

Greater Christchurch Public Transport Futures Combined Business Cases

NON-TECHNICAL SUMMARY

Prepared by Boffa Miskell on behalf of the Greater Christchurch
Public Transport Joint Committee

DECEMBER 2020

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Bibliographic reference for citation:

Boffa Miskell, 2020. Greater Christchurch Public Transport Futures Combined Business Cases: Non-technical Summary

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Status: Revision: D

Issue date: December 2020

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Introduction

OVERVIEW

This document provides a non-technical summary of the Greater Christchurch Public Transport Combined Business Case that recommends a programme of improvements to increase the uptake of public transport over the next decade.

The Business Case has been prepared to inform the Greater Christchurch Public Transport Futures Programme (PT Futures) on behalf of the Greater Christchurch Partnership.

The Greater Christchurch Partnership agreed the low level of public transport uptake in Christchurch is of concern and needs addressing over the short to medium term with a focus on the following three key problems:

- The current PT system can be unreliable, and many journey times are not competitive with the private vehicle, resulting in poor PT mode share and longer and less reliable journey times.
- The current PT system is not effectively supporting highly populated/high growth areas and connections to key destinations, resulting in poor PT mode share within these areas.
- There are several barriers to using PT in Greater Christchurch, resulting in a low uptake of new PT users and subsequent poor PT mode share.





The business case recommends an investment programme for inclusion in the partner organisations' Long Term Plans that:

- Delivers high-frequency PT options to existing Key Activity Centres (KACs) and planned growth areas;
- Provides reliable bus services with journey times that are competitive with private vehicles;
- Enhances the safety and attractiveness of the environment at bus stops for customers;
- Improves bus routing and frequency that takes people where they want to go, when they want to get there; and
- Provides a catalyst for land use development adjacent to frequent public transport routes.









A further business case with a longer term focus is being prepared separately and will consider the role of rapid transit in the Greater Christchurch area.

KEY OUTCOMES

The PT Futures Combined Business Case recommends a programme of improvements to provide faster, more frequent bus journeys across Greater Christchurch with the following expected key benefits:

-  More people using the bus network with annual ridership increasing from 14 million trips (2018) to 20 million trips (2028)
-  Reduction in car travel by 20 million kilometres per year
-  123,000 more households can access the city centre within 30 minutes by bus
-  52,000 more people living within a 5 minute walk of a high frequency bus route

Key elements in the programme include:

-  Approximately 100 more buses running more frequently across the network, providing enough seats
-  229 more bus shelters providing better waiting facilities
-  190 more real time display units providing accurate information on bus arrival times
-  On-board audio-visual announcements providing information on upcoming stops and transfers
-  Approximately 22 kilometres of bus lanes making buses more reliable and faster
-  Priority measures for buses at key intersections across the city making journeys more reliable
-  Park and ride facilities at larger towns making it easier to access the bus network
-  Secure bike parking at key stops providing more options with a greater catchment to frequent bus routes

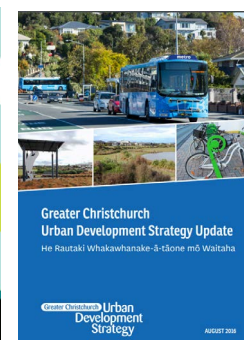
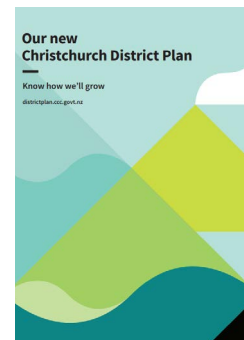
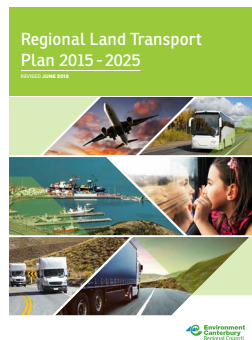
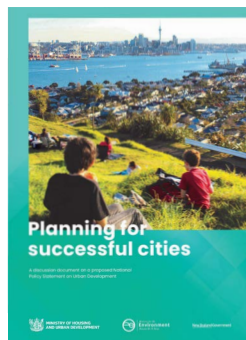
STRATEGIC CONTEXT

It is anticipated that the population of Greater Christchurch will increase from 489,000 to over 641,000 by 2048, with a large concentration of this growth being located within 10km of the central city. Employment is forecast to grow by approximately 28% between 2018 and 2048 from 239,600 to 307,100. The largest concentration of employment will be in the central city and southern employment belt, with the central city continuing to play a key role in supporting the regional economy and future employment opportunities. The Key Activity Centres (KAC's) are a focus of suburban employment along with other key employment nodes around Christchurch Hospital, the airport, Blenheim Road, Hornby and the University of Canterbury. This ongoing growth will place additional demands on the transport network.

The National Policy Statement for Urban Development (NPS-UD) identifies Greater Christchurch as a high growth area. The Canterbury

Regional Policy Statement and 'Our Space' sets out proposed locations of future development areas in Greater Christchurch. There is a focus on residential intensification particularly in Christchurch with the aim to both increase the residential population in the central city along with redevelopment of existing urban areas in and around Key Activity Centres, larger neighbourhood centres and nodes located along core public transport routes.

Both the existing urban areas and priority areas for growth will enable ongoing recovery and rebuilding through to 2028. The spatial pattern for Greater Christchurch aims for smaller and consolidated footprints encouraging higher density living environments, mixed use and a range of housing types to encourage use of less energy and provide better opportunities and choice for people in terms of transport modes.

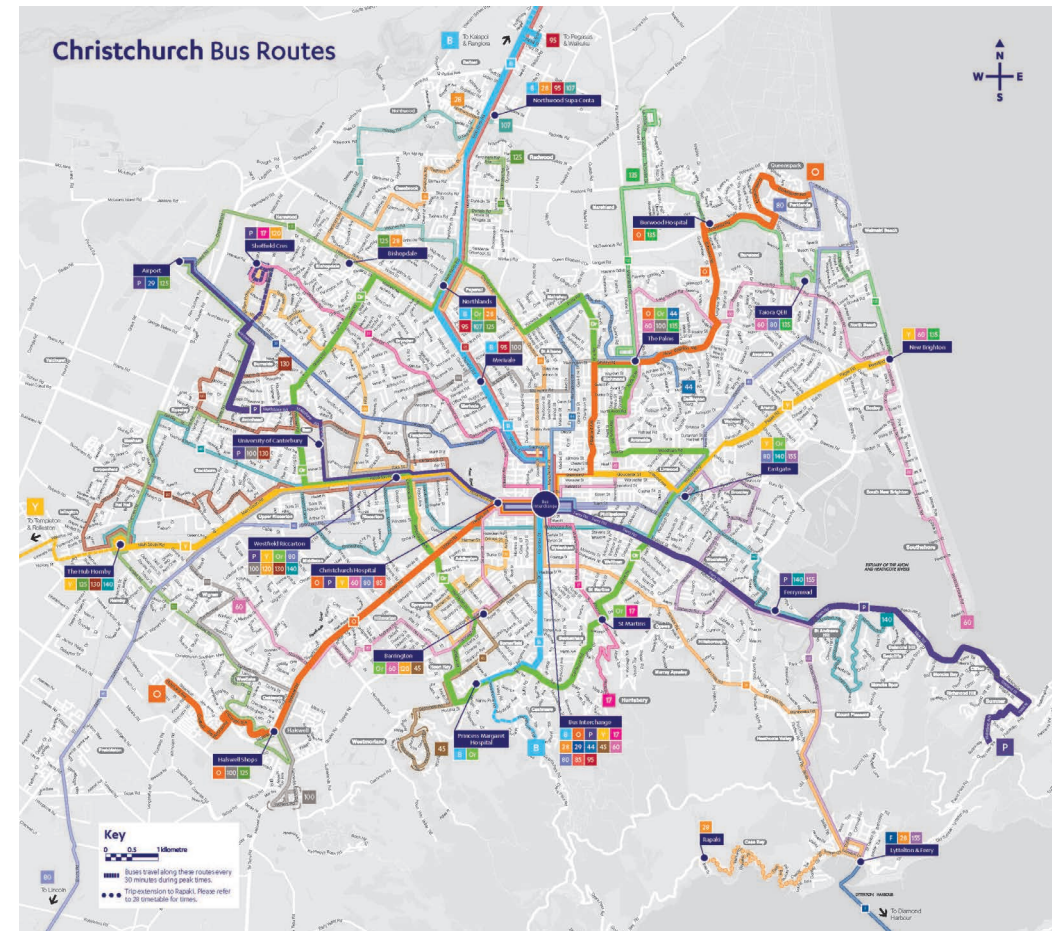


The ongoing growth and regeneration of Christchurch provides an opportunity to ensure that transport infrastructure and land use are closely aligned. To support the projected levels of growth the public transport network will need to evolve to support key residential and commercial growth areas, better matching future growth and contributing to a safer, more sustainable and accessible transport choices. This will set the scene over time for public transport to grow and develop, reducing the reliance on the private vehicle and the impact this has on the transport network.

Greater Christchurch has a comprehensive network of PT services which is comprised entirely of bus services (except for one ferry route). It includes bus priority measures on some key corridors particularly those that include key commercial centres along them. The network is largely radial based on connecting to the central city. Pre-covid trip numbers stabilised post earthquake, but public transport only carries a 2.25% share of all trips in Greater Christchurch. This is low in comparison to other centres in New Zealand.

More people and jobs will result in more demand for travel. A continuation of the low bus mode share will result in longer travel times, more congestion on the road network with traffic spilling over from arterials into quiet residential streets as they run out of capacity.

A more convenient and competitive bus network is therefore essential given the current reliance on private vehicles for travel is not sustainable.



VISION FOR GREATER CHRISTCHURCH

The vision for Greater Christchurch has been developed via the Greater Christchurch Urban Development Strategy and provides the primary strategic direction for Greater Christchurch. In addition, the Canterbury Regional Public Transport Plan sets out a vision for public transport.

Vision for Greater Christchurch

By the year 2041, Greater Christchurch has a vibrant inner city and suburban centres surrounded by thriving rural communities and towns, connected by efficient and sustainable infrastructure. There are a wealth of public spaces ranging from bustling inner city streets to expansive open spaces and parks, which embrace natural systems, landscapes and heritage. Innovative businesses are welcome and can thrive supported by a wide range of attractive facilities and opportunities. Prosperous communities can enjoy a variety of lifestyles in good health and safety, enriched by the diversity of cultures and the beautiful environment of Greater Christchurch.

Greater Christchurch Urban Development Strategy

“Mō tātou, a, mō kā uri a muri ake nei.






“For us and for those who follow.”

Vision for Public Transport

Public transport is innovative and successful and sits at the heart of a transport network that supports a thriving, liveable greater Christchurch. The public transport system is accessible and convenient, with high quality, zero emission vehicles and facilities. The system gets people where they want to go – as a result it is well used and valued by the people of greater Christchurch.

Canterbury Regional Public Transport Plan 2018-2028

BASED ON THIS VISION THE KEY TRANSPORT PRIORITIES FOCUS ON:

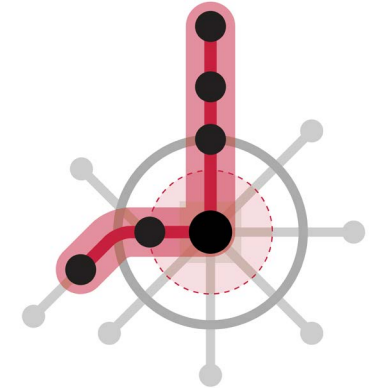
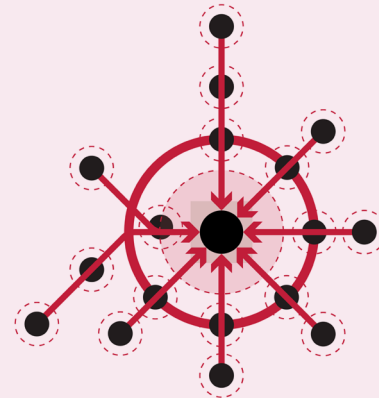
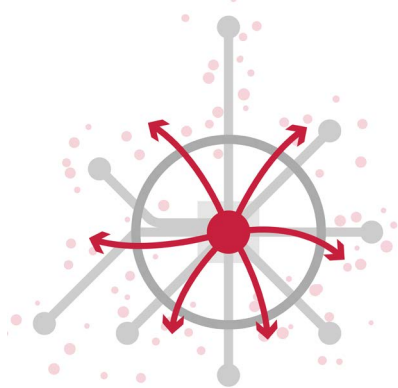
-  Improving Our Environment
-  Growing Patronage
-  Enhanced Accessibility
-  Improved Innovation
-  Affordable network

PUBLIC TRANSPORT AND URBAN FORM

It is important for Greater Christchurch's growth and development to be accommodated in a way that creates high quality integrated communities. Employment dispersed to peripheral locations post the earthquakes making it hard for public transport to provide a competitive and attractive alternative to private car use. The bus network now requires some adjustments and enhancements as various parts of the city develop and employment refocuses on the central city.

This Business Case focuses on interventions that will support a more connected, consolidated and intensified Greater Christchurch by 2028.

A future Business Case will investigate Mass Rapid Transit along key corridors.



Post Earthquake

- Employment dispersed to peripheral locations

2018

- Refocused central city
- Linked employment generators

2028

- Consolidate and intensify
- Develop connected places

2038

- Prioritisation of corridors
- Rapid and frequent corridors




KEY PUBLIC TRANSPORT CHALLENGES

The problem definition below outlines the case for change and was informed by talking with existing and potential new bus customers as well as transport and land use professionals within each partner organisation.

PROBLEM STATEMENTS	OBSERVED EVIDENCE	BENEFITS IN SOLVING THE PROBLEM	INVESTMENT OBJECTIVES
The current PT system can be unreliable, and many journey times are not competitive with the private vehicle, resulting in poor PT mode share and longer and less reliable journey times.	Analyses of the core routes in Christchurch (Orange, Purple, Blue, Yellow and Orbiter) show journey time on most trips could be 50% longer than expected and needs to be accounted for in trip planning by users. The journey time analysis also shows bus journeys to be consistently slower than car journey times with many journeys taking more than double the time to complete by bus when compared to car.	Bus services will become more attractive to use and provide customers with a real competitive choice over the alternative. Enhanced reliability will also increase customers confidence that they will be able to complete time sensitive journeys within expected timeframes.	Improve journey time and reliability of PT services relative to cars by 2028.
The current PT system is not effectively supporting highly populated/ high growth areas and connections to key destinations, resulting in poor PT mode share within these areas.	There are substantial parts in the city zoned for high density development but lying outside a walk-up catchment to frequent public transport services. Two key employment areas outside the city centre (the airport and Middleton/Addington area) are also not well connected to their labour market by direct frequent PT services.	Enhancing the number of key destinations, a greater number of users can reach within 30 minutes by using the bus system.	Improve PT services to and from highly populated/high growth areas and key destinations across Greater Christchurch by 2028.
There are a number of barriers to using PT in Greater Christchurch, resulting in a low uptake of new PT users and subsequent poor PT mode share.	Qualitative feedback from people who live in Christchurch highlights high level of satisfaction from existing bus users but identifies a number of barriers to attract new users. The 2019 Environment Canterbury Christchurch User Metro Survey confirms existing users were highly satisfied, but identified the lowest areas of satisfaction in bus timetables and frequency, quality and availability of shelters along with information about delays and disruptions.	The bus system attracts new and retains existing users, increasing PT mode share.	Remove barriers to the uptake of PT by 2028.

BUSINESS CASE FRAMEWORK

To determine how well different options including the preferred programme may perform against the Problems Statements, a comprehensive set of Key Performance Indicators (KPIs) were developed and these are set out in the following table.

INVESTMENT OBJECTIVE	MEASURE	KEY PERFORMANCE INDICATORS
 Improve journey time and reliability of PT services by 2028	1.0 In-vehicle journey time and congestion	1.1 Reduce in-vehicle PT journey time along specific routes
		1.2 Reduce private vehicle congestion along bus routes
		1.3 Reduce severe congestion at intersections
 Improve PT services to and from highly populated/growth areas and key destinations across Greater Christchurch by 2028	2.0 End-to-end journey time and accessibility from and to key areas	2.1 Increase households able to access the city centre by bus within 30mins
		2.2 Increase households able to access high employment zones by bus within 30mins
		2.3 Increase households able to access the Papanui, Riccarton, Hornby, Shirley and Linwood KACs by bus within 30mins
		2.4 Increase households that can access more than one KAC by bus within 30mins
		2.5 Increase access to more businesses from key residential areas by bus within 30mins
		2.6 Increase households able to access Rolleston and Rangiora centres by bus within 30mins
	2.7 Reduce journey time from Rangiora, Kaiapoi, Rolleston and Lincoln to the city centre	
3.0 Spatial coverage	3.0 Increase the population that are located within 800m of a frequent route	
 Remove barriers to the uptake of PT by 2028	4.0 Environment	4.1 Reduce private vehicle kilometres travelled
		4.2 Reduce greenhouse gas emissions (CO2) from all transport sources
		4.3 Reduce air pollution (PM10 and NO2)
	5.0 Public Transport Ridership	5.1 Increase the number of PT trips
		5.4 Increase the proportion of trips made by PT
	6.0 Perception in ease of use of public transport system	6.1 Improve the perceived ease of use of the PT system

EXPLORING OPTIONS

A wide range of possible interventions were identified and reviewed as part of the development of a preferred programme. Although some interventions contributed more significantly than others, all interventions contributed in some way and hence none were discarded in totality. Rather critical conclusions were drawn to inform the preferred programme:

- **High Frequency (Core) Routes:** Improvements to the five high frequency (core) routes have the potential to increase patronage by 31% from 2018 by 2028. The majority of this patronage uplift occurs in the inner portion of Christchurch City (within approximately 5km of the city centre).
- **Additional High Frequency Routes:** Expanding the number of high frequency routes from five to nine increases the number of people within 800m of frequent bus route by 20% from 334,000 to 402,000. The expansion however appears to divert growth from the five core routes and therefore only adds approximately a further 4% to the overall patronage uplift for Greater Christchurch over and above the forecasted improvements from enhanced core routes. However, service improvements would still be required to ensure capacity meets demand and this was recommended further consideration at an individual route basis as part of short list option assessment.
- **Park and Ride:** Park and ride located at satellite towns and or the fringe of Christchurch City has the potential to increase overall ridership by a further 3%.
- **Direct Services:** Enhanced direct services from Waimakariri and Selwyn have the potential to achieve significant mode shift if these services are supported by frequency, service pattern and corridor improvements that ensure parity with vehicle traffic.
- **Third Tier Routes:** Optimising third-tier routes like Route 130 (Hei Hei / Avonhead) can provide patronage uplift, but it is unlikely to be of a scale that makes a meaningful impact on citywide mode share (0.2% uplift).
- **Land Use:** Redistributing land use growth towards the five high frequency core routes has the potential to increase patronage by 40% in 2038. Population growth is a significant driver of future patronage uplift.
- **Fares:** Removing fares has potential to increase ridership by up to 50% and further consideration will be required to determine if this will offset the loss in revenue from fares.

The following section sets out the 'Preferred Programme' in detail.





Part 1: the preferred programme

OVERVIEW OF THE PREFERRED PROGRAMME

PART 1 – THE PREFERRED PROGRAMME

The preferred programme includes an integrated set of interventions ranging from higher frequency services, realignment of routes and new routes and these are identified in the following pages. The interventions focus on responding to the 'Problem Statements' with a focus on improving journey time and reliability, improved access to growth areas and destinations and removing the barriers to the uptake of public transport. The seven key interventions outlined in the following pages include:

1. Enhance the Inner Core Routes
2. Enhance Secondary Core Routes
3. Provide Direct Connections
4. Branch Out from Core Routes
5. Expand the Frequent Network
6. Enhance Connector Services
7. Multi-Modal Network Connections

The Preferred Programme is split into **short and medium term interventions**. The **short term interventions** include enhanced frequencies through the inner core of Greater Christchurch (area with high density and land-use intensification) through adoption of short runs on the inner core and improving the frequency on the Orbiter to improve transfer between routes. The philosophy for the short-term interventions is to make best use of the existing network structure and assets that support the highest population and employment areas. The short term interventions will be a building block for future expansion with minimum abortive investment.

The **medium-term interventions** focus on more substantial route changes to keep pace with the forecast growth in population and economic activity. The changes will significantly increase PT capacity across the sub-region, improve coverage and reduce the need for transfers. These improvements will leverage capacity created through the short-term programme to enhance access to economic and social opportunities to residents in outer suburbs. It does this by introducing branching of services on key routes.

The combined package of interventions across the short and medium term timescales will result in a **revised network map** which is outlined on the page opposite.

PART 2 – PHYSICAL ENHANCEMENTS

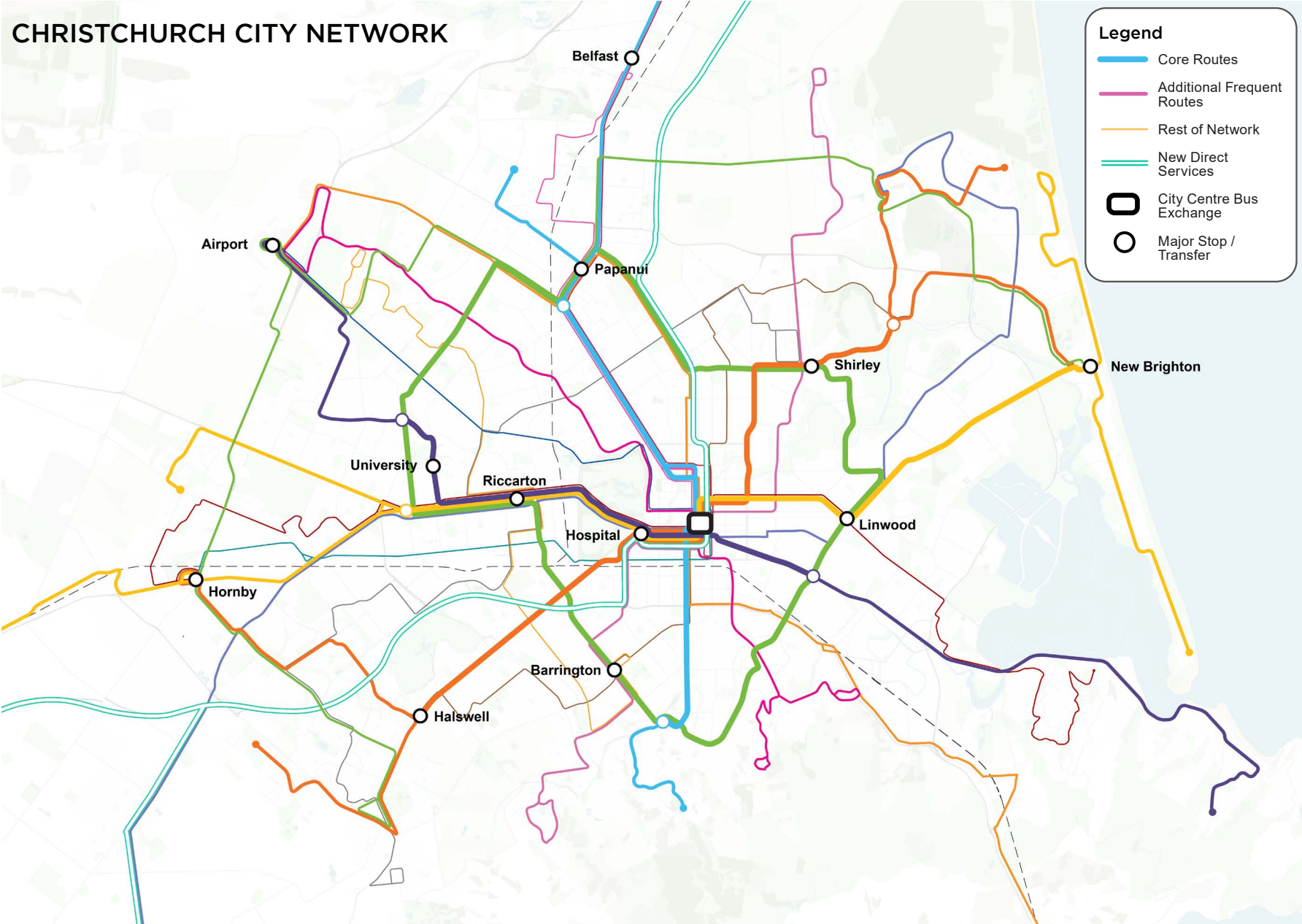
Network changes are only part of the equation. To ensure our future as a public transport city there must be physical changes to our urban environment that supports the bus network and significantly improve customer experience. The physical enhancements outline the proposed changes to the urban environment that will support the network changes.

PART 3 – STAGING AND SUMMARY OF BENEFITS

The short and medium term options will be undertaken in a staged approach and has been developed based on a number of criteria. A number of benefits will arise from the various network and physical environment changes. These are summarised in relation to each of the three 'Problem Statements' and how a greater alignment between PT and land use will be achieved.

PREFERRED PROGRAMME NETWORK PLAN

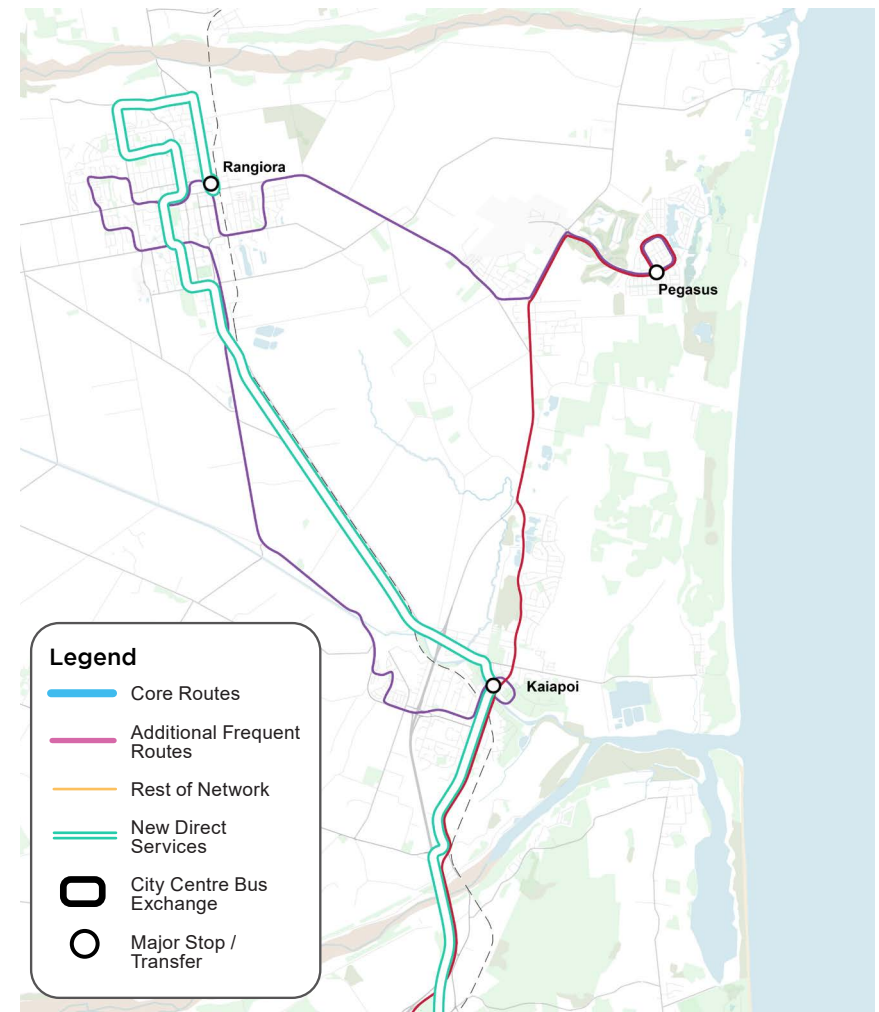
CHRISTCHURCH CITY NETWORK



SELWYN DISTRICT NETWORK



WAIMAKARIRI DISTRICT NETWORK



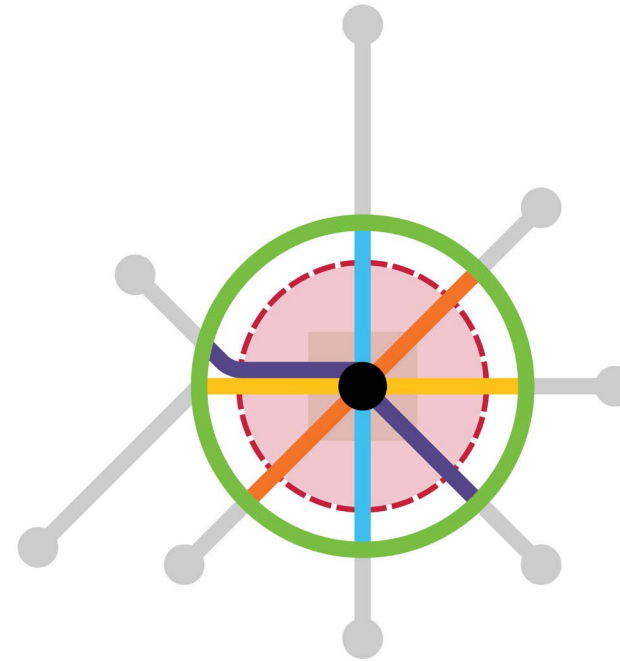
1. Enhance the Inner Core Routes

WHAT

- Increased frequency and reduced wait time of five core routes
 - 7.5 minute peak
 - 10 minute off-peak
- Bus lanes that ensure fast reliable service even in peak periods
- Customer experience improvements

WHY

The inner core has the greatest density of residents, workers, and activity along with the highest levels of congestion and poor reliability, so is the first priority for high quality Public Transport. Improved quality of Public Transport and customer experience means people are more likely to choose sustainable options. Enhancing public transport within the inner core also responds to a long term plan of urban intensification.



KEY BENEFITS



Improve Journey Time and Reliability

- Increased frequency reducing the wait and transfer time
- Better punctuality through bus priority infrastructure enabling queue jumping and signal priority



Improve Access to Growth Areas and Destinations

- Catalyst for land-use intensification of inner core areas
- Enhanced access to the central city employment and retail
- Targets neighbourhoods with low car ownership



Remove Barriers to Uptake of Public Transport

- Removes the need to consult timetables with true turn-up-and-go frequencies
- Bus journey times that are more competitive with private car journey times.
- More predictable bus arrival and departure times.

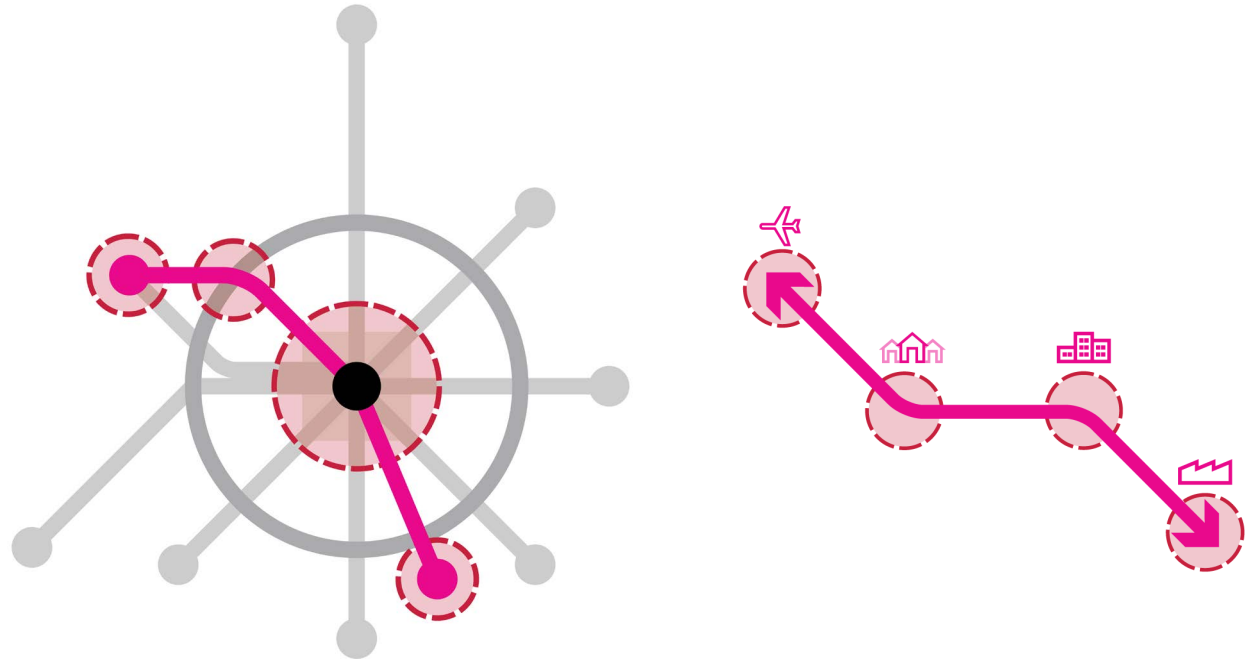
2. Enhance Secondary Core Routes

WHAT

- Increased frequency and directness on routes 17, 28 and 29
 - 10 minute peak for route 29
 - 15 minute peak for routes 17 and 28
 - 15 minute off-peak on all three routes

WHY

Enhanced bus capacity along these routes that already experience bus crowding and have strong demand forecast for trips to the city centre and airport employment area.



KEY BENEFITS



Improve Journey Time and Reliability

- Increased frequency reduces wait and transfer times



Improve Access to Growth Areas and Destinations

- Additional high frequency service to areas zoned for intensification
- Increased access to employment and retail areas (Woolston, Papanui, Airport)
- Reinforces land use intensification and catalyst for growth



Remove Barriers to Uptake of Public Transport

- More people with access to high frequency bus service
- Bus journey times competitive to car journeys to more parts of the city
- Direct connections minimise the need to transfer



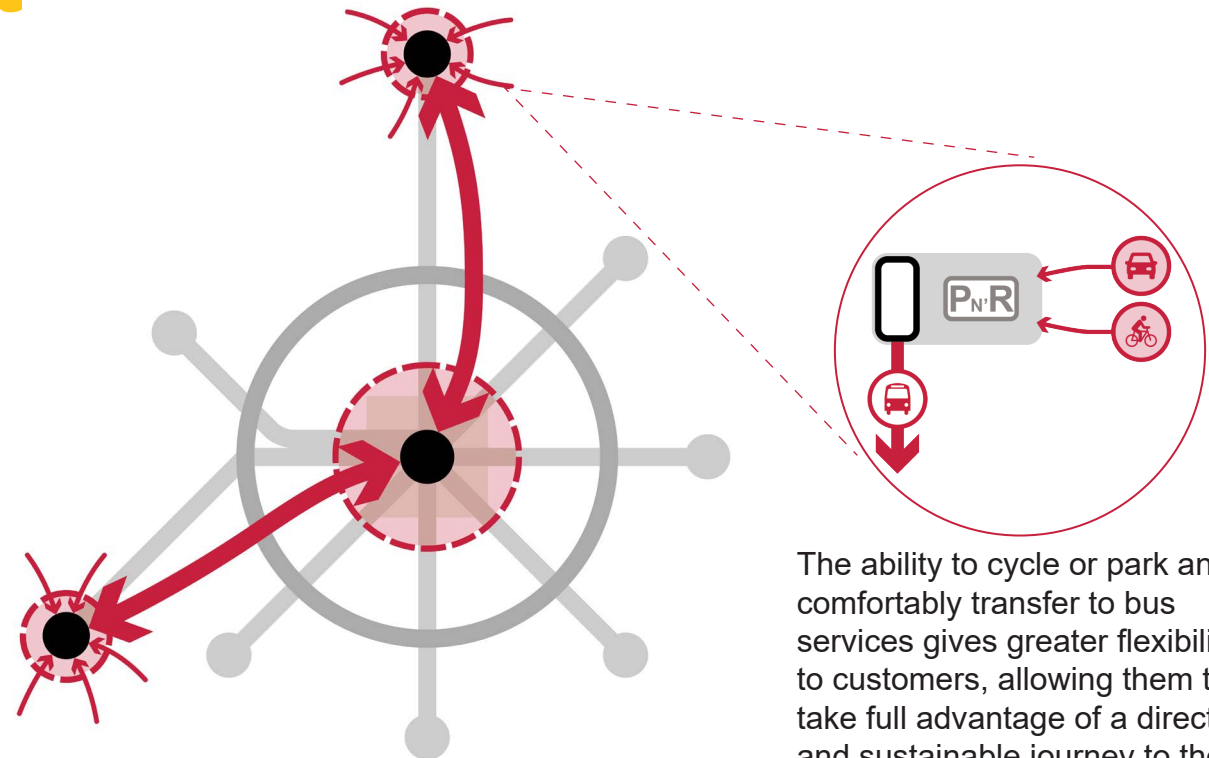
3. Provide Direct Connections

WHAT

- New direct services from Lincoln to the city centre
 - 20 minute peak
- Over time enhance frequencies on the new Lincoln and other existing 'direct' services from Rolleston, Rangiora and Kaiapoi
 - 15 minute peak
 - 30 minute off-peak

WHY

Part of Greater Christchurch's long term plan is to not only intensify the inner-core, but to acknowledge the role of the satellite centres which support the city. It will become increasingly important to provide sustainable transport options to these growing centres as Christchurch strives towards a sustainable future. This will be achieved through direct connections.



The ability to cycle or park and comfortably transfer to bus services gives greater flexibility to customers, allowing them to take full advantage of a direct and sustainable journey to their destination.

KEY BENEFITS

Improve Journey Time and Reliability

- Direct service provides more competitive journey times when compared to car travel
- Priority lanes during peak period to improve reliability and competitiveness against car journeys.

Improve Access to Growth Areas and Destinations

- Enhances access to the City Centre
- Sustainable transport option for rural residents

Remove Barriers to Uptake of Public Transport

- Park and ride facilities at satellite towns to enable better transfer from car to bus
- Secure bike lockers at park and rides to provide options to access direct service
- All-day service gives flexibility for a more diverse range of commuters

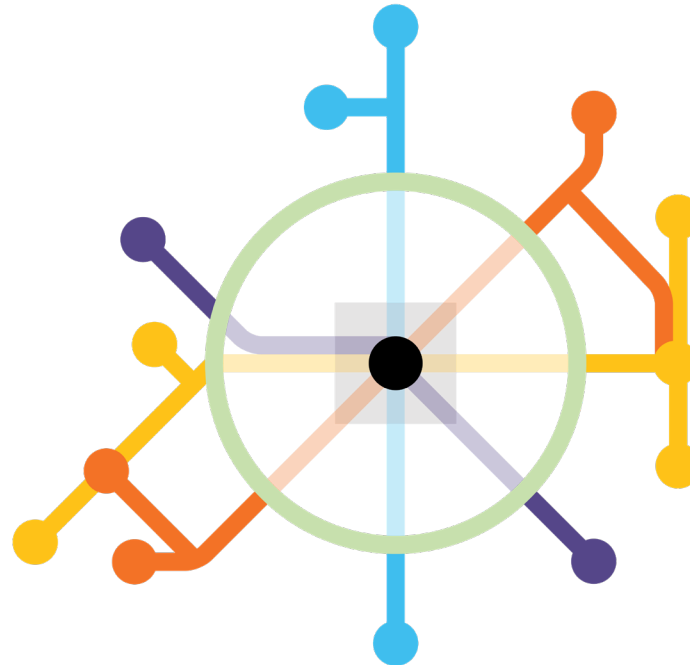
4. Branch Out From Core Routes

WHAT

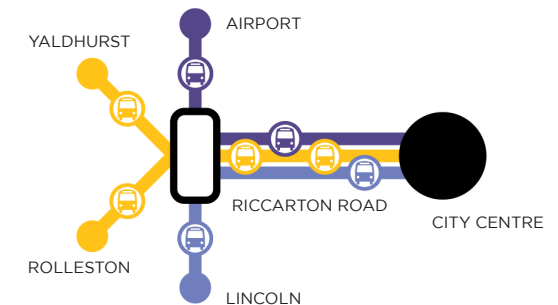
- Increase inner core route frequency to 7.5 minute all day (7AM to 7PM) and branch the routes outside the Orbiter
 - 7.5 minute all day on inner core section
 - 15 minute all day on each branch
- Increase frequency on the Orbiter to 7.5 minute all day
- New routes to connect Key Activity Centres (KAC's) and the city centre

WHY

A network of branched routes ensures maximum coverage of the outer city, while providing maximum frequencies on the key corridors through the inner core. It also provides more same-seat trips to the central city, removing the need for transfers for many people.



Feeder routes branching out from the core routes and associated investment will create a greater focus on PT around destinations, employment areas, identified growth areas and community facilities. This will encourage higher density and mixed-use development and zoning oriented around these key corridors.



KEY BENEFITS

Improve Journey Time and Reliability

- Increased frequency reducing the wait and transfer time
- Better punctuality through bus priority infrastructure enabling queue jumping and signal priority

Improve Access to Growth Areas and Destinations

- Increased access to the City Centre
- Increased access to and between KAC's and key destinations
- Improved access to and from Priority Growth Areas

Remove Barriers to Uptake of Public Transport

- Greater access to employment opportunity and community facilities
- Enhanced customer experience due to more same seat journey options
- Removes the need to transfer for many customers



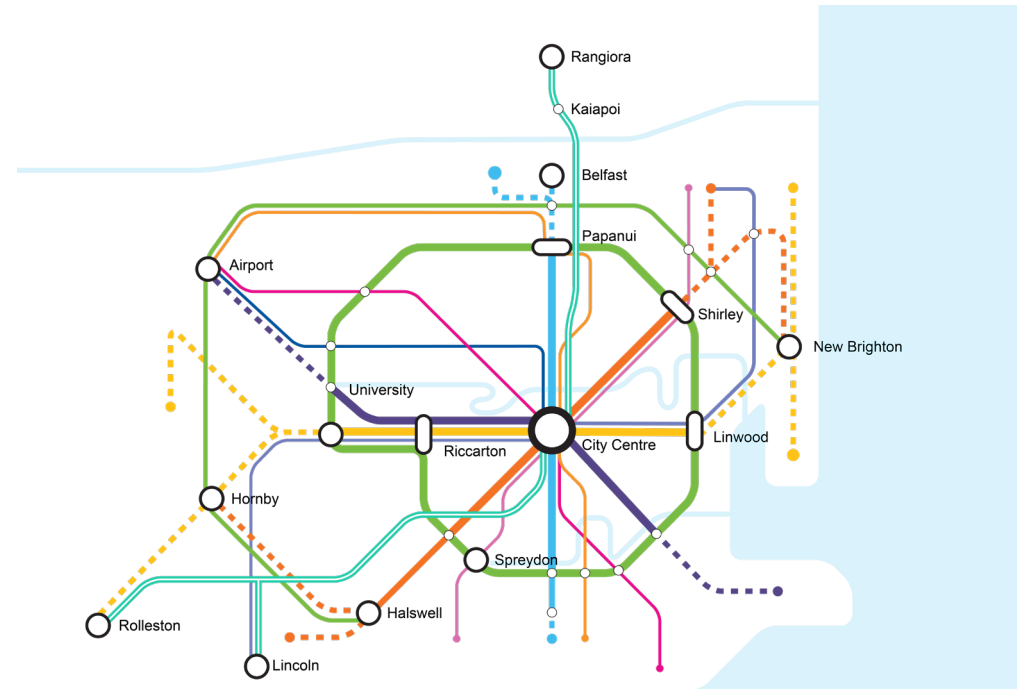
5. Expand the Frequent Network

WHAT

- Increase frequency and directness of routes 60 and 80 - 15 minute all day frequency
- Rerouting Route 60 to connect the developments in the Preston area directly with the city centre.
- Rerouting Route 80 to run through Riccarton Road towards city centre.

WHY

Expanding the frequent network will provide more residents with walk-up catchment to frequent bus service. More direct connections will also better connect new growth areas with the city centre and key activity centres.



KEY BENEFITS



Improve Journey Time and Reliability

- Increased frequency reduces wait and transfer times
- Decreased journey time by providing more direct routes
- More single seat journeys to the city centre



Improve Access to Growth Areas and Destinations

- Increased, direct access to the City Centre
- Improved access to and from Priority Growth Areas



Remove Barriers to Uptake of Public Transport

- More people with access to high frequency bus service
- Bus journey times competitive to car journeys to more parts of the city
- Direct connections minimise the need to transfer

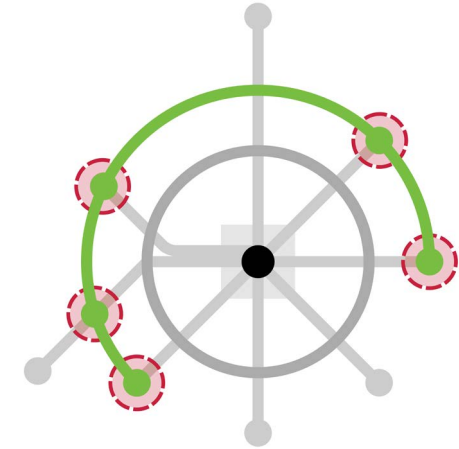
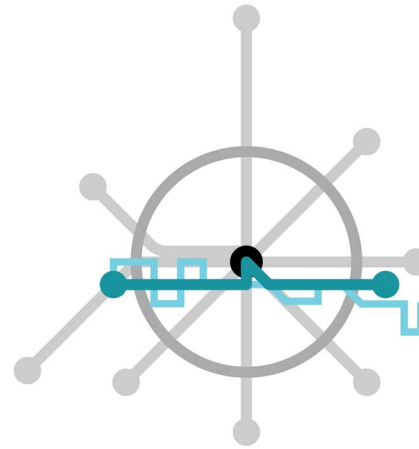
6. Enhance Connector Services

WHAT

- Reroute connector services (100,120,125,130,140) to provide more direct connections, connecting with high frequent routes at key locations
- Extend Route 125 to provide an outer half-orbiter function to distribute trips across the outer parts of the city
- Straighten the 140 route to provide a spine through the industrial employment area and increase its frequency

WHY

Some current bus services wind through streets trying to reach a wide range of customers. The ability of the PT system to cater for the complex number of trips made daily requires a network of connected services that enable transfers to frequent radial routes without the need to divert the journey through the suburbs and the city centre.



KEY BENEFITS



Improve Journey Time and Reliability

- More direct and shorter routes for customers – reducing pressure on the city centre bus exchange
- Decrease journey times for customers making cross town trips



Improve Access to Growth Areas and Destinations

- Increased access to and between KAC's and key destinations
- Improved access to employment areas outside the city centre
- Enable access to more locations through one transfer

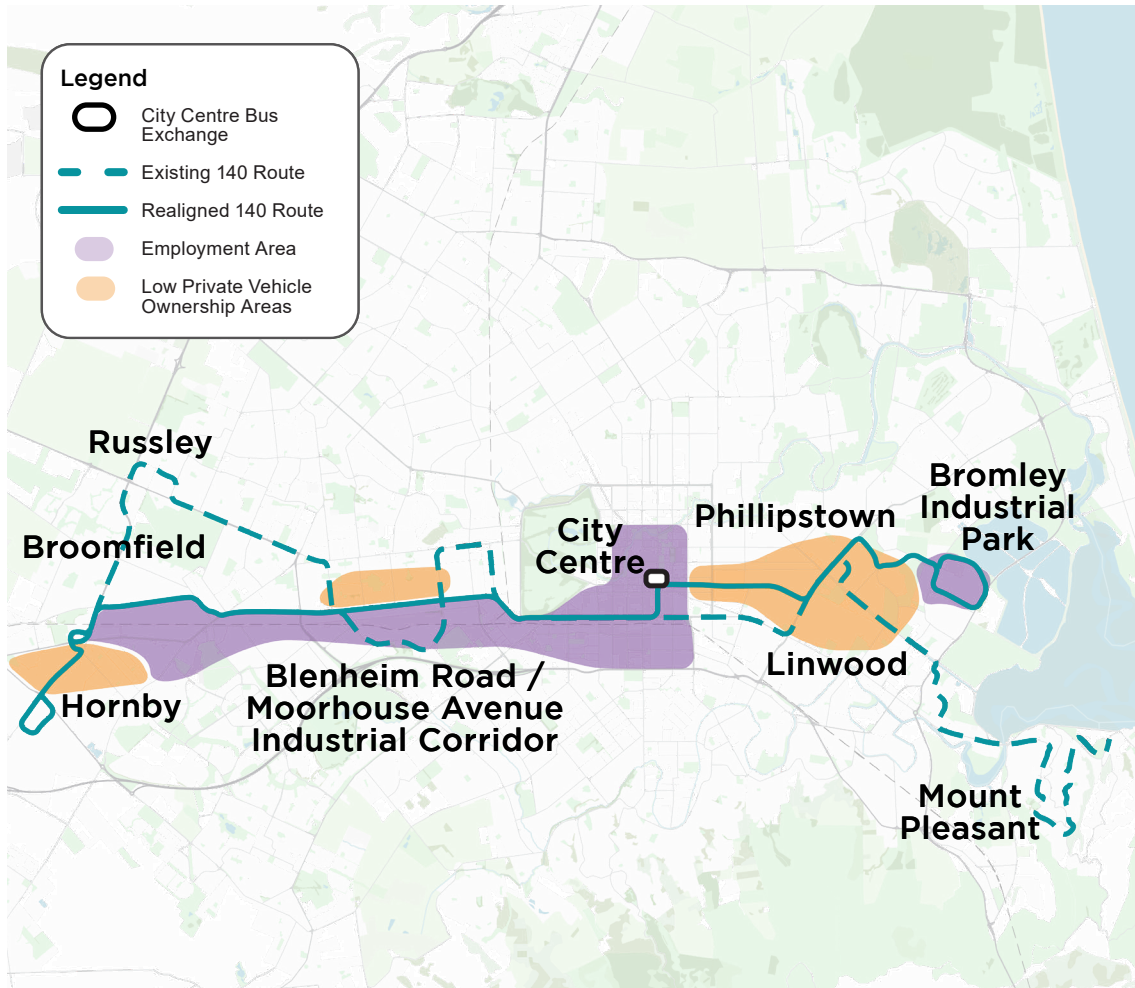


Remove Barriers to Uptake of Public Transport

- Enables everyday use promoting short trip options and more diverse customer groups
- Simplified timetable
- More intuitive routes travelling in straight lines.



MORE DIRECT 140 ROUTE



MORE DIRECT ROUTES

From existing winding routes to a more consolidated direct service. By better aligning services with employment and identified growth areas, KACs and communities with low private vehicle ownership the PT network becomes more equitable, serving diverse communities.



The example shown is the 140 bus route. Currently the bus runs from Mount Pleasant, a lower density neighbourhood through Linwood, the City Centre, Russley, Broomfield then finally to Hornby. The realigned service connects industrial employment centres across the city and more directly connects fringe residential areas with the city centre making journeys by bus more competitive. Journey times, frequency and customer experience will all see significant improvements.

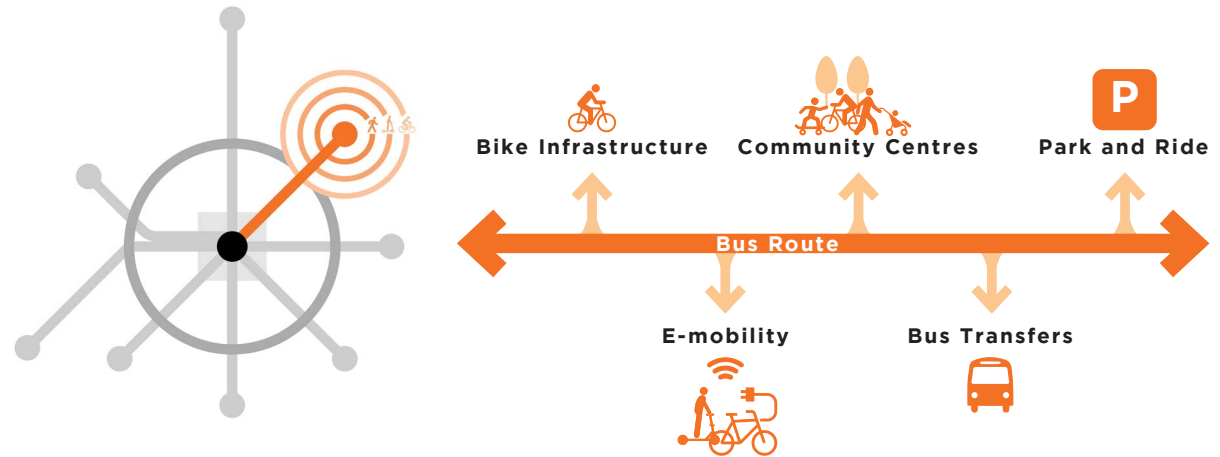
7. Multi-Modal Network Connections

WHAT

- Enhance the opportunities to transfer from various modes to the bus network
- Transfer opportunities between connected bus and cycle networks including cycle lock ups and E-mobility stations at main transfer facilities
- On board announcements to alert customers to transfer opportunities at upcoming stops and destinations that can be accessed from key stops

WHY

Providing a diversity of interconnected transport options is important in making it easy for people to access the bus network. Options such as bike infrastructure, park and ride and bus transfers will add flexibility to peoples journeys. Provision of bus shelters and real time information will also improve access and encourage sustainable transport choices.



KEY BENEFITS

Improve Journey Time and Reliability

- Decreased journey time through faster first mile last mile options incorporated into overall journey.
- More customers can access high frequency routes, reducing the wait and transfer time at stops.

Improve Access to Growth Areas and Destinations

- Wider residential catchment has access to frequent bus routes within a 5-minute trip to bus stop.
- Customers can reach wider range of destinations within 5 min trip from where they alight the bus.
- Rural community can access bus network through park and ride.

Remove Barriers to Uptake of Public Transport

- Provide options to customers to make the “first and last mile” trips between destination and bus network.
- Enables everyday use promoting short trip options and more diverse customer groups.
- Efficient and effective transfer experience.





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Route Destination
p Sheffield Cres
via Otahuhu

metro

Sheffield Cres

PLEASE SIGNAL DRIVER



Bicycle loading only
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SEATING

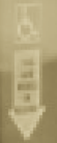
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A. Bus Priority

Providing priority bus lanes on the 5 Inner Core routes will see significant enhancement to customer experience. Integration of the signal priority systems and the bus real time information system will enable the ability to detect the presence of buses in a traffic stream and then allow for priority should a bus be behind schedule. Bus priority ensures faster journey times, more reliable buses, a legible and trusted bus network, and removes the need for consulting bus timetables, shifting to a 'turn-up-and-go' model.

The 5 Inner Core Routes where bus priority will be provided, align with Christchurch's long term urban development planning. The Inner Core Routes target identified growth and employment areas and enhanced access to the Central City. Locations for bus priority interventions were selected by considering average congestion experienced by existing services, the number of services that will run along these section under short and medium term options, the ability for services running through these sections to keep to their scheduled time tables and comparison of travel times between bus services and general vehicles along the corridors.

The "Before and After" images below show an example of Papanui Road bus priority lanes and associated infrastructure. It will utilise the existing road carriageway width (i.e. kerb to kerb) to reduce capital expenditure and require some intersection changes.

South bound bus lane between 7am-9am

Cycle, parking and vehicle legibility confusing



Simplified all day priority bus and cycle lanes



Benefits

- More reliable journey times for services, especially during morning and afternoon peaks.
- More competitive travel times between bus and car journeys.
- Kerbside bus lanes with safe boarding and alighting.
- Intersection signal priority to buses.
- Extended traffic signal phasing for buses.
- Incorporates safe crossing facilities.

Safe crossing facilities

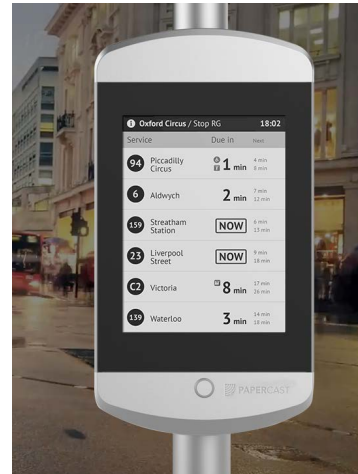
Branded buses for network identity and improved wayfinding to stops and PT services

Improved bus stop infrastructure with wayfinding, branding and real time information

B. Greater Use of Technology

Environment Canterbury is already investing in an advanced bus positioning and real time information system to enhance information on real-time bus locations. The short-term programme will build on this investment by expanding technology infrastructure to enable bus priority at signalised intersections along the frequent routes and enhanced headway management capability for the bus operators.

Real-time information displays at key bus stops provide equitable access to information to everyone, with no need to own a smart-phone, or be technologically capable to use it. Every bus will have an onboard computer sending location data back to a central repository, which will be available on real time displays, devices and screens at key locations.



Benefits

With a shift in focus to the customer, technology will be key to improving all aspects of Christchurch's public transport experience. Benefits include:

- Much more accurate and rich real-time information for customers as to exactly how far away their bus is, via physical screens/ devices as well as feeds to the website and their smartphone apps.
- Information to drivers on when to slow down and speed up to maintain optimal spacing between buses, avoiding bunching.
- Help with driver training - gives new drivers directions and tips.
- Management of transfers - tells drivers to wait if a transferring service is late.
- Ability to install screens with bus departure and arrival times inside key places like the airport, libraries, shopping malls and the hospital.
- Ability to provide customers with on-board announcements and screens showing what stop is coming up.
- Ability to integrate with traffic signal priority, so signals turn green when a bus is approaching reducing delays.

C Bus Stop Enhancements

Improved bus stop infrastructure will play a significant role in enhancing customer experience. Focusing investment on the frequent inner core routes which have large user numbers will help to develop a bus network people can identify and rely on.

Establishing a hierarchy of bus stop elements will intuitively help with legibility and wayfinding within Greater Christchurch. 'Connection Stops' are those on high frequency routes and are located at transfer points, Key Activity Centres or community destinations. 'Key Stops' are the in-between destinations/ KACs on the same frequent core routes or other destination stops on the less frequent routes. The 'Minor Stops' are all the other stops on the less frequent routes.

Benefits

- Enhanced customer comfort
- Convenience
- Enhanced safety and security
- Enhanced legibility of bus network
- Enhanced public usage of the bus network

Core + Direct Route Stop Infrastructure



CONNECTION STOP

Located on frequent inner core and orbital routes at community destinations, transfer points, KACs or other centres and to include:

- Real time information
- All weather shelters
- Lighting and planting
- Integrated wayfinding and signage



KEY STOP

Located on frequent core and orbital routes with moderate customer numbers and to include:

- Real time information
- All weather shelters
- Lighting and planting

All Other Routes



MINOR STOP

Located on non-core (cross city, secondary and branch out) routes that have lower frequency and to include:

- Static schedule information
- Standard bus shelters

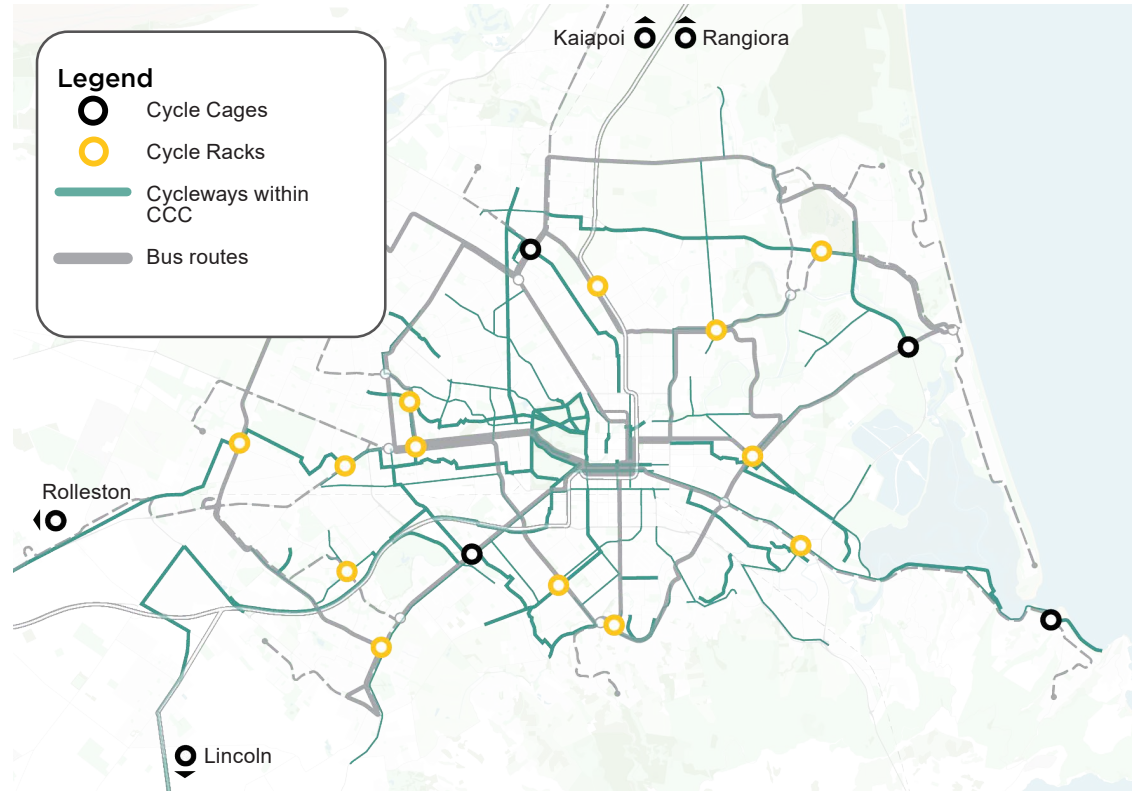
D. Multi-Modal Infrastructure

The ability to expand the catchment and usefulness of the fixed route PT services to areas beyond the immediate corridor requires the PT system to be attractive to customers from outside a walk-up catchment to a bus stop. These additional customers will largely arrive by another bus, a car, bike or electric scooter.

A focus on 'Bike and Bus Share' alongside 'First and Last Mile' trips will significantly improve customer experience, legibility and overall liveability. Several cycle storage facilities will be provided at key stop locations with consideration given to alignment with the key strategic cycleways (see map opposite).

Modal integration options therefore include:

- Cycle infrastructure and storage at stops
- Bus bike loading ability
- Demand Responsive Services
- E-mobility
- Park 'n Ride in the outer areas



Benefits

- Design of bus stop boarding / alighting zone with protected cycle infrastructure.
- Space considerations of bike parking infrastructure.
- Transfer stops to be proximate and integrated with safe crossing facilities, bike racks, e-mobility stands, taxi or ride share and park and ride facilities
- Transfer stops to be supported with ground-plane way finding to aid with customer legibility





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Bicycle loading only.
Please button to open.

FOR NEXT

FOR

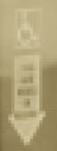


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STAGING AND SEQUENCING

The PT Futures Combined Business Case recommends a programme of improvements to the existing public transport network that is staged over two horizons; a short-term horizon and a medium-term horizon.

The short-term horizon (first 6 years of the programme) focuses improvements on the inner core of Greater Christchurch. The philosophy for this horizon is to enhance the existing public transport offering in areas that connect the largest potential customer base with the largest number of opportunities. It also aims to enhance access to city centre opportunities through more direct services from the satellite towns in Selwyn and Waimakariri.

The medium-term horizon (years 7-10) leverage capacity created in the short term to enhance access to economic and social opportunities to residents in the outer suburbs. It requires adjustments to the network structure to connect growth areas more directly to Key Activity Centres and the opportunities in the central city.

A staged introduction of the service improvements is recommended to ensure optimal value for money.

The service enhancement sequencing is influenced by available capacity on the existing service; the number of people that will benefit from enhancements and the impact any upgrade will make on patronage uplift.

The staging of upgrades to the physical infrastructure in each corridor is influenced by the level of congestion experienced by current bus services, the timing of recommended service improvements as well the likely implementation timeframes of other committed projects and how this programme integrates with those.

Incremental improvements to the bus services will result in a gross operational expenditure increase from a base of \$65.5 million per annum (in 2020) to \$118 million per annum (in 2020 dollars) by the end of the programme (year 10).

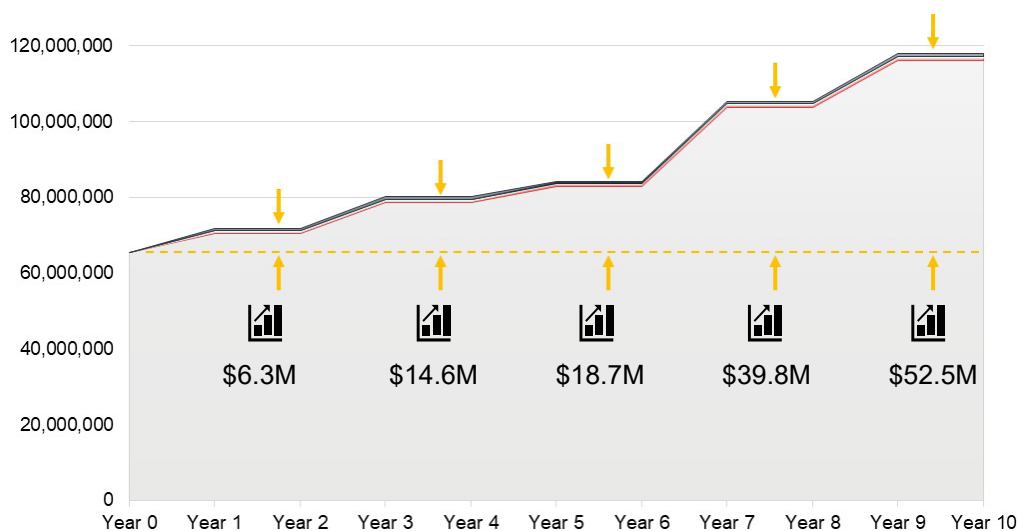
The farebox take is also forecast to increase with the increased ridership, and net of farebox the overall increase in operational expenditure is estimated to increase by approximately \$31.85 million per annum to \$71 million per annum.

Improvements in the first six years focus on frequency enhancements in the inner core of Christchurch City, a new direct service from Lincoln, as well as inter-peak runs to the direct services to the other satellite towns. Adjustment to the network structure is recommended to occur in year 7.

The total physical works for the programme (the costs to construct the improvements) have been estimated at \$115million, with the breakdown shown in the following table.

CAPITAL EXPENDITURE	SHORT TERM	FULL PROGRAMME
Bus lane priority programme	\$51.6M	\$58.95M
Intersection improvement programme	\$17.93M	\$18.71M
Bus stop improvement programme	\$12.47M	\$17.27M
Park and ride programme	\$2.55M	\$5.75M
Bus interchange upgrades	\$1.5M	\$12.46M
Enhancement to bus management system	\$0.89M	\$1.87M
Total (2020 dollars)	\$86.94	\$115.01M

ANNUAL OPERATIONAL EXPENDITURE (2020 DOLLARS)



EXPECTED OUTCOMES

The recommended programme is expected to increase annual PT trips from 14 million in 2018 to 20 million in 2028, a 44% increase at an annual compound growth rate of 4.9% from 2022 to 2028. The 2028 forecast annual PT trips per capita improves to 38 annual PT trips per capita for the recommended option, a 21% increase from 2018. The total Private Vehicle Km travelled on the Greater Christchurch network will decrease by 19.7 million per year, with corresponding reductions in emissions from private vehicles.

The programme delivers outcomes against the Investment Objectives in the following ways:

Improve journey time and reliability of PT services relative to private vehicles by 2028:

- End-to-end journey times decrease as a result of improved wait times and in-vehicle journey times. This improves access to KACs and employment areas, including the Central City where 123,000 more people have 30-minute access to city centre by PT.
- The vehicle journey time gap between cars and PT is forecast to reduce by 16% for the purple line; 36% for the orange line; 21% on the yellow line; 16% on the blue line, 13% for direct services from Rangiora and 35% for services from Rolleston.

Improve PT services to and from highly populated/high growth areas and key destinations across Greater Christchurch by 2028:









- 123,000 more households can access the Central City within 30 minutes on PT, a 88% increase.
- 133,000 more household can access their nearest KAC within 30 minutes on PT. In addition, over 90% of households in the high density residential areas can access more than one KAC within 30 minutes by public transport.
- 218,000 more jobs can be accessed within 30 minutes on PT. Public transport accessibility to high employment zones (Christchurch Airport, University of Canterbury, Blenheim Road Industry, Hornby, Addington) is also forecast to increase with 45,000 more households able to access these locations within 30 minutes by bus.
- Public transport accessibility within Rangiora and Rolleston improves with 12,500 more households able to access the region's KAC within 30 minutes by bus.
- More services connecting customers more directly to social and economic opportunities.
- Approximately 100 more buses running more frequently across the network (in peaks and off-peak periods) providing customers with enough available seats as well as improved scheduled hours (early and late in the day).
- 229 more bus shelters providing customers with better waiting facilities.
- 190 more real time display units across the network, providing customers with accurate information on bus timetables and arrival times, as well as information about delays.
- 44 real time information screens within key centres providing customers with information on bus arrivals and departures screens
- Enhanced on-board experience through audio announcements on upcoming stops as well as opportunities to access / transfer at these stops.
- Note: enhancements to the metro card system will occur as part of the national integrated ticketing project

Remove barriers to the uptake of PT by 2028:

- Population catchments living within 400m of a frequent route (i.e. minimum PT frequency of 15 minutes) increase by 39% (from 132,000 to 184,000).












PROBLEM STATEMENT ONE

Improve journey time and reliability of PT services by 2028

INVESTMENT OBJECTIVE	MEASURE	KEY PERFORMANCE INDICATORS	OUTCOMES BY 2028	
 <p>Improve journey time and reliability of PT services by 2028</p>	 <p>Gap between Bus and Car journey time ratio</p>	Purple - reduction in travel time	16%	
		Orange - reduction in travel time	36%	
		Yellow - reduction in travel time	21%	
		Blue - reduction in travel time	16%	
	 <p>Congestion</p>	Intersections where Bus Delay/ Level of Service > D	4 less intersections	

PROBLEM STATEMENT TWO












Improve PT services to and from highly populated/growth areas and key destinations across Greater Christchurch by 2028

INVESTMENT OBJECTIVE	MEASURE	KEY PERFORMANCE INDICATORS	OUTCOMES BY 2028
 <p>Improve PT services to and from highly populated/growth areas and key destinations across Greater Christchurch by 2028</p>	 <p>End-to-end journey time and accessibility from and to key areas</p>	Household access* the Chc City	88% increase 
		Household access* high employment zones	72% increase 
		Household access* the KACs	85% increase 
		Household access* to more than one KAC, from high density suburbs	91% HH have access 
		Number of jobs access* to key areas	89% increase 
		Household access* to Rolleston and Rangiora centres	81% increase 
		PT journey time from Rangiora, Kaiapoi, Rolleston, and Lincoln to the Chc	Average 16% reduction 
	 <p>Spatial Coverage</p>	Population within 400m of a frequent route	39% increase 

access* = number of households/jobs able to access 'X' within 30 minute journey time (including walk and wait time) by Public Transport

PROBLEM STATEMENT THREE

Remove barriers to the uptake of PT by 2028

INVESTMENT OBJECTIVE	MEASURE	KEY PERFORMANCE INDICATORS	OUTCOMES BY 2028
 <p>Remove barriers to the uptake of PT by 2028</p>	 <p>Environment</p>	Vehicle Kilometres travelled in private vehicles	19.7m km/year reduction 
		Emissions from transport fleet	0.4% increase in CO2* No change to NO ₂ /PM10* 
	 <p>Public Transport Ridership</p>	Number of PT trips from each area	39% increase 
		Number of PT trips to the Chc Central City	121% increase 
		PT trips per capita	21% increase 
		Proportion of citywide PT trips made on PT	26% increase 
	 <p>Perception in ease of use of public transport system</p>	Improved bus stops	Programme extended to core route branches, 60 & 80 including: Marketing, TDM, bus stop shelters, real time information screens, integration with cycling and park-n-ride. 
		Improved on-bus information	
		Improved trip planning information (Metro website, phone apps)	
		Improved availability of MetroCard (reduced cost, ease of signing up, locations where sold)	

**All emissions reduce if electric buses exceed 23% of fleet by 2028*