

Limerick Bus Network Redesign

Volume I: Draft New Network

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National Transport Authority

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1 Introduction & Summary

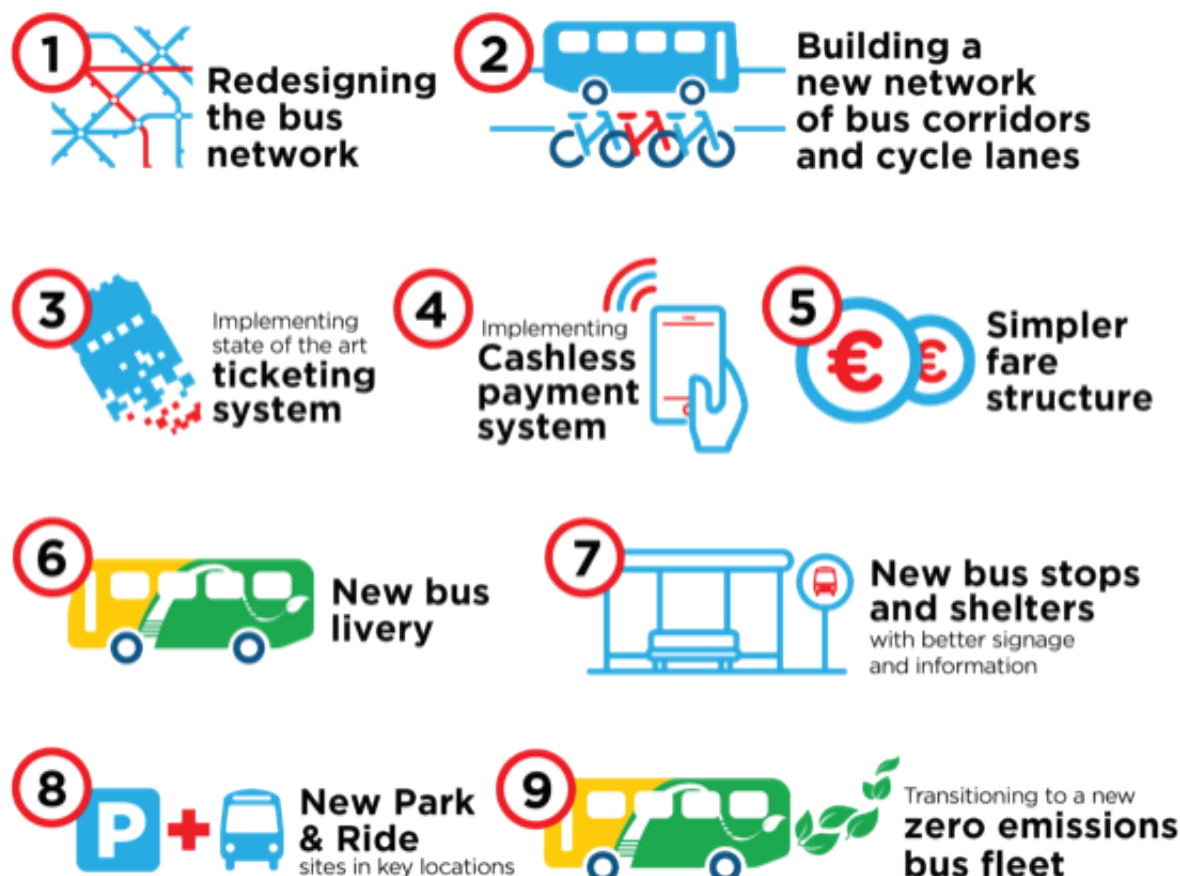
What is BusConnects Limerick?

BusConnects is a programme of public transport investment in Ireland's major urban centres. It is developed and managed by the National Transport Authority (NTA), and funded by Project Ireland 2040.

BusConnects includes many elements:

- **Redesigning the bus network**
- **Building new bus corridors and cycle lanes**
- **Implementing a state of the art ticketing system**
- **Implementing a cashless payment system**
- **Simpler fare structure**
- **New bus livery**
- **New bus stops and shelters**
- **New Park & Ride sites in key locations**
- **Transitioning to a new zero emissions bus fleet**

Some of these elements are already underway in Limerick. Many older buses with Bus Éireann livery have been replaced by newer yellow-and-green TFI buses. Twenty new battery-electric buses will be added to the local fleet in 2023.



Completing BusConnects Limerick will help realise these Government policy strategies and local plans:

- **The National Development Plan 2021-2030**
- **The Climate Action Plan 2023**

- **The Limerick Development Plan 2022-2028**
- **The Limerick Shannon Metropolitan Area Transport Strategy 2040**
- **The Clare County Development Plan 2023-2029**

What is the Network Redesign?

Limerick's bus network has evolved gradually over many years, as the city and its surroundings have changed.

Given recent and planned growth, and national efforts to develop more sustainably, there is an urgent need to re-evaluate bus services. It is time to rethink the design of the local bus network and invest in its success.

This network redesign is a collaboration between the:

- **National Transport Authority**
- **Limerick City and County Council**
- **Clare County Council**
- **Bus Éireann**

The bus network redesign is a review of where and how often the bus should come. This includes which roads buses run on, times and days of service, frequencies, stop locations, and how passengers interchange.

To make sure the network is right for current and future needs, the project team is rethinking the network from a blank slate, rather than adjusting the current network. Most of the new network will run on the same streets as today, but not necessarily in the same patterns.

Redesign Process

This report includes:

- **Assessment of existing demand and need** for public transport.
- **Key principles and choices** in redesigning the bus network
- **Draft New Network proposal.**

This report forms the basis of public engagement on the Draft New Network and the gathering of important feedback.

Since every detail of the existing network is something somebody relies on, NTA expects a broad range of positive and negative comments. Any large change to a bus network will result in inconvenience for some people, even if it is on balance and in the long term an improvement for nearly everyone.

Once the team has understood all of the feedback given, a Final New Network will be designed in consideration of that feedback. Implementation of route changes consistent with the Final New Network plan could begin by 2025.

Routes Under Review

This network redesign focuses on Limerick City and its suburbs. It includes services currently provided on the following existing routes:

Route	Operator
301	Bus Éireann
302	Bus Éireann
303	Bus Éireann
304	Bus Éireann
304A	Bus Éireann
305	Bus Éireann
305A	Bus Éireann
306	Bus Éireann
310	Dublin Coach
313	Bus Éireann

The network redesign may change which roads buses run on, times and days of service, frequencies, stop locations and how people interchange.

Study Area

The study area for this network redesign includes areas served by Transport for Ireland (TFI) local bus services operated by Bus Éireann and Dublin Coach. It includes built-up areas in:

- **Limerick City and suburbs**
- **Mungret**
- **Annacotty**
- **Ardnacrusha and Parteen**

These areas collectively form an urbanised area that is home to over 100,000 people, with an economic base of nearly 50,000 jobs¹.

The study area does not include towns further to the northeast (such as Castleconnell, Killaloe or Nenagh) or the northwest (such as Shannon or Sixmilebridge) as these settlements are outside the catchment of the city bus network.

Bus services between outlying areas and Limerick City are being reviewed as part of Connecting Ireland, a national initiative for the improvement of rural and intercity public transport services.

¹ According to small-area data from Census 2016. Small-area data from Census 2022 still pending at time of report publication.



Key Principle - More Service Investment

Patronage vs. Coverage

Public transport can be designed to achieve different goals.

One of the main goals for public transport is high patronage. Service designed for high patronage is typically frequent, direct, and connects places where many people live and work. This type of service is necessary to meet Limerick's climate, development and liveability goals.

But patronage is not public transport's only goal. Public transport is also expected to provide a basic level of service to certain areas where relatively few people live or work, even if patronage is low, to prevent isolation.

Within a limited service budget, these two goals are in tension. The more a network concentrates service into frequent, all-day routes, in the places with the most residents and activities, the less service is available to serve areas with fewer people.

This tension between pursuing high patronage and providing wide coverage exists in every public transport system.

Added Service

Recognising that the existing bus network does not adequately address patronage or coverage goals, the NTA is proposing a significant increase in service through BusConnects Limerick.

The Draft New Network would increase the amount of bus service in Limerick City and its suburbs by about 70%. This increase includes elements primarily targeting higher patronage, such as:

- 24-hour service between University Hospital Limerick, City Centre and the University of Limerick
- 4 routes operating every 15 minutes or better until 8 PM, seven days a week

It also includes elements aimed at expanding the area covered by public transport, such as:

- New services on the Dock Road, Ennis Road and Condell Road
- All-day service to Ardnacrusha, Parteen and Raheen Industrial Estate

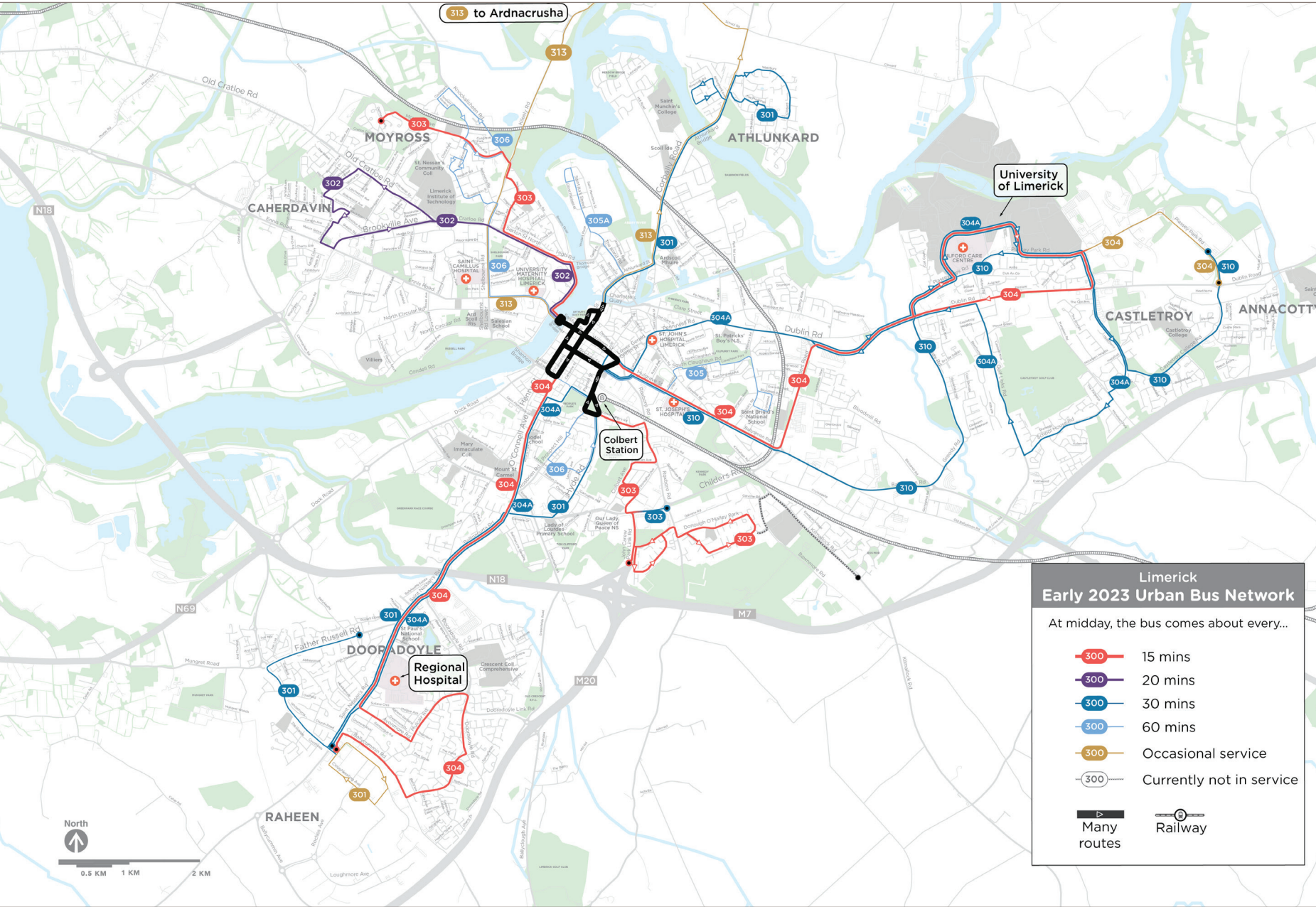
Why add service to meet patronage goals?

- **Make service more useful for more people**
- **Support dense and walkable development**
- **Improve access to large numbers of jobs, educational and other opportunities**
- **Encourage more people to switch from car to public transport**
- **Combat traffic congestion and support economic growth**
- **Reduce carbon emissions and combat climate change**

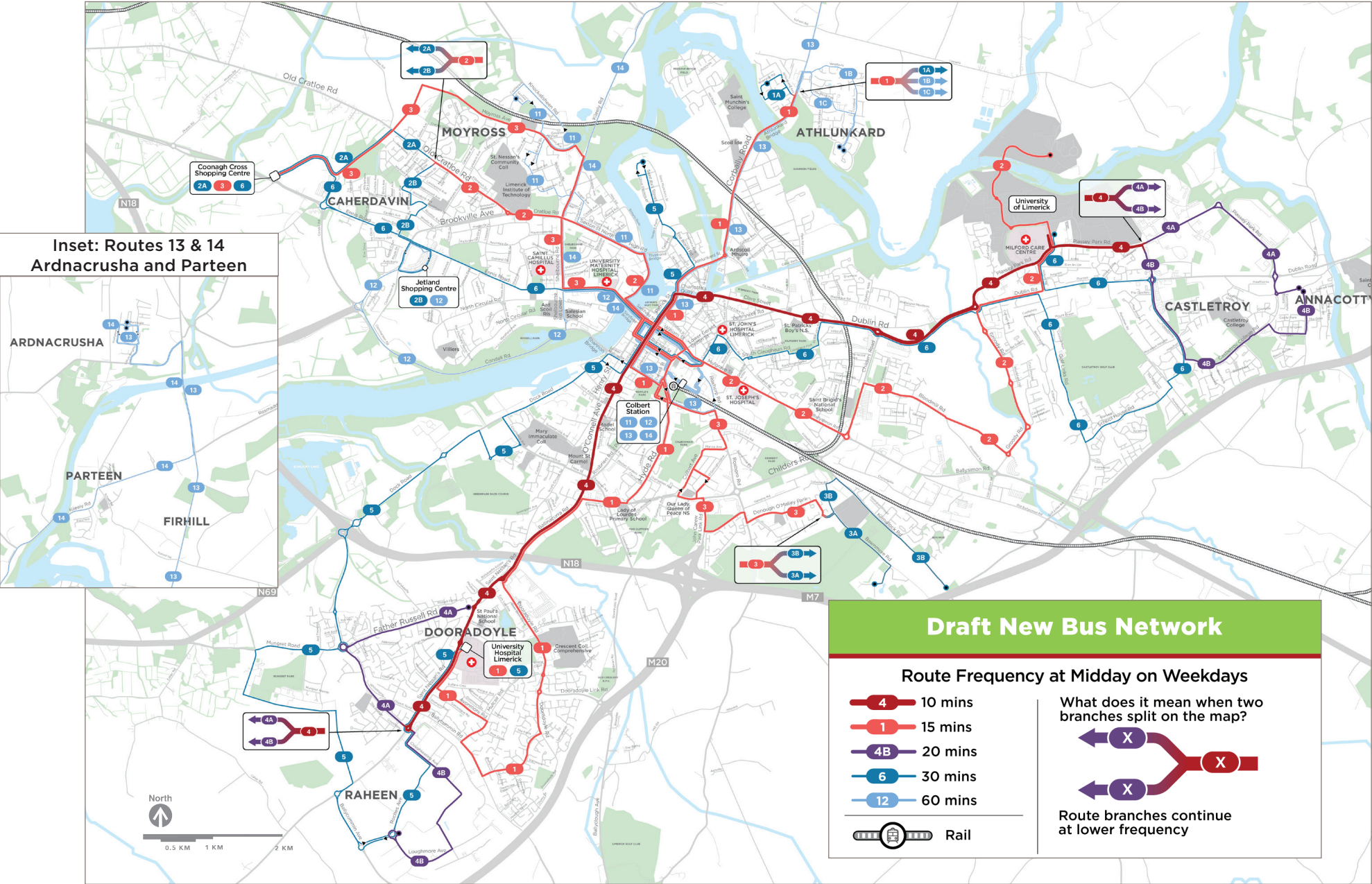
Why add service to meet coverage goals?

- **Promote social and economic inclusion, regardless of where people live**
- **Serve people for whom public transport is their only option to travel**
- **Include everyone in the benefits of public transport**

Map of the Existing Network



Map of the Draft New Network



How to Read the Network Maps

Colours Show Frequency

The maps on the previous pages feature a style used throughout this report, in which **route colours represent frequency**, in the daytime on weekdays.

- **Dark red** lines indicate very frequent service, with a bus coming every 10 minutes or better.
- **Red** lines indicate frequent service, every 15 minutes or better.
- **Purple** lines indicate routes that come about every 20 minutes.
- **Dark blue** lines indicate routes that come about every 20 minutes.
- **Light blue** lines indicate routes that come about every 20 minutes.

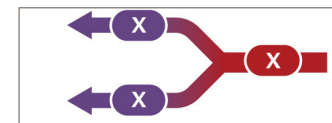
New Route Numbers

The route numbers in the Draft New Network are different from any existing route numbers.

These new numbers are provided to avoid confusion with existing services. They are not final, and may change before the Final New Network is put in place.

Route Branching

Some routes in the Draft New Network would branch at their ends. This is shown on the maps as below:



This is not an interchange. The buses on the purple (or blue) routes come together to form the red route.

For example, Route 4 is a combination of Route 4A and Route 4B. Route 4A (from Fr. Russell Road) and Route 4B (from Raheen Industrial Estate) come together at the Raheen roundabout. All 4A and 4B buses continue to City Centre and the University of Limerick. They split again in Castletroy, where 4A buses continue on Plassey Park Road, while 4B buses continue to Kilmurry Road and Castletroy College Road.

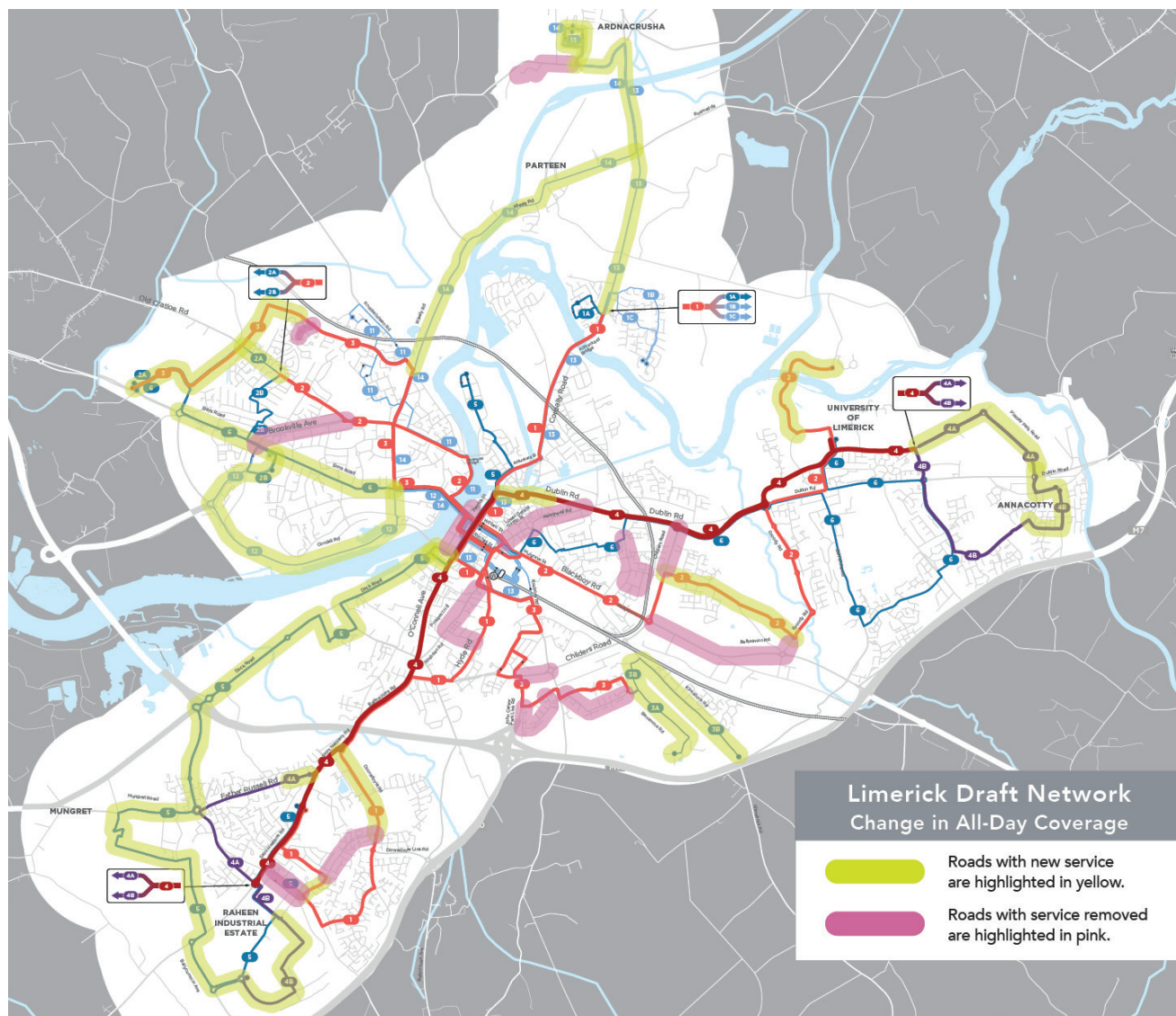
Service to More Areas

The Draft New Network would provide all-day service in many areas not served today, or served just a few times a day. These include:

- **Ennis Road**
- **Dock Road**
- **Condell Road**
- **Raheen Industrial Estate**
- **Bloodmill Road**
- **University of Limerick, north campus**
- **Ardnacrusha, Parteen and Firhill**
- **Dooradoyle Road**, between St. Nesson's Road and Mulcair Road
- **Plassey Park Road**, between Oaklawns and Annacotty
- **Development Lands at Mungret**

The Draft New Network would also remove service on some roads. In many cases, this would replace one-way service on two roads with two-way service on a single road. Roads with service removed include Brookeville Ave; Pennywell Road; Lord Edward Street; Mulcair Road; and parts of Ballysimon Road; Childers Road; John Carew Park; O'Malley Park; and St. Patrick's Road.

Overall the share of residents within a 400 metres walk of a bus stop (about a five minute walk) would increase from 53% to 61%.



More Routes with Frequent Service

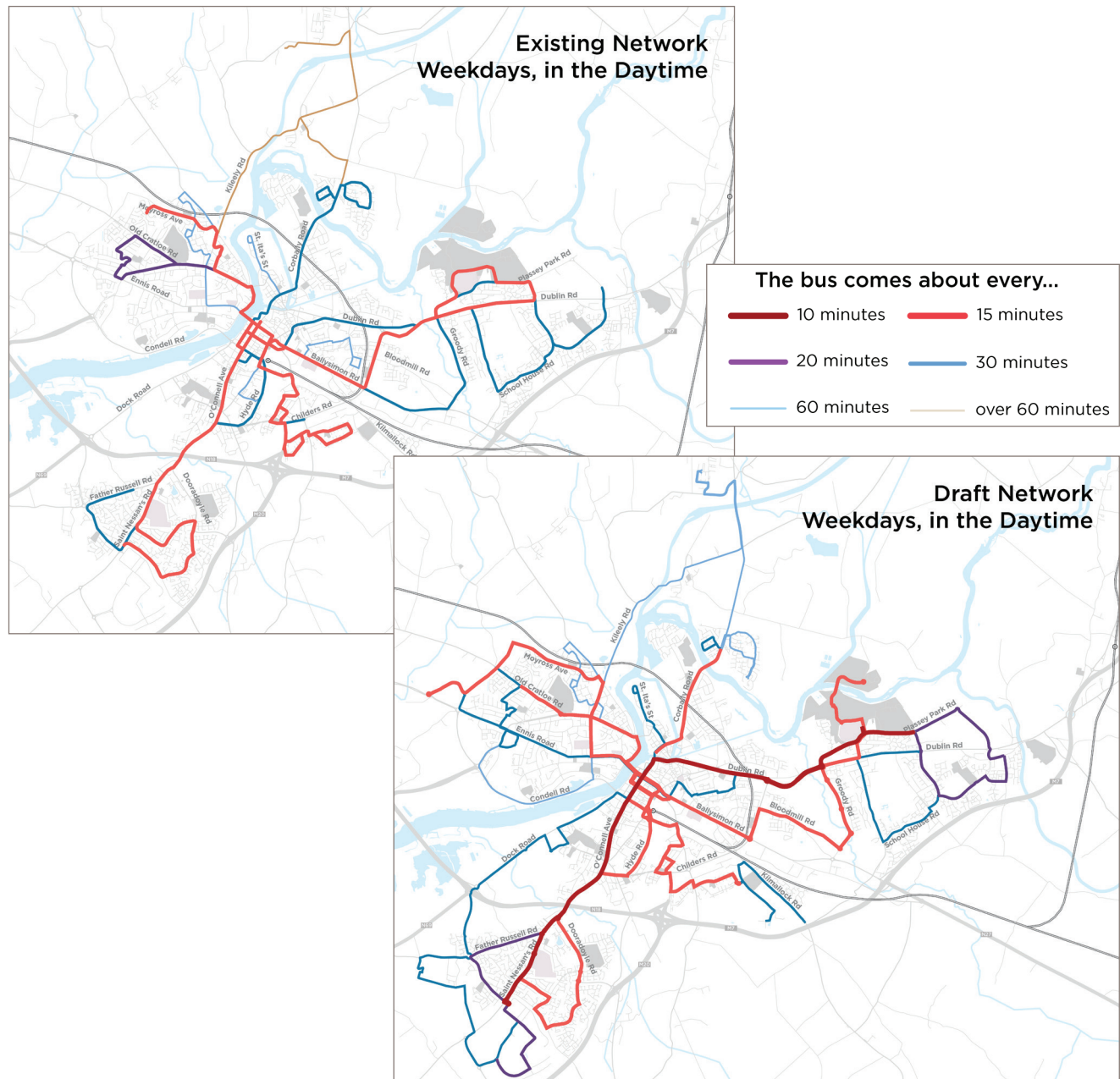
Frequent service is more useful service because it:

- Reduces time spent waiting.
- Makes interchange fast and reliable.
- Improves reliability, because if a bus breaks down, another one is coming soon.

Frequent service would be extended to new areas and key destinations including:

- **Dooradoyle Road**
- **Hyde Road**
- **TUS Moylish**
- **Coonagh Cross Shopping Centre**
- **Corbally Road**
- **Bloodmill Road**
- **Groody Road**
- **University of Limerick, north campus**

As a result, 41% of residents would live within 400 metres of service every 15 minutes or better, compared to 28% in the existing network.



Better Service on Sundays

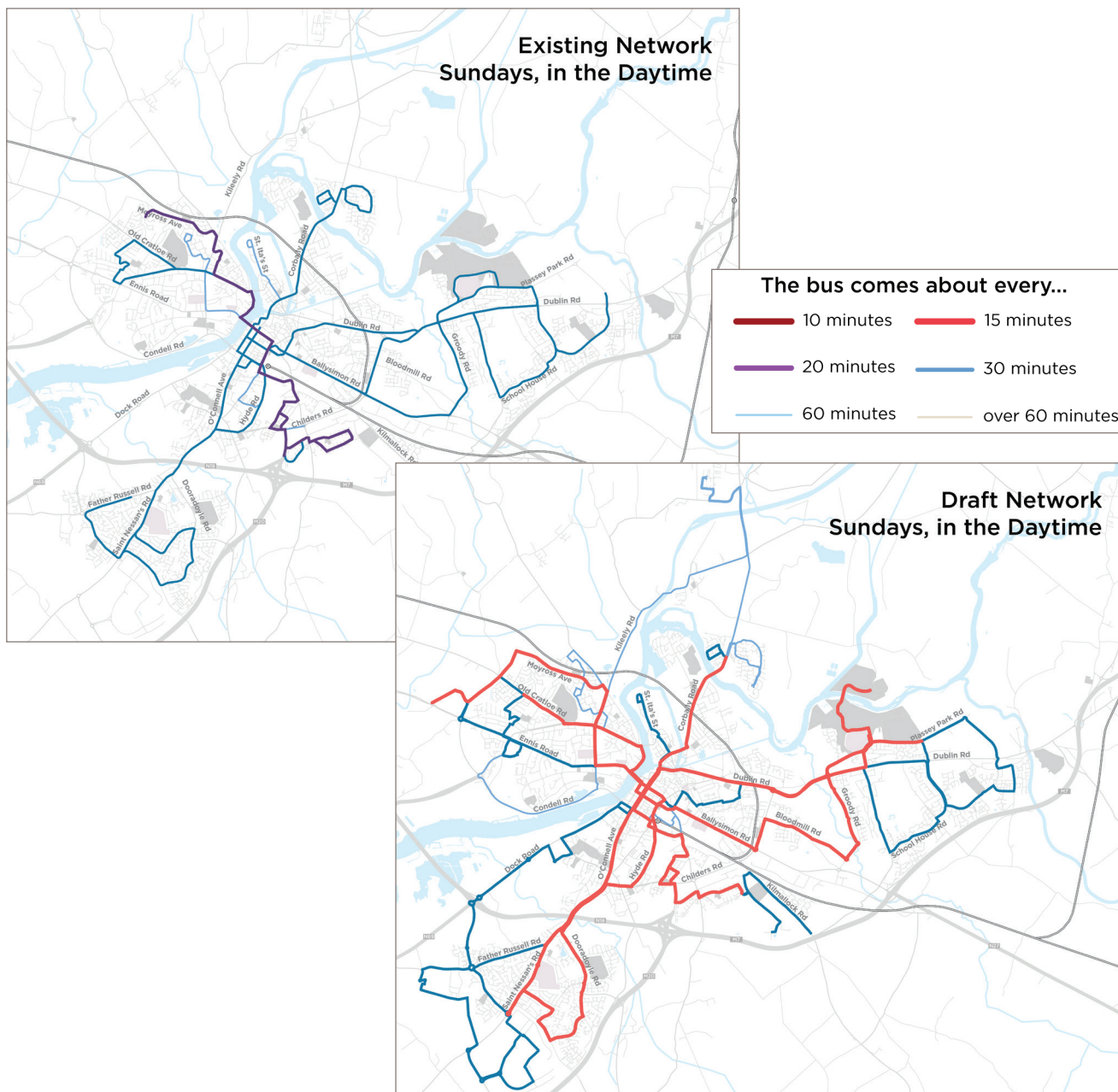
Sunday service is important in helping people live with fewer cars, since people cannot rely on public transport unless it is useful every day they may need to travel.

In the existing network, many public transport trips that might be convenient on weekdays are inconvenient or impossible on Sundays.

This is for a variety of reasons: most routes start service after 10 AM; no route provides service better than every 20 minutes; and some routes don't operate at all on Sundays.

For most of Sunday, public transport would run at frequencies comparable to weekdays. The 41% of residents within 400 metres of service every 15 minutes on weekdays would also be near service every 15 minutes or better on Sundays.

- **Most routes would start service at 7 AM.**
- **The four frequent routes would offer service every 15 minutes or better from 9 AM to 8 PM.**
- After 10 AM, service on less frequent routes would be similar to service on weekdays and Saturdays.



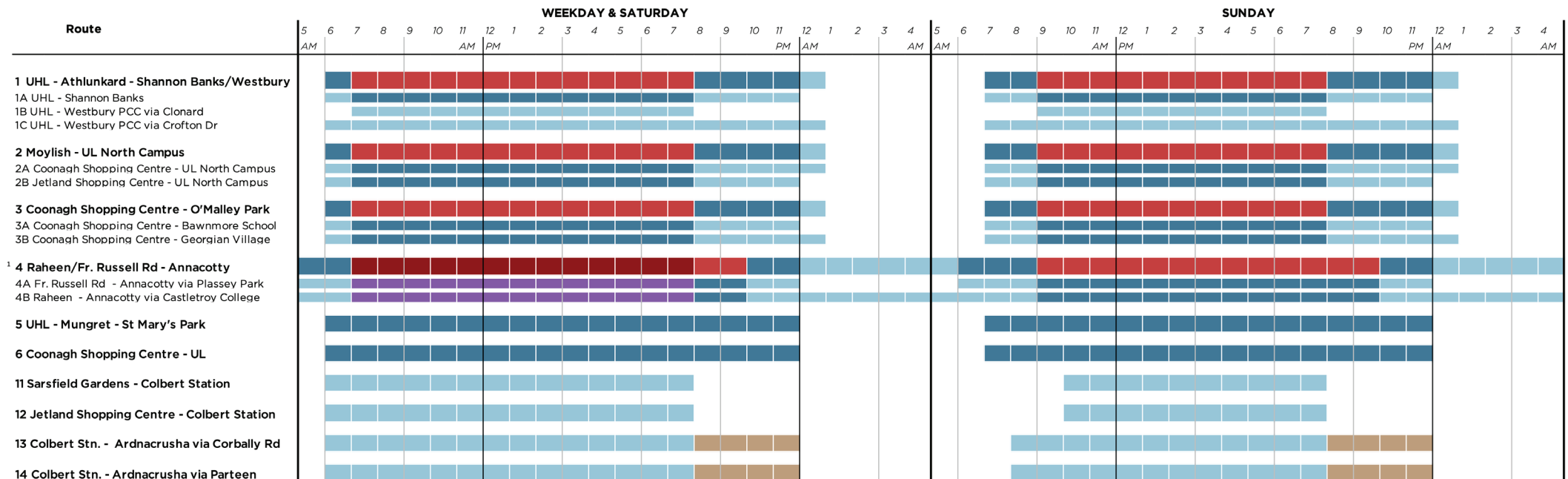
24-Hour Service in Key Areas

The proposed Route 4, which would connect University Hospital Limerick, City Centre and the University of Limerick would provide service at all times of day and night.

Late night service would be provided on the 4B branch, which would serve several areas with significant night-time activity, including Raheen Industrial Estate, University Hospital Limerick, City Centre, and the University of Limerick.

Limerick Urban Bus Routes — Service Frequencies* — Draft Network

The bus comes about every 10 min 15 min 20 min 30 min 60 min 120 min



Notes

* Service to Castleconnell, Shannon, and Ennis is not included in this study. Revisions to these routes are being studied through TFI's Connecting Ireland scheme.

1 On Saturdays between 7 am and 8 pm, Route 4 has a frequency of 15 minutes, and not 10 minutes. Correspondingly, Routes 4A and 4B have a frequency of 30 minutes, and not 20 minutes.

Key Principle - More Access to Opportunity

More Useful Service

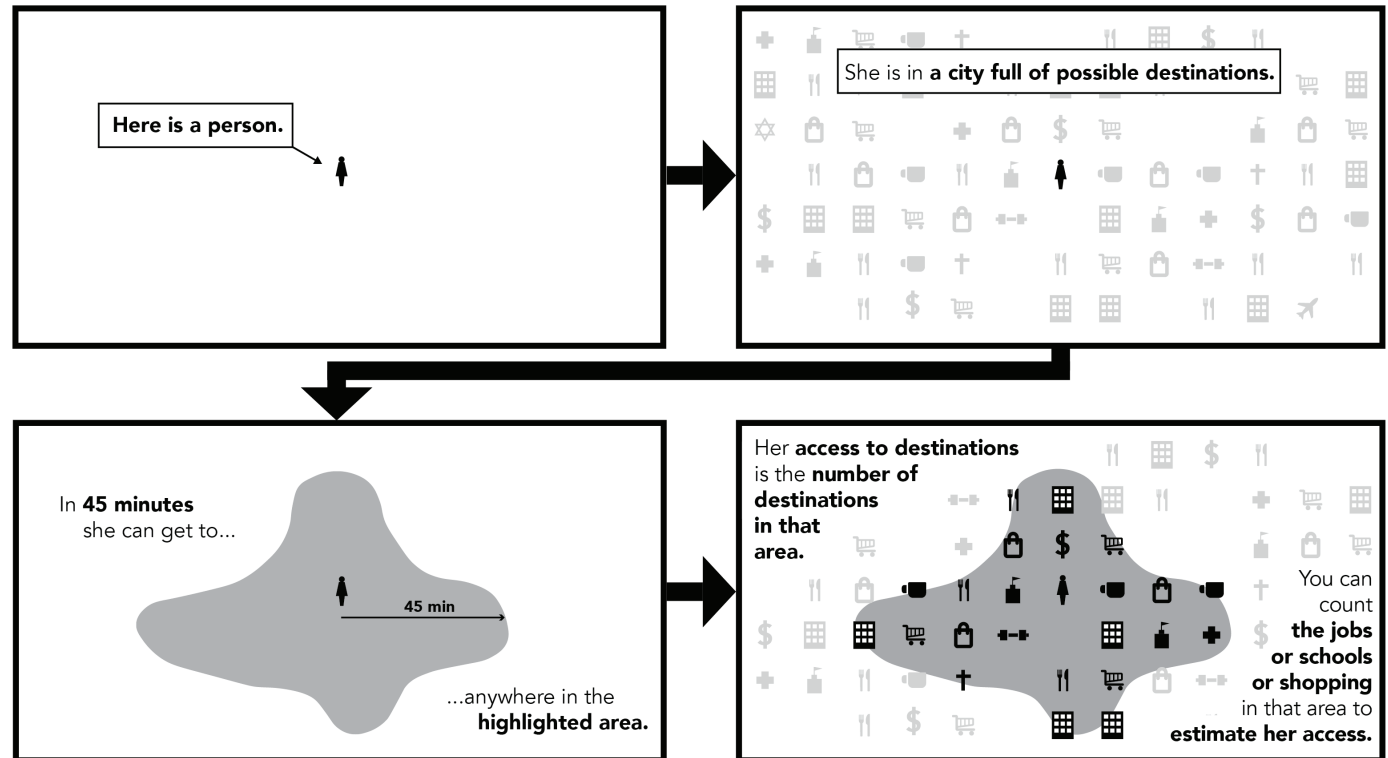
It's impossible to predict exactly how many people might use an improved bus network. A person's decision to use public transport on any given day might depend on where they are going, when they want to travel, the weather, their plans throughout the day, the price of a taxi, and many other factors.

However, it is possible to measure whether changes in service would make public transport more useful.

Public transport is useful to the extent that it allows people to go where they need, in a reasonable amount of time. **The more useful places you can reach in a reasonable amount of time, the more access to opportunity you have.**

In turn, designing service to increase many people's access to opportunity is the best tool that planners have to increase public transport patronage.

WHAT IS ACCESS?



What factors affect access to opportunity?

Access to opportunity by public transport is affected by:

- **How many destinations are near public transport**
- **How long a person has to walk to and from service**
- **How long they have to wait** for the service
- **How far they have to travel** on public transport
- **The speed of the service**
- **How long they have to wait to interchange between services**

Public transport providers have control over some of these factors: waiting time, interchange, route directness, where service is provided.

They have less control or no control over other factors: public transport speed, travel distances, where jobs and housing are located. These factors are generally controlled by local authorities as they manage land use, development and roadways.

Estimating Journey Times

Often when people describe public transport journey time they focus on the time spent on the bus. Public transport journeys also include time spent walking and waiting, which can exceed the time spent on the vehicle itself.



Walking to and from the stop

Most public transport journeys begin and end with walking.



Waiting for the next bus

Waiting doesn't always happen at the start of your journey, it can also happen at the end. You may leave home only a short time before your bus departs, but if your bus comes infrequently you often have to choose between arriving at your destination very early or too late.

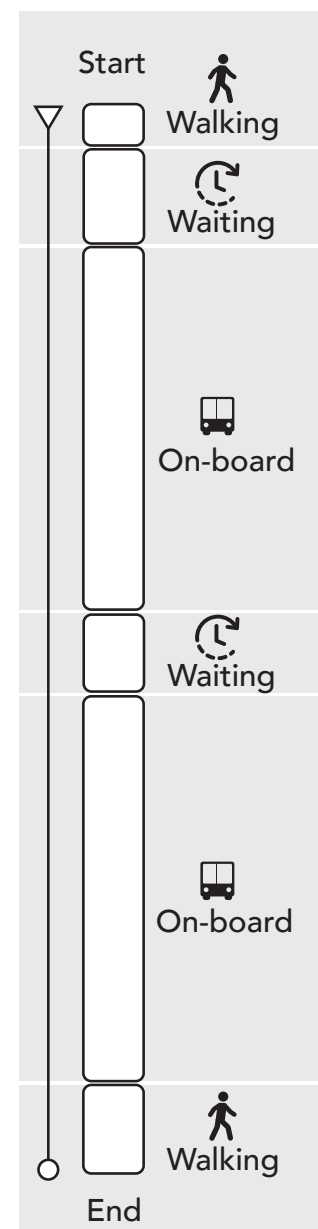
If you're interchanging, you'll have to wait a second time.

On average, across all passengers, both of these forms of waiting will require about one-half the frequency of the routes in question.



On-board the vehicle

Time spent on the vehicle is affected by the distance you are traveling and the speed of the vehicle. Our analysis of the Draft New Network used conservative (slow) speed assumptions. Improvements in speeds will result in greater job and school access for more people.



Increased Access Throughout the City

The maps on this page show how far someone can travel from the City Centre, starting from the intersection of O'Connell Street and William Street, in 30 and 45 minutes, in the existing network (in pink) and with the Draft New Network (in blue).

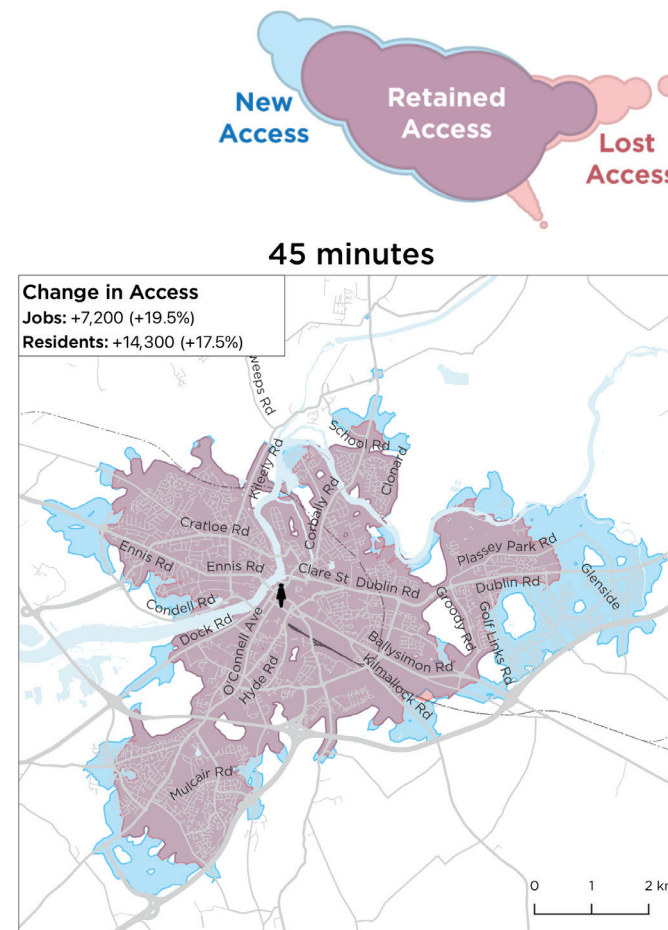
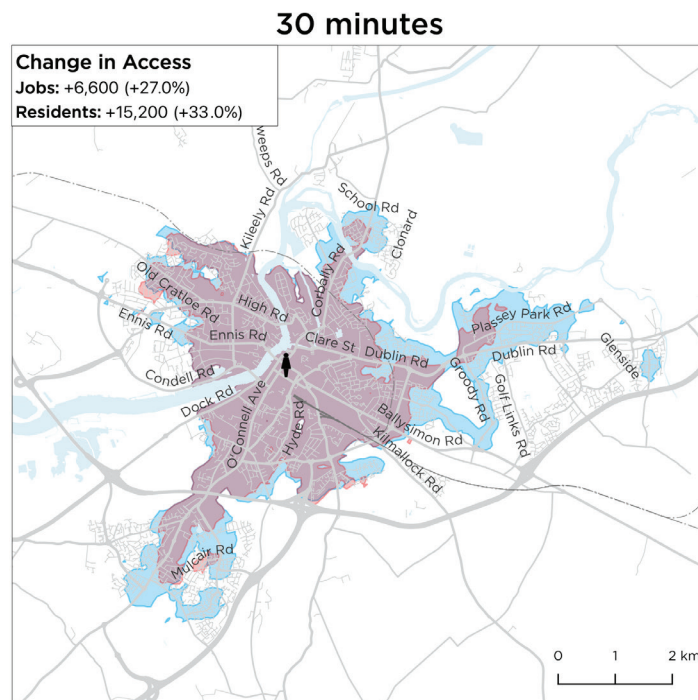
These maps show that, for example, if the Draft New Network were put into place, someone living in the City Centre could reach about 27% more jobs in 30 minutes or less using public transport. The 30 minute travel time includes time spent walking to and from bus stops, waiting for the bus, and journey time on the bus itself.

This kind of change has been measured throughout the study area. Key outcomes include:

- **The average Limerick resident could access 48% more jobs on weekdays, and 107% more jobs on Sundays within 30 minutes.**
- Within 45 minutes, the average Limerick resident could access 29% more jobs on weekdays, and 47% more jobs on Sundays.
- **Over 90% of study area residents would be able to access more jobs within 45 minutes.**

How far could I travel from
↑ **O'Connell St & William St**
in a reasonable amount of time?

Weekdays, in the Daytime



Many places people visit regularly (such as shopping, schools, restaurants, medical services) are places of employment, so better access to jobs means better access to many kinds of opportunity.

Map of Increased Access to Jobs on Weekdays

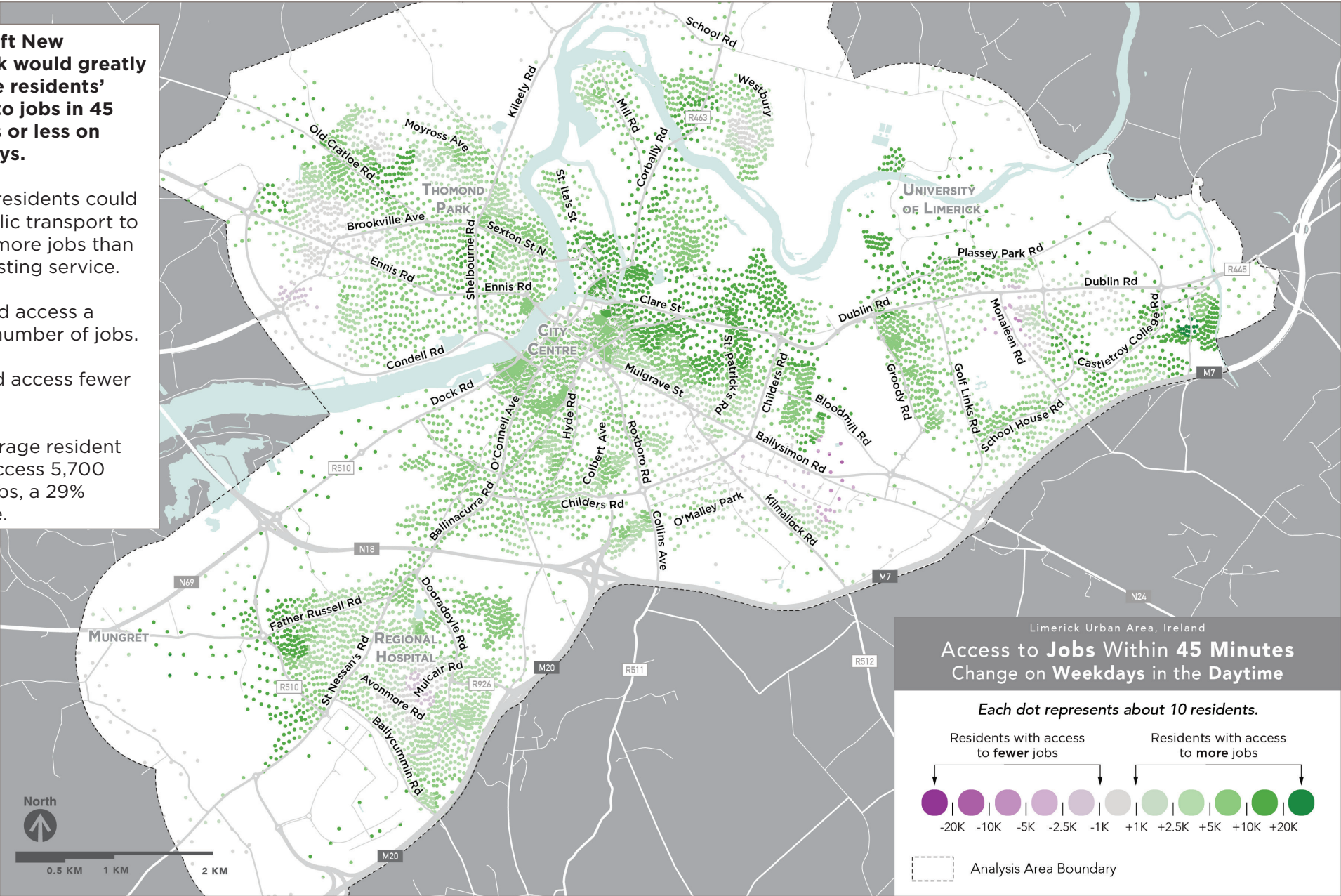
The Draft New Network would greatly improve residents' access to jobs in 45 minutes or less on weekdays.

92% of residents could use public transport to access more jobs than with existing service.

7% could access a similar number of jobs.

1% could access fewer jobs.

The average resident could access 5,700 more jobs, a 29% increase.



Map of Increased Access to Jobs on Sundays

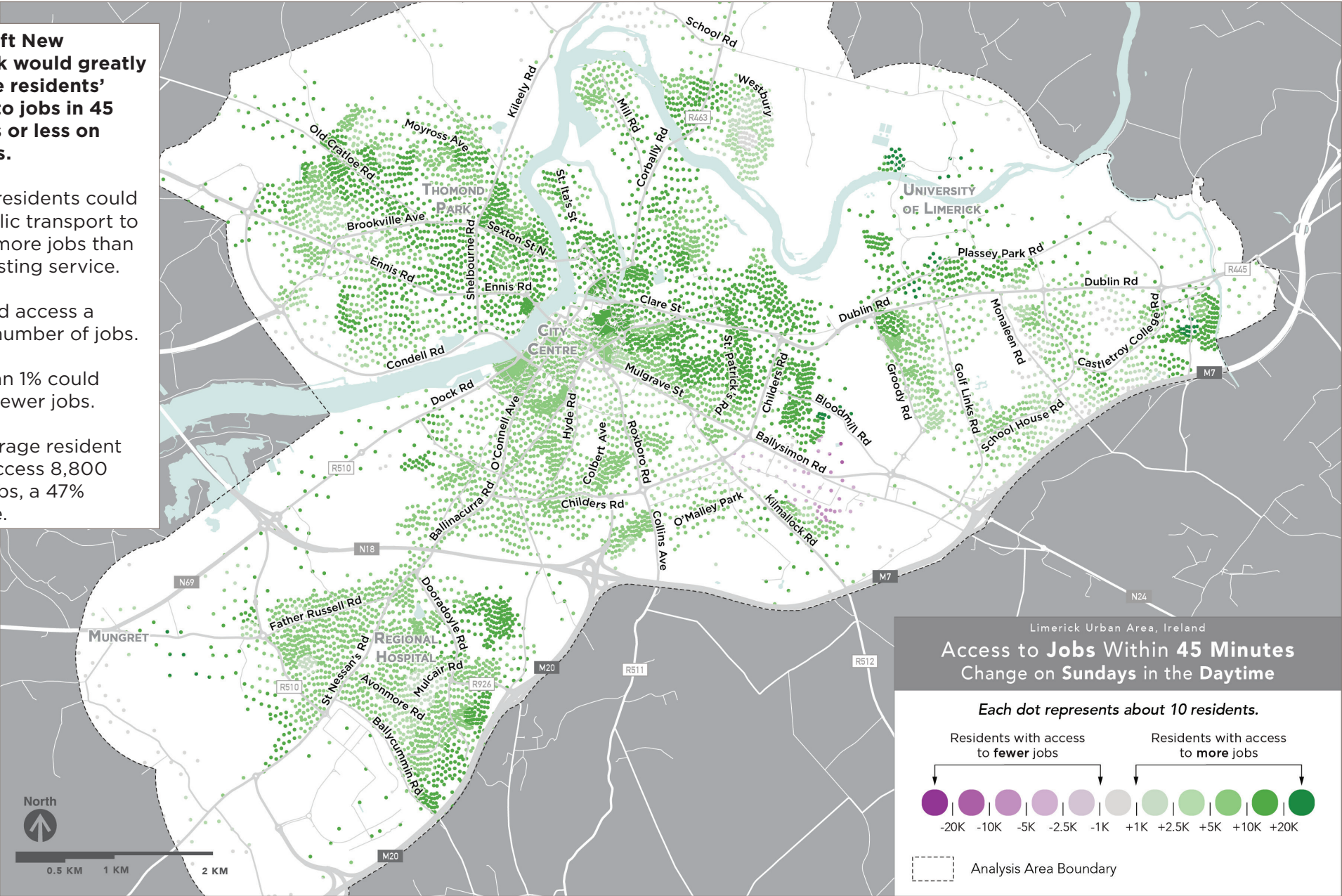
The Draft New Network would greatly improve residents' access to jobs in 45 minutes or less on Sundays.

95% of residents could use public transport to access more jobs than with existing service.

3% could access a similar number of jobs.

Less than 1% could access fewer jobs.

The average resident could access 8,800 more jobs, a 47% increase.



How to Learn About the Draft New Network

In this Report

This Report is one source of information about the Draft New Network. Within this Report you will find:

- **The principles used in bus network design, starting on page 22.**
- **An overview of the existing bus network serving Limerick City and its suburbs, starting on page 38.**
- **An overview of the demographic and built environment factors in Limerick relevant to understanding the demand and need for public transport service, starting on page 51.**
- **An overview of the proposed Draft New Network, starting on page 73.**
- **Analysis of how residents' access to jobs and schools would change with the Draft New Network, starting on page 90.**

New Route Numbers

All of the routes in the Draft New Network have been given new numbers and names.

The purpose of using all-new numbers is to avoid confusion during public engagement as people compare existing and proposed new routes.

The route numbers presented at this time may not be the final route numbers used when the new network is implemented.

All routes in the Draft New Network have new numbers!

Online Map

To explore what the Draft New Network would mean for your area and for your journeys, you can refer to the online webmap available at the [BusConnects website](https://www.busconnects.ie/limerick).

The online map allows you to:

- **Zoom in and see detailed routing.**
- **Look at areas across the City (that are difficult to show on these small pages).**
- **See how average access to jobs would change in your area.**
- **Create an “isochrone” comparing where you could travel in 30 or 45 minutes using the existing network or the Draft New Network.**

Give us your feedback on the NTA's project website: www.busconnects.ie/limerick



2 Public Transport & Network Design Principles

What Leads to a Useful Network?

Access to opportunity, described on the previous pages, is the way that public transport network design can affect **patronage**.

There are many factors that affect patronage which have nothing to do with access or public transport network design, such as the weather, people's plans throughout the day, or price of a taxi.

In this report, we focus on the factors that the NTA and partners in Limerick **CAN** influence. These factors determine the degree to which a public transport network can be useful, and thus contribute to patronage outcomes:

- **Frequency and hours of service**
- **The connections among public transport services, and the usefulness of the entire network**
- **Land use and development patterns**
- **Street design, distance and walkability**
- **Demographics, and where people with particular needs are located**

A well-connected network is key to high patronage. Routes must connect with one another so that people can reach many destinations without a difficult or costly interchange.

Frequency

One of the most powerful ways to increase access across a network is to shorten waiting times by improving frequency.

More frequent service:

- **Reduces waiting time (and thus overall travel time).**
- **Lets you travel whenever you want.**
- **Improves reliability, because if you miss your bus or it breaks down, another one is coming soon.**
- **Makes interchange (between two frequent services) fast and reliable.**

When frequency improves in places with large numbers of residents, jobs and other opportunities, that improves access for many people.

Better frequency increases the potential for high patronage, but it isn't enough on its own to cause high patronage.

A high-patronage network is useful for most people. And most people are in a hurry.

How Frequent is Frequent Enough?

In cities of the scale of Limerick, peoples' trips tend to be short. Public transport must be very frequent for short trips, since waiting time can dwarf journey time on the bus.

To think about whether any frequency is "frequent enough," imagine waiting one-half of the frequency (since on average, you will) and ask yourself whether you could tolerate waiting that long as part of an everyday trip.

One can imagine that with real-time bus arrival information available on people's phones, frequency doesn't matter, because nobody needs to wait for a bus anymore. So if a bus only comes once an hour, that's fine, because your phone will tell you when you should walk to the stop.

Despite this new technology, frequency still matters enormously, because:

- **Waiting doesn't just happen at the start of your journey, it also happens at the end. You might not spend much time waiting at the stop, but if your bus is infrequent, you may have to choose between being very early or too late.**

o For example, if you start work at 8:00 am but the bus passes your workplace only at 7:10 and 8:10 am, you have a choice between being 50 minutes early or 10 minutes late. Many people would choose to travel by other means like car or bicycle.

- **Many of the places people travel to don't let them hang around until the next bus arrives. You may be able to time your departure from home to the bus schedule, but few people get to decide when their work shift ends, let alone when a cinema screening finishes, or when a doctor's appointment ends.**

Real-time arrival information doesn't make the bus more reliable. Your phone can tell you when your bus is arriving, but it cannot prevent your bus from having a problem and being delayed. Only frequency—which means that another bus is always coming soon—can offer this kind of reliability.

The shorter their trip, the less people tend to tolerate a long wait.

Distance, Speed and the Cost of Frequency

Within a limited public transport budget, longer routes trade-off against higher frequencies.

This doesn't mean that a high frequency network is all short routes. But it does mean that as a system expands to serve new areas, maintaining high frequency requires investing in more vehicles, and paying more drivers. The more people a route serves per kilometre, the more likely the public transport provider can justify that investment.

Slower speeds have the same effect as longer distances. If the same route takes twice as long to serve now than it did ten years ago, the transport agency needs twice as many buses and drivers to maintain the same frequency.

As public transport slows down, the cost of operating it increases. A public transport provider can either reduce frequencies or come up with additional funding, which could otherwise have been used to improve service rather than run slower service at a higher cost.



One bus can provide 30-minute frequency service over a short distance...



...but double the distance means half the frequency. Now the bus comes every 60 minutes.

As routes get longer, their frequency must get worse, or the transport agency must spend more to add buses and drivers to the route.

Frequency, Speed and Bus Priority

The link between speeds and operating costs is why **bus priority** is so essential to public transport success in a growing city like Limerick.

Measures that protect buses from the impacts of traffic congestion not only help passengers travel faster, they help maintain convenient service frequencies.

When congestion slows down public transport, it becomes more costly to operate. This consumes funding that could otherwise be spent to make the service better.

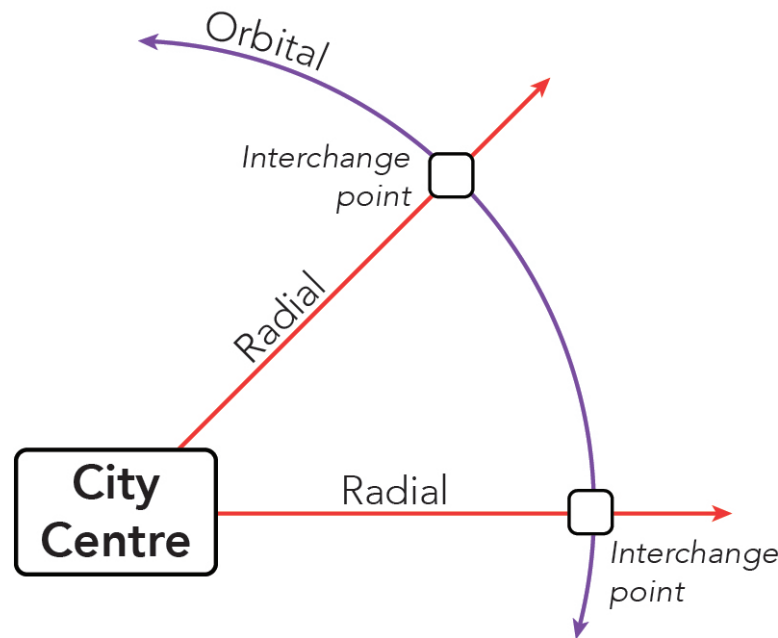
Radial vs. Orbital Services

A public transport network should be greater than the sum of its routes. One route can take people only so many places – but if that route makes connections with many other lines, vastly more places become reachable.

The Limerick public transport network is highly **radial**: all lines connect in the City Centre. This reflects the shape of the city: all major surface roads lead to the City Centre, which comprises the highest concentration of activity.

In a purely-radial network, every route connects with every other route at the centre; only one interchange is needed to reach every point in the system. But as Limerick has grown, more journeys take place between outlying locations, and travelling through the centre can feel like a hassle.

Orbital routes might solve this problem, by allowing for cross-city travel without going through the centre. However, the relatively small size of Limerick and concentration of demand in the City Centre mean that larger numbers of journeys are served by focusing investment on high frequency interconnecting radial routes. At the same level of funding, adding more orbital routes means less frequent service overall.



Radial bus routes travel between the City Centre and suburbs. All existing bus routes in Limerick are radial, following the main roads in and out of town.

Orbital bus routes travel between suburbs. This can be useful to connect suburban destinations. However, there is a trade-off between adding orbital service, and making radial routes more frequent.

Connections or Complexity?

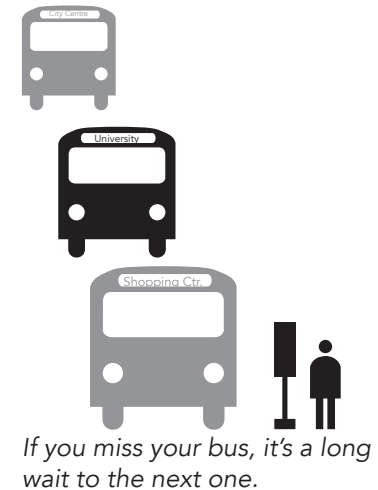
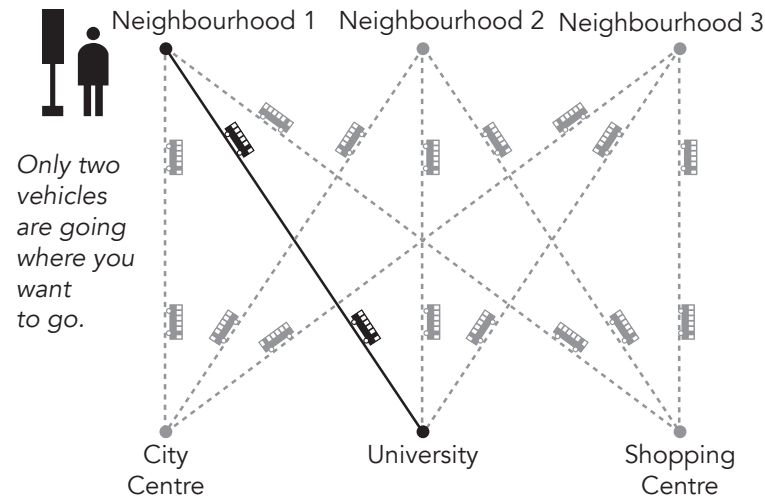
There is a trade-off between interchange and complexity that arises from the simple math and geometry of transport. The more a public transport network is designed to avoid interchange, the more complex it will be, and the poorer the frequency of many routes.

Obviously we would all prefer a one-seat-ride, rather than a second wait for a second bus. But making that wish come true for all would spread service thin, and thereby make it less useful.

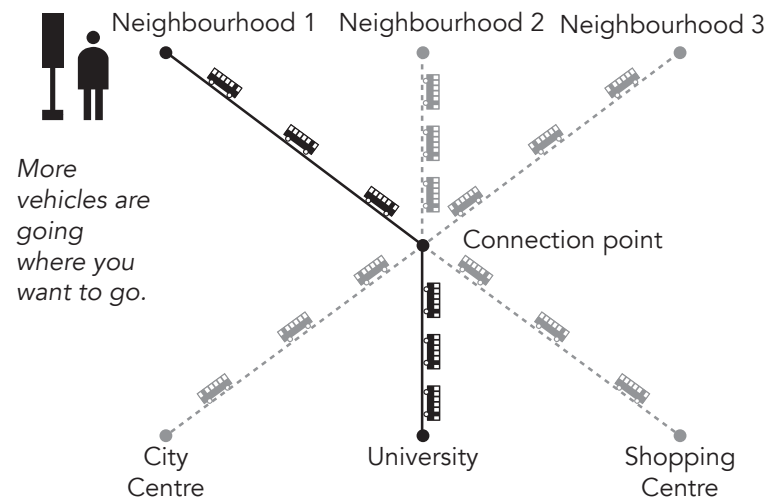
The illustration to the right shows why designing a network for some interchange allows for better frequencies, better reliability and shorter journey times overall.

The top network is made of direct routes, one from each of three neighbourhoods to each of three major destinations. There are a total of nine routes, but each is only run by two buses, so the frequencies are poor. A person travelling from home to the city centre gets a direct journey, but they can't depart when they want to, they have to time their departure to the bus schedule. If they miss their bus, it's a long wait until the next one.

Direct Routes, Higher Complexity



Connections, Lower Complexity



The bottom network connects the same six places but uses fewer routes. Each route offers much better frequency. In order to make this high frequency service possible, it must be designed for interchange for some trips—but the high frequencies also make those interchanges fast and reliable.

In the network at bottom, a person travelling from home to the city centre can depart at the right time for their work shift, because a bus is always coming soon. They needn't get to the work excessively early because that's when the bus schedule dictates. They spend less time waiting for the bus and their travel time is shorter—even despite the interchange.

An important thing to note about these two networks is that they cost the same to operate.

Even with the significant increase in service envisioned by BusConnects Limerick, there is a low limit to how many routes can run at high frequency if avoiding interchange remains important.

Interchange in Limerick

There are an increasing number of major destinations in outlying areas of Limerick City and its suburbs. There is also a lack of viable suburb-to-suburb paths for buses.

This means that **many journeys will inevitably go through Limerick City Centre, which must function as a viable interchange point between multiple bus routes.**

To facilitate a higher level of interchange, BusConnects Limerick will include the elimination of interchange fares. But interchange must also be organised to minimise waiting time. This can be done in two ways.

Pulses

When routes are infrequent (e.g. every 30 to 60 minutes), the best way to facilitate connections is to create a “pulse”. This is a connection point where all buses meet at the same time, and dwell together for a few minutes.

People can interchange between them with a reliably short wait, instead of the very long waits that would inevitably occur with random connections.

For pulses to work, buses must be able to arrive on time extremely

reliably. Pulses are hard to maintain in congested or unreliable traffic.

Pulses become less necessary as service becomes more frequent, when the next bus is coming in a few minutes at any time.

Frequent Connections

In situations where pulses aren’t viable or preferable, the best way to facilitate connections is to make them comfortable and frequent. **The more often every route involved in an interchange becomes, the less time passengers will spend waiting for their second bus.**

This argues for concentrating bus service into as few routes as necessary to connect all parts of the city, and to run each route as often as possible. **This is the approach proposed in the Draft New Network.**

The Built Environment's Impact on Public Transport

Public transport providers can attract more passengers by offering service that more people find useful.

However, land use and street design have a huge impact on how many people a service can reach, and at what cost.

Five land use factors are especially suggestive of high patronage potential:

- **Density**
- **Walkability**
- **Linearity**
- **Continuity**
- **Mix of Uses**

The way these factors affect public transport patronage and cost are described on the following pages, and illustrative examples are given from Limerick.

Density

A place with many residents, employees, shoppers, students, and customers has a high density of activities.

The graphic on the right shows two identical bus routes. The route on the top is travelling in an area that has twice as many homes as the route on the bottom.

All else being equal, the route on top will be useful to more people, because there are simply more people travelling to and from the area.

The highest densities of residents and destinations in Limerick, by a significant margin, are in the City Centre.

This reinforces the argument for organising bus service around the City Centre, because it is both the largest attractor and the largest source of daily travel.

How many people, jobs and activities are near each stop?



+ Many people and jobs are within walking distance of public transport.



- Fewer people and jobs are within walking distance of public transport.

Walkability

To use a bus route, people need to be able to get to the stop, and the vast majority of passengers will start their trip by walking.

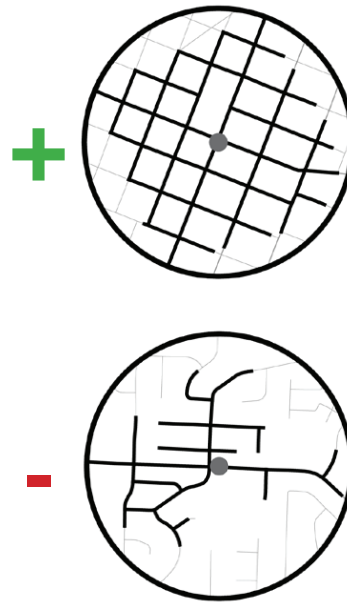
The street network, footpaths and crossings around a bus stop affect how many people are willing and able to walk to the stop. If a street network is disconnected, the bus stop on a main road may be close “as the crow flies” but quite far away by walking. As a result, it will be useful to relatively few people.

At large road crossings and roundabouts, bus stops are often located far from the junction. This adds extra distance to the walk to any point on the intersecting street.

In Limerick, the primary impediment to walkability is the lack of street permeability between estates.

Walking through estates from one main road to the next one over is nearly always indirect, and in many cases impossible. This is a major impediment to transport operators’ ability to provide service within a short distance of most people and destinations.

Is it easy to walk between the stop and the activities nearby?



The dot at the center of these circles is a transport stop, while the circle is a 400 metres radius.

The whole area is within 400 metres, but only the black-shaded streets are within a 400 metre walk.

This is explained in more detail on page 44 and page 45.



+ It must also be safe to cross the street at a stop. You usually need the stops on both sides for two-way travel!

Linearity

Exactly where development is allowed determines how linear and direct public transport routes can be.

The graphic on the right shows destinations aligned in two different ways. In the town on the top, the destinations are on the main road. Public transport can serve all destinations with a straight line. If you are travelling through this area, you're always travelling towards your destination, and never feel that you're being taken out of your way.

The town on the bottom has the same four destinations, but has permitted them to be built far from the main road. To serve these places, a bus needs to drive away from the main road, get to the front door, and then drive back to the main road. If this is your destination, this is great for you... but if you are travelling between any other places, you are taken out of your way and your trip is longer.

These deviations can also happen if a road is too dangerous for people to walk across. The bus deviation becomes a costly sort of pedestrian-crossing-service.

Can public transport run in reasonably straight lines?



Poor street connectivity can result in bus routes that deviate into estates. This solves the walkability problem, but makes the route indirect for passengers, and costly to operate.

Most areas of Limerick have developed as linear corridors, as the city has grown along the roads coming out of the City Centre.

The most significant exception is the University of Limerick, whose main buildings are located several hundred metres north of Plassey Park Road. As a result, buses serving Plassey Park Road make a long deviation into the University campus. This is shown on the aerial image at right, where the main pattern of bus traffic is represented as a magenta line.

This deviation is good for anyone travelling to and from the University. However, anyone travelling between the City Centre and the areas further to the east loses the time spent deviating into the centre of campus.



Continuity

With public transport, distance is a major contributor to the cost of service.

The greater the distance a public transport operator has to drive to serve 100 passengers, the fewer passengers it can serve within any particular operating budget.

For this reason, places that have continuous density and activities along a road, will generate higher patronage relative to costs.

Connecting places that are far away is more expensive than connecting places that are close by, and – as described on page 25 – longer routes require more spending or poorer frequencies.

Does public transport have to cross long gaps?

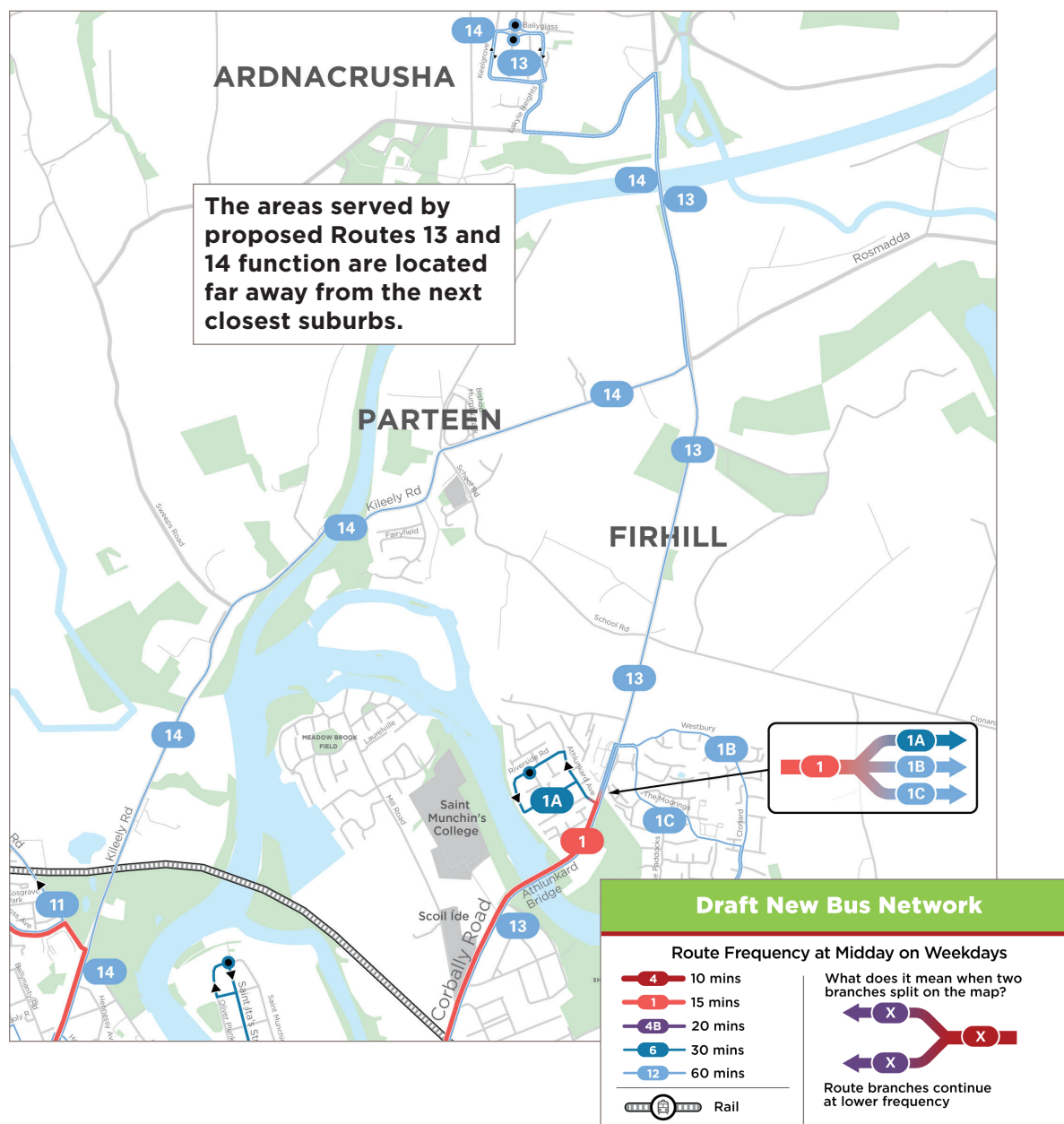


Some settlements at the edge of Limerick show development in a discontinuous fashion.

This is particularly visible in places like Parteen and Ardnacrusha. These have developed far from the closest built-up areas in Shannon Banks and Westbury.

As a result, providing bus service to these areas is expensive, relative to the likely number of passengers who would find it useful.

This is why Route 313 has historically provided service just a few times a day, and why the Draft New Network proposes only hourly service on Routes 13 and 14.



Mix of Uses

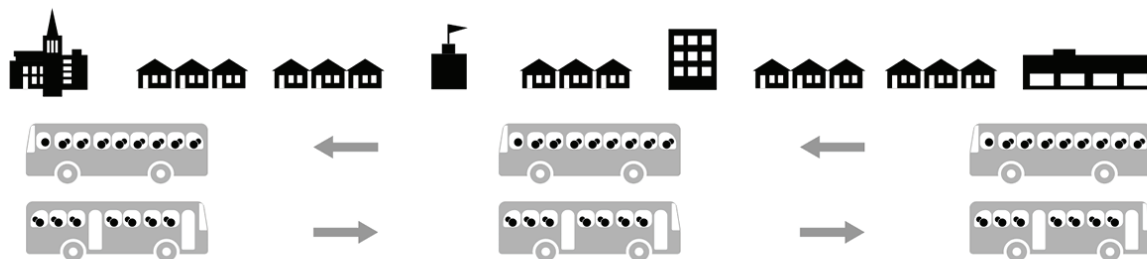
The mix of uses along a road affects how many passengers transport can attract, relative to cost. A mix of uses tends to generate patronage in both directions, at many times of day and week.

Transport in purely residential areas tends to be used mostly in one direction – away from the residences, towards jobs – and experiences significantly higher use at peak hours.

There are three ways that mixed-use development patterns can support productive transport:

- **Vehicles can be full in both directions, rather than being empty half the time.**
- **If people board and alight all along the route, then the route is used for many short trips. Each seat on the vehicle is useful to multiple people.**
- **Vehicles can be full all day and all week, so the cost of buying and maintaining the vehicles is supporting more passengers in total.**

Do people travel in both directions, all day?



+ A mix of land uses means buses are ridden in both directions, more times of the day and week.



- Transport serving purely residential areas tends to fill up in one direction, but not in the other.



3 The Existing Bus Network

Structure of the Existing Network

The graphics and maps on the following pages feature a style used throughout this report, in which **route colours represent frequency**.

Red represents frequent service, with a bus coming every 15 minutes or better, in the midday on weekdays, and **dark red** indicates service every 10 minutes or better.

Purple is for routes coming every 20 minutes. **Dark blue** routes come every 30 minutes and **light blue** routes come every 60 minutes.

Areas Served

The existing bus network covers many parts of the Limerick urban area.

Routes 303 and 304 are the most frequent, with service every 15 minutes in the daytime on weekdays and Saturdays. They connect several destinations including the City Centre, University of Limerick, University Hospital Limerick, several major shopping centres, and many residential areas like Dooradoyle, O'Connell Ave, Mulgrave Street, O'Malley Park, John Carew Park, Roxborough, Ballynanty, and Moyross.

Route 302 connects TUS Moylish and Caherdavin to the City Centre at a 20-minute frequency.

Predominantly residential areas like Shannon Banks, Westbury, Corbally Road, Hyde Road, Father Russell Road, Groody Road, Monaleen, and Castletroy are served every 30 minutes by Routes 301, 304A, and 310. Garryowen, King's Island and parts of Moyross and Ballynanty are also served once an hour by Routes 305, 305A, and 306.

Areas Not Served

Several parts of the Limerick urban area do not currently have urban bus service. Ennis Road is only served by the hourly intercity Route 343 to Shannon and Ennis. Dock Road has no regular service.

The area between Dublin Road and Corbally Road is very developed, but there are many physical constraints obstructing useful bus service there. Other areas without service are the North Campus of the University of Limerick and the new developments near Mungret and Bloodmill Road.

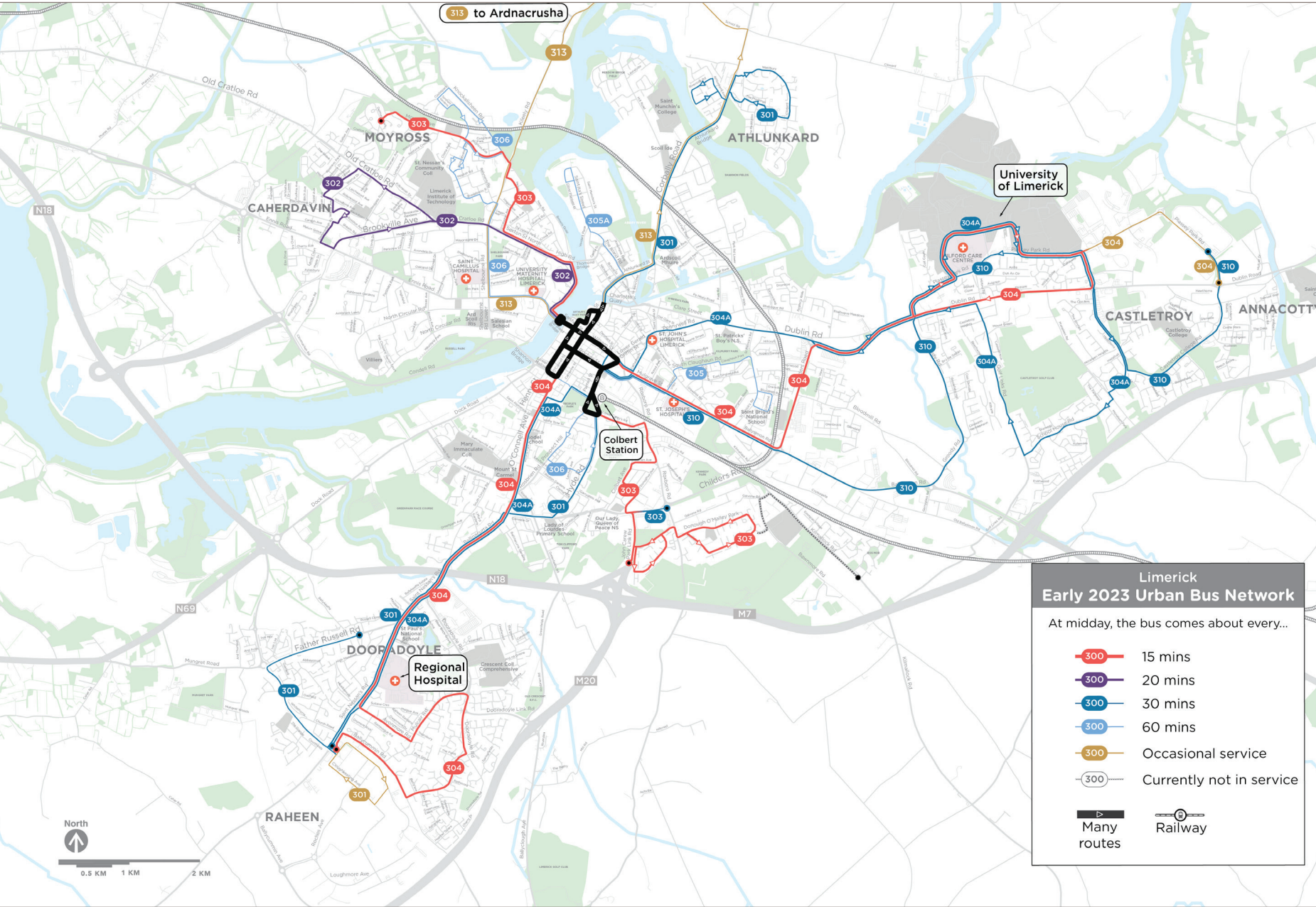
Service Through City Centre

All routes in the Limerick network serve the City Centre. Some routes end there, but most routes pass through and travel cross-city.

As discussed on page 26, this type of service is called **radial service**. A radial network makes sense in Limerick because:

- People and activities are concentrated in the City Centre
- Having one central point lets people interchange between all routes.
- Focusing on radial routes allows for more frequent service.
- The potential time savings of orbital service for suburb-to-suburb trips are very limited in a city the size of Limerick.

Map of the Existing Network



Existing Frequencies and Hours of Service

Frequencies and Hours of Service (Span)

The colourful graphic on the next page shows when each route in the urban area network offers service during the week. The service offered on weekdays and Saturdays is almost identical, and is presented together¹.

Each hour is colour-coded based on the frequency of service during that hour, using the same colours as on the maps.

Some routes have segments which only operate at certain times of day. These segments are shown separately from the predominant pattern.

¹ Routes 301 and 304 have small differences in their weekday and Saturday service, which are not represented in this graphic

Daily Spans

The network consists of 10 routes, but the hours of service vary on each route. Most routes offer service all day on weekdays, but Route 313 only offers a handful of trips a day in an irregular manner. It is not shown on this graphic.

All ten routes operate from Monday to Saturday. Eight of the ten routes also provide some level of service on Sunday.

Service on most routes starts around 7 am on weekdays and Saturdays. On Sundays, most routes start much later, at 10 am. Most routes make their last trips around midnight.

The Frequent Network

Routes 303 and 304 form the frequent network in Limerick. These routes provide service every 15 minutes or better most of the time, Monday to Saturday.

When buses consistently arrive every 15 minutes or more frequently, passengers don't need to memorise the schedule. Whenever they want to travel, a bus will be coming soon. This consistent short wait makes interchange among frequent routes

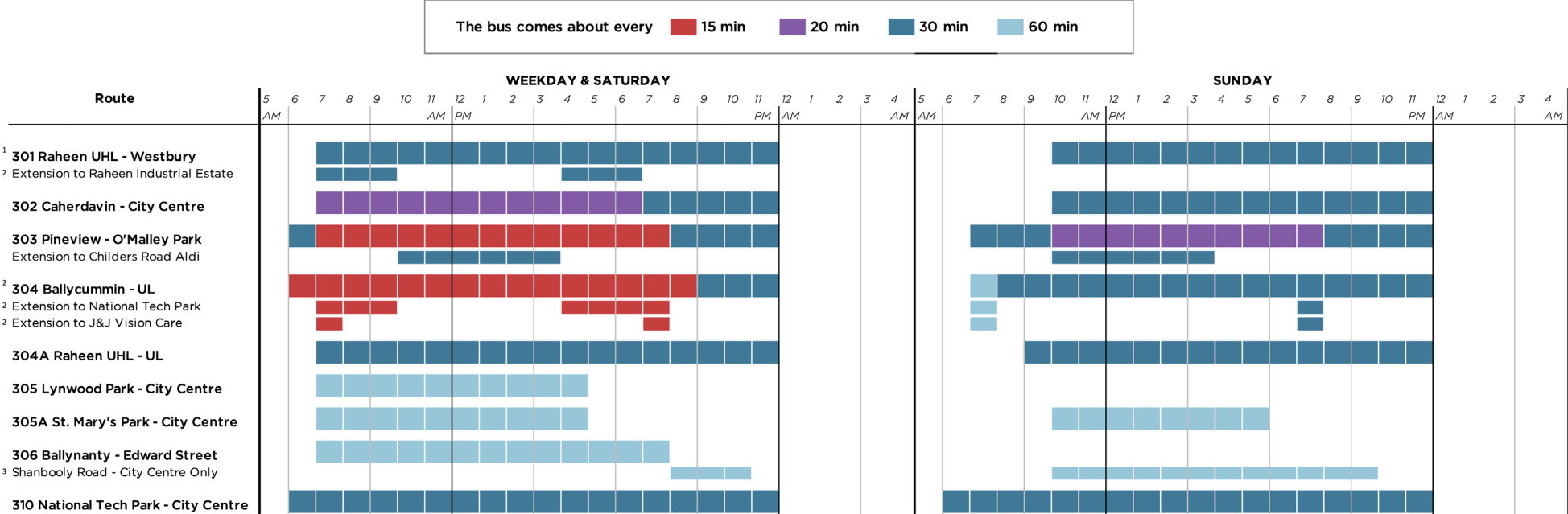
fairly fast.

These routes also have longer spans of service than other routes. They typically start at 6 am on weekdays and Saturdays, and 7 am on Sundays. However, the service provided on Sunday is not as frequent.

As described on page 24, high-frequency service is most important for shorter journeys. The shorter someone's trip, the less they will tolerate a long wait for the bus before finding an alternative.

Frequency and Hours Graphic - Existing Network

Limerick Urban Bus Routes — Service Frequencies* — Early 2023



* Route **313** (to Ardnacrusha) is not shown on this chart as it offers only a few round trips every day with an irregular frequency. Routes **323** (to Castleconnell and Nenagh) and **343** (to Shannon and Ennis) are not included in this study. Revisions to these routes are being studied through the TFI Connecting Ireland scheme.

1 After 7:00 PM, Route 301 does not serve Hyde Road but instead serves O'Connell Road.

2 Different Weekday and Saturday service: Route 301 serves Raheen Industrial Estate on weekdays only. Route 304 has lower frequency between 6:00 AM and 8:00 AM on Saturday. Route 304 extensions to National Tech Park and J&J Vision Care only operate between 7:00 - 8:00 AM (three trips) and 7:00 - 8:00 PM (four trips) on Saturday

3 On weekdays and Saturdays after 7:00 PM and on Sundays throughout the day, Route 306 does not serve areas south of Sarsfield St and Henry St. At those times, service to Ballynanty ends at Shanbooly Road instead of Sarsfield Gardens.

Notes

Proximity to Any Service, and Frequent Service

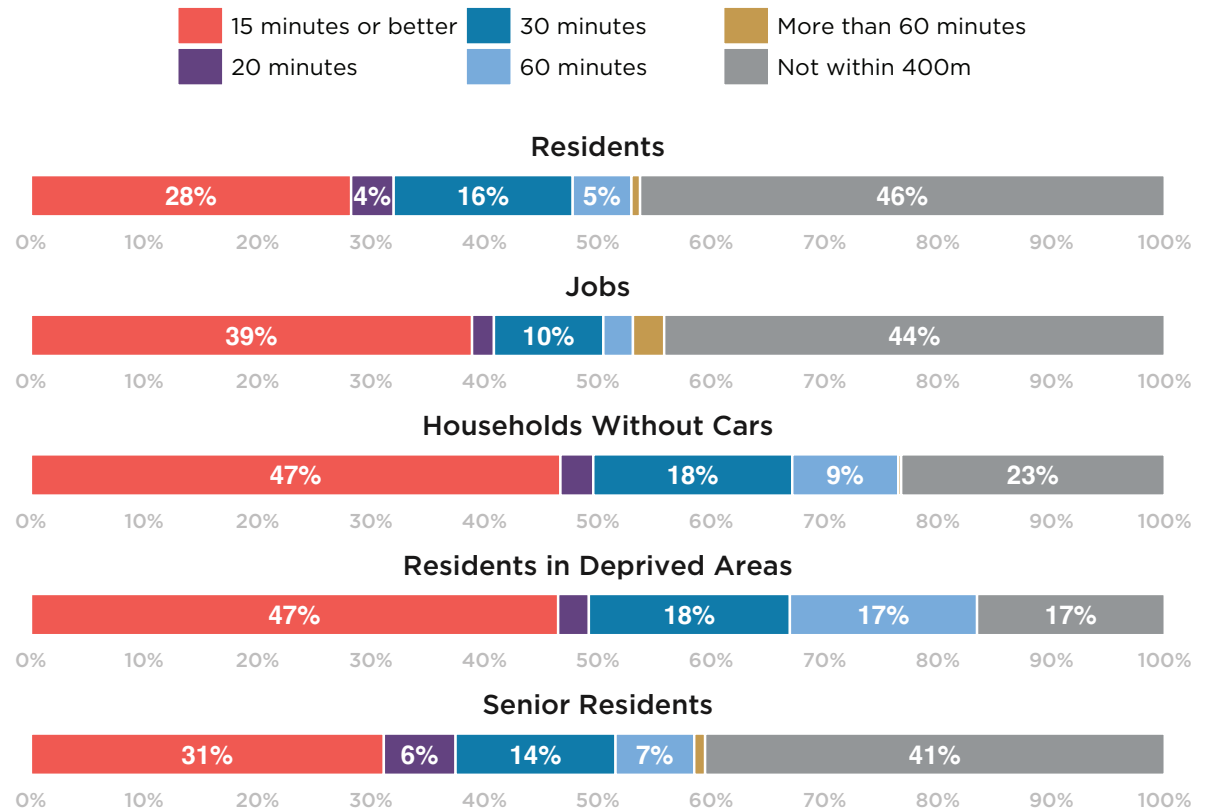
The graphic to the right shows how many people and jobs are close to public transport at different frequencies in the BusConnects Limerick study area. The study area includes built-up areas in and near Limerick City, and is home to 102,000 people (see page 7).

Increasing the percentage of residents and jobs near **any service** addresses **coverage** goals such as social inclusion.

As shown on the graphic, 53% of the area's residents and 56% of jobs are within a 400 m walk (about five minutes on foot) of any form of public transport service. These figures are higher for seniors (59%), households without cars (77%) and residents in deprived areas (83%).

Increasing the number of people near **frequent service** addresses patronage goals, since higher frequency services tend to be more useful and attract more users. But only 28% of residents and 39% of jobs are within a 400 m walk of public transport that comes every 15 minutes or better. This includes fewer than half of seniors (31%), households without cars (47%) and residents in deprived areas (47%).

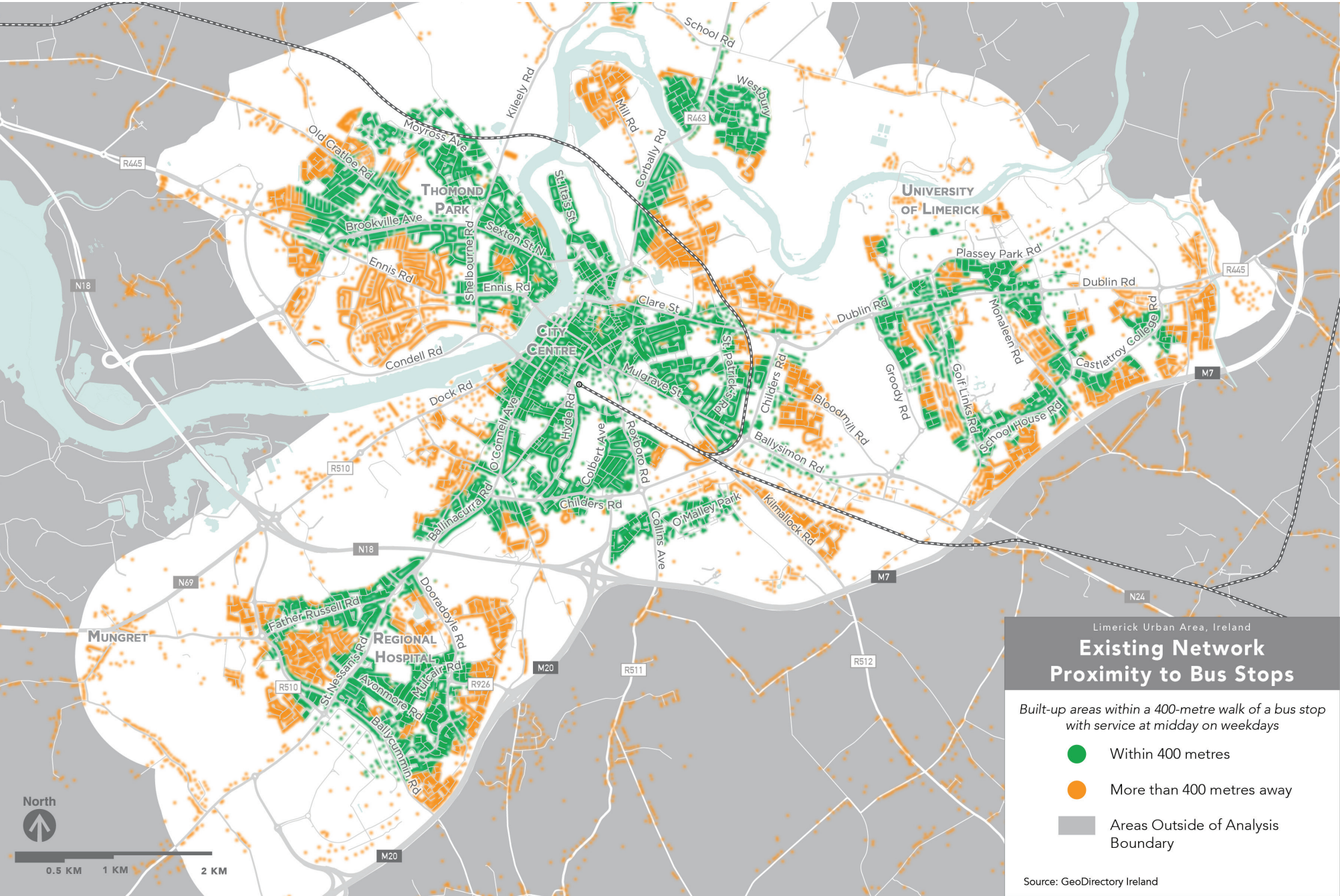
Existing Network Proximity - Weekday at Daytime
What percentage of the Limerick urban area is near public transport that comes every:



Note: Proximity is measured as being located within 400 m of a bus stop.

Most people in Limerick live far from a frequent bus service.

Map of Areas within 400 m of Existing Service



Factors Affecting Proximity to Service

The map on the previous page depicts how much of the built-up area in Limerick is reachable by walking 400 metres from a bus stop with urban service. The areas coloured in green are within 400 metres and the areas coloured in orange are more than 400 metres away from a bus stop.

Linearity and Permeability

Many developments outside the core of Limerick have circuitous, disconnected road networks with many cul-de-sacs and walled estates. These areas have often been developed branching off of main roads without through connections to other main roads. This makes it hard to walk through these developments between main roads.

The map extract on top on the right shows the area between Father Russell's Road and St. Nessan's Road. Although existing Route 301 provides service on all three major roads surrounding this area, a large part of this area is more than a 400 metre walk from a bus stop.

As a result of a combination of walls, fences, and cul-de sacs, it is also not

possible for someone to walk to a nearby bus stop on St. Nessan's Road from any estate connected to Father Russell Road. As a result, there's no access from these areas to the more frequent Route 304.

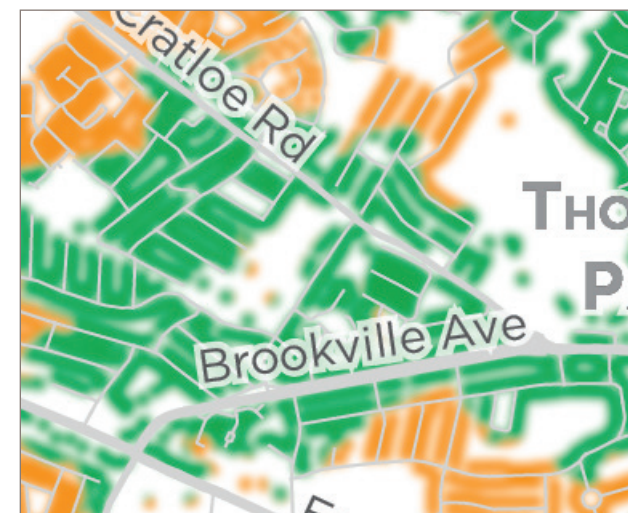
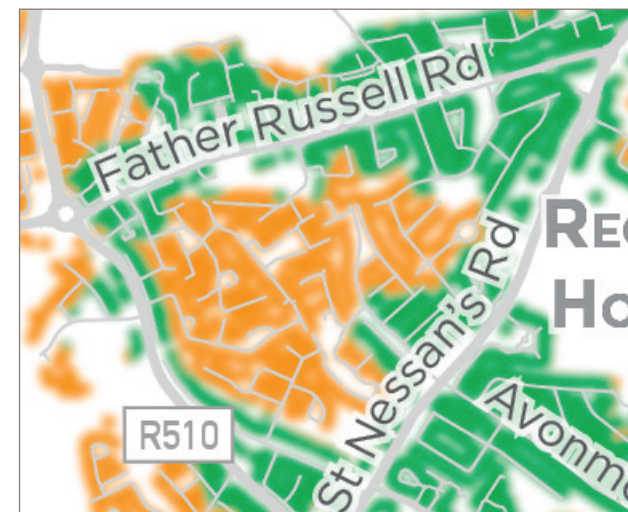
As a comparison, the area between Old Cratloe Road and Brookville Avenue (served by existing Route 302) shown in the map extract to the right on the bottom, has much higher permeability due to a more linear and connected pattern of streets and walking paths.

Bus Stop Spacing

Wide stop spacing helps buses run faster, which makes travel faster. But wide stop spacing also means some people will need to walk farther to reach service.

However, in areas with poor pedestrian permeability like the one in the top extract to the right, stop spacing that is too wide leads to many more people far from service.

400 metres of distance between stops is often cited as a good compromise between bus speeds and easy access to stops. The Route 301 stops in the



area in the top extract are quite far apart, as much as 850 metres, limiting the catchment of the service.

Complexity in the Existing Network

The existing urban bus network includes some features that introduce complexity for passengers. These include:

1. One-way streets and one-way operating patterns cause routes to use different streets, depending on the direction of travel. This is true in much of the City Centre, and in many outlying areas as well.
2. Several routes feature special deviations or extensions only made at certain times of day.
3. In the City Centre, where all routes converge, there is service on many different streets and stops, so it is harder to get to the correct stop to interchange to another route. Interchange is also discouraged by the charging of a second fare whenever someone boards a second bus during their journey. Discouraging interchange reduces the usefulness of the network as a whole.

What does this mean for passengers, especially for new users and people considering using public transport but unfamiliar with the system?

1. There are many routes and service patterns to learn and remember, relative to the amount of transport service provided.
2. If someone is travelling to the City Centre, the stop where they alight may be several city blocks away from the stop where they should board for their return journey.
3. If someone wants to travel to the areas served by deviations or extensions, but outside of the times when that highly-specialised service operates, they may wait a long time or they may decide public transport just doesn't work for them.
4. If a route has variations in its pattern throughout the day, people who don't know the system will occasionally get on the wrong bus, and end up someplace they didn't expect.

This also has consequences for new residents of Limerick. Upon arrival, they will make decisions about where to live, where to apply for jobs, and

whether to purchase a car and live at a place that necessitates a car commute.

If new arrivals cannot understand the public transport network, and don't quickly see its value, then that will affect the choices they make. These individual choices add up, and affect the success of local transport strategies in reducing emissions and mitigating congestion.

Complex bus networks are not good for passenger growth and patronage goals. Many successful changes to bus networks focused on increasing patronage make the network simpler by investing in routes that run all day and all week and providing frequent service on clear, linear corridors. This network redesign is an opportunity to make the network simpler and easier-to-use.

One-Way Splits

The most impactful form of complexity in the Limerick network may be long one-way splits.

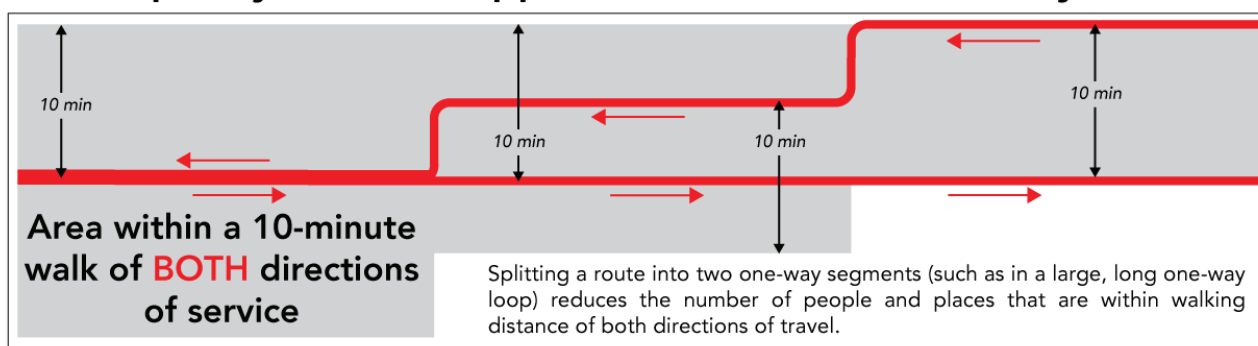
One-way splits cause the area usefully served by a route to be smaller even as it appears on a map to be larger. This is illustrated in the graphic to the right.

Public transport needs to be useful in both directions. When the two directions of a route are split, people take different walking routes for their two journeys, which adds time and complexity to their day.

The wider the split between two directions, the more people will find that their walk, for one direction of travel, is uncomfortably long.

The effect on each individual's experience may seem small, but the cumulative impact over many people is significant. Even a small nudge or disincentive, if it affects a whole population, will have an effect on transport outcomes.

A route split by direction appears to cover more, actually covers less.



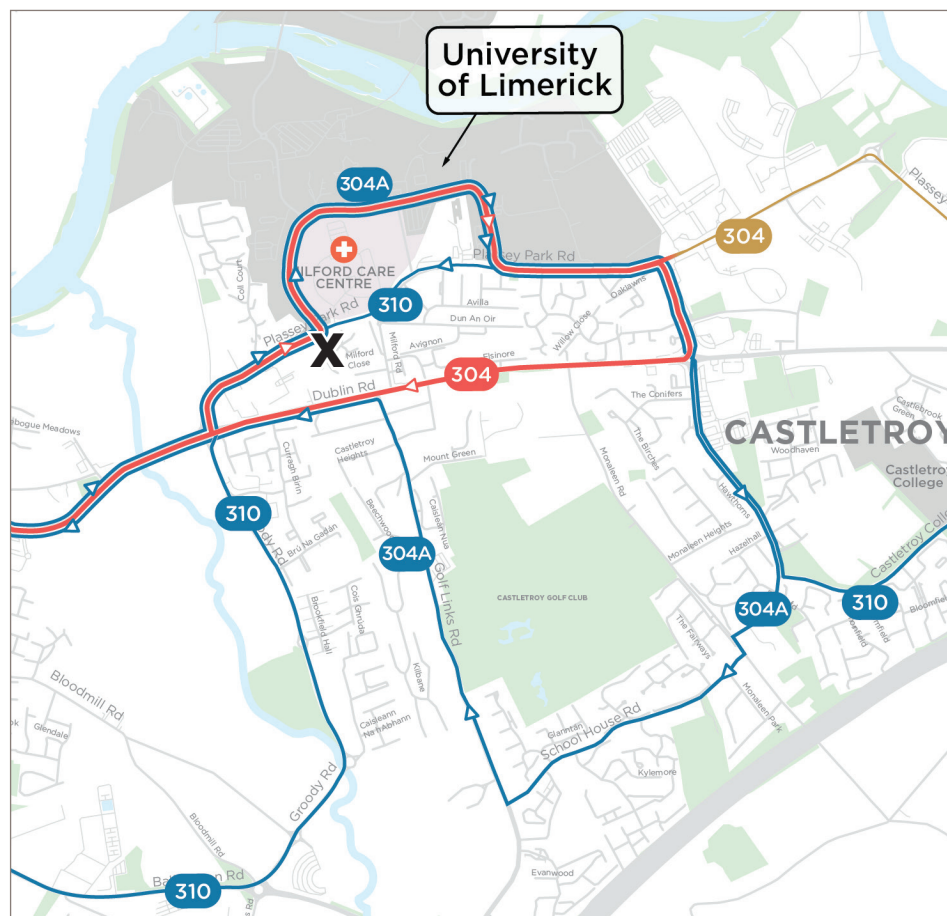
The map extract on the right shows an example of a one-way split in service that affects many Limerick residents. Route 304 operates as a one-way loop near the University of Limerick. Several kilometres of stops are only served in one direction.

Take for example someone at Plassey Village (near the “X” marked on the map) travelling towards the City Centre on this route. They can either:

- Board at their stop, travel two stops, wait a few minutes at the Student Life stop, then ride through Plassey Park Road and back on Dublin Road;
- Walk about 10 minutes to the Student Life stop and ride though all the roads listed above; or
- Walk about 10 minutes to the stop at Golf Links Road.

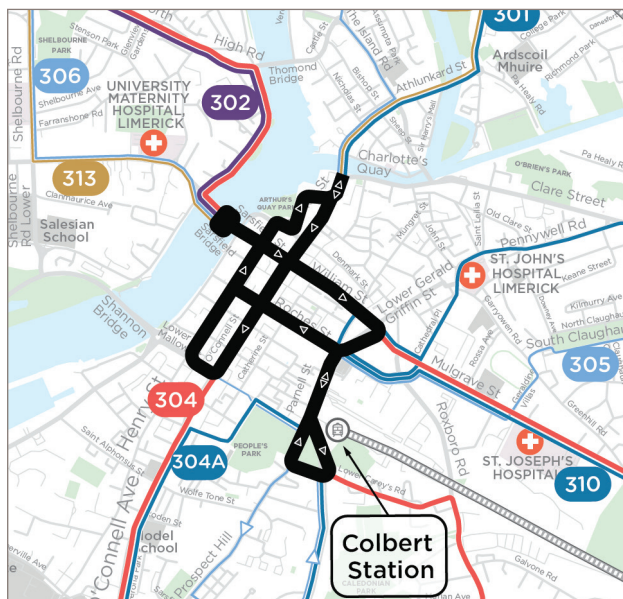
Some people may not mind a ten minute walk—but there are sure to be many people who do mind. This reduces the number of people who consider themselves close enough to the use Route 304 regularly.

The alternative bus routes in the area do not provide a satisfactory solution for most cases. Route 304A features an even longer one-way loop. Route 310 provides a two-way path, but operates less frequently than Route 304, and takes a longer path to City Centre.



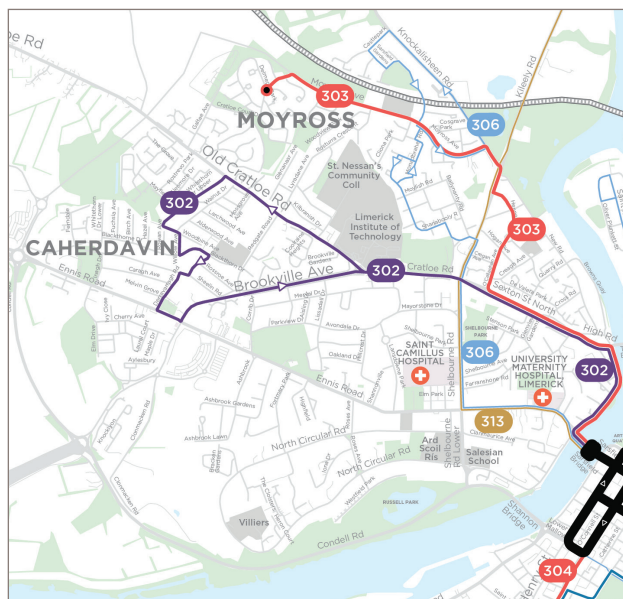
When two directions of a route are far apart, some people will find that the walk, either going or returning, is too long for them.

Local Observations on the Existing Network



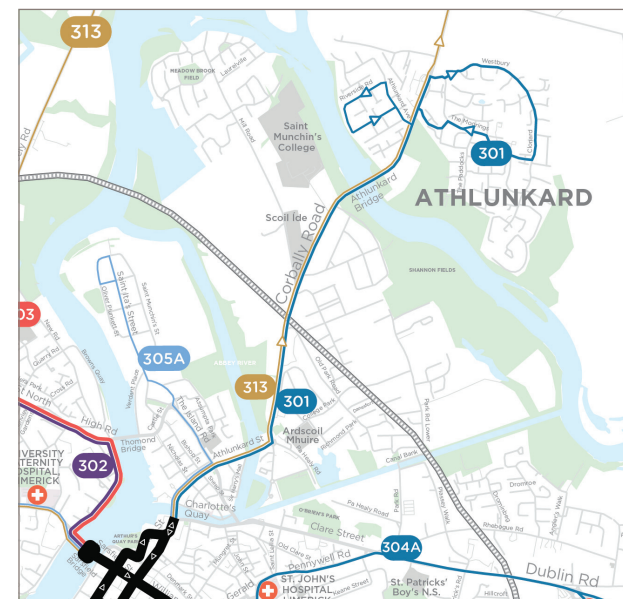
City Centre

- The core of Limerick has service on many different streets and stops, which makes interchange confusing. Consolidating service onto fewer streets with two-way service could make the network easier to understand. Interchange between routes would be easier, and bus priority measures could be effectively targeted.
- There are important regional and national connections at Colbert Station, which is located a few streets away from where most service converges at present.



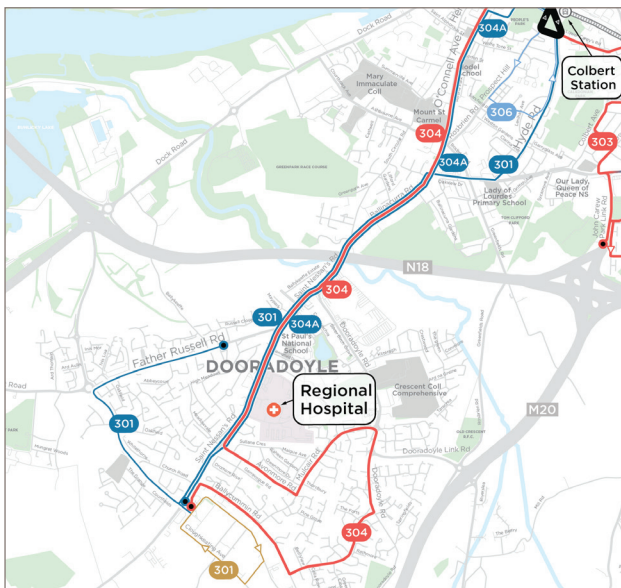
North West

- The Ballynanty and Moyross areas face high levels of deprivation. To some extent, Route 306 provides coverage service to areas farther from Route 302 or 303.
- Route 302 has very high patronage relative to its levels of service, and could warrant a higher frequency.
- There is no urban bus service on Ennis Road, despite being very linear, and near significant numbers of residents and jobs.



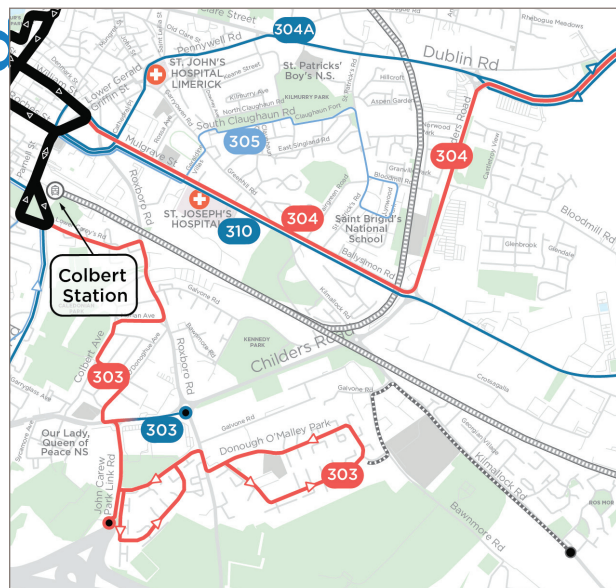
North East

- St. Mary's Park faces high levels of deprivation and is served by the hourly Route 305A to City Centre only. This area could warrant more frequent service connecting to places further beyond walking and cycling distance.
- Route 301 loops through Shannon Banks, increasing outbound journey times to Westbury.
- Mill Road and the area between Corbally Road and Clare Street/ Dublin Road have physical constraints that obstruct any potential bus service.



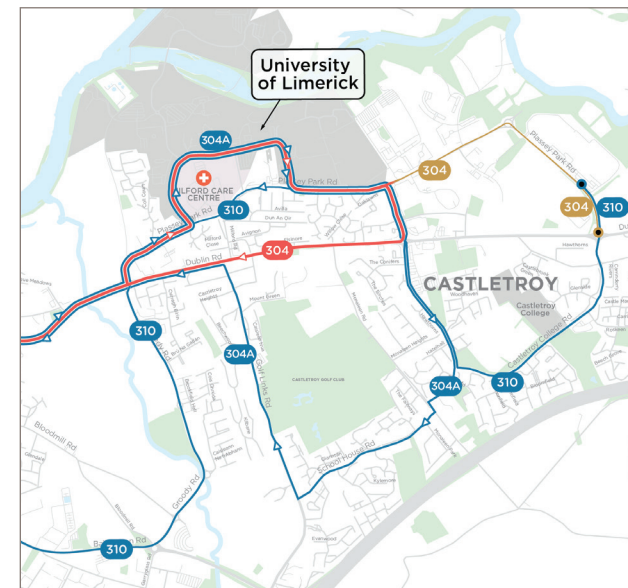
South West

- Although there is a lot of service on O'Connell Ave/Ballinacurra Road/St. Nessian's Road, it is organised into separate routes that cannot be coordinated into a single very high frequency.
- Route 306 runs once an hour, and serves a very small area to City Centre only. It may benefit more people to replace this service with increased service on the Hyde Road.
- No service on Dock Road despite significant number of nearby jobs.
- No service on parts of Dooradoyle Road despite significant number of nearby residents.



South and Inner East

- Some of the areas served on Route 305 in Garryowen are within 400m of Route 304 on Mulgrave Street, which is far more frequent and connects to many more places.
- Route 303 recently went from every 30 minutes to every 15 minutes, but patronage growth has been relatively slow. This may be due in part to deviations and one-way route splits that increase journey time, as well as population declines in areas under regeneration like O'Malley Park.
- Route 303 service cannot reach its intended terminus on Kilmallock Road at present because no turn-around facilities have been constructed.



East

- East of the River Groody, Routes 304 and 304A include large one-way splits in this area. These increase walking distances and journey times. A large area south of Dublin Road is served in one direction only.
- South of Dublin Road, no road is near enough people to generate high patronage. Hence Routes 304A and 310 run in zig-zag patterns to get service close to many people.
- The missing link road between Golf School House Road and Groody Road precludes a more linear bus path from Annacotty to City Centre via School House Road and Ballysimon Road.



4 Market and Need for Service

Indicators of Demand and Need for Public Transport

In this chapter, we present data that informs two different types of considerations in transport planning:

- **Where are the strongest markets for transport, with potential for high patronage and low operating costs?**
- **Where are there moderate or severe needs for transport, where services may be important, whether or not they attract high patronage?**

The maps on the following pages show:

- **Activity**, which combines residents, jobs and higher education
- **Residents**
- **Jobs and Higher Education**
- **Primary and Secondary Schools**
- **No-Car Households**
- **Areas with High Deprivation**
- **Unemployed Residents**
- **Youths**
- **Seniors**

The maps draw on 2016 Census data and other pre-2020 sources. As such, the impacts of new development in areas like Mungret are not represented.

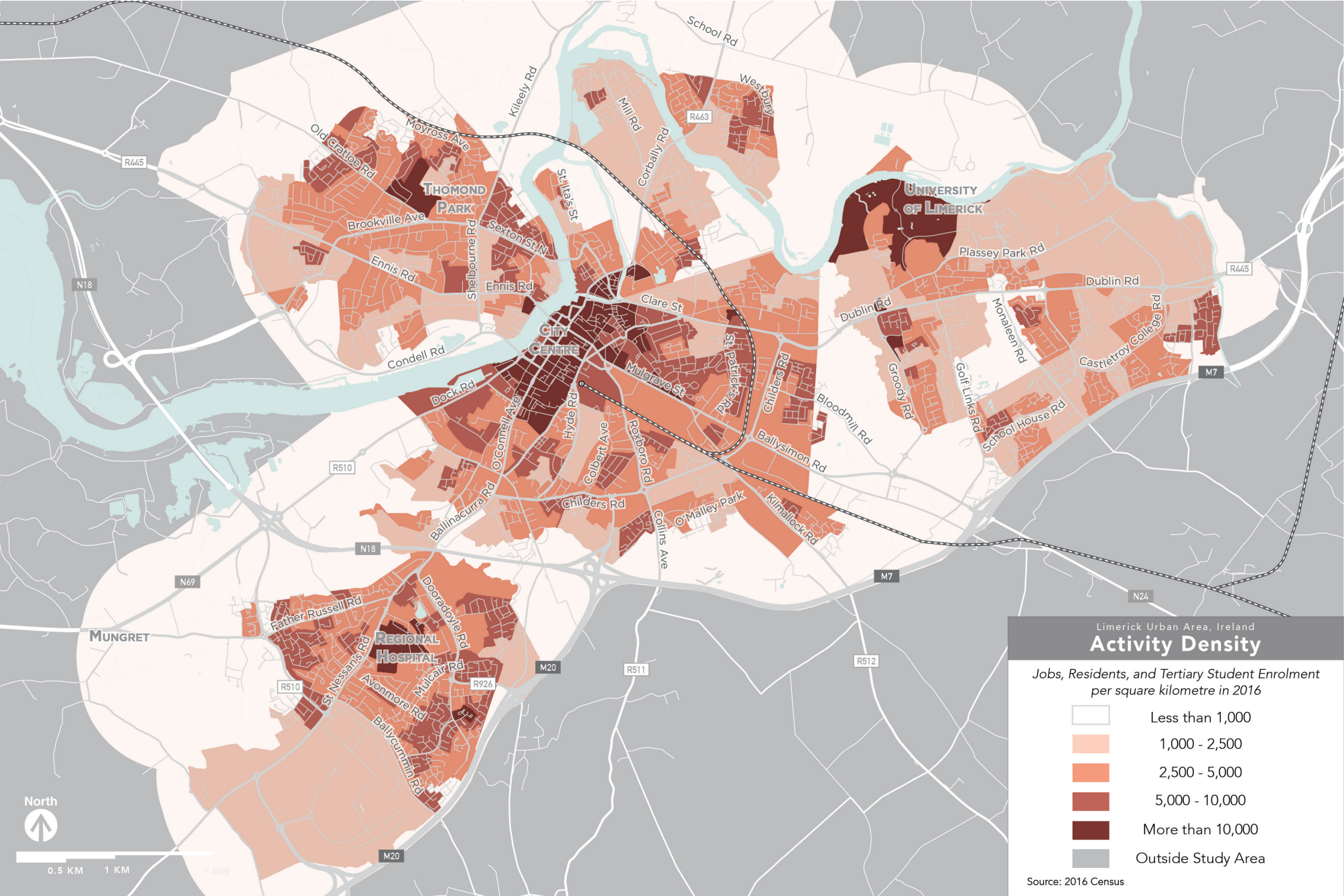
While designing the Draft New Network, the team worked closely with staff from Limerick City and County Council and Clare County Council to ensure that the Draft New Network addresses current conditions and development anticipated by 2025.

Most of these maps show the density of each population group across the area. However, density on its own is not enough to support high patronage. We must examine these maps for all

of the land use qualities that indicate high patronage potential, in addition to density:

- **Walkability.** The last map in this series shows how conducive the local street and path network is to providing short walks to bus stops.
- **Linearity.** These maps, especially when viewed in combination, reveal where public transport can run in reasonably straight lines, without deviating or following circuitous patterns, while getting close to large numbers of people and activities.
- **Continuity.** Crossing rural areas and open space takes time and therefore consumes operating budget. This means that the farther apart destinations are, the greater is the cost to connect them, or the worse frequency can be offered across that distance.
- **Mix of Uses.** This is best visualised in the first map in the series, which shows Activity. When places are dense with both residents and jobs, public transport can work efficiently in both directions at many times of the day and week.

Activity Density (Residents, Jobs, and Higher Education)



Relevance

The map of activity density on the previous page shows the density of residents, jobs, and higher education (measured as third-level student enrolment) together. This makes it possible to identify areas with a high mix of residents and activities.

Such areas are likely to have many potential passengers and destinations. Areas with mixed use are likely to generate trips in all directions, at many times of the day and week. This makes it possible to attract high patronage efficiently, as service and vehicles are useful in both directions of each route.

Key Observations

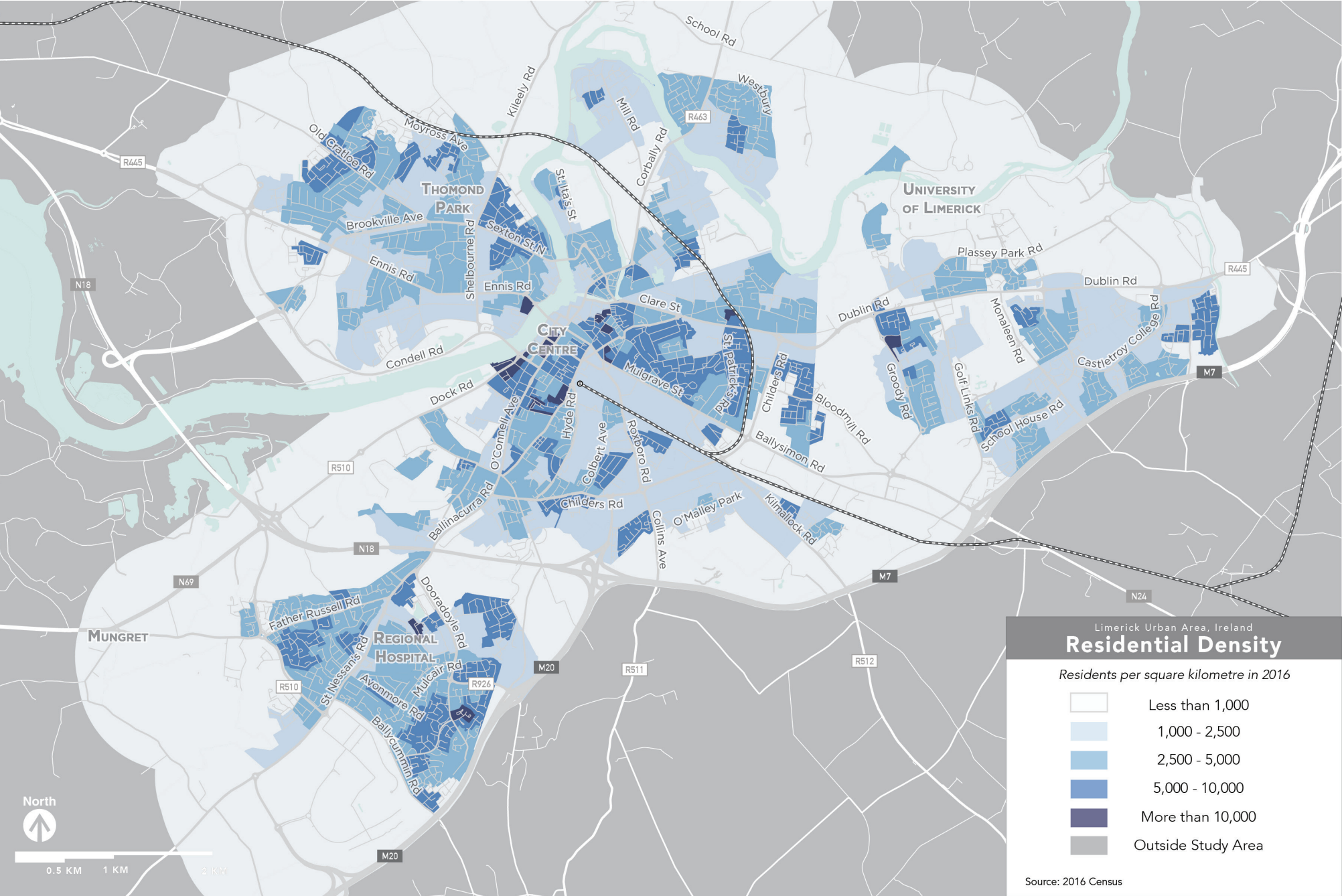
The activity pattern in Limerick is segmented into distinct areas. This is because of physical barriers like the N18 strategic route, the rail line to Ennis, the Park Canal, the Shannon, Groody, and Abbey rivers, and the Ballinacurra creek.

Four centres of activity stand out. These are focal points in both the existing and Draft New Network. The largest concentration of activity by far is in and around the City Centre. Secondary centres are also evident from the map, at the University of Limerick, University Hospital Limerick, and TUS Moylish (former Limerick Institute of Technology).

In addition to these locations, there are major centres of employment on Plassey Park Road and in Raheen which do not emerge from a density analysis due to their format and layout, and due to the composition of the Census boundaries

Outside of these centres, density is relatively uniform in built-up areas. A few small areas have higher densities in spots. These tend to reflect specific housing developments that are marginally denser than their surroundings, rather than concentrated centres of activity.

Residential Density



Relevance

Understanding where many people live close together can help us see where there is a greater market for public transport. This is because many journeys start and end at home, so places where many people live have potential for high patronage.

People's homes also serve as destinations for other people's trips such as for visiting, caring for family, or receiving services someone provides from home.

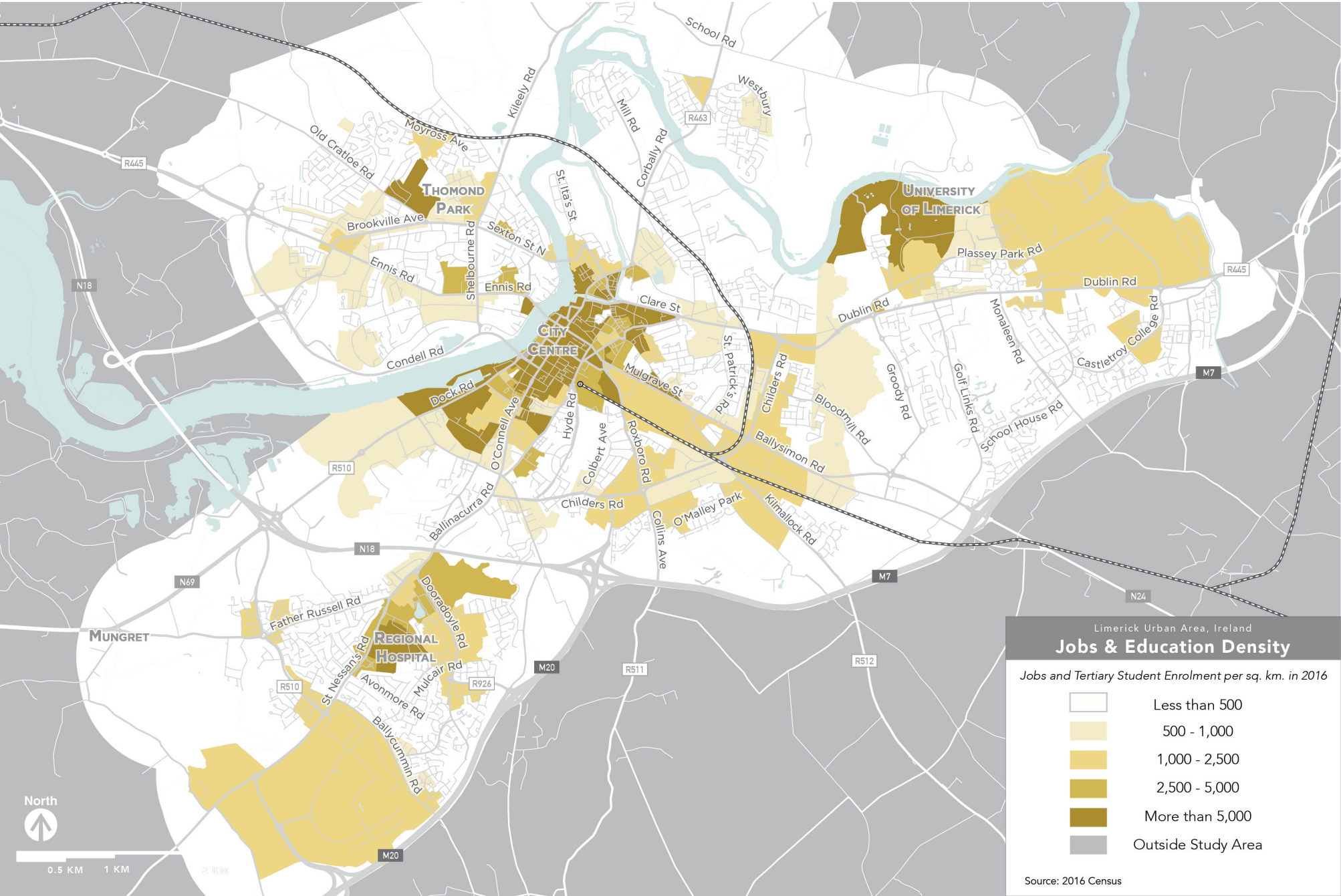
Key Observations

The oldest and most central neighbourhoods have the highest densities. The largest contiguous area of high residential density is around the City Centre, Irishtown and Garryowen. Most of this area has more than 5,000 residents per square kilometre. This reflects the building style of older districts of town, with continuous terraced houses and apartments. It also reflects some of the newer high-density housing in parts of the City Centre.

The area south of the N18 has higher residential densities than other suburbs. This may reflect larger household sizes. There appears to be a correlation between high residential density in general, and high densities of children.

Residential densities are lowest east of the River Groody. This reflects the relatively high affluence of this area; the presence of large campuses like the University of Limerick and business parks around Plassey Park Road; and the continued presence of exurban land uses such as reservoirs, agricultural fields and a large golf course.

Jobs & Higher Education Density



Relevance

The density of jobs and higher education positions can show the areas where destinations are concentrated and people travel to most.

However, helping people travel to these destinations is about more than just work and education commutes. Job locations also represent places people visit regularly for shopping, medical care, socialising, fitness, and all of the other activities that make a full life.

Higher education facilities, in addition to attracting students, are also important destinations for the faculty and staff that support their studies, researchers, visitors, and in the case of medical schools and teaching hospitals, patients seeking care.

Key observations

The four key centres of activity in Limerick are the centres of jobs and education. As in the activity density map, the areas that show up most are the City Centre, the University of Limerick campus, University Hospital Limerick, and the TUS Moylish campus.

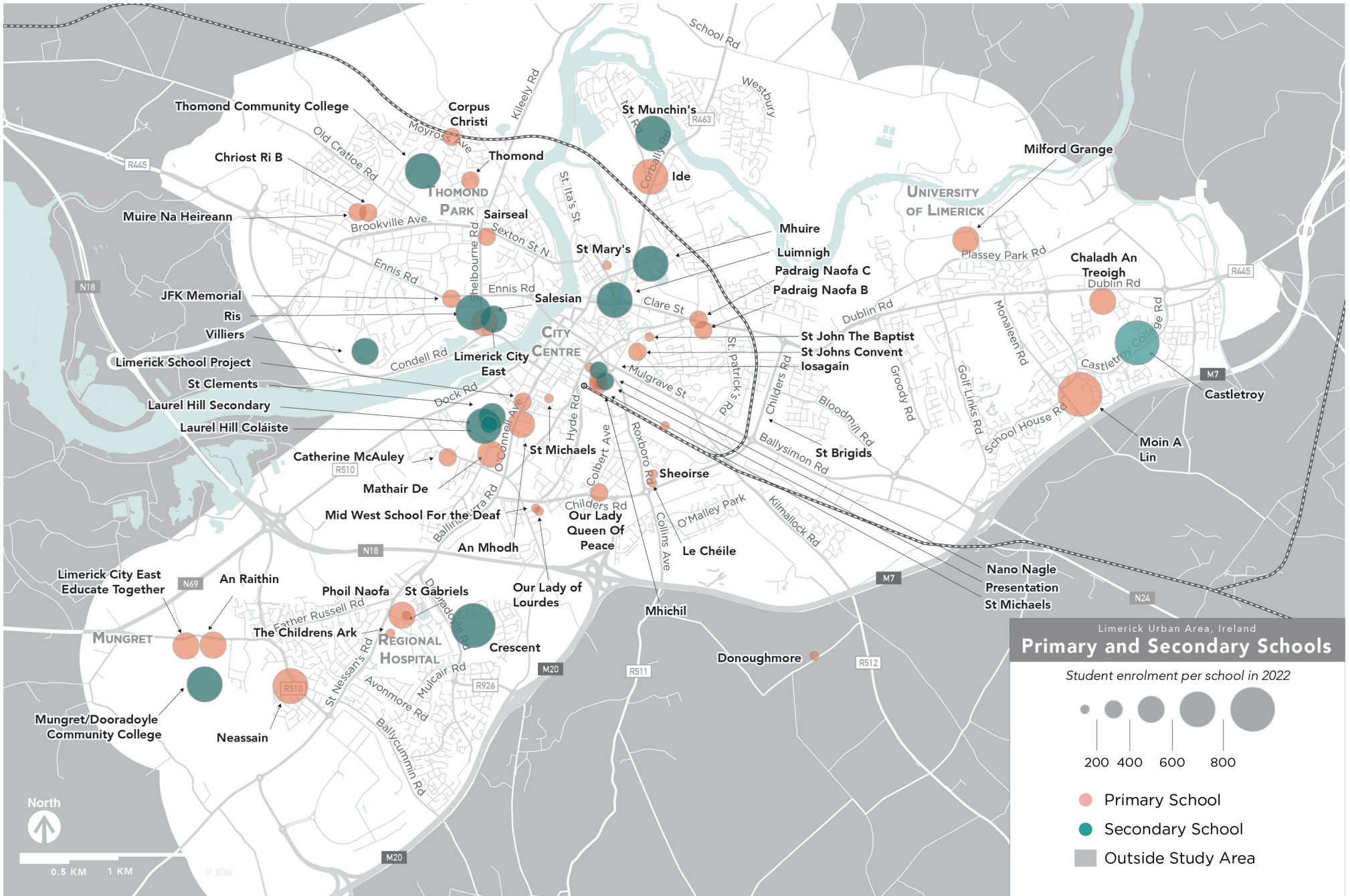
Industrial areas have numerous jobs, but are spread out at relatively low densities. This include areas like the Raheen Industrial Estate, business parks on Plassey Park Road, Ballysimon Road, and Dock Road. The low densities of jobs in such areas often mean that workers have to walk a long distance from a bus stop to their actual job site.

The map may slightly understate the importance of some suburban shopping centres. Places like the Limerick One, Roxboro, Parkway, Crescent, Jetland and Coonagh Cross Shopping Centres have relatively few jobs per square kilometre, due to their vast footprint on the ground. However, they do attract many customer trips.

Both recent industrial and retail developments are often sprawling, with large factories and big-box stores

set back behind enormous car parks. This makes the jobs in those locations harder to reach with public transport, especially when buildings are placed at the ends of cul-de-sacs or behind walls.

Primary and Secondary Schools



Relevance

The map on the previous page shows the primary and secondary schools in the Limerick area and their student enrolment in 2018.

The travel demand patterns around primary and secondary schools is very different from those at colleges and universities. While third-level institutions tend to generate trips all day, primary and secondary schools tend to generate many trips over very short period in the morning and afternoon.

If a bus route meant to serve schools only connects schools to residences, it may not be very useful for the rest of the day. It is possible to connect schools to residential areas on routes that only run in the mornings and evenings with an intention to reduce how much service is spent on such specialised trips.

However, such specialisation makes the bus network more complex and harder to understand.

There are also additional costs to trips which only operate during periods of peaked demand. These include the cost of purchasing and maintaining

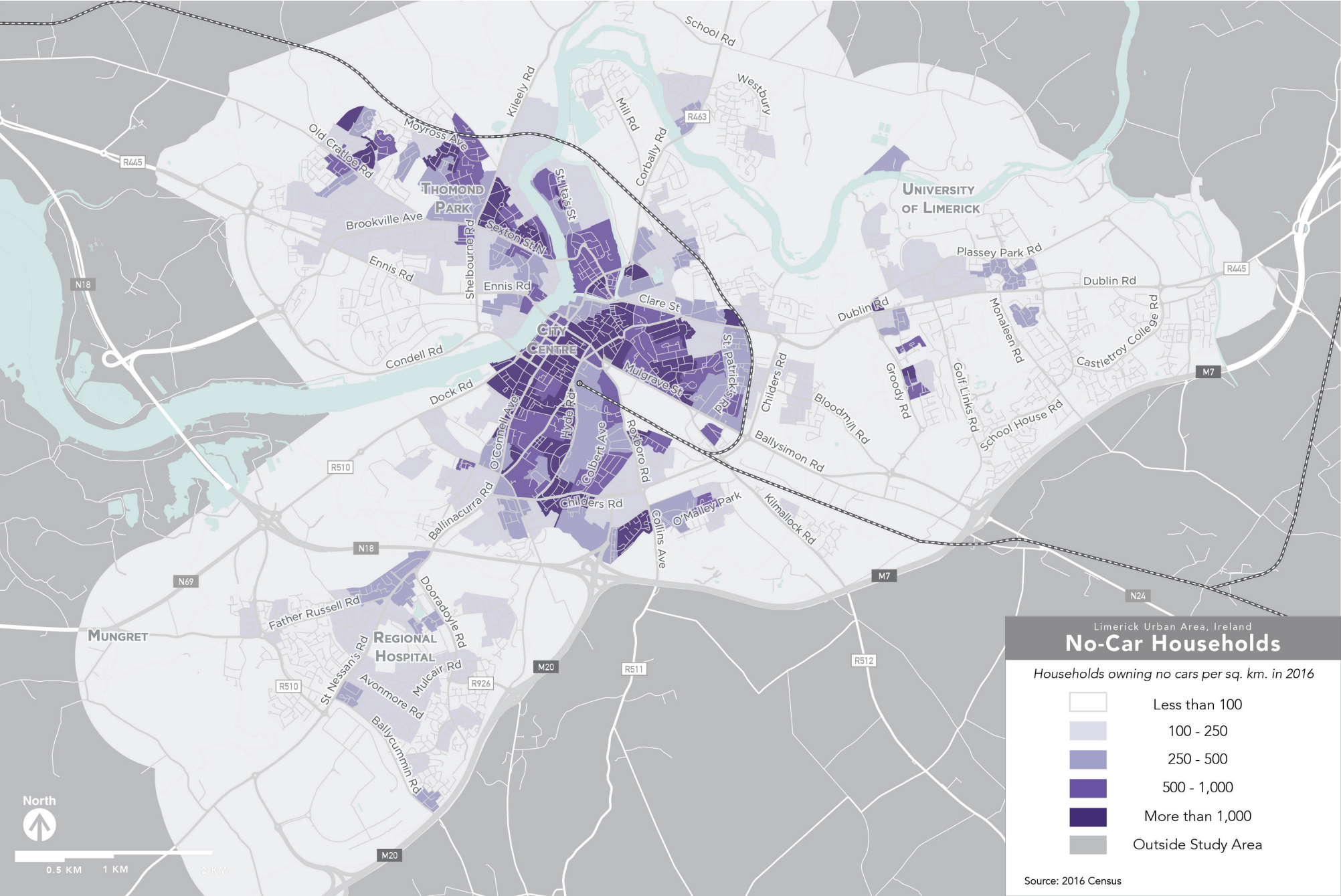
extra buses to serve those trips and the cost of paying drivers for short shifts or split shifts with large breaks in between.

Key Observations

Many schools are located at the edges of the City Centre. These schools are likely to have nearby public transport service under any configuration of the bus network, although it may not be to their front door.

There are also several large schools in outlying areas. When those schools are located at the ends of long cul-de-sacs, with little else near them, they are more complicated and expensive to serve.

No-Car Households



Relevance

The map on the previous page shows where no-car households are concentrated in Limerick.

The presence of households with no cars indicates both potential for high patronage and a need for public transport service.

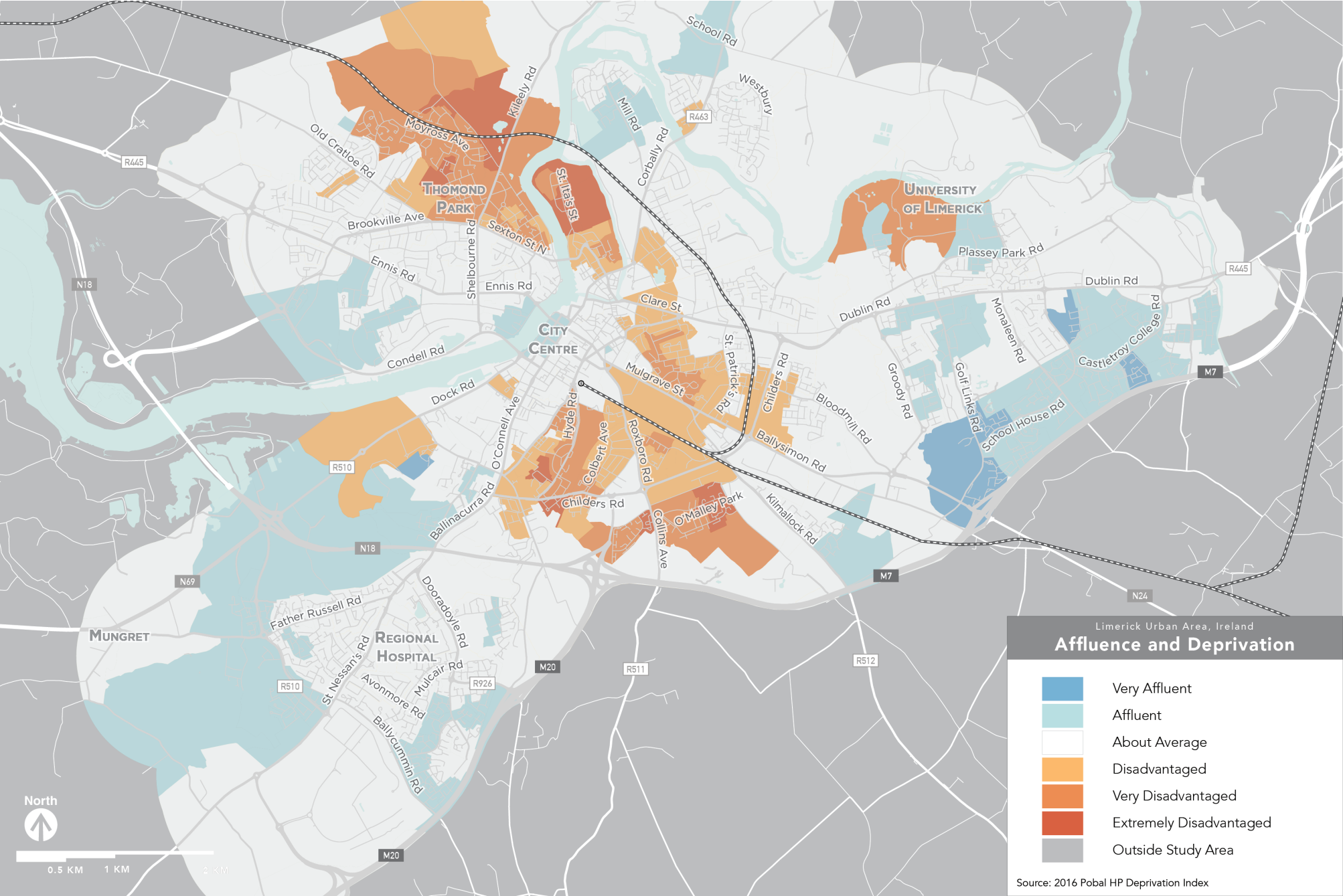
In places that are far from the City Centre, households without cars may have few options besides public transport for reaching jobs and services beyond their immediate area.

Key Observations

There are high densities of no-car households in and near the City Centre. These areas have generally higher density of activity, a well-connected street network, and are close to frequent and useful public transport service. Furthermore, space constraints are tighter and it may be challenging or expensive to consistently park a car in much of this area. As a result, these are the areas where living without a car is most convenient.

In suburban areas, density of no-car households is highest in areas with significant deprivation, and in student housing. High-deprivation areas like Moyross, St. Mary's Park, Hyde Road, John Carew Park, and O'Malley Park all have relatively high densities of no-car households. It is also possible to almost pinpoint student housing buildings on the Dublin Road and Groody Road based on the density of no-car households.

Areas of Affluence and Deprivation



Relevance

The map of affluence and deprivation on the previous page shows the variation of the Pobal HP Deprivation Index in 2016 in the Limerick urban area¹. Unlike other maps in this chapter, this is not a map of density, but shows the relative levels of affluence or deprivation in each area.

Affluence and deprivation tend to affect people's travel behaviour, with some impacts on demand and need for public transport.

Affluent people tend to travel more, because they have money to spend on travel itself and on activities they enjoy. At the same time, affluent people are also more likely to own cars. Therefore, affluent areas may generate high public transport patronage, but only if service is sufficiently convenient.

Conversely, people with fewer means travel less on average, and are less likely to own cars. Therefore, deprived areas may not always generate high public transport patronage. Nonetheless, deprivation is still a strong indicator of a need for service.

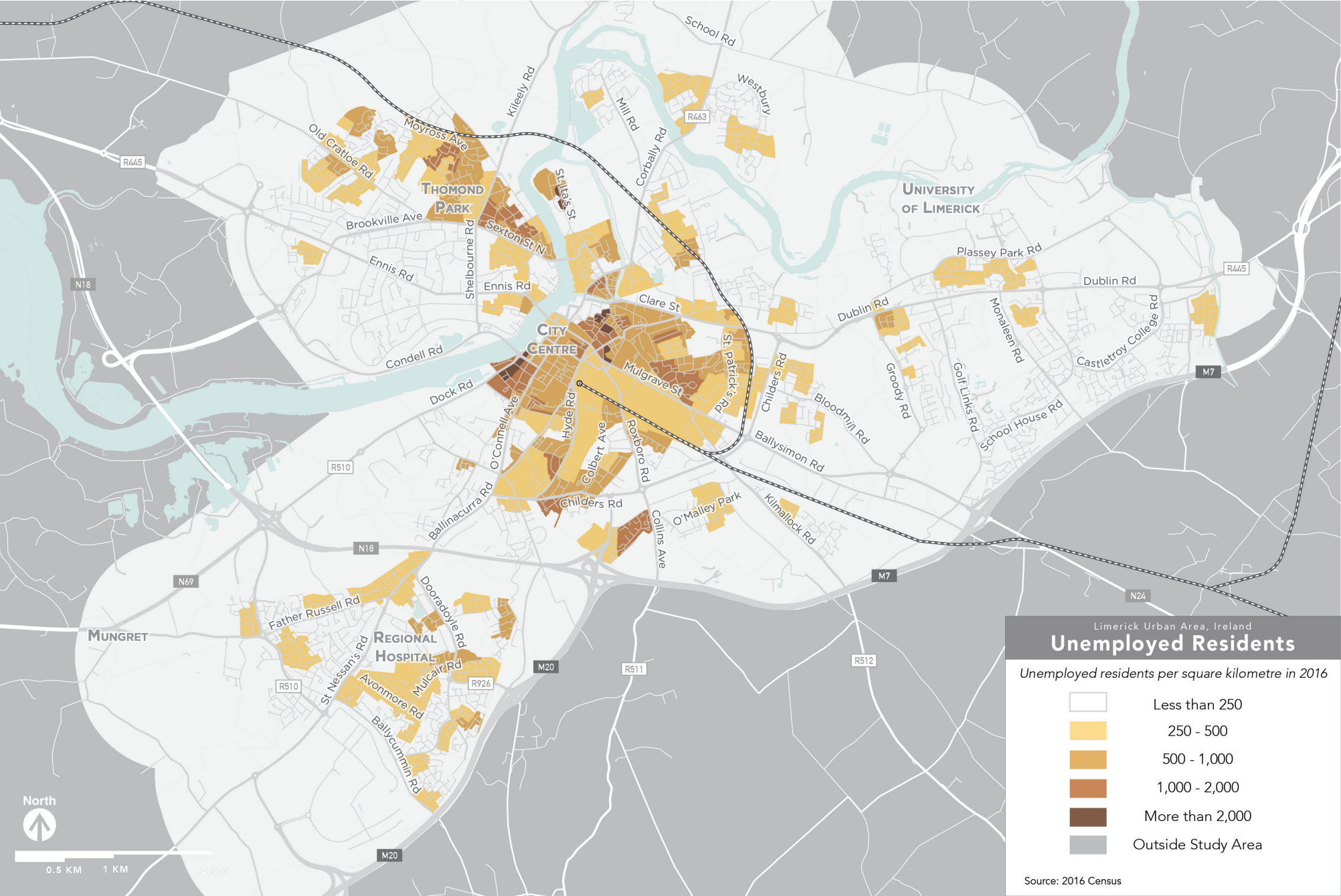
Key Observations

Outside of the City Centre, there is a strong association between areas of deprivation and areas with high densities of no-car households. As a result, in the context of Limerick, deprivation may be linked to both need for public transport, and relatively high patronage.

The University of Limerick campus also shows up as an area of significant deprivation on this map. However, the data likely reflect students living in on-campus housing, who are not experiencing deprivation in the same sense as residents of other areas.

¹ More details about the Deprivation Index can be found at the archived [Trutz Haase website](#).

Unemployed Residents



Relevance

The map of unemployed residents on the previous page shows where people who were unemployed in 2016 were concentrated.

It may seem strange to focus on unemployed people as a source of transport demand or need, given that unemployment typically requires less travel than employment.

However, high unemployment and deprivation are closely linked. Areas facing high levels of deprivation tend to have high densities of unemployed residents.

A map of unemployment density therefore adds important context. It helps identify areas where many people may benefit from better access to employment and educational opportunities, even if the average person may not be severely deprived.

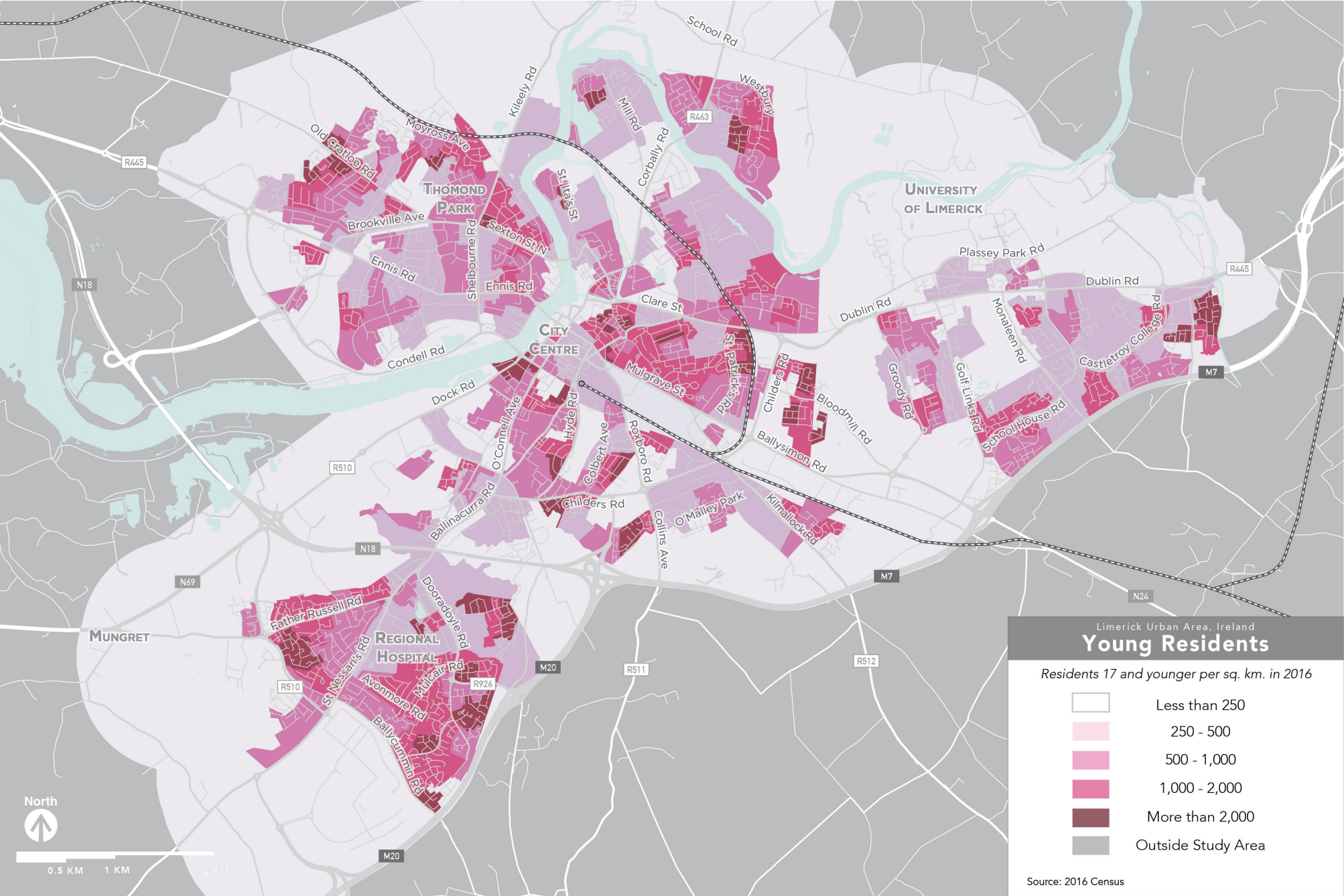
Together, maps of unemployment and deprivation help identify where public transport would be valuable for social reasons. In denser and more central areas, this need complements patronage goals. In outlying areas of low density, public transport may help fulfil coverage and inclusion goals.

Key Observations

High densities of unemployed residents suggest a significant amount of social need in and near the City Centre. This includes need for public transport services. Although the City Centre offers the most easily accessible opportunities for someone without a car, many jobs, services, and educational and recreational opportunities are available in suburban areas that may be difficult to reach without public transport.

The map of unemployment also suggests a level of social need in Dooradoyle that may be higher than visible on the map of affluence and deprivation.

Youth Density (ages 17 and under)



Relevance

Children are not legally able to drive. Nonetheless, they may still need to travel to schools, to see friends and family and to attend various activities.

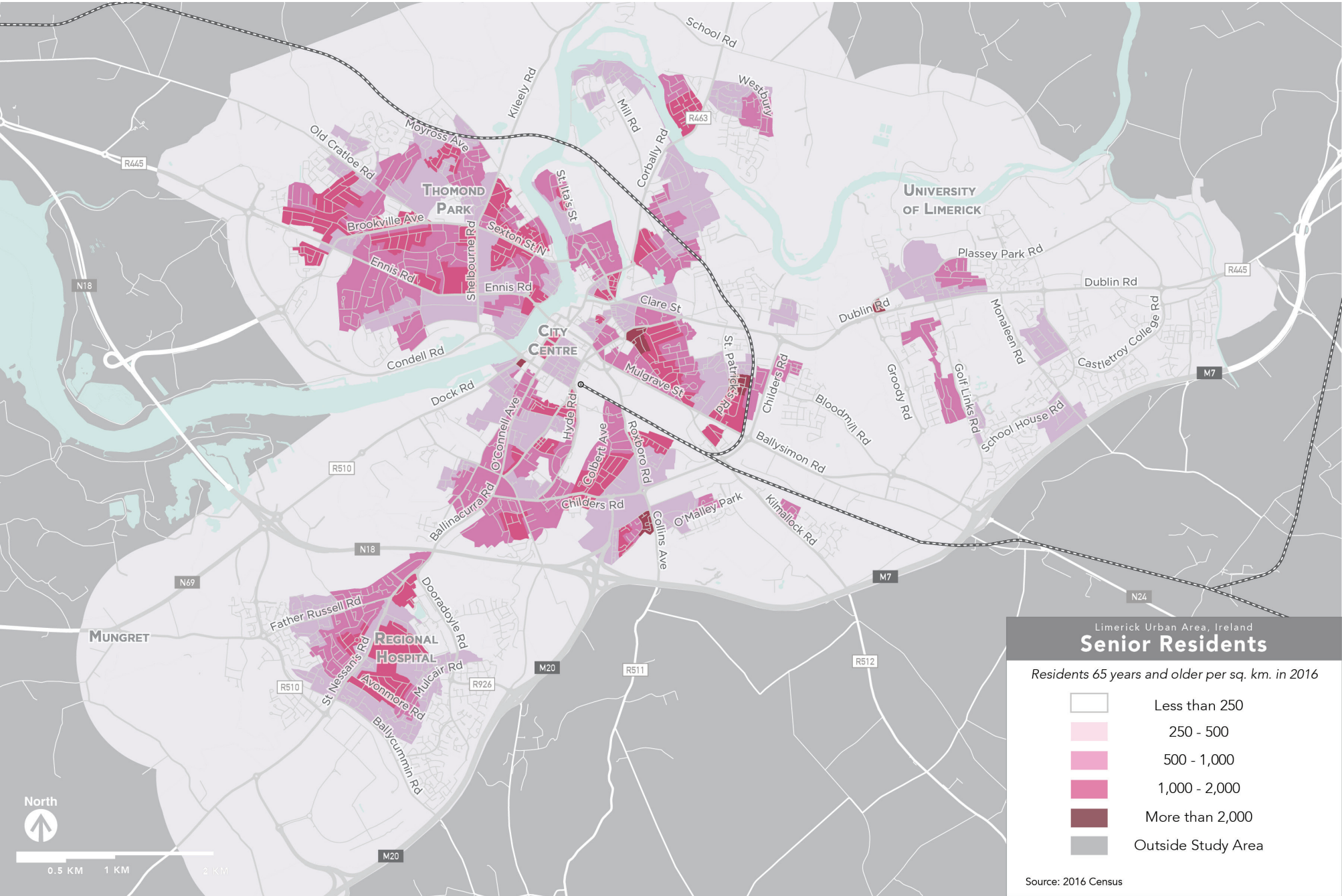
Driving children around is a major consumer of parents' and other caretakers' time. Public transport can be both a relief to busy adults and a source of independence and empowerment for children who have reached the age and level of maturity to travel on their own or with friends. Children also have access to discounted youth fares.

A map of youth density is therefore another measure that combines both a certain level of need, and a certain amount of potential for high patronage, as many people who have travelled on a bus at 4 pm on a weekday can attest.

Key Observations

Higher densities of young residents generally follow patterns of high residential density in Limerick. This is likely due to the association between presence of children and larger household sizes.

Seniors (ages 65 and above)



Relevance

Retirees and seniors have a relatively high propensity for using public transport, due to fixed incomes, lower rates of driver licensing, difficulty maintaining driving skills, and the Free Travel Scheme.

However, as a group, they tend to have different preferences for transport service design than younger people and working people:

- They often have a stronger preference for a shorter walk to and from the bus stop.
- They often have more time to plan and make their journey.
- They are less likely to make trips for which they do not control the timing (such as to a job or school). Therefore, they are a bit more able to time their trips around the bus schedule.

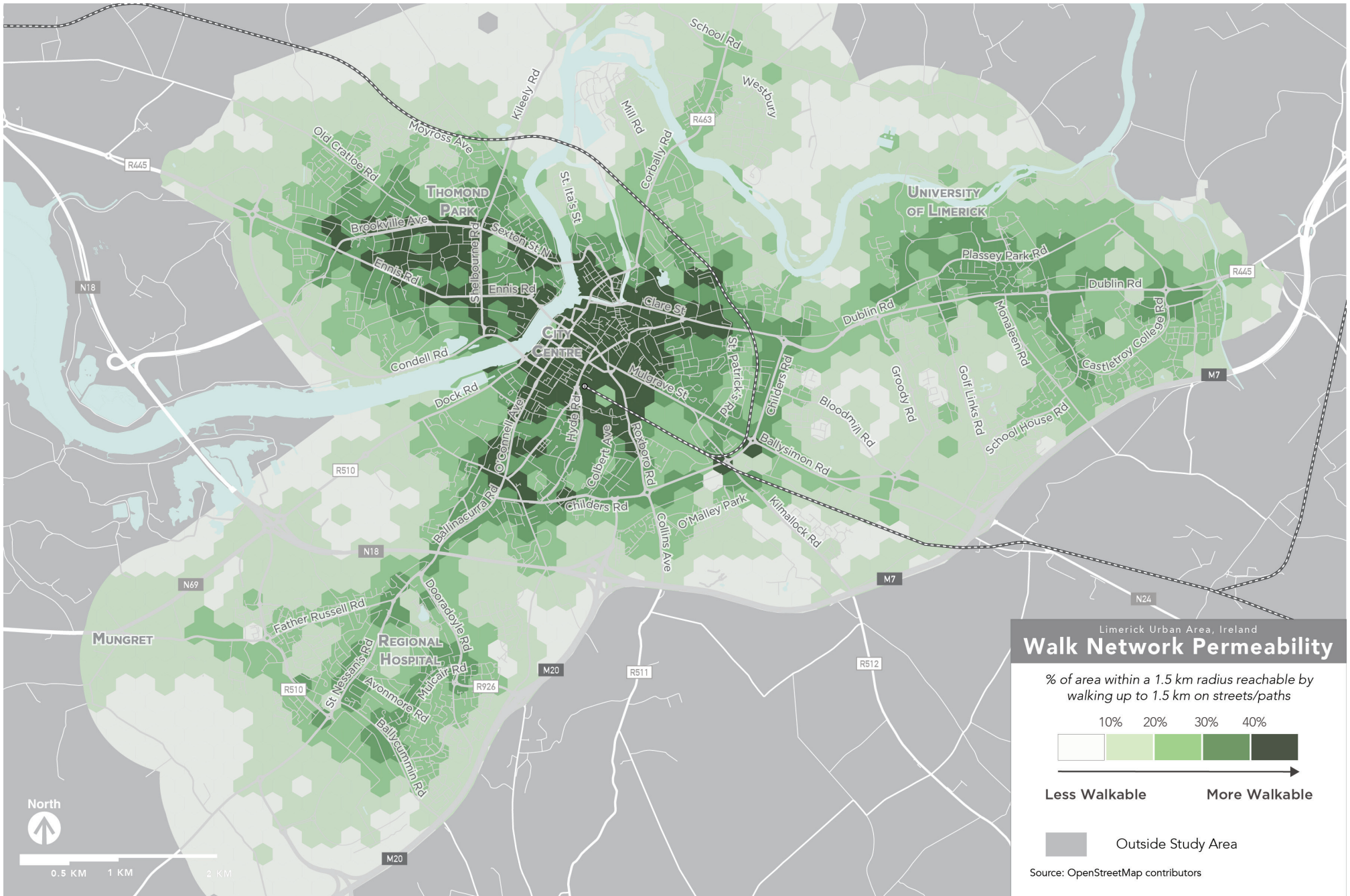
For these reasons, retirees and seniors are sometimes more concerned that transport routes get close to their homes and destinations, and less concerned about whether the service is frequent or fast.

Key Observations

With some notable exceptions (see below), **the density of seniors mostly follows the patterns of overall residential density.** This suggests that the planning of any bus network in Limerick must take into account the needs of seniors within the context of the needs of the general population.

Newer neighbourhoods, particularly in affluent areas, tend to have low densities of people over 65. This is especially noticeable in the areas east of the River Groody, where densities of seniors are especially low. This suggests that existing public transport services are somewhat inadequate for the needs of this area, given the infrequent and circuitous nature of existing Routes 304A and 310 are.

Walk Network Permeability



The map on the previous page shows one measure of walkability: the portion of the nearby area that can be reached by walking up to 1.5 km on streets or paths. A higher portion means that an area is more permeable for walking.

Places with few street or path connections will require people to walk longer distances to reach destinations that are nearby “as the crow flies.” Such places appear on this map in light green or grey. Places where many connected streets or paths allow people to reach most nearby places quickly appear in dark green.

Much of the area around Limerick City Centre is fairly permeable, but outside of that, many areas are hard to walk across between the main roads. For example, closer to the City Centre, it’s easy to get from O’Connell Avenue to Dock Road. But further out, there are fewer paths for people to walk between them.

Many developments around Limerick also have circuitous street patterns and developments nestled inside cul-de-sacs. As was pointed out on page 45, the area around Father Russell Road has moderate-to-high residential density, but a disconnected

street pattern that makes it impossible to directly walk to any service on St. Nessen’s Road.

Lack of permeability is widespread throughout Limerick, and affects both affluent and deprived areas. For example, there is no direct means to walk between a point halfway on Monaleen Road and halfway on Golf Links Road, or between Roxboro Road and Hyde Road.



5 Overview of the Draft New Network

What is the Draft New Network?

The Draft New Network is the **initial redesign proposal** put forward by BusConnects Limerick. The proposal is being put forward for public consultation. After public consultation, the NTA and its partners intend to develop a Final New Network that addresses the feedback received.

More Service Investment

Recognising that the existing bus network does not adequately address patronage or coverage goals, the NTA is proposing a significant increase in service through BusConnects Limerick.

The added service would include:

- **Service to More Areas**
- **More Routes with Frequent Service**
- **Better Service on Sundays**
- **24-Hour Service in Key Areas**

Overall, the Draft New Network would increase the amount of bus service in Limerick City and its suburbs by about 70%.

More Useful Service

The network redesign does not simply increase service for its own sake, but specifically to maximise how many useful places people can reach in a reasonable amount of time.

The proposed investments in service result in:

- **Less waiting**
- **Service when you need it**
- **More connections to useful destinations**

Reading Network Maps

The map on the next page depicts the Draft New Network in Limerick. As in previous pages, **route colours represent frequency**.

Red represents frequent service, with a bus coming every 15 minutes or better, in the midday on weekdays, and **dark red** indicates service every 10 minutes or better.

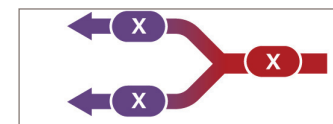
Purple is for routes coming every 20 minutes. **Dark blue** routes come every 30 minutes and **light blue** routes come every 60 minutes.

Route Numbers

The route numbers in this network are different from any existing route numbers. These new numbers are provided to avoid confusion with existing services. They are not final, and may change before the Final New Network is put in place.

Route Branching

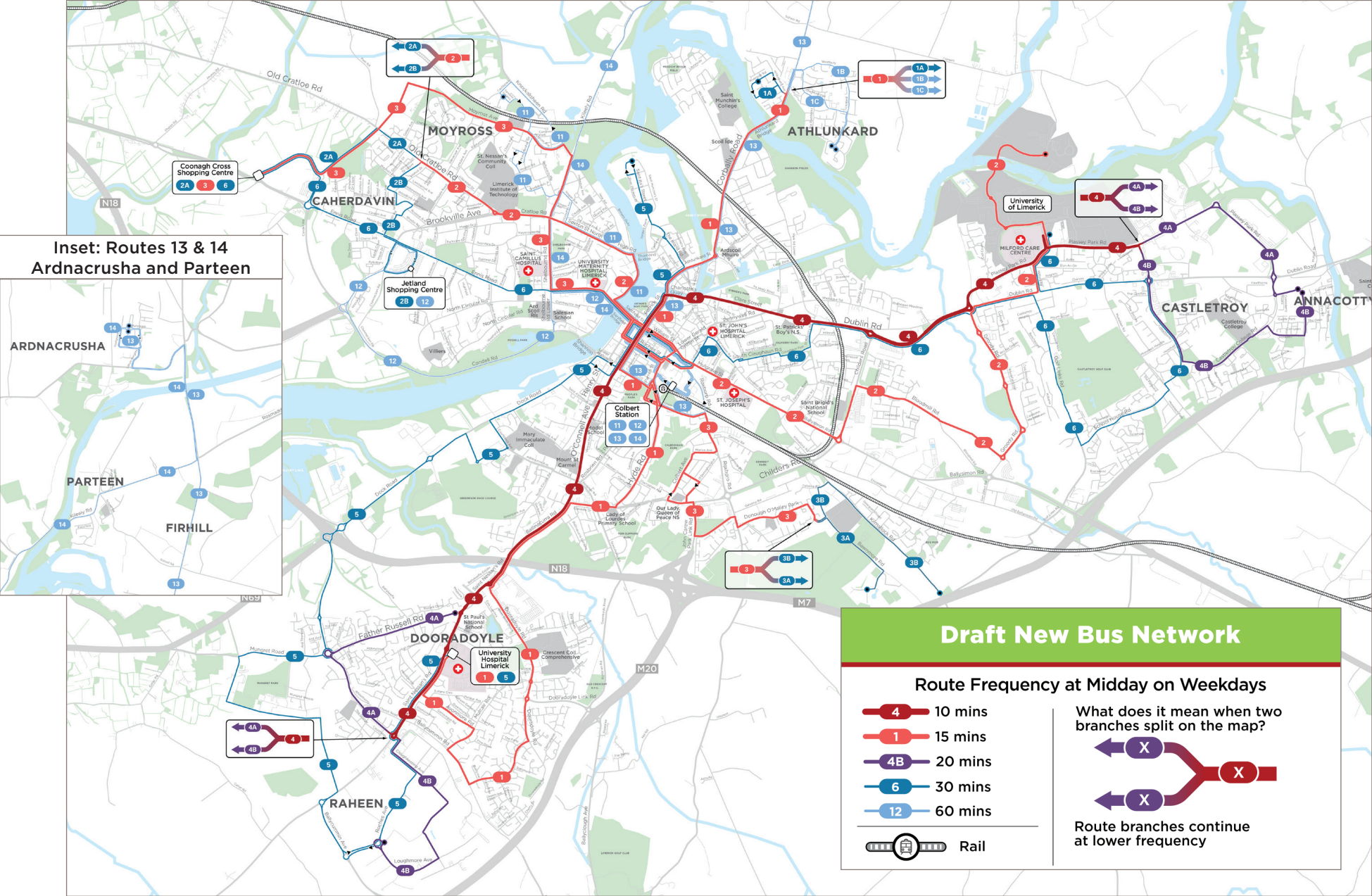
Some routes in the Draft New Network would branch at their ends. This is shown on the maps as below:



This is not an interchange. The buses on the purple (or blue) routes come together to form the red route.

For example, Route 4 is a combination of Route 4A and Route 4B. Route 4A (from Fr. Russell Road) and Route 4B (from Raheen Industrial Estate) come together at the Raheen roundabout. All 4A and 4B buses continue to City Centre and the University of Limerick. They split again in Castletroy, where 4A buses continue on Plassey Park Road, while 4B buses continue to Kilmurry Road and Castletroy College Road.

Map of the Draft New Network



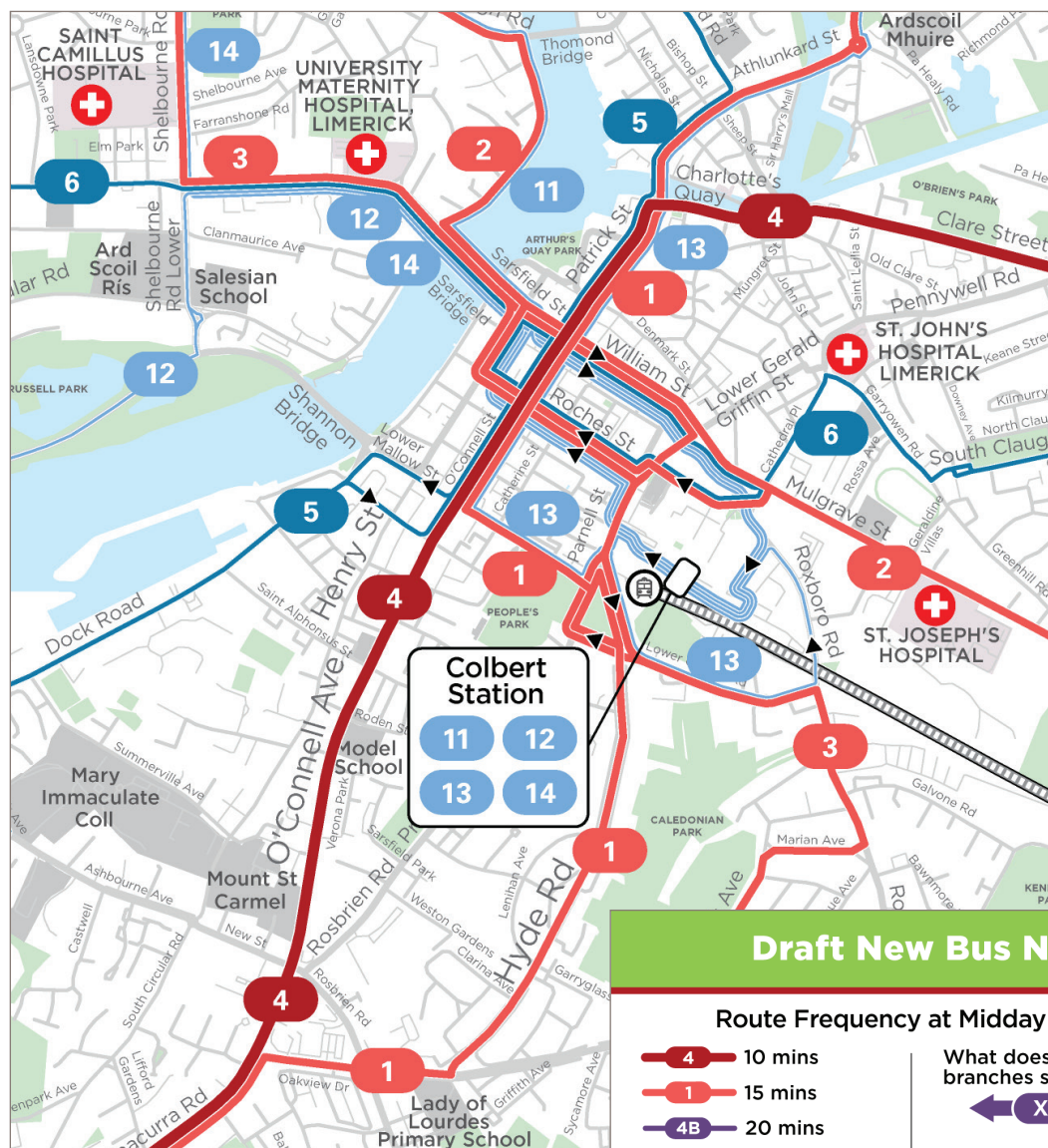
Proposed Service in the City Centre

All routes in the Draft New Network would serve the City Centre. As in the existing network, some routes would end there, but most would pass through and travel cross-city.

As much as possible, proposed service would be consolidated into a single north-south path on O'Connell Street, and an east-west path using William Street (eastbound) and Roches Street (westbound). The main points of interchange for cross-city travel would therefore be near the junctions of:

- **O'Connell Street and William Street**, between north-south buses, and buses heading east
- **O'Connell Street and Roches Street**, between north-south buses and buses heading west

Reliably operating services on O'Connell Street, Patrick Street, Roches Street and William Street will require a review of car circulation and bus priority. The NTA and Limerick City and County Council would collaborate on this review as part of the Limerick City Centre Transport Study to commence in 2023 and be finalised in advance of BusConnects being implemented.



Draft New Bus Network

Route Frequency at Midday on Weekdays

- 4 10 mins
- 1 15 mins
- 4B 20 mins
- 6 30 mins
- 12 60 mins



What does it mean when two branches split on the map?



Route branches continue at lower frequency

Impacts to City Centre Access Points

Colbert Station

Colbert Station is Limerick's primary connection to regional and national transport services. In the Draft New Network it would be served by the following routes:

- **Route 1** and its branches, every 15 minutes to University Hospital Limerick, Dooradoyle, Hyde Road and Corbally Road
- **Route 3** and its branches, every 15 minutes to O'Malley Park, John Carew Park, Roxboro, Shelbourne Road, Moyross, and Coonagh Cross
- **Route 11**, every 60 minutes to Ballynanty
- **Route 12**, every 60 minutes to Condell Road and Jetland Shopping Centre
- **Routes 13 and 14**, providing service every 60 minutes to Parteen, Firhill and Ardnacrusha

Service to other areas would require a 400 metre walk to O'Connell Street or Upper William Street. This includes the University of Limerick, which would be reachable via Route 2 (every 15 minutes) on Upper William Street and Route 4 (every 10 minutes) on O'Connell Street.

Sarsfield Bridge

The Sarsfield bridge would become the sole bridge carrying all local buses from the northwest, including:

- **Route 2** and its branches, every 15 minutes, coming from Old Cratloe Road
- **Route 3** and its branches, every 15 minutes, coming from Moyross
- **Route 6**, every 30 minutes from the Ennis Road
- **Route 11**, every 60 minutes from Ballynanty
- **Route 12**, every 60 minutes from Condell Road
- **Route 14**, every 60 minutes from Parteen and Ardnacrusha

The increase in bus volume carried by this bridge may require a review of existing traffic circulation patterns to ensure reliable operation of buses and minimise new car traffic congestion.

Mathew Bridge

The Mathew Bridge would also see an increase in buses, due to increased frequency to and from Corbally Road (**Route 1**, every 15 minutes), St. Mary's Park (**Route 5**, every 30 minutes), and Ardnacrusha (**Route 13**, every 50 minutes).

These levels of frequency may not require bus priority measures on the bridge for its own sake, but any changes required on Patrick Street or Charlotte's Quay may require changes to traffic circulation in this area.

Charlotte's Quay

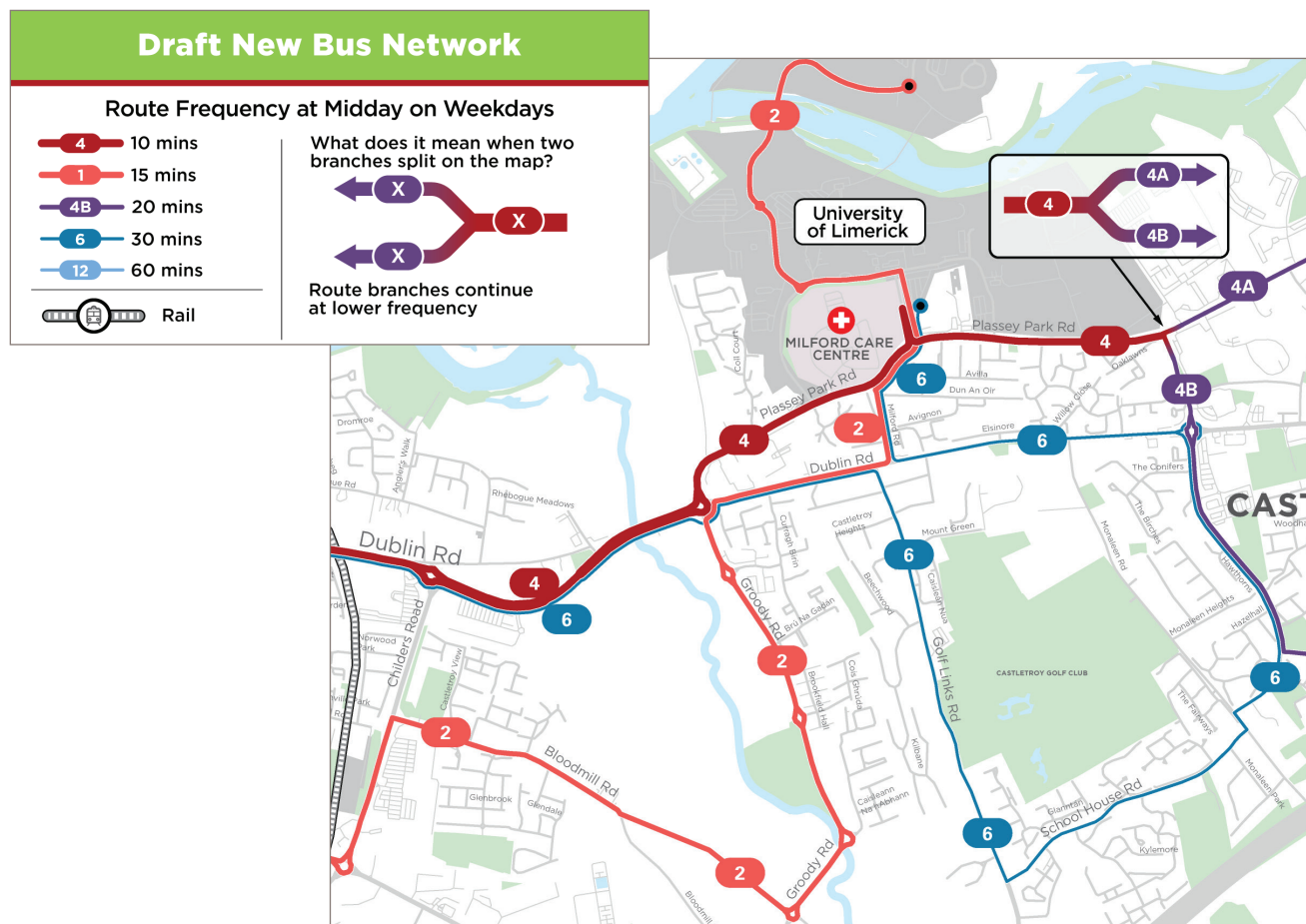
The most frequent and direct path between the City Centre and University of Limerick (**Route 4**, every 10 minutes) would use Patrick Street, Charlotte's Quay and Clare Street. This will make trips between the University of Limerick and City Centre 5 to 10 minutes faster.

However, at the moment, introducing frequent, all-day local service in this area will very likely require new bus stops and some changes to street configuration.

Proposed Service at the University of Limerick

After the City Centre, the University of Limerick (UL) is the second most important public transport destination in Limerick. The Draft New Network would significantly increase service in this area, making travel to many parts of Limerick faster (see page 96). Service at UL would include:

- **Route 4**, every 10 minutes. This would be the fastest, most frequent and most direct path from campus to City Centre and Dooradoyle, via the Dublin Road and Clare Street.
- In the eastbound direction, Route 4 would split into **Route 4A** and **Route 4B**, each every 20 minutes, providing service to parts of Castletroy and Annacotty.
- **Route 2**, every 15 minutes. This route would connect the north campus, central campus and student housing on Groody Road, and would continue to shopping and services on Childers Road and in the City Centre. This route would also provide direct service to TUS Moylish and Caherdavin.
- **Route 6**, every 30 minutes. This would provide service from campus to areas south of the Dublin Road. It would also continue to City Centre and the Ennis Road.



Making this possible would rely on two key changes to bus circulation:

- **A new facility located off the Plassey Park Road** would be the main campus bus stop. This would also be the terminus for Route 6.
- **Two-way bus circulation on some campus roads**, to allow Route 2 to reach north campus.

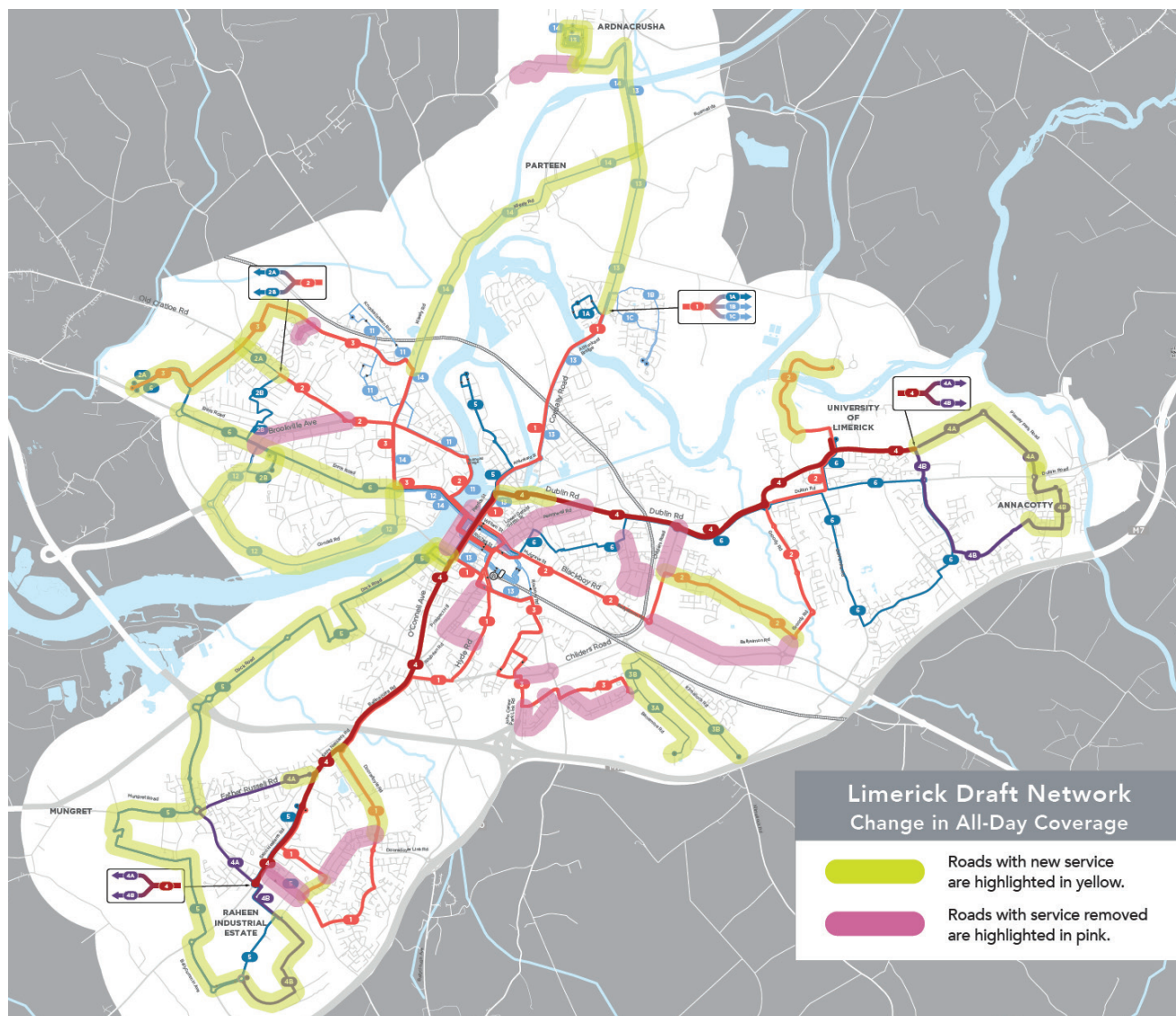
Access from UL to Colbert Station would rely on Routes 2 and 4. There would be a 400 metre walk in the City Centre between the train station and the nearest bus stop. Passengers unable to make this walk could avail any of the routes stopping at Colbert Station (see page 77) to interchange with Route 4 at O'Connell Street.

Service to More Areas

The Draft New Network would provide all-day service in many areas not served today, or served just a few times a day. These include:

- **Ennis Road**
- **Dock Road**
- **Condell Road**
- **Raheen Industrial Estate**
- **Bloodmill Road**
- **University of Limerick, north campus**
- **Ardnacrusha, Parteen and Firhill**
- **Dooradoyle Road**, between St. Nesson's Road and Mulcair Road
- **Plassey Park Road**, between Oaklawns and Annacotty
- **Development Lands at Mungret**

The Draft New Network would also remove service on some roads. In many cases, this would replace one-way service on two roads with two-way service on a single road. Roads with service removed include Brookeville Ave; Pennywell Road; Lord Edward Street; Mulcair Road; and parts of Ballysimon Road; Childers Road; John Carew Park; O'Malley Park; and St. Patrick's Road.

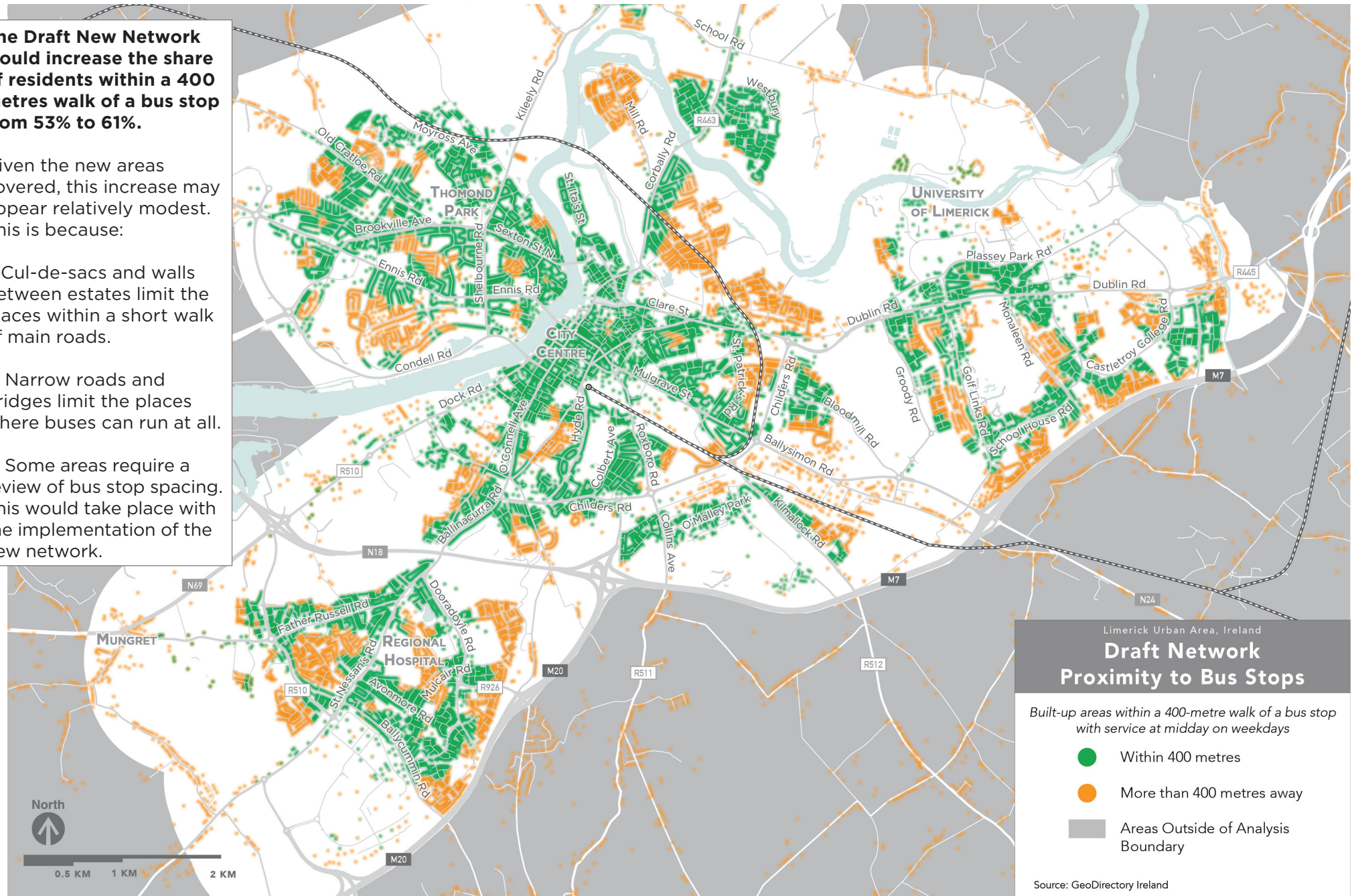


Map of Areas within 400 m of Proposed Service

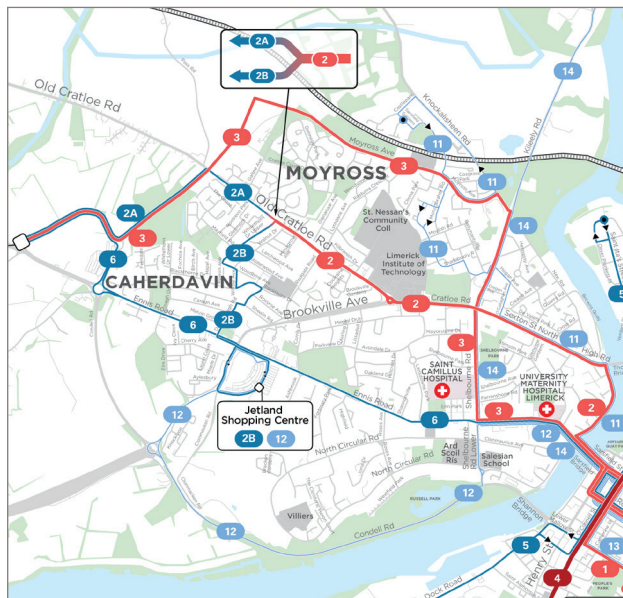
The Draft New Network would increase the share of residents within a 400 metres walk of a bus stop from 53% to 61%.

Given the new areas covered, this increase may appear relatively modest. This is because:

1. Cul-de-sacs and walls between estates limit the places within a short walk of main roads.
2. Narrow roads and bridges limit the places where buses can run at all.
3. Some areas require a review of bus stop spacing. This would take place with the implementation of the new network.



Local Detail



North West

- Route 2 would serve TUS Moylish every 15 minutes. It would split into Route 2A to Coonagh Cross and Route 2B to Jetland.
- Route 3 would serve Shelbourne Road, Kileely Road and Moyross every 15 minutes.
- Route 6 would serve the Ennis Road every 30 minutes.
- Route 11 would serve areas of Ballynanty and Moyross farther from Route 3, every 60 minutes.
- Route 12 would serve Condell Road, every 60 minutes.
- The Northern Distributor Road under construction would allow Routes 2A and 3 to extend to Coonagh Cross Shopping Centre.
- Routes 2 and 6 would both continue past City Centre to the University of Limerick.



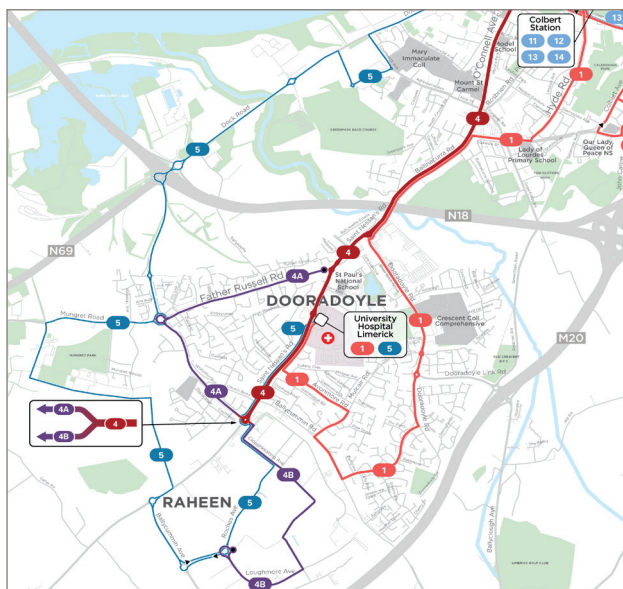
North East

- Route 4 would connect City Centre to the University of Limerick. It would operate via Clare Street and Dublin Road, every 10 minutes.
- Route 1 would serve Corbally Road every 15 minutes. It would continue beyond City Centre to Hyde Road, Dooradoyle and University Hospital Limerick.
- Route 1 would split into three branches. Route 1A would serve Shannon Banks, every 30 minutes. Route 1B and Route 1C would each serve different parts of Westbury every 60 minutes.
- Route 5 would serve Saint Mary's Park every 30 minutes. It would continue beyond City Centre to Dock Road, Mungret and Raheen Industrial Estate.
- Route 6 would serve Garryowen every 30 minutes. It would continue beyond City Centre to Ennis Road.



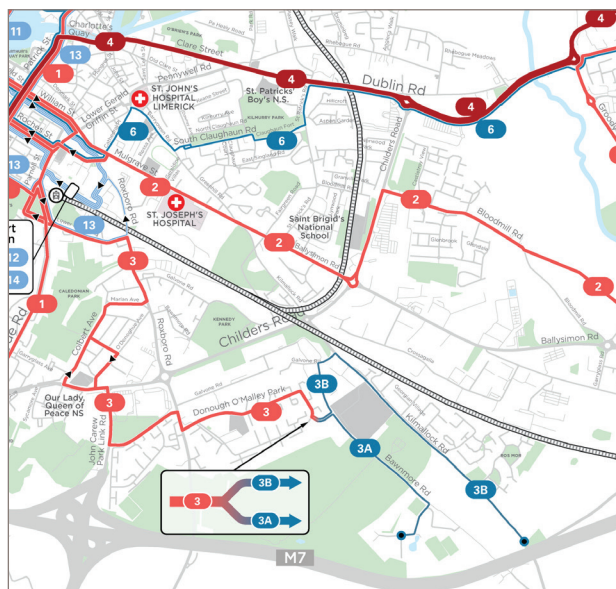
Far North

- Route 13 would serve Firhill and Ardnacrusha to City Centre every 60 minutes via R463.
- Route 14 would serve Parteen and Ardnacrusha to City Centre every 60 minutes via R464. It would include a stop within walking distance of Thomond Park and TUS Moylish.
- Route 13 and 14 would be jointly scheduled such that there would be a bus approximately every 30 minutes between Ardnacrusha and City Centre.



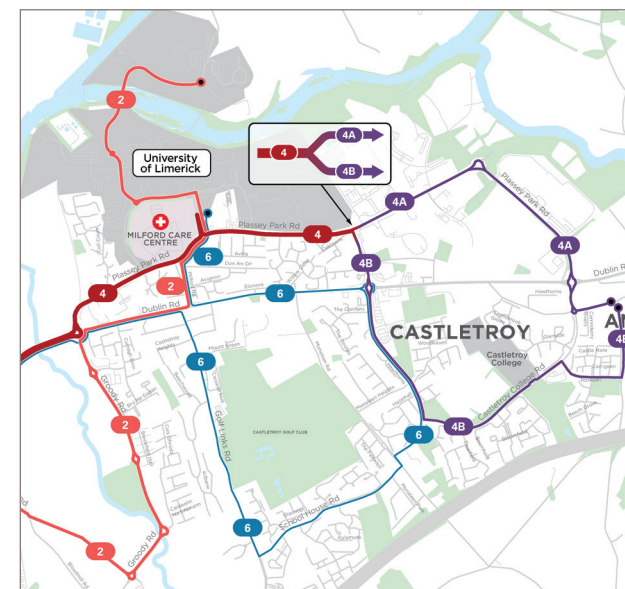
South West

- Route 4 would connect City Centre to University Hospital Limerick via O'Connell Ave and St. Nessel's Road, every 10 minutes. It would split into Route 4A to Fr Russell Road and Route 4B to Raheen Industrial Estate.
- Route 4 would also provide a direct service between this area and the University of Limerick.
- Route 1 would provide service from University Hospital Limerick, through residential areas in Dooradoyle, to the Hyde Road and City Centre. It would continue beyond City Centre to Corbally Road.
- Route 5 would provide a new service every 30 minutes on Dock Road and through Mungret to Raheen Industrial Estate, ending at University Hospital Limerick.



South and Inner East

- Route 2 would provide service every 15 minutes on Mulgrave Street and Bloodmill Road. This service would continue to University of Limerick heading east. Going west, this route would connect the area to City Centre and TUS Moylish.
- Route 3 would provide service to Colbert Ave, John Carew Park and O'Malley Park every 15 minutes. It would split into Route 3A to Bawnmore Road and Route 3B to Kilmallock Road.
- Route 3 would make fewer deviations and splits than existing service, by operating two-way on the northern streets of Carew Park and O'Malley Park. It would serve Aldi and Roxboro Shopping Centre via a stop by the Maldron Hotel.



East

- Route 4 would connect Annacotty and the University of Limerick to City Centre, every 10 minutes. It would split into Route 4A on Plassey Park Road, and Route 4B on Kilmurry Road and Castletroy College Road. It would continue beyond City Centre to University Hospital Limerick
- Route 2 would connect the University of Limerick north campus to City Centre every 15 minutes via Groody Road, Bloodmill Road and Mulgrave Street. It would continue past City Centre to TUS Moylish.
- Route 6 would provide service every 30 minutes on Golf Links Road, School House Road, Kilmurry Road and Dublin Road. It would connect to both the University of Limerick and City Centre.
- All routes in this area would be designed to provide two-way service. This would be made possible by a new bus station entrance to the University of Limerick, removing the requirement for buses to traverse campus in one direction only.

Route-by-Route Description

The table on this page provides a detailed textual description of every proposed route and branch in the Draft New Network.

The frequencies described in this table represent the minimum frequency provided on weekdays, between 7 am and 8 pm.

All routes shown in red or dark red would also operate every 15 minutes or better from 7 am to 8 pm on Saturdays, and from 9 am to 8 pm on Sundays.

Full details on route and branch frequencies at different times of day are provided in the following pages.

Route	From	Via	To	How Often
1	University Hospital Limerick	St Nessans Road - Avonmore Road - Ballycummin Road - Dooradoyle Road - Crescent Shopping Centre - Ballinacura Road - Hyde Road - Colbert Station - Mallow Street - City Centre - Athlunkard Street - Corbally Road	Athlunkard	Every 15 mins
1A	University Hospital Limerick	St Nessans Road - Avonmore Road - Ballycummin Road - Dooradoyle Road - Crescent Shopping Centre - Ballinacura Road - Hyde Road - Colbert Station - Mallow Street - City Centre - Athlunkard Street - Corbally Road - Athlunkard Avenue - Riverside Drive	Shannon Banks	Every 30 mins
1B	University Hospital Limerick	St Nessans Road - Avonmore Road - Ballycummin Road - Dooradoyle Road - Crescent Shopping Centre - Ballinacura Road - Hyde Road - Colbert Station - Mallow Street - City Centre - Athlunkard Street - Corbally Road - Annavilla Grove	Westbury via Annavilla Grove	Every 60 mins
1C	University Hospital Limerick	St Nessans Road - Avonmore Road - Ballycummin Road - Dooradoyle Road - Crescent Shopping Centre - Ballinacura Road - Hyde Road - Colbert Station - Mallow Street - City Centre - Athlunkard Street - Corbally Road - Crofton Drive	Westbury via Crofton Drive	Every 60 mins
2	Moylish	Old Cratloe Road - TUS Moylish - Sexton Street - Clancy's Strand - Sarsfield Bridge - City Centre - Mulgrave Street - Childers Road - Bloodmill Road - Groody Road - Dublin Road - Milford Road - University of Limerick - University Bridge	UL North Campus	Every 15 mins
2A	Coonagh Shopping Centre	Coonagh/Knockalisheen Distributor Road - Old Cratloe Road - TUS Moylish - Sexton Street - Clancy's Strand - Sarsfield Bridge - City Centre - Mulgrave Street - Childers Road - Bloodmill Road - Groody Road - Dublin Road - Milford Road - University of Limerick - University Bridge	UL North Campus	Every 30 mins
2B	Jetland Shopping Centre	Derravarragh Road - Sheelin Drive - Whitethorn Drive Upper - Old Cratloe Road - TUS Moylish - Sexton Street - Clancy's Strand - Sarsfield Bridge - City Centre - Mulgrave Street - Childers Road - Bloodmill Road - Groody Road - Dublin Road - Milford Road - University of Limerick - University Bridge	UL North Campus	Every 30 mins
3	Coonagh Shopping Centre	Coonagh/Knockalisheen Distributor Road - Moyross Avenue - Kileely Road - Shelbourne Road - Ennis Road - Sarsfield Bridge - City Centre - Colbert Station - Upper Careys Road - Roxboro Road - Marian Avenue	O'Malley Park	Every 15 mins
3A	Coonagh Shopping Centre	Coonagh/Knockalisheen Distributor Road - Moyross Avenue - Kileely Road - Shelbourne Road - Ennis Road - Sarsfield Bridge - City Centre - Colbert Station - Upper Careys Road - Roxboro Road - Marian Avenue - O'Malley Park	Bawnmore	Every 30 mins
3B	Coonagh Shopping Centre	Coonagh/Knockalisheen Distributor Road - Moyross Avenue - Kileely Road - Shelbourne Road - Ennis Road - Sarsfield Bridge - City Centre - Colbert Station - Upper Careys Road - Roxboro Road - Marian Avenue - O'Malley Park - Kilmallock Road	Georgian Village	Every 30 mins
4	St Nessans Church	St Nessans Road - Ballinacura Road - O'Connell Avenue - City Centre - Charlotte's Quay - Dublin Road - Plassey Park Road	University of Limerick	Every 10 mins
4A	Father Russell Road	R510 - St Nessans Road - Ballinacura Road - O'Connell Avenue - City Centre - Charlotte's Quay - Dublin Road - Plassey Park Road - UL - Plassey Park Road	Annacotty via Plassey Park Road	Every 20 mins
4B	Raheen Industrial Estate	Cloughkeating Avenue - St Nessans Road - Ballinacura Road - O'Connell Avenue - City Centre - Charlotte's Quay - Dublin Road - Plassey Park Road - UL - Castletroy Shopping Centre - Castletroy College Road	Annacotty via Castletroy College Road	Every 20 mins
5	University Hospital Limerick	St Nessans Road - Raheen Industrial Estate - Roches Avenue - Mungret Link Road - Mungret Park - Mungret Road - R510 - Dock Road - Ashford - Courtbrack Avenue - Dock Road - O'Connell Street - Island Road	St Mary's Park	Every 30 mins
6	Coonagh Shopping Centre	Ennis Road - Sarsfield Bridge - City Centre - Cathedral Place - Garryowen Road - S. Claughan Road - Claughan Port - St Patrick's Road - Dublin Road - Golf Links Road - School House Road - Castletroy Shopping Centre - Dublin Road - Milford Road	University of Limerick	Every 30 mins
11	Sarsfield Gardens	Kileely Road - Moyross Avenue - Monabrahoe Road - Shanabooly Road - Hogan Avenue - O'Callaghan Ave - High Road - Clancy's Strand - Sarsfield Bridge - City Centre	Colbert Station	Every 60 mins
12	Jetland Shopping Centre	R857 - Condell Road - Shelbourne Road - Ennis Road - Sarsfield Bridge - City Centre	Colbert Station	Every 60 mins
13	Colbert Station	Mallow Street - O'Connell Street - Bridge Street - Athlunkard Street - Corbally Road - O'Connors Cross - Blackwater Cross - Lakyle Heights	Ardnacrusha via Corbally Road	Every 60 mins
14	Colbert Station	City Centre - Sarsfield Bridge - Ennis Road - Shelbourne Road - Kileely Road - Parteen - Connors Cross - Blackwater Cross - Lakyle Heights	Ardnacrusha via Kileely Road & Parteen	Every 60 mins

*Midday frequency shown in table. Services may be more frequent in peak hours. Less frequent at weekends/evenings.

Detailed Frequencies and Hours of Service

The graphic below provides detailed frequencies by time and day for all routes planned in the Draft New Network.

Service on most routes would be provided from 6 am to midnight on weekdays, and 7 am to midnight on Sundays.

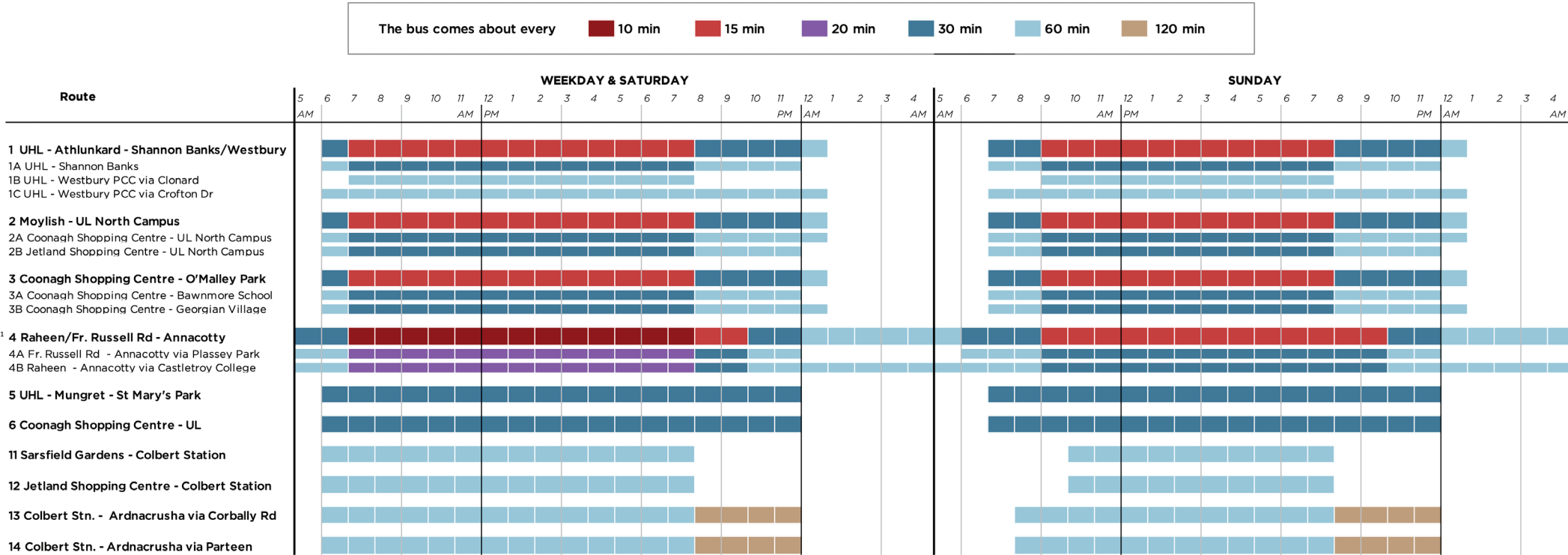
Frequent Routes (1, 2, 3 and 4) would operate every 15 minutes or better from 7 am to 8 pm on weekdays and Saturdays, and from 9 am to 8 pm on Sundays.

Branches of frequent routes would typically operate at half the frequency of the principal route.

30-minute Routes 5 and 6 would operate every 30 minutes whenever in service.

60-minute Routes 11, 12, 13 and 14 would have reduced hours compared to more frequent routes. However, they would still operate seven days a week.

Limerick Urban Bus Routes — Service Frequencies* — Draft Network



Notes

* Service to Castleconnell, Shannon, and Ennis is not included in this study. Revisions to these routes are being studied through TFI's Connecting Ireland scheme.

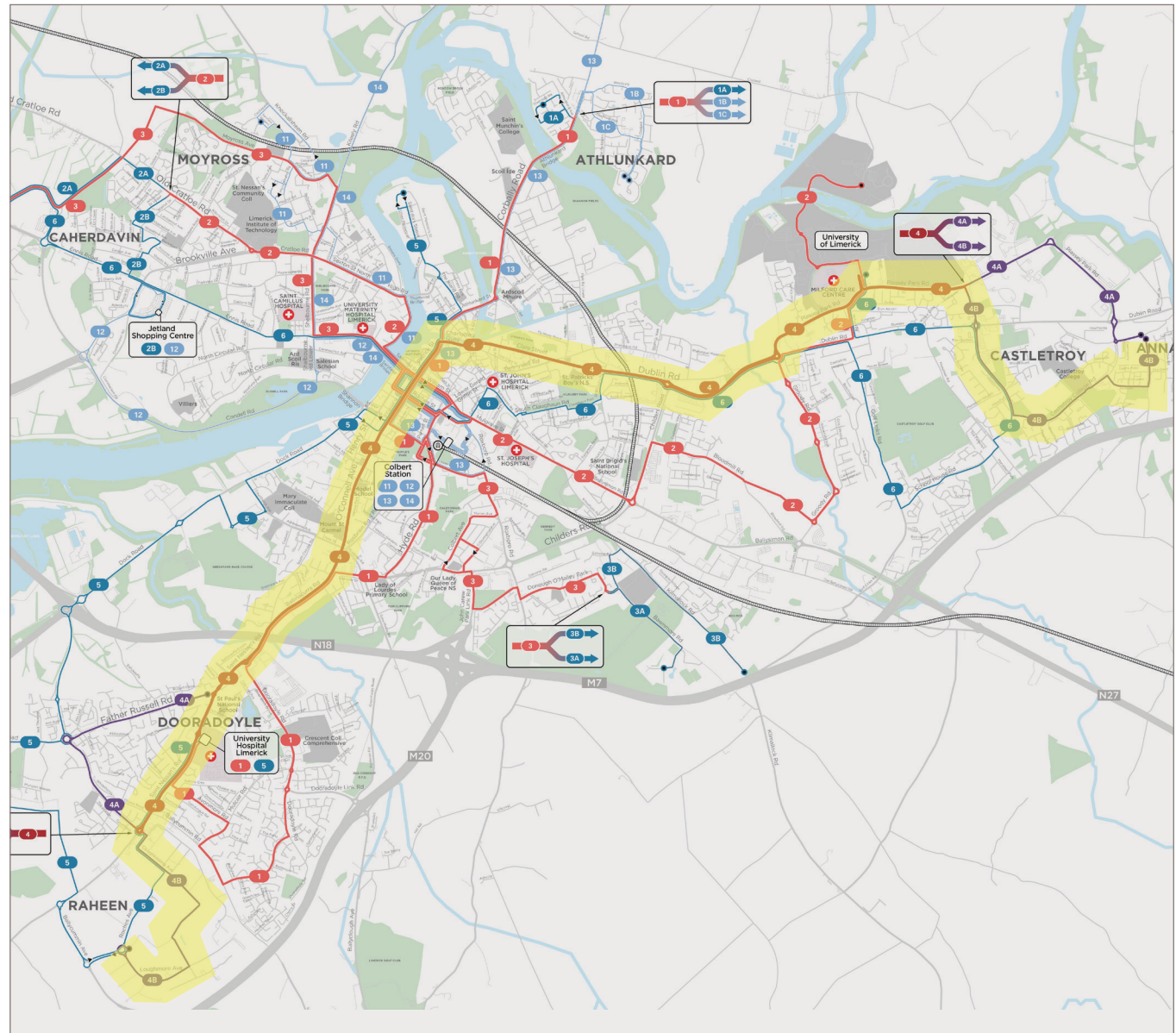
1 On Saturdays between 7 am and 8 pm, Route 4 has a frequency of 15 minutes, and not 10 minutes. Correspondingly, Routes 4A and 4B have a frequency of 30 minutes, and not 20 minutes.

24-Hour Service on Proposed Route 4

The proposed Route 4, which would connect University Hospital Limerick, City Centre and the University of Limerick would provide service at all times of day and night.

Route 4 would operate at a higher level of service than other routes at most other times, including service every 10 minutes from 7 AM to 8 PM on weekdays.

Late night service would be provided every 60 minutes on the 4B branch from midnight to 6 am. This would serve several areas with night-time activity, including Raheen Industrial Estate, University Hospital Limerick, City Centre and the University of Limerick.



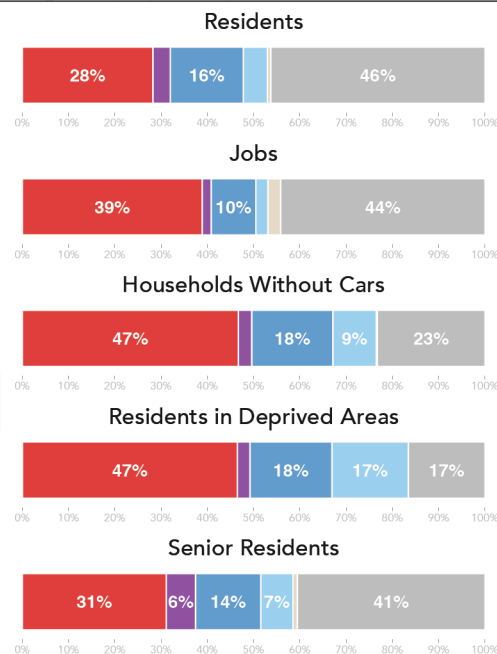
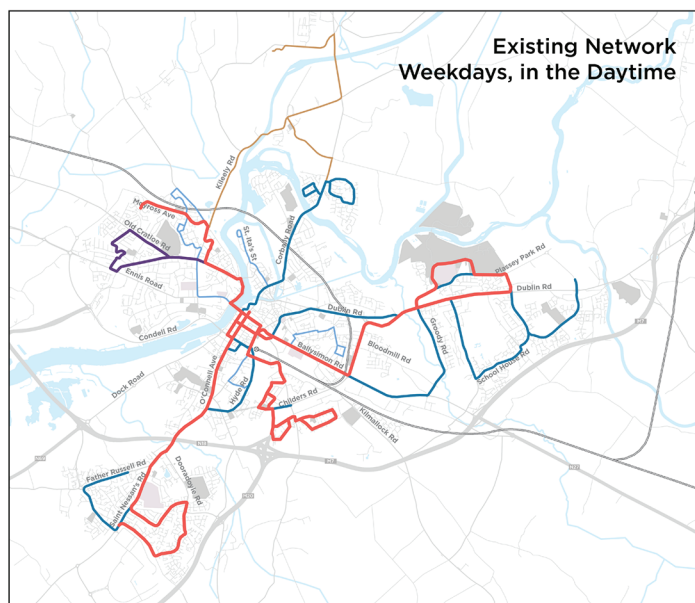


6 Snapshot Comparisons: Existing Network vs. Draft New Network

Weekday, Daytime

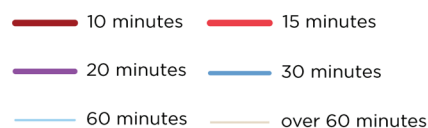


Many people need to travel throughout the day, in addition to mornings and afternoons, be it to come home from an early shift, get off work or school early, go to a meeting, or run errands.



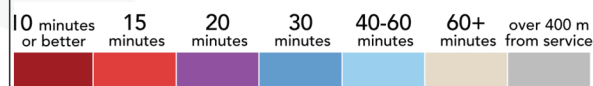
Map legend:

The bus comes about every...



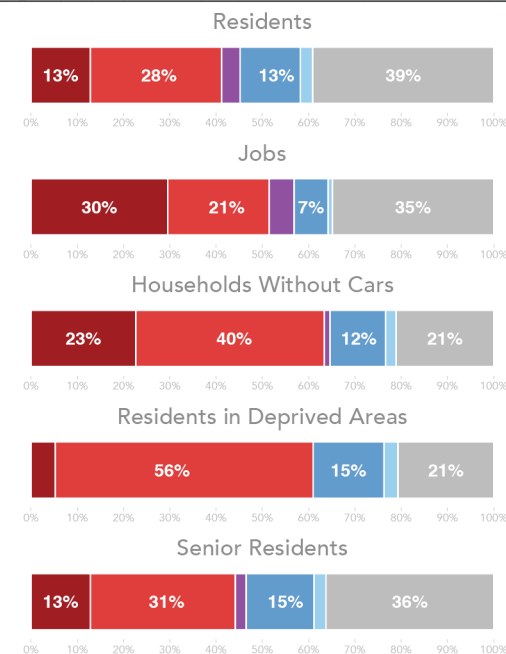
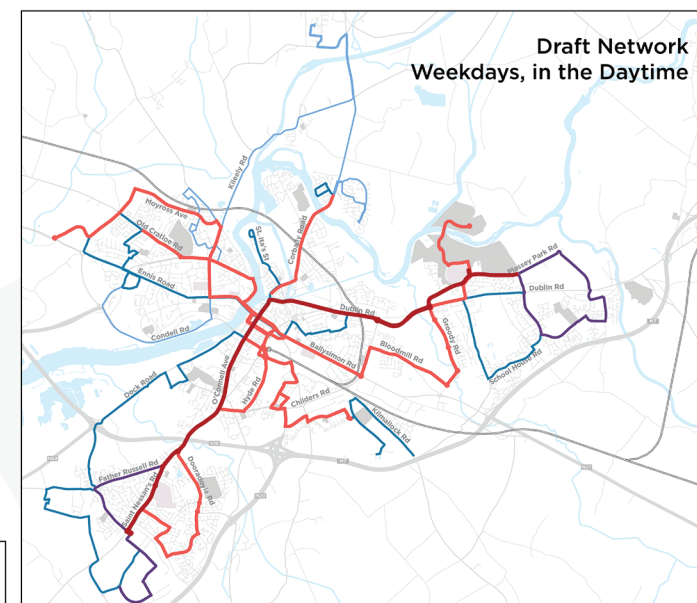
Graph legend:

Within 400 m walk of buses coming around every



The graph at left shows the percentage of residents and jobs in the study area that are today within a 400 metre walk of public transport, and at what frequency, in the daytime on weekdays.

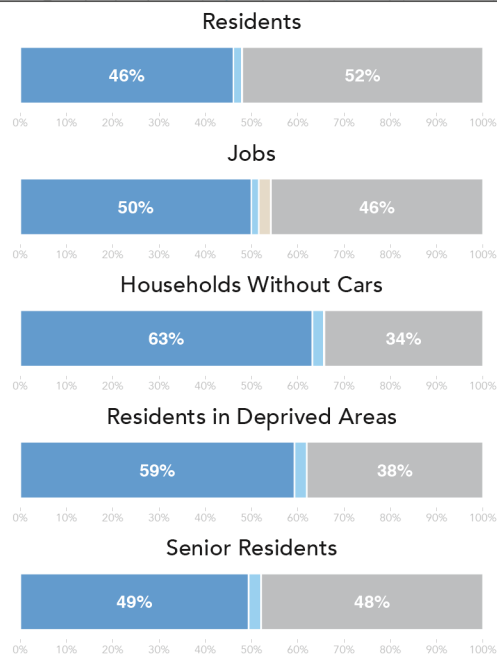
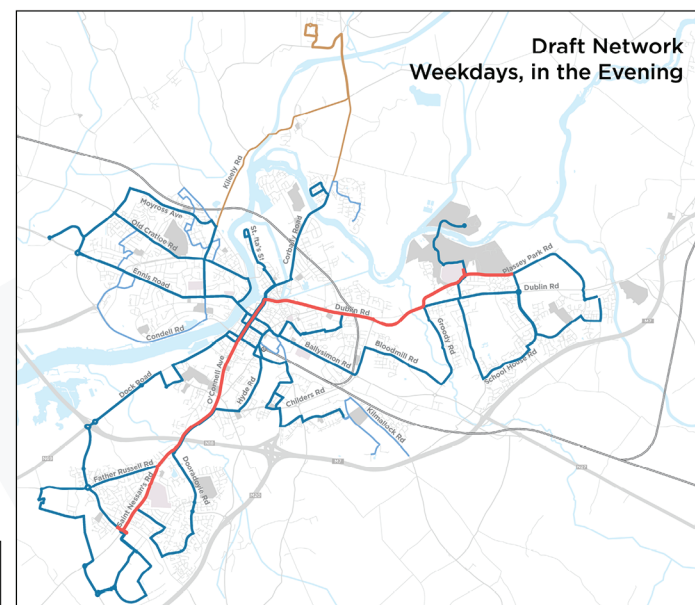
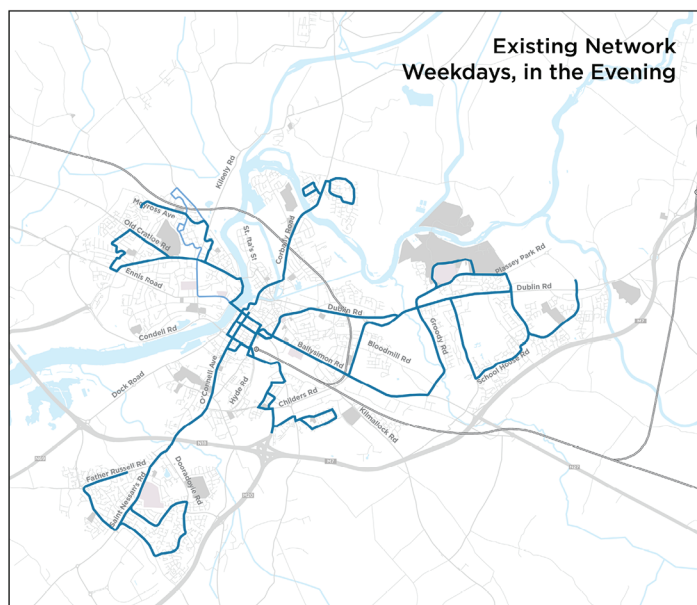
The graph on the right shows the same measure for the Draft New Network.



Weekday, Evening

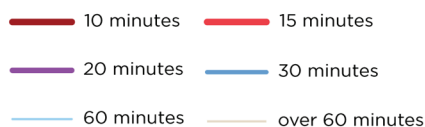


Evening and nighttime service rarely gets as much patronage as daytime service, but it is an important part of the network because it allows people to rely on public transport for journeys at any time of day.



Map legend:

The bus comes about every...



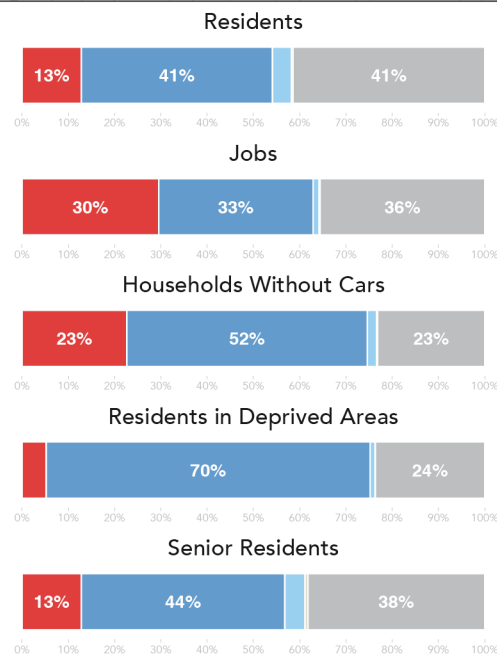
Graph legend:

Within 400 m walk of buses coming around every

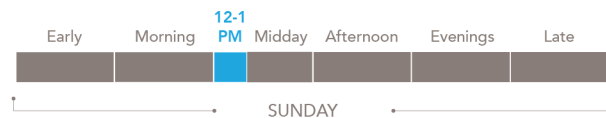


The graph at left shows the percentage of residents and jobs in the study area that are today within a 400 metre walk of public transport, and at what frequency, in the evenings on weekdays.

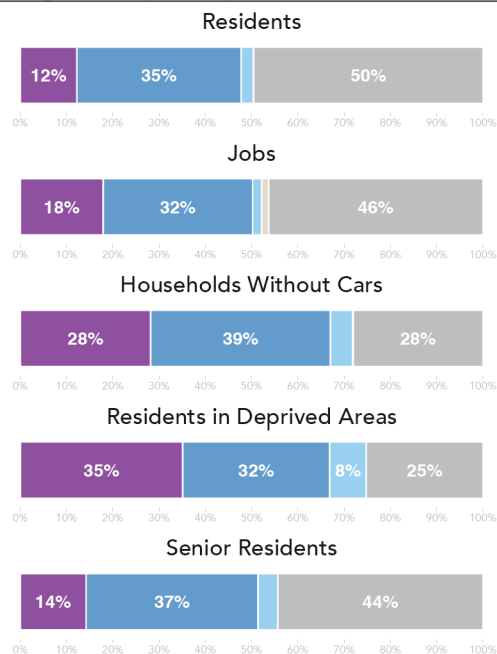
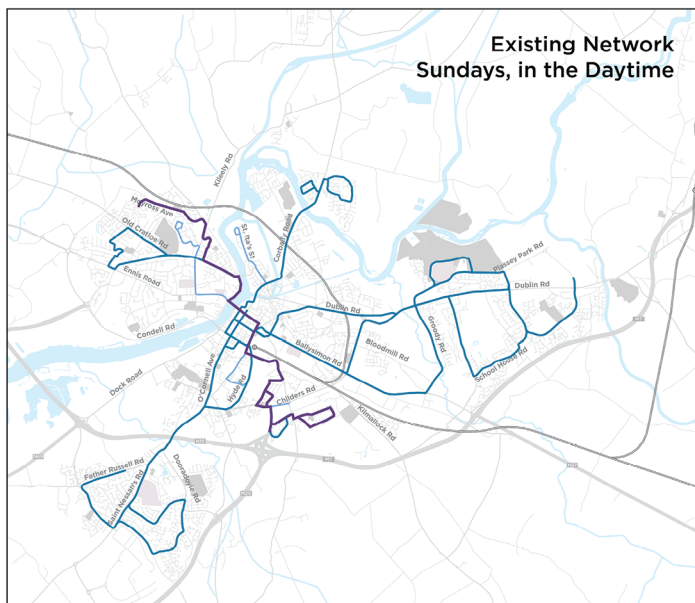
The graph on the right shows the same measure for the Draft New Network.



Sunday, Daytime

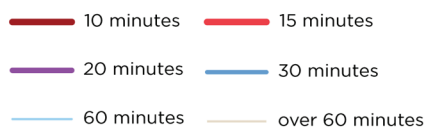


As traditions relating to Sundays shift, more people want to travel for all purposes. Industrial jobs sometimes call for weekend shifts as well.



Map legend:

The bus comes about every...



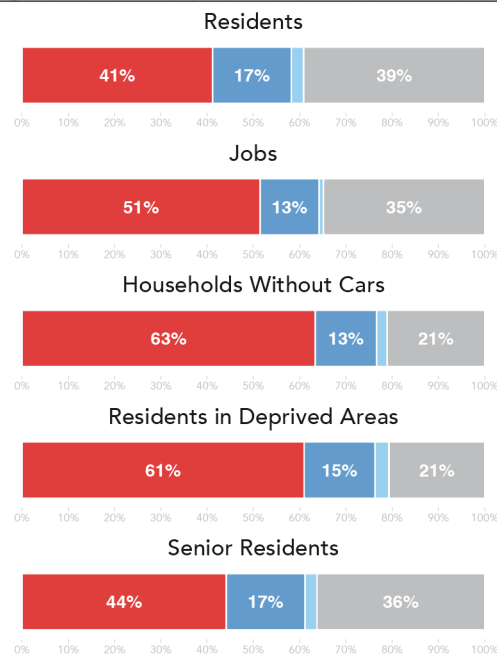
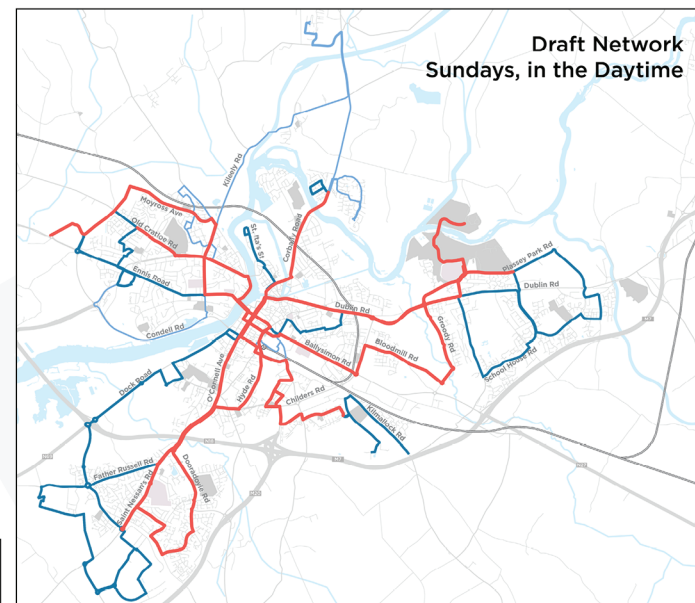
Graph legend:

Within 400 m walk of buses coming around every



The graph at left shows the percentage of residents and jobs in the study area that are today within a 400 metre walk of public transport, and at what frequency, in the daytime on Sundays.

The graph on the right shows the same measure for the Draft New Network.





7 How the Draft New Network would be More Useful

Key Principle - More Access to Opportunity

More Useful Service

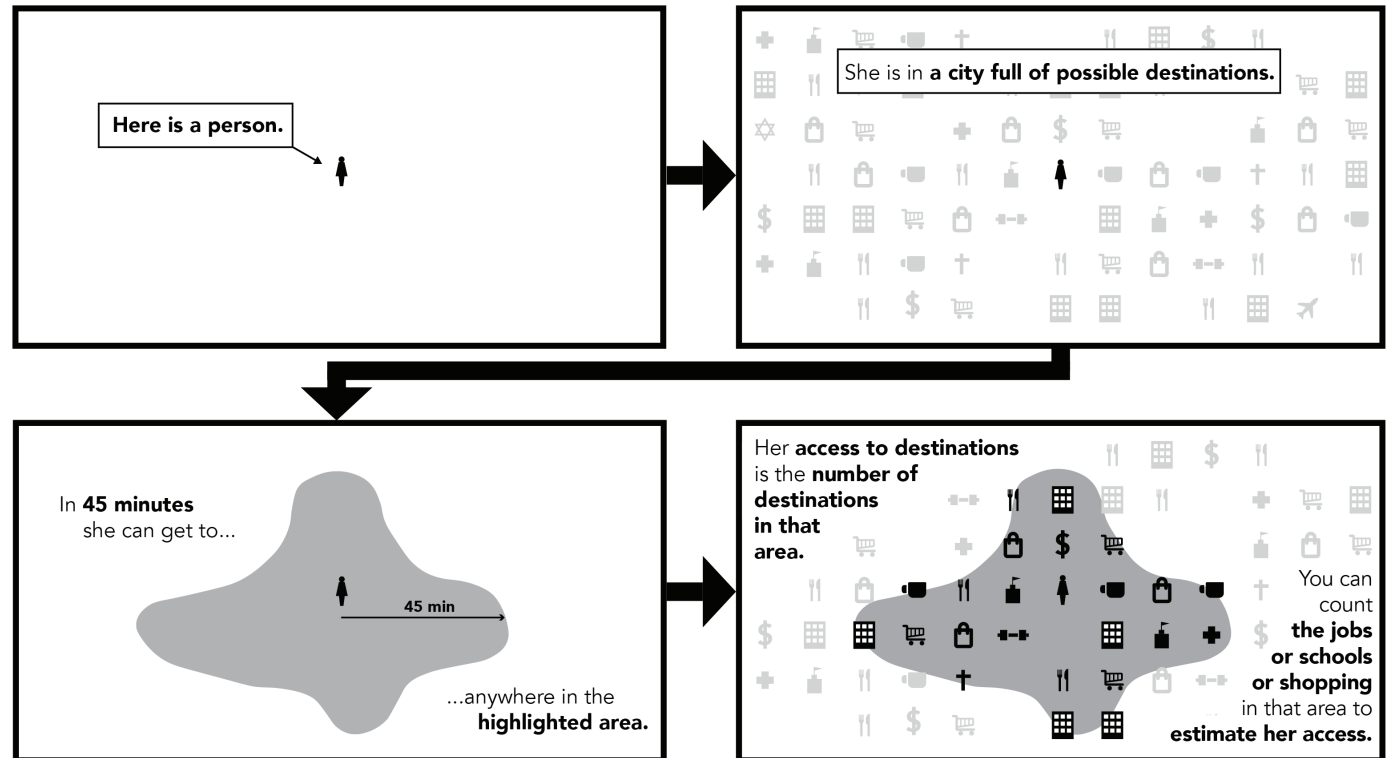
It's impossible to predict exactly how many people might use an improved bus network. A person's decision to use public transport on any given day might depend on where they are going, when they want to travel, the weather, their plans throughout the day, the price of a taxi, and many other factors.

However, it is possible to measure whether changes in service would make public transport more useful.

Public transport is useful to the extent that it allows people to go where they need, in a reasonable amount of time. **The more useful places you can reach in a reasonable amount of time, the more access to opportunity you have.**

In turn, designing service to increase many people's access to opportunity is the best tool that planners have to increase public transport patronage.

WHAT IS ACCESS?



What factors affect access to opportunity?

Access to opportunity by public transport is affected by:

- **How many destinations are near public transport**
- **How long a person has to walk to and from service**
- **How long they have to wait** for the service
- **How far they have to travel** on public transport
- **The speed of the service**
- **How long they have to wait to interchange between services**

Public transport providers have control over some of these factors: waiting time, interchange, route directness, where service is provided.

They have less control or no control over other factors: public transport speed, travel distances, where jobs and housing are located. These factors are generally controlled by local authorities as they manage land use, development and roadways.

Estimating Journey Times

Often when people describe public transport journey time they focus on the time spent on the bus. Public transport journeys also include time spent walking and waiting, which can exceed the time spent on the vehicle itself.



Walking to and from the stop

Most public transport journeys begin and end with walking.



Waiting for the next bus

Waiting doesn't always happen at the start of your journey, it can also happen at the end. You may leave home only a short time before your bus departs, but if your bus comes infrequently you often have to choose between arriving at your destination very early or too late.

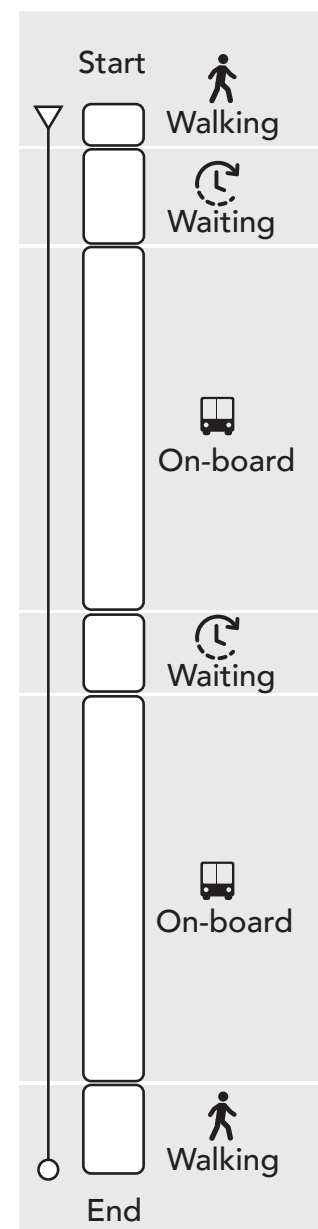
If you're interchanging, you'll have to wait a second time.

On average, across all passengers, both of these forms of waiting will require about one-half the frequency of the routes in question.



On-board the vehicle

Time spent on the vehicle is affected by the distance you are traveling and the speed of the vehicle. Our analysis of the Draft New Network used conservative (slow) speed assumptions. Improvements in speeds will result in greater job and school access for more people.



Improved Access from Key Locations

The following pages will present maps that show how access to the most significant locations in Limerick would change in the Draft New Network. These maps cover:

- **O'Connell Street & William Street**, the centre of the City Centre
- **Colbert Station**, Limerick's connection point to regional and national public transport
- **University of Limerick**, the largest educational destination in the city, and a significant employer
- **University Hospital Limerick**, the largest employment destination outside City Centre
- **TUS Moylish**, the second largest educational destination in the city

Maps for many more locations are available as an appendix to this report.

What do these maps mean?

These maps are meant to answer the following questions:

- **How many places could I reach from each place, in a reasonable amount of time?**
- **How would this be different from where I could go today?**

Implicit Assumptions

You're using public transport. This is showing improvement in the bus network, not comparing car or bicycle trips to public transport trips.

You walk at an average speed. The maps assume a walking speed of 1 metre per second, on the slow side for a healthy and able-bodied adult. This reflects things that can slow people down like street crossings.

Most bus stops will be located in the same places as they are now. In places where the Draft New Network would change which streets are served, we've made some assumptions about where stops would be located. Otherwise, the maps assume stops are unchanged from today. This avoids overestimating the benefit of changing the network.

On average, you'll wait for the bus for a time equal to half its frequency, for the reasons explained on the previous page. For example, if the bus comes every 15 minutes, you'll wait 7.5 minutes on average. If it comes every 30 minutes, you'll wait 15 minutes on average.

Buses will travel at similar speeds as they do now. It's possible that bus speeds might improve in future, thanks to bus priority measures or changes in bus stop locations. However, most of this network is intended to be operable before those come into play. This also avoids overstating the benefit of changing the network.

You're willing to interchange, if it makes your trip shorter overall. Unless you're willing to walk long distances, interchange is required for many bus trips in Limerick at present, and this would continue to be the case. BusConnects Limerick will include the elimination of interchange fares.

If you interchange, you'll have to wait for the second bus as well. As with the first bus, your wait time will be half the frequency of the second bus on average.

You're travelling on a weekday, in the daytime. Similar maps exist for Sundays, in the appendix to this report.

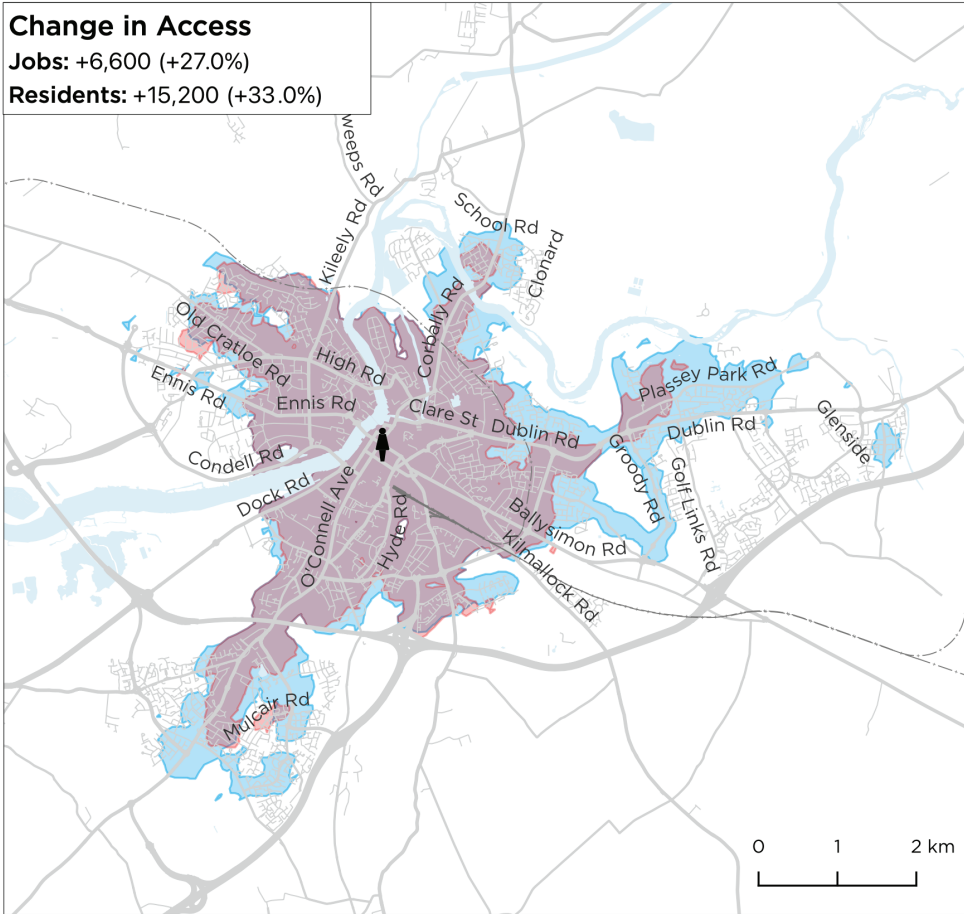
City Centre

How far could I travel from
📍 **O'Connell St & William St**
in a reasonable amount of time?

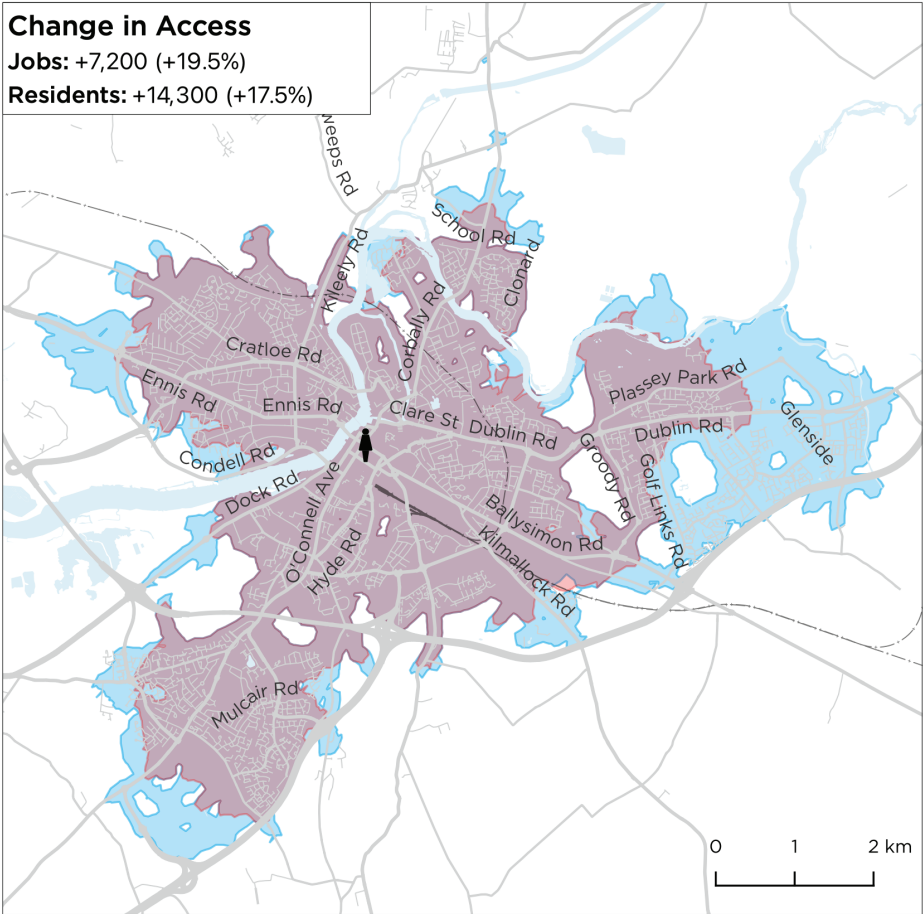
Weekdays, in the Daytime



30 minutes



45 minutes



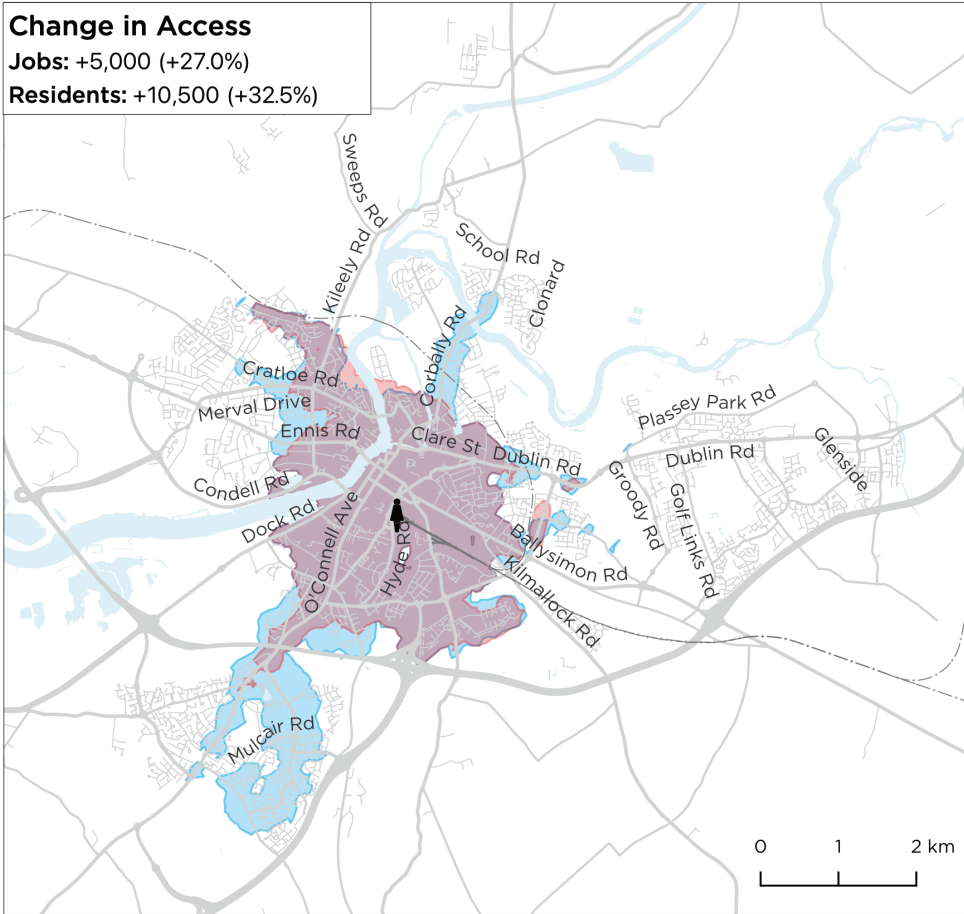
Colbert Station

How far could I travel from
📍 **Colbert Station**
in a reasonable amount of time?

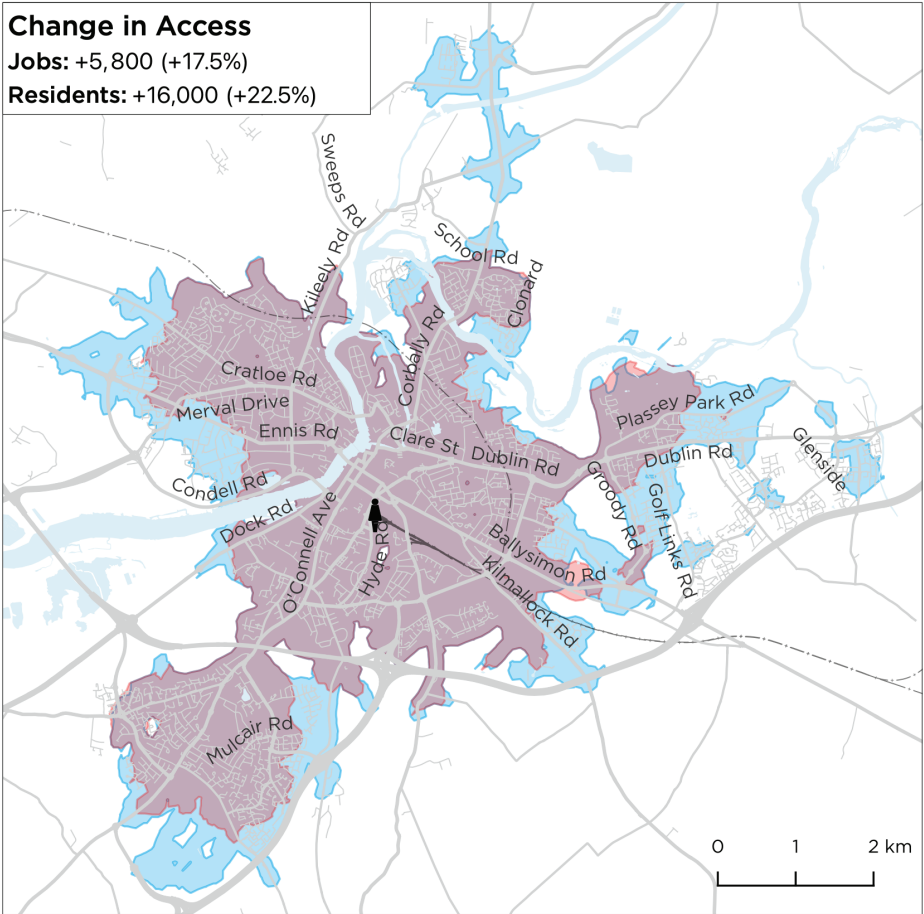
Weekdays, in the Daytime



30 minutes



45 minutes

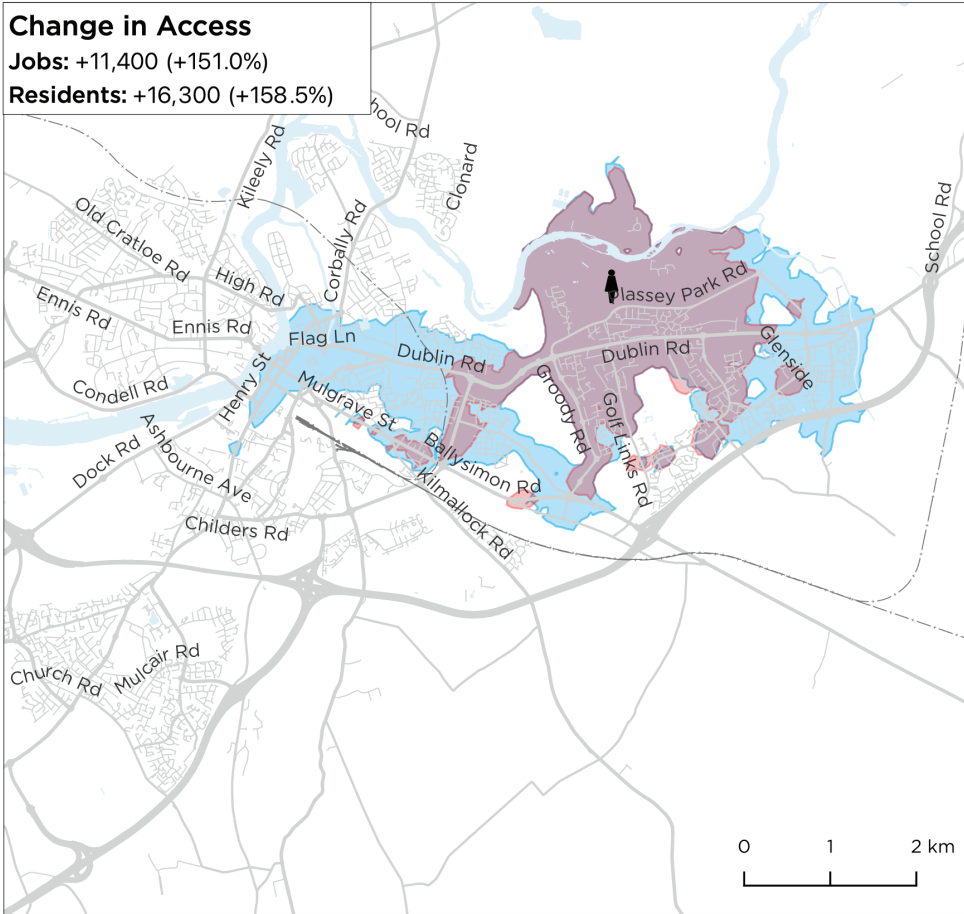


University of Limerick

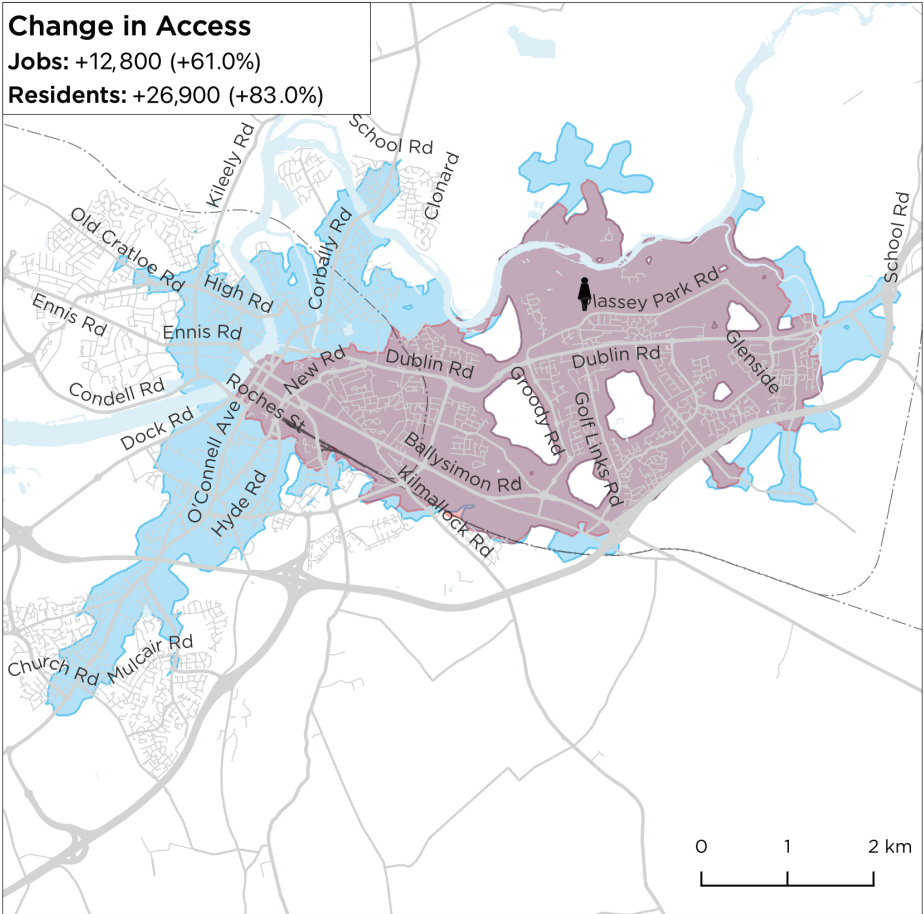
How far could I travel from
UL Student Life
in a reasonable amount of time?
Weekdays, in the Daytime



30 minutes



45 minutes

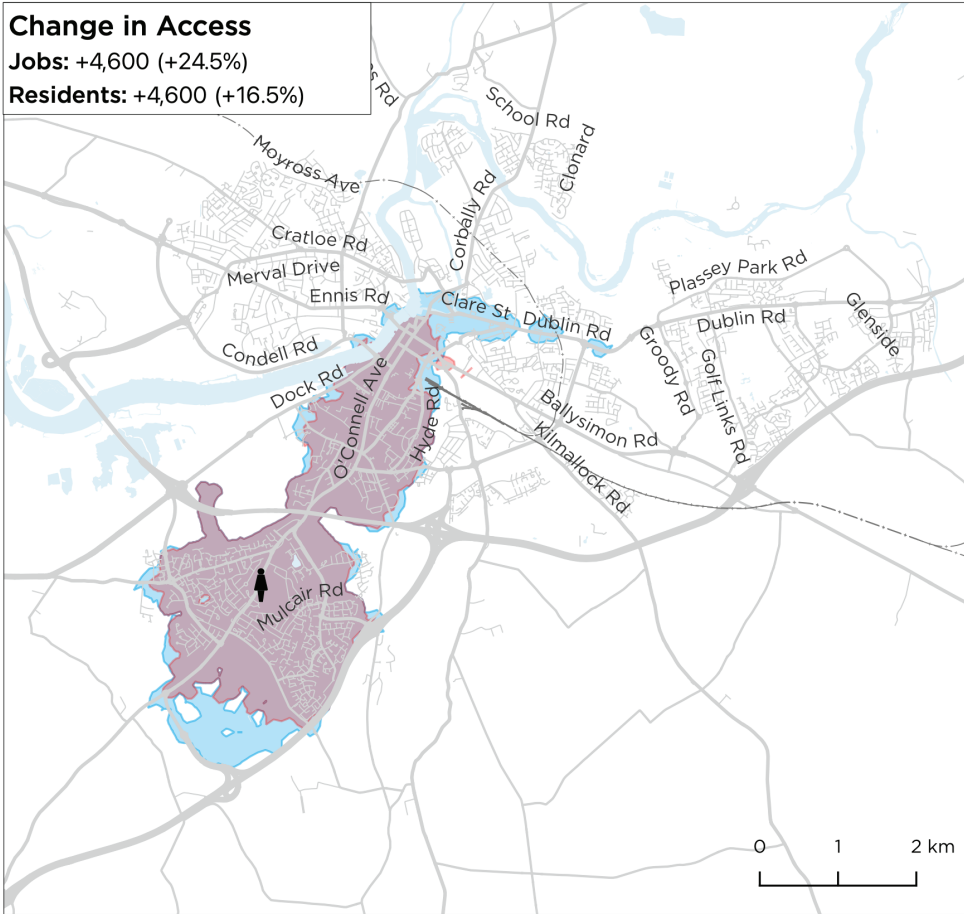


University Hospital Limerick

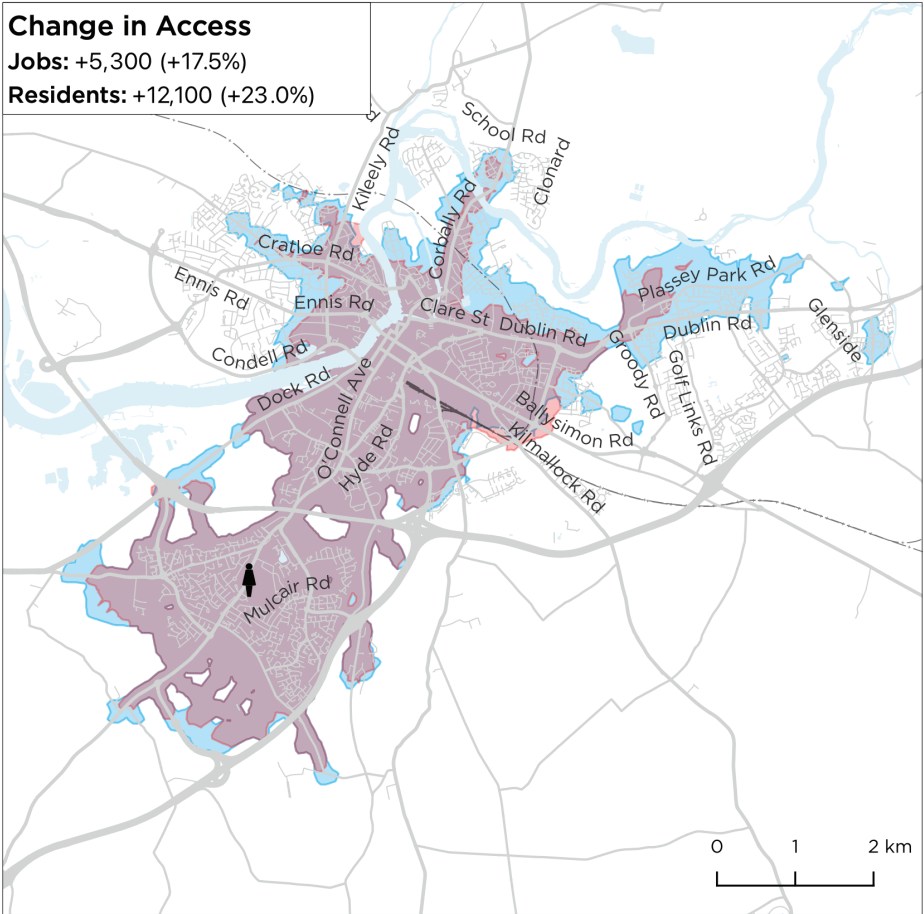
How far could I travel from
📍 **Regional Hospital (UHL)**
in a reasonable amount of time?
Weekdays, in the Daytime



30 minutes



45 minutes



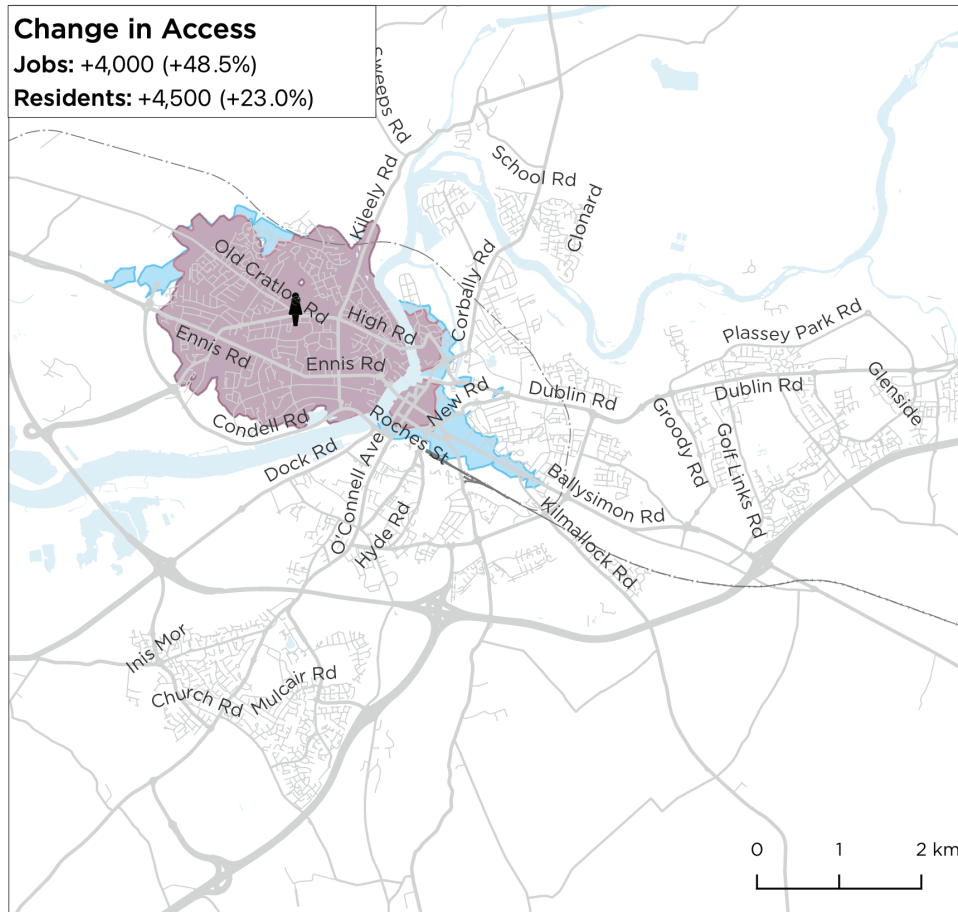
TUS Moylish Campus (former Limerick IT)

How far could I travel from
📍 **TUS Moylish**
in a reasonable amount of time?

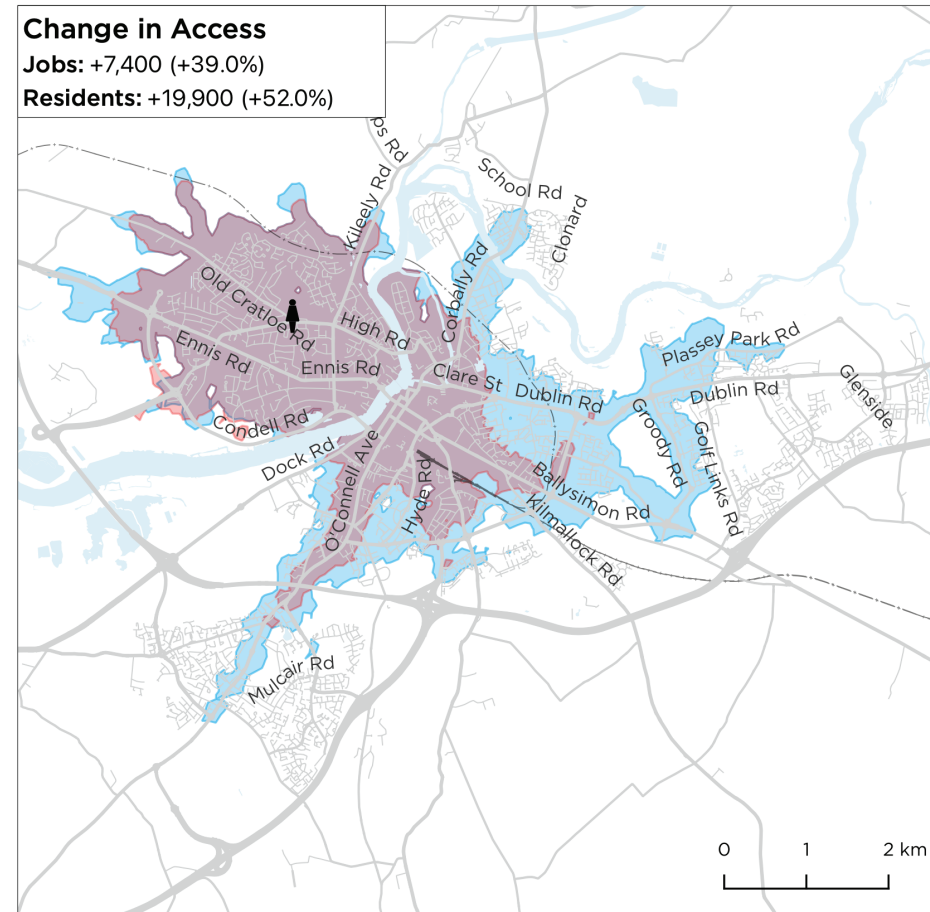
Weekdays, in the Daytime



30 minutes



45 minutes



Improved Access Throughout the City

The kind of change shown in the maps on previous pages has been calculated throughout the study area.

The following pages will include maps that answer the following questions:

- **Where would the Draft New Network improve access to jobs, in a reasonable amount of time?**
- **Where would access to jobs degrade, compared to existing service?**

The maps focus on change in access in 30 and 45 minutes, on weekdays and on Sundays.

Saturday services are nearly the same as on weekdays, and as such were not analysed separately.

Why focus on access to jobs?

People need to travel to many kinds of places everyday. Even before COVID, non-work travel comprised a large portion of daily journeys. So why focus just on jobs in this report? There are three main reasons:

- **Jobs and third-level student enrolment have the most consistent and comparable data.** Data on other types of destinations isn't as consistently maintained, and isn't as comparable from one location to another.
- **Many places people visit regularly are places of employment.** This includes shopping, schools, restaurants, medical services, and many others. As a result, better access to jobs means better access to many kinds of opportunity.
- **Third-level enrolments are highly concentrated in two locations: the University of Limerick and TUS Moylish.** Jobs are more dispersed throughout the city. Incorporating both jobs and third level enrolment might overstate the benefit of the Draft New Network, in places where improvements only helped people reach those two places.

Summary Outcomes

Within 30 minutes:

- The average resident could access 48% more jobs on weekdays, and 107% more jobs on Sundays.
- 60% of residents could access more jobs, and 3% could access fewer jobs.

Within 45 minutes:

- The average resident could access 29% more jobs on weekdays, and 47% more jobs on Sundays.
- 92% of residents could access more jobs, and 1% could access fewer jobs.

Map of Job Access Change - 30 Minutes, Weekdays

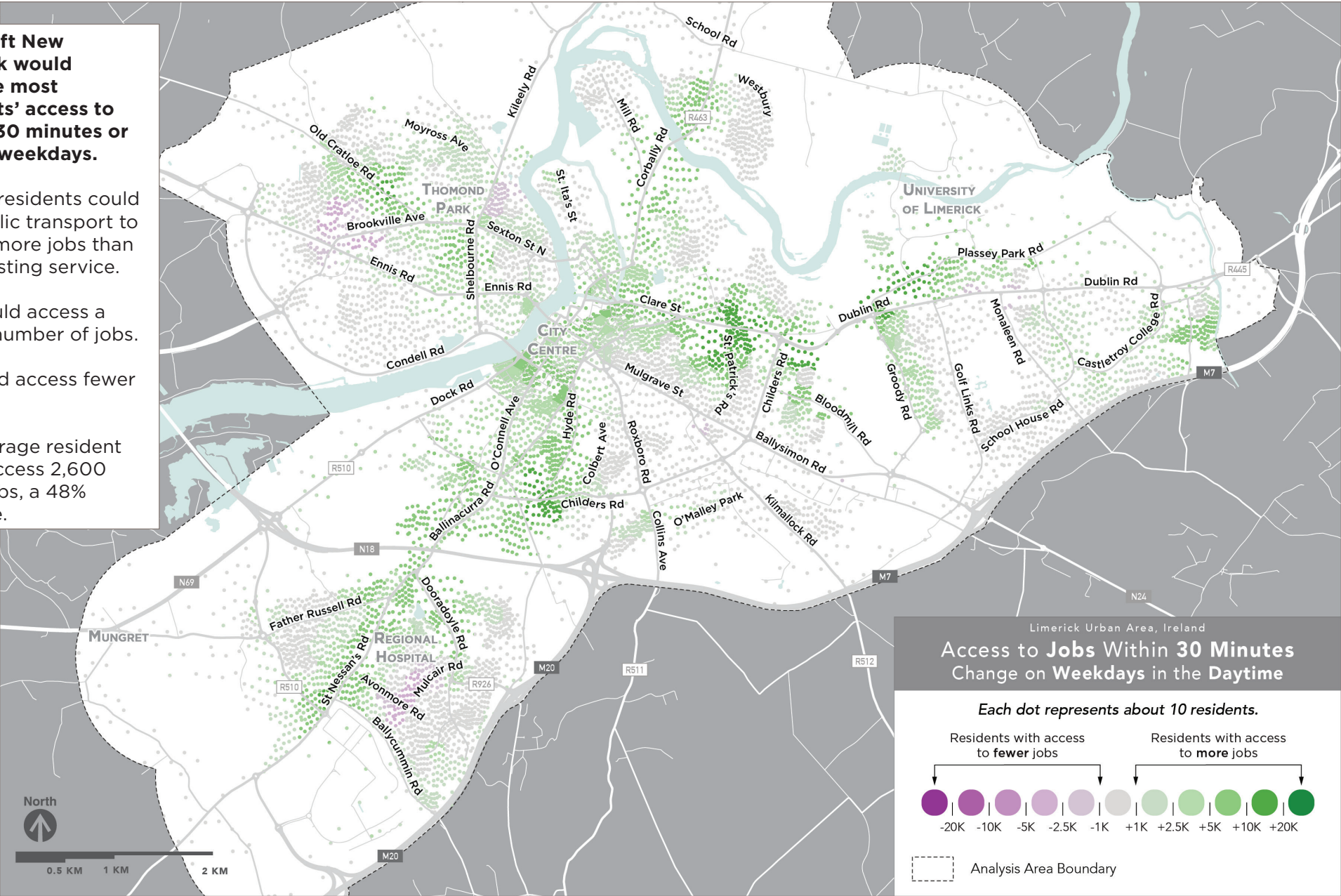
The Draft New Network would improve most residents' access to jobs in 30 minutes or less on weekdays.

60% of residents could use public transport to access more jobs than with existing service.

37% could access a similar number of jobs.

3% could access fewer jobs.

The average resident could access 2,600 more jobs, a 48% increase.



Map of Job Access Change - 45 Minutes, Weekdays

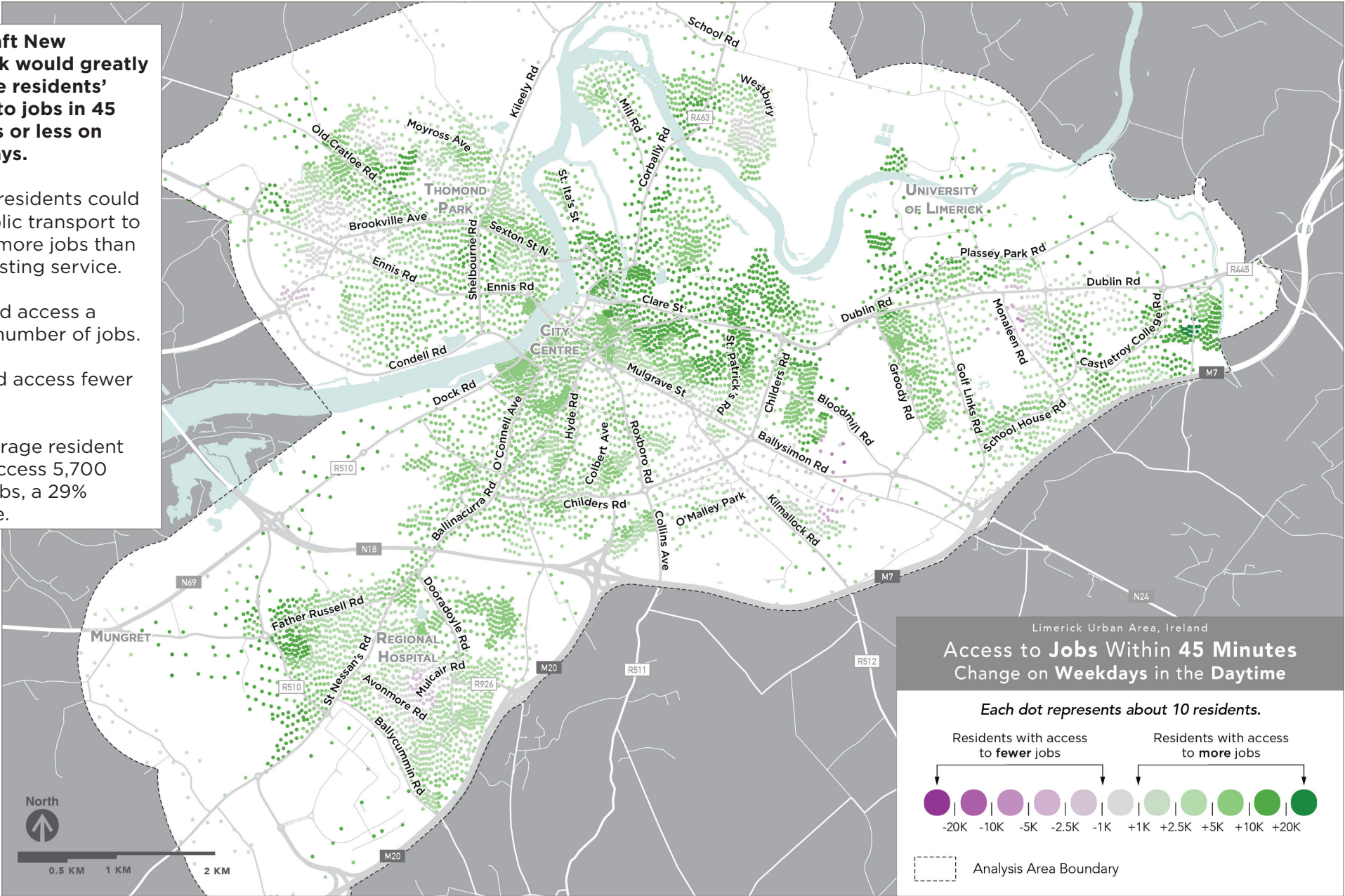
The Draft New Network would greatly improve residents' access to jobs in 45 minutes or less on weekdays.

92% of residents could use public transport to access more jobs than with existing service.

7% could access a similar number of jobs.

1% could access fewer jobs.

The average resident could access 5,700 more jobs, a 29% increase.



7 How the Draft New Network would be More Useful

The average resident could access 4,900 more jobs, a 107% increase.



Map of Job Access Change - 45 Minutes, Sundays

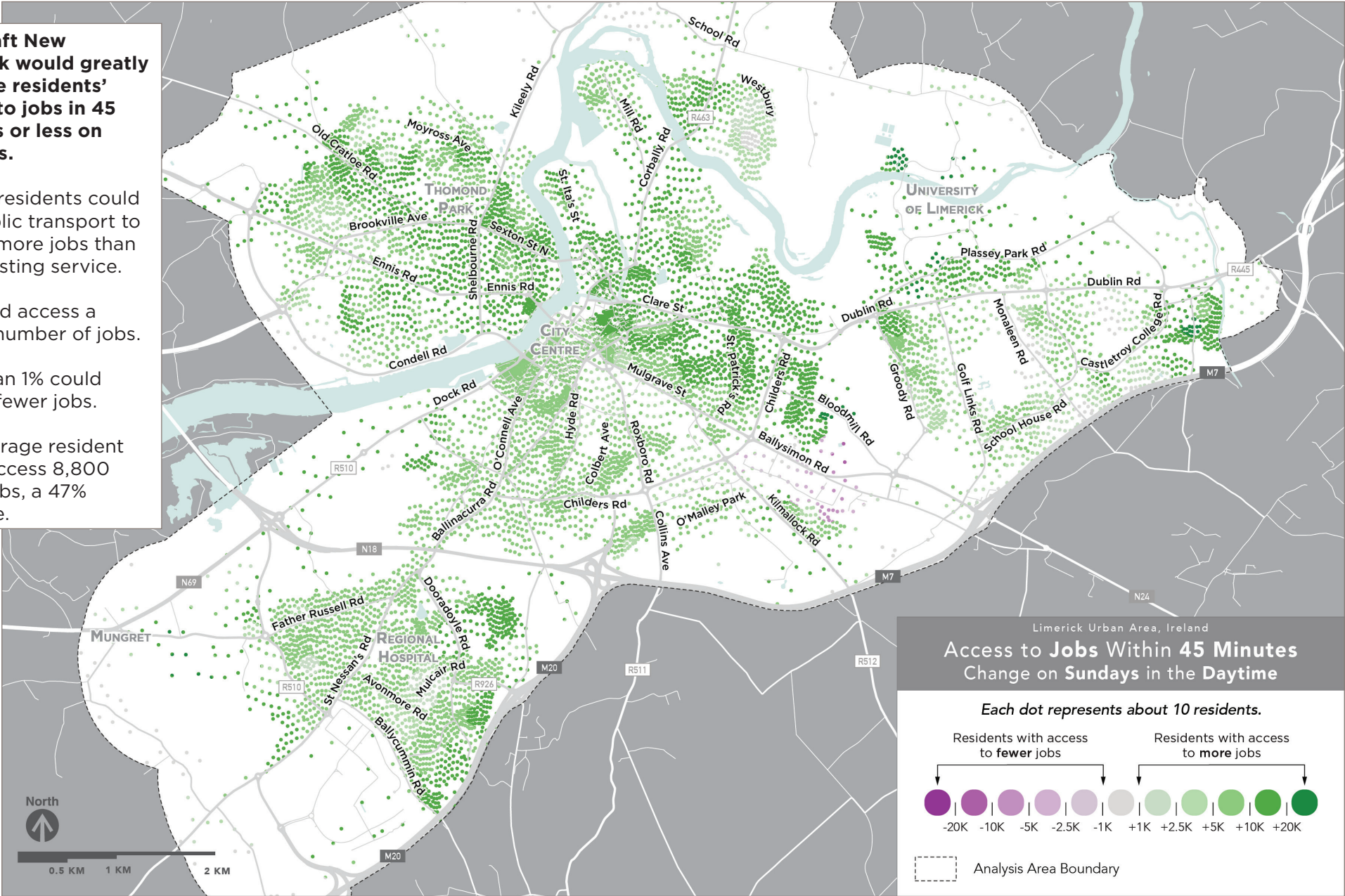
The Draft New Network would greatly improve residents' access to jobs in 45 minutes or less on Sundays.

95% of residents could use public transport to access more jobs than with existing service.

3% could access a similar number of jobs.

Less than 1% could access fewer jobs.

The average resident could access 8,800 more jobs, a 47% increase.





This report continues in three appendices. Appendix A follows this page.

To control file size, Appendices B and C have been published separately.

These are available at the project website: www.busconnects.ie/limerick/.



Appendix A

**Service Frequencies by Time of Day in the
Existing Network and Draft New Network –
Accessible Table**

Existing Network Frequencies and Spans (Text, 1/2)

Route	Weekdays and Saturdays from 5am to 8pm	Weekdays and Saturdays from 8pm to 5am	Sundays from 5am to 8pm	Sundays from 8pm to 5am	Notes
Route 301 between Raheen and Westbury	Every 30 minutes from 7am to 8pm	Every 30 minutes from 8pm to 12 midnight	Every 30 minutes from 10am to 8pm	Every 30 minutes from 8pm to 12 midnight	After 7pm, Route 301 does not serve Hyde Road, but instead serves O'Connell Avenue
Route 301 Extension to Raheen Industrial Estate	Every 30 minutes from 7am to 10am and between 4pm and 7pm	No service	No service	No service	
Route 302 between Caherdavin and Limerick City Centre	Every 20 minutes from 7am to 7pm	Every 30 minutes from 7pm to 12 midnight	Every 30 minutes from 10am to 8pm	Every 30 minutes from 8pm to 12 midnight	
Route 303 between Pineview and O'Malley Park	Every 30 minutes from 6am to 7am, then every 15 minutes to 8pm	Every 30 minutes from 8pm to 12 midnight	Every 30 minutes from 7am to 10am, then every 20 minutes to 8pm	Every 30 minutes from 8pm to 12 midnight	
Route 303 Extension to Childers Road Aldi	Every 30 minutes from 10am to 4pm	No service	Every 30 minutes from 10am to 4pm	No service	
Route 304 between Ballycummin and University of Limerick	Every 15 minutes from 6am to 9pm	Every 30 minutes from 9pm to 12 midnight	Every 60 minutes from 7am to 8am, then every 30 minutes to 8pm	Every 30 minutes from 8pm to 12 midnight	
Route 304 Extension to National Tech Park	Every 15 minutes from 7am to 10am and between 4pm to 8pm	No service	Every 60 minutes from 7am to 8am	Every 30 minutes from 7pm to 8pm	
Route 304 Extension to Johnson & Johnson Vision Care	Every 15 minutes from 7am to 8am	Every 15 minutes from 7pm to 8pm	Every 60 minutes from 7am to 8am	Every 30 minutes from 7pm to 8pm	

Existing Network Frequencies and Spans (Text, 2/2)

Route	Weekdays and Saturdays from 5am to 8pm	Weekdays and Saturdays from 8pm to 5am	Sundays from 5am to 8pm	Sundays from 8pm to 5am	Notes
Route 304A between Raheen and University of Limerick	Every 30 minutes from 7am to 8pm	Every 30 minutes from 8pm to 12 midnight	Every 30 minutes from 9am to 8pm	Every 30 minutes from 8pm to 12 midnight	
Route 305 between Lynwood Park and Limerick City Centre	Every 60 minutes from 7am to 5pm	No service	No service	No service	
Route 305A between St Mary's Park and Limerick City Centre	Every 60 minutes from 7am to 5pm	No service	Every 60 minutes from 10am to 6pm	No service	
Route 306 between Ballynanty and Edward Street	Every 60 minutes from 7am to 8pm	No service	No service	No service	
Route 306 short segment between Shanbooly Road and Limerick City Centre only	Served by route 306 every 60 minutes from 7am to 8pm	Every 60 minutes from 7am to 11pm	Every 60 minutes from 10am to 8pm	Every 60 minutes from 8pm to 10pm	On weekdays and Saturdays after 7pm and all day Sunday, Route 306 does not serve areas south of Sarsfield Street and Henry Street.
Route 310 between National Tech Park and Limerick City Centre	Every 30 minutes from 6am to 8pm	Every 30 minutes from 8pm to 12 midnight	Every 30 minutes from 6am to 8pm	Every 30 minutes from 8pm to 12 midnight	

Draft New Network Frequencies and Spans (Text, 1/3)

Route	Weekdays and Saturdays from 5am to 8pm	Weekdays and Saturdays from 8pm to 5am	Sundays from 5am to 8pm	Sundays from 8pm to 5am	Notes
Route 1 between University Hospital Limerick and Athlunkard	Every 30 minutes from 6 am to 7am, then every 15 minutes until 8pm.	Every 30 minutes from 8 pm to 12 midnight, then every 60 minutes until 1 am	Every 30 minutes from 7am to 9am, then every 15 minutes until 8pm	Every 30 minutes from 8 pm to 12 midnight, then every 60 minutes until 1 am	
Route 1A between UHL and Shannon Banks	Every 60 minutes from 6am to 7am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	Every 60 minutes from 7am to 9am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	
Route 1B between UHL and Westbury PCC via Clonard	Every 60 minutes from 7am to 8pm	No service	Every 60 minutes from 9am to 8pm	No service	
Route 1C between UHL and Westbury PCC via Crofton Drive	Every 60 minutes from 6am to 8pm	Every 60 minutes from 8pm to 12 midnight	Every 60 minutes from 7am to 8pm	Every 60 minutes from 8pm to 1am	
Route 2 between Moylish and UL North Campus	Every 30 minutes from 6 am to 7am, then every 15 minutes until 8pm.	Every 30 minutes from 8 pm to 12 midnight, then every 60 minutes until 1 am	Every 30 minutes from 7am to 9am, then every 15 minutes until 8pm	Every 30 minutes from 8 pm to 12 midnight, then every 60 minutes until 1 am	
Route 2A between Coonagh Shopping Centre and UL North Campus	Every 60 minutes from 6am to 7am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	Every 60 minutes from 7am to 9am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	
Route 2B between Jetland Shopping Center and UL North Campus	Every 60 minutes from 6am to 7am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	Every 60 minutes from 7am to 9am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	

Draft New Network Frequencies and Spans (Text, 2/3)

Route	Weekdays and Saturdays from 5am to 8pm	Weekdays and Saturdays from 8pm to 5am	Sundays from 5am to 8pm	Sundays from 8pm to 5am	Notes
Route 3 between Coonagh Shopping Centre and O'Malley Park	Every 30 minutes from 6 am to 7am, then every 15 minutes until 8pm.	Every 30 minutes from 8 pm to 12 midnight, then every 60 minutes until 1 am	Every 30 minutes from 7am to 9am, then every 15 minutes until 8pm	Every 30 minutes from 8 pm to 12 midnight, then every 60 minutes until 1 am	
Route 3A between Coonagh Shopping Centre and Bawnmore School	Every 60 minutes from 6am to 7am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	Every 60 minutes from 7am to 9am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	
Route 3B between Coonagh Shopping Centre and Georgian Village	Every 60 minutes from 6am to 7am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	Every 60 minutes from 7am to 9am, then every 30 minutes to 8pm	Every 60 minutes from 8pm to 12 midnight	
Route 4 between St Nessans Church to University of Limerick	Every 30 minutes from 5am to 7am, then ever 10 minutes to 8pm	Every 15 minutes from 8pm to 10pm, then every 30 minutes from 10pm to 12 midnight, then every 60 minutes to 5am	Every 60 minutes from 5am to 6am, then every 30 minutes from 6am to 9am, then every 15 minutes to 10pm	Every 30 minutes from 10pm to 12 midnight, then every 60 minutes from 12 midnight to 5am	On Saturdays between 7am and 8pm, Route 4 would have a frequency of every 15 minutes.
Route 4A between Father Russell Road to Annacotty via Plassey Park Road	Every 60 minutes from 5am to 7am, then every 20 minutes to 8pm	Every 30 minutes from 8pm to 10pm, then every 60 minutes from 10pm to 12 midnight.	Every 60 minutes from 5am to 9am, then every 30 minutes to 10pm	Every 60 minutes from 10pm to 12 midnight.	On Saturdays between 7am and 8pm, Branch 4A would have a frequency of every 30 minutes.
Route 4B between Raheen Industrial Estate and Annacotty via Castletroy College Road	Every 60 minutes from 5am to 7am, then every 20 minutes to 8pm	Every 30 minutes from 8pm to 10pm, then every 60 minutes from 10pm to 5am	Every 60 minutes from 5am to 9am, then every 30 minutes to 10pm	Every 60 minutes from 10pm to 5am	On Saturdays between 7am and 8pm, Branch 4B would have a frequency of every 30 minutes.

Draft New Network Frequencies and Spans (Text, 3/3)

Route	Weekdays and Saturdays from 5am to 8pm	Weekdays and Saturdays from 8pm to 5am	Sundays from 5am to 8pm	Sundays from 8pm to 5am	Notes
Route 5 between UHL and St Mary's Park	Every 30 minutes from 6am to 8pm	Every 30 minutes from 8 pm to 12 midnight	Every 30 minutes from 7am to 8pm	Every 30 minutes from 8 pm to 12 midnight	
Route 6 between Coonagh Shopping Centre and University of Limerick	Every 30 minutes from 6am to 8pm	Every 30 minutes from 8 pm to 12 midnight	Every 30 minutes from 7am to 8pm	Every 30 minutes from 8 pm to 12 midnight	
Route 11 between Sarsfield Gardens and Colbert Station	Every 60 minutes from 6am to 8pm	No service after 8pm	Every 60 minutes from 10am to 8pm	No service after 8pm	
Route 12 between Jetland Shopping Centre and Colbert Station	Every 60 minutes from 6am to 8pm	No service after 8pm	Every 60 minutes from 10am to 8pm	No service after 8pm	
Route 13 between Colbert Station and Ardnacrusha via Corbally Road	Every 60 minutes from 6am to 8pm	Every 120 minutes from 8pm to 12 midnight	Every 60 minutes from 8am to 8pm	Every 120 minutes from 8pm to 12 midnight	
Route 14 between Colbert Station and Ardnacrusha via Kileely Road	Every 60 minutes from 6am to 8pm	Every 120 minutes from 8pm to 12 midnight	Every 60 minutes from 8am to 8pm	Every 120 minutes from 8pm to 12 midnight	

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