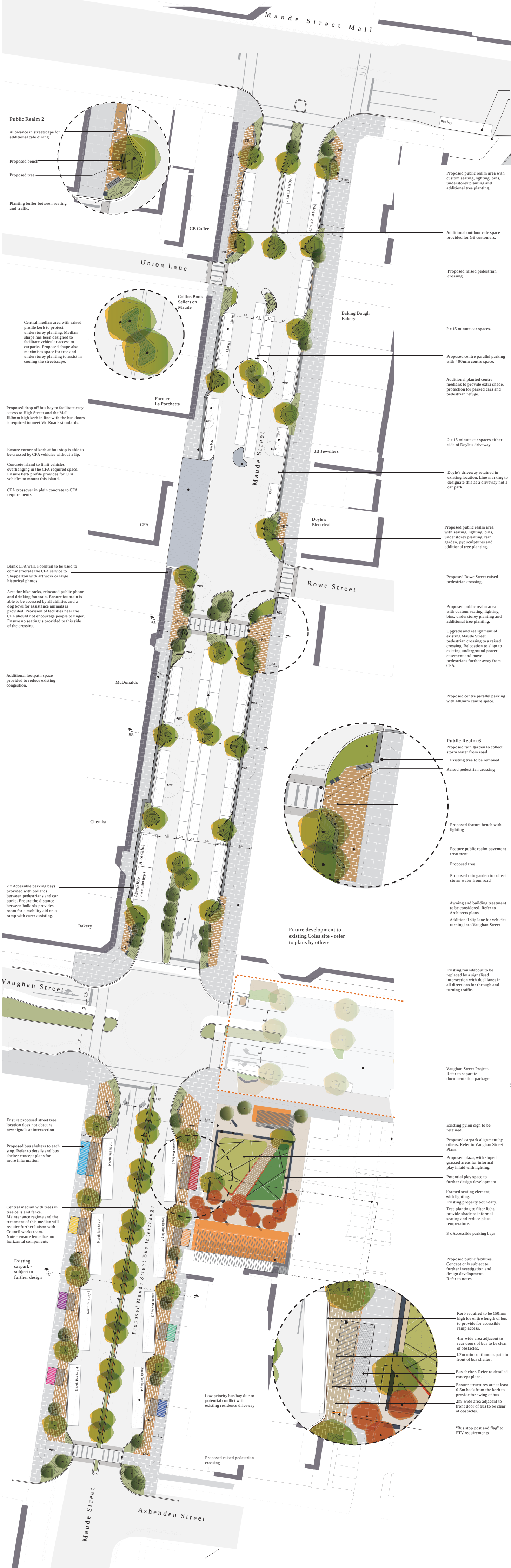
ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

16 September 2014

Agenda Item 9.3 **Maude Street Bus Interchange and Maude Street Redevelopment**



Maude Street Mall
Bus bay
Proposed bus bay.
Entrance to Rowe Street carpark realigned to allow for minimal disturbance of High Street traffic. Refer to GSCC plans for details.
Public Realm 2
Allowance in streetscape for additional cafe dining.
Proposed bench
Proposed tree
Planting buffer between seating and traffic.
GB Coffee
Union Lane
Proposed public realm area with custom seating, lighting, bins, understorey planting and additional tree planting.
Additional outdoor cafe space provided for GB customers.
Proposed raised pedestrian crossing.
Collins Book Sellers on Maude
Baking Dough Bakery
Central median area with raised profile kerb to protect understorey planting. Median shape has been designed to facilitate vehicular access to carparks. Proposed shape also maximises space for tree and understorey planting to assist in cooling the streetscape.
2 x 15 minute car spaces.
Proposed centre parallel parking with 400mm centre space.
Additional planted centre medians to provide extra shade, protection for parked cars and pedestrian refuge.
Former La Porchetta
Proposed drop off bus bay to facilitate easy access to High Street and the Mall. 150mm high kerb in line with the bus doors is required to meet Vic Roads standards.
Maude Street
JB Jewellers
2 x 15 minute car spaces either side of Doyle's driveway.
Ensure corner of kerb at bus stop is able to be crossed by CFA vehicles without a lip.
Concrete island to limit vehicles overhanging in the CFA required space. Ensure kerb profile provides for CFA vehicles to mount this island.
CFA crossover in plain concrete to CFA requirements.
Doyle's driveway retained in existing location. Line marking to designate this as a driveway not a car park.
CFA
Doyle's Electrical
Proposed public realm area with seating, lighting, bins, understorey planting rain garden, pyc sculptures and additional tree planting.
Blank CFA wall. Potential to be used to commemorate the CFA service to Shepparton with art work or large historical photos.
Rowe Street
Proposed Rowe Street raised pedestrian crossing.
Area for bike racks, relocated public phone and drinking fountain. Ensure fountain is able to be accessed by all abilities and a dog bowl for assistance animals is provided. Provision of facilities near the CFA should not encourage people to linger. Ensure no seating is provided to this side of the crossing.
Proposed public realm area with custom seating, lighting, bins, understorey planting and additional tree planting.
Upgrade and realignment of existing Maude Street pedestrian crossing to a raised crossing. Relocation to align to existing underground power easement and move pedestrians further away from CFA.
Additional footpath space provided to reduce existing congestion.
McDonalds
Proposed centre parallel parking with 400mm centre space.
Public Realm 6
Proposed rain garden to collect storm water from road
Existing tree to be removed
Raised pedestrian crossing
Chemist
Proposed feature bench with lighting
Feature public realm pavement treatment
Proposed tree
Proposed rain garden to collect storm water from road
Accessible
2 x Accessible parking bays provided with bollards between pedestrians and car parks. Ensure the distance between bollards provides room for a mobility aid on a ramp with carer assisting.
Awning and building treatment to be considered. Refer to Architects plans
Additional slip lane for vehicles turning into Vaughan Street
Future development to existing Coles site - refer to plans by others
Bakery
Vaughan Street
Existing roundabout to be replaced by a signalised intersection with dual lanes in all directions for through and turning traffic.
Vaughan Street Project. Refer to separate documentation package
Ensure proposed street tree location does not obscure new signals at intersection
Existing pylon sign to be retained.
Proposed carpark alignment by others. Refer to Vaughan Street Plans.
Proposed bus shelters to each stop. Refer to details and bus shelter concept plans for more information
Proposed plaza, with sloped grassed areas for informal play inlaid with lighting.
Potential play space to further design development.
Framed seating element, with lighting.
Existing property boundary.
Central median with trees in tree cells and fence. Maintenance regime and the treatment of this median will require further liaison with Council works team. Note - ensure fence has no horizontal components
Tree planting to filter light, provide shade to informal seating and reduce plaza temperature.
3 x Accessible parking bays
North Bus bay 1
North Bus bay 2
North Bus bay 3
North Bus bay 4
Proposed Maude Street Bus Interchange
Existing carpark - subject to further design
Proposed public facilities. Concept only subject to further investigation and design development. Refer to notes.
South Bus bay 3
South Bus bay 4
Kerb required to be 150mm high for entire length of bus to provide for accessible ramp access.
4m wide area adjacent to rear doors of bus to be clear of obstacles.
1.2m min continuous path to front of bus shelter.
Bus shelter. Refer to detailed concept plans.
Ensure structures are at least 0.5m back from the kerb to provide for swing of bus
2m wide area adjacent to front door of bus to be clear of obstacles.
"Bus stop post and flag" to PTV requirements
Low priority bus bay due to potential conflict with existing residence driveway
Proposed raised pedestrian crossing
Ashenden Street
Maude Street

Closed Circuit TV (CCTV)
CCTV is to be provided throughout the streetscape and in the bus interchange.
A comprehensive design by specialists will be required to ensure this is adequately provided for.

New signalised intersections Vaughan Street
GSCC intended that this intersection and the Maude Street precinct would be included in the Smart Roads program. However this option was not available at the time of conceptual design. Should it become available during documentation this process could be undertaken.

CFA and signalised intersections
The new intersection at Vaughan Street is to be able to be activated by the CFA to limit negative impact on response times.
Consideration of similar facilities at the High Street intersection should be discussed with Vic Roads

CFA traffic movements
The CFA have been consulted with directly to ensure that their vehicles have been designed for in the streetscape. The road design has been created using a turning circle of a vehicle larger than the biggest in the current fleet to future proof the streetscape. The final road way width is a balance of pedestrian and vehicle requirements. It has been developed collaboratively with GSCC Engineers, Shepparton Transit and the CFA

Kerb radii
5m radii have been used on the kerbs to provide for the street sweeper requirements. Note the central median does not require street sweeper access as it is the high point of the road.

Existing services
A Services Investigation Report has been undertaken by CS and A. The service findings have been considered and adjustments made to the design to limit conflict with existing services. However, to ensure best outcomes, the exact location and depth of services should be surveyed and liaison with service authorities should be undertaken.

Future underground power
Underground power requires a significant easement. Any future underground power should consider the locations' impact on the street trees. Minor alterations to the alignment of the power will have a significant impact on the streetscape.

Car parking restrictions
Some traders have expressed that 2hr carparks is too long for their business models. They have suggested 1hr car parks throughout the street. 15min carparks have been requested in front of several shops to suit the nature of their business.

Duration of construction
Some traders have raised concern about the impact of construction on their business. This issue should be considered during documentation and by GSCC to mitigate the impact where possible.

Public Facilities in the Plaza
The public facilities shown on this plan are a concept only and are subject to further investigation and design development. There is the potential to provide an integrated public facilities and toilet in this location.
A Public Toilet Review (2013) has been produced by LMLA for the Greater Shepparton City Council. This report should be referred to for any design development. The report notes that public toilet facilities have been requested in this location. The report recommends that not only are 9 or more cubicles needed in this area, but additional facilities are also required, such as adult change facilities, a parents' room, breast feeding room and child changing facilities.
Please note - Bus service provider has requested bus staff toilets be included in the facilities.
Facilities to consider provision of a mobility aid recharge point.

Design for all abilities
The design of individual feature elements and furniture is to ensure sufficient contrast with it's environment to limit potential hazards for the visually impaired.
Tactile Ground Surface Indicators (TGSIs) are to be provided in the streetscape at areas of potential pedestrian / vehicle hazards as well as intersections and crossings.
Ensure space for mobility aids in public realm is provided for.

Streetscape Design Rationale
The streetscape design provides a stronger pedestrian link between the Mall, Vaughan Street and the proposed bus interchange. At the same time this design provides a quality retail streetscape experience.
New tree planting provides greater shade for pedestrians, and for parked cars, while also assisting in cooling the streetscape.
"Public realm spaces" provide areas for resting / socialising without a commercial imperative. These public realm areas are to be welcoming spaces with understorey planting to contribute to the overall streetscape amenity. They have been strategically placed to provide resting areas with shade, seating, lighting and bins.

Note:
Please refer to Bus shelter concept for details

Car parking

North
(High Street to Vaughan Street)
Existing parking
- 43 x Standard bays
- 2 x 15 minute bays
- 5 x Bus Bays

Proposed Parking
- 40 x Standard bays
- 4 x 15 minute bays
- 2 x Accessible bays
- 1 x Bus drop off bay
- 1 x Bus stop in High street

South
(Vaughan Street to Ashenden Street)
Existing parking
- 33 x Standard bays

Proposed Parking
- 8 x Bus Bays

Legend
- Proposed pedestrian footpath
- Proposed parking
- Proposed public realm paving
- Existing kerb
- Proposed understorey planting
- Proposed rain-garden
- Proposed custom seating element
- Proposed bench to GSCC standards
- Existing trees to be removed
- Proposed Street tree — Geijera parvifolia, Wilga
- Proposed Street tree — Zelkova serrata, Zelkova
- Proposed Plaza tree — Eucalyptus pauciflora, Little Snowman
- Proposed shelter - refer to additional plans

This Concept Plan is based on a desktop study of existing services and infrastructure. Significant changes may occur to the Concept Plan during an impact assessment of existing services to this concept. It is intended that the design integrity and concept of the overall streetscape will be maintained after the existing services investigation.

Proposed plaza design is conceptual only. This design has been shown for discussion purposes only.
All elements are subject to change during consultation and design development.

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Maude Street Streetscape Redevelopment
Greater Shepparton City Council
Streetscape Concept Plan

Project number	1050	Revision	C
Sheet No.	1050_CPDD		

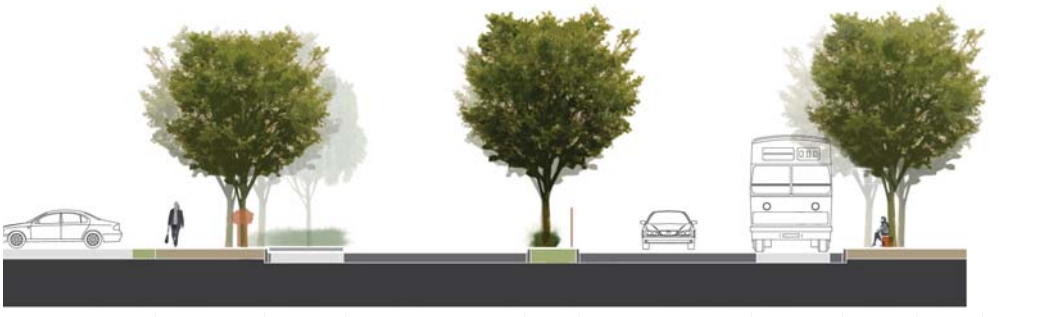
N

Scale 1: 250 @ 594 x 1500mm

Designed	CR LM	Nov 2013
Drawn	CR	16.12.2013
Rev -	-	

Section AA
Raised pedestrian crossing - Maude Street Rowe Street

Section BB
Central median with raised planting



Section CC
Maude Street Bus Interchange

Streetscape Design Rationale

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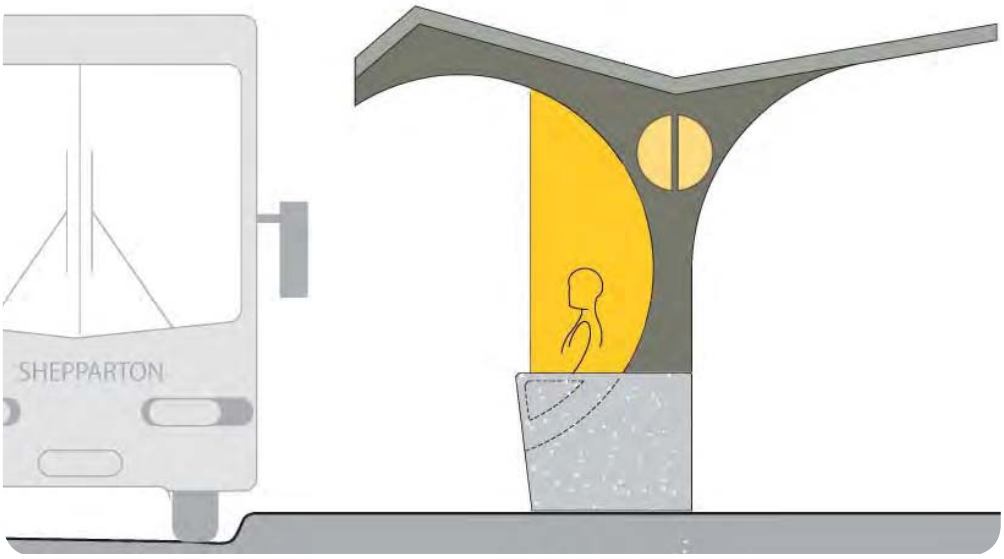
Maude Street Streetscape Redevelopment
Greater Shepparton City Council
Streetscape Concept Sections

Project number	1050	Revision	C
Sheet No.	1050_CS		
Designed	CR LM		Nov 2013
Drawn	CR		19.12.2013
Rev -	-		



Maude Street Bus Interchange
Bus Shelters

Design report

December 2013

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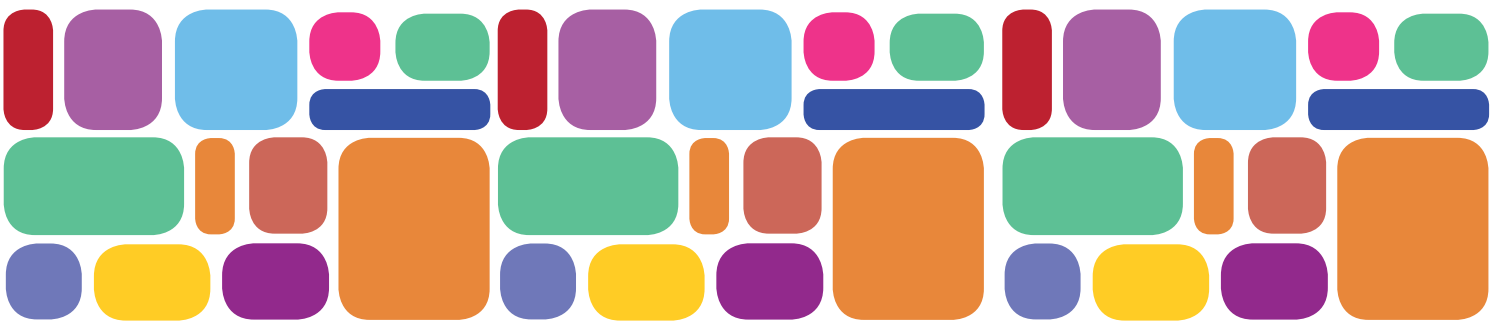
Table of Contents

Page



Introduction

Report Purpose

This document has been prepared to provide a record of how the bus shelter design has been developedwith theBus Shelter Working Group. Their input guided the direction of the bus shelter design and was a collaborative process.

Project background

LMLA has been working on the concept to redevelop Maude Street since 2010. The project's key outcomes include linking the new Vaughan Street redevelopment (now known as Vaughan Central) with the Maude Street Mall. This aims to create a walk-able inner CBD connecting the major commercial areas with a new bus interchange and the existing railway station.

Why is a new bus interchange proposed?

The design of the new bus interchange is central to the success of the overall Maude Street redevelopment. The existing bus stop area in Maude Street provides for 5 buses at one time. Shepparton Transit (the major public bus provider in Shepparton and surrounds) has advised that this is becoming inadequate for the needs of the Greater Shepparton community. The need for buses to be able to wait in this area is causing congestion and time tabling restrictions. Greater Shepparton City Council (GSCC) has identified the block between Vaughan Street and Ashenden Street as a suitable location for a bus interchange.

Why is the bus shelter being updated?

Shepparton has a standard CBD bus shelter which has serviced the centre of Shepparton for some time. The need for a new design for Shepparton's Maude Street Bus Shelters is an outcome of the following issues:

• The Vaughan Street Redevelopment brief called for a new palette of materials and structure of the new streetscape to influence future works in Shepparton's CBD. The Vaughan Central project has been constructed and completed in November 2013. The design needs to respond and fit in with the new style developed in Vaughan Central.

•Public transport will play a large role in Shepparton's future transport and traffic requirements. The bus stop and shelters need to reflect this reality creating an environment that supports increasing public transport usage. The new design response needs to include the modern systems found in capital cities such as audible / digital timetables which are linked to bus GPS systems to provide up to the minute information to transport users.

Influence from the Vaughan Street Redevelopment

In early 2010 LMLA began work on the Vaughan Street Redevelopment (now known as Vaughan Central). LMLA were the key designers on many aspects of the streetscape including the idea of restructuring the streetscape to provide a more welcoming pedestrian experience, the level crossings to address access issues and the detailed design features such as the custom seating and pyc sculptures.

The new design in Vaughan Street was to promote Shepparton as a city in a regional area. The cultural definition that 'in the country people want to stop and talk in the street' became the key driver behind the streetscape structure and the need to address walk-ability of Shepparton's CBD. This new direction for Shepparton's CBD aims to influence Shepparton's dependance on cars.

Pattern and detail were developed as a way to celebrate Shepparton culture and also provided an alternative to urban minimalism which was generating negative feedback from the public.

Within the bus shelters and the bus interchange, these principles of inclusion, walk-ability, detail and pattern are continued.

Process

The Bus Shelter Working Group

From the outset, the design of the bus shelters was to address issues of access and inclusion, including those faced by people with a disability and older people, as well as the general community's needs. For this reason a Bus Shelter Working Group was established with representatives from GSCC including Carl Byrne (Development Officer - Projects Department at GSCC), Darren Buchanan (Team Leader Design Services at GSCC), Louise Dwyer (Access and Inclusion Officer at GSCC) and representatives from the Disability Advisory Committee (DAC) and Positive Ageing Advisory Committee (PAAC). The Working Group met for a series of workshops to develop the bus stops. Their input guided the direction of the bus shelter design and was a collaborative process.

The four workshops with the Bus Shelter Working Group addressed the following:

• The existing Shepparton CBD Standard Bus Shelters were reviewed and discussed.

• A precedent study of bus stops and public transport facilities was collated and discussed with the Working Group.

• A survey regarding bus stop user needs and thoughts on the current bus shelters was developed and distributed through the Working Group. Feedback was received and incorporated into the design.

• Crime Prevention Through Environmental Design (CPTED) principles were applied to each design and formed a major consideration in each revision.

• Louise Dwyer has been involved in providing comprehensive comments on both the streetscape and the bus shelter design at all stages. Her comments on both the shelters' form and the streetscape environment have been valuable in addressing access and inclusion issues on multiple levels.

• The design form of the bus shelters was considered in the streetscape to ensure the shelter responded to site-based issues including response to the Shepparton climate. At each stage, the bus shelter form was refined and developed to meet the needs of the users.

Traffic and the bus shelter environment

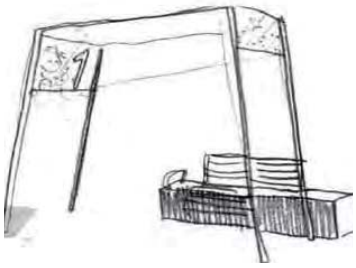
Additional expertise from within Council was drawn on to help address the bus shelters in the streetscape. Brendan Walsh (Senior Design and Traffic Engineer at GSCC) has reviewed the turning circles and bus movement systems as well as providing information on Vic Road Bus Stop Standards.

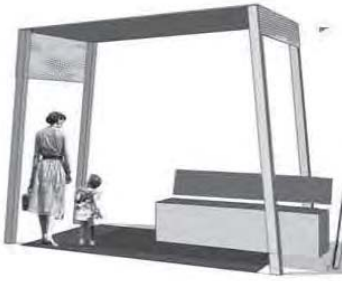
• As part of Brendan Walsh's review, the streetscape has undergone several realignment studies utilising turning circles. Each time the streetscape has been refined to meet the traffic needs of different stakeholders including the CFA, traders and buses. The needs of vehicles have been balanced with the need to promote an excellent pedestrian experience. The bus shelters' design have responded to the changing streetscape to meet standards.

• Public Transport Victoria's website refers to Vic Roads to set the standard for bus shelters and stops. The Vic Roads standard for bus stops and shelters was reviewed and incorporated into the design.

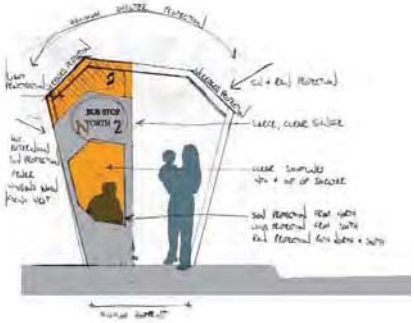
Draft drawings and images

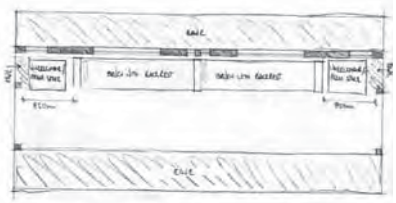
Current Shepparton CBD Standard Bus Shelter





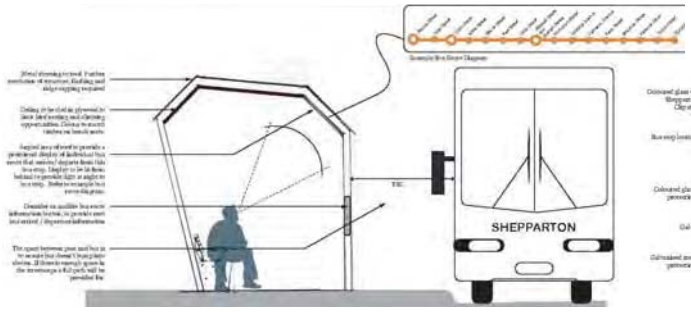
LMLA draft sketch design

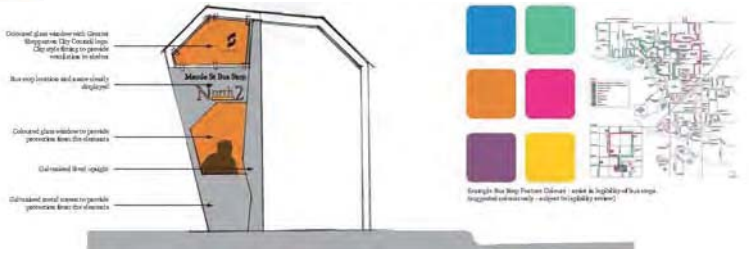


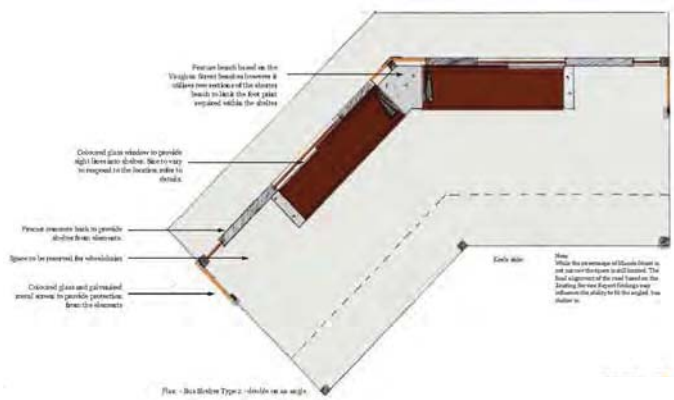


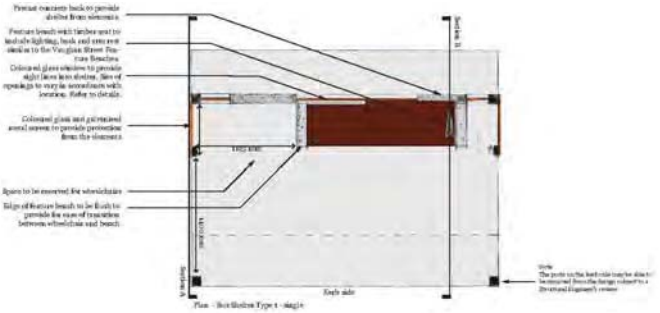
LMLA draft sketch design amended to respond to survey feedback

LMLA draft sketch design amended to respond to workshop feedback









The Final Bus Shelter Design

As a result of the workshops and discussions with the Bus Shelter Working Group, the follow key design principles were developed:

Legible - easy to read cues, the information provided is clear and linked to the new GSCC wayfinding strategy

Robust - withstand daily wear and tear, as well as destructive behaviour and not provide a target for vandalism.

Welcoming & comfortable - Pattern and texture, provide a welcoming space which imbues the user with a sense that they can be trusted with a beautiful facility, create a comfortable space which encourages people to use the service.

Ergonomic design principles - the materials and form should respond directly to the human forms of a diverse user group.

Modern and state of the art - utilise modern technology to improve the transport users' experience.

Designed for Shepparton - respond to environmental conditions to ensure good shelter is provided, use Vaughan Central styling, design for local skills and materials.

These key principles are discussed in detail on the Maude Street Bus Shelter Conceptual Plans included in this report.

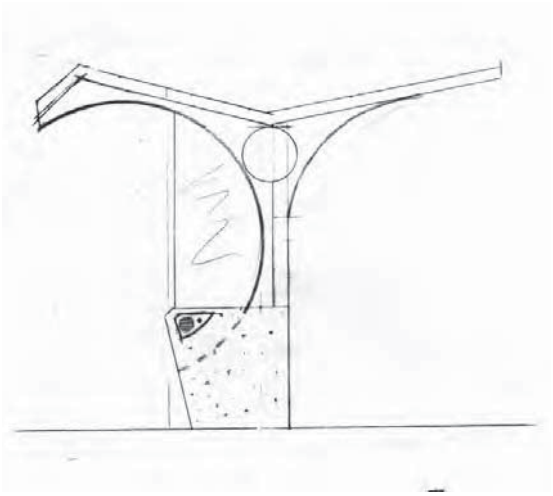
Key design outcomes

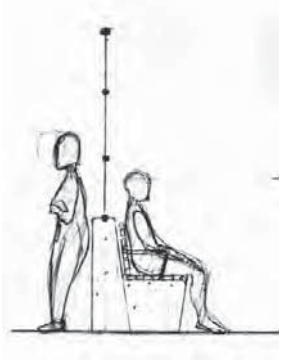
Key features of the design are discussed in detail on the plans included in this report such as:

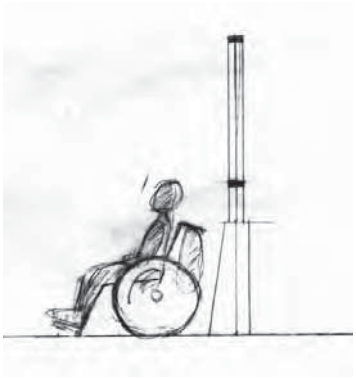
• Use of colour, super graphics and other cues to distinguish the bus shelters apart.
• A guide for providing timetable and route information as well as regulatory and location signage has been outlined.
• A robust materials palette of concrete, toughened glass and steel, balanced with timber slats on the seat, a plywood ceiling and feature detailing to ensure the space is welcoming and comfortable.
• Sight lines to provide good visual surveillance.
• The form of the bus shelter has been designed around the human form whether in a wheelchair or free standing. Space for luggage and additional items such as prams has been considered.
• An audible timetable has been designed into the structure. Additional digital timetables have been suggested.
• The roof form to responds to the environmental conditions and provides excellent shelter.

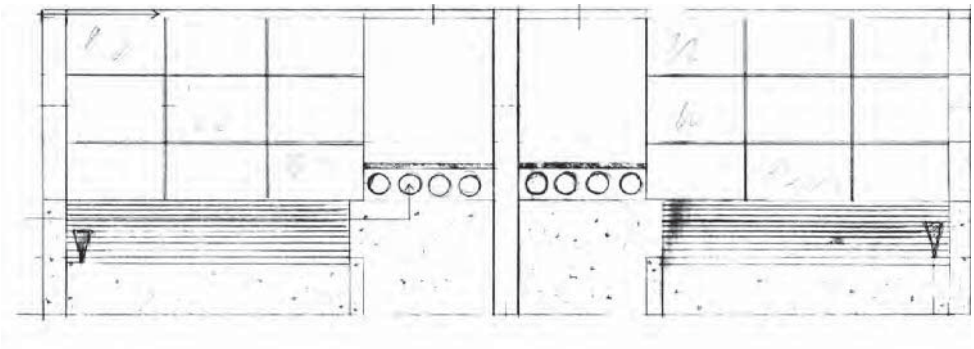
Final Draft Sketch Design Drawings

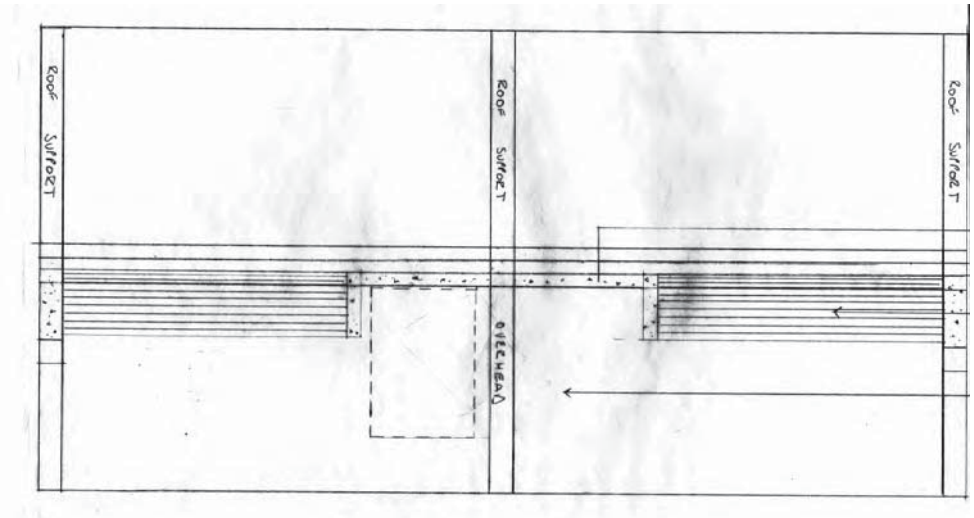
LMLA final draft sketch design
amended to respond to workshop feedback











Legibility
It is essential that the bus stops and shelters provide easy to read cues that they are bus stops, the route serviced and that the information provided is clear. Refer to colour and super graphics notes for more information.

Information such as maps, route diagrams and timetables needs to conform to modern legibility expectations. In this concept , where possible, the information has been provided in multiple formats eg Bus system map (spatial reading) and a route diagram with all stops shown (diagrammatic reading), timetable with arrival times at each stop (list reading) and an audible timetable (listening). Multiple formats cater for a variety of needs and provide a rich information base to empower transport users.

Robust
Bus shelters by their nature will need to withstand daily wear and tear, as well as destructive behaviour and not providing a target for vandalism.
It is the design intent to use robust materials such as steel, shatter proof glass and concrete to limit ongoing maintenance requirements. These materials are treated sensitively with detail to provide a sense of pride in the Shepparton Public Transport system. The details have been designed to fit in with existing maintenance programs. By providing care and detail CPTED issues are addressed by ensuring the space feels welcoming and comfortable.

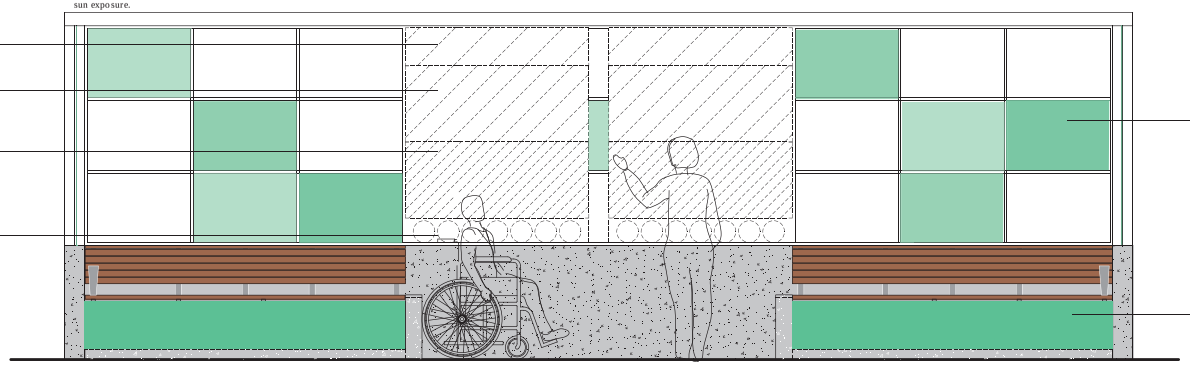
Ergonomic design principles
Bus shelters can be designed simply to respond to traffic standards. However these spaces become an uncomfortable space spent waiting impatiently for a bus - the user just wants to leave as soon as possible. By considering the needs of human bodies, the design intends to respond to this issue. The space provided is to be comfortable, with multiple waiting spaces. The seating provided is of a generous length with back rest, arm rest and capacity for an easy transition from wheelchair. Materials have ben chosen not just for their robust nature, but also their thermal properties in the Shepparton environment eg, timber slats on the seats provide a warm / cool seat, the low concrete wall blocks drafts and heat. The roof shape responds to rain and direct sun exposure.

Ergonomic design principles con't
The spaces have been designed around human bodies whether in a wheel chair or free standing. Space for baggage has been thought through and included at the base of the seats and available within a large area within the shelter.

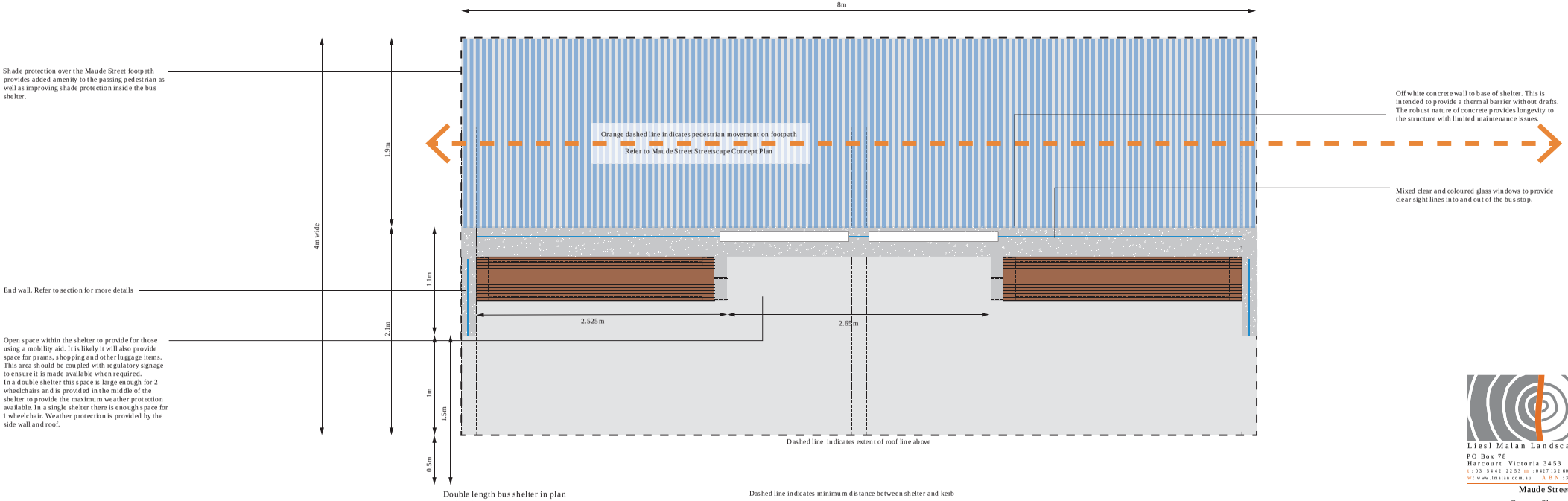
Welcoming and comfortable
The role of public transport in Shepparton is expected to increase. The bus shelter design needs to support this trend by providing a space that is comfortable and welcoming.
It is intended that by including pattern and detail as well as design for the human body, people will feel supported in their choice to use public transport in Shepparton.

Modern and state of the art
A new bus shelter design has the opportunity to utilise modern technology to improve the transport users' experience. For this reason the concept includes digital and audible timetables. A direct link to bus GPS to give up to the minute information should be included. Timetable service apps are outside the scope of this project, however should be considered as part of a comprehensive response to the bus interchange. Provision of free limited Wifi would improve the users experience and provide a valuable service.

Designed for Shepparton
The design intends to respond to the Shepparton environment by providing sun, rain and wind protection from north and south.
The design has been developed for Shepparton's CBD. Vaughan Central styling has been worked with to ensure the new works fit with the recent style direction.
When developing this conceptual design local skills and materials have been considered.



Double length bus shelter in section - road side view
1:20 at A1



Double length bus shelter in plan
1:20 at A1

Elements to assist in identifying your bus stop
During the working group meetings it was identified that significant change to bus stop locations and the increased number of stops may lead to confusion in some bus users.
To help combat this issue each of the eight bus stops is to be distinguished by colour and by a super graphic able to be read at some distance. While colour can not be relied on alone to differentiate the stops, it is one of the layers of information provided to make the bus stops look different.
Within the shelter itself the route(s) and timetables will be clearly displayed providing additional cues to bus users.

Colour in the Bus Shelters
The use of colour is an important element to ensure the bus shelters can be identified as different. It will however require review to ensure there is enough colour variation to meet the needs of visually impaired people. The colour palette shown here is intended as a guide to start this process.

It is intended that relationship between the colour of the shelter and the bus route be created. Bus route maps and other branding of the routes could be updated to match in with the colour of the shelters. Some shelters may service more than one bus route, multiple colours could be considered here.

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Maude Street Bus Interchange
Greater Shepparton City Council
Draft Bus Shelter Design Development

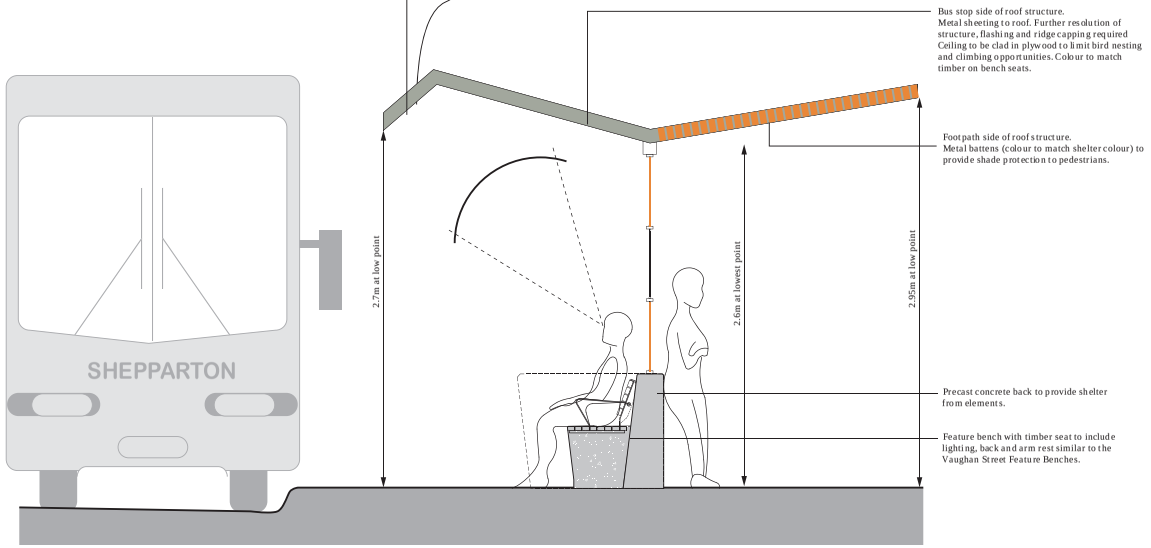
Project number 1050 Revision -
Sheet No. DD Bus Shelter 01

N
Scale 1:20 @ A1

Designed CR LM November 2013
Drawn CR 19.12.2013
Rev - -

Angled area of roof to provide a prominent display of individual bus route that arrives/ departs from this bus stop. Display to be lit from behind to provide light at night to bus stop. Refer to example bus route diagram.

Example bus route diagram.

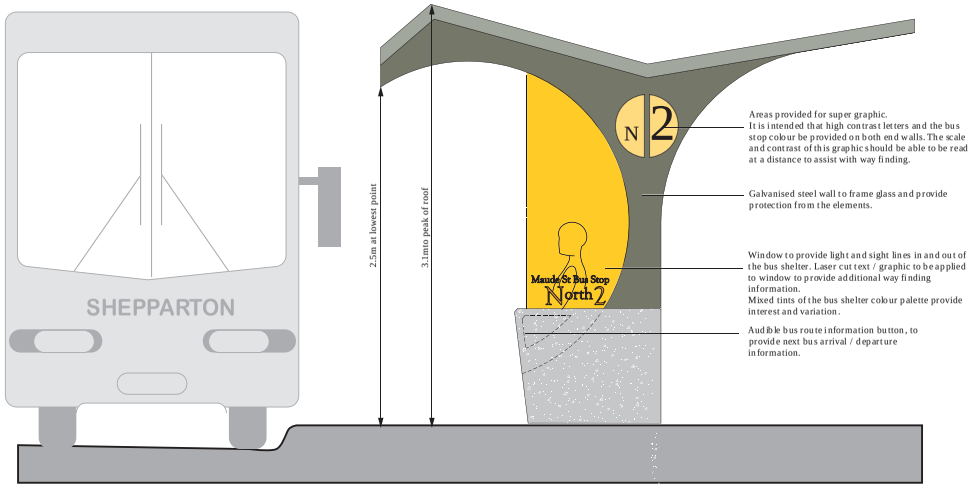


Bus stop side of roof structure.
Metal sheeting to roof. Further resolution of structure, flashing and ridge capping required
Ceiling to be clad in plywood to limit bird nesting and climbing opportunities. Colour to match timber on bench seats.

Footpath side of roof structure.
Metal battens (colour to match shelter colour) to provide shade protection to pedestrians.

Precast concrete back to provide shelter from elements.

Feature bench with timber seat to include lighting, back and arm rest similar to the Vaughan Street Feature Benches.

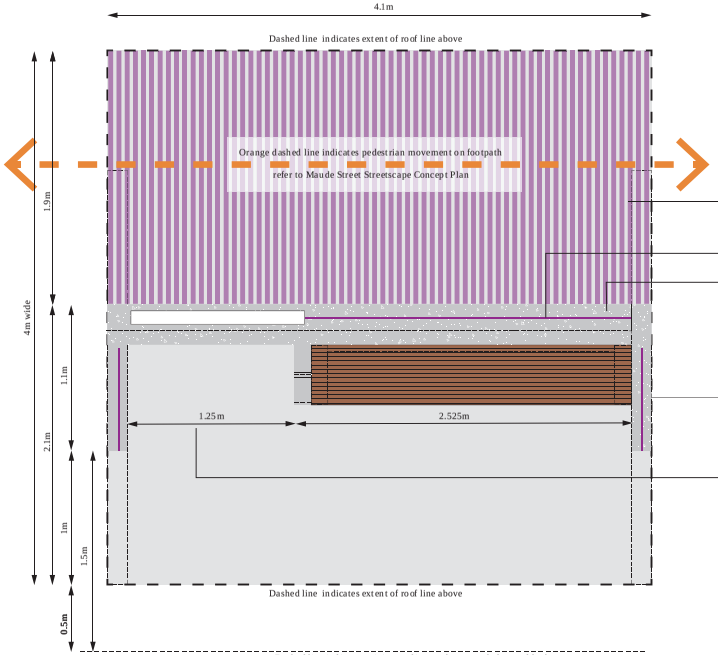


Areas provided for super graphic.
It is intended that high contrast letters and the bus stop colour be provided on both end walls. The scale and contrast of this graphic should be able to be read at a distance to assist with way finding.

Galvanised steel wall to frame glass and provide protection from the elements.

Window to provide light and sight lines in and out of the bus shelter. Laser cut text / graphic to be applied to window to provide additional way finding information.
Mixed tints of the bus shelter colour palette provide interest and variation.

Audible bus route information button, to provide next bus arrival / departure information.



Single length bus shelter in plan
1:20 at A1

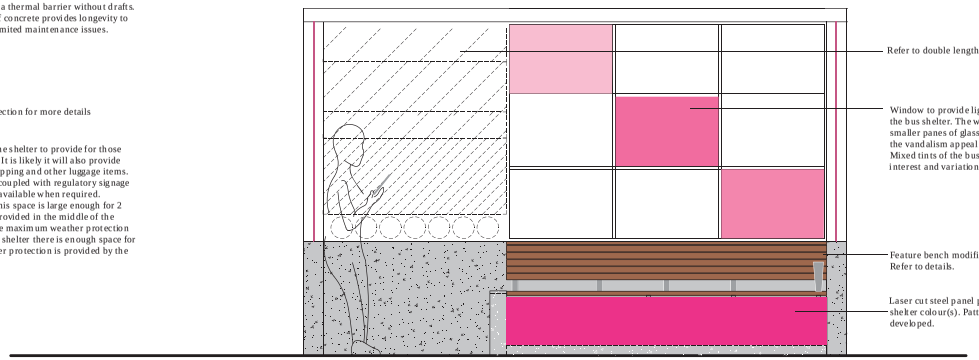
Shade protection over the Maude Street footpath provides added amenity to the passing pedestrian as well as improving shade protection inside the bus shelter. Refer to section for more information.

Mixed clear and coloured glass windows to provide clear sight lines into and out of the bus stop.

Off white concrete wall to base of shelter. This is intended to provide a thermal barrier without drafts. The robust nature of concrete provides longevity to the structure with limited maintenance issues.

End wall. Refer to section for more details

Open space within the shelter to provide for those using a mobility aid. It is likely it will also provide space for prams, shopping and other luggage items. This area should be coupled with regulatory signage to ensure it is made available when required.
In a double shelter this space is large enough for 2 wheelchairs and is provided in the middle of the shelter to provide the maximum weather protection available. In a single shelter there is enough space for 1 wheelchair. Weather protection is provided by the side wall and roof.



Refer to double length shelter for display details.

Window to provide light and sight lines in and out of the bus shelter. The window has been divided into smaller panes of glass to limit replacement costs and the vandalism appeal of a large sheet of glass.
Mixed tints of the bus shelter colour palette provide interest and variation.

Feature bench modified from Vaughan Central. Refer to details.

Laser cut steel panel powdercoated to match bus shelter colour(s). Pattern with transport theme to be developed.

Single length bus shelter in section - road side view
1:20 at A1

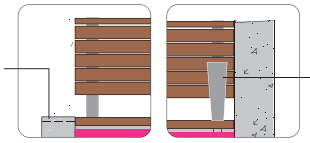
Vaughan Central - a design style direction

The Vaughan Street redevelopment was completed in November 2013. The materials, form and style are to create a style direction for the Maude Street works. It is intended that there will be precincts within the area of Vaughan and Maude Street.

The bus interchange will form one of these precincts. The paving and logic behind the streetscape should remain. However to ensure the needs of bus users are met and the area is distinctly a bus interchange there will need to be some key differences such as a more diverse colour palette, as well as, additional street furniture associated with the bus stop.

Feature benches - adapted to meet bus shelter needs

The feature benches (first installed and designed for Vaughan Central) have been modified to be an integral part of the bus shelters.
It is intended that the concrete base of the seats and the low concrete wall are integrated as one, or appear to be one element.
The back rest has been extended to service the entire length of the bench. The arm rest and concrete end of the bench have been located to make transferring from a wheelchair to the bench easier.

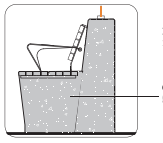


Detail of end of feature bench 1:10 at A1.

The end of the bench is clear of obstructions to provide for wheelchair to bench transfer.

Detail of end of feature bench 1:10 at A1.

Arm rest provided to assist people with mobility requirements



Detail of bench and wall 1:10 at A1.

Concrete elements to be integrated.

Public Transport Victoria (PTV) requirements

The Vic Roads standards for bus shelter design are endorsed by PTV. These standards have been reviewed and incorporated into the design as an integral element of the form of the bus shelter.
During the consultation process it was noted that PTV will require their logos to be clearly displayed on the shelters. Suggested locations have been designed into the signage areas and are intended to be able to be updated should logos or authorities change.

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Maude Street Bus Interchange

Greater Shepparton City Council

Draft Bus Shelter Design Development

Project number	1050	Revision	-
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N

Scale 1: 20 @ A1

Designed	CR LM	November 2013
Drawn	CR	19.12.2013
Rev -	-	

Further work required

The bus shelter design has progressed to a final concept. The project team has discussed that there are areas best resolved during detailed design and documentation. The following list outlines some items which will need to be resolved:

• Detailed drawings and specifications should be produced. It is intended that shop drawings will be produced by fabricators and approved prior to fabrication and installation of items.

• The conceptual design should be work shopped /reviewed with a Structural Engineer. The design should be revised as a result. Then the Structural Engineer should undertake computations of the documented design.

• The conceptual design should be work shopped /reviewed with fabricators to ensure the design is able to be fabricated efficently, manufactured and maintained using local skills and easily sourced materials. The design should be revised as a result.

• The lighting design of the individual bus shelters and the streetscape will need to be co-ordinated / work shopped with a lighting expert / designer and lighting authorities.

• The detailed design and discussions with fabricators should be used to produce an Opinion of Probable Costs specific to the bus shelter.

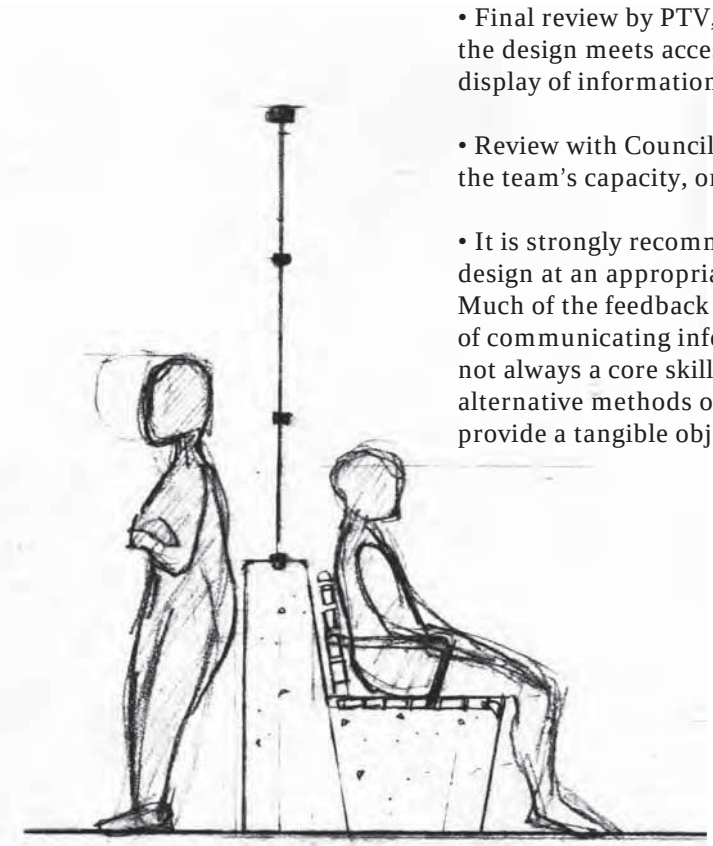
• The audible/digital timetable system to be discussed and negotiated with PTV.

• PTV logos and signage to be co-ordinated with PTV to ensure requirements are met.

• Final review by PTV, DAC, PAAC and relevant Council team members to ensure that the design meets access requirements including fine details such as colour and contrast, display of information and spatial relationship requirements.

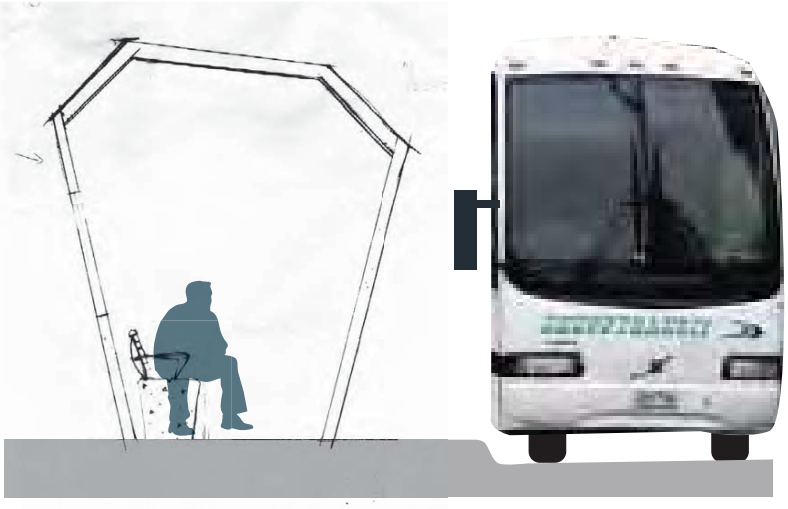
• Review with Council works team to ensure the maintenance requirements are within the team's capacity, or acceptable capacity extension.

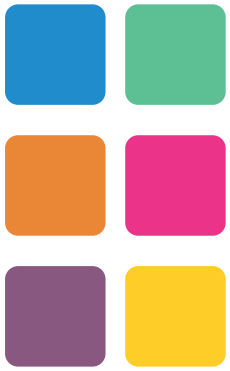
• It is strongly recommended that a physical model be made of the final bus shelter design at an appropriate scale (eg 1:10).
Much of the feedback on the bus shelter design discussed the need for multiple ways of communicating information to ensure it has been understood. Reading plans is not always a core skill for committee members, however their input is valuable and alternative methods of communication should be considered. A physical model would provide a tangible object to engage with.

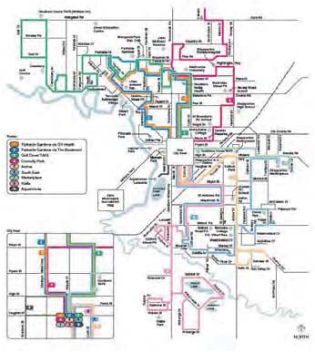


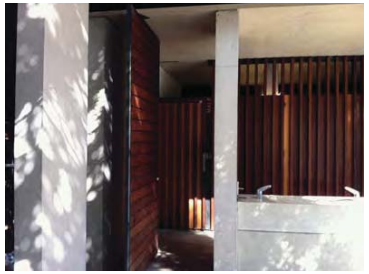
Appendices

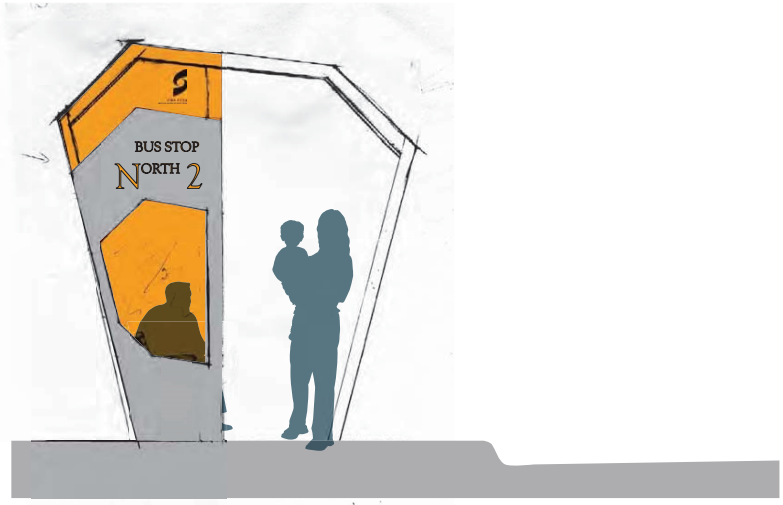
- LMLA draft sketch design (1)
- LMLA draft sketch design (2)
- Concept for Maude Street redevelopment - Streetscape plans
- Shepparton CBD standard Bus Stop
- Vic Roads standard

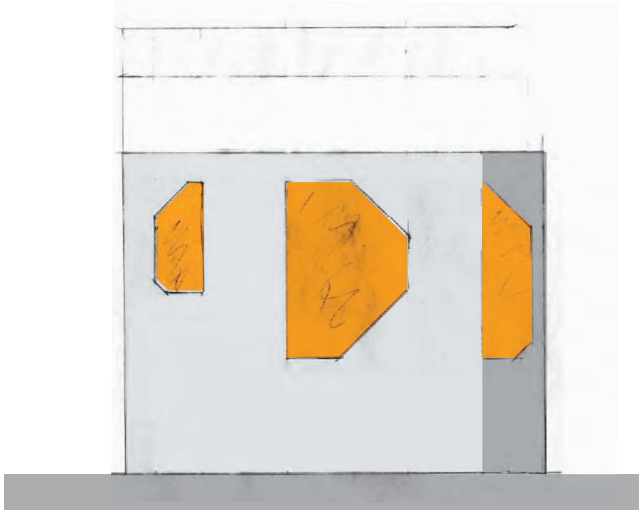


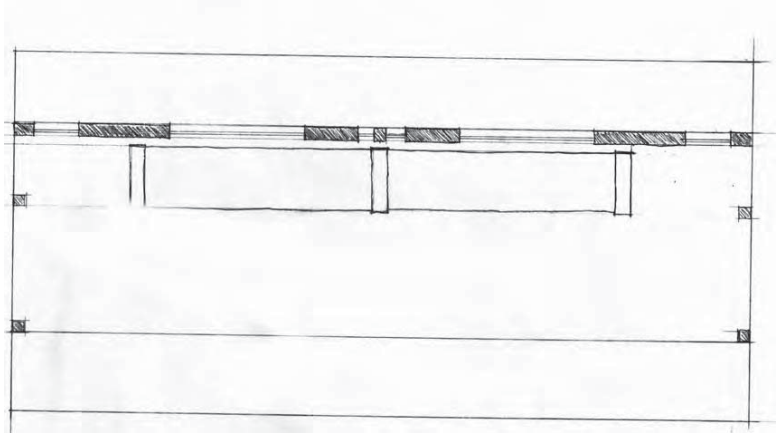


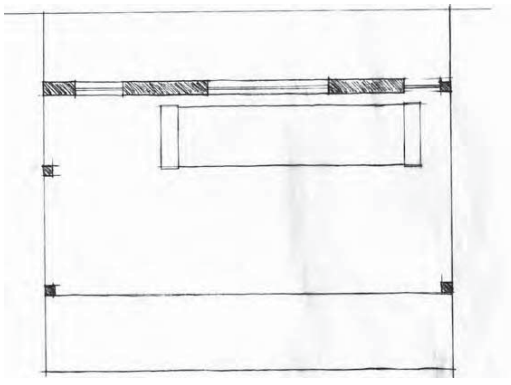












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Maude Street Bus Interchane
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Scale 1:20@ A1

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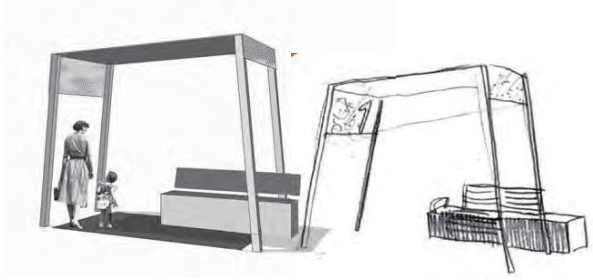
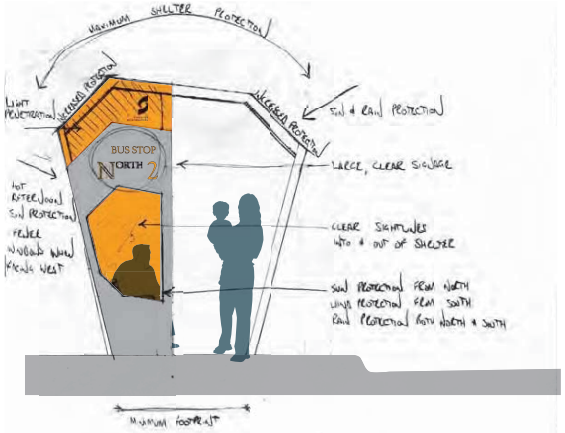
Drawn CR 28.08.2013
Rev. - -

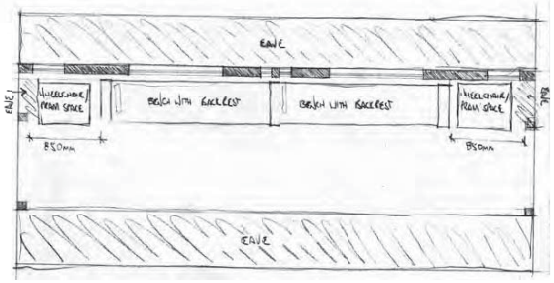
Concept Development Process and Feedback Summary



Bus Shelter Concept - 12.08.2013
N.T.S.

Feedback summary
Protection from wind is very important and needed to be improved
Service information to be provided in additional formats such as braille and an audible timetable
Design to ensure that shelter reads as an identifiable bus shelter utilising colour to help identify individual stops
Bus shelters to be smoke free
Timetable and bus route to be clearly displayed inside the shelter
Seating and lighting components to ensure space is safe and welcoming.
Ensure CCTV and visibility is included for safety
Bus terminus to have supporting facilities near by including public toilets, drink fountain, parents facilities and breast feeding room.
Design should utilise the Vaughan Street design further

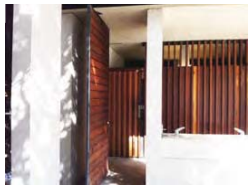


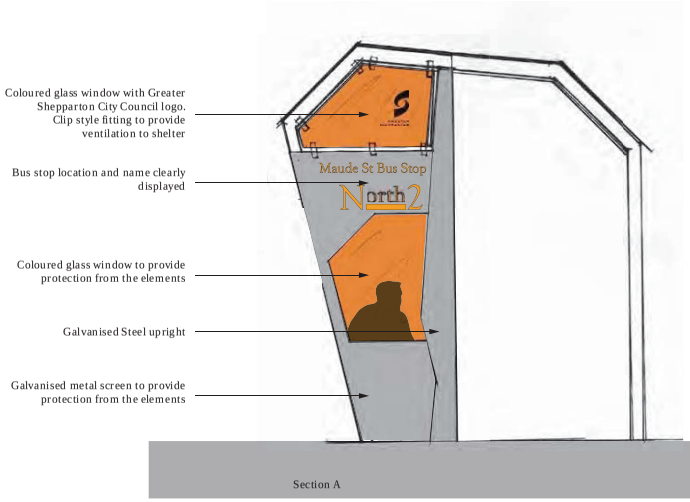


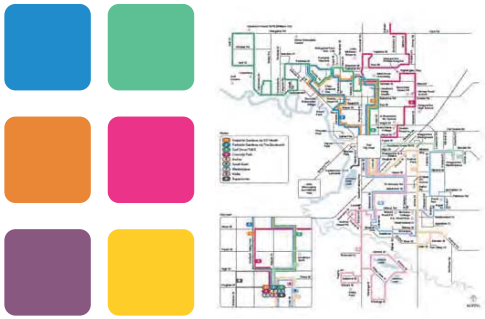
Bus Shelter Concept - 28.08.2013
N.T.S.

Feedback summary
Spaces for wheelchairs to be wider and noted as reserved
Bench next to wheelchair area to have no arm rest to ensure the wheelchair user can move across to sit on the bench
Concept is providing better shelter and has better legibility and way finding orientation cues
Consider a shelter model that uses the angled bench model from Vaughan Street
Straighten upright of frame on bus side to improve access & minimise possibility injury by bumping into post.

Precedent images

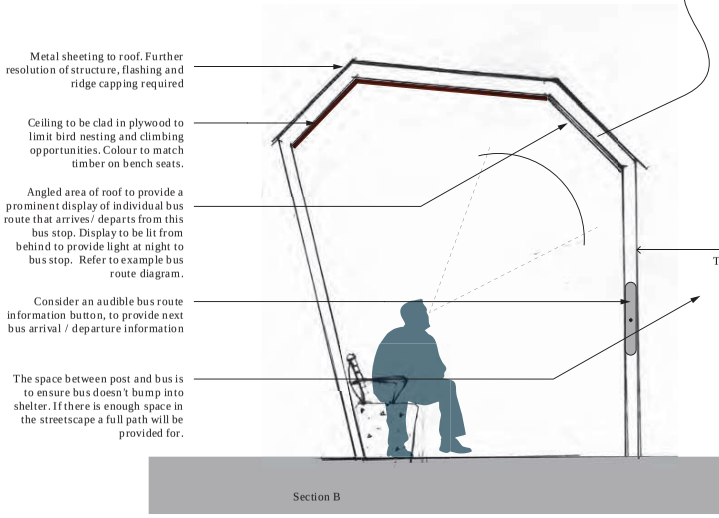


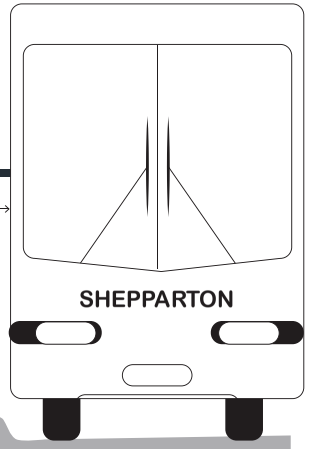




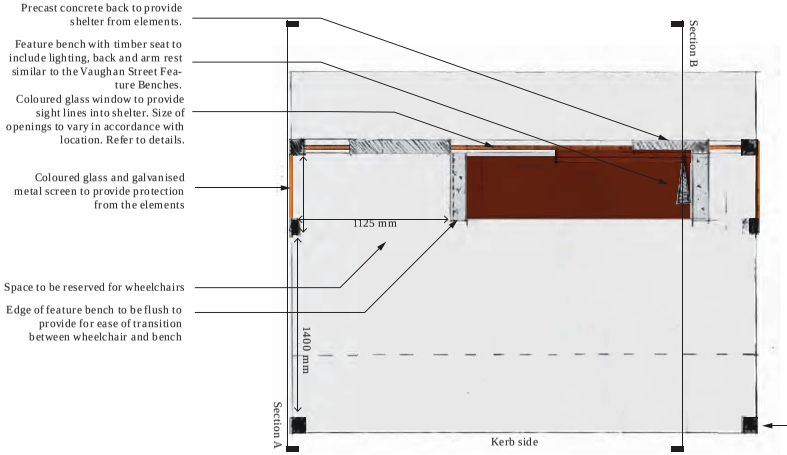
Example Bus Stop Feature Colours - assist in legibility of bus stops
(suggested colours only - subject to legibility review)

Example Bus Route Diagram





Note
While the streetscape of Maude Street is not narrow the space is still limited. The final alignment of the road based on the Existing Service Report findings may influence distance between the bus shelter and the bus.



Plan - Bus Shelter Type 1 - single

Note
The posts on the kerb side may be able to be removed from the design subject to a Structural Engineer's review

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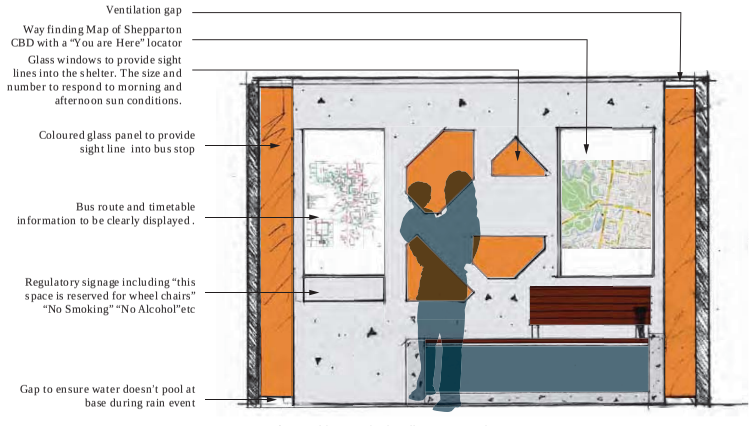


View of internal bus stop back wall - Western side

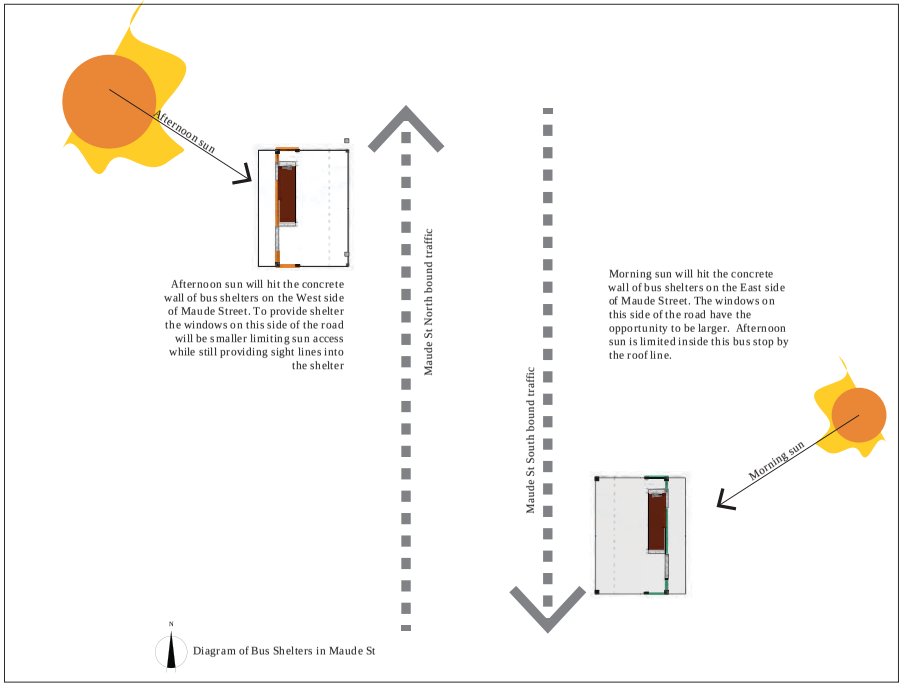
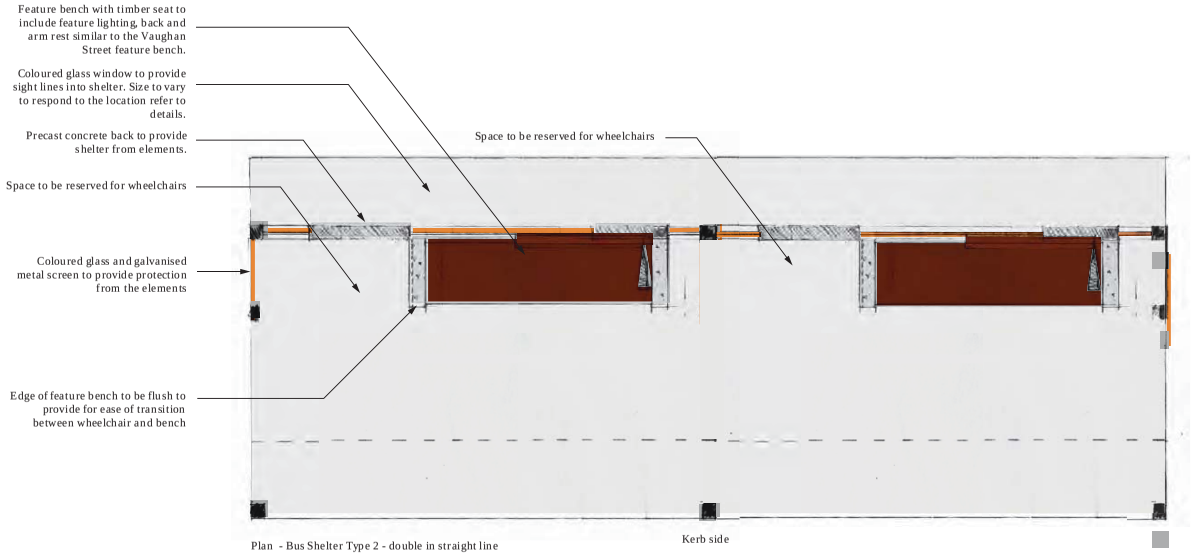
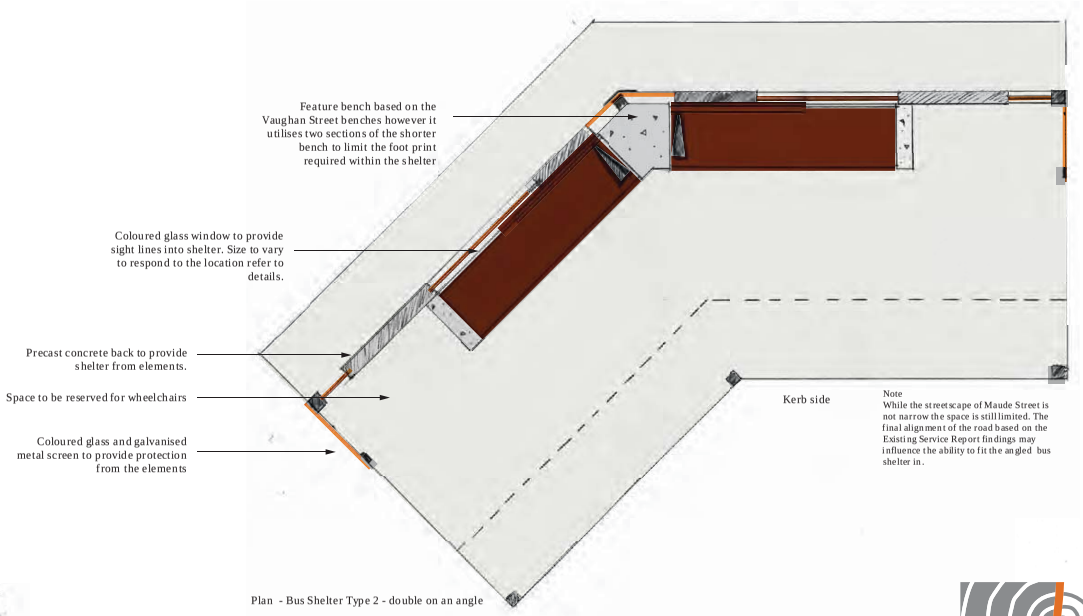


Diagram of Bus Shelters in Maude St

View of internal bus stop back wall - Eastern side



Plan - Bus Shelter Type 2 - double in straight line



Plan - Bus Shelter Type 2 - double on an angle

Design Rationale

When developing the bus shelter design we considered multiple and competing concerns while listening to the feedback of the project review team. Shelters have the functional requirement of protecting from the elements whilst still feeling safe and maintaining clear sight lines. Information is to be clearly displayed and available in different formats to meet a wide range of users requirements. The feedback on existing Shepparton Bus Shelters acknowledged concerns over longevity and vandalism but expressed a desire for a more welcoming and comfortable bus stop. These requirements became the driving factors in selecting materials and in designing the form of the shelters.

Note it is intended that toilets, and other public facilities as well as bike hoops, drinking fountains and bins will be provided at an appropriate distance within the streetscape or the plaza.

Further Work

Further work will be required to finalise the bus shelter design. An existing services report is currently being produced. The findings in this report will not only affect the streetscape and bus stop layout but will also influence the final design form of the shelter.

All signage, bus information and the exact colours of the bus shelters require a review to ensure the information meets best practice for information display and to ensure legibility for all.

These designs are intended as a preliminary concepts only and further design development will be based on feedback received and Structural Engineering requirements. Further resolution of the roof structure including flashing and ridge capping will be required. The design for the glass window fixings will require design development with a Structural Engineer and fabricators.

The audible timetable will require development to ensure it meets the needs of both transport users and providers.

A comprehensive lighting design will need to be undertaken for all elements of the bus shelter and in the context of the streetscape.

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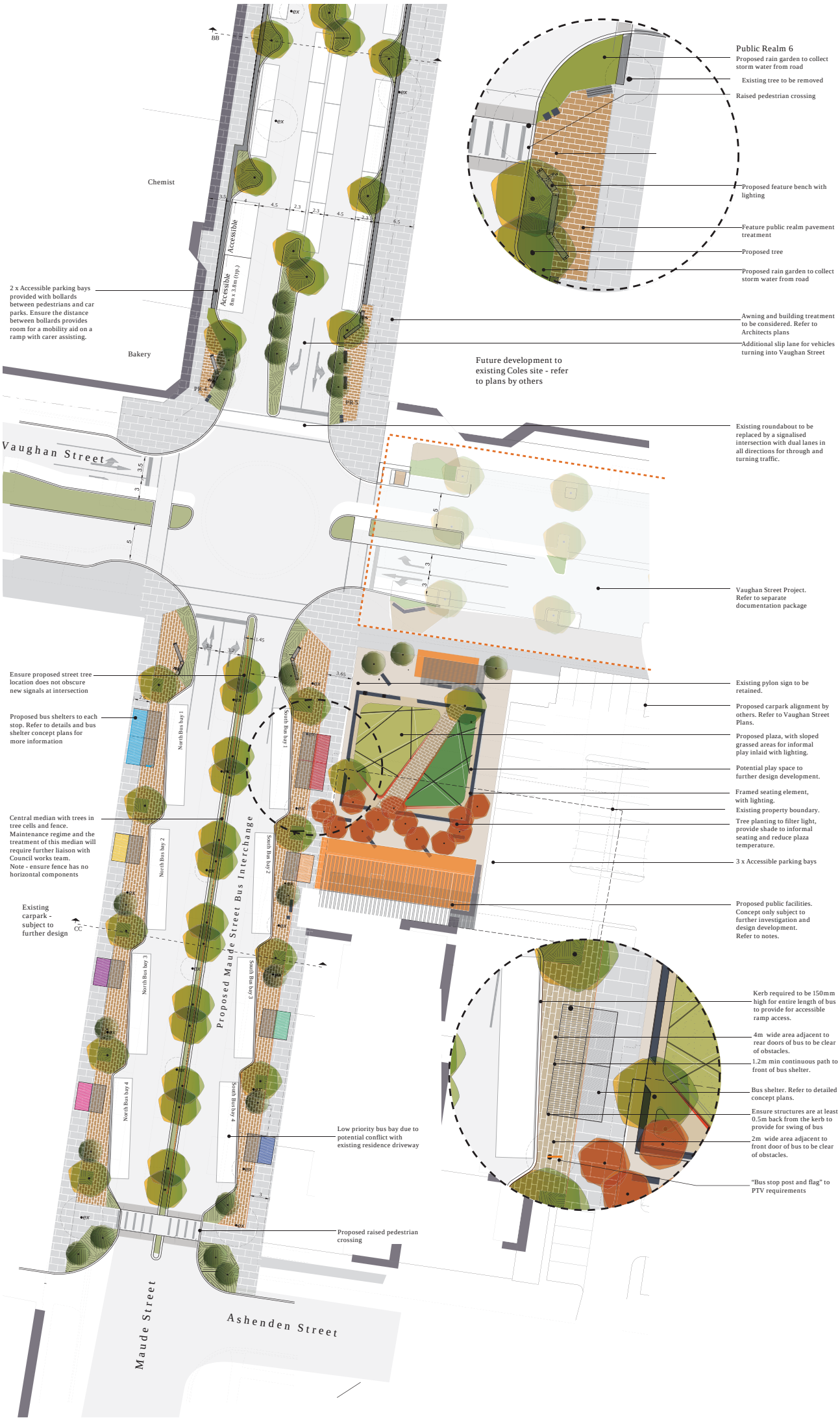
Maude Street Mall
Public Realm 2
Allowance in streetscape for additional cafe dining.
Proposed bench
Proposed tree
Planting buffer between seating and traffic.
Proposed bus bay.
Entrance to Rowe Street carpark realigned to allow for minimal disturbance of High Street traffic. Refer to GSCC plans for details.
Bus bay
PR 8
PR 7
7.2m x 2.3m (typ.)
6.7m x 2.3m (typ.)
3 min
4.3
6
5
GB Coffee
Union Lane
Proposed public realm area with custom seating, lighting, bins, understorey planting and additional tree planting.
Additional outdoor cafe space provided for GB customers.
Proposed raised pedestrian crossing.
Collins Book Sellers on Maude
Central median area with raised profile kerb to protect understorey planting. Median shape has been designed to facilitate vehicular access to carparks. Proposed shape also maximises space for tree and understorey planting to assist in cooling the streetscape.
Baking Dough Bakery
15min
4.5
2.3
2.3
4.5
2 x 15 minute car spaces.
Proposed centre parallel parking with 400mm centre space.
Additional planted centre medians to provide extra shade, protection for parked cars and pedestrian refuge.
Former La Porchetta
Proposed drop off bus bay to facilitate easy access to High Street and the Mall. 150mm high kerb in line with the bus doors is required to meet Vic Roads standards.
Ensure corner of kerb at bus stop is able to be crossed by CFA vehicles without a lip.
Concrete island to limit vehicles overhanging in the CFA required space. Ensure kerb profile provides for CFA vehicles to mount this island.
CFA crossover in plain concrete to CFA requirements.
Bus bay
Maude Street
JB Jewellers
2 x 15 minute car spaces either side of Doyle's driveway.
Doyle's driveway retained in existing location. Line marking to designate this as a driveway not a car park.
CFA
Doyle's Electrical
Proposed public realm area with seating, lighting, bins, understorey planting rain garden, pyc sculptures and additional tree planting.
Blank CFA wall. Potential to be used to commemorate the CFA service to Shepparton with art work or large historical photos.
Area for bike racks, relocated public phone and drinking fountain. Ensure fountain is able to be accessed by all abilities and a dog bowl for assistance animals is provided. Provision of facilities near the CFA should not encourage people to linger. Ensure no seating is provided to this side of the crossing.
Rowe Street
Proposed Rowe Street raised pedestrian crossing.
Proposed public realm area with custom seating, lighting, bins, understorey planting and additional tree planting.
Upgrade and realignment of existing Maude Street pedestrian crossing to a raised crossing. Relocation to align to existing underground power easement and move pedestrians further away from CFA.
AA
PR 1
PR 6
3.4
3.5
Additional footpath space provided to reduce existing congestion.
McDonalds
Proposed centre parallel parking with 400mm centre space.
Closed Circuit TV (CCTV)
CCTV is to be provided throughout the streetscape and in the bus interchange.
A comprehensive design by specialists will be required to ensure this is adequately provided for.
New signalised intersections Vaughan Street
GSCC intended that this intersection and the Maude Street precinct would be included in the Smart Roads program. However this option was not available at the time of conceptual design. Should it become available during documentation this process could be undertaken.
CFA and signalised intersections
The new intersection at Vaughan Street is to be able to be activated by the CFA to limit negative impact on response times.
Consideration of similar facilities at the High Street intersection should be discussed with Vic Roads
CFA traffic movements
The CFA have been consulted with directly to ensure that their vehicles have been designed for in the streetscape. The road design has been created using a turning circle of a vehicle larger than the biggest in the current fleet to future proof the streetscape. The final road way width is a balance of pedestrian and vehicle requirements. It has been developed collaboratively with GSCC Engineers, Shepparton Transit and the CFA
Kerb radii
5m radii have been used on the kerbs to provide for the street sweeper requirements. Note the central median does not require street sweeper access as it is the high point of the road.
Existing services
A Services Investigation Report has been undertaken by CS and A. The service findings have been considered and adjustments made to the design to limit conflict with existing services. However, to ensure best outcomes, the exact location and depth of services should be surveyed and liaison with service authorities should be undertaken.
Future underground power
Underground power requires a significant easement. Any future underground power should consider the locations' impact on the street trees. Minor alterations to the alignment of the power will have a significant impact on the streetscape.
Car parking restrictions
Some traders have expressed that 2hr carparks is too long for their business models. They have suggested 1hr car parks throughout the street. 15min carparks have been requested in front of several shops to suit the nature of their business.
Duration of construction
Some traders have raised concern about the impact of construction on their business. This issue should be considered during documentation and by GSCC to mitigate the impact where possible.
Public Facilities in the Plaza
The public facilities shown on this plan are a concept only and are subject to further investigation and design development. There is the potential to provide an integrated public facilities and toilet in this location.
A Public Toilet Review (2013) has been produced by LMLA for the Greater Shepparton City Council. This report should be referred to for any design development. The report notes that public toilet facilities have been requested in this location. The report recommends that not only are 9 or more cubicles needed in this area, but additional facilities are also required, such as adult change facilities, a parents' room, breast feeding room and child changing facilities.
Please note - Bus service provider has requested bus staff toilets be included in the facilities. Facilities to consider provision of a mobility aid recharge point.
Design for all abilities
The design of individual feature elements and furniture is to ensure sufficient contrast with it's environment to limit potential hazards for the visually impaired.
Tactile Ground Surface Indicators (TGSIs) are to be provided in the streetscape at areas of potential pedestrian / vehicle hazards as well as intersections and crossings.
Ensure space for mobility aids in public realm is provided for.



Streetscape Design Rationale

The streetscape design provides a stronger pedestrian link between the Mall, Vaughan Street and the proposed bus interchange. At the same time this design provides a quality retail streetscape experience.

New tree planting provides greater shade for pedestrians, and for parked cars, while also assisting in cooling the streetscape.

"Public realm spaces" provide areas for resting / socialising without a commercial imperative. These public realm areas are to be welcoming spaces with understorey planting to contribute to the overall streetscape amenity. They have been strategically placed to provide resting areas with shade, seating, lighting and bins.

Note:
Please refer to Bus shelter concept for details

Car parking

North
(High Street to Vaughan Street)
Existing parking
- 43 x Standard bays
- 2 x 15 minute bays
- 5 x Bus Bays

Proposed Parking
- 40 x Standard bays
- 4 x 15 minute bays
- 2 x Accessible bays
- 1 x Bus drop off bay
- 1 x Bus stop in High street

South
(Vaughan Street to Ashenden Street)
Existing parking
- 33 x Standard bays

Proposed Parking
- 8 x Bus Bays

Legend

- Proposed pedestrian footpath
- Proposed parking
- Proposed public realm paving
- Existing kerb
- Proposed understorey planting
- Proposed rain-garden
- Proposed custom seating element
- Proposed bench to GSCC standards
- Existing trees to be removed
- Proposed Street tree: Geijera parvifolia Wilga
- Proposed Street tree: Zelkova serrata Zelkova
- Proposed Plaza tree: Eucalyptus pauciflora Little Snowman
- Proposed shelter - refer to additional plans

This Concept Plan is based on a desktop study of existing services and infrastructure. Significant changes may occur to the Concept Plan during an impact assessment of existing services to this concept. It is intended that the design integrity and concept of the overall streetscape will be maintained after the existing services investigation.

Proposed plaza design is conceptual only. This design has been shown for discussion purposes only.
All elements are subject to change during consultation and design development.

Liesl Malan Landscape Architects
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Maude Street Streetscape Redevelopment
Greater Shepparton City Council
Streetscape Concept Plan

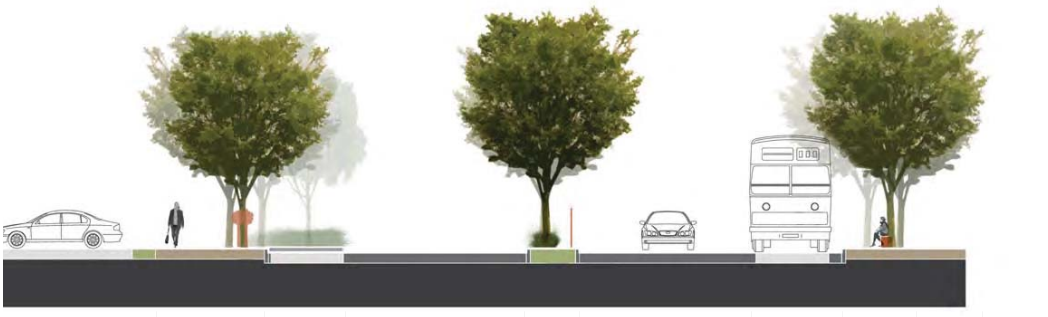
Project number	1050	Revision	C
Sheet No.	1050_CPDD		

Scale 1: 250 @ 594 x 1500mm

Designed	CR LM	Nov 2013
Drawn	CR	16.12.2013
Rev -	-	

Section AA
Raised pedestrian crossing - Maude Street Rowe Street

Section BB
Central median with raised planting



Section CC
Maude Street Bus Interchange

Streetscape Design Rationale

The streetscape design provides a stronger pedestrian link between the Mall, Vaughan Street and the proposed bus interchange. At the same time this design provides a quality retail streetscape experience.
New tree planting provides greater shade for pedestrians, and for parked cars, while also assisting in cooling the streetscape.
"Public realm spaces" provide areas for resting / socialising without a commercial imperative. These public realm areas are to be welcoming spaces with understorey planting to contribute to the overall streetscape amenity. They have been strategically placed to provide resting areas with shade, seating, lighting and bins.

Note:
Please refer to Bus shelter concept for details

Proposed plaza design is conceptual only. This design has been shown for discussion purposes only.
All elements are subject to change during consultation and design development.

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Maude Street Streetscape Redevelopment
Greater Shepparton City Council
Streetscape Concept Sections

Project number	1050	Revision	C
Sheet No.	1050_CS		
Designed	CR LM	Nov 2013	
Drawn	CR	19.12.2013	
Rev -	-		

Bus & Taxi Shelters - CBD use

DESIGN PHILOSOPHY

The Bus and Taxi Shelter is designed specifically for the Shepparton City. It draws on the theme of metallic furniture with blue colour trim of the Greater Shepparton furniture range. The signage on the end elevation metallic fins uses the Greater Shepparton logo and identifies the shelter as a taxi rank or bus shelter.

The shelter has a laminated glass surround that is housed in a metallic coloured frame, providing shelter whilst maintaining visibility of oncoming buses or taxis. A double shelter can provided for major Bus Stops.

This double Bus shelter has a blue seat matching the blue trim of the roof whilst the standard Single Shelter for Taxi's and Bus's has the standard Bright Silver Satin coloured seat. The shelter roof extends over the frame providing maximum shade from summer sun for pedestrians. A light weight aluminium frame is designed to be attached to the glass walls to provide bus information from both sides of the shelter.

Profile of Front Nose of fin to match front bull-nosed fascia.

Front Elevation bull nosed fascia to be Powdercoated DULUX Blaze Blue Gloss 19941

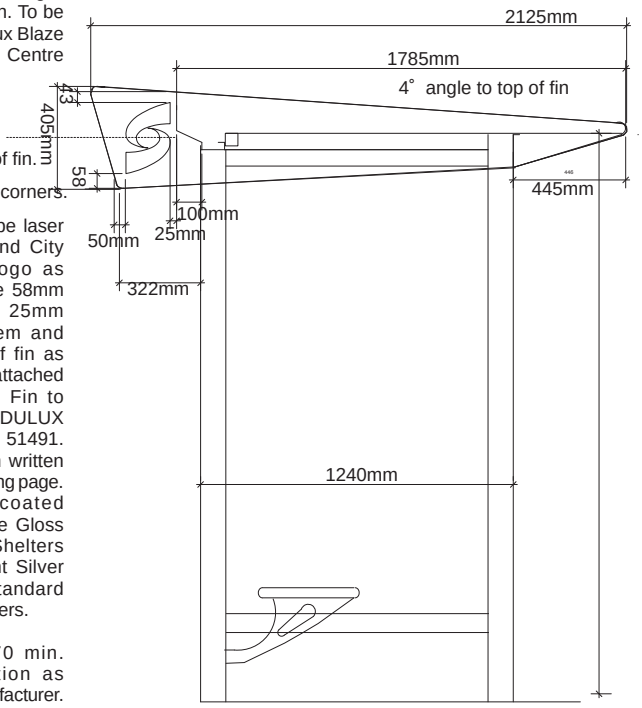
Zinc plated gutter system to be 100mm in length from rear of column. To be powdercoated Dulux Blaze Blue gloss 19941. Centre line of logo.

-74˚ angle to rear of fin.

25mm radius to all corners.

Side Fasci Fin to be laser cut with profile and City of Shepparton logo as shown. Logo to be 58mm from base of fin, 25mm from gutter system and 48mm from top of fin as shown. Fin to be attached to roof structure. Fin to be powdercoated DULUX Bright Silver Satin 51491. Graphic to be sign written as shown on following page. Seat to powdercoated DULUX Blaze Blue Gloss for Double Bus Shelters and DULUX Bright Silver Satin 5149 for Standard Bus and Tazi Shelters.

RHS Frame 2270 min. height. Fabrication as nominated by manufacturer. Frame to be powdercoated DULUX Bright Silver Satin 51491.



SUPPLIER

Bus & Taxi Shelter
Polite Enterprises Pty Ltd.
ph. 03 9436 9922
fax. 03 9436 9944

Aluminium Frame for Bus Information
20mm Snap & Grip Foolscap size Clear anodised aluminium frame.
See Urban Design Manual F 820.

DESIGN CONTACT

Urban Initiatives
ph. 03 9329 6844

SHELTER FINISHES

Side Fins
8mm thick Laser Cut ends.
Powdercoat DULUX Bright Silver Stain 51491.
Graphic Sigh to be written using:
Green Colour - DULUX Thai Teal 53 GG 50/360.
Gloss to match powdercoat colours.
Blue Colour - DULUX Blaze Blue Gloss 19941.
Blue Text - DULUX Space Blue Gloss 19990.

Front Bull Nosed Fascia & Rear Gutter
Blue Colour - DULUX Blaze Blue Gloss 19941.

Bus Shelter Frame
Powdercoat DULUX Bright Silver Stain 51491.

Seat for Double Bus Shelter
Blue Colour - DULUX Blaze Blue Gloss 19941.

Seat for Standard Bus & Taxi Shelter
Silver Colour - DULUX Bright Silver Stain 51491.

RECOMMENDED USE

In Shepparton City Centre.

MAINTENANCE

Cleaning and maintenance as required.

DOCUMENTATION

Cross reference with site layout drawings.

RESPONSIBLE COUNCIL OFFICER

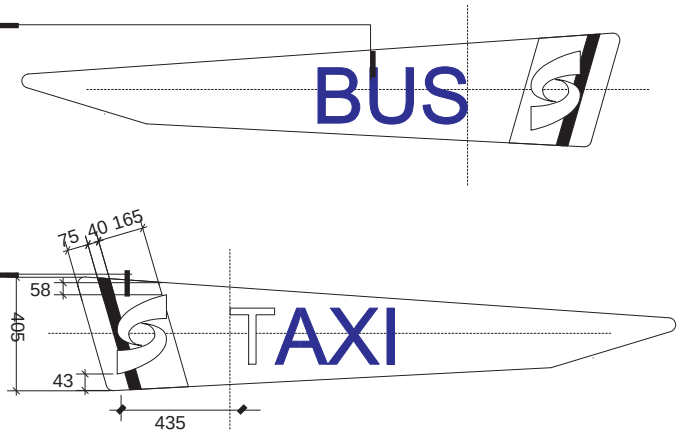
Manager - Engineering Projects
ph. 03 5832 9700

Text to be 200mm high Arial Font, aligned horizontally. Centre on centre line of fin and 435mm from bottom rear corner of fin. Text to be adhesive vinyl as recommended by manufacturer. Colour to match DULUX Space Blue Gloss 19990 powdercoat colour.

Bands of Colour to be parallel to rear of fin beginning 75mm from end of fin.

40mm wide band of adhesive vinyl as recommended by manufacturer. Colour to be DULUX Thai Teal Green 53GG 50/360 gloss to match powdercoat colour gloss.

165mm wide band of adhesive vinyl as recommended by manufacturer. Colour to be DULUX Blaze Blue Gloss 19941 powder coat.



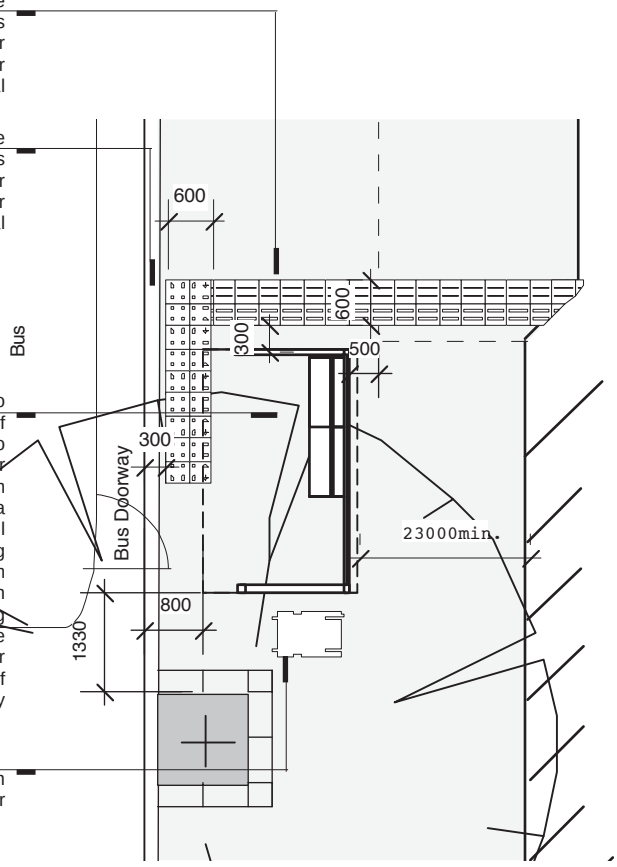
Graphic to Shelter Fins Not to Scale

Provide Directional Tactile ground surface Indicators in Locations as shown. For paving types and detail refer to Urban Design Manual Notes H 040.

Provide Hazard Tactile ground surface Indicators in Locations as shown. For paving types and detail refer to Urban Design Manual Notes H 040.

Bus and taxi Shelter to be aligned a minimum of 800mm from front of kerb to front of overhang on shelter roof. A minimum of 500mm from edge of tree pit, a minimum of back of wall of shelter to overhanging verandas. Allow a 2300mm minimum width of footpath between adjacent building and rear of shelter where possible. Make sure shelter is out of the alignment of adjacent doorways and entry to shops and buildings.

Ensure 1330mm minimum clear distance to allow for wheelchair turning circles.



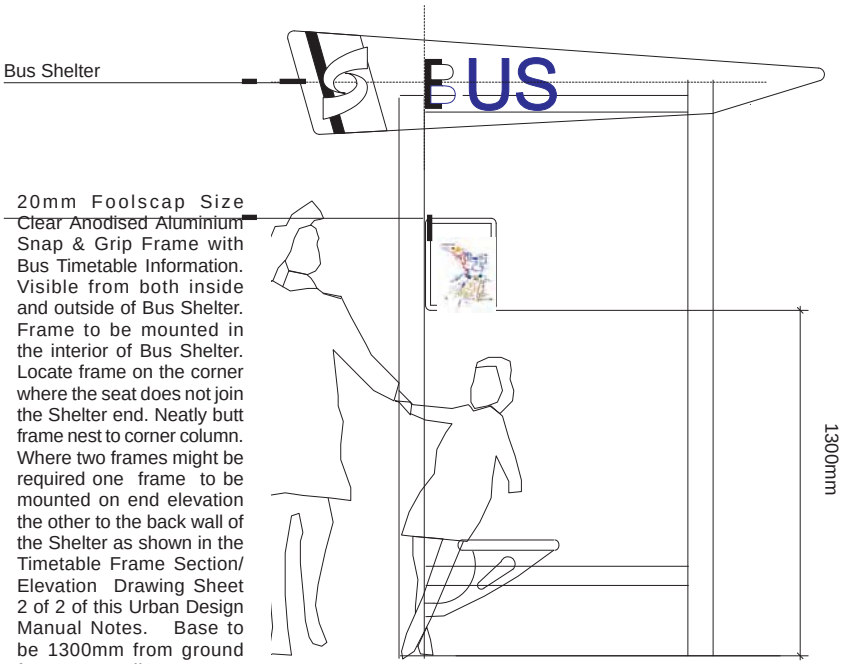
Typical Layout Plan Not to Scale

Aluminium Frame for Bus Timetable

DESIGN PHILOSOPHY

The 20mm snap and grip clear anodised aluminium frame used to house bus timetable information has been selected for its ability to be mounted on a glass wall so that bus timetable information can be seen from both the interior and exterior of the shelter. Its form is unobtrusive and its finish has been selected to compliment the bus shelter metallic finish.

The snap and grip unit provides a frame that is fixed in appearance but its sides and tops flip out allowing timetable information to be easily placed by Shepparton Transit. When Council orders bus shelters two frames per shelter should also be ordered and installed when bus shelters are placed in Shepparton City Centre.



20mm Foolscap Size Clear Anodised Aluminium Snap & Grip Frame with Bus Timetable Information. Visible from both inside and outside of Bus Shelter. Frame to be mounted in the interior of Bus Shelter. Locate frame on the corner where the seat does not join the Shelter end. Neatly butt frame nest to corner column. Where two frames might be required one frame to be mounted on end elevation the other to the back wall of the Shelter as shown in the Timetable Frame Section/ Elevation Drawing Sheet 2 of 2 of this Urban Design Manual Notes. Base to be 1300mm from ground for easy reading. Frame supplied an mounted by Polite Enterprises ph. 9436 9922

End Elevation

Not to Scale

SUPPLIER
Polite Enterprises Pty Ltd.
ph. 03 9436 9922

DESIGN CONTACT
Polite Enterprises Pty Ltd.
ph. 03 9436 9922

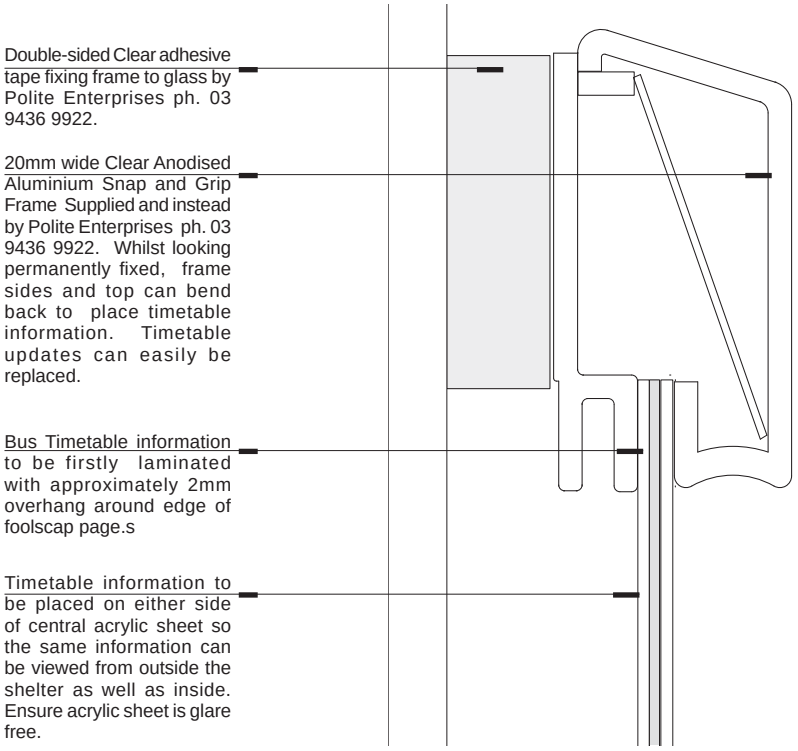
MATERIALS & FINISHES
20mm Snap & Grip Foolscap size Clear anodised aluminium frame. Frame to be mounted to glass as shown in drawing by supplier. Clear acrylic sheet to be glare free.

RECOMMENDED USE
In Shepparton City Centre Bus Shelters.

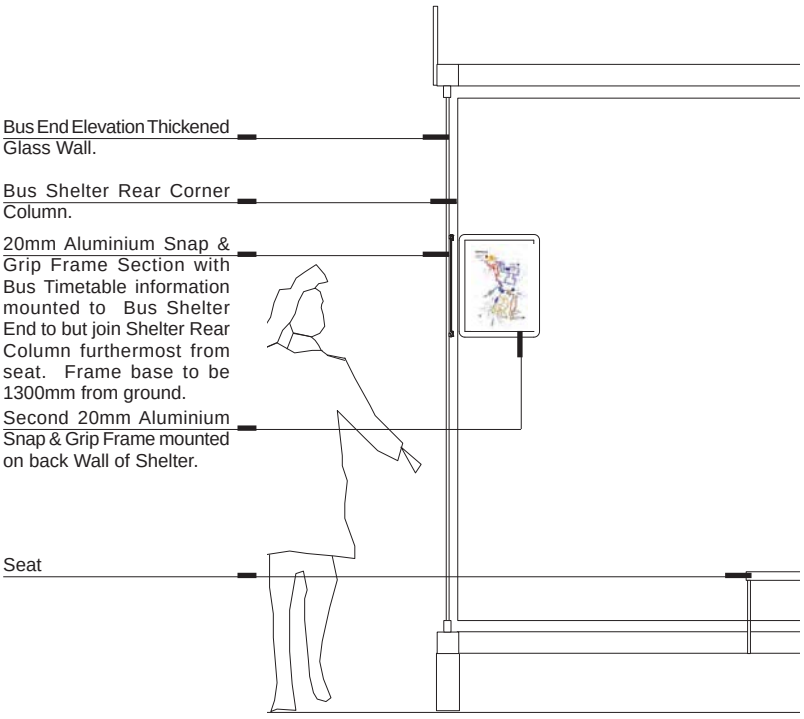
MAINTENANCE
Cleaning and maintenance as required.

DOCUMENTATION
Cross reference with site layout drawings.

RESPONSIBLE COUNCIL OFFICER
Manager - Engineering Projects
ph. 03 5832 9700



Bus Timetable Information and Frame Detail
Not to Scale



Timetable Frame Section/
Not to Scale

vicroads

Bus Stop Guidelines

February 2006

Introduction

Bus stops are an important interface between buses and passengers. They provide facilities for waiting passengers and facilities for the bus. Appropriate traffic management issues also need to be addressed to allow the bus to enter and leave the stop. This approach means that bus stops can be divided into the two distinct components of passenger waiting area and bus stopping area. The following guidelines provide information on the design and intended operation of both passenger waiting and bus stopping areas for rigid buses up to 14.5 metres in length. Guidance on bus stops for articulated buses is not covered in this document.

Passenger waiting area

The passenger waiting area at bus stops should have a consistent and predictable layout, taking into account waiting, boarding and alighting passengers, passing pedestrians, access for people with vision or physical impairments, and interaction with the bus and bus driver.

All new bus stops must now comply with the requirements of the Disability Discrimination Act (1992) and the Disability Standards for Accessible Public Transport (2002). The Standards outline the requirements in areas such as access paths, manoeuvring areas, ramps, waiting areas, surfaces and tactile ground surface indicators (TGSIs). These bus stop guidelines use 'accessible' design principles, but should be read in conjunction with the Disability Standards.

Bus stop post and flag

A bus stop post and flag (i.e. sign) are used to identify the bus stop, and provide a "marker" for the bus driver to stop with the front of the bus in line with the post. This provides a "control point" for the layout of bus stop facilities, and allows a consistent and predictable environment to be created. This is particularly important to passengers with vision or physical impairments.

Boarding and alighting clear areas

To provide unobstructed access to the front and rear doors of the bus, an area adjacent to the doors should be free from obstacles such as street furniture, trees, and poles. This is particularly important for wheelchair access to the bus, for the efficient loading and unloading of passengers, and to provide a consistent bus stop layout.

Figure 1 illustrates the minimum clear areas. These dimensions are based on:

- Provision of manoeuvring space for a wheelchair adjacent to the doors, as low floor buses may have ramps at either the front or rear doors
- A wider clear area at the rear door to provide improved egress with passengers being able to easily exit in a number of directions once off the bus, and
- The rear door location varying with different length buses.

Bus stop with shelter and bus service information totem

Passenger hardstand area

A passenger hardstand area with a sealed smooth surface provides a connection between the bus doors and the nearby footpath, particularly for wheelchair users. It also defines the waiting and circulating space around the bus stop passenger facilities. The extent of the hardstand area may vary depending upon the bus stop environment. It should consist of one of the following:

- The boarding/alighting clear area adjacent to the door with wheelchair access (suitable if all buses using the stop deploy ramps from the same door)
- The boarding/alighting clear areas adjacent to both doors
- The boarding/alighting clear areas plus the space between them, or
- The options described above, but with a connection to the footpath.

Additional hardstand area may be required on the other side of the post if timetable cases face the opposite direction, and can't be spun around.

Tactile ground surface indicators

Tactile ground surface indicators (TGSIs) assist people with vision impairment to access the bus from the adjoining footpath. Tactile directional indicators direct people from the footpath to the kerb where the bus front door will be, and from the bus back to the footpath. Tactile warning indicators warn people of the kerb and potential hazard beyond it. The layout and specification of TGSIs should generally be in accordance with the Australian Standard AS1428 Design for Access and Mobility Part 4, Tactile Indicators.

The TGSI layout shown in figure 1 provides good guidance for people who are vision impaired by directing them to where the front door of the bus will be. It also minimises the impact of the tiles on wheelchair users if they are boarding or alighting from the front door. This is achieved by locating the directional tiles central to the front doors so the wheelchair can straddle them. In addition to this, it should be noted that most of the tactile warning indicators will be covered by the ramp when it is deployed from the bus.

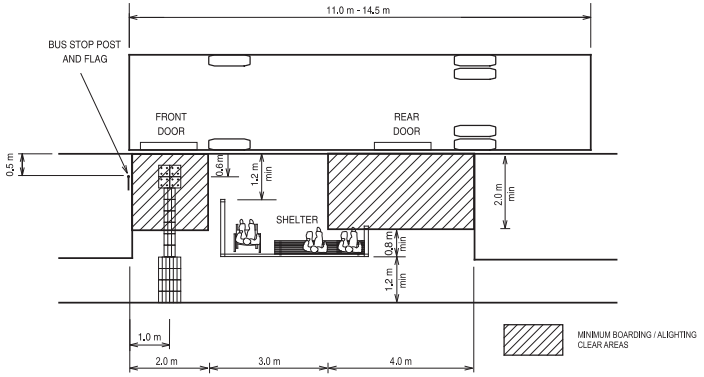


Figure 1: Preferred Bus Stop Layout - Roadside Width > 3.2 m (with 3 m long shelter) or > 4.0 m (with larger shelter as shown)

Minimum boarding and alighting clear areas at a low-usage stop

With more facilities, this stop still provides required clear areas

Bus passenger shelter

Bus passenger shelters provide an important service to waiting passengers. The design and layout of shelters should meet a number of requirements including:

- Providing shelter from the sun, wind, and rain
- Allowing passengers to see the approaching bus and for the bus driver to see the passengers
- Being accessible with the necessary clearance and circulation spaces, particularly for people with physical or vision impairments, and
- Providing a safe shelter for passengers while not posing unnecessary dangers to the occupants or riders of passing vehicles.

Bus shelters should be positioned so that sight distance requirements for road users are not significantly impacted. Where there is ample width, bus shelters should be located outside the Clear Zone (as defined in VicRoads Road Design Guidelines, 2002). However, in most cases this will not be possible, so shelters should be made of materials to minimise injury to errant road users.

In a constrained environment the preferred location for a bus passenger shelter is as shown in figure 1. A minimum width 1200 mm is shown on each side of the shelter to provide a continuous accessible path of travel. If the shelter has an advertising panel that is 1500 mm wide, a minimum roadside width of 3.9 metres would be required. If there were 800 mm end panels, the minimum roadside width would be reduced to 3.2 metres.

When the roadside width is less than 3.2 metres, it can be difficult to locate a bus passenger shelter and maintain the appropriate clearances.

The minimum requirements to be maintained are as follows:

- A continuous accessible path of travel of 1200 mm is to be maintained throughout the bus stop
- People waiting (seated or standing) occupy an 800 mm width, and if more than this space is occupied (for example by a wheelchair user) then this additional space could be shared with the continuous accessible path of travel
- The area to 500 mm from the back of the kerb is to be free of fixed obstacles to allow for overhang of the bus and its mirrors on entry and exit, and
- The boarding and alighting clear areas shown in figure 1 are to be free from fixed obstacles.

Using the above criteria, the following four options have been identified for roadsides narrower than 3.2 metres. Each option has advantages and disadvantages that will need to be considered prior to determining the most appropriate solution for a particular site.

Shelter Option A is set back behind the footpath as shown in figure 2. This usually requires negotiations with the adjoining landowner. However, this option provides a solution for roadside widths as narrow as 2.0 metres. An advertising end panel could be provided on the shelter. Adequate clearances and sight lines should be provided around the shelter for maintenance, passenger security and visibility between waiting passengers and bus drivers.

Sites with fences, vegetation or other obstructions adjacent to the proposed set back shelter may not be suitable for Shelter Option A.

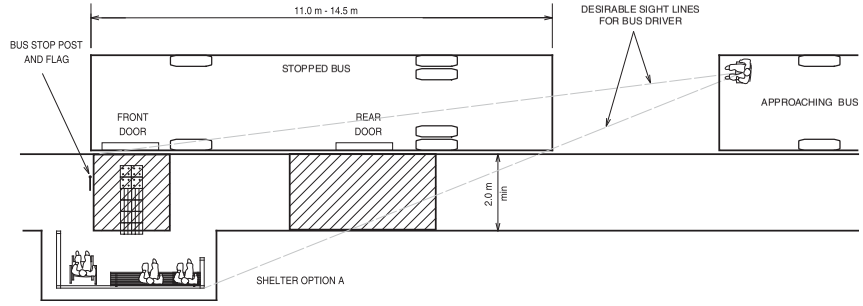


Figure 2: Bus Passenger Shelter Location Option A - Roadside width > 2.0 m

Shelter Option B provides a bus passenger shelter without seats or end panels and is located against the property line as shown in figure 3. It could be fitted with a leaning rest to provide some support for waiting passengers, but would need to be of minimum width and have tapered ends to minimise its impact on people with vision impairment.

Shelter Options C and D position a bus passenger shelter with its back to the kerb as shown in figure 4. The proximity of the shelter to the kerb increases the risk of it being hit by an errant vehicle. Whilst there is a low incidence of this type of crash, it is nevertheless an issue for consideration. Figure 4 is considered to be appropriate only in low-speed environments or where nearby parking creates a buffer, as shown in figure 7.

Visibility between waiting passengers and drivers can be compromised with shelters facing away from the road. Good sight lines should be maintained with these options, which may be preferred on the basis of providing better weather protection in some circumstances.

Advertising end panels may not be possible if the minimum clearances and adequate sight lines are to be maintained.

Option C is shown downstream of the bus stop post and flag. This location may impact on sight lines for vehicles exiting nearby driveways. Option D is between the boarding and alighting clear area. However with only 3000 mm between the areas, a smaller shelter would be required.

Timetable information

Timetable information should be provided on the bus stop pole. At high use stops, it is desirable to display timetable information more prominently, such as on the bus passenger shelter. However it should be noted that the current contract (June 2003) between the bus operators and the Government of Victoria requires the operator to “display a clearly legible timetable in display case for at least 30% of all bus stops”.

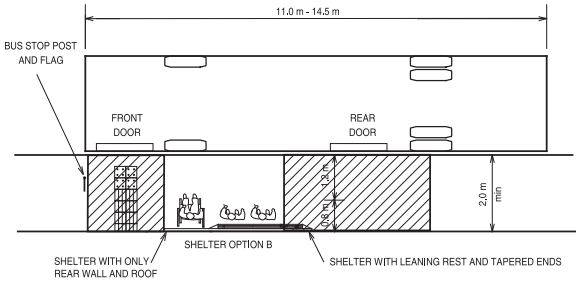


Figure 3: Bus Passenger Shelter Location Option B - Roadside width > 2.0 m

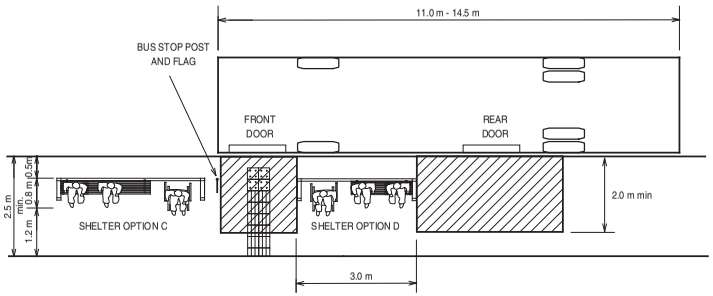


Figure 4: Bus Passenger Shelter Location Options C and D - Roadside width > 2.5 m

Other street furniture

Other street furniture such as rubbish bins, seats in lieu of bus passenger shelters, real-time information signs, and bus service information totems may also be provided. These should be located such that the boarding and alighting clear areas are maintained, and the 1200 mm continuous accessible path of travel is provided throughout the bus stop area. All street furniture should be set back from the kerb by 500 mm to allow for bus overhangs.

Lighting

Lighting at bus stops serves a number of purposes. It provides illumination for accessing the stop, waiting, boarding, and alighting. It also provides an increased level of perceived safety and security. The minimum lighting standard is to meet the requirements of the Public Lighting Code AS/NZS 1158 - 1997. Lighting levels above the Code should be considered at locations where there is a high demand for the service.

Bus stop kerbing

Where a kerb is provided at a bus stop, it should be 150 mm high barrier kerb as per VicRoads Standard Design Drawing SD 2001. This type of kerb provides good guidance for the bus driver, provides some protection to the waiting bus passengers, and meets the ramp height requirements of the Disability Standards for Accessible Public Transport (2002). If kerb is not provided, consideration must be given to otherwise achieving the minimum required gradient for ramps deployed from the bus.

Bus stopping area

Defining a bus stopping area

A bus stop is designated by a bus stop flag or sign. Stopping at or near a bus stop is defined in the Road Rules. Rule 195 states that "A driver (except the driver of a public bus) must not stop at a bus stop, or on the road, within 20 metres before a sign, and within 10 metres after the sign, unless the driver stops at a place on a length of road, or in an area, to which a parking control sign applies and the driver is permitted to stop at that place under the Road Rules".

If the bus stop area is other than 30 metres in length, or additional parking control is needed, parking control signs and/or Bus Zone signs as shown in figure 5 are required.

Pavement markings as shown in figure 5, may be installed to support the Bus Zone signs. However, the pavement markings do not have regulatory significance.

Bus zone signs and pavement markings may also be used:

- ❒ at bus stops abutting parking areas
- ❒ where problems exist with illegal parking at bus stops, or
- ❒ where it is desirable to improve the conspicuity of a bus stop for intending passengers, or for traffic operational reasons.

It is not appropriate to use bus zone pavement markings at indented bus bays.

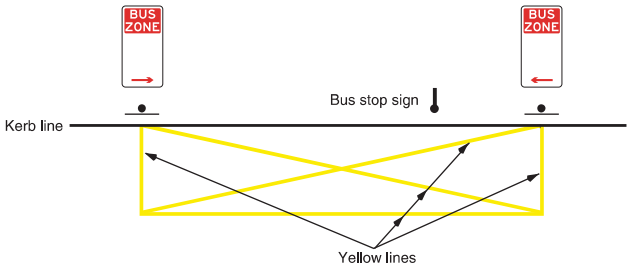


Figure 5: Bus Zone Sign And Bus Zone Pavement Markings

Bus stop bays

Bus stops may be indented into the adjacent road side area so that the bus is out of the traffic stream while it is setting down or taking up passengers. Figure 6 shows the layout of a typical bus stop bay. Road Rule 77 requires drivers to give way to buses displaying a "Give Way to Buses" sign, however bus operators experience difficulty exiting from bus bays due to other traffic being reluctant to allow the bus to re-enter the traffic stream.

VicRoads has adopted a policy to limit the use of bus stop bays, which considers the views and experiences of bus operators, and also operational characteristics of a road. As a result of the policy, the following guidelines have been established when considering bus stop bays:

- ❒ Bus bays should not be constructed in 60 km/h zones unless there is physically no way another vehicle could overtake the stopped bus, or the stop is very close to the departure side of a signalised intersection in a way that would severely impact intersection operation
- ❒ Bus bays should not be constructed in 70 km/h zones unless there is only one lane in the bus direction, or the stop is close to the departure side of a signalised intersection
- ❒ Bus bays should not be constructed in 80 km/h zones unless there are only one or two lanes in the bus direction, or the stop is close to the departure side of a signalised intersection, and
- ❒ Bus bays may be constructed in 90 km/h and 100 km/h zones. Consideration should be given, where the bus bay is in a shoulder, to providing a longer acceleration zone to assist re-entering the traffic stream.

In places where the bus is stopping in traffic, consideration of markings and signage to increase the conspicuity of stops is required (refer to figure 5).

Bus bays may, however, be constructed where the stop:

- ❒ Is used as a timing point, where buses may need to wait for several minutes if running early
- ❒ Is used as a bus driver change-over point, requiring the bus to stop for longer periods, or
- ❒ Is a particularly high loading bus stop, where the time taken to load passengers can regularly take minutes.

In places where a bus bay is considered as necessary, it is also important to obtain written agreement from the operator and to consider means of assisting the bus exiting the bay through measures such as:

- ❒ Linemarking, pavement markings or static roadside signs to advise motorists of the bus bay and the need to give way to exiting buses, and
- ❒ Assisting bus exit manoeuvre through the use of nearby signals to create a gap in the traffic stream.

Guidance on special circumstances can be provided by VicRoads' Road Based Public Transport section.

Bus stops and road shoulders

Where bus stops are situated on road shoulders, the width of the shoulder and the nature and condition of the surface should be carefully considered, taking account of vehicle volumes and sight distance.

Sites and treatments should provide safe and convenient conditions for:

- ❒ passenger access and waiting
- ❒ buses stopping and re-entering the traffic flow
- ❒ vehicles to pass or overtake a stopped bus.

The use of bus bays is to be limited to particular situations

No bus bay is required in a 6-lane road with an 80 km/h speed zone

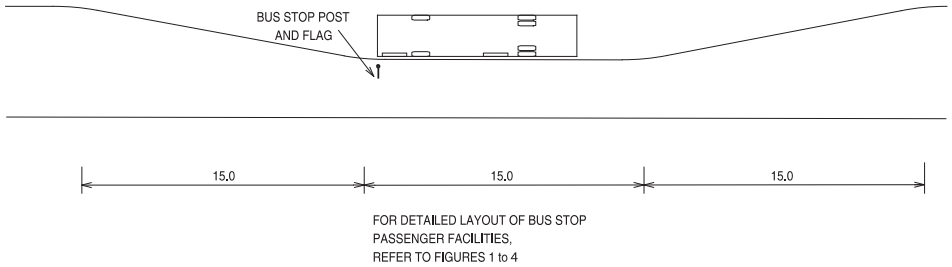


Figure 6: Typical Bus Bay Layout

Kerbside bus stops

It is necessary to have sufficient clear kerbside space to allow a bus to enter the bus stop, straighten up, and stop at the bus stop flag with its front and rear doors close to the kerb. The bus must then be able to exit the bus stop without encroaching into the next traffic lane.

Computer modelling using "AutoTURN" and field tests have been used to determine the minimum clear kerbside length needed for the rear doors of the bus to be not more than 300 mm from the kerb. For a 12.5 metre long bus, an approach length of 26 metres and an exit length of 10 metres are required. For a 14.5 metre long bus, an approach length of 30 metres and an exit length of 10 metres are needed. These recommended minimum dimensions are illustrated in figure 7.

Using other road space

Prohibiting 36 or 40 metres of kerbside parking may be difficult at some sites. Locating the bus stop so that the bus makes use of other road space on the approach or exit to the stop can reduce the amount of clear kerbside space required. For example, figure 8 shows a bus zone on the downstream side of a midblock pedestrian crossing with the bus making use of the space from the pedestrian signals.

In some locations where parking is at a premium, it may be acceptable to provide a kerb outstand and have the bus stop in the traffic stream as shown in figure 9. Whilst this has a momentary impact on the general traffic flow, it significantly reduces the amount of parking that needs to be removed and removes the delays to the bus associated with exiting a conventional bus stop. Careful consideration to bicycle movements should be made, particularly on roads with bicycle lanes.

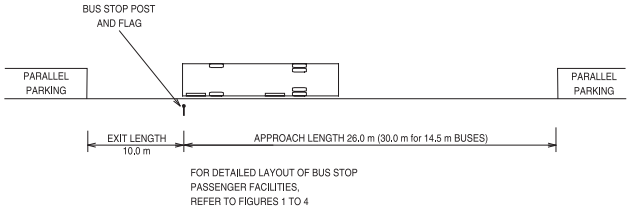


Figure 7: Kerbside Stop with Parking On Approach and Exit

Bus Stop Guidelines

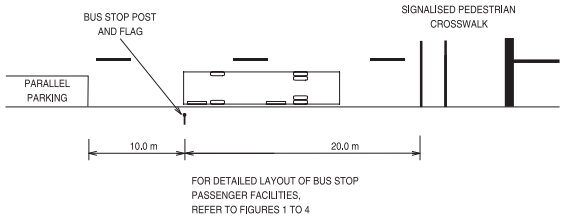


Figure 8: Kerbside Stop on Departure Side of Pedestrian Signals

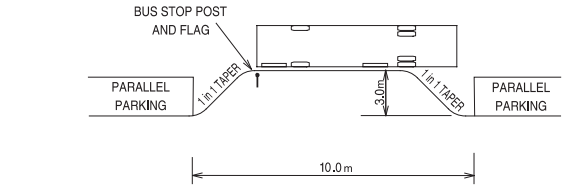


Figure 9: Kerbside Stop with Kerb Outstand

Further reading

AUSTROADS (1994) Guide to Traffic Engineering Part 11 – Parking, Section 7.2.3 Bus Stops.

COMMONWEALTH OF AUSTRALIA (2002) Disability Standards for Accessible Public Transport.

DEPARTMENT OF INFRASTRUCTURE (2005) Requirements for Bus Stop Compliance.

VICROADS (1999) Traffic Engineering Manual Volume 1, Section 9.3.4 Bus Zones and Minibus Zones.

VICROADS (2001) Traffic Engineering Manual Volume 2, Section 18.5.1 Pavement Markings at On-Road Bus Stops.

VICROADS (2002) Road Design Guidelines, Section 3.9 Clear Zones.

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Further information

For further information on road based public transport standards and guidelines, contact:

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Road Based Public Transport
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These guidelines are also available on VicRoads website, www.vicroads.vic.gov.au, under the Public Transport heading. Future updates will also be placed on the website.

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