CITY OF VINCENT

WAYFINDING SIGNAGE STRATEGY 2012

Adopted at the Ordinary Meeting of Council held on 10 July 2012

PARKING & TRAFFIC
CONSULTANTS

Client

City of Vincent

Project

Wayfinding Signage Strategy

For the attention of:

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Date

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1 Executive Summary

Parking & Traffic Consultants was engaged by the City of Vincent ("the City") in accordance with our proposal dated 16 December 2011 to provide a clear and concise wayfinding signage package to assist those wishing to park in nominated town centres and pedestrians wishing to walk to key landmarks.

In accordance with the City's Project Brief dated 23 November 2011, our report addresses:

- an analysis and audit of the area including current signage (types and location), access to the town centres, availability and type of car parking, public transport and pedestrian / transport movements;
- areas appropriate for signage;
- the purpose of the wayfinding signage;
- signage principles including type and location of signs, concept designs, a detailed graphics schedule and a signage style manual for the use of signage manufacturers;
- recommendations for the entire City and for specific town centres; and
- commentary on implementation of the signage packages and estimated costs.

In preparing our signage packages, we have been cognisant of the City's requirement for a concise and detailed wayfinding strategy and the following objective which is set out in the City's Project Brief:

> "The aim of the Way Finding Strategy is to make the City of Vincent more legible through the use of signage which brands the City and assists drivers to:
>
> - know where to look for parking and way finding signage when they need it;
> - understand the way the information is communicated; and
> - obtain the information quickly without fuss.
>
> This Strategy will identify a 'family of signs' for the City of Vincent area and the most appropriate number and location for these signs."

As agreed with the City, our car park wayfinding signage package includes directions to twelve car parks. A total of ten car parks are located in the Leederville, Mount Hawthorn, Mount Lawley and North Perth Town Centres. Our car park wayfinding signage package also includes the Loftus Centre Car Park (although this is located outside the Leederville Town Centre) and the Brisbane Street Car Park in Perth.

Our pedestrian wayfinding signage package caters primarily for those arriving by bus and other modes of transport at the Leederville, Mount Hawthorn, Mount Lawley, North Perth and Perth Town Centres.

Section 2 of our report covers the current signage in the nominated town centres and provides an overview of access to the town centres while **Sections 3** and **4** respectively provide details of the proposed car park and pedestrian wayfinding signage packages.

In **Section 5** we outline additional steps which need to be undertaken before tender documentation can be issued for the signage packages. **Section 6** contains our estimate of indicative costs for signage manufacture and installation.

The option of dynamic car park signage is considered in **Section 7**.

We recommend that the signage initiatives be promoted using the City's website and local media to raise awareness of the proposed changes and the resultant benefits to the community.

We trust that our wayfinding signage strategy report will assist the City to improve vehicle and pedestrian wayfinding in its town centres and that the principles outlined in our report can also be utilised to improve other areas of the City. We presented this strategy at the City Forum on 29 May 2012 and have addressed some of the feedback from that Forum in our report.

2 Current Situation

We visited all town centres and car parks included in this strategy in February 2012 to inspect the existing car park signage and gain a comprehensive knowledge of the areas involved, their attributes and issues.

We walked around the town centres and car parks and also drove between the various town centres, concentrating on key arterial roads to enhance our understanding of the area.

2.1 Car Park Entry and Directional Signage

We prepared an inventory of car park signage sighted during our February 2012 visit and provided this to the City on 22 March 2012. This inventory is included as **Appendix A** to our report. In summary, we note that the current car park signage is inconsistent and inadequate in terms of giving motorists advance warning of car parks. While we completed extensive surveys of the town centres and car parks, we cannot guarantee that we have identified all existing signs.

The inventory details car park directional and entry signs and includes photographic examples of the existing signs. The **majority** of car park entry signs and directional signs (located at nearby intersections) are similar to that shown in the photo below.

Variations include the following:

Many of these "P" signs have faded due to age or have been damaged by graffiti.

We only noted one example of the City of Vincent parking sign shown on the previous page (to the right) at the Richmond Street entrance to the Loftus Centre Car Park. The vast majority of signs refer instead to the outdated "Town of Vincent".

The following sign is located at the Richmond Street entrance to the Loftus Centre Car Park:

The entry sign at the Barlee Street Car Park in Mount Lawley utilises existing infrastructure at this former service station as shown below.

Signage at the Faraday Street entrance to the Oxford Street Car Park is as follows:

The signage inventory includes a directional sign for the Leederville Oval Car Park. This car park is not included in our strategy due to complications regarding times when this car park is available for use by the public, particularly during the football season.

2.2 Car Park Terms and Conditions Signage

While our car park signage inventory does not include signs inside car parks covering terms and conditions of parking, we note that these vary between the car parks and many have been damaged by graffiti and / or are in varied states of disrepair. One example of more recent signage is located in the Chelmsford Road Car Park in Mount Lawley as illustrated below.

Similar signs are located in:

- The Avenue and Frame Court Car Parks in Leederville;
- the Oxford Street Car Park in Mount Hawthorn;
- Raglan Road and Barlee Street Car Parks in Mount Lawley; and
- the Brisbane Street Car Park in Perth.

Terms and conditions signage in other car parks varies considerably.

The following terms and conditions sign is located in the Loftus Centre Car Park.

The Coogee Street Car Park signage in Mount Hawthorn is as follows:

The Flinders Street Car Park does not include a terms and conditions sign. This car park comprises 22 spaces owned by the City. It forms part of a larger car park located at the back of The Paddington Ale House, with no identification of the bays owned by the City and those owned by The Paddington. No parking restrictions currently apply to this car park. The car park can also be accessed from Fairfield Street, behind the Paddington. As noted in **Appendix A**, there is no car park entry sign in Flinders Street although one is located in Fairfield Street

Signage in the Wasley Street and View Street Car Parks in North Perth is as follows:

While this terms and conditions signage is outside the scope of our report, we recommend that consideration be given to updating some of this signage to present a consistent range of signs.

2.3 Pedestrian Signage

The only example of pedestrian signage we noted was in front of the library in the Loftus Centre Car Park as shown below.

2.4 Cycling Signage

Signage for cyclists is evident throughout the City. A number of examples we sighted are included below for reference purposes.

2.5 Road Access to the Town Centres

The town centres are well serviced by major arterial roads, with principal roads into the five town centres as follows:

Town Centre	Key Arterial Roads
Leederville	Oxford Street Newcastle Street Vincent Street
Mount Hawthorn	Scarborough Beach Road
Mount Lawley	Beaufort Street
North Perth	Angove Street Fitzgerald Street
Perth	William Street

In preparing our car park and pedestrian wayfinding signage packages, many of the signs are focused on these roads.

2.6 Public Transport

All five town centres are well served by Transperth public buses, with bus stops located within all of the town centres.

In addition to the buses, train stations are located in East Perth, Glendalough and Leederville. While the Leederville train station is located on the edge of the Leederville Town Centre, the East Perth and Glendalough train stations are located some distance away from the Mount Lawley and Mount Hawthorn Town Centres, approximately 1.3 km and 2.0 km respectively.

2.7 Walking Infrastructure

While the quality of footpaths in the City and particularly in its town centres is high, there is very little in the way of signage or other information available to encourage residents and visitors to walk to their destinations.

3 Car Park Wayfinding Signage Strategy

We have prepared a car park wayfinding signage package for the town centres and car parks identified by the City. These have been prepared in accordance with the City's requirements for a concise and detailed wayfinding strategy and a "family of signs".

The key aims of the car park wayfinding signage package include:

- improving the customer experience by promoting the availability of car parks;
- giving advance warning of the location of nearby car parks (including the number of parking spaces) along the main approaches to the town centres;
- improve access to and utilisation of the City's car parks; and
- generally making parking easier and more convenient for drivers.

The signage package caters for the following town centres and car parks:

Town Centre	Car Park	Capacity
Leederville	The Avenue	279
	Frame Court	232
Mount Hawthorn	Coogee Street	44
	Oxford Street	27
	Flinders Street	22
Mount Lawley	Raglan Road	98
	Chelmsford Road	56
	Barlee Street	47
North Perth	Wasley Street	48
	View Street	40

Also included are the **Loftus Centre Car Park** (although this is located outside the Leederville Town Centre) and the **Brisbane Street Car Park** in Perth. These car parks have capacities of 342 and 214 vehicles respectively.

Locations of the twelve car parks included in the signage package are highlighted in yellow in **Appendix B**. A number of other car parks are located within the City as indicated in this appendix. On street parking is also available throughout the City, with parking restrictions and paid parking applicable in certain areas.

While we have only addressed the car parks identified by the City, additional signs could be manufactured for other City car parks or car parks managed by the City (such as those at North Perth Plaza, The Mezz, Leederville Hotel and Village Square) using the principles outlined in our report.

As discussed at the 29 May 2012 Forum, it may also be possible to incorporate car parks operated by parties other than the City in the signage strategy. This could require changes to the proposed sign layouts which currently include the City's logo.

3.1 Purpose and Nature of Car Park Signs

We have designed three types of parking signs with a view to providing a consistent, structured and informative approach to car park signage that will assist motorists to easily locate the car parks nominated by the City. All signs are coloured royal blue (PMS 287C) and use white Interstate Bold font (which we understand is similar to that used for major road signs in Western Australia) making these instantly identifiable as parking signs.

The purpose, nature and location of the various signs are detailed in this section.

3.1.1 Gateway Signs

Gateway Signs provide details of all nominated car parks in each town centre. As agreed with the City's representatives, the signs incorporate the universal "P" symbol, the number of spaces in each car park, the approximate distance to each car park, directional arrows and the City's logo.

We have positioned these signs on each approach to the town centre's major intersection or the first turn off to a car park, whichever comes first. In positioning these signs, we have considered potential conflicts with other signs, bus stops, side streets, telegraph poles etc. This has been done utilising the many photos taken during our February 2012 visit and by reference to Google Maps' Street View application. All Gateway Signs have been places on footpaths / verges. We have not proposed that any signs are located on Western Power poles, either on median strips or on the side of roads, as we understand Western Power does not support signage on its power poles.

An example of a Gateway Sign showing directions to three car parks is shown below. This sign measures 940 mm (high) by 1,400 mm (wide).

The text height for all Gateway Signs is 80 mm except for the distance which has a text height of 50 mm. This is considered reasonable in these town centre locations with speed limits of up to 50 km per hour.

An example of a Gateway Sign showing directions to two car parks is shown below. This sign measures 705 mm (high) by 1,400 mm (wide).

3.1.2 Intersection Signs

Intersection Signs are generally to be located at intersections where motorists will turn into a side street to approach a car park. The signs incorporate the universal "P" symbol, the number of spaces in each car park, a directional arrow and the City's logo.

Where it is possible to turn down the side street from both directions, the Intersection Sign will be double sided. Where it is only possible to access the side street from one direction due to one way streets, median strips or other factors, the Intersection Sign will be single sided. We have determined whether each sign should be double or single sided by reference to our photos and Google Maps Street View.

When approaching an intersection with the side street on the left hand side, we propose that the sign should be located on the far corner of the intersection to ensure optimal visibility.

In some instances, such as the Barlee Street Car Park, where access is directly off a main street (Beaufort Street), we have located the Intersection Sign at the car park entry.

A sample Intersection Sign is included below. This sign measures 600 mm (high) by 700 mm (wide). The text height is 75 mm except for the "P" symbol which has a text height of 80mm.

3.1.3 Car Park Entry Signs

Car Park Entry Signs are to be located at most car park entries (apart from instances such as the Barlee Street Car Park where an Intersection Sign is proposed). The signs incorporate the universal "P" symbol, the number of spaces in the car park and a directional arrow. These signs are widely recognisable and similar to those currently in place.

A sample Car Park Entry Sign is included below. This sign measures 600 mm (high) by 450 mm (wide). The text height is 45 mm except for the "P" symbol which has a text height of 80mm.

3.2 Car Park Sign Graphics, Locations and Mounting

A comprehensive range of maps showing each of the proposed signs (on an aerial view) and their location is included in our report as **Appendix C**. These maps are summarised in the following table.

Map / Drawing Number	Map / Drawing Title	Scale (A3 maps)
OVCP1	Overall Layout	1:12000
LETC1	Leederville Town Centre Overview	1:2500
LECP1	Leederville Town Centre	1:2500
LECP2	The Avenue Car Park	1:1000
LECP3	Frame Court Car Park	1:500
LECP4	Loftus Centre Car Park	1:1000
MHTC1	Mount Hawthorn Town Centre Overview	1:2000
MHCP1	Mount Hawthorn Town Centre	1:2000
MHCP2	Oxford Street Car Park	1:500
MHCP3	Flinders Street Car Park	1:500
MHCP4	Coogee Street Car Park	1:500
MLTC1	Mount Lawley Town Centre Overview	1:2000
MLCP1	Mount Lawley Town Centre	1:2000
MLCP2	Raglan Road Car Park	1:500
MLCP3	Chelmsford Road Car Park	1:500
MLCP4	Barlee Street Car Park	1:500
NPTC1	North Perth Town Centre Overview	1:2000
NPCP1	North Perth Town Centre	1:2000
NPCP2	Wasley Street Car Park	1:500
NPCP3	View Street Car Park	1:500
BRCP1	Brisbane Street Car Park	1:1500

The details provided on the various maps are as follows:

- The Overall Layout map shows the areas of each Town Centre map.
- The Overview maps show the areas covered by each of the individual car park maps.
- The Town Centre maps show each of the car parks in the town centre and the content and location of all Gateway and Intersection Signs while the individual car park maps show the details for the Car Park Entry Signs.

A detailed signage schedule showing details of each sign and the quantities required is included as **Appendix D**. Specifications for these signs, to be provided to sign manufacturers for tender purposes and subject to the comments in **Section 5**, are included in **Appendix H**.

In accordance with chapter 4.2 of the Main Roads Western Australia Standards and Guideline (Single or Multiple Posts – Sign Structural Design), rectangular flat aluminium sheet signs not exceeding 900 mm nominal width and 1,200 mm nominal height can be unbraced and supported on a single post.

Rectangular aluminium sheet signs exceeding these dimensions must be braced and supported on multiple posts.

On this basis, Gateway Signs require two posts while Intersection Signs and Car Park Entry Signs require a single post. Many of the proposed Intersection and Car Park Entry Signs could be installed on existing posts.

All car park wayfinding signs in pedestrian trafficable areas should be mounted at a height of 2.5 metres (or above) to comply with the requirements of AS1742.2 -2009 and Part 8 of the Austroads Guide to Traffic Engineering Road Practice (Traffic Control Devices). If signs are located in an area which is not designated as a pedestrian traffic area, this height can be reduced to 2.0 metres.

3.3 Issue for Further Consideration

Gateway Sign MLG3 is located on Beaufort Street (north of Walcott Street) in the City of Stirling. Approval for this sign would be required from the City Of Stirling. Alternatively, it may be necessary to locate a similar sign on the other side of the Beaufort Street and Walcott Street intersection.

4 Pedestrian Wayfinding Signage Strategy

We have prepared a pedestrian wayfinding signage package for the key landmarks identified by the City. These landmarks include parks, sporting venues, train stations, educational institutions and other locations.

The table below summarises the landmarks we have provided signage for in each of the town centres following consultation with City representatives.

Town Centre	Landmark
Leederville	Leederville Central TAFE
	Leederville Train Station
	Britannia Road Reserve
	Leederville Oval
	Administration & Civic Centre
	Beatty Park Recreation Centre
Mount Hawthorn	Menzies Park
	Glendalough Train Station
Mount Lawley	Forrest Park
	Mount Lawley Central TAFE
	East Perth Train Station
	Banks Reserve / Swan River
	Hyde Park
	Perth Oval
North Perth	Angove Street
	Beatty Park Recreation Centre
Perth (William Street)	Hyde Park
	Robertson Park
	Perth Oval
	Dorrien Gardens
	Weld Square
	Perth Central TAFE
	Perth Train Station
	Perth CBD

Further to discussions with the City's representatives, we have not included hotels, cinemas or shopping centres. This is in accordance with a wish not to favour particular businesses.

The pedestrian wayfinding signage package is designed to encourage walking and to enable those unfamiliar with the area to easily locate the selected landmarks.

4.1 Purpose and Nature of Pedestrian Signs

We have designed two types of pedestrian wayfinding signs with a view to providing coherent, easy to follow signage that will assist pedestrians to easily locate key landmarks from each of the Leederville, Mount Hawthorn, Mount Lawley and North Perth town centres as well as from the section of William Street between Brisbane Street and Newcastle Street. The purpose, nature and location of the various signs are detailed in this section.

In general terms, we believe best practice for pedestrian wayfinding signs is illustrated by concepts utilised in the Bristol Legible City project. Map based totem signs and directional signs were installed in Bristol in 2001 as part of this project. This project incorporated "direction signs, street information panels with city and area maps, printed walking maps, visitor information identity and arts projects". Concepts used in the design of signs for this UK city have since been applied around the world, including many recent projects in Australia.

We have incorporated elements of this approach, including map based totem signs and directional signs in the City's pedestrian wayfinding signage package. Maps are considered key to navigating a new area for many people and are a central part of our strategy. All maps should include "You are Here" markers and three dimensional pictograms highlighting key landmarks. Whilst the detailed graphic design of these maps is not part of our strategy document, we have allowed for the inclusion of a map in our designs.

As shown in the image below, the City's current street signs (located on many corners) are burgundy in colour.

We have utilised the burgundy (PMS 187) and teal (PMS 3165) colours which make up the City's logo in our pedestrian sign designs, with a focus on teal to provide a consistent theme and differentiate the pedestrian signs from the existing burgundy coloured street signs.

4.1.1 Map Based Totem Signs

We recommend the use of Map Based Totem Signs and have placed these at key bus stops located near major intersections in the four town centres and in William Street. These bus stops are considered to be key decision points as they are located in the heart of the town centres and cater to many of those arriving by public transport.

We have prepared two Totem Signs for Leederville, Mount Hawthorn and North Perth. Only one Totem Sign has been prepared for Mount Lawley (as the one of the main bus stops located to the north of the Beaufort Street and Walcott Street intersection is located in the City of Stirling) and William Street (which is a one way street).

A sample Totem Sign is included below.

These Totem Signs are four sided and utilise the City's burgundy and teal colour scheme. The signs measure 2,300 mm (high) by 400 mm (wide). This height is under the City's minimum awning height of 2,750 mm. The width is designed for a suburban footpath with the expectation that the panels will be installed near bus stops.

Key information included on the Totem Signs for pedestrians includes the directional information and map panel. These have been included at heights between 800 mm and 2,000 mm to allow for ease of viewing by people of varying heights.

Pedestrian pictograms and the City's logo have been included on three of the four panels.

We have allowed space for up to five landmarks on each sign as any more than this could appear cluttered and it is important to include only key landmarks. For each landmark, the Totem Sign indicates:

- the name of each landmark (abbreviated in some instances to fit the sign);
- a directional arrow;
- a generic pictogram intended to depict the type of landmark (e.g. a graduation cap could be used by the City's graphic designer at the detailed design stage to indicate an educational institution such as a TAFE); and
- the approximate distance to each landmark.

We have not included estimated walking times as actual walking speeds can vary significantly.

We recommend that the map panels should incorporate "heads-up" maps which are orientated with the viewer located at the centre of the bottom of the map (i.e. north will not always be at the top of the map). The maps then provide an indication of what lies directly ahead when facing the map. Two maps will be provided back to back, with maps showing the pedestrian what lies ahead of them when facing in either direction.

The panel facing the road includes the town centre name only as it is undesirable to encourage motorists or people standing on the road to read these panels.

We have allowed for the panel facing the shops to include a history component. Alternatively, this could be used to display local artwork or information on current / upcoming events.

We understand that the City may wish to incorporate informational voice messages in these Totem Signs, accessed by pressing a button. We have not included these in our design although note that this feature could be added by the City if required.

As agreed with the City's representatives, we have focused the pedestrian signage on those people arriving in each town centre by bus. Subject to the success of this initiative, it may be appropriate to include additional Totem Signs or other signs at Glendalough, East Perth and Leederville train stations at a later date.

The Totem Signs reflect the landmarks agreed with the City. As only two landmarks have been nominated for Mount Hawthorn and North Perth, these signs currently have space for a range of other landmarks. Subject to further guidance from the City, we can include additional landmarks on these signs.

These Totem Signs are similar in size to many installed recently in the City of Perth and other local government bodies in Perth. An example of one of the City of Perth signs (not designed by us) is included below for reference purposes.

The Totem Signs specified in **Appendix H** are similar to those shown above, with aluminium panels with vinyl graphics and steel structural framing. These signs can be updated by reprinting graphics. They are also cost effective and low maintenance. They can, however, be less damage resistant than other options and need separate lighting for nighttime viewing.

A more expensive option is vitreous enamel panels on a steel frame. These signs are generally hard wearing and graffiti-resistant but can be difficult to change and also require separate night time lighting.

The most expensive option is digital printing encased in smash-resistant polycarbonate screen. Such signs can be backlit and are useful when the signs are used by many pedestrians in the evening. These signs can be damaged by graffiti or scratching.

4.1.2 Directional Signs

We recommend the use of Directional Signs along the route to identify landmarks to assist pedestrians to navigate to their destination. We have located these signs at intersections where pedestrians are required to change direction and at major intersections where pedestrians are required to continue straight ahead and there has been no directional sign for some distance.

Our strategy incorporates two different sizes of Directional Signs, the first Small Directional Sign showing one destination (measuring 100 mm high and 600 mm wide) and the second Large Directional Sign showing two destinations (measuring 200 mm high and 600 mm wide). Combinations of these signs could be used as appropriate at each relevant corner. If, for example, there were four destinations to the right, two of the larger signs could be used. This allows destinations to be added or removed at a later date at minimal cost without necessarily discarding all signs. Sample Small and Large Directional Signs for one and two destinations are included below.

We have included a pedestrian pictogram on these signs. This provides a visual link to the same pictogram included on the Totem Signs.

We have not included a space for destination pictograms on these signs (e.g. a graduation cap to indicate an educational institution). Such pictograms could be included next to the distance if required.

We have not included the City's logo on these signs as the logo is incorporated on the existing street signs and we anticipate that many of the pedestrian Directional Signs will be installed on existing posts.

4.2 Pedestrian Sign Graphics and Locations

Maps showing locations of each of the proposed Totem Based Map Signs and Directional Signs are included in our report as **Appendix E** and are summarised in the following table.

Map Number	Map Title
LEPE1	Leederville Precinct
MHPE1	Mount Hawthorn Precinct
MLPE1	Mount Lawley Precinct
NPPE1	North Perth Precinct
PEPE1	Perth Precinct

A detailed signage schedule showing details of each sign is included as **Appendix F**. All Directional Signs will be double sided as indicated in this appendix. **Appendix H** includes additional specifications to be provided to sign manufacturers for tender purposes (subject to the comments in **Section 5**).

Approximate distances from each Totem Sign and Directional Sign to the various landmarks are included as Appendix G. These distances have been estimated using Daft Logic's Advanced Google Maps Distance Calculator.

4.3 Issues for Further Consideration

For the Mount Hawthorn and North Perth Town Centres, Totem Signs at major bus stops will provide the first directions to landmarks. In the case of Leederville Town Centre, we have also included earlier Directional Signs at the intersection of Oxford Street and Vincent Street to ensure all destinations are sign posted from this major intersection. Similarly for Mount Lawley Town Centre, we have included earlier Directional Signs at the intersection of Beaufort Street and Walcott Street. Finally, for the Perth Town Centre, we have included earlier Directional Signage at the intersection of William Street with both Newcastle Street and Brisbane Street. This approach reflects the relative number of landmarks in these busier locations.

The pedestrian wayfinding signage package is focused on those arriving at bus stops in town centres and those arriving in these town centres by other means. Subject to the City's budget, it may be appropriate to provide additional signs for pedestrians arriving at train stations and in car parks at a later date. These could include broad contextual maps in simple frames, incorporating the City's logo and a pedestrian pictogram. The maps could provide an overview of the surrounding area and highlight key landmarks and distances to nearby town centre locations. We have not included any such additional maps in our signage package. Alternatively, it may be appropriate to include map based totem signs in these locations. As discussed at the 29 May 2012 Forum, Highgate is another potential location for a map based totem sign (at the bus stop near the intersection of Broome Street and Beaufort Street).

5 Preparation for Signage Tender

We have designed all car park and pedestrian signs based on our knowledge of the relevant areas, our experiences driving and walking in these areas, photos taken by us and where required, reference to Google Maps Street View.

We recommend that a comprehensive review of all proposed signage is conducted on site by the City to assess the proposed vehicle and pedestrian routes, the efficiency of the signs proposed, sign locations and distances.

While we have endeavoured to propose the most appropriate routes to each car park and landmark, we recognise that the City may prefer an alternative route in some cases.

It is important to ensure that the proposed locations are not impacted by trees, other signs, awnings or existing street furniture and that all no right turn signs, one way streets, median strips etc. have been appropriately addressed. As discussed at the 29 May 2012 Forum, it would be advisable to consult directly with landowners and businesses which may be impacted by proposed car park or pedestrian signs prior to finalisation of the sign locations.

We recommend that an ongoing signage maintenance programme be implemented to ensure that signs are regularly reviewed to clean graffiti, remove growing vegetation and identify any other issues which may result in compromised viewing or usefulness of each sign.

Where distances have been included on signs, these are approximate. All distances should be checked by the City before tender documents are finalised.

While we have taken all care to ensure the proposed signs are accurate, we will not accept responsibility for incorrect signage.

We understand that implementation of this strategy is subject to funding and will require the preparation of an implementation plan to manage the timing and cost implications for installation. If required, we would be available to assist with updating our signage maps and schedules once final sign locations, landmarks, pedestrian / vehicle routes are determined to ensure the revised details are provided to tenderers. A fee estimate for this additional work could be provided once the scope is clarified.

Detailed design input will be required from a graphic designer to finalise “heads up” maps for the Totem Signs and pictograms for the various landmark categories (if these pictograms are to be included on the Totem Signs).

6 Estimated Cost of Car Park and Pedestrian Wayfinding Signage

The total number of each type of sign included in Appendices D and F and the estimated cost of manufacturing the signs proposed for Leederville (LE), Mount Hawthorn (MH), Mount Lawley (ML), North Perth (NP), William Street Perth (PE) and the Brisbane Street Car Park (BR) are detailed below.

	LE	MH	ML	NP	PE	BR	Total	Unit Cost Estimate (excl. GST) $	Total Cost Estimate (excl. GST) $
CAR PARKS									
Single Sided 3 Line Gateway Sign		3	2				5	400	2,000
Single Sided 2 Line Gateway Sign	5		1	3			9	320	2,880
Single Sided Intersection Sign	4		1			3	8	140	1,120
Double Sided Intersection Sign	1	4	3	3		3	14	280	3,920
Single Sided Car Park Entry Sign	4	1				1	6	105	630
Double Sided Car Park Entry Sign	4	3	4	3		2	16	210	3,360
							58		**13,910**
PEDESTRIANS									
Map Based Totem Sign	2	2	1	2	1		8	8,000	64,000
Double Sided Large Directional Sign	3	1	3		7		14	210	2,940
Double Sided Small Directional Sign	4	3	11	1	8		27	95	2,565
							49		**69,505**
							107		**83,415**

The above cost is indicative only and based on feedback from a Perth based sign manufacturer that has manufactured signs for the City of Perth. We understand a formal tender would be conducted by the City to ensure a competitive price is obtained.

The above costs do not include posts or installation. We expect that many of the existing posts supporting "P" signs at car park entries and at intersections could be re-used. Indicative unit costs (excluding GST) for posts and installation are as follows:

- 50 mm lite galvanised post – from $56 (3.2 metres) to $72 (3.6 metres) to $88 (4.2 metres);
- installation of sign and post including cement bags in soft ground only (i.e. no concrete cutting is included) - $300; and
- installation of sign on existing post - $120.

7 Dynamic Car Park Signage Alternative

The car park sign designs and costs referred to in the earlier sections of this report are based on the premise that all signs will be static in nature. We understand that the City may be interested in considering the implementation of dynamic car park signage for some of the busier car parks.

7.1 Car Park Demand

Based on our observations during February 2012 and in earlier years, it is clear that The Avenue and Frame Court Car Parks in Leederville and the Chelmsford Road and Raglan Road Car Parks in Mount Lawley are consistently subject to very high levels of demand.

Limited occupancy information has been provided to us by the City's Ranger and Community Safety Services team for a number of car parks as summarised below.

Town Centre / Suburb	Car Park	Daytime Occupancy	Evening Occupancy
Leederville	The Avenue	90%	70%
	Frame Court	90%	95%
Mount Hawthorn	Oxford Street	10%	5%
Mount Lawley	Raglan Road	95%	100%
	Chelmsford Road	95%	100%
	Barlee Street	55%	90%
Perth	Brisbane Street	45%	80%

7.2 Potential Benefits and Issues

The introduction of dynamic signage alerting drivers to the number of spaces available in off street car parks can improve their utilisation and assist drivers to locate **vacant** parking spaces prior to entering and circulating the car parks. This technology would be most appropriate for the following car parks in the Leederville and Mount Hawthorn town centres.

Town Centre	Car Park	Capacity
Leederville	The Avenue	279
	Frame Court	232
Mount Lawley	Raglan Road	98
	Chelmsford Road	56
	Barlee Street	47
TOTAL		**712**

Dynamic signage for outdoor car parks is generally managed using either loop based technology (counting vehicles as they enter and exit the car park) or more accurate (but more expensive) individual parking space sensors.

If dynamic signage is implemented for a town centre, it should be applied to all car parks in that town centre to ensure all available spaces are highlighted.

We consider loop based technology is inappropriate for the Leederville and Mount Lawley town centre car parks. This is due to a number of factors including a significant amount of trucks and other delivery vehicles accessing the car parks and a large number of private parking areas for retailers and other businesses around the perimeter of car parks (particularly in The Avenue Car Park). Parking illegally, in areas not marked for parking, can also cause problems. These factors would result in a large number of vehicles entering the car parks and not parking in the City's parking spaces. Occupancy and availability counts will be distorted as a result.

Even if these issues were not a concern, the output of loop based counting systems must be checked at least daily to ensure the number of available parking spaces displayed is correct. Manual adjustments to the number of available parking spaces should then be made using the central management system.

An individual parking space sensor system could provide the basis for reliable dynamic car park signage. The sensors provide real time occupancy / turnover data and other valuable car park management information.

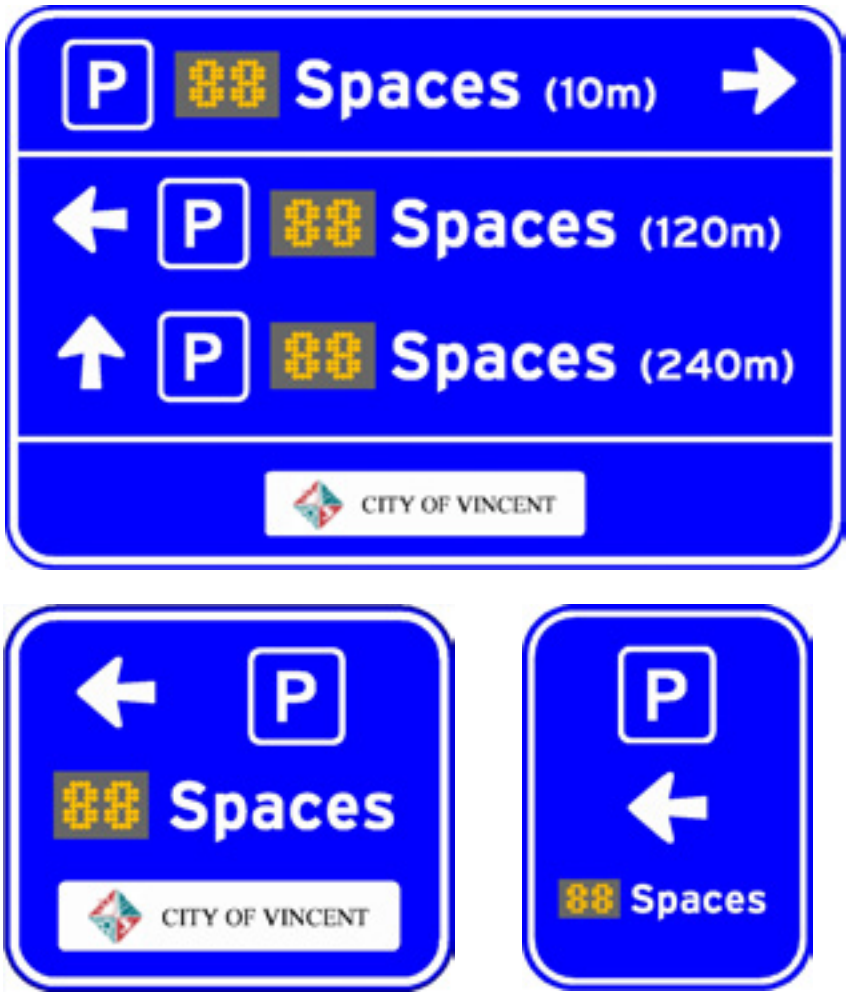
In addition to providing data regarding the number of vacant parking spaces in the various car parks, the sensors could be used to monitor length of stay in these car parks and assist the City's Ranger and Community Safety Services team to identify vehicles which have overstayed the relevant time limit. This can result in improved enforcement and increased turnover of vehicles.

The use of individual bay sensors to assist with parking enforcement is most useful when specific time limits apply. In cases where pay and display machines exist, such as those in Leederville and Mount Lawley, the enforcement benefits of sensors are significantly diminished. Other benefits outlined earlier in this section are more relevant in such scenarios.

While technology is available which allows enforcement notices to be issued based purely on the length of stay data recorded by the parking space sensors, many councils prefer to retain the existing tickets machines to avoid potential problems with car park users disputing their length of stay.

The designs for car park signs would essentially remain unchanged. The static number of car parking spaces in each car park would simply be replaced by the dynamic number of **vacant** parking spaces available in each of the car parks.

Examples of dynamic signage are included below.



Implementation of dynamic car park signs can lead to other opportunities for promoting the City's car parks including web based and mobile phone applications.

7.3 Estimated Cost

Suppliers of various parking space sensor systems have a range of cost structures with costs applicable for the individual sensors, zone / master controllers or internet gateways, handheld devices to monitor vehicles which have overstayed their time limit and in some instances, a standalone management computer.

As mentioned in **Section 7.2**, there are 712 parking spaces in the Leederville and Mount Lawley town centres which could potentially benefit from the installation of individual parking space sensors. We estimate that the upfront capital cost of installing parking space sensors and acquiring associated equipment would be in the order of **$200,000 plus GST** (approximately $280 per bay).

Ongoing costs would include monthly reporting and / or access to an external server. Costs for two of the main suppliers range from around $150 to $300 per month.

Maintenance costs for the sensors and associated equipment, after expiration of the warranty period, could be in the order of $40,000 per annum (around 20% of the capital cost).

The above costs do not include the cost of manufacturing the dynamic signs which we recommend should be aluminium plates with integrated dynamic inserts. We estimate the additional cost for dynamic inserts would be in the order of $2,000 per sign. Further costs of approximately $500 per sign would be required to network the signs to a wireless network. With 38 car park signs proposed for The Avenue and Frame Court car parks and the three Mount Lawley car parks, this additional cost would be in the order of **$95,000 plus GST**.

Maintenance costs would also be applicable to the dynamic signs.

Our car park signage schedules are currently based on the provision of static signs. If the City elects to proceed with dynamic car park signage, we could provide detailed information for provision to signage manufacturers. In this case, it would be necessary to increase the text size as we generally recommend text heights for dynamic signage are at least 100 mm. This would also result in a requirement to increase the size of the various car park wayfinding signs, adding to the cost of manufacture.

We understand that the City is considering construction of one or two multi-storey car parks in the future. Such developments would present a good opportunity for the introduction of dynamic signage. The use of loops in such an environment may provide a satisfactory outcome.

As suggested by one of the City's representatives on 30 May 2012, dynamic signage could perhaps be trialed at the entrance to the Barlee Street car park in an effort to increase utilisation of this car park.

Car Park	Existing Sign	Signs at Car Park Entrance	Signs in Surrounding Streets
Frame Court Car Park	 2 sided	Oxford Street entry / exit Frame Court entry / exit *(signage in this area is cluttered – refer **Image 1** following this table)*	Corner of Loftus Street & Leederville Parade (directs drivers to both Frame Court & The Avenue car parks) Corner of Leederville Parade & Frame Court *(this is one example of faded signage with graffiti – refer **Image 2** following this table)*
The Avenue Car Park	 2 sided	Vincent Street entry (on IGA side) Leederville Parade entry (closest to Vincent Street) Leederville Parade entry / exit (halfway between Vincent & Oxford Streets) Leederville Parade entry / exit (closest to Oxford Street)	Corner of Loftus Street & Leederville Parade (directs drivers to both Frame Court & The Avenue car parks) Corner of Vincent Street & Leederville Parade (near Caltex service station) Corner of Oxford Street & Vincent Street (near bankwest) *(an example of a sign partially covered by stickers making the direction difficult to determine – refer **Image 3** following this table)*

Car Park	Existing Sign	Signs at Car Park Entrance	Signs in Surrounding Streets
Leederville Oval Car Park	 2 sided		Opposite Vincent Street entrance (i.e. on other side of road to car park)
Loftus Centre Car Park	 2 sided  1 sided	Richmond Street entry	
	 2 sided	Loftus Street entry / exit	Corner of Loftus Street & Richmond Street

Car Park	Existing Sign	Signs at Car Park Entrance	Signs in Surrounding Streets
Loftus Centre Car Park	 2 sided		Corner of Oxford & Richmond Street (near Eyes on Oxford)

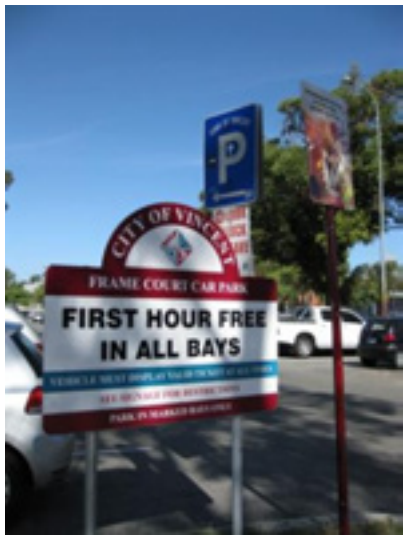


Image 1 – cluttered signage
Oxford Street entrance to Frame Court Car Park

Image 2 – faded sign with graffiti
Corner of Leederville Parade & Frame Court

Image 3 – sign partially covered by stickers
Corner of Oxford Street & Vincent Street

Car Park	Existing Sign	Signs at Car Park Entrance	Signs in Surrounding Streets
Coogee Street Car Park	 2 sided	Scarborough Beach Road entry / exit Coogee Street entry / exit	Corner of Scarborough Beach Road & Coogee Street *(difficult to see when approaching Coogee Street from Scarborough Beach Road – refer **Image 4** following this table)*
Flinders Street Car Park	 2 sided	Fairfield Street access to The Paddington's car park *(this City sign directs drivers to The Paddington end of this combined car park and not to the City's end – refer **Image 5** following this table)* *This car park accommodates approximately 54 vehicles including some close to The Paddington and 22 (City owned bays closer to the Flinders Street access). There is no signage at the Flinders Street entry / exit and no distinction in the car park between those bays owned by the City and other bays (owned by The Paddington). There is no charge for using the City's bays and no time restrictions for parking in these bays.*	

Car Park	Existing Sign	Signs at Car Park Entrance	Signs in Surrounding Streets
Oxford Street Car Park	 2 sided	Oxford Street entry / exit Faraday Street (between entry & exit)	Corner of Scarborough Beach Road & Faraday Street *(partially hidden by trees when approaching Mount Hawthorn along Scarborough Beach Road - refer **Image 6** following this table)* Corner of Wilberforce Street & Faraday Street *(partially hidden by trees when approaching Faraday Street from direction of Oxford Street – refer **Image 7** following this table)*
	 2 sided	Faraday Street (between entry & exit)	

Image 4 – difficult to see sign when driving along Scarborough Beach Road
Corner of Scarborough Beach Road and Coogee Street

Image 5 – City sign directing drivers to The Paddington's car park
Fairfield Street entrance to The Paddington car park

Image 6 – difficult to see sign when approaching Faraday Street
Corner of Scarborough Beach Road & Faraday Street

Image 7 – difficult to see sign when approaching Faraday Street
Corner of Wilberforce Street & Faraday Street

Car Park	Existing Sign	Signs at Car Park Entrance	Signs in Surrounding Streets
Raglan Road Car Park	 2 sided	Raglan Road entry / exit	Corner of Walcott Street & Raglan Road Corner of Beaufort Street & Grosvenor Road (directs drivers to both the Raglan Road and Chelmsford Road Car Parks)
Chelmsford Road Car Park	 2 sided	Chelmsford Road entry / exit	Corner of Beaufort Street & Grosvenor Road (directs drivers to both the Raglan Road and Chelmsford Road Car Parks)
Barlee Street Car Park	 2 sided	Between Corner of Barlee & Beaufort Streets and Beaufort Street entry / exit	

Car Park	Existing Sign	Signs at Car Park Entrance	Signs in Surrounding Streets
View Street Car Park		View Street entry / exit *Note that this car park is separated from the Rosemount Hotel car park by a fence.*	Corner of Fitzgerald Street & View Street
Wasley Street Car Park		Wasley Street entry / exit Forrest Street entry / exit	Corner of Fitzgerald Street & Forrest Street *(partially obscured by telegraph post when approaching Forrest Street along Fitzgerald from city end – refer **Image 8** below)*

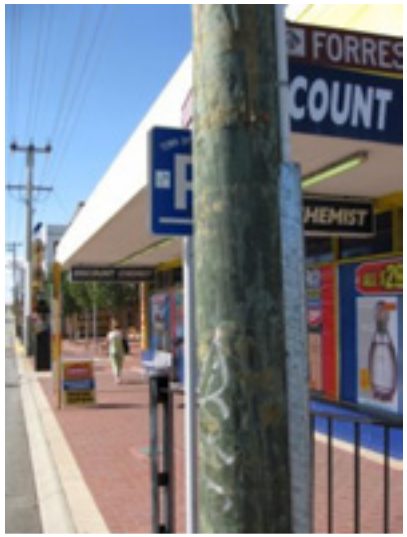


Image 8 – Sign partially obscured by telegraph pole
Corner of Fitzgerald Street & Forrest Street

Car Park	Existing Sign	Signs at Car Park Entrance	Signs in Surrounding Streets
Brisbane Street Car Park	 2 sided	Beaufort Street entry / exit Brisbane Street entry / exit *No "P" signs at either entry / exit on Greenway Street (although there are signs at either end of Greenway Street, at the corner of Beaufort Street & Stirling Street)*	Corner of Beaufort Street & Greenway Street Corner of Stirling Street & Greenway Street