

## GREATER CHRISTCHURCH METRO BUS NETWORK REVIEW

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### ABSTRACT

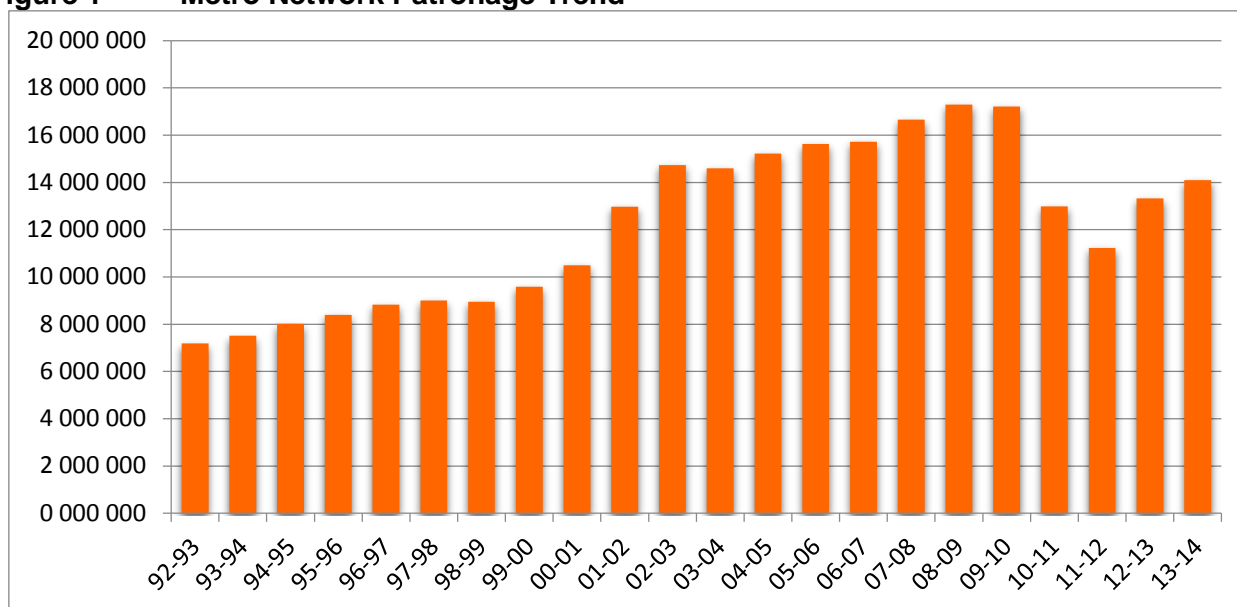
An extensive review of the Greater Christchurch Metro Bus Network has recently been undertaken by Environment Canterbury Regional Council. The review sought to implement the new connected Hubs & Spokes model to the Metro network. The focus has been on providing high frequency routes along key corridors to the central city, supported by local services connecting at suburban hubs. Through smart, careful planning the network will provide excellent coverage of the city (95% of households within 500m of a bus route and 55% within 500m of a high frequency route). Better organisation of the network, the removal of unnecessary duplication and the removal of poorly performing services is anticipated to result in savings of \$2.1million.

Routes included in the review account for 91.9% of the patronage and 90.57% of the kilometres operated in the Greater Christchurch Metro network. Given the scale of the review, extensive consultation was undertaken with the public and key stakeholders. Following the consultation process a number of changes were made to the proposed routes. The new routes will support the design and operation of the new Bus Interchange due to open mid-2015 and sets up Christchurch with a stronger public transport system for the future.

## Introduction

The February 2011 earthquakes had a significant impact on patronage levels of the Greater Christchurch Metro Network. From July 2011 to June 2012 11,221,807 passenger trips were recorded, compared to 17,209,745 from July 2009 to June 2010, representing a decline in patronage of 35% as shown in **Figure 1**. This decline led to an operating deficit of \$5.5 million in the 2011/2012 financial year and a significant drop in Commerciality Ratio through less fare revenue. The Commerciality Ratio indicates what portion of the costs of running a service are recovered from fare revenue and is used to assess network performance as a whole.

**Figure 1 Metro Network Patronage Trend<sup>1</sup>**



A number of changes have already been made to the Greater Christchurch Metro Network to respond to the earthquakes and increase patronage and network efficiency. These changes have taken place over three stages. In 2011, Metro services which had been performing poorly and services which were unable to continue following damage to the roading network were discontinued as part of Stage 1 of the Post-earthquake Metro Redevelopment Project.

In 2012, Stage 2 focused on improving services in the north and south of the city including services in the Waimakariri District. During this stage a reorganisation of services was carried out to introduce a new connected network known as Hubs & Spokes.

Stage 3, which is the focus of this paper, follows on from this, by introducing the new connected model to the remaining parts of the network including the Selwyn District.

## A New Connected Network

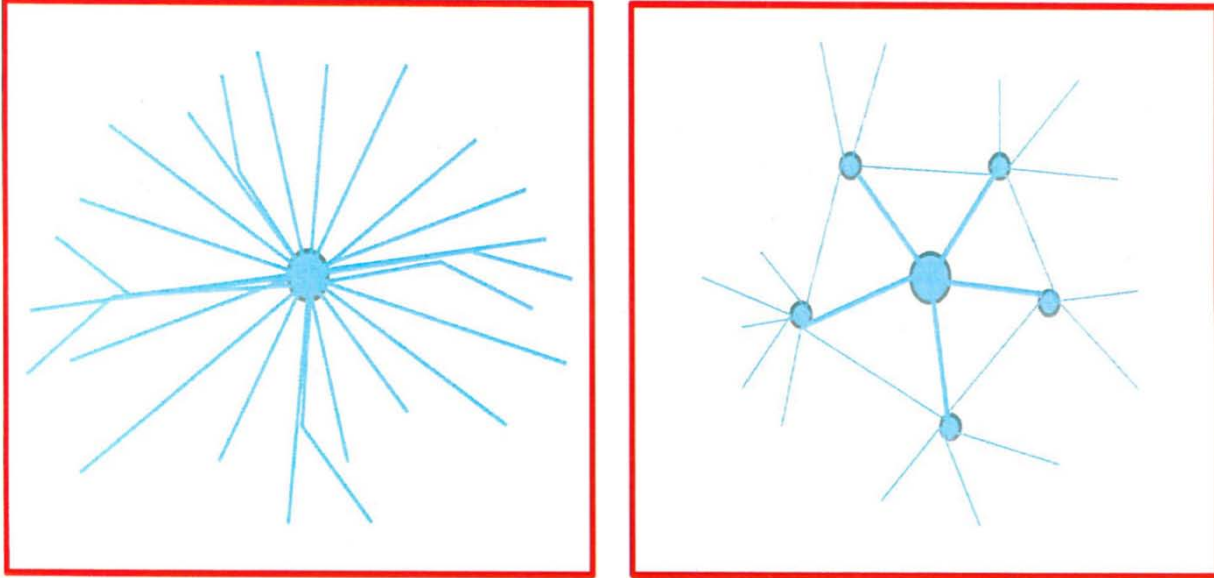
The Hubs & Spokes network focuses on providing high frequency routes along key corridors to the central city. This approach in network planning has been shown to be successful in other comparable cities and has been recognised as best practice for New Zealand cities<sup>2</sup>. These high frequency routes are supported by local services which connect at suburban hubs. It is envisaged that by adopting this model and applying it to the Greater Christchurch Metro Network, it will increase cost effectiveness by removing unnecessary duplication of routes along key corridors whilst continuing to provide excellent coverage of the city and increasing patronage.

<sup>1</sup> Environment Canterbury Regional Council, Metro Monitoring Report June 2014

<sup>2</sup> Mees, P, J Stone, M Imran and G Nielsen (2010) Public transport network planning: a guide to best practice in NZ cities. NZ Transport Agency research report 396. 72pp

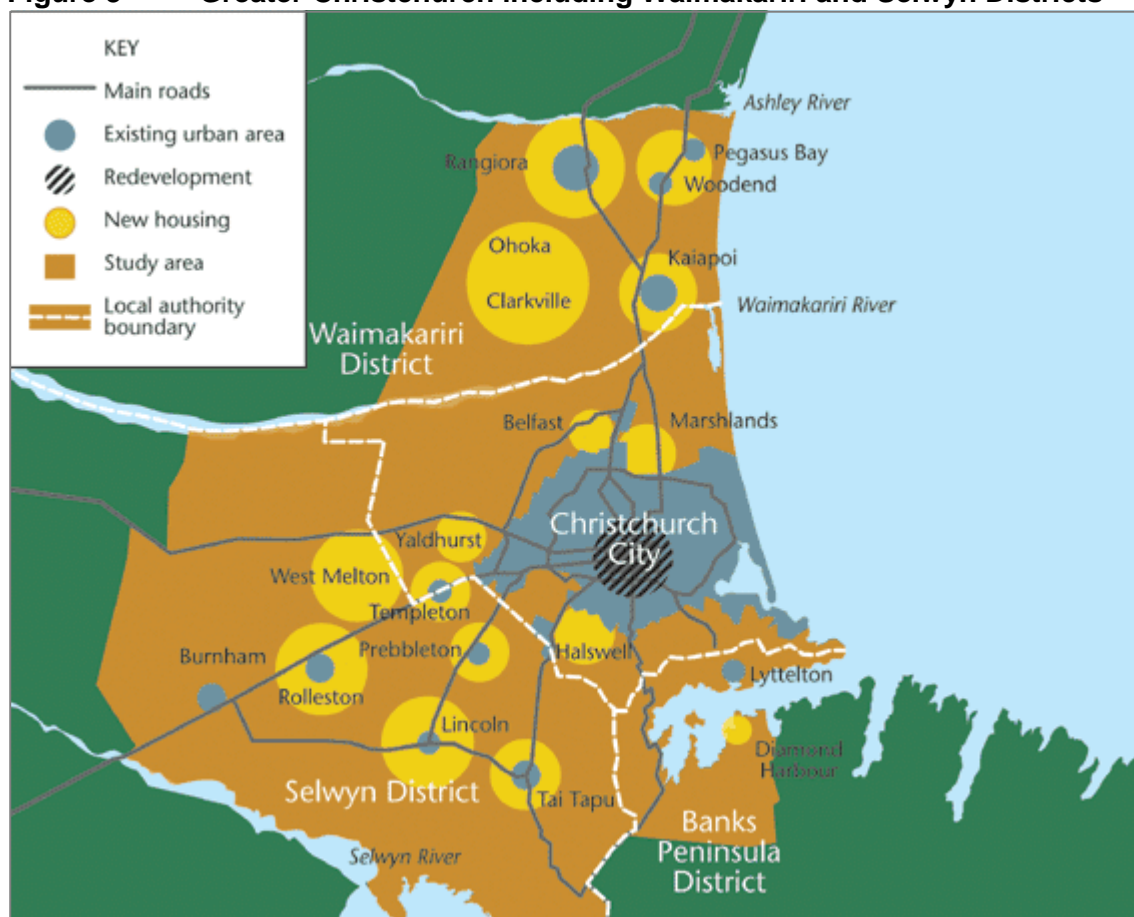
**Figure 2** provides a simplistic illustration of the Greater Christchurch Metro Network prior to the earthquakes (on the left) where virtually all routes travelled through the central city to the Central Station. This meant that there was a large volume of buses travelling through the central city each hour resulting in bus congestion. Following the earthquakes, communities and the public were engaged with in a variety of ways and were encouraged to 'Share an Idea' on how the Central City should be redeveloped. This indicated a strong desire from the public for fewer buses travelling through the city and less bus congestion.

**Figure 2**      **Examples Network Approaches**



Passengers' travel needs have changed dramatically over the last couple of years. The places where people live and work along with the rapid growth of communities in the Selwyn and Waimakariri Districts and new key employment areas located around the periphery of the central city, as shown in **Figure 3**, mean that the pre-earthquake model does not meet the needs of the city.

The Hubs & Spokes model (on the right of Figure 2) better reflects these changes in passengers travel patterns. As well as adapting to passengers' changing travel needs, the route review also took into account changes occurring to the roading network and the requirements of An Accessible City. An Accessible City is a statutory documents which outlines the future transport aspirations of Christchurch as part of the Christchurch Central City Recovery Plan.

**Figure 3 Greater Christchurch including Waimakariri and Selwyn Districts<sup>3</sup>**

## Options Considered

The impact of the earthquakes on patronage and fare recovery of the Greater Christchurch Metro Network meant that changes were necessary to help the system recover and grow. There were two main ways of achieving this;

1. Retaining the original network structure and reducing service levels. This would mean that the majority of routes would continue to travel through the central city but the frequency of services and/or the number of routes would need to be cut, or
2. Through changing the entire network model to make it more cost effective whilst retaining coverage and encouraging patronage growth.

Consideration was given to both of these options, prior to Stages 1 and 2, and it was subsequently agreed to proceed with implementing the new Hubs & Spokes model across the network. All the changes to the network proposed as part of Stage 3 were developed to align with the policies set out in the Regional Public Transport Plan 2012 (RPTP). The RPTP sets out the objectives and policies for the operation of public transport services in the Canterbury Region.

It is envisaged that the changes proposed will form a base network which is extensible, in coverage and frequency, in years to come as the city rebuilds and the CBD is redeveloped. The new network could also be developed to cater for different modes, such as light rail, as the population grows and patronage increases.

<sup>3</sup> Greater Christchurch Urban Development Strategy;  
<http://www.greaterchristchurch.org.nz/Background/Options/BusinessAsUsual/index.aspx#>

## Consultation

The routes included in the Stage 3 review accounted for 91.9% of the patronage and 90.57% of the vehicle kilometres operated in the Greater Christchurch Metro Network (as of March 2014). Given the scale of the proposed changes and in accordance with the requirements of the Local Government Act 2002, extensive public consultation was carried out and where possible changes were made to ensure the proposed services better suited the needs of the travelling public. Those likely to be most affected by the proposed changes were considered to be both the current and potential customers using Metro bus services.

Other affected parties were also engaged included the existing bus and ferry operators, affected territorial authorities, the New Zealand Transport Agency and other stakeholder groups (such as disability advocate groups and the Public Transport Advisory Group). As well as sharing their views directly with the consultation team, a number of these parties also made submissions as part of the public consultation process.

The public consultation phase ran from 2 May to 16 June 2014. Over 2,300 submissions were received during the consultation period and a total of 596 signatures from five petitions were also received.

The level of public feedback in response to the changes was one of the largest Environment Canterbury Regional Council (ECan), who manage and operate the Metro Network, has ever received for any route review, indicating a significant level of engagement from the local community. There was a high level of general awareness amongst the public regarding the proposed changes as a result of;

- The distribution of the consultation material to all households in the Greater Christchurch area, which contained a map of the proposed network, a feedback form and details of where to find further information
- Eight drop-in sessions which were run in various locations throughout Christchurch and Lincoln allowing the public to attend and ask questions about the proposals, seek clarification on the changes and informally give their feedback
- Meetings with a number of community groups who had specific concerns regarding the proposals including the Bus Users Group, Southshore Residents' Association and Mt Pleasant Community Group. These sessions were all well attended by members of the public
- Presentations were given to all of the Community Boards at the start of the consultation phase outlining the changes relating to each ward area along with an overview of the changes across the network. Mid-way through the consultation phase, the Community Boards were also provided with updates of the key issues arising from the feedback specific to their ward areas
- Four focus groups were also carried out which allowed for specific issues arising from the consultation feedback to be discussed in more detail with both bus users and non-bus users.

People had the option of providing feedback either online or via the feedback form on the consultation document. The majority of submissions were via the online feedback form (1,199 submissions) on the Metro website which included a number of set questions. The remainder of the feedback (1,157 submissions), were written submissions mainly from the feedback form included in the consultation document but also through emails.

Analysis of the feedback indicated that 44% (1,037 submissions) were not in support of the proposed changes. The number of people who indicated that they did not support the proposal

was higher than desirable, but many submitters provided feedback on specific concerns related to individual routes. Out of the issues raised by submitters who did not support the proposed changes, approximately 40% (415 submissions) were resolved through further changes to some of the proposed routes.

The feedback showed that there was general support for;

- the five high frequency routes proposed to run across the city every 10 – 15 minutes
- having the high frequency routes travel more direct routes to the central city, and
- the clear and easy to understand map highlighting the high frequency routes and the suburban interchanges.

There was also significant support for the existing bike racks which are already fitted on the majority of buses. This further highlights the role of public transport as part of the integrated transport network in Christchurch. As part of the new Metro Network it was proposed that all vehicles operating on the new routes would be fitted with bike racks, meaning that all buses on all routes are fitted with bike racks.

A significant proportion of submissions, approximately 15% (367 submissions), also referred to the need for good quality infrastructure at the suburban hubs where the majority of connections between high frequency and local routes will occur. The main locations where people identified a need for improved infrastructure included;

- Westfield Riccarton Mall
- New Brighton
- The Palms Mall
- Barrington Mall

Approximately 8% (194 submissions) referred to the need for bus priority measures and were concerned that without these measures the benefits of the high frequency routes would not be fully realised due to congestion. The main locations identified by submitters requiring bus priority lanes included;

- Riccarton Road
- Colombo Street
- Papanui Road
- Clarence Street / Whiteleigh Avenue

The Stage 3 review focused on the core network which comprises the five high frequency routes including:

- Blue Line (Rangiora – Cashmere)
- Orbiter
- Purple Line (Airport / Sheffield Crescent to Sumner)
- Yellow Line (New Brighton to Rolleston)

- Orange Line (Halswell to Queenspark)

The review also looked at the branding of these routes to help promote and distinguish them as the high frequency routes, making the network easier to use for passengers. While the route branding was not part of the consultation, a lot of positive feedback was received regarding the existing branded routes which include the Blue Line and Orbiter. The Purple, Yellow and Orange Lines were introduced to complete the 'family' of high frequency routes as shown in **Figure 4** below.

**Figure 4 The Metro Lines**



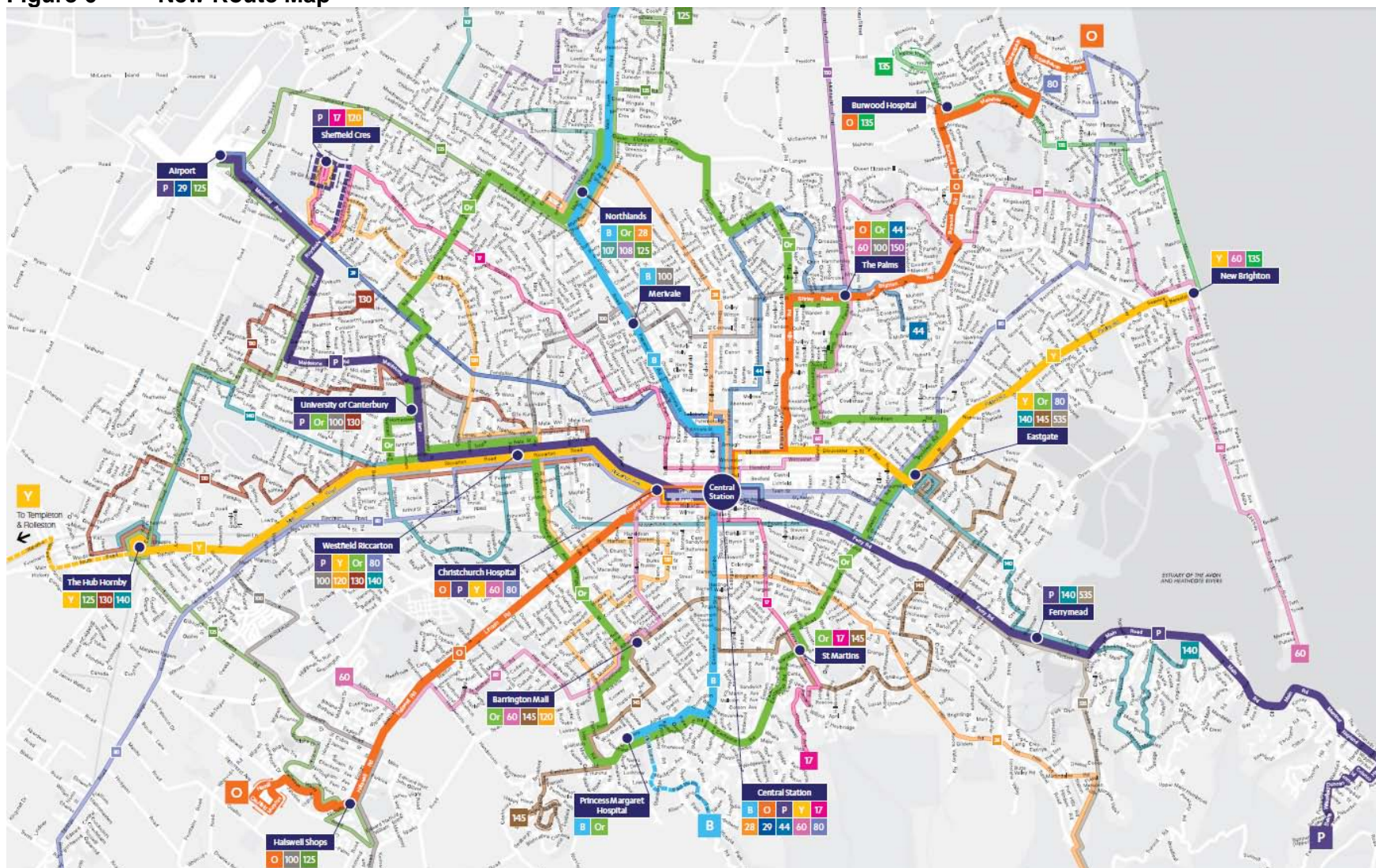
The high frequency routes are supported by a small number of connector services which still travel to the city but less frequently, and a number of local routes which link to these services at key hubs. **Figure 5** is a simplistic illustration of the new Hubs & Spokes model and shows the five high frequency core routes, four of which travel through the city and the Orbiter which travels around the city. The overall Metro network map is shown in **Figure 6** and demonstrates how the Hubs & Spokes model translates to the Christchurch area.

**Figure 5 New High Frequency Core Routes**





**Figure 6**      **New Route Map<sup>4</sup>**



<sup>4</sup> Metro Network Map; <http://www.metroinfo.co.nz/map/>



## Key Issues

Given the scale of the review and the number of changes to the network, there were numerous concerns raised by the public. Some of the key challenges encountered during the public consultation and the steps taken to resolve or mitigate these issues are summarised below;

### **Metrostar**

The Metrostar was one of the existing branded routes on the network and it was proposed to be discontinued as part of the changes. However, the route section between the major suburban malls of Westfield Riccarton and The Palms was to be retained, although under a different route number, as this section was quite strong in terms of patronage numbers. The feedback indicated that there was a lot of confusion in relation to this, as a lot of people did not initially realise that a significant part of the route would actually be retained.

It was considered inappropriate for the 'Metrostar' brand to be retained for the new route as it was considerably different to the original Metrostar route. Furthermore, only the high frequency routes would be branded and as the Metrostar is not part of the high frequency routes it should therefore be a numbered route. As the brand 'Metrostar' was to be discontinued, it was assumed by many that this meant the entire route would also be discontinued. Further clarification on this was needed in the online consultation material and once this was made clearer, it alleviated a significant number of concerns people had raised.

The 'Metrostar' had provided a link from the Halswell area to the College of Education, University of Canterbury and Church Corner where there are a number high schools. Strong feedback was received in relation to this and consequently the proposed replacement route was amended to include these areas.

### **Orange Line**

As part of the route planning process, the high frequency routes were amended so that they would travel on the most direct routes to/from the central city. Route 7 was an existing high frequency route but was proposed to be altered slightly and rebranded as the Orange Line. Route 7 previously travelled quite a convoluted route through the residential area of Halswell. Consequently, its replacement, the Orange Line, was taken out of the residential area onto Halswell Road as it is a more direct route.

Many submitters expressed concern over the loss of the route through the residential area. As a result of the feedback, one of the connector services was extended to provide coverage in this area and also retain a link for residents to the central city. The connector route still provided a frequent service during the peak hours and allowed for the high frequency Orange Line to take the direct route to the city along Halswell Road as proposed.

### **Route 60**

The proposal to change Route 60 from Worcester Street to Hereford Street caused a strong response mainly due to the location of Aspire Canterbury, which is an organisation that provides services to people with disabilities, on Worcester Street. The change was proposed primarily due to alterations in the roading network as a result of An Accessible City which would limit the traffic movements at the Fitzgerald Avenue / Worcester Street intersection and Christchurch City Council's plans to run a major cycleway along Worcester Street with public transport and cycle routes separated by being on adjacent streets. The proposed route along Hereford Street also provided a more direct route for the service through to the Bus Interchange.

Extensive consultation was carried out with all key stakeholders regarding concerns over access to the route for mobility impaired people visiting Aspire Canterbury. Alternative routing options were investigated and changes to the intersection layout were also considered. Eventually an access from the rear of the Aspire Canterbury property to Hereford Street across a parcel of land was considered the most appropriate solution. While the preferred option for Aspire Canterbury was for

the route to remain on Worcester Street, this proposed option was acceptable to them as it continues to enable convenient and direct access to their premises for visitors and staff who travel by public transport.

### **Route 151**

This route was a new route proposed as a result of feedback previously received from the Southshore Residents' Association and was proposed to run between Southshore and New Brighton. As this would be quite a short route, it was envisaged that it could be operated using a smaller shuttle vehicle which would help to alleviate the concerns of residents in Southshore who were worried about the existing large buses causing vibrations to their houses as a result of the changes in the surrounding land following the earthquakes.

The existing route which served Southshore, provided a high frequency service to the central city. If the shuttle service were to be introduced as proposed, this would have meant that all passengers would have to transfer onto other services at New Brighton as the shuttle would be insufficient to continue any further picking up passengers.

Meetings with the local community were held during the consultation period and it became clear that while a significant proportion of the community were concerned about the vibrations to houses caused by buses and heavy vehicles, equally there were a large number of residents who did not want a shuttle service or to lose the connection to the city. This was ultimately an issue which had to be decided by the community.

The feedback from the community during consultation indicated that the majority of residents wished to maintain the link to the central city. Consequently, it was proposed to extend one of the connector services from New Brighton to Southshore which maintained a direct link to the central city from this area.

### **Route 535**

Route 535 (Lyttelton – Eastgate) was proposed to be discontinued due to low patronage numbers. A considerable level of feedback was received during the consultation period, including a petition, requesting the service be retained. The loss of the BNZ bank in Lyttelton coincided with the public consultation. This was mentioned by many submitters who noted that there would be an increased reliance on services in Ferrymead where the next nearest bank and large supermarket would be located for Lyttelton residents. This emphasised the importance of maintaining community connections that form an integral part of the community and social life, while enabling economic activity and which need to be supported with appropriate bus services. Following consideration of the feedback received it was proposed to retain Route 535 at a reduced frequency.

## **Financial Implications**

Environment Canterbury Regional Council is responsible for the planning, funding and implementation of public transport in Greater Christchurch. Their co-funder of services Central Government (New Zealand Transport Agency) has an expectation that public transport services should recover 50% of their costs from fare revenue by 2017/18. Prior to the earthquakes in 2009/10, the cost recovery rate (previous measure of Commerciality Ratio) in Christchurch was 44.8% but this fell to 30% following the quakes. In June 2014, the Commerciality Ratio of Christchurch services was 40.2%. This is a steady increase from 34.7% in June 2013 and 30.9% in June 2012 before the services were changed as part of the Stage 2 Post Earthquake Redevelopment Project.

Total patronage in June 2014 was 1,191,981 which was a 23.6% increase on June 2012 before the network changed. The north/south services showed an 18.4% increase in patronage for the same period. Although this growth is slightly less than the overall network, it is still a positive trend considering the Stage 2 changes meant a 5% reduction in peak buses and a 6% reduction in kilometres across the network contributing to an overall saving of \$1.8 million.

The total budget for Greater Christchurch Passenger Services contracts 2014/15 is \$52,733,104. This budget includes provision for a \$650K half year saving based on preliminary data (as service changes commenced December 8).

The total saving for the implementation of Stage 3, based on final schedules, is approximately \$2.1 million per annum dependant on the final outcome of negotiation with the operators. These savings were achieved through the better organisation of the network, the removal of duplication on certain routes and the discontinuing of services which have low patronage numbers and very low cost recovery rates making them uneconomical to run.

As a result of the projected savings, contract expenditure for 2014/15 was forecast to be \$52,333,104, a further saving of \$400K above that budgeted. This amount was as a result of the changes proposed and makes no allowance for cost indexation increase due to increased fuel, labour, road user costs etc.

Once bus priority measures are fully introduced on key routes affected by the changes it is expected that further savings of approximately \$1.1 million per annum will be realised by reducing travel times and consequent operating costs.

Patronage for the 2012/2013 financial year (July – June) was 13,317,293 million trips – an 18.67% increase in patronage relative to the year before. The commerciality ratio for the year was 36.98%. Patronage for the 2013/14 financial year was 14,085,265 – a further 5.77% increase on the previous year. The commerciality ratio was 40.85%. Whilst these figures indicate growth, the implementation of the Stage 3 changes are required to continue this trend in improved patronage and farebox revenue by adapting the network to the changing travel needs of passengers.

In terms of accessibility, the new network model delivers an excellent level of coverage, with 95% of households within a 500m catchment area of a bus route and 55% within a 500m catchment of a high frequency route. It also provides access to new and emerging destinations, however it requires fewer buses to deliver services, travelling fewer overall kilometres.

The final changes resulted in savings of 1,409,727 'in-service' kilometres per annum until the new bus interchange opens at the end of May 2015. Once the new Bus Interchange is operating, the savings will be reduced to 848,384 'in-service' kilometres per annum and 8 fewer peak buses will be required than is currently the case. While the 'in-service' kilometre savings will be reduced once routes begin to travel through the new Bus Interchange, bus movements through the core of the city will be kept to a minimum ensuring minimal delay to buses.

## RISK ASSESSMENT

While the new connected network provides positive benefits for passengers by focusing on the delivery of easily identified high frequency services along key corridors supported by local services which connect at suburban hubs, the extensive changes presented some risks:

- The revised network relies upon five high frequency core routes which dissect the city. To connect with these core routes, more passengers need to change buses at suburban interchanges which could potentially result in a loss in suburban patronage. A comprehensive marketing campaign was launched to highlight the benefits of the high frequency routes in a bid to offset this and the risk will be further mitigated by providing timed connections at hubs and by providing good quality suburban interchange facilities.
- A higher loss of users is more likely if suitable infrastructure is not able to be provided by territorial authorities at the interchange locations in a timely manner. Given the tight timeframes from consultation through to implementation of the new network, all the necessary infrastructure was not in place when the new routes were implemented. While the success of Stage 3 is not dependant on the infrastructure being in place, the gains to be

realised may be compromised if the necessary interchange infrastructure, such as passenger waiting lounges and Superstops, are not in place at the suburban hubs.

- The reliability of connections in the new model is very important. Due to congestion on city streets and lack of bus priority measures, there's a significant risk that these connections may not always be reliable.
- There is a risk that cost savings made by these (or any other) changes may not be fully realised because of increases in operating costs such as fuel or Road User Charges.
- Although the final proposals were amended to try to respond to public feedback, there was still the potential for negative public responses to some of the changes, particularly where services were being removed. Clear public messaging explaining why these low performing services were being discontinued helped to mitigate any adverse reaction to the changes.

The final changes were implemented on 8 December 2014. The reasons for implementing the changes to the network on one date rather than having a staged implementation are as follows:

- The new network is an integrated network and relies on all revised services being introduced at the same time so that customers can make connections to services to travel across the city as required.
- It is easier for passengers to understand that all changes are being made on one date rather than having to keep track of different dates that changes will be made to different routes.
- It allows for a more effective use of resources e.g. time, personnel, costs etc. to run a significant promotional campaign for one date rather than spreading this over time for staged implementation.
- Implementing changes over a period of time may lead to a perception by the public that services are continually changing, making all changes on one date helps to avoid this.
- It provides sufficient time for passengers to get familiar with the new routes prior to the new Central Bus Interchange becoming operational.
- Implementing the changes in December when this is a quieter time of the year on the bus network allows passengers to become familiar with the new routes prior to the holiday period. Having any changes commence in January is typically avoided as a lot of people are away during the holiday period meaning they may not be aware of the changes when they first return.

Prior to the implementation of the route changes, a significant public information campaign was run to inform the public of the changes and highlight how the connections between services were designed to be as easy as possible for passengers. A direct mailer with the new Metro Network map was posted to all households, staff were placed at key locations handing out new timetables and there on the implementation date to assist passengers in making their connections. The website and journey planner were also important parts of ensuring people received the information they needed to make their journey. Metro staff and bus drivers were educated so they were adequately prepared to assist and provide advice to passengers on how the services and connections will work.

## CONCLUSION

Extensive consultation was carried out during the development and planning of the Stage 3 routes and significant changes were made as a result of the feedback received. The Stage 3 changes will



build on the work already carried out in redeveloping the network during Stages 1 and 2, completing the implementation of the new connected network of Hubs & Spokes.

Some of the key learnings from the development, planning and consultation of the Stage 3 routes have been;

- To avoid confusion or uncertainty to customers, clear and simple messaging of the changes proposed is vital. While this can be difficult when there is a vast amount of information to publicise, the easy to read maps were very successful in giving customers a broad understanding of the changes proposed. For further and more detailed information, customers could then contact the Metro team or go online for specific information which many people found helpful.
- Some issues may ultimately be down to the community to resolve. Bringing the community together to discuss and debate those issues may be required to determine the best outcome for both individuals and the community as a whole.

The third and final stage of changes to the Greater Christchurch Metro Network will encourage higher patronage growth by providing a simple and attractive frequent network, which reduces duplication and better supports the recovery of the city by adapting to passengers changing travel needs while maintaining excellent coverage. By reducing duplication of routes the changes will increase the financial viability of the network and will assist in achieving NZTA's commerciality ratio target of 50% by 2017/18.

## **Acknowledgements**

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