

# New Bus Shelter Design

## Recommendations

That the Board:

- i. Approves the rollout of the preferred new suite of bus shelter designs.
- ii. Endorses the public announcement of the preferred new suite of bus shelter designs.

## Executive summary

In response to the changes and transformation of the bus route and network design (New Network) initiated through the Regional Public Transport Plan (RPTP) and a focus on the 'whole of journey' experience, a new suite of bus shelter designs has been developed to roll out across the region. The preferred new shelter design has been identified via a design tender, including a physical trial of three of the designs at two locations in 2014, a stakeholder engagement process, and detailed post-trial design evaluation.

The intention is to replace the 32+ existing shelter designs (with the exception of Adshel shelters in the short-medium term) with the new design and implement as budgets allow. They will be installed where existing assets are approaching the end of their life and also targeted initially around the New Network rollout. For key corridor upgrade projects the new shelters may be installed along the entire route.

The customer experience will be improved through a number of changes including:

- a) Enhanced wet weather and wind protection
- b) Improved safety features
- c) An overall more consistent and legible user experience
- d) Sensor activated solar powered lighting
- e) The ability to incorporate local identity via art
- f) Integration of an enhanced real-time system and (trial of) enhanced customer interface into the shelters
- g) Incorporation of other facilities (eg retail, cycle racks etc)
- h) The smart shelter concept
- i) Way-finding and information

The designs for the minor, intermediate and major shelters have now been finalised and are ready to commence fabrication and installation as required. A number of projects such as Te Atatu Road and the Pukekohe Interchange, need approval of the shelter design so it can be included in the respective project scope.

## Strategic context

The new RPTP is changing how bus services are delivered across Auckland. A hub-and-spoke approach with higher frequency, shorter trips requires more interchange between public transport modes. Providing more frequent, reliable services does mean that some users will need to interchange, therefore the environment at these interchange locations will need to change to deliver a more user-friendly experience.

As a part of the RPTP rollout, up to 20 neighbourhood interchanges are required and there is a strong organisational preference to ensure that the neighbourhood interchanges are impressive from both a form and functionality perspective.

Overarching this is the on-going rollout of bus shelter replacement across the city. The new shelter is an adaptable design that provides the same look and feel across the various tiers of bus stop that both looks, and functions to, a very high standard.

## Background

The new design was procured via open tender and seven concept designs were received and shortlisted to three for further refinement.

All three shortlisted 'major' size shelter designs were taken to physical trial on Symonds Street to gauge public and stakeholder feedback and to test how they perform in situ. Minor shelters were also trialled in Silverdale to assess whether the larger design translated to the most commonly used shelter size.

A preferred design by Design Brand and Metshelter has been selected.

## Evaluation

The initial tenders were evaluated against a number of different criteria such as track record, methodology, and innovation. The trial shelters were assessed against the 'Innovation' criterion and the various elements and sub-elements contained within it. This was further supplemented with a number of third party reports to assist the Tender Evaluation Team with their evaluation.

The innovation sub-criteria are:

<ul style="list-style-type: none"><li>• Look and Feel (20%)</li></ul>	<ul style="list-style-type: none"><li>• Functionality (20%)</li></ul>	<ul style="list-style-type: none"><li>• Adaptability (20%)</li></ul>
<ul style="list-style-type: none"><li>• Materiality (20%)</li></ul>	<ul style="list-style-type: none"><li>• Cost Effectiveness (20%)</li></ul>	

An evaluation matrix was developed (Attachment 1) that listed the innovation sub-criteria and the various elements contained within. Scoring of each of the three shortlisted designs and related visuals is provided in Attachment 2.

## Issues and options

### Financial impacts & Funding

Bus shelters are generally purchased/installed/renewed through 3 main streams – bus shelter renewals programme, bus stop improvements programme & individual projects (such as corridor upgrades).

The majority of shelters are delivered from the first 2 categories above. Budget typically dictates the rollout of the shelter programme. The table below indicates the current budget situation for the next 3 years (assuming the new shelter design and costs).

Financial Year	15/16	16/17	17/18
Budget (new)	\$3.6m	\$2.2m	\$2.1m
Budget (renewals)	\$900,000	\$900,000	\$900,000
Approximate number of shelters	100	90	90

The new shelter design including assembly, hardwood seat, carved front portal and a lock-up box comes in at approximately \$13,977 +GST which is ~\$1,200 more than the existing shelter design being rolled out today. Install costs vary considerably dependant on the site and whether the installation is at a new or existing site but there is unlikely to be any real difference to current install costs (which range between \$5,000 - \$10,000 per shelter). At time of writing the final cost for the shelter is yet to be finalised as it is dependent on order numbers (bulk orders will produce further discount) but is expected to reduce further from the price above.

It is the intention to bulk order these shelters through tender, once budget certainty is gained.

### Stakeholder engagement

A stakeholder and public engagement process was undertaken. AT received 856 responses through the engagement process plus a number from Local Boards, Mana Whenua, disability groups and other stakeholders.

### Safety and Security

Attachment 3 provides commentary on the safety design aspects of the preferred bus shelter option. Sight lines and the avoidance of the ability for persons to conceal themselves behind panels is critical. All panels can be changed for alternate designs including glass panels.

## Risks and mitigations

1. Ensuring compatibility of the design to a number of other changes to the functionality of shelters such as provision of wifi and integration of Liquid Crystal Display (LCD) screen advertising panels. This is being addressed through trials starting shortly at the prototype shelters at Symonds Street.
2. Examining the agreement with Adshel and what the new shelter design means for the network of Adshel shelters and revenue for AT from those arrangements. Talks are underway with Adshel to potentially move to a hybrid model where AT shelters contain Adshel advertising (the preferred design has been designed with this in mind), eventually migrating to AT owning and managing all advertising and infrastructure completely as the Adshel contracts end (approximately 8-10 years).
3. The market supply for fabrication work of this type is small in New Zealand. AT has worked to try and ensure the preferred shelter design can be put out to fabrication tender in the future to attract alternative suppliers by retaining the IP for the design.

## Customer impact

The 3 base designs for the 3 sizes of shelter are detailed below:

### a) Major Shelter



### b) Intermediate Shelter



### c) Minor Shelter



Neighbourhood Interchanges are the 4<sup>th</sup> category of shelter but due to their complexity will generally be a bespoke design utilising the kit of parts to develop a design, however concept designs are shown below. Neighbourhood Interchange locations will require public and stakeholder engagement to ensure the design is accepted by the community.

## d) Neighbourhood Interchanges



The overall design is characterised by timber, extruded recycled aluminium, glass, and solar powered lighting. There is also the ability for a mains power connection. There is provision for an advertising or digital panel but this can be swapped out for glass and/or timber/ steel/ aluminium and the ability to integrate real time signage. The roof can be glass, solid, or a combination depending on the locational needs. Locations that are more prone to vandalism can have materials changed. This shelter design received the least vandalism during the trial.

### Customer Experience

There are nine key features that will enhance customer experience and these are highlighted in Attachment 4. Improvement to timetables and customer information is a separate project but the shelter design can accommodate those changes once they are confirmed.

### Legal and regulatory issues

Generally the new shelters do not require resource consent unless there is a particular issue that generates the need. Triggers may include specific locations such as the City Centre, and areas of historical/archaeological significance. It is likely that Neighbourhood Interchanges will also require resource consent. Building Consent is required for shelters over 10m<sup>2</sup> but this will be undertaken via a streamlined process.

### Additional Benefits

Aside from the customer benefits, there are a number of other benefits to be gained through the new shelter design:

- a) One system and kit of parts which will make maintenance easier and cheaper.
- b) Bespoke designs for complex locations can be designed from the kit of parts rather than a new design from scratch.
- c) AT own the intellectual property of the design and the ability to tender the fabrication out to other parties, including Design Brand designed extrusions and shelter parts. Design Brand retains the ability to use their system of parts in other independent projects.
- d) Potential application of the kit of parts to other transport infrastructure such as at rail stations, bus ways, light rail stations.




## Next steps

1. Refer to the AT Board for approval - 26 May 2015.
2. Confirm the final design through public statement - late May 2015
3. Commence fabrication of shelters for some projects that are waiting for confirmation to include the new design- May 2015
4. Include the design suite and accompanying design guide in the Auckland Transport Code of Practice- May/June 2015
5. Use Design Brand and Metshelter for design and fabrication over the next 12-18 months.
6. After 12-18 months, go to the market and competitively tender for the fabrication and installation of new shelters – July/August 2016
7. Trial of integrating both real time signage and an enhanced customer interface in the prototype shelter at Symonds Street – May to July.

## Attachments

Attachment Number	Description
1	Evaluation criteria matrix
2	Visuals of the 3 shortlisted shelter designs and their evaluation scoring
3	Bus shelter safety commentary
4	Customer Experience Summary

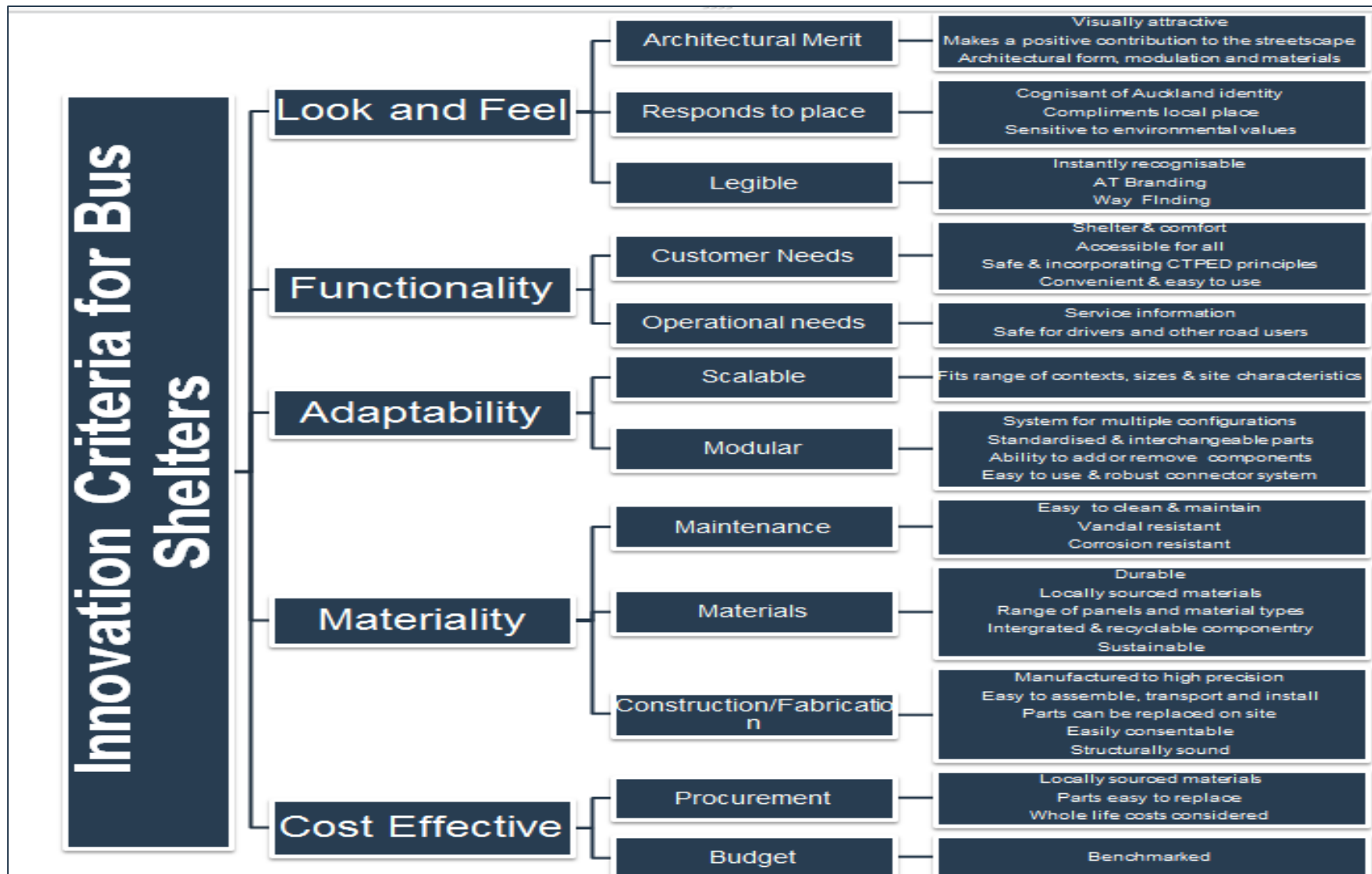
## Document ownership

<b>Submitted by</b>	Brendon Main <b>Manager, Bus Services</b>	
<b>Recommended by</b>	Mark Lambert <b>General Manager, AT Metro</b>	
<b>Approved for submission</b>	David Warburton <b>Chief Executive</b>	

## Glossary

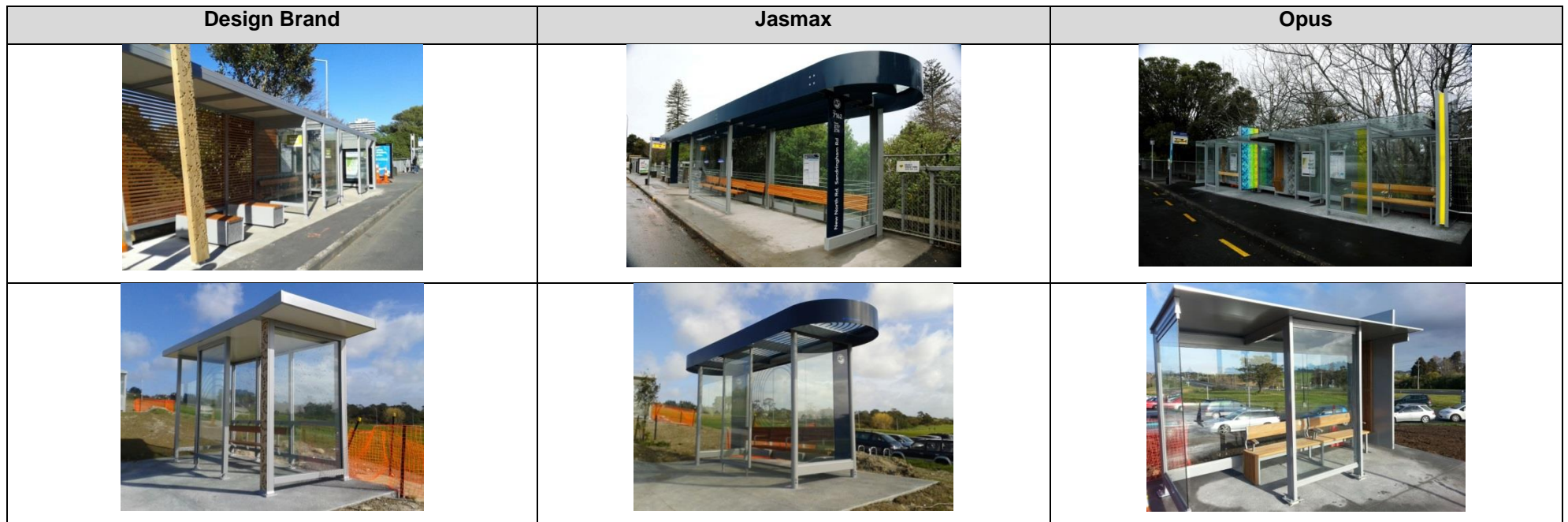
Acronym	Description
AC	Auckland Council
AT	Auckland Transport
CPTED	Crime Prevention Through Environmental Design
LED	Light Emitting Diode
RPTP	Regional Public Transport Plan

## Attachment 1 – Evaluation criteria matrix





## Attachment 2 – Visuals of three shortlisted shelter designs and evaluation scoring



Innovation Criteria	Weighting	Design Brand	Jasmax	Opus
Look and Feel	20%	78	67	75
Functionality	20%	73	75	71
Adaptability	20%	82	66	70
Materiality	20%	77	63	73
Cost Effectiveness	20%	76	60	69
<b>Final score</b>	<b>(/100)</b>	<b>77.1</b>	<b>66.2</b>	<b>71.4</b>

## Attachment 3 – Bus shelter safety commentary

### Purpose

The purpose of this report is to provide some context and commentary on the safety of the new modular bus shelter design.

### Context

#### The Auckland Plan

The Auckland Plan identifies the public transport system as crucial to becoming the world's most liveable city.

The Auckland Plan identifies the need for a transformational shift in public transport and has set a number of challenging targets, including doubling public transport from 70 million to 140 million trips by 2022 (Auckland Transport, 2013).

The Regional Public Transport Plan (RPTP) sets the delivery framework for public transport over the next 10 years. A key feature of this Plan is the introduction of a simpler, better connected, public transport network that is more attractive to people who don't use it at present.

The new network structure described in the RPTP places considerable emphasis on high quality public transport facilities that are designed to provide good access and safety and personal security at all stages of the journey, particularly for the vulnerable and transport disadvantaged.



#### Personal Security as a Barrier to Public Transport Use

It is widely recognised that concerns about personal security can influence travel choices (Loukaitou-Sideris, 2009) and act as a major barrier to public transport use, especially after dark (Newton, 2004).

Fear of crime while waiting at bus stops and walking to and from buses has been identified as a particular problem especially for the more vulnerable in society (Transport Studies Group, 2014, Loukaitou-Sideris, 2009).

It has been estimated that, by improving personal security on public transport through the implementation of appropriate measures, the number of journeys could increase by 11.6%. (Transport Studies Group, 2014).

More specifically, the (former) UK Department of the Environment, Transport and the Regions (DETR) White Paper suggests patronage on public transport could be increased by 3% at peak and 10% at off peak times if the fear of crime were reduced (Newton, 2004).

#### Designing and Crime and the Fear of Crime

High quality public transport infrastructure design is seen as a major contributor in reducing crime on public transport (Transport for London, 2010). There is now an established link both between design and crime and design and the reduction of fear (Newman, 1971, Department for Transport, 2012).

Good design of public transport infrastructure can reduce opportunities for crime, by:

- Increasing the perceived effort of offending;
- Increasing the perceived risk of offending;
- Decreasing the perceived reward of offending;

For example, the use of anti-graffiti paint makes it harder to commit the crime and the presence of CCTV makes it more likely that the offender will be caught.

Design of the physical environment can also reduce fear. Good lighting for example can help to remove the fear created by darkness, and clear sightlines can reassure someone that no one is lurking, waiting to pounce. (Department for Transport, 2012)

These principles have been considered through the design of the bus shelters.

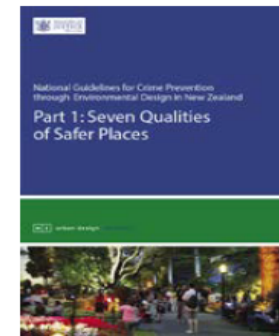
#### National Guidelines for Crime Prevention through Environmental Design

This section of the report refers to the New Zealand National Guidelines for Crime Prevention through Environmental Design, prepared under the auspices of the New Zealand Urban Design Protocol.

The National Guidelines define 7 qualities that characterise safer places. These are as follows:

##### Access: Safe movement and connections

Places with well defined routes, spaces and entrances that provide for convenient and safe movement without compromising security.



##### Surveillance and sightlines: See and be seen

Places where all publicly accessible spaces are overlooked, and clear sightlines and good lighting provide maximum visibility.

##### Layout: Clear and logical orientation

Places laid out to discourage crime, enhance perception of safety and help orientation and way finding.

##### Activity mix: Eyes on the street

Places where the level of human activity is appropriate to the location and creates a reduced risk of crime and a sense of safety at all times by promoting a compatible mix of uses and increased use of public spaces.



##### Sense of ownership: Showing a space is care for

Places that promote a sense of ownership, respect, territorial responsibility and community.

##### Quality environments: Well designed, managed and maintained environments

Places that provide a quality environment and are designed with management and maintenance in mind to discourage crime and promote community safety in the present and the future.

##### Physical protection: Using active security measures

Places that include necessary, well designed security features and elements.

The 7 qualities provide some structure to the subsequent section of this report, which demonstrates how the modular bus shelter design responds to each of the qualities.





**National Guidelines for Crime Prevention through Environmental Design**

**Commentary**

**Access: Safe Movement and Connections**

The bus shelter design incorporates way finding elements that will help with the legibility and accessibility of the public transport network.

Travel information will be strategically placed in well lit locations that are easily accessible. Appropriate font sizes will be used.

Tactile pavers, contrasts in colour and material choice is used to help the visually impaired safely use the public transport network.



**Surveillance and sight-lines: See and be seen**

The shelter design maximises the use of glazing to ensure good levels of visibility and unobstructed sight-lines, in, out and through the bus waiting environs.

The use of solid panels is minimised.

The shelter design provides for both ambient and brighter levels of lighting. Built in movement sensors trigger brighter levels of lighting when people approach, or move in, the shelters.

Solar panels provide a renewable power source. This allows lighting at bus shelters in isolated locations: that may not otherwise benefit from access to power (and lighting).

The solar panels are tamper proof and are located on top of the roof structure out of reach and not easily visible from the street.



**Layout: Clear and Logical orientation**

The layout of the bus shelter design enables easy access and movement into and through the bus waiting environs.

A combination of forward facing seating and leaner are provided. This orientation facilitates passive surveillance of the street.

Space at the head of the stop can accommodate a wheelchair or pram. This location is well lit, close to travel information and provides convenient access onto the bus. Adequate maneuvering space is provided between the seating and front and sides.

The potential for entrapment is limited with two entry/exit points at the front of the shelter.



**National Guidelines for Crime Prevention through Environmental Design**

**Commentary**

**Activity mix: Eyes on the street**

The new design improves the overall amenity and experience of the bus waiting environment. This will encourage more people to use the bus and, in turn, the activity will result in greater informal surveillance of the area.

**Sense of Ownership: Showing a place is well cared for**

The modular design has the ability to use different materials that can respond to and reflect the local place context and community. This local distinctiveness will help create a stronger sense of ownership.

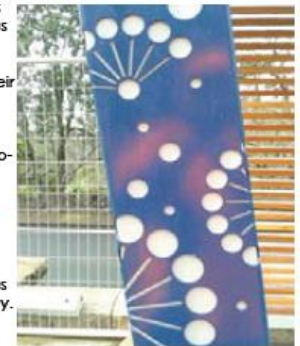
There is also the potential to involve and have input from the community on detailed design elements, including the interchangeable portal feature.



**Quality Environments: Well designed, managed and maintained environments**

The bus shelter design uses quality materials and finishes to improve the amenity and bus waiting experience.

The materials used have been tested for their robustness and durability over a sustained period. The outcome of the tests demonstrate the shelter and chosen materials are easy to clean, maintain, and are less susceptible to vandalism.



**Physical protection: Using active security measures**

The design uses toughened glass and anti graffiti film, applied to all glazing surfaces.

The battery housing is located within the bus shelter structure hidden behind lock and key.

There is the potential to include CCTV.



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## Attachment 4 – Customer experience summary

There are 9 key features that will enhance customer experience:

### a) Enhanced wet weather and wind protection.

The lack of adequate weather protection is one of the main complaints from customers, therefore provision of side and rear walls that extend lower to the ground will reduce the impact of wind and rain from the rear and side of the shelter. Improved rain protection to the front of the shelter will be achieved by the addition of a front panel.

A design variation is possible for the larger shelters where part of the structure can be made to be more open to allow for a breeze to blow through and gives people an option about where they sit - especially relevant during warmer periods. This was trialled in the Symonds Street shelter.

### b) Improved safety features

The shelter system has been designed to ensure a high level of safety for users. One of the evaluation criteria required consideration of safety and incorporation of CPTED principles (Crime Prevention Through Environmental Design). Safety features include:

- i) two entry points
- ii) flexibility in design componentry depending on location constraints (e.g. replacing timber with glass or glass with steel)
- iii) high quality lighting (see 'd' below)
- iv) ability to provide CCTV camera's in shelters (this is considered on a case-by-case basis)

The area of safety of the new modular bus shelter design is discussed in more detail in Attachment 3.

### c) An overall more consistent and legible user experience

Given there are ~32 shelter designs across the city that range in quality and user experience, one suite of designs will, over time, ensure a more consistent experience for customers and create a more identifiable bus network to the wider community.

### d) Sensor activated solar powered lighting

Solar powered Light Emitting Diode (LED) lighting that operates at night at a low level when the shelter is not in use will brighten up when a customer arrives via motion activated sensors. The level of lighting in the shelter exceeds the industry standard of 26 lux. The LED lighting is white light which is more similar to daylight and users tend to find it better than standard lighting. It is also considerably cost effective and cheaper to maintain. The solar powered aspect will also reduce AT's shelter running costs.

**e) The ability to incorporate local identity via art**

Certain features such as the vinyl on the glass, the vertical timber panel at the front of all three shelters, as well as the larger portal at the left end of the Major Shelter can be modified to reflect local community and/or cultural aspirations via artwork. This helps create an improved sense of place which can aid overall customer experience and in some cases improved community ownership and responsibility for a bus shelter.

**f) Integration of an enhanced real-time system into the shelters**

Integration of both real time and an enhanced large screen customer interface in the shelter has been designed for. The new shelter design will be flexible to AT's final real time screen design and the prototype shelter on Symonds Street will be used shortly for a trial of both options.

**g) Incorporation of other facilities**

There is the ability to incorporate other facilities into the shelters. Concepts have been developed for a café, cycle storage and a retail snack shop. These concepts could be considered as a part of larger Neighbourhood Interchanges but may also be relevant in some other locations as a part of smaller shelters in highly patronised areas.

**h) The smart shelter concept**

The design has been developed with a view to integrating other opportunities within the piece of infrastructure itself such as public Wi-Fi, CCTV, Digital Media, Digital Advertising and Cellular 'In-Fill'. Whilst still in its infancy, this has the ability to generate healthy revenue returns for AT moving forward.

**i) Way-finding and information**

The way-finding project is underway and preliminary sign design options have been considered for incorporation into the shelter design. The shelter design has been designed to accommodate a range of possible way-finding features and any completed shelters can be retrofitted once the way-finding approach is confirmed.

Improvement to timetables is a separate project but the shelter design can accommodate those changes once they are confirmed.