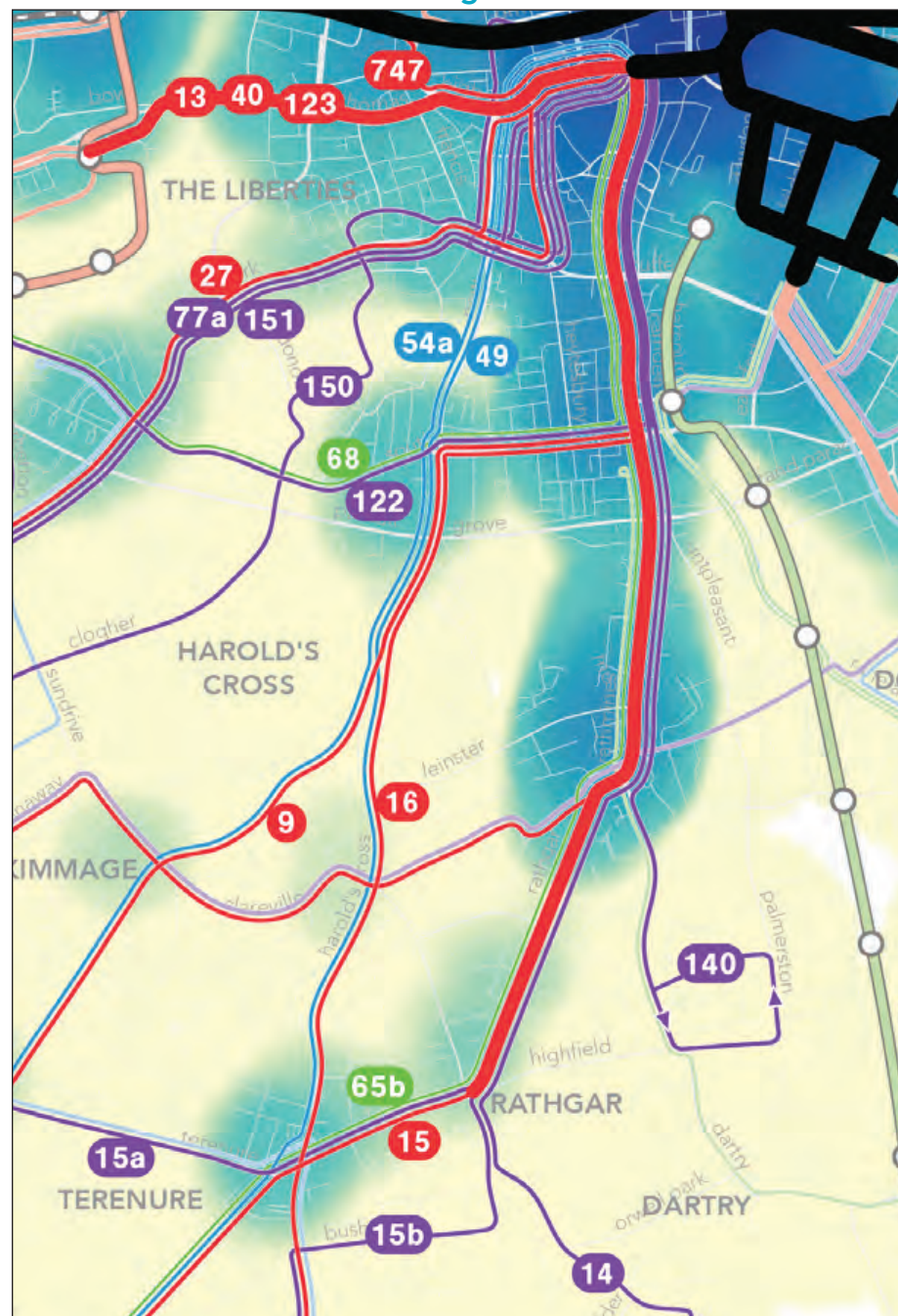


³ A similar pattern prevails at other times, with less extreme contrasts.

Sometimes bus volumes converge to meet high demand

In many cases, convergence of multiple bus routes is positive and consistent with the overall demand pattern: demand for bus service is generally stronger in inner, denser neighbourhoods, so it helps for frequency to increase there. One example of bus volumes logically converging to provide super-frequent service to a high-demand area is from Rathmines Road to Aungier Street, as shown in the map below..

Figure 68: Map of bus routes and density of bus boardings in the Rathmines/Camden/Aungier corridor



Sometimes bus volumes converge through areas of very low demand

However, in other cases, the strong radial pull of the network forces large volumes of buses through areas that have no demand at all, or very low demand. In these cases, there is an imbalance between service frequency and demand in more central areas. Chapelizod Road is a clear example, as can be seen in the map below.

Figure 69: Map of bus routes and density of bus boardings on the Chapelizod Road and Chapelizod Bypass



The existing cross city route pattern minimizes the need for interchange...

As in many cities, the Dublin network design includes many features designed to reduce the need to interchange.

This is most evident in the design of the cross city radial corridors. Major radial corridors are generally oriented to use multiple overlapping routes to:

- Distribute service to a broad fan of suburban areas on one side of the city.
- Extend through the city centre to serve multiple corridors on the other side.

Drumcondra Road and Malahide Road both present good examples. In both cases, multiple routes provide frequent service to a long segment, while routes fan out to provide broader coverage in outer neighbourhoods. At the same time, the routes on both corridors aim in different directions on their way south through the city centre.

This is portrayed in the maps below to the left (Drumcondra corridor) and to the right (Malahide corridor)

Figure 70: Map of all-day routes on the Drumcondra Road corridor

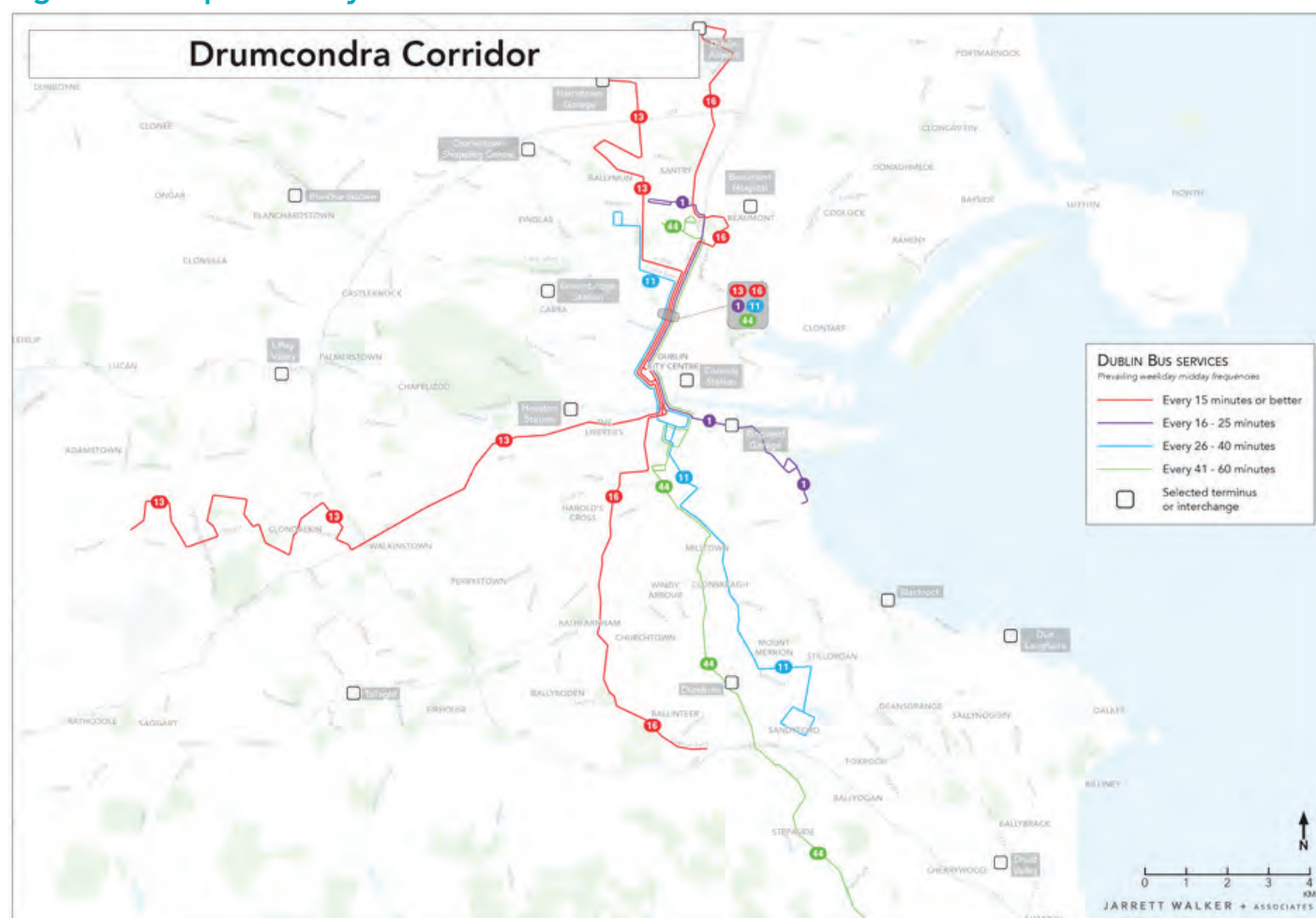


Figure 71: Map of all-day routes on the Malahide Road corridor

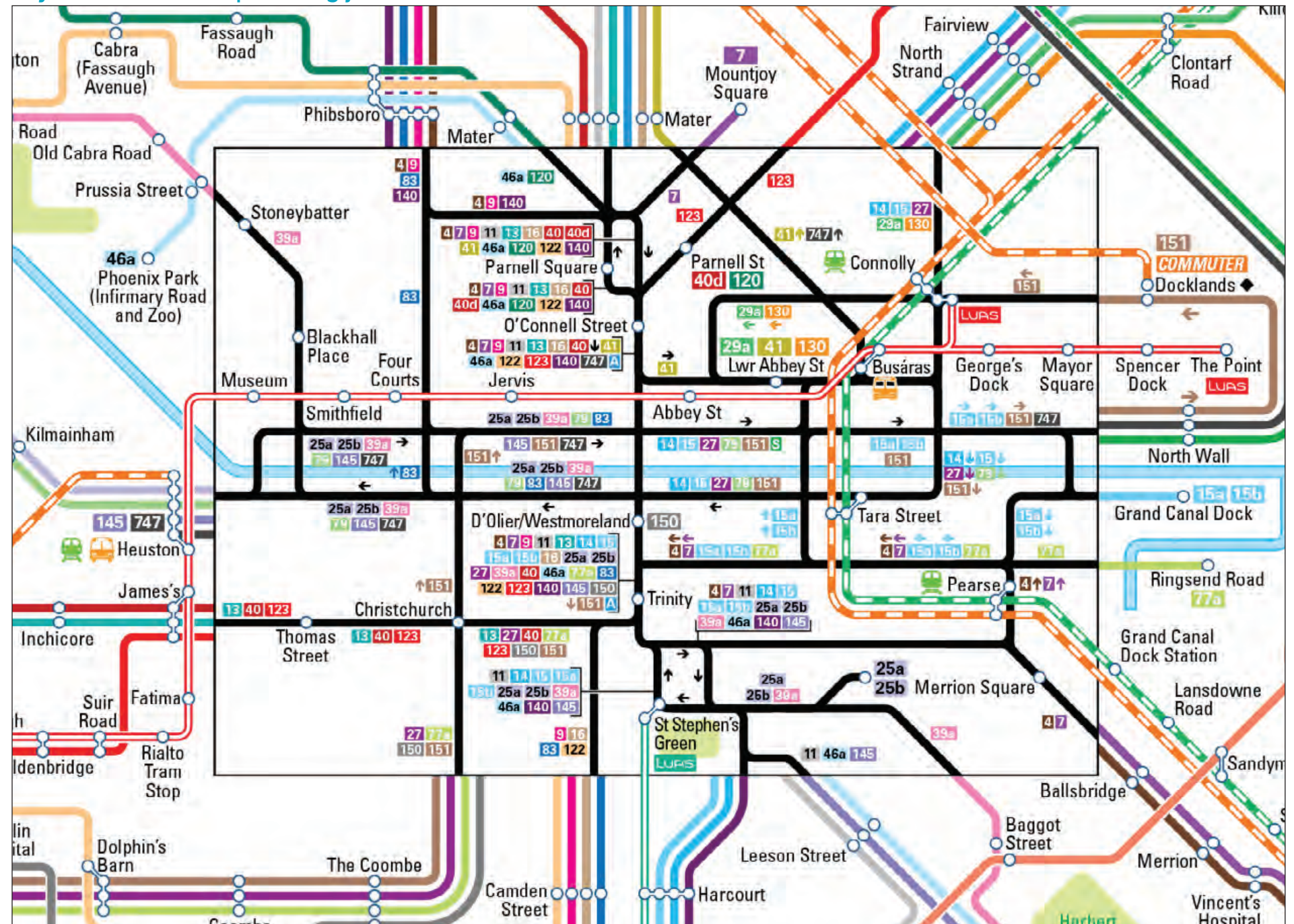


...which makes the network very complex, and more difficult to use

The through-routing pattern described above means that it is possible to take a one-seat ride between numerous areas, minimizing the need for interchange. This is convenient for some users, but it comes at a cost:

- The line structure is necessarily complex and difficult to read, requiring many individual route and branch numbers to describe different levels of similarity and difference between routes.
- Because cross-city buses weave in all directions as they connect different corridors to each other, the city centre network is so complex that we have found no record to date of a map that successfully shows all the bus routings through central Dublin.
 - » The closest approximations focus either on (a) listing city centre stops where one can catch the bus to various suburbs, or (b) displaying the streets where buses operate, but focusing only on certain bus routes.
 - » For example, the adjacent image is a simplified map that shows only streets where the more frequent routes operate, but even so the visual complexity is overwhelming.
- This is not just a mapping issue, though. In a city with a large centre like Dublin, if a user cannot understand the network, they are likely dissuaded from using it between different parts of the city centre despite the high quantity of service.
 - » Easy legibility is crucial to attracting the occasional user who is not motivated to learn much complexity to make a desired and often spontaneous trip. This feature, routine in rail services, can also be brought to bus services through careful network design and branding, options explored in Chapter 5.

Figure 72: The map below shows the complex web of routes that cross Dublin City Centre. With an overwhelmingly complex city centre, even a map showing just a subset of routes is difficult to follow.



The fare structure reinforces avoidance of interchange

Even in cases where interchange might result in the most efficient trip, passengers are discouraged from changing buses by the price structure of public transport in Dublin.

This problem is not unique to the bus network, but affects Luas and Irish Rail as well. The following are examples of price challenges inherent to interchange:

- It is always more expensive to use a second mode (bus-to-rail, or rail-to-bus), even when it saves time or results in a shorter journey.
- Unless one holds a Taxsaver pass or comparable discounted pass, it is also always more expensive to board a second bus.
- When paying with a Leap card, an interchange results in a 1 euro discount on the second fare, but only if taken within 90 minutes of the initial boarding.
- The daily cap available on the Leap card is 7 euro if one uses only the bus in a given day, but rises to 10 euro if a rider switches between bus and rail at any point.
- In either case, the Leap daily cap is over 3 times the cost of a single boarding.
- Dublin Bus, Luas, and Irish Rail each have different weekly or monthly unlimited pass options, but no single operator's pass is transferable to any other operator.

Because the NTA is working on fare issues in parallel through the BusConnects plan, **the network plans explored in this study will presume that fare barriers to interchange can be removed⁴**, to illustrate the travel time benefits that arise when there are no added costs to the passenger due to changing between two public transport services.

⁴ As of October 2019, the NTA is studying the option to implement a 90-minute pass system on the Leap card. Passengers using the Leap card would pay the fare only on the first tap upon entering the first vehicle. Further taps upon interchange to a second vehicle would not result in additional fare.

5

Strategies for a Redesigned Bus Network

How More Interchange Can Improve Travel Time

In reviewing the existing network, we have noted several issues:

- **Many overlapping routes**, each with their own frequency, prevent buses from being evenly spaced to minimize waiting. Along with low frequency on some routes, this means many people wait longer than necessary.
- **Complexity**. The sheer number of routes and branches is a barrier to understanding the network and discourages many trips for which service could be useful.
- **Too many buses in the city centre**. Many streets carry extremely high volumes of buses, which produces major delay due to buses blocking each other.
- **Poor Orbital Service**. There is abundant service into and out of the city centre, but poor service for travel between other destinations.

Many of these problems operate on the current assumption that the network should minimize the need for interchange—that is, for people to get off one bus and onto another bus or train.

This chapter explores what might be gained and what trade-offs would occur in a network design that is based on accepting an increased degree of interchange to unlock major solutions to all the problems above.

Important note: This chapter explores only concepts; it contains no recommendations or proposals. Where appropriate, the concepts have been illustrated in the context of what they might mean geographically. Nonetheless, the goal is to illustrate the principles, not propose specific actions. See Chapter 7 for a full description of the revised proposed network.

How Connections Improve Travel Time: Theory

Imagine a simple city that has three primary residential areas, as seen in the diagram to the right along the top, and three primary centres of employment or activity, along the bottom.

- In designing a network for this city, the first impulse is to try to run direct service from each residential area to each activity centre. If we have three of each, this yields a network of nine transit routes, as shown in the diagram at top right. Suppose that we can afford to run each route every 30 minutes. Call this the **Direct Service Option**.

Figure 73: Example of direct service from each residential area to activity centre

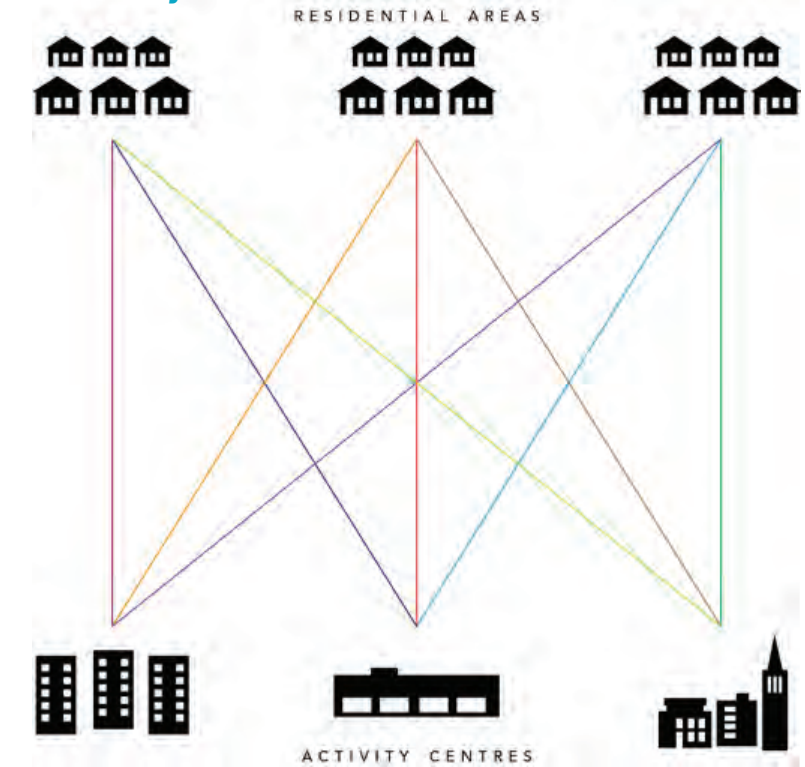
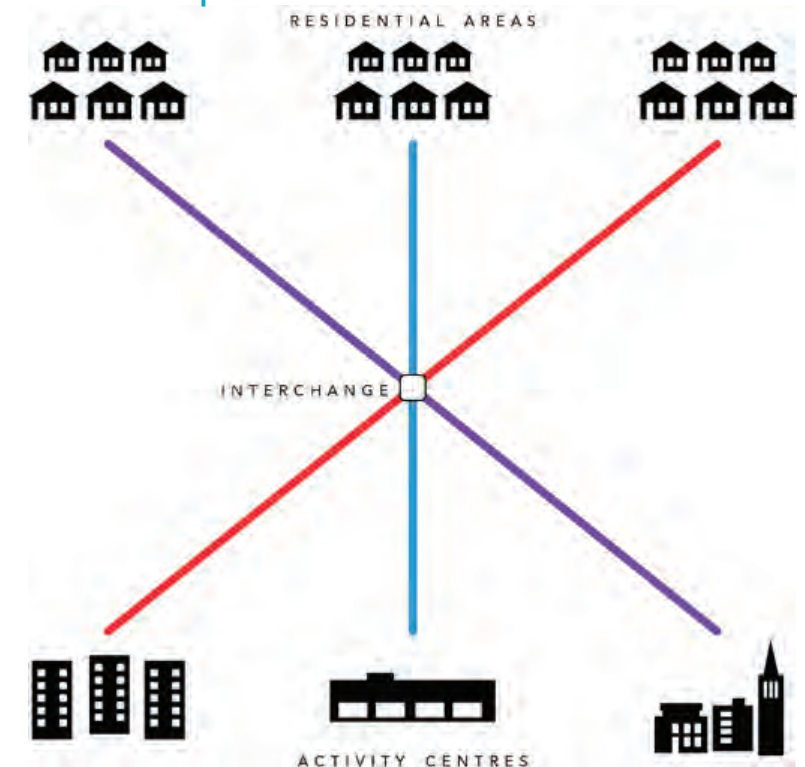


Figure 74: Example of frequent connective service to a central transfer point



- Now consider another way of serving this simple city for the same cost. Instead of running a direct route between every residential area and every activity centre, we run a direct route from each residential area to a single activity centre, but we make sure that all the resulting routes connect with each other at a strategic point, as shown in the diagram at bottom right.
- Now we have three routes instead of nine, so we can run each route three times as often at the same total cost as the Direct Service option. Instead of service every 30 minutes, we have service every 10 minutes. Let's call this the **Connective Option**.

The Direct Service option may appear to be the obvious solution to minimising travel time. But if we want to maximise people's ability to get places with our fixed budget, we should use the Connective option.

Consider how long a typical trip takes in each scenario, from the standpoint of a person who needs to leave or arrive at a particular time. **For example, let's look at trips from the rightmost Residential Area to a given Activity Centre.** For simplicity, let's also assume that all routes, in all scenarios, are 20 minutes long.

In the **Direct Service Option**, a service runs directly from the upper right residential area to the middle activity centre. It runs every 30 minutes, so on average, the waiting time is 15 minutes¹. Once we're on board, the travel time is 20 minutes. So the average trip time is:

$$\begin{aligned} &\text{Wait 15 minutes + Ride 20 minutes} \\ &= \mathbf{35 \text{ Minutes}} \end{aligned}$$

Now look at the **Connective Option**. We leave the same residential area on its only route, which runs every 10 minutes, so our average wait is 5 minutes. We ride to the connection point and get off. Since this point is halfway between the residential areas and the activity centres, the travel time is 10 minutes. Now we get off and wait for the service to the middle activity centre. It also runs every 10 minutes, so our average wait time is 5 minutes. Finally, our ride from the connection point to the middle Activity Centre is 10 minutes. So our average trip time is:

$$\begin{aligned} &\text{Wait 5 minutes + Ride 10 minutes} \\ &+ \text{Wait 5 minutes + Ride 10 minutes} \\ &= \mathbf{30 \text{ minutes}} \end{aligned}$$

The Connective Network is faster, even though it requires interchange, because of the much higher frequencies that it can offer for the same total budget.

¹ Many passengers minimize the wait time at the stop by consulting the timetable or real-time arrival information. Although this reduces wait time at the stop, it does not change the fact that the passengers must still spend extra time wherever they are before they reach the bus stop, or that they must otherwise re-arrange their lives to fit the timetable. There is still, in all cases, a portion of time where the passengers are not on the way they would like to be going.

Figure 75: Example of a trip taken with direct service from a residential area to an activity centre

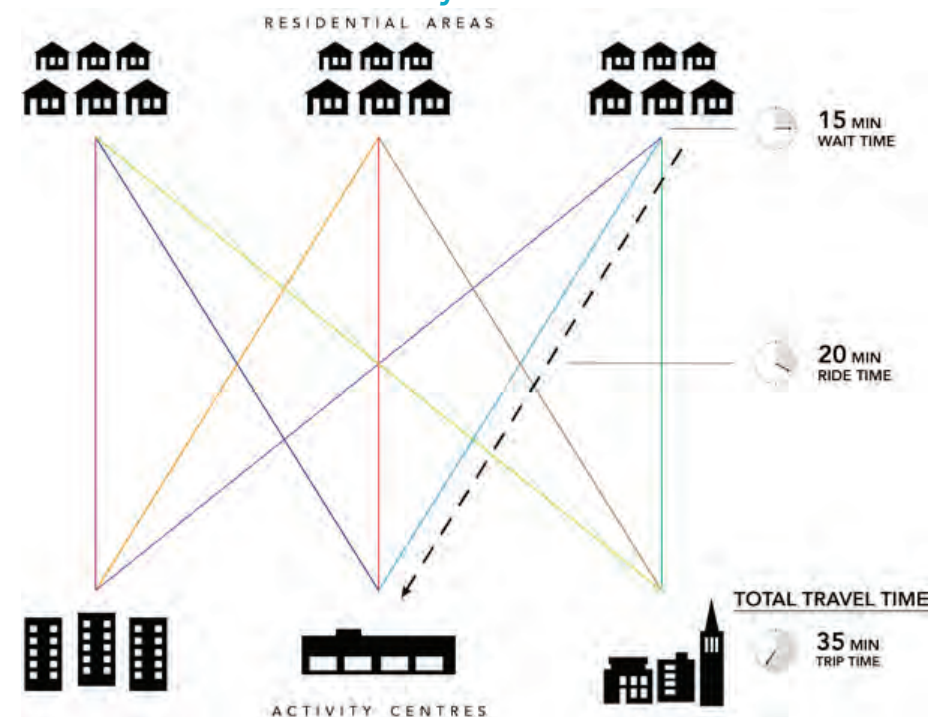
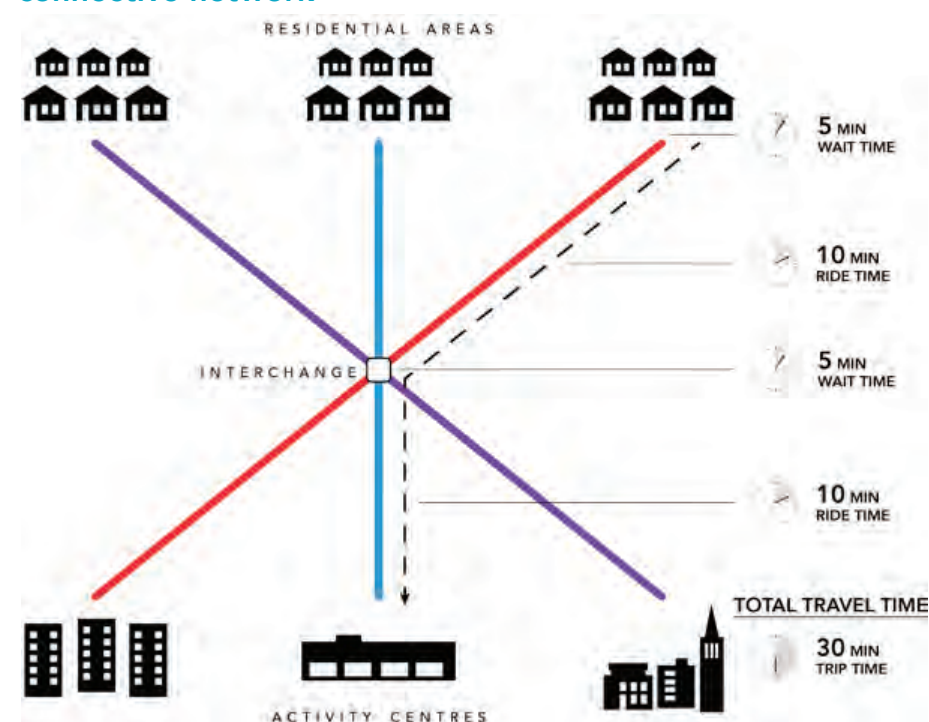


Figure 76: Example of the same trip taken with frequent connective network



As cities grow, the travel time advantages of the Connective Network increase. For example, suppose that instead of having three residential areas and three activity centres, we had six of each. In this case, the direct service network would have 36 routes, while the connective network would have only six. You can run the numbers yourself, but the answer is that the Direct Service network still takes 35 minutes, while the Connective network is down to only 25 minutes, because of the added frequency.

The Interchange Penalty Objection

If we were actually using travel time as a means of estimating patronage, we would have to consider the widespread view, built into most patronage models, that connections impose an “interchange penalty” in addition to the actual time they take.

These interchange penalties assume that, even though people say they want the fastest possible trip, they’ll actually prefer a slower trip if it saves them the trouble of getting out of their seat partway through the journey.

In the previous example, a patronage estimate might assume that although the average trip in the Connective option is faster, the Direct Service option would give us higher patronage, because the Connective option imposes the inconvenience of the connection.

The modeller might say that this inconvenience is the equivalent of 10 minutes of travel time, so that the Connective option will really attract patronage as though the trip took 40 minutes instead of 30. This common modelling approach assumes that the inconvenience of interchange is something different to, and separable from, the time that the interchange takes.

There is considerable documentation² behind the addition of this kind of factor, but the unpleasantness of the interchange experience depends on many details of how the interchange works, and especially on the frequency of service. All factors that affect customer experience of walking and waiting also apply to the interchange walk and wait.

Assumptions about an “interchange penalty” (as distinct from the time the connection takes) therefore must to be scrutinized: What kind of connection experience was used to calibrate the model?

Finally, interchange may affect patronage but it does not affect the liberty and opportunity that a network delivers. The range of places that you can reach in a given time is greatest if you are willing to interchange as needed, rather than allowing the interchange experience to dissuade you.

The Commuter’s Objection

Many people who make regular commutes would object to the way we have inferred average waiting times from frequencies. After all, if a particular train line has one journey per day, we do not spend half the day at the station waiting for it. We go on with our lives and work, and catch the train whenever it is going. Many people treat schedules in this way, especially when making regular commutes that can be planned into a routine.

However, the average wait is still a valid way of capturing the inconvenience of low-frequency services. For example, if you need to be at work at exactly 8:00 and your half-hourly bus arrives there at 7:35 and 8:05, you will have to take the earlier one. This means you will have 25 minutes to wait before your work starts, which you would probably rather have spent otherwise. You may figure out how to make use of this time, but it’s still time you must spend somewhere other than where you want to be, and thus constitutes a reduction of your liberty.

Note too that we have been discussing commutes to work public transport serves many kinds of trips happening all day. You may figure out how to make use of a predictable 25 minute delay at the beginning of your work day, but it’s much harder to deal with unpredictable 25 minute gaps in the many trips that you need to make in the course of the day, such as while taking a lunch break or running errands that involve many destinations.

Other Advantages of Connective Networks

In addition to the faster total trip time when interchanging between frequent services, there are other reasons to prefer Connective networks over Direct Service networks. For example:

- The Connective network is made of more frequent services, with the multiple benefits discussed in Chapter 2. Among these benefits is the fact that trips are not only be faster for those who need to interchange, they are even faster for those who would now be on a direct frequent line.
- The Connective network is simpler. Three frequent routes are much easier to remember than nine infrequent ones.

Many public transport systems start as direct networks with little interchange. But as a city grows bigger, direct networks become massively complex. At that point, it becomes useful to transition from a direct network to a connective one. This can require severing direct links to create a structure of very frequent service that saves time and is more broadly legible.

Disadvantages of Connective Networks

We do not want to imply, however, that connective networks, which require more interchanging, have no downsides.

The largest disadvantage to interchange is simply the effort required. Partway through your trip, you must gather your things, exit the bus, walk to another stop, and wait for another bus. Ideally, the walk will be very short, and high frequencies mean that the wait will be short as well. Excellent shelter and information will also be provided. But even then it will still be an inconvenience. The level of effort is also greater for people with limited mobility.

The second disadvantage is that interchange can compound risks associated with reliability. There is always the fear of missing a connecting bus and being stuck at the interchange point.

In a frequent connective network, this will only occur in cases of major disruption. In routine operations, there should be so many buses along each route that waits would be very short.

Assumptions for this Study

In thinking about interchange and the strategies we lay out over the following pages, please assume that:

- **Fare penalties for interchanging are removed.** Any fare paid getting on the bus would be valid for 90 minutes throughout the Dublin public transport network.
- **Progressive improvements in reliability** as the Core Bus Corridors project and other initiatives increase bus priority on Dublin’s main roads.
- **Information is available at every interchange stop, and any walk required for the interchange is safe.** NTA would work with local councils to improve stop locations and pedestrian facilities to ensure short and easy connections. A program of improvements would progressively bring better shelter and lighting to all interchange stops.
- **Key interchange facilities can be developed and expanded.** The plan requires only one entirely new interchange, at Liffey Valley Shopping Centre. Several other interchanges (e.g. in Tallaght, Blanchardstown, Dundrum) would need expansion.
- **The network does not increase overcrowding.** A significant part of the effort to revise the proposed network from 2018 to 2019 has been geared specifically at ensuring that adequate service is provided to meet peak capacity needs.

² See for example the Scottish Executive Central Research Unit’s “Interchange and Travel Choice,” by M. Wardman, J. Hine, and S. Stradling. (2001).

Four Strategies for a More Useful Network

This study has developed a revised network proposal based on:

- The theory and data presented in the Choices Report³.
- Public approval for the four strategies below, expressed through a consultation in June 2017.
- A collaborative design process with NTA, Dublin Bus, local councils and the consultant team.
- Public reaction to the initial network proposal, expressed through a consultation in summer 2018.
- Updates to the design in response to this reaction, again in a collaborative approach between NTA, Dublin Bus and the consultant team.

The proposed network relies more heavily on interchange to increase usefulness and shorten travel times based on public response to the Choices Report. Here are the four major strategies that were pursued in the design of the proposed network.

- **Strategy #1: Standardize Service Categories**
- **Strategy #2: Simplify Radial Services**
- **Strategy #3: Build Frequent Orbitals**
- **Strategy #4: Grow Suburban Feeder Networks**

All are examples of ways to increase the liberty that public transport confers, measured in how many useful destinations you can reach in a given time. Because of the geometry explained above, this also means relying more heavily on interchange to complete passenger trips.

As the table to the right shows, each strategy is relevant to all of the problems identified at the beginning of this chapter. Together or separately, they are all likely to improve travel times on many more trips than they degrade, because of the geometric relationship between interchange, frequency, and travel time explained at the beginning of this chapter.

Figure 77: Table explaining how the four main strategies behind the bus network redesign help solve known issues with the existing bus network in Dublin.

TOOL	PROBLEM ADDRESSED				
		Poor orbital service	Complexity	Low frequency	Buses in City Centre
	1 STANDARDIZE SERVICE CATEGORIES	Yes. Categories make planning efficient services easier.	Yes. Frequency and span are apparent from the category, without looking at timetables.	Yes. Standard categories make frequencies predictable and consistent.	Yes. Categories make planning efficient services easier, reducing excess bus trips.
	2 SIMPLIFY RADIAL SERVICE	Yes. Releases resources for orbital use.	Yes. Reduction of complexity, especially in city centre	Yes. Higher frequency for travel to, from and through the city centre	Yes. Consolidating service to the centre on fewer routes means frequency can be optimized, reducing surplus trips.
	3 BUILD FREQUENT ORBITALS	Yes.	Yes. The intersection of frequent orbitals and radials produce a pattern that is easy to grasp.	Yes. Increased orbital frequency.	Yes. Fewer passenger trips are forced through city centre, reducing loads.
	4 GROW SUBURBAN FEEDER NETWORKS	Yes. Improves market for both orbital and radial services to regional centres.	Yes. Fewer overlapping routes in suburban markets	Yes. Improved local frequency for travel within suburban areas.	Yes. Feeder networks support consolidating service to city centre on fewer routes.

³ Chapters 1, 2, 3, 4 and 5 of this report are an updated version of the Choices Report.

Strategy #1: Standardize Patterns of Frequency and Span

In the existing network, a bus route may have any frequency. Although there are tendencies, such as higher frequency at peak, there is no fixed pattern for when certain frequencies begin or end.

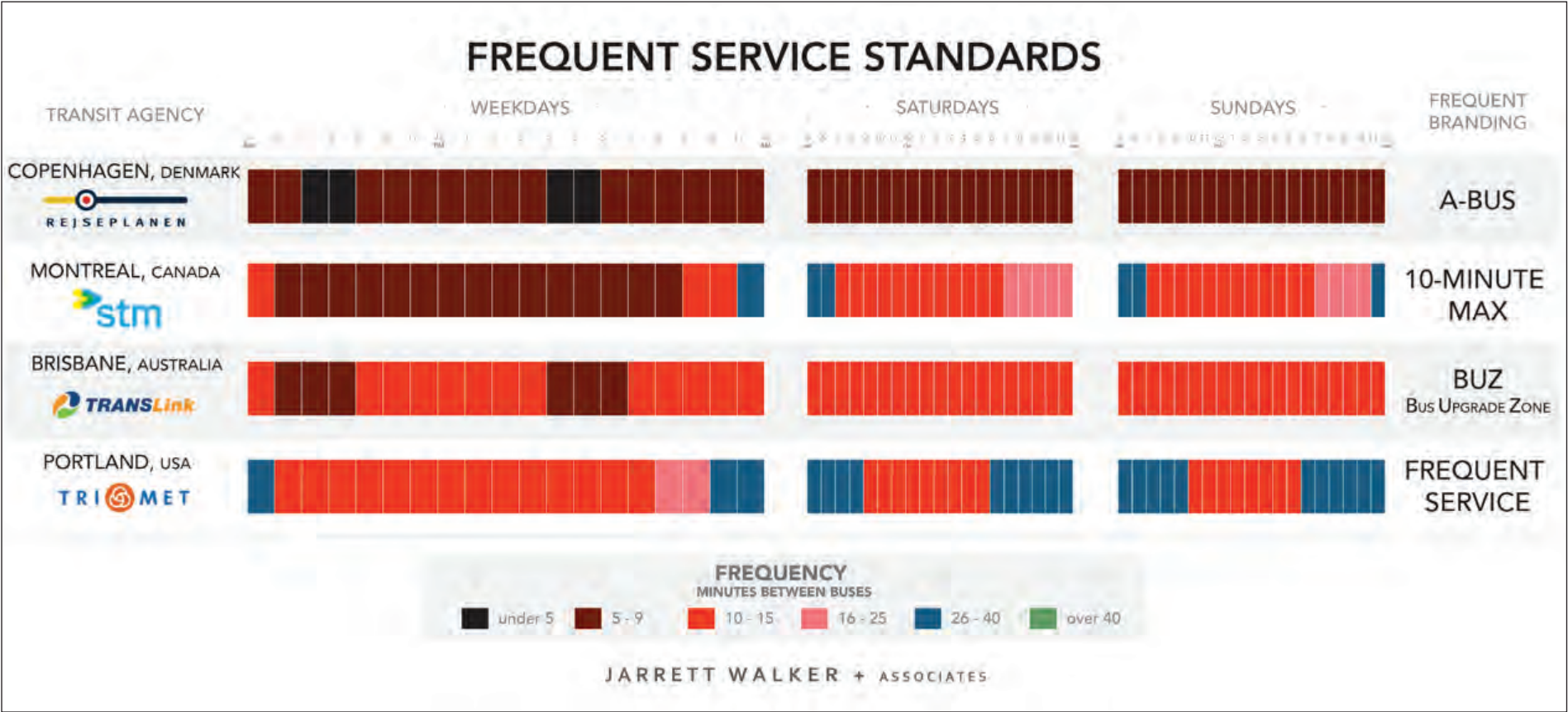
On the one hand, this can seem sensible, as variations in service may respond to variations in patronage. Unfortunately, variations in service also create variations in patronage, since predictable frequency is so critical to making public transport useful for many purposes. This makes it easy to set a service level too low, get low patronage, and never see that demand is being suppressed.

One way to make a public transport network easy to understand is to use a standard set of service categories. Each category refers the user to set levels of frequency and hours of service. Categories can then be highlighted in mapping and public information. This makes it easier to explore beyond the one or two routes you know, because you can easily see what the service level of a route would be by its category.

A typical system of categories would include at least three tiers:

- **Frequent Network** includes routes that are always coming soon. For example, this could mean service every 10 to 15 minutes or more often.
- **Basic Network** are all other routes that operate throughout the day at regular frequencies. This can be divided into several subcategories.
- **Peak and Specialised Routes** are services targeted to specialised needs or surges of demand, such as peak express service, night-time service, or special event service.

Figure 78: Typical frequencies and spans for Frequent Network standards in various cities



The diagram above shows some examples of typical frequencies and spans for Frequent Network standards in other cities. Figure 79 and Figure 80 (below) show how a Frequent Network standard

can be turned into a Frequent Network brand, making it possible to instantly visualize easy access provided throughout the city.

Figure 79: Portland, United States - "Frequent Service" bus stop pole and network diagram

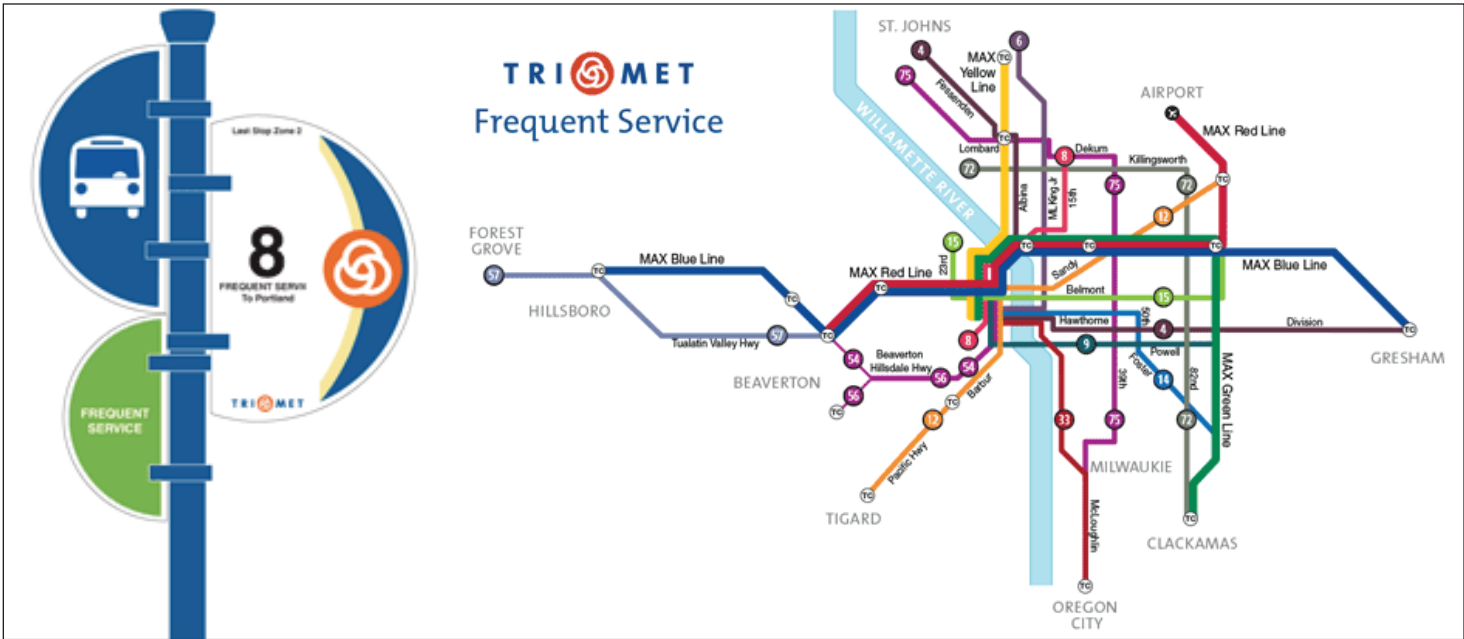


Figure 80: Montréal, Canada - "10 Minutes Max" logo and frequent network map



Strategy #2: Simplify Radial Services to Form Very Frequent Spines

Existing Radial and Cross City Pattern

The diagram to the right (top) is a simplified representation of how radial bus routes are organised in Dublin. As detailed in Chapter 4, each corridor has several overlapping bus routes, which do different things on the opposite side of the city centre.

For example, two overlapping frequent routes from Ballymun approach the city centre from the north, but one continues to Kimmage (Route 9) while the other continues toward Blackrock (Route 4). The advantage of this scheme is that each corridor has direct service to several different corridors on the opposite side of the city, reducing the need to change buses.

But there are at least two disadvantages to the existing pattern:

- Direct service requires waiting for a particular bus rather than taking whichever is coming next. This means lower frequency and thus longer waits.
- The number of cross-city bus patterns creates huge complexity in the city centre. Dozens of routes weave in different directions from different origins, so there are few locations to wait for all buses going out on a given corridor. It is also harder to identify frequent paths useful for short trips in and near the city centre.

Alternative Concept - High Frequency Spines

The diagram to the right (top) shows another way this could work. Imagine if, instead of having direct service from each corridor to several others, all service in a corridor could flow through to a single corridor on the other side.

These services would run together to a certain point, then branch to serve multiple destinations further out. The combined service would form a spine of extreme frequency, in the range of a bus **every 3 to 8 minutes** in the middle of the day. This could also provide other benefits:

- **Simpler cross city paths.** Short trips across the city centre would be easier, because frequency would always be very high and the network would be simple to navigate.
- **Better ability to match service to observed loads.** As service is concentrated on fewer routes, it becomes easier to adjust bus volume to match real demand.
- **Reduced bus congestion in city centre.** Fewer frequent routes are easier to schedule so that buses are not obstructing one another. The total number of bus trips traversing the centre could be slightly lower without any reduction in service to the customer.

Figure 81: Existing Network. Multiple routes from each corridor cross the city centre in different directions.

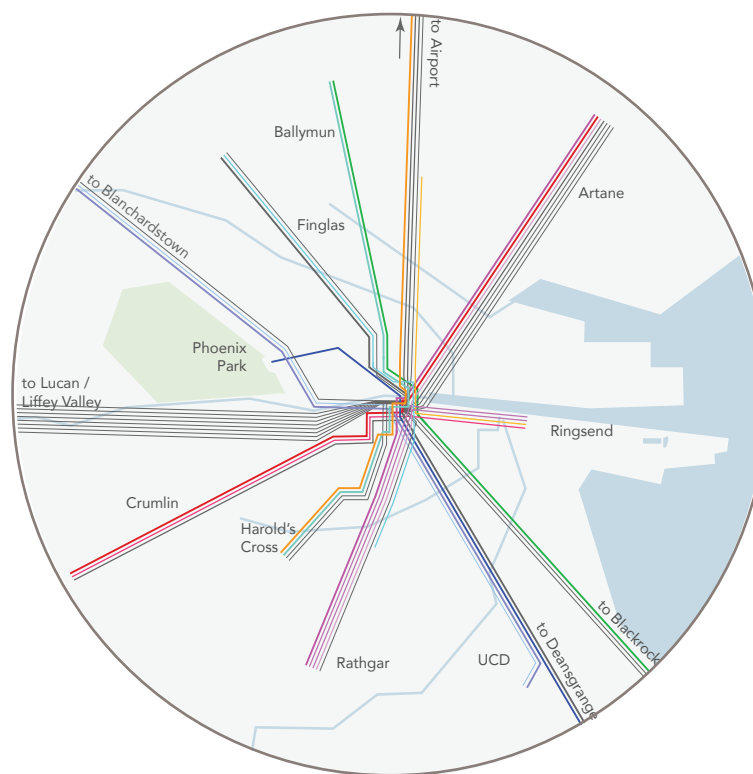


Figure 82: Proposed Network. Each corridor has a single frequent line crossing the city centre on a single path.



Cross City Travel Time Conceptual Examples

Here a few examples of how cross public transport travel times might change, based on the spine frequencies described in Chapter 7.

NEW INTERCHANGE - HAROLD'S CROSS TO DRUMCONDRA

In the existing network, this trip would use Route 16:

Wait 6 minutes + Travel 35 minutes = **41 minutes**

In the revised proposed network, this would change to:

Wait 2.5 minutes + Travel 20 minutes + Wait 1.5 minutes + Travel 15 minutes = **39 minutes**

NEW INTERCHANGE - DONNYBROOK TO HEUSTON STATION

In the existing network, this trip would use Route 145:

Wait 5 minutes + Travel 30 minutes = **35 minutes**

In the revised proposed network, this would change to:

Wait 2.5 minutes + Travel 20 minutes + Wait 2 minutes + Travel 10 minutes = **34.5 minutes**

RESTRUCTURED INTERCHANGE - LUCAN VILLAGE TO UCD BELFIELD

At present, this trip would use Routes 66/a/b and 39a:

Wait 7.5 minutes + Travel 32 minutes + Wait 5 minutes + Travel 17 minutes = **61.5 minutes**

In the revised proposed network, this would change to:

Wait 4 minutes + Travel 27 minutes + Wait 2.5 minutes + Travel 17 minutes = **50.5 minutes**

STILL DIRECT - DONNYCARNEY TO CRUMLIN HOSPITAL

In the existing network, this trip would use Route 27:

Wait 5 minutes + Travel 43 minutes = **48 minutes**

In a restructured network with spines, this would change to:

Wait 2 minutes + Travel 43 minutes = **45 minutes**

Strategy #3: Build Frequent Orbitals by Reducing Duplication

The existing network features few orbital routes, none of which are frequent outside peak hours. This means it is difficult to travel between points that are generally on the same side of the city, without going through the city centre. This also means that some of the crowding on services into the city centre consists of people who could avoid the city centre if they had a more direct route.

One way to increase the frequency of orbital service would be to reallocate resources from radial routes with significant orbital components, as in the example below.

Existing Service - Orbital-Radial Overlap

As shown on the map at top right, the existing orbital Route 18 operates every 20 to 25 minutes in the middle of the day, connecting multiple neighbourhoods in the southern half of Dublin City. Route 83 operates every 15 minutes between Kimmage and city centre. Routes 18 and 83 duplicate each other for a long segment between Kimmage and Rathmines Road.

Alternative Concept - Frequent Orbital

Figure 84 shows another way this could work if the resources currently allocated to Route 83 south of the city centre were allocated to Route 18. It would probably be possible to operate Route 18 every 15 minutes or better all day long, and more frequently at peak. At the same time, service on Rathmines Road would remain extremely frequent, even without Route 83.

Travel Time Examples

The examples below show that many **orbital trips would be faster due to shorter waits. However, small areas would have only orbital service**, so must change buses to reach the city centre.

WORST CASE RADIAL TRIP - ARMAGH ROAD TO CITY CENTRE

In the existing network, this trip would use Route 83/a:

Wait 7.5 minutes + Travel 29 minutes = **36.5 minutes**

With a frequent Route 18 and interchange at Rathmines:

Wait 7.5 minutes + Travel 12 minutes + Wait 3 minutes
+ Travel 17 minutes = **39.5 minutes**

Figure 83: Existing Service - routes 18 and 83

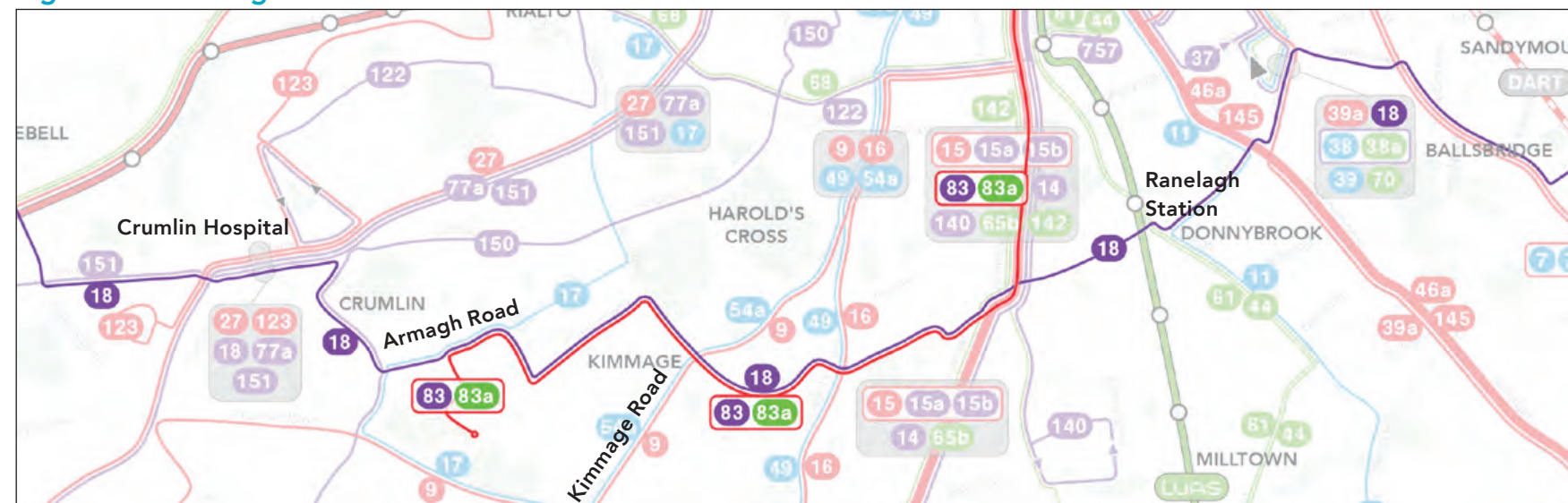
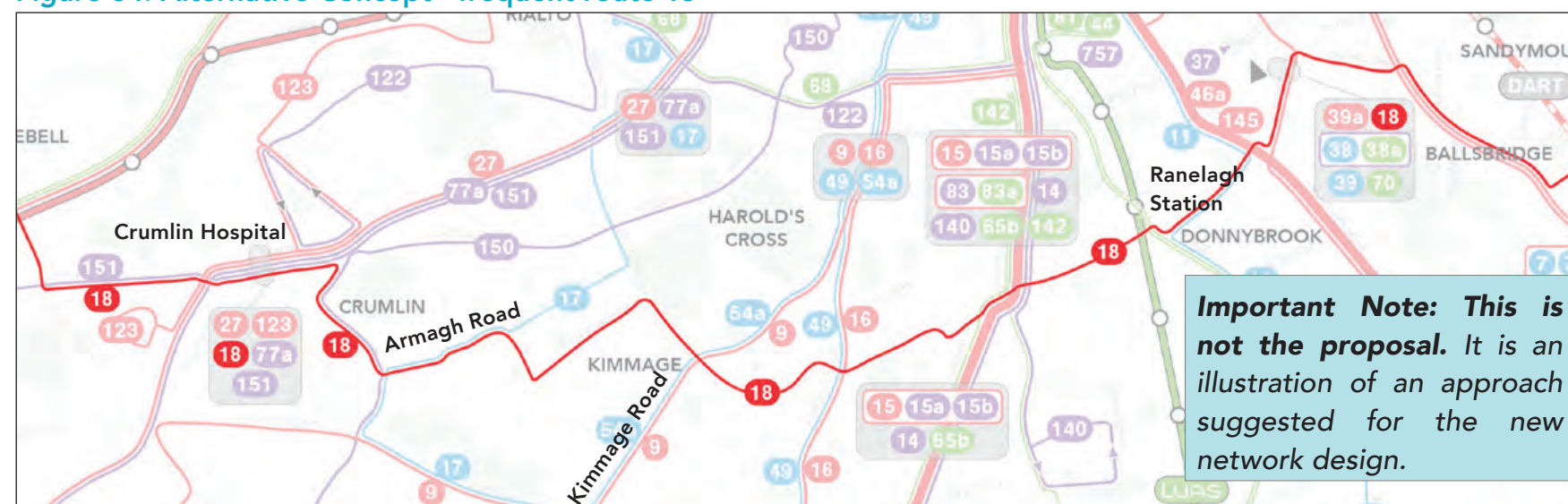


Figure 84: Alternative Concept - frequent route 18



Important Note: This is not the proposal. It is an illustration of an approach suggested for the new network design.

IMPROVED DIRECT ORBITAL TRIP - CRUMLIN HOSPITAL TO BALLSBRIDGE

In the existing network, this trip would use infrequent Route 18:

Wait 12.5 minutes + 31 minutes = **43.5 minutes**

With a frequent Route 18, this would change to:

Wait 7.5 minutes + Travel 31 minutes = **38.5 minutes**

IMPROVED INTERCHANGE ORBITAL TRIP - DUNDRUM TO KIMMAGE ROAD LOWER

In the existing network, this trip would use Luas Green Line and Route 9, with interchange at Harcourt near the city centre:

Wait 3 minutes + Travel 14 minutes + Wait 7.5 minutes
+ Travel 16 minutes = **40.5 minutes**

This would change to Luas Green Line and frequent Route 18, with interchange south of the city centre at Ranelagh Station:

Wait 3 minutes + Travel 11 minutes + Wait 7.5 minutes
+ Travel 12 minutes = **30.5 minutes**

Strategy #4: Grow Suburban Feeder Networks Supporting the Major Routes

Nearly every suburb of Dublin currently has a direct bus service to the city centre. At the same time, many suburban areas of Dublin have very low local bus frequencies.

These two facts are linked. The long run into the City typically duplicates many other routes, and consumes resources that could be used to increase local frequencies.

In many cases, if outlying suburbs were served only by a route to their closest regional centre, they would experience significantly more frequent bus service, as in the following example.

Feeder Example - Dunboyne/Blanchardstown

At present, Dunboyne is served by Route 70 to the city centre, and Route 270 to Blanchardstown Centre. As shown in Figure 85, both operate very infrequently in the middle of the day, every 60 minutes on average in each direction.

If all resources dedicated to Route 70 were re-allocated to Route 270, as shown in the diagram at right, it would be possible to provide service to Blanchardstown Shopping Centre every 20 minutes. Passengers going from Dunboyne to City Centre would connect to frequent radial service at Blanchardstown.

Based on existing schedules, **the increased frequency on Route 270 would greatly reduce average travel times from Dunboyne to Blanchardstown Centre and to the city centre.**

TRAVEL TIME CHANGE - DUNBOYNE TO BLANCHARDSTOWN CENTRE

Under existing service, this trip would use the hourly Route 270, for the following midday travel time:

Wait 30 minutes + Travel 19 minutes = **49 minutes**

With a more frequent Route 270:

Wait 10 minutes + Travel 19 minutes = **29 minutes**

TRAVEL TIME CHANGE - DUNBOYNE TO CITY CENTRE

Under existing service, this trip would use the direct hourly Route 70, for the following midday travel time:

Wait 30 minutes + Travel 49 minutes = **79 minutes**

With a more frequent Route 270 feeding into Route 39a :

Wait 10 minutes + Travel 19 minutes + Wait 5 minutes
+ Travel 39 minutes = **73 minutes**

Figure 85: Existing Midday Service - Dunboyne example

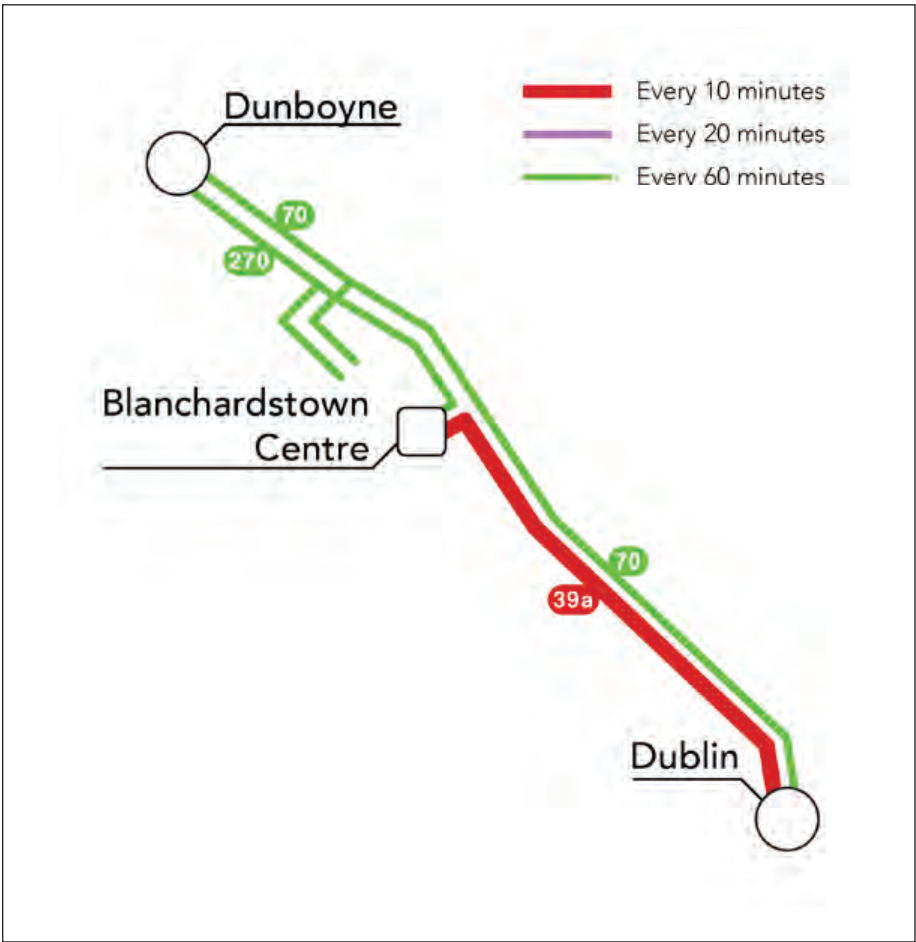
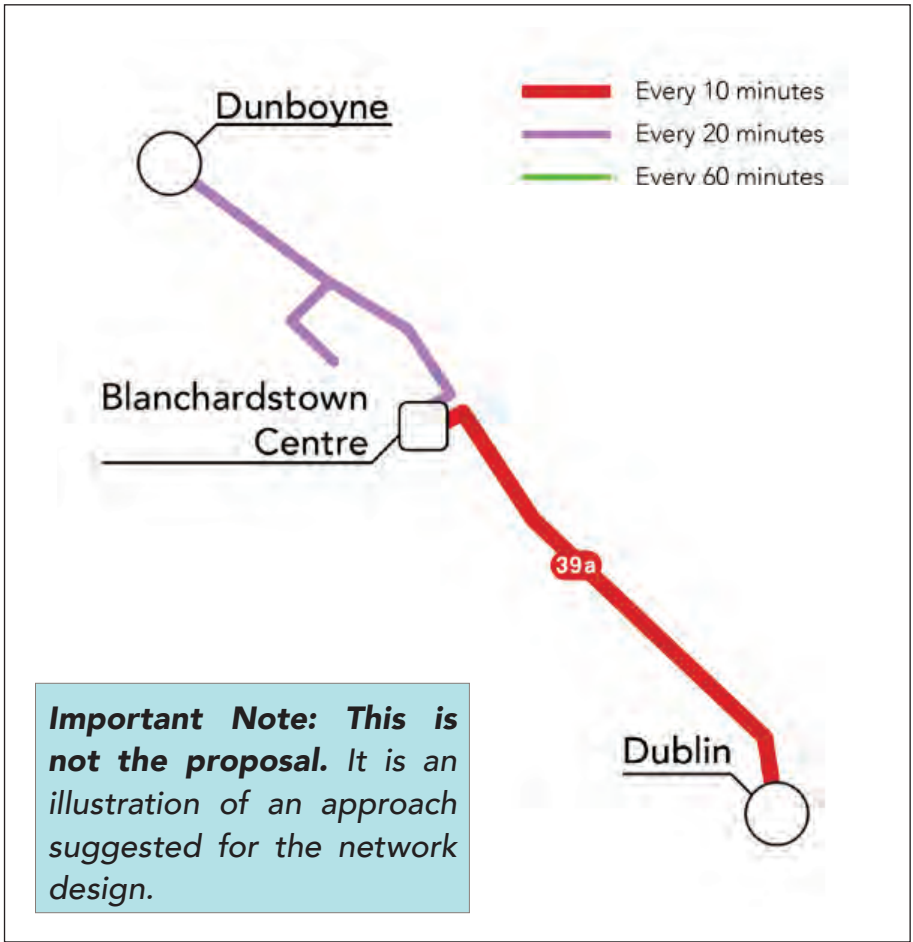


Figure 86: Alternative Concept - Dunboyne example



Peak Hour Considerations

The following additional considerations should be taken into account when thinking about this concept for peak-hour travel. These issues will be considered in any detailed proposal using this principle.

- **Core Radial Capacity.** Converting Route 70 into a feeder service means that a large number of passengers will interchange to the core radial route into the city centre (e.g. existing Route 39a, or Spine B as shown on page 68).
 - » The core radial route may require additional service may to handle increased loads, and it may be necessary to add a peak express service.
- **Time Delay to Access Interchange.** Many regional centres such as Blanchardstown Centre are subject to peak-hour congestion. This means that the time benefits of feeder service will be less at peak hour than during the middle of the day.

Summary of Choices and Next Steps

To sum up, **the most important choice facing the Dublin area bus network is whether to increase the reliance on inter-changing, in return for service that is more frequent and less complex** and offers faster total journey times even for trips where an interchange is newly required.

This chapter has illustrated the advantages and disadvantages of interchange in general, and also has laid out some examples of the kinds of changes that might appear in a plan that embraces the high-interchange, high-frequency principle. These are organised into four strategies:

- **Standardize Service Categories** so that users instantly know the frequency and service hours of any given route, just by looking at a map.
- **Simplify Radial Services** by consolidating core radial routes such that each major corridor is served by a single “spine” that crosses the city centre on a single path, and continues to another single corridor on the other side.
- **Build Frequent Orbitals** to create more frequent and direct paths between suburbs, and to allow suburb-to-suburb trips to avoid the city centre.
- **Grow Suburban Feeder Networks** so that services between outer suburbs and regional centres can become much more frequent, and the number of buses reaching the city centre is reduced.

6

How Public Consultation Has Informed the Network Proposal

Summary of the Planning and Consultation Process

Choices Report and First Public Consultation

The contents of Chapters 1 to 5 of this report were initially published in June 2017 as the Dublin Area Bus Network Redesign Choices Report.

Following the release of the Choices Report, the NTA held a public consultation to help determine the degree to which there was a public appetite for the strategies proposed in Chapter 5:

- Standardize Service Categories so that users instantly know the frequency and service hours of any given route.
- Simplify Radial Services by consolidating core radial routes such that each major corridor is served by a single “spine”.
- Build Frequent Orbitals to create more frequent and direct paths between suburbs.
- Grow Suburban Feeder Networks so that services to regional centres can become much more frequent.

The feedback from the first public consultation suggested that large segments of the public favoured exploring the strategies outlined above, providing the NTA and consultant team a mandate to redesign the bus network along these lines.

Network Proposal and Second Consultation

Following the first public consultation, the initial network redesign was elaborated over the course of a year. During this time:

- The NTA, Dublin Bus, local councils and the consultant team held an intensive design workshop to sketch out the basic principles and form of the proposed network, including the initial routing and frequencies of every all-day bus line.
- The consultant team developed the initial draft network, and refined the concept further over several months based on NTA guidance and Dublin Bus comments.
- A second workshop with the NTA and Dublin Bus focused specifically on designing peak-only services.
- NTA and the consultant team reported on the proposed network in the Public Consultation Report.

The initial network proposal was detailed in the Public Consultation Report, released in July 2018 along with other information materials. This launching a second public consultation that lasted throughout the summer of 2018.

Revised Network Proposal and Third Consultation

The NTA received over 28,000 comments and submissions in response to the initial network proposal. Given the broad range of concerns, the NTA decided to make significant revisions.

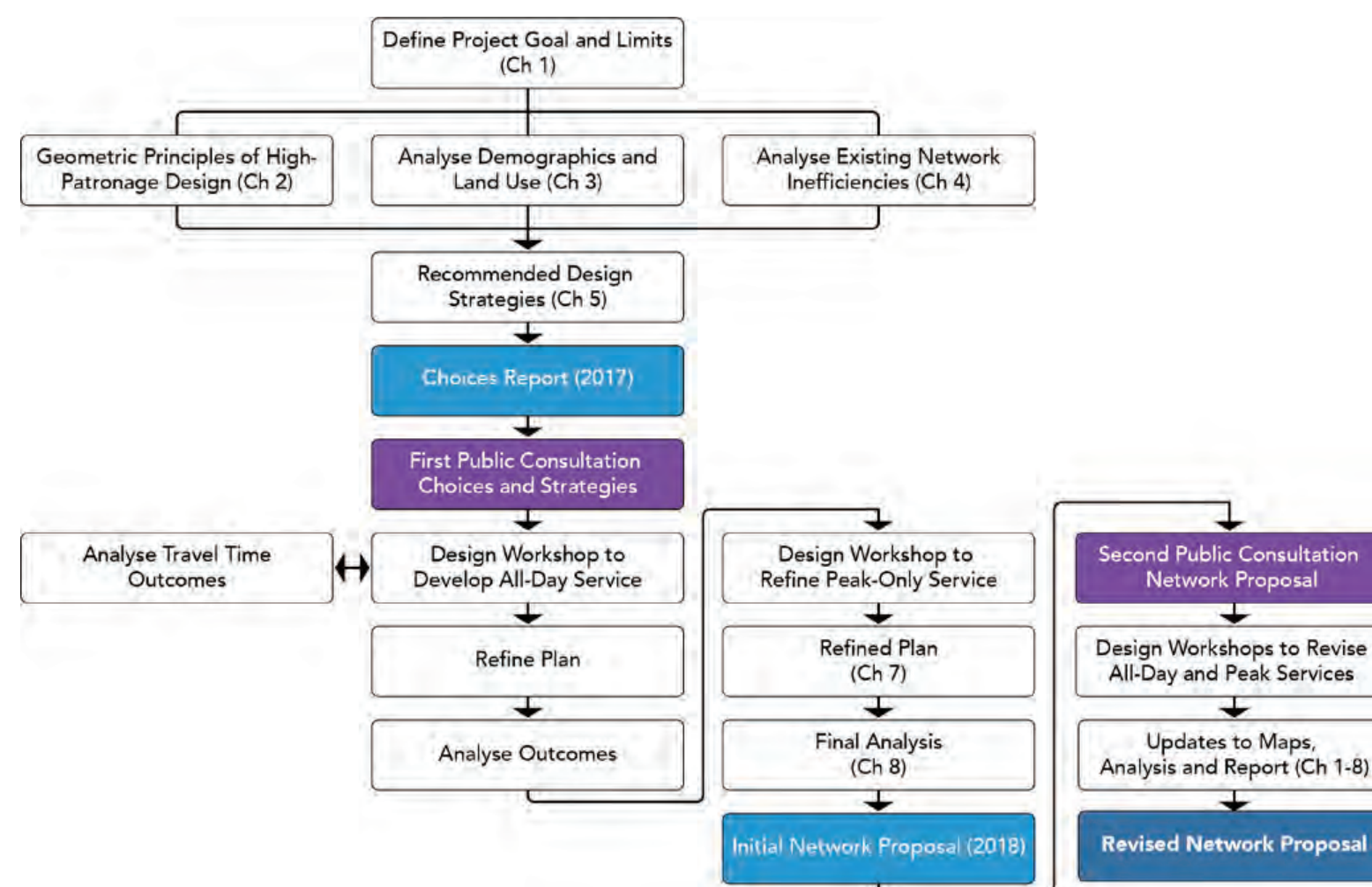
Over 2018 and 2019, the NTA, Dublin Bus and consultant team have held several more design workshops. Over the course of these workshops:

- The basic structure of the proposed network (spines, branches, orbitals etc.) was retained, but every single proposed route was reviewed and nearly all were edited in some way. New routes were added as well.
- The total quantity of service included in the proposal increased by over 20%, as a result of:

- » Frequency increases, particularly on most spines and secondary radials with service to and from City Centre.
- » Large increases in peak-hour service, responding to passenger loading surveys carried out in Autumn 2018.
- » Adding “lifeline” radial routes to maintain some direct service to City Centre in as many estates as possible.

This document, the Revised Network Proposal, is the update to the initial Public Consultation Report. The NTA is now launching a third public consultation regarding the revised proposal. Submissions and comments received during this phase of consultation will help guide final decisions about the plan.

Figure 87: The chart below shows the process used to develop the network redesign proposal, and how each step relates to the chapters in the report. The revised network proposal comes on the heels of a comprehensive design process and two rounds of public consultation, in 2017 and 2018.



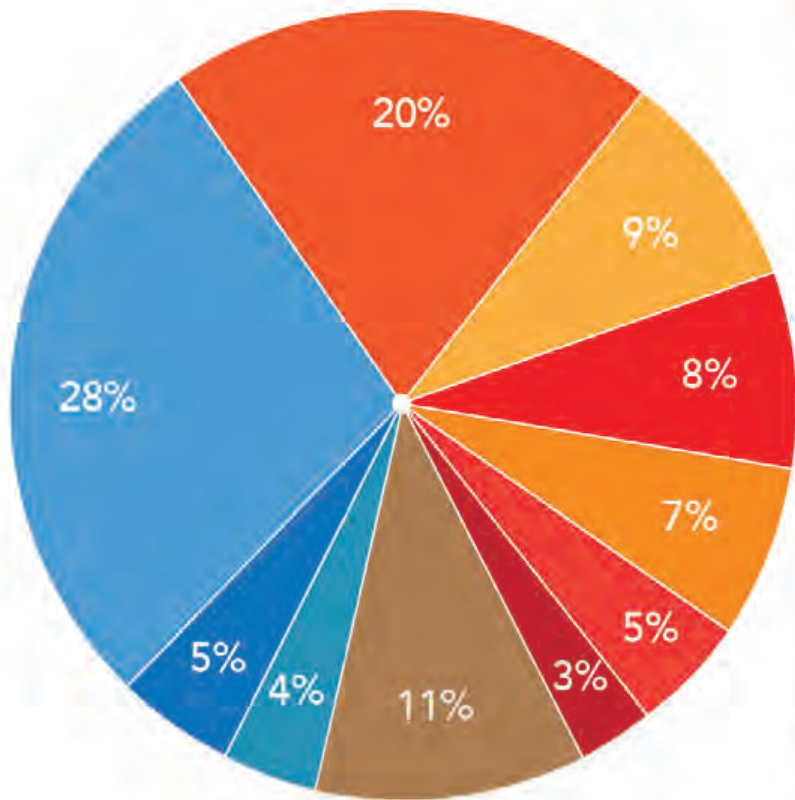
Elements of Consultation

The initial public consultation, held in June 2017, included the following elements:

- **A public survey**, made available online and on paper, asked a series of questions about priorities for public transport, and about the specific ideas presented in Chapter 5 above. NTA received over 12,000 responses; almost 1% of Dublin's population replied, the largest response ever to an NTA consultation¹.
- **Workshops with key stakeholders**. In each of the four Dublin council areas², NTA invited a group of local elected officials, council staff, and civic leaders to an all-day workshop where the principles were explored in detail. About 20-40 people attended each workshop. During the workshop we polled participants on key questions largely similar to those included in the public survey.
- **Written submissions**. In total, 41 written submissions were received.

This section summarizes results of the public survey. Where the stakeholder workshops were asked the same question, we also describe those results.

Figure 88: Survey Respondents' top goal for public transport



Higher patronage goals

- 20% 5. Reduce dependence on private cars
- 9% 6. Limit traffic congestion
- 8% 1. Attract as many customers as possible
- 7% 10. Require as little government subsidy as possible
- 5% 7. Reduce air pollution and climate impacts
- 3% 8. Help build a denser city with less sprawl

Need-based goals

- 28% 2. Provide service everywhere that someone needs it
- 5% 3. Meet the needs of older and disabled persons
- 4% 4. Meet the needs of low-income persons

General goals

- 11% 9. Make the city an attractive place to work and live

1. Goals of Public Transport

People have different ideas about what goals public transport should serve. The survey listed ten commonly expressed goals for public transport and asked respondents to rank them in order of importance. These goals are listed in the chart above.

Goals 1, 5, 6, 7, 8, and 10 tend to be met by achieving high patronage. Although this is only explicitly stated in Goal 1, high patronage is nonetheless also a precondition for: reducing dependence on cars (Goal 5), limiting congestion (Goal 6), or reducing pollution (Goal 7).

A denser city with less sprawl (Goal 8) is also one where large numbers of people use public transport. And because the cost of providing public transport depends on the quantity of service rather than the quantity of customers, the more people ride the lower the subsidy becomes (Goal 10). In other words, **goals associated with higher patronage were the top priority of 52% of respondents.**

Goals 2, 3 and 4 are about responding to individual needs. Responding to needs is about the basic availability of service; it isn't necessarily linked to whether that service generates significant patronage. There are people everywhere who need some public transport service, so these goals are relevant when justifying low-patronage services. Overall, **37% of respondents chose a need-based goals as their top priority.** Most of these responses chose Goal 2, "provide service everywhere that someone needs it."

Finally, 11% of respondents chose Goal 9, "make the city an attractive place to live and work. This goal can depend on any of the others, depending on what someone finds attractive in a city.

Consistent with this feedback, the initial proposed network was designed to focus primarily on increasing patronage by making the service more useful. It addressed need-based goals by proposing that most areas that currently have PSO bus service would retain service, though the proposed service might not be on the same street or at the same hours and frequencies.

¹ NTA received 12,769 responses. The population of the area within 400m of the Dublin public transport network is about 1.3 million. The total 2016 population of the four council areas that make up County Dublin is 1.35 million, with another roughly 200,000 in adjacent areas of counties Wicklow and Kildare that are affected by the network.

² Workshops were held in Dublin City, Tallaght (South Dublin), Dun Laoghaire (Dun Laoghaire-Rathdown), and Tyrellstown (Fingal). Representatives from County Wicklow were present at the Dun Laoghaire workshop, and some County Kildare representatives were present at the Tallaght workshop.

2. Importance of Frequency and Hours of Service

The survey asked people three questions about whether or not public transport services at different types of frequencies and duration are useful to them.

The answers to these questions strongly point to the need for consistent all-day patterns of high-frequency service to serve the majority of residents (in the range of 60 to 80%, based on survey responses). However, it also indicates that a sizable minority (perhaps 20 to 30%) can make some use of infrequent, peak-only or occasional services.

For each of the questions above, the survey also asked whether we should assume that most people are in the same situation. Depending on the question, only 30 to 50% believed their situation was typical and should be the basis of planning. This indicates some degree of openness to a plan that is not optimal for respondents personally, so long as it achieves the larger goals.

3. Openness to Network Change

To assess how open the public would be to changing the bus network, the survey asked the public to pick a position somewhere in between:

- Matching travel patterns of existing passengers
- Redesigning the system with reference to the future

Respondents could move a slider to whatever position in between these two points felt most comfortable to them¹. On that slider, a score of 0 indicated the absolute desire to “keep patterns existing passengers are used to”, while a score of 100 indicated an absolute preference for “design[ing] the best system for the future”.

The average response had a score of 81, suggesting a broad level of comfort with very significant change in the bus network.

Figure 89: Survey responses regarding the prominence of the regular commute as the driver of public transport use.

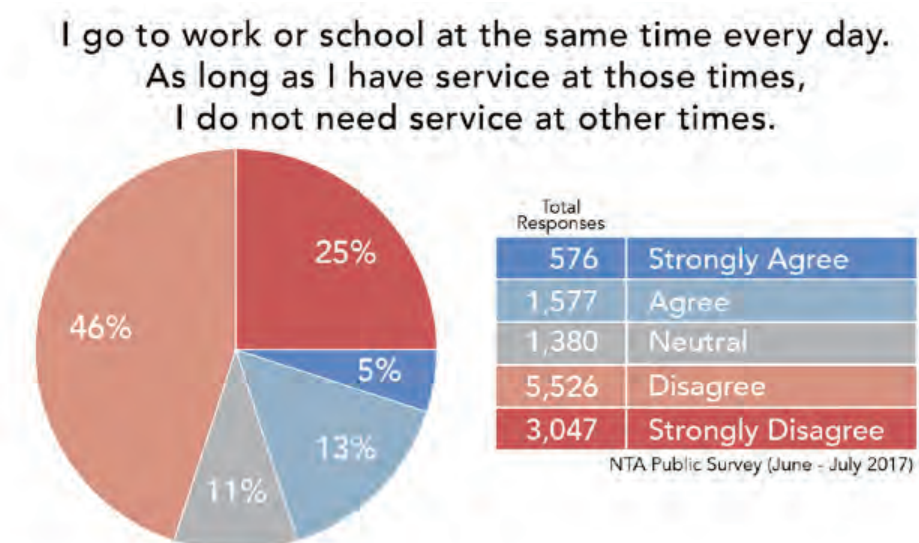


Figure 90: Survey responses regarding the usefulness of infrequent bus services.

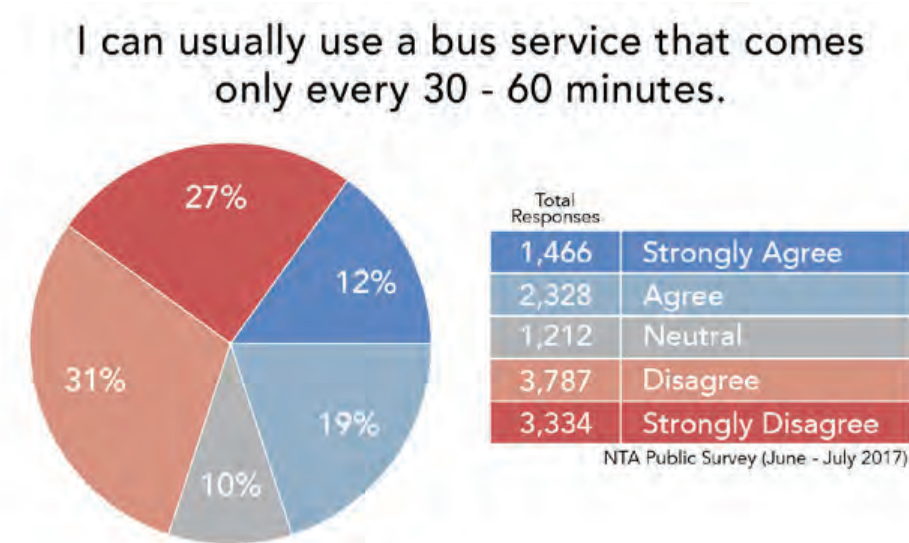
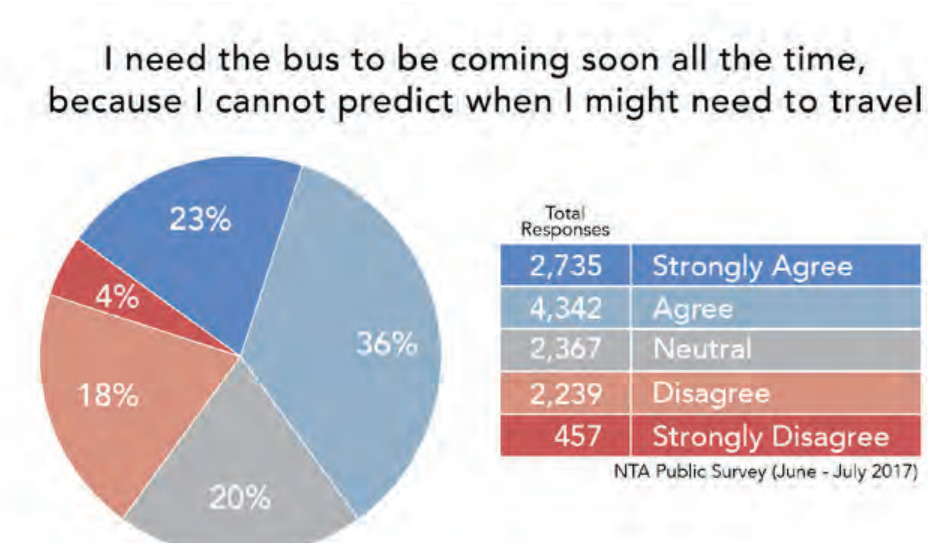


Figure 91: Survey responses on the need for frequent services at all times



¹ On the paper survey, respondents could mark their preferred position with a tick on a line somewhere in between the two extremes. The relative distance of the tick from either end was used to calculate the score from 0 to 100.

4. Willingness to Interchange

The survey asked how people feel about three statements:

- "We can ask people to change vehicles (buses or trains) once during a trip, if those people reach their destination sooner." 81% agreed.
- "We can ask people to change vehicles once during a trip, if that creates a network that helps more people reach more destinations sooner." 80% agreed.
- "We can ask people to change vehicles once during a trip, if it helps make the network simple enough that people can remember it." 68% agreed.

The responses to all three questions are summarized in the charts below.

These questions are very similar to a question that was asked in the stakeholder workshops. After presenting the various advantages and drawbacks of designing a network that relied on higher levels of interchange we asked participants in the workshop "Does the idea of relying on interchange sound promising?"

Responses from the stakeholder workshop are summarized in the table to the right:

While we know some people will be unhappy about having to make a connection, **the results of the survey and workshops nonetheless indicate very high levels of support (70 to 80%) for designing a network with higher levels of interchange.**

Figure 94: Stakeholder workshop responses on openness to interchange

Does the idea of relying on interchange sound promising?

	Dublin City	Dun Laoghaire Rathdown*	South Dublin**	Fingal
Strongly Agree	53%	43%	40%	53%
Agree	20%	47%	36%	34%
Neutral	13%	7%	16%	9%
Disagree	10%	0%	8%	3%
Strongly Disagree	3%	3%	0%	0%

* included some attendees from County Wicklow
** included some attendees from County Kildare

Figure 93: Survey responses on openness to interchange for faster individual trips

"We can ask people to change vehicles (buses or trains) once during a trip, if those people reach their destination sooner."

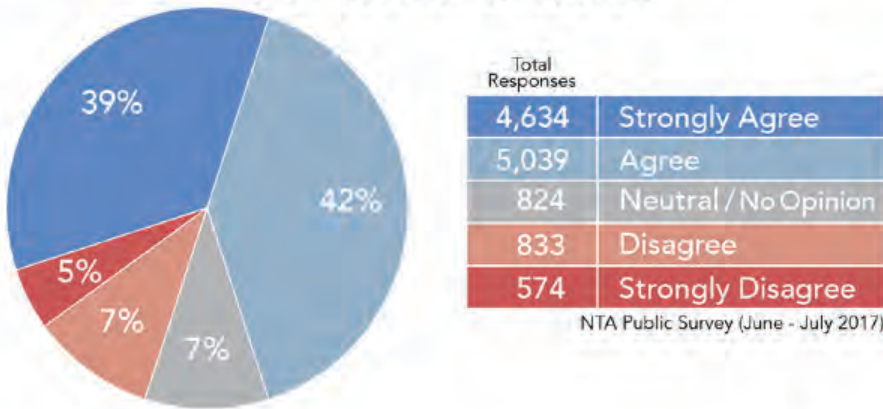


Figure 92: Survey responses on openness to interchange for faster trips generally

"We can ask people to change vehicles (buses or trains) once during a trip, if that creates a network that helps more people reach more destinations sooner"

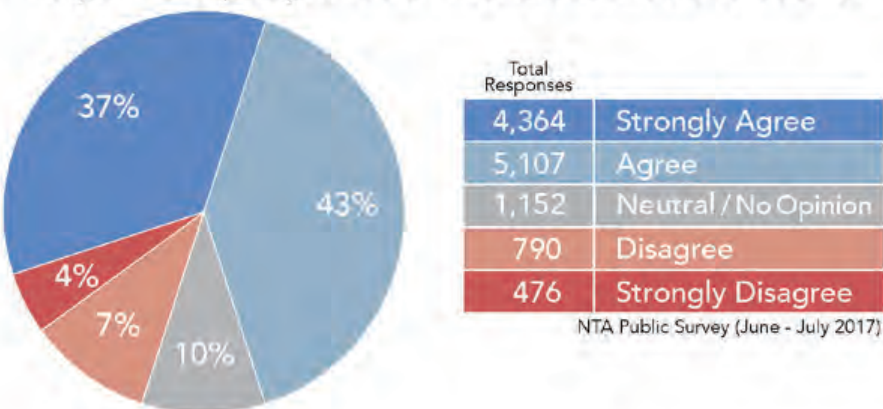
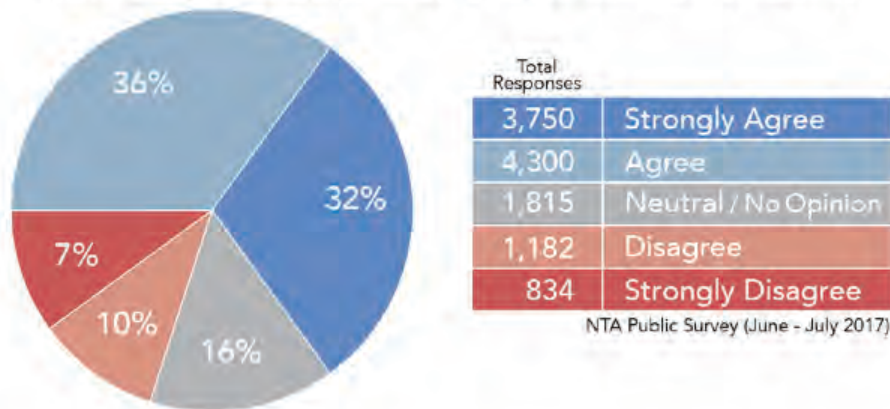


Figure 95: Survey responses on openness to interchange for simplicity

"We can ask people to change vehicles (buses or trains) once during a trip, if helps make the network simple enough that people can remember it"



5. Interest in Proposed Network Design Strategies

Chapter 5 of the Choices Report (also included as Chapter 5 in this report) proposed four strategies that could be used in a network redesign:

- **Strategy #1: Standardize Service Categories**
- **Strategy #2: Simplify Radial Services**
- **Strategy #3: Build Frequent Orbitals**
- **Strategy #4: Grow Suburban Feeder Networks**

The survey queried the public specifically on strategies 2 and 3 (spines and orbitals). We did not ask the public about service categories because the question was considered too technical.

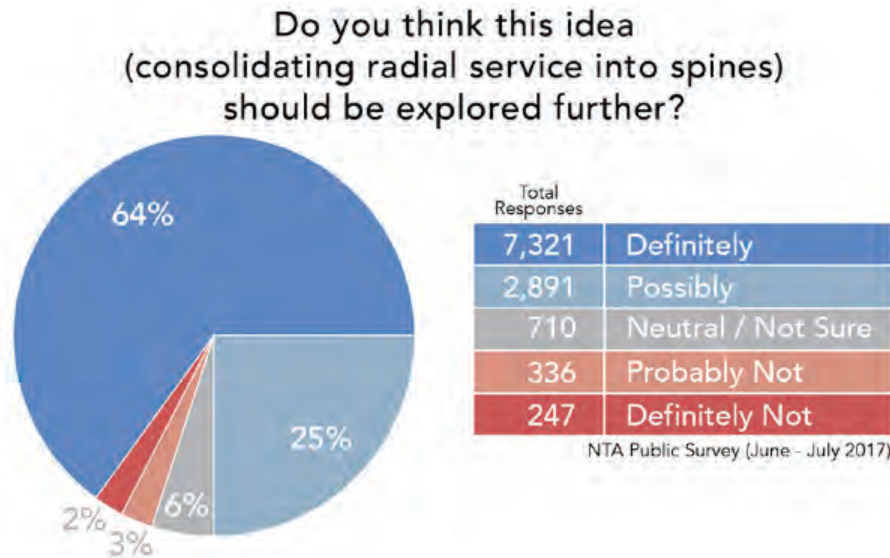
We also did not ask the public about Strategy 4 (suburban feeders) because in practice, many of the consequences of this strategy are very similar to orbitals: higher frequency service at the local level, but more areas that require interchange to reach the city centre.

Strategy 4 also would affect a much smaller share of Dublin's population, so a citywide response (i.e. a response including many people who would not be affected by the idea) would be less helpful.

Consolidate Radial Services into Spines

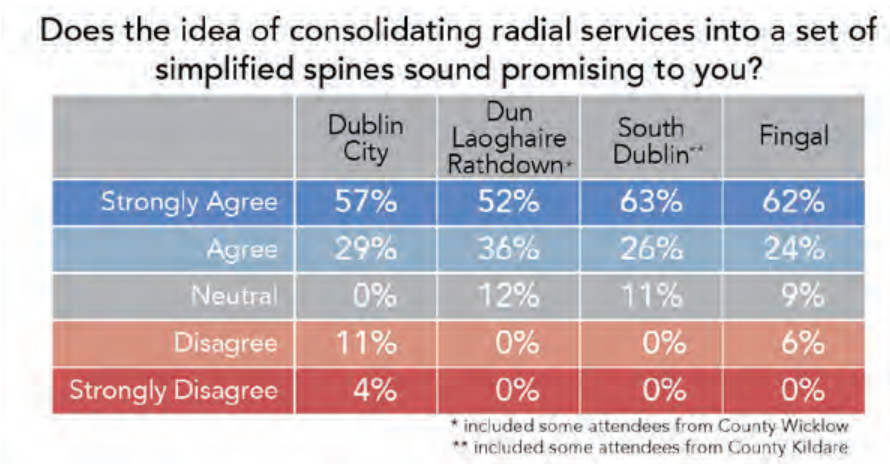
The survey provided an explanation of this strategy similar to what appears in Chapter 5 above, and then asked if the idea should be explored further.

Figure 96: Survey responses on the spine strategy



In the stakeholder workshops, we asked a similar question: "Does the idea of consolidating radial services into a set of simplified spines sound promising to you?"

Figure 97: Stakeholder responses on the spine strategy

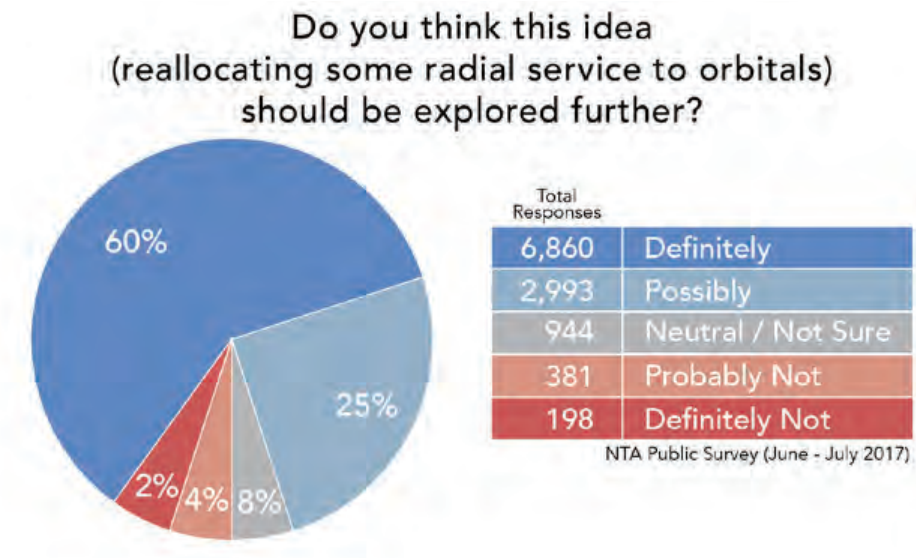


These results indicate very strong support (80 to 90%) for consolidating radial service into super-frequent spines. As a result, this strategy was taken as the central pillar of the proposed network design.

Reallocating Some Radial Service to Orbitals

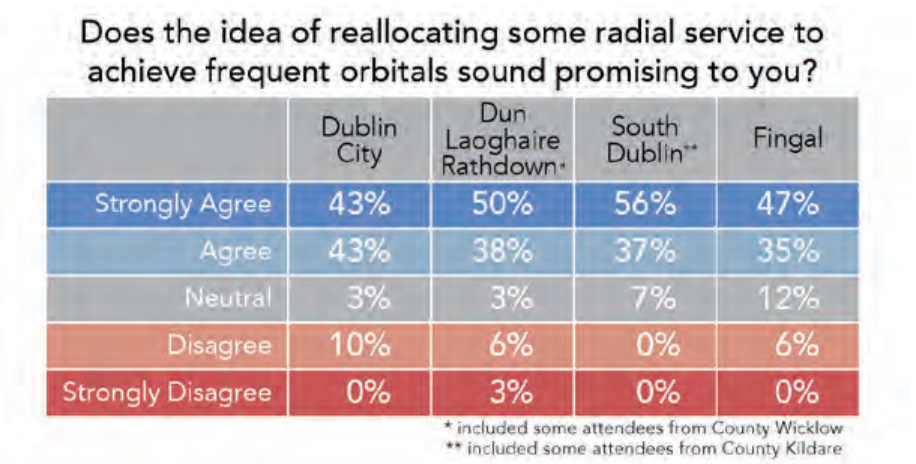
As with the prior question on radial services, the survey provided an explanation of this strategy similar to what appears in Chapter 5 above, and then asked if the idea should be explored further

Figure 98: Survey responses on the orbital strategy



We asked a similar question of the stakeholder workshops: "Does the idea reallocating some radial service to achieve frequent orbitals sound promising to you?"

Figure 99: Stakeholder responses on the orbital strategy.



These results also indicate very strong support (80 to 90%) for developing high frequency orbitals, even if it means some areas would no longer receive radial service.

Suburban Local Feeders

As explained above, we did not ask this question in the public survey.

In the stakeholder workshop only, we asked: “Does developing or significantly improving suburban feeders by eliminating long radials sound promising?”

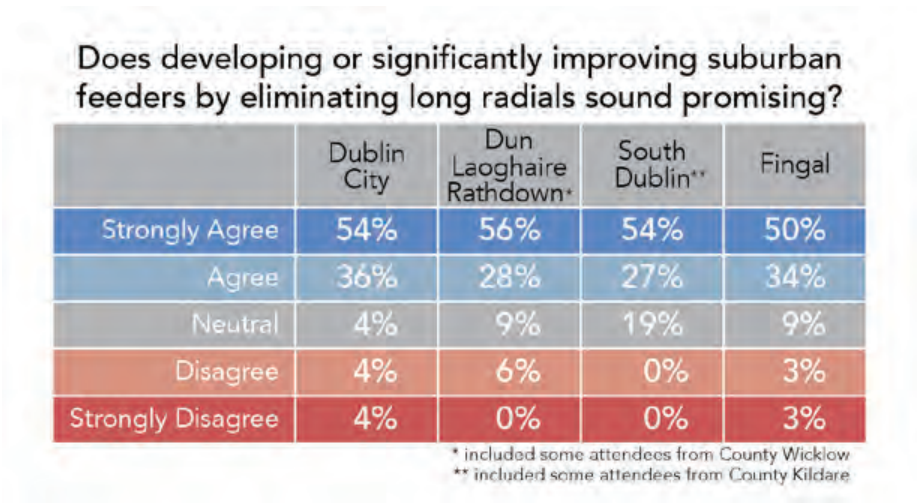
The response suggests a similar level of support for developing suburban feeders as for frequent orbitals.

Conclusion

All of the feedback presented in this chapter was based on a high-altitude presentation of the issues, as summarized in Chapter 5. Each key question was presented as a trade-off with a clear description of possible negative impact.

Despite this, the level of support shown for the proposed strategies was extremely high. Based on this, NTA directed the consultant to develop a detailed plan based on those strategies.

Figure 100: Support for suburban feeder strategy



Initial Network Proposal

In July 2018, the NTA released the initial bus network redesign proposal. The redesign proposed an overhaul of the existing bus network, along the lines of the strategies previously presented. Some of the key elements of the proposal included:

- Most radial bus services reorganized into a system of super-frequent cross-city spines (A to G), with branches in suburban areas.
- Increased number and frequency of orbital services, including a super-frequent inner orbital (O) and five other frequent orbital routes with service every 10 to 15 minutes.
- An increase in the number and frequency of local feeder routes in outer suburban areas.
- A 27% increase in bus service overall, compared to 2016 levels¹. This notably made it possible to increase service levels on weekday evenings and weekends.

The combination of these features yielded significant travel time benefits. Based on these improvements:

- The average Dubliner using public transport would have been able to reach over 20% more jobs in 30 minutes, and 15% more jobs in 45 minutes on weekdays.
- Over 200,000 more residents and 50,000 more jobs would have been located within 400m of bus service every 15 minutes or better.

These benefits, while considerable, relied on a total redesign of the route structure. As a result, hundreds of thousands of people would need to experience a major service change, and certain areas would be located farther from bus service than they are today. The NTA therefore decided to launch a second public consultation to gauge the public's appetite for change in this direction.

Elements of Consultation

The second public consultation was carried out from July to September 2018. The NTA offered the following informational elements to the public:

- The **Public Consultation Report**, including the rationale for the network proposal, results of the first public consultation, detailed description of the proposed network and high-level outcomes in terms of coverage, travel times and job access.
- **Detailed maps** of the existing and proposed network for all parts of Dublin, and **local area brochures** focusing on the changes applicable in different parts of the city.
- This information was made available both on the **BusConnects website** and through **33 community information sessions** held in locations throughout the Dublin area.

The resulting public conversation was carried out in many different forums. The network redesign effort was covered in the news media through the summer. Many local elected officials and neighbourhood groups organized their own meetings. Countless social media exchanges occurred on the merits and disadvantages of the proposed changes.

Throughout this time, the NTA recorded public comments on the proposal through:

- A **public survey**, available through the BusConnects website, which:
 - » Asked whether the new network would be an improvement over existing service.
 - » Provided an opportunity for open-ended comments in regards to specific areas, and existing or proposed bus routes.
- **Written submissions** provided by e-mail, post and in person.
- **Petitions** signed by members of the public, requesting various changes to the proposal.

In total, the NTA received 20,751 responses to the public survey, 7,780 written submissions, and 65 petitions with a total of 20,209 signatures. This represents an unprecedented level of response to a public consultation on public transport in Ireland.

¹ The NTA has increased bus service in Dublin considerably since this time. See Chapter 7, page 90 for further details.

Overall Survey Response²

The survey asked respondents whether overall the proposed network would be better or worse for Dublin than the existing network.

Overall, the survey response to the plan was negative. The majority of survey responses (60%) said the proposed network would be somewhat or much worse. Only a quarter of respondents (25%) believed it would be somewhat better or much better.

Response by Council Area

The survey asked respondents to identify which council area they lived in. It also split Dublin City into three areas: City Centre (between the canals), North and South.

The most positive responses came from those living in Dublin City Centre where over half of respondents (56%) indicated that the initial network proposal would be an improvement over the existing network.

Outside City Centre, majorities in all council areas except Dun Laoghaire-Rathdown responded that the network would be worse than the existing system.

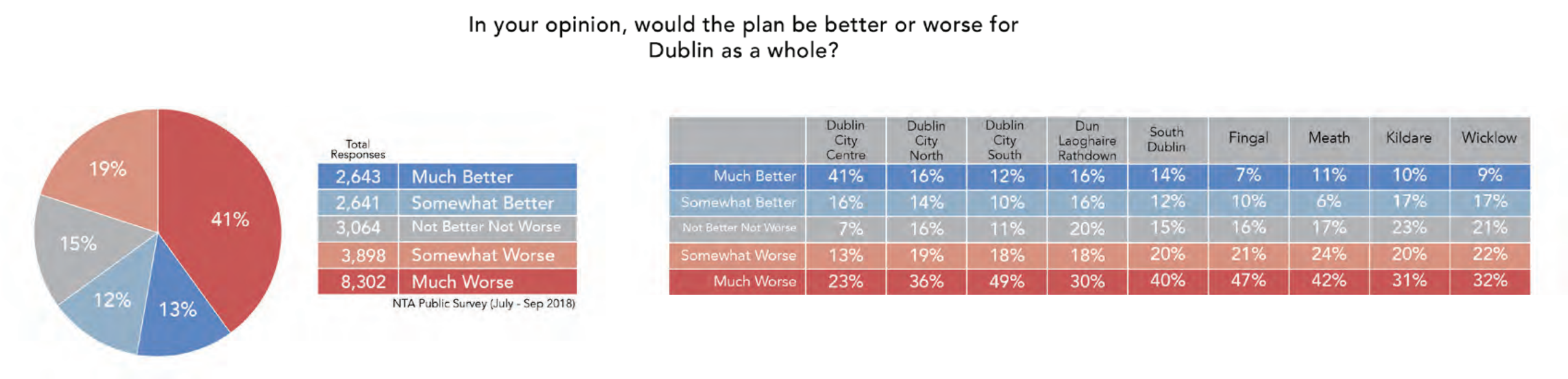
General vs. Specific Comments

One notable trend was that **respondents with positive opinions tended to have general comments about the network.**

In contrast, **respondents with negative opinions were more likely to cite specific issues** or problems with reference to existing routes.

- Among those who said the network would be “much better” for Dublin, just over half (53%) of respondents provided a comment with regard to a specific existing route.
- Among those who said the network would be “much worse”, the vast majority (82%) had comments in regard to a specific route.

Figure 101: Public survey responses on the initial network proposal, summer 2018, for all of Dublin and by sub-area.



² In this and following pages, we focus primarily on responses to the public survey, because these are simpler to quantify, providing a sense of scale for the different types of input received by the NTA during the second consultation. However, every petition and written submission was also separately reviewed by the NTA. Though each written submission and petition focused on the specific concerns of its author and/or signatories, the general sentiments expressed were broadly similar to those expressed in the survey. The NTA and consultant team also explicitly considered the network design ideas suggested in more detailed submissions.

Responses by Location and Existing Route

The pattern of survey responses by area and existing bus routes suggests that **there were very different levels of concern from one area to another.**

- Respondents had the option to identify their comments by area, based on a list of 147 different areas in Dublin.
 - » **50% of comments by area came from 22 areas.**
 - » The following 25% of comments came from 27 areas.
 - » The final 25% of comments came from 98 areas.
- Respondents had the option to identify their comments by existing bus route as well, among 115 routes.
 - » **50% of comments by route related to 19 existing routes.**
 - » The following 25% of comments related to 20 routes.
 - » The final 25% of comments related to 76 routes.

Furthermore, the areas that generated the largest number of comments also generated the largest number of negative comments.

- 40 areas produced 100 or more comments. Respondents from all of these areas had a majority negative opinion of the initial network proposal.
- 76 areas produced 50 or fewer comments. Respondents from only a third of these area (35%) had a majority negative opinion.

This suggests that, although a number of concerns about the proposed network were broad-based, **the strongly negative overall opinion in survey responses was significantly tilted by a limited set of neighbourhoods with strong objections.**

The adjacent table lists the existing routes that generated the highest number of comments, and the areas most impacted by proposed changes to those routes in the initial network proposal.

The table on the following page lists the areas that generated the highest number of comments, and the most cited concerns in those areas.

Figure 102: The table below shows the number of survey comments provided with reference to existing routes, and relates those comments to the areas most impacted by the change in those routes. About half of comments referencing existing routes were made in regard to the 19 routes listed below.

Existing Route	No.of Comments	Cumulative %	Areas Most Impacted
33	698	4%	Rush, Lusk, Skerries, Balbriggan
27	674	8%	Coolock
33x	645	12%	Rush, Lusk, Skerries
70	522	16%	Dunboyne, Clonee, Littlepace
13	517	19%	Ballymun, Clondalkin
1	506	22%	Sandymount, Shanowen
14	451	25%	Ballinteer, Beaumont, Artane
145	447	28%	Bray
4	435	30%	Monkstown
9	382	33%	Glasnevin
15a	365	35%	Perrystown, Greenhills
15	343	37%	Knocklyon
42	336	39%	Malahide
67	327	41%	Celbridge
16	318	43%	Ballinteer
47	301	45%	Belarmine, Stepside
66a	297	47%	Leixlip
37	265	48%	Castleknock, Carpenterstown
17a	253	50%	Blanchardstown, Finglas, Ballymun, Coolock
All Other Routes (96)	8086	100%	

Recurring Themes in Submissions

Survey responses and written submissions cited a broad range of concerns regarding the initial network proposal. Many of those concerns were specific to individual situations. Nonetheless, certain recurring concerns have emerged from a detailed review of the whole. These recurring themes include:

- **People in many areas would be required to interchange to travel to or from the City Centre.** This is the result of reallocating radial service toward more orbital service. Although support for this strategy was very strong in the first consultation, many respondents to the second consultation objected to the consequences.
- **Certain interchange locations require significant improvements.** To date, the public transport network in Dublin has not been operated with interchange as a primary consideration.
 - » As a result, there are relatively few and small existing interchange facilities (e.g. at Blanchardstown, Tallaght, Dundrum). These would need to be expanded to accommodate proposed service, and in some locations safety issues would need to be addressed as well.
 - » Beyond purpose-built interchange facilities, most on-street bus stops are set back from intersections, making interchange where routes cross potentially difficult. This is something the NTA will address through infrastructure improvements, including in the Core Bus Corridor project.
- **Proposed peak routes and frequencies may not provide sufficient passenger capacity.** This is partly related to existing conditions. There has been rapid patronage growth on public transport in Dublin since 2016, and many peak-hour buses are overcrowded. The proposal focused service increases on evenings and weekends. The total amount of peak service proposed was only 5% above 2016 levels. However, patronage growth has outpaced this.
- **Existing conditions on Luas, DART and main bus lines do not favour additional interchange.** This point relates both to the quality of interchange and problems of peak overcrowding. The initial network proposal was built on the assumption that it is acceptable to require more interchange from orbital and feeder routes onto main bus and rail lines. However, existing peak-hour conditions on Luas and DART, and certain bus lines are already very crowded. As a result, there is a general concern that requiring more

Figure 103: The table below shows the number of survey comments provided with reference to specific areas of Dublin, and the most cited concerns. About half of comments referencing specific areas were made in regard to the 22 areas listed below.

Area	No. of Comments	Cumulative %	Most Cited Existing Routes	Closest Proposed Routes	Most Cited Concern
Rush	504	4%	33, 33x	285	Loss of direct service to City Centre.
Celbridge	387	8%	67, 67x	C4	Longer path to City Centre. Not enough peak trips.
Clondalkin	357	11%	13, 151, 40, 69	D3, G2, 63, 255	Loss of direct service to City Centre. Insufficient frequency and/or no service in some locations.
Coolock	350	14%	27, 27b, 17a	A1, N8	Loss of direct service and/or new paths to City Centre. Proposed orbital route does not serve enough destinations.
Malahide	345	17%	42, 142, 102	D1, 281	Loss of direct service to City Centre from certain areas.
Leixlip	325	20%	66a, 66x	C3, 259	Loss of direct service to City Centre from certain areas. Insufficient frequency and/or no service in some locations.
Bray	319	23%	145, 84x, 185	E1, 212, 213	Loss of direct service to City Centre from certain areas. Insufficient frequency and/or no service in some locations.
Lucan	314	25%	25, 25a	C1, C2, 252	Existing and potential peak bus overcrowding. Reliability of travel time.
Finglas	295	28%	40, 140, 9, 83	F1, F2, F3	Insufficient frequency on some proposed services to City Centre.
Swords	261	30%	41, 41c, 43	A4, 282, 280	Insufficient direct services to both Airport and City Centre.
Lusk	232	32%	33, 33x	285	Loss of direct service to City Centre.
Tallaght	205	34%	77a, 54a	240	Loss of direct service to City Centre from certain areas.
Ballinteer	197	36%	14, 16	A3	Fewer direct routes and change in route to City Centre.
Rathfarnham	196	38%	15b, 61	16, 234	Peak frequency/crowding on proposed route to City Centre. Loss of direct service to City Centre in some locations.
Clonee	195	39%	70	264	Loss of direct service to City Centre and Littlepace.
Blanchardstown	184	41%	39, 39a	B1, B2	Congestion at Blanchardstown Shopping Centre. Loss of direct service to City Centre in some locations.
Crumlin	180	42%	17, 18, 83	S2, S4	Fewer bus routes than existing, longer resulting walks. Loss of some orbital connections.
Howth	176	44%	31, 31a	N6	Loss of direct service to City Centre.
Chapelizod	165	45%	66	14	Significant reduction in service due to bypass routing. Insufficient frequency on proposed route.
Dunboyne	160	47%	70	264	Loss of direct service to City Centre and Littlepace.
Glasnevin	157	48%	9, 11, 83	7a, 7b	Longer walks to direct service to City Centre. Insufficient frequency on proposed services to City Centre.
Ballymun	156	50%	13, 17a	E1, E2, N8	Loss of direct service to City Centre from certain areas. Proposed orbital route does not serve enough destinations.
All Other Areas	5759	100%			

interchange at peak will be uncomfortable at best, or result in major delays to passengers at worst.

- **Changes to the network may be difficult for people who are elderly and/or disabled.**
 - » This concern is in part related to walking distances. The initial proposal was designed under the assumption that it is acceptable to trade a higher frequency of service for a longer walking distance to a bus stop. This is less acceptable to people for whom walking is more difficult.
 - » A second part of this concern relates to the notion that any change is harder for older and/or less able people. A network redesign would result in a service change affecting many people. People with less interest in or ability to absorb change would be more affected.
- **Many proposed routes take different paths than existing service, disrupting existing travel patterns.** This concern is partly about change in general (as above), but was particularly expressed with respect to schools and hospitals. The initial proposal was primarily designed with regard to all-day travel patterns. It has become clear that more peak-hour trips (like for schools) need to be addressed, and that connections to hospitals need to be reviewed.
- **Potential loss of transport service in semi-rural areas.** The initial network proposal did not include service in several semi-rural areas that have historically been served by Dublin Bus. The general idea was that these areas would be served by new Local Link services, but the replacement service had not yet been designed.

Many concerns expressed in public consultation touched on themes that were related to the network redesign, but are ultimately subject to separate decisions. Some of the more prominent themes along these lines included:

- Desire for a 90-minute flat fare across public transport to be implemented as soon as possible.
- Concerns about possible privatisation¹ of public transport services, particularly in relationship to the introduction of service provided by Go-Ahead Ireland.
- Desire for improvement of rail services, including relief of overcrowding on Luas and DART services, and acceleration of the Metro and/or Metrolink projects.

¹ These concerns were expressed as “privatisation”, but PSO services now operated by Go-Ahead are funded by NTA and operated as a public service under NTA’s authority. A more appropriate term to describe this would be “market opening for public transport services”.

Conclusion

The first public consultation found that there was a high level of support for the strategies that would underlie a bus network redesign in Dublin.

However, the second public consultation revealed considerable concern over the actual network proposal built on these strategies.

There are several likely reasons for this apparent discrepancy:

- General support for a strategy does not necessarily indicate that one is ready to accept its consequences. For example, it appears from the first consultation that most residents agree with the principle of losing some direct service to City Centre in exchange for more frequent orbital routes. But every area actually affected by this type of change in the initial network proposal submitted many comments in opposition in the second consultation.
- People who are negatively impacted tend to submit more comments than people who are positively impacted. This is apparent from the analysis of survey responses: far more comments were received from areas where the proposal might have had negative consequences than from areas where the proposal was an unambiguous improvement.
- It may be that not enough public transport service investment has been made in the Dublin region generally. This is plausible because most of the concerns raised can be solved at a higher level of investment. For example, if more subsidy were available for service generally, it would be possible to increase orbital service without reallocating service away from direct services to City Centre.

The NTA has now taken on the feedback received in the second consultation, and the project team has made a large number of revisions to the proposed network.

The full revised proposal is described in the following chapter (Chapter 7) of this report. A table detailing the changes from the 2018 to the 2019 proposal is also available as an appendix to this report.

7

Revised Network Proposal

Collaborative Planning Process

The initial network proposal was largely developed in intensive design workshops where experts from the NTA, Dublin Bus, local councils and consultant team met all day for multiple days to craft the network together. The consultant team then further refined the plan through continuous conversation with NTA staff, and additional workshops with both NTA and Dublin Bus, to yield what was presented in the 2018 public consultation.

Following on the second public consultation in 2018, the network was revised through a series of further design workshops with the NTA and Dublin Bus, as well as a more detailed off-line review of existing peak-hour services and passenger loads.

Throughout the planning process, the impact on access – where people could get to in a given amount of time – served as a guiding indicator. We used this information to revise the network design to ensure the best possible outcomes. Travel time and access outcomes for the new network are explained in Chapter 8.

What's Changed Since Last Year?

This chapter summarizes the guiding principles behind the revised proposed network, how and where those are different from the 2018 network proposal, and what the proposed service is like in each part of Dublin.

1. The general principles and Dublin-wide ideas are presented from page 85 to page 108.
2. A detailed description of the revised proposed service in each part of Dublin is presented from page 109 to page 165.
3. A table listing changes from the initial (2018) proposal to this revised proposal is provided as an Appendix to this report.

Initial Guiding Principles

In descending order of importance, the following principles have guided the revised network design. These are maintained from the initial network proposal, but with a slight shift in emphasis between them:

- **Expand people's ability to get more places, sooner.** This remains the primary goal of the network redesign and the basis for how it would attract more customers and improve the liveability of Dublin.
- **Continue to serve the entire area now served.** Everyone who has service nearby now would continue to have service nearby. This principle has been reinforced in the revised network proposal. To the extent gaps existed in the initial proposal, the vast majority have been filled.
- **Create a simpler network,** that is easier to understand, navigate, explain, and remember. However, a stronger emphasis on the goal of continuing to serve the entire area has somewhat reduced the pre-eminence of this principle.

Together and in this order, these principles imply several others:

- **Focus on the network of high frequency lines, and on expanding the hours at which high frequency service is available.** By high frequency service, we mean service coming every 10 to 15 minutes or better. Because wait time is such a large component of urban public transport trips, reduced wait times are essential to expanding the range of places people can go using public transport.
- **Increased interchange is acceptable if it leads to improved travel times.** It takes a combination of multiple connecting high frequency lines to turn a pile of bus routes into the City Centre into a comprehensive network that can allow people to efficiently travel throughout Dublin.
- **We must be open to change wherever it improves service.** A route should not be left unchanged purely because it is historic or because some people are used to it. It must make sense as a way to achieve the goals of the network today and in future. The overwhelming majority of street segments that are served today are served in the new network, but that is because they still make sense, not just because they were served before.

Responding to Consultation Feedback

These high-level guiding principles have also been set against some of the key considerations brought up in the second public consultation, with the following results.

- **Direct service to the City Centre.** In the interest of minimizing the impacts of interchange on vulnerable populations, the revised proposal sets the principle that 95% of areas with zero-interchange service to the City Centre will maintain this. Nonetheless, there will be many cases where this "direct" service may not be the fastest or straightest path. The priority for investments in frequency will remain on the primary spines and orbital paths as this has the greatest overall impact on overall mobility.
- **Avoiding overcrowding at peak travel times.** In response to concerns about peak crowding and the difficulty of interchange onto crowded rail and mainline bus services, the revised proposal includes approximately 10% more service and vehicle capacity at peak than in the initial proposal. This amount was determined based on peak-hour passenger counts performed at locations throughout Dublin in November 2018, and a review of patronage trends by route since 2016.
- **Ensuring neighbourhood connections to schools, hospitals and other services.** The initial network proposal prioritized expanding the ability to get to the highest number of places above all. In some cases, this led to route designs that would have severed existing direct connections to schools, hospitals and other critical services. Many of these connections have been restored with changes to route design in the revised proposal.
- **Continuing service in semi-rural areas.** The initial network proposal did not include service in certain semi-rural areas that have historically been served by Dublin Bus. The general idea was that these areas would be served by new Local Link services, but the replacement service had not yet been designed. This service is now designed and included for reference in the maps and other materials in this document.

In applying the principles laid out on this page, the proposal assumes broader improvements to public transport in Dublin.

No Fare Penalty for Interchange

The proposed network relies on increased interchange to improve access and reduce total travel times. Therefore, it is critical that the fare and ticketing system be revised.

Ideally, a customer's fare for a given trip should be the same regardless of which part of the network is being used (bus, Luas, DART or Commuter Rail), or whether any interchange is required. The NTA is actively working on fare integration strategies to support higher levels of interchange. Therefore, the plan assumes that at minimum:

- The fare schedule will be the same across bus, Luas, DART, and Commuter Rail.
- Customers using the Leap card will not pay a second fare when interchanging between bus, Luas, DART and Commuter Rail.

Improved Commuter Rail Frequency

We assumed that DART will operate every 10 minutes between Howth Junction, Dublin city centre, and Bray (as it has since September 2018), and every 20 minutes on the branches to Howth, Malahide, and Greystones.

We also assumed that Commuter Rail services will operate at improved midday frequencies:

- Maynooth Line: Every 30 minutes between Maynooth and Connolly Station.
- Kildare Line: Every 60 minutes between Kildare and Heuston Station.
- Northern Line: Every 60 minutes between Drogheda and Connolly Station.

Infrastructure Improvements

The vast majority of this network proposal can be operated using current infrastructure. Nonetheless:

- At least one new major interchange facility will be needed (Liffey Valley), and at least 2 others will require expansion in the short term to accommodate significantly higher volumes of terminating and through-running buses (Blanchardstown, Tallaght).
- A number of other locations are operable in the short term, but would benefit from improvements to allow for greater passenger and operator comfort.
 - » An example of one such location would be at Beaumont Hospital, where the number of terminating and through-running buses would also increase, if less dramatically than in the locations above.
- A number of locations on the proposed network are designed with the notion of interchange in mind, in places where existing facilities would not make it comfortable for large numbers of people. These don't prevent the proposed network from operating, but the full benefits of the network will not be realized until interchange conditions at such locations are improved.
 - » An example of one such locations would be the junction of the N11 and Wyattville Road, where a route with service every 10 minutes to City Centre (E1) and another with service every 15 minutes to Dun Laoghaire (222) would intersect. Existing facilities make it possible but relatively difficult to interchange at this location. Both routes can function without the improved interchange, but both would benefit from it as well.
- Improvements in travel time reliability will continue to depend on improvements to bus priority.

Once implemented, the continued high performance of the proposed network will depend in part on continued improvements to interchange stops, and continued bus priority improvements on the Core Bus Corridors.

Service Types and Route Numbering

Overview

The proposed network would organize bus routes into six categories according to their role in the network structure. These are:

- Spines.
- Spine Branches.
- Orbitals.
- Other Radials.
- Locals.
- Peak Only Services.

Spines: Simple, Frequent Routes Across the Core

In the proposed network, most of the bus routes that flow into the centre of Dublin are reorganized into eight spines.

Spines are very frequent routes. With a bus coming every 3 to 8 minutes, there is always a bus coming soon. This high frequency makes it very fast to connect from one spine to another, and to other frequent services like DART, Luas, and the frequent orbitals. Most spines would operate cross-city, meaning that buses don't end in City Centre, but continue across the centre and to the other side of Dublin.

Spines are designated by the letters A to H. 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 (see "Spine Branches" below).

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

Spine Branches

A spine is not a route in itself. Rather, it is a combination of two to five bus routes that operate with staggered timetables to provide high frequency on the "spine" segment.

Each of these routes in a spine branch. **No interchange is required where the branches merge to form the spine.** Branches leading to and from the same spine share a letter (e.g. "A") but have different numbers (e.g. "A1", "A2", "A3", "A4").

Most spine branches are proposed with all-day frequencies every 10 to 15 minutes.

Orbitals

Orbitals are routes that connect multiple neighbourhoods and destinations but do not run into the City Centre. They tend to run perpendicular to the spines and other radial routes. Together, orbitals and spines form a web-shaped grid.

- N1-N9 are North Orbitals. These are east-west routes across the northern side of the city, numbered outward from the city centre.
- S1-S9 are South Orbitals. These are east-west routes across the southern side of the city, numbered outward from the city centre.
- W1-W9 are West Orbitals. These are north-south routes across the western side of the city, numbered outward from the city centre.
- O is the innermost orbital route, running near the canals. It is the only one that forms a complete loop around the city.

The O orbital would run every 8 minutes on weekdays. Five other key orbitals would run every 10 to 15 minutes. A further three would run every 20 to 30 minutes all day, but with higher frequencies at peak hours.

Other Categories

There are three other categories of service, which carry numbers without an initial letter:

- **Numbered Radials.** In some areas, main roads run too far apart for radial service to be provided entirely through the spine-and-branch system. In these places, radial routes are numbered between 1 and 99. The frequency on routes 1 to 99 varies by route and anticipated level of demand.
- **Suburban Locals.** These routes cover outer suburban areas and connect them to major suburban centres and interchanges where passengers can connect to spines, orbitals, or rail services. Local routes are numbered from 200 to 299.
- **Peak-only services.** These are routes run only during the peak period. Peak-only routes are numbered from 300 to 399. The design and function of peak-only routes may vary:
 - » In some cases, they provide direct service to City Centre in places where this is not available in the midday.
 - » In some cases, they provide faster or express service to City Centre in places where the journey on a local route would be very long.

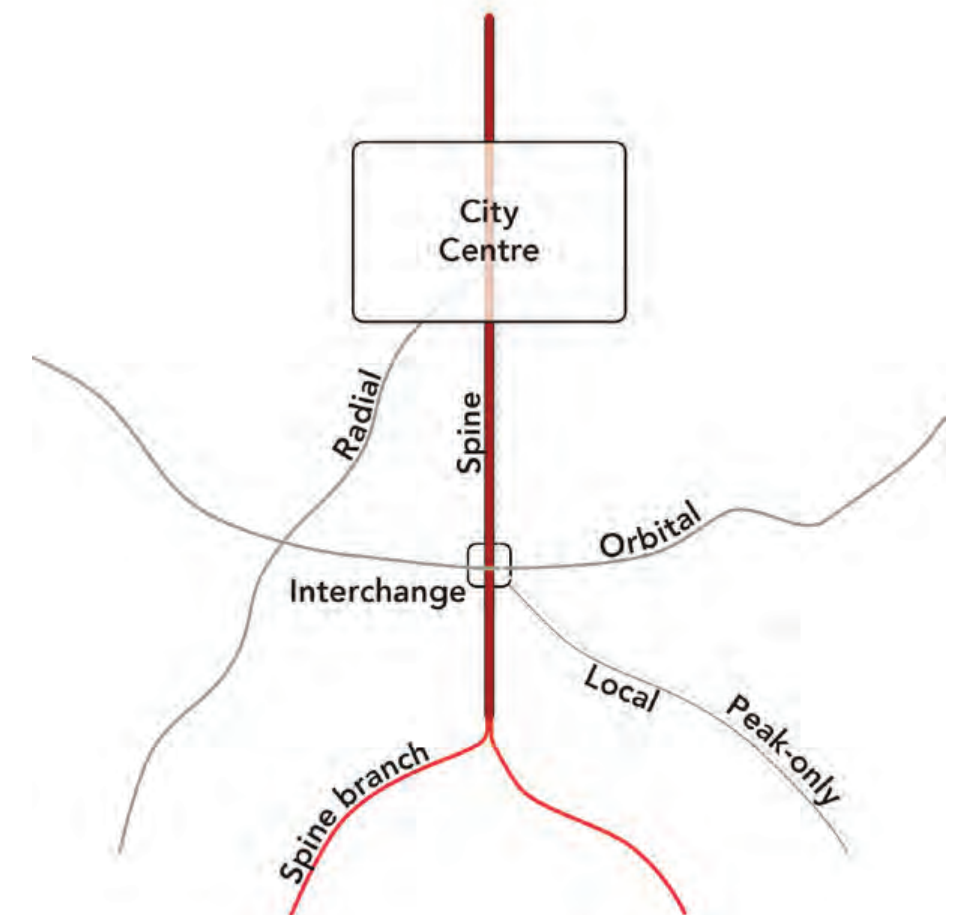
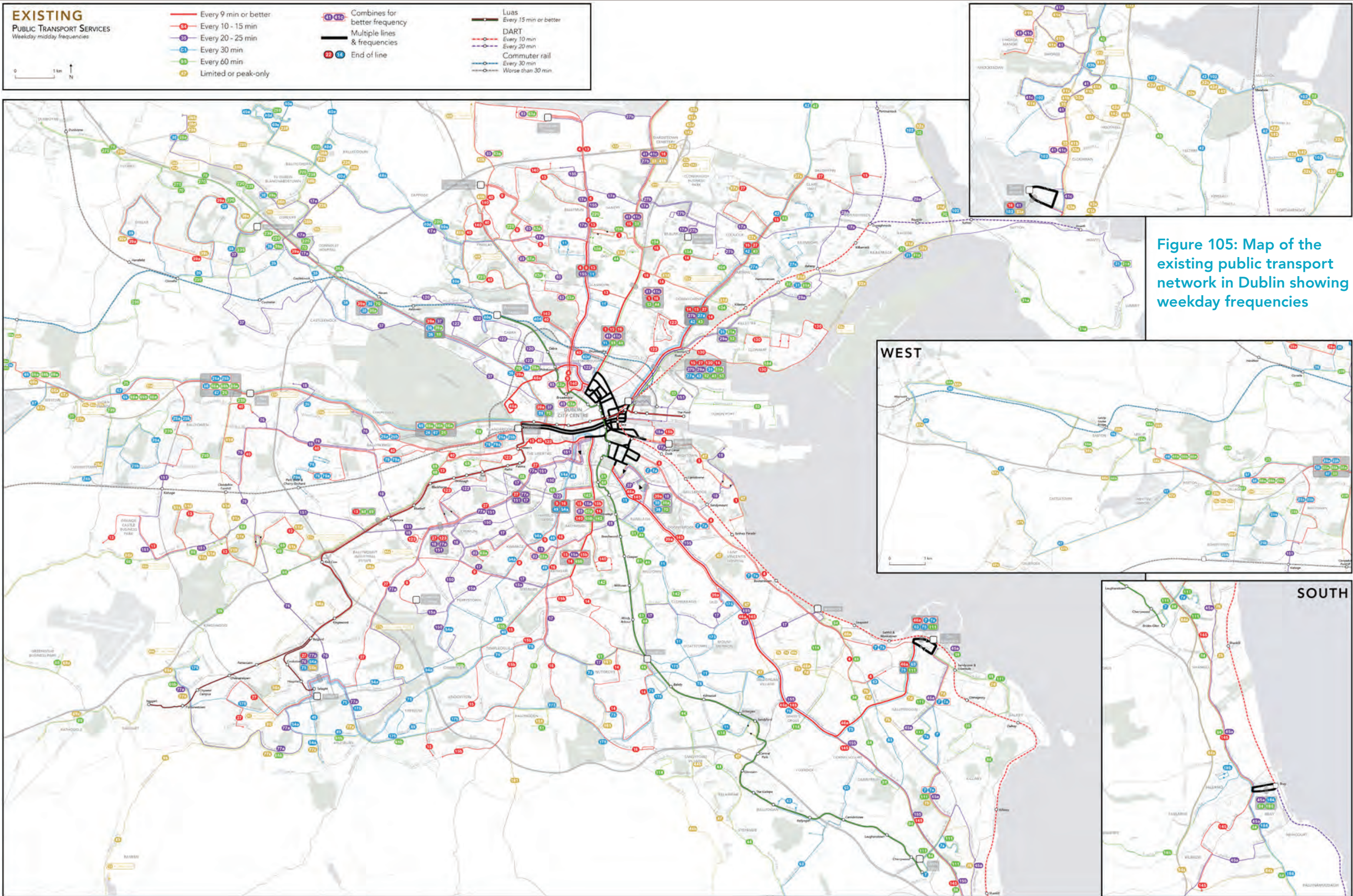
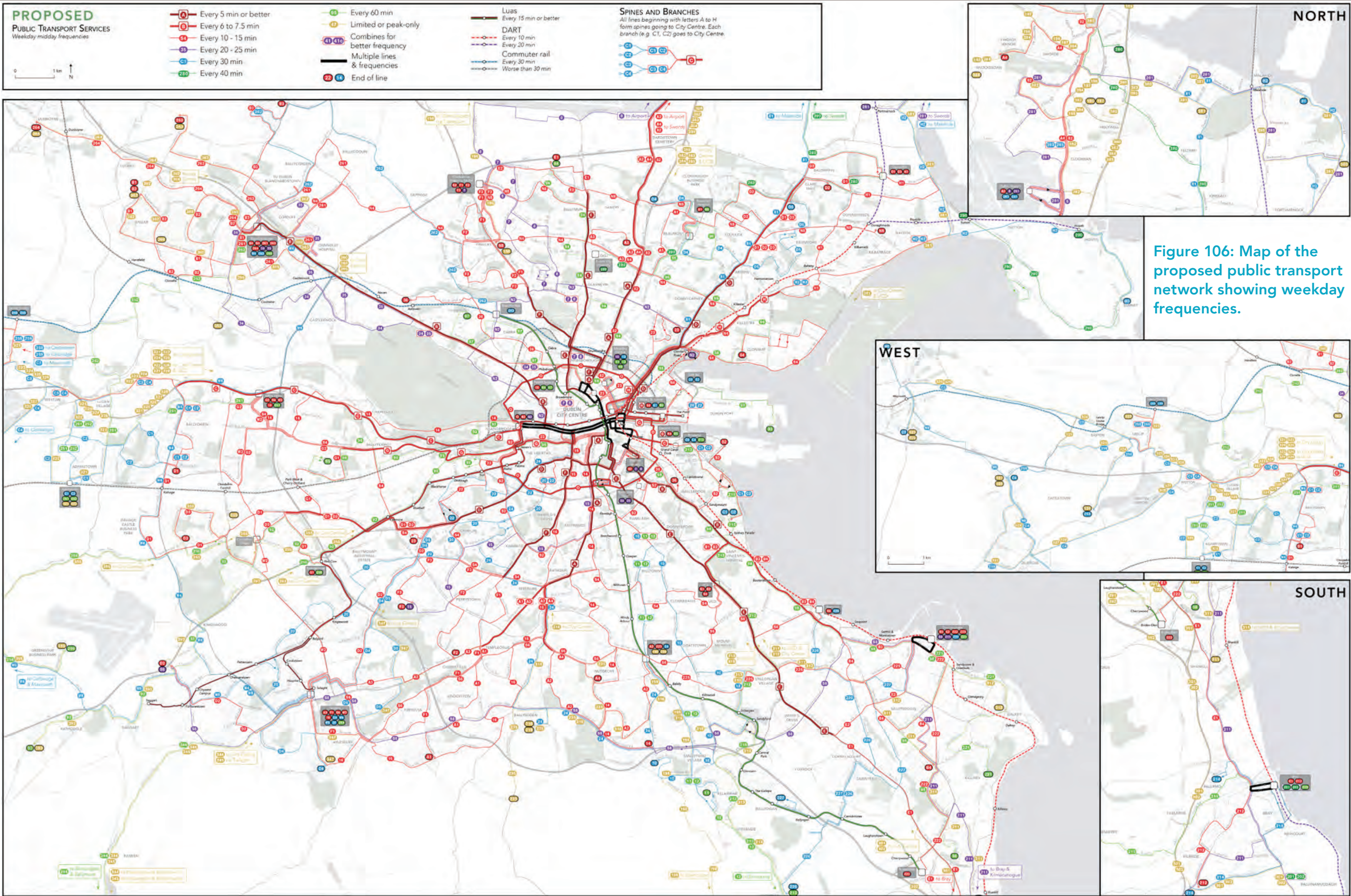


Figure 104: The diagram above illustrates the spine, spine branch, orbital, radial and local and peak-only route types, as described on this page.

Existing Network: Big Picture



Revised Proposed Network: Big Picture



The revised network proposal reflects a substantial investment in new public transport service for Dublin by the National Transport Authority.

How do we measure investment in service?

The three operating factors with the most direct impact on the cost of providing service and the level of service visible on the street are:

- **Vehicle in-service hours.** This is a direct measure of the number of hours that buses are out running on the streets and carrying passengers. The number of in-service hours is perhaps the most direct measure of the level of investment in service. This is because the largest cost of providing public transport service is the cost of labour, which relates to the number of in-service hours on the road. Labour typically accounts for 50 to 70% of the cost of bus operations.
- **Vehicle in-service kilometres.** This represents the total kilometres driven by buses while they are out running on the streets and carrying passengers. This is perhaps the most direct measure of the level of actual transport service provided to the public. From a cost point of view, maintenance costs are a function of how many kilometres a bus operates. This typically account for 10 to 20% of all operating costs.
- **Peak vehicle requirement.** This measure tells us how much service is being provided during the weekday morning peak only. As such, it is not a very good indicator of the overall level of service. Nonetheless, the number of peak vehicles has a significant influence on service cost, for two main reasons. For one, each additional vehicle requires an initial purchase, and incurs ongoing inventory, maintenance and depreciation costs, even if it is used much less than other vehicles. For another, it's generally more expensive per hour to pay drivers for short, peak-only shifts.

New Service Investment

Based on a detailed accounting of the amount of service intended in the revised network proposal, relative to 2016:

- Annual in-service hours would increase by 52%.
- Annual in-service kilometres would increase by 35%, from 47.6 to 64.3 million kilometres per year.
- The peak vehicle requirement would increase by 15%, from 1014 to 1167.

The NTA has already made significant investments in additional service from 2016 to 2019. So **relative to 2019, in-service hours would increase approximately +22%, and in-service kilometres would increase approximately +18%.** This is approximately 20% more service than was included in the initial network proposal, largely in response to input from public consultation.

The breakdown of this cost by hours, kilometres and fleet tells us that:

- **Overall, larger investments are being made on the busiest routes.** This is reflected in the fact that the investment in service hours is not quite matched by the added number of vehicle kilometres. The busiest routes in any bus network tend to be slower for two reasons:
 - » They operate in the areas where more people want to go, so they tend to be on more congested streets.
 - » The higher number of boardings and alightings require more stops, and often longer dwell times at stops.
- **Most of the investment in new service is provided off-peak.** This is reflected in the 52% total new service, but only a 15% increase in peak vehicles (relative to 2016).

Major Purposes of New Investment

Relative to 2019 service, the major sources of increased service include:

- **More all-day service on weekdays: +10% annual service hours.** Overall, the revised network proposal includes a higher level of baseline weekday radial and suburban local service than the existing network. Far more areas would experience frequency increases than reductions.
- **More frequent orbitals: +15% annual service hours.** The existing network has only six true orbital route (Routes 17, 17a, 18, 75, 76 and 175), all of which are infrequent. The new network features eleven orbital routes, seven of which would operate every 15 minutes or better.
- **Increased peak service: +5% annual service hours.** The total level of designed peak-hour service (between 7:00 and 9:00, and 15:00 and 18:00) would increase around 10% from existing levels, in response to comments heard during public consultation. Furthermore, the peak vehicle requirement reflects an additional contingency for emerging capacity issues.
- **Increased weekday evening frequency: +4% annual service hours.** In existing services, most routes experience a significant reduction in frequency around 19:00. While the proposed network still provides less service overall in the evenings than at midday, all frequent services would continue at every 15 minutes or better until 23:00.
- **Increased weekend frequency: +4% annual service hours.** The proposed network increases both Saturday and Sunday service relative to existing levels, though it still features less service on weekends than on weekdays. This partly reflects lower demand and the absence of peak hour conditions, but the larger limiting factor is the much higher hourly cost of Sunday and holiday service.

	Existing Service		Proposed Network	
	2016	2019	Initial	Revised
In-Service Kilometres	47.6 mln.	54.4 mln. + 14%	55.1 mln. + 16%	64.3 mln. + 35%
In-Service Hours	3.03 mln.	3.78 mln. + 25%	3.86 mln. + 27%	4.61 mln. + 52%

Figure 107: This table shows existing levels of bus service in Dublin as of 2016 and 2019, and compares those to proposed levels of bus service in the initial and revised network proposals.

What is the Frequent Network?

As discussed in Chapter 2, frequency is a dominant factor in determining whether urban public transport is useful. Frequency means that a customer:

- Travels closer to their desired time.
- Can connect easily between routes to reach many destinations
- Experiences less delay when a single bus is disrupted.

We define the Frequent Network as the set of all routes that run every 10 to 15 minutes (or better) all day¹. This includes all the spines, most spine branches and orbitals, and some numbered radials and suburban locals. **In all of the maps in this report, bus routes on the Frequent Network are drawn in shades of red**, so that it is clearly visible against the background of less frequent services.

Much of the travel time and access benefits of the proposed network arise directly from expanding the Frequent Network. If you look at the red lines on the next two pages, the dramatic expansion of the Frequent Network is obvious.

Start with the Frequent Network, then Plan Lower Frequencies

A high frequency route is a big investment, so it must be designed to provide the greatest possible usefulness to the greatest number of people. That means that it needs other routes to connect to it, but not to duplicate it.

When two frequent routes connect to each other in an easy and intuitive way, both are made more useful to more people. This makes both routes stronger: they tend to generate higher patronage relative to what it costs to operate each route.

Conversely, when two frequent routes duplicate each other (such as by running along the same road for several kilometres), many of the same passengers are divided among the two routes. This usually means that the patronage on both routes is weaker, relative to the cost of operating each route.

For these reasons, it was important to design the network in declining order of frequency.

- **First, we designed the major routes that would have the highest level of service**, generally every 15 minutes or better all day. These frequent routes must make sense by themselves, as an optimally efficient network that will carry the bulk of customers.
- **Once the frequent routes were drawn, we designed less frequent routes around them** to cover areas that the frequent network did not serve, or to allow direct trips to critical service in areas where nearly all trips would otherwise require an interchange and/or a long walk to service.
- **The last services to be designed were those that run only during the peak commute period.** These services were added only where added capacity or faster travel times are critical on weekday mornings and evenings.

What is Sufficient Demand?

This chapter often speaks of demand being adequate or sufficient to support a certain frequency of service. How were those judgments made?

1. We considered the total resources that we are apportioning. This plan reflects a considerable investment in new added service when compared with what is currently available. Nonetheless, the resources are still finite and must be apportioned appropriately.
2. We looked at existing and planned urban form, seeking patterns that are favourable to public transport. These are explained and illustrated in Chapter 2, and include:
 - » *Density* – How many people or activities are around each stop?
 - » *Walkability* – Can people near the stop walk to the stop?
 - » *Linearity* – Can the bus travel in a reasonably straight path?
 - » *Proximity* – Does the bus have to cross long empty gaps with no demand?
3. We look at existing patronage by stop. After having considered more broad-based demand through the lens of urban form (“where are there people?”), we sought to continue running service to places with existing patronage (“where are people already riding?”).
4. We looked at other demographic data, especially to ensure that we are adequately serving places with significant economic deprivation.

Of course, our judgments were not just based on data. Because we worked collaboratively (with NTA, Dublin Bus, and local council staffs all involved) and thanks to the input received in public consultation, we were also planning based on extensive local knowledge.

¹ In the existing network, “all-day” means roughly from 7:00 to 19:00, and frequencies are lower in the early morning and evening. In the proposed network, “all-day” frequencies on most routes persist from 7:00 to 23:00, with some remaining lower frequencies in the early morning and late evening.

Existing Network: Frequent Service

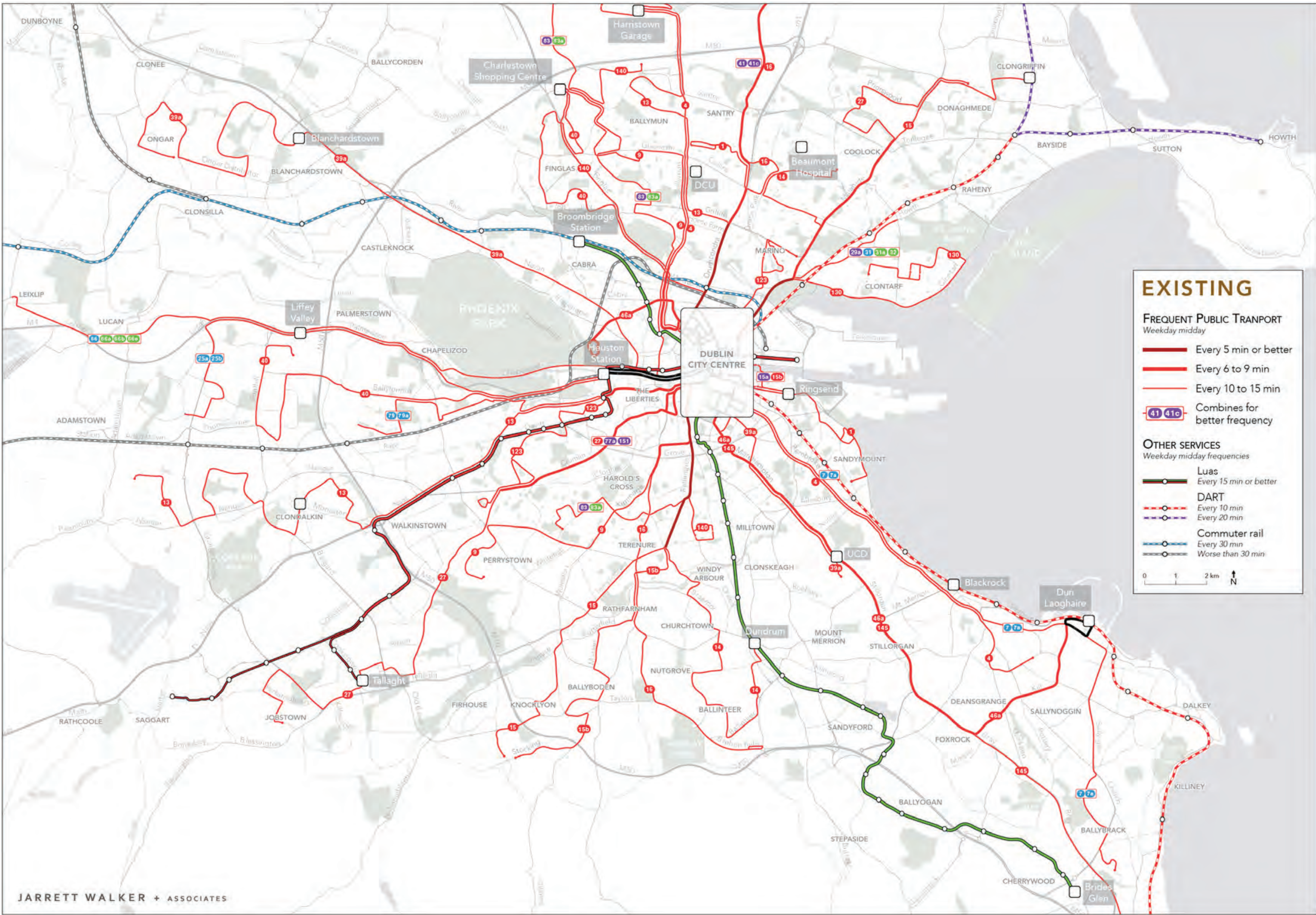


Figure 108:

This map shows routes that operate every 15 minutes or better all day (from about 7:00 to 19:00) in the existing network.

Frequent services continuing beyond this map include Route 145 to Ballywaltrim, and DART to Bray Daly station.

Routes 41 and 41c to Swords split for service every 20 minutes immediately north of this map extent.

Revised Proposed Network: Frequent Service

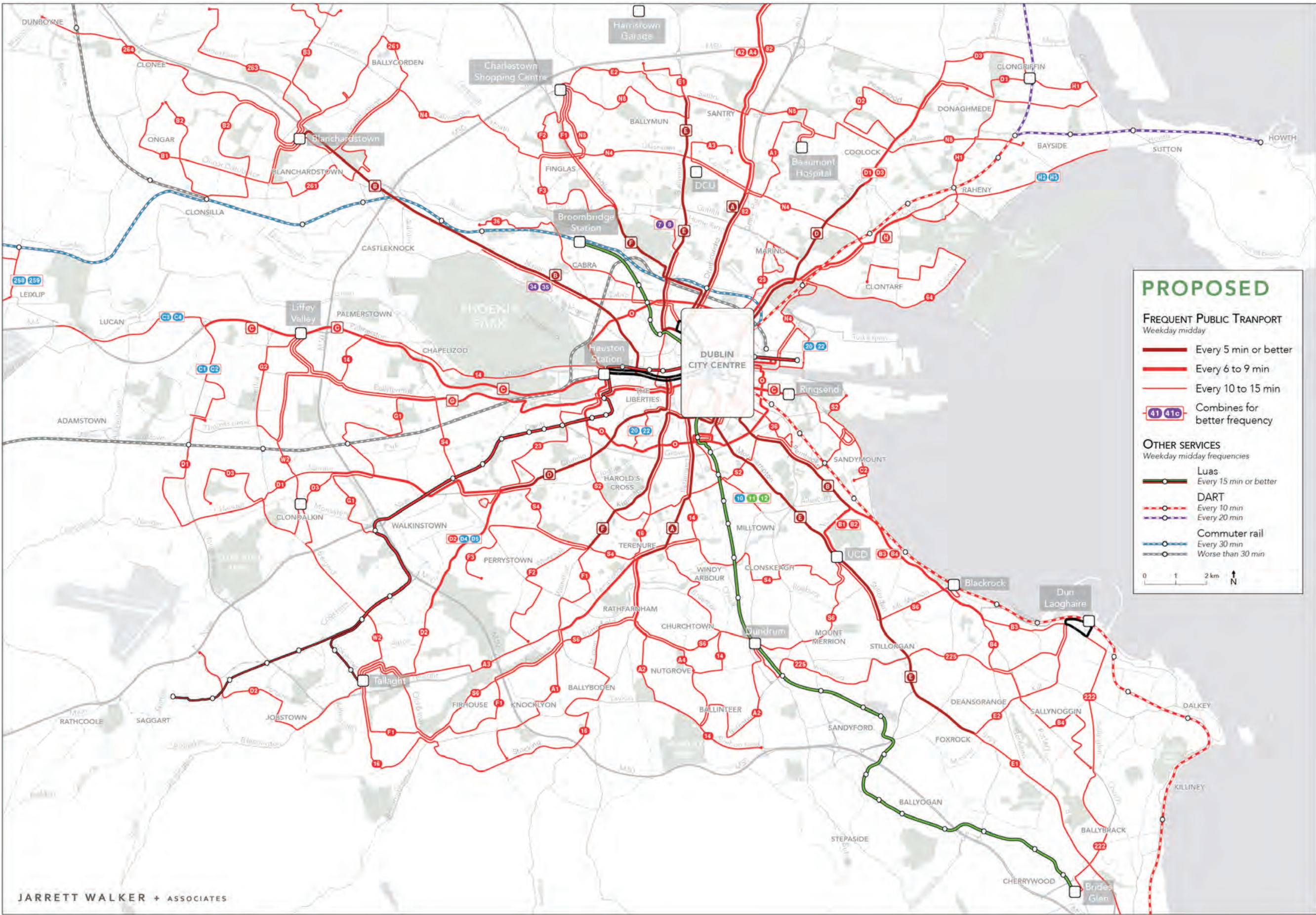


Figure 109:

This map shows routes that would operate every 15 minutes or better all day (from about 7:00 to 23:00) in the revised proposed network.

Frequent services continuing beyond this map would include Route E1 and DART to Bray Daly station, Route 212 from Bray Daly station to Ballywaltrim, Route A4 to Swords Manor, and Route 82 to Swords - Glen Ellen Road.

Designing the Frequent Network: Spines and Orbitals

The proposed Frequent Network is made up of many frequent radial and orbital routes that combine to form a web-shaped grid. Everywhere a radial crosses an orbital, a possible interchange opens up vast possibilities for travel.

Most of the radial routes in this structure are spines and spine branches. The diagram to the right shows a simplified diagram of the spine, branch and orbital structure.

Spines

To locate the spines, we identified the major corridors extending out of City Centre that required very high frequency service. We then paired corridors on either side of the city, based on the following considerations:

- Paired corridors should be on opposite sides of the City Centre, so that a spine combining them will form a reasonably direct line that is likely to be useful for many purposes.
- Paired corridors should support comparable levels of frequency off-peak, since the frequency on the core part of a spine will be the same on both sides of the City Centre.

In practice, **each spine is made up of several routes that join to form the spine on one side of the city, and then split up again on the other side.** Each of these routes is a "branch" of the spine. The timetables of different spine branches would be staggered to ensure a consistently short time between buses on the main spine segment. We designed the branching structure using the following principles:

- Spines should split where the combined frequency of the spine is no longer justified by demand, preferably not too close to the City Centre to provide a long high-frequency segment.
- Each branch should deliver the right frequency given the demand in the neighbourhoods it serves. In some cases, this means that a spine branches into two and then, further out, branches again.
- The total travel time of a route should not exceed two hours from one end of the route to the other².

²This is considered very long by most standards. Wherever possible, we designed routes not to exceed 90 minutes each way. The size of Dublin and current operating speeds make it impossible to design cross-city service to this standard.

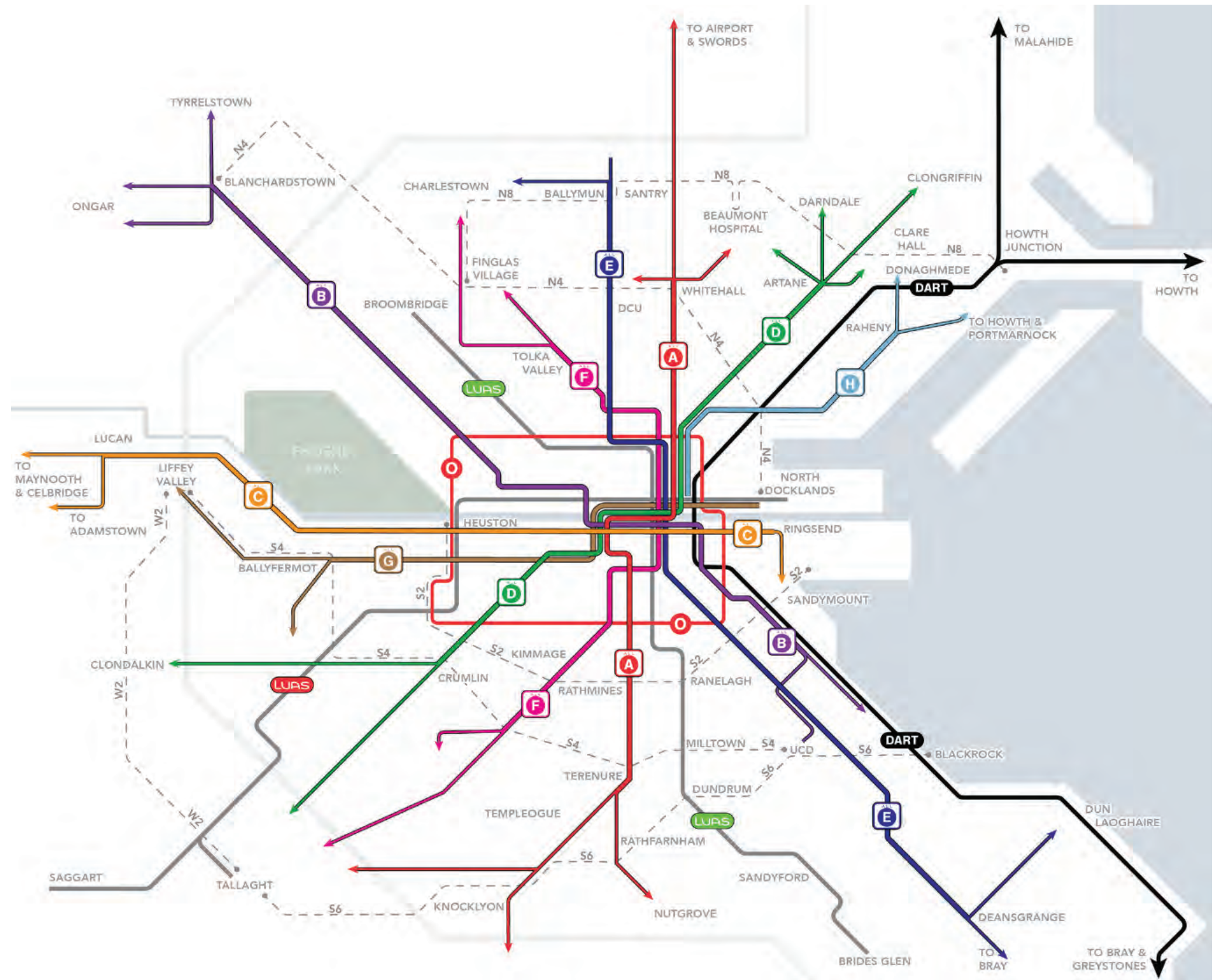


Figure 110: The image above is a simplified diagram of spines and frequent orbitals in the proposed network. Spines would have buses every 3 to 8 minutes, and divide into branches (e.g. A1, A2, A3, A4) with no interchange required. Most branches would operate every 15 minutes or better, with higher frequencies at peak times. The orbitals shown in grey on this map would operate every 10 to 15 minutes. The O would run every 8 minutes, almost like a spine.

Those principles generate the eight spines, as follows.

A SPINE: WHITEHALL TO TERENCE

The A spine would combine the Swords Road corridor on the north side of the city with the Rathmines - Rathgar corridor on the south side. These are Dublin's busiest bus corridors, so service on the A spine would run every 3 minutes on weekdays.

On the north side, the A spine would split at Whitehall (Collins Avenue) into four branches, each with service every 12 minutes:

- A1 would extend to Beaumont Hospital via Lorcan Avenue. This would add a new radial service to Beaumont Hospital via the Swords Road.
- A2 would extend on Swords Road to the Airport, similar to Route 16 but without a deviation into Beaumont.
- A3 would extend on Collins Avenue, going past DCU and continuing into Santry to the Santry Garda Station. This would provide a new radial service to DCU while also maintaining service currently provided by Route 1 in Santry.
- A4 would extend to Swords Main Street and Swords Manor, combining several existing segments of Routes 41 and 41c³.

In the south, the A spine services remain together to Terenure, then splits into the four 15-minute branches:

- A1 would extend past Templeogue to Knocklyon, similar to existing Route 15.
- A2 would extend past Rathfarnham to Ballinteer and Dundrum, combining elements of existing Routes 16 and 14.
- A3 would extend past Templeogue to Tallaght, providing a new high-frequency service to Tallaght via Rathmines - Rathgar.
- A4 would extend past Rathfarnham to Nutgrove Shopping Centre, allowing direct travel to this centre from far more areas.

On the segment between Terenure and Templeogue, the A1 and A3 would combine to provide a service every 6 minutes. The A2 and A4 do the same on the segment between Terenure and Rathfarnham.

B SPINE: UCD TO BLANCHARDSTOWN

The B spine, running every 4 minutes on weekdays, would extend from Blanchardstown Shopping Centre to St. Vincent's Hospital.

The B spine would be composed of four branches, each with service every 15 minutes. Three branches would extend past Blanchardstown Shopping Centre:

- B1 would extend to Ongar via the Ongar Distributor Road, providing a more direct path than the existing Routes 39 and 39a.
- B2 would extend to Ongar via Hartstown, Huntstown and Clonsilla. This would maintain frequent service on a similar path to existing service in Hartstown and Huntstown, while improving frequency in Clonsilla.
- B3 would extend to Tyrrelstown, providing a more frequent route that connects both to the local activity centre and City Centre.

On the south side, all four branches would continue past St. Vincent's:

- B1 and B2 would extend together every 8 minutes to UCD, maintaining the link between the Navan Road corridor and UCD on existing Route 39a.
- B3 and B4 would extend together every 8 minutes to Blackrock, and then split further south:
 - » B3 would extend to Dun Laoghaire via Monkstown Road, similar to part of existing Routes 7 and 7a.
 - » B4 would extend down Stradbroke Road like existing Route 4, and then continue to Sallynoggin via Abbey Road and Rochestown Ave. This would also cover part of the area served by existing Route 7a.

C SPINE: LUCAN TO RINGSEND

The C spine, running every 8 minutes on weekdays, would be the main link between Dublin and its western suburbs.

The spine would extend from the junction of the N4 motorway and Grange Castle Road to Ringsend in the south Docklands. Because the goal is a fast, frequent route into the city that is useful to a vast area, this spine would bypass Chapelizod Village, and serves Palmerstown only via a stop on the N4⁴.

Liffey Valley Shopping Centre emerges as a major node in the proposed network, with a new bus interchange to be placed adjacent to the existing motorway stop on the north side of the shopping centre. This interchange will provide direct connections between the C spine buses on the N4 and various orbital and local services.

In the west, the C spine splits at the N4's Ballyowen Road interchange. At this point:

- The C1 and C2 branches continue south along Grange Castle Road, following a similar path as existing Routes 25a and 25b. This yields service every 15 minutes through Ballyowen. C1 and C2 split to cover both sides of the Griffeen Valley with service every 30 minutes, rejoining at Adamstown Station.
- The C3 and C4 branches continue west every 15 minutes through Lucan Village. They then divide, with service every 30 minutes on the C3 to Leixlip and Maynooth (replacing existing Route 66) and every 30 minutes to Celbridge via Weston (replacing existing Route 67).

As with existing service, the C spine would be complemented by numerous additional peak-only services on weekday mornings and evenings. Some of those services would be extra trips on the C1 and C2 branches, and others would be special peak expresses replacing existing routes 66x and 67x.

In the east, the C3 and C4 branches end at Ringsend, but the C1 and C2 continue to Irishtown and Sandymount, replacing existing Route 1 to St. John's Church in Sandymount, not far from Sydney Parade DART station.

Important Note on How Bus Routes are Described

In describing bus routes, this document may only refer to one direction of travel. For example, we may say "this route extends along X street and then turns into Y street." In almost all cases, we are describing two-way service. Except as noted, if we say the bus turns left from X street into Y street, then the same bus in the other direction turns right from Y street into X street.

³ Other parts of existing Routes 41 and 41c would be picked up by a new numbered radial called Route 82, with service every 15 minutes between Swords and City Centre.

⁴ A numbered radial, the new Route 14 running every 15 minutes (10 peak), is proposed for Chapelizod Village and Chapelizod Road alongside Phoenix Park.

D SPINE: MALAHIDE ROAD TO CRUMLIN

To build the D spine we combined the Malahide Road corridor in the northeast with the Crumlin Road corridor in the southwest.

The D spine would have service every 4 minutes on weekdays. It would be composed of five branches, three of which would have service every 15 minutes (D1, D2, D3), while the other two would have service every 30 minutes (D4, D5).

On the north side, the spine would split at the Artane Roundabout and replace various segments served by existing routes 15, 27, 27a and 27b.

- D1 and D3 would continue to Clongriffin via the Malahide Road, splitting at Clare Hall so D3 would serve Belmayne and D1 would serve Main Street.
- D2 would serve Darndale and end at Clare Hall.
- D4 would serve various estates in Coolock, Beaumont and Kilmore, as well as Beaumont Hospital.
- D5 would serve Harmonstown, Edenmore and Ard Na Greine.

On the south side, the spine would split after Crumlin Hospital, with branches extending to various parts of Tallaght and Clondalkin:

- D1 and D3 would extend to Clondalkin on the New Nangor Road, splitting at Woodford Walk. They would together replace existing Routes 13 and 151 in Clondalkin.
- D2, D4 and D5 would extend to Tallaght along the Walkinstown Road and Greenhills Road. In Tallaght:
 - » D2 would extend past The Square to Jobstown and Citywest, with some similarity to existing Route 27.
 - » D4 would extent past The Square to Killinarden Heights and Kiltipper Way.
 - » D5 would split off at Castletymon Road to serve Tymon North and Seskin View on the way to The Square.
 - » In this way, D4 and D5 would both cover different parts of existing Route 77a, at slightly lower frequency (every 30 minutes instead of every 20) but with more direct routings.

E SPINE: BALLYMUN TO DEANSGRANGE (STILLORGAN ROAD)

The N11/Stillorgan Road, one of the city's busiest bus corridors, would be paired with the Ballymun Road corridor. This spine would operate every 5 minutes on weekdays, and extend from Ballymun through Phibsborough, City Centre and then out Stillorgan Road, splitting at Kill Lane in Deansgrange. This spine would stop near both Dublin City University and University College Dublin.

The E spine would split into two branches, each of which would operate every 10 minutes. In the north, these branches would be largely replacing existing Routes 4 and 13:

- E1 would extend past Ballymun to IKEA.
- E2 would continue to Charlestown Shopping Centre via Balbutcher Lane (North) and Saint Margaret's Road.

In the south, the two branches are similar to existing Routes 46a and 145:

- E1 would extend to Bray, replicating existing Route 145 but terminating at Bray Daly station⁵. This is necessary because the Service to Ballywaltrim would be on a separate local route (the new Route 211).
- E2 would follow the existing 46a path into Dun Laoghaire.

F SPINE: FINGLAS TO KIMMAGE

This spine, with service every 5 minutes on weekdays, would replace most of the existing Finglas and Harold's Cross services.

In the north, all F1, F2 and F3 service would begin at Charlestown Shopping Centre, with each branches covering different parts of Finglas every 15 minutes:

- The F1 would serve as the "bypass branch", similarly to existing Route 140, taking the Finglas Bypass directly to the Tolka Valley.
- The F2 and F3 would serve as the "local branches", with service to many places currently on existing Route 40.
 - » F2 would serve Finglas Northwest via Barry Road and pass by Finglas Village on the Finglas Bypass.
 - » F3 would serve McKee Avenue, pass by Finglas Village on Collins Avenue, then serve Finglas Southwest

The branches would merge at Tolka Valley Road. From there the spine would flow past Glasnevin Cemetery, and meet the E spine

at Phibsborough. Rather than duplicate the E, the F spine would follow the current Route 40/40b/40d routing, turning east on Whitworth Road to Drumcondra and then south into the centre.

On the south side the spine would extend out Clanbrassil Street to Harold's Cross and then along Kimmage Road as far as Terenure Road. At this point the spine would branch three ways:

- F1 would extend to Tallaght via Templeogue and Firhouse, replacing parts of Routes 49 and 54a at much higher frequency.
- F2 would serve parts of Perrystown and Templeogue, terminating at the Spawell Roundabout, similar to parts of Routes 15a, 150 and 54a, but again at higher frequency.
- F3 would follow the Cromwellsfort Road to Greenhills College, similar to existing Route 9.

G SPINE: BALLYFERMOT TO SPENCER DOCK

The G spine is based on a combination of existing Routes 40 and 79/a in inner West Dublin, with an extension to the North Docklands. This spine would operate every 8 minutes on weekdays between Spencer Dock and Ballyfermot, splitting into two 15-minute branches at Clifden Road:

- G1 would turn southward onto Clifden Road, and then proceed through Cherry Orchard and Park West like existing Route 79. It would extend past Park West rail station to the Red Cow Luas station in Clondalkin.
- G2 would proceed to Neilstown and Fonthill Road, terminating at Liffey Valley Shopping Centre, similar to existing Route 40.

H SPINE: HOWTH ROAD TO CITY CENTRE

The H spine is based on a combination of existing Routes 29a, 31 and 32 serving the Howth Road. This spine would operate every 8 minutes on weekdays, splitting at All Saints Road:

- H1 would extend to Donaghmede like existing Route 29a but at a higher frequency (every 15 minutes). Instead of terminating at Baldoyle, it would continue to Clongriffin via Red Arches Road.
- H2 and H3 would run together every 15 minutes until Baldoyle Road, where H2 would continue every 30 minutes to Portmarnock and Malahide, and H3 would continue every 30 minutes to Howth.

⁵ Service between Bray Daly station and Ballywaltrim would be on a local Route 212, with service every 10 minutes as well.

Revised Proposed Network: Spine and Branch Paths



Figure 111:

This map highlights the paths taken by the spines and their branches.

All the highlighted paths would serve the City Centre.

In addition, all paths on routes numbered 1 to 99 (not highlighted) would also serve the City Centre.

7 REVISED NETWORK PROPOSAL

Orbitals

In the existing network, the only path available for many trips beginning and ending on the same side of Dublin is through the City Centre. In the proposed network, frequent orbital service would allow many such trips to bypass the City Centre, resulting in much faster travel times.

Three primary considerations govern the design of orbitals:

- The most useful orbitals connect a series of major destinations to a large number of residential neighbourhoods.
- Orbitals are more useful when they connect to many other routes. They should run all the way across one side of the city (north, west, or south) and meet all possible spines and numbered radials along the way. For example, one orbital would run from Blanchardstown to Tallaght, and another all the way from Tallaght to Dun Laoghaire⁶.
- There should be as many orbitals as the road network allows, so long as they do not duplicate each other. Across most of the city, especially between the canals and the M50, most people would be located near both a radial and an orbital, so that they can travel in whichever direction they are going.

The following briefly reviews each one of the orbitals included in the revised network proposal.

THE INNER ORBITAL (ROUTE O)

The innermost orbital is Route O, a two-way loop running near the canals, wherever possible on the North or South Circular Road. This is effectively a “Circle line” operated by a bus. The terminus, in both directions, would be at Heuston Station. Service on Route O would operate every 8 minutes on weekdays.

A key function of Route O would be to allow people to reach major destinations on the edge of City Centre more efficiently, including Heuston station, Grand Canal, the North Docklands and Connolly Station.

Unlike most bus routes in Dublin, Route O would need to be run with single-deck buses, so that it could cross under the railway tracks on Macken Street in the Docklands. There is no other way for a bus route to run north-south through this area.

⁶ One might ask why there isn't a Blanchardstown to Dun Laoghaire orbital via Tallaght. In practice, this is not achievable at a useful level of frequency, reliability and directness. On surface streets, this route would be so long and unreliable that it may well be inoperable. Running as an express route with these endpoints via the M50 means the route could only pick passengers up where it gets on and off the motorway. As a result, it would be useful for a relatively limited number of trips, so it would not support high frequency; there would also still need to be long segments getting on and off the motorway, causing delay to through-passengers.

NORTHERN ORBITALS

The revised network proposal includes three orbitals in north Dublin, numbered outward from the centre.

- Route N2 would mostly follow Griffith Avenue between Broombridge Luas and the Clontarf Road DART station, with service every 20 minutes on weekdays (every 15 at peak).
- Route N4 would extend from Blanchardstown to Spencer Dock in the North Docklands, mostly following Glasnevin Avenue and Collins Avenue. It would provide a new direct Docklands service from a much of north Dublin City, and would provide frequent orbital service to Dublin City University. With service every 10 minutes, this would be the busiest of the northern orbitals.
- Route N8 would extend from Finglas Village to Howth Junction DART station, going by Charlestown Shopping Centre, Ballymun, Santry, and Coolock, also with service every 10 minutes.

N4 and N8 together replace different segments of existing Route 17a at much higher frequency. The connection between the two routes at Finglas Village is made to facilitate the continuation of existing 17a trips from Northeast Dublin to Ballycoolin and Blanchardstown.

SOUTHERN ORBITALS

The revised network proposal features four orbitals on the south side of Dublin.

- Route S2 would run every 15 minutes. It would extend from Heuston Station to St. James' Hospital, Rialto, Sundrive Road, Kimmage, Rathmines, Ranelagh, Ballsbridge and Sandymount, ending on Sean Moore Road in Poolbeg.
- Route S4 would run every 10 minutes from Liffey Valley Shopping Centre to UCD. On the way, it would serve Ballyfermot, Kylemore, Crumlin, Terenure, Rathgar, Milltown, and Clonskeagh. S4 would provide frequent connections to every spine, and directly connect a range of useful neighbourhood destinations along the way. S4 would make much more frequent and direct travel to UCD possible from most of the south side and much of the west side.
- Route S6 would run every 15 minutes between Tallaght and Blackrock. It would serve Firhouse, Templeogue, Rathfarnham, Dundrum, Goatstown, and UCD on the way. This would also be a major new link to UCD and between several spines.

- Route S8 would run every 20 minutes (every 15 at peak), between the Citywest Business Campus and Dun Laoghaire. On the way, it would serve Tallaght, Knocklyon, Ballyboden, Ballinteer, Sandyford Business Park, Galloping Green and Monkstown.

Routes S2 and S4 would together replace different segments of existing Route 18. Although they would not meet, all trips currently performed on Route 18 would remain possible with one interchange.

Routes S6 and S8 (and local Route 225) would together replace different segments of existing Routes 75 and 175, but the intention is to provide more direct and frequent paths between major destinations.

WESTERN ORBITALS

The proposed north-south orbitals on the west side of Dublin have been designed to improve access to industrial employment and to link major suburban centres.

- W2 would be very similar to existing Route 76, but operating at higher frequency (every 15 minutes). It would extend from Liffey Valley Shopping Centre to Tallaght via Neilstown, Clondalkin Village, Belgard Road and Tallaght.
- W4 would be a new orbital extending from Tallaght to Blanchardstown Shopping Centre. It would follow Grange Castle Road between Tallaght and Lucan, then the N4 and M50 motorways to Blanchardstown. The W4 would serve Liffey Valley Shopping Centre via the motorway stop on the N4, where it would connect to the C spine and many other services. Service is initially proposed every 30 minutes (every 15 at peak). Some reliability problems are likely due to traffic on the M50, but there is no other path available to make this crucial link.
- W8 would be a new far western orbital running between Maynooth, Celbridge, Saggart, Citywest, and Tallaght. The W8 is proposed with service every 30 minutes.

Revised Proposed Network: Orbital Route Paths



Figure 112:

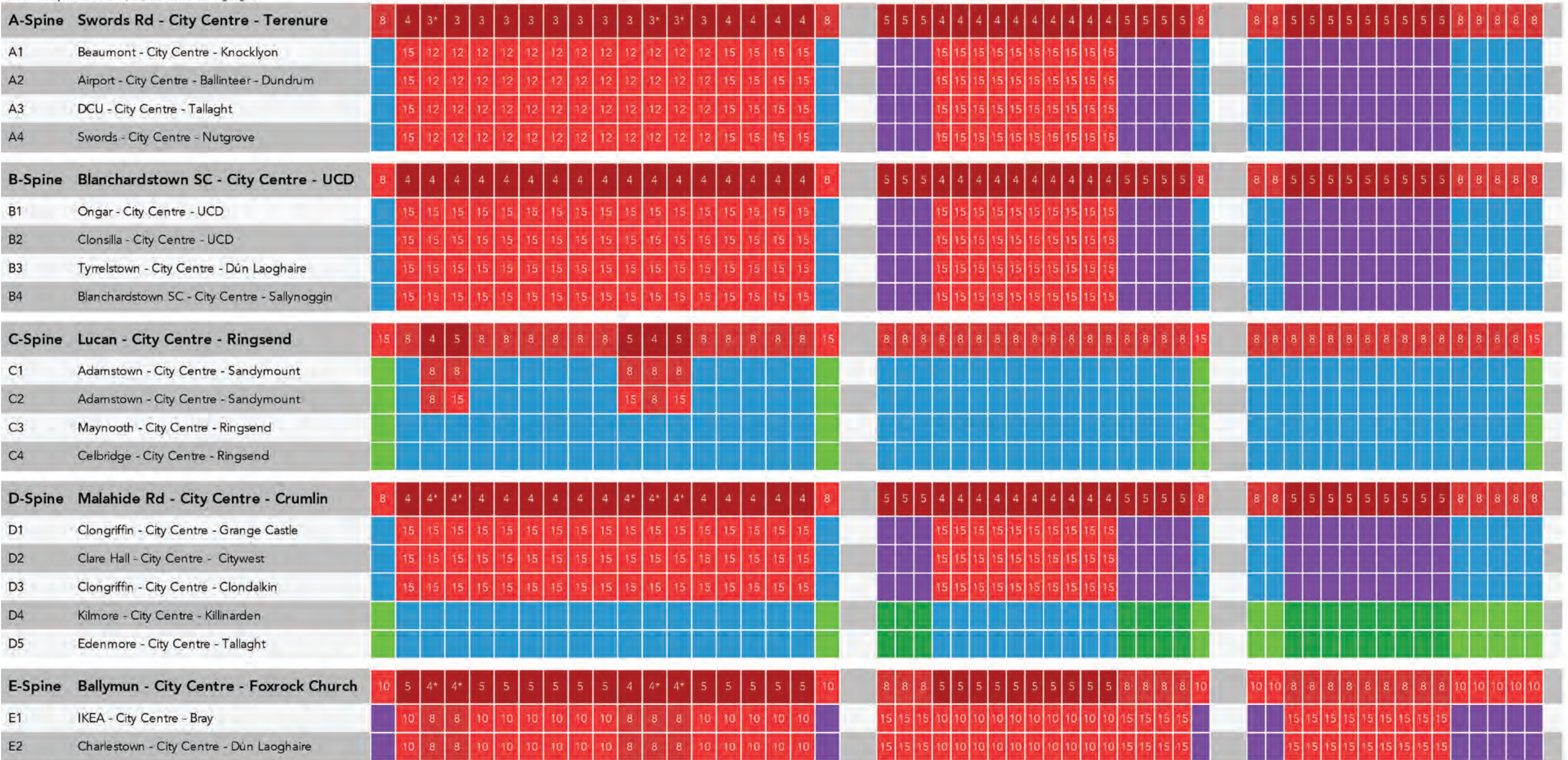
This map highlights the paths taken by the orbital routes in the revised network proposal.

These routes would avoid the City Centre, focusing instead on connecting different areas on the same side of the city.

PROPOSED NETWORK
All-Day Routes: Frequencies and Hours of Service

Spines and Branches

NOTE: "A-Spine" means A1, A2, A3 and A4 running together.



NOTES: 1. No interchange is required from a branch to a spine, or from a spine to a branch. For example, getting on bus A1 at Beaumont Hospital, one could travel to City Centre (or as far south as Knocklyon) without changing buses.
2. "A-Spine" means the areas where A1, A2, A3, and A4 all run on the same path. Departures of A1, A2, A3 and A4 would be staggered to provide a higher combined frequency on the spine. The same observation applies to all other spines and branches (A1 to H3).
3. Where frequencies are marked with an asterisk (*), peak hour frequency would be higher on parts of the route. For example, the Malahide Road portion of the D spine would see extra buses in both the morning and afternoon peak to ensure enough service is available to carry all passengers.

PROPOSED NETWORK
All-Day Routes: Frequencies and Hours of Service



NOTES: 1. No interchange is required from a branch to a spine, or from a spine to a branch. For example, getting on bus F1 at Charlestown, one could travel to City Centre (or as far south as Tallaght) without changing buses.
2. "F-Spine" means the areas where F1, F2, and A3 all run on the same path. Departures of F1, F2 and F3 would be staggered to provide a higher combined frequency on the spine. The same observation applies to all other spines and branches (A1 to H3).
3. Where frequencies are marked with an asterisk (*), peak hour frequency would be higher on parts of the route. For example, the Finglas Bypass portion of the F spine would see extra buses in both the morning and afternoon peak to ensure enough service is available to carry all passengers.

Numbered Radials

In some areas, main roads run too far apart for radial service to be provided entirely through the spine-and-branch system, or landscape barriers (rivers, rail lines etc.) make it difficult.

The initial network proposal included a small number of additional radials to cover some of these areas, numbered from 1 to 99. Following on the input in the second public consultation, the revised network proposal includes 22 numbered radials.

This category includes routes with several different purposes:

- **Some numbered radials serve as the primary public transport route through areas of significant demand.** In those cases, the routes are proposed on relatively direct paths with service every 15 to 20 minutes. These include:
 - » Routes 7 and 8, serving different parts of Glasnevin.
 - » Route 14, serving Palmerstown, Chapelizod, Dartry, Churchtown and parts of Nutgrove and Ballinteer.
 - » Route 15, serving parts of Perrystown and Kimmage.
 - » Route 16, serving parts of Knocklyon, Ballyboden, Rathfarnham and Harold's Cross.
 - » Route 23, serving Marino and parts of Drimnagh.
 - » Routes 34 and 35, serving Cabra, Castleknock, Carpenterstown (34), and Corduff (35).
 - » Route 36, serving Cabra, Royal Canal Park and Rathborne.
 - » Route 64, serving Clontarf.
- **A few serve as the primary public transport route through areas of relatively low demand.** In those cases, service remains on direct paths but may only be proposed every 30 or 60 minutes. These include:
 - » Route 10, serving Clonskeagh, Milltown, Goatstown, Sandyford and Ticknock.
 - » Routes 11 and 12, serving Milltown, Dundrum, Sandyford, and Belarmine (11 and 12), as well as Stepside, Kilternan and Enniskerry (12 only).
 - » Route 20, serving East Wall, Clogher Road, Crumlin Village, Ballymount, Kingswood and Cookstown.
- **A few more serve as "lifeline" routes.** These routes provide service to City Centre in areas that would otherwise be served by nearby orbital or suburban local service. In some

cases, the lifeline route is provided for social reasons, to accommodate significant elderly or disabled populations. In others, the lifeline route is a response to neighbourhoods that objected strongly to a lack of direct service in the initial network proposal. The service on lifeline routes would be infrequent, every 30 to 60 minutes. The paths followed by lifeline routes are in some cases relatively windy and long, as the goal is to serve as many areas as possible. These include:

- » Route 20, serving parts of Drimnagh, and East Wall.
- » Route 24, serving parts of Crumlin, Kimmage and Ballyboden.
- » Route 93, serving Rathcoole, parts of Clondalkin and Inchicore, and Dublin Port.
- » Route 94, serving parts of Ballymun, Wadelai and Drumcondra.
- » Route 95, serving Cherry Orchard and Decies Road.
- » Route 96, serving parts of Beaumont, Donnycarney and Clontarf.
- » Route 97, serving Ashington Park and parts of Cabra.
- » Route 98, serving Loughlinstown Park.

Suburban Locals

There are a number of outer suburban and semi-rural areas served by the public bus network in Dublin where either:

- The sheer distance to City Centre make it impractical to operate direct service to City Centre all day⁷; and/or
- The local demand pattern means many trips are heading toward a local suburban centre; and/or
- The local road network is primarily oriented toward a suburban centre rather than City Centre.

In those places, the proposed service consists of suburban local routes, most of which are numbered 201 to 299. Most of these routes connect suburban or semi-rural residential areas to major suburban centres. One way to think of the suburban locals is as a

⁷ This is especially true given that we are designing most radial service to operate cross-city. This is why certain outlying areas that have service to City Centre now (e.g. Ballywaltrim on existing Route 145) would no longer have it in the proposed network (it's not possible to operate a bus route from Ballywaltrim to Ballymun in 2 hours or less each way).

series of local mini-networks where:

- Routes in the 200s are centred around Greystones.
- Routes in the 210s are mostly centred around Bray.
- Routes in the 220s and 230s are centred in DLR, around Dun Laoghaire, Dundrum and Blackrock.
- Routes in the 250s focus on western suburbs including Lucan, Leixlip, Celbridge and Newcastle.
- Routes in the 260s are centred around Blanchardstown.
- Routes in the 280s are centred around Swords, Malahide and Dublin Airport.

For those areas that are even further out, the network includes:

- Route 196 from Finglas Village to West Swords via Toberburr.
- Route 197 from Ashbourne to Swords.
- Route 198 from Glencullen to Dundrum.
- Route 244 from Ballymore to Tallaght via Blessington.

Most suburban local routes would operate every 30 to 60 minutes. However, a few would operate every 10 to 15 minutes and are part of the Frequent Network. These include:

- Route 212 from Ballywaltrim to Bray Daly Station.
- Route 261, a circulator to major destinations in the Blanchardstown area.
- Route 263, from Damastown to Blanchardstown Centre.
- Route 264, from Dunboyne to Blanchardstown via Littlepace.
- Routes 283 and 285 would operate on staggered timetables to provide frequent service between Swords Main Street and the Dublin Airport.

A few local routes would operate every 20 or every 40 minutes, in areas where it is important to make timed connections to outer DART branches⁸. This includes Routes 201/202 south of Greystones, Route 280 in parts of Swords and Kinsealy, and Route 281 in parts of Swords, Malahide and Portmarnock.

⁸ As noted prior, we are assuming service on all outer DART branches will be every 20 minutes in the time frame in which this network plan is implemented.

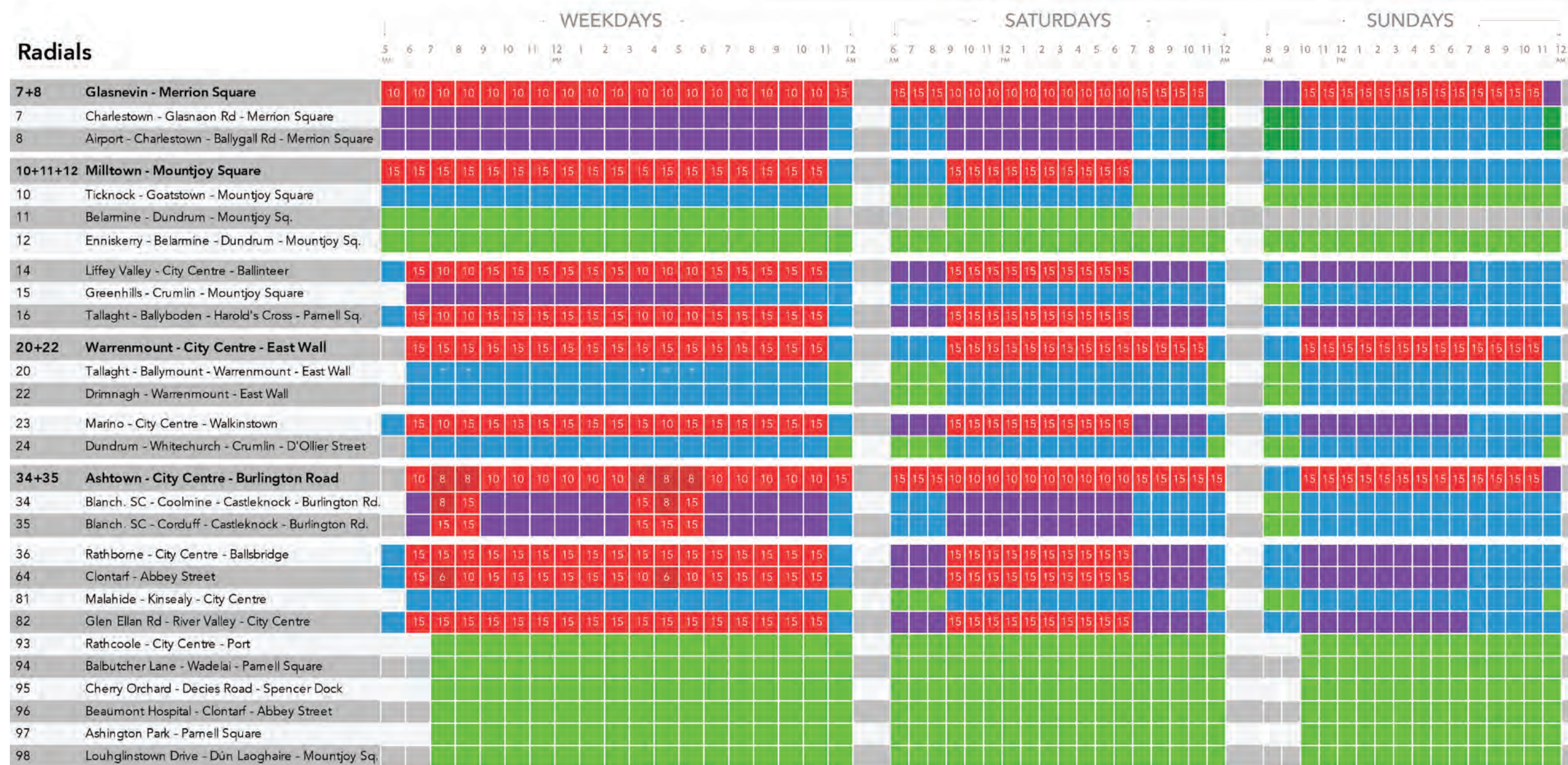
Revised Proposed Network: Secondary Radial Paths



Figure 113: This map highlights the paths taken by non-spine radial routes in the revised network proposal. These routes would be numbered from 1 to 99. They would focus on providing direct service to the City Centre to areas that would be relatively far (or across significant landscape barriers) from rail, Luas, spines and spine branches. In many cases, they overlap with the spines for part of their alignments.

7 REVISED NETWORK PROPOSAL

All-Day Routes: Frequencies and Hours of Service



NOTES: 1. **Where frequencies are marked with an asterisk (*), peak hour frequency would be higher on parts of the route.** For example, Route 20 would operate every 15 minutes at peak hours from Walkinstown to East Wall, to ensure enough service is available to carry all passengers.

Revised Proposed Network: Suburban Local Paths



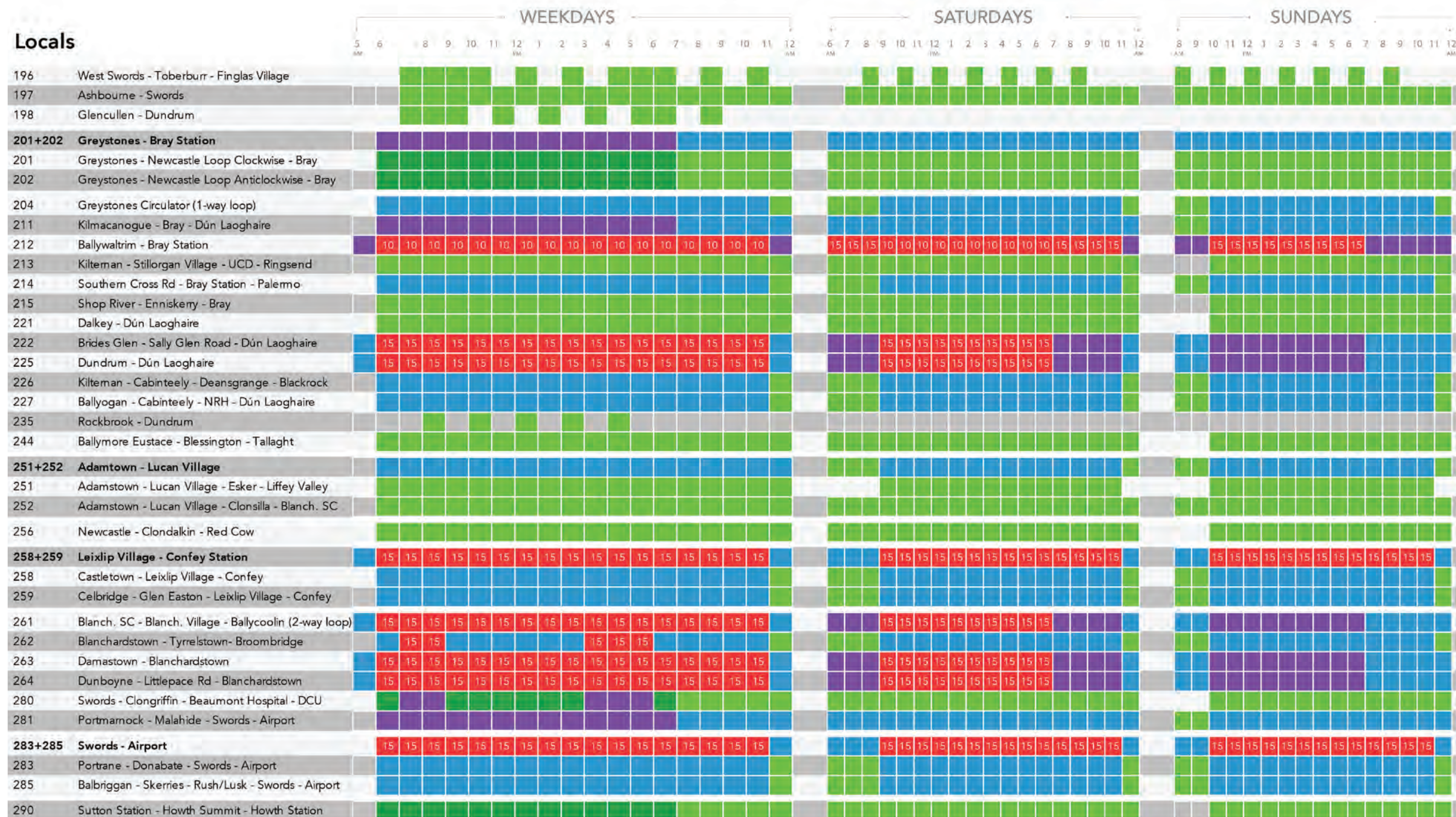
Figure 114:

This map highlights the paths taken by suburban local routes.

These routes would mostly be numbered from 201 to 299. They would focus on providing service from outer suburban areas to major suburban destinations and/or connections to main rail, Luas and bus services.

In addition to the paths highlighted on this map, there would be local routes in Fingal centred around Swords; in northern Wicklow centred around Bray; and in Leixlip and Celbridge.

All-Day Routes: Frequencies and Hours of Service



NOTES:

1. Unless otherwise indicated, peak-only services would operate one-way inbound in the AM (to City Centre and/or UCD) and outbound in the PM.
2. Routes marked with an asterisk (*) correspond to extra frequency on parts of all day routes.



*A9	Whitehall - City Centre			6														3	3						
*D9	Clare Hall - City Centre			6	6													6	6	6					
*E9	Brides Glen - UCD			6	6													6	6						
*F9	Charlestown - City Centre			6														3	3						
*H9	All Saints Road - City Centre			6														3	3						
*20 short	Walkinstown - City Centre			2	2													2	2	2					
301	Kilcoole - Southern Cross - City Centre	84x		2	4													1	5						
302	Newcastle - Kilcoole - Southern Cross - City Centre	84x		1	2													1	2						
311	Shankill - Ballybrack - City Centre	7b		2	4	1													6						
312	Dalkey - City Centre	7d			2															2					
313	Kilternan - Stepside - UCD				2	2												2	2						
316	Whitechurch - UCD	116			1													1							
318	Whitechurch - City Centre	118			2															2					
321	Adamstown Road - City Centre - Ringsend	25d			4															4					
322	Dodsborough - Lucan Village - City Centre - UCD	25x			4													1	2						
323	Leixlip River Forest - City Centre	66x			3													1	2						
324	Leixlip Castletown - City Centre	66x			2													1	1						
325	Maynooth - Glen Easton - City Centre	66x			2													1	1						
326	Maynooth - City Centre - UCD	66x			3													1	2						
327	Celbridge Aghards Rd - City Centre - UCD	67x			5													2	2						
328	Celbridge Main Street - City Centre - UCD	67x			4													2	2						
344	Ballymore Eustace - Blessington - City Centre	65			1															1					
345	Ballyknockan - Blessington - City Centre	65			1															1					
347	Kiltipper - Seskin View - Tymon North - City Centre	77x			1															1					
355	Clondalkin - City Centre - Ringsend	51x			3															2					
356	Newcastle - Peamount - City Centre	68x			1															1					
360	Hartstown - Huntstown - City Centre	39x			4															4					
362	Ongar - Littlepace Distributor - City Centre	39x			4															4					
363	Damastown - Corduff - City Centre (two-way)	38b			3	3												3	3	3					
364	Dunboyne - City Centre				2															2					
365	Diswellstown Rd - Clonsilla Rd - City Centre				2															2					
380	Portmarnock - City Centre - UCD	142			6													2	3						
381	Malahide - Portmarnock - Clontarf - City Centre - UCD	32x			2													1	1						
382	Glen Ellan Rd - River Valley - City Centre - UCD	41x			3															3					
383	Portrane - Donabate - City Centre - UCD	33d			1															1					
384	Knocksedan - Swords Manor - City Centre - UCD	41x			3															3					
385	Skerries - Rush - Lusk - City Centre - UCD	33x			2	3												2	3						
393	Rathcoole - City Centre	69x			2															1					

- Higher frequency on all-day routes. For example, proposed Route 35 would operate every 20 minutes all day, but every 15 minutes at peak.
- Higher frequency on parts of all-day routes. For example, the highest demand part of the D spine system is Malahide Road from Clare Hall to City Centre. Six extra trips per hour would be provided during the peak period as a special service, designated as "D9" on the table to the left.
- Peak-only routes, some of which are to be provided as express services. These are shown on the table to the left, along with the most comparable existing peak service where applicable. Unless otherwise indicated, all peak-only routes would operate in the inbound direction in the morning and the outbound direction in the evening.

As a result, the revised proposal, includes 15 more peak-only routes and patterns than were in the initial proposal. The revised proposal has also added more trips to several of these services, matching and in some cases exceeding the number of trips on the equivalent existing service.

Revised Proposed Network: Peak-Only Paths



Figure 115:

This map highlights the originating areas of peak-only services heading to City Centre and (in some cases) UCD.

These routes would be numbered from 301 to 399. They would focus on providing peak-only direct service to the City Centre to areas that may not have all-day direct service, where additional passenger capacity is required to City Centre at peak hours, and in some cases where an express service may provide a considerable speed benefit at peak.

Proposed Service by Area: City Centre

Overview

The centre of Dublin (defined for our purposes as the area between the canals, or roughly orbital Route O) was the most difficult part of the plan to develop.

Demand for travel into and within the city centre is extremely high, so every routing decision affects large numbers of people. Yet the obstacles are obvious and extreme: the medieval pattern of streets rarely provides a direct path, so most bus routes must make many turns and fit through tight spaces. This limited space has been managed in part through complex one-way patterns that often form barriers in themselves. Furthermore, any uses of the street must fit into very little space, so every bit of road, kerb and footpath space is precious.

Fortunately, improvements to bus circulation are also underway, particularly in the form of dedicated lanes. The new two-lane bus facilities on the Liffey quays provide an efficient path to bring more buses into and quickly through the city, so that they serve major destinations but do not get stuck.

While it may sometimes seem that there are too many buses in the middle of Dublin, the real problem is just that the buses are often not moving. Buses that are protected from delay flow efficiently through the city and onward, so that they bring great numbers of people to the city centre but do not become obstacles themselves.

Improving the efficient flow of buses by will be crucial to realise the objective of reducing the need to drive cars into or across the core of the city. This will require a combination of infrastructure investments, enforcement of bus-only lanes, and potentially new restrictions on what non-bus vehicles may use bus lanes.

One major City Centre change in the revised network proposal is the rejection of the College Green Plaza plan by An Bord Pleanála. Because of this, it will remain possible for buses to travel across College Green between Dame Street and the O'Connell Bridge.

Nonetheless, clear obstacles remain: the more buses flow out of College Green and in front of Trinity College's front gate, the more difficult it will be to maintain reliable operations on the Luas Green Line. For this reason, and to avoid over-relying on an area that may yet become pedestrianised through future planning efforts, it remains important not to continue routing every major cross-city route across College Green.

The proposed network is expected to slightly reduce the overall volume of buses entering the city at the same time. However, impacts would vary from one location to another. In the interest of preserving reliability on the main paths through the Quays and

O'Connell Street, many secondary routes would be routed on a secondary path through the City Centre from Gardiner Street to Merrion Square.

As it stands, a preliminary estimate suggests there is room for the proposed number of buses to fit through the streets proposed, though further refinement of these estimates will be done before implementation, in consultation with Dublin City Council. In particular, adjustments may be required to the exact routings of peak-only routes to prevent any specific intersection from becoming a choke-point due to excess peak bus volume.

Finally, it should be noted that the details of the city centre routings are largely separable from the rest of the proposed network. The basic plan design specifies certain frequencies of service flowing into the centre from each major corridor, and (in the case of the spines) flowing across the centre to certain other streets. Discussions about details of routing in the centre can thus proceed on a separate track from those of the plan as a whole.

Goals

In the light of the goals of the entire project, the city centre routings were driven by the following goals.

- Provide high frequency service within a short walk of as much the entire city centre as possible.
- Provide reasonably direct paths across the City Centre for the spines.
- Ensure all spines serve the core area of 24-hour activity, a roughly 800m radius as the crow flies from O'Connell Bridge.
- Maximize interchange opportunity with Luas and DART, and also provide good access to Heuston and Connolly stations.
- Ensure that interchanging between any two spines requires a minimum of walking and street crossing. While the length of interchange walks cannot be measured exactly until bus stops are finalized, the objective is that they should all be under 300m. The details of stop placement – currently in development at NTA – will be critical to this outcome.
- Ensure that connections between any two spines yield a reasonably direct trip.
- Avoid putting more buses down any street than its infrastructure can support. This motivated us to be careful about the number of buses assigned to O'Connell Street, and to the Liffey Quays.

- Minimize the number of turns that buses need to make. Turns consume more intersection capacity than going straight. For example, the plan eliminates all need for buses to turn at O'Connell Bridge.

With all the constraints that govern bus routing through the centre, most of these goals had to be compromised to some degree, and the outcomes are often not ideal, but we believe that the proposal reflects a reasonable balance among the same competing needs.

In the end, regardless of individual routing details, the proposal would overall represent a dramatic improvement in the usefulness of bus services within and through the City Centre. In particular, the consolidation of all major paths into eight spines and the introduction of orbital Route O would make it possible to present a clear map of proposed all-day bus service across the City Centre, which has not been possible to date.

Revised Proposed Network: City Centre Map

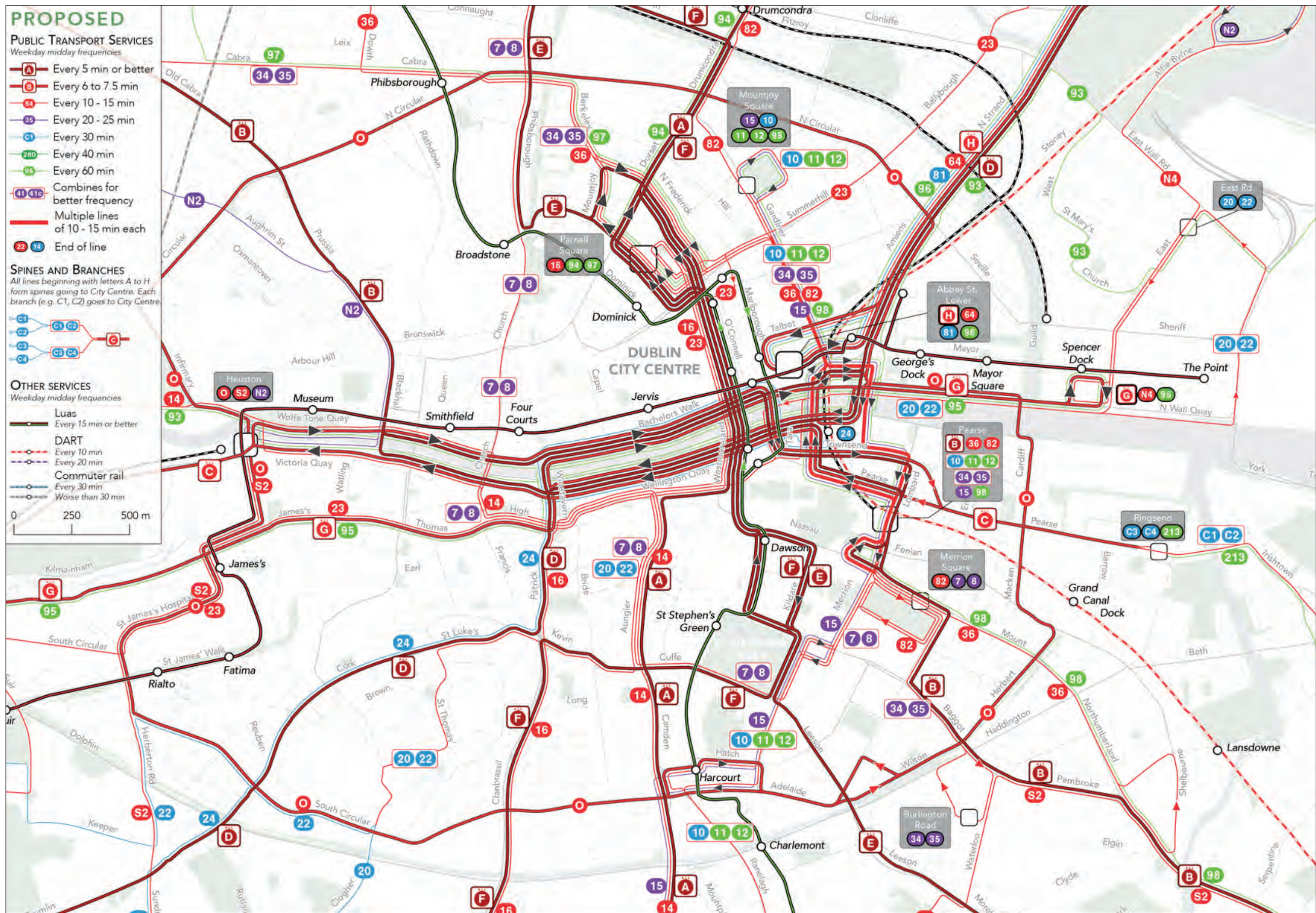


Figure 116: The map above shows the revised proposed network in the City Centre, including the entire area between the canals and the Docklands.

Spines

A SPINE: WHITEHALL TO TERENCE

On the south side, all A spine buses⁹ would approach City Centre from Rathmines through Camden Street, Aungier Street and Great Georges Street, before traversing College Green on the way to O'Connell Street. From O'Connell Street, A spine buses would continue through Parnell Square to Dorset Street and Drumcondra Road.

This routing affords the A spine the most direct north-south path through the City Centre, with connections to frequent bus and Luas routes available at nearly all points between the canals.

B SPINE: BLANCHARDSTOWN TO UCD

Coming from the west, B spine buses would flow from the Navan Road through Stoneybatter onto the Liffey Quays. Heading southeast from the Quays, the B spine would follow the Pearse/Townsend one-way couplet to Pearse Station, then through Westland Row, Merrion Square, Fitzwilliam Street, Pembroke Street and onward to Ballsbridge.

This routing allows the B spine to serve the area between the canals on a northwest-to-southeast axis. It is also explicitly intended as an improvement to the existing 39a routing, avoiding the long one-way split currently in operation between Trinity College and the Baggot Street Bridge.

C SPINE: LUCAN TO RINGSEND

Coming from the Chapelizod Bypass, C spine buses would pass Heuston Station and follow the Quays to just east of O'Connell Street. They would then transition to Townsend and Pearse Streets, ultimately following Pearse Street through the Grand Canal area to Dublin Bus's operating depot at Ringsend.

This routing has the advantage of serving most of the core parts of the City Centre while also reaching the South Docklands.

D SPINE: MALAHIDE ROAD TO CRUMLIN

Coming from Malahide Road, D spine buses would enter the City Centre via North Strand Road and Amiens Street. At the Custom House gyratory, the spine would turn west along the Quays, following the Quays until Winetavern Street. It would then use Winetavern Street two-way to join Patrick Street, where D spine

buses would also run two-way before heading back out of the City Centre via Cork Street to Dolphin's Barn and Crumlin.

This routing would allow the D spine to serve the area between the canals as the most direct northeast-to-southwest axis. It bears some similarity to the existing 27 routing, but staying on the Quays would allow it to operate with fewer turns.

E SPINE: BALLYMUN TO STILLORGAN ROAD

The E Spine would approach the city centre from Ballymun and Glasnevin via Phibsborough Road. It would then turn east to Parnell Square, then south through O'Connell Street, College Green, Nassau Street, Dawson and Kildare Streets as a one-way couplet, St Stephen's Green East, and Leeson Street and to Stillorgan Road.

This routing arises in part from the need for a direct north-south path, and the desire to avoid conflicts with Luas by routing buses that mostly follow the Luas alignment rather than cross it.

F SPINE: FINGLAS TO KIMMAGE

From Finglas, the F Spine would connect to the E Spine at Prospect Road. But rather than duplicate the E Spine, the F Spine would turn east onto Whitworth Avenue (like existing Route 40), bringing it close to Drumcondra station.

Turning south into Dorset Street, F Spine buses would head to Parnell Square and O'Connell Street. Not wanting to turn at O'Connell Bridge, there is no choice but to continue around the south side of Trinity, and onward through Nassau Street, the Dawson/Kildare couplet, and St. Stephen's Green East. From here, the spine would turn west through Cuffe Street and Kevin Street to Patrick Street, then turns south toward Harold's Cross.

This routing is rather circuitous, but made inevitable by the strong preference for all spines to traverse the core of the City Centre while avoiding turns at the O'Connell Bridge¹⁰.

G SPINE: BALLYFERMOT TO NORTH DOCKLANDS

The G Spine, would approach from the west via James Street and Thomas Street, similar to the existing 40. It would then head up to the Quays at Winetavern Street, continuing on the Quays until

Spencer Dock. Past Custom House, it would operate two-way on North Wall Quay.

As a result, this routing provides a full spine service to the North Docklands, so lots of interchange can be expected to and from the G spine in the core of City Centre.

H SPINE: HOWTH ROAD TO CITY CENTRE

The H spine would have a relatively short path in City Centre, entering via North Strand Road and Amiens Street, and terminating in Abbey Street Lower

This places the H spine as an exception as the only spine that does not operate cross-city. This is considered acceptable in the short term, as it largely reproduces existing service patterns from the Howth Road. If peak-hour capacity and congestion issues alleviate, future study would logically consider ways to extend the H spine across the centre to serve major destinations more directly.

Route O (Inner Orbital)

Route O is the most frequent orbital route in the whole network, operating every 8 minutes in the middle of the day, similarly to spines G and H.

Line O is intended to surround the inner city along the North and South Circular roads, allowing travel from the very dense and active areas surrounding it to avoid travel directly through the city centre, and allowing connections to and from all radial services. This should help relieve pressure on radial service through the core of City Centre.

Important Note on How Bus Routes are Described

In describing bus routes, this document may only refer to one direction of travel. For example, we may say "this route extends along X street and then turns into Y street." In almost all cases, we are describing two-way service. Except as noted, if we say the bus turns left from X street into Y street, then the same bus in the other direction turns right from Y street into X street.

⁹ In this section as everywhere else in this document, when we refer to "X spine" or "X spine buses" we mean a set of bus routes that would in practice be designated X1, X2, X3 etc. In places where we call this set of routes a "spine", all buses with the same letter designation use the same path, and together operate at very high frequency.

¹⁰ Another idea we studied, which would make the spine much shorter and straighter, would be for the spine to extend south from Dorset Street via North King Street, Church Street, Bridge Street Lower, High Street and into Patrick Street. Two concerns prevailed against this option. First, an interchange with the quay-running services at Father Matthew Bridge would be crucial, and it is very difficult to place Church Street stops close enough to the quays on both sides of the bridge. Second, the routing takes the spine far west of the major centres of demand in the city centre, requiring large numbers of people to interchange.

Secondary Radials

ROUTES 7 AND 8: GLASNEVIN TO MERRION SQUARE

These routes combine to form a 10 minute frequency in the City Centre. Coming from Phibsborough, Routes 7 and 8 would follow Church Street across the bridge to Christ Church Cathedral, then east on Dame Street, south on Great Georges Street and Aungier Street, east on Cuffe Street, north along St. Stephen's Green East on the way to Merrion Street and terminating at Merrion Square.

Although somewhat circuitous, this pattern directly connects many origins and destinations within the City Centre that would otherwise rely on an interchange for a relatively short trip. The primary challenge is the difficulty of placing north-south stops close to the Father Matthew Bridge, to allow for interchange with services on the Liffey quays.

ROUTES 10, 11 AND 12: MOUNTJOY SQUARE TO RANELAGH AND BEYOND

These routes combine to form a 15-minute frequency north of Ranelagh and through the City Centre. Coming from Ranelagh, they would operate via a relatively complex one-way split at Harcourt, then two-way on Earlsfort Terrace to St. Stephen's Green East. From there, Routes 10, 11 and 12 would head to Merrion Street, Westland Row, the Pearse/Townsend one-way couplet, Custom House, and ultimately Gardiner Street and Mountjoy Square.

These and other routes on this path from Gardiner Street to Pearse Station are afforded a relatively direct path in the City Centre serving many destinations, while relieving pressure on the primary routes on the Quays and O'Connell Street.

ROUTE 14 PALMERSTOWN, CHAPELIZOD TO DARTRY, BALLINTEER

This route would run every 15 minutes (every 10 at peak), and would enter the City Centre via Chapelizod Road and Conyngham Road on the south edge of Phoenix Park. Route 14 would then follow the Liffey Quays only until Father Matthew Bridge, turning south on Church Street, east on Lord Edward Street and Dame Street, then south on Great Georges Street, Aungier Street and Camden Street toward Rathmines. This path allows this secondary route to reach points close to the very centre of the city, while also preserving capacity on the Quays for spine services.

ROUTE 15 GREENHILLS, RATHMINES TO MOUNTJOY SQUARE

This route would run every 20 minutes on weekdays, and is primarily intended as a replacement for existing orbital connections between areas in southwest Dublin and Rathmines. Having served this market, it would then enter the City Centre via Richmond

Street, and then turn toward Harcourt, ultimately following the same path as Routes 10, 11 and 12 to Mountjoy Square.

ROUTE 16: PARNELL SQUARE TO HAROLD'S CROSS, BALLYBODEN, TALLAGHT

This long route, running every 15 minutes all day (every 10 minutes at peak), would approach the City Centre from the south via Clanbrassil St, continuing north into Patrick Street (the only route going straight at this point). From there it would proceed to Dame Street and through College Green to O'Connell Street, terminating at Parnell Square.

It was considered important to provide Routes 16 and 23 access through College Green, as two of the most important numbered radials, and in response to feedback from public consultation.

ROUTES 20 AND 22: EAST WALL TO SOUTH CIRCULAR ROAD AND BEYOND

These routes would each operate every 30 minutes along their full lengths, although the segment between East Wall and South Circular road would combine with Route 22 for service every 15 minutes.

Coming from East Wall, Routes 20 and 22 would serve North Wall Quay, then turn south via the Tara/Hawkins one-way couplet to reach College Street and College Green. From there, these routes would take Dame Street to Great George's Street, Aungier Street, Kevin Street, and Saint Luke's Avenue before proceeding through Warrenmount to South Circular Road.

ROUTE 23: MARINO TO DRIMNAGH, CRUMLIN HOSPITAL

Route 23, which would run every 15 minutes, would enter the City Centre via Ballybough Road and Summerhill, before proceeding through Parnell Square, O'Connell Street, College Green, Dame Street/Thomas Street/James' Street to St. James' Hospital, proceeding from there to Drimnagh.

In other words, this route as revised would be very similar to existing Route 123, and it was considered important to maintain a largely similar routing through the core of City Centre.

ROUTE 24: FLEET STREET TO CRUMLIN, BALLYBODEN, WHITECHURCH

Route 24 would primarily serve as a lifeline route to isolated parts of south Dublin and so its routing in City Centre is more incidental than deliberate, following the patterns of available street space. Nonetheless, it does provide direct access to a very central terminus.

Coming from Cork Street, Route 24 would follow the D spine routing onto the Liffey Quays. However, rather than running across City Centre, it would terminate at Fleet Street.

ROUTES 34 AND 35: CASTLEKNOCK (AND BEYOND) TO BURLINGTON ROAD

These routes would combine to form a 10 minute frequency in the City Centre. Coming from the northwest, these routes would approach the City Centre from Cabra Road, joining North Circular Road in Phibsborough. For access to Mater Hospital, they turn south along Berkley Road toward Parnell Square.

From Parnell Square, they would continue to Parnell Street and Gardiner Street, then following the 10/11/12 path to Merrion Square. From Merrion Square, they would follow the B spine path to Baggot Street, but then terminate at Burlington Road like the existing 37.

ROUTES 36: RATHBORNE, CABRA TO BALLSBRIDGE

Route 36 would follow the same routing as Routes 34 and 35 from Cabra Road to Merrion Square. However, instead of proceeding toward Baggot Street, it would then continue on Mount Street to Northumberland Road, terminating at Ballsbridge.

Extending Routes 34, 35 and 36 south of the River Liffey was done in response to input from public consultation.

ROUTE 64: CLONTARF TO ABBEY STREET

Route 64, running every 15 minutes would approach the City Centre along Amiens Street and terminate at Abbey Street Lower, much like the H spine (and the existing 130).

ROUTE 81: MALAHIDE TO ABBEY STREET

Route 81, running every 30 minutes, would also follow the H spine path (and the existing 42) to Abbey Street Lower.

ROUTES 93 TO 98: HOURLY "LIFELINE" SERVICES

Routes 93 to 98 are intended to provide isolated and/or high-need areas direct (in the sense of lacking interchange) but infrequent service to the City Centre.

These routes would not be useful for circulation within the City Centre, and their routing in the City Centre would be largely incidental to the available streets, depending on the side of the Dublin they would arrive from.

Peak-Only Routes

The detailed routings of peak-only routes through the City Centre has not yet been determined. These are likely to reflect existing routings, modified as necessary to fit within City Centre street capacity constraints, given the all-day routes proposed in the same areas.

Proposed Service by Area: Detailed Atlas and Descriptions

Reading the Maps

A complete network map for Dublin would not be legible on a single page, so we have laid the network out in a series of tiled maps, like a road atlas. When looking at the maps, it is important to start with the legend, which shows that:

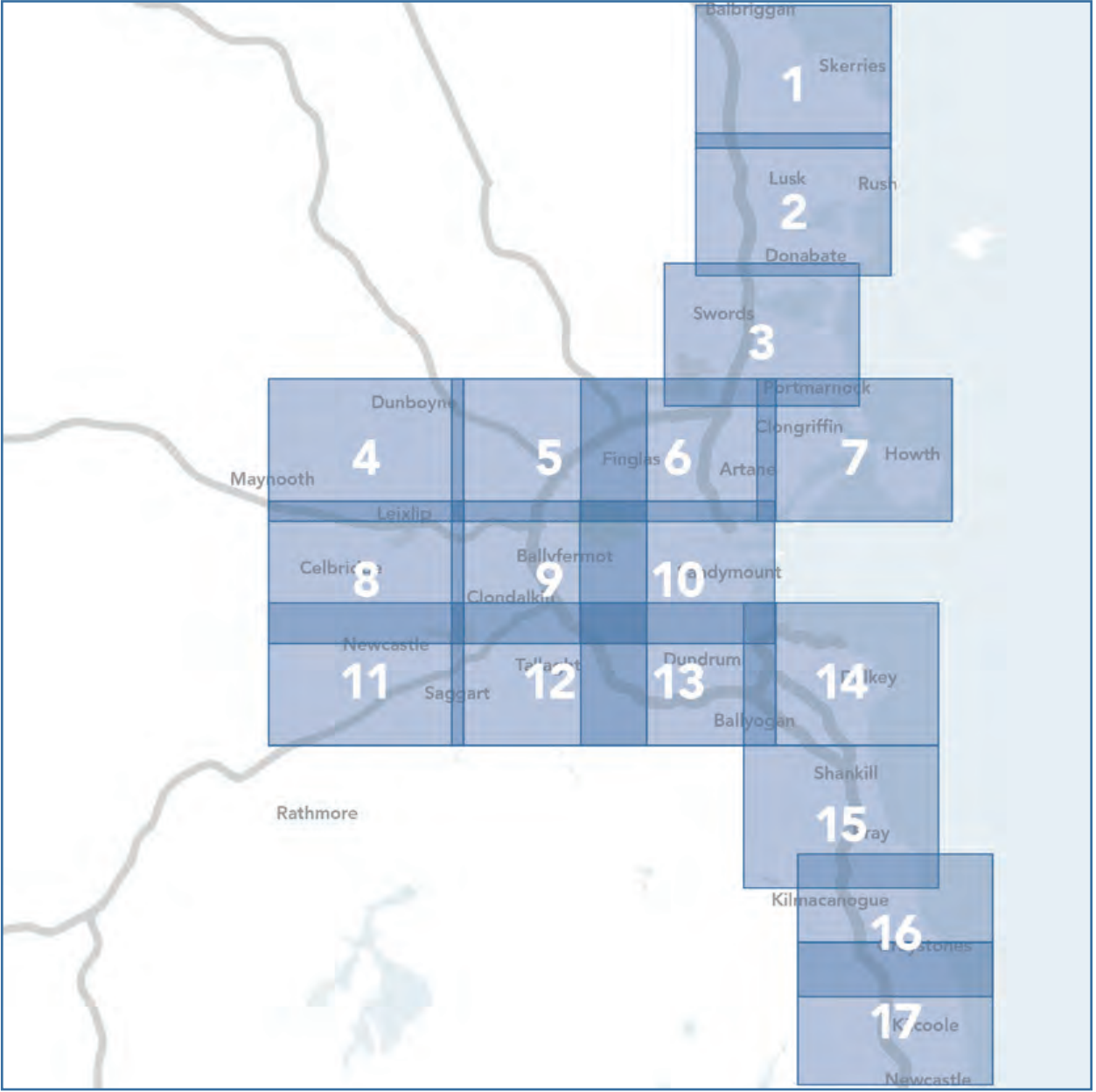
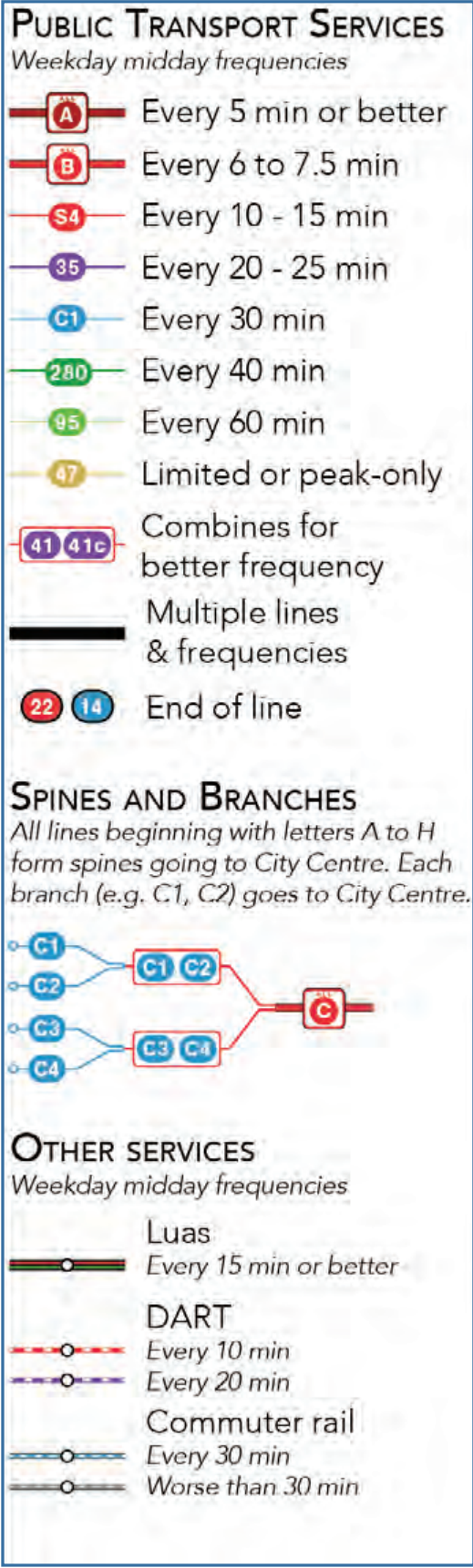
- Colours indicate all-day frequency, or the longest scheduled time between two buses from 7:00 to 19:00 on weekdays. **Red lines indicates the Frequent Network, where service comes every 15 minutes or better.**
- DART and commuter rail services are drawn in the appropriate colour for their frequency.
- Luas lines are drawn according to their marketed colour (Red Line and Green Line). No change in service is assumed.
- Routes sometimes change frequency along their path, which is shown as a change in colour. Do not confuse the change in colour with a change in route; the buses continue through this point. This happens in two situations:
 - Partway along a route, some buses turn back, leaving a lower frequency further out.
 - The spines divide into branches, which are less frequent than the spine. **There would be no interchange required from the spines to their branches in the proposed network. Each spine (e.g. "A") is made up of several routes called branches (e.g. "A1", "A2", "A3", "A4").** When we refer to "the A spine", "all A buses" or "A spine buses" we are referring collectively to the full set of A routes, including A1, A2, A3, A4. The same observation applies for all spines and branches, from A1 to H3.

In each tile area, the existing and proposed services are presented on consecutive pages. Note the bar on the right side of the page indicating whether the map is existing or proposed. Explanations of the thinking behind the network in each area are on a page directly after each pair of maps.

Important Note on How Bus Routes are Described

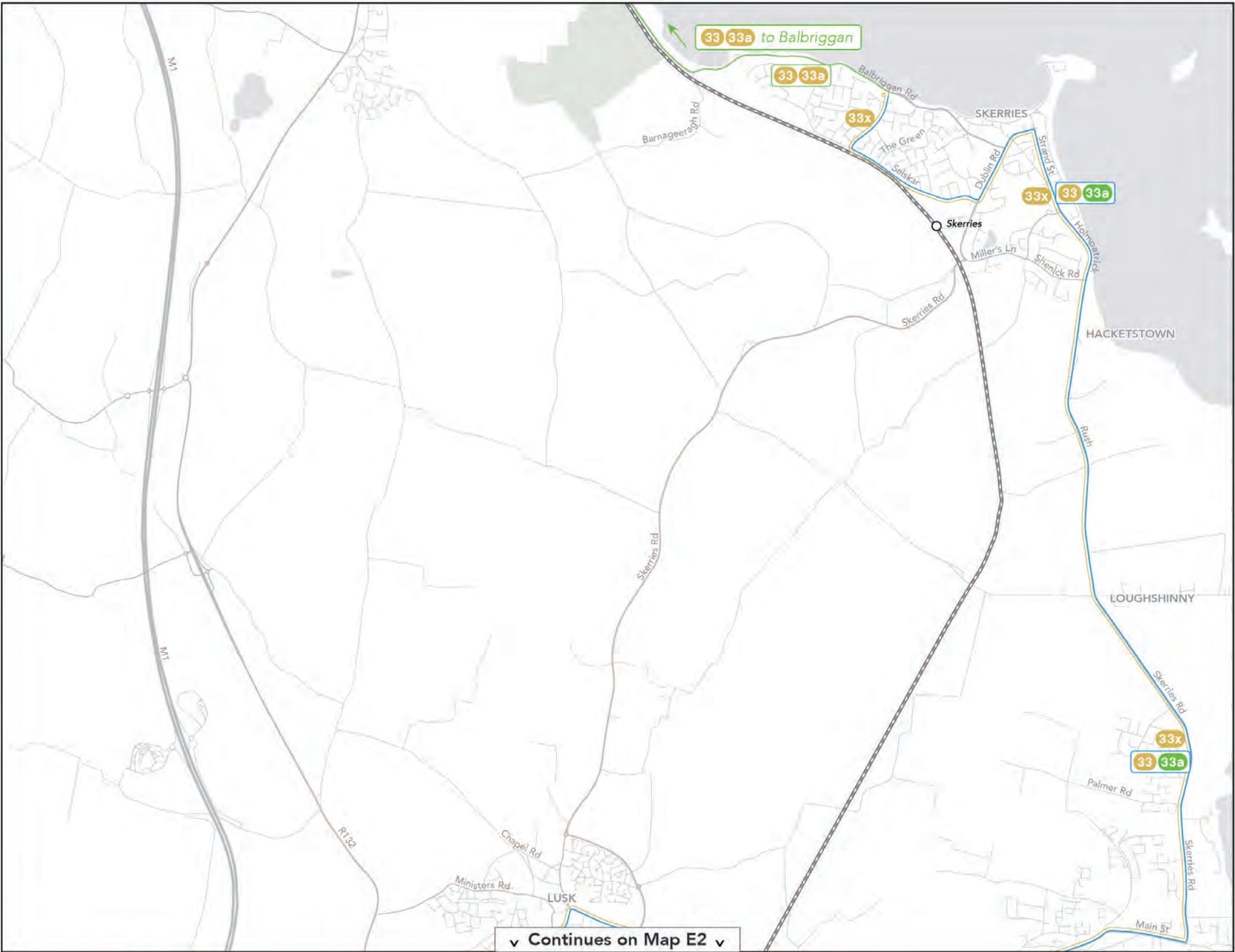
In describing bus routes, this document may only refer to one direction of travel. For example, we may say "this route extends along X street and then turns into Y street." In almost all cases, we are describing two-way service. Except as noted, if we say the bus turns left from X street into Y street, then the same bus in the other direction turns right from Y street into X street.

Figure 117: Overview and legend for maps showing the existing and proposed public transport network in each part of Dublin. Each area is numbered, and each map's number is preceded by an "E" (existing) or "P" (proposed).



Remember, the **colours of the maps show typical midday frequency**, which is the lowest frequency between 7:00 and 19:00 on weekdays in the existing network, or between 7:00 and 23:00 on weekdays in the revised proposed network.

Peak commute period frequency is never worse and often better. Early morning, late evening and weekend frequency may be less. **See the frequency tables (on Pages 100-101, 104, and 106-107), to understand the exact level of service proposed at different days and times.**

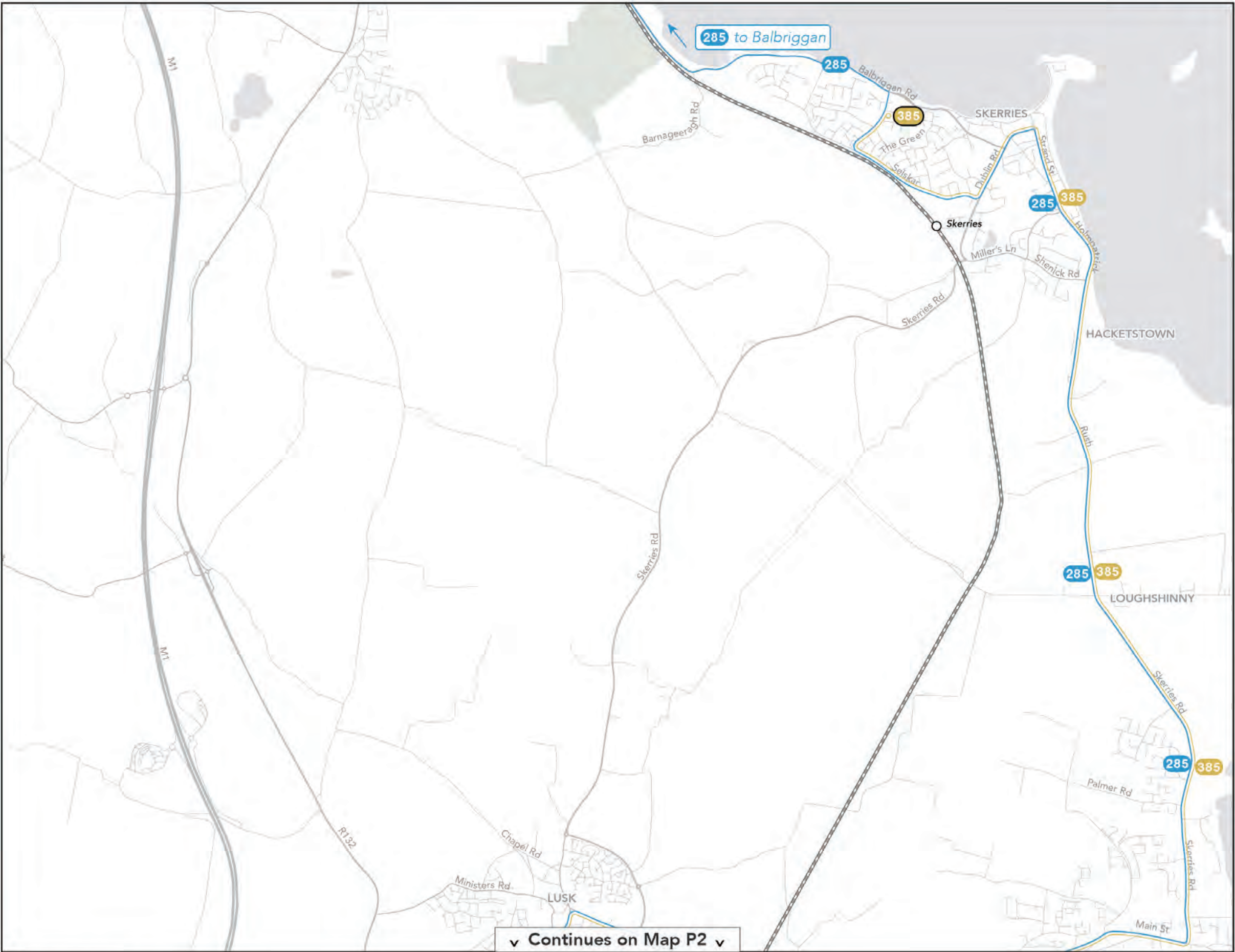


- PUBLIC TRANSPORT SERVICES**
Weekday midday frequencies
- Every 9 min or better
 - Every 10 - 15 min
 - Every 20 - 25 min
 - Every 30 min
 - Every 60 min
 - Limited or peak-only
 - Combines for better frequency
 - Multiple lines & frequencies
 - End of line
- OTHER SERVICES**
Weekday midday frequencies
- Luas
Every 15 min or better
 - DART
Every 10 min
Every 20 min
 - Commuter rail
Every 30 min
Worse than 30 min



Revised Proposed Network: Skerries

Map P1



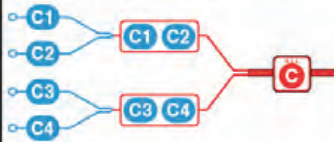
PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



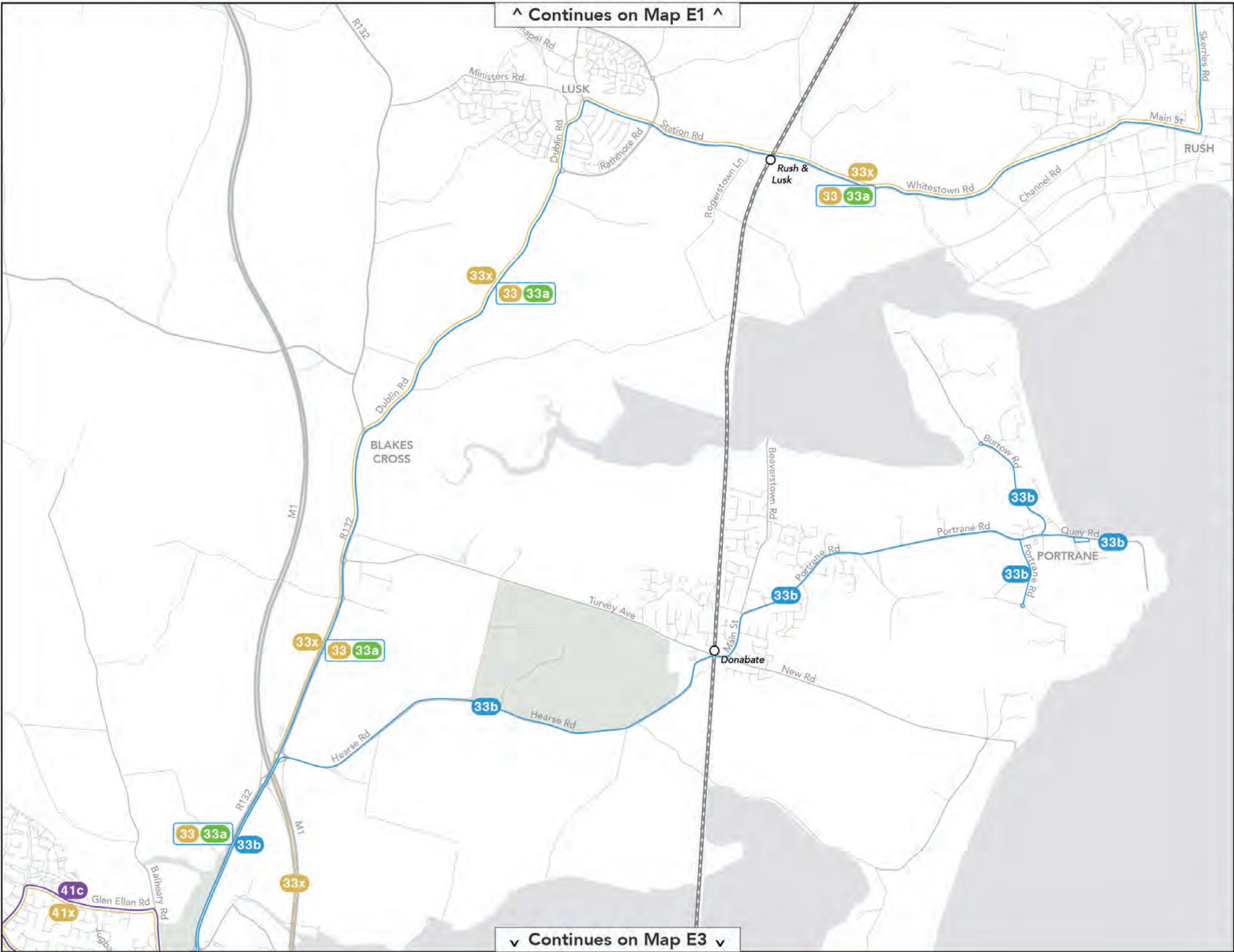
OTHER SERVICES

- Weekday midday frequencies
- Luas**
 - Every 15 min or better
 - DART**
 - Every 10 min
 - Every 20 min
 - Commuter rail**
 - Every 30 min
 - Worse than 30 min

Maps E1, P1: Skerries

The revised network proposal consists of essentially two routes in northern Fingal:

- **Route 285 from Balbriggan to Dublin Airport.** All-day service every 30 minutes, replacing existing Routes 33 and 33a. The main differences would be:
 - » Service every 30 minutes consistently to Balbriggan, rather than alternating 30 and 60 minute intervals between buses.
 - » Service would continue from Swords to Dublin Airport every 30 minutes instead of every 90 minutes.
 - » All service would terminate at Dublin Airport, rather than a bus to City Centre every 90 minutes. This leaves passengers the option to connect to frequent services at Swords Main Street or at the Airport.
- **Route 385 from Skerries to City Centre.** Peak express trips direct to City Centre, similar to existing Route 33x. This route is restored in the revised network proposal in response to public consultation feedback.



- PUBLIC TRANSPORT SERVICES**
Weekday midday frequencies
- Every 9 min or better
 - S4 Every 10 - 15 min
 - 35 Every 20 - 25 min
 - C1 Every 30 min
 - 95 Every 60 min
 - 47 Limited or peak-only
 - 41 41c Combines for better frequency
 - Multiple lines & frequencies
 - 22 14 End of line
- OTHER SERVICES**
Weekday midday frequencies
- Luas
Every 15 min or better
 - DART
Every 10 min
Every 20 min
 - Commuter rail
Every 30 min
Worse than 30 min





PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES
Weekday midday frequencies

- Luas**
Every 15 min or better
- DART**
Every 10 min
Every 20 min
- Commuter rail**
Every 30 min
Worse than 30 min



Maps E2, P2: North of Swords

RUSH AND LUSK

Rush and Lusk would continue to be on the same routes as Skerries (see maps E1, P1).

- **Route 285 from Balbriggan to Dublin Airport.** All-day service every 30 minutes, replacing existing Routes 33 and 33a. The main differences would be:
 - » Service every 30 minutes consistently to Balbriggan, rather than alternating 30 and 60 minute intervals between buses.
 - » Service would continue from Swords to Dublin Airport every 30 minutes instead of every 90 minutes.
 - » All service would terminate at Dublin Airport, rather than a bus to City Centre every 90 minutes. This leaves passengers the option to connect to frequent services at Swords Main Street or at the Airport.
- **Route 385 from Skerries to City Centre.** Peak express trips direct to City Centre, similar to existing Route 33x. This route is restored in the revised network proposal in response to public consultation feedback.

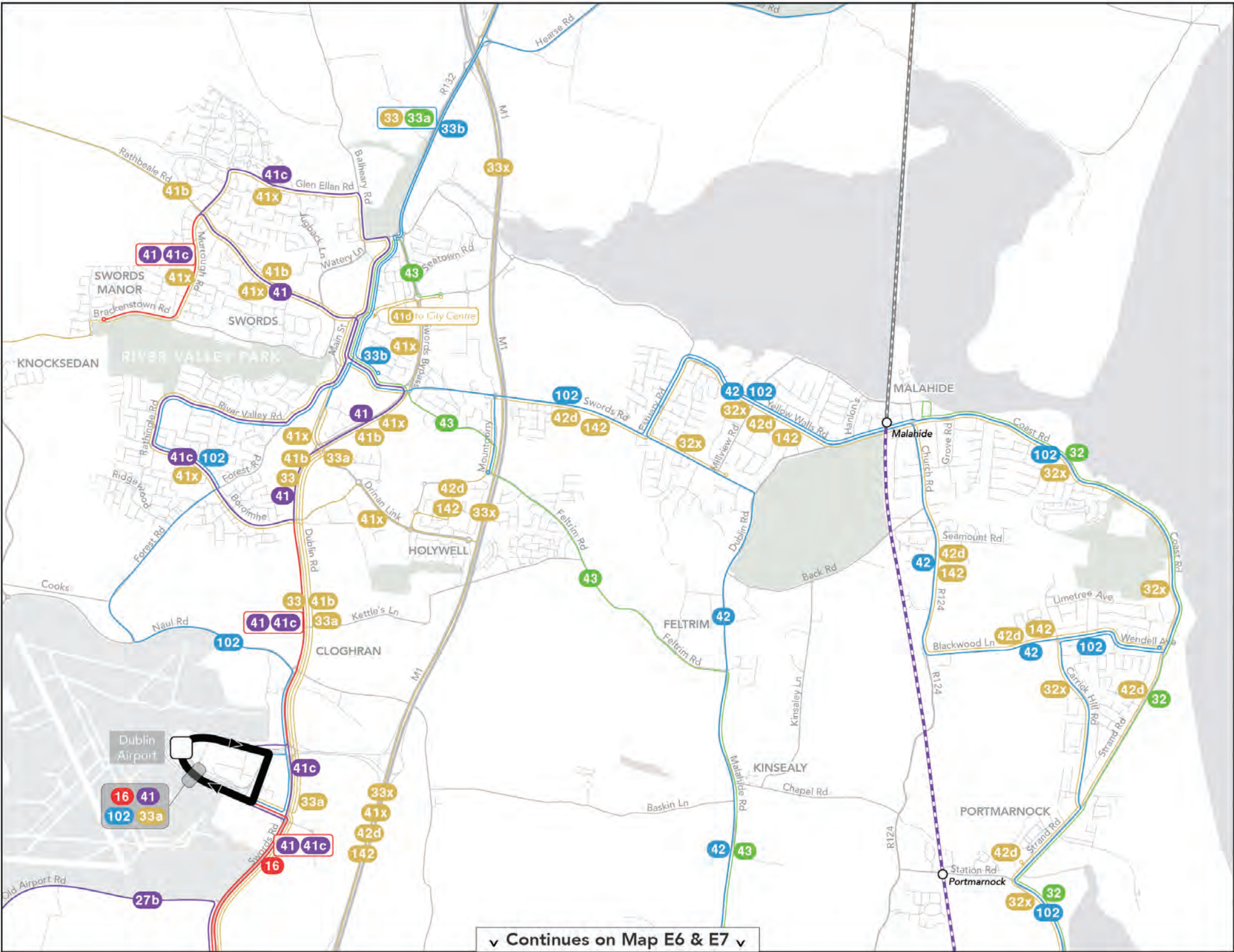
PORTRANE AND DONABATE

Existing routes would be replaced by mostly similar service, including:

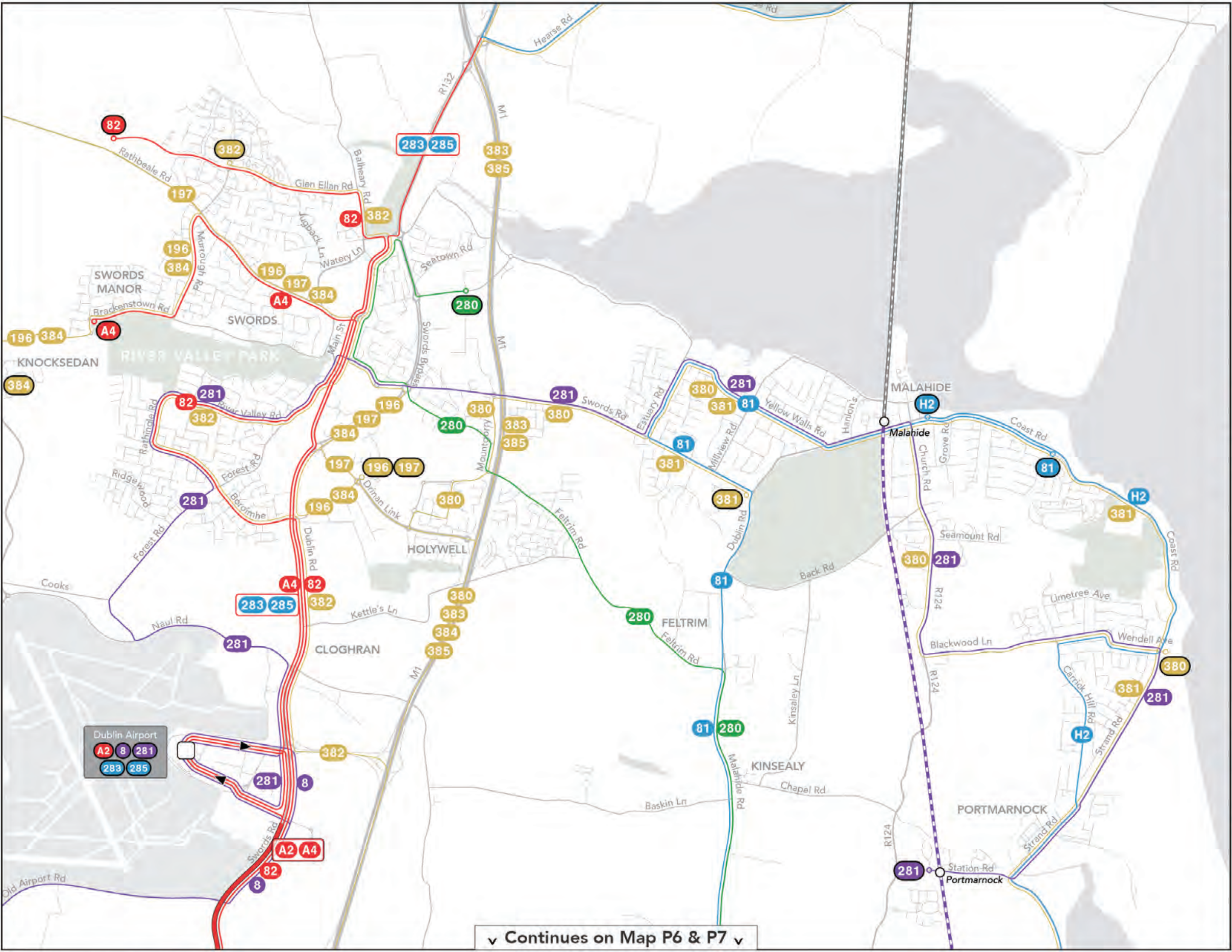
- **Route 283 from Portrane to Dublin Airport.** All-day service, similar to existing Route 33b. The main difference is that service would be extended to continue past Swords to Dublin Airport.
- **Route 383 from Portrane to City Centre.** Peak express service similar to existing Route 33d.

Existing Network: Swords, Malahide and Portmarnock

Map E3



Revised Proposed Network: Swords, Malahide and Portmarnock Map P3



PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

Every 5 min or better

Every 6 to 7.5 min

Every 10 - 15 min

Every 20 - 25 min

Every 30 min

Every 40 min

Every 60 min

Limited or peak-only

Combines for better frequency

Multiple lines & frequencies

End of line

SPINES AND BRANCHES
*All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.***OTHER SERVICES**
Weekday midday frequencies Luas
Every 15 min or better DART
Every 10 min Every 20 min Commuter rail
Every 30 min Worse than 30 min

Maps E3, P3: Swords - Malahide

The focus in this area has largely been on increasing service frequencies and, where possible, reducing the complexity of peak-only express service patterns.

We have assumed that Swords Express continues to exist, providing all-day nonstop service between Swords and the city centre via the M1 tunnel, and that the public bus network will not compete directly for this market. Private Airport Express buses are also assumed to continue to exist, linking the airport nonstop to various parts of Dublin, also outside of the scope of this study.

CENTRAL AND WESTERN SWORDS

The existing routes 41 and 41c, serving the densest and largest neighbourhoods of Swords, are replaced by a branch of the A Spine and a frequent numbered radial.

- **Route A4 from Swords Manor to Nutgrove.** All-day service, every 12 minutes. Would serve Swords Manor, Rathbeale Road and Main Street before continuing to City Centre via the Dublin Road/Swords Road.
- **Route 82 from Glen Ellan Road to City Centre.** All-day service, every 15 minutes. Would start near Applewood Community Centre, would serve Glen Ellan Road, North Street, Main Street, River Valley and Boroimhe before continuing to City Centre via the Dublin Road/Swords Road.

Because A4 and 82 would both be oriented to the City Centre, they would bypass the Dublin Airport terminals. Instead, service between north Swords and the airport would be provided by:

- **Routes 283 and 285 from Main Street to Dublin Airport.** All-day service, two routes coming from Northern Fingal every 30 minutes, with staggered timetables combining to provide a bus every 15 minutes. Passengers seeking to reach the Airport from north Swords would connect to Routes 283/285 on or near Main Street.
- There would also be direct service from **River Valley to the Airport via Route 281** (see Airport Area), every 20 minutes.

At peak hours, there would also be express service:

- **Routes 382 and 384 from Swords to City Centre and UCD.** Peak-only express services, mostly similar to existing Route 41x.

AIRPORT AREA

The Airport terminals would be served by:

- **Route A2 from Dublin Airport to Dundrum.** All-day service, every 12 minutes. Would travel to City Centre via the Swords Road, mostly similar to existing Route 16.
- **Route 8 from Dublin Airport to Merrion Square.** All-day service, every 20 minutes. The main purpose of this route here would be to connect the Airport to Northwest Dublin. It would travel via Harristown to Charlestown and Glasnevin on the way to City Centre.
- **Route 281 from Dublin Airport to Portmarnock DART.** All-day service, every 20 minutes. From Dublin Airport, it would serve Naul Rd, River Valley, Swords Pavilions, Seabury, Malahide Village, Seamount and Portmarnock. This route's purpose would be to connect many residential neighbourhoods to the Airport and central Swords, as well as DART at both Malahide and Portmarnock. Operating every 20 minutes, it could be timed for DART arrivals or departures at either Malahide or Portmarnock station.
- **Routes 283 and 285 from Main Street to Dublin Airport,** as previously described.

EAST SWORDS, FELTRIM AND KINSEALY

The primary all-day service in this area would be:

- **Route 280 from Seatown to DCU.** All-day service, every 40 minutes (every 20 minutes at peak). From Swords Business Park, would serve Seatown, Swords Pavilions, Drinan, Feltrim and Kinsealy to Clongriffin station. Peak service every 20 minutes would be timed to DART southbound departures in the morning (and northbound arrivals in the evening) at Clongriffin station. The route would continue from Clongriffin Station to Darndale, Beaumont Hospital, terminating at Dublin City University.

Parts of this area (Drinan, Hollywell) would also be served by:

- **Route 380 from Portmarnock to City Centre and UCD.** Peak -only express service, similar to existing Route 142. This would be the main peak-hour service between most of Portmarnock and Malahide to City Centre.

MALAHIDE AND PORTMARNOCK

The primary all-day radial services from Malahide and Portmarnock would be:

- **Route H2 from Malahide to City Centre.** All-day service, every 30 minutes via Portmarnock. This route would be similar to existing route 32 but at higher frequency. The routing within Portmarnock would change from Strand Road to Wendell Avenue and Carrickhill Road, taking it past a larger share of houses and businesses
- **Route 81 from Malahide to City Centre.** All-day service, every 30 minutes via Seabury, Feltrim, Kinsealy and the Malahide Road. This would be similar to existing Route 42.

The local route in this area would be

- **Route 281 from Dublin Airport to Portmarnock DART,** as previously described (see Airport Area).

Two peak express routes would also serve this area:

- **Route 380 from Portmarnock to City Centre and UCD,** as previously described (see East Swords, Feltrim and Kinsealy).
- **Route 381 from Malahide to City Centre.** Peak-only express service via Portmarnock, Baldoyle and Clontarf. Similar to existing route 32x.

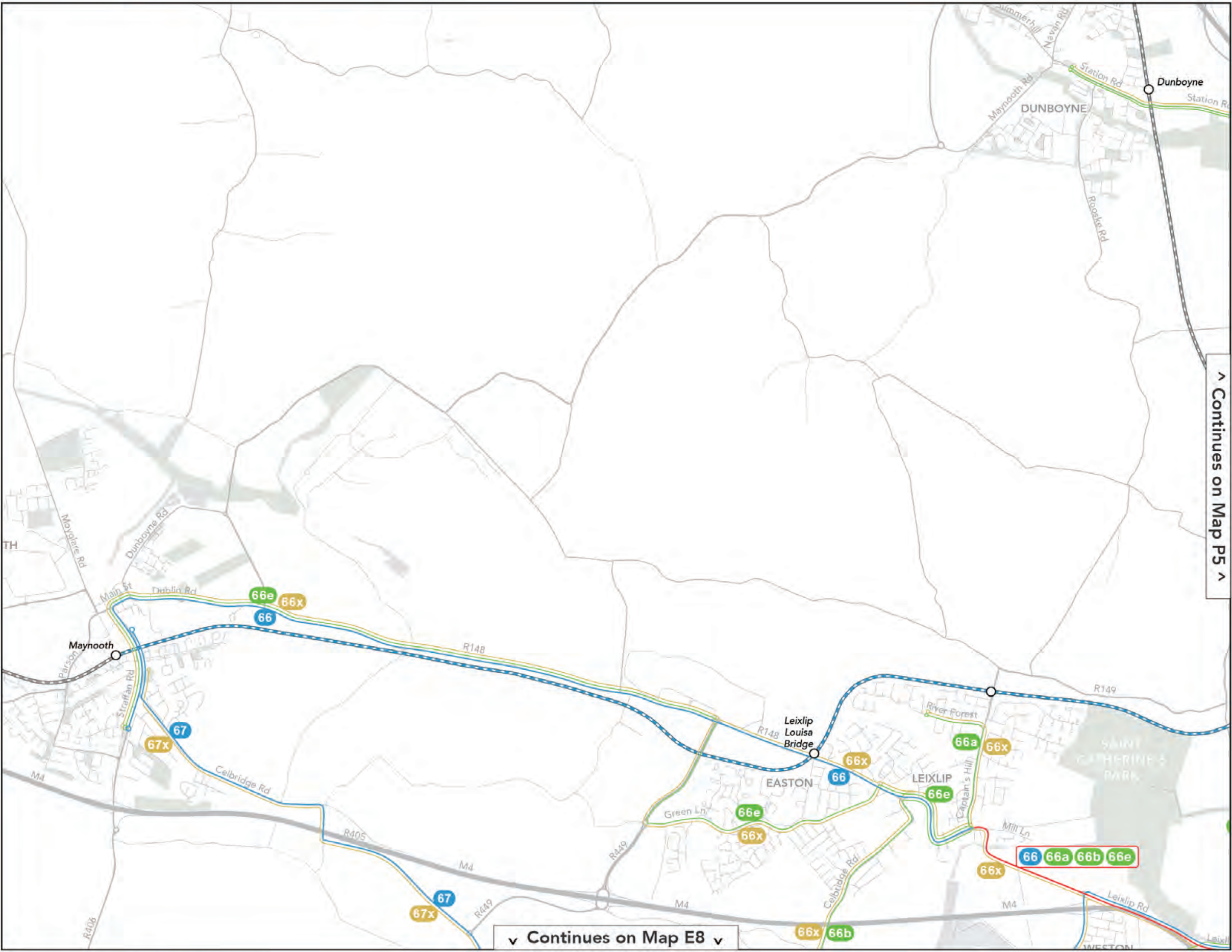
SEMI-RURAL SERVICES

The revised network proposal also includes:

- **Route 196 from Swords to Finglas.** All-day service, every 60 to 120 minutes. This route is primarily targeted at providing a minimum level of service to rural areas located between west Swords and Charlestown, including Toberburr.
- **Route 197 from Ashbourne to Swords.** All day service, every 60 minutes. This would be an outer suburban local route between these two communities, via Rolestown.

Existing Network: Maynooth and Leixlip

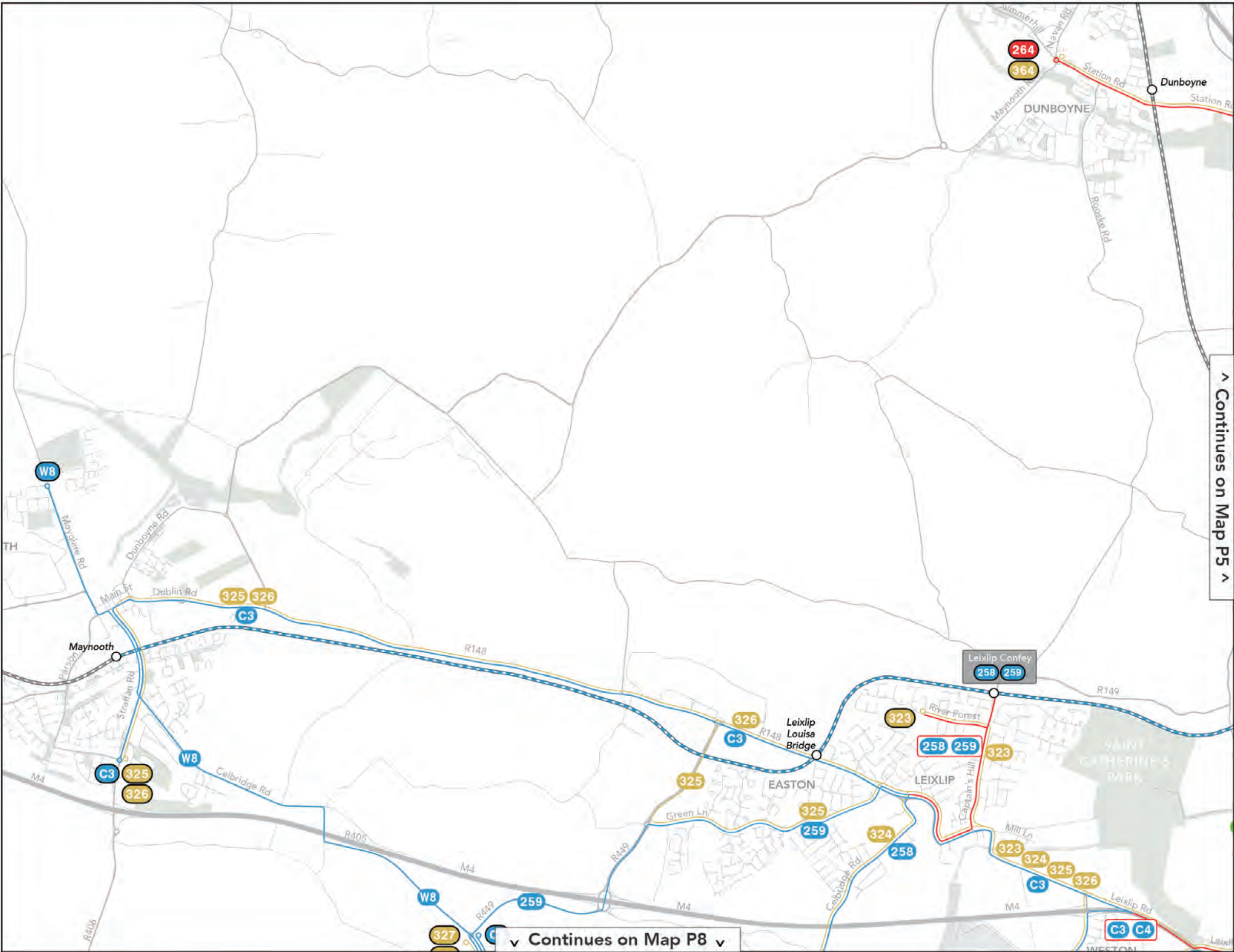
Map E4



- PUBLIC TRANSPORT SERVICES**
Weekday midday frequencies
- Every 9 min or better
 - S4 Every 10 - 15 min
 - 35 Every 20 - 25 min
 - C1 Every 30 min
 - 95 Every 60 min
 - 47 Limited or peak-only
 - 41 41c Combines for better frequency
 - Multiple lines & frequencies
 - 22 14 End of line
- OTHER SERVICES**
Weekday midday frequencies
- Luas Every 15 min or better
 - DART Every 10 min
 - DART Every 20 min
 - Commuter rail Every 30 min
 - Worse than 30 min

Revised Proposed Network: Maynooth and Leixlip

Map P4



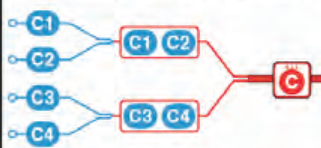
PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES

Weekday midday frequencies

- Luas**
 - Every 15 min or better
- DART**
 - Every 10 min
 - Every 20 min
- Commuter rail**
 - Every 30 min
 - Worse than 30 min



Maps E4, P4: Maynooth and Leixlip

The revised service design in this area seeks to take advantage of plans for increased frequency on the Maynooth and Kildare commuter rail lines, while nonetheless understanding that in the short term bus service remains an extremely important part of how people travel to and from City Centre. In addition, Maynooth would gain a new orbital service to Celbridge, Newcastle, Citywest and Tallaght.

MAYNOOTH

The revised proposed network provides both radial service to Lucan and Dublin city centre, and orbital service to Celbridge and Tallaght.

- **Route C3 from Maynooth to Ringsend.** All-day service, every 30 minutes. This would be similar to existing Route 66, except it would reach City Centre faster by making use of the Chapelizod Bypass, and it would continue past Merrion Square to Ringsend.
- **Route W8 from Maynooth to Tallaght.** All-day service, every 30 minutes. Part of this route replaces the existing segment of Route 67 between Maynooth and Celbridge, but its primary function is as a longer orbital to jobs at Greenogue, Citywest and Tallaght.

As in existing service, there would be peak express service:

- **Routes 325 and 326 from Maynooth to City Centre and UCD.** Peak-only express service, similar to service patterns on existing Route 66x.

LEIXLIP

All-day service in Leixlip would come from a combination of radial and local routes:

- **Route C3 from Maynooth to Ringsend,** as previously described (see Maynooth).
- **Route 258 from Castletown to Confey Station.** All-day service, every 30 minutes. This route would replace existing Route 66b in south Leixlip, and to some extent Route 66a in River Forest. The main differences would be that Route 258 would operate twice as often, but would not continue to City Centre. Instead, passengers would interchange either at Leixlip Village (C3) or Confey Station (rail).
- **Route 259 from Hazelhatch to Confey Station.** All-day service, every 30 minutes. This route would be designed to operate in parts of west Celbridge and Leixlip (Glen Easton, River Forest) that would not otherwise receive all-day radial service to City Centre. Instead, passengers would interchange either at Leixlip Village (C3) or Confey Station (rail).

The timetables for Routes 258 and 259 would need to be carefully constructed in the light of potentially contradictory goals:

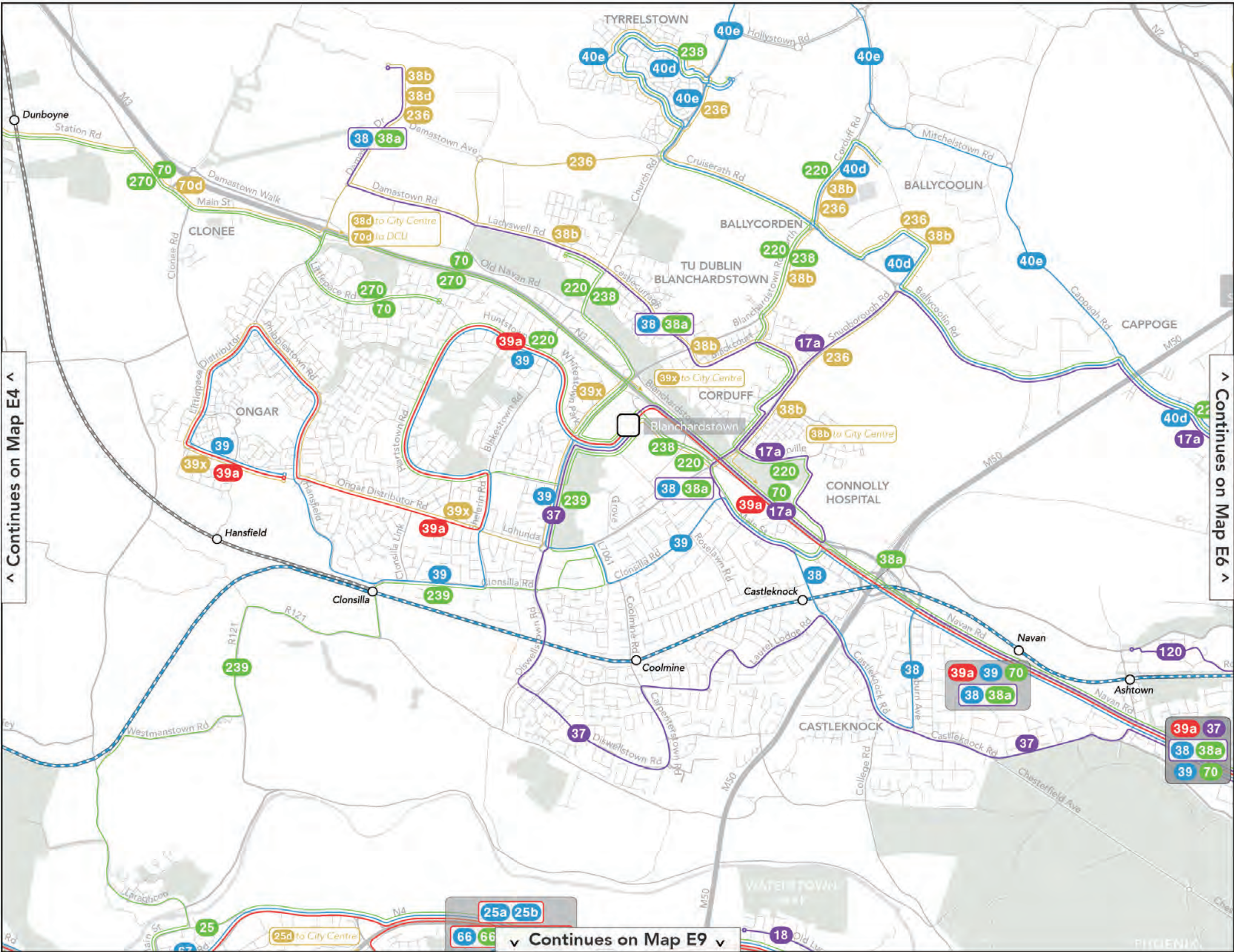
- Timed connections to either or both of Route C3 and the Kildare Line at Confey Station.
- Staggered timetables to provide high frequency in the common segment between Confey Station and Leixlip Village.

Peak services from or through Leixlip (replacing various patterns of Route 66x) would include:

- **Route 323 from River Forest to City Centre.**
- **Route 324 from Castletown to City Centre.**
- **Route 325 from Maynooth to City Centre,** on the direct path through Leixlip (via Louisa Bridge).
- **Route 326 from Maynooth to City Centre,** on the path through Glen Easton.

Existing Network: Blanchardstown and Environs

Map E5



PUBLIC TRANSPORT SERVICES

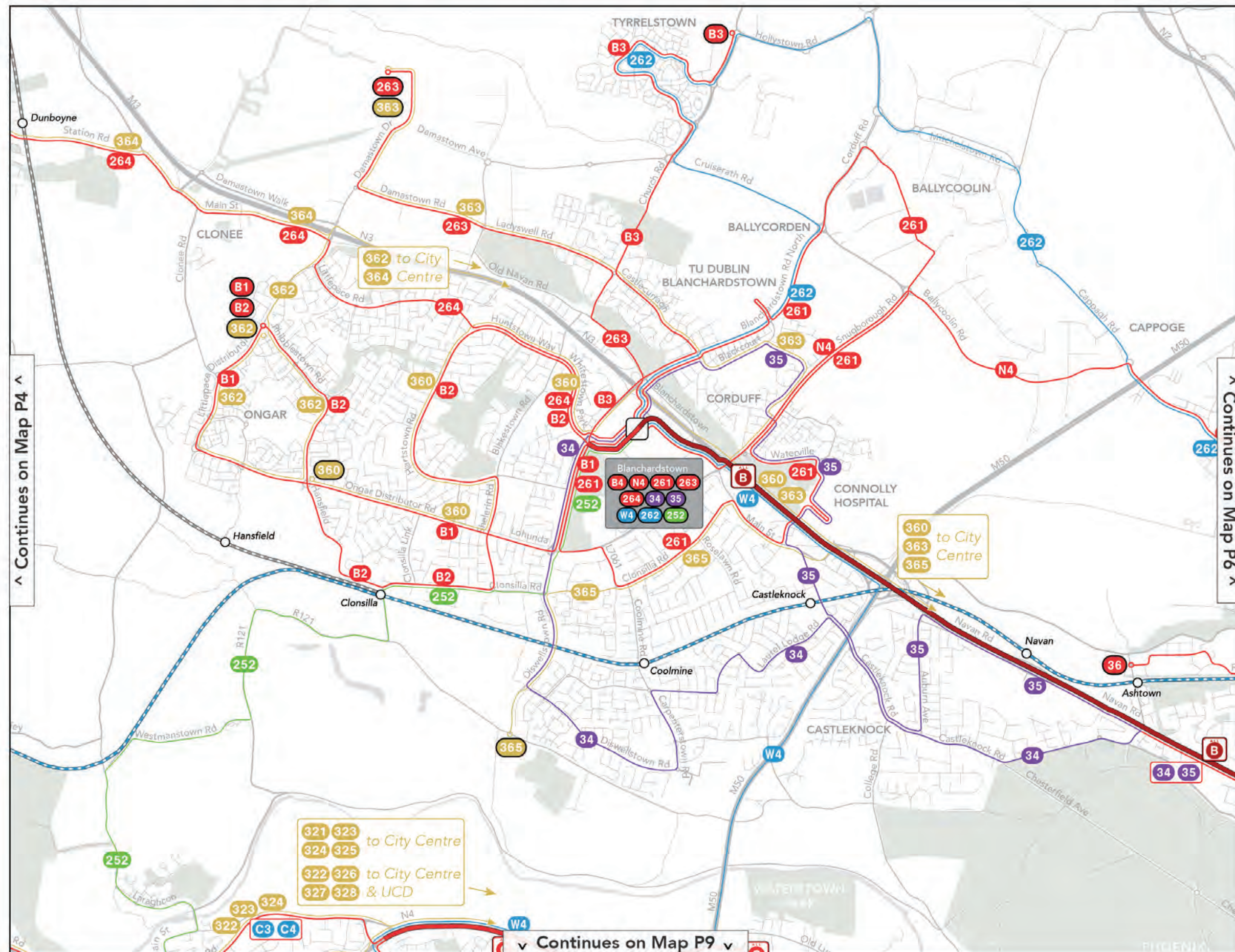
Weekday midday frequencies

- Every 9 min or better
- 34 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

OTHER SERVICES












Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min



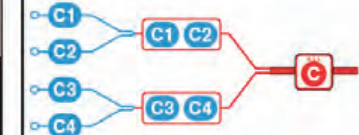
PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

- | | |
|---|-------------------------------|
|  | Every 5 min or better |
|  | Every 6 to 7.5 min |
|  | Every 10 - 15 min |
|  | Every 20 - 25 min |
|  | Every 30 min |
|  | Every 40 min |
|  | Every 60 min |
|  | Limited or peak-only |
|  | Combines for better frequency |
|  | Multiple lines & frequencies |
|  | End of line |

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES

Weekday midday frequencies

- Luas**
Every 15 min or better
- DART**
Every 10 min
Every 20 min
- Commuter rail**
Every 30 min
Worse than 30 min

Maps E5, P5: Blanchardstown and Environs

The main idea of the plan is to use Blanchardstown Shopping Centre as the point where most routes meet. From here, the **B Spine**, every 4 minutes all day would extend directly to the City Centre and UCD. In addition, we have designed peak-hour express services that mostly avoid Blanchardstown Shopping Centre to provide faster trips. Nonetheless, significant bus stop investments will be required at the Shopping Centre and that bus priority into and out of the Shopping Centre will need to improve significantly.

ONGAR, CLONSILLA, HARTSTOWN, HUNTSTOWN

Branches of the B Spine would replace the current 39 and 39a in this area, continuing to offer direct service into the city centre.

- **Route B1 from Ongar to City Centre.** All-day service, every 15 minutes. This would be the faster and more direct path from Ongar via the Ongar Distributor Road directly to Blanchardstown Shopping Centre on the way to City Centre.
- **Route B2 from Ongar to City Centre.** All-day service, every 15 minutes. Although this service would start in Ongar, its primary intended service areas would be Clonsilla, Hartstown and Huntstown, on the way to Blanchardstown Shopping Centre and City Centre.

These all-day routes would be complemented by several peak-only routes:

- **Route 360 from Ongar Distributor Road to City Centre.** Peak-only express, similar to existing Route 39x on the Ongar Distributor Road, and in Hartstown and Huntstown. Would not serve Ongar.
- **Route 362 from Ongar to City Centre.** Peak-only express. This route would be intended to mainly serve Ongar and Littlepace. It would enter the N3 at the Littlepace Distributor Road, bypassing most of Blanchardstown.

Portions of this area would also be served by:

- **Route 252 from Adamstown to Blanchardstown.** All-day service, every 60 minutes. Would provide service between Adamstown Station, Lucan Village and Blanchardstown via Clonsilla, similar in many ways to existing Route 238.

DUNBOYNE AND LITTLEPACE

The revised service pattern proposed for Dunboyne and Littlepace would be as follows:

- **Route 264 from Dunboyne to Blanchardstown.** All-day service, every 15 minutes. This route would connect Dunboyne, Clonee, and Littlepace to each other Blanchardstown Shopping Centre. Unlike existing Routes 70 and 270, which back into and then back out of Littlepace, the proposed Route 264 would take advantage of a proposed bus gate at Huntstown Wood to enable a more direct trip.
- **Route 362 from Ongar to City Centre,** as previously described. This would be the peak express service for western parts of Littlepace.
- **Route 364 from Dunboyne to City Centre.** Peak-only express service, 2 trips a day per direction. This service would operate faster (fewer stops) but less frequently than existing Route 70. At peak hours, passengers from Dunboyne could choose to time their trip to catch Route 364, or to take the frequent Route 264 connecting to buses every 4 minutes at Blanchardstown Shopping Centre.

This pattern responds to the strong demand for a restored connection between Dunboyne and Littlepace for schools, and for better service to both areas than was initially proposed.

NORTH OF THE N3: DAMASTOWN, TYRELLSTOWN, CORDUFF, BALLYCOOLIN

The revised service pattern proposed would be as follows:

- **Route B3 from Tyrrelstown to City Centre.** All-day service, every 15 minutes. This would be a new radial route from Tyrrelstown and Castlecurragh to Blanchardstown Shopping Centre and City Centre. It would simultaneously improve travel times for local travel and provide higher frequency for trips into the city.
- **Route 35 from Blanchardstown to City Centre.** All-day service, every 20 minutes (every 15 minutes at peak). This would be the radial service for Corduff, replacing parts of existing Route 38. Terminating at Blanchardstown Shopping Centre provides a more useful outbound destination.
- **Route N4 from Blanchardstown to Spencer Dock.** All-day service, every 10 minutes. This route would be the primary orbital route connecting areas across North Dublin, operating every 10 minutes all day. Near Blanchardstown, the new Route N4 would largely replicate the path of existing Route 17a to Finglas and DCU, but at much higher frequency.
- **Route 261 East Blanchardstown Circulator.** All-day service, every 15 minutes (two-way loop). This route would link a variety of important destinations north and south of the Navan Road like Ballycoolin, TU Dublin-Blanchardstown,

Connolly Hospital, and Blanchardstown Village to frequent connecting service at Blanchardstown Shopping Centre.

- **Route 262 Blanchardstown to Broombridge.** All-day service, every 30 minutes (every 15 at peak). This route would largely replicate service provided by existing route 40e, adding a connection to Blanchardstown Shopping Centre for a more useful outbound destination.
- **Route 263 Damastown to Blanchardstown.** All-day service, every 15 minutes. This would replace existing Routes 38 and 38a on Damastown Drive and Damastown Road at higher frequency. However, it would terminate at Blanchardstown Shopping Centre rather than City Centre.
- **Route 363 Damastown to City Centre.** Peak-only service, operating two-way. This is intended to replace some functions of existing Route 38b, providing both a faster peak service into City Centre, and a reverse-peak service from the city to Damastown.

SOUTHEAST: BLANCHARDSTOWN VILLAGE, CARPENTERSTOWN, CASTLEKNOCK

Service in this area would include:

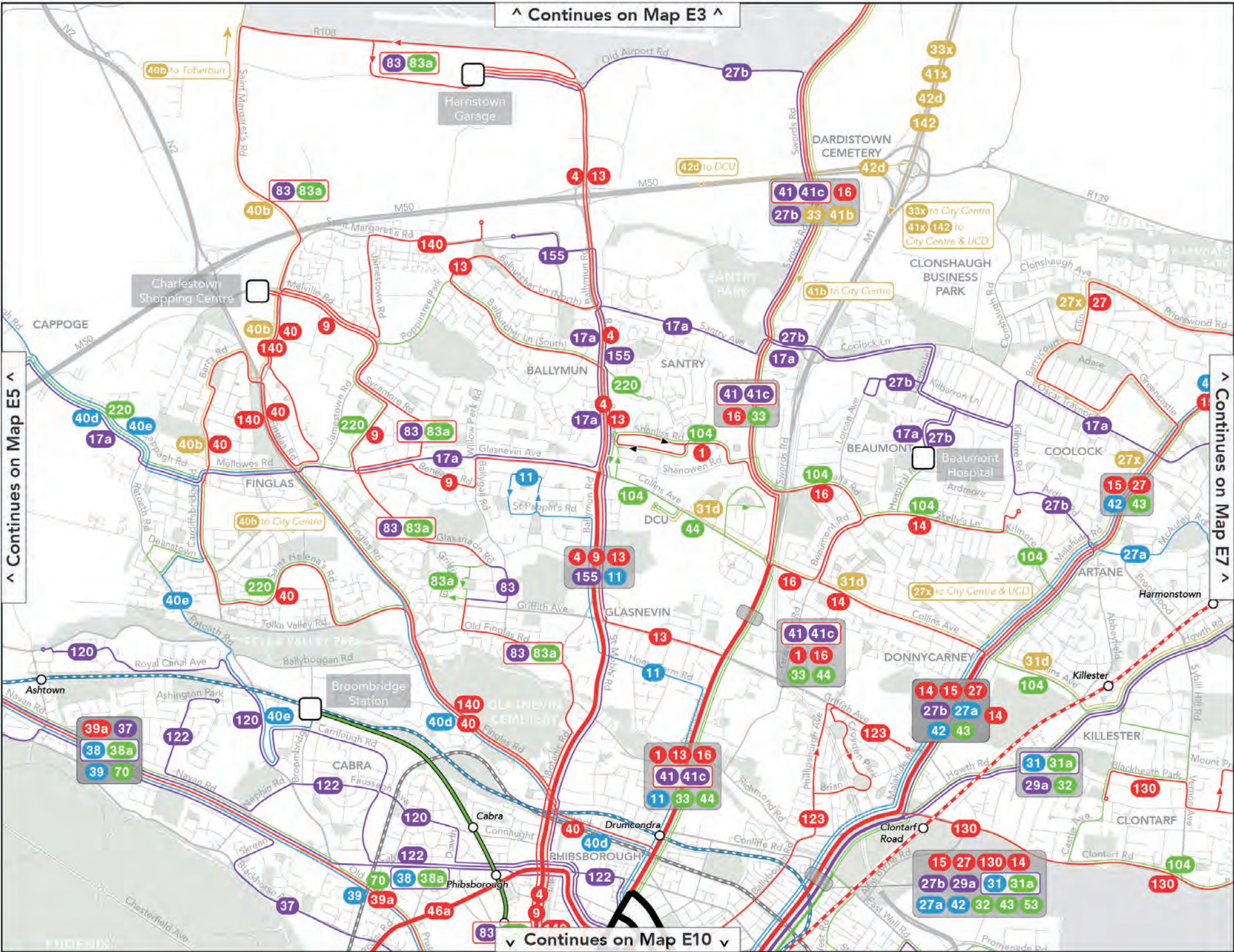
- **Route 34 from Blanchardstown to City Centre.** All-day service, every 20 minutes all day (every 8-15 minutes at peak). This would replace existing Route 37 in Carpenterstown and Castleknock. The path into City Centre would change from Blackhorse Avenue to Cabra Road.
- **Route 35 from Blanchardstown to City Centre.** All-day service, every 20 minutes (every 15 minutes at peak). This would replace existing Route 38 through Blanchardstown Village and Castleknock.
- **Route 261 East Blanchardstown Circulator,** as previously described (see North of the N3).
- **Route 365 Diswellstown to City Centre.** Peak-only express service. This is added due to the loss of all-day direct service to City Centre on Clonsilla Road in Coolmine.

NEW ORBITAL TO LUCAN AND TALLAGHT

- **Route W4 from Blanchardstown to Tallaght.** All-day service, every 30 minutes (every 15 minutes at peak). This would be orbital service linking suburbs to large shopping centres and industrial estates. Route W4 would link Blanchardstown Shopping Centre, Liffey Valley Shopping Centre, Ballyowen Road in Lucan, and Grange Castle Business Park, and extending to Tallaght via Kingswood Road (near Citywest) and Cheeverstown Road.

Existing Network: Inner North

Map E6



PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

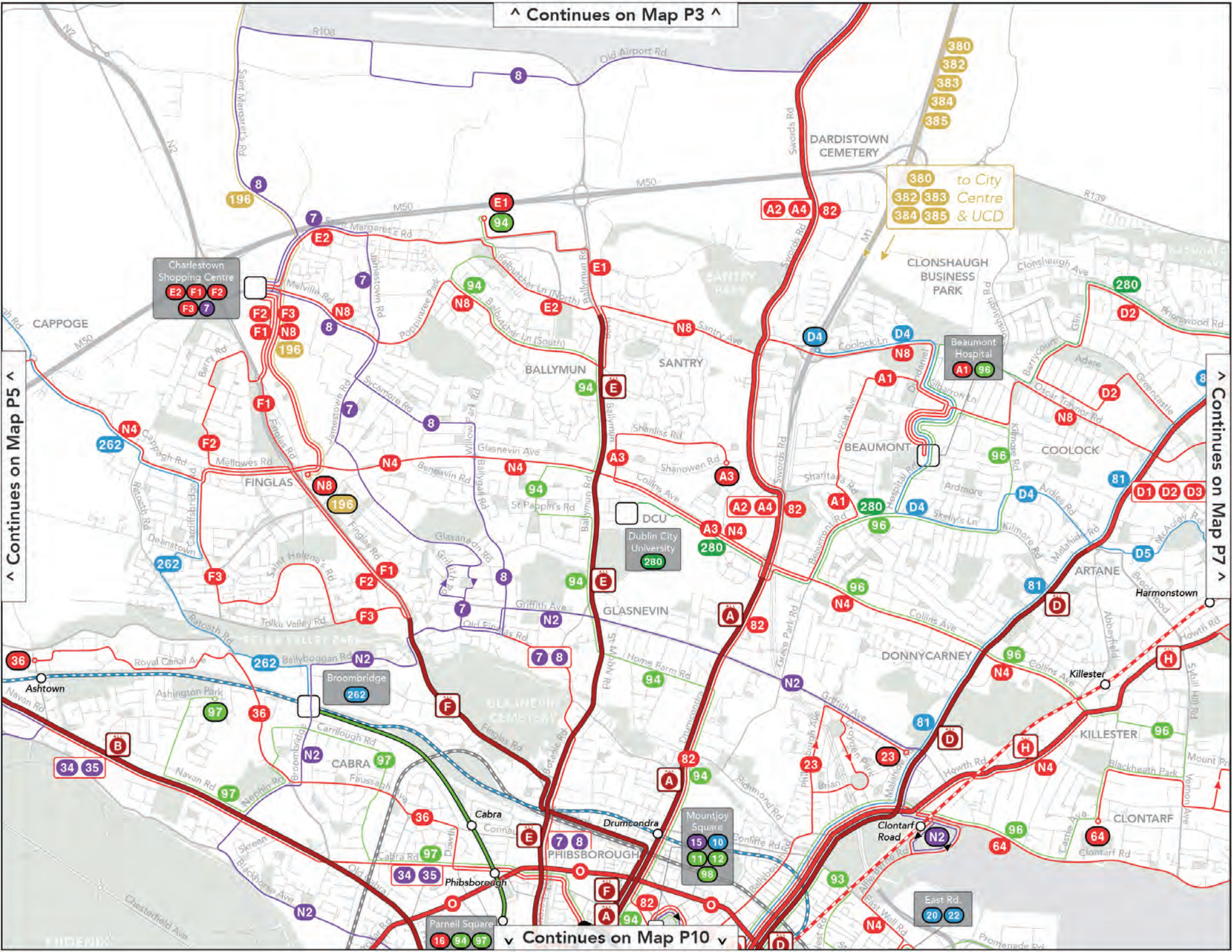
- Every 9 min or better
- Every 10 - 15 min
- Every 20 - 25 min
- Every 30 min
- Every 60 min
- Limited or peak-only
- Combines for better frequency
- Multiple lines & frequencies
- End of line

OTHER SERVICES
Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min

Revised Proposed Network: Inner North

Map P6

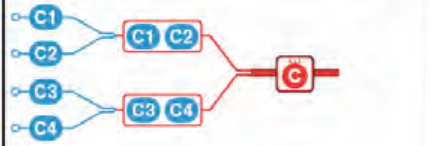


PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES
Weekday midday frequencies

- Luas**
 - Every 15 min or better
- DART**
 - Every 10 min
 - Every 20 min
- Commuter rail**
 - Every 30 min
 - Worse than 30 min



Maps E6, P6: Inner North

In this area, each main road into the City Centre would be served by a combination of bus routes providing extremely frequent service. The primary innovation of the proposed network is the increased number and frequency of orbital services.

NEW ORBITALS

Three orbital services are proposed in North Dublin.

- **Route N2 from Heuston station to Clontarf Road station.** All-day service, every 20 minutes (every 15 at peak). This would be an orbital route primarily following Griffith Avenue. Due to a relatively limited number of destinations along the route, it is not proposed at high frequency at this time.
- **Route N4 from Blanchardstown to Spencer Dock.** All-day service, every 10 minutes. This would be the primary orbital through much of north Dublin. It would operate mostly on Collins Avenue and Glasnevin Avenue, linking major destinations including the North Docklands, DCU, Finglas Village and Blanchardstown Shopping Centre.
- **Route N8 from Howth Junction station to Finglas.** All-day service, every 10 minutes. This would be the “outer north” orbital, and would also link several important destinations: Beaumont Hospital, Ballymun Civic Centre, Charlestown Shopping Centre and Finglas Village.

In addition to these:

- **Route 280 from Seatown to DCU.** All-day service, every 40 minutes (every 20 minutes at peak). This would be a less frequent “mini-orbital”, linking DCU and Beaumont Hospital to Clongriffin and points north.

RADIAL SERVICES

1. NAVAN ROAD AND CABRA

The primary services in this area to City Centre would be:

- **All B spine buses (B1, B2, B3, B4).** All-day service, every 4 minutes on the Navan Road to City Centre.
- **Routes 34 and 35.** All-day service, two routes timetabled to provide combined service every 10 minutes on the Navan Road to Cabra Road, Mater Hospital, and City Centre.
- **Route 36.** All-day service, every 15 minutes. This would be the primary service from Rathborne, Royal Canal Park and

Cabra to City Centre.

In addition, parts of this area would be served by:

- **Route 97 from Ashington Park to Parnell Square.** All-day service, every 60 minutes. This would be a lifeline route, providing service to streets and stops located farther from main roads in Ashington Park and Cabra.

2. FINGLAS

Radial services in Finglas would be on different branches of the F Spine:

- **F1 via the Finglas Bypass.** All-day service, every 15 minutes (with 3-6 extra trips per hour to City Centre only at peak). This would be the “express” service, with some similarity to existing Route 140.
- **F2 via Finglas Northwest.** All-day service, every 15 minutes. Would connect Finglas Northwest to Finglas Village, and then City Centre via the Finglas Bypass.
- **F3 via McKee Avenue and Finglas Southwest.** All-day service, every 15 minutes. Would connect other parts of Finglas to both Finglas Village and City Centre.

From Tolka Valley Road into City Centre, the three routes would operate at a combined frequency of every 5 minutes.

Finglas South would also be served by the local:

- **Route 262 from Blanchardstown to Broombridge.** All-day service, every 30 minutes. This would be mostly similar to existing Route 40e.

3. GLASNEVIN

Glasnevin would be served by two radial routes, replacing segments of existing routes 9, 83 and 83a:

- Route 7 via Glasnaon Road. All-day service, every 20 minutes. Would serve parts of Poppintree and west Glasnevin, including Tolka Estate.
- Route 8 via Ballygall Road. All-day service, every 20 minutes. Would serve east Glasnevin.

From the Old Finglas Road into City Centre, the two routes would operate at a combined frequency of every 10 minutes.

4. BALLYMUN ROAD

Radial service in the Ballymun Road corridor would include:

- **All E spine buses (E1, E2).** All-day service, every 5 minutes from Ballymun to City Centre and points beyond. North of Ballymun Civic Centre, E1 and E2 would separate, with:
 - » **Route E1** continuing to IKEA. All-day service, every 10 minutes.
 - » **Route E2** continuing to Charlestown Shopping Centre. All-day service, every 10 minutes. Would serve Balbutcher Lane (North) and Saint Margaret’s Road.

In addition, parts of this corridor would be served by:

- **Route 94 from IKEA to Parnell Square.** All-day service, every 60 minutes. This would be a lifeline route, providing infrequent but relatively direct service to City Centre from Balbutcher Lane (South), Wadelai and Home Farm Road.

5. SWORDS ROAD

The Swords Road would be served by:

- **All A spine buses (A1, A2, A3, A4).** All-day service, every 3 minutes from Whitehall to City Centre and points beyond. North of Whitehall, the branches would separate, with:
 - » **Route A1** continuing to Beaumont Hospital via Lorcan Avenue. All-day service, every 12 minutes.
 - » **Route A2** continuing to Dublin Airport via Swords Road. All-day service, every 12 minutes.
 - » **Route A3** continuing to Santry via Collins Avenue/DCU. All-day service, every 12 minutes.
 - » **Route A4** continuing to Swords. All-day service, every 12 minutes.

In addition, there would also be:

- **Route 82 from Swords to City Centre.** All-day service, every 15 minutes. In north Dublin City, this route would provide additional capacity to City Centre.

6. MALAHIDE ROAD

The Malahide Road would be served by:

- **All D spine buses (D1, D2, D3, D4, D5).** All-day service, every 4 minutes from the Artane Roundabout to City Centre and points beyond. North of the Artane Roundabout, the branches would separate, with:
 - » **Route D1** continuing to Clare Hall and Clongriffin (via Main Street). All-day service, every 15 minutes.

- » **Route D2** continuing to Darndale and Clare Hall. All-day service, every 15 minutes.
- » **Route D3** continuing to Clare Hall and Clongriffin (via Belmayne). All-day service, every 15 minutes.
- » **Route D4** continuing to Beaumont Hospital and estates in Kilmore and Coolock. Swords. All-day service, every 30 minutes.
- » **Route D5** continuing to Harmonstown, Edenmore and Ard Na Greine. All-day service, every 30 minutes.

In addition, there would also be:

- **Route 81 from Malahide to City Centre.** All-day service, every 15 minutes. In north Dublin City, this route would provide additional capacity to City Centre.
- **Route 96 from Beaumont Hospital to City Centre.** All-day service, every 60 minutes. This would be a lifeline route, providing infrequent service to City Centre from a variety of streets and stops located farther from main roads in Beaumont and Clontarf.

7. HOWTH ROAD AND CLONTARF

The Howth Road would be served by:

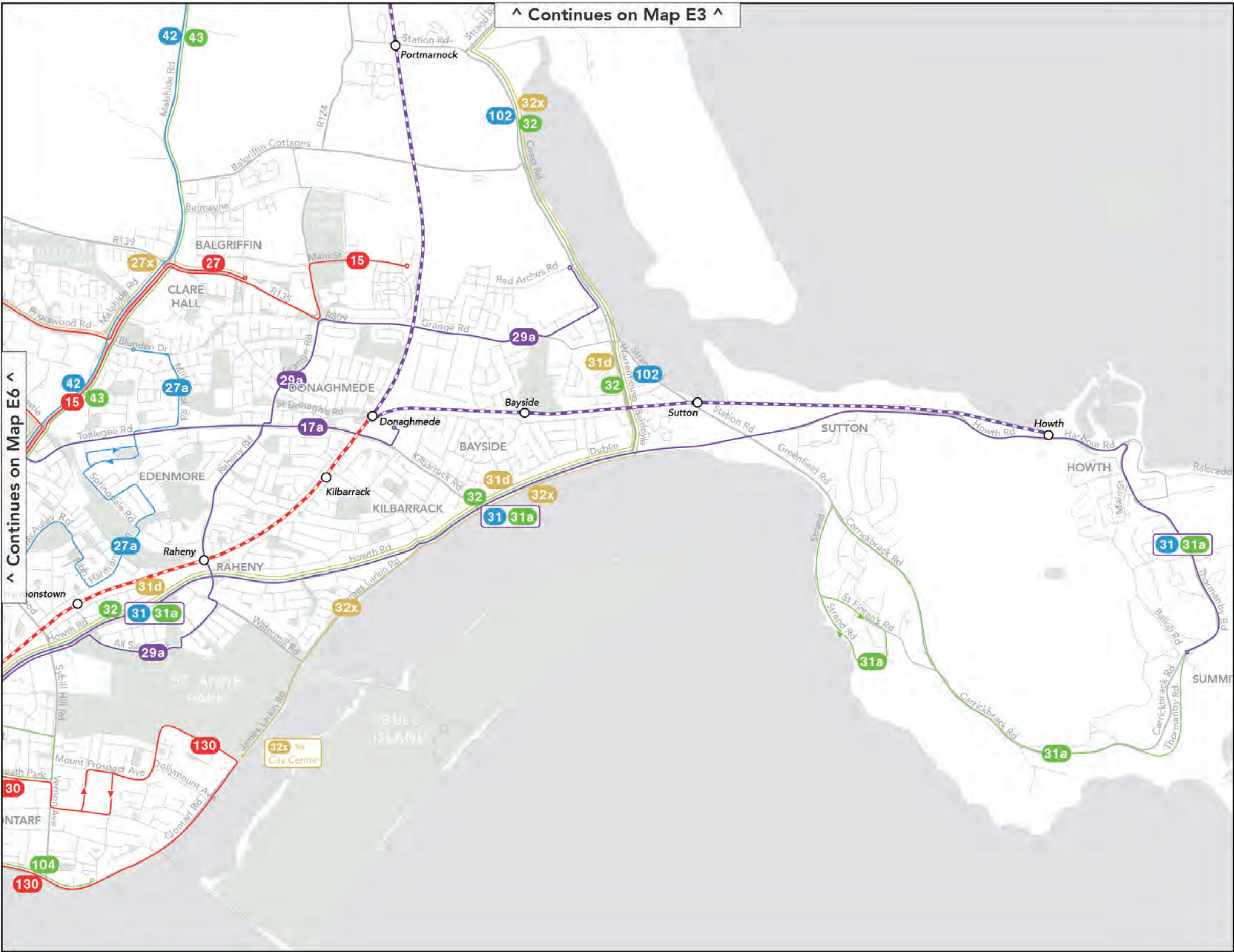
- **All H spine buses (H1, H2, H3).** All-day service, every 8 minutes from All-Saints Road to City Centre. North of the Artane Roundabout, the branches would separate into three branches (see map P7)

Clontarf would be served by:

- **Route 64 from Clontarf to City Centre.** All-day service, every 15 minutes (every 6 minutes at peak). This route would essentially be the same as existing Route 130, with frequency adjustments matching demand (higher frequency at peak, slightly lower off-peak).

Existing Network: Howth and Northeast

Map E7



PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

- Every 9 min or better
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

OTHER SERVICES

Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min





- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES
Weekday midday frequencies

- Luas**
Every 15 min or better
- DART**
Every 10 min
Every 20 min
- Commuter rail**
Every 30 min
Worse than 30 min



Maps E7, P7: Howth and Northeast

This area would see relatively little change compared to existing service, except for the southern part of the Howth peninsula.

HOWTH ROAD CORRIDOR

The inner parts of the Howth road would be served by all H spine buses, with a combined frequency of every 8 minutes to City Centre. However, these buses split at All Saints Road:

- **H1 from Clongriffin (east side) to City Centre.** All-day service, every 15 minutes. This would serve as the primary radial route for Baldoyle and Donaghmede, replacing existing Route 29a at higher frequency.
- **H2 from Malahide to City Centre.** All-day service, every 30 minutes. This would be the primary radial bus service coming from Portmarnock, replacing existing Route 32 at higher frequency.
- **H3 from Howth to City Centre.** All-day service, every 30 minutes. This would be the radial bus service coming from Howth and Sutton, replacing existing Route 31.

Routes H2 and H3 would combine to provide 15 minute frequency on the Howth Road in Bayside and Kilbarrack.

The Howth Road corridor would also be served by:

- **Routes 290 from Howth to Sutton.** All-day service, every 40 minutes. This would be a local route intended mainly for the southern part of the Howth peninsula, connecting to DART at Sutton Station. The timetable for this route will need to be designed with regard to inbound connections in the morning, and outbound connections in the evening.
- **Route 381 from Malahide to City Centre.** Peak-only express service via Portmarnock, Baldoyle and Clontarf. Similar to existing route 32x.

CLONTARF

Clontarf would be served by:

- **Route 64 from Clontarf to City Centre.** All-day service, every 15 minutes (every 6 minutes at peak). This route would essentially be the same as existing Route 130, with frequency adjustments matching demand (higher frequency at peak, slightly lower off-peak).

CLONGRIFFIN

There would be an expansion of service to Clongriffin reflecting its ongoing high-density development. This would include:

- **Routes D1 and D3 to the Malahide Road and City Centre.** All-day service, every 15 minutes on both routes. D1 would serve Main Street on the way to City Centre, while D3 would serve Belmayne.
- **Route H1 to the Howth Road and City Centre.** All-day service every 15 minutes, as previously described (see Howth Road Corridor).

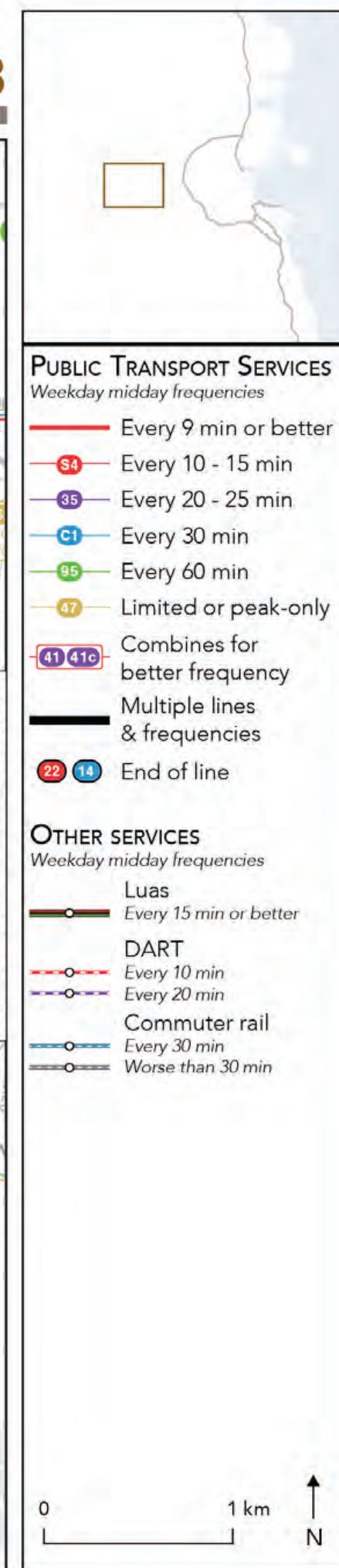
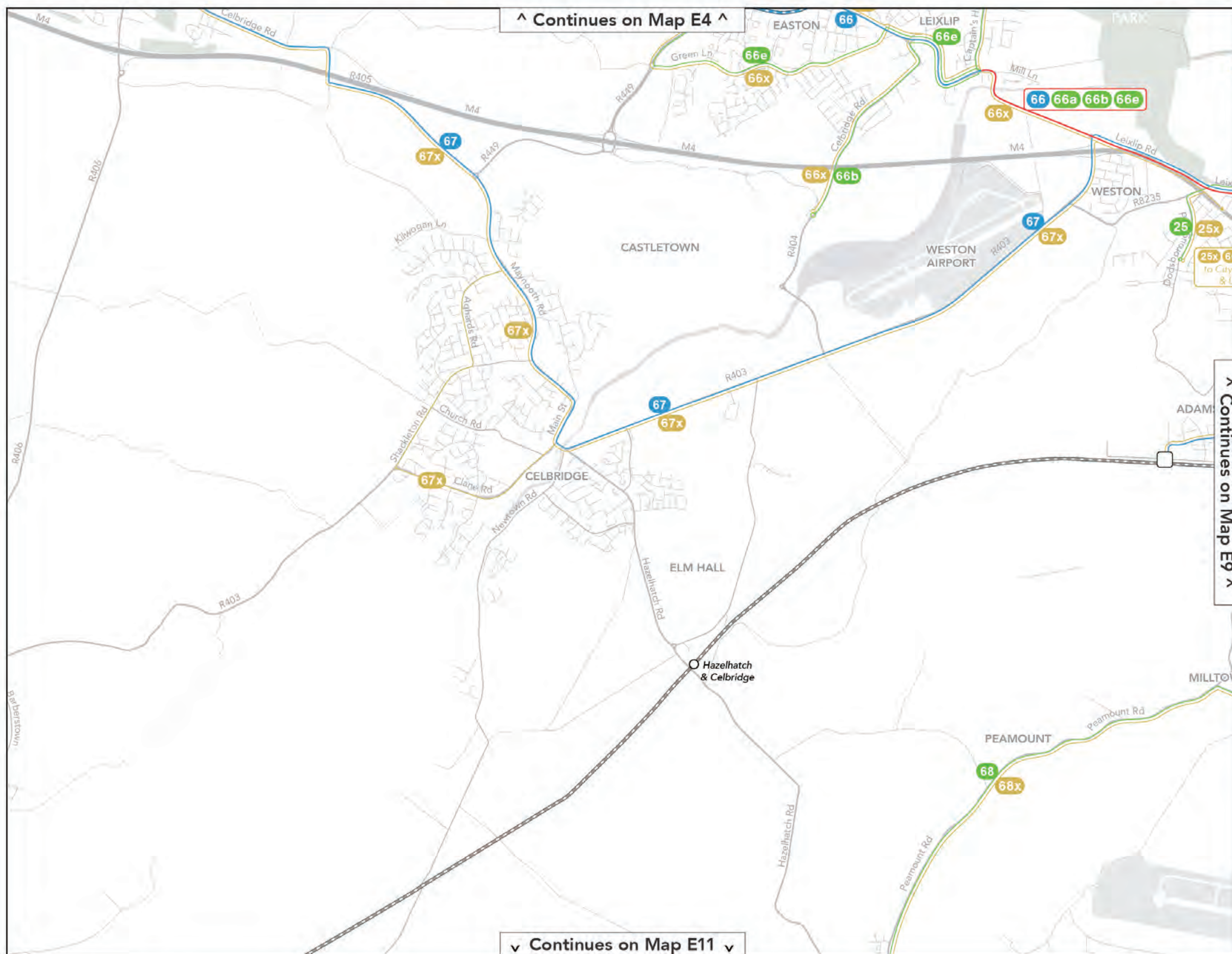
ORBITAL SERVICE

Orbital service from Northeast Dublin would include:

- **Route N8 from Howth Junction station to Finglas.** All-day service, every 10 minutes. This would be the “outer north” orbital, linking this area to destinations like Beaumont Hospital, Ballymun Civic Centre, Charlestown Shopping Centre and Finglas Village.
- **Route 280 from Seatown to DCU.** All-day service, every 40 minutes (every 20 minutes at peak). This would be a less frequent “mini-orbital”, linking DCU and Beaumont Hospital to Clongriffin and points north.

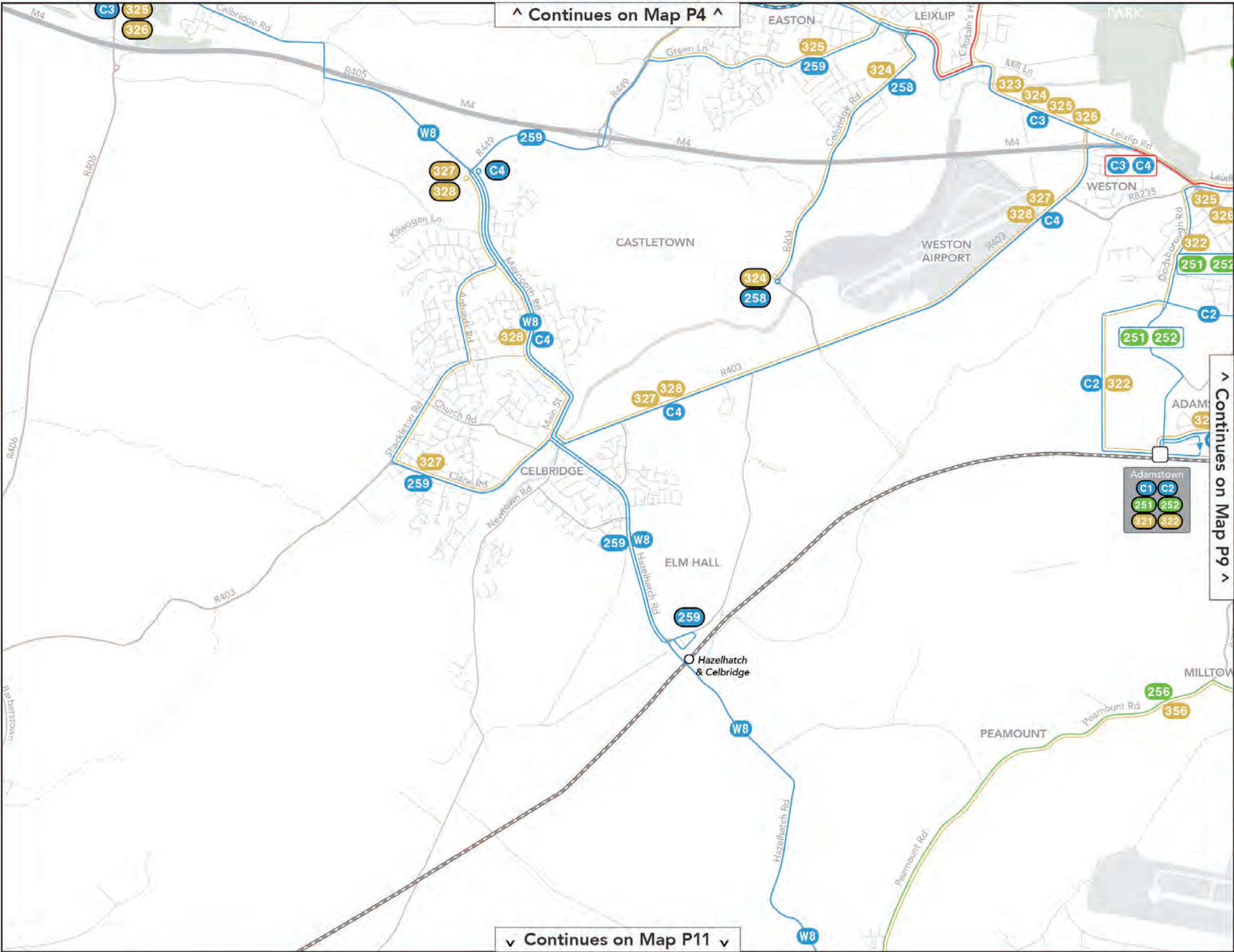
Existing Network: Celbridge

Map E8



Revised Proposed Network: Celbridge

Map P8



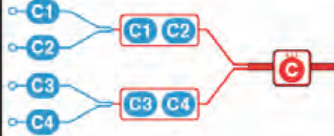
PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES

Weekday midday frequencies

- Luas**
 - Every 15 min or better
- DART**
 - Every 10 min
 - Every 20 min
- Commuter rail**
 - Every 30 min
 - Worse than 30 min



Maps E8, P8: Celbridge

The primary radial service from Celbridge would be:

- **Route C4 from Celbridge to City Centre.** All-day service, every 30 minutes. This service would run north-south through Celbridge on Maynooth Road and Main Street, and then follow the R403 to Lucan Village, similar to existing Route 67.

At peak hours, this service would be complemented by:

- **Routes 327 and 328 from Celbridge to City Centre.** Peak-only express service, replicating different patterns of existing Route 67x.

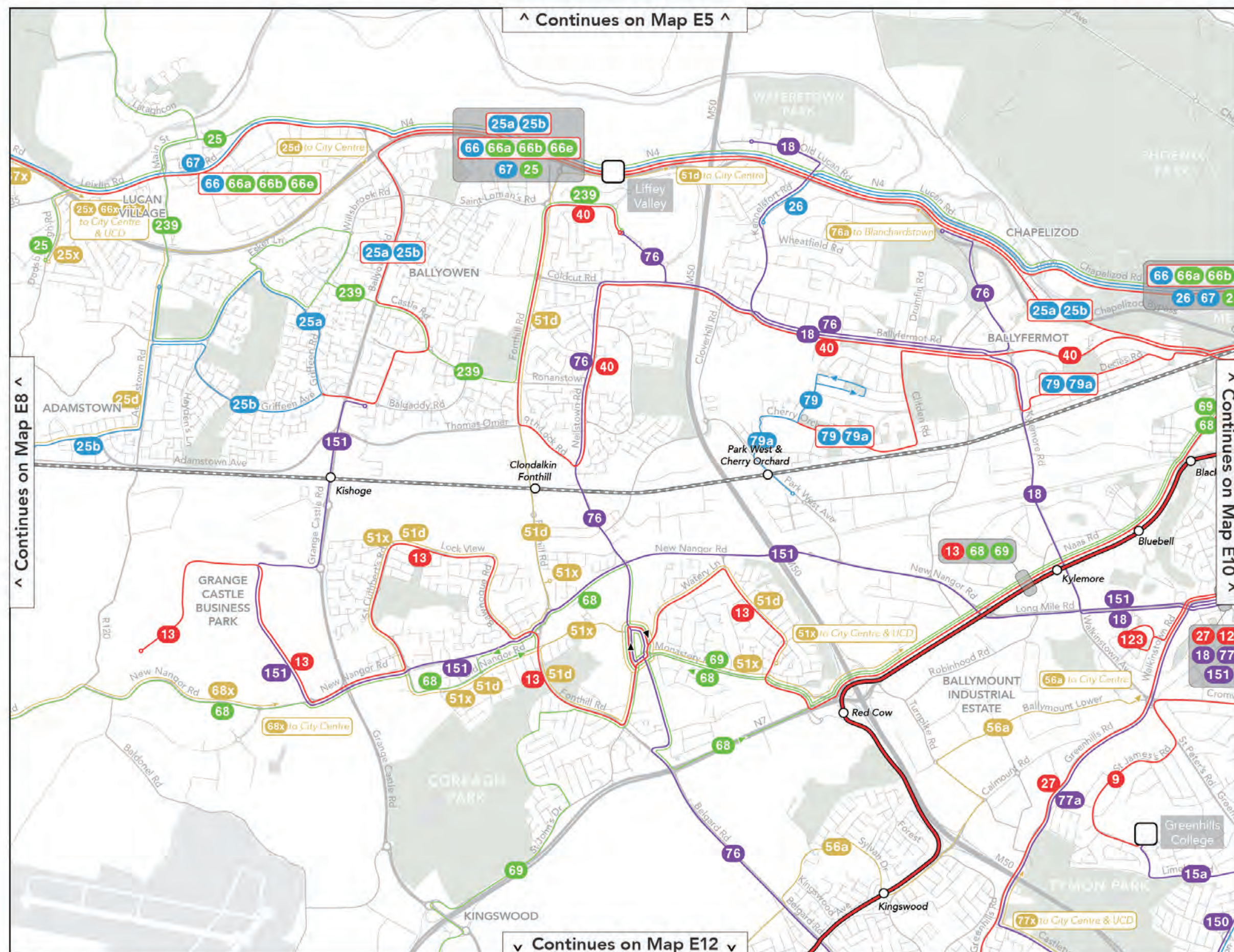
In response to public consultation feedback, this distribution and routing of peak and all-day service would essentially be unchanged from existing service.

However, it's also worth noting two new orbital and local routes that remain in the revised proposal:

- **Route W8 from Maynooth to Tallaght.** All-day service, every 30 minutes. Part of this route replaces the existing segment of Route 67 between Maynooth and Celbridge, but its primary function is as a longer orbital to jobs at Greenogue, Citywest and Tallaght.
- **Route 259 from Hazelhatch to Confey Station.** All-day service, every 30 minutes. This local route would connect neighbourhoods in Celbridge and Leixlip to each other, as well as to Hazelhatch and Confey stations.










Existing Network: Inner West

Map E9



PUBLIC TRANSPORT SERVICES

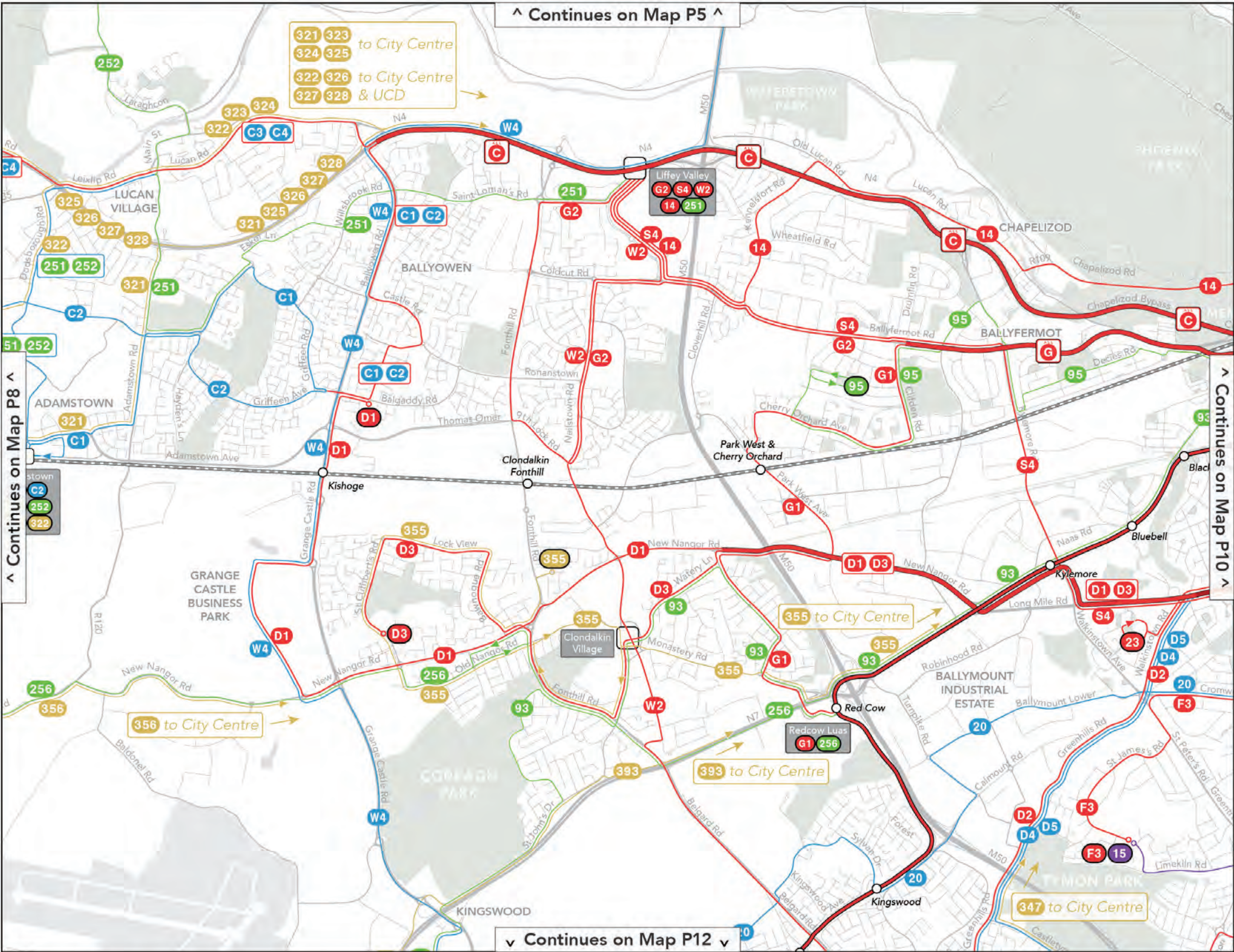
Weekday midday frequencies

-  Every 9 min or better
-  Every 10 - 15 min
-  Every 20 - 25 min
-  Every 30 min
-  Every 60 min
-  Limited or peak-only
-  Combines for better frequency
-  Multiple lines & frequencies
-  End of line

OTHER SERVICES

Weekday midday frequencies

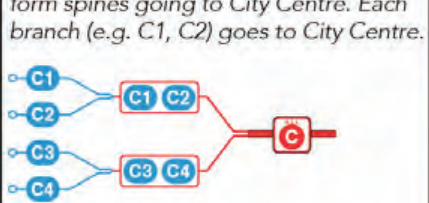
- Luas**
Every 15 min or better
- DART**
Every 10 min
Every 20 min
- Commuter rail**
Every 30 min
Worse than 30 min



PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES
All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES
Weekday midday frequencies

- Luas**
 - Every 15 min or better
- DART**
 - Every 10 min
 - Every 20 min
- Commuter rail**
 - Every 30 min
 - Worse than 30 min



H3: Map E9, P9 Inner West

In this area, we worked to increase the amount of frequent service, and the number of connections between frequent routes, while maintaining coverage and existing local travel patterns.

The proposed interchange on the north side of Liffey Valley Shopping Centre, adjacent to the pedestrian bridge to the bus stops on the N4 motorway, would dramatically expand connection opportunities and thus the destinations that can be reached.

ORBITALS

The most significant changes in this area are to orbital service:

- **Route S4 from Liffey Valley to UCD.** All-day service, every 10 minutes. This route is designed to create direct service from Liffey Valley and Ballyfermot across the south side of Dublin, including Crumlin, Terenure, and UCD. It would run significantly more frequently than existing Route 18.
- **Route W2 from Liffey Valley to Tallaght.** All-day service, every 15 minutes. Very similar to the existing 76, but at slightly higher frequency. The new connections at Liffey Valley would make this route useful to reach more places.
- **Route W4 from Blanchardstown to Tallaght.** All-day service, every 30 minutes (every 15 minutes at peak). This would be orbital service linking suburbs to large shopping centres and industrial estates. Route W4 would link Blanchardstown Shopping Centre, Liffey Valley Shopping Centre, Ballyowen Road in Lucan, and Grange Castle Business Park, and extending to Tallaght via Kingswood Road (near Citywest) and Cheeverstown Road.

LUCAN CORRIDOR

The **C Spine** is the main service from the city centre to Lucan and all points west. It includes:

- **All C spine buses (C1, C2, C3, C4).** All-day service, every 8 minutes (every 5 minutes at peak) from Liffey Valley to City Centre. One of the primary improvements compared to the existing 25/66/67 services (from the perspective of passengers coming from farther west) would be that all routes would use the Chapelizod Bypass, saving time on the trip into City Centre. West of Liffey Valley, the service splits into separate routes:
 - » **Routes C1 and C2** continuing to Ballyowen, Griffeen Valley and Adamstown. All-day service, every 15 minutes (every 4 to 8 minutes at peak) until Griffeen Valley,

splitting there into two route every 30 minutes until Adamstown (each branch every 8 to 15 minutes at peak).

- » **Routes C3 and C4** continuing to Lucan Village, Leixlip, Maynooth and Celbridge. All-day service, every 15 minutes to Lucan Village.

This corridor would also include several peak express services:

- Route 321 from Adamstown to City Centre. Peak-only express service, similar to existing 25d.
- Route 322 from Adamstown to City Centre and UCD. Peak-only service, similar to existing 25x, but with service through Lucan Village before getting on the N4.
- Routes 323 and 324 from Leixlip to City Centre. Peak-only service, similar to existing 66x but with service through Lucan Village before getting on the N4.

Lucan would also be served by two local routes, replacing different parts of existing Route 238:

- **Route 251 from Adamstown to Liffey Valley Shopping Centre.** All-day service, every 60 minutes. Primarily connecting suburban residential areas to shopping.
- **Route 252 from Adamstown to Blanchardstown Shopping Centre.** All-day service, every 60 minutes. Also connecting suburban residential areas to shopping, and providing a low-frequency orbital connection to Blanchardstown.

PALMERSTOWN AND CHAPELIZOD

In the proposed network, Chapelizod Village would no longer be on the main radial paths to Dublin coming from Lucan Village, Maynooth and Celbridge. Instead, Chapelizod would be on:

- **Route 14 from Liffey Valley to Ballinteer.** All-day service, every 15 minutes (every 10 minutes at peak). Coming from Liffey Valley, this route would serve Kennelsfort Road, Palmerstown, Chapelizod and Islandbridge on its way to City Centre and points beyond.

BALLYFERMOT AND NEILSTOWN

The main radial service in this area would be:

- **All G Spine buses (G1, G2).** All-day service, every 8 minutes (every 6 minutes at peak) from Ballyfermot to Spencer Dock. West of Clifden Road, this service splits into separate routes:
 - » **Route G1 from Red Cow to City Centre.** All-day service, every 15 minutes (every 12 at peak). This is the path

of existing Route 79a, but extended past Park West into east Clondalkin and to the Red Cow Luas station.

- » **Route G2 from Liffey Valley to City Centre.** All-day service, every 15 minutes (every 12 at peak). This is the path of existing Route 40.

There would also be a secondary radial service:

- Route 95 from Cherry Orchard to City Centre. All-day service, every 60 minutes. This would be a lifeline route providing infrequent but direct service to stops and streets farther from main roads, in particular the middle of Cherry Orchard estate and Decies Road.

CLONDALKIN

Most radial service in Clondalkin would be on branches of the D spine, specifically:

- **Route D1 from Foxborough to City Centre.** All-day service, every 15 minutes. This path would serve Grange Castle Business Park and the New Nangor Road.
- **Route D3 from Nangor to City Centre.** All-day service, every 15 minutes. This branch would serve Lock View, Bawnogue, Clondalkin Village and Watery Lane before joining the New Nangor Road.

Other all-day routes proposed in Clondalkin would include:

- **Route 93 from Rathcoole to City Centre.** All-day service, every 60 minutes. This is essentially a replacement for existing Route 69.
- **Route 256 from Newcastle to Red Cow.** All day service, every 60 minutes. This would serve the Old Nangor Road in Clondalkin.

There would also be a peak express service:

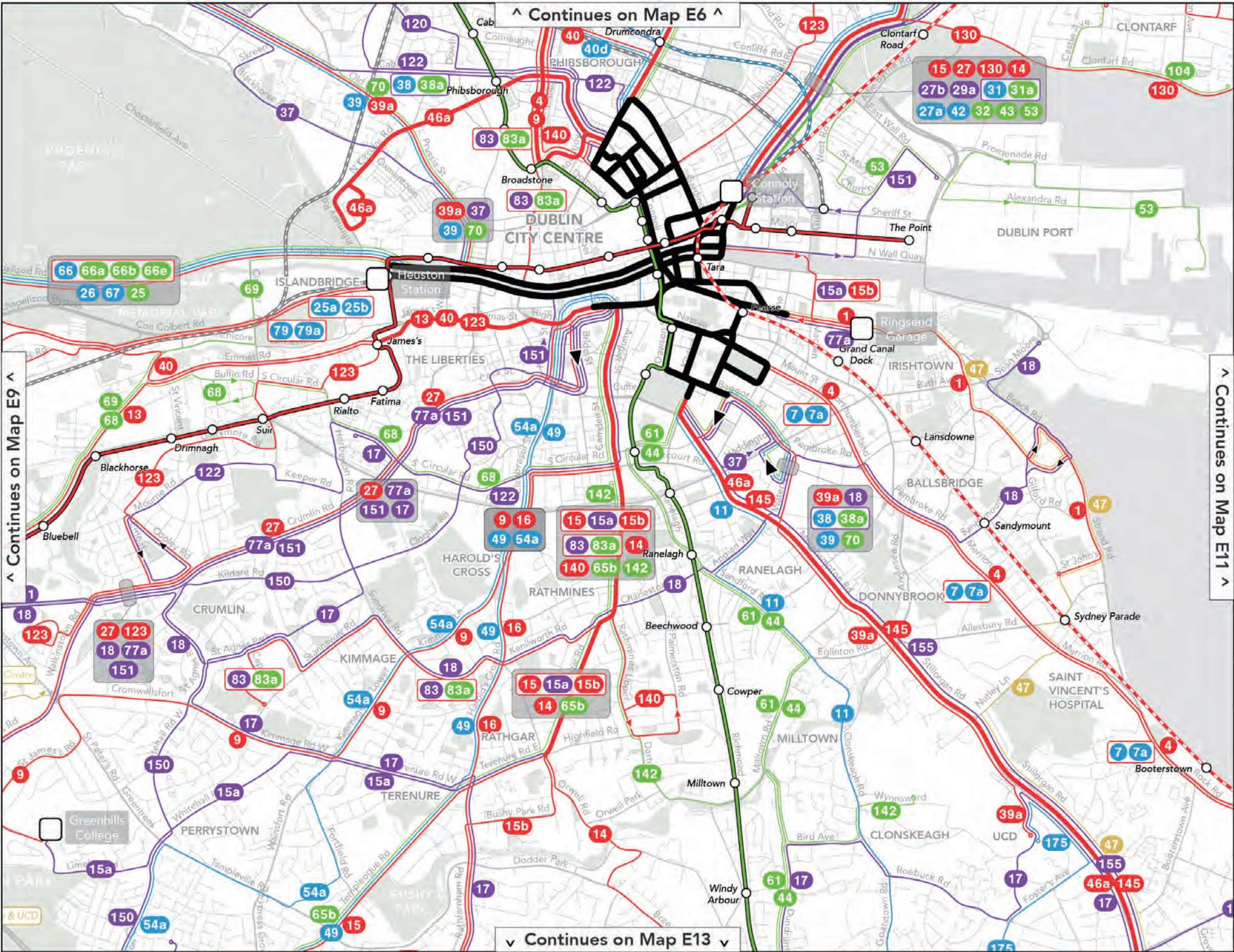
- **Route 355 from Clondalkin to City Centre.** Peak-only express service, similar to existing route 51x.

BALLYMOUNT

- **Route 20 from Tallaght to City Centre. All-day service, every 30 minutes.** This route would replace existing Route 56a at much higher frequency.

Existing Network: Inner South

Map E10



PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

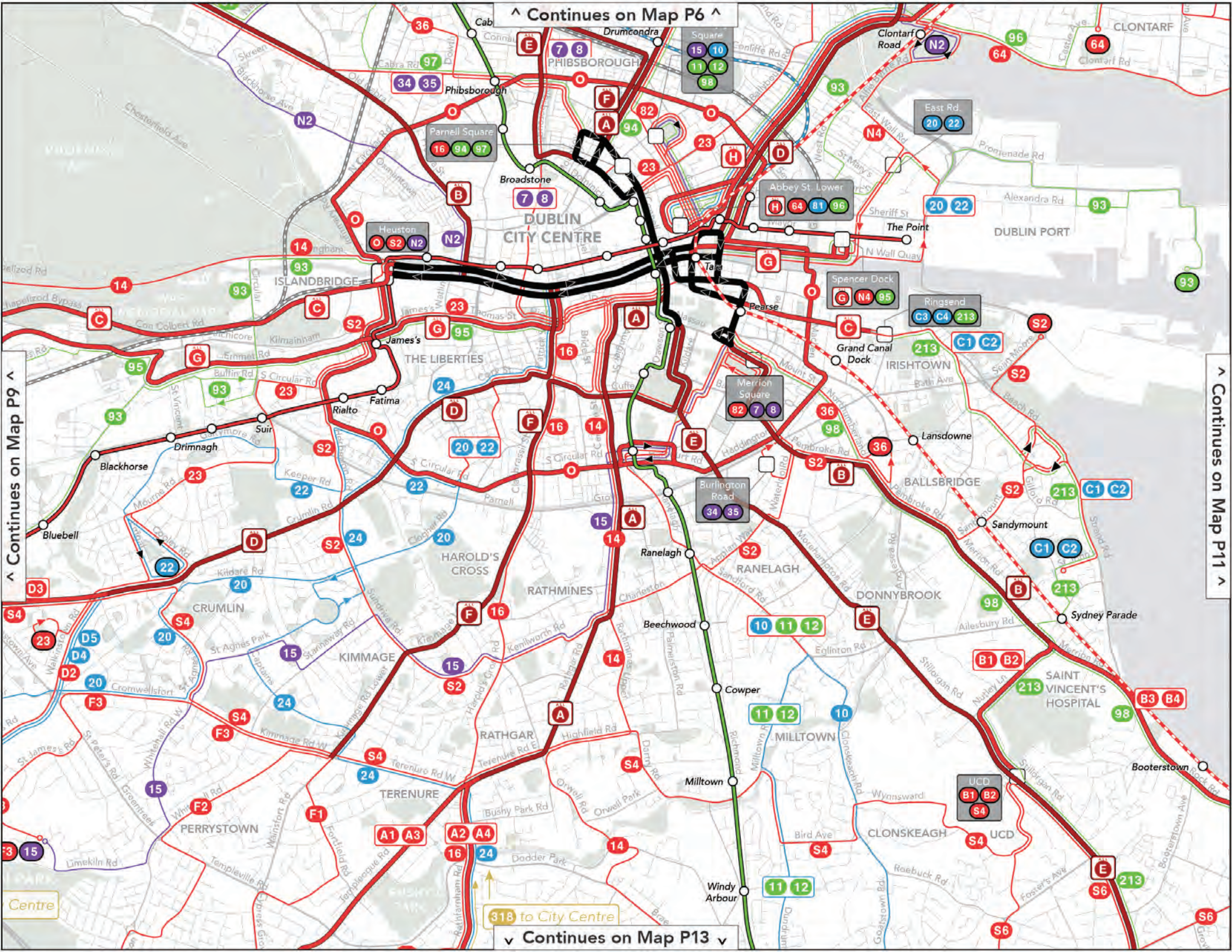
- Every 9 min or better
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

OTHER SERVICES

Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min

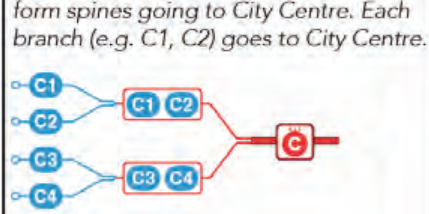




PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

- A Every 5 min or better
- B Every 6 to 7.5 min
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 280 Every 40 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

SPINES AND BRANCHES
All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES
Weekday midday frequencies

- Luas Every 15 min or better
- DART Every 10 min
- Every 20 min
- Commuter rail Every 30 min
- Worse than 30 min

Maps E10, P10: Inner South

Five spines would radiate from the centre into this area, as well as several numbered radials. Orbitals O, S2, and S4 would provide a vast improvement in east-west services. Here are some of the considerations in the design.

NEW ORBITALS

- **Route O - Inner Orbital.** All-day service, every 8 minutes. This route would run on the North and South circular roads, connecting many destinations at the edge of the centre (e.g. Grand Canal, Docklands, Heuston), and allowing many trips coming from south and north Dublin to bypass the core of the City Centre.
- **Route S2 from Heuston station to Poolbeg.** All-day service, every 15 minutes. This route would replace the western half of Route 18, at higher frequency and connecting to Heuston. It would serve Heuston station, St. James' Hospital, Rialto, Sundrive Road, Kimmage, Rathmines, Ranelagh, Ballsbridge and Sandymount, ending on Sean Moore Road.
- **Route S4 from Liffey Valley to UCD.** All-day service, every 10 minutes. This would be a new orbital extending west from UCD, to Milltown, Rathgar, Terenure and Crumlin. The large number of residential areas and villages, combined with major destinations at either end of the route, suggest that it would be useful for many trips that do not need to go through City Centre.

INCHICORE

The primary radial services in and near Inchicore would be:

- The Luas Red Line, continuing to operate as it does today.
- **All G spine buses (G1, G2).** All-day service, every 8 minutes (every 6 minutes at peak) from Ballyfermot to Spencer Dock.

Furthermore, two secondary radials would cross Inchicore as well:

- **Route 93 from Rathcoole to Dublin Port.** All-day service, every 60 minutes. Coming from the Naas Road, this route would follow Tyrconnell Road to Emmet Road, Bulfin Road/ Goldenbridge Ave as a one-way couplet, and continue to City Centre via Islandbridge.
- **Route 95 from Cherry Orchard to Spencer Dock.** All-day service, every 60 minutes. This route would follow the same path as Routes G1 and G2 in this area.

DRIMNAGH AND CRUMLIN

The primary radial services in Drimnagh and Crumlin would be:

- The Luas Red Line, continuing to operate as it does today.
- **All D spine buses (D1, D2, D3, D4, D5).** All-day service, every 4 minutes from Crumlin Hospital to City Centre and points beyond. South and west of Crumlin Hospital, the branches would separate, with:
 - » **Routes D1 and D3** continuing to Clondalkin via Long Mile Road, Kylemore Luas station and the New Nangor Road. All-day service, every 8 minutes until Watery Lane, splitting to every 15 minutes on each branch beyond that point.
 - » **Route D2, D4 and D5** continuing to Tallaght via Walkinstown Road and the Greenhills Road. All day service, every 8 minutes, splitting at Castletymon Road. D2 and D4 continue on a direct path to Tallaght Village and The Square, D5 takes a longer path through Tymon North and Seskin View.

In addition, Drimnagh would be served by two numbered radial routes:

- **Route 22 from Crumlin Hospital to East Wall.** All-day service, every 30 minutes, via Galtymore Road and Keeper Road.
- **Route 23 from Crumlin Hospital to Marino.** All-day service, every 15 minutes, via Mourne Road and St. James' Hospital.

Crumlin would be served by three numbered radial routes:

- **Route 15 from Greenhills College to Mountjoy Square.** All-day service, every 20 minutes. This route would start in Greenhills, serving Limekiln Road, Whitehall Road West, St. Agnes Road (Crumlin Village), St. Agnes Park, Stannaway Road, and Sundrive Road, heading to Rathmines, then continuing to City Centre. This route is intended to replace some of the functions of existing routes 15a, 18 and 83.
- **Route 20 from Tallaght to East Wall.** All-day service, every 30 minutes (every 15 minutes at peak from Walkinstown to City Centre). This route would arrive in Crumlin via Ballymount and Walkinstown. It would run on Cromwellsfort Rd, through Crumlin Village, then onto Kildare Road and Clogher Road to City Centre.
- **Route 24 from Dundrum to Fleet Street.** All-day service, every 30 minutes. This route would be arriving from

Whitechurch, Ballyboden and Rathfarnham. From Terenure, it would take Terenure Road West to Kimmage Road Lower, Captain's Way, St. Agnes Park and Clonmacnoise Road to Sundrive Road, then heading to City Centre via the Crumlin Road.

HAROLD'S CROSS, KIMMAGE, PERRYSTOWN, AND GREENHILLS

The primary radial services in these areas would be:

- **All F spine buses (F1, F2, F3).** All-day service, every 5 minutes from the Kimmage Crossroads to City Centre (via Harold's Cross) and points beyond. South and west of the Kimmage Crossroads, the branches would separate, with:
 - » **Routes F1** continuing to Greenhills College via Kimmage Road West, Cromwellsfort Road, St. Peter's Road and St. James' Road, similar to existing route 9. All day-service, every 15 minutes.
 - » **Route F2** continuing to Perrystown and Templeogue via Whitehall Road, Templeville Road and Glendown Avenue. All-day service, every 15 minutes.
 - » **Route F3** continuing to Templeogue, Firhouse and Tallaght via Fortfield Rd, Fortfield Park, Templeville Road, Cypress Grove Road and Old Bridge Road. All-day service, every 15 minutes.

In addition, these areas would be served by:

- **Route 15 from Greenhills College to Mountjoy Square,** as previously described (see Drimnagh and Crumlin).
- **Route 16 from Tallaght to Parnell Square.** All-day service, every 15 minutes (every 10 minutes at peak). Coming from Rathfarnham, this route would serve Harold's Cross Road, Clanbrassil Street and Patrick Street (two-way) coming into City Centre. It would replicate portions of existing routes 15b and 16.
- **Route 24 from Dundrum to City Centre,** as previously described (see Drimnagh and Crumlin).

RATHMINES, RATHGAR, TERENURE, DARTRY

Rathmines, Rathgar and Terenure would be primarily served by:

- **All A spine buses (A1, A2, A3, A4).** All-day service, every 3 minutes from Terenure to City Centre and points beyond. South of Terenure, the branches would separate, with:
 - » **Routes A1 and A3** continuing to Templeogue via Templeogue Road. All-day service, every 6 minutes,

splitting at Templeogue into service every 12 minutes to Tallaght (A1) and Knocklyon (A3).

- » **Routes A2 and A4** continuing to Rathfarnham via Rathfarnham Road. All-day service, every 6 minutes, splitting south of Rathfarnham Village into service every 12 minutes to Ballinteer (A2) and Nutgrove (A4).

These areas would also be served by **Route 15, Route 16** and **Route 24**, as previously described (see above).

Dartry would be served by:

- **Route 14 from Ballinteer to Liffey Valley.** All-day service, every 15 minutes (every 10 minutes at peak). Coming from Nutgrove, this route would serve Braemor Road, Orwell Road, Highfield Road and Rathmines Road Upper, continuing to City Centre on Rathmines Road.

RANELAGH, MILLTOWN, CLONSKEAGH

Radial service in these areas would follow similar paths to existing service, with:

- **Route 10 from Ticknock to Mountjoy Square.** All-day service, every 30 minutes. Coming from Sandyford, this route would serve Goatstown, Clonskeagh and Ranelagh.
- **Routes 11 and 12 from Belarmine to Mountjoy Square.** All-day service, two routes combining for service every 30 minutes. Coming from Dundrum these routes would serve Milltown and Ranelagh.

From Milltown Park, all three routes would combine for service every 15 minutes to City Centre.

STILLORGAN ROAD CORRIDOR AND UCD

The N11/Stillorgan Road corridor would primarily be served by:

- **All E spine buses (E1, E2).** All-day service, every 5 minutes from Foxrock Church to City Centre and points beyond.
 - » At peak hours, and extra **E9** service would add 6 trips per hour between Brides Glen Luas and UCD, to relieve loads on buses headed to City Centre.

At the same time, the largest destination in this corridor is UCD, which would also be served by:

- **Routes B1 and B2** to City Centre and points beyond via Merrion Road. All-day service, every 8 minutes.
- **Route 213 from Kilternan to Ringsend.** All-day service,

every 40 minutes (every 20 minutes when combined with Route 313 at peak, from UCD to Kilternan).

In addition to being a prime destination on orbital Routes S4 and S6 (see New Orbitals), UCD would also continue to be a major focal point for peak express routes from many directions. See maps from the origin areas of these routes for further descriptions.

MERRION ROAD CORRIDOR

The Pembroke Road/Merrion Road/Rock Road corridor would be primarily served by

- DART train service, operating every 10 minutes.
- **All B spine buses (B1, B2, B3, B4).** All-day service, every 4 minutes from St. Vincent's Hospital to City Centre and points beyond. South of St. Vincent's, the branches would separate, with:
 - » **Routes B1 and B2** continuing to UCD via Nutley Lane and Stillorgan Road. All-day service, every 8 minutes.
 - » **Routes B3 and B4** continuing to Blackrock. All-day service, every 8 minutes, splitting south of Blackrock into service every 15 minutes to Dun Laoghaire (B3) and Sallynoggin (B4).

A secondary radial service in this area would be:

- **Route 98 from Loughlinstown Park to Mountjoy Square.** All-day service, every 60 minutes. This is a lifeline radial service targeted at serving more isolated areas further south.

IRISHTOWN AND SANDYMOUNT

Irishtown and Sandymount would be served by:

- **Routes C1 and C2.** All-day service, every 15 minutes to City Centre and points beyond on the same path served by existing Route 1.
- **Route 213 from Kilternan to Ringsend.** All-day service, every 40 minutes. This route would provide an infrequent but direct connection to St. Vincent's Hospital and UCD, similar to existing Route 47, but coming nearly twice as often. Unlike Route 47, it would not continue into City Centre.

Existing Network: Newcastle and Rathcoole

Map E11



PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

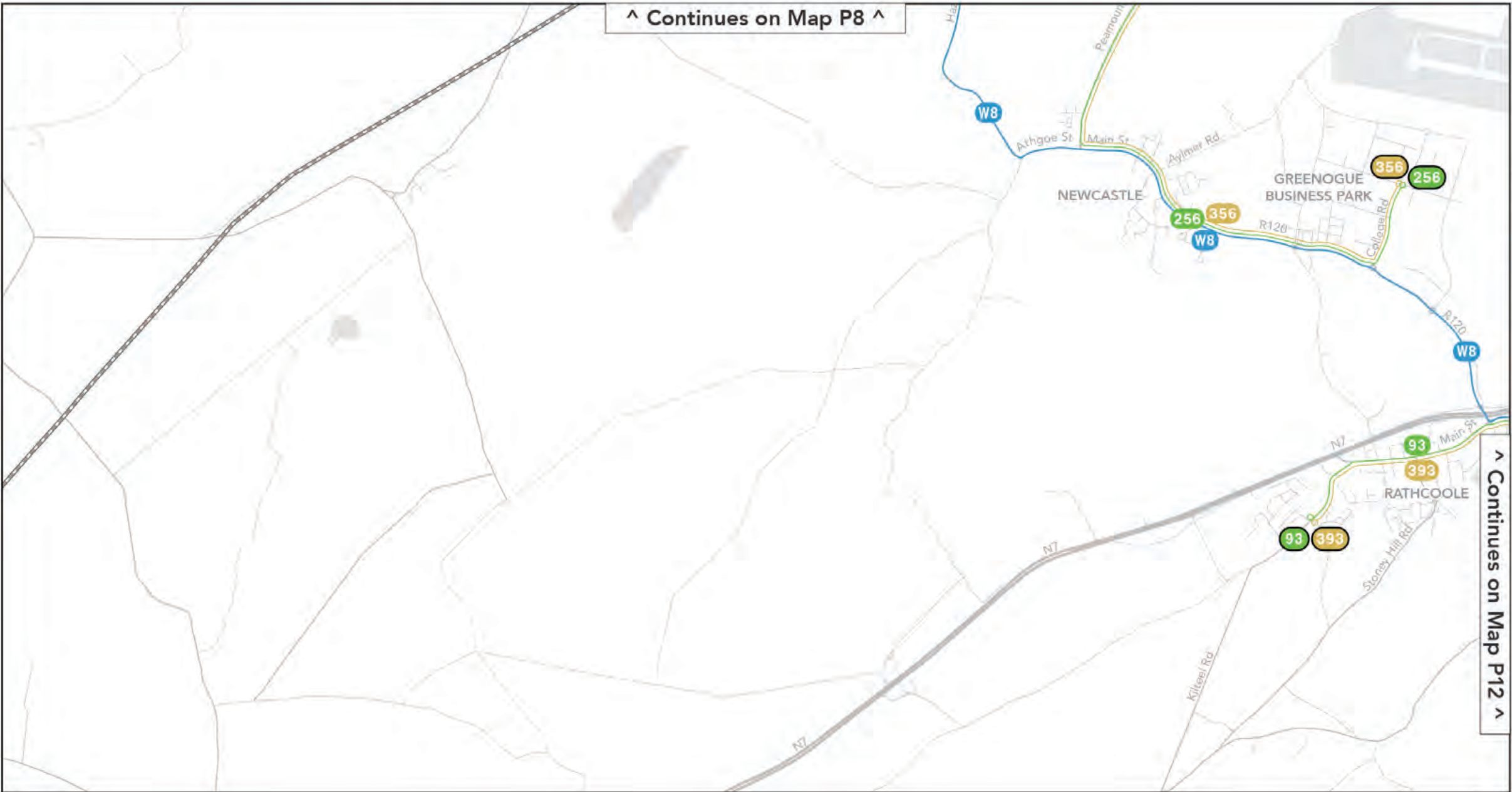
- Every 9 min or better
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

OTHER SERVICES

Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min

0 1 km N

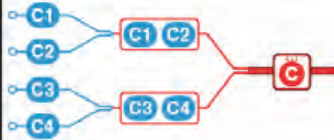


PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

- Every 5 min or better
- Every 6 to 7.5 min
- Every 10 - 15 min
- Every 20 - 25 min
- Every 30 min
- Every 40 min
- Every 60 min
- Limited or peak-only
- Combines for better frequency
- Multiple lines & frequencies
- End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES
Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min



Maps E11, P11: Newcastle and Rathcoole

RATHCOOLE

Rathcoole would be served by both a peak and all-day radial route, similar to existing Routes 69 and 69x:

- **Route 93 from Rathcoole to Dublin Port.** All-day service, every 60 minutes. This route would start at the existing 69 terminus in Rathcoole, and head from there to Saggart, Citywest and Clondalkin on the way to City Centre.
- **Route 393 from Rathcoole to City Centre.** Peak-only express service, similar to Route 69x, but with a second trip added in the morning in response to observed loads.

The eastern half of Rathcoole would also be near the orbital **Route W8**, described below.

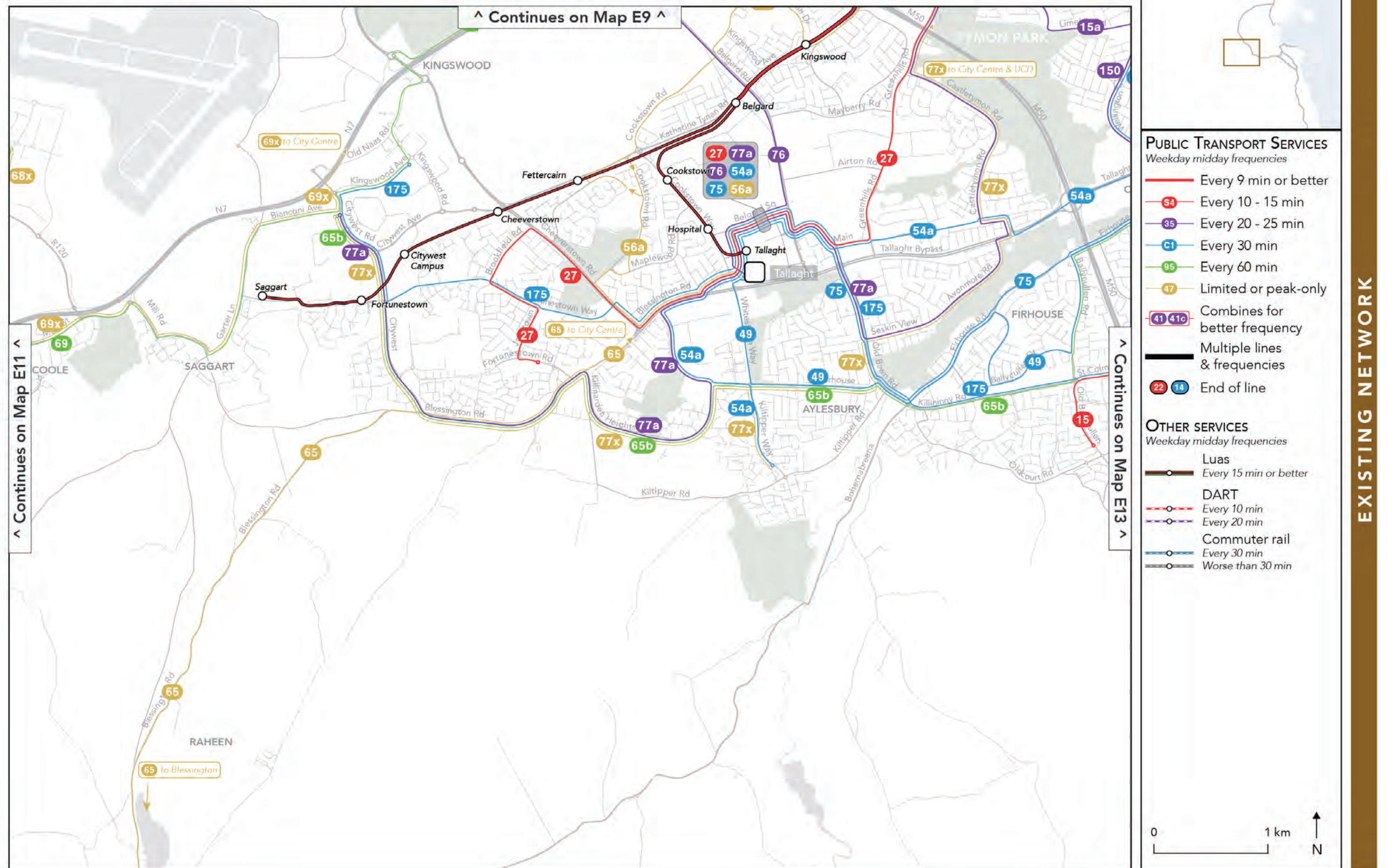
NEWCASTLE AND GREENOGUE

Newcastle would be served by two all-day routes and one peak-only express:

- **Route W8 from Maynooth to Tallaght.** All-day service, every 30 minutes. This route would provide a new regular link to Maynooth, Celbridge and Hazelhatch Station to the north, and to Saggart, Citywest and Tallaght to the south.
- **Route 256 from Greenogue Business Park to Red Cow.** All-day service, every 60 minutes. This route would replace existing Route 68, but would terminate at Red Cow instead of City Centre.
- **Route 356 from Greenogue Business Park to City Centre.** Peak-only express service, similar to existing Route 68x, but with a new evening return trip added.

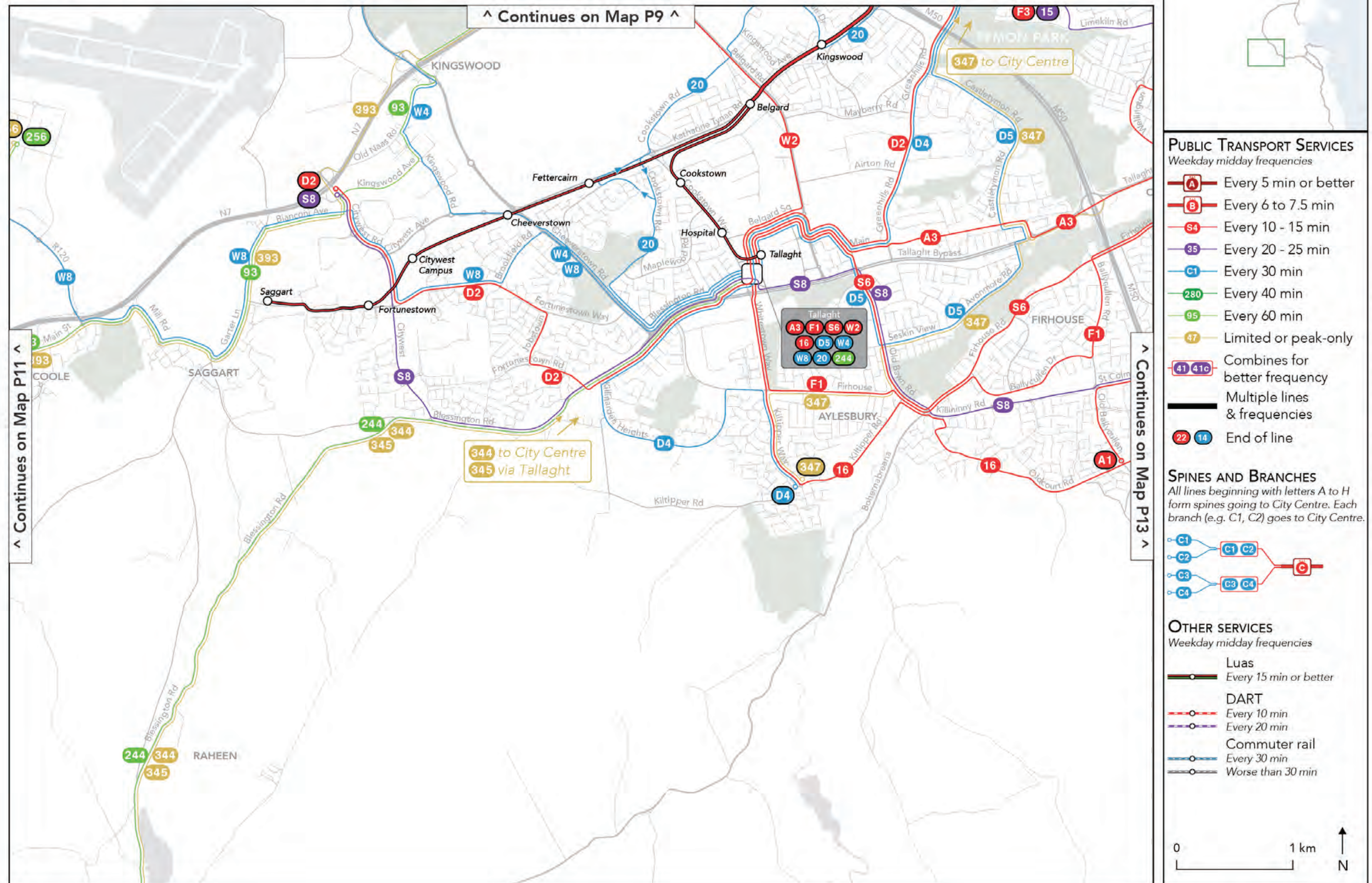
Existing Network: Tallaght and Environs

Map E12



Revised Proposed Network: Tallaght and Environs

Map P12



Maps E12, P12: Tallaght and Environs

Tallaght is a strong centre with intense demand. It is also the logical hub for numerous routes, because of its position in the southwest corner of the city where many routes logically end.

The revised network proposal seeks to take advantage of the possibility of connections in central Tallaght, while also providing as many direct trips as possible.

EAST OF THE SQUARE - SAGGART, CITYWEST, JOBSTOWN, COOKSTOWN

The radial services in this area would be:

- The Luas Red Line, Saggart branch, which would continue to operate as it does today.
- **Route D2 from Citywest to Clare Hall.** All-day service, every 15 minutes. From Citywest Business Park, this route would serve Citywest Road, turning onto Citywest Drive to Fortunestown Lane, Fortunestown Way, then Jobstown Road and Fortunestown Road, then continuing to The Square and City Centre via the Blessington Road. This is in some respects similar to Route 27, but the routing has been modified to prioritize the highest boarding points in Jobstown and extend frequent bus service into Citywest.
- **Route 20 from Tallaght to City Centre.** All-day service, every 30 minutes. This route is similar to existing Route 56a, but at much higher frequency, providing service to Cookstown Road and Kingswood, going to Ballymount Industrial Estate and City Centre.
- **Route 93 from Rathcoole to City Centre.** All-day service, every 60 minutes. This would be an infrequent all-day service to City Centre from Rathcoole and Saggart, similar to existing Route 69.

This area would be served by three orbital routes:

- **Route S8 from Citywest to Dun Laoghaire.** All-day service, every 20 minutes (every 15 minutes at peak). From Citywest Business Park, this route would operate on Citywest Road to Blessington Road until The Square. Past The Square it would take Old Bawn Road on the way to Knocklyon, Ballyboden, Ballinteer, Sandyford Business Park and Dun Laoghaire.
- **Route W4 from Blanchardstown to Tallaght.** All-day service, every 30 minutes (every 15 minutes at peak). This would be a new orbital route linking employment and shopping areas in west and southwest Dublin, including Citywest (via Kingswood Road), Grange Castle Business Park, Liffey Valley Shopping Centre and Blanchardstown Shopping Centre.

- **Route W8 from Maynooth to Tallaght.** All-day service, every 30 minutes. This would be a new orbital route with service to Celbridge and Maynooth.

There would also be a peak-only route in part of this area:

- **Route 393 from Rathcoole to City Centre.** Peak-only, express service similar to existing Route 69x but with an added morning trip due to observed loads.

WEST AND NORTH OF THE SQUARE - KINGSWOOD, TYMON NORTH, TALLAGHT VILLAGE, INDUSTRIAL ESTATES

The primary radial services in this area would be:

- The Luas Red Line, Saggart and Tallaght branches, which would continue to operate as it does today.
- **Route A3 from Tallaght to Santry.** All-day service, every 12 minutes. This would be a new, more frequent and more direct alternative to Route 54a. From The Square, it would traverse Tallaght Village and then past Balrothery on Main Road, continuing into City Centre via the Templeogue Road, Rathgar and Rathmines.
- **Routes D2 and D4.** All-day service, every 15 minutes (D2) and every 30 minutes (D4) to City Centre and points beyond, following the same routing as existing Route 27 via Tallaght Village and the Greenhills Road.
- **Route D5 from Tallaght to Edenmore.** All-day service, every 30 minutes. This route would start at The Square and serve Old Bawn Road, Seskin View, Avonmore Road and Castletymon Road, before taking the Greenhills Road to City Centre, similar to part of existing Route 77a.
- **Route 20 from Tallaght to City Centre,** as previously described (see East of The Square).

There would be one orbital heading north from The Square:

- **Route W2 from Tallaght to Liffey Valley.** All-day service, every 15 minutes. This would be orbital service to Clondalkin and Liffey Valley Shopping Centre, similar to existing Route 76 but at higher frequency.

There would also be a peak-only route in part of this area:

- **Route 347 from Kiltipper Way to City Centre.** Peak-only, express service similar to part of existing Route 77x but starting in Kiltipper rather than Citywest, with an added evening outbound trip.

SOUTH OF THE SQUARE - KILLINARDEN, AYLESBURY, OLD BAWN

The primary radial services in this area would be:

- **Route F1 from Tallaght to Charlestown.** All-day service, every 15 minutes. Starting at The Square, this route would take Whitestown Way and Firhouse Road West on the way to Firhouse, Templeogue, Kimmage and City Centre.
- **Route 16 from Tallaght to City Centre.** All-day service every 15 minutes (every 10 minutes at peak). Starting at The Square, this route would take Whitestown Way, Kiltipper Way, Kiltipper Road to Old Bawn Cross. From there it would head to Oldcourt Road and Stocking Avenue to Ballyboden, Rathfarnham, Terenure, Harold's Cross and City Centre.
- **Route D4 from Tallaght to Kilmore.** All-day service, every 30 minutes. Starting on Kiltipper Way, this route would follow Killinarden Link Road to Killinarden Heights, then to Blessington Road on its way to The Square and City Centre.
- **Route D5 from Tallaght to Edenmore.** All-day service, every 30 minutes, as previously described.

This area would also be served by two orbital routes and one peak-only route:

- **Route S6 from Tallaght to Blackrock.** All-day service, every 15 minutes. This new frequent orbital would replace Route 75 at higher frequency and with more direct routing to Rathfarnham, Dundrum and points beyond.
- **Route S8 from Citywest to Dun Laoghaire.** All-day, every 20 minutes (every 15 at peak), as previously described.
- **Route 347 from Kiltipper Way to City Centre,** as previously described (see West and North of The Square).

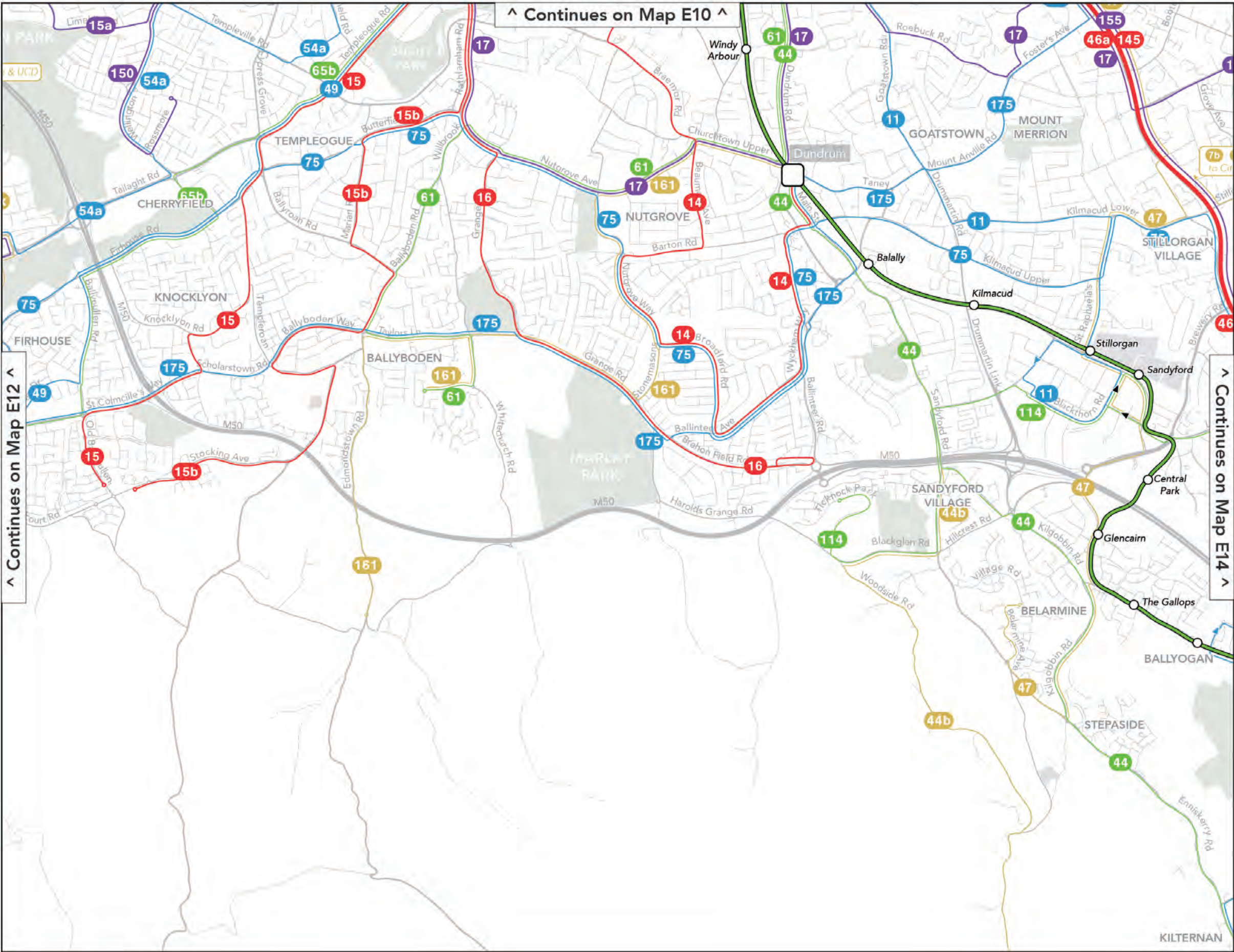
FAR SOUTH - BLESSINGTON, BALLYMORE EUSTACE AND BALLYKNOCKAN

These would be served by an all-day local and two peak routes:

- **Route 244 from Ballymore Eustace to Tallaght.** All-day service, every 60 minutes. This would be the primary replacement to existing Route 65. It would come twice as often, but it would end in Tallaght rather than continue to City Centre. Also, all buses would serve Ballymore Eustace.
- **Routes 344 and 345 from Ballymore and Ballyknockan to City Centre.** Peak-only, express service to City Centre. Each route represents one morning trip and one evening trip (i.e. from Blessington there would be 2 trips in the morning and 2 in the evening). Service to City Centre would involve fewer stops than on existing Route 65.

Existing Network: Outer South

Map E13



PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

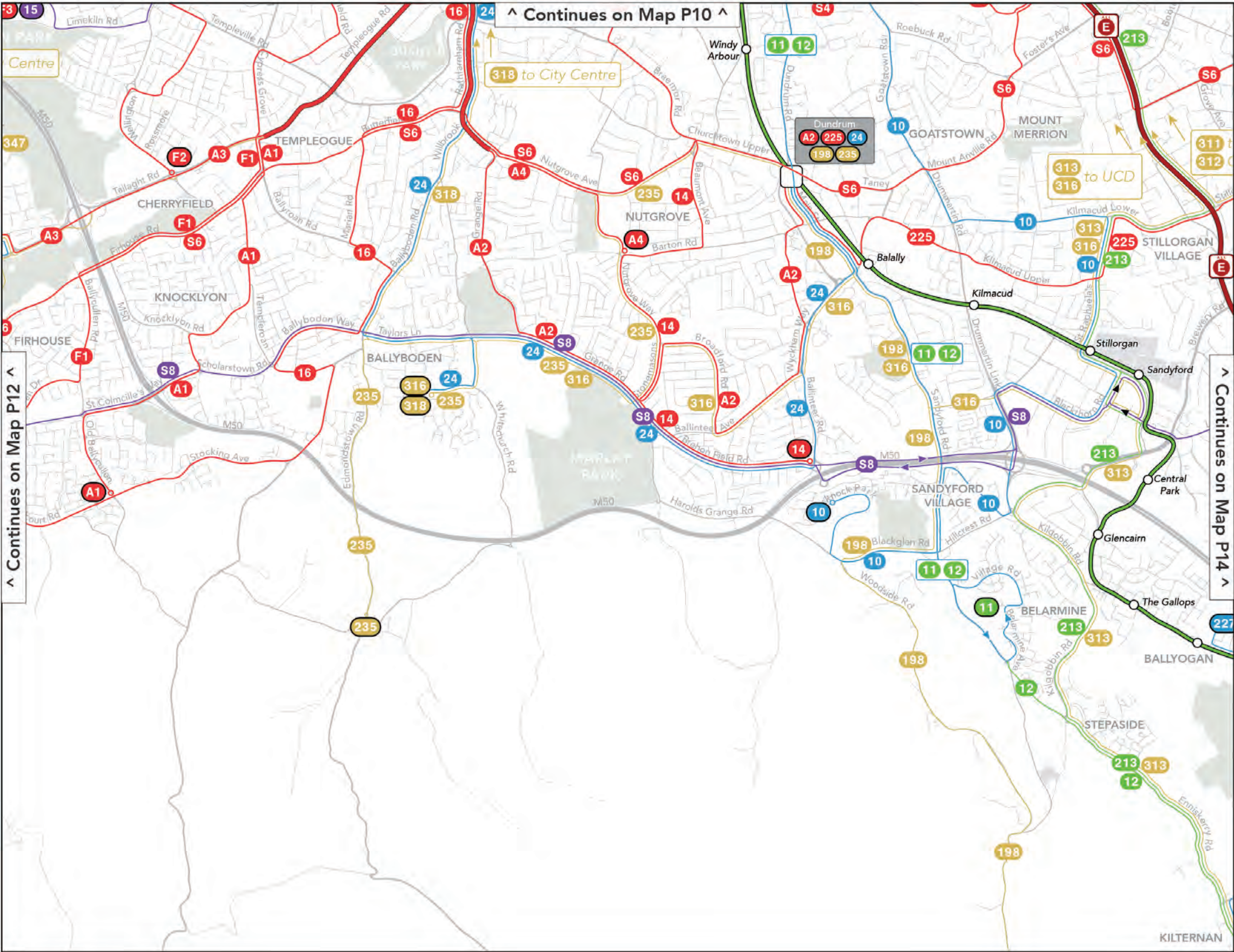
- Every 9 min or better
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

OTHER SERVICES
Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min

Revised Proposed Network: Outer South

Map P13



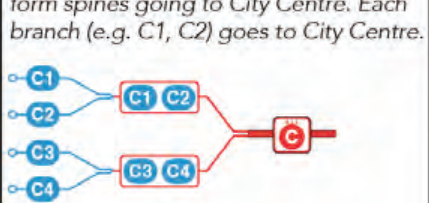
PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES

Weekday midday frequencies

- Luas**
 - Every 15 min or better
- DART**
 - Every 10 min
 - Every 20 min
- Commuter rail**
 - Every 30 min
 - Worse than 30 min



Maps E13, P13: Outer South

NEW ORBITALS

This area's transport options are transformed by the new orbitals:

- **Route S6 from Tallaght to Blackrock.** All-day service, every 15 minutes. This route would replace parts of existing Routes 17, 75 and 175 with higher frequencies and more direct routes, connecting Tallaght, Rathfarnham, Nutgrove, Dundrum, UCD and Blackrock.
- **Route S8 from Citywest to Dun Laoghaire.** All-day service, every 20 minutes (every 15 minutes at peak). This route is in parts a more frequent replacement for existing Route 175, and in others an entirely new orbital service. It would connect Citywest, Tallaght, Knocklyon, Ballyboden, Ballinteer, Sandyford Business Park, Leopardstown, Galloping Green, Monkstown and Dun Laoghaire.

TEMPLEOGUE, FIRHOUSE AND KNOCKLYON

In addition to the orbitals described above, several radial services would be available in these areas:

- **Routes A1 and A3.** All-day service, every 6 minutes from Templeogue to City Centre. South of Templeogue, these split into:
 - » **Route A1 from Knocklyon to Beaumont Hospital.** All-day service, every 12 minutes. This route essentially replaces existing Route 15 on the south side of Dublin.
 - » **Route A3 from Tallaght to Santry.** All-day service, every 12 minutes. Coming from Tallaght, this route takes the Tallaght Road to the Templeogue Road, joining Route A1 at the junction of Old Bridge Road and Templeogue Road.
- **Route F1 from Tallaght to Charlestown.** All-day service, every 15 minutes. Coming from Tallaght, this route serves Firhouse on Ballycullen Drive and Ballycullen Road, then continuing north on the Firhouse Road to Old Bridge Road, Templeville Road, Fortfield Road and to City Centre via Kimmage Road Lower.
- **Route 16 from Tallaght to City Centre.** All-day service, every 15 minutes (every 10 minutes at peak). In this area, the new Route 16 would replace the existing 15b, but at higher frequency and with outbound service continuing to Tallaght. Going to City Centre, this route would use Harold's Cross Road instead of the Rathgar-Rathmines corridor.

RATHFARNHAM AND BALLYBODEN

Radial services available to these areas would include:

- **Routes A2 and A4.** All-day service, every 6 minutes from Rathfarnham Village to City Centre. South of Rathfarnham Village, these split into:
 - » **Route A2 from Dundrum to Dublin Airport.** All-day service, every 12 minutes. This route takes the place of parts of Routes 14 and 16 in this area. Service would start in Dundrum, would go through much of Ballinteer similar to existing Route 14, but would take Stonemasons Way (instead of Nutgrove Way) to Grange Road and Rathfarnham, and then head to City Centre via the Rathgar-Rathmines corridor.
 - » **Route A4 from Nutgrove to Swords.** All-day service, every 12 minutes. This would be a new radial route from Nutgrove Shopping Centre. It would run on Nutgrove Way and Nutgrove Ave to Rathfarnham Village, and then to City Centre via the Rathgar-Rathmines corridor.
- **Route 24 from Dundrum to City Centre.** All-day service, every 30 minutes. The purpose of this route is largely to prevent the isolation of Ballyboden Road and Whitechurch, providing service every 30 minutes to both the major local centre (Dundrum) and to City Centre in the other direction.

Ballyboden and Whitechurch would also be served by some much less frequent and peak-only routes:

- **Route 235 from Edmondstown to Dundrum.** Every 2 hours in the day on weekdays. This is a continuation of existing Route 161, providing shopping access to Nutgrove and Dundrum from outer suburban and semi-rural areas.
- **Route 316 from Whitechurch to UCD.** Peak-only service, similar to existing Route 116.
- **Route 318 from Whitechurch to UCD.** Peak-only service, similar to existing Route 15d, with an additional morning trip.

NUTGROVE AND BALLINTEER

Radial services available in these areas include:

- The Luas Green Line, operating as it does today.
- **Routes A2 and A4,** as described previously (see Rathfarnham and Ballyboden).
- **Route 14 from Ballinteer to Liffey Valley.** All-day service, every 15 minutes (every 10 minutes at peak). Starting on

Brehon Field Road, would take Stonemasons Way, Nutgrove Way, Barton Road, Beaumont Avenue and Braemor Road, continuing to Rathgar, Dartry, Rathmines, City Centre and points beyond.

- **Route 24 from Dundrum to City Centre.** All-day service, every 30 minutes, as previously described.

GOATSTOWN, MOUNT MERRION AND STILLORGAN

Radial services available in these areas include:

- The Luas Green Line, operating as it does today.
- **Route 10 from Ticknock to City Centre.** All-day service, every 30 minutes. Coming from Ticknock and Sandyford Village, this route would serve Sandyford Business Park, St. Raphaela's Road, Kilmacud Road Lower, the Drummartin Road and Goatstown Road on its way to City Centre.
- **Routes 11 and 12 from Enniskerry (12) and Belarmine (11) to City Centre.** All-day service, 60-minute frequency south of Belarmine, 30-minute frequency starting at Belarmine to Dundrum and City Centre.

Orbital Route S6 would be important in this area, as would be:

- **Route 225 from Dundrum to Dun Laoghaire.** All-day service, every 15 minutes. This would be a mini-orbital, connecting Dundrum, Balally, Kilmacud Road Upper, Stillorgan, Fleurville Road, Monkstown Avenue and Dun Laoghaire.

SANDYFORD, BELARMIN, STEPASIDE, KILTERNAN, GLENCULLEN

Radial services available in these areas include:

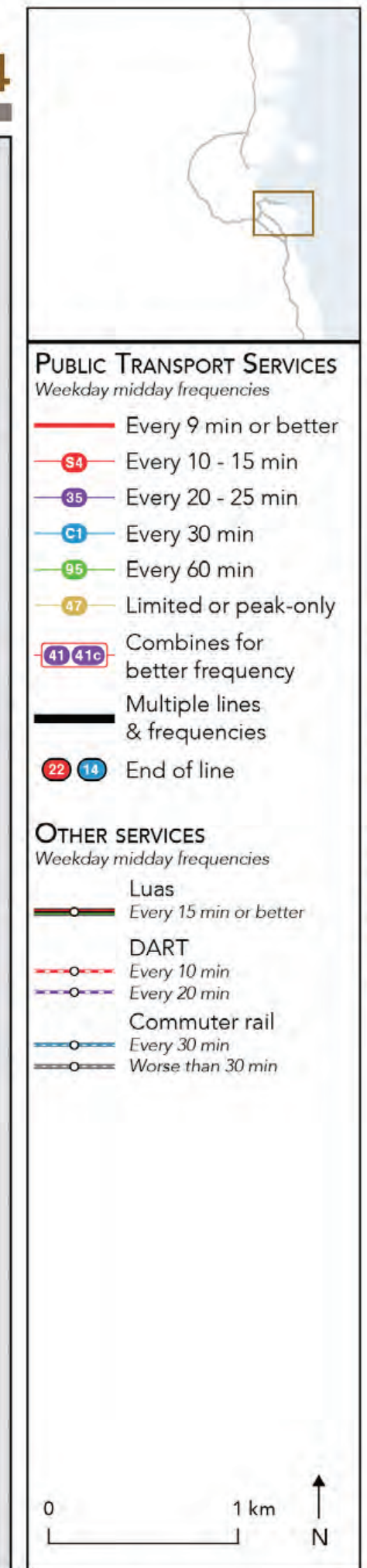
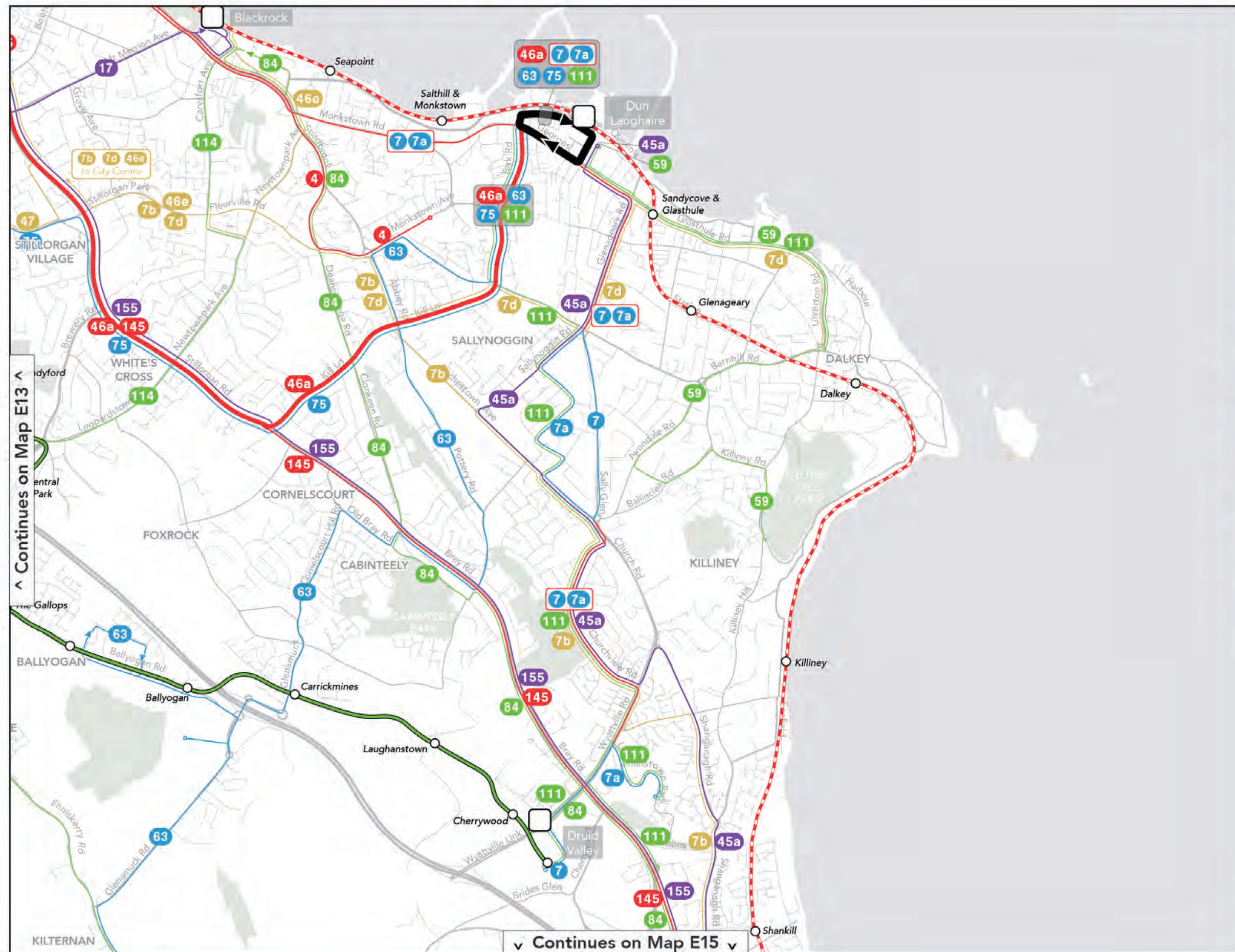
- The Luas Green Line, which would continue to operate as it does today.
- **Route 10 from Ticknock to City Centre.** All-day service, every 30 minutes, as previously described.
- **Routes 11 and 12 from Enniskerry and Belarmine to City Centre.** All-day service, as previously described.

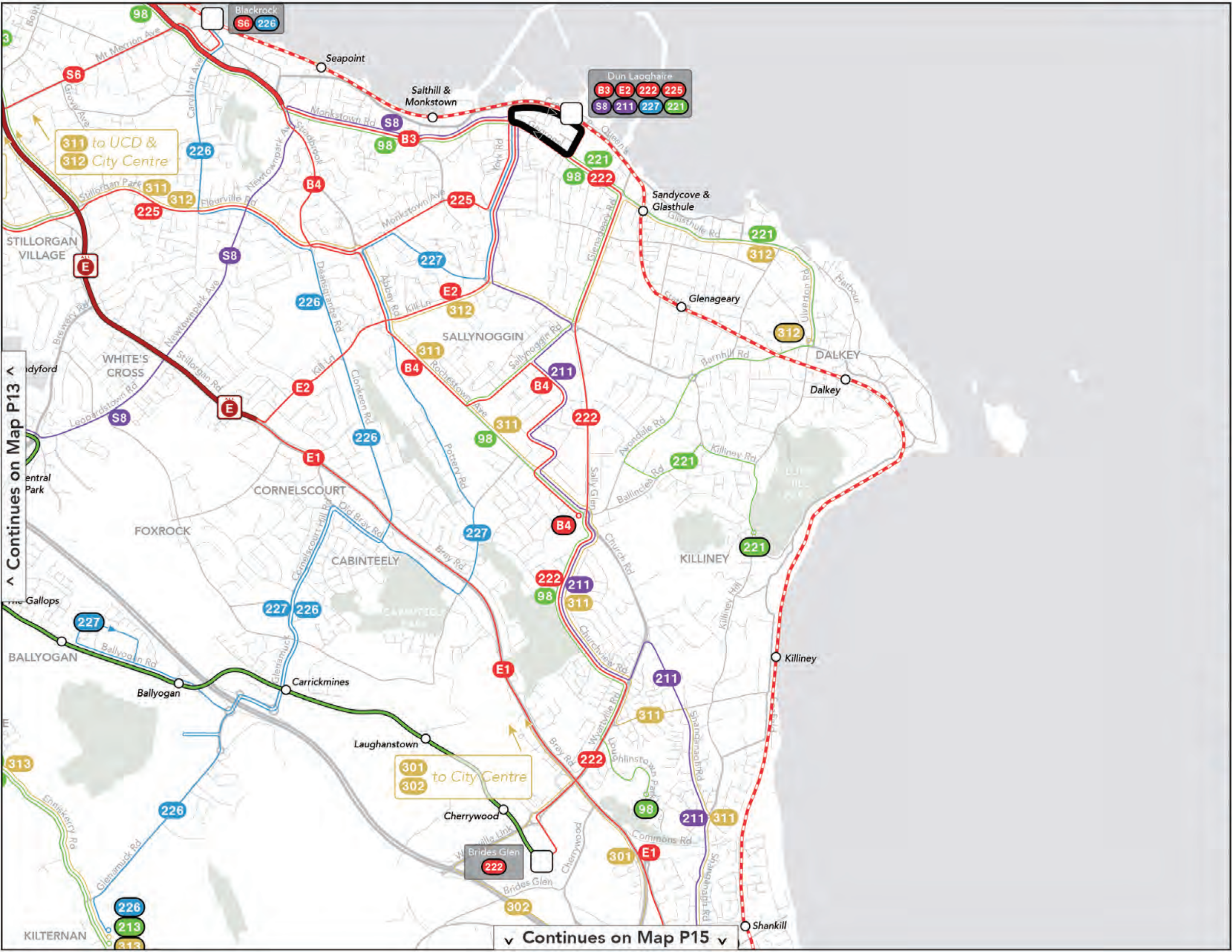
Local routes include:

- **Route 198 from Glencullen to Dundrum.** Mostly peak service, replacing existing Route 44b.
- **Route 213 from Kilternan to Ringsend.** All-day service, every 40 minutes (with **Route 313**, every 20 minutes at peak between Kilternan and UCD). This would replace existing Routes 47 and 118 to UCD and St. Vincent's Hospital.

Existing Network: Dun Laoghaire and Environs

Map E14



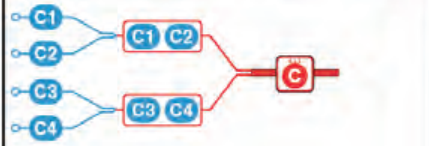


PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

- A** Every 5 min or better
- B** Every 6 to 7.5 min
- S4** Every 10 - 15 min
- 35** Every 20 - 25 min
- C1** Every 30 min
- 280** Every 40 min
- 95** Every 60 min
- 47** Limited or peak-only
- 41 41c** Combines for better frequency
- Multiple lines & frequencies**
- 22 14** End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES
Weekday midday frequencies

- Luas**
Every 15 min or better
- DART**
Every 10 min
Every 20 min
- Commuter rail**
Every 30 min
Worse than 30 min



Maps E14,P14: Dun Laoghaire and Environs

The public transport network in this area needs to serve multiple competing objectives: service to City Centre, but also the pull of strong local centres at Blackrock and (especially) Dun Laoghaire.

The DART train service would continue to operate at the centre of this area through Dun Laoghaire, and the Luas Green Line would continue to operate at its edges.

N11 CORRIDOR

Other than DART, the primary radial corridor in this area remains the N11/Stillorgan road, which would be served by:

- **All E spine buses (E1, E2).** All-day service, every 5 minutes from Foxrock Church to City Centre and points beyond. Beyond Foxrock Church, these would split into:
 - » **Route E1**, continuing to Bray Daly station via the N11. All-day service every 10 minutes, similar to existing Route 145 but with termination in Bray town rather than Ballywaltrim.
 - » **Route E2**, continuing to Dun Laoghaire via Kill Lane and York Road, similar to existing Route 46a. All-day service every 10 minutes.
 - » At peak hours, and extra **E9** service would add 6 trips per hour between Brides Glen Luas and UCD, to relieve loads on buses headed to City Centre.

Several peak-only routes would also feed into the N11, including:

- **Routes 301 and 302.** Peak-only, express service replacing existing Route 84x from northern Wicklow.
- **Route 311 from Shankill to City Centre.** Peak-only service replacing existing Route 7b.
- **Route 312 from Dalkey to City Centre.** Peak-only service replacing existing Route 7d.

ROUTES TO/FROM BLACKROCK

Blackrock's primary radial service would come from DART and:

- **Routes B3 and B4.** All-day service, every 8 minutes. South of Blackrock, these would split into:
 - » **Route B3**, continuing to Dun Laoghaire via Monkstown Road. All-day service, every 15 minutes.
 - » **Route B4**, which would extend down Stradbroke Road like existing Route 4, and then continue to Sallynoggin

via Abbey Road and Rochestown Ave. All-day service, every 15 minutes.

Furthermore, the following routes would start in Blackrock:

- **Route S6 from Blackrock to Tallaght.** All-day service, every 15 minutes. This new route would replace parts of existing Routes 17, 75 and 175 with higher frequencies and more direct routes, connecting Tallaght, Rathfarnham, Nutgrove, Dundrum, UCD and Blackrock.
- **Route 226 from Blackrock to Kilternan.** All-day service, every 30 minutes. This is a new local route replacing the Kilternan branch of existing Route 63 and parts of Route 84. From Blackrock, it would run on Carysfort Avenue, Fleurville Road, Deansgrange Road, Clonkeen Road, Cornellscourt Road and Glenamuck Road past Carrickmines to Kilternan.

ROUTES TO/FROM DUN LAOGHAIRE

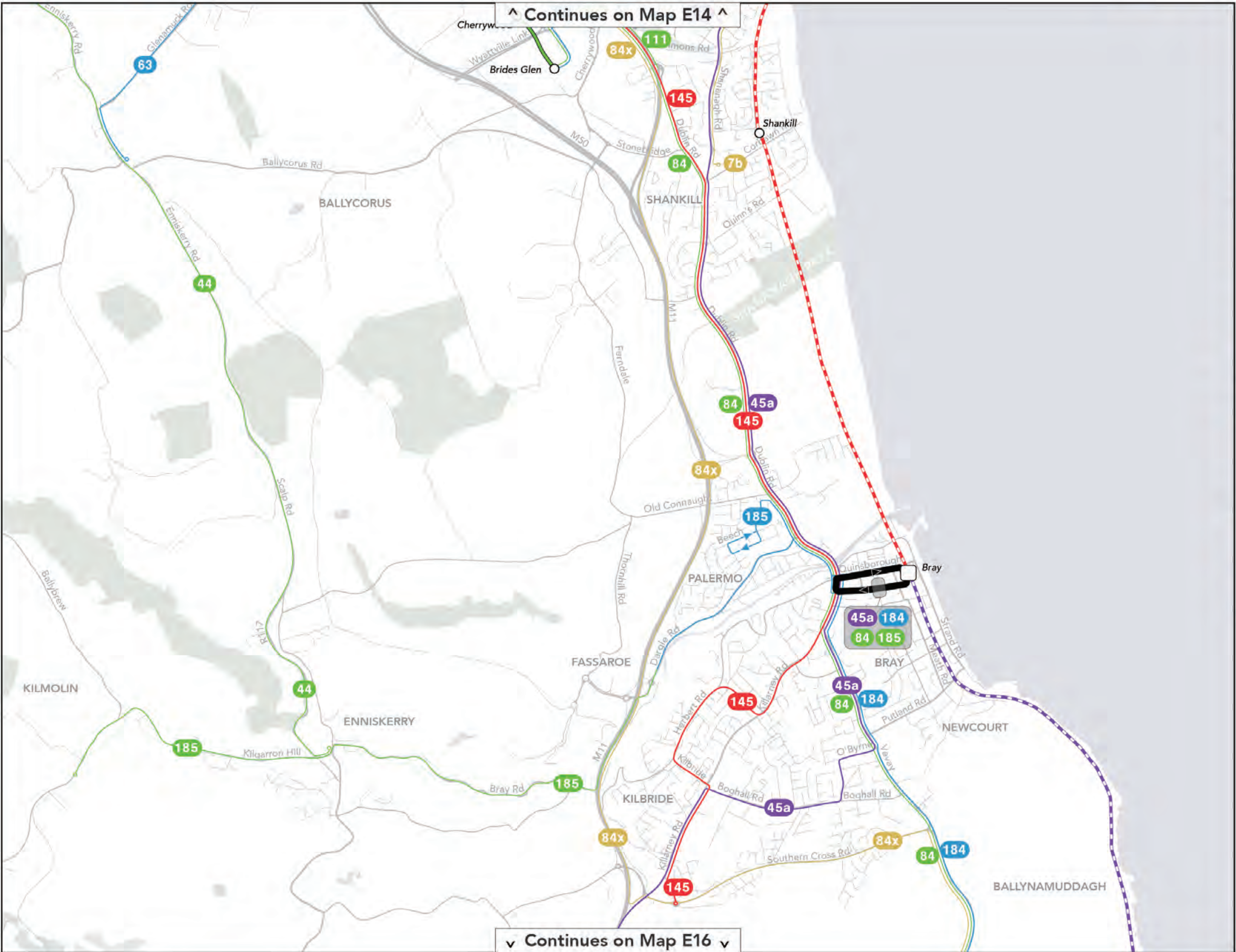
Dun Laoghaire would continue to function as the centre of an extensive local network, in addition to having lots of radial service. The primary radial service would come from DART, **Route B3** and **Route E2**, as previously described (see N11 Corridor and Routes to/from Blackrock).

In order of frequency, other service to or through Dun Laoghaire would include:

- **Route 222 from Dun Laoghaire to Brides Glen.** All-day service, every 15 minutes. This service would take the place of existing Route 7 south of Dun Laoghaire, with service on the Glenageary Road, Sally Glen Road, Churchview Road (Ballybrack) and Wyattville Road.
- **Route 225 from Dun Laoghaire to Dundrum.** All-day service, every 15 minutes. This would be a mini-orbital, connecting Dundrum, Balally, Kilmacud Road Upper, Stillorgan, Fleurville Road, Monkstown Avenue and Dun Laoghaire.
- **Route S8 from Dun Laoghaire to Citywest.** All-day service, every 20 minutes (every 15 minutes at peak). In this part of Dublin, this would be an entirely new orbital service. It would connect Citywest, Tallaght, Knocklyon, Ballyboden, Ballinteer, Sandyford Business Park, Leopardstown, Gallopington Green, Monkstown and Dun Laoghaire.
- **Route 211 from Dun Laoghaire to Kilmacanogue.** All-day service, every 20 minutes. This would be mostly similar to existing Route 45a, with a few changes from Sallynoggin to Dun Laoghaire. Coming from Bray, Route 211 would take the Dublin Road to Shankill, then the Shanganagh Road,

Churchview Road and Rochestown Avenue. It would then travel through the centre of Sallynoggin (via Pearse) rather than at the edges, and continue to Dun Laoghaire via Glenageary Road Upper, Mounttown Road Lower and York Road.

- **Route 227 from Ballyogan to Dun Laoghaire.** All-day service, every 30 minutes. This is a new local route replacing the Ballyogan branch of existing Route 63. From Dun Laoghaire, it would run on York Road, Mounttown Road Lower, Monkstown Farm, Monkstown Avenue, Abbey Road, Pottery Road, Old Bray Road, Cornellscourt Hill Road, Glenamuck Road and Ballyogan Road, ending by the Ballyogan Luas station.
- **Route 98 from Loughlinstown Park to City Centre.** All-day service, every 60 minutes. This is a lifeline route to City Centre, intended to avoid the isolation of Loughlinstown Park by providing an infrequent but direct service to Dun Laoghaire and City Centre.
- **Route 221 from Dun Laoghaire to Killiney Hill Park. All-day service, every 60 minutes.** This is the continuation of existing local route Route 59, providing infrequent local service to parts of Glasthule, Dalkey and Killiney.



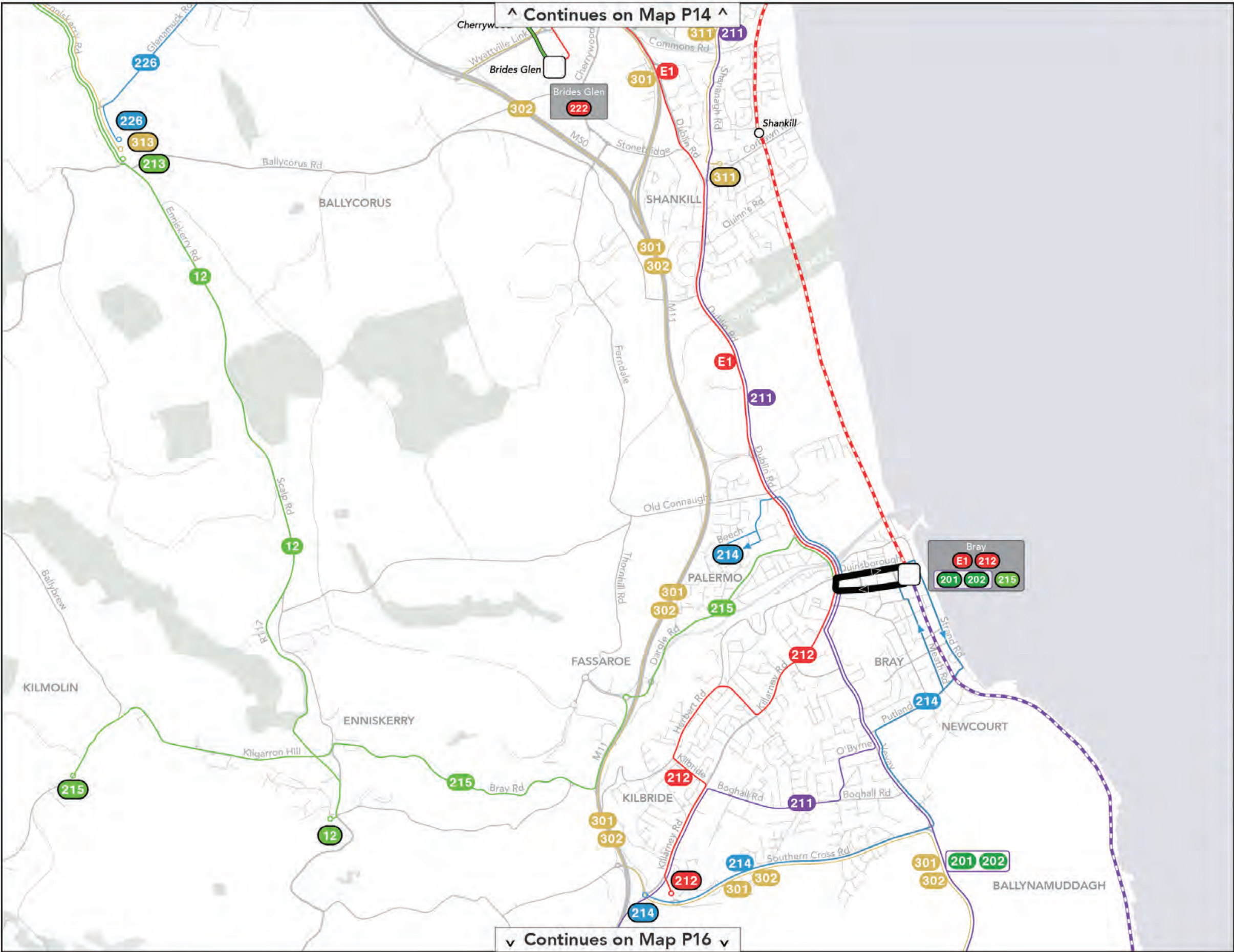
PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

- Every 9 min or better
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

OTHER SERVICES
Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min





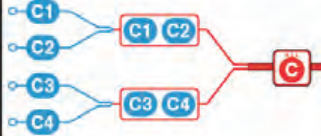
PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

- A Every 5 min or better
- B Every 6 to 7.5 min
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 280 Every 40 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

SPINES AND BRANCHES

All lines beginning with letters A to H form spines going to City Centre. Each branch (e.g. C1, C2) goes to City Centre.



OTHER SERVICES

Weekday midday frequencies

- Luas Every 15 min or better
- DART Every 10 min
- Every 20 min
- Commuter rail Every 30 min
- Worse than 30 min



Maps E15, P15: Bray, Enniskerry and Shankill

The primary radial services to Bray and Shankill would remain:

- DART, continuing to operate as it does today.
- Route E1 from Bray Daly station to Ballymun. All-day service, every 10 minutes. This would be similar in some ways to Route 145, but would cross City Centre to north Dublin instead of heading to Heuston. It would also start at Bray Daly station instead of Ballywaltrim.

Enniskerry Village would also retain a less frequent radial service on:

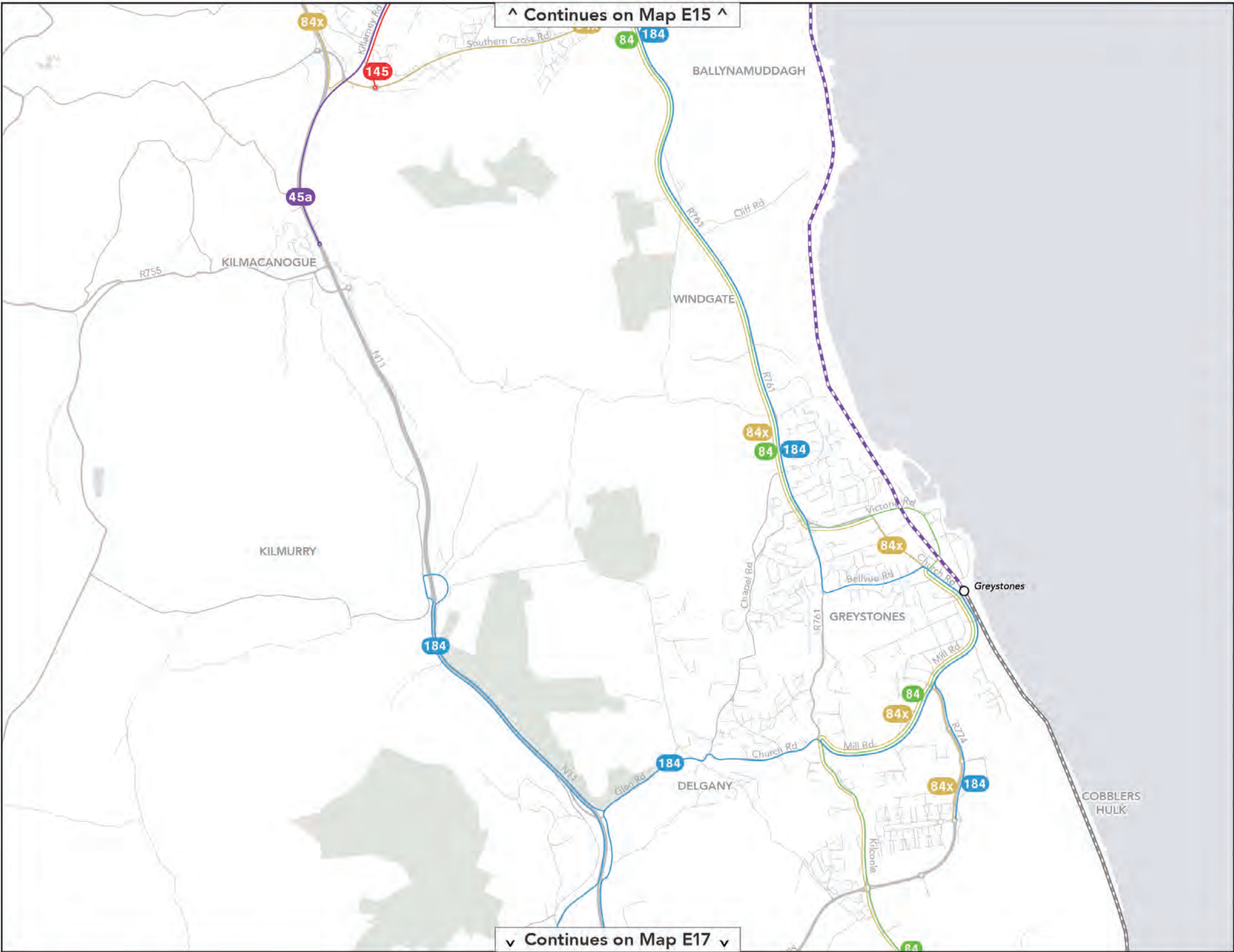
- Route 12 from Enniskerry to City Centre. All-day service, every 60 minutes, similar to existing Route 44, except it would operate through Belarmine rather than Kilgobbin Road.

Bray would be at the centre of a network of local routes including, in order of frequency:

- **Route 212 from Ballywaltrim to Bray.** All-day service, every 10 minutes. This would replace the south end of existing Route 145. It may be more reliable due to its shorter routing, but would require interchange with either Route E1 or DART for travel into Dublin.
- **Route 211 from Kilmacanogue to Dun Laoghaire.** All-day service, every 20 minutes. This would be mostly similar to existing Route 45a, with slight changes in routing between Sallynoggin and Dun Laoghaire.
- **Routes 201 and 202** coming from Greystones and towns to the south of Greystones. All-day service, every 20 minutes.
- **Route 214 from Southern Cross Road to Palermo.** All-day service, every 30 minutes. This would be a new service, proposed in response to public feedback from Bray. It would combine more frequent service to Palermo (currently a deviation on the existing 185), going through the centre of Bray, then down the beach, and out to Southern Cross Road via Putland Road and Vevay Road.
- **Route 215 from Bray to Shop River.** All-day service, every 60 minutes. This would be a replacement for existing Route 185 at a more regular 60-minute frequency, without deviations to Palermo.

Furthermore, the Southern Cross Road would continue to have peak service, in the form of:

- **Routes 301 and 302.** Peak-only service, similar to existing Route 84x.

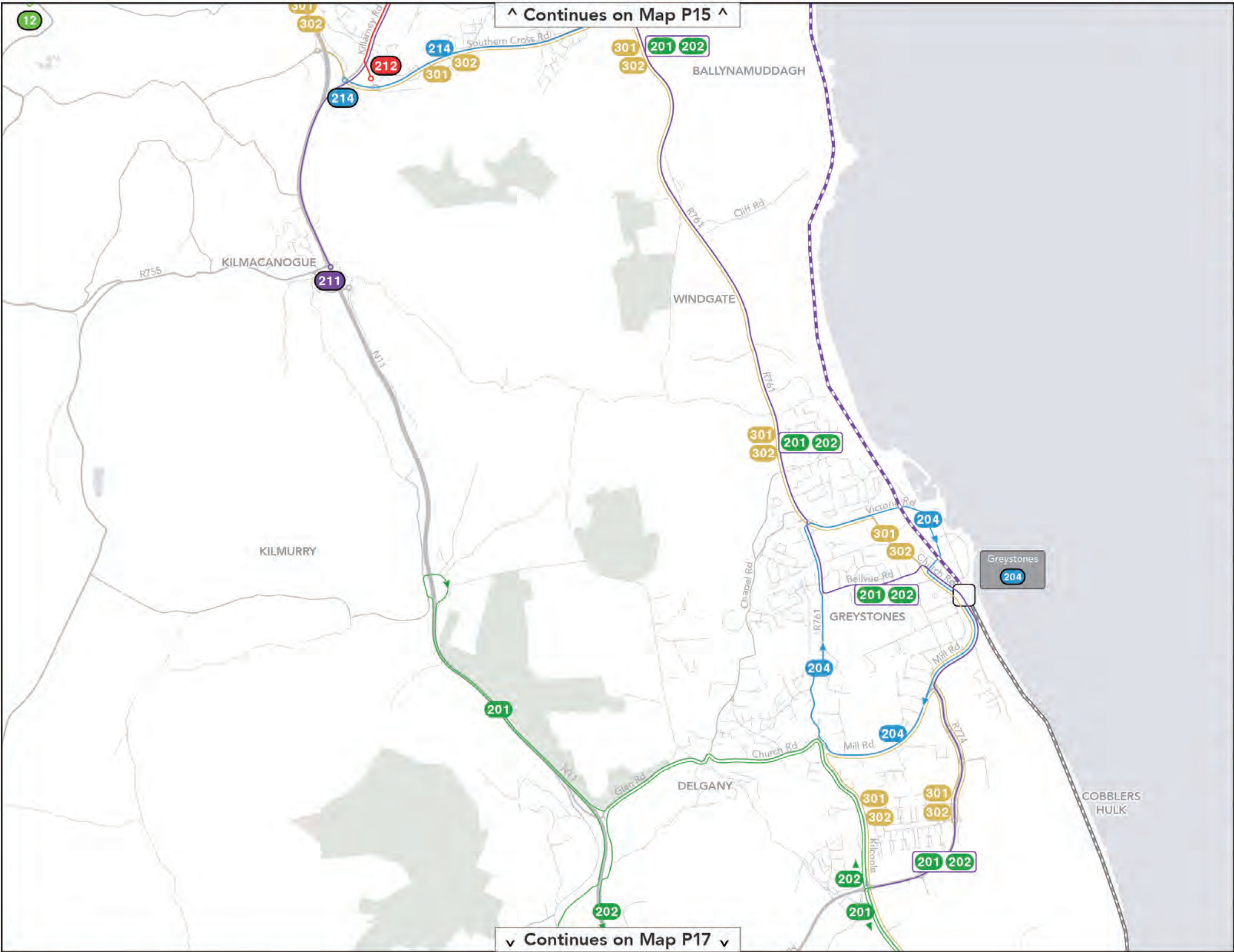


PUBLIC TRANSPORT SERVICES
Weekday midday frequencies

- Every 9 min or better
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

OTHER SERVICES
Weekday midday frequencies

- Luas Every 15 min or better
- DART Every 10 min
- Every 20 min
- Commuter rail Every 30 min
- Worse than 30 min



Maps E16, E17, P16, P17: Greystones and South of Greystones

DART would remain the all-day radial public transport service from Greystones.

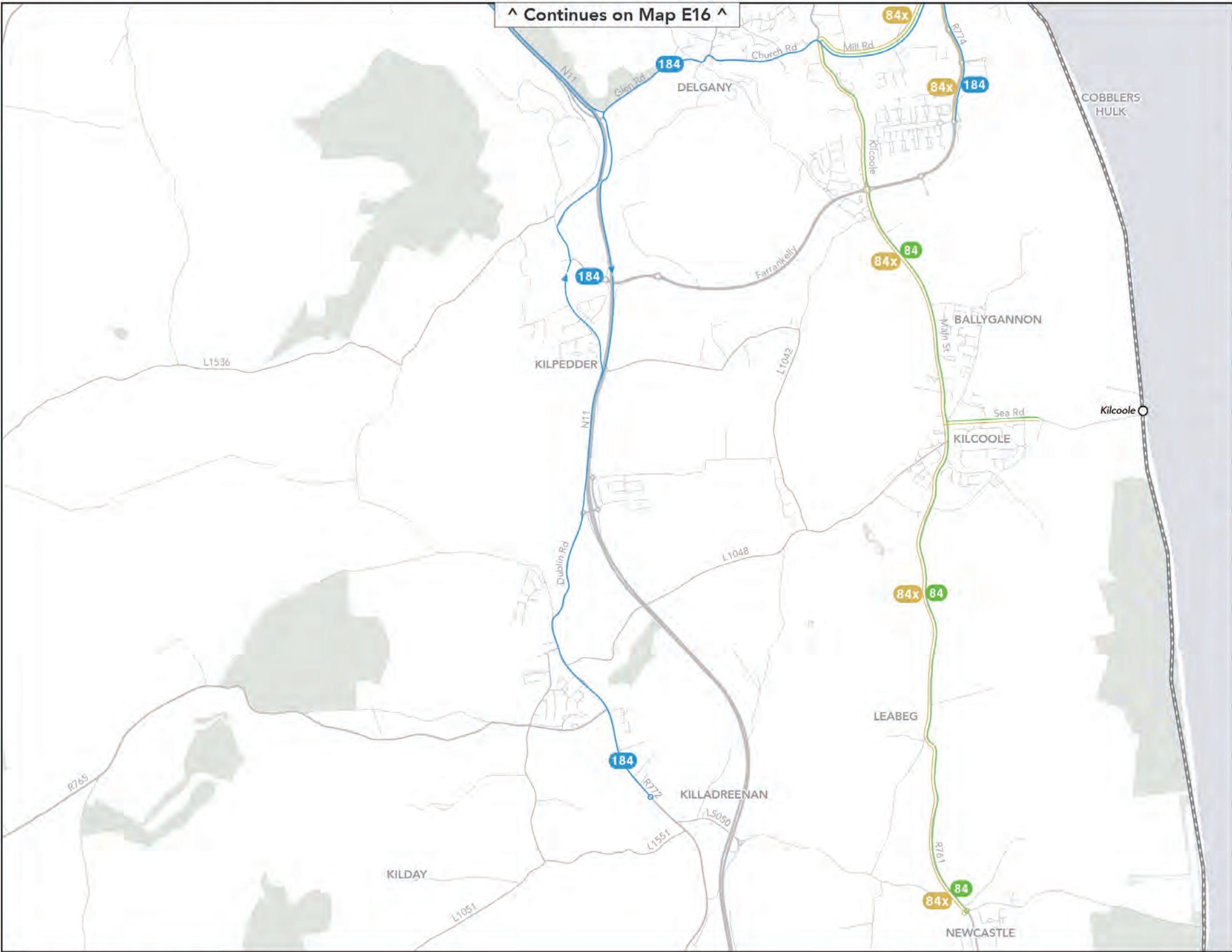
The proposal described below for Greystones and points south is made under the assumption of DART service every 20 minutes all day to Greystones. However, there are significant infrastructure challenges to improving DART frequency to Greystones. If DART service to Greystones continues to operate only every 30 minutes, then the frequency of Routes 201 and 202 would need to change to make timed connections every 30 minutes with DART.

Greystones and points south would be served by the following local bus routes:

- **Routes 201 and 202.** All-day service, every 20 minutes between Charlesland, Greystones village and Bray. This frequency is proposed with the intention of timed connections with 20-minute DART service. South and west of Charlesland, the service would split into a two-way loop with:
 - » **Route 201** continuing on a clockwise loop through Kilcoole, Newcastle, Newtownmountkennedy and Kilpedder, following the paths of existing Routes 84 and 184, but then returning to Charlesland to head north into Greystones and Bray. All-day service, every 40 minutes (one-way).
 - » **Route 202** continuing on an anticlockwise loop through Kilpedder, Newtownmountkennedy, Newcastle and Kilcoole, following the parts of existing Routes 84 and 184. All-day service, every 40 minutes (one-way).
- **Route 204, the West Greystones circulator.** All-day service, every 30 minutes (one-way). This route would be a local route enabling trips between residential areas and Greystones Village.

In addition, there would continue to be peak express service into Dublin City Centre:

- **Routes 301 and 302.** Peak-only service, similar to existing Route 84x, but with one additional morning and evening trip to/from Newcastle, and no midday trips.



PUBLIC TRANSPORT SERVICES

Weekday midday frequencies

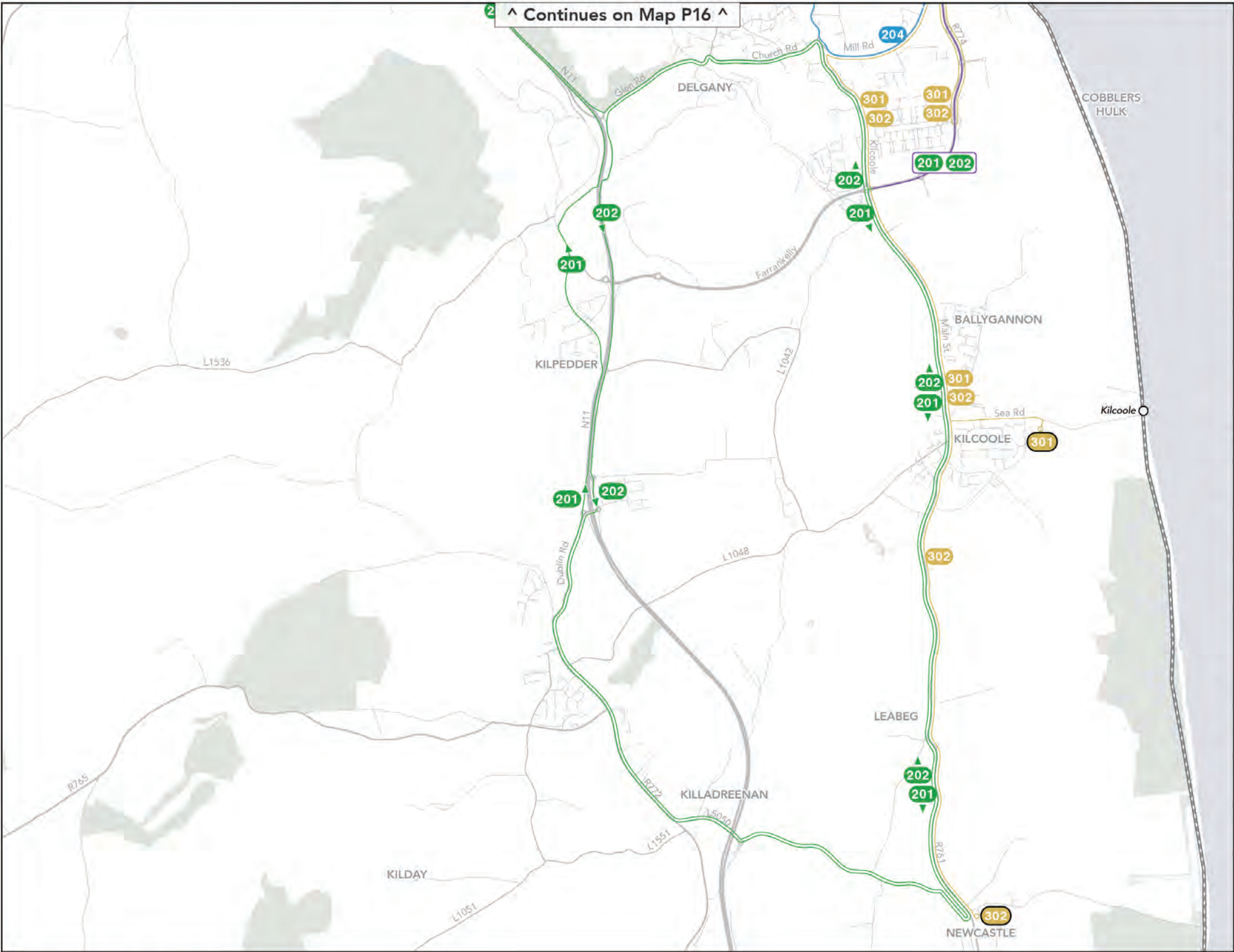
- Every 9 min or better
- S4 Every 10 - 15 min
- 35 Every 20 - 25 min
- C1 Every 30 min
- 95 Every 60 min
- 47 Limited or peak-only
- 41 41c Combines for better frequency
- Multiple lines & frequencies
- 22 14 End of line

OTHER SERVICES

Weekday midday frequencies

- Luas
- Every 15 min or better
- DART
- Every 10 min
- Every 20 min
- Commuter rail
- Every 30 min
- Worse than 30 min





The proposed network was designed assuming the street and road network available in 2019. Wherever possible, the design avoids relying on the construction of major new public works. Nonetheless, the plan's principles have some consequences for future infrastructure planning. Specifically:

- The increased reliance on interchange will require adjustments to **stop placement**, particularly in places where proposed routes would intersect or overlap.
- The consolidation of primary radial services on a limited number of spines reinforces the importance of achieving consistent **bus priority** on all of Dublin's core radial corridors.
- The development of frequent orbitals suggest that similar priority improvements will be needed along the major orbital corridors.
- The reliance on major suburban centres as hubs for local public transport routes will require **expansion of key suburban bus hubs**, and in the case of Liffey Valley Shopping Centre, creation of a new hub.

Stop Placement and Spacing

It is not the purpose of this study to reassess the placement of every bus stop in Dublin. Stop placement requires significant coordination between the NTA, operating companies, and local councils.

However, it's worth noting the basic conflict at play when considering the addition or removal of any bus stops: **is it more important for the bus to proceed quickly along its route with very few stops, or to place a stop as close as possible to everyone's front door?**

If there are too few stops along a route, the bus will be useful to fewer people, as most people are only willing to walk so far to reach public transport. On the other hand, if a bus stops every 100m, it will lurch along at a very slow speed, and lose its utility to most people on board.

It is also impossible to provide adequate stop and shelter infrastructure if the stops are too numerous, and each is lightly patronized. Good stop infrastructure is easier to justify where many people gather, and a wider stop spacing encourages that.

Typical practice in transport planning assumes that a bus stop serves a radius of approximately 400m, though the truth is that the optimal walk distance is very much in the eye of the beholder. A fit and healthy person in a hurry may be happy to walk a kilometre

to reach a bus coming every 5 minutes, where a more elderly or physically challenged customer with more time to spare might prefer a much shorter walk, even if it means sitting on the bus stop bench for a while and getting a slower ride.

So a good compromise benchmark for stop spacing is around 400m on services that are meant to be available to everyone along a corridor. When stops are farther apart, some people near the service cannot walk to it. When stops are closer together, the bus ride becomes too slow to be useful to many passengers.

A stop spacing of 400m is only a general guideline. **Other important points to consider in an interchange-based system include:**

- **It is important for stops to be located near major road intersections that allow connections with other routes**, to reduce the walk distance when changing buses. This is in fundamental conflict with principles of automobile traffic management that have governed stop placement in Dublin until now, whereby it is preferable for stops to be located far from intersections to minimize traffic delay. Stop placement around intersections is usually a clear signal about how much a community values car traffic as opposed to public transport.
- **It is usually preferable for stops to be placed on the far side of an intersection (after the light)**. This ensures outcomes that are to the advantage of both interchanging and through-riding passengers:
 - » Interchanging passengers never have to cross more than one street to reach the stop of an intersecting bus route. This is also possible if all stops are placed on the near side, but when stops are on the far side:
 - » The bus sits through fewer red lights after stopping, making everyone's ride faster. This is particularly effective if stop placement is paired with signal priority, where a bus can trigger the delay of a red light, or the early onset of a green light.
- **At large roundabouts, it may be necessary to place stops on both sides to maintain acceptable walk distances.** Many large intersections in Dublin have been converted to all-way roundabouts (e.g. Artane, Crumlin, Walkinstown and others). Roundabouts are very efficient and safe means to allow many vehicles to pass. However, they are inconvenient for pedestrians and interchanging passengers, requiring longer walks. The wider the roundabout, the more likely it is that stops should be placed on both sides. This is important

both for shortening the walks of interchanging passengers, and for the legibility of the bus network: it's confusing when stops in opposing directions are located several hundred metres apart.

Bus Priority on Spines and Orbitals

The proposed network includes many very frequent routes. Maintaining high service frequencies is expensive, in that it requires paying for more vehicles and more service hours. The cost of maintaining frequencies increases when buses are slower, because it takes more buses to run a slower route, while maintaining the same time interval between vehicles. Slower buses are also much less useful, as passengers can reach fewer places in the same amount of time.

Therefore, **a focus on frequent service inevitably increases the need for buses to operate faster and more reliably**. In addition to bus stop placement (discussed above), one of the most effective ways to improve the speed and reliability of service is to reconfigure road space with a higher level of priority for buses.

This can include expanding dedicated bus lanes, ensuring that bus lanes are present through major intersections, green-light priority and other measures. Such improvements are not easy: reallocating road space means taking it away from other uses, such as private vehicles and street parking; creating new bus-only space can require creating new easements or purchasing private land.

The **NTA is currently leading a parallel effort of bus priority on all of Dublin's core radial corridors**, which would significantly improve performance on the spines in the proposed network. In the future, **NTA may want to undertake a bus priority effort on some of the more frequent orbital routes**, particularly Line O (which will operate every 8 minutes on especially congested inner circular roads) and Routes S4, N4 and N8, which are intended to operate every 10 minutes.

Orbital – Radial Interchange Example

By design, the proposed network includes many locations where very frequent radial spines connect with frequent orbital routes. In most of those cases, the two routes meet on intersecting roads. Prioritizing interchange in such locations will require making a number of local changes to stop placement.

Consider the example of the intersection of the Malahide Road and Collins Avenue at Donnycarney Church. As shown in Figure 118, the existing network includes routes on both roads, but without the intention of interchange. The bus stops are far from the intersection, where a stop can be located to minimize disruption to through-traffic.

In the proposed network, Route S4 on Collins Avenue would operate every 10 minutes, and cover a substantial swath of north Dublin City, including major destinations like the North Docklands and Dublin City University. As a result, we can expect substantial new interchange to take place at this intersection. The current bus stop configuration requires walks longer than 400m to achieve this interchange. Figure 119 shows how, in concept, bus stops on Collins Avenue should be much closer to the Malahide Road to facilitate future patronage.

The exact location of future bus stops in comparable locations would require a detailed study of each orbital – radial intersection, but it would be critical to increase the priority of buses over car traffic in placing stops.

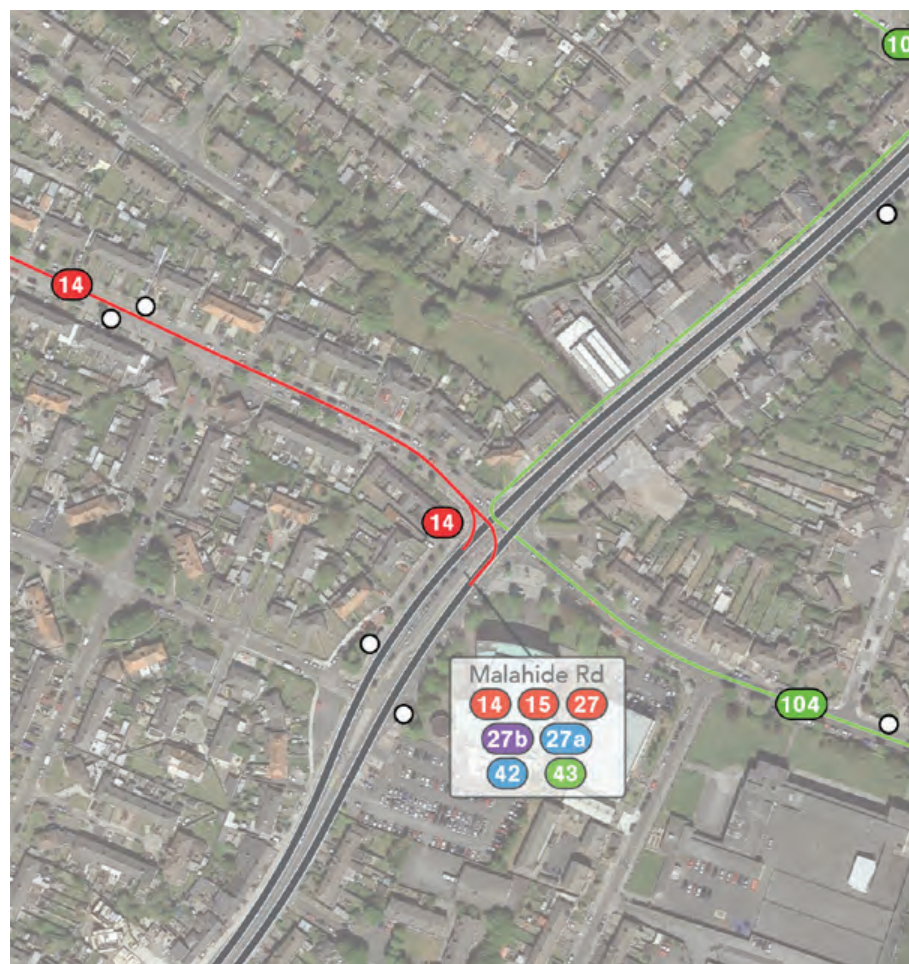


Figure 118: The diagram above shows the existing bus stop configuration at the Intersection of Malahide Road and Collins Avenue. Bus stops are represented by white circles.



Figure 119: The diagram above shows the recommended concept for bus stop configuration at the Intersection of Malahide Road and Collins Avenue to match the proposed network and interchange.

Suburban Interchange Example

The proposed network relies on a number of major suburban centres to serve as hubs where spines, orbitals and local routes meet. In some cases, these centres already include dedicated bus facilities or significant space allocated for buses. Examples include Blanchardstown Shopping Centre, Charlestown Shopping Centre, Tallaght, and Dun Laoghaire.

The proposed network would route significantly more services to some of these locations, including many terminating services. As a result, we anticipate that, at minimum, expansions of bus facilities will be required in the short term at Blanchardstown Shopping Centre, and The Square in Tallaght.

Furthermore, for service and interchange to be effective in large parts of west Dublin under the proposed network, a significant new public transport hub would be required at Liffey Valley Shopping Centre.

As shown on Figure 120, service to Liffey Valley is currently provided mainly through two bus stop locations:

- The motorway stop on the N4 connects the shopping centre to buses going to Lucan, Leixlip, Maynooth and Celbridge. Neither the stop environment on the side of such a large road or the walking distance between this stop and the shopping centre are ideal, but this configuration does allow service to a very important destination along a very important bus corridor.
- A bus stop on the western peripheral roadway provides access to the shopping centre for buses on local roads coming from Palmerstown, Neilstown and Ballyfermot.

This configuration ensures that passengers coming from local neighbourhoods can get relatively close to a shopping centre entrance, but it also reflects the absence of expectations for interchange, as the two bus stop locations are located approximately 800m apart using the available walking paths. Given that all existing services but Route 76 (which runs only every 20 minutes) are radial, this is a reasonable expectation and a reasonable enough outcome.

However, under the proposed network, Liffey Valley would become a hub for interchange between several radial and orbital services, nearly all of which would be frequent some of the time. Frequent radial services would include the C spine on the N4 and the G2 branch coming from Ballyfermot.

Frequent orbital services would primarily consist of the W2 to Clondalkin and Tallaght; but the W4 on the motorway should not

be discounted, as despite its lower frequency it will be very fast, and it is proposed for frequent service during peak hours.

As a result, we would expect significant levels of interchange at this location. Figure 121 illustrates the most obvious way to accommodate this, by bringing all bus routes operating on surface streets to the northern edge of the Shopping Centre parking lot, and by constructing a new hub that would be as close as possible to the N4 motorway stop.

The actual location and design of this interchange remain to be negotiated between the NTA, local council and the local property owner, but something like this is the most likely outcome.



Figure 120: The diagram above shows the existing bus stop configuration at Liffey Valley Shopping Centre. Bus stops serving the shopping centre itself are represented by white circles.



Figure 121: The diagram above shows the recommended concept for bus stop configuration at Liffey Valley Shopping Centre to match the proposed network, including a new interchange facility.

8

How Would the Network Make Public Transport More Useful?

Measuring the Usefulness of the Proposed Network

Goals

As stated at the outset of Chapter 7, some of the overarching principles guiding the revised network proposal include:

- Expand people's ability to get more places, sooner, taking advantage of interchange on a frequent network.
- Continue to serve the entire area now served, including urban, suburban and semi-rural areas.
- Retain direct service to the City Centre in as many areas as practical.

Note: The analyses presented in this chapter are based on weekday service levels, in the middle of the day (i.e. speeds and frequencies between 10:00 and 15:00). This is because:

- Midday service is a baseline. This is when frequencies are the lowest between 7:00 and 19:00. If you have a certain frequency at midday, it's almost always the same or better at peak.
- Aside from about one hour in the morning representing about 10% of daily bus patronage, peak and midday bus speeds are not very different. As of late 2018, midday bus operating speeds averaged 17.7 km/h vs. 16.5 km/h at peak hours. The average difference in how far you could go in a half-hour is 600m.
- Most peak-only services don't have a "frequency" in the sense of a regular interval of time between buses for several hours. They come just a few times each morning and evening, and not necessarily at regular intervals between buses.

Measures

To assess the performance of the network based on the goals above, we rely on three main methods:

- A **coverage analysis**, showing the number of people within reach of different categories of public transport services. This analysis allows us to assess whether we have increased or decreased.
 - » The number of people within 400m of any public transport service.
 - » The number of people within 400m of the most frequent services, which are useful for the largest number of trips.
 - » The number of people within 400m of direct service to City Centre.¹
- An **access analysis**, showing the change in the number of jobs and students within reach of any point in Dublin in 30, 45 and 60 minutes using public transport.
 - » This is useful in understanding whether the proposed network could get people to more places in a reasonable amount of time. If you can get to more jobs and schools in the same amount of time, there's a good chance you can get to more shopping, social services, medical centres, recreational areas and many other useful places.
 - » This is also a way of understanding whether most trips would be shorter or longer. If many more jobs and schools are available within 45 minutes of you in future, that means most of your trips would be shorter.
- **Isochrone visualizations**. Isochrones are maps showing how far a person could go in a certain amount of time (e.g. 30, 45 or 60 minutes), starting from a given location, using public transport.
 - » This is useful to understand whether people can get to more places, sooner. New routes, increased frequencies or both can expand the area reachable in a given amount of time. Conversely, routes that are removed or changed, or where frequencies are removed may cause the area to contract.

¹ By "direct service to City Centre", we refer to service where it is possible to reach City Centre via a one-seat ride, with no interchange. We are not referring to whether the service takes an especially direct path. Many existing routes, and a few proposed routes, go to City Centre, but via paths that are not straight and involve one or more deviations.

Key Outcomes

While the rest of this chapter presents the results of these analyses in detail, the following points provide a selection of several of the most important high-level outcomes of the Proposed Network.

- The number of residents within 400m of any all-day local public transport service² in Dublin would increase by 2%, from approximately 1.29 million to 1.32 million.
 - » **The number of residents within 400m of all-day frequent service³ would increase by 25%**, from approximately 832,000 to over 1.04 million.
- The number of residents within 400m of all-day direct service to City Centre would decrease by 5%, from approximately 1.19 million to 1.135 million.
 - » **The number of residents within 400m of frequent service to City Centre would increase by 16%**, from approximately 800,000 to 925,000.
 - » Nearly all of the areas losing all-day direct service to City Centre would either retain peak-only direct service to City Centre, or would be located on a local route at higher frequency than existing radial service, or both.
- **The average Dublin-area resident could reach 27% more jobs and student enrolments in 30 minutes or less**, and 21% more jobs and student enrolments in 45 minutes or less.
 - » Access benefits would extend far beyond the urban core. The average resident living beyond the M50 could reach 26% more jobs and student enrolments in 45 minutes or less.
 - » Access benefits would not be universal, but would be very widespread. Approximately 65% of Dublin-area residents would experience a measurable increase in job access within 45 minutes, while 5% would experience a measurable decrease⁴.

² Excluding Bus Éireann and private bus companies.

³ Service every 15 minutes or better from at least 7:00 to 19:00 on weekdays. Note that in the proposed network, these routes would continue operating every 15 minutes or better until 23:00 on weekdays, and there would also be frequency improvements on weekends.

⁴ Where "measurable increase" means an increase of +10% or better, and "measurable decrease" means a decrease of -10% or worse.

What are we measuring?

By geographic coverage, we mean the number of people, jobs, or other type of destination within a typical walking distance of public transport. This is useful to understand for two reasons:

- It helps us understand the potential for the network to meet basic needs. Providing some amount of service to as many places as possible reduces the isolation of people with very limited choices.
- It may help us understand the potential for the network to achieve high patronage. When more people and jobs are located near useful, convenient, and reliable service, the network is likely to attract far more customers.

The chart across compares the number of people within 400m as the crow flies of all-day service⁵ at different frequencies, either existing or proposed. The chart shows:

- Existing service, and the revised network proposal, as they both stand in 2019.
- In lighter colours for reference, the existing service at the beginning of this study (2016) and initial network proposal (2018).

Change in Coverage - Overall

The vast majority of the developed area of Dublin currently has access to at least a limited level of public transport service, and this carries through to the Proposed Network.

The revised network proposal would cover a small number of new areas, amounting to a 2% increase in the number of residents within 400m of service, from 1.29 to 1.32 million. This includes:

- Some newly developing areas in places where it is readily possible to extend routes to City Centre. Examples include the vicinities of Clongriffin, Adamstown, Applewood (Swords), Oldcourt Rd (between Knocklyon and Tallaght)
- Some outer suburban areas that currently receive peak-only or occasional services, such as west Celbridge, or Palermo and Southern Cross Road (Bray).
- Areas where entirely new routes would create incidental coverage through undeveloped or semi-rural areas, such as parts of orbital Route W8 through semi-rural areas between Celbridge, Newcastle and Citywest.

Midday Network Coverage

Population and Jobs within 400m of stops between 12:00 and 13:00

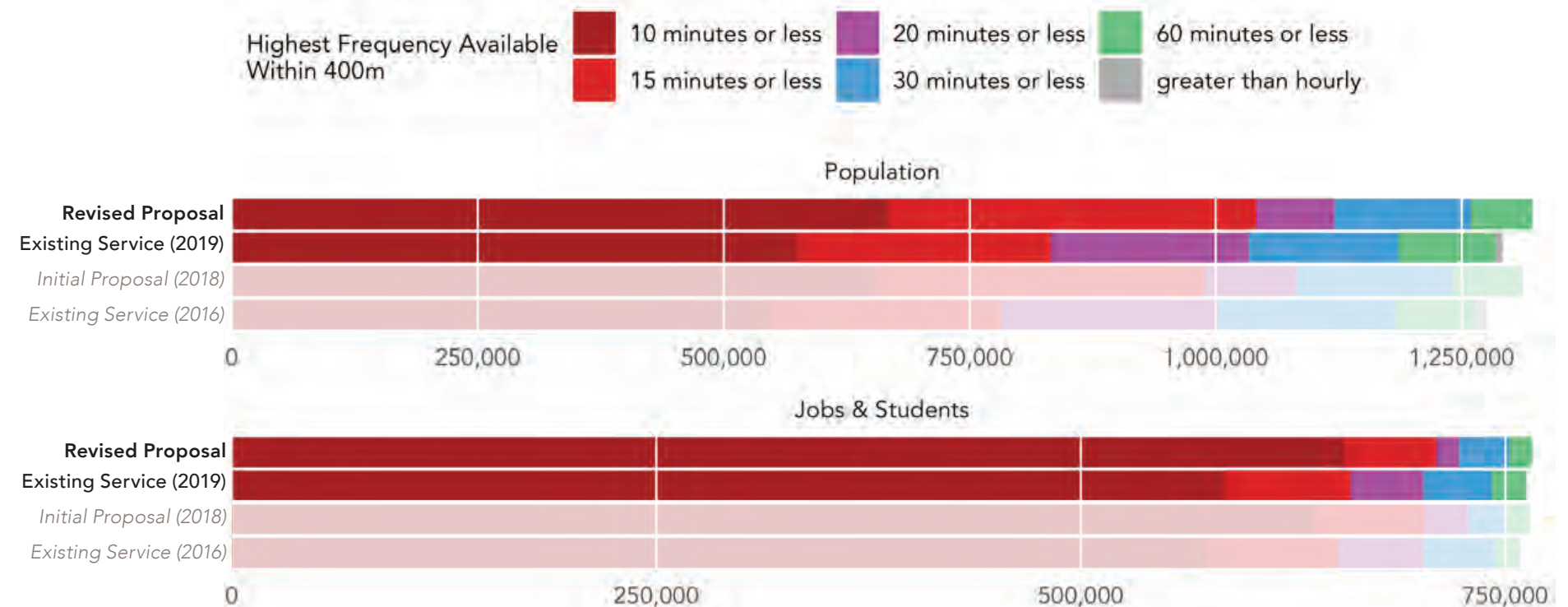


Figure 122: The chart above shows the change in the number of residents (top) and jobs and students (bottom) located within 400m as the crow flies from local public transport service at various frequencies, indicated by the colour of the bar. Overall, the revised proposed network would increase both total network coverage and coverage by frequent routes.

Change in Coverage - Frequent Service

There is a much more significant increase between the existing and proposed networks in the number of people within 400m of frequent service.

In the revised network proposal, the number of residents near public transport with all-day service every 15 minutes or better would increase by 25%, from about 832,000 today to over 1.04 million.

Of the million residents on the proposed Frequent Network, nearly 670,000 would have access to service every 10 minutes or better. This illustrates the expansion in the reach and intensity of the Frequent Network, extending the benefits of short waits and reliable transfers to a much larger share of Dublin's population.

⁵ Operating continuously from 7:00 to 19:00, in almost all cases every 60 minutes or better.

Change in Coverage - Radial Service Only

A notable characteristic of the existing bus network in Dublin is the high amount of service that carries through from outer suburbs to the City Centre.

As noted in Chapter 4, this is advantageous in some ways and disadvantageous in others. On the one hand, City Centre is the single largest and most useful destination in the Dublin area, so it makes sense to focus most service there. On the other, concentrating almost exclusively on radial service forces many trips through City Centre that don't need to go there, has limited the amount of orbital service, and resulted in relatively low frequencies and awkward routing patterns in many suburban areas.

The chart across compares the number of people within 400m as the crow flies of all-day direct service to City Centre⁶ at different frequencies, either existing or proposed. The chart shows:

- Existing service, and the revised network proposal, as they both stand in 2019.
- In lighter colours for reference, the existing service at the beginning of this study (2016) and initial network proposal (2018).

By this measure, the total number of Dublin area residents near direct service to City Centre has remained nearly the same from 2016 to 2019, at approximately 1.19 million. The initial network proposal would have reduced the number of people with all-day direct service to City Centre by over 15%, to 1.01 million.

Losses of direct service to City Centre were the single largest concern expressed in the summer 2018 public consultation. **The revised network proposal would result in a 5% reduction in the number of residents with direct service to City Centre, from about 1.19 million to 1.135 million.** In almost all cases, this is mitigated by one or more of the following:

- A suburban local service scheduled every 10 to 15 minutes, such as in Damastown, Dunboyne and Ballywaltrim (Bray).
- A suburban local service that is not frequent, but comes more often than existing direct service, as on the southern Howth peninsula, on Feltrim Road (Swords), in River Forest and Castletown (Leixlip), Dodsborough (Lucan) or Blessington.
- Peak-only direct service, such as in northern Fingal, Dunboyne, River Forest and Castletown (Leixlip), Dodsborough (Lucan), Newcastle, and Blessington.

⁶ Operating continuously from 7:00 to 19:00, in almost all cases every 60 minutes or better.

Midday Network Coverage of Radial Services

Population and Jobs within 400m of stops between 12:00 and 13:00

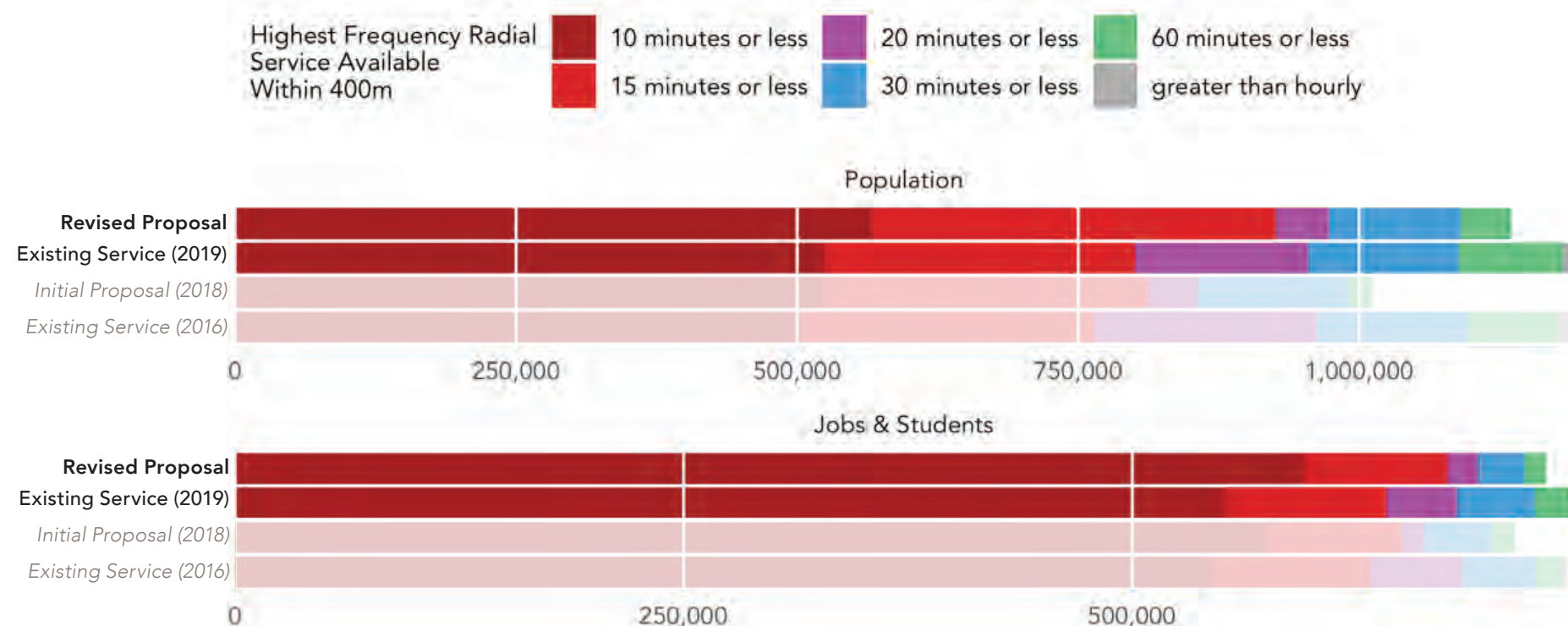


Figure 123: The chart above shows the change in the number of residents (top) and jobs and students (bottom) located within 400m as the crow flies from direct service to City Centre at various frequencies, indicated by the colour of the bar. Overall, the revised proposed network would slightly reduce the number of people near any kind of direct service to City Centre, but would increase the number of people near frequent service to City Centre.

Change in Coverage - Frequent Radial Service

Unlike overall service to City Centre, there would be a significant increase in the number of people with frequent service to City Centre.

In the revised network proposal, the number of residents near public transport with all-day direct service to City Centre every 15 minutes or better would increase by 15%, from about 800,000 today to 925,000.

This is consistent with the overall level of increase in frequent service in the revised network proposal (see prior page). This also shows that the increase in frequent service is not by and large an artefact of converting radial service to orbital service, as was often the case in the initial proposal.

What are we measuring?

This section describes the changes in access to opportunity – the number of jobs and student enrolments reachable in a given time – that the revised network would produce. Specifically, we are seeking to show the degree to which the network proposal is useful, by measuring how much more it would connect people to places they need to travel.

With the data available in Dublin, we measure the number of jobs and student enrolments that can be reached in 30, 45 and 60 minutes. It's harder to measure other opportunities, like shopping and socializing, but an improvement in access to jobs and universities is a signal that access to many other activities would improve as well. We carried out the following analysis:

- On a map, we divided the Dublin area into hexagons, where each hexagon has an in-circle radius of 200m. In other words, the centres of hexagons are located on a 400m grid.
- We calculated the total number of jobs and student enrolments accessible within 30, 45 and 60 minutes from the centre of each hexagon, via public transport and walking.
 - » **The travel times used in this analysis represent a door-to-door trip.** They include not just time on a bus or train, but also time spent walking, waiting and (where necessary) interchanging⁷.
- We calculated the population inside each hexagon, based on the 2016 population of Census small areas.
- We calculated a weighted average of change in access based on the change at each hexagon centre, multiplied by the population in the corresponding hexagon.

Access to Opportunity - Average Change

The chart across shows the average percent change in access to opportunity in 30, 45 and 60 minutes for Dublin residents.

If the revised network proposal were implemented, the average resident of the Dublin area could reach +28% more jobs and student enrolments within 30 minutes, +21% within 45 minutes, and +16% within 60 minutes.

⁷ The formula is: *Travel Time* = *Walk Time from origin* + *Wait Time* + *In-Vehicle Time* + *Walk Time to destination*. Walk times are calculated based on distance along the street network as mapped in OpenStreetMap, and an average walking speed of 0.93 m/s. Research suggests this speed is achievable by most children and older adults. Wait times are assumed to be half of service frequency. In-Vehicle Time means the time during which one is actually on board a bus or train. In cases where interchange is required, the travel time also includes any added wait, walk and in-vehicle time required for the second leg of the public transport trip.

Job & Student Access - % Change by Zone and Travel Time

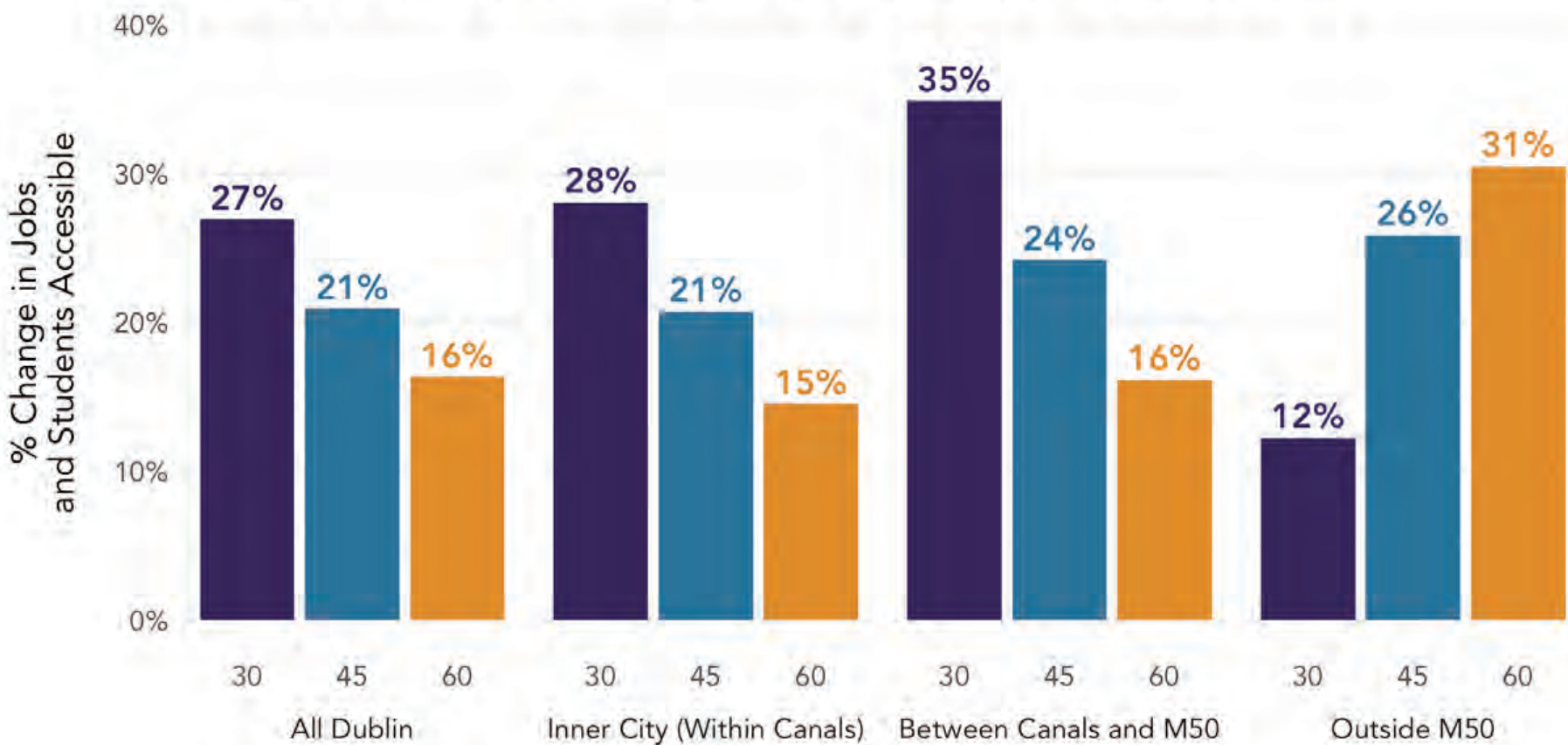


Figure 124: The chart above shows the percent change in the number of jobs and student enrolments accessible to the average Dublin resident, and how that change varies for residents of the inner city (within the canals), the area between the canals and the M50, and the outer suburbs beyond the M50.

This shows that the added service, and the emphasis on expanding the Frequent Network, would allow more people in Dublin to reach more places in similar amounts of time. Or, in other words, that trips to reach the same places would usually be shorter.

Of course, the level of change varies according to where people are located. One of the biggest determinants of how useful public transport can be is distance from the City Centre. For this reason, we've split the results into three broad areas:

- **Inner City (Within Canals).** This area corresponds broadly to City Centre, most of the Docklands and the older residential neighbourhoods immediately to the west and north of the centre. For the average resident in this zone, the change in access to opportunity would be +28% within 30 minutes, +21% within 45 minutes, and +15% within 60 minutes. This is very similar to the regional average.

- **Between the Canals and the M50.** This zone encompasses areas mostly within 2 to 8 km from City Centre, and some areas further out in the southeast (much of Dun Laoghaire-Rathdown). This area encompasses roughly half the population and nearly half the jobs and student enrolments in Dublin. The average change in access to opportunity in this zone would be +35% within 30 minutes, +24% within 45 minutes, and +16% within 60 minutes. The above-average improvements to access within 30 and 45 minutes or less reflects the focus on expanding the frequent network, particularly the new frequent orbitals and coordinated spine timetables for higher frequencies on main roads into City Centre.
- **Outside the M50.** In these areas, residences tend to be located much further away from major destinations. As a result, the average change in access to opportunity outside the M50 would be only +12% within 30 minutes, but +26% within 45 minutes and +31% within 60 minutes.

Access to Opportunity - Maps of Dublin

The following pages present maps of Dublin comparing access to opportunity between the existing and proposed networks.

These maps show Dublin divided into hexagonal areas, as described on page 173. We calculated access to jobs and student enrolments from the centre of each hexagon, comparing the situation under existing service, to a future situation where the revised network proposal would be implemented in full⁸.

On these maps, green areas indicate improvements in access due to the proposed network, and brown areas indicate degradation in access. If a hexagon on these maps is green, a person starting from its centre could reach more jobs and schools in the same amount of time if the proposed network were implemented. If a hexagon is brown, then a person could reach fewer jobs and schools in the same amount of time.

Within 30 Minutes

30 minutes door-to-door is a relatively short time to travel by public transport; walking and waiting can easily take up 15 minutes of a typical trip. As a result, relatively few trips are viable in this amount of time.

Nonetheless, more would be viable in 30 minutes or less under the proposed network, largely as a result of higher frequencies. **Nearly all locations within four kilometres of the O'Connell Bridge would experience a significant improvement in access within 30 minutes.**

Locations that would experience a degradation in access within 30 minutes are almost all places where midday frequencies would be reduced. Examples include places like Marino and Clontarf, where midday frequency would be reduced from every 10 minutes to every 15 minutes.

Overall, we estimate that, among Dublin residents:

- **749,000 live where access to opportunity within 30 minutes would improve by +10% or better.**
- **143,000 live where access to opportunity within 30 minutes would degrade by -10% or worse.**

⁸ Note that this analysis does not include any possible improvements to bus speeds as a result of infrastructure improvements in the Core Bus Corridors or any other projects. Any improvements or degradation in access measured here are purely the result of changes to frequency and routing.

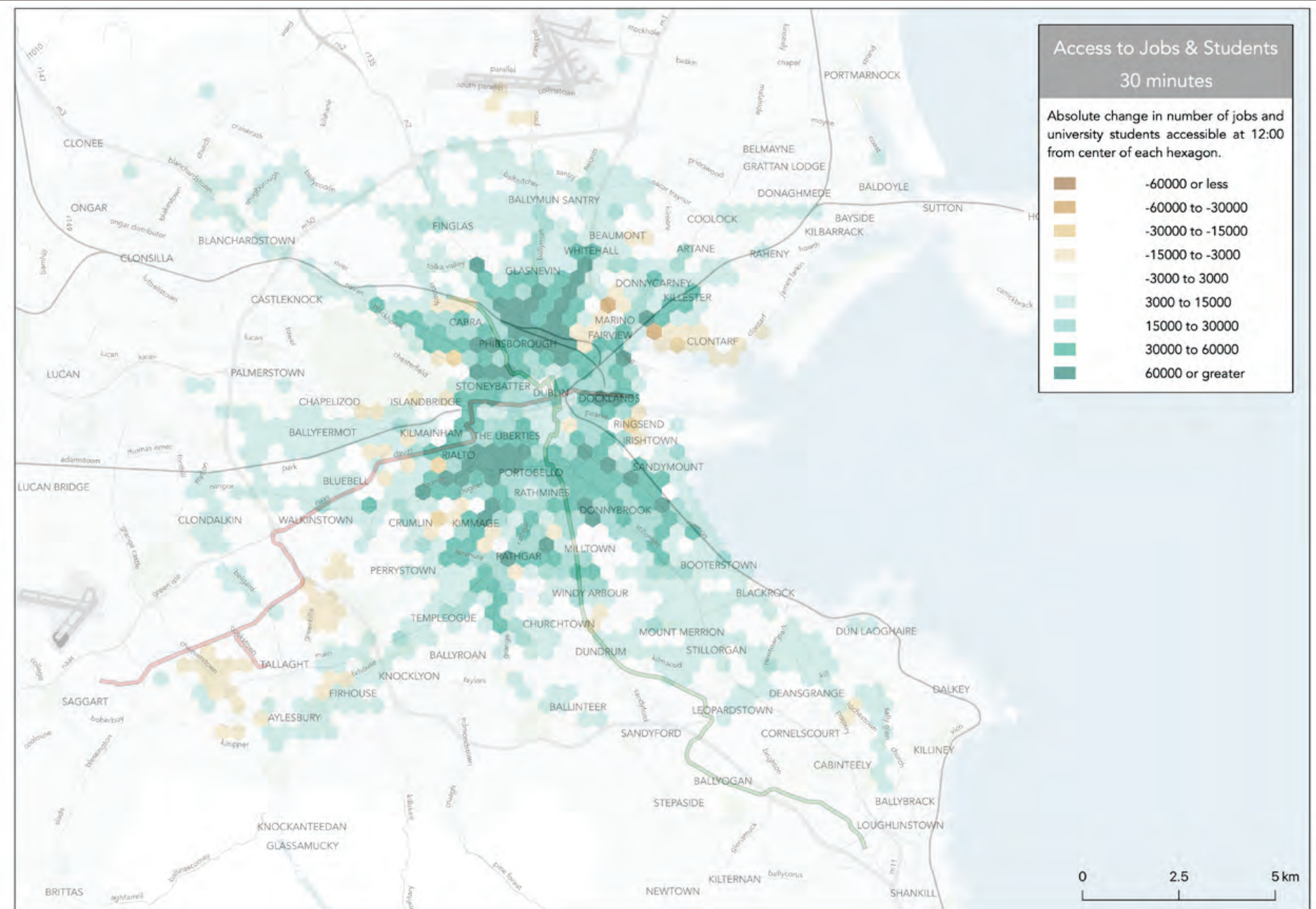


Figure 125: The maps above and to the right show the change in the number of jobs accessible in 30 minutes or less by walking, waiting and public transport from different parts of Dublin on weekdays.

Within 45 minutes

For a city at Dublin's scale and density, far more trips are possible within 45 minutes than within 30 minutes. 45 minutes is enough time for a trip from 5 to 10 kilometres long, meaning for example most trips from within the M50 to City Centre⁹.

As a result, the range of places experiencing significant improvements in access to opportunity within 45 minutes is considerably greater than within 30 minutes. **Nearly all locations within the M50 would experience a significant improvement in access within 45 minutes.**

This is a result of the combination of several factors:

- Frequent orbital routes would make far more suburb-to-suburb trips viable within 45 minutes or less.
- Many more locations would have access to frequent cross-city service connecting north and south Dublin, since every spine branch would operate not just to but through City Centre.

These two factors are extremely significant because there are actually more jobs and student enrolments between the canals and the M50 (about 320,000) than within the canals (about 210,000). Furthermore, some areas would experience higher frequencies and more direct routing to City Centre.

Again, there are also a number of locations that would show losses of access within 45 minutes. The most visible ones on the map to the right represent places where midday frequencies would be reduced, such as from every 10 to 15 minutes (e.g. Clontarf, Darndale), or from every 20 to every 30 minutes (e.g. parts of Kilmore, Tymon North, Killinarden).

Overall, we estimate that, among Dublin residents:

- **958,000 live where access to opportunity within 45 minutes would improve by +10% or better.**
- **74,000 live where access to opportunity within 45 minutes would degrade by -10% or worse.**

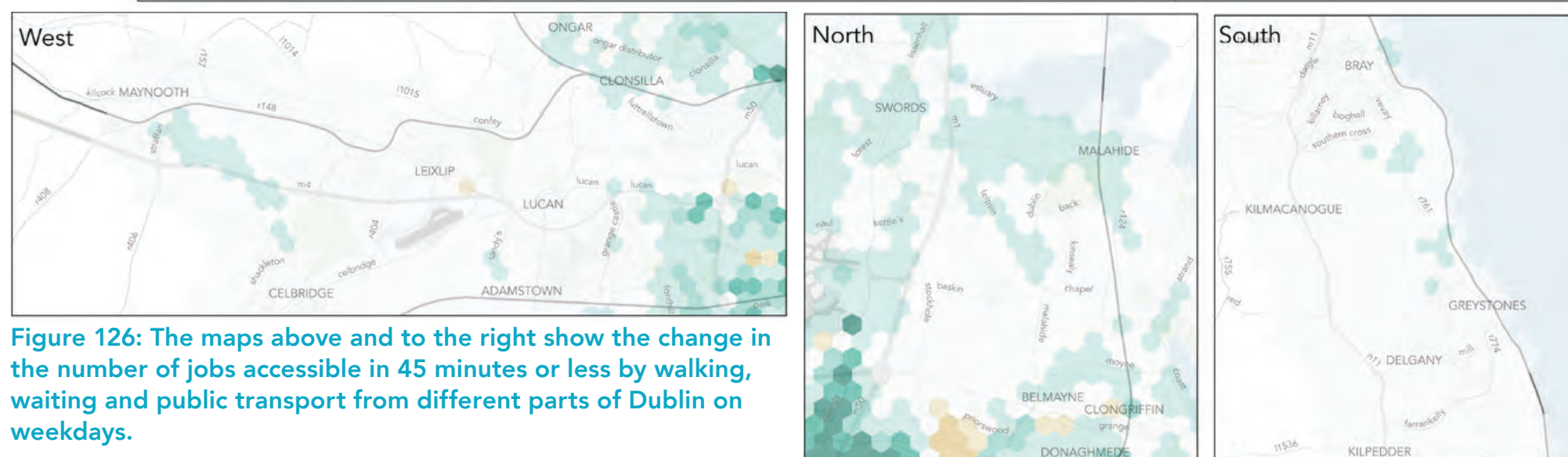
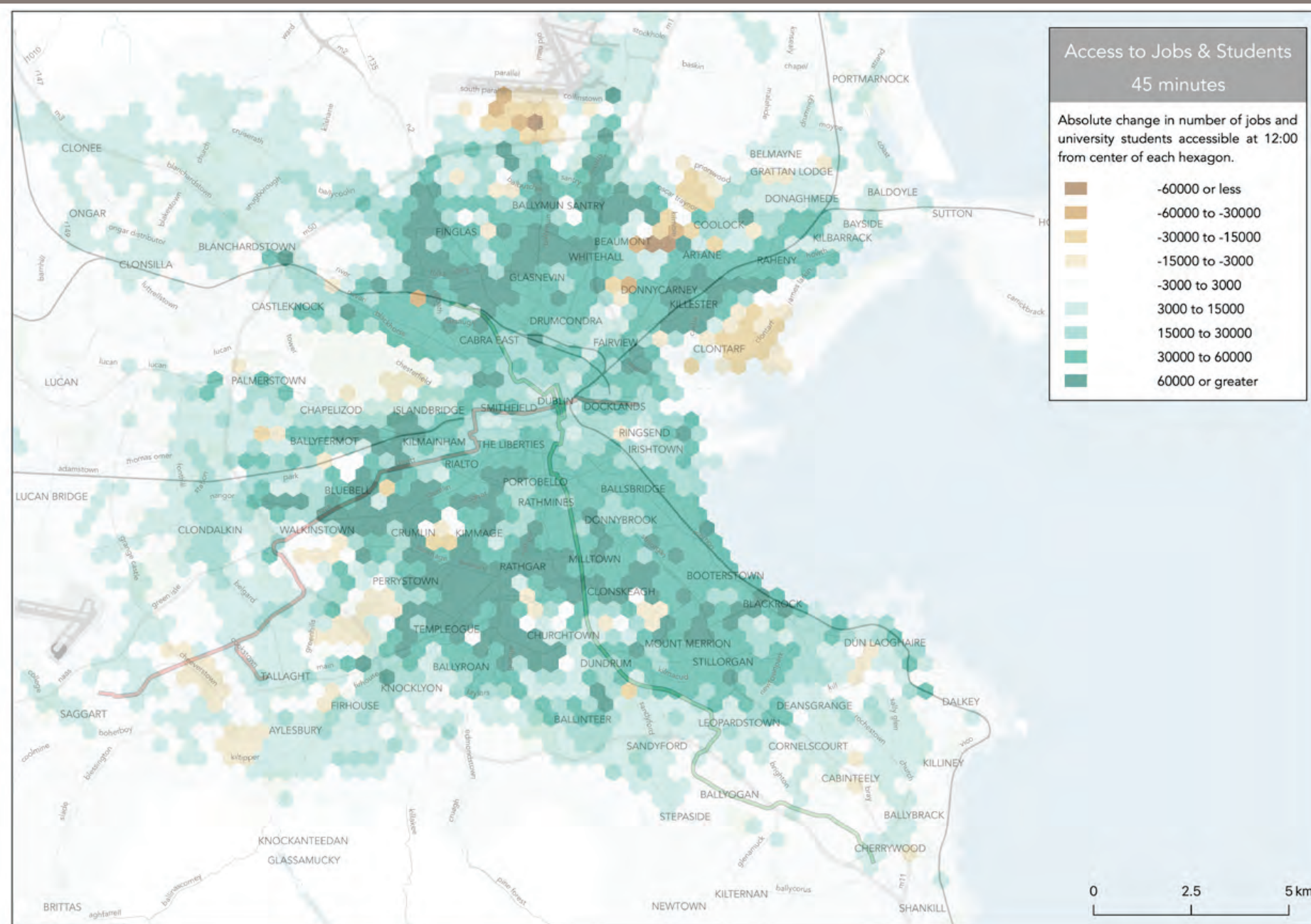


Figure 126: The maps above and to the right show the change in the number of jobs accessible in 45 minutes or less by walking, waiting and public transport from different parts of Dublin on weekdays.

⁹ This is true on average, but obviously not in all cases. Actual travel times vary depending on the actual locations of travel. Certain roads, certain hours, and even certain individual bus trips will be slower than others.

Within 60 minutes

A 60 minute door-to-door travel time would put most major sub-urban centres within reach of each other, and within reach of a large portion of the inner city.

As a result, the benefits of the proposed network to outer suburban areas are most apparent at this time horizon. **This is where significant improvements in access to opportunity would appear in most locations within 5 to 8 kilometres outside the M50.**

Most areas beyond the M50 have relatively limited options in terms of radial service to City Centre. In some cases, the proposed network provides a slightly more frequent or more direct radial route. But this is not true everywhere, and its effect on access to opportunity is limited. Many outer suburbs can already reach City Centre within an hour.

Furthermore, the increase in cross-city services would certainly provide more direct trips from outer suburbs to destinations on the other side of City Centre, but very few of those trips could be completed in an hour. This underscores how critical infrastructure improvements in the Core Bus Corridors are: they are the only way to achieve any significant improvements in radial and cross-city mobility from the outer suburbs.

From a network design perspective, the key to access improvements within 60 minutes from outer suburban areas is the higher number and frequency of orbital routes. Some examples of trips that would become possible in an hour (including waiting time):

- Swords to Charlestown Shopping Centre.
- Dublin Airport to Finglas Village.
- Blanchardstown Shopping Centre to DCU St. Patrick's College.
- Liffey Valley Shopping Centre to Crumlin Hospital.
- Tallaght to Dundrum.

Overall, we estimate that, among Dublin residents:

- **957,000 live where access to opportunity within 60 minutes would improve by +10% or better.**
- **37,000 live where access to opportunity within 60 minutes would degrade by -10% or worse.**

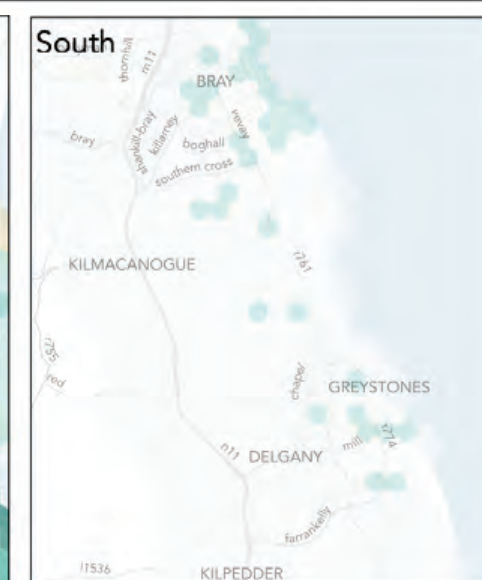
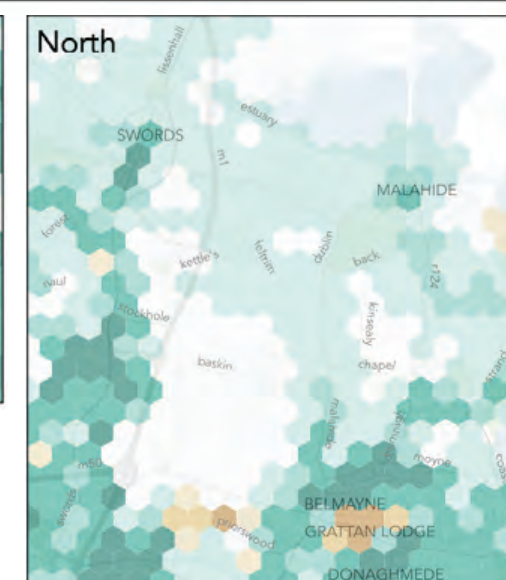
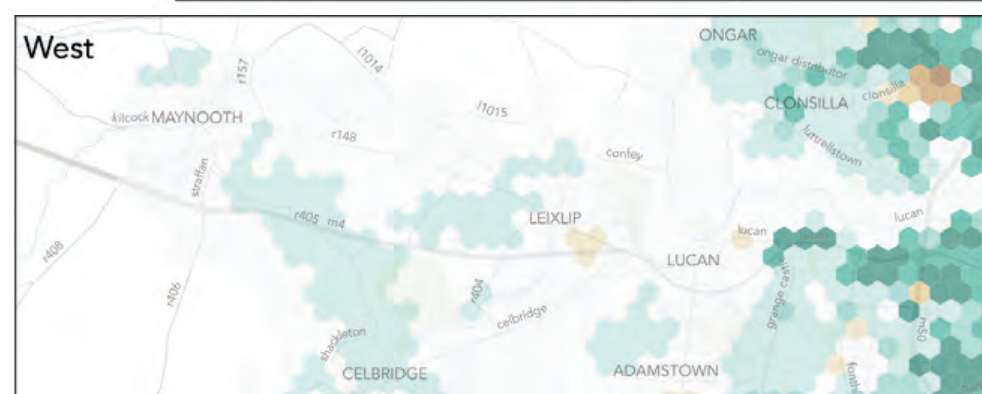
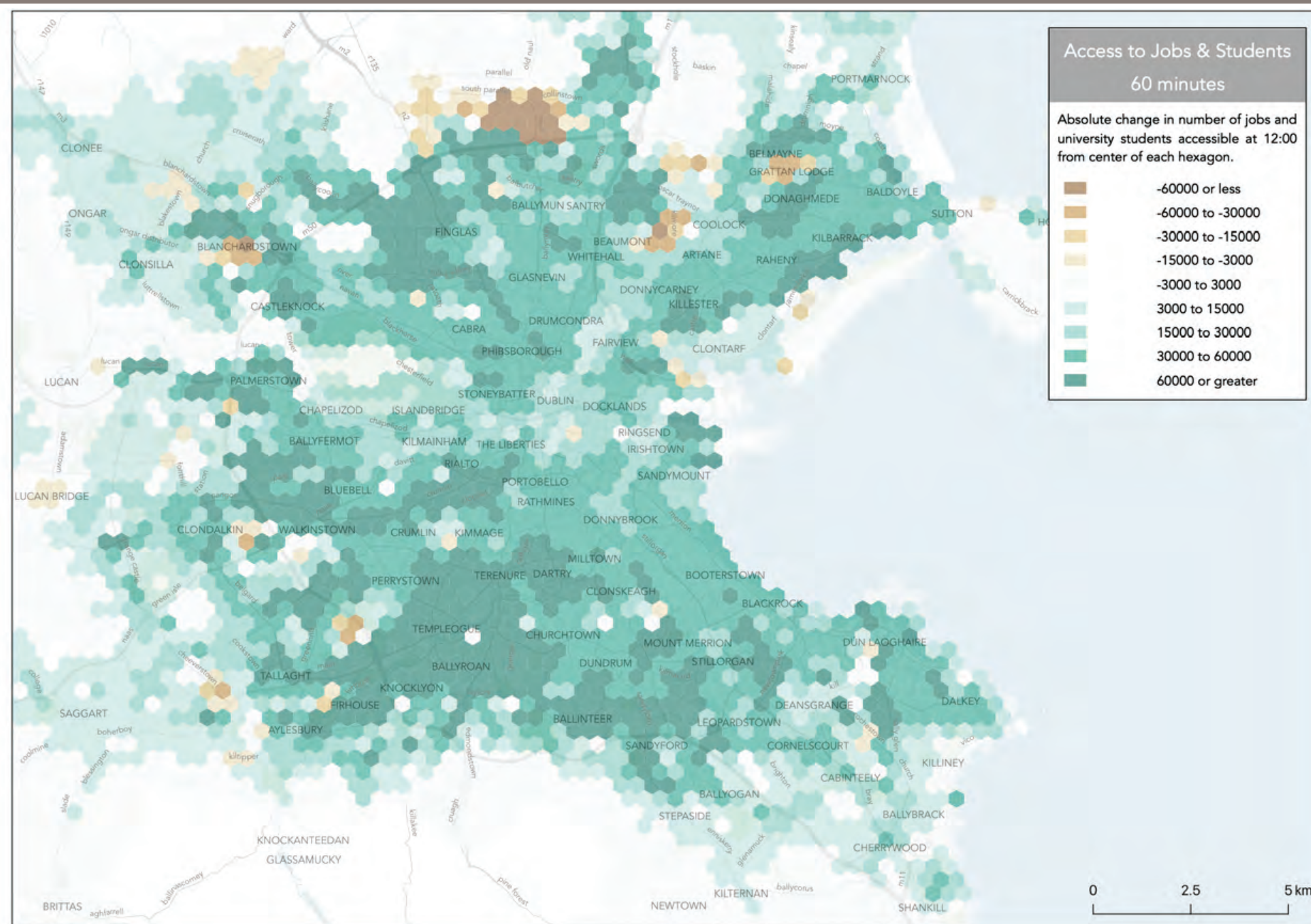


Figure 127: The maps above and to the right show the change in the number of jobs accessible in 60 minutes or less by walking, waiting and public transport from different parts of Dublin on weekdays.

What is an isochrone?

An isochrone is a map that highlights the areas an individual could reach from a specific place, in a given amount of travel time.

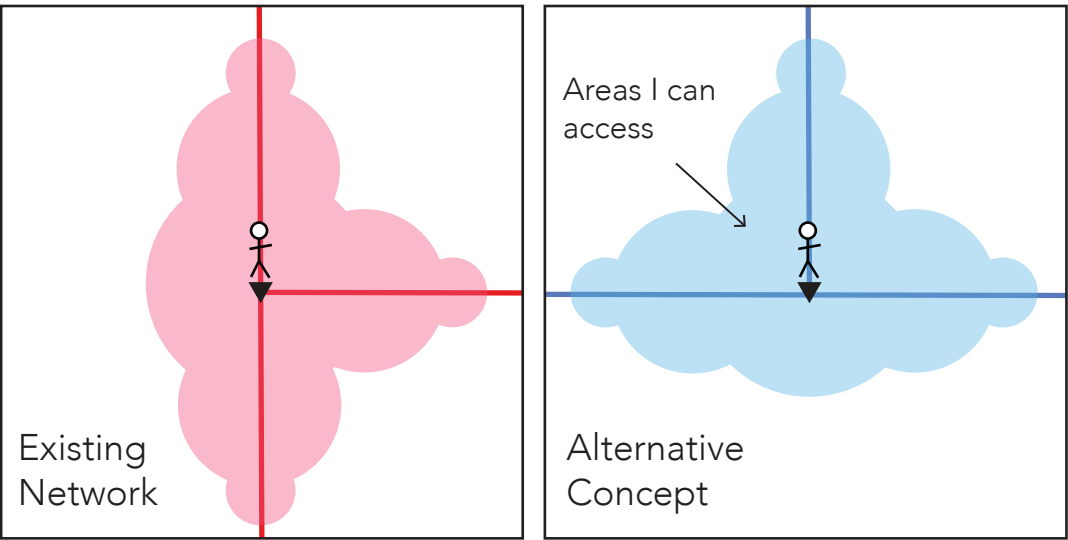
Individual isochrones can be used to visualize changes in access available to and from particular places.

In the following pages, we provide a selection of isochrones that measure how far one could travel in 30, 45 or 60 minutes by walking and public transport from a set of 18 key locations, to provide a better sense of the ways in which the proposed network would change mobility in the Dublin area.

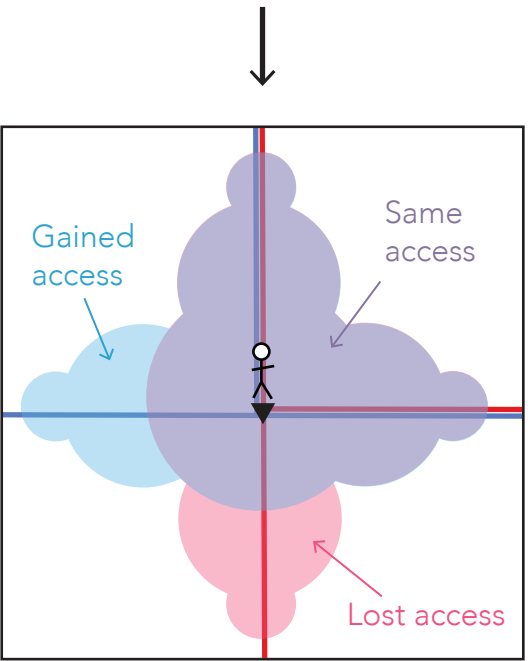
In each of these maps, the isochrone areas calculated for the existing and proposed networks are overlaid. As a result:

- Areas shown in purple can be reached within the stated time threshold in both the existing and proposed network
- Areas shown in blue would be newly accessible with the proposed network
- Areas shown in red can be reached in the stated time in the existing network, but would not be under the proposed network.

By walking and transit, where can I get to in 30 minutes?



How is my access different between these two networks?

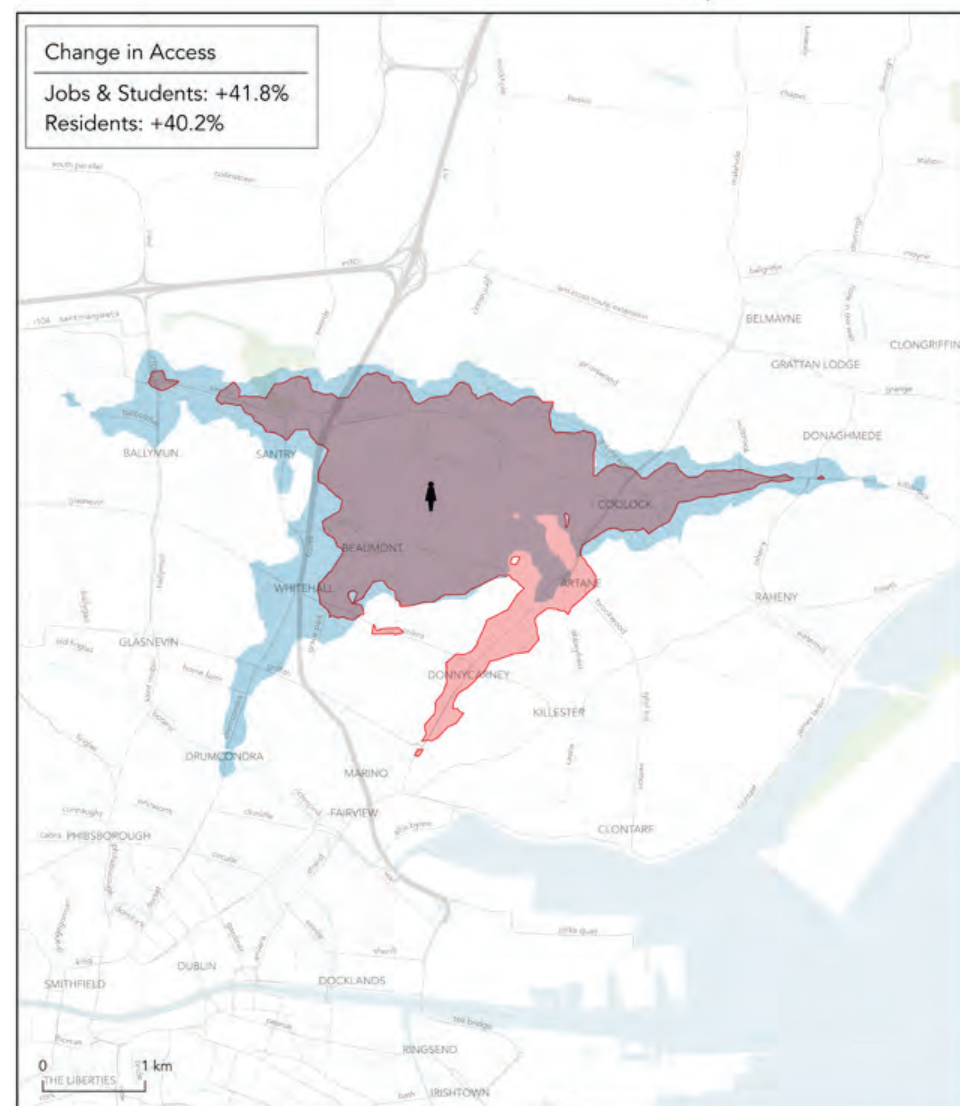


Overlapping isochrones can show the areas that are lost or gained between two transit networks.

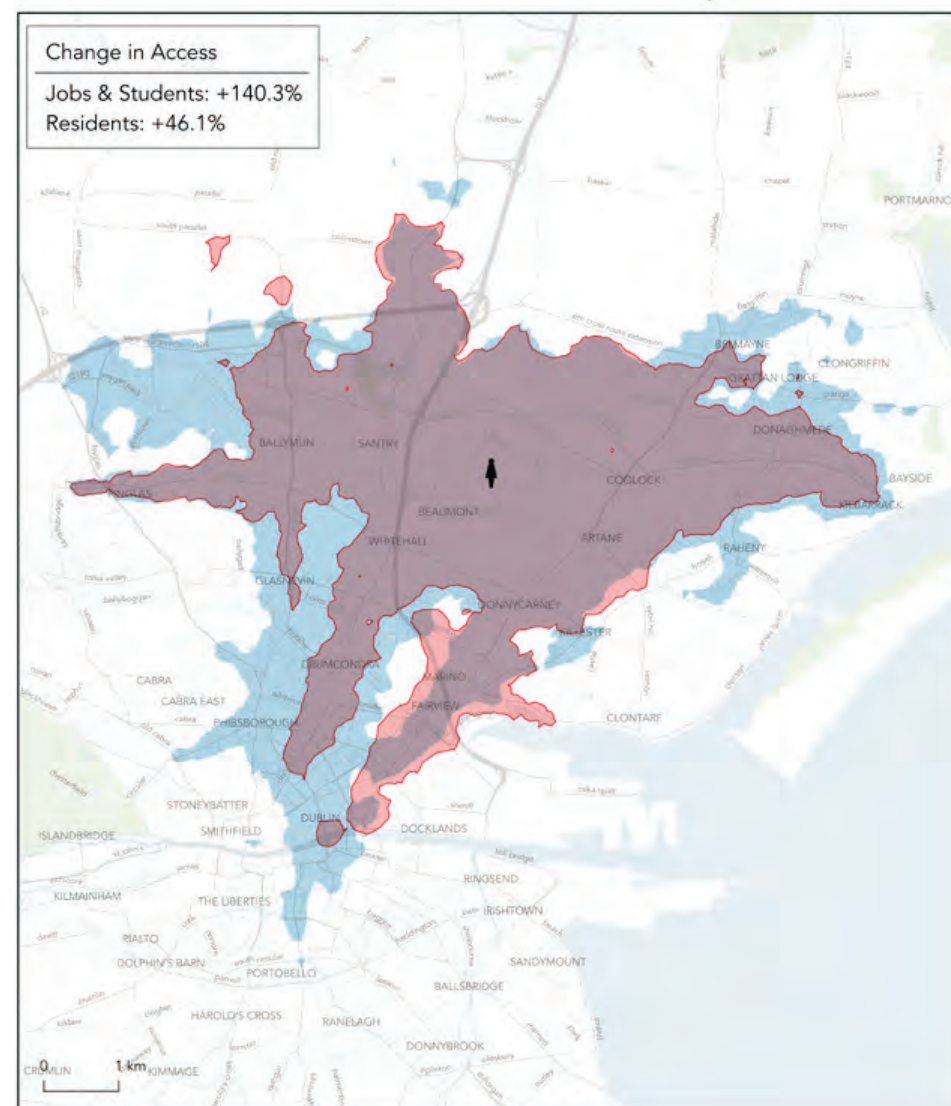
Figure 128: Examples showing how to read an isochrone map.

How far could I travel from **Beaumont Hospital** in...

...30 minutes?



...45 minutes?



...60 minutes?

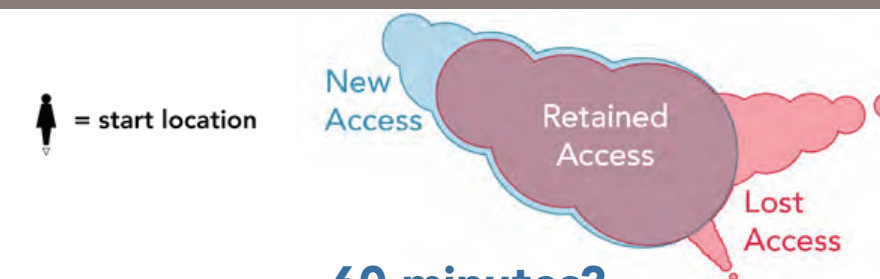
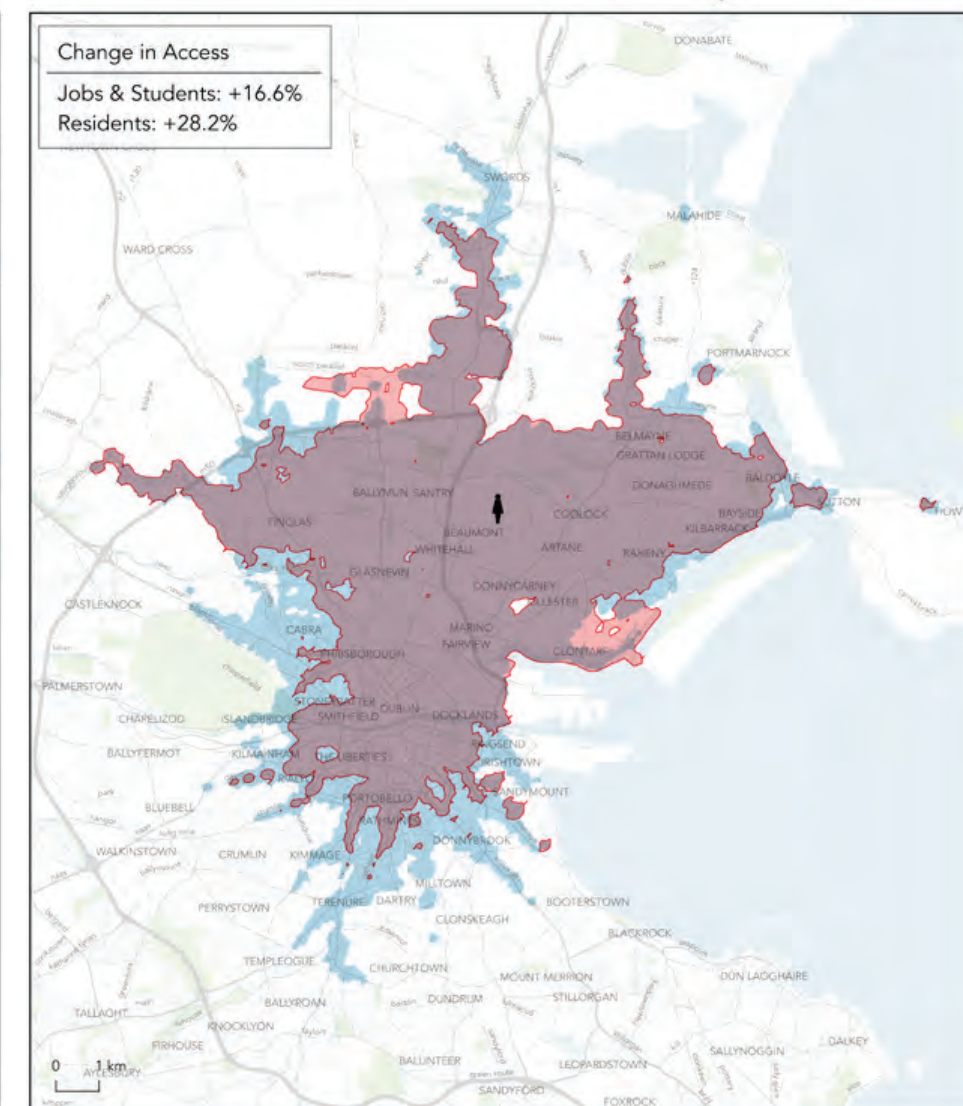


Figure 129: Isochrone maps from Beaumont Hospital. The new Route A1 would connect Beaumont Hospital to the Swords Road and City Centre, while the new orbital Route N8 would operate at least twice as frequently as existing Route 17a. However, the new Route D4 would run every 30 minutes, compared to existing route 27b every 20 minutes. As a result, travel to and from Beaumont Hospital would become faster from all areas, except the Malahide Road between City Centre and the Artane roundabout.

Notes:

1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Blanchardstown Shopping Centre** in...

...30 minutes?

...45 minutes?

...60 minutes?

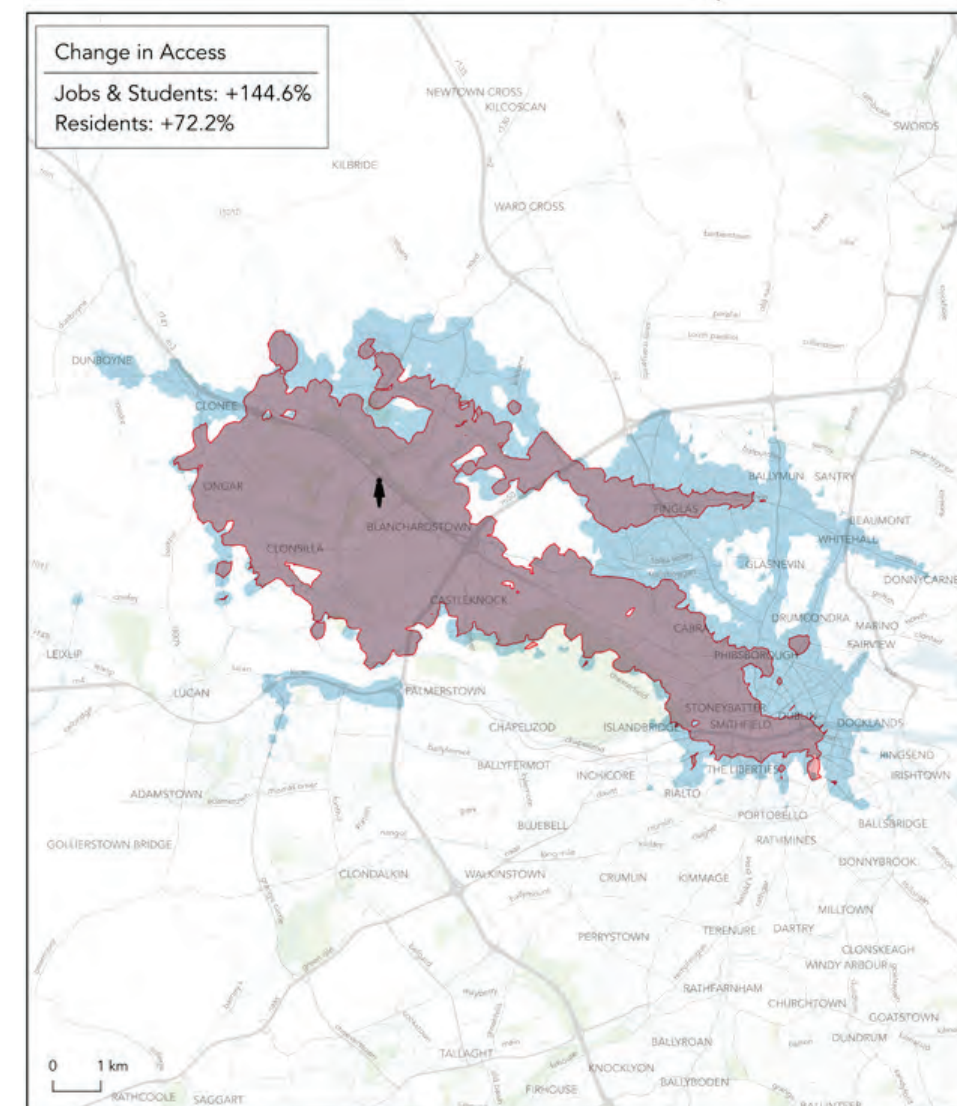
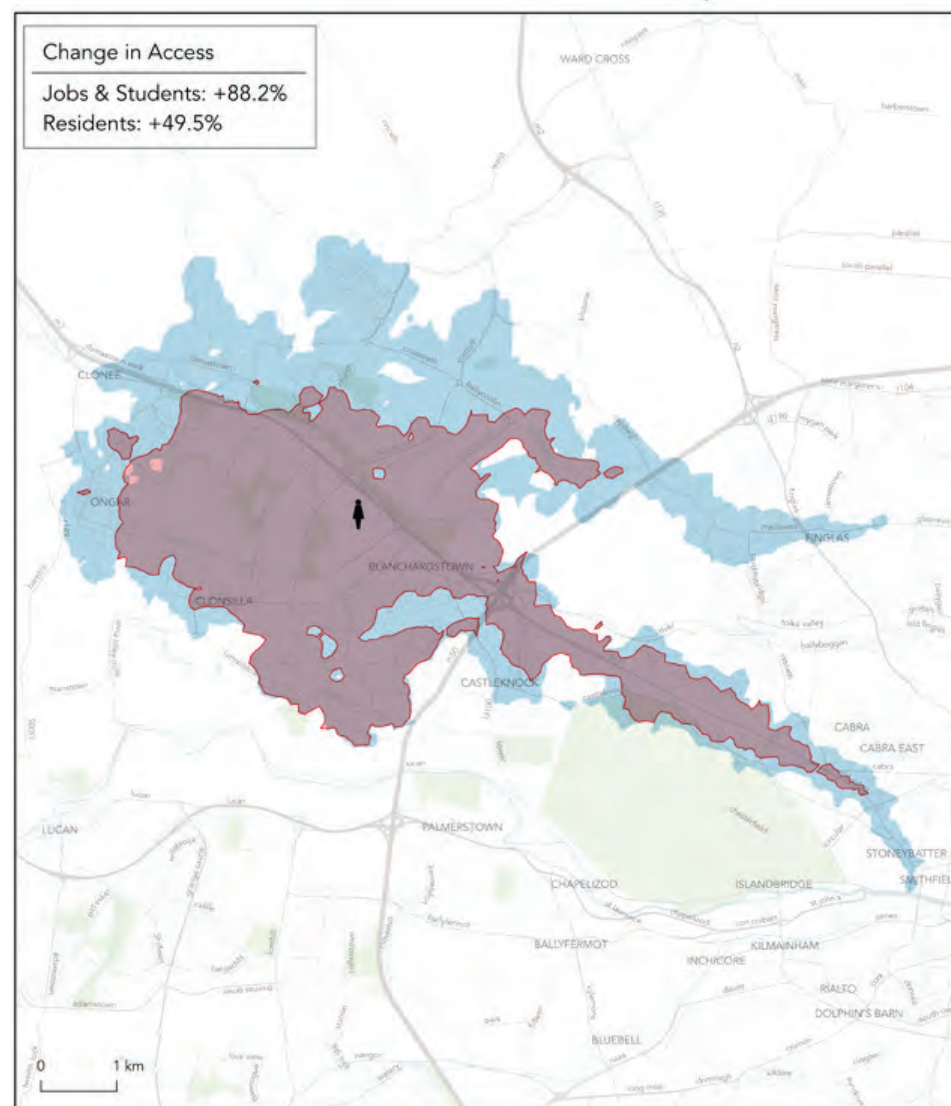
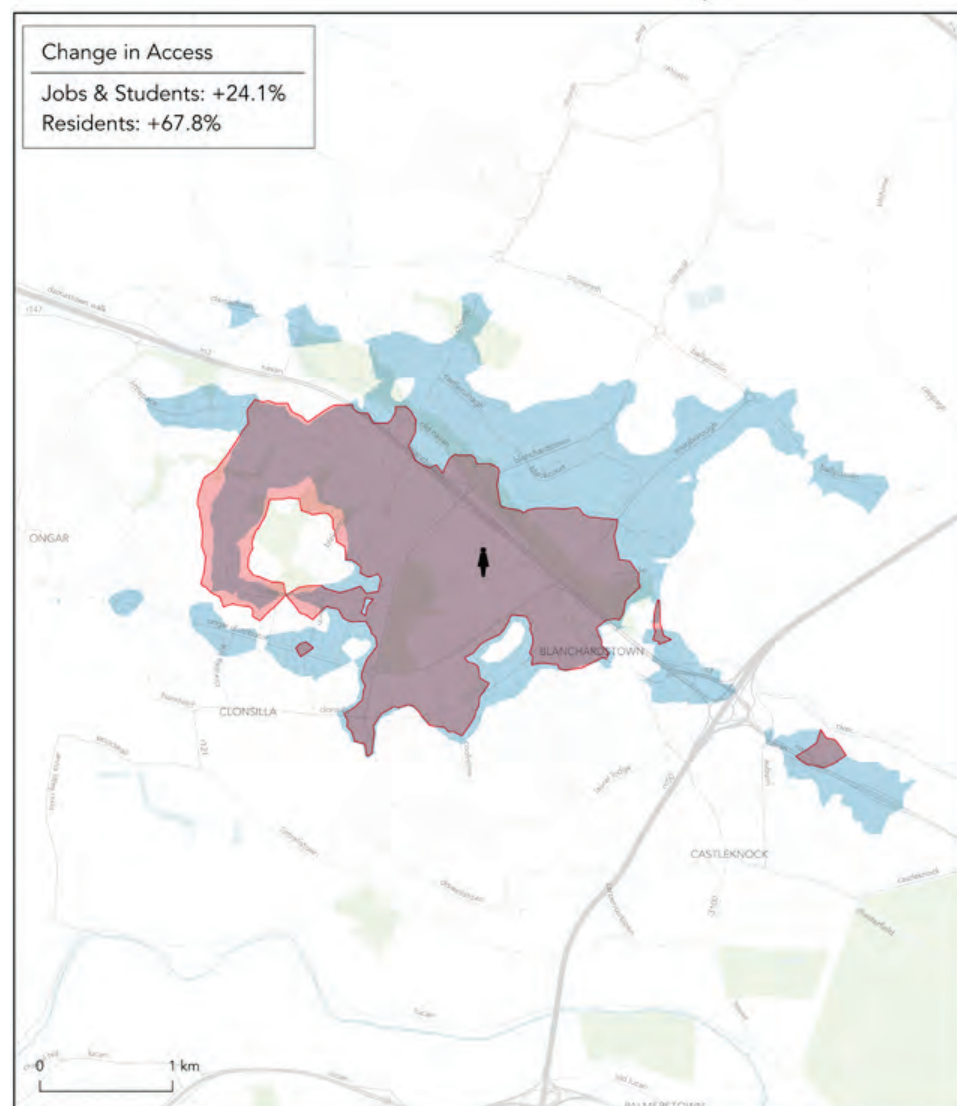


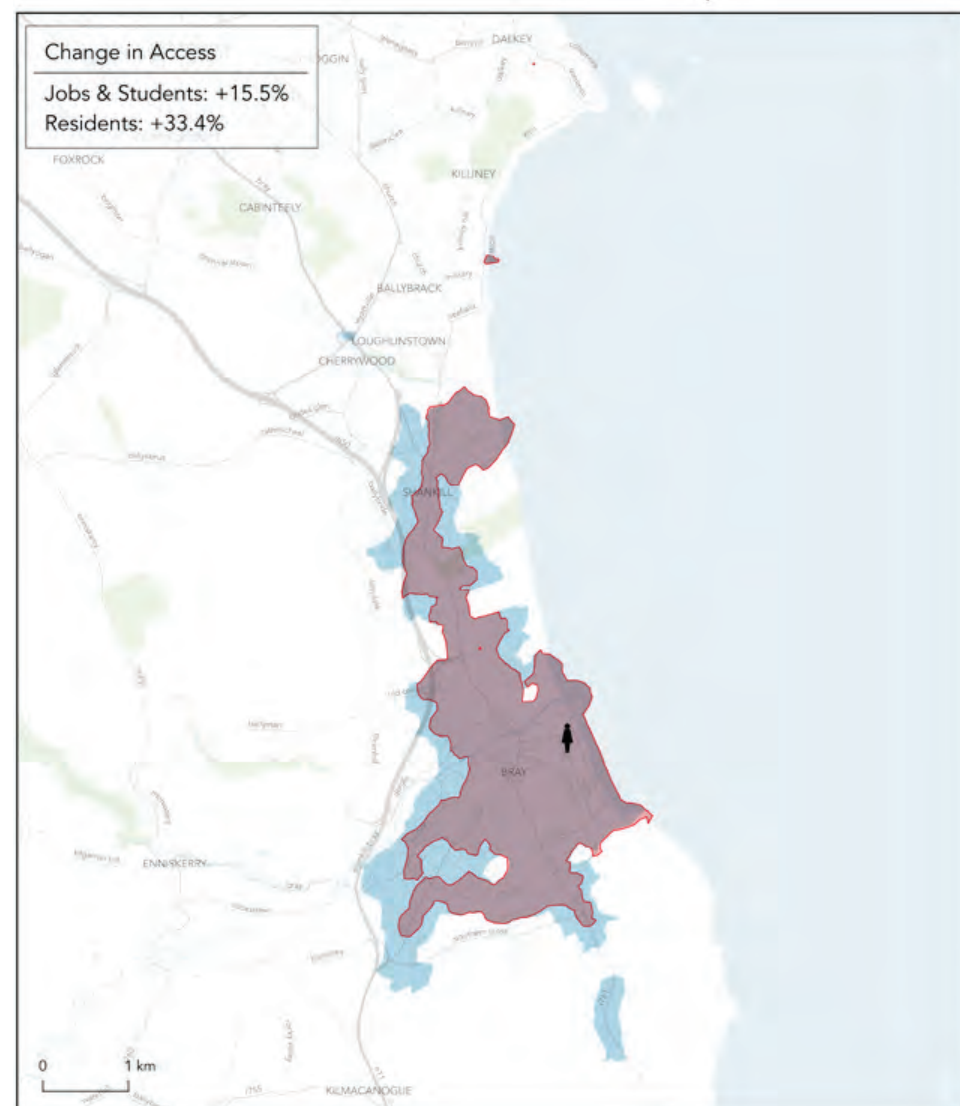
Figure 130: Isochrone maps from Blanchardstown Shopping Centre. In the proposed network, this location would become a hub for many frequent radial, orbital and local services. As a result, travel to and from the shopping centre would become more convenient from nearly every direction. The biggest difference would be between areas north and south of the N3/Navan Road. Several proposed routes (B3, 261, 263) would provide frequent service between the shopping centre and areas to the north.

Notes:

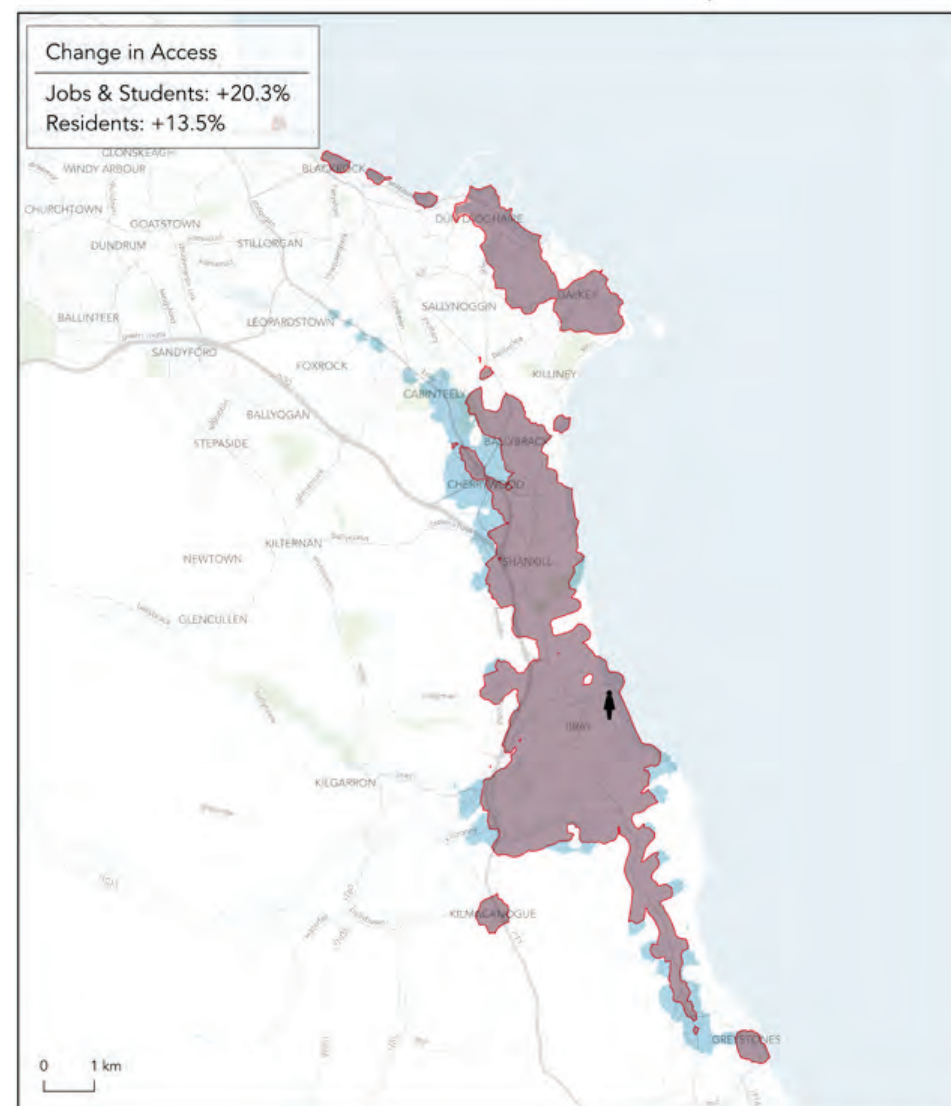
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Bray Daly Station** in...

...30 minutes?



...45 minutes?



...60 minutes?

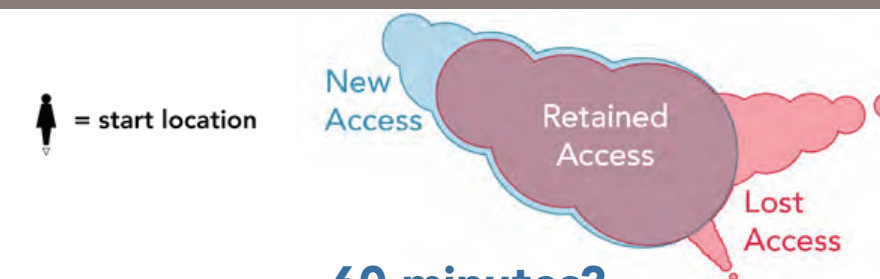
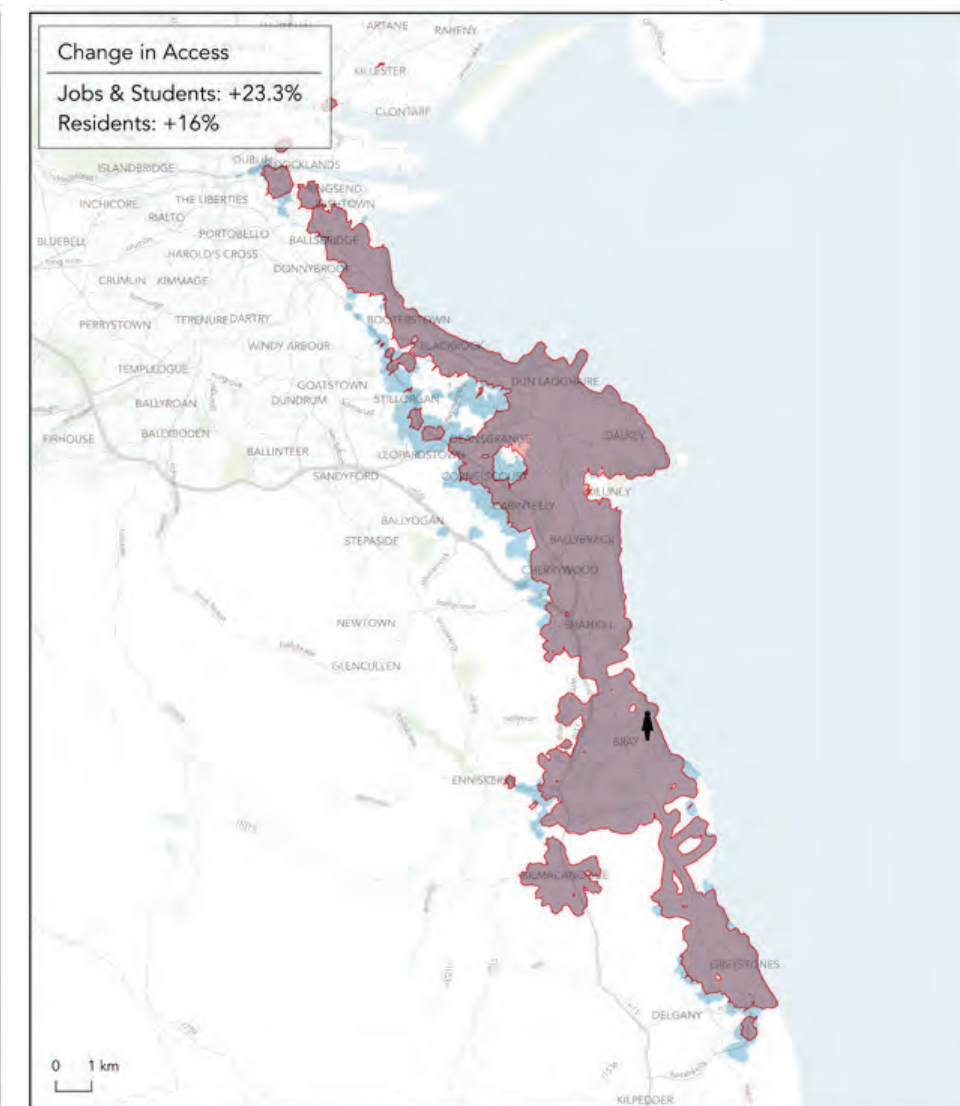
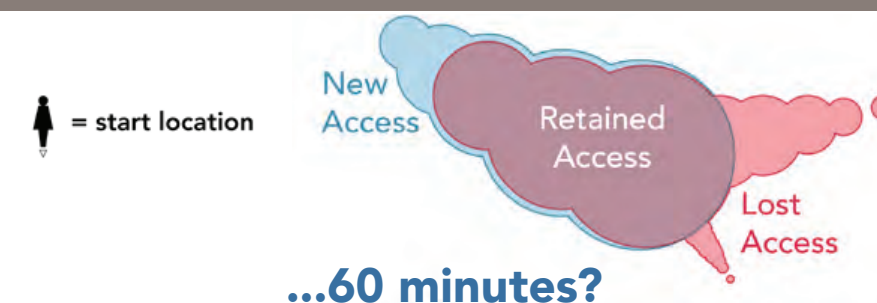


Figure 131: Isochrone maps from Bray Daly Station. Daly station would continue to be on DART, but it would now also be on Route E1 to City Centre (via the N11/Dublin Road), and on several local routes (201, 202, 211, 212, 214, 215). This would result in better connections between Bray neighbourhoods and the station.

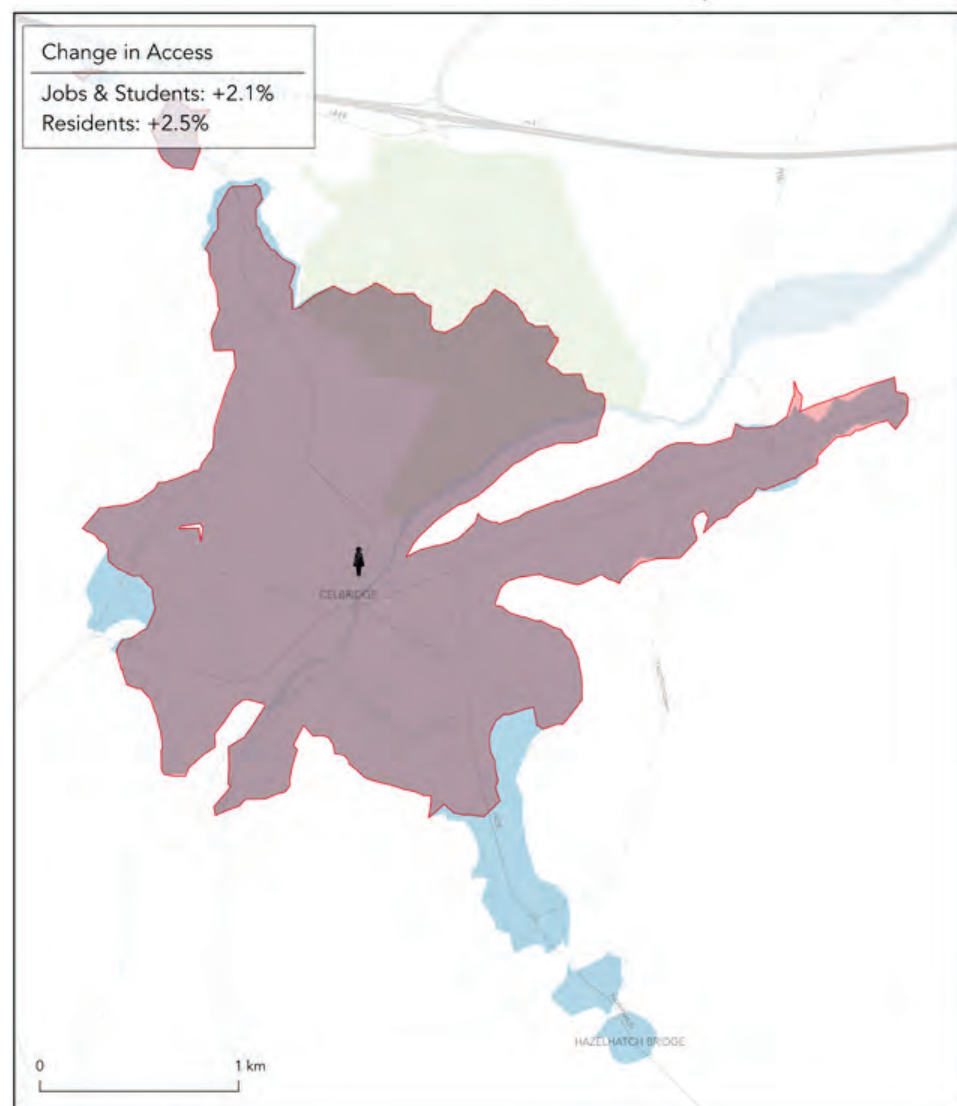
Notes:

1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

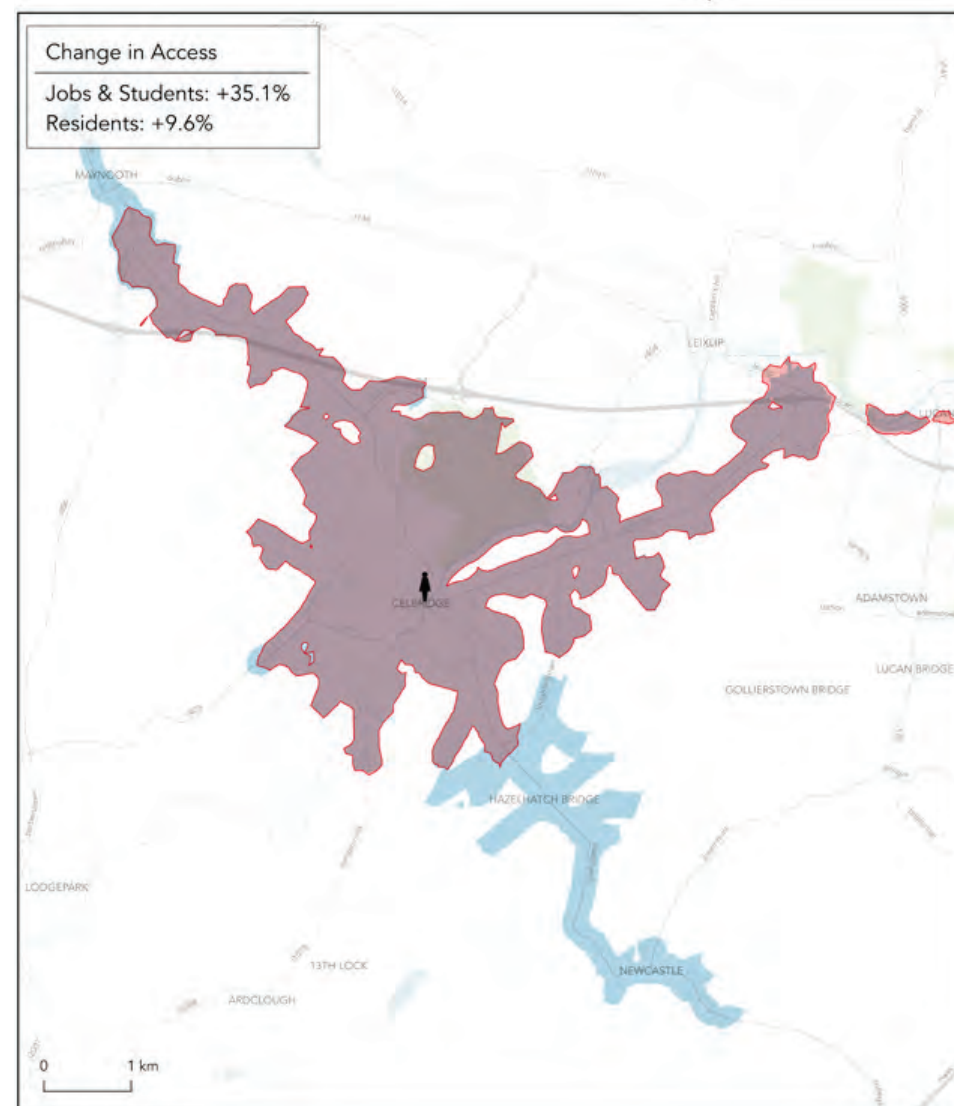
How far could I travel from **Celbridge Main Street** in...



...30 minutes?



...45 minutes?



...60 minutes?

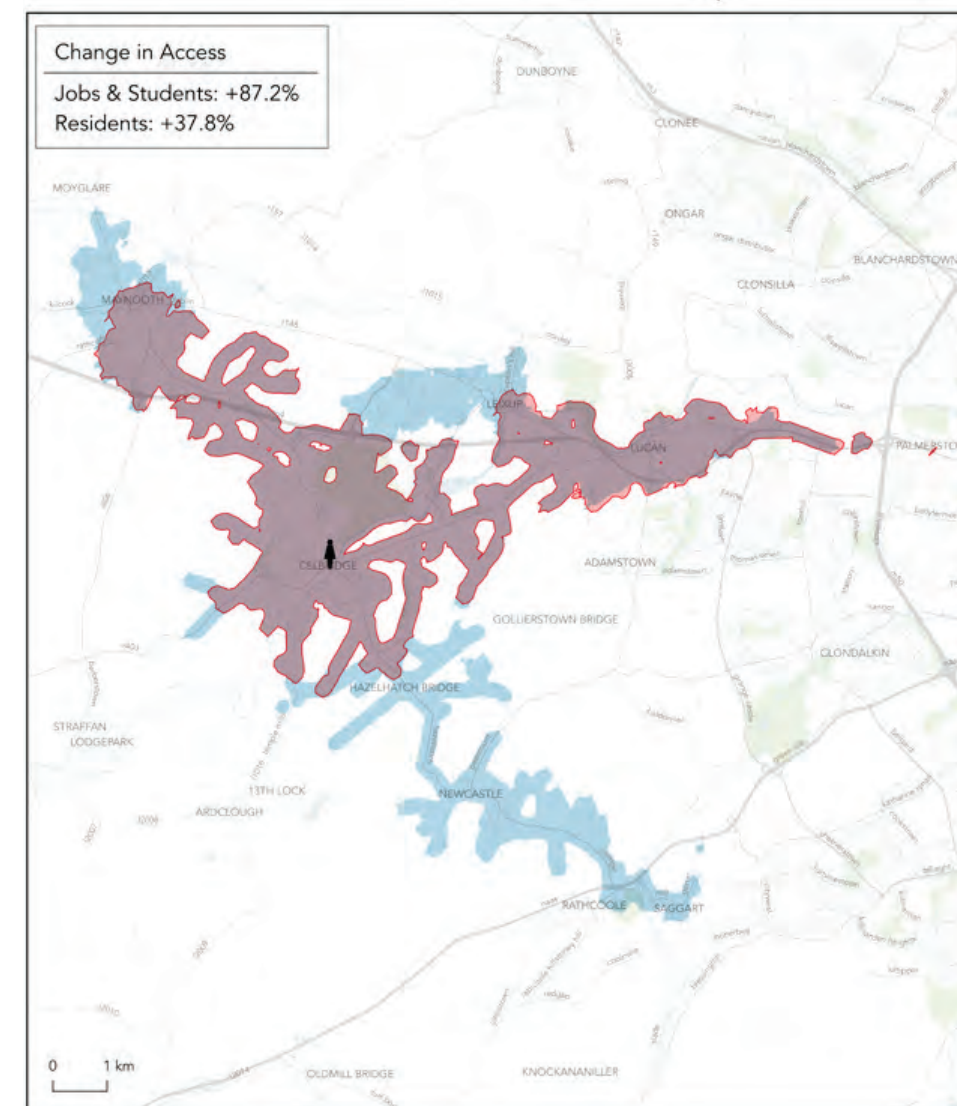


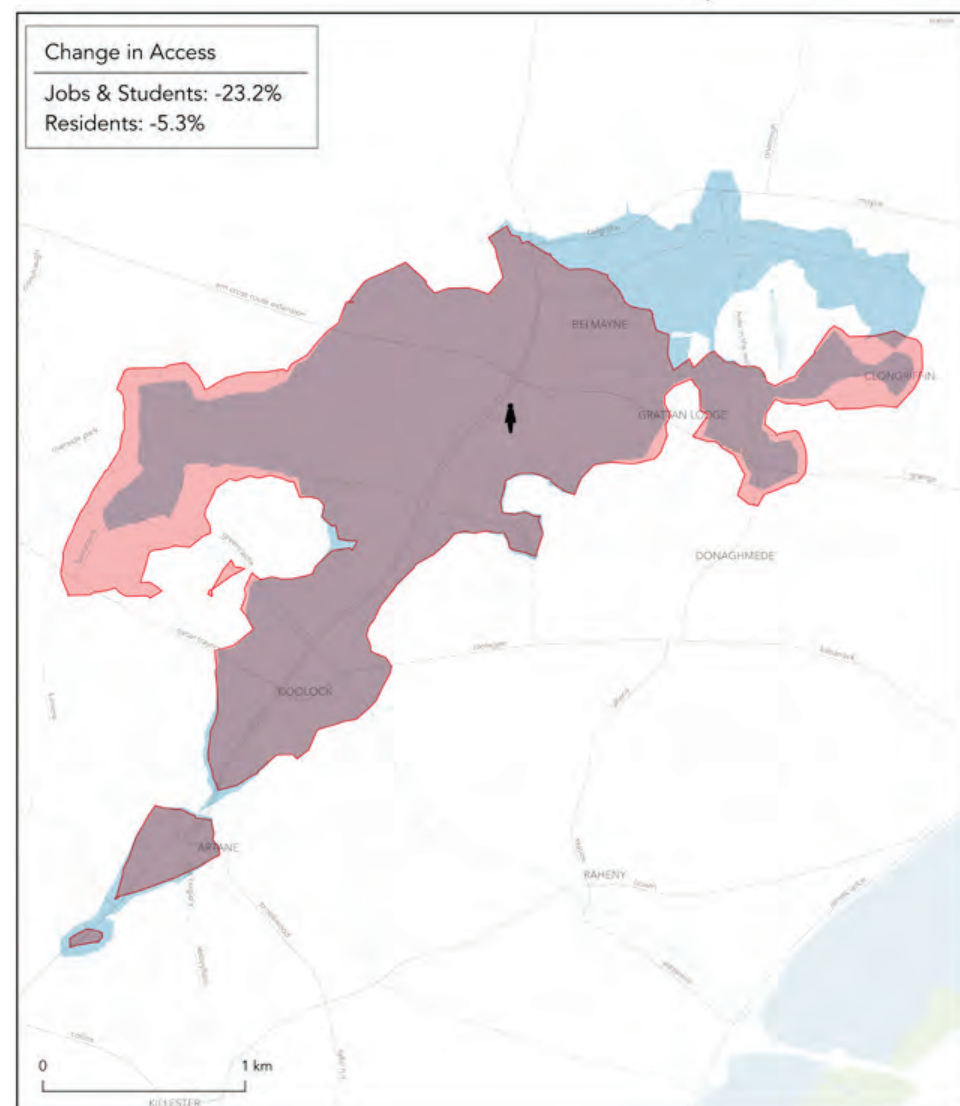
Figure 132: Isochrone maps from Celbridge Main Street. Service frequency and speed in the direction of City Centre would not change. However, a new orbital Route W8 would provide new service every 30 minutes in the direction of Citywest and Tallaght, and a new local service (259) would provide a direct trip to Leixlip every 30 minutes via Glen Easton.

Notes:

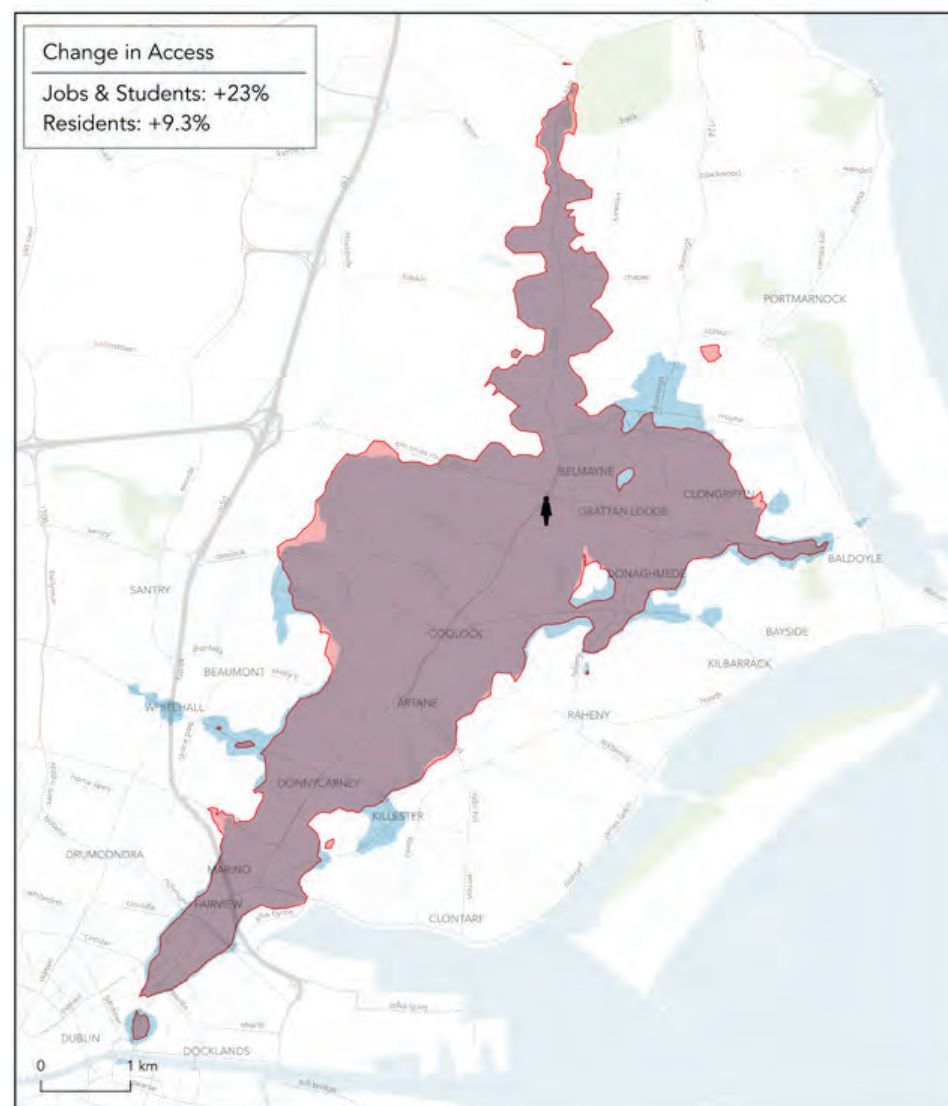
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak conditions differ at this location due to express services (higher frequency and speed to City Centre).
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Clare Hall Shopping Centre** in...

...30 minutes?



...45 minutes?



...60 minutes?

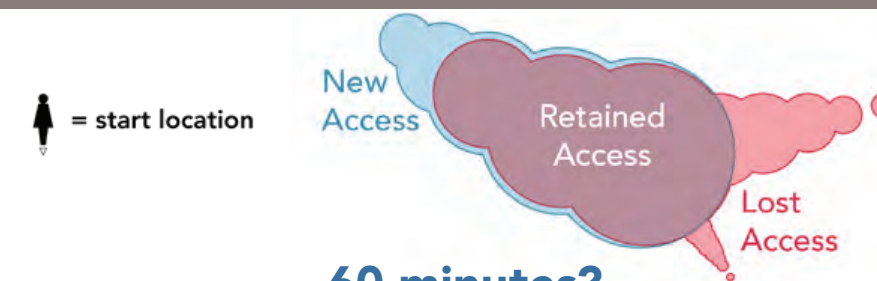
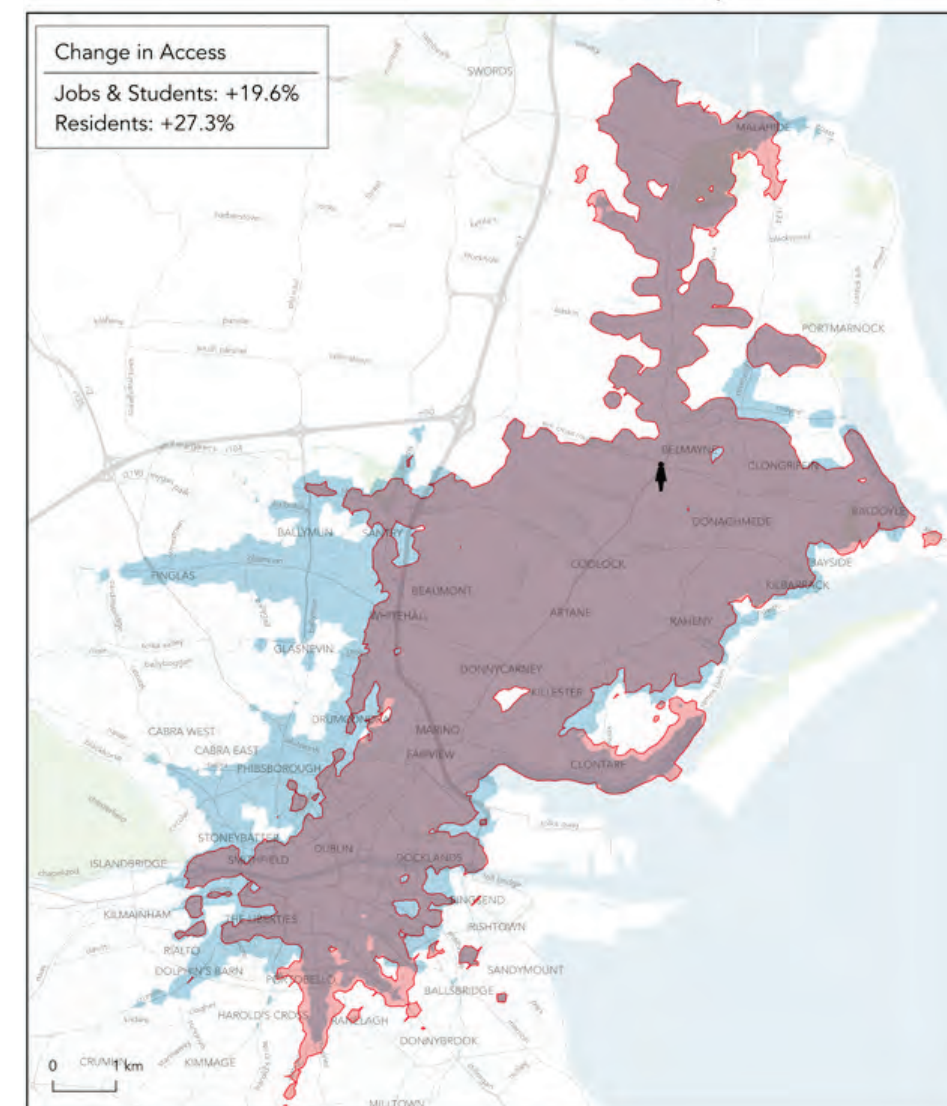


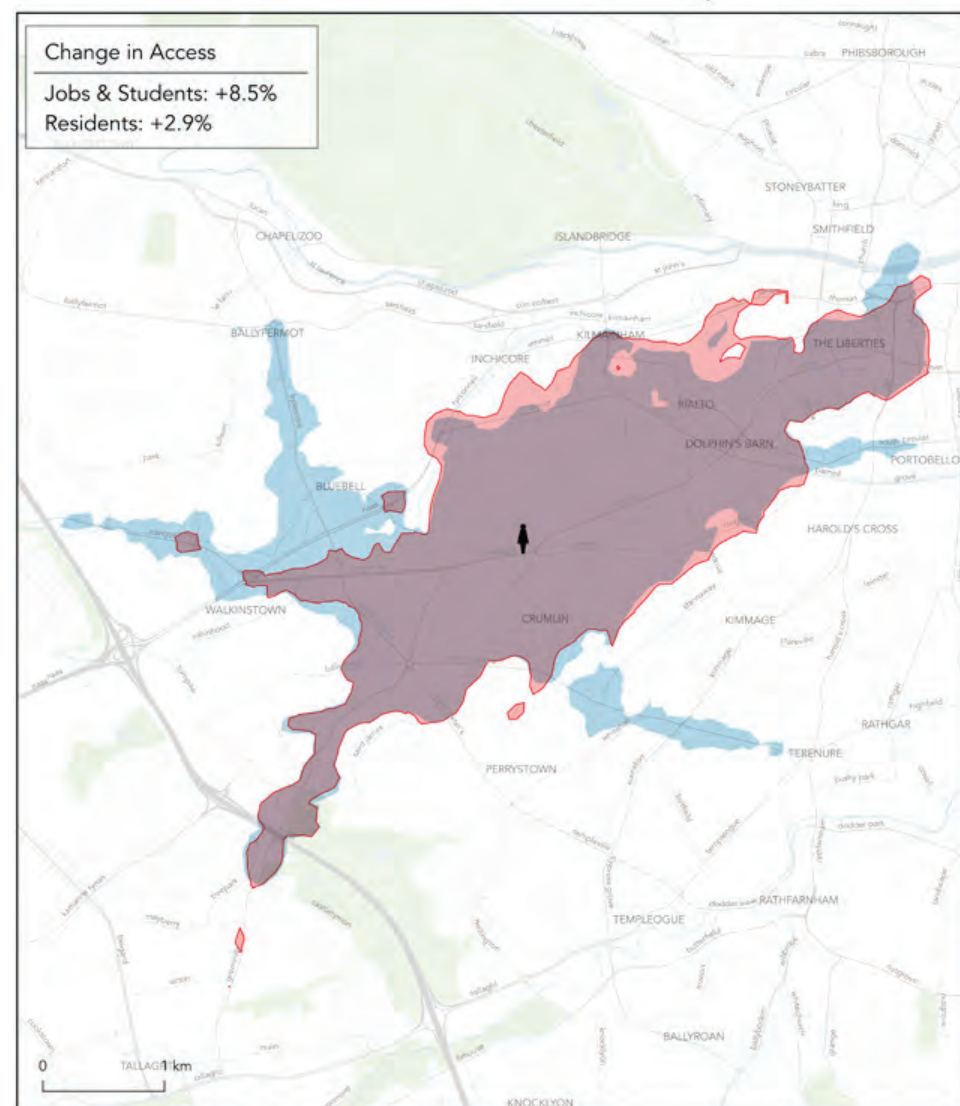
Figure 133: Isochrone maps from Clare Hall Shopping Centre. This location would in future be served by most D buses (D1, D2, D3) and Routes 81 and 280. Because Route D2 would be less frequent than the existing 27, there would be a slight decrease in total access between this location and Darndale. However, at the 45 and 60 minute horizons, connections from D buses to the new frequent orbital Routes O, N4 and N8 would open up accesst to new parts north Dublin City. Concentrating frequent service on D buses means that travel to the Crumlin Road on the south side would be faster by up to 5 minutes, but travel to the Rathmines Road would require interchange, and so would be slower by 3-5 minutes.

Notes:

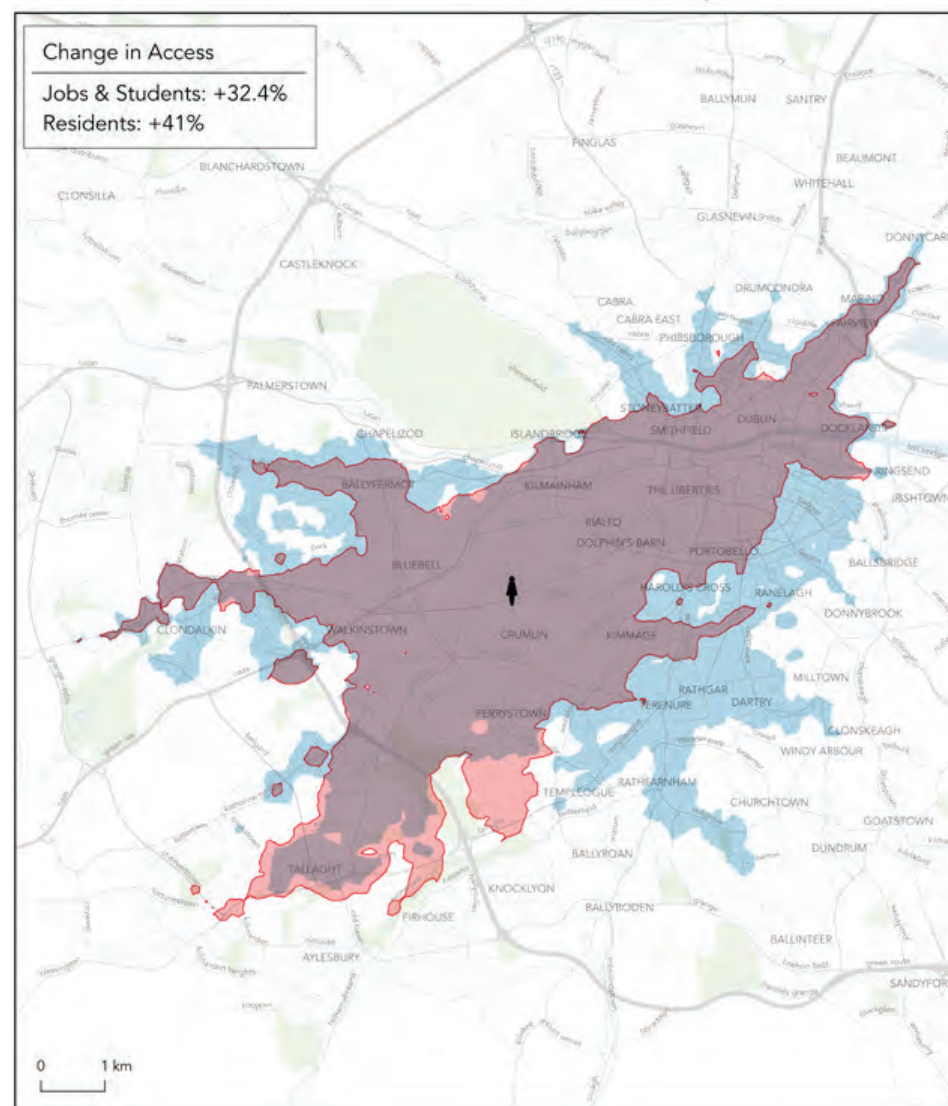
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Crumlin Hospital** in...

...30 minutes?



...45 minutes?



...60 minutes?

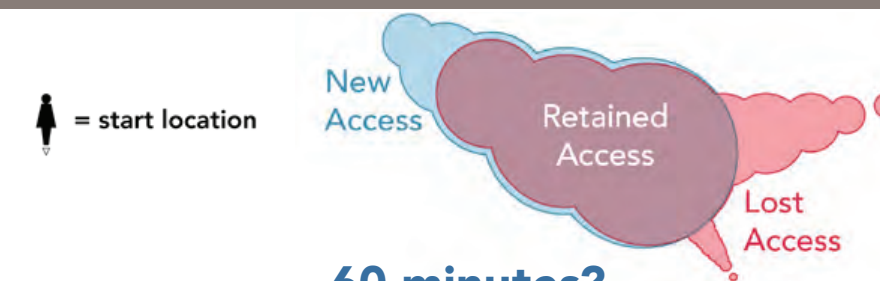
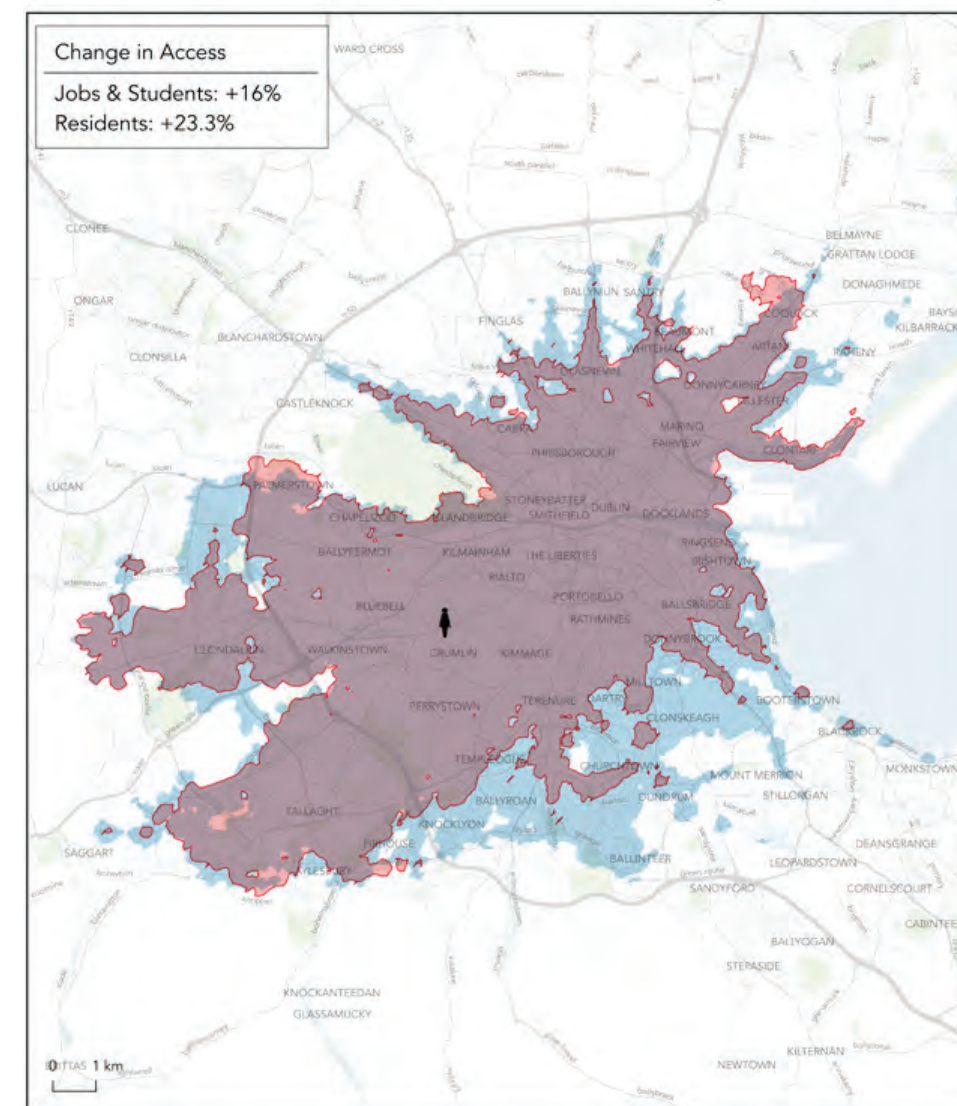


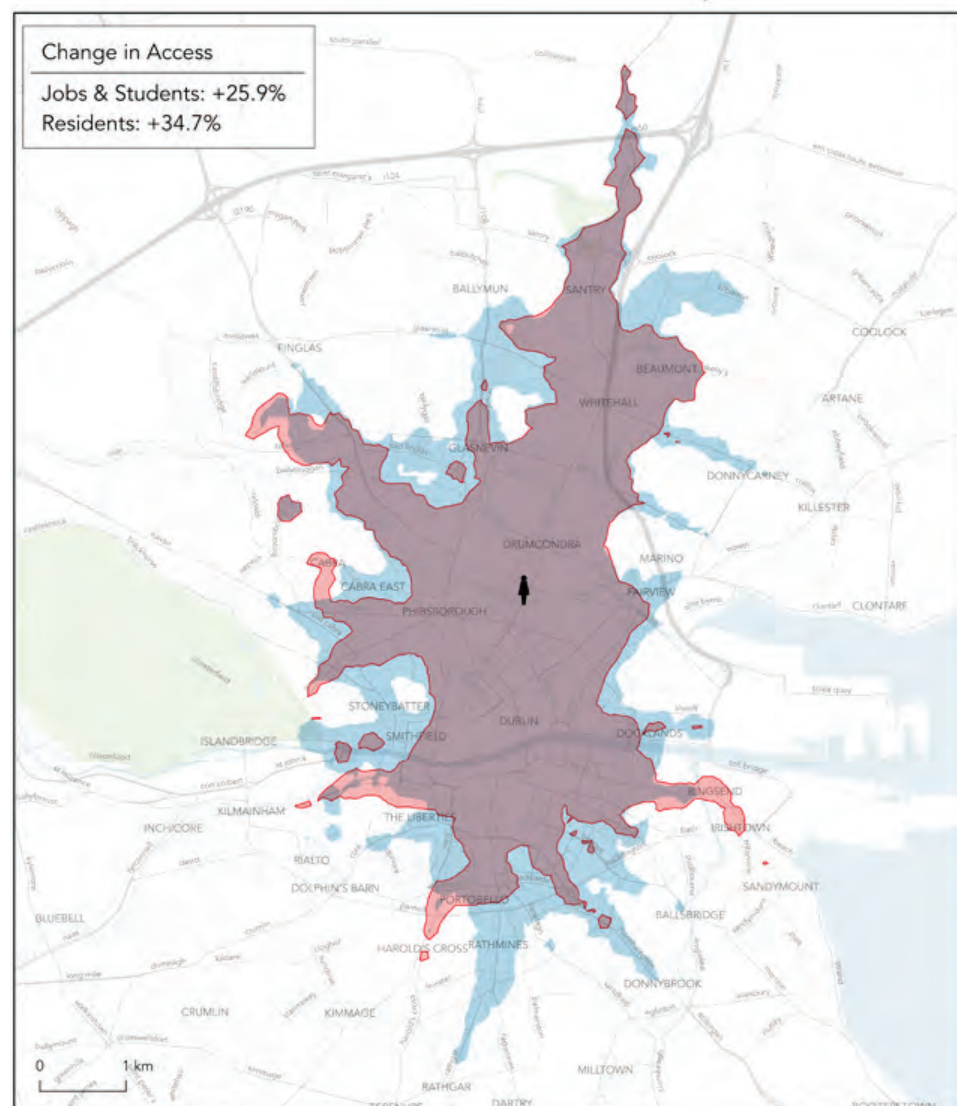
Figure 134: Isochrone maps from Crumlin Hospital. The positive impact of new orbital Route S4 is evident at all three time scales, significantly expanding the range of south Dublin destinations reachable to/from Crumlin Hospital. There is also a slight improvement in travel to and through City Centre, due to slightly higher frequencies on the Crumlin Road (D spine) and interchange to other high-frequency spines in the City Centre. At the same time, access would decline to/from certain directions due to slightly lower frequencies (to Tallaght, proposed D2/4/5 vs. existing 27/77a) or significant routing changes requiring interchange (to Perrystown and Templeogue, proposed S4-to-F2 interchange, vs. existing 150).

Notes:

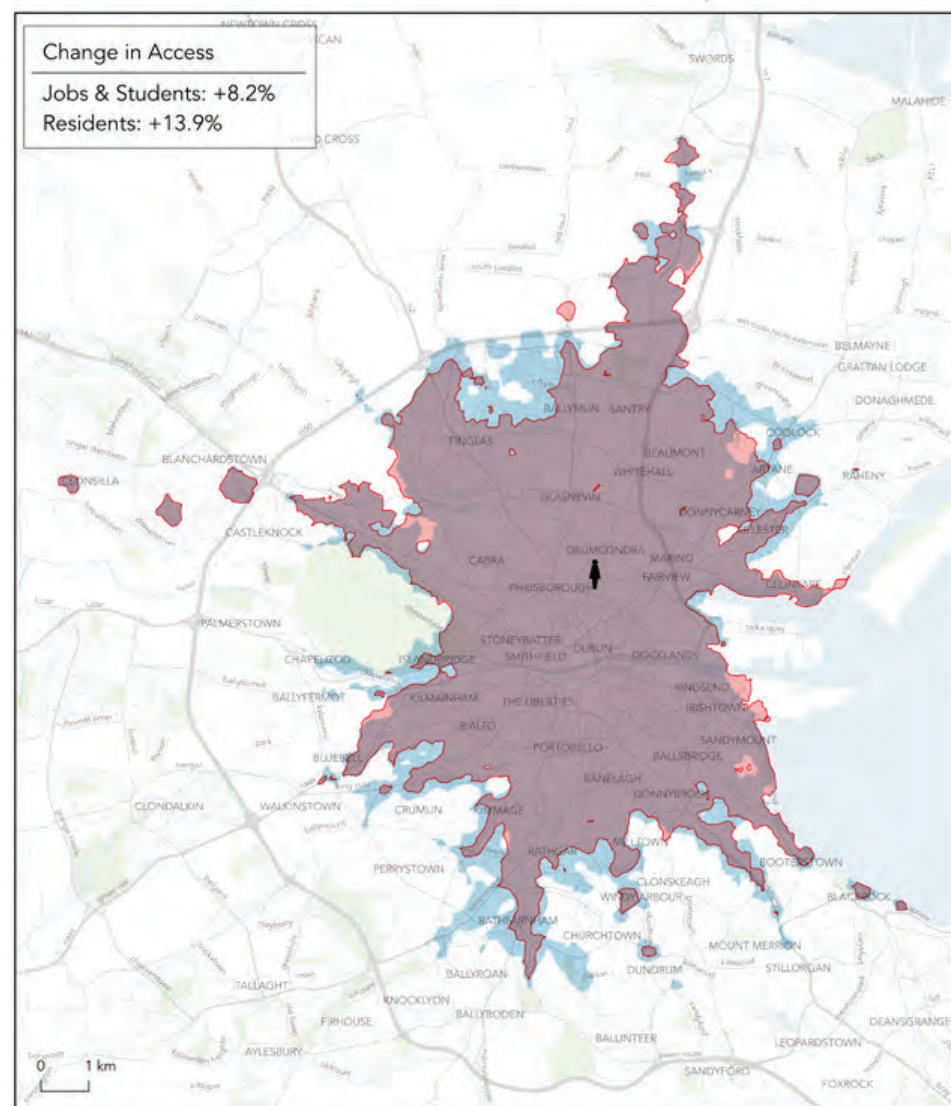
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Drumcondra Station** in...

...30 minutes?



...45 minutes?



...60 minutes?

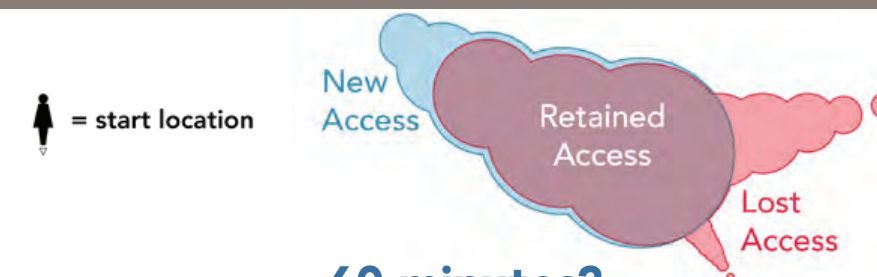
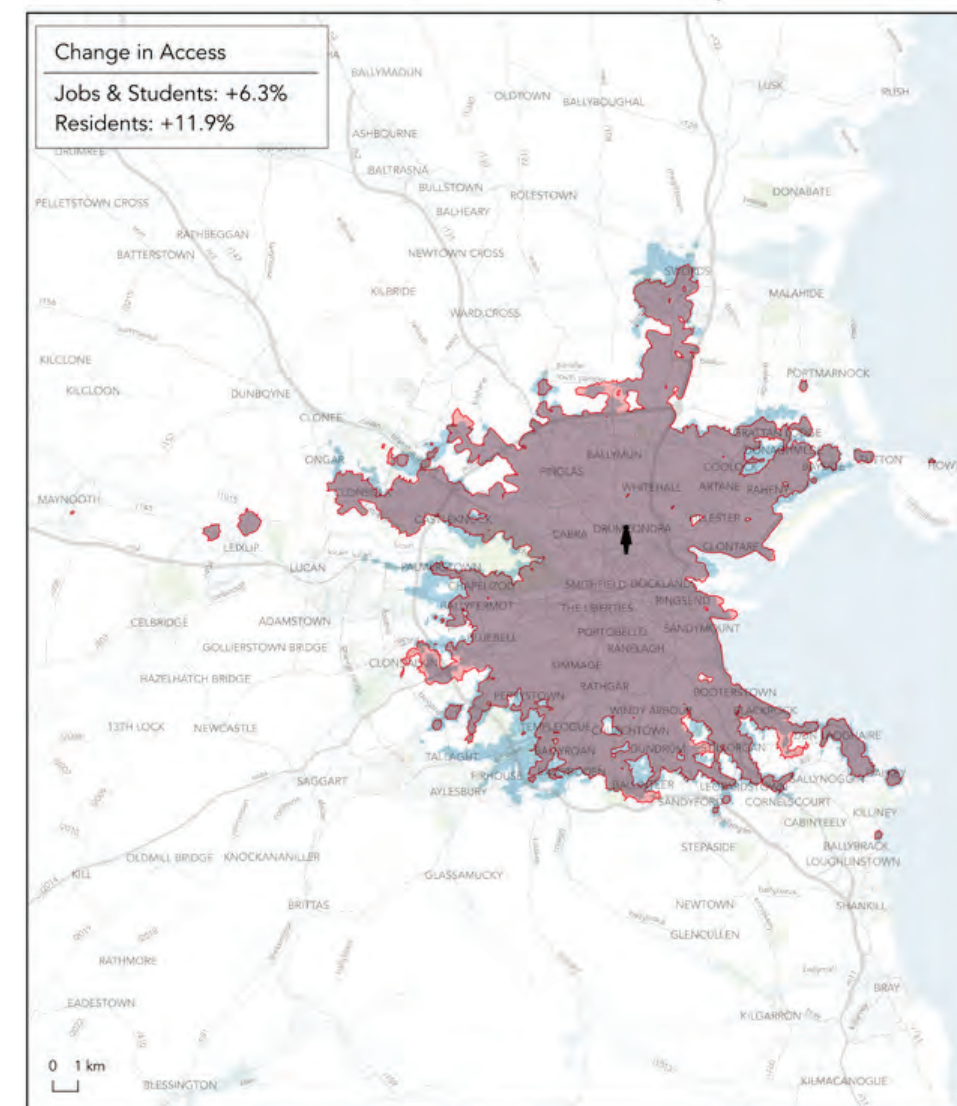


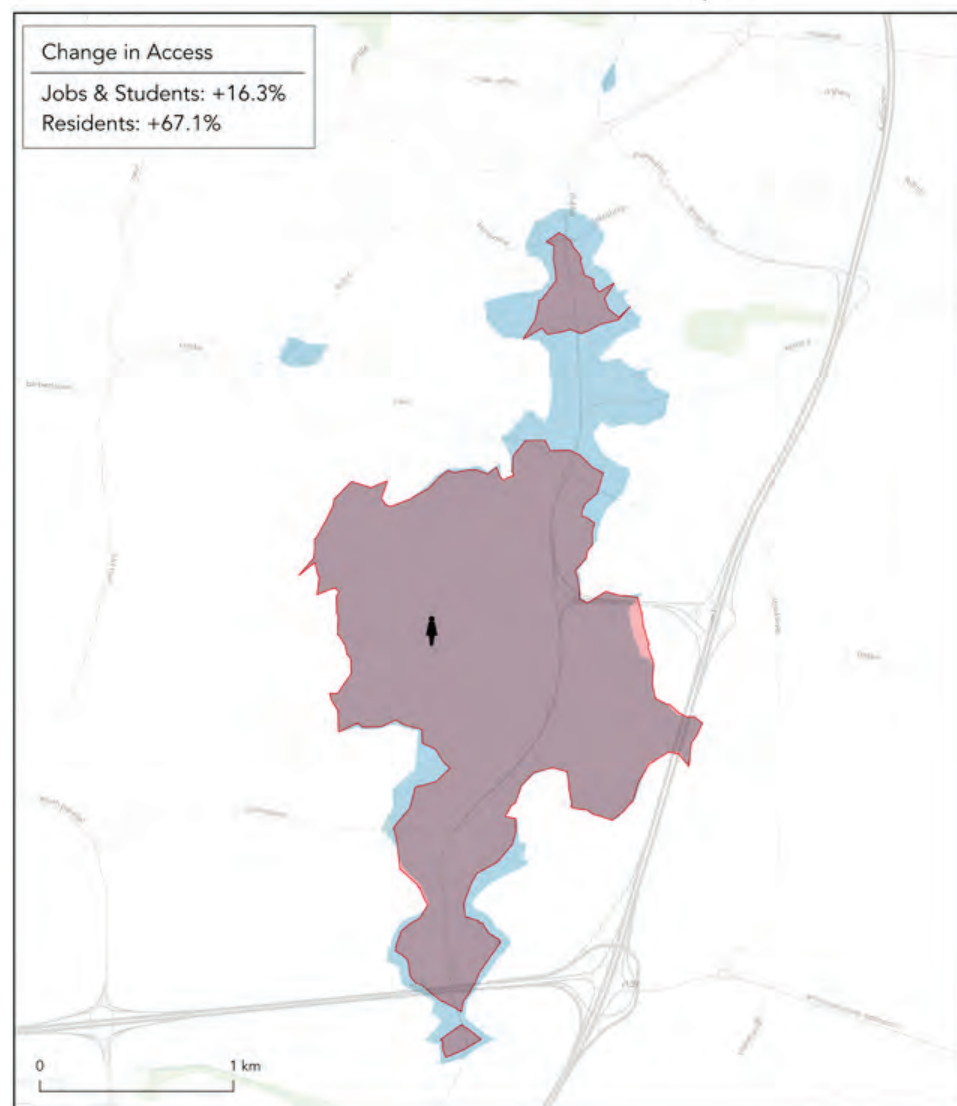
Figure 135: Isochrone maps from Drumcondra Station. This is a central and highly accessible location today, and would become even more so as a result of the proposed changes to the bus network, because Drumcondra would be served at extremely high frequencies by both the A and F spines, while also being located near the orbital Route O. The positive impact is particularly noticeable at the 30 minute time scale. However, there would be slight increases in travel time between this location and areas where new interchanges would be required, notably Sandymount and Inchicore.

Notes:

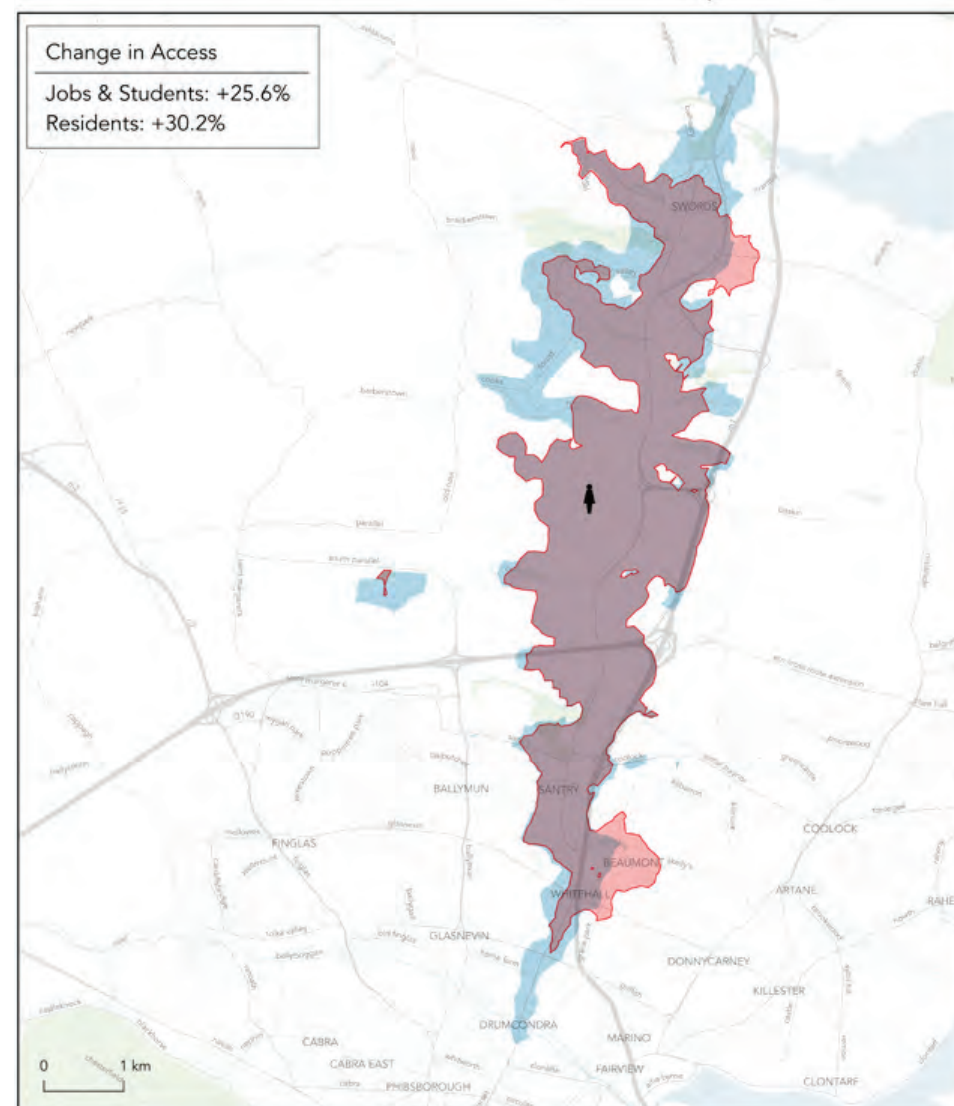
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Dublin Airport** in...

...30 minutes?



...45 minutes?



...60 minutes?

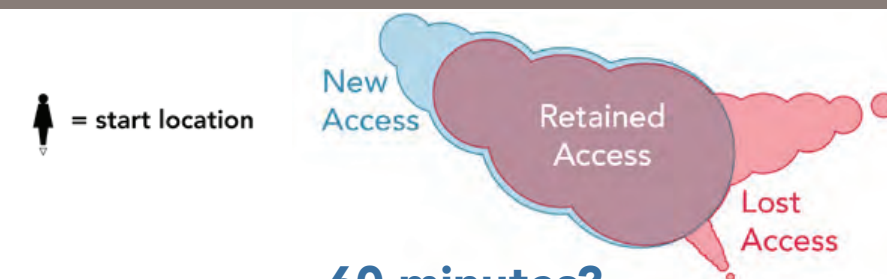
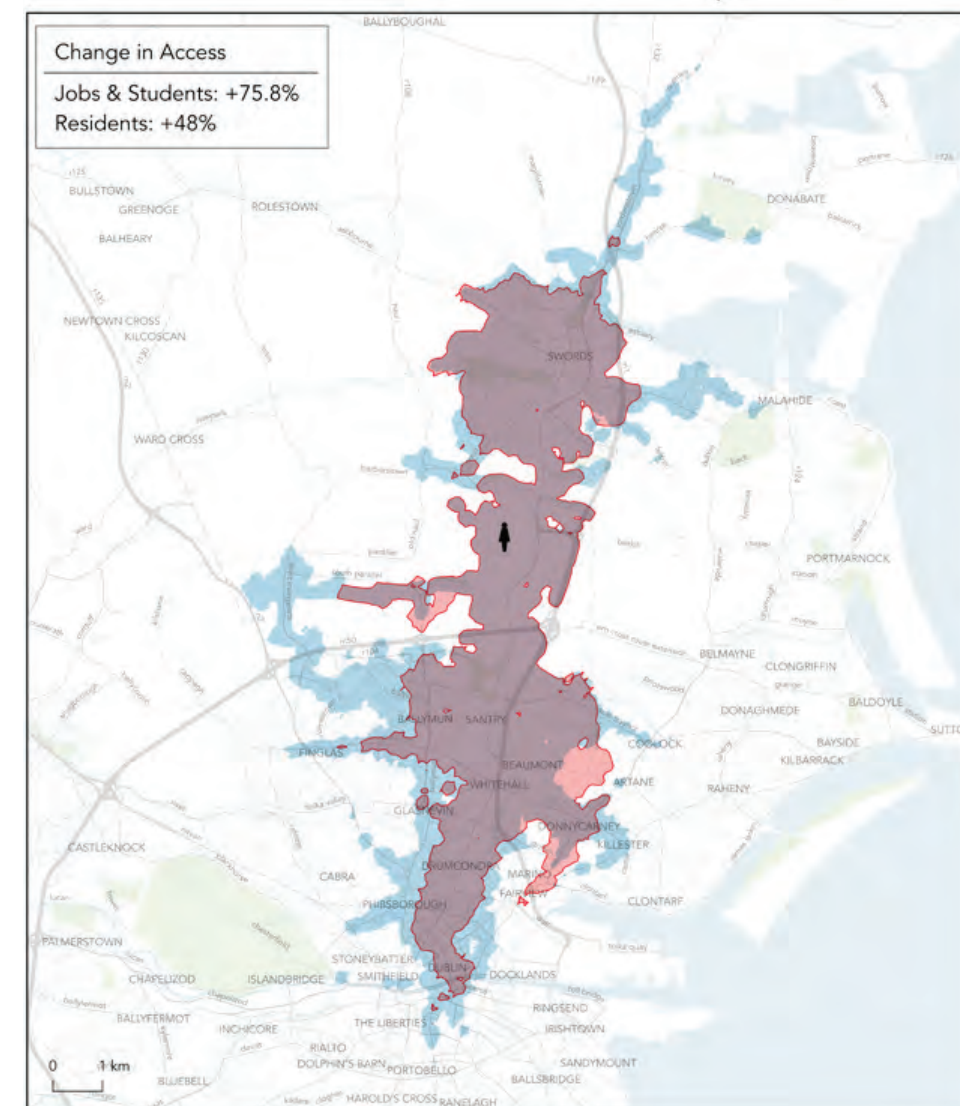


Figure 136: Isochrone maps from Dublin Airport. At the 30 and 45 minute time horizons, these show improved travel times due to higher frequency to River Valley (proposed Route 281) and central and north Swords (proposed Routes 283 and 285). Service to City Centre would also be accelerated by a few minutes because proposed Route A2 would not deviate off the Swords Road in Beaumont. At the 60 minute horizon, orbital Routes O, N4 and N8 would provide improved access to parts of north Dublin City beyond Swords Road.

Notes:

1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Dublin City University - Main Campus** in...

...30 minutes?

...45 minutes?

...60 minutes?

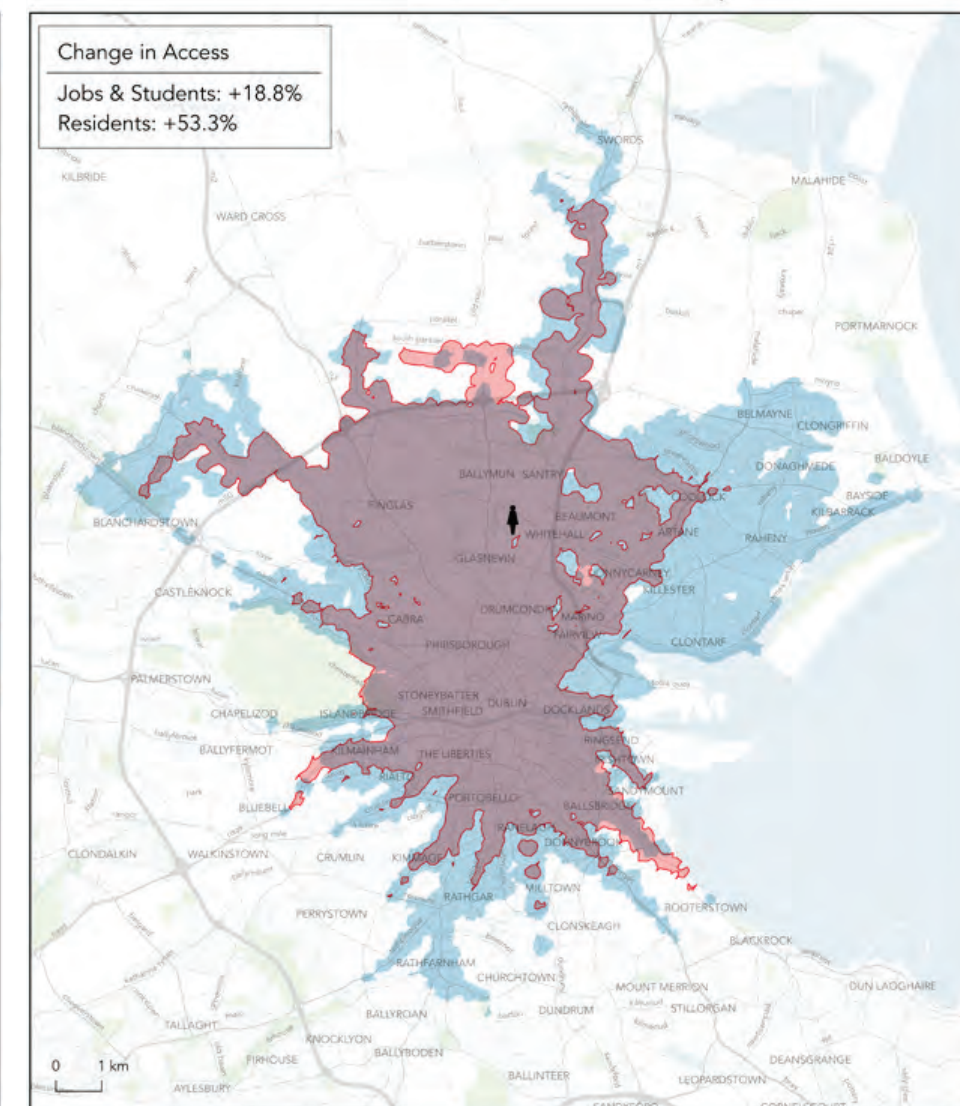
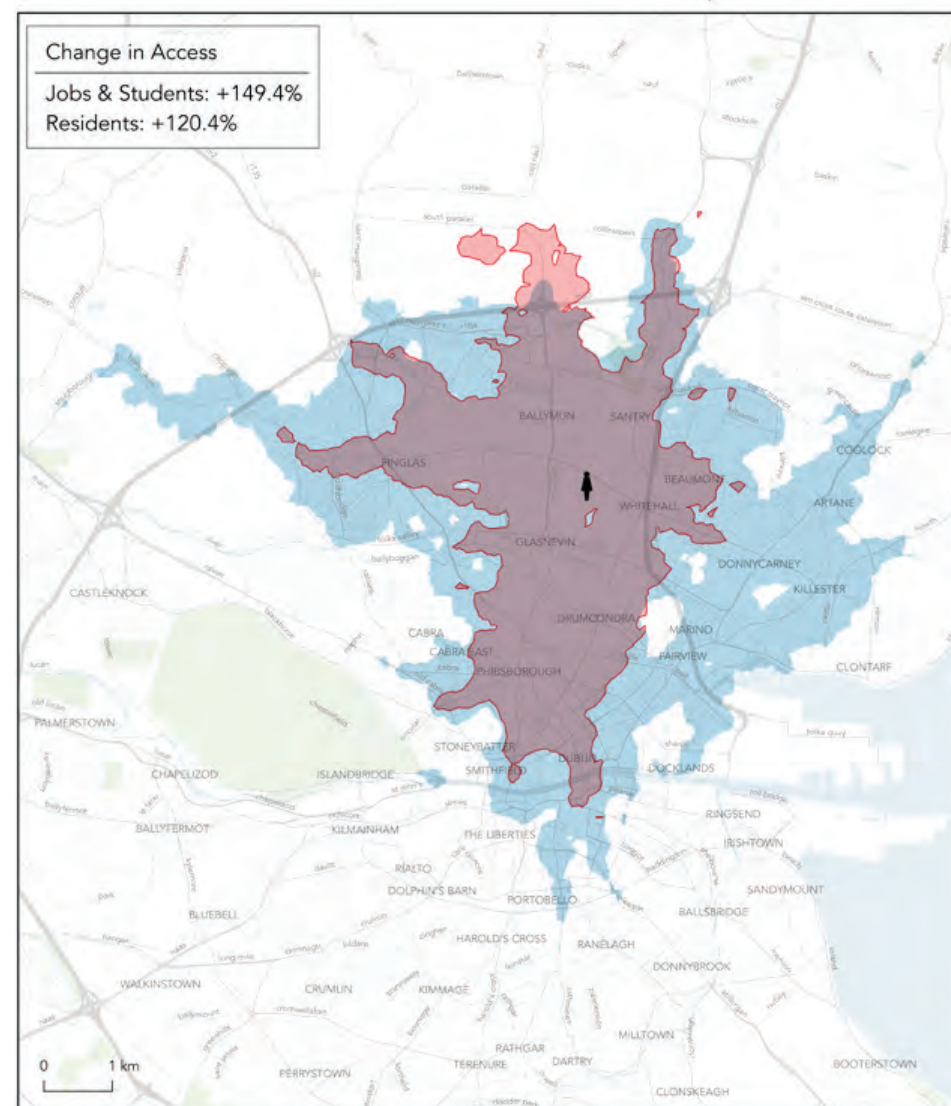
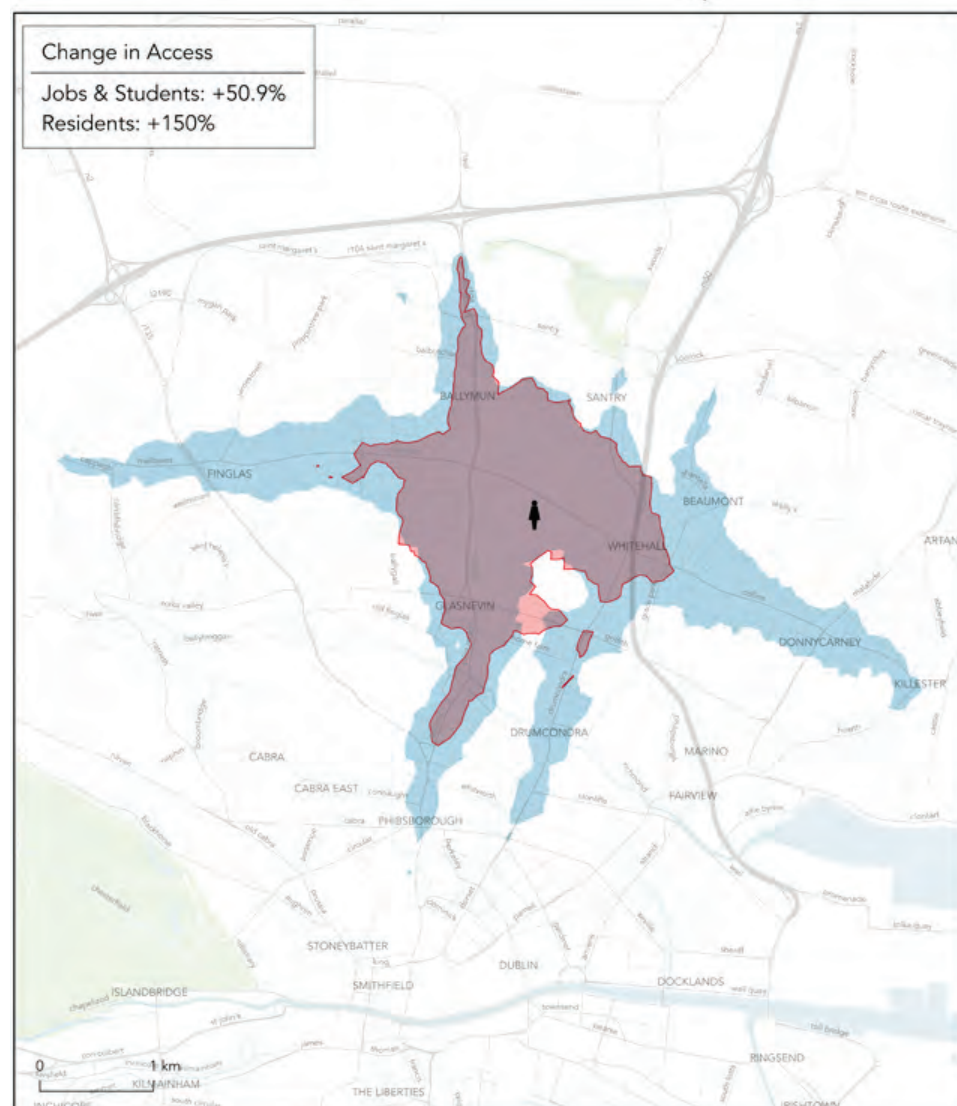
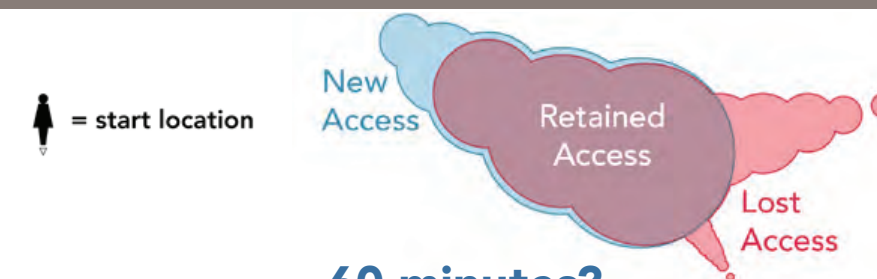


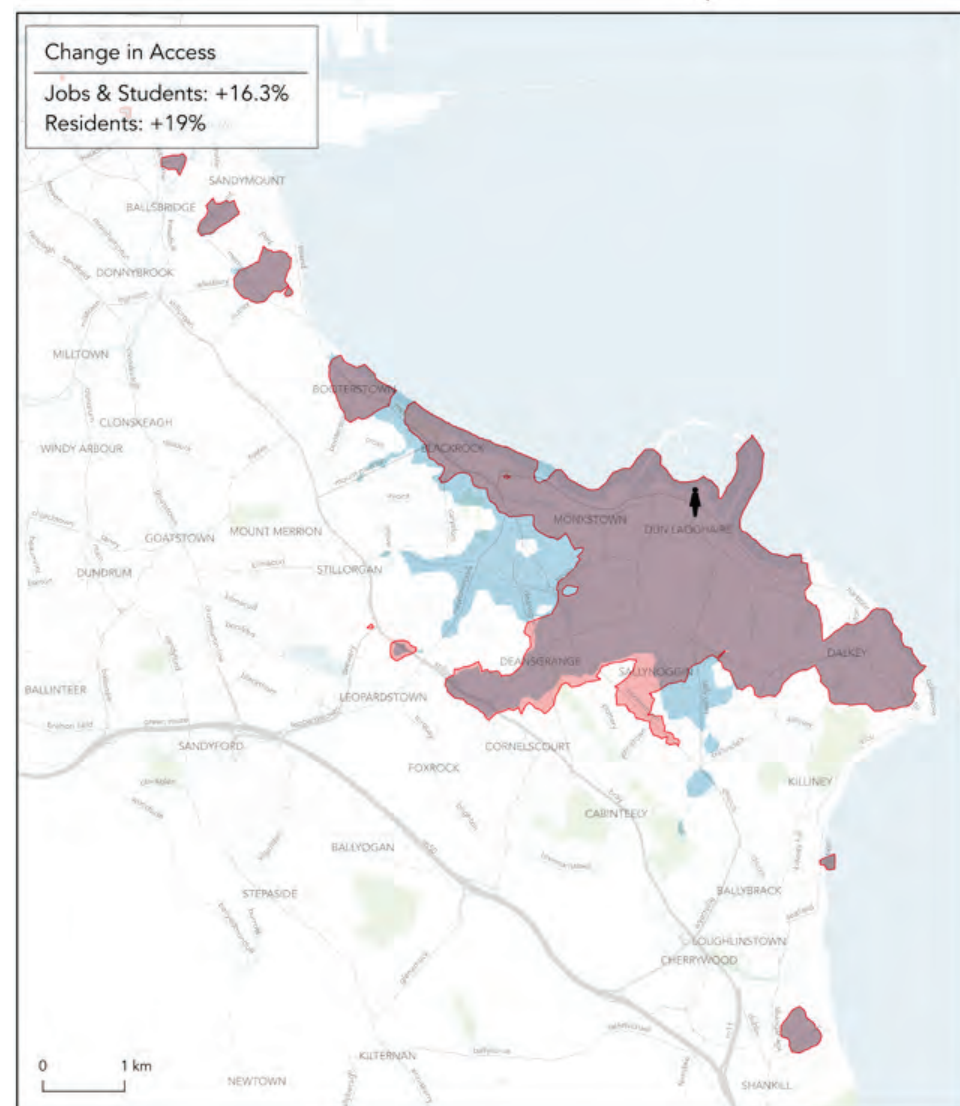
Figure 137: Isochrone maps from Dublin City University. DCU would be served by more frequent service on the Ballymun Road (E Spine), and new frequent radial service (Route A3) to the Swords Road and new frequent orbital service (Route N4) along Collins Avenue. As a result, access would improve significantly in all directions. In other words, nearly all public transport trips to Dublin City University would take significantly less time.

Notes:

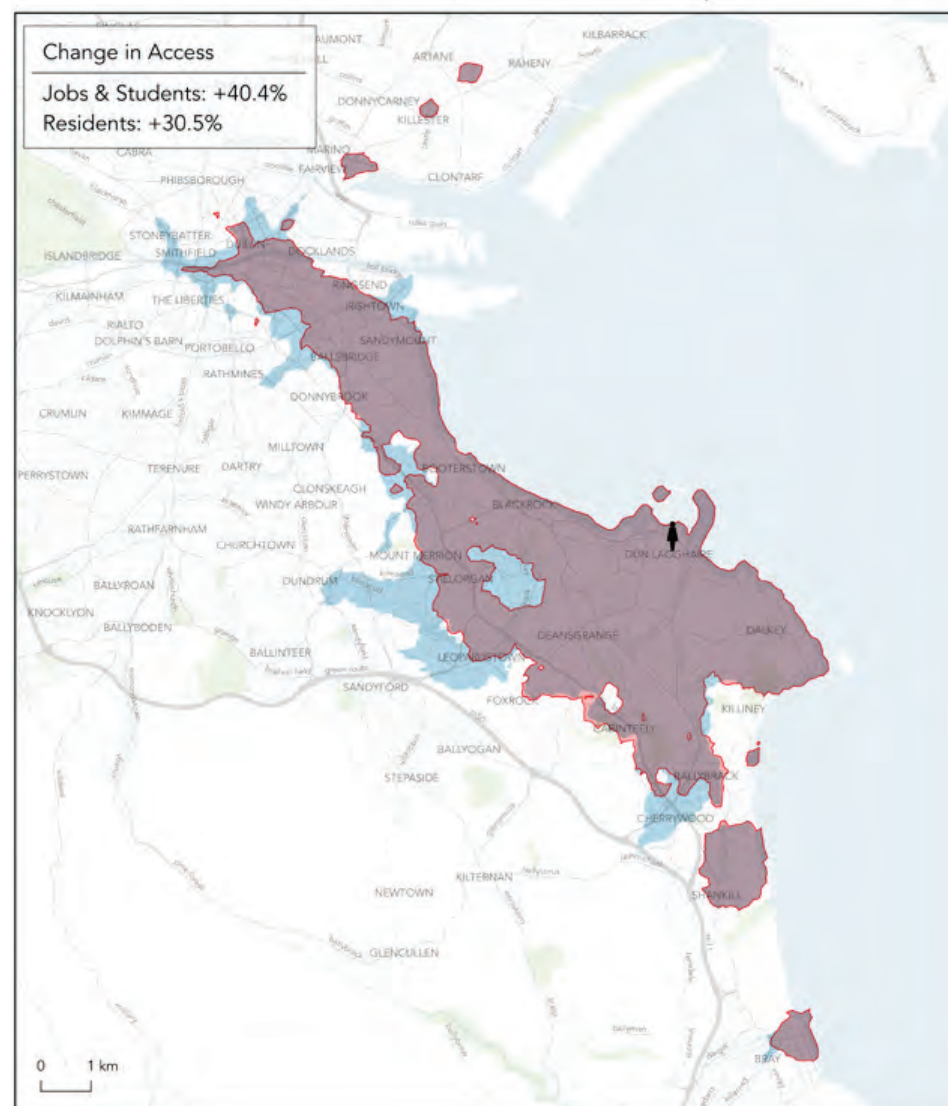
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Dún Laoghaire** in...

...30 minutes?



...45 minutes?



...60 minutes?

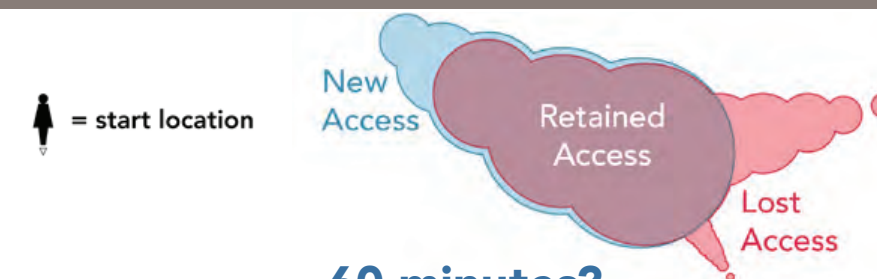
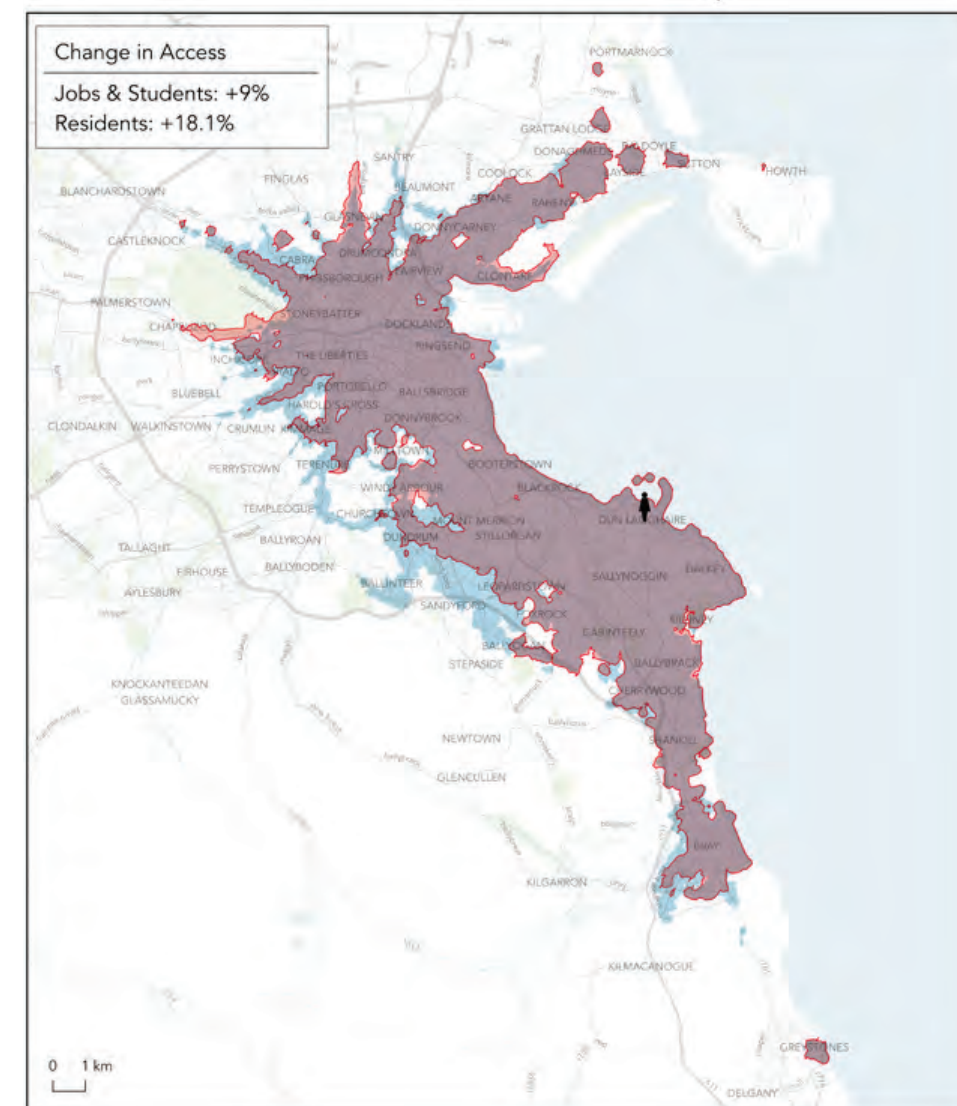


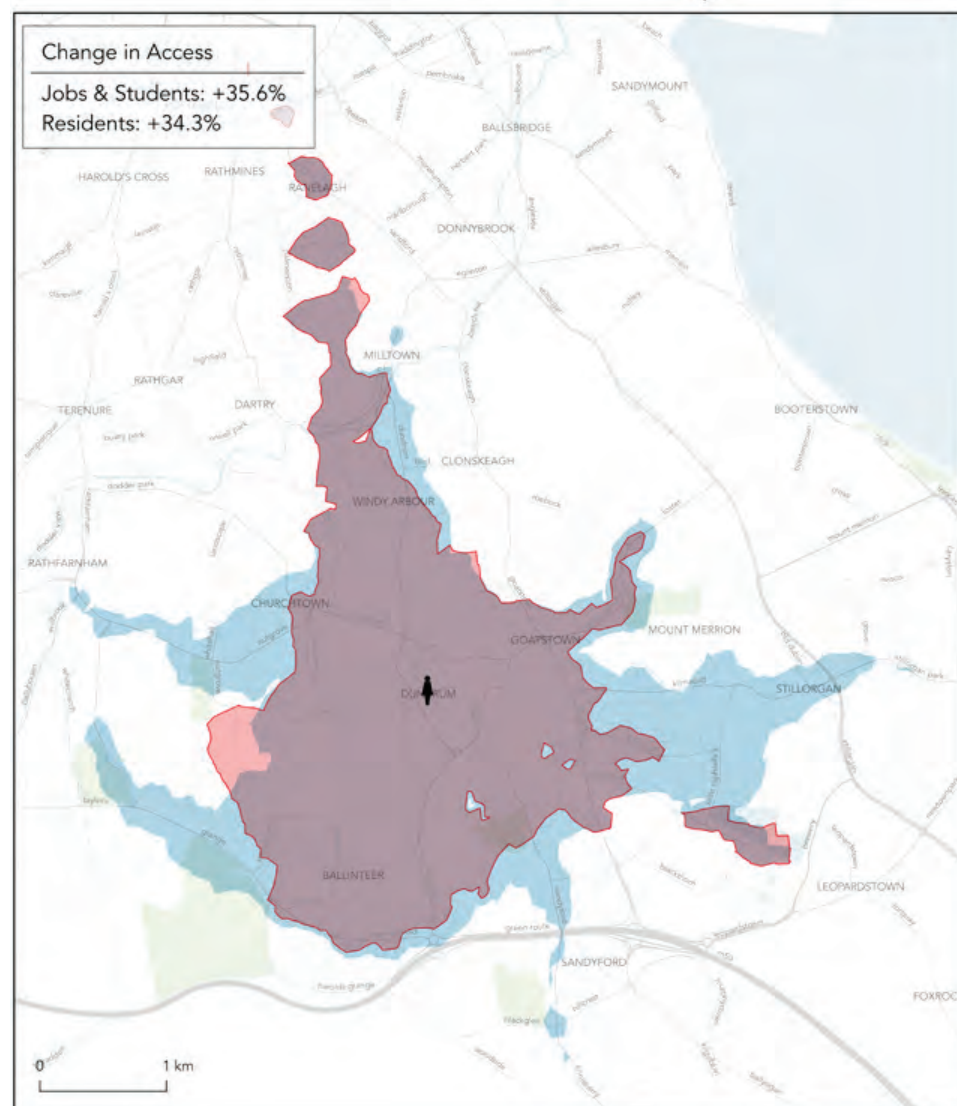
Figure 138: Isochrone maps from Dun Laoghaire. DART would continue to be the fastest and most frequent service to City Centre from this location. The most visible improvements in access would be related to new local and orbital service, including Route S8 to Sandyford, Route 222 to Cherrywood and Route 225 to Dundrum. At 45 and 60 minutes, the maps also show slight improvements (3-5 minutes) for cross city trips, due to higher frequency interchange in the City Centre.

Notes:

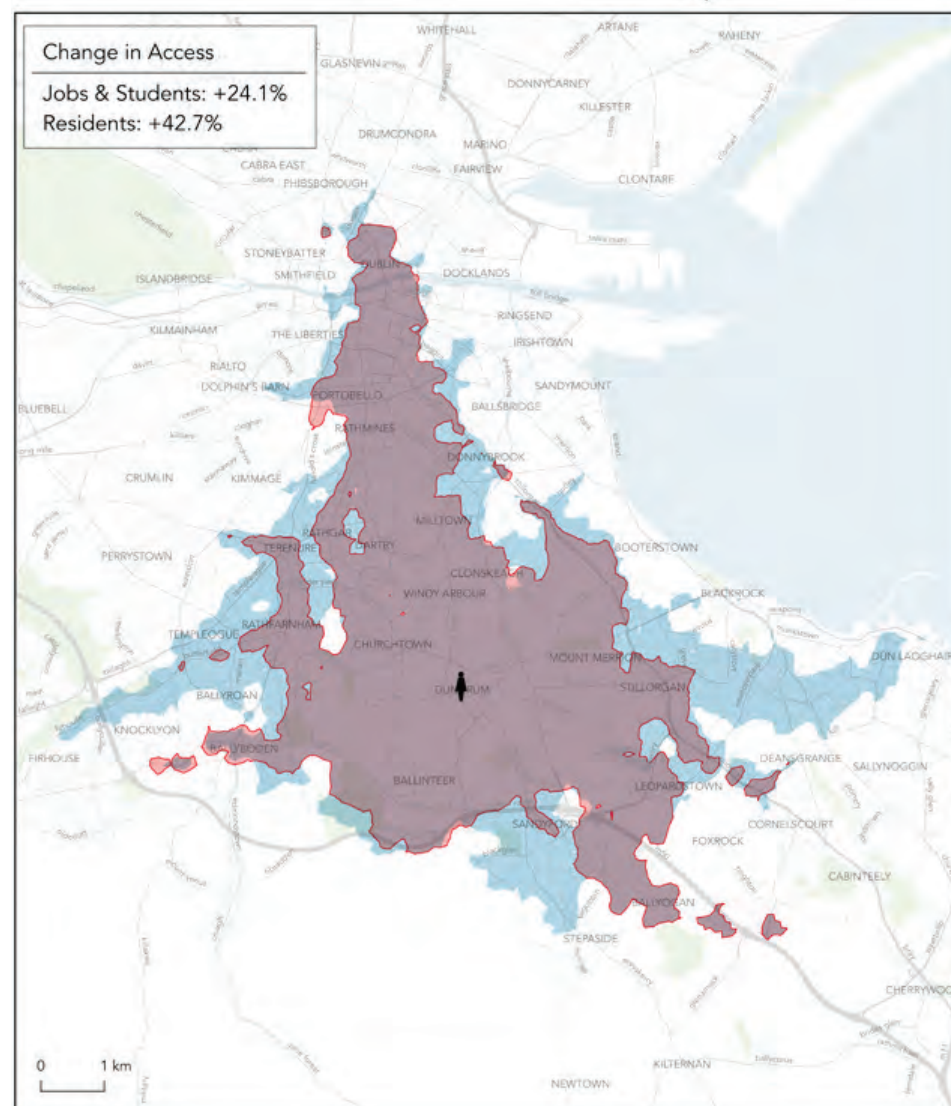
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Dundrum** in...

...30 minutes?



...45 minutes?



...60 minutes?

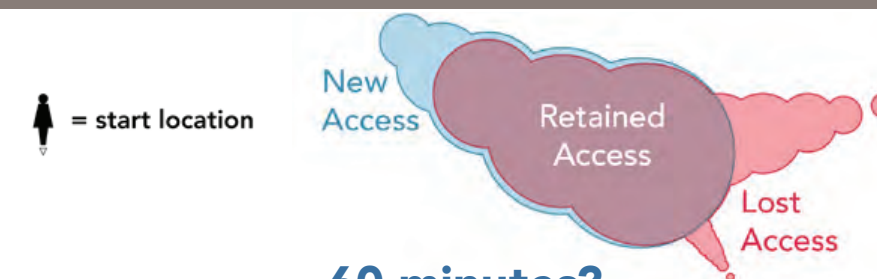
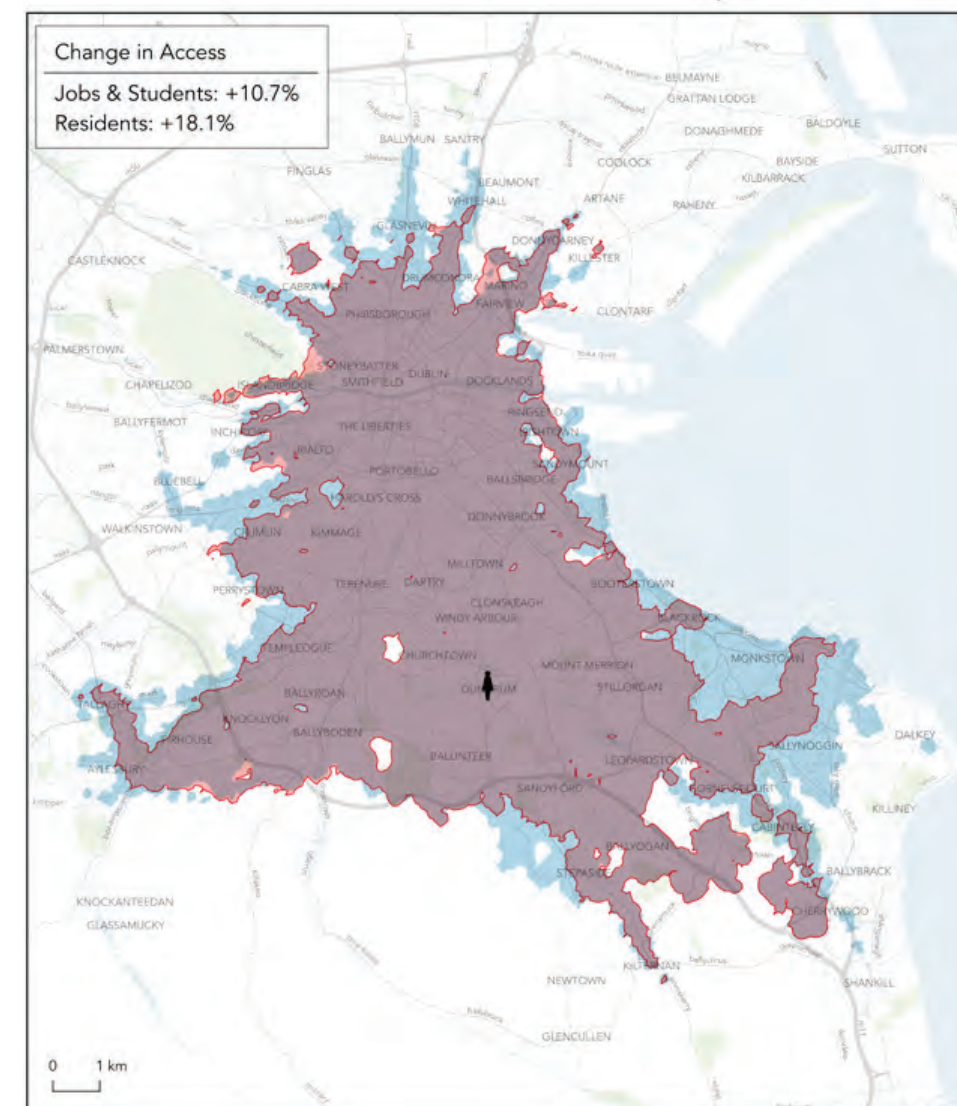


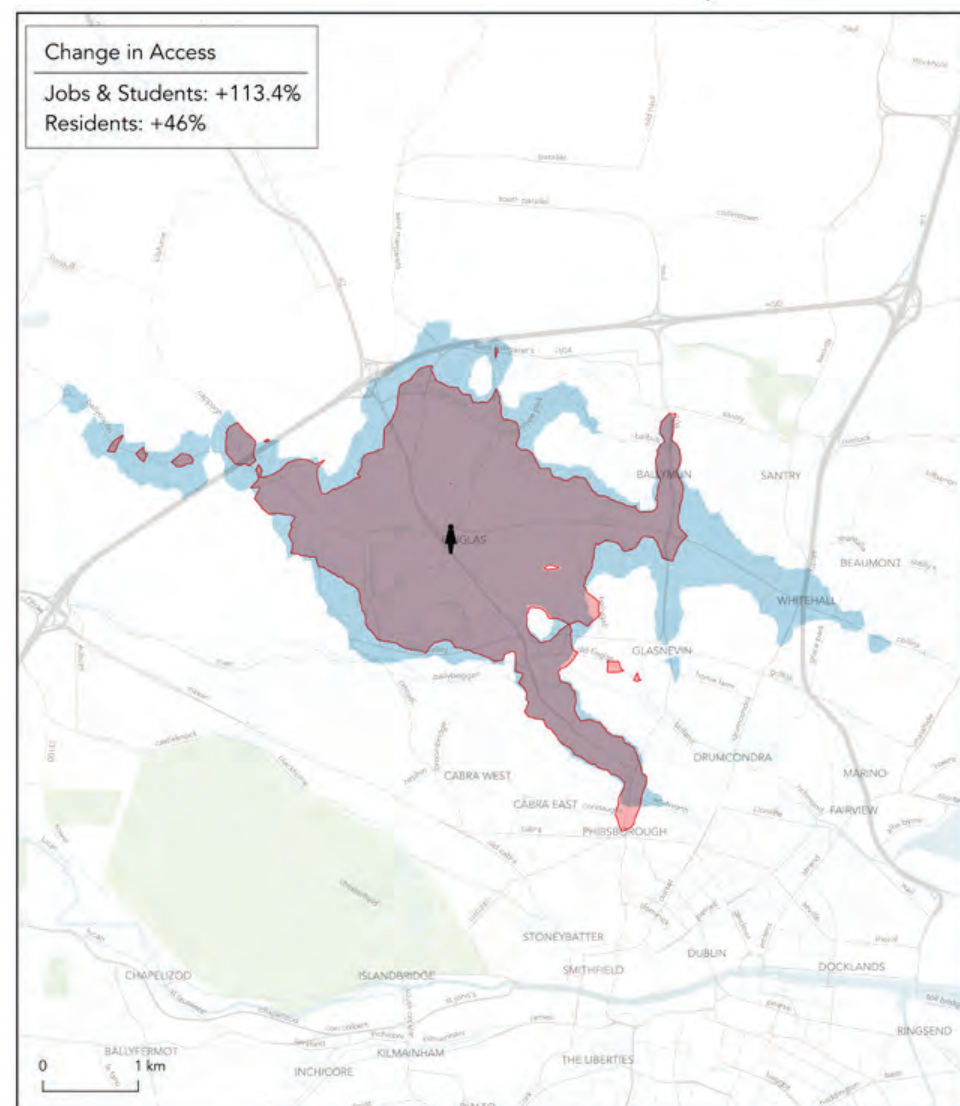
Figure 139: Isochrone maps from Dundrum. The main service to City Centre from this location would remain the Luas Green Line, with no changes. However, orbital and local services would increase, including frequent Routes S6 (to Rathfarnham, Tallaght, UCD, Blackrock) and Route 225 (to Dun Laoghaire), resulting in significant increases in access to and from Dundrum within 30 and 45 minutes.

Notes:

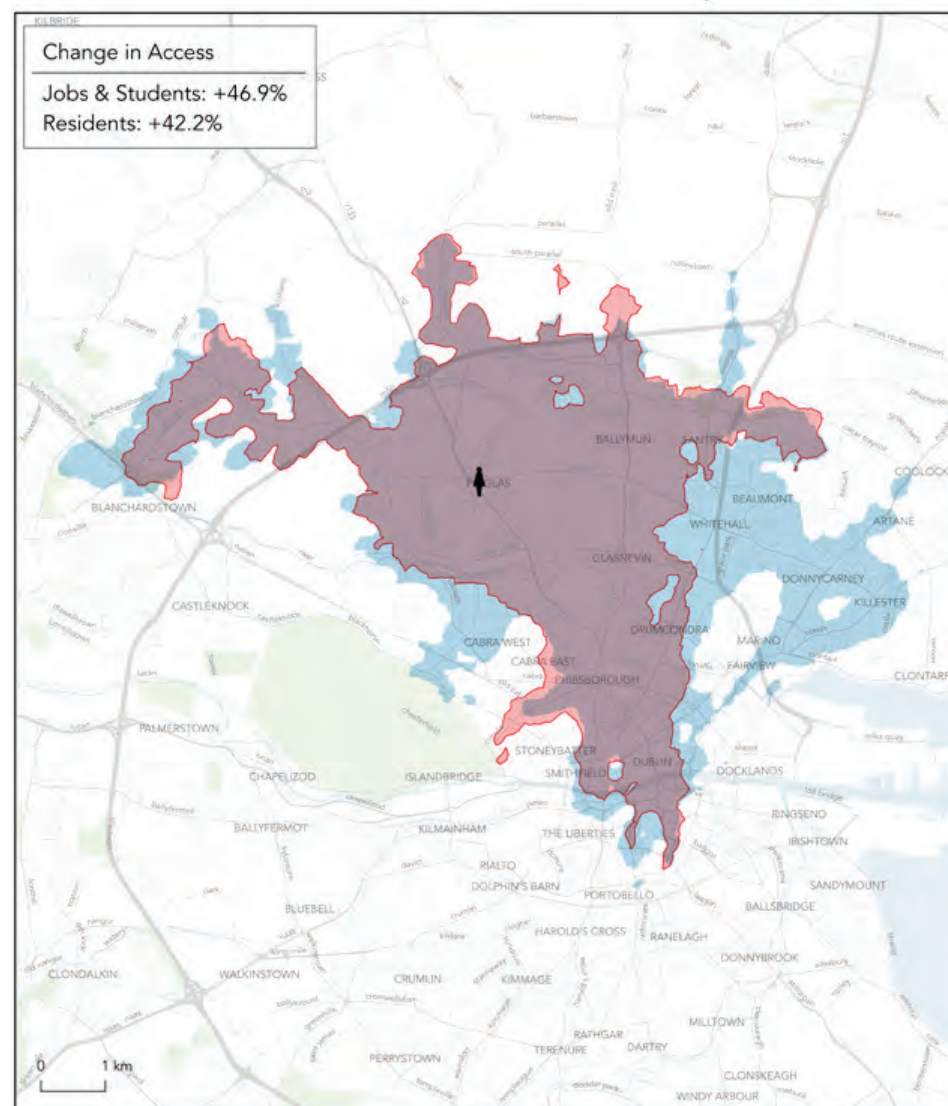
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Finglas Village** in...

...30 minutes?



...45 minutes?



...60 minutes?

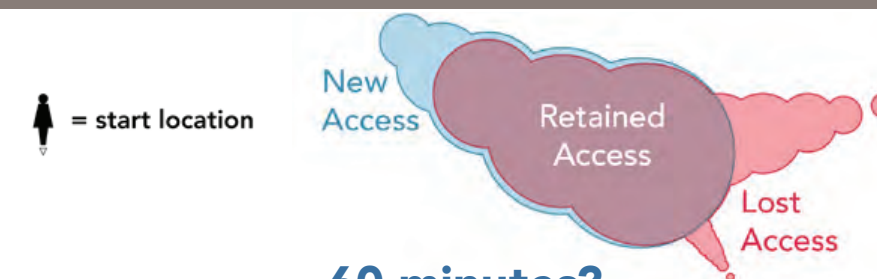
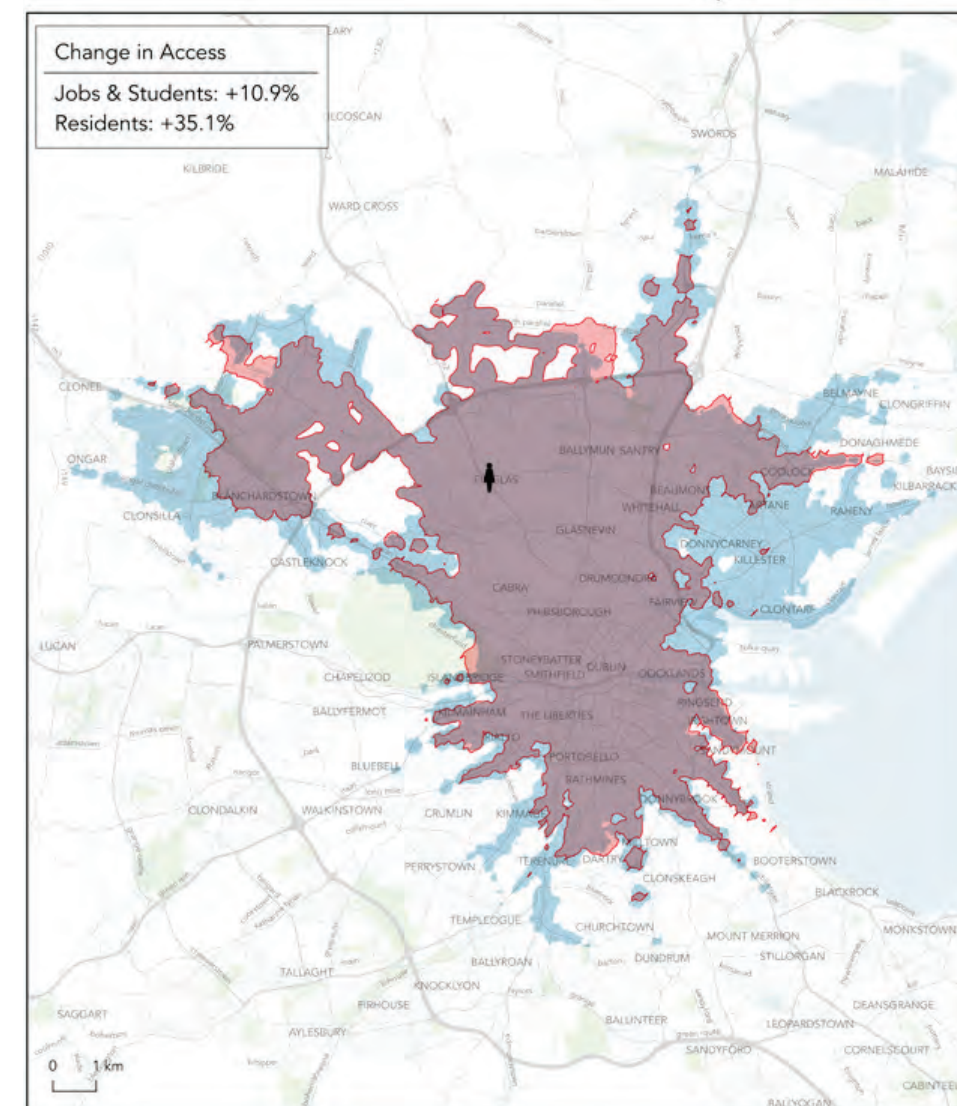


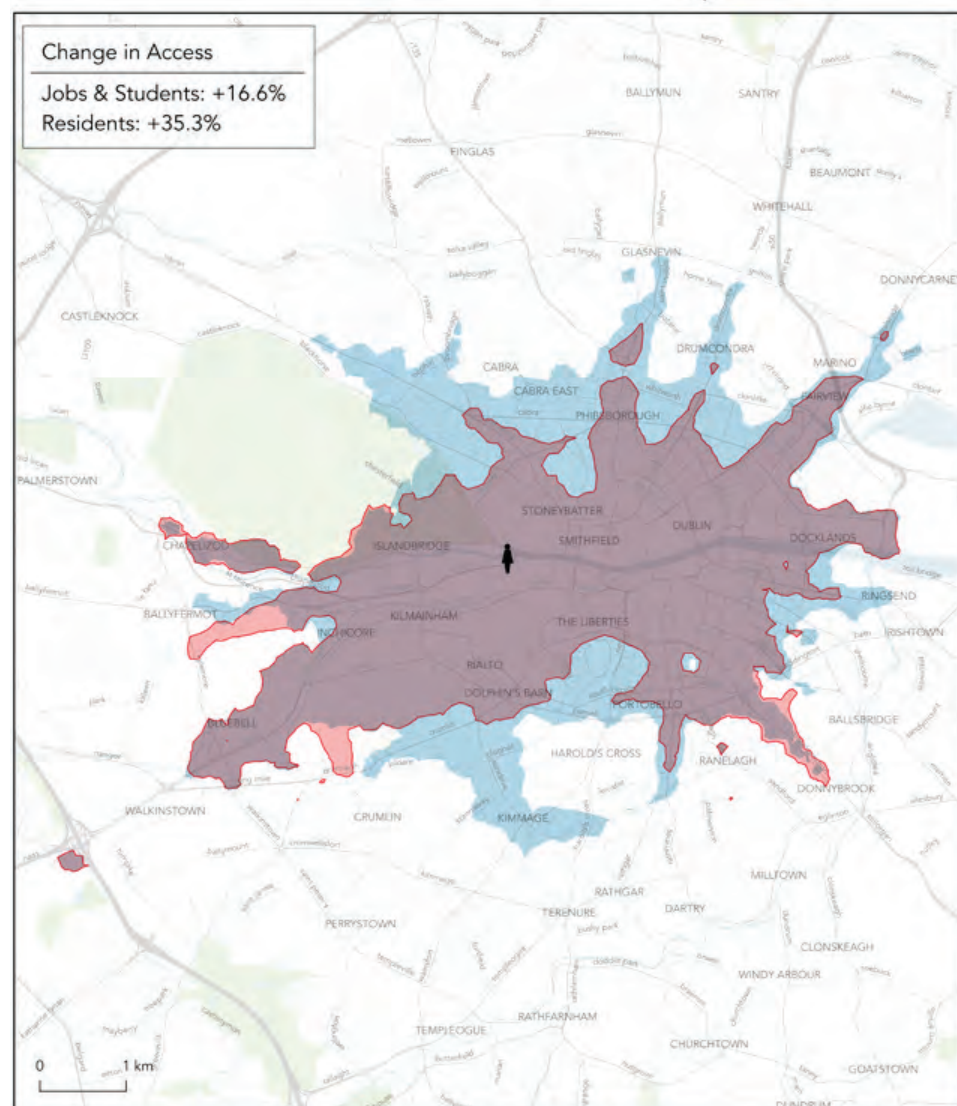
Figure 140: Isochrone maps from Finglas Village. The main proposed radial routes in Finglas (F1, F2, F3) would have more direct routings than existing Route 40, and the proposed orbital Routes N4 and N8 would be both more frequent and direct than the existing Route 17a. As a result, travel times would improve in all directions, and access to and from Finglas Village would improve at the 30, 45 and 60 minute time horizons.

Notes:

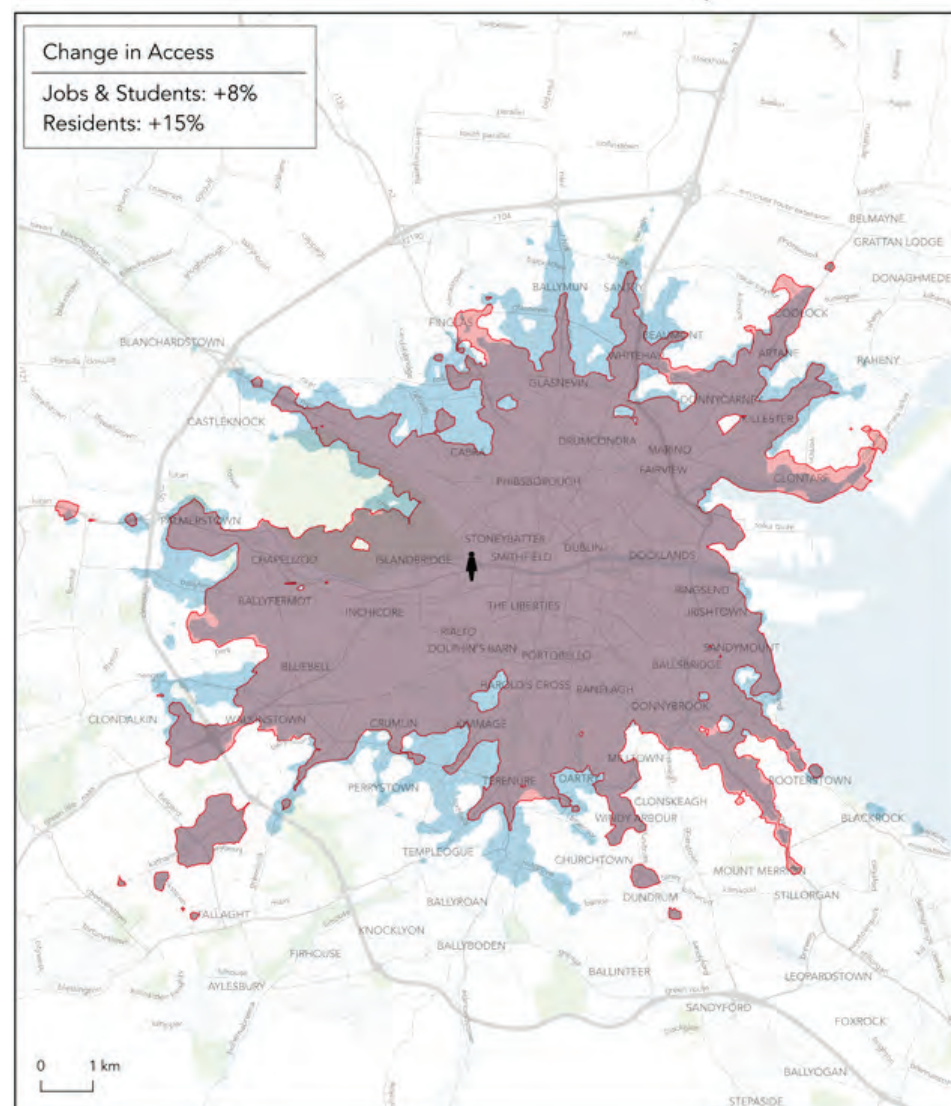
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Heuston Station** in...

...30 minutes?



...45 minutes?



...60 minutes?

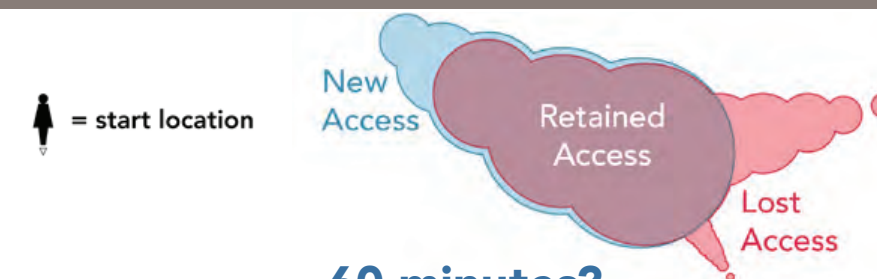
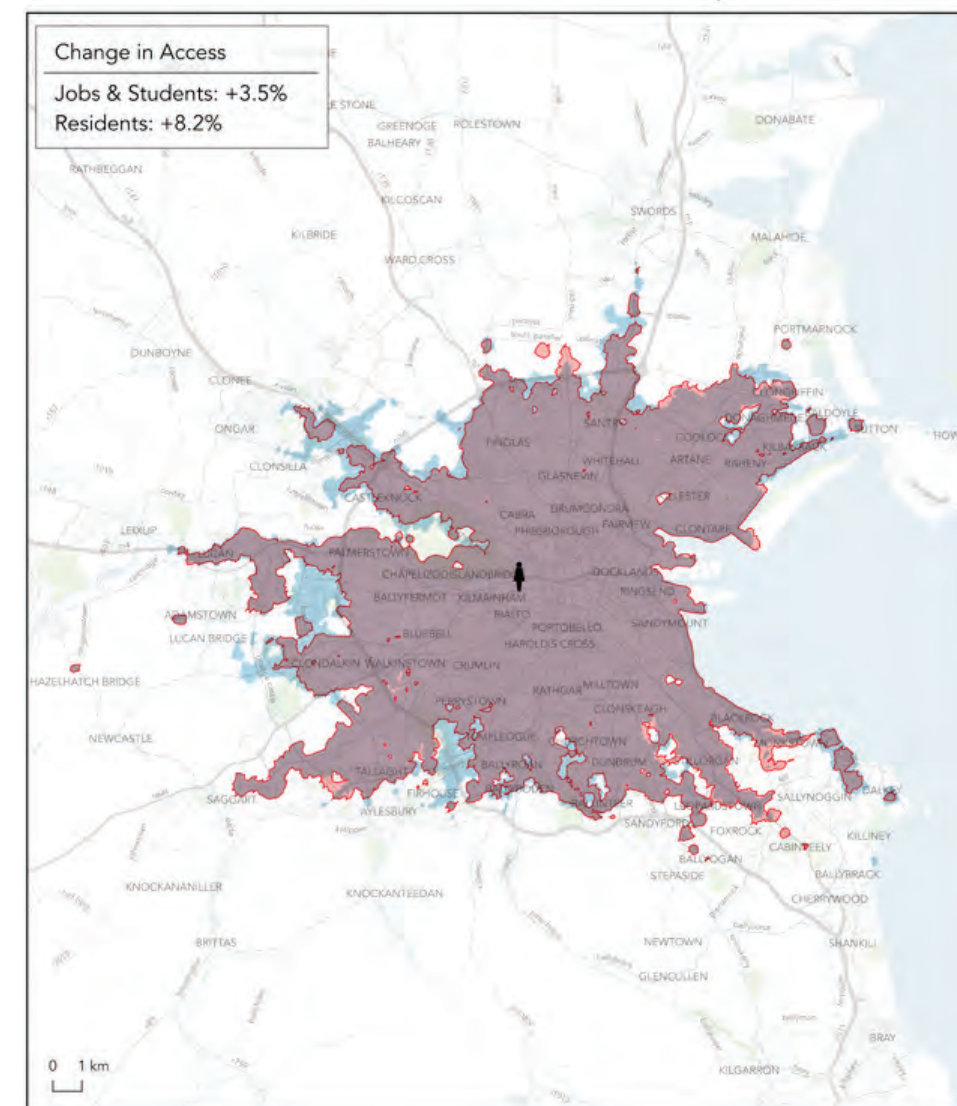


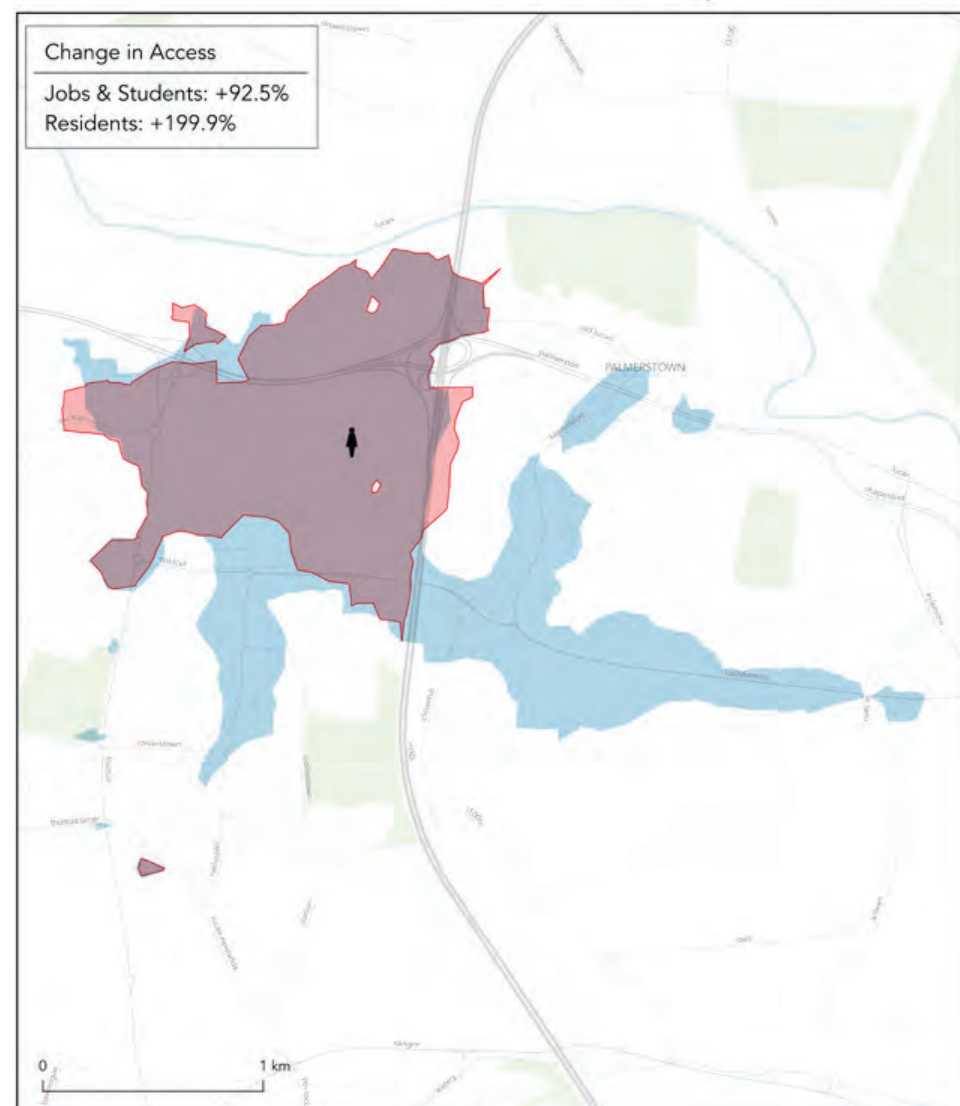
Figure 141: Isochrone maps from Heuston Station. Because of its central location, Heuston Station is currently and would remain accessible within 60 minutes from much of the Dublin area. However, travel times between Heuston and areas of inner north and south Dublin would improve significantly as a result of the introduction of the orbital Route O, with service around the edges of the City Centre to Heuston every 8 minutes in both directions.

Notes:

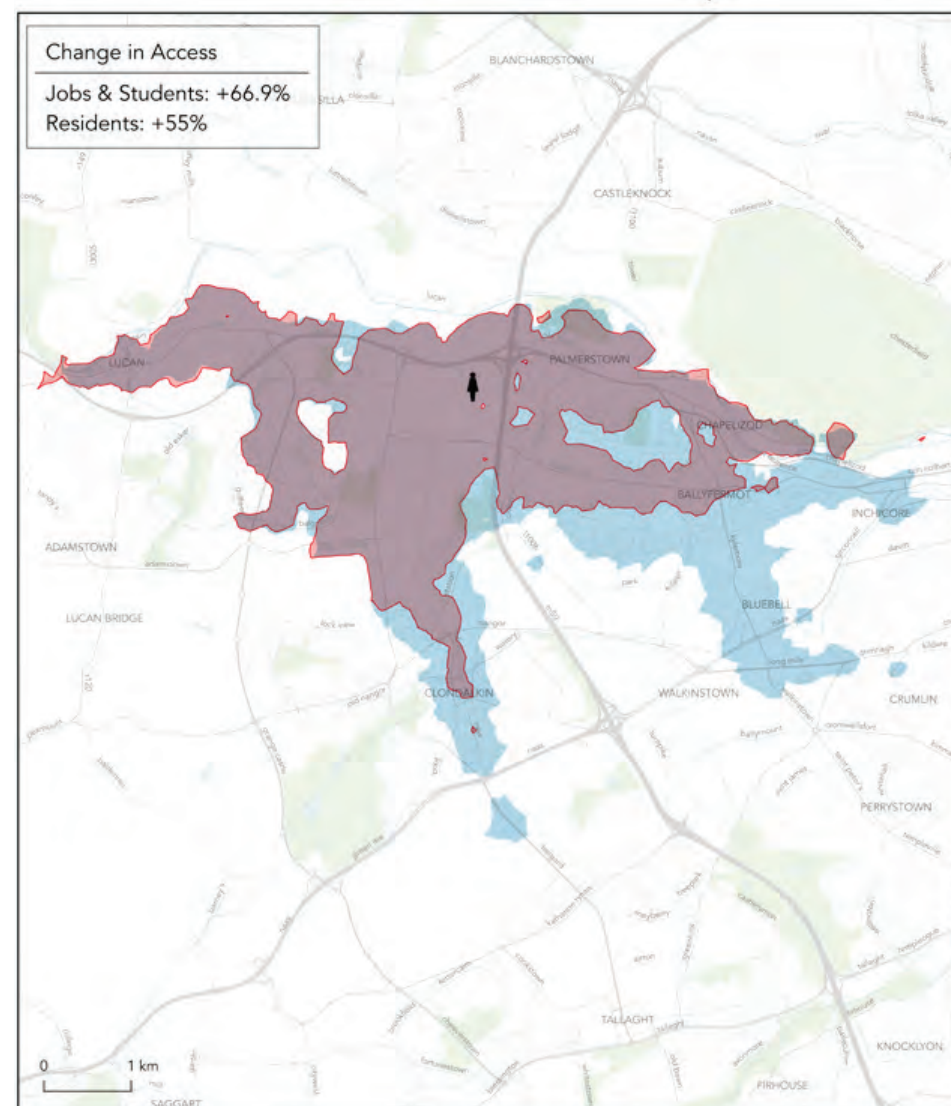
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Liffey Valley Shopping Centre** in...

...30 minutes?



...45 minutes?



...60 minutes?

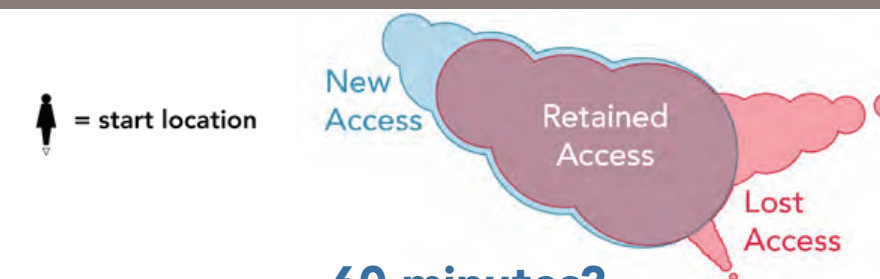
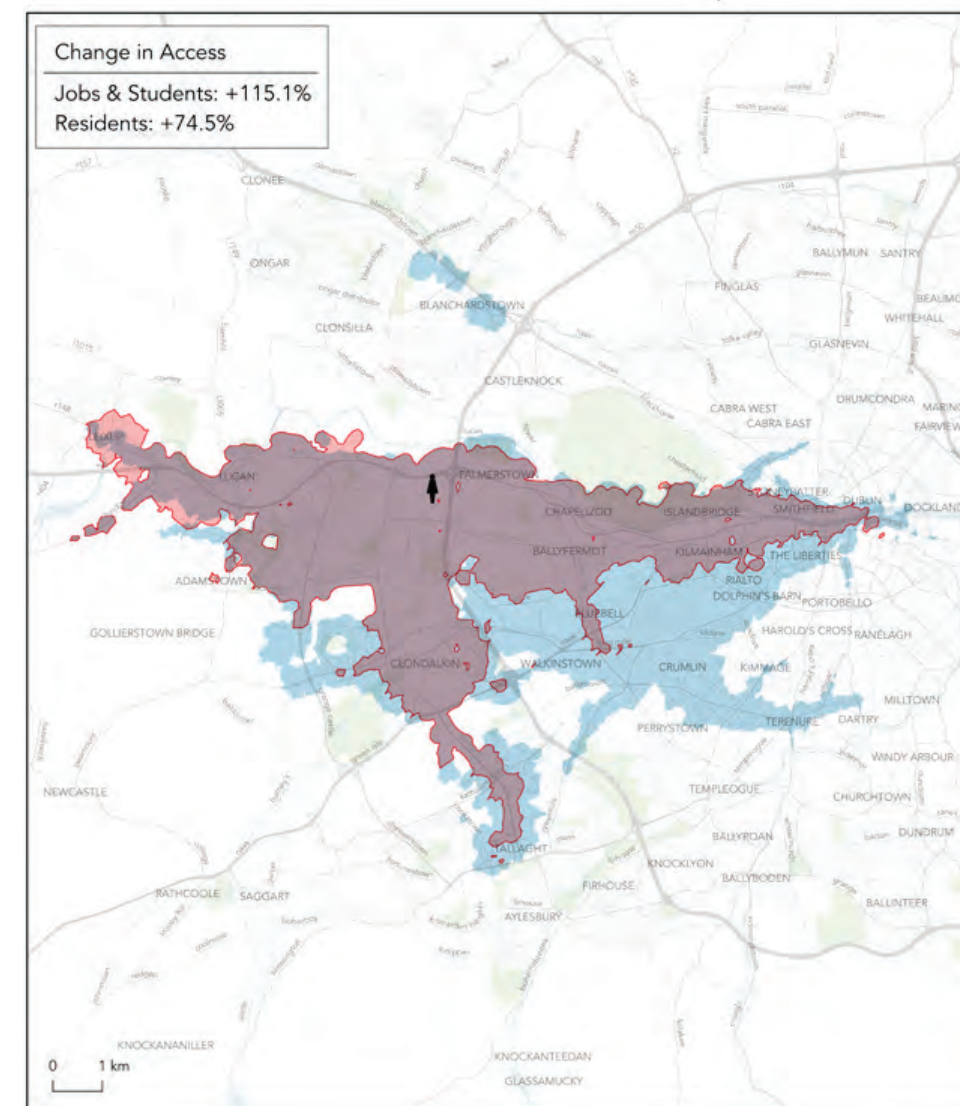


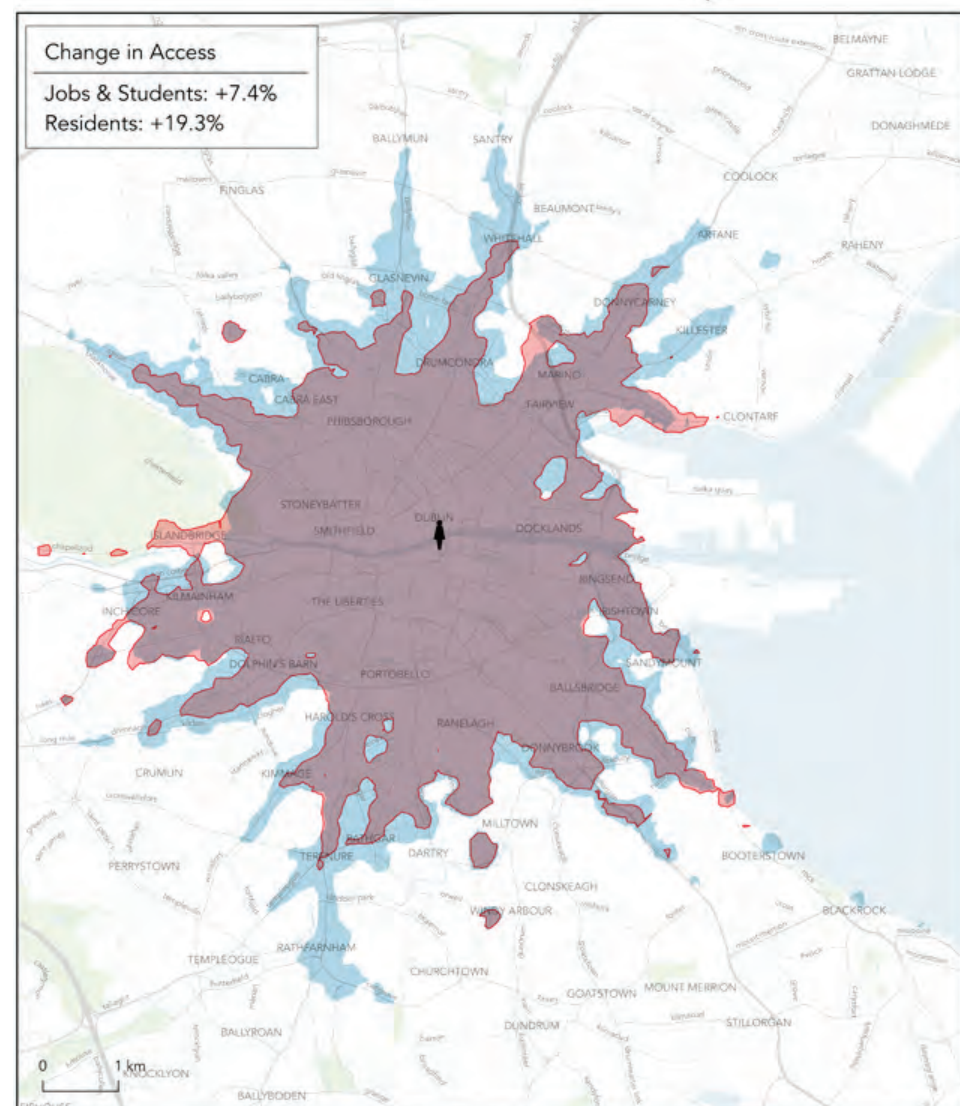
Figure 142: Isochrone maps from Liffey Valley Shopping Centre. As a result of its location and design, Liffey Valley has traditionally been a heavily auto-oriented location, with few convenient public transport options, mostly service on the N4 motorway to and from Lucan and north Kildare. This would change in the proposed network, with new frequent service to Clondalkin and Tallaght (Route W2), Ballyfermot and much of inner south Dublin (Route S4).

Notes:

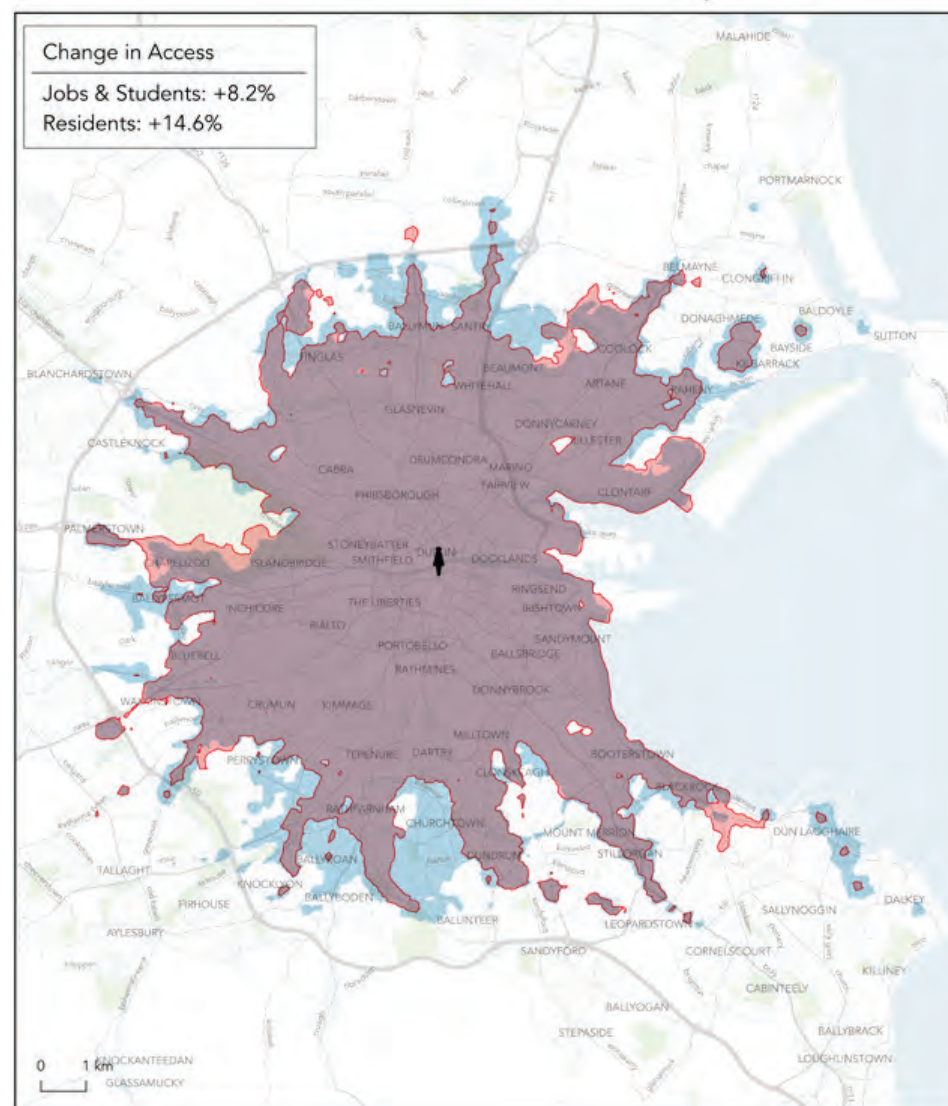
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from the **O'Connell Bridge** in...

...30 minutes?



...45 minutes?



...60 minutes?

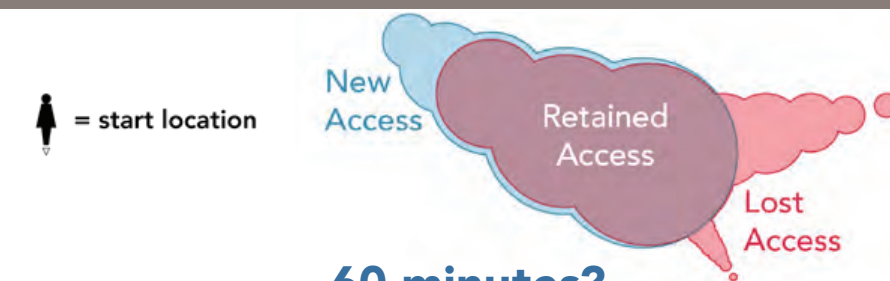
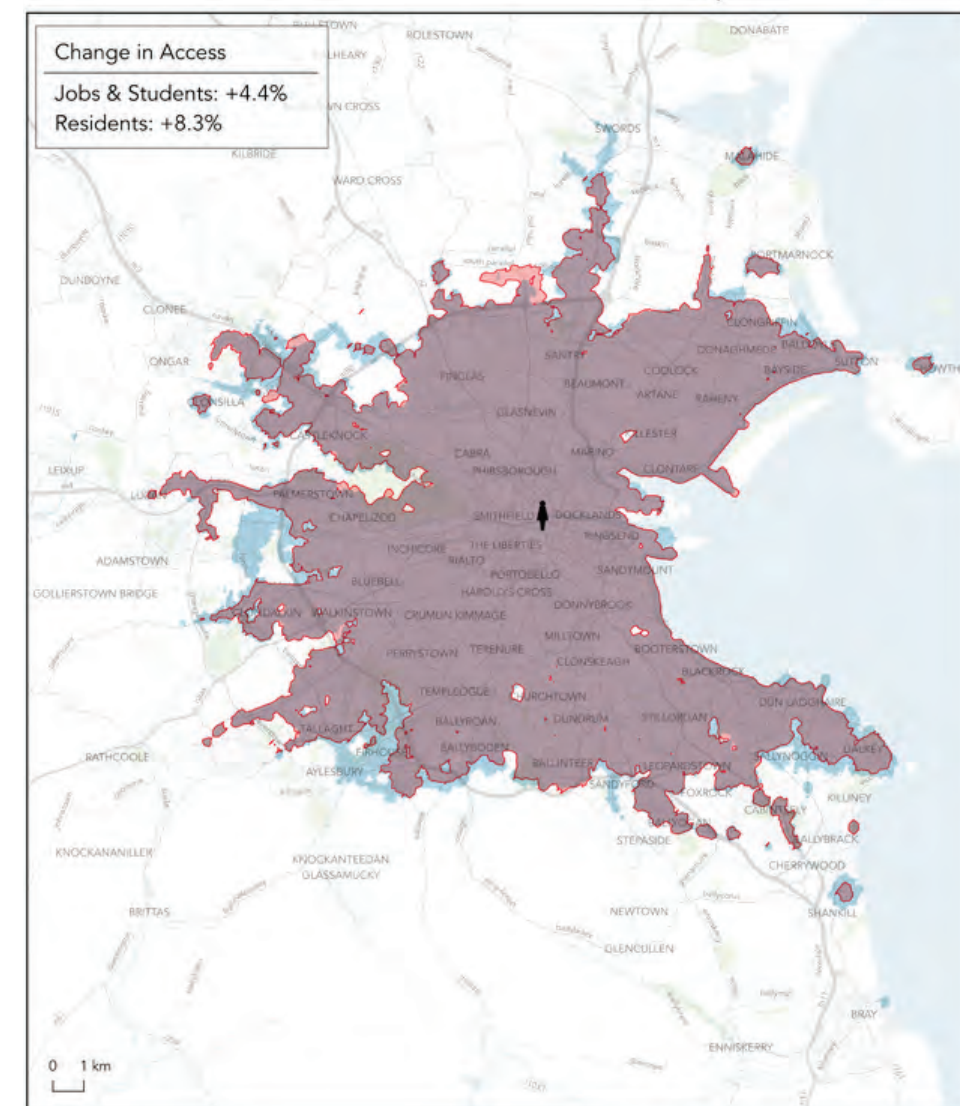


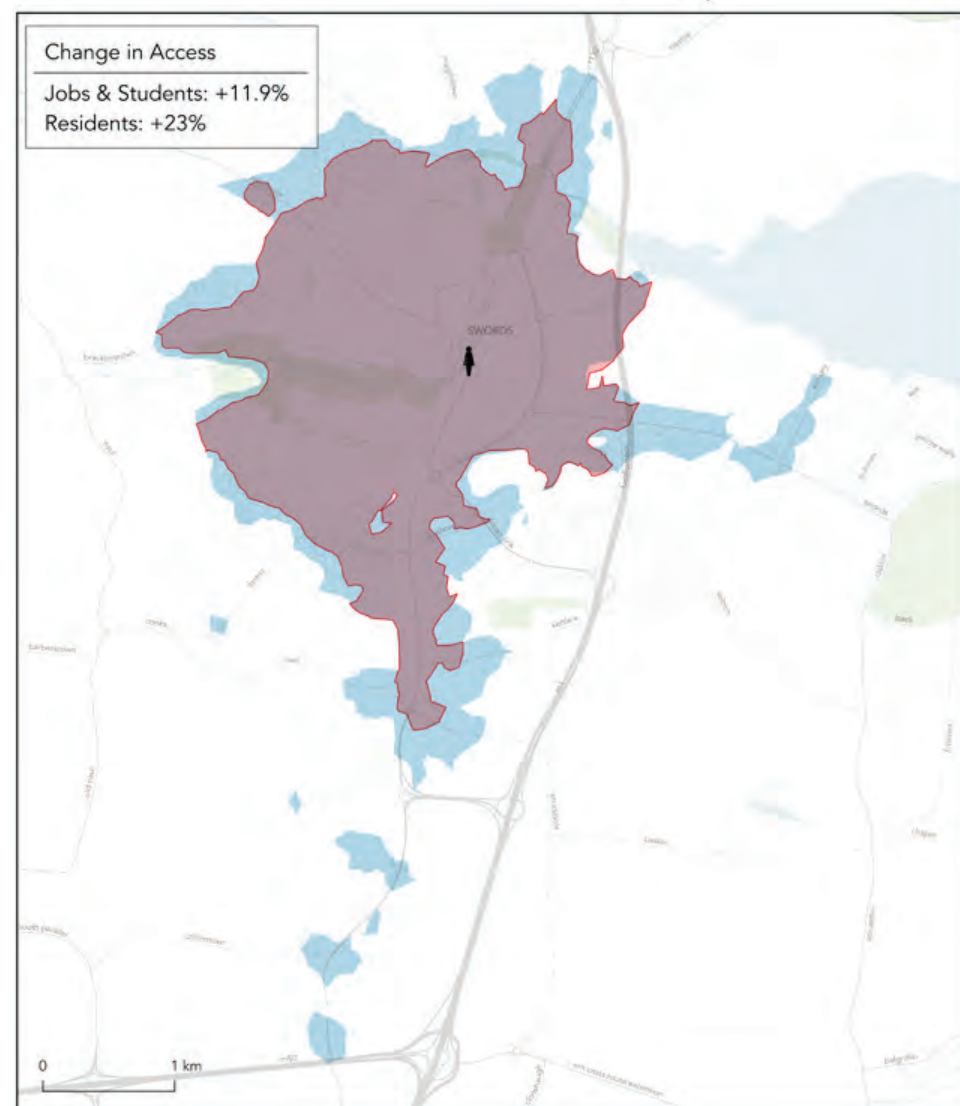
Figure 143: Isochrone maps from the O'Connell Bridge. This location has been and would remain the very centre of the bus network in Dublin, and would remain accessible to most of the Dublin area within 60 minutes. Nonetheless, the number of places within 45 minutes or less of O'Connell Bridge would still increase, due to the increased frequency, and directness of most of the proposed spines and branches, relative to the main existing bus routes.

Notes:

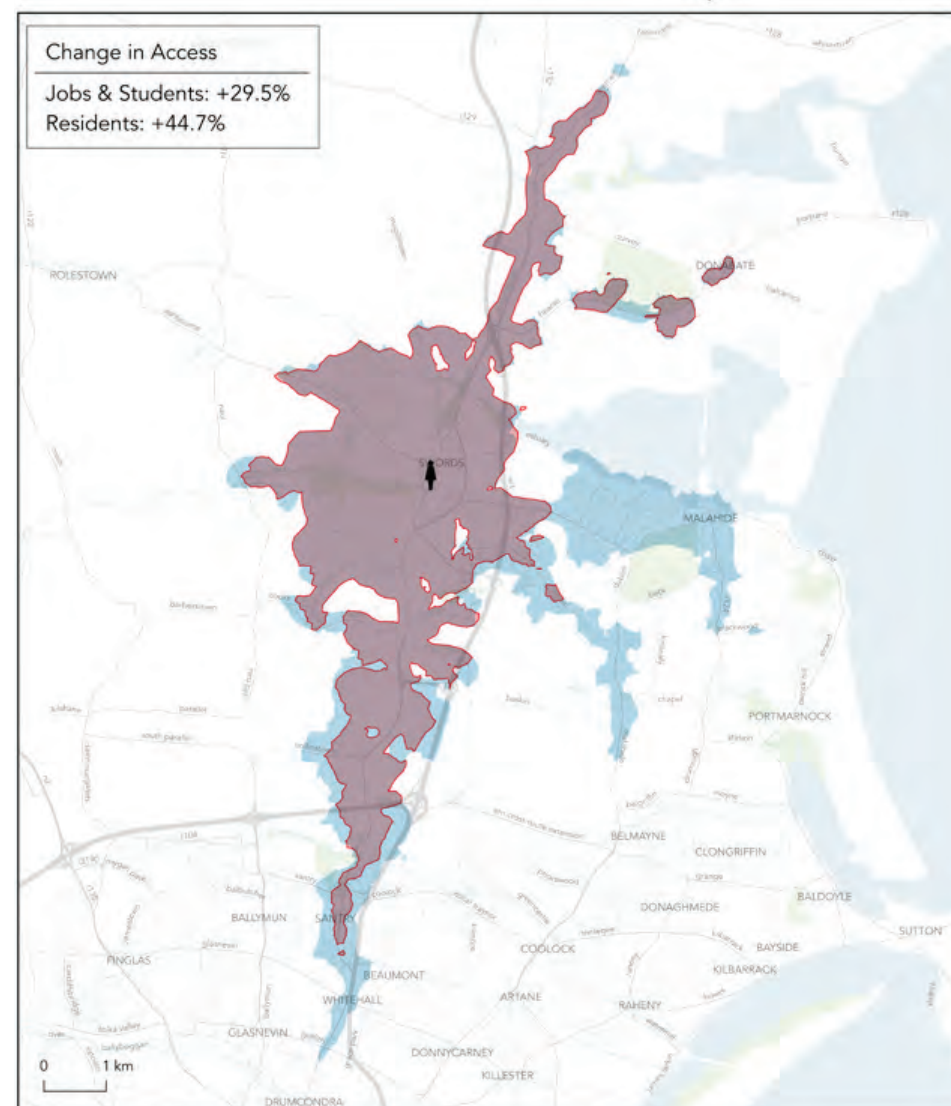
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **Swords Main Street** in...

...30 minutes?



...45 minutes?



...60 minutes?

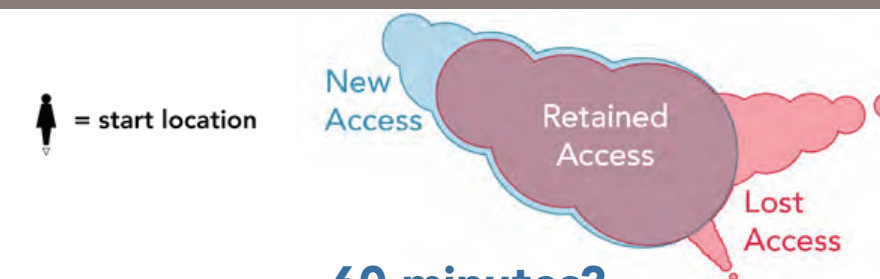
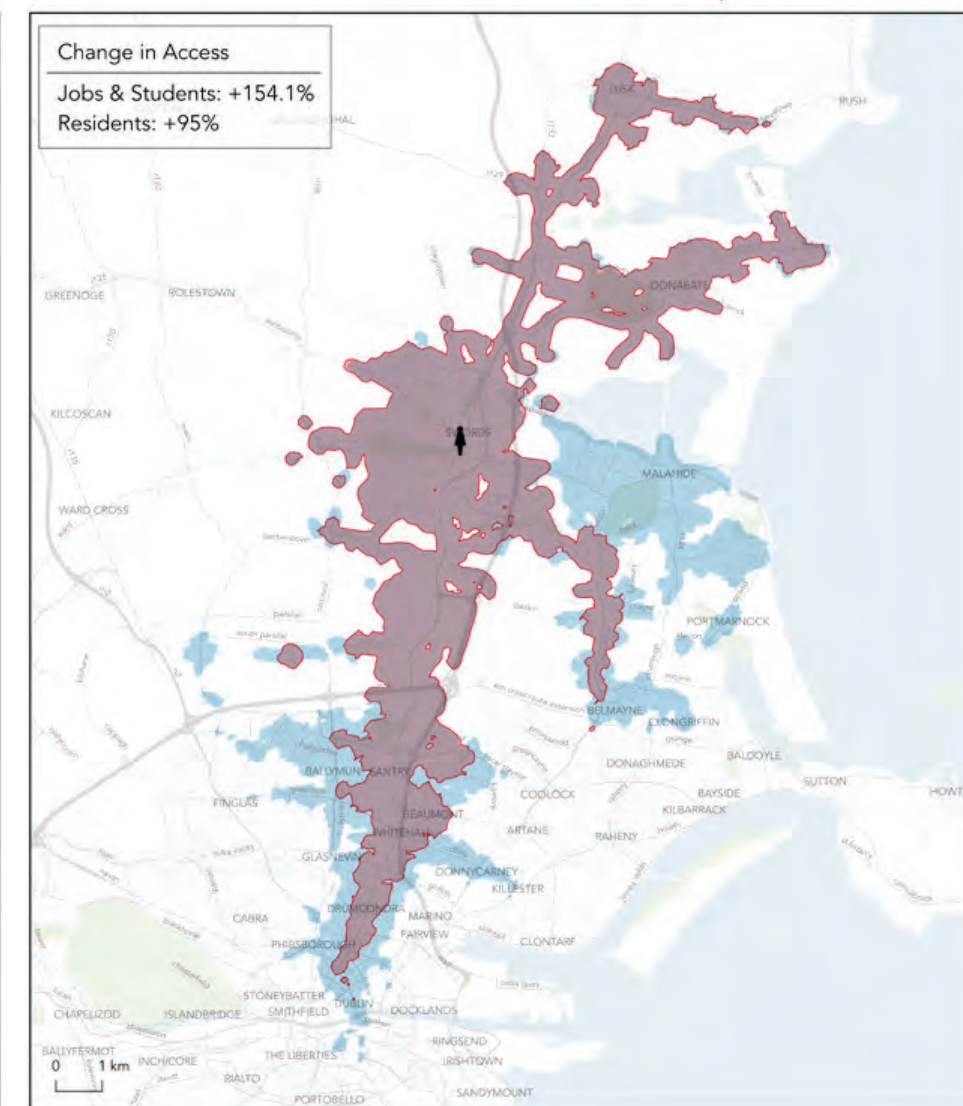
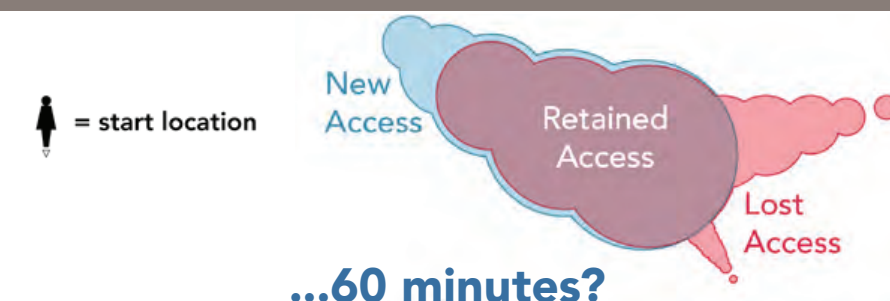


Figure 144: Isochrone maps from Swords Main Street. Service between Swords and northern Fingal would remain similar, as local routes operating every 30 minutes. However, service to the Airport, north Dublin City, City Centre and Malahide would generally become more frequent and direct. As a result, access to and from Swords Main Street would improve in 30, 45 and 60 minutes. In 60 minutes, the maps also show the effects of improvements to orbital service in north Dublin City on proposed Routes N4 and N8.

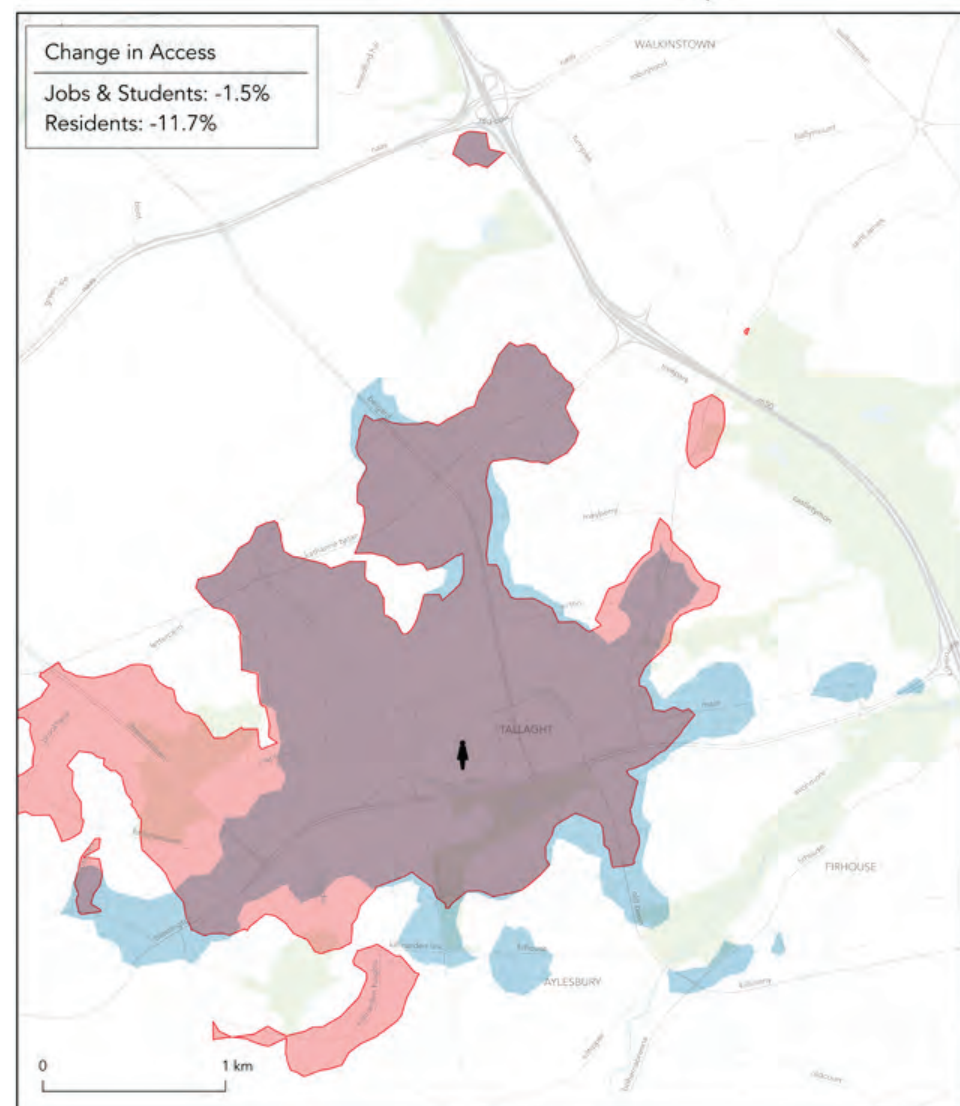
Notes:

1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher, and from some locations faster travel times may be available on peak express routes.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.
4. This analysis is only on the public bus network. It does not take into account private express bus services, such as Swords Express.

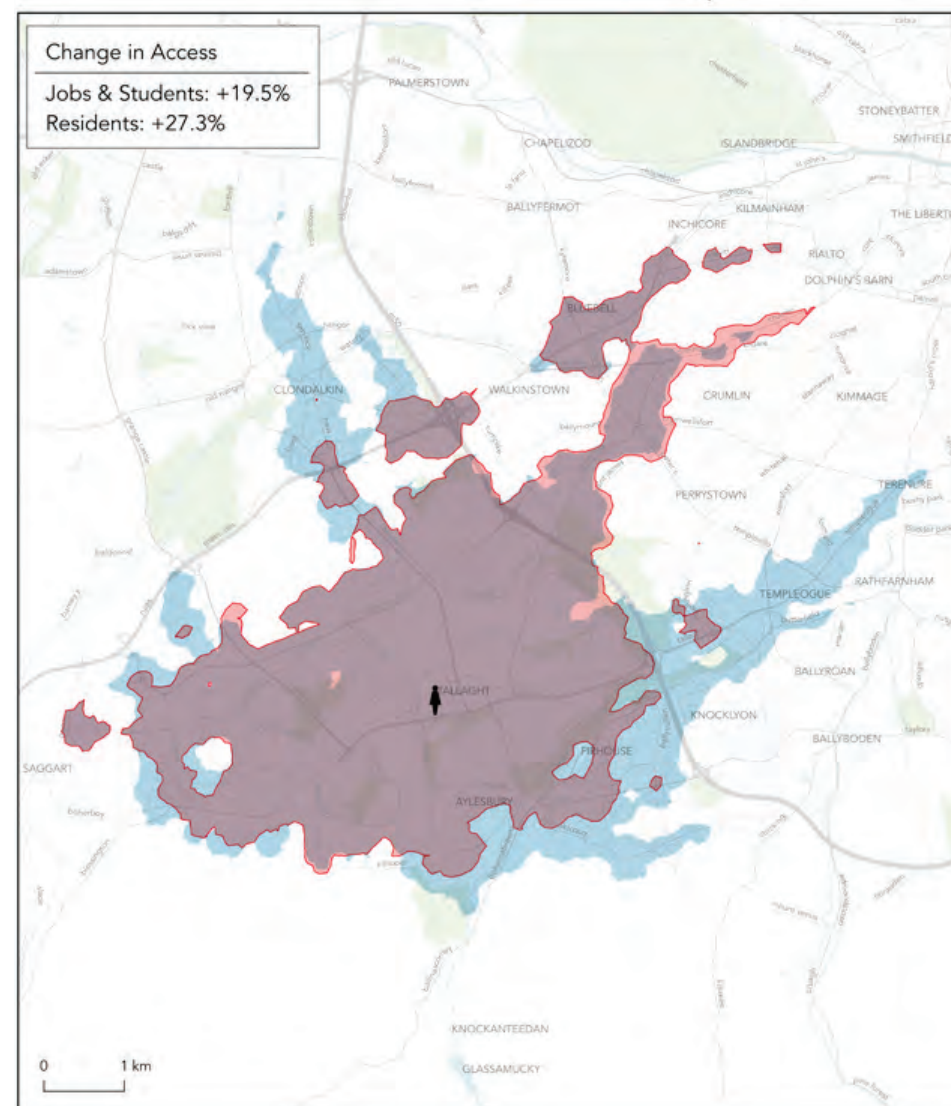
How far could I travel from **Tallaght - The Square** in...



...30 minutes?



...45 minutes?



...60 minutes?

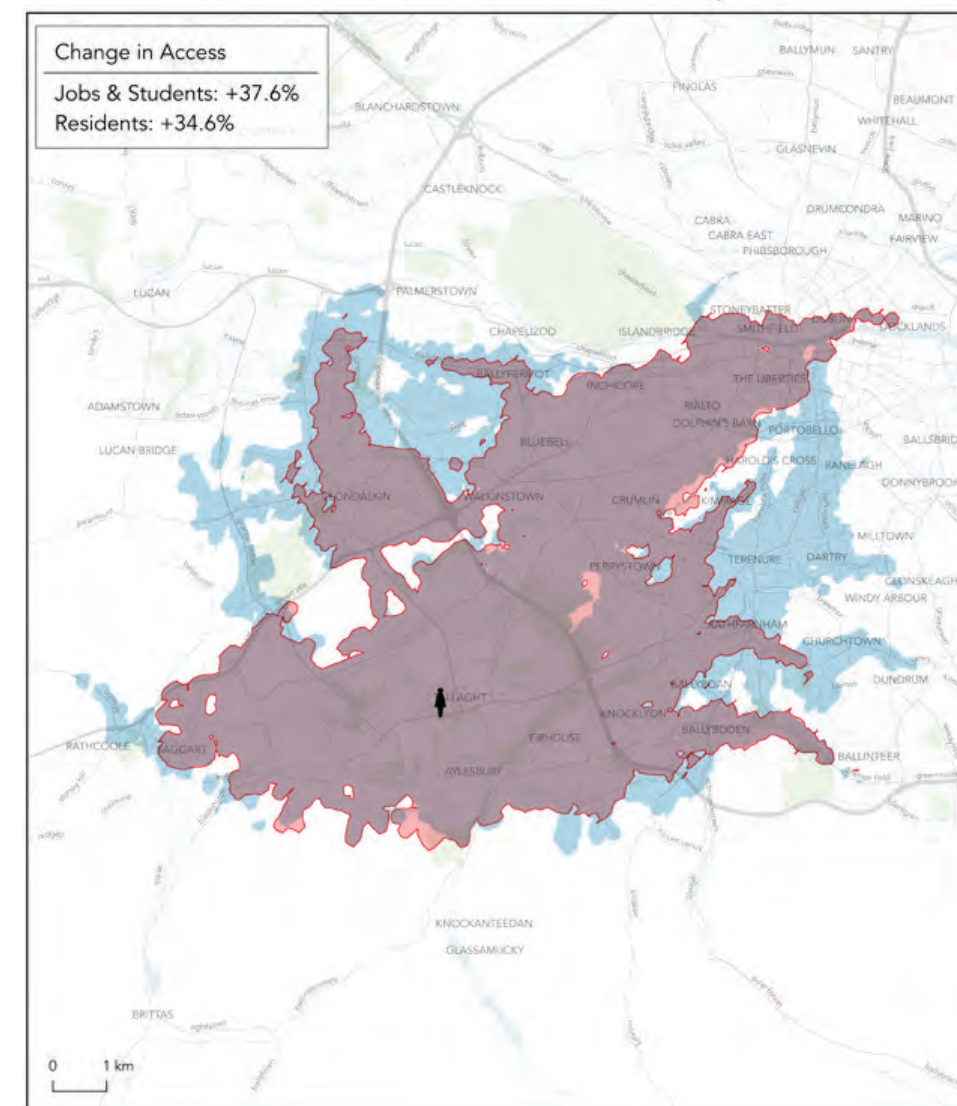


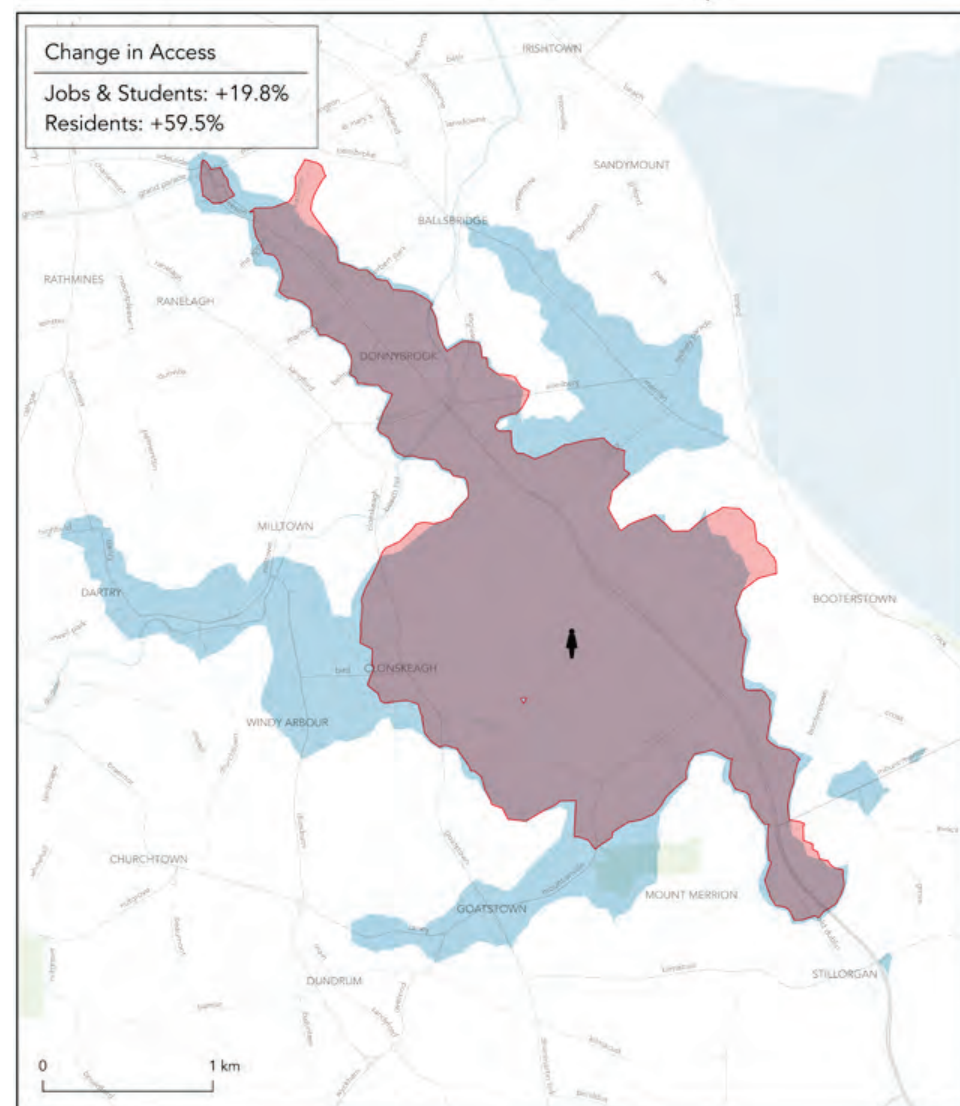
Figure 145: Isochrone maps from Tallaght - The Square. New frequent service to Clondalkin and Liffey Valley (Route W2), and to City Centre via Templeogue (Route A3) would significantly improve access between Tallaght and many parts of south and west Dublin. However, some of the changes in Tallaght would result in longer travel times to and from certain estates. This includes a change in path for the most frequent service to City Centre (existing 27), to a routing that prioritizes direct travel to Citywest (proposed D2), and lower frequencies in some areas served by existing route 77a (e.g. Tymon North, Killinarden).

Notes:

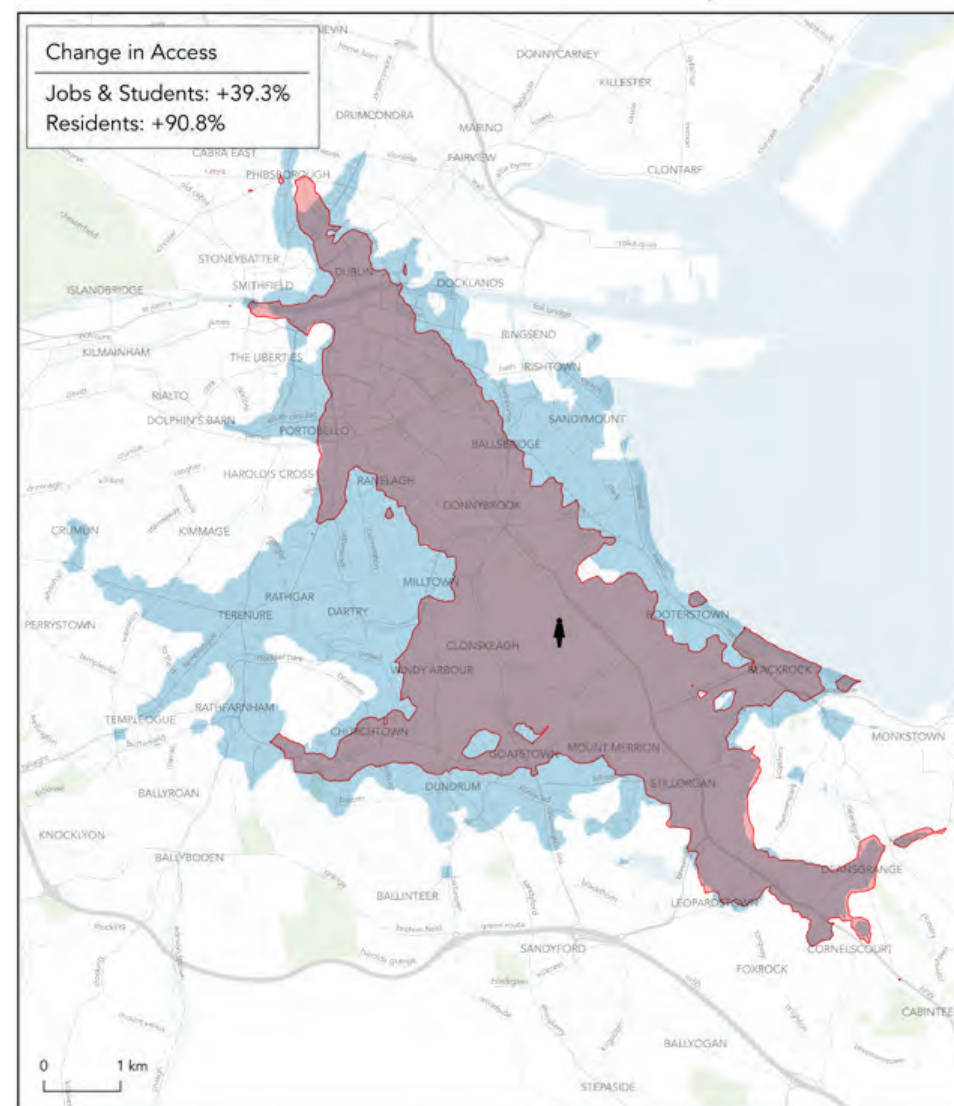
1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

How far could I travel from **University College Dublin (UCD) - Belfield** in...

...30 minutes?



...45 minutes?



...60 minutes?

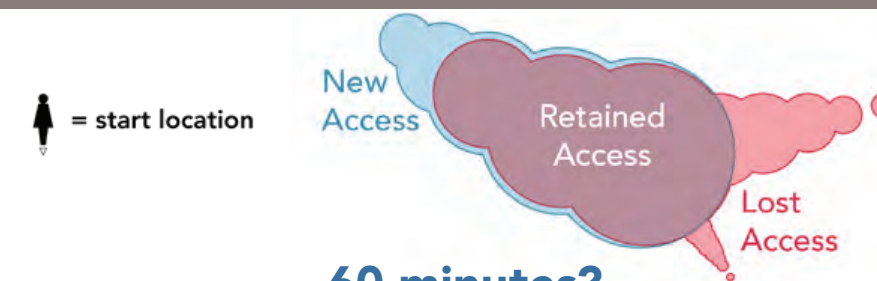
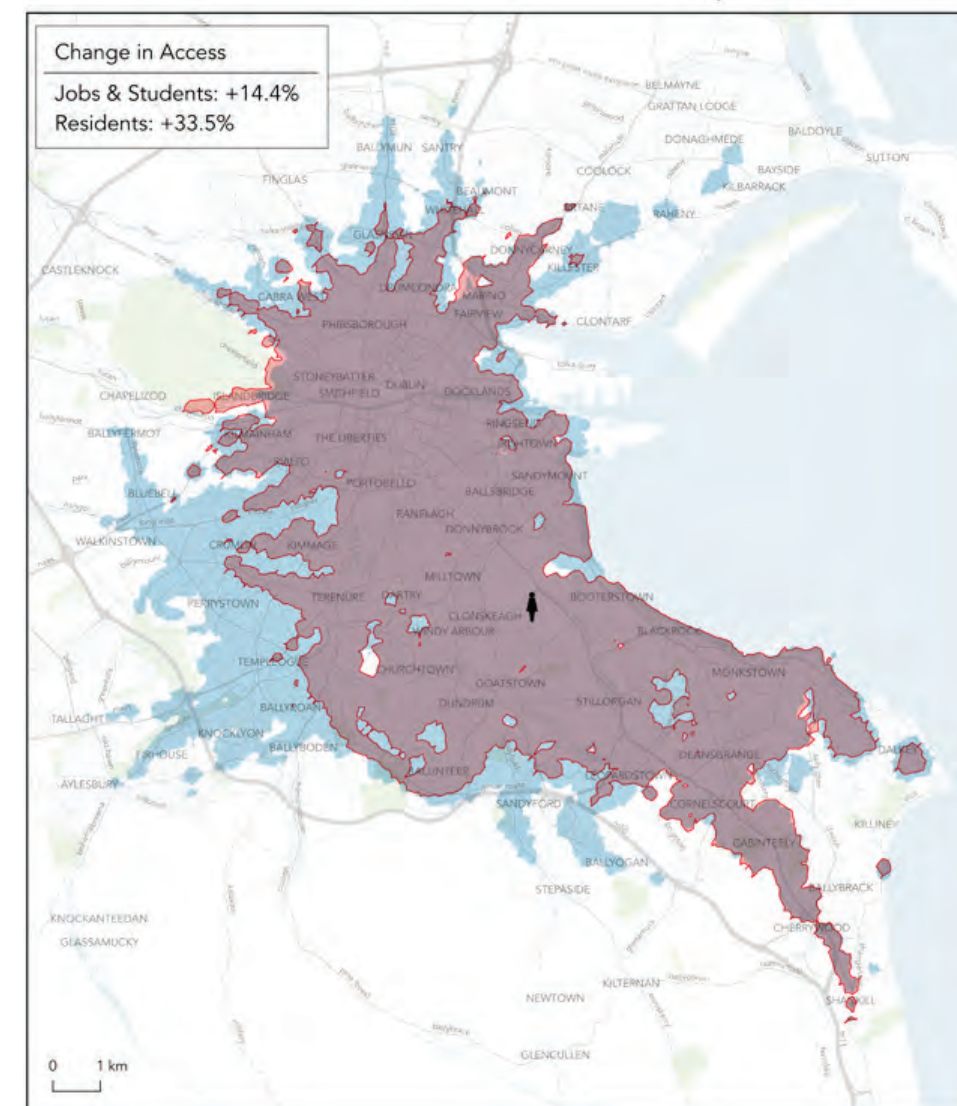


Figure 146: Isochrone maps from UCD Belfield. The proposed network would significantly increase both radial and orbital services to UCD. Cross-city radial routes include service every 5 minutes via the Stillorgan Road (E spine) and every 8 minutes via Merrion Road/Ballsbridge (B1, B2). Frequent orbital service would include both Route S4 (to Milltown, Terenure, Crumlin, Ballyfermot and Liffey Valley), and Route S6 (to Blackrock, Dundrum, Rathfarnham, Firhouse and Tallaght). As a result, UCD would become accessible in a reasonable amount of time from far more locations.

Notes:

1. Travel times based on travel on weekdays, given typical speeds and service frequencies between 10:00 and 15:00. Peak speeds are typically lower, but frequencies are often higher, and from some locations faster travel times may be available on peak express routes.
2. Travel time includes walking, waiting, and time in vehicle, including time spent changing buses and/or trains at interchanges where applicable.
3. Walk speed is assumed to be 0.93 m/s, and waiting time for any bus or train is assumed to be half of the service frequency, i.e. half the scheduled amount of time between two buses.

Appendix - Full List of Revisions to the Proposed Network

Full List of Changes - Spines and Branches

ROUTE	NETWORK CHANGES		
	2018 Proposed Route	2019 Update Route(s)	Changes
	A Spine	A Spine, 82	<p>A Spine Weekday frequency increased from every 4 minutes (16 bph) to every 3 minutes (20 bph).</p> <p>The A Spine and its branches (A1, A2, A3, A4) remain the primary radial and cross-city services connecting north-central Dublin to south-central Dublin via Swords Rd, City Centre, and Rathmines/Terenure, but with some changes to the branch termini. Route 82 is a new service on the North side linking parts of Swords to City Centre and sharing a long segment with A services on Swords Rd and Drumcondra Rd.</p>
	A1	North: A1, D2, 280 South: A1	<p>A1 weekday frequency increased from every 15 minutes to every 12 minutes.</p> <p>North side: A1 branch now begins at Beaumont Hospital, serves Lorcan Ave and Beaumont Rd before joining the spine at Whitehall. Priorswood is no longer on this branch. Priorswood to City Centre now on Route D2, every 15 minutes. Priorswood to Beaumont Hospital and Swords Rd now on Route 280, every 40 minutes.</p> <p>South side: No changes to A1.</p>
	A2	North: A2 South: A3	<p>A2 weekday frequency increased from every 15 minutes to every 12 minutes.</p> <p>North: No changes to A2.</p> <p>South: A2 branch now takes path to Rathfarnham, Ballinteer and Dundrum. Service to Tallaght via Templeogue Rd now on the A3 Branch.</p>
	A3	North: A3 South: A2	<p>A3 Weekday frequency increased from every 15 minutes to every 12 minutes.</p> <p>North: A3 branch would stop in front of DCU Campus Collins Ave, but would no longer enter the campus. Route extended to Shanowen Road terminus via Shanard Ave and Shanliss Road.</p> <p>South: A3 branch now takes path to Tallaght via Templeogue Rd. Service to Rathfarnham, Ballinteer and Dundrum now on the A2 Branch.</p>
	A4	North: A4, 82 South: A4	<p>A4 weekday frequency increased from every 15 minutes to every 12 minutes.</p> <p>North: New A4 path heading south starts in Swords Manor, turns east onto Rathbeale Rd, south onto Main Street, continues to City Centre as previously. Glen Ellan Rd service to City Centre now on Route 82, every 15 minutes.</p> <p>South: A4 path extended past Rathfarnham to Nutgrove Shopping Centre.</p>
	B Spine	B Spine	<p>B Spine weekday frequency increased from every 8 minutes (8 bph) to every 4 minutes (16 bph).</p> <p>The B spine's scope has increased. The B buses are still largely targeted at connecting greater Blanchardstown/D15 and the Navan Road to City Centre and UCD, but now is also the primary radial bus service along the coast in southeast Dublin to Dún Laoghaire. Spine now splits at St. Vincent's Hospital on the south side, with two branches (B1, B2) going to UCD via Nutley Lane. Two new branches added to serve Tyrrelstown, Dún Laoghaire (B3) and Monkstown, Sallynoggin (B4).</p>
	B1	B1, 360	<p>B1 peak frequency reduced from every 10 minutes to every 15 minutes, replaced by more peak express service. Route 362 would provide express service from Ongar to City Centre via Littlepace Distributor Road/Navan Rd.</p> <p>No routing changes to B1.</p>
	B2	B2, 362	<p>B2 peak frequency reduced from every 10 minutes to every 15 minutes, replaced by more peak express service. Route 360 would provide express service from Ongar Distributor and Hartstown/Huntstown to City Centre skipping Blanchardstown Shopping Centre.</p> <p>No routing changes to B2.</p>

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	Added route	B3	<p>B3 branch added, with weekday frequency every 15 minutes.</p> <p>North: Starts at Hollystown Roundabout, goes through Tyrrelstown on the Boulevard, continues to Blanchardstown Shopping Centre via Church Rd, Castlecurragh. Continues from Blanch SC to City Centre and south side.</p> <p>South: from St, Vincent's Hospital, continues on Merrion Road to Blackrock and Dún Laoghaire on path of existing 7/7A. Ends at Dun Laoghaire.</p>
	Added route	B4	<p>B4 branch added, with weekday frequency every 15 minutes.</p> <p>North: No northside branch on B4. Starts at Blanchardstown Shopping Centre, follows Navan Road to City Centre on the spine.</p> <p>South: From St. Vincent's Hospital heading south, continues on Merrion Road to Blackrock, then takes Stradbroke Rd, Abbey Road, Rochestown Ave, Sallynoggin Rd. Serves Pearse St in Sallynoggin, ends at the Graduate Roundabout.</p>
	C Spine	C Spine	<p>C Spine weekday midday frequency reduced from every 6 minutes (10 bph) to every 8 minutes (8 bph), in favour of a stronger focus on peak services in the N4 corridor.</p> <p>The C spine and branches remain the primary all-day radial services linking north Kildare and Lucan to the City Centre and south Docklands. Reflecting public input and observed loads, the emphasis in those areas has shifted slightly away from midday service and toward a significant increase in peak-only services (see C1, C2 and 320-series routes). In addition, significantly higher frequency would be provided on the branches to Sandymount. No changes in routing on the common spine.</p>
	C1	C1	<p>C1 weekday midday frequency reduced from every 24 minutes to every 30 minutes. Weekday peak frequency increased to every 8 minutes (8 bph).</p> <p>West: No routing changes to C1.</p> <p>South: C1 and C2 now run together all the way to Saint John's Church, providing weekday midday 15 minute frequency/peak 8 minute frequency in Irishtown and Sandymount.</p>
	C2	C2, S4	<p>C2 weekday midday frequency reduced from every 24 minutes to every 30 minutes. Weekday peak frequency increased to every 8 to 15 minutes.</p> <p>West: No routing changes to C2.</p> <p>South: C1 and C2 now run together all the way to Saint John's Church, providing 15 minute or better frequency all day between City Centre and Irishtown and Sandymount. C2 no longer serves Sean Moore Rd. Sean Moore Road will be on S4 orbital, every 15 minutes.</p>
	C3	C3, 323, 324, 325, 326	<p>C3 weekday midday frequency reduced from every 24 minutes to every 30 minutes. Peak frequencies replaced with peak-only express service on Routes 323 - 326, which represent different patterns of the existing Route 66x.</p> <p>No routing changes.</p>
	C4	C4, 327, 328	<p>C4 weekday midday frequency reduced from every 24 minutes to every 30 minutes. Peak frequencies replaced with peak-only express service on Routes 327 - 328, which represent different patterns of the existing Route 67x.</p> <p>C4 returns to existing Route 67 path between Celbridge and Lucan via Celbridge Airport and Weston Estate.</p>

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	D Spine	D Spine, 81	<p>D spine weekday frequency increased from every 5 minutes (12 bph) to every 4 minutes (16 bph).</p> <p>The D spine and branches remain the primary radial and cross-city services on the Malahide Road and the Crumlin Road, but with substantial changes to branches. On the south side, two D spine branches now serve Clondalkin, and three serve greater Tallaght. On the north side, direct service to City Centre restored to Edenmore and parts of Kilmore.</p> <p>North spine: The spine now splits at Artane Roundabout on the north side, with new branches to Killinarden (D4) and Edenmore (D5), closer to existing 27a/b services.</p>
	D1	81	Service between Malahide and City Centre is now on a separate Route 81, running every 30 minutes, similar to existing Route 42. See description of branches D2 and D3 (below) for revised D1 alignment.
	D2	North: D1, D9 South: D2	<p>D2 weekday midday frequency unchanged, every 15 minutes. Peak frequency reduced from every 10 minutes to every 15 minutes, in favour of new peak hour extra service on the Malahide Road only (D9, 6 bph).</p> <p>North: D2 now takes path from Clare Hall through Darndale to Malahide Road, similar to existing route 27. The path from Clongriffin to Clare Hall via Main Street is now on the D1 branch, continuing to City Centre and Clondalkin.</p> <p>South: D2 path from Tallaght to Jobstown changed and extended to Citywest Business Park. From The Square, new path takes Blessington Road, Fortunestown Rd, Fortunestown Way to Citywest Road. Cheeverstown Rd now on W4 and W8 orbitals (both every 30 minutes), Brookfield Road on W8 only (every 30 minutes).</p>
	D3	North: D3, D9 South: D1, D3	<p>D3 weekday midday frequency unchanged, every 15 minutes. Peak frequency reduced from every 10 minutes to every 15 minutes, in favour of new peak hour extra service on the Malahide Road only (D9, 6 bph).</p> <p>North: No routing changes to D3.</p> <p>South: There are now 2 different D branches, both operating every 15 minutes, serving different parts of Clondalkin. The new D1 follows the New Nangor Road to Grange Castle Business Park, then continues north on the Grange Castle Rd and terminates at Griffeen Ave in Foxborough (south Lucan). The new D3 turns off the New Nangor Road onto Watery Lane to serve Clondalkin Village, then serves Fonthill Road and Bawnogue Road before ending at St. Ronan's Church.</p>
	D4	North: D1 South: 15, 20	<p>Entire D4 path is now on differently-numbered branches or routes. Apart from the spine segment, the new D4 is a substantially different route (see below).</p> <p>North: The path from Clongriffin to Clare Hall via Main Street now on D1 branch, continuing to City Centre and Clondalkin.</p> <p>South: St. Agnes Road/Crumlin Village are now on Route 20 to City Centre, every 30 minutes (15 peak) via Kildare Road and Clogher Road. Limekiln Road and Whitehall Road West are now on new Route 15, every 20 minutes to City Centre via Kimmage and Rathmines.</p>
	Added route	D4	<p>D4 weekday frequency every 30 minutes.</p> <p>North: Headed south, the new D4 starts at Coolock Lane, continues through Beaumont Hospital to Skelly's Lane and Ardlea Road before entering the spine at Artane Roundabout. Intended to be a more direct replacement for parts of existing Route 27b.</p> <p>South: Headed south, D4 continues past Crumlin Hospital to Tallaght via Greenhills Road, Main Street, Belgard Square. After The Square, follows Blessington Road to Killinarden Heights, ends at the south end of Kiltipper Way. Intended as a more direct replacement for parts of Route 77a.</p>
	Added route	D5	<p>D5 weekday frequency every 30 minutes.</p> <p>North: Follows the path of existing route 27a through Ard Na Gréine, Edenmore, Harmonstown before entering the spine at Artane Roundabout.</p> <p>South: D5 Continues past Crumlin Hospital to Walkinstown, Greenhills Road. Turns off Greenhills Road at Castletymon Road. Serves Castletymon Road, Avonmore Road, Seskin View, Tallaght Village and ends at The Square. Intended as a replacement for parts of Route 77a.</p>

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	E Spine	E Spine	No changes to E spine routing or frequency. The E spine and its branches continues to be the main radial and cross-city services on Ballymun Road in the north and the Stillorgan Road/N11 in the south. Supplemental E9 peak-only service between Brides Glen and UCD.
	E1	E1	No changes to E1 frequency, every 10 minutes. North: E1 service to start at IKEA instead of Northwood, similarly to existing Route 155. South: no changes to E1 routing to Bray.
	E2	E2	No changes to E2 routing or frequency.
	F Spine	F Spine	F spine weekday midday frequency increased to every 5 minutes (12 bph) with three branches, each every 15 minutes. The F spine and branches continue to be proposed as the primary radial and cross-city services for all parts of Finglas, albeit with more (and slightly more direct) paths through Finglas. On the south side, the F spine branches extend further, including F1 out to Tallaght via Firhouse. In Kimmage, the F spine stays together further south, until junction of Kimmage Road West, Kimmage Road Lower, Terenure Road and Fortfield Road. Significant changes to how the three branches (F1, F2 and F3) distribute service south of Kimmage.
	F1	North: F2, F3 South: F1, F2	F1 weekday frequency increased to every 15 minutes. Finglas NE and SW: Jamestown Road to Finglas Village now on new F3, which continues west on Mellows Road to Cardiffsbridge Road and serves Finglas Southwest before taking the Tolka Valley Road to Finglas Road and City Centre. Finglas NW: The new F2 arrives onto Mellows Road from - Road, then continues east on Mellows Road, and takes the Finglas Bypass to City Centre. South: The new F1 continues south of Kimmage on Fortfield Road, but turns south onto Cypress Grove Road and serves Templeogue, Firhouse, ending in Tallaght.
	F2	North: F2, F3	F2 weekday frequency increased to every 15 minutes. See above (F1) for changes in Finglas. South: The new F2 continues to serve Whitehall Road south of Kimmage Road, but moves service previously on Wellington Road to Glendown Ave, Orwell Lane before rejoining Wellington Lane, ending at the Spawell Roundabout.
	F3	North: F1 South: F3, 15	F3 weekday frequency unchanged, every 15 minutes. North: See above for new F3 northside path. The new F1 takes the direct path to City Centre from Charlestown, via the Finglas Bypass. South: F3 stays on Kimmage Road Lower until junction with Kimmage Road West and Terenure Road, then turns west onto Kimmage Road West. Rejoins its previous path at Cromwellsfort Road, continuing to Walkinstown, Saint James' Road and ends at Greenhills College. New Route 15 (every 20 minutes) serves St. Agnes Park and Stannaway Road to City Centre via Rathmines.

	2018 Proposed Route	2019 Update Route(s)	Changes
ROUTE	G Spine	G Spine	<p>No changes to G spine frequency, every 8 minutes midday (8 bph) and every 6 minutes peak (10 bph).</p> <p>G spine and branches continue to be the primary radial services in the Ballyfermot area; one branch extended further out into Clondalkin. East of City Centre, G spine extended past College Green to end in the Docklands at Spencer Dock.</p>
	G1	G1	<p>No changes to G1 frequency, every 15 minutes midday / 12 peak.</p> <p>East: G1 extended from College Green to Spencer Dock.</p> <p>West: G1 extended past Park West to Red Cow via New Nangor Road, Woodford Walk.</p>
	G2	G2	<p>No changes to G2 frequency, every 15 minutes midday / 12 peak.</p> <p>East: G2 extended through College Green and Custom House to Spencer Dock.</p> <p>West: No routing changes to G2.</p>
	Added route	H Spine, H9	<p>The prior iteration of the plan did not include any radial service on the Howth Road past All Saints Road. Beyond that point, service was provided on the orbital N6, which is not included in the revised proposal. Service on the Howth Road been changed back to a configuration more consistent with other major routes into the City Centre, as the H Spine combining three branches (H1, H2, H3) serving the areas that feed into the Howth Road.</p> <p>H spine combined weekday frequency is every 8 minutes (8 bph), with some additional peak-only service for the inner portion of the route (H9) from All Saints Road to the City Centre terminus at Abbey Street.</p>
	Added route	H1	<p>H1 replaces Route 60 from prior iteration of proposal, and is similar to existing route 29a (but at higher frequency).</p> <p>Would operate every 15 minutes from Clongriffin to City Centre via Red Arches Rd, Grange Rd (Donaghmede), Raheny Rd, All Saints Road, continuing to City Centre.</p>
	Added route	H2	<p>H2 is similar to existing Route 32, but with frequency increased to every 30 minutes.</p> <p>Would operate every 30 minutes from Malahide to City Centre via Portmarnock, Coast Road, Bayside, Howth Road. H2 and H3 combine to provide service every 15 minutes in Bayside and Kilbarrack.</p>
	Added route	H3	<p>H3 is similar to existing Route 31.</p> <p>Would operate every 30 minutes from Howth to City Centre. H2 and H3 combine to provide service every 15 minutes in Bayside and Kilbarrack.</p>

Full List of Changes - Orbitals

	2018 Proposed Route	2019 Update Route(s)	Changes
	O	O	No changes to routing or frequency on O.
	N2	N2	No changes to frequency on N2. N2 remains the Griffith orbital, with two routing changes. (1) No longer on Howth Road and Copeland Ave. From Clontarf Road Station heading west, would run west on Clontarf Road, north on Malahide Road, east on Griffith Ave. (2) From Ballymun Road heading west, would run west on Griffith Ave, south on Ballygall Road East (not Tolka Estate Rd.), west on Old Finglas Road; this change in response to changes to Route 7, maintains connection between N2 and service every 10 minutes to City Centre (on Old Finglas Rd).
	N4	N4	No changes to routing or frequency on N4. N4 remains the very frequent (every 10 minutes) Collins Ave orbital, with service from Spencer Dock to Blanchardstown via the north Dublin City.
	N8	N8	No changes to frequency on N8. N8 remains the very frequent (every 10 minutes) orbital connecting outer north Dublin City, but with two routing changes to better connect to major destinations.. (1) N8 now serves Beaumont Hospital. Buses would deviate off Kilbarron Road to main hospital entrance and then back out, in both directions. (2) N8 extended south past Charlestown Shopping Centre to Finglas Village via McKee Ave; this allows N8 to connect with N4, reducing the number of interchanges between north Dublin and Blanchardstown.
ROUTE	S2	S2	S2 weekday frequency increased to from every 20 minutes/15 peak to every 15 minutes all day. S2 remains the inner south orbital through Kimmage, Rathmines, Ballsbridge. Extended east past Sandymount to Beach Road and Sean Moore Rad (Poolbeg SDZ).
	S4	S4	No changes to frequency on S4. S4 remains the very frequent (every 10 minutes) orbital connecting a wide variety of south Dublin City neighbourhoods to each other and UCD. Two routing changes. (1) Rerouted away from Walkinstown and toward Crumlin Village. From Kylemore Road and Long Mile Road heading east, east on Long Mile Rd and Drimnagh Rd, southwest on St. Mary's Road, south on Saint Agnes Road, east on Kimmage Road West. (2) Extended east to new UCD terminus on Stillorgan Road.
	S6	S6	S6 and S7 combined into a single S6 orbital, with weekday frequency every 15 minutes. S6 would still connect Tallaght, Rathfarnham, Dundrum, UCD and Blackrock. Two main routing changes. (1) Starting and The Square and heading east, S6 now serves Belgard Square and Tallaght Village before continuing south on Old Bawn Rd going toward Firhouse. (2) In Firhouse, S6 now stays on Firhouse Road, does not serve Ballycullen Drive and Ballycullen Ave.
	S7	S6, F1	S7 deleted from this iteration of the plan. Segments on Ballycullen Drive and Ballycullen Road now on F1, every 15 minutes. This means service to Firhouse will be more frequent (2 routes @ every 15 minutes instead of 2 routes @ every 30 minutes), and Firhouse will have both an orbital (S6) and a direct service to City Centre (F1).
	S8	S8	No changes to S8 frequency, weekdays every 20 minutes/15 peak.. S8 remains the "outer south" orbital connecting Tallaght, Sandyford and Dún Laoghaire. Two routing changes. (1) Extended east from The Square to Citywest Business Park via Blessington Road and Citywest Road. (2) Serves Monkstown Rd instead of Monkstown Ave. From Newtownpark Ave & Fleurville Rd, follows Newtownpark Ave north, then north on Temple Hill, east on Monkstown Rd to Dún Laoghaire.

	2018 Proposed Route	2019 Update Route(s)	Changes
	W2	W2	<p>No changes to W2 frequency, every 15 minutes on weekdays.</p> <p>W2 remains the "inner west" orbital linking Liffey Valley, Clondalkin and Tallaght. One routing change in Clondalkin. Between Clondalkin Village and Belgard Road, would serve New Road instead of Boot Road, similar to existing Route 76.</p>
	W4	W4	<p>No changes to W4 routing or frequency. W4 continue to provide the new direct link between Blanchardstown SC and Liffey Valley via the M50, and to connect job centres along Grange Castle Road, in Citywest/Kingswood and Tallaght.</p>
	W8	W8, S8	<p>No changes to W8 frequency, every 30 minutes on weekdays.</p> <p>W8 continues to be the "outer west" orbital via Maynooth, Celbridge, Newcastle, Saggart, Citywest and Tallaght. Routing changes between Citywest and Tallaght. From Fortunestown Way & Citywest Road going southeast, would serve Fortunestown Way, Brookfield Road, Cheeverstown Road, Blessington Road and Old Blessington Road to The Square. Citywest Road south of Fortunestown Way to be served by S8 (every 20 minutes) instead of W8.</p>

Full List of Changes - Numbered Radials

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	7a	North: 7 South: B1,B2,B3,B4	<p>North: Routes 7A and 7B replaced by Routes 7 and 8. Routes 7 and 8 would operate jointly between City Centre and Glasnevin, effectively forming a single route operating every 10 minutes on weekdays between Merrion Square and the junction of Ballygall Rd & Old Finglas Rd. North of this junction, Route 7 would serve Tolka Estate, Glasnaon Rd, Jamestown Rd and St. Margaret's Road to Charlestown Shopping Centre, running every 20 minutes on weekdays.</p> <p>South: Service south of Merrion square to Dun Laoghaire now on B spine and branches. All B branches operate to Saint Vincent's Hospital (i.e. every 4 minutes on weekdays between Merrion Square and Saint Vincent's). B3 and B4 follow Merrion Road and Rock Road to Blackrock (i.e. service every 8 minutes between Blackrock and City Centre). South of Blackrock, B3 branch would continue every 15 minutes to Dun Laoghaire via Monkstown Rd. B4 branch every 15 minutes to Sallynoggin via Stradbroke Rd.</p>
	7b	North: 8 South: B3, B4	<p>North: Routes 7A and 7B replaced by Routes 7 and 8. Routes 7 and 8 would operate jointly between City Centre and Glasnevin, effectively forming a single route operating every 10 minutes on weekdays between Merrion Square and the junction of Ballygall Rd & Old Finglas Rd. North of this junction, Route 8 would serve Ballygall Road, Willow Park Road, Sycamore Road and Melville Road to Charlestown Shopping Centre. Service also extended northward to Dublin Airport via St. Margaret's Road, Harristown and Old Airport Road. Route 8 would run every 20 minutes on weekdays.</p> <p>South: see changes to Route 7a above.</p>
	10	10	<p>As in the prior plan iteration, there is a combined service every 15 minutes between City Centre and Eglington Rd/Milltown Rd, through Harcourt and Ranelagh. That service is the combination of new Routes 10, 11 and 12 (previously 10 and 12). City Centre terminus shifted from Parnell Square to Mountjoy Square.</p> <p>South of Eglington Road, no changes to Route 10 frequency, every 30 minutes on weekdays. Route extended south past Sandyford Luas to Ticknock via Blackthorn Rd and Sandyford Village. This provides a direct path to City Centre for Ticknock.</p>
	12	11, 12	<p>Route 12 split into Routes 11 and 12. Routes 11 and 12 continue running together south of Eglington Road via Milltown Road, Dundrum Rd, Sandyford Road to Belarmine, providing service every 30 minutes to City Centre. Route 11 would terminate at Belarmine Ave. South of Belarmine Ave, Route 12 would be extended every 60 minutes to Enniskerry, similar to existing Route 44.</p>
	14	West: 14 South: 14, A2	<p>Weekday frequency on proposed Route 14 increased from every 30 minutes (15 at peak) to every 15 minutes (10 at peak). Weekend frequencies also increased.</p> <p>West: no routing changes.</p> <p>South: no changes between City Centre and Nutgrove Ave. South of Nutgrove Ave, Route 14 would turn west on Nutgrove Ave, south on Nutgrove Way, and west on Brehon Field Road, more closely matching service on parts of existing Routes 14 and 16. Service between Ballinteer and Dundrum would be on the A2 spine branch (every 15 minutes). Ballinteer would retain two frequent paths to City Centre, as in existing service (14/16), but on slightly different routes (14/A2).</p>
	Added route	15	<p>Responding to concerns about frequency and direct connectivity between parts of Perrystown, Crumlin and Kimmage to Rathmines and City Centre (provided by portions of routes 15a, 18 and 83/a in existing service), the revised plan proposes a new Route 15 from Greenhills College to Mountjoy Square. This route would operate every 20 minutes on weekdays.</p> <p>From Greenhills College heading northeast, Route 15 would operate via Limekiln Road, Whitehall Road West, St. Agnes Park (Crumlin Village), Stannaway Road, Sundrive Road, Kenilworth Road to Rathmines, continuing north to Harcourt then St. Stephen's Green, Pearse Station, Custom House and Gardiner Street to Mountjoy Square.</p>
	16	16	<p>Weekday midday frequency on proposed Route 16 increased to every 15 minutes, peak frequency still every 10 minutes. Weekend frequencies also increased.</p> <p>Routing modified in Ballyboden to serve Ballyboden Way (like existing 15b).</p>

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	20	20	<p>Weekday frequency unchanged on inner portions of Route 20, every 30 minutes (15 at peak) between Walkinstown and City Centre. Peak frequency reduced from every 15 minutes to every 30 minutes between Walkinstown and Kingswood Luas. Frequency increased on outer portions of route, between Kingswood Luas and Tallaght, from every 60 minutes to every 30 minutes.</p> <p>Route 20 and new Route 22 would now operate jointly every 15 minutes between South Circular Road and East Wall.</p> <p>North: Route 20 routing changed through City Centre and extended north to Docklands and East Wall (replacing existing route 151). From Kevin Street going north, Route 20 would now operate via Kevin Street, Aungier Street, College Green, Tara Street, Custom House, to Spencer Dock and East Wall.</p> <p>South: See above for Route 20 changes through City Centre. Routing unchanged between from junction of Kevin Street & Clanbrassil Street to the junction of Kildare Road and Crumlin Road (near Crumlin Hospital). From this junction, Route 20 would turn south and serve St. Agnes Road (Crumlin Village), then west on Cromwellsfort Road, through the Walkinstown Roundabout to Ballymount Industrial Estate. Route 20 would then continue to Kingswood Luas and Tallaght via Cookstown Road, as previously planned (similar to existing Route 56a).</p>
	22	22, 23	<p>Previously planned Route 22 (proposed at every 15 minutes on weekdays) replaced with new Routes 22 and 23. The intent is to provide more service closer to more places in parts of Crumlin and Drimnagh.</p> <p>Route 22 would operate every 30 minutes on weekdays. From Crumlin Hospital heading north, it would serve Galtymore Road, Suir Road, Keeper Road, Herberton Road and South Circular Road, before continuing to East Wall jointly with new Route 20 (see above).</p> <p>Route 23 would operate every 15 minutes on weekdays (10 at peak). From Crumlin Hospital heading north, it would serve Mourne Road, Suir Road and South Circular Road to St. James' Hospital, then continue across City Centre via Thomas Street, Dame Street, College Green and O'Connell Street to Summerhill and Marino.</p>
	Added route	24	<p>New Route 24, operating every 30 minutes on weekdays, intended to prevent isolation of various south Dublin neighbourhoods located relatively far from main spine and radial services. In particular, this new route would serve to connect Whitechurch and Ballyboden to Dundrum as well as City Centre, and to continue providing direct service to City Centre in certain parts of Crumlin. City Centre service on the Quays.</p> <p>From the Quays headed south, Route 24 would operate on Winetavern Street, Patrick Street and Cork Road to Dolphin's Barn, continuing south via Sundrive Road to St. Agnes Park, St. Agnes Rd (Crumlin Village), Captain's Way, Kimmage Road Lower, Terenure Road, Ballyboden Road, Taylors Lane and Whitechurch Road to Whitechurch. It would then continue back out of Whitechurch to Dundrum via Whitechurch Road, Grange Road, Brehon Field Road, Ballinteer Road, Wyckham Way and Main Street.</p>
	35	35	<p>In the previous plan iteration, Routes 35 and 37 operated jointly at a combined frequency of every 15 minutes (8 at peak) between the Ashtown Roundabout and City Centre. This remains the case in the revised proposal, with the following changes. (1) Route 37 has been renamed Route 34, so that the two routes at the joint frequency have consecutive numbers. (2) The City Centre routing has been modified to serve Parnell Square, Gardiner Street Lower, Custom House, Pearse Station, Merrion Square and Baggot Street, terminating at Burlington Road, making these more similar to existing routes 37, 38 and 38a. (3) the midday frequency of the joint segment is now every 10 minutes.</p> <p>With regards to Route 35 specifically, the weekday midday frequency has been increased to every 20 minutes (similar to combination existing Routes 38/38a). The routing between Blanchardstown Shopping Centre and Castleknock has been changed to serve Corduff and Connolly Hospital. From Blanchardstown Shopping Centre heading to City Centre, Route 35 would serve Blanchardstown Road North, Blackcourt, Corduff, Waterville Rd, Connolly Hospital, Main Street and Castleknock Rd to Castleknock, the continuing to town via Auburn Ave and the Navan Road.</p>
	36	36	<p>No changes to proposed Route 36 frequency, every 15 minutes on weekdays.</p> <p>The City Centre routing has been modified and extended (similar to routes 34 and 35) to serve Parnell Square, Gardiner Street Lower, Custom House, Pearse Station, Merrion Square and Baggot Street, terminating at Burlington Road.</p>

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	37	34	Route 37 renamed as Route 34. See Route 35 above with respect to the joint segment from the Ashtown Roundabout to City Centre. With regards to Route 34 specifically, the weekday midday frequency has been increased to every 20 minutes with peak frequencies every 8-15 minutes (similar to existing Route 37). No routing changes between Blanchardstown Shopping Centre and Mater Hospital, see Route 35 for changes in City Centre.
	60	H1, H2, H3	See H Spine and branches above for service on the inner Howth Rd, as well as service to All Saints Road, Donaghmede, Baldoyle, and Portmarnock via the Howth Road.
	63	93	Route 63 renamed Route 93. See Route 93 below.
	64	64	Most Route 64 frequencies unchanged. Weekday peak-hour frequencies increased from every 10 minutes (6 bph) to every 6 minutes (10 bph) to provide sufficient passenger capacity. Routing within Clontarf restored to existing route 130 pattern.
	Added route	81	The prior iteration of the plan incorporated the route from Malahide to City Centre as one of the branches of the D spine. However, the long-distance from Malahide to City Centre limited the cross-city potential of the D branch, and required a more direct path bypassing Yellow Walls Rd and Seabury to maintain an operable running time. In response to these operational issues and public comments, this is resolved in this iteration of the plan by separating the Malahide to City Centre path onto a separate Route 81, operating every 30 minutes on weekdays, similar to existing Route 42. This route would operate every 30 minutes from Malahide Village to City Centre via Yellow Walls Rd, Seabury, Feltrim, Kinsealy and on the Malahide Road to Talbot Street/Abbey Street.
	Added route	82	In response to public comments, Route 82 is proposed to allow for more direct services between neighbourhoods in Swords, North Dublin and City Centre. The route is in many ways similar to existing Route 41c, but provided at a higher frequency, every 15 minutes on weekdays. Heading from Swords to City Centre, the route would begin at Glen Ellan Road, then continue to North Street, Main Street, River Valley Road, Rathingle Rd, and Boromimhe before joining the Dublin Road/R132. It would bypass the Airport, continuing on to the Swords Rd/Drumcondra Rd to City Centre. Arriving in the City Centre, Route 82 would turn from Dorset Street onto Gardiner Street Upper, then continue down Gardiner Street to Custom House and by Pearse Station before terminating at Merrion Square.
	Added route	93	Route 93 is a renaming and extension of Route 63 in the previous iteration of the plan. Also replaces Route 242 from prior iteration of the plan. No changes in frequency, every 60 minutes. North: no routing changes from previously proposed Route 63, route continues to connect the Port to City Centre. South: Routing modified and extended to serve Saggart and Rathcoole, similar to existing Route 69. From Kingswood Avenue heading southwest, it would operate on Citywest Road, Bianconi Avenue and Garter Lane to Saggart, continuing to Rathcoole via Mill Road and Main Street.
	Added route	94	Route 94 has been added to provide a minimum level of direct service to City Centre in certain North Dublin neighbourhoods that would be located farther from the main spine and radial services. It would operate every 60 minutes. Starting from IKEA and heading toward City Centre, this route would serve Balbutcher Lane South, Ballymun Road, the parts of Wadelai currently served by existing route 11, then back on the Ballymun Rd and St. Mobhi Road, then east on Home Farm Road, south on Drumcondra Road, Dorset Street, and terminating at Parnell Square.
	Added route	95	Route 95 has been added to provide a minimum level of direct service to City Centre in certain West Dublin neighbourhoods that would be located farther from the main spine and radial services. It would operate every 60 minutes. Starting in Cherry Orchard (at the terminus of existing route 79) and heading toward City Centre, this route would serve Cherry Orchard, Clifton Road, Kylemore Road, Decies Rd to Emmet Road, then continuing along the same path as the G Spine to City Centre and the Docklands.

R O U T E	2018 Proposed Route	2019 Update Route(s)	Changes
	Added route	96	<p>Route 96 has been added to provide a minimum level of direct service to City Centre in certain North Dublin neighbourhoods that would be located farther from the main spine and radial services, and to maintain an existing link between Beaumont Hospital and the Rehabilitation Hospital in Clontarf (existing route 104). It would operate every 60 minutes.</p> <p>Starting from Beaumont Hospital and headed toward City Centre, this route would serve Kilbarron Lane, Kilmore Road, Skelly's Lane, Beaumont Road, Collins Avenue heading to Killester and Clontarf. In Clontarf, it would head south on Sybil Hill Road, then serve Blackheath Park and Castle Ave before joining Clontarf Road, and following Clontarf Rd and the Malahide Road to City Centre, terminating in Abbey Street.</p>
	Added route	97	<p>Route 97 has been added to provide a minimum level of direct service to City Centre in portions of Cabra and Ashington Park that currently receive service, and would otherwise be located farther from the main spine and radial services. It would operate every 60 minutes.</p> <p>Starting at Ashington Park and heading toward City Centre, this route would serve Ashington Ave, Kinvara Ave, the Navan Road, Nephin Road, Ventry Park, and Carnlough Road, passing by Mater Hospital and terminating at Parnell Square.</p>
	Added route	98	<p>Route 98 has been added to provide a minimum level of direct service to City Centre in certain DLR neighbourhoods that would be located farther from the main spine and radial services.</p> <p>Starting in Loughlinstown Wood Estate (terminus of existing Route 7a) and heading toward City Centre, this route would serve Loughlinstown Drive, Wyattville Road, Churchview Road, Rochestown Ave, Sallynoggin Road and Glenageary Road Lower, continuing to Dún Laoghaire and then to City Centre via Monkstown, Blackrock, St. Vincent's Hospital and Ballsbridge. In City Centre, would serve Merrion Square, Pearse Station, Custom House, Gardiner Street and terminate at Mountjoy Square.</p>

Full List of Changes - Suburban Locals

	2018 Proposed Route	2019 Update Route(s)	Changes
	201	201	<p>Routes 201 and 202 continue to provide service at a combined 20 minute frequency from Bray Daly Station to Charlesland in Greystones. South of Charlesland, these routes would split into a clockwise loop (201) and an anticlockwise loop (202) serving Kilpedder, Newtownmountkennedy, Newcastle, and Kilcoole. Along the loop, there is a bus every 40 minutes in each direction.</p> <p>On the 201, the routing of the loop has shifted in Kilpedder to continue serving existing stops northbound in the village and Willowgrove. Due to the configuration of the junction of the N11 and Glen Road, this requires also continuing to serve the Ballydonagh Road stop in the northbound direction before turning back toward Greystones and Bray.</p>
	202	202	See Route 201 above for general explanation. No changes to Route 202 otherwise.
	204	204	No changes to routing or frequency on proposed Route 204. Still proposed as a one-way circulator within Greystones.
	211	211	<p>Weekday frequency increased from every 30 minutes to every 20 minutes on proposed Route 211, reflecting increase in frequency of existing route 45a.</p> <p>Still service from Kilmacanogue to Dún Laoghaire via Bray, Shankill, Ballybrack, Sallynoggin. Proposed service in Ballybrack moved from Church Road to Churchview Road, so that all services in this area would run on Churchview Road.</p>
	212	212	No changes to routing or frequency on proposed Route 212. Still local feeder service every 10 minutes from Ballywaltrim to Bray Daly Station.
	213	12, 213, 215, 313	<p>In the previous plan iteration, Route 213 operated every 40 minutes between Bray and UCD via Enniskerry village, Kilternan, Stepside, and Sandyford. In response to public comments, the following changes have been made:</p> <p>Enniskerry Village, Kilternan and Stepside are now on a radial route (Route 12), which would operate every 60 minutes, similar to existing Route 44. Kilternan and Stepside would also remain on Route 213, which would operate every 60 minutes to Sandyford, Stillorgan Village, UCD and Ringsend. At peak hours, this would be supplemented by Route 313 between Kilternan and UCD, providing up to 3 trips per hour in each direction.</p> <p>Shop River, the Kilgarron Hill and Enniskerry Village are now on a local feeder route (Route 215), which would run every 60 minutes to Bray, similar to Route 185 but more direct to Bray Station (no deviation to Palermo, which is now proposed on new Route 214).</p>
	Added route	214	<p>The previous plan iteration did not include service to the Palermo area of Bray, and service to the Southern Cross Road was limited to Route 301 (similar to existing 84x). In response to public comments, we propose the new Route 214, which would operate every 30 minutes on weekdays between Ballywaltrim and Palermo via the centre of Bray and the beach.</p> <p>From Ballywaltrim heading north, the route would serve Southern Cross Road, Vevay Road, Putland Road, Meath Road (Strand Road southbound), Bray Daly Station, Florence Rd (Quinnsborough Road southbound), Main Street, Castle Street and Beech Rd/Hawthorn Rd in Palermo.</p>
	Added route	215	See Route 213 above for details. Route 215 would replace most of existing route 185, connecting parts of Enniskerry to Bray every 60 minutes.

2018 Proposed Route	2019 Update Route(s)	Changes
221	221, 312	No changes to weekday midday frequency on proposed Route 221, every 60 minutes. Weekday peak frequency reduced from every 30 minutes to every 60 minutes. Additional peak service from Dalkey to City Centre is planned on Route 312. Route 221 continues to serve as the bus connection between Killiney, Dalkey, Glasthule and Dún Laoghaire.
222	222, 311, B4	No changes to weekday midday frequency on proposed Route 222, every 15 minutes. Weekday peak frequency reduced from every 10 minutes to every 15 minutes. Route 222 continues to serve as direct link between Brides Glen and Dún Laoghaire via Wyattville Road, Churchview Road, Sally Glen Road and the Glenageary Road Lower. Peak frequency reduced in favour of restoring direct all-day service to City Centre in Sallynoggin (see Route B4) and calibrating the number of trips on peak-only Route 311 through Ballybrack.
225	225	No changes to frequency on proposed Route 225, every 15 minutes on weekdays. Route 225 continues to connect Dundrum to Dún Laoghaire via Stillorgan Village, Fleurville Road, and Monkstown Ave. However, the proposed routing from Dundrum to Stillorgan Village has changed. From Dundrum Luas heading east, Route 225 would now serve Main Street, Sandyford Road, Overend Ave (near Balally Luas), Kilmacud Road Upper and St. Raphaela's Road. This change allows the route to serve the whole Dundrum commercial area, and restores service to Kilmacud Road Upper (on route 75 in existing service).
226	226, B4	No changes to frequency on proposed Route 226, every 30 minutes on weekdays. Route 226 still proposed as local service from Kilternan to Blackrock via Carrickmines, Cornelscourt, Clonkeen Road and Deansgrange. However, the path from Deansgrange Road & Fleurville Road to Blackrock now takes Fleurville Road and Carysfort Ave (instead of Deansgrange Road and Stradbroke Road). Service on Stradbroke Road now on B4 spine branch, providing frequent direct service to Blackrock and City Centre similar to existing route 4.
227	226, 227	No changes to frequency on proposed Route 227, every 30 minutes on weekdays. Significant routing changes. Route 227 would now connect Ballyogan to Dún Laoghaire rather than Blackrock, similar to existing route 63 (via Cornelscourt, Cabinteely, Johnstown Road, Pottery Road, Abbey Road, Monkstown Ave, Monkstown Farm, Mounttown Road Lower, York Road)
229	98, 227	Route 229 no longer included in revised proposal. All areas otherwise served. In particular: Loughlinstown Drive and Rochestown Ave are now on proposed Route 98 with service to Dún Laoghaire and City Centre. Abbey Road, Monkstown Ave, Monkstown Farm now on Route 227 with service to Dún Laoghaire and Carrickmines.
233	10, 11, 12	Route 233 not included in revised proposal. In the previous plan iteration, Route 233 was proposed every 60 minutes from Belarmine through Ticknock Park to Harold's Grange Road, terminating in Dundrum. In response to public comment, Ticknock is now at the end of Route 10, providing service every 30 minutes to Sandyford at City Centre. Belarmine is served by Routes 11 and 12, which go to Dundrum and City Centre.
234	24	Route 234 not included in revised proposal. Service to Whitechurch significantly expanded, including: Route 24 to Dundrum and City Centre (see Route 24), every 30 minutes. Route 235 to Dundrum (see below). Route 316 to UCD, similar to existing route 116. Route 318 to City Centre, with some similarities to existing route 15d.
235	235	No changes to routing or frequency on proposed Route 235. Service from Edmondstown to Dundrum via Whitechurch, Nutgrove, similar to existing route 161.

2018 Proposed Route	2019 Update Route(s)	Changes
240	D4, D5, F1	<p>Route 240 not included in revised proposal. In the previous plan iteration, Route 240 provided a frequent local service every 15 minutes linking various areas in Tallaght (Killinarden Heights, Seskin View, Avonmore, Balrothery, Tymon North, Airtown Road) to each other and The Square. In response to public comment, this has been replaced by a proposal for less frequent service, but with no interchange required to City Centre, on spine branches D4, D5 and F1.</p> <p>Killinarden Heights is now proposed on branch D4, every 30 minutes to The Square and City Centre.</p> <p>Seskin View, Avonmore, Balrothery and Tymon North are now proposed on branch D5, every 30 minutes to The Square and City Centre. (Balrothery also remains on branch A3, every 12 minutes to City Centre via Templeogue).</p> <p>Firhouse Road West (Aylesbury) is now proposed on branch F1, every 15 minutes to The Square and City Centre.</p>
242	93	<p>Route 242 not included in revised proposal. In the previous plan iteration, Route 242 provided local service every 30 minutes (15 peak) from Rathcoole to Saggart Luas. In response to public comment, this is now replaced by proposed Route 93, providing service every 60 minutes to Saggart, Citywest, Clondalkin and City Centre, on an alignment in many ways similar to existing route 63. See Route 93 for more details.</p>
244	244, 344, 345	<p>No changes to frequency on proposed Route 244, every 60 minutes from Ballymore Eustace to Blessington, Brittas and Tallaght.</p> <p>Direct trips to City Centre added as peak only service on Route 344 (from Ballymore and Blessington) and Route 345 (from Ballyknockan and Blessington).</p>
251	251	<p>In the previous plan iteration, Routes 251 (Adamstown - Liffey Valley) and 252 (Adamstown - Blanchardstown) were proposed as separate services. In this revised proposal, Routes 251 and 252 operate in a combined fashion, such that:</p> <p>Route 251 would provide service every 60 minutes from Adamstown Station to Liffey Valley Shopping Centre via Dodsborough, Lucan Village, Adamstown Road, Old Esker Lane, Esker Lane South, Willsbrook Road, Ballyowen Road and St. Loman's Road.</p> <p>Route 252 would provide service every 60 minutes from Adamstown Station to Blanchardstown Shopping Centre via Dodsborough, Lucan Village, the Larraghcon Distributor Road, Westmanstown Road, Anna Liffey Mills Road, Woodwall Road, Clonsilla Road, and Blanchardstown Road South.</p> <p>The timetables for Routes 251 and 252 would be staggered such that there would be a combined frequency of service every 30 minutes between Adamstown and Lucan Village.</p>
252	251, 252	See Route 251.
255	D1, D3	<p>Route 255 not included in revised proposal. In response to public comment, Clondalkin is now served by two frequent branches of the D spine, D1 and D3, both operating every 15 minutes. Grange Castle Road and the New Nangor Road now on proposed D1. Fonthill Road and Clondalkin Village now on proposed D3.</p>
256	256, 356	<p>No changes to routing or frequency on proposed Route 256, every 60 minutes from Newcastle to Clondalkin and Red Cow. Direct trips to City Centre provided at peak on Route 356.</p>
Added route	258	<p>In response to public comment from Celbridge, the alignment of spine branch C4 (Celbridge to City Centre) was moved away from Castletown to provide a more direct path. As a result, we are now proposing Route 258 to provide service in Castletown. Route 258 would operate every 30 minutes from Liffey Business Park (existing 66b terminus) to Leixlip Confey station via the Celbridge Road/R404, Old Hill, Station Road, Main Street, Captain's Hill and River Forest.</p> <p>Routes 258 and 259 would have staggered timetables, so that service would be provided every 15 minutes between Leixlip Village, River Forest and Leixlip Confey.</p>
259	259	<p>No changes to routing or frequency on proposed Route 259, linking Hazelhatch Station, Celbridge (west), Glen Easton and Leixlip.</p>

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	261	261, 35	<p>Route 261 is intended as a frequent circulator connecting several neighbourhoods and major destinations within Blanchardstown every 15 minutes, and allowing these destinations to be easily accessible from the interchange facility at Blanchardstown Shopping Centre. Route 261 would operate as a two way loop, with service available in both directions.</p> <p>South of Blanchardstown Shopping Centre, the route is unchanged. It would primarily serve Coolmine Industrial Estate, Clonsilla Road West and Main Street (Blanchardstown Village).. North of Blanchardstown Shopping Centre, the route would serve TU Dublin-Blanchardstown, Ballycoolin Industrial Estate, the National Sports Campus and Connolly Hospital.</p> <p>Route 261 would no longer serve Blackcourt Road and Blackcourt Avenue in Corduff. Those would instead be on Route 35, providing service every 20 minutes to City Centre (and Blanchardstown SC in the other direction).</p>
	262	262, B3	In the previous plan iteration, Route 262 was proposed every 15 minutes from Blanchardstown SC to Tyrrelstown, with an extension every 30 minutes to Broombridge via Finglas. In response to public comment, Tyrrelstown is now on a direct path to City Centre via spine branch B3. However, Route 262 remains with service every 30 minutes from Blanchardstown Shopping Centre to Broombridge.
	263	263	<p>No changes to frequency on proposed Route 263, still every 15 minutes.</p> <p>Routing still proposed from Damastown (IBM) to Blanchardstown, with one change. Route 263 would no longer serve Castlecurragh (now on B3 spine branch) on the way to Blanchardstown Shopping Centre; instead, it would operate via Mulhuddart on the Old Navan Road.</p>
	264	264, 362, 364	<p>Weekday frequency increased to every 15 minutes on proposed Route 264, and more areas now served.</p> <p>Route 264 would now provide service from Dunboyne to Blanchardstown Shopping Centre via Clonee, Littlepace Road, Huntstown Way and Whitestown Park. This makes it possible to retain existing connections between Dunboyne, Clonee and Littlepace while also avoiding a costly deviation into and back out of Littlepace Road. Note that this change requires the opening of a bus gate between Little pace Road and Huntstown Wood.</p> <p>In addition, new peak-only direct trips to City Centre would be provided on Route 362 (Littlepace Distributor Road) and Route 364 (Dunboyne).</p>
	265	264	Route 265 not included in this revised proposal. See Route 264 for service to Littlepace.
	279	D4, D5	Route 279 not included in this revised proposal. In response to public comment, bus service to these areas (Ard Na Gréine, Edenmore, Harmonstown, Kilmore) now on branches of the D spine, with service every 30 minutes to City Centre via the Malahide Road. This restores a configuration more similar to existing Routes 27a and 27b.
	280	280, 283	<p>In the previous plan iteration, Route 280 combined service from Portrane to Swords, with service from Swords to Clongriffin, every 40 minutes. In response to public comments, the following changes have been made:</p> <p>Route 280 is still proposed to run every 40 minutes (20 minutes at peak, for timed connections with DART at Clongriffin). However, it is now proposed to start at Seatown in Swords. From Seatown going toward Dublin, it would serve Main Street, Swords Pavilions, Drynam Road, Mountgory Way, Feltrim Road, Kinsealy, and Belmayne going to Clongriffin. Route 280 would also provide direct continuing service from Clongriffin to Beaumont Hospital and DCU.</p> <p>Route 283 is now proposed to connect Portrane, Donabate, Swords Main Street and the Airport every 30 minutes, matching the existing frequency between Portrane and Swords. The timetables for Routes 283 and 285 (see below) would be staggered such that they would provide a combined frequency of service every 15 minutes between Swords Main Street and the Airport.</p>
	281	281	<p>No changes to frequency on proposed Route 281, every 20 minutes, for timed connections with DART at Portmarnock Station.</p> <p>The proposed route has been extended to the Airport. Previously, Route 280 was proposed from Portmarnock Station to North Street in Swords, via Malahide. The revised proposal would not go to North Street. Coming from Portmarnock and Malahide, Route 281 would pass by Swords Pavilions and turn south at Main Street. It would then serve River Valley Road, Rathingle Road, Forest Road and Naul Road, terminating at the Airport. This allows for a direct airport connection from large parts of Portmarnock, Malahide and Swords, similar to what is provided by existing route 102 but at a higher frequency.</p>

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	282	82, A4	<p>In the previous plan iteration, portions of Swords received direct service to the City Centre via Swords Road (on route A4), while other areas were on a local feeder route operating every 10 minutes to Main Street and the Airport (Route 282). In response to public comments, Route 282 has been eliminated in favour of more direct service to City Centre.</p> <p>See Routes A4 and 82 for details on service between Swords and City Centre via Swords Road. See Routes 283 and 285 for details on service between Swords and the Airport.</p>
	Added route	283	<p>Route 283 would provide service from Portrane and Donabate to Swords Main Street and Dublin Airport, every 30 minutes on weekdays.</p> <p>The timetables for Routes 283 and 285 (see below) would be staggered to provide a combined frequency of service every 15 minutes between Swords Main Street and the Airport.</p>
	285	285, 385	<p>In the previous plan iteration, Route 285 provided service between Balbriggan, Skerries, Rush, Lusk and Swords every 30 minutes on weekdays (15 at peak). No peak direct trips to Dublin were offered, and service to Balbriggan was only available every 60 minutes. In response to public comments, the following changes have been made:</p> <p>Route 285 is now proposed to operate every 30 minutes from Balbriggan to Dublin Airport (still via Rush, Lusk and Swords Main Street). Note that the timetables for Routes 283 (see above) and 285 would be staggered to provide a combined frequency of service every 15 minutes between Swords Main Street and the Airport.</p> <p>Route 385 would replicate existing Route 33X, from Skerries to Dublin City Centre, with limited trips continuing to UCD.</p>
	290	290	<p>Proposed Route 290 frequency increased from every 60 minutes to every 40 minutes on weekdays.</p> <p>Route 290 would no longer operate north of Sutton Station to Baldoyle and Clongriffin. Instead, it would operate from Sutton Station out to St. Fintan's, and then return to Sutton Station.</p>
	291	290	<p>Route 291 no longer proposed as a separate route, now integrated within Route 290.</p>

Full List of Changes - Peak-Only Services

	2018 Proposed Route	2019 Update Route(s)	Changes
ROUTE	301	301, 302	<p>Route 301 was designed as a replacement for existing route 84x, operating between northern Wicklow towns and City Centre. In the revised proposal, it has been split into Route 301 (trips starting in Kilcoole) and Route 302 (trips starting in Newcastle and operating through Kilcoole).</p> <p>Route 301 is proposed with 6 AM northbound trips starting between 6:00 and 8:00, and 6 PM southbound trips starting between 16:00 and 18:00. Route 302 is proposed with 3 AM northbound trips starting between 6:00 and 8:00, and 3 PM southbound trips starting between 16:00 and 18:00.</p>
	Added route	302	See Route 301 above.
	311	311	<p>Route 311 is intended as a replacement for existing Route 7b, from Shankill to City Centre via Ballybrack, Rochestown Ave and Stillorgan Park. In response to observed peak-hour loads and likely increases in peak load through Ballybrack, the number of trips has been increased.</p> <p>Route 311 is proposed with 7 AM northbound trips starting between 6:00 and 8:30, and 6 PM southbound trips starting between 17:00 and 18:00.</p>
	Added route	312	<p>The previous plan iteration proposed increasing local frequency between Dalkey and Dun Laoghaire to every 30 minutes at peak hours. This is no longer the case (see Route 221). Instead, the revised plan proposes Route 312 as a more direct replacement to existing Route 7d.</p> <p>Route 312 is proposed with 2 AM northbound trips starting between 7:00 and 8:00, and 2 PM southbound trips starting between 17:00 and 18:00.</p>
	313	313	<p>More PM trips have been added to Route 313, which would provide service between Kilternan, Stepside and UCD.</p> <p>Route 313 is now proposed with 4 AM trips starting between 7:00 and 9:00, and 4 PM trips starting between 16:00 and 18:00. All told, Routes 213 and Routes 313 would run on staggered timetables to provide a combined peak frequency of service every 20 minutes in the peak direction for 4 hours per day between Kilternan and UCD.</p>
	315	E1	The previous plan included Route 315 to provide extra peak-hour service between Bray and UCD, relieving peak loads in the N11 corridor. Further load analysis suggest that 8 minute frequency (on the E1 spine branch) is likely sufficient from Bray at this time. Extra capacity is still to be provided from Brides Glen to UCD on a special E9 service. See also Route 317 (below) for details.
	Added route	316	<p>Route 316 would replace existing Route 116, providing service between Whitechurch and UCD. It was not included in the previous plan iteration.</p> <p>Route 316 is proposed with 1 northbound trip starting between 7:00 and 8:00, and 1 southbound PM trip starting between 16:00 and 17:00.</p>
	317	E9	<p>The previous plan included Route 317 to provide extra capacity between Brides Glen and UCD during peak hours. This has been retained, but folded into the E spine. Special E9 buses would run at peak hours between Brides Glen and UCD only.</p> <p>E9 is proposed with 12 northbound AM trips starting between 7:00 and 9:00, and 12 southbound PM trips starting between 16:00 and 18:00.</p>
	Added route	318	<p>Route 318 would replace most of existing Route 15d, providing more direct peak-hour service between Whitechurch and City Centre. It was not included in the previous plan iteration.</p> <p>Route 318 is proposed with 2 northbound trips starting between 7:00 and 8:00, and 2 southbound PM trips starting between 17:00 and 18:00.</p>

	2018 Proposed Route	2019 Update Route(s)	Changes
	321 to 326	321	The previous plan iteration proposed Route 321 to 326 to provide extra peak-hour trips between Lucan and north Kildare towns (Leixlip, Celbridge, Maynooth), beyond the frequencies proposed on the C spine and branches. In response to public comments, the revised proposal has made significant changes to the configuration of the C spine and branches, and the 320 peak express series. In general, the C1 and C2 branches serving Lucan south of the N4 (Adamstown, Esker, Griffeen Valley, Ballyowen) are proposed at higher peak hour frequencies, with service up to every 8 minutes (8bph) on each branch. On the C3 and C4 branches (which serve north Kildare and Lucan Village), peak hour frequencies have been reduced. However, the proposed number of trips of nearly all peak express routes has increased. Specifically:
		322	
		323	Route 321 (Adamstown to City Centre) is now proposed with 4 AM eastbound trips starting between 7:00 and 8:00, and 4 PM westbound trips starting between 17:00 and 18:00. This route is now more similar to existing route 25d, directly entering the N4 after serving Adamstown Station and Adamstown Road.
		324	Route 322 (Adamstown/Lucan Village to UCD) is now proposed with 4 AM eastbound trips starting between 7:00 and 8:00, and 3 PM westbound trips starting between 16:00 and 18:00. This route is most similar to existing routes 25 and 25x; it would start at Adamstown Station, and serve Dodsborough Road and Lucan Village before entering the N4 going to City Centre and UCD.
		325	Route 323 (Leixlip River Forest to City Centre) is now proposed with 3 AM eastbound trips starting between 7:00 and 8:00, and 3 PM westbound trips starting between 16:00 and 18:00. This route replaces peak-hour trips serving River Forest and Captain's Hill on existing routes 66a and 66x.
		326	Route 324 (Leixlip Castletown to City Centre) is now proposed with 2 AM eastbound trips starting between 7:00 and 8:00, and 2 PM westbound trips starting between 16:00 and 18:00. This route replaces peak-hour trips serving Castletown and Celbridge Road/R404 on existing route 66b and 66x.
		327	Route 325 (Maynooth/Glen Easton to City Centre) is now proposed with 2 AM eastbound trips starting between 7:00 and 8:00 and 2 PM westbound trips starting between 16:00 and 18:00. It would replace peak-hour trips serving Maynooth, Glen Easton and Leixlip Village on existing route 66x.
		328	Route 326 (Maynooth to UCD) is now proposed with 3 AM eastbound trips starting between 7:00 and 8:00, and 3 PM westbound trips starting between 16:00 and 18:00. It would replace peak-hour trips serving Maynooth and Leixlip Village only on existing route 66x. Route 327 (Celbridge West to UCD) is now proposed with 5 AM eastbound trips starting between 7:00 and 8:00, and 4 PM westbound trips starting between 16:00 and 18:00. It would replace peak-hour trips serving Aghards Road on existing route 67x. Route 328 (Celbridge East to UCD) is now proposed with 4 AM eastbound trips starting between 7:00 and 8:00, and 4 PM westbound trips starting between 16:00 and 18:00. It would replace peak-hour trips serving Main Street on existing route 67x. See also C Spine, C1, C2, C3, C4, and Routes 258 and 259 for service in Lucan and north Kildare.
	344	344	Route 344 was proposed as a peak-only direct service from Blessington to City Centre, complementing the all-day service every 60 minutes to Tallaght on Route 244. In the previous plan iteration, Route 344 was proposed to start in Ballyknockan. In this revised proposal, some trips would start/end in Ballyknockan and others in Ballymore Eustace, such that: Route 344 (Ballymore Eustace to City Centre) would provide 1 AM northbound trip starting between 7:00 and 8:00, and 1 PM southbound trip starting between 17:00 and 18:00. Route 345 (Ballyknockan to City Centre) would provide 1 AM northbound trip starting between 7:00 and 8:00, and 1 PM southbound trip starting between 17:00 and 18:00.
	Added route	345	See Route 344 above.

2018 Proposed Route	2019 Update Route(s)	Changes
355	355	The previous plan iteration included only one AM peak express trip between Clondalkin and City Centre on Route 355. In this revised proposal, this is increased to 3 AM inbound trips starting between 7:00 and 8:00, and 2 PM outbound trips starting between 17:00 and 18:00. See also Routes D1, D3 and 93 for service from Clondalkin to City Centre.
Added route	356	Route 356 would replace existing Route 68x, providing service between Newcastle and City Centre. It was not included in the previous plan iteration. Route 356 is proposed with 1 inbound AM trip starting between 7:00 and 8:00, and 1 outbound PM trip starting between 17:00 and 18:00.
360	360	Route 360 would be a peak express route, previously targeted only at Hartstown, Huntstown and Whitestown, then proceeding directly onto the N3 skipping Blanchardstown Shopping Centre. This is one of several services proposed to replace the existing route 39x (see also Route 362). In the revised proposal, it also serves the Ongar Distributor Road. The number of trips proposed has reduced, because the total peak volume on the B spine (and other Navan Road/N3 services) has increased considerably, reducing downstream passenger load and crowding concerns. Route 360 is now proposed with 4 inbound AM trips starting between 7:00 and 8:00, and 4 outbound PM trips starting between 17:00 and 18:00.
Added route	362	Route 362 would be a peak express route connecting Ongar and areas near the Littlepace Distributor Road directly to City Centre. It would replace Route 39x with a more direct path entering the N3 without traversing Hartstown and Huntstown. Route 362 is proposed with 4 inbound AM trips starting between 7:00 and 8:00, and 4 outbound PM trips starting between 17:00 and 18:00.
363	363	Route 363 is a proposed peak-only route providing direct service from Damastown to City Centre via Ladyswell Rd, Castlecurragh and Corduff. The proposed routing has not changed, but the proposed frequency has increased from every 30 minutes for five hours per day (2 hours AM, 3 hours PM), to every 20 minutes for five hours per day. Route 363 would operate in both directions.
Added route	364	Route 364 is a newly proposed peak-only direct service from Dunboyne and Clonee to City Centre. It would operate in addition to Route 264 at peak hours. Route 364 is proposed with 2 inbound AM trips starting between 7:00 and 8:00, and 2 outbound PM trips starting between 17:00 and 18:00.
Added route	365	Route 365 is a newly proposed peak-only direct service to City Centre targeted at areas south of Blanchardstown Shopping Centre (esp. Clonsilla Road). Route 365 is proposed with 2 inbound AM trips starting between 7:00 and 8:00, and 2 outbound PM trips starting between 17:00 and 18:00.
369	F9	The previous plan included Route 369 to provide extra capacity between Charlestown and City Centre during peak hours. This has been retained, but folded into the F spine. Special F9 buses would run at peak hours between Charlestown and City Centre only, via the Finglas Bypass.. E9 is proposed with 12 southbound AM trips starting between 7:00 and 9:00, and 12 northbound PM trips starting between 16:00 and 18:00.
370	D9	The previous plan included Routes 370 and 375 to provide extra capacity between areas along the Malahide Road and City Centre. This has been retained, but folded into the E spine. Special E9 buses would run at peak hours between Clare Hall and City Centre only. D9 is proposed with 12 southbound AM trips starting between 7:00 and 9:00, and 18 northbound PM trips starting between 15:00 and 18:00.
375	D9	See Route 370 above.

ROUTE	2018 Proposed Route	2019 Update Route(s)	Changes
	381	381	No changes to routing on proposed Route 381, this route exists to replace existing route 32x, providing peak-only service between Malahide, Portmarnock, Clontarf and City Centre. Route 381 is proposed with 2 southbound AM trips starting between 7:00 and 8:00, and 2 northbound PM trips starting between 16:00 and 18:00.
	382	382	Proposed Routes 382 and 384 both exist to replace different patterns served under existing route 41x, i.e. direct service to City Centre and UCD via the Port Tunnel. No changes to routing since the previous proposal. Route 382 would serve Glen Ellan Road and River Valley, Route 384 would serve Knocksedan and Swords Manor. Route 382 is proposed with 3 AM southbound trips starting between 7:00 and 8:00, and 3 PM northbound trips starting between 17:00 and 18:00. Route 384 is also proposed with 3 AM southbound trips starting between 7:00 and 8:00, and 3 PM northbound trips starting between 17:00 and 18:00.
	Added route	383	Route 383 is newly added to provide a peak express service between Portrane, Donabate and City Centre, similar to existing Route 33d. Route 383 is proposed with 1 southbound AM trip starting between 7:00 and 8:00, and 1 northbound PM trip starting between 17:00 and 18:00.
	384	384	See Route 382 above.
	Added route	385	Route 385 is newly added to provide a peak express service between northern Fingal towns (Skerries, Rush, Lusk) and City Centre, similar to existing Route 33x. Route 385 is proposed with 5 southbound AM trips starting between 7:00 and 9:00, and 5 northbound PM trips starting between 16:00 and 18:00.
	390	H2, H3	The previous plan iteration did not include all-day radial service on the Howth Road beyond All Saints Road, so a Route 390 was proposed to provide this instead. In this revised proposal, the H2 and H3 branches of the H spine would serve this area all day, including at peak.
	Added route	393	Route 393 is newly added to provide a peak express service between Rathcoole and City Centre, similar to existing Route 69x. Route 393 is proposed with 2 northbound AM trips starting between 7:00 and 8:00, and 1 southbound PM trip starting between 17:00 and 18:00.