

DELIVERING AN ACCESSIBLE CITY

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ABSTRACT

Following the Canterbury earthquakes of 2010 and 2011, the Christchurch Central Recovery Plan (Recovery Plan) was created as a Blueprint for the city, with a number of Anchor Projects designed to catalyse the economic recovery and social well-being of central Christchurch. 'An Accessible City' (AAC) is the transport chapter of the Recovery Plan prepared by the Canterbury Earthquake Recovery Authority (CERA) in partnership principally with the Christchurch City Council, Environment Canterbury, Te Runanga o Ngai Tahu and the New Zealand Transport Agency. It aims to create the transport system for a vibrant new central city through the delivery of increased, resilient travel choices for the new central city that will accommodate projected population and employment growth, while maintaining efficient access for general traffic.

AAC has been informed by international examples of cities that have set out to deliver more "people friendly", balanced transport systems - a key theme of early community feedback received after the earthquakes. The successful delivery of AAC is critical to supporting the recovery and growth of commercial and residential development both within the central city and citywide. This paper explores the sometimes difficult balances that traffic and transport engineers, planners and urban designers have faced in responding to this 'once in a lifetime' opportunity.

BACKGROUND

A destructive 7.1 magnitude earthquake struck Christchurch in the early hours of Saturday September 4th 2010. Despite the magnitude of the earthquake, there were no fatalities and few serious injuries. The event was declared a 'state of local emergency' that remained in place for approximately 3 weeks. The city and surrounding residential and employment areas of the Greater Christchurch area were making good progress into the recovery phase, when a second, more violent and much more damaging earthquake occurred in the middle of the working day on 22 February 2011. A state of national emergency was declared to respond to the devastation. An unsettling sequence of aftershocks continued throughout 2011 and 2012.

INTRODUCTION

Planning for the new central city – The Recovery Plan

Following the February 2011 declaration of a national state of emergency, the New Zealand Government passed the Canterbury Earthquake Recovery Act. This Act established CERA and with it, the responsibility to develop a Greater Christchurch Earthquake Recovery Strategy.

In April 2011 the Canterbury Earthquake Recovery Act gave the Council the role of developing a draft Central City Recovery Plan as part of the Greater Christchurch Earthquake Recovery Strategy. The Draft Plan was to be prepared for the Minister for Earthquake Recovery by the close of 2011, and was to set out how the Christchurch community – businesses, property owners, organisations, residents, and community groups wished the central city to recover. The resulting draft Recovery Plan contained an ambitious programme of projects that would seek to attract private sector investment into the reconstructed central city.

Experts and community leaders from around the globe shared with the Council a common theme of international experience, that community-led recovery and a *shared vision* often delivers the best overall outcomes. Consequently *Share an Idea* was a public engagement campaign aimed at maximising community and stakeholder involvement in the redevelopment of the central city. *Share an Idea* asked residents, businesses and community leaders to think about the central city for today's residents and, just as importantly, future generations. *Share an Idea* energised the community, with a total of 106,000 ideas received - a level of community involvement that had never been seen before in New Zealand. *Share an Idea* later earned the Council an international award as a new model for public engagement.

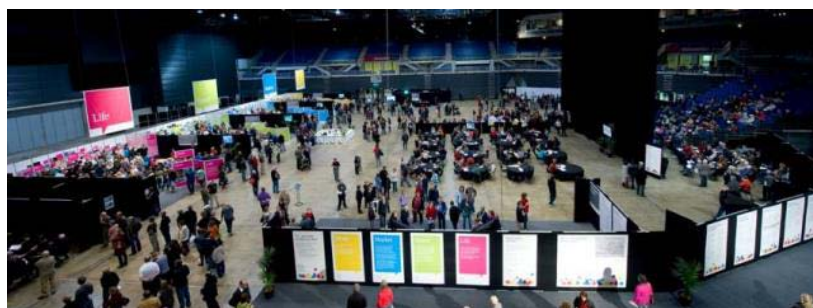


Figure 1 The Community Expo for Share An Idea held in 2011

For matters specifically affecting transport and travel choice (one of a number of key themes of *Share an Idea* feedback), people wanted:

- green spaces and more street trees;
- a people and pedestrian friendly central city; and
- less cars, traffic, concrete and buses.

Importantly from the transport viewpoint, as the community asked, the Draft Plan envisaged the central city as a safe, attractive *people friendly* place, with priority given much more to pedestrians than in the past, and with the *place* function of streets recognised much more as important public realm - and with workers and visitors encouraged to choose travel increasingly by public transport and cycle.

THE CHRISTCHURCH CENTRAL RECOVERY PLAN

Principles and key proposals

The Government responded to the publication of the Draft Recovery Plan in April 2012, establishing a new Central Christchurch Development Unit (CCDU) within CERA. In July 2012 CCDU published a Christchurch Central Recovery Plan (the Recovery Plan). This represented the New Zealand Government's commitment to the rebirth of the city as one of the most ambitious projects in New Zealand's history.

A number of the key themes and principles of the Council's earlier draft Plan were captured in the new Recovery Plan, which contained a number of Anchor Projects across the central city, many of which were located within a new green Frame around the heart of the central city, comprised of the Avon River precinct itself, partnered by three new green "frames" to the north, east and south. Figure 2 shows an artist's impression of the proposed Avon River Promenade from the original Draft Plan.



Figure 2 – Artist's Impression of the new Avon River Promenade from the Draft Central City Plan (Christchurch City Council, December 2011)

Defining a new central city "Core", and providing new green space and a range of commercial and residential development opportunities, the Frame aims to reshape central Christchurch. Compressing the available area in this way addresses the issues of too much space and potentially unconstrained development, while also adding high quality urban open space to the centre to catalyse investment, growth and social energy, bringing people back into the central city. The Anchor Projects and precincts are shown in Figure 3.

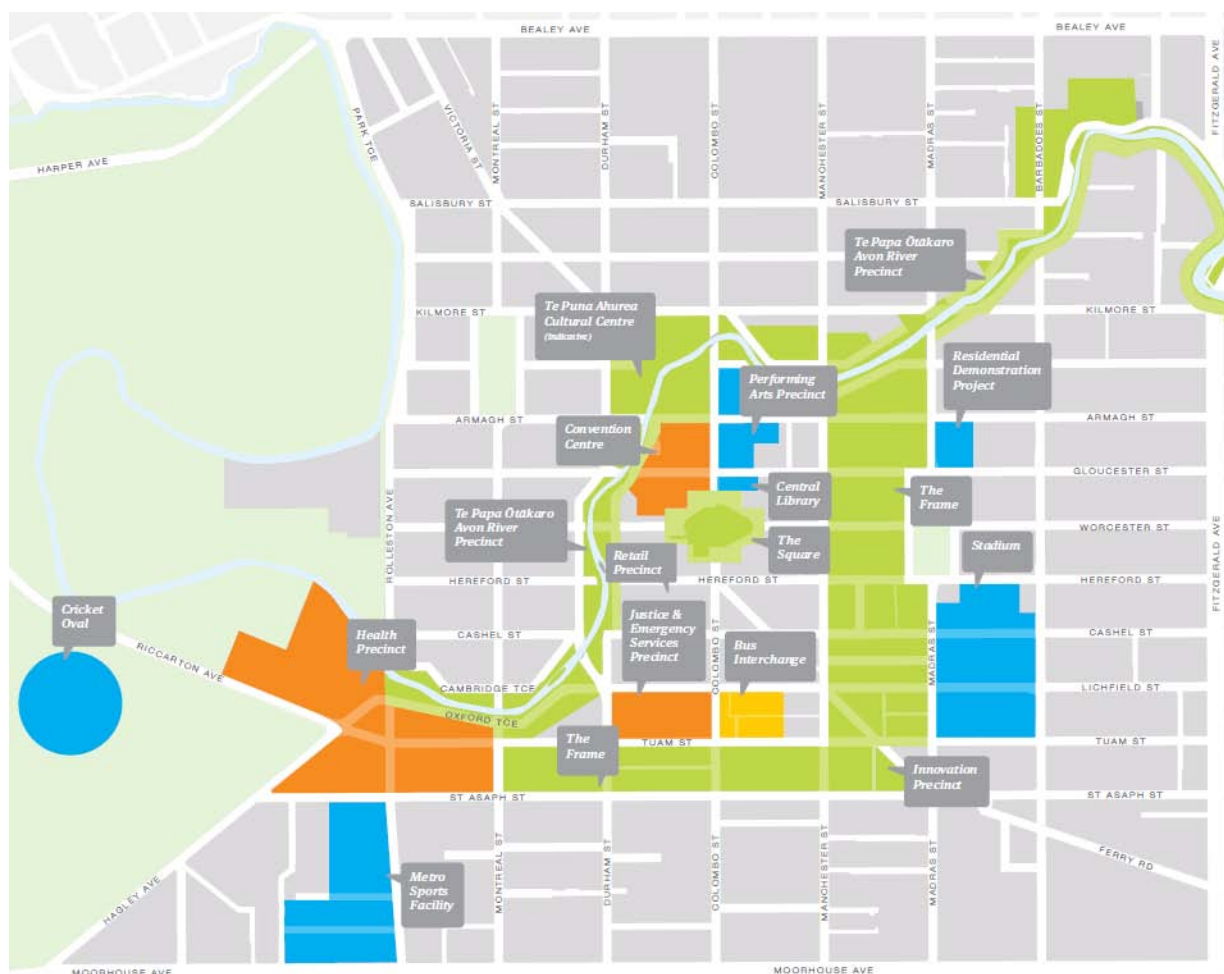


Figure 3 The Recovery Plan showing proposed Anchor Projects and Precincts

The *Recovery Plan*'s projects aim to respect the community's feedback from *Share An Idea*. Over time, more people are expected to live in the central city, creating new neighbourhoods and adding to the vibrancy of the area – a key feature influencing planning for new journey patterns and travel choices to and within the re-shaped central city.

The *Recovery Plan*'s Anchor Projects and precincts are being developed in partnership with a number of agencies and stakeholders, including central government, Council, Te Runanga o Ngai Tahu, the private sector and the community. The total value of the recovery proposals is in the order of \$5.4 billion.

The transport chapter

Other than the proposal for a new Transport Interchange, the *Recovery Plan* itself only contained outline concepts for a new transport system to service the new Anchor Projects and the expected growth in central city employment places, residents and visitors. A Transport Chapter was therefore to be prepared to support the *Recovery Plan*. The new Transport Chapter's role was to respond to and enable the key precincts and Anchor Projects to function, be easily accessed by a mix of modes and be linked both together and to the rest of the city and sub-region.

In August 2012 the CCDU invited the Council, Environment Canterbury and the NZ Transport Agency to assist them with preparing the draft Transport Chapter for the new *Recovery Plan*. The draft transport chapter was titled *An Accessible City* – and

following community and stakeholder engagement in late 2012 / early 2013, *An Accessible City* was gazetted in October 2013.

AN ACCESSIBLE CITY – KEY PLANNING PRINCIPLES

Traffic impacts and travel mode share

Before the earthquakes, central Christchurch provided over 20 percent of the jobs within the greater Christchurch area, resulting in around 350,000 trips per day to, from and within the central city. Accommodating increased trip making, as would be expected with the range of new land uses, Anchor Projects, precincts and activities promoted by the Recovery Plan, required some early assessments to be made of the increased trip making pressures likely as a consequence. The combined proposals were for an estimated 30% increase on pre-earthquakes employment places, a 120% increase in residential population (from around 8000 to nearly 20,000 households), and other increases in leisure activity trips. These increased activity levels are shown in summary in Figure 4 - the vertical axis being the number of people as per the Urban Development Strategy (UDS).

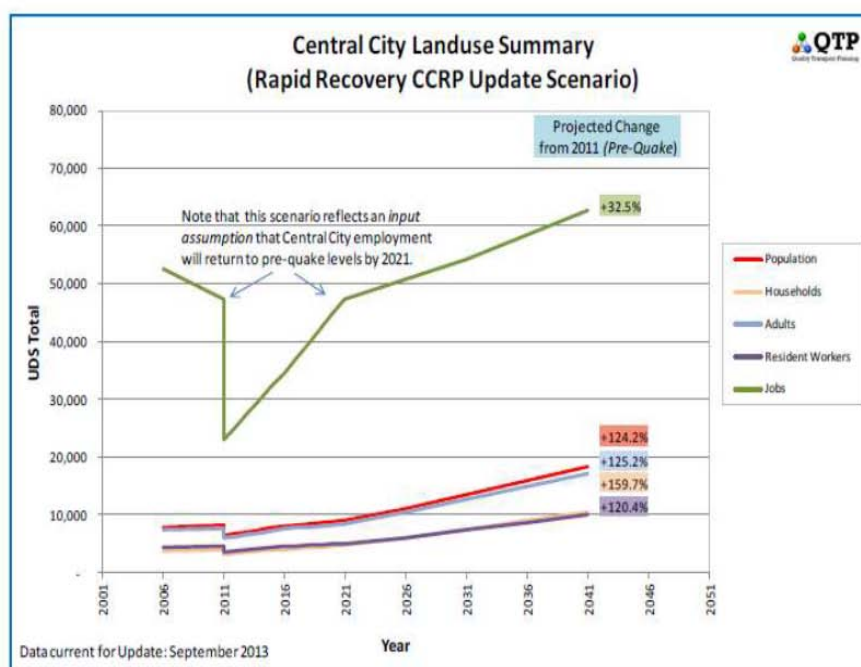


Figure 4 – Forecast activity levels in the new central city by 2041 (CERA)

Traffic modelling of the expected effects of these land use changes was undertaken to various horizon years – primarily 2031 and then 2041. Figure 5 shows the quantum effects of these increased activity levels on likely total central city trip making at the horizon year of 2041. The twin graphs on the left show that a *business as usual* approach to mode share (i.e. the majority of trips continuing to be shared across the modes largely as pre-earthquake and therefore with the majority remaining in single vehicles) would likely result in an extra 70,000 trips a day on central city roads. However, the twin graphs on the right show that, by attempting to accommodate the extra daily trips created by the Recovery Plan's development proposals largely by non-car modes (cycling, public transport and walking), the likely increased congestion effects of the extra trip making could be adequately accommodated without debilitating congestion effects.

Traffic modelling AAC has therefore projected a target increase in cycling and public transport usage of a tripling in these modes by 2041 compared with their pre-

earthquake levels. A challenging and stretching target, but in comparison with other cities worldwide, not viewed as unrealistic if there was to be a positive supporting programme of infrastructure delivery and awareness campaigns to support the uptake of those alternative travel modes.

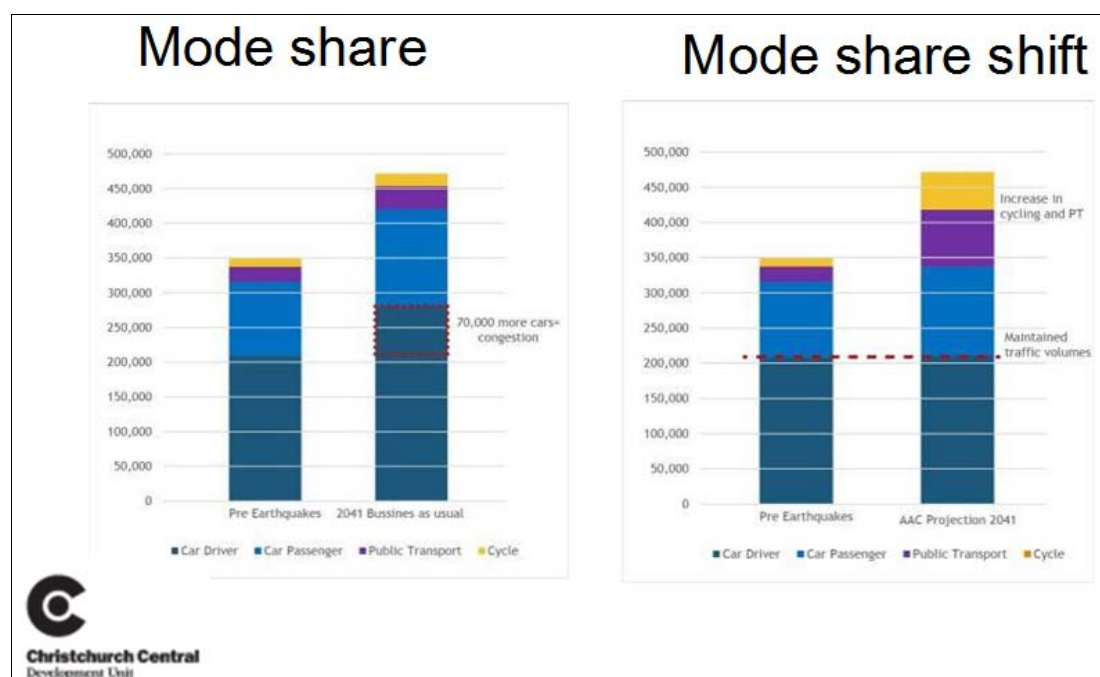


Figure 5 – Trip making impacts of the Recovery Plan – alternative mode share scenarios

A new road user hierarchy

The objective was therefore to improve transport *choice* – so that the new central city would function without unacceptable congestion. The new transport system should be accessible to all and offer increased choice of cycling and public transport for journeys to and from the central city, plus offer increased walking amenity within it. As a result, a new road user hierarchy featured in the planning of the new AAC transport network from the outset. The AAC road user hierarchy (Figure 6) was grounded in the reality that most Christchurch central city streets are only 20.1m wide (one chain in the old imperial measurement system). There will be plenty of competition for this street space as shown in Figure 7, with a typical two way street cross section needing to accommodate:

- Vehicles (with a desirable minimum lane width for access and network resilience / flexibility) of 3.25m. Total space allocation circa 6.5m
- Footpaths. Mostly pre-existing in the central city at 3m. Total space allocation circa 6m
- Parking lanes / street trees / landscaping kerb extensions – 2.5m on each side



Figure 6. The AAC road user hierarchy

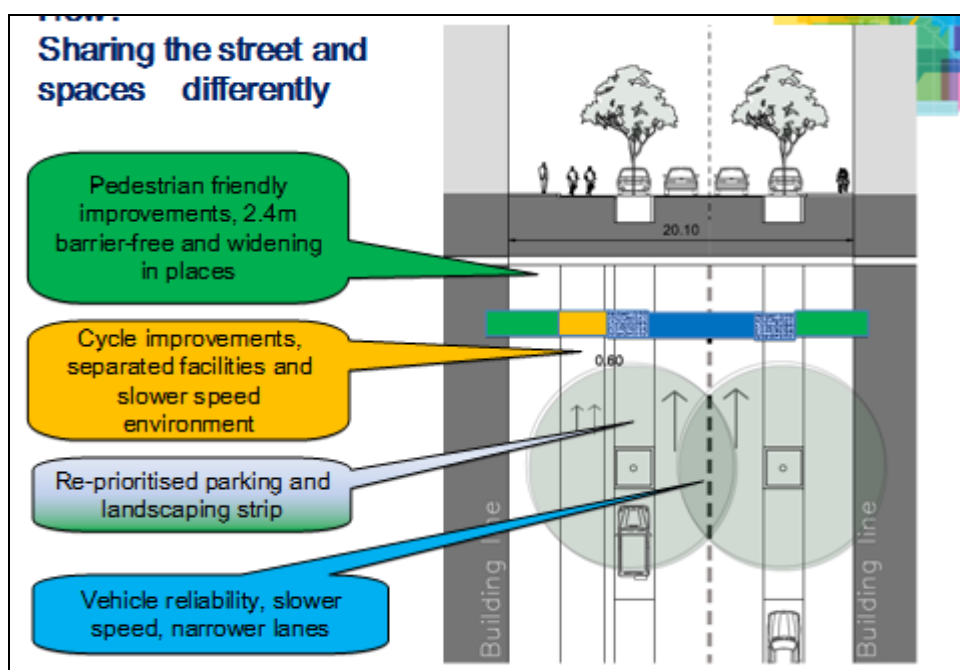


Figure 7. A typical street cross section – the competition for space

With the above space needs largely as “givens” and taking account of some 15 metres of a typical total width of some 20 metres, it was clear that difficult decisions would be required over how best to apportion the limited remaining space of only some 5 metres or so on most streets. Choices over deployment of the remaining space were required therefore to best serve the competing demands of:

- Optional parking lane retention on both sides of any street (shared with some street trees / kerb extensions/ landscaping) – requiring typically 2.5m;
- A desire to incorporate more physically separated cycleways (typically a 2.5m wide cycleway with a physical margin from traffic of 0.6 to 0.8m) – therefore requiring typically 3.1 to 3.3m overall;
- Further widening of existing footpaths for improved pedestrian amenity at locations with high projected footfall – requiring typically some 1m to 2m extra on an individual footpath;
- Widened vehicle lanes to accommodate bus lanes on some streets – around an extra 0.5m per lane and / or for routes with higher levels of servicing and freight vehicles.

For the above reasons, the Road User Hierarchy (Figure 6) was prepared early in the preparation of the draft AAC and was the subject of public consultation. This proposed network priority uses for groups of streets in the central city, informed in turn by:

- the detailed safety and amenity needs of those individual modes and the envisaged place function of those streets,
- their speed regime, and
- the relative network needs and projected flows of general traffic, freight, buses, cyclists and pedestrians.

These elements were the key building blocks for AAC - and planning for the needs of individual road user groups, placemaking and the design of individual streets progressed from there.

Planning for the needs of pedestrians

At the heart of AAC's plans for a new approach to meeting people's travel needs in the new central city, is delivering the community's desire for a more "people friendly" city. There was also a desire to learn from international experience of recent years which has increasingly focussed on the "placemaking" potential of streets. Key international examples of emerging practice were studied, such as New York's experiences with remodelling Times Square, *"Measuring the Street"* (NYC Department of Transportation, 2012), the UK's *Manual for Streets – Volumes One and Two* (UK Department for Transport / CIHT, 2007/10) and Auckland Council's implementation of a number of shared space streets in the CBD area, including Fort Street (Auckland Council, 2012).

Each of these examples, as well as many others across the world, have typically demonstrated the benefits of emphasising the place functionality of streets over traditional planning, which is focussed often on movement needs. Calming streets where possible, both in traffic volume and speed terms, and designing some streets as shared spaces, were all seen to have merits in supporting the Recovery Plan's principle of creating a more people friendly, attractive and prosperous central city. Evidence from those examples and others demonstrated that key benefits of such approaches have included improved safety for all with a predictable popularity with pedestrians and cyclists; but perhaps more surprisingly, with courier drivers as well when streetscapes are designed well. The key benefit for the new central Christchurch however was seen to be the emerging evidence that less vehicle dominated streets are found to have an increased footfall, resulting in improved retail and hospitality turnover - and thus, the potential for enhanced property and rental values.

AAC has therefore sought to reflect this changed thinking in what may be the country's largest low speed (maximum of 30km/h) zone, and with proposals for a

number of shared space streets, especially in the vicinity of the new Avon River and Retail Precincts.

Another key theme of AAC has been to make a significant improvement in achieving a *universal design* approach, providing access for all central city pedestrians – especially helpful to those with mobility impairments. The rebuild of central Christchurch offers an unparalleled opportunity to create a barrier free environment for all pedestrians. This does however pose delivery and design challenges, especially in shared space environments, so Council and CERA staff are working hard with local mobility advisers to achieve legible, continuous networks with barrier free transitions into new central city developments and anchor project destinations.



Figure 8 More shared space, low speed streets are planned for the central city – as here in Cashel Mall



Figure 9. AAC plans to deliver a more legible, barrier free environment that is accessible by everyone

Planning for the needs of cyclists

From early on in the development of AAC, and in order to make the new central city far more attractive for cycling, there was seen to be a need to introduce many more cycle lanes and paths across the central city that are physically separated from vehicle traffic. The AAC team learnt from the experience of the Gehl partnership who had close knowledge of the development of a network of separated cycle facilities in Copenhagen, and from Roger Geller, the Cycling Coordinator from Portland, USA, (Geller, 2009), who identified four types of cyclist to plan networks around. The draft AAC therefore contained proposals for a network of separated facilities across the central city focussed on key cycling streets featuring in the Road User Hierarchy plan (Figure 6).

This concept of physical separation from traffic had received strong support from the community from the outset with *Share an Idea* and has continued to be a popular feature of the road network proposals for AAC throughout its development. The principle target group, as Roger Geller has identified, is the “*interested but concerned*” cyclist – that is someone who might cycle regularly for a variety of journeys, but who often finds existing road conditions just too intimidating. This group is estimated to represent perhaps 40% of potential daily commuters in Christchurch.

So, AAC sets out to encourage through the delivery of new cycle facilities inside the central city and linked to a Council programme for 13 new strategic cycleways largely separated from traffic right across the city; a fairly challenging but achievable tripling in pre-earthquake levels of cycle use on central city streets by 2041. The difficult balance to strike however was how to accommodate well designed, generous width facilities on enough streets to achieve a continuous, legible network for most cycling

journeys. The space constraints of most streets has limited the number that can benefit from separated facilities, and so again the road user hierarchy has been the key reference source to inform the debate. Additionally, even within the inner low speed zone (maximum 30km/h), where the need for physical separation should be less, there have still been challenges in curtailing predicted traffic flows to below around 5000 vehicles per day – a rough yardstick from European and Australian practice as a level of traffic above which cyclists feel uncomfortable sharing space with general traffic.



Figure 10. AAC will provide key cycle routes separated from adjacent traffic on busier streets

Planning for the needs of bus passengers

Share an Idea in 2011 had revealed that many in the Christchurch community felt that a significant bus presence on some pre-earthquake central city streets had created an unwelcome environment, especially on streets where there was a desire for pedestrian activity and creating a more pleasant streetscape. There had been particular concerns with significant bus presence on Colombo Street through the heart of the central city, especially as the retail focussed sections south of Cathedral Square were the busiest for pedestrian activity anywhere in Christchurch. Consequently, meeting the desire for reduced bus presence on key streets, whilst enabling more people to access the city centre easily by public transport has been perhaps one of AAC's greatest challenges.

AAC has therefore modelled the new central city bus network and new Transport Interchange on dovetailing with ECan's new city wide "hubs and spokes" bus network model, the first key stage of which was implemented in late 2014. Prior to the earthquakes, some 40 individual bus services served the central city - with the new bus network these are reduced to eight core radial services, each on high frequencies (15 minutes or less). These key routes meet orbital and suburban services at a new network of suburban interchanges (or hubs), where passengers transfer from those largely less frequent services to the core routes.

Within the central city, the new Transport Interchange (a Recovery Plan anchor project itself) is therefore sized to accommodate this new rationalised bus network with a high emphasis on passenger comfort and convenience. The Interchange has been located adjacent to the new Retail Precinct, Innovation Precinct and South Frame – within a convenient 5 minutes or so walking distance to a large proportion of the new central city's attractions and employment places.

Within the central city some streets such as Manchester and Tuam Streets are identified for bus priority in the road user hierarchy (Figure 6) – and measures are being planned to offer bus priority through a mixture of bus gating arrangements, signal pre-emption (especially towards the Interchange), some dedicated lanes and two “superstops” at Manchester Street and close to the Hospital. The Interchange and new bus network is therefore being designed to handle an anticipated threefold increase in bus use by 2041, with the majority of routes operating just outside the inner core of pedestrian friendly streets.



Figure 11. The new central city bus interchange is due to open in winter 2015



Figure 12 New bus superstops to support the Interchange are planned for Hospital Corner and Manchester Street

Planning for the needs of general traffic

The AAC road user hierarchy (Figure 6) contains proposals for general traffic efficiency to be prioritised on a number of preferred routes into and around the central city best able to accommodate higher traffic volumes. The key features of the strategy are shown in Figure 13.

Prior to the earthquakes some central city streets were accommodating nearly a quarter of their traffic movements as cross-city movements with no origin or destination within the five Avenues (the boundary of AAC). The network management

approach taken for AAC has therefore been to prioritise the use of the Avenues (as the highest category of arterial route) and for them to increasingly act as both an orbital arterial “ring road” for the central city, then for vehicles accessing the central city to enter and exit it by main distributor streets. Access to individual car parking buildings and key land uses is finally via local distributor streets. Thus, there is a three tier approach to the general traffic network hierarchy, with decisions about the design of individual streets informed again by that road user hierarchy.



Figure 13. AAC three tier approach for the general traffic network hierarchy

As a result, AAC puts forward proposals for the progressive enhancement of the Avenues and critical intersections to maximise their traffic efficiency and safety. The drafting process for AAC also considered the potential for those main distributors, which have mostly acted as one way pairs since the 1970's, to be returned to two way traffic operations. That analysis concluded that the northern one way pair of east-west Salisbury and Kilmore Streets, where traffic pressures are predicted to be somewhat lower, could be returned to two way traffic operations. However, due to the traffic efficiency and safety needs of the network, and the effective removal of some streets such as those within the Avon River precinct from the key traffic network, the other three one way pairs to the west, south and east are proposed to remain. Nevertheless, the intention is to progressively introduce streetscape enhancements and speed management measures on those remaining pairs, to better accommodate adjacent land uses.

Planning for the needs of parking

A supporting project to AAC has been the drafting of a new Christchurch Central Parking Plan. Closely linked to the new AAC road user hierarchy and seeking to maximise the linkages with the new network of orbital arterial Avenues, main and then local distributor streets, the key principles of the new parking plan are as shown in Figure 14.

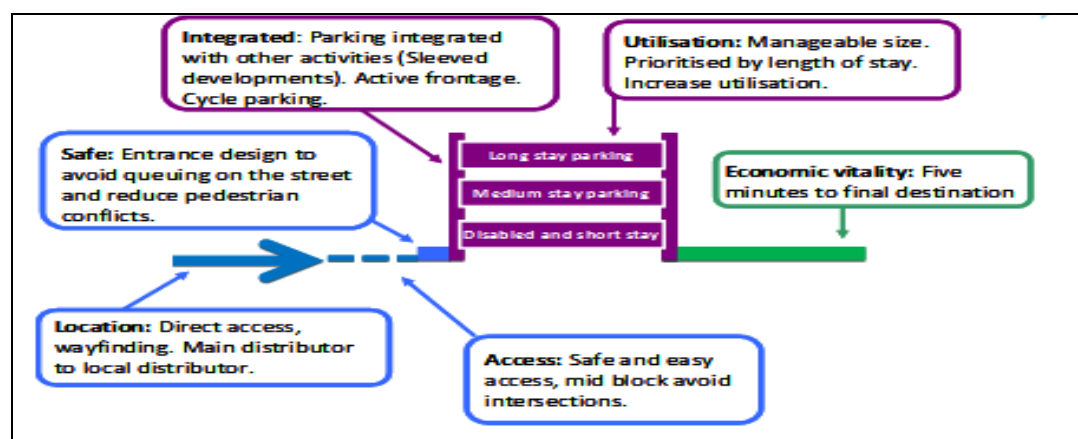


Figure 14. Key parking delivery principles of the draft Christchurch Central Parking Plan

The Parking Plan is being prepared as a five part plan including Guiding Principles, a Short Term Parking Tool (largely focussed on a five year planning horizon); a Long Term Parking Tool (i.e. what the new mix of land uses and Anchor Projects will require at a notional 30 year horizon), an Operations Plan and a Delivery Plan.

Although the Plan is still at its drafting stage, some of the key guiding principles it sets out for consideration are as follows:

- Temporary car parks remain the most effective mechanism to increase short term supply as the central city is rebuilt.
- On-street parking should be prioritised in support of AAC for short-stay visits, disabled parking, taxis and for service vehicles, rather than for long-stay.
- The Plan will identify priority areas for providing car and cycle parking, by Council or private.
- There should be a clear focus for on and off street public parking provision towards providing for short-stay parking to encourage visitors and support retail.
- Long stay parking needs (i.e. largely for commuters) within off street facilities should be delivered through private developments, allied to AAC's proposals for mode shift.
- The Plan should provide good information to inform private sector investment decisions for both long and short stay parking needs.
- Implementation of the Parking Plan should be staged and monitored with the central city's rebuild.

Planning for placemaking

A major workstream of AAC is the development of a consistent set of streetscape design treatments to ensure the philosophy of enhancing the place function of many streets in the central city, especially in the inner zone and in the vicinity of the new precincts and key Anchor Projects, is achieved in a consistent, legible way.

A Public Realm Network Plan is currently in production jointly between CERA and the Council which will provide a unified and comprehensive reference document for the delivery of public realm projects in streets and gathering spaces across the central city.

The Public Realm Network Plan is an essential component of delivering AAC as the central Christchurch street network constitutes approximately 87% of the entire public realm of the central city.

IMPLEMENTATION AND FUNDING OF AN ACCESSIBLE CITY

AAC establishes the long-term strategic transport framework, with a number of workstreams identified and progressing simultaneously in order to successfully deliver the essential recovery components of the chapter.

The Phase 1 transport projects

In June 2013, the Crown and Council signed a Cost Sharing Agreement which specifies, among other things a \$72 million funding package for a First Phase of AAC projects. It was agreed through the Cost Sharing Agreement that these transport projects were to be 'confirmed and optimised' by a business case – and these have in turn been prioritised generally to support early Anchor Projects and precincts, such as the Avon River, Otakoro precinct, the Health, Retail and Justice Precincts, plus the new Transport Interchange (due to open winter 2015).

Implementation of the First Phase transport projects got underway in November 2014. The first projects to hit the ground were around 'Hospital Corner', Tuam Street Lichfield Street, Colombo Street and Oxford Terrace, with supporting works at Hagley / Moorhouse corner. These streets changes are due to be well underway, and with the most significant traffic route changes complete, prior to the opening of the new Transport Interchange in the first half of 2015.

The remaining implementation phases of An Accessible City

CERA, Council, NZTA and ECan are preparing a full Programme Business Case, which considers the entire AAC programme of over 130 projects. The goal of the business case is to identify whether there is a strong case for change, options that may provide value for money, and in what order programmes might be progressed if funding were constrained.

Key challenges

The Strategic Partners are faced with a number of ongoing challenges to successfully deliver the vision of AAC as gazetted in the Recovery Plan. Perhaps the greatest is the sheer scale of transportation, access and roading changes needing to be implemented within a city that is rebuilding itself and continually changing, almost on a daily basis. This challenge is shared by that of the anchor projects, precincts and privately funded developments across the central city, as well as the Christchurch community faced with daily changes to travel routes, modes and parking.

The key challenges for continuing to move AAC forward can be best summarised as follows:

- The limited space practically available within the existing road corridor widths for separating cyclists, pedestrians, buses and cars - to ensure that all modes operate as safely and as efficiently as possible. There is rarely enough space and so each scheme is a fine balance, informed by the critical Road User Hierarchy.
- Undertaking public and key stakeholder consultation in parallel with tight design and delivery timeframes.
- The timing of any further funding for the staged delivery of the full AAC plan from the Strategic Partners in a financially constrained environment and the need to deliver the most beneficial projects to recovery within the next 5 to 10 years. The key transport led benefits include mode shift, safety and health improvements, reflected in the new 30km/hr slow core and quality public realm, which should in turn generate further economic investment in the central city.

KEY LEARNINGS

With the AAC only just beginning to be implemented on the ground, it is impossible to draw conclusions from what has been undertaken so far, but some key early learnings are these:

- International experts provided valuable early insight, in particular advising that success would most likely come through a clear shared vision of the future influenced by the community;
- There has been a continual need to remind ourselves of the vision for a transformed transport network for the central city, especially when difficult choices and decisions have needed to be made over the shape, look and cost of individual projects;
- That a suitable balance can be struck on most schemes across many competing pressures and objectives that preserves the vision and the ultimate goals, but often compromises are needed to get there;
- That the new central city transport network is not an end in itself – but it should be the best network to enable the Recovery Plan's vision of a vibrant, attractive, people friendly central city to be achieved for present and future generations;
- That the partnership of the bodies and staff charged with delivering the plan is our greatest strength – and the ability to have sometimes difficult conversations with friends;
- ...and as they say, Rome wasn't built in a day - as you will witness when you visit our recovering city!

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