Design Evaluation Report

Hornsby Station Footbridge

NA80013006

Prepared for
Hornsby Shire Council

July 2013
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Executive Summary

Cardno (NSW/ACT) Pty Ltd in association with Conybeare Morrison International Pty Ltd, Hill PDA and M Raven North were appointed on 17 September 2012 by Hornsby Shire Council to provide Engineering Consultancy Services in relation to the Concept Design for a Replacement Pedestrian Bridge at George Street, Hornsby, NSW.

The objective of this Design Evaluation Report is to investigate all constraints and identify the most suitable bridge option based on site constraints, constructability, economics, aesthetics, urban design, environmental issues, health and safety considerations and provides reasoning for the selection of the preferred option.

Following the review of a number of options, it is recommended that the replacement bridge is aligned towards the centre of Florence Street and the existing roadway relocated to the northern side of the street. The recommended structure is a steel vierendeel through-truss supported on reinforced concrete blade piers. The new structure shall provide 5.5m clearance over George Street and shall provide universal access between Hornsby Railway Station and Florence Street Mall.
1 Introduction

1.1 Brief

Cardno (NSW/ACT) Pty Ltd was appointed on 17 September 2012 by Hornsby Shire Council to provide Engineering Consultancy Services in relation to the Concept Design for a Replacement Pedestrian Bridge at George Street, Hornsby, NSW.

Cardno was the Principal Consultant responsible for the engineering design, land surveying, public consultation and overall delivery of the Concept Design Services. They worked in association with: Conybeare Morrison International Pty Ltd who were primarily responsible for architectural design of the bridge and its urban design considerations; Hill PDA who undertook the role of commercial feasibility experts; and M Raven North who undertook the quantity surveying aspects of the design.

The objective of this Design Evaluation Report is to investigate all constraints and identify the most suitable bridge option based on site constraints, constructability, economics, aesthetics, urban design, environmental issues, health and safety considerations and provides reasoning for the selection of the preferred option.

The intention of this report is to seek endorsement on the recommended alignment and structural form of the proposed bridge from Hornsby Shire Council, prior to commencing the Public Consultation Process.

1.2 Background Information

The existing George Street Pedestrian Bridge is a key piece of infrastructure providing an elevated pedestrian link between Hornsby Railway Station and the east side of Hornsby, over the busy George Street roadway, an arterial road. The bridge provides important access to and from the station to the east side of Hornsby, to shops, offices, small businesses, schools and medium density housing. Studies undertaken by Parsons Brinckerhoff in 2009 estimated that more than 14,700 people use the bridge on an average weekday (Ref: Parsons Brinkerhoff, 2009, George Street Pedestrian Bridge, Hornsby, Viability of Submission for Funding – Report, for Hornsby Shire Council 1).

The existing bridge is some 30 years old and is recognised as nearing the end of its useful life. As well as being dilapidated, the bridge is under sized for the foot traffic it carries. It is recognised as presenting a poor image at an important gateway point to Hornsby Town Centre. The concept design process therefore focussed on the complete replacement of the existing structure.

The existing bridge does not comply with current disabled access standards in terms of its gradients, providing an inappropriate width of path and lacking disabled access handrails. It has been found to not be wide enough to meet current level of service standards for an access way to a major public transport interchange.
The existing structure over George Street does not meet current minimum clearance requirements over an arterial road (recent surveys have confirmed that it provides a clearance of approximately 4.9 metres above the road in some locations whereas the Roads and Maritime Services (RMS) minimum clearance requirement for footbridges is 5.5 metres.
2 Site and Location

2.1 General

The existing pedestrian bridge connects the eastern side of Hornsby Town Centre with Hornsby Railway Station. The pedestrian bridge spans over George Street which is an arterial road.

2.2 Hornsby Town Centre

Hornsby is a mixed use centre located approximately 25km north of Sydney CBD. It is a major centre connecting Sydney’s public transport system to the Central Coast and the Lower Hunter regions.

Hornsby Town Centre is an administrative and commercial centre for the sub-region. The Town Centre encompasses a commercial core surrounded by light industrial, civic / community and residential development. Development within and adjacent to this core is to provide or support the provision of offices and services of sub-regional strategic significance.

The commercial precinct of Hornsby Town Centre has an estimated 150,000m$^2$ of commercial and retail floor space. Hornsby is a major retail destination for the sub-region with Westfield shopping centre contributing to approximately 60% of the total retail floor space (92,000m$^2$).

The eastern and western precincts of Hornsby Town Centre are divided by the Main Northern Railway line and George Street.

2.3 Urban Context

George Street Pedestrian Bridge is located within the urban context of the Eastern side of Hornsby Town Centre and sited adjacent to the northern footpath of the western end of Florence Street.
2.3.1 Florence Street Streetscape

Florence Street is flanked on both sides of the street by two storey buildings with retail at ground level and commercial uses at first floor level. Horizontal awnings extend over the footpaths to provide shelter to pedestrians and retail frontages.

South side of Florence Street, east of pedestrian bridge

North side of Florence Street, east of pedestrian bridge

2.3.2 George Street streetscape

George Street is a State arterial road with an urban streetscape along the eastern side of the street comprising:

- To the north of Florence Street:
  - A six storey commercial development, two storey Council library building and a surface level carpark within the block south of Burdett Street;
  - a two storey building located at the north-eastern side of the intersection of George and Florence Streets; and
  - multi-unit residential flat developments beyond.

Adjoining developments to the north of Florence Street

View to 12-14 George Street located at the northern corner of Florence and George Streets
To the south of Florence Street:
  - Two storey retail/commercial developments to the south of Florence Street; and
  - Three storey retail development of Westfield Shopping Centre.

Adjoining developments to the south of Florence Street

Along the western side of George Street is an open car parking area sited on RailCorp land.

Car parking along the western side of George Street – view north  Car parking along the western side of George Street – view south

George Street has poor pedestrian amenity due to:
  - its function as a busy arterial road, with:
    - Two vehicular lanes northbound, increasing to three lanes on approach for right turn to Burdett Street; and
    - Two vehicular lanes southbound, increasing to three lanes on approach to the intersection of the Pacific Highway;
  - lack of active retail frontages along the eastern side of George Street; and
  - the use of the western side of George Street as an open car park with minimal footpath width (1.2m). The paved verge is isolated from the parking area by a high retaining wall that runs along the boundary.
2.3.3 Public transport facilities

Hornsby railway station and bus interchange is located on the western side of the pedestrian bridge. The existing pedestrian bridge links to these public facilities.
2.4 Existing Bridge

2.4.1 Structural Form

The existing pedestrian bridge was constructed circa 1980 and was part funded from Westfield contributions. It is formed of two post-tensioned, reinforced concrete approach ramps which cantilever some 8m from piers to support a central simply supported, precast, reinforced concrete, drop-in span. The bridge has a clear span of 29.8m over George Street.

The bridge and approach ramps are formed of a 3m wide ‘U’ shaped trough of varying depth. The bottom web of the concrete trough is 125mm thick and forms the walkway surface. The piers and walls are typically founded on pad footings. The roof framing are welded steel tubular frames supporting a Perspex cladding system.

The original General Arrangement Drawing for the Existing Bridge is included in Annex A.

2.4.2 Location and Function

The bridge provides a key pedestrian connection between the eastern and western side of Hornsby Town Centre. The bridge spans over George Street (an arterial road) from the western end of Florence Street (on the eastern side of Hornsby Town Centre) and connects to Hornsby railway station. The pedestrian bridge also spans over the public surface car parking area located to the east of the rail corridor and connects to Hornsby Railway Station. Hornsby Railway Station spans the rail corridor of the Main North and North Shore rail lines (to the west). The railway station, in turn, is accessed from Station Street (to the west).

The pedestrian bridge is sited adjoining the northern footpath of Florence Street. Florence Street is a local road that extends to Florence Mall to the east. The street is one way eastbound from George Street and is approximately 20m in width, with approximately 4m wide footpaths on both sides of the street. At its intersection with George Street, with the presence of the existing bridge of ramps and stairs, Florence Street narrows to a 5.5m wide roadway comprising a 4m wide footpath on the southern side of the street, and a 1m wide footpath on the southern side of the bridge.

View north of existing pedestrian bridge over George Street
2.4.3 Problems with the Existing Structure

The existing bridge is:

- Non-compliant with minimum clearance requirements over the arterial road of George Street, being approximately 4.9m above the road;
- Non-compliant with disabled standards for universal access in terms of gradient, width and handrails;
- Functionally undersized (in width) for pedestrian traffic that utilizes the railway station and bus interchange, as it is estimated that more than 14,700 people traverse the bridge each weekday, and is not wide enough to meet the current level of service standards for an accessway to a major public transport interchange;
- Presenting a poor image at a gateway point to the Town Centre;
- Non-compliant with safety and security strategies in that the structure provides:
  - Lack of natural surveillance with the configuration of the ramps, solid balustrades and lack of visible CCTV cameras;
  - Lack of signage;
  - Lack of spaces safe from entrapment with its enclosed spaces creating vulnerability for the traveller; and
  - Numerous hiding places under ramps and stairs.
- Nearing the end of its useful life. Significant cracks had developed in the lower supporting corbels of the step joints that support the central drop-in span. Remedial work in 2009 involved strengthening this element by installing steel brackets.
3 Previous Studies

3.1 Geotechnical Report (1977)


This report recommended that the residual clays provided adequate strata for pad foundations provided that water ingress was controlled during excavations.

3.2 Bridge Refurbishment Options (2001)

Ref: George Street Pedestrian Bridge Hornsby, for Hornsby Shire Council by Tony Caro Architecture, 2001.

This report considered the options of: refurbishment and maintenance of the existing bridge; major refurbishment; and the replacement of the existing bridge. It was recommended at that time that the bridge should be replaced.

It is understood that this study was prepared at the time of the Westfield expansion and followed representations from Westfield that this aspect of the town centre should be upgraded and was focussed on improving the appearance of the area.

The study appears to be simply an exploratory study undertaken by Council to assist in working up options for renovation of the bridge. It follows representations from Westfield to gain approval for controlling advertising on the bridge. The Westfield proposals led to Council decisions to invite Expressions of Interest from signage companies to fund the redevelopment of the bridge through the purchase from Council of advertising as well as a decision to proceed with further investigations to provide a new pedestrian bridge across George Street at Florence Street. However, it is understood that these options were not taken to Council.
3.3 Purchase of No. 12-14 George Street (2002)

It is understood that in 2001 and 2002 the Work Program of Hornsby Shire Council’s Property Development considered consolidating a number of blocks of land to the north of Florence Street. This entailed constructing a new footbridge that linked directly into the proposed building development.

Due to these potential development opportunities, in 2002 the Council bought No. 12-14 George Street (Commonwealth Bank Building), located on the northern side of Florence Street.

3.4 Development Options (2003)


This report is understood to have been used to brief Councillors on the potential development opportunities as outlined in Section 3.3 above.

Redevelopment Option Presented by Ian & Nola Ezzy in 2003

The option of redeveloping 12-14 George Street is considered further in Section 7 of this Report.
3.5 Viability of Submission for Funding (2009)

Ref: George Street Pedestrian Bridge, Hornsby, Viability of Submission for Funding by Parsons Brinkerhoff, 2009.

This report considered the appropriateness of replacing the existing footbridge. In consideration of its findings, it recommended that Council proceed in its application to Transport for New South Wales (formally known as the New South Wales Ministry of Transport) for funding through the Parking Space Levy to construct a replacement pedestrian bridge over George Street Hornsby to improve access to Hornsby Transport Interchange.

3.6 Hornsby Mall, Rail, West Side Link (2013)

Ref: Hornsby Mall, Rail, West Side Link by Ezzy Architects, 2013.

Ezzy Architects prepared a design concept for a building redevelopment at 12-14 George Street that incorporates a new footbridge. It has been indicated that this proposal forms a part of a larger development proposal that includes development on the airspace of the railway station. It is understood that this proposal was prepared without invitation.

Redevelopment Option Presented by Ezzy Architects in 2013

The option of redeveloping 12-14 George Street is considered further in Section 7 of this Report.
4 Design Constraints

4.1 Roads and Maritime Services Constraints

The Roads and Maritime Services (RMS) has advised that the project works and temporary works must meet the following requirements:

- The minimum vertical height clearance from the road must be 5.5m \textit{(in accordance with Clause 9.11 of AS 5100.1)};
- Provision of a suitably designed protective mesh to prevent any objects falling onto vehicles on the road *;
- Provision for the use of the bridge by disabled or less mobile people in accordance with relevant Australian Standards; and
- The project works and temporary works must meet the standard of RMS, AUSTROAD publications and any relevant Australian Standards.

* With reference to the requirement for a protective mesh \textit{(i.e. throw screens)} Hornsby Shire Council noted that there is no history of such antisocial behaviour at the existing bridge. Cardno therefore undertook a risk assessment \textit{in accordance with Appendix II of RMS BTD 2012/01. Based on this assessment a safety screen is recommended at the George Street location.}

4.2 Railcorp Constraints

Railcorp require that any new facility must provide continuity of services such as CCTV, lighting and PA (if provided) and no reduction in functionality or facilities that are currently provided to their customers at Hornsby Railway station.

In relation to constructability, Railcorp require safe access and egress to and from the station to be maintained at all times.


RailCorp have strategic plans to potentially construct an additional two tracks and a new platform on the eastern side of their existing tracks. The proposed bridge replacement design should not compromise these plans.

Possible future developments at Hornsby Railway Station are considered feasible, such as: a multi-storey development over the railway line; a multi-storey car park; demolishing the existing railway station and erecting a new station/ transport interchange integrated with a commercial/ residential transit-oriented development over the rail corridor. However, RailCorp have noted that they have no such plans at present.
4.3 Planning Constraints

The replacement of the existing pedestrian bridge must comply with the State Metropolitan Strategies and with local legislative instruments and guidelines. A full review of the relevant documents is included in Annex B of this Report. The salient issues are summarised below:

4.3.1 Hornsby Town Centre Development Control Plan

- Development should facilitate the role of the Town Centre as a key transport interchange with pedestrian links between the commercial core, railway station and bus terminus;
- Where overhead bridges are proposed in accordance with the Pedestrian Network element, the bridges should be designed to promote a gateway or arrival point;
- Florence Street Mall should be extended to George Street and incorporate a shared pedestrian and vehicular zone. The carriageway should provide for vehicle movements, loading/unloading and be defined with bollards and paving to provide pedestrian priority;
- Development should maintain and enhance views into the Florence and Hunter Street Malls;
- Pedestrian linkages between the Town Square and the Hornsby Transport Interchange and west precinct should be reinforced;
- The pedestrian overpass into the Florence Street Mall should be incorporated into development on the north-western corner of the Mall to open view into the Mall. (See Section 4.3.3 below);
- A shared pedestrian and vehicular zone should be provided in Florence Street (west) with bollards to define the carriageway and paving to provide pedestrian priority;
- Through site pedestrian links should:
  - have a minimum unobstructed width of 3m and 4.5m minimum height;
  - achieve changes of level by means of ramps suitable for disabled persons (i.e. not greater than a grade of 1:14) or escalators;
  - be functional and practical; and
  - be lit, ventilated, cleaned and maintained to standards approved by Council.
- The design of the overpass into Florence Street Mall should provide for views of the Mall for pedestrians, facilitate direct access to the Mall and provide after hour access; and
- Pedestrian networks should allow free, unobstructed passage of people with a disability.

4.3.2 Hornsby Draft DCP 2011

- One way vehicular access from George Street into Florence Street;
- One way vehicular access from Florence Street into Hunter Lane;
- Extend Florence Mall to George Street;
- The redevelopment of the pedestrian overpass into Florence Street Mall should:
  - Be incorporated into development on the north-western corner (See Section 4.3.3 below);
  - Provide for views of the Mall for pedestrians;
  - Facilitate direct access to the Mall;
  - Provide after hour access;
As a public domain element, bridges should be designed to promote a gateway or arrival point. George Street adjacent to Hornsby Railway Station and the Florence Street Mall represent arrival points within the Town Centre and require special treatment; and

- The pedestrian overpass should be relocated to open views into the Town Square (See Section 4.3.3 below).

### 4.3.3 Review of Development Control Plans

Hornsby Shire Council has advised that options that do not rely on the use No. 12-14 George Street should be explored. As noted in Sections 4.3.1 and 4.3.2 above, the Development Control Plans refer to the proposed interconnection with this building; however, Hornsby Shire Council have since stated that this is not a strict constraint.

### 4.4 Hornsby Shire Council Constraints

Hornsby Shire Council has advised that the project works and temporary works must meet the following requirements:

- The road access into Florence Street shall remain open. The road currently operates a one-way system, running west-east. This road access is to be maintained to enable deliveries, service parking and access to the existing premises. This access must allow an 8.8m long Medium Rigid Vehicle to turn from George Street onto Florence Street;
- The rear access to 16 George Street off Florence Street must be maintained. This provides access to a basement car parking and loading facility;
- The proposed bridge shall be lightweight or transparent appearance while providing adequate weather protection. It shall be durable, easy to service and require a low level of repair and maintenance. Finishes shall be resilient overtime and adequately withstand the rigours of community use; and
- Design shall meet the requirements of all relevant statutory regulations, Australian Standard and Codes of Practice, including the following:
  - Building Code of Australia;
  - Disability Discrimination Act;
  - NSW Government Regulations; and
  - OH&S Regulations

### 4.5 Hornsby Shire Council Desirable Issues

Hornsby Shire Council has noted the following desirable, but not compulsory issues:

- The design should ensure that the flow of pedestrians is not unduly disrupted during construction works;
- The new bridge does not necessarily have to be fully enclosed and can be open to the elements in a manner similar to the existing structure;
- Consider the use of advertising on the proposed bridge;
- Consider the provision of drop-off bays on the northern side of Florence Street (Safer for passengers alighting vehicles);
- Consider the provision of time restricted parking bays on the southern side of Florence Street;
- Minimise any disruption to the existing bike lockers and motorcycle parking near the western end of the existing bridge;

- Bridge and lift structures are to be as transparent as possible;

- Consideration of the relationship of the bridge to adjoining buildings shall include considering the potential impact of the replacement bridge structure on the façade and awnings of nearby buildings and public spaces;

- With reference to the existing No. 12-14 George Street, the design may consider modification to the building structure; avoidance of the structure; or demolition if deemed necessary; and

- Consideration of sustainable energy principles in the design and construction of the bridge. This shall include:
  - Consideration of incorporating energy efficient and renewable energy technologies where appropriate; and
  - Where appropriate utilising passive design opportunities through the use of shading, thermal insulation and natural ventilation systems.
5 Option of Retail Floorspace on the New Bridge

The opportunity to provide for and accommodate retail space on a new bridge was explored. Allowing for each retail kiosk to measure 12m² (4m wide, 3m deep), a row of retail kiosks were provided for on each side of the bridge. Additional circulation space (around 3m) would be added to the overall width of the bridge.

A high-level cost estimate undertaken as follows:

High Level Cost Estimate

<table>
<thead>
<tr>
<th>Option</th>
<th>Form</th>
<th>Span (m)</th>
<th>Width (m)</th>
<th>Area (m²)</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge Only</td>
<td>Steel through-truss with roof.</td>
<td>30</td>
<td>5</td>
<td>150</td>
<td>$1m-$1.5m to $7,000/m²-$8,500/m²</td>
</tr>
<tr>
<td>Bridge incorporating Retail Space</td>
<td>Precast, pre-stressed, concrete beams to support fully-enclosed and serviced kiosks</td>
<td>30</td>
<td>14</td>
<td>420</td>
<td>$4m-$5m to $10,000/m²-$12,000/m²</td>
</tr>
</tbody>
</table>

NB: The above relate to construction costs only and exclude services, fit-out works, design fees, project management etc.

The incremental cost of constructing a wider bridge to incorporate retail floorspace and additional circulation space is, in the worst case, in the order of $4m ($5m less $1m).

After allowing for vacancies and tenant changeover the retail space created on the bridge (168m²) should lease for a minimum of $2,000/m²/annum of lettable area in order to achieve at least 7% return on the capital invested (incremental cost of $4m).

For the purposes of comparison, the following are rents achieved in Wynyard and Town Hall stations:

Retail Rents in Station Concourses and Arcades

<table>
<thead>
<tr>
<th>Location</th>
<th>Net Rent ($/m²/annum GLAR)</th>
<th>Daily Pedestrian Counts*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wynyard Walkway, Wynyard station</td>
<td>$3,000-$4,000</td>
<td>110,000</td>
</tr>
<tr>
<td>Met Centre, Wynyard station</td>
<td>$3,000-$4,000</td>
<td>110,000</td>
</tr>
<tr>
<td>Town Hall Square, Town Hall station</td>
<td>$1,500-$2,500</td>
<td>155,000</td>
</tr>
</tbody>
</table>

*Daily pedestrian counts associated with respective rail station
Considering that retail rents along Florence Street (closer to the Westfield mall) are achieving less than $1,000/m²/annum, it is not considered to be feasible for rents on the new footbridge to achieve $2,000/m²/annum considering that daily passenger counts at Hornsby station are 11,280 each way (entry and exit). According to the funding submission report dated May 2009, the number of daily pedestrians estimated to use the pedestrian bridge daily is 14,720.

The above figures illustrate that the incremental cost of construction of $4m (for a wider bridge to allow for retail space) is unlikely to be offset by higher rents (which need to be in excess of $2,000/m²/annum). There is therefore unlikely to be a benefit by providing for retail space on the bridge and the revenue expected to be generated is unlikely to offset the additional capital cost required.
6 Bridge Advertising

6.1 Potential Revenue

The Outdoor Media Industry in Australia has been growing steadily in recent years. Although outdoor advertising is commonly associated with billboards, outdoor media covers a broad range of opportunities.

1. Large format advertising generally comprises supersites and ‘spectaculars’ which are located primarily on major highways, freeways or principal arterials. They offer high-density consumer exposure, mostly to vehicular traffic.

2. Posters are another common form of billboard advertising, located mainly in commercial and industrial areas on primary and secondary arterial roads. Posters are smaller and are viewed principally by residents and commuter traffic, with some pedestrian exposure.

The above formats generate more than 95% of revenue from outdoor advertising (Ref: Outdoor Media Association Inc.). Other outdoor advertising include sky signs (wall or roof-mounted) and hoardings around development sites.

Advertisers are reported to be increasingly acknowledging of the effectiveness and reach potential of outdoor advertising. In 2010 the categories of top 5 major spenders on outdoor media were from the retail, finance, entertainment and leisure, communications and motor vehicles industries. The top 5 advertisers in outdoor media were: NSW Government, Coca Cola, Telstra, Lion Nathan National Foods and McDonalds.

Large format billboards are highly visible, often used for maximum impact and to elevate the status or prestige of a brand. Two types of this format media are:

- Spectaculars - typically illuminated and on key highway and inner city locations, poster displays over 50m², with some exceeding 400m²; and

- Supersites - illuminated and can be seen in a variety of locations including national highways and major arterial routes, the largest industry standard size poster display 42m² (12.66m x 3.35m).
The availability and pricing of the above large format outdoor media in locations considered comparable to that offered by the Hornsby pedestrian bridge has been investigated. The following locations are quoted as:

### Large Billboard Licence Fees

<table>
<thead>
<tr>
<th>Location</th>
<th>Board Dimensions</th>
<th>Vehicles per Day</th>
<th>Monthly Fee**</th>
</tr>
</thead>
<tbody>
<tr>
<td>George Street (existing roadside location)</td>
<td>18m² (8.3m x 2.2m)</td>
<td>25,000-30,000*</td>
<td>$4,000</td>
</tr>
<tr>
<td>Hornsby</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1 Pacific Highway</td>
<td>42m² (12.66m x 3.35x)</td>
<td></td>
<td>$8,000</td>
</tr>
<tr>
<td>Hornsby</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1 Alfred Street (Harbour bridge approach)</td>
<td>75m² (22.5m x 3.35m)</td>
<td>43,000</td>
<td>$28,000</td>
</tr>
<tr>
<td>North Sydney</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epping Road overpass</td>
<td>42m² (12.66m x 3.35m)</td>
<td>47,000</td>
<td>$19,000</td>
</tr>
<tr>
<td>North Ryde</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M7 Pennant Hills Road overpass</td>
<td>42m² (12.66m x 3.35m)</td>
<td>62,000</td>
<td>$19,000</td>
</tr>
<tr>
<td>Thornleigh</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*2006 RTA average daily counts in both directions - counting stations at Burdett Street (24,900) and Edgeworth David Ave (32,500)
**Indicative rates, often subject to discount depending on length of campaign
Source: APN Outdoor

Given the comparatively low volumes of daily traffic on George Street (25,000-30,000), depending on the permissible billboard size and method of illumination, revenue from outdoor advertising could potentially achieve between $8,000 and $10,000 per month.

Indoor advertising is much less lucrative, railway billboard advertising ranges between $1,500 and $2,500 per month depending on the station.

It is understood that Westfield have secured consent to install 3 advertising signs on its building, addressing George Street to the south of the footbridge. Westfield is considered to be a good candidate for footbridge advertising; the ability to advertise on their own building could conceivably impact the marketability of advertising space on the bridge. That said, the market for outdoor advertising is a growing one and is increasingly considered as advertising media.

### 6.2 Approval Requirements

Since the proposed bridge will cross a state road, any advertising panels will be controlled by the criteria set out in SEPP64 and the Department of Planning document ‘Transport Corridor Outdoor Advertising & Signage Guidelines’. These documents state that a Development Application would be required for any advertising on the bridge and it would need to be approved by RMS.

This process will include a safety audit that would consider the proximity to intersections and other visual issues from a safety perspective. At this stage, the inclusion of advertising on the bridge is considered to be feasible, but this would need to be confirmed by the process described above.
6.3 Integration with Bridge Structure

Advertising panels are commonly later additions to bridges once they have been in service for a period of time. Whereas the bridge is typically structurally capable of supporting such a panel, it is not usually aesthetically detailed to accommodate such a panel. This can frequently result in an unattractive ‘add-on’ appearance as illustrated by some examples below.

Footbridge over Devlin Street at Top Ryde City Shopping Centre, NSW
The footbridge at Top Ryde has an intricate twisted space frame truss. However, the addition of advertising panel has largely obscured the original profile, and extends below the soffit. In this instance, it appears that the inclusion of the panel was not considered in the original design.

Footbridge over Beecroft Road at Epping Railway Station, NSW
The footbridge at Beecroft was originally a relatively light and transparent footbridge prior to the inclusion of the advertising panel. The diagonal truss members are not considered to be particularly well suited (visually) to the addition of the rectangular advertising panel.

Footbridge over Military Road at Bridgpoint Shopping Centre, Mosman, NSW
The footbridge at Mosman appears to have been refurbished with the inclusion of adverts considered in the redesign process, resulting in a relatively neat appearance - relative to the examples above. Through discussions with the RMS, they have advised that the most successful advertising that sells and makes money for the state government, follows what they call standard sizes, which are as follows:

- Super-Size: 12.66m x 3.33m
- Super 8: 8.3m x 2.2m
- Portrait size: 6m x 9m (this is a newer format)

The RMS noted that they have a number of older bridge signs that use the format of 18m x 1.8m which they advise do not make money and are not as successful.

It is noted that the inclusion of an advertising panel on the side of a bridge will largely dominate the appearance of the structure, and that it will obscure views from the bridge for pedestrians.

If Council wish to include advertising panels, then it is recommended that this should be incorporated into the original design of the bridge. Based on the above information and the likely size of the proposed bridge, the Super 8 format is considered to be the most appropriate size to incorporate into the bridge design.
7 Alignment Options

7.1 Potential Connection into No. 12-14 George Street

The option of constructing a new footbridge that connects directly into the existing No.12-14 George Street was considered. As noted in Section 3 of this Report, this building was purchased by Hornsby Shire Council in 2002 with such an option in mind. The development options presented by Ezzy Architects in 2003 and 2013 propose such an arrangement along with significant redevelopment of the existing building.

The upper floor of the existing building is currently used by Hornsby Shire Council and the ground floor is leased to charity shops.

The advantages of such an option include:

- A straight alignment following the desire-line out of Hornsby Railway Station;
- The subsequent removal of the existing footbridge would open up a clear vista along the entire length of Florence Street; and
- Development potential to improve the Urban Landscape.

However, without significant redevelopment of the existing building this option is not considered to be economically feasible. Due to the level differences between the proposed bridge level and the existing building floor levels, significant structural alterations would need to be undertaken to accommodate such a pedestrian link.

The existing No.12-14 George Street has a relatively small site area of 350m². A significant portion of this area would be taken by the necessary ramps, stairs, lifts etc. that would be necessary to vertically connect the footbridge with the Florence Street level. The remaining space available for retail or commerce is not considered to be sufficient to provide commercially viable rental returns.

It is further noted that there is currently no on-site parking at the existing building; hence the practical need for more basement levels, further undermines the viability of such a development. Also public circulation spaces would need to provide 24hrs access through any such building which would present additional security issues.

Therefore, it is considered that for such a pedestrian link into the building to be viable it would need to involve a complete redevelopment of 12-14 George Street and an amalgamation of adjoining premises. For example, this would need to be in the form of a 6 storey commercial building. However, it is noted that the commercial market has suffered more than the retail market in Hornsby since the Global Financial Crisis of 2007/2008. Hornsby is more known as a retail centre than as an employment centre. Resales of 88 George Street indicate a 15%-20% decline in commercial values since 2006/2007. There is currently no commercial development proposed in Hornsby as the expected end sale values do not justify the cost of development.
Although the redevelopment of No.12-14 George Street can be seen to have a number of benefits, it is considered to be dependent upon private development and the agreement of adjoining landowners. Hornsby Shire Council has noted a desire for the bridge to be redeveloped independent of potential private development. Therefore the option of connecting the footbridge into No.12-14 George Street has not been considered further.

The option of connecting into the eight shops on the southern side of Florence Street was also briefly considered. However, unlike No.12-14 George Street, these shops are privately owned and are understood to be currently trading well (particularly east of and including 8-10 Florence Street). A new bridge that involves their demolition and reconfiguration is not considered economically feasible as these shops are estimated to be worth approximately $16M ($2M x 8 shops). Therefore the option has not been considered further

7.2 Alignment Options Considered

7.2.1 General

During the Design Evaluation phase Cardno presented a number of different options to Hornsby Shire Council illustrating numerous variables in terms of: access arrangements; interconnection with surrounding buildings; and differing alignments. Based on these discussions, the options were refined and three separate general alignment options are presented in this Report as follows:

- Alignment Option 1 – Into the Space of No.12-14 George Street;
- Alignment Option 2 – Northern side of Florence Street (Existing Footbridge Alignment); and
- Alignment Option 3 – Middle of Florence Street (South or Roadway).

The advantages and disadvantages of each of these Options are discussed overleaf.

All of the options consider a direct link into the existing Railway Station Concourse similar to the existing bridge as this is considered to be the most appropriate solution.

It is noted that due to the town centre location of the bridge site, there are numerous underground and above ground services in the vicinity. Railcorp and Ausgrid above ground power lines run along the western side of George Street. In addition there are below ground: water; electricity; gas; and communication services along the eastern side of George Street and along both sides of Florence Street. All three of the above Alignment Options will need to be cognisant of the presence of these services, and where possible the substructure would be designed to avoid impacting on these utilities. All three options are considered to have a similar impact on these services. It is highlighted that any necessary service diversions are not included in the cost estimates presented in this report.
7.2.2 Alignment Option 1 – Into the Space of No.12-14 George Street

Whereas the option described in Section 7.1 entailed the redevelopment of No.12-14 George Street, this Option 1 considers the demolition of the existing building and landing the new bridge in a newly formed plaza space.

The salient points of this proposal are as follows:

**Advantages**
- Provides generous public domain around the bridge structure;
- Creates opportunity to improve Florence Street Mall with additional set down, parking and plaza functions;
- Opens up view along the length of Florence Street;
- Could be some benefit for adjoining building (16 George Street) to activate ground floor retail if reconfigured to open onto Florence Street;
- Could include improved exposure and visibility for shops on southern side of Florence Street with new bridge alignment further north of existing footprint;
- Existing footbridge can be kept open during construction of new bridge;

**Disadvantages**
- Hornsby Shire Council lose an asset (No.12-14 George Street) worth approximately $2.5M (conservative estimate of market value);
- Pedestrians still need to cross traffic lane at Hunter Lane;
- An attractive plaza could only be achieved in conjunction with the redevelopment of adjoining properties. This outcome could not be guaranteed;

**Neutral**
- Opportunities for new retail kiosks in the piazza would have to generate at least $225,000 per annum to maintain commercial return (no net gain);
Preliminary Cost Estimate

- $4.5M (Project Cost)

  *Project Cost: includes 40% contingency; excludes roadworks and service diversions.*

  After allowing for the loss of the asset that is No. 12-14 George St, the Net Project Cost is $7.0m

7.2.3 Alignment Option 2 – Northern side of Florence Street (Existing Footbridge Alignment)

This option considers the replacement bridge being constructed on roughly the same alignment as the existing bridge.

The salient points of this proposal are as follows:

**Advantages**

- If the existing ramp arrangement is removed and replaced with alternative access means, then the extent of the structure in front of No.12-14 George Street would be reduced. This could improve the ground floor exposure of No.12-14 George Street and activate the retail space. An increase in exposure and visibility of ground floor space at No.12-14 George Street will improve its rental potential. For example, if rental potential is increased by $500/m²/annum (at present, ground floor rental is $220/m²/annum), the property’s capital value could potentially increases by at least $1m;

- Similar to the improvement to the exposure of No.12-14 George Street, a similar improvement would slightly impact on shops on southern side of Florence Street (those shops closer to George Street intersection) as a consequence of the bridge structure being shorter.

**Disadvantages**

- Pedestrians still need to cross traffic lane at Hunter Lane;

- Existing bridge would need to be closed for a period of time to allow construction of the new bridge. If a temporary bridge was to be provided, it is estimated that the cost would be similar to the cost of a new bridge, but there could be some sell back difference. We would expect that, with foundations, such a temporary bridge could be $0.6 - $1.0 Million. In addition, it would be very difficult to accommodate a temporary bridge without disrupting access into Florence Street;
Neutral

- This option would allow the potential to connect into No.12-14 George Street at a later date if required. However, it is noted that the incorporation of the bridge into such a redevelopment option should allow for channelling of 100% foot traffic through the building. This would be necessary to maximise exposure from footfall that would support the rental levels necessary for commercial viability;

- The vista along Florence Street would be largely similar to that at present.

Preliminary Cost Estimate

- $5.8M (Project Cost)

  Project Cost: includes temporary bridge and a 40% contingency; excludes roadworks and service diversions.

  Allowing for the potential benefit of value uplift to No. 12-14 George St, the Net Project Cost is $4.8m.

7.2.4 Alignment Option 3 – Middle of Florence Street (South of Roadway)

This option considers the roadway in Florence Street being relocated to the northern side of the Street, with the replacement bridge being constructed to the south of the roadway. Initial Alignment 3 Options considered a bridge alignment closer to the southern properties as indicated in the plan view below. A more refined, central alignment option is presented in Section 10 of this Report.

The salient points of this proposal are as follows:

Advantages

- Pedestrians no longer need to cross traffic lane at Hunter Lane. Provides a direct pedestrian link between the mall and the proposed bridge;

- This option will help increase the visibility and exposure of 12-14 George Street, being less obscured from view. This creates opportunity for rentals on the ground floor retail to improve, similar to Alignment Option 2 (above);

- The existing footbridge can be kept open during construction of new bridge. See Section 9.3 for further details;
Disadvantages

- This alignment option reduces the width of the roadway within Florence Street. To minimise the negative effect on the shops located on the southern side of Florence Street, it is recommended that the distance between the shops and the new bridge structure is maximised. Hence, the bridge is located as close to the centre of Florence Street as possible, while maintaining an operational traffic lane. It is understood that Florence Street is currently accessed by articulated trucks once or twice a week and medium and large rigid vehicles more frequently. It is proposed that the alignment will be designed to allow an 8.8m long Medium Rigid Vehicle to turn from George Street into Florence Street and subsequently into Hunter Lane;

Neutral

- Although the proposed alignment will direct pedestrians to the southern side of the street it is acknowledged that the new structure will partly obscure the frontages to the shops at the western end of the street. A neutral impact could be expected on these shops as the bridge placement is expected to be kept as far away from these buildings as possible, in a central alignment, and the structure itself will be shorter with no ramps. The shops from 8-10 Florence Street are understood to be currently trading well, achieving rents in excess of $800/m²-$900/m². We do not anticipate rental potential to increase with this option, although all adjoining shops on the southern side of Florence Street may benefit from having a greater number of pedestrians passing closer to them and being able to access their business without crossing a road;

- This option would allow the potential to connect into the buildings on the both sides of Florence Street at a later date if required;

Preliminary Cost Estimate

- $5.0M (Project Cost)

  Project Cost: includes 40% contingency; excludes roadworks and service diversions.

  Allowing for the potential benefit of value uplift to No. 12-14 George St, the Net Project Cost is $4.0m.
## 7.3 Alignment Comparison Summary

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Alignment Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
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<tr>
<td></td>
<td>Demolition of No.12-14 George Street</td>
</tr>
<tr>
<td>Pedestrian Access between Railway Station and Mall</td>
<td>Poor (need to cross traffic lane)</td>
</tr>
<tr>
<td>Streetscape &amp; Urban Landscape</td>
<td>Potentially Good (but dependent upon redevelopment of adjoining properties)</td>
</tr>
<tr>
<td>Preliminary Net Cost Estimate</td>
<td>$7.5M</td>
</tr>
<tr>
<td><em>includes 40% contingency, temporary bridges, change in asset value (No.12-14 George St); excludes roadworks and service diversions</em></td>
<td></td>
</tr>
<tr>
<td>Impact on Council Owned No.12-14 George Street</td>
<td>Poor (building demolished)</td>
</tr>
<tr>
<td>Impact on Shops on Northern Side of Florence Street</td>
<td>Neutral</td>
</tr>
<tr>
<td>Impact on Shops on Southern Side of Florence Street</td>
<td>Good</td>
</tr>
<tr>
<td>Constructability</td>
<td>Good</td>
</tr>
</tbody>
</table>

Based on the above considerations, in particular the safety consideration or pedestrians having to cross traffic lanes, the net cost estimate, and the anticipated impact on the adjacent businesses, **Alignment Option 3** is recommended.
8 Accessibility Options

8.1 Width

The ‘Viability of Submission for Funding’ Report by Parsons Brinkerhoff in 2009, noted that the technical minimum width of the walkway on the replacement bridge should be 2.8m, but based on the specific key factors at the site, the desirable and recommended width was 4.2m.

The report notes that this 4.2m width would facilitate provision of 6 lanes of pedestrian traffic at approximately 600 mm per pedestrian (4 in the peak direction, 2 in the other direction), leading to a requirement for 3.6m width with clearances of 300 mm on each.

This 2009 assessment was partly based on the population growth forecasts available at that time. Hornsby Shire Council’s Strategic Planning Team has reviewed the populations projections adopted in the Parsons Brinkerhoff Report and confirmed that the assumptions made are broadly consistent with the latest available information.

The 4.2m width noted below is considered to be adequate, however Hornsby Shire Council have noted a desire to further enhance the width of the proposed bridge due to its level of amenity and it proposed use as a ‘gateway’ facility. Therefore a minimum clear width of 4.5m between barriers or handrails is proposed.

8.2 Vertical Movements

The existing footbridge has both ramps and stairs at both its eastern and western ends. However, as noted previously these are non-compliant with disabled standards for universal access in terms of gradient and width. As illustrated in Annex A, the existing bridge has ramp gradients up to 9.6%, which is significantly greater than the current design standards outlined out in Section 8.4.1 below.

The vertical access options available include the following:

- Stairs;
- Ramps;
- Lifts; and
- Escalators.

Each of these options are discussed further below:

8.3 Stairs

Stairs are considered to provide an efficient solution that would bring people down from the bridge level over a shorter length relative to escalators and especially compared to a ramp solution. However, clearly stairs by themselves would not provide adequate access for people with reduced mobility.
8.4 Ramps

8.4.1 Guidelines

The relevant guidance and/or requirements in relation to longitudinal gradients for pedestrians are included in the following documents:

- AS 1428 Design for Access and Mobility
  - Maximum gradients given for:
    - Ramps: 1:14 (7%)
  - Level rest areas shall be provided as follows:
    - Minimum length: 1.2m
    - Max gradient: 1:33 (3%)
    - Spacing based upon gradient as follows:
      - 9m for 1:14 (7%)
      - 15m for 1:20 (5%)
      - 25m for 1:33 (3%)

- AS 5400.1 Bridge Design – Part 1: Scope and General Principles
  - Ramp gradient (Clause 9.11)
    - Max 1 in 14 (7%) up to 50m long, or for elderly or disabled access
    - To satisfy AS 1428.1 where appropriate

- RMS Bridge Policy Circular BPC2005/09
  - Provision of disabled access for Pedestrian Bridges
    - RMS bridgeworks must comply with AS5100, including disabled access as appropriate.

8.4.2 Review

Due to the sub-standard vertical clearance under the structure, the bridge will need to be raised. This in combination with the necessary shallower slope would result in a significantly longer ramp than that currently in use at Florence Street.

The ramp would need to be approximately 100m in length to allow safe access from the footbridge height down to Florence Street level. This could be achieved either as a long straight ramp or as a series of switch-backs similar to the existing solution.

The long straight option is desirable for pedestrians travelling straight between the Railway Station and the Westfield Shopping Centre. However, this option would have a significant detrimental effect on the businesses currently located on Florence Street as all passing traffic would bypass their premises. In addition, this alignment would be particularly undesirable for people wishing to simply cross from one side of George Street to the other.

The switch-back option would require a significant footprint in Florence Street that would have the following detrimental effects:

- The inclusion of a ramp would push the replacement bridge structure closer to the existing shops reducing their visibility and exposure, which would reduce their commercial viability;
- A switch back layout results in a highly circuitous route not following the desire line of pedestrians; and
The existing ramp is considered to be a relatively unattractive and detrimental to the urban form as it is a bulky structure that dominates the western end of Florence Street. It is noted that any new ramp would need to be longer than what is there at present.

8.5 Lifts and Escalators

8.5.1 Associated Costs

Lifts and escalators provide excellent access solutions but clearly have cost, maintenance and reliability issues.

The table below outlines the estimated costs of lifts and escalators including their annual operating costs:

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</tr>
</thead>
<tbody>
<tr>
<td>Lift Maintenance: monthly</td>
<td>$90,000</td>
<td>$110,000</td>
<td>15-20 Years</td>
<td>34.7</td>
<td>36.4</td>
<td>$8,671</td>
<td>$9,000</td>
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<td>Escalator Maintenance: monthly</td>
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<td>15-20 Years</td>
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<td>57.0</td>
<td>$13,557</td>
<td>$11,000</td>
<td>$24,572</td>
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<tr>
<td>Lift and Escalator Maintenance: monthly</td>
<td>$190,000</td>
<td>$230,000</td>
<td>15-20 Years</td>
<td>61.5</td>
<td>64.6</td>
<td>$15,379</td>
<td>$18,000</td>
<td>$33,379</td>
</tr>
</tbody>
</table>

It is understood that State Government agencies are unlikely to support the installation of escalators. Examples of escalators installed at St Leonards and Chatswood Railway Stations have been facilitated through joint partnership agreements with developers and local body corporate's. In these instances escalators were installed under an agreement with adjoining landholders where they benefited from an enhanced service.

It is noted that the Hornsby Mall situation does not offer a clear opportunity for a developer or shopping centre operator to contribute to the capital or operating costs of such escalators.
8.5.2 Consultation

Access and Social Justice Committee

The views of the local Access and Social Justice Committee have been sought and they commented as follows:

- The committee generally favour lifts
- Members of the committee noted that they have experienced problems with lift breakdowns at the pedestrian bridge at Epping Railway Station, NSW. In the event of a lift breakdown, the committee requested that the provision of alternative arrangements be considered such as a second lift or an improved alternative ramp arrangement.
- If lifts are to be provided, they should be of a reasonable size. They should be large enough to allow motorised scooters to turn around or alternatively have a drive through arrangement with doors arranged to provide for one way entry and exit.

Hornsby Shire Council

Hornsby Shire Council have commented that it was felt that a large number of users (i.e. parents) would not want to rely solely on lifts, and that they would probably prefer ramps.

Railcorp

Railcorp have indicated that in their experience, public consultation would lead to a demand for ramp access to be retained, alongside the installation of a lift, due to community concerns with the reliability of lifts. However, Railcorp also suggested that in their experience lifts have up to 99% reliability. Escalators are considered to have a lower reliability, especially when in an open environment such as for this project.

8.6 Review

8.6.1 Railway Station end of the Bridge

Due to the slight level difference between the proposed bridge and the railway station, a direct ramp solution is recommended in this instance.

To access the western side of George Street it is recommended that a stair and ramp solution is retained, similar to that in operation at present.

8.6.2 Florence Street end of the Bridge

A stair and lift arrangement is recommended at the Florence Street end of the bridge. However, the design should allow for the potential future inclusion of escalators. It is therefore recommended that the stairs are wide enough to be modified into a stair/escalator solution.

A ramp solution is not recommended due to the detrimental effects it would have on the existing Florence Street businesses and the urban environment.

It is noted that concerns have been raised in relation to the reliability of lifts. However, Railcorp have suggested that this perception is incorrect. In the event of a lift being out of action, users would still be able to cross George Street at grade at the existing intersection with the Pacific Highway. This, would result in a 250m diversion.
9 Structural Options

9.1 Superstructure

It is undesirable in terms of safety and aesthetics to place a pier in the centre of George Street, hence a single clear span is proposed over the road. This results in a required span length of approximately 25m, which could be accommodated by a variety of structural forms as discussed further below:

**Beam**

The cheapest solution for a footbridge of this length would be to use a precast, prestressed concrete beam. However, this form of structure would require a relatively large structural depth (approximately 1500mm); and would have an unattractive utilitarian appearance. The consequences of such a deep structure would be to raise the footpath level, thereby increasing the length and cost of any approach ramps or stairs.

**Suspension or Cable Stayed Bridge**

A suspension or cable-stayed option is not considered to be practical for this relatively short span length. While Hornsby Shire Council wishes for an attractive ‘gateway’ structure, they have not requested such an iconic or landmark bridge structure due to the prohibitive costs and the inappropriate visual impact that would result from such a structural form.

**Arch**

An arched bridge would be a feasible option, but would be a relatively expensive solution (NB: arch above deck level). A bridge of this form could have a minimal structural depth and the required throw screens could be incorporated into the chords of the arch. However, the necessity to provide a roof could look ‘messy’ as it would not be practical for the roof to follow the line of the arch.

**Through Girder**

We consider a through-girder to be the most feasible solution. This solution could also have a minimal structural depth. The side girders could be formed of either concrete beams, steel beams or a steel truss. The existing footbridge at Hornsby is basically a through-girder with concrete side beams. A through-truss solution is particularly suitable as the roof and throw screens can be incorporated into the main structural elements.

A steel truss is preferred for the side chords, rather than a sold beam as this will result in the bridge having a lighter and more open appearance. A wide variety of truss patterns could be adopted (e.g. warren, vierendeel, lattice etc.). Below is a selection of images of existing footbridges around Sydney.

*Warren Truss (with vertical members) - Longueville Road, Lane Cove, NSW*
All truss options presented above are considered to be practical and efficient from a technical point of view. They meet all the required technical needs of the project in an efficient and effective manner. However, based on the possibility of incorporating a rectangular advertising panel onto the side of the bridge superstructure, it is recommended that a rectangular ‘vierendeel’ pattern would result in a neater appearance due to the lack of diagonal bracing members.

Alternatively, more creative (and more expensive) truss options are technically feasible such as those illustrated below:

We would expect the cost of an intricate space frame structure similar to those above to be approximately 60% to 70% more expensive compared to a more standard vierendeel form. It is also noted that it would be much more difficult to successfully incorporate advertising onto the sides of such a highly architectural structural form.
9.2 Approaches

9.2.1 West Side (Hornsby Railway Station)

It is proposed that the walkway will ramp down from the western edge of George Street to the Railway Station concourse. This will entail a curved elevated walkway with 3 x 8 metre spans. It is proposed that the form of this walkway should closely match the superstructure of the main bridge span.

It is understood that there is potential for the construction of an additional railway platform, track or bus interchange on the eastern side of Hornsby railway station. The proposed elevated structure could be removed relatively easily at a later date, and hence does not preclude any such future development.

9.2.2 East Side (Florence Street Mall)

It is proposed that a lift will be provided at the eastern end of the proposed bridge facilitating movements down to the ground level. Hence a 4m x 7m platform is proposed at the eastern end of the main bridge span to provide a waiting area adjacent to the lift and at the top of the proposed stairs.

A 5m stairway is proposed to link the bridge down to Florence Street Mall. As noted in Section 8.6.2 these wide stairs would allow for the potential future inclusion of escalators.

To provide pedestrian shelter, a high overhead canopy, supported by columns, is proposed to cover this stairway. This feature will provide a degree of weather protection, but will also act as a ‘gateway’ feature at the end of the Florence Street Mall. It is proposed that the roof level of the main bridge is maintained over this canopy. This will allow views directly from the bridge towards the mall and vice-versa.

Below is a selection of images of similar awnings around Sydney:
9.3 Substructure

The existing bridge is supported on pad footings, founded on the underlying residual clays. It is recommended that the replacement bridge could utilise similar foundation details. Relatively slender reinforced concrete blade piers are recommended for supporting the main span and the approach spans.

9.4 Construction and Buildability

The proposed construction sequence is as follows:

- Reduce the width of the existing Florence Street roadway and shift the alignment as far to the south as possible. Apply appropriate traffic management measures;
- Relocate existing above ground powerlines. This may require up to 500m of underground cable work;
- Remove the existing switchback ramp from the eastern end of the existing footbridge. Provide a temporary lift to accommodate users with reduced mobility;
- Construct new pad foundations and reinforced concrete blade piers;
- Prefabricate steel truss main span and approach spans off site;
- Deliver prefabricated superstructure elements to site and preassemble. This could potentially be undertaken in the open air car park to the eastern side of the railway corridor, adjacent to the bridge site. It is noted that this land is owned by Railcorp.
- Temporarily close George Street and erect new bridge superstructure. It is anticipated that this could be undertaken over a single night closure;
- Divert pedestrians onto the new bridge. Relocate temporary lift to the new bridge location;
- Temporarily close George Street and demolish the existing bridge superstructure. It is anticipated that this could be undertaken over a single night closure;
- Realign the Florence Street Roadway to the northern side of the new bridge; and
- Construct permanent lift structure on the southern side of the bridge at Florence Street.

9.5 Health & Safety Considerations

9.5.1 General

The design shall consider the safe interface of the proposed works with George Street, Florence Street, Hornsby Railway Station and the surrounding utilities.

There are inevitably potential risks associated with the construction of the above option. It is a requirement of the design process that the risks associated with any proposed construction be identified and evaluated, and mitigated as far as may be practical and reasonable. The risks which should be considered are not only those which may arise during construction of the bridge, but also those which may arise during its operation and maintenance, and its eventual demolition.

The structural option being considered here can be constructed, maintained and demolished safely, and does not pose an undue risk to users of the crossing, the affected roads or the public. It is noted that the options result in the handling of precast elements and that careful consideration of the existing prestressed beams would need to be accounted for during demolition.
The detailing of the approach ramps and stairs will require careful consideration of potential anti-social behaviour. Hence, adequate lighting and sightlines would need to be ensured. The ‘Crime Prevention through Environmental Design’ guidelines will be adopted. These guidelines promote the idea that creative design can be an effective deterrent to criminal behaviour within the community. For example, Railcorp have indicated that it is best to try to increase opportunities for passive surveillance at lifts and escalators. This could be achieved through the siting of concession outlets nearby or within the bridge structure (e.g. under the stairs) with good views onto the lift entry area.

9.5.2 Traffic Management during Construction

The proposed option can be constructed with minimal interference to the operation of the existing road network and with minimal impact on pedestrians crossing George Street.

The main steel superstructure will be able to be constructed off site and then pre-assembled close to the bridge site without disrupting the existing infrastructure network.

George Street would require a couple of night closures to accommodate the installation of the new bridge and the removal of the existing superstructure.

Access to the site is readily available along the road network. However, due to the busy urban environment there will be potential for significant conflict between construction activities and the general public. The construction activities for the bridge works as well as the traffic management around the site will have to be coordinated to assure safe working conditions.

9.5.3 Safety in Use

As noted in Section 4.1, a ‘throw screen’ will be required where the bridge passes over George Street. It is therefore recommended that an architectural stainless steel mesh is incorporated into the sides of the truss superstructure. A mesh is preferred to a solid panel as this will provide ventilation, open up views from the bridge and minimise the likelihood of graffiti.

It is noted that the material selection and detailing of the various bridge elements will need to be vandal resistant.

It is recommended that the entire length of the proposed walkway is illuminated to the current mandatory design requirements. The luminaries should include vandal resistant fittings and it is recommended that energy efficient lighting should be adopted, with timers where appropriate.

It is noted that Hornsby Shire Council intend to make the roadway in Florence Street a share way to improve safety for pedestrians. The road may be defined by kerb and gutter or constructing a raised threshold with a bollard treatment.

It is noted that the new roadway will accommodate a medium rigid vehicle and that signage will need to be installed limiting access into Florence Street to 8.8m length vehicles.
9.5.4 **Particular Risks**

The Particular Risks are:

- Interface with general public;
- Interface with live traffic on both George Street and Florence Street;
- Handling heavy prefabricated components;
- Transport of potentially long prefabricated elements to the site;
- Demolition of an existing post-tensioned structure;
- Interface with above ground powerlines; and
- Interface with below ground services.
10 Preferred Option

Following discussion of the various options presented in this Report, it was agreed with Hornsby Shire Council that: the alignment option recommended in Section 7; the access arrangements recommended in Section 8; and the structural form recommended in Section 9 should be developed further and a more detailed cost estimate produced. Photomontages of this preferred scheme are presented overleaf:
Existing Bridge

Proposed Southern Elevation
The two options above differ in relation to the position of the upper level lift waiting area and the consequent start position of the stairs. With Option A, the waiting area is positioned on the eastern side of the lift. This results in the stairs being pushed further into Florence Street. This therefore increases the length of structure in front of the shops on the southern side of the street. However, as illustrated above, by pushing the stairs away from the bridge pier support and the lift, it also opens up a view of these shops from George Street under the structure. Option B conversely, minimises the footprint of the structure in Florence Street, but results in a less transparent structure from George Street. The position of the waiting area in Option B results in a cantilevered outstand on the southern elevation of the bridge. This would complicate the structural design of the bridge by introducing torsional moments and would also have a detrimental impact on the bridge appearance.
Various alternative roof treatments are possible for the canopy over the staircase at Florence Street Mall as illustrated below.

**Proposed Eastern Elevation (Sloped Roof Option)**

**Eastern Elevation (Stepped Roof Option)**

**Eastern Elevation (Glazed Stepped Roof Option)**
As noted in Section 7.2.4, the estimated Total Project Cost for this preferred Option = $5.0M
Project Cost: includes 40% contingency; excludes roadworks and service diversions
Allowing for the potential benefit of value uplift to No. 12-14 George St, the Net Project Cost is $4.0m.
Full details of this estimate are included in Annex C.

Some potential variations on this theme were presented by Hornsby Shire Council as illustrated below:

Potential Timber Roof and Sculpted Roof Support Columns

Potential for Future Link into Westfield Shopping Centre

Potential Curved, Glazed Space Frame
11 Recommendations

The recommendations are as follows:

- The replacement footbridge should be aligned towards the centre of Florence Street;
- The existing footbridge should be demolished;
- The existing roadway should be relocated to the northern side of the proposed footbridge;
- The footbridge should be designed as a standalone structure independent of the adjacent buildings;
- The footbridge should provide 5.5m clearance over George Street;
- The footbridge should have a clear width of 4.5m between handrails;
- The footbridge design should consider the potential for incorporating advertising panels on both elevations (Super 8 size);
- Provide ramp access from bridge to railway concourse;
- Provide ramp and stair access from bridge to western side of George Street (similar to existing arrangement);
- Provide lift and stair access from bridge to Florence Street. Provide potential for future addition of escalators;
- Structural form to be a steel vierendeel through truss supported on reinforced concrete blade piers;
- Entire length of bridge and approach ramps and stairs to be roofed;
- Sides of the bridge to be clad in an architectural stainless steel mesh; and
- Proposed structure will be supported on pad foundations as per the existing structure.
12 Next Step - Proposed Community and Stakeholder Consultation

12.1 General

If Hornsby Shire Council endorse the recommendations made in this Report it is proposed that the design options will be presented to the community.

It is proposed that the following effective and meaningful consultation strategies are adopted to engage the community and to assist in the delivery and to engender a sense of community ownership of the new pedestrian bridge.

12.2 Key Stakeholder Meetings

Key stakeholder meetings will be held prior to the general community consultation period and will target key stakeholders identified by the Council. The aim of these meetings will be to present the proposed design options to key stakeholders within a private forum. This will enable stakeholders to gain a clear and comprehensive understanding of the proposed design options, including how they may be impacted upon. The meetings will also provide an opportunity for key stakeholders to ask the project team specific and technical questions following the presentation.

Stakeholder meetings will be structured as follows:

- Stakeholder Meeting No. 1 - Landowners and Tenants: Land owners and tenants that immediately adjoin and surround the pedestrian bridge will be invited to attend a private presentation of the proposed design options. The project team will be available to answer questions and encourage feedback from attendees.

- Stakeholder Meeting No. 2 - Key Stakeholders: Key stakeholders will be invited to attend ‘drop in’ sessions to view the proposed design options and speak directly with the project team.

12.3 Public Display of Design Options

Design options would be displayed, unmanned, at four locations in public places that are regularly frequented by the community. In this regard, we recommend the displays may be set up in the public foyer of the Hornsby Shire Council administration centre, Hornsby Shire library, Hornsby Railway Station and Hornsby Westfield shopping centre. Displays will capture a diverse range of respondents from all sectors of the community, including commuters. The display should include comment sheets that prompt respondents to provide feedback on their preferred design option. Comment collection boxes will be provided at the location of each display or advice that submissions may be posted or emailed to Council.

Display areas at the railway station and shopping centre will be subject to land owners consent.
12.4 Additional display of Design Options

Design options would be displayed on Hornsby Shire Council’s website, including social media, ‘have your say’ website link, e-newsletters and rate payer mail-outs, and online and radio announcements by the Mayor.

12.5 Advertised Outdoor Community Information Stall

The proposed pedestrian bridge is located in the heart of Hornsby town centre and is likely to be utilized by many different sectors of the community. As such we propose to set up a ‘market style’ stall in close proximity to the existing pedestrian bridge within the public domain adjoining the main entry to the Hornsby Westfield shopping centre. The stall would display highly visible posters of each design option, as well as an overview of Council’s objectives in redeveloping the pedestrian bridge. The community consultation team will invite members of the community passing by to view and comment on the proposal, including options for alternative treatments to the Florence Street stair elevation and confirmation that a stair and lift combination are the most appropriate solution for the Florence Street level change. The community consultation team would be available to inform members of the public about the project and answer any technical queries. The team would also encourage participants to provide written comments. Comment sheets could either be completed by participates at the stall or emailed to Council. This flexible approach would ensure that those that do not stop to view and comment on the design options are encouraged to take the opportunity to provide comment in their own time.

It is recommended that the stall is manned between 1pm and 7pm on a typical weekday to ensure a diverse range of community members have the opportunity to talk face to face with the consultation team. Details of the information stall would be advertised through Council’s website and local newspaper. In this instance, we believe face to face consultation within the public domain will ensure a high response rate.

12.6 Stakeholders Engagement Outcomes Report

Response data collected through additional stakeholder meetings and Council’s various advertising mediums must be reviewed and collated to be documented into a final Stakeholder Engagement Outcomes Report.

12.7 Final Design Evaluation Report

Comments and findings received during the community consultation period will be collated and used to update this Design Evaluation Report.
Annex A
Existing Footbridge
Annex B
Review of Planning Framework
1 Planning Framework

Replacement of the existing pedestrian bridge must comply with the State Metropolitan Strategies and with local legislative instruments and guidelines.

1.1 North Subregional Strategy

The North Subregional Strategy provides the strategic framework for development within the Hornsby Town Centre. The North Subregional Strategy and the NSW Metropolitan Strategy for Sydney 2036, which updates the NSW Metropolitan Strategy for Sydney 2031, identify Hornsby as a Major Centre. Future directions outlined in the Plan include:

- Provide for increased employment in retail and office uses;
- Provide for residential development within walking catchment of the Centre;
- Investigate opportunities for better pedestrian links between eastern and western sides of the Centre;
- Revitalise the traditional Centre to the west of the station; and
- Investigate development opportunities to the west of the station.

The North Subregional Strategy provides planning direction in the categories of:

1.1.1 Economy and Employment

Hornsby, as a Major Centre, has the highest concentration of employment in the sub-region. An employment capacity target of 12,000 jobs by 2031 has been established for Hornsby Town Centre, an increase of 3,000 jobs over 25 years. Hornsby is the commercial centre of the subregion, with the Westfield’s shopping complex attracting a high proportion of retail expenditure. Historically, Hornsby has not attracted large-scale commercial development.

1.1.2 Housing

Hornsby LGA has recently undergone development of medium and high density housing. The Subregional Strategy identifies that future residential development will be focussed around centres, particularly along major transit routes, with Hornsby Town Centre identified as a location for additional housing.

Various high density housing developments adjacent to the commercial core of the Major Centre are expected to continue with the Metropolitan Development Program forecasting 2,057 dwellings could be developed in the transit nodes of Hornsby and Waitara between 2006 and 2014. As a major centre, Hornsby will continue to provide additional medium and high density housing adjacent to the commercial core to cater for a growing population. To strengthen its role as a Major Centre, opportunities for greater housing densities, in addition to the achievement of the minimum employment capacity targets for the centre, should be explored.
1.1.3 Transport

Hornsby is a mixed use centre, well serviced by public transport. Located approximately 25km north of Sydney CBD, Hornsby is the major centre connecting Sydney’s public transport system to the Central Coast and Lower Hunter.

Hornsby is a key interchange for an increasing number of people from the Central Coast and Lower Hunter travelling to key employment destinations including Global Sydney and Parramatta. The Epping-Chatswood rail link performs a significant role in distributing workers to some of the largest employment concentrations in the region. This positions Hornsby as a place for business to service a broad range of surrounding centres.

Improvement works at Hornsby railway station include an additional platform to relieve congestion by providing a dedicated terminating platform for Northern Rail Line trains. The project will allow separation of freight trains and interurban services from suburban services, helping to prevent delays throughout the network. The project will additionally improve capacity to start and terminate suburban services at Hornsby.

The Department of Planning, in consultation with transport agencies and other stakeholders, is developing a metropolitan-wide parking policy. The parking policy will guide the supply and management of parking to support the use of sustainable transport to major centres such as Hornsby.
1.2 Hornsby Shire Local Environmental Plan 1994

The Hornsby Shire LEP 1994 (Amendment No. 78 – Hornsby Town Centre) promotes employment-generating development within the commercial core of the centre, and higher density residential development surrounding the commercial/retail precinct.

1.2.1 Land use zoning

George Street Pedestrian Bridge is located within the Business F (Town Centre) zone.

The objectives of the Business F (Town Centre) Zone are:

a) To encourage economic growth and employment opportunities.

b) To accommodate the retail, commercial, housing and social needs of the local and regional community.

c) To encourage development that improves the health, vitality, cultural environment and social environment within the Hornsby Town Centre.

1.2.2 Floor space ratio

The FSR for the Business F (Town Centre) zone is 2:1. Within the Business F (Town Centre) zone that is marked 1 in the HSLEP, the Council may consent to development that results in a FSR that exceeds 2:1, but does not exceed 5:1, if the gross floor area that results in a FSR in excess of 2:1 is used, or is proposed to be used, exclusively for the purpose of employment generating development.

1.2.3 Height limits

No height limits for the Business F (Town Centre) zone are stated in the HSLEP 1994.
1.3 Hornsby Shire Draft LEP 2011

Hornsby Shire Draft LEP 2011 has been prepared in accordance with the State government’s Standard Instrument template. The draft Hornby LEP Council has publically exhibited the document and is currently reviewing the submissions received. It is anticipated that the recommendations will be made to the elected council in December 2012 for endorsement, after which the draft LEP will be forwarded to the Department of Planning and Infrastructure for gazettal.

Under the Draft HSLEP 2011, the land is zoned **B3 Commercial Core**.

The objectives of this zone are:

- To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
- To encourage appropriate employment opportunities in accessible locations.
- To maximise public transport patronage and encourage walking and cycling.
1.3.1 Floor space ratio

Under the Draft HSLEP 2011 the maximum FSR is 5:1.
1.3.2 **Height limits**

Under the Draft HSLEP 2011, the maximum building height for:

- The northern side of Florence Street of 32.5m (8 storeys for commercial building and 6 storeys for mixed use building); and
- The southern side of Florence Street of 23.5m.

![Height of buildings](image)

1.3.3 **Heritage listing**

Under both the 1994 and 2011 HSLEP the train station on the west side of George Street is listed as a Heritage Item.
1.4 Hornsby Town Centre Development Control Plan

Hornsby Town Centre Development Control Plan (DCP) provides controls and guidelines for development within Hornsby Town Centre. Hornsby Town Centre is the northern gateway for Sydney, being located at the intersection of the Main Northern Railway and the North Shore Railway. The Town Centre is bisected by the Pacific Highway and located to the west of the F3 Freeway.

Hornsby Town Centre DCP provides controls and guidelines for development within the context of the pedestrian bridge as follows:

1.4.1 Town Centre Strategy

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>To provide an overall planning strategy for the Hornsby Town Centre.</td>
<td>Development should facilitate the role of the Town Centre as a key transport interchange with pedestrian links between the commercial core, railway station and bus terminus.</td>
</tr>
<tr>
<td>To ensure development is consistent with the role and function of the Town Centre.</td>
<td>Development should be sympathetic to the individual characteristics of the precincts within the Town Centre.</td>
</tr>
<tr>
<td>To encourage development that is environmentally sustainable and minimises environmental impacts within and outside of the Town Centre.</td>
<td>Development should preserve and enhance the &quot;Old Town Centre” character on the western side of the railway line.</td>
</tr>
<tr>
<td>Development should facilitate the role of the Town Centre as a key transport interchange with pedestrian links between the commercial core, railway station and bus terminus.</td>
<td>Development should enhance the character and heritage values of the Old Town Centre to provide an alternative experience and urban form to the retail/ commercial core on the eastern side of the railway line.</td>
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</table>

1.4.2 Masterplan

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>To provide an overall structure and urban form for the Town Centre.</td>
<td>Development should be consistent with the future townscape and urban form identified in the Masterplan.</td>
</tr>
<tr>
<td>To define the extent of the Town Centre as a retail core on the eastern side of the railway line and the Old Town Centre to the west.</td>
<td>Private and public development should be integrated within the Town Centre.</td>
</tr>
<tr>
<td>To identify the setting and relationship between the Town Centre and surrounding land uses and development.</td>
<td>Development should be consistent with the urban design guidelines provided in the Masterplan diagram.</td>
</tr>
<tr>
<td>Development should conform to the civic improvements outlined in the Masterplan diagram.</td>
<td>Private development should contribute to the public domain improvements identified in the Masterplan.</td>
</tr>
<tr>
<td>Development should facilitate the provision of improved physical connections across the railway line.</td>
<td>Development should facilitate the provision of improved physical connections across the railway line.</td>
</tr>
<tr>
<td>The built form of development should reinforce the urban design guidelines of the Town Centre.</td>
<td>The built form of development should reinforce the urban design guidelines of the Town Centre.</td>
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</table>
### 1.4.3 Density

<table>
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<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
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</table>
| - To ensure the density of development is consistent with the role and function of the Town Centre.  
- To control the density of development to promote the character of the retail core on the eastern side of the railway line and the Old Town Centre to the west.  
- To provide incentives for the provision of employment generating development. | - The maximum floor space in the Business F (Town Centre) zone is 2:1.  
- However, additional floor space ratio may be achieved subject to the additional floor space being for employment generating purposes, contributing to the goods, services and employment opportunities available within the Town Centre. The additional floor space should not be for residential purposes. |

### 1.4.4 Gateways, arrival points and feature points

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
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</table>
| - To give definition to the entry and approach to the Town Centre.  
- To identify significant arrival points within the Town Centre.  
- To identify significant feature and/or focal points within the Town Centre. | - Where overhead bridges are proposed in accordance with the Pedestrian Network element, the bridges should be designed to promote a gateway or arrival point.  
- The intersection of Burdett and George Streets represent the gateway to the Town Centre and require special treatment.  
- George Street adjacent to Hornsby Railway Station and the Florence Street Mall represent arrival points within the Town Centre and require special treatment.  
- Florence Street Mall should be extended to George Street and incorporate a shared pedestrian and vehicular zone. The carriageway should provide for vehicle movements, loading/unloading and be defined with bollards and paving to provide pedestrian priority.  
- The pedestrian overpass into Florence Street Mall should be relocated to open views into the Town Square. |

### 1.4.5 Views and vistas

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
</table>
| - To preserve important views and vistas into the Town Centre.  
- To maximise views of the townscape and bushland from development within the Town Centre. | - Key vistas to and from the Town Centre include:  
  - South along George Street; and  
  - North along George Street towards the intersection with Florence Street Mall.  
- Development should maintain and enhance views into the Florence and Hunter Street Malls. |
### 1.4.6 Street trees

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
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</thead>
<tbody>
<tr>
<td>▪ To enhance Hornsby’s bushland setting and improve the appearance and amenity of the streets within the Town Centre.</td>
<td>▪ Primary street tree planting should be provided in George Street, Edgeworth David Avenue and the Pacific Highway. ▪ Primary tree planting and footpath widening should be provided to create a shaded pedestrian walkway along George Street in the North precinct and the Pacific Highway connecting the Town Centre and Barker College. ▪ Tree planting should primarily be of native evergreen species.</td>
</tr>
<tr>
<td>▪ To provide street trees along the main vehicular and pedestrian links.</td>
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</table>

### 1.4.7 Public Domain

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<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ To create a public domain that encourages vitality and improves the identity of the Town Centre.</td>
<td>▪ Development of the public domain should make the Town Centre an attractive place that encourages development and provides amenity for residents and workers. ▪ Pedestrian linkages between the Town Square and the Hornsby Transport Interchange and west precinct should be reinforced.</td>
</tr>
<tr>
<td>▪ To create a public domain that is compatible with development within the Town Centre and engenders a feeling of community pride and identity.</td>
<td>▪ The pedestrian overpass into the Florence Street Mall should be incorporated into development on the north-western corner of the Mall to open view into the Mall. ▪ A shared pedestrian and vehicular zone should be provided in Florence Street (west) with bollards to define the carriageway and paving to provide pedestrian priority.</td>
</tr>
</tbody>
</table>
### 1.4.8 Pedestrian Network

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>To establish an integrated system of pedestrian paths through and around the Town Centre.</td>
<td>Pedestrian links should be provided in accordance with the Pedestrian Network Plan.</td>
</tr>
<tr>
<td>To enhance pedestrian amenity in streets and squares, particularly in areas of intense pedestrian activity.</td>
<td>Through site pedestrian links should:</td>
</tr>
<tr>
<td>- have a <strong>minimum unobstructed width of 3m</strong> and <strong>4.5m minimum height</strong>;</td>
<td>- achieve changes of level by means of ramps suitable for disabled persons (i.e. not greater than a grade of 1:14) or escalators;</td>
</tr>
<tr>
<td>- be functional and practical; and</td>
<td>- be lit, ventilated, cleaned and maintained to standards approved by Council.</td>
</tr>
<tr>
<td>To improve the accessibility and pedestrian amenity of the Town Centre, particularly in light of increased residential population and high numbers of commuters and shoppers who access the Centre via the Hornsby Transport Interchange.</td>
<td><strong>The pedestrian overpass into the Florence Street Mall should be incorporated into development on the north-western corner of the mall to open views into the Mall.</strong></td>
</tr>
<tr>
<td></td>
<td>The design of the overpass into Florence Street Mall should provide for views of the Mall for pedestrians, facilitate direct access to the Mall and provide after hour access.</td>
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<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
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<tbody>
<tr>
<td>A pedestrian link should be provided along Hunter Street and into George Street to link future commercial/retail development along Burdett and George Streets with the Hornsby Transport Interchange.</td>
<td><strong>The entry to pedestrian links should be expressed through the use of architectural features incorporated in the building facade, awning or veranda and/or modulation of the entrance walls.</strong></td>
</tr>
<tr>
<td>The entry to pedestrian links should be expressed through the use of architectural features incorporated in the building facade, awning or veranda and/or modulation of the entrance walls.</td>
<td><strong>Insets in the paving may be used to mark the entry and include the name of the path/arcade where appropriate. Entries should be splayed or widened to facilitate pedestrian circulation.</strong></td>
</tr>
<tr>
<td>Insets in the paving may be used to mark the entry and include the name of the path/arcade where appropriate. Entries should be splayed or widened to facilitate pedestrian circulation.</td>
<td><strong>The width of the pedestrian links should be determined following consideration of likely pedestrian flow and the proportion of space.</strong></td>
</tr>
<tr>
<td>The width of the pedestrian links should be determined following consideration of likely pedestrian flow and the proportion of space.</td>
<td><strong>Where colonnades are proposed, the preferred proportion of height to width is 2:1 (minimum of 1.5:1). Where possible, pedestrian links should be a minimum of 3m wide and 4.5m high.</strong></td>
</tr>
<tr>
<td>Where colonnades are proposed, the preferred proportion of height to width is 2:1 (minimum of 1.5:1). Where possible, pedestrian links should be a minimum of 3m wide and 4.5m high.</td>
<td><strong>Pedestrian networks should allow free, unobstructed passage of people with a disability.</strong></td>
</tr>
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</table>
### 1.4.9 Traffic management

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
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</thead>
<tbody>
<tr>
<td>To promote traffic management works to provide for the safe and efficient movement of vehicles within and through the Town Centre.</td>
<td>The traffic modelling assumes development within the Town Centre to a maximum floor space ratio of 4:1. Development proposals within this assumption do not require additional traffic modelling. Development proposals exceeding this assumption should be accompanied by a comprehensive traffic assessment including modelling of relevant intersections.</td>
</tr>
<tr>
<td>To promote traffic management works to provide for the safe and efficient movement of vehicles to and from the Town Centre.</td>
<td></td>
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### 1.4.10 Traffic access routes

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<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>To provide for the safe and efficient movement of vehicles to and from the Town Centre.</td>
<td>Bridge Road and George Street should provide the main access route through the Town Centre.</td>
</tr>
</tbody>
</table>

### 1.4.11 Heritage

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
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</thead>
<tbody>
<tr>
<td>To provide for continuity with the past by retaining and enhancing heritage items within the Hornsby Town Centre.</td>
<td>Development within or adjacent to heritage items should illustrate the means proposed to conserve and respect such items.</td>
</tr>
<tr>
<td></td>
<td>Development involving heritage items should be accompanied by a Heritage Impact Assessment which outlines the impact, if any, the proposal will have on the heritage significance of the item and its setting.</td>
</tr>
<tr>
<td></td>
<td>Development adjacent to heritage items or within or adjacent to heritage conservation areas should demonstrate how the proposal will support the significance of the area or item. A heritage report should be submitted as part of the Statement of Environmental Effects.</td>
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</tbody>
</table>
### 1.4.12 Crime Prevention

<table>
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<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
</table>
| To reduce crime risk and minimise opportunities for crime. | Development should be designed to provide or enhance opportunities for effective surveillance by providing:  
  - opportunities for overlooking of public space while maintaining internal amenity;  
  - clear sightlines between public and private places;  
  - effective lighting of public and private places; &  
  - landscaping that makes places attractive, but does not provide offenders with a place to hide or entrap victims.  
|                      | Development should be designed to incorporate physical or symbolic barriers to attract, channel or restrict the movement of people to clearly defined public spaces.  
|                      | Development should comprise elements that contribute to effective access control by creating:  
  - landscapes that channel people into public areas;  
  - clear and safe access points;  
  - public spaces that attract, rather than discourage people from gathering; and  
  - restrict access to high crime risk areas such as dark and non-visible areas, car parks and other rarely visited areas. |
## 1.4.13 Building Design

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ To provide for the integration of individual development into the Masterplan for the Town Centre.</td>
<td>▪ The design of new buildings should be consistent with, and enhance the character of, the precinct as the major focus of retail and commercial development within the Shire.</td>
</tr>
</tbody>
</table>

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<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ To ensure the design of buildings complements and enhances existing development.</td>
<td>▪ <strong>Building design should provide a pedestrian scale at the base.</strong> Upper levels should contribute to the creation of a distinctive Town Centre profile and maximise solar access.</td>
</tr>
<tr>
<td>▪ To encourage pedestrian comfort and amenity through the design of buildings which enhance safety and security, shade and shelter and access for people with a disability.</td>
<td>▪ <strong>Corner buildings should be given special consideration</strong> to reinforce the important contribution they make to the streetscape and townscape.</td>
</tr>
<tr>
<td></td>
<td>▪ Buildings on the eastern side of George Street (between Burdett Street and the Pacific Highway) should provide a built form to give additional height and definition to the Hornsby Town Centre.</td>
</tr>
<tr>
<td></td>
<td>▪ Buildings on the eastern side of George Street (between Burdett Street and the Pacific Highway) should incorporate colonnades or awnings to provide shelter for pedestrian. The colonnades or awnings should be continuous, aligned with those of adjacent buildings and relate to the architectural features of the facade.</td>
</tr>
<tr>
<td></td>
<td>▪ Buildings located adjacent to the Florence and Hunter Street Mall should be designed to integrate with the Mall.</td>
</tr>
<tr>
<td></td>
<td>▪ Safety and security should be implemented through specified design features and through encouragement of activity and the &quot;passive policing&quot; of people on or watching the street.</td>
</tr>
<tr>
<td></td>
<td>▪ <strong>The design and use of buildings should encourage active uses fronting public streets and places</strong> to contribute to the creation of a vibrant precinct.</td>
</tr>
<tr>
<td></td>
<td>▪ Entrances to buildings should be clear, well lit and well defined.</td>
</tr>
</tbody>
</table>

## 1.4.14 Setbacks

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ To provide for setbacks which complement the streetscape, promote a pleasant pedestrian environment and reinforce the character of the precinct.</td>
<td>▪ The <strong>setback of buildings from the property boundary along George Street</strong> (south of Burdett Street) is 3m.</td>
</tr>
</tbody>
</table>
### 1.4.16 Height

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>To ensure the height of buildings is consistent with the character of the precinct as the main retail and commercial core of the Town Centre.</td>
<td>Tall buildings should be clustered along George Street north of Florence Street Mall to provide a distinctive Town Centre profile and identify the central core from the surrounding area. The height of buildings on the northern side of Florence Street Mall should be designed to minimise overshadowing of the Mall between 12 noon and 2.00pm on 22 June.</td>
</tr>
</tbody>
</table>

### 1.4.17 Landscaping

<table>
<thead>
<tr>
<th>Element Objectives</th>
<th>Relevant Prescriptive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>To enhance the character of the precinct as the main retail and commercial core of the Hornsby Town Centre.</td>
<td>Formal tree lined avenue planting to create a green spine should be provided along Edgeworth David Avenue, the Pacific Highway and George Street.</td>
</tr>
<tr>
<td>To provide attractive landscapes which reinforce the function of a street and enhance the amenity of buildings and public places.</td>
<td></td>
</tr>
<tr>
<td>To preserve significant trees, groups of trees and trees that add to the environmental character of the precinct.</td>
<td></td>
</tr>
</tbody>
</table>
1.5 Hornsby Draft DCP 2011

Hornsby Draft DCP 2011 provides development controls and guidelines for Hornsby Town Centre that will accompany Hornsby Shire Draft LEP 2011. Controls and guidelines relevant to the pedestrian bridge and its surrounds are as follows:

1.5.1 Desired future character

General:

- Development within and adjacent to the commercial core of the Town Centre should provide or support the provision of offices and services of sub-regional strategic significance.
- Development within the Town centre will be consistent with the urban form and public domain improvements depicted in the Masterplan Diagram (Fig.4.5(e), p.250).
- The design and use of buildings will incorporate active uses adjacent to public streets and places to contribute to the vibrancy of the area.
- Building design will promote pedestrian comfort and amenity through inclusion of building features that enhance a pedestrian scale at the base, shade and shelter, safety and security and access for people with a disability.
- Development will improve physical connections across the railway line, linking the western and eastern parts of the Town Centre;
- Buildings at gateways, arrival points or feature points will incorporate elements that signify the focal point of the Town Centre.
- Avenues of street trees along the main vehicular and pedestrian links will enhance the visual quality of the area.

East precinct:

- Buildings located adjacent to the Florence and Hunter Street Mall will integrate with the Mall.

1.5.2 Setbacks

- Setbacks of all buildings and structures to the boundary at George Street (south of Burdett Street): 3m.

1.5.3 Vehicle access and parking

Vehicle access:

- One way vehicular access from George Street into Florence Street;
- One way vehicular access from Florence Street into Hunter Lane.

Car parking:

- On-site car parking should:
  - Be provided behind or beneath buildings;
  - Be accessed via rear laneways or side streets where available;
  - Share car park entrances with adjoining properties where possible.
1.5.4 Public domain and traffic management works

Street trees:
- Along George Street: Primary street tree planting should provide formal tree lined avenues of native evergreen species along the main links to the Town Centre.
- On streets running east-west (along Florence Street): deciduous tree species.

Pedestrian links:
- Extend Florence Mall to George Street.
- Pedestrian links should have a minimum unobstructed width of 3m and 4.5m minimum height.
- Lights, trees, bollards and paving should be used where appropriate to define pedestrian zones and improve the quality of the environment.

1.5.5 George Street pedestrian bridge

The redevelopment of the pedestrian overpass into Florence Street Mall should:
- Be incorporated into development on the north-western corner;
- Provide for views of the Mall for pedestrians;
- Facilitate direct access to the Mall;
- Provide after hour access;
- As a public domain element, bridges should be designed to promote a gateway or arrival point. George Street adjacent to Hornsby Railway Station and the Florence Street Mall represent arrival points within the Town Centre and require special treatment.
- The pedestrian overpass should be relocated to open views into the Town Square.

1.5.6 Design elements within the public domain

- The design and use of buildings should encourage active uses fronting public streets and places to contribute to the creation of a vibrant precinct. Entrances to buildings should be clear, well lit and well defined.
- Development should maintain and enhance views into Florence Street Mall.
Annex C
Cost Estimate
(Preferred Option)
# NEW GEORGE STREET PEDESTRIAN BRIDGE HORNSBY

**COST OPTION dated 27/3/2013**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>RATE</th>
<th>AMOUNT</th>
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<tr>
<td>1</td>
<td>New Steel Bridge</td>
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<td>5</td>
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<td></td>
<td></td>
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<tr>
<td>6</td>
<td>Allowance for Demo and make Good, Pedestrian Safety</td>
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<td>7</td>
<td>Allowance for Signage and Lighting</td>
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<td>Demolish existing Pedestrian Bridge</td>
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<td>9</td>
<td>Relocate Ramp/Temp Access</td>
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<td>40</td>
<td>1500</td>
<td>$60,000</td>
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**TOTAL CONSTRUCTION COST**

<table>
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<tbody>
<tr>
<td></td>
<td>$3,003,585</td>
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- Design and Investigation Costs: $210,251
- Project Management cost: $240,287
- Client Costs: $150,179

**TOTAL PROJECT COST**

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<tr>
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<tr>
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<td>$3,604,302</td>
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- Contingency-Base on minimal information 40\%: $1,441,721

**TOTAL PROJECT COST Including Contingency**

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<tbody>
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No allowances for:
- Temporary bridge
- Works to services or Roadworks
- Civil works to Florence St
- Red Cross building and stairs
## New George Street Pedestrian Bridge Works Details

**Date**: March 2013

### Material Required

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<thead>
<tr>
<th>Description</th>
<th>Code</th>
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<th>Rate</th>
<th>Landline</th>
<th>Plant</th>
<th>Vat</th>
<th>Gross</th>
<th>Amount</th>
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<td><strong>Reinforcement</strong></td>
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<td>1.2</td>
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### Base Bar Pad to Columns

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<tr>
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<th>Code</th>
<th>Unit</th>
<th>SI</th>
<th>Net</th>
<th>Rate</th>
<th>Landline</th>
<th>Plant</th>
<th>Vat</th>
<th>Gross</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structural Steel - Tie Bars</strong></td>
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<td>30</td>
<td>30</td>
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### Water Main 12mm

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<th>SI</th>
<th>Net</th>
<th>Rate</th>
<th>Landline</th>
<th>Plant</th>
<th>Vat</th>
<th>Gross</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td><strong>Concrete</strong></td>
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### Bridge Abutments

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<th>Unit</th>
<th>SI</th>
<th>Net</th>
<th>Rate</th>
<th>Landline</th>
<th>Plant</th>
<th>Vat</th>
<th>Gross</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concrete</strong></td>
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### Bridge Railings

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<th>Unit</th>
<th>SI</th>
<th>Net</th>
<th>Rate</th>
<th>Landline</th>
<th>Plant</th>
<th>Vat</th>
<th>Gross</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concrete</strong></td>
<td>m3</td>
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<td>1,800</td>
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### Fencing

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<th>SI</th>
<th>Net</th>
<th>Rate</th>
<th>Landline</th>
<th>Plant</th>
<th>Vat</th>
<th>Gross</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concrete</strong></td>
<td>m3</td>
<td>0.2</td>
<td>0.2</td>
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### Total for Bridge

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<tr>
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<th>Net</th>
<th>Rate</th>
<th>Landline</th>
<th>Plant</th>
<th>Vat</th>
<th>Gross</th>
<th>Amount</th>
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<tbody>
<tr>
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### Total for Works

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<th>Landline</th>
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<th>Vat</th>
<th>Gross</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
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### Materials & Equipment

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<th>Price</th>
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**Total Materials & Equipment:** $25,000

### Labor

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<th>Total Rate</th>
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**Total Labor:** $2050

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<th>Rate</th>
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<th>Total Rate</th>
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**Total Subcontractors:** $2050

### Total Costs

**Total Estimated Cost:** $30,050