Appendix F

Non-Aboriginal heritage impact statement
Sydney Harbour Bridge —
Southern Toll Plaza Upgrade
Heritage Impact Statement

Report prepared for Roads and Maritime Services
October 2012
Report Register

The following report register documents the development and issue of the report entitled Sydney Harbour Bridge—Southern Toll Plaza Upgrade—Heritage Impact Statement, undertaken by Godden Mackay Logan Pty Ltd in accordance with its quality management system. Godden Mackay Logan operates under a quality management system which has been certified as complying with the Australian/New Zealand Standard for quality management systems AS/NZS ISO 9001:2008.

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1.0 Introduction

1.1 Background

Godden Mackay Logan (GML) has been commissioned by Roads and Maritime Services (RMS) to prepare a Heritage Impact Statement (HIS), pursuant to the provisions of the *Heritage Act 1977 (NSW)* (the Heritage Act) to identify and assess the heritage impacts associated with the proposed upgrade of the southern toll plaza of the Sydney Harbour Bridge (SHB).

In January 2009, exclusively electronic toll collection replaced cash toll collection making the existing cash toll booths redundant. RMS proposes to remove these toll booths at the southern approaches to the SHB so that it can then realign and resurface traffic lanes on the Bradfield Highway.

In 2009, GML prepared a revised Conservation Management Plan (CMP) for the SHB. The 2009 CMP addresses the issue of an appropriate buffer zone to protect the cultural values of the bridge within its harbour and city setting.

In November 2009, GML prepared a HIS to identify and assess the heritage impacts associated with the conversion of the SHB to an exclusively electronic toll collection facility. This HIS acknowledged that the works were an essential component of the fundamental traffic management upgrade of the bridge to maintain its historic function as the main road connection across Sydney Harbour. Nevertheless, the conversion to an exclusively electronic toll collection facility did bring to an end the toll collection process by bridge staff that has been an intrinsic part of the day to day operations of the bridge for 77 years.

1.2 Description of the Study Area

The SHB spans Sydney Harbour, joining Sydney’s northern and southern shores at Milsons Point and Dawes Point. The bridge itself comprises the arch, four granite-faced pylons, the railway line, and the footpaths and roads that provide vehicular, cyclist and pedestrian access to the northern and southern approaches.

The bridge dominates most of the views from within this part of Sydney Harbour, and is visible from many places along both sides of Port Jackson, including The Rocks, Circular Quay and Bennelong Point on the southern side, and Kirribilli, Taronga Zoo and McMahons Point on the northern side.

The northern and southern approaches are characterised by large reinforced concrete retaining walls that link the distributor roads on both the northern and southern shores onto the Bradfield Highway. The approach spans comprise open-work steel trusses which are mounted on concrete abutments and the northern abutment towers and are supported by granite-faced pillars.

The approaches have been significantly modified in the past in response to traffic increases since the construction of the bridge in 1932, including the connection with the Cahill Expressway and the replacement of the tramways in 1958, the connection with the Warringah Expressway in 1968, and the creation of bus lanes in 1972.

While the toll booths located on the southern approach are outside the State Heritage Register (SHR) and National Heritage List (NHL) curtilages (Figures 1.3 and 1.4), a majority of the proposed works occur outside of these curtilages (occur south of Cumberland Street), however some associated lane resurfacing works and the installation of new variable message signs occur within the SHR curtilage. The overall impact of the toll booths removal and associated works, and their effect on the heritage values of the SHB is assessed in this HIS.
1.3 Existing Heritage Status

The SHB is listed on a number of heritage statutory listings including the SHR, City of Sydney Local Environmental Plan (LEP) 2005 and the North Sydney LEP 2001, and the NHL. It is also noted on non-statutory heritage listings including the National Trust of Australia Register.

It has been assessed as having National and State heritage significance because of its technical qualities as a world standard bridge in scale, aesthetics and design features. The SHB is an iconic element in the harbour landscape and a key link in the arterial network that connects the city to the northern suburbs.

1.4 Methodology and Terminology

This HIS has been prepared in accordance with the guideline document Statements of Heritage Impact published by the NSW Heritage Office and Department of Urban Affairs and Planning 1996, revised 2002 and contained in the NSW Heritage Manual.

The technical terminology used in this HIS is consistent with the terminology used in the 2009 CMP. Figure 1.1 illustrates the main structural elements and terminology used for the construction features of the bridge.

- ‘The setting’—existing unobstructed views of the bridge and approach spans, including: views of the bridge end from the northern and southern approach roads; views of the bridge from ground level nearby and from the water; and views of the steel structure and pylons from deck level.

- ‘Approaches’—rendered concrete viaducts at the northern and southern extremities of the bridge.

- ‘Approach spans’—a series of steel trusses on piers supporting the deck from the abutment towers to the approaches.

It is also understood that the NSW State Agency Guidelines require the RMS to advise the Heritage Branch of any works that might impact on the values of a heritage item owned by the agency that is not listed on the SHR. It is therefore relevant to include the southern approach toll booths in the assessment. It is also our understanding that RMS has commenced discussions with the Heritage Branch about this project.

This HIS is based on the project documentation provided to GML by RMS. Refer to Appendix E.

1.5 Author Identification

This HIS has been prepared by Julian Siu, Consultant, with input and review provided by Peter Romey, Partner of GML.
Figure 1.1 Illustration of technical terminology used in this HIS. (Source: SHB CMP 2009)
Figure 1.1 Location plan

Figure 1.2 Proposed work area—southern approach resurfacing and toll plaza upgrade. (Source: RMS 2012)
Figure 1.3 State Heritage Register listing boundary. (Source: NSW Heritage Branch, OEH)
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Figure 1.5 Sydney Harbour Bridge curtilage map from the CMP. (Source: SHB CMP 2009)
2.0 Historical Background

2.1 Construction of the Bridge

The first sod of the construction of the SHB was turned at the site of the future North Sydney Railway Station on 28 July 1923 by the Honourable RT Ball, Secretary for Public Works and Minister for Railways and State Industrial Enterprises.

Work on the approach spans from the north and south was carried out through 1923 and 1924, prior to the signing of the final contract for the bridge proper. The approach spans were designed and built by the SHB Branch of the Public Works Department and the Metropolitan Railway Construction Branch of the NSW Government Railways. Construction began at North Sydney with the excavation of tunnels for the railway, followed by bridges over Euroka, Bank, Fitzroy, Burton, Lavender and Arthur Streets (completed between 1924 and 1929), and retaining walls of stepped section concrete being built at Broughton and Alfred Streets, the Bradfield and Pacific Highways. Fill for the construction of the roadway and approach spans was provided on the north side by the excavated material from the North Sydney railway site and tunneling operations.

In January 1925 Dorman Long began excavating at Dawes Point and built a ramp from George Street North to haul materials up from the wharf below. The foundation stone for the Southern Abutment Tower was laid in March 1925 and the first goods train of materials for the bridge arrived at North Sydney. By the end of March, the first shipment of steel had arrived from England and work to erect the fabrication workshops got underway. Two wharves were constructed in Lavender Bay where the steel was unloaded into a stockyard which contained angle benders, saws and croppers, before it was moved, via crane and light rail, first to the light workshops, where it was straightened or cut to length as required. Above the workshops was the template loft, where the templates for the bridge pieces were created. The steel was taken from the light workshops to the marking-out bay, and then to the drills for the holes needed for rivets and screws to be drilled through. From here, the pieces were transported to the heavy workshop where the steel was painted and then the pieces assembled into sections. The sections, most measuring up to 50 metres in length and weighing 100 tonnes, were then transported via overhead gantry crane to pontoons for transport out to the bridge site.

The workshops were filled with specifically designed machines, each playing an important part in the overall production process. The light workshop had a cutting and edging machine over 20 metres long; the guillotine cutters in the stockyard, cutting steel up to 54mm thick, could reputedly be heard in Manly on a calm day. Amongst these, gangs of riveters and other construction workers went about the business of working the machines and putting the pieces together. Conditions were hot and incredibly noisy throughout the Lavender Bay workshops.

As the approaches advanced from north and south towards the harbour, 5-tonne steam locomotive cranes advanced with them, erecting temporary timber trestling to support the steel work. Behind each small crane was a larger electric crane of 25 tonnes, which lifted the steel into place. The cranes moved forward on the approaches as they were constructed, stopping as they reached the site for each pier, which they also helped erect.

While the approaches were being constructed, the abutment towers were also being built. Constructed on reinforced concrete, the abutment towers include the four main bearings at the base of the lower cord of the bridge: two at Milsons Point and two at Dawes Point. The bearings take the thrust of the arch, transmitting the pressure directly to the ground where the load is spread through an area of 68 x 49
metres, excavated to a depth of 19.2 metres to solid rock and then filled with hexagonal shaped concrete blocks to the base of the abutment towers. The towers, like the piers, have their concrete structure faced with granite from Moruya. The concrete was mixed by a gang of six men only for each side of the harbour and poured by another gang of six men for each tower. Each gang placed the reinforcing, poured the concrete and packed it by hand with rods. In total each gang poured and packed a total of 95,000 cubic metres. Once the towers reached 47 metres from ground level, reinforced concrete floors were created to build and launch the creeper cranes which would be used to build the bridge’s arch spans.

Like the cranes for the approaches, the two creeper cranes erected their own track, the arch itself, in front of themselves to advance. One creeper crane worked from each side of the harbour and they were critical elements for the bridge construction. The cranes were supplied by Wellman Smith and Owen Engineering Corporation of Great Britain, and were designed specifically to travel along the top of the arch, moving forward as each section of the arch was completed. Each crane was in fact a collection of five cranes, grouped on a travelling frame, working together. The main crane consisted of a main hoist with a lifting capacity of 123 tonnes. Next was a 20-tonne jigger hoist to help control the heavy bridge members as they were erected. A 5-tonne walking crane operated across the front of the girder of the creeper crane to lift working cages, while two 2.5-tonne cranes operated at the back of the frame to assist in the riveting stages of construction. Once the first section was assembled, the two creeper cranes began to move forward towards each other. To prevent slipping back, each unit was also fitted with a special braking system.

The erection of the arch spans began on 26 October 1928. Each side of the arch was held by 128 steel cables, anchored into the rock through horseshoe shaped tunnels placed between the first and second piers on each side of the harbour. The cables obviated the need for any other supports to be built during the construction phase. As the half-arches moved towards each other across the harbour, the cables were tensioned to suit the increasing weight of the structure.

The arches were manhandled by the crews working on the bridge structure. As each piece of steelwork was fabricated, it was transported from the workshops via barge out onto the harbour, where the creeper cranes would lift it into position. Up on the bridge, teams of riveters, steel fabricators, carpenters, riggers, form-workers, boilermakers, labourers and other tradesmen all worked to put the bridge pieces together. Once work started, the bridge moved quickly forward. By August 1930 the two half arches were ready to be joined. On 7 August the cables holding the giant arches back from each other were ready to be slackened. Before they were finally joined, a severe wind storm hit Sydney. With winds of over 110 kilometres per hour, the 15,000-tonne arches swayed (albeit only 7.5cm) when less than one metre apart. Despite this excitement, at 4.15pm on 19 August 1930, the two spans touched for the first time. They briefly parted again as the cables contracted as they cooled, but were brought together finally at 10pm the same night.

The meeting of the halves was celebrated with a half day holiday for the workers, a gold sovereign for those involved in releasing the cables and two shillings for everyone else to drink a toast to their achievement.

With the release of the cables, the arch spans underwent stress testing and final adjustments to bring the full load to bear on the two hinged bearings at the abutment tower bases.

As the two creeper cranes were now positioned in the middle of the arch spans, the construction of the deck and vertical hangers began from the centre and moved back towards the shorelines as the cranes
returned to their starting positions. Each hanger section was lifted from a barge on the harbour directly below using a special cradle which enabled them to be positioned underneath the arch not directly accessible to the crane lifting cables. A rigger rode each section up from the harbour to fit it to the arch chord. The cradle also acted as a brace for the hangers as they were lifted from the harbour and fitted. Once the hangers were attached, the deck cross girders were placed, followed by diagonal bracing and stringers, and steel troughings to take the roadway were formed. The construction of the hangers and deck took just nine months from the time the arch span was closed.

In June 1931 the creeper cranes were dismantled and the remaining major tasks involved the completion of the pylons above the deck level and the surfacing of the deck with asphalt. The last stone, set in the northwest pylon, was set on 15 January 1932 and the last rivet on the bridge was driven on 21 January. In February the bridge was test loaded. To undertake this, the four rail lines were packed with 72 locomotives placed buffer to buffer, and then shifted, moved and removed in different patterns to test the stresses. The bridge passed its tests easily and was prepared for opening.

On completion the bridge was the largest man-made structure in Sydney and towered over the surrounding low rise city. The Sydney Harbour Bridge was officially opened on 19 March 1932 by the then Premier Jack Lang.

2.2 Traffic Control and Toll Collection

The following summary is based on the historical evolution of traffic control and toll collection facilities contained in the SHB 1998 CMP.

Traffic control measures on the bridge in 1932 consisted of policeman on point duty at each end during peak hour. Vehicles were not allowed to change lanes whilst on the bridge so there was little need for signs or lane indicators. In 1951 lanes were marked out by removable rubber lane markers, placed and removed by hand twice daily for peak hours. In 1977 the system was modified with the introduction of movable median strips. However, the manual placing and removal of rubber flaps continued until 1985 when electronic lane control signals were installed. Electronic lane signs, movable toll booths and medians operated from the traffic control office located in the Old Toll Office. In 1986 this was followed up with the erection of new overhead gantries with lane indicator lights and electric lane control signals, phasing out the rubber lane markers.

Tolls have been collected from motorists crossing the bridge since its opening in 1932 (see Figure 2.5). Toll collectors were initially installed on a traffic island with a small rail around them (see Figures 2.6 and 2.7) until December 1932 when the first toll booths and toll bars were added. Tolls were collected directly outside the Toll House at the southern end of the bridge from northbound and southbound traffic. The toll bars were modified in 1959 and two new groups of similarly streamlined toll booths were installed at the northern end of the bridge to serve southbound traffic.

The next major change came in July 1970 when one-way toll collection was brought into operation, so that only vehicles travelling south into the city were charged the toll. The toll collection locations remained unchanged but some automatic booths were introduced and new movable booths were installed on the southern approaches to serve those lanes that alternate between northbound and southbound traffic (See Figure 2.4).

In January 2009, cashless electronic toll collection replaced cash toll collection, making the existing cash toll booths redundant.
Figure 2.1  View of typical decommissioned fixed southern toll booth. (Source: RMS 2012)

Figure 2.2  View looking south of decommissioned fixed southern toll booths. (Source: RMS 2012)
Figure 2.3 View looking south of decommissioned fixed southern toll booths. (Source: RMS 2012)

Figure 2.4 View of decommissioned moveable southern toll booths. (Source: GML 2007)
Figure 2.5 The first cars at the toll bar view of toll bar in 1932. (Source: State Library of NSW)

Figure 2.6 1932 view of the toll bar and Toll House. (Source: State Records NSW)
Figure 2.7 1932 view of the toll collection in operation. (Source: State Records NSW)

Figure 2.8 1949 photograph showing previous southern toll booths. (Source: RTA).
Figure 2.9 1949 photograph showing previous southern toll booths. (Source: State Library of NSW)

Figure 2.10 Toll booths in 1954. (Source: State Library of NSW)
Figure 2.11  1958 photograph showing southern toll booths. (Source: RTA).

Figure 2.12  1964 aerial photograph showing earlier fixed southern toll booths. (Source: RTA).
2.3 Endnotes

2 ibid, p 34.
3 ibid, p 37.
4 ibid, p 39.
5 Roads and Traffic Authority, op cit, p 10.
6 ibid, p 11.
7 ibid, p 11.
3.0 Legislative Requirements

3.1 Environment Protection and Biodiversity Conservation Act 1999

Sydney Harbour Bridge, Bradfield Highway, Dawes Point, Milsons Point, NSW, was placed on the National Heritage List (NHL) in March 2007. The NHL listing sheet for the SHB includes the following summary of significance:

*The Sydney Harbour Bridge is considered the world's greatest arch bridge and is one of Australia's best known and photographed landmarks. An engineering masterpiece, the bridge represented a pivotal step in the development of modern Sydney and an important part of the technical revolution of the 1930s.*

The legislative instrument that governs the management of places listed on the NHL is the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). A map indicating the curtilage for the jurisdiction of the provisions of the EPBC Act is included as Figure 1.3.

The provisions of the EPBC Act require Commonwealth approval for activities which have a ‘significant impact on the National Heritage values’ of a place listed on the NHL. The EPBC Act also provides for proponents to ‘refer’ activities to the Commonwealth Minister for determination as to whether activities are ‘controlled’. It should be noted that the notification and referral requirements of the EPBC Act are not relevant to works unless the threshold of ‘significant impact on the National Heritage values’ would be exceeded.

3.2 Heritage Act 1977

Heritage items of particular importance to the people of New South Wales are listed on the State Heritage Register (SHR) which was created in April 1999 by amendments to the *Heritage Act 1977* (NSW) (the Heritage Act).

The ‘Sydney Harbour Bridge, approaches and viaducts (road and rail)’ was placed on the SHR in June 1999. The ‘Milsons Point Railway Station group’, which includes the area bounded by the bridge approach spans and reserves surrounding it, was also listed on the SHR in April 1999.

The curtilage of the SHR listing (Figure 1.2) is slightly larger than that included in the NHL entry (Figure 1.3), which omits the northern end of the SHB approach spans.

The listing of the SHB on the SHR ensures that, pursuant to Section 57(1) of the Heritage Act, the approval of the NSW Heritage Branch, Department of Planning, is required for any proposed development on and/or in the vicinity of the bridge.

Section 57(2) of the Heritage Act provides for exemptions to Section 57(1) approval requirements. Exempted development does not require prior NSW Heritage Branch approval. Exemptions are of two types: standard exemptions, which apply to all items on the SHR; and specific exemptions, approved for a specific site on the SHR (refer to Appendix B and C).

The SHB listing is supported by an endorsed Conservation Management Plan (GML 2009). A range of specific exemptions under Section 57 of the Heritage Act has been gazette for the SHB, derived from the CMP (refer to Appendix C).
3.3 NSW Roads and Maritime Services Heritage and Conservation Register
In accordance with Section 170 of the Heritage Act, RMS (the former RTA) has established a register to record all heritage items in its ownership or under its control. The following items are listed on the RMS Heritage and Conservation Register:
- Sydney Harbour Bridge, approaches and viaducts;
- Sydney Harbour Bridge Workshops Collection;
- Sydney Harbour Bridge Memorabilia Collection; and
- Sydney Harbour Bridge Southeast Pylon Museum Collection.

3.4 RailCorp Heritage and Conservation Register
In accordance with Section 170 of the Heritage Act, RailCorp has established a register to record all heritage items in its ownership or under its control. The following items are listed on the RailCorp Section 170 Register (the Heritage and Conservation Register):
- Sydney Harbour Bridge (Rail Property Only); and
- Sydney Harbour Bridge Approaches Concrete Underbridge (Group Entry).

3.5 Sydney Local Environmental Plan (LEP) 2005
The southern approach spans and curtilage are identified in Schedule 8 Part 1 of the Sydney Local Environmental Plan (LEP) 2005, which lists the heritage items within the Local Government Area (LGA). The site is also located within the Millers Point Conservation Area, identified as a Special Area on the plans attached to the LEP.

3.6 North Sydney Local Environmental Plan (LEP) 2001
The SHB and approach viaducts (NSHS No. 0030) and the north pylons (NSHS No. 0076) are listed on Schedule 3 Part 6 of the North Sydney LEP 2001.

3.7 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (NSW)
The ‘Sydney Harbour Bridge, approaches and viaducts (road and rail)’ is listed as a heritage item on the Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (NSW) (REP) (Item 67).

3.8 Non-Statutory Listings
In 1988, the bridge was declared an International Historic Civil Engineering Landmark during an official visit by a delegation from the American Society of Civil Engineers (ASCE). The ASCE plaque is fixed to the eastern wall of the southeast pylon adjacent to the entrance to the Pylon Lookout. At the same time, the bridge was declared a National Engineering Landmark under the Australian Historic Engineering Plaquing Program managed by Engineering Heritage Australia. This plaque is fixed to the parapet wall opposite the eastern doorway that leads to the Pylon Lookout.

The bridge is also included in the Register of the National Trust of Australia (NSW).
The bridge was included in the Register of the National Estate, which was frozen in 2007 and has been replaced for Commonwealth statutory purposes by the National Heritage List.
4.0 Heritage Significance

4.1 Sydney Harbour Bridge

The National Heritage criteria established under the regulation 10.01A of the EPBC Act and the State Heritage criteria established by the NSW Heritage Branch, Department of Planning have been used to identify the National and State heritage values of the SHB.

The following assessment of significance under the EPBC Act and the State Heritage criteria is taken from the Sydney Harbour Bridge 2009 CMP (Section 4.4):

4.1.1 Historic

NHL—Criterion A: The place has outstanding heritage value to the nation because of the place’s importance in the course, or pattern, of Australia’s natural or cultural history

SHR—Criterion A: An item is important in the course, or pattern, of NSW’s cultural or natural history (or the cultural or natural history of the local area).

National Heritage Values

- The SHB was a remarkable feat of bridge engineering and construction, especially for a young nation that had previously not taken on a project of this scale and complexity. Even today, it continues to be the widest long-span bridge in the world and is recognised as the world’s greatest steel arch bridge because of its combination of size, load bearing capacity and the difficulties overcome in its construction.

- The bridge is a symbol of national pride. At the time of its construction, it represented progress and modernity and symbolised Australia’s industrial maturity, particularly as it was constructed with extensive use of Australian engineering expertise, materials and labour.

- For Australians, the bridge was seen as a great achievement and a symbol of hope at a time of world-wide depression.

State Heritage Values

- The bridge was the outcome of the personal vision and commitment of Dr JJC Bradfield, Chief Engineer, Sydney Harbour Bridge, City Transit and Metropolitan Railway Construction, and the leading figure in the development of Sydney’s transport system in the first part of the twentieth century.

- The bridge has been in continuous use since 1932 as the main road and rail connection across Sydney Harbour. Together with the city railway system, it constituted a radical expansion of Sydney’s transportation network.

- The construction of the bridge allowed a major acceleration in the growth of the northern residential suburbs of metropolitan Sydney, particularly in the post-World War II years, as well as the extension of the Central Business District into North Sydney in the 1960s and 1970s.

- The bridge approach spans provide the physical evidence of extensive urban redevelopment within The Rocks/Milsons Point precinct and the wider North Sydney precinct. Large parts of the early subdivision patterns and built forms in both of these early parts of Sydney were demolished prior to the construction of the bridge.
• The bridge approach spans and roadways (especially the Warringah Freeway at North Sydney) truncated established and homogeneous neighbourhoods, creating distinctive precincts whose landuse and built forms developed separately.

• The construction of the bridge consumed a major portion of the public works capacity and budget of New South Wales, and was a very significant undertaking for the public sector at the time.

• The bridge became an early focal point for political tensions and national celebrations, starting with the 'De Groot' incident in 1932, and more recently the 'Walk for Reconciliation' in 2000, the Sydney Olympic Games in 2000 and the annual role it continues to play as part of New Year's Eve and Australia Day celebrations.

• The SHB Movable Heritage Collection comprises a range of components and materials which are physical evidence of the construction of the Sydney Harbour Bridge, and which illustrate aspects of the technologies in use at the time. The collection also contains journals and documents which provide a historical record of the presence and activities of individual people involved in the construction of the Bridge in both Australia and England. The range of original material, such as newspaper 'special' supplements, published books and souvenir editions, as well as badges, postcards and pictures, manufactured during and following the construction of the Bridge, illustrate the role and the perceptions of the Bridge in the community at the time.

• The SHB Movable Heritage Collection includes evidence of the activities associated with the celebrations in 1982 for the fiftieth anniversary of the opening of the Bridge, a major public event in its day and an important affirmation of the singular attachment that Sydneysiders have for the Bridge, both as a public facility and as an icon of the city. The collection also contains evidence of the activities associated with the celebrations for the Australian Bicentennial in 1988.

• The SHB Movable Heritage Collection includes a range of toll collection equipment, maintenance equipment, redundant operating fittings and workshop memorabilia which provide evidence of the ongoing activities carried out in regard to the Sydney Harbour Bridge and are demonstrative of the Bridge’s ongoing historical and other importance to Sydney and New South Wales.

• The SHB Movable Heritage Collection comprises items that were specifically set aside for preservation as part of the record of the construction of the Sydney Harbour Bridge. Collectively the items represent the society in which the Bridge was built and the reaction of that community to the completion of the Bridge. The items associated with the Opening Day ceremonies provide a unique and original record of Sydney society in the period, illustrating elements of the organisation of the Opening Day commemorations, including the production of a range of small and personal items expressive of the human scale and of the individuals that were involved.

4.1.2 Rarity

NHL—Criterion B: The place has outstanding heritage value to the nation because of the place’s possession of uncommon, rare or endangered aspects of Australia’s natural or cultural history.

SHR—Criterion F: An item possesses uncommon, rare or endangered aspects of NSW’s cultural or natural history (or the cultural or natural history of the local area).

National Heritage Values

• The scale and engineering expertise evident in the structure of the bridge is unique in Australia.
State Heritage Values

- The bridge is a uniquely important development in Sydney’s transportation network.

- As it introduced a main road and rail connection across Sydney Harbour, the bridge was the single most important factor in the expansion of metropolitan Sydney north of the harbour.

- The SHB Movable Heritage Collection is a collection of rare surviving relics relating to the construction methodology, technology and materials of the bridge, assembled as part of the overall construction program, the first time in Australia that the construction of a bridge had been approached in this manner.

- The SHB Movable Heritage Collection comprises original relics of the ceremonies and celebrations for the Opening Day of the Bridge and represents a rare record of Sydney society in the period during the construction of the Bridge. It also contains rare surviving relics of the fiftieth birthday celebrations of the Bridge and of the Bicentennial celebrations in 1988.

4.1.3 Scientific/Research

NHL—Criterion C: The place has outstanding heritage value to the nation because of the place’s potential to yield information that will contribute to an understanding of Australia’s natural or cultural history.

SHR—Criterion E: An item has potential to yield information that will contribute to an understanding of NSW’s cultural or natural history.

National Heritage Values

- The bridge has the potential to contribute to the understanding of very large scale construction methods and materials of the 1920s and 1930s, especially the use of high quality structural steel.

State Heritage Values

- The bridge allows for the understanding of working conditions in the 1930s.

- The archaeological remains in Dawes Point have the potential to yield further information about the early development of this very historic area of Sydney, particularly the Dawes Point Battery and later alterations.

- The SHB Movable Heritage Collection contains original fabric elements such as the samples of original steel shavings and rivets, which provide a future opportunity for materials testing and analysis without the requirement for taking samples directly from the standing structure.

4.1.4 Representativeness

NHL—Criterion D: the place has outstanding heritage value to the nation because of the place’s importance in demonstrating the principal characteristics of (i) a class of Australia’s natural or cultural places; or (ii) a class of Australia’s natural or cultural environments

SHR—Criterion G: An item is important in demonstrating the principal characteristics of a class of NSW’s cultural or natural places or environments (or a class of the local area’s cultural or natural places or environments).

National Heritage Values

- The bridge is representative of a conventional two-hinged arch bridge design, but of a scale and detail execution that makes it an outstanding work of engineering at the international level.
Although completed in 1932, the bridge is substantially unaltered, retaining the clarity and integrity of the original design of the arch, pylons, approach spans and detail components.

The image of the bridge in its harbour setting has become an internationally recognised emblem representing both Australia and the city of Sydney.

The bridge is representative of a range of major public works projects undertaken in Australia and in other countries during the Depression era.

**State Heritage Values**

- The bridge is representative of a significant stage in the development of Sydney and associated changes in modes of transport, including the growing reliance on private motor vehicles.

- The SHB Movable Heritage Collection comprises components and materials which are representative of the technologies in use at the time and utilised for the construction of the bridge. It contains tools, instruments, documents and equipment used in the fabrication and construction of the bridge which are representative of the specialised technology of the period and which illustrate typical processes used during the manufacture, installation and testing of the bridge. The collection also comprises equipment representative of the ongoing operation and maintenance operations of the bridge, including toll collection.

- The SHB Movable Heritage Collection contains original memorabilia of the ceremonies and celebrations for the Opening Day of the Bridge, such as newspaper special supplements, published books and souvenir editions, as well as badges, postcards and pictures. This material is representative of the aesthetic and cultural context during the construction of the bridge, as well as of the media technologies and materials prevalent at the time.

**4.1.5 Aesthetic**

*NHL—Criterion E*: The place has outstanding heritage value to the nation because of the place’s importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

*SHR—Criterion C*: An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area).

**National Heritage Values**

- The steel arched form, Art Deco inspired granite pylons and composite approach spans create an iconic and dramatic composition that consistently evokes a positive response from observers.

- The bridge is seen as a major element of one of the most internationally recognised views of Australia and the city of Sydney, which also comprises the Sydney Opera House, the harbour and its foreshores and the city skyline.

- The bridge is a popular motif for tourist products and other items intended to portray an ‘Australian’ image.

- The dramatic aesthetic quality of the bridge and its setting has, since the commencement of its construction, been an inspiration to artists, photographers and film makers. It has and continues to be the subject of many works of Australian art, captured by acclaimed artists such as Grace Cossington-Smith and Roland Wakelin.
State Heritage Values

- The bridge is a monumental landmark in the centre of the city of Sydney and an important visual element in the cityscape when viewed from many key points within the city.

- The pylons and abutment towers designed by English architect Thomas Tait exhibit a sophisticated degree of Art Deco design influence comparable with other examples in Sydney and New South Wales, such as the former Maritime Services Board building and the Hyde Park War Memorial.

- The sweeping curve of the northern approach spans exhibits a dramatic aesthetic quality and is the subject of many works of art and photos.

- The consistent detail treatment of the components that make up the approaches (i.e., arched and flat-topped voids utilised as tenancies, retaining walls, balustrades, steps, lighting) is of a high quality and makes a major contribution to the streetscapes of Milsons Point and The Rocks/Millers Point.

- The SHB Movable Heritage Collection contains a range of items which are expressive of the precision of work and attention to detail undertaken for the construction of the bridge. The collection provides a human dimension to the bridge, highlighting the people involved in its design, manufacture and construction.

- The SHB Movable Heritage Collection comprises documentary and photographic evidence of the progressive construction of the bridge, and is illustrative of the people and fabric of Sydney at the time of its construction and opening. The collection includes documentary evidence of the style, materials and presentation of official and government invitations, certificates and programmes from the time of the completion of the Bridge.

4.1.6 Technical

*NHL—Criterion F: The place has outstanding heritage value to the nation because of the place’s importance in demonstrating a high degree of creative or technical achievement at a particular period.*

*SHR—Criterion C: An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area).*

National Heritage Values

- The bridge demonstrates outstanding engineering design and technical achievement, especially given the difficulties overcome in its construction. This achievement is particularly notable for a young nation that had previously not taken on a project of this scale and complexity.

- The bridge is recognised as the world’s greatest example of a two-pin steel arch design, with its combination of size, load bearing capacity and the use of high quality structural steel in the construction of the arch. The bridge also contains the heaviest steelwork of its kind ever constructed.

State Heritage Values

- The approach span arches, slabs and retaining walls of the bridge are important examples of the use of in situ reinforced concrete on a massive scale, combined with the fine scale use of the material for detail components such as balustrades, step and bass relief decoration.

- The scale and design of the viaducts forming the approach spans to the bridge are notable within the New South Wales context.
- The masonry pylons and abutments of the approach spans designed by the English architect Thomas Tait exhibit a sophisticated degree of Art Deco design influence comparable with other examples in Sydney and New South Wales.

- The SHB Movable Heritage Collection commemorates the technical achievement evident in the design and construction of the Sydney Harbour Bridge. It contains steel samples, rivets, bolts and examples of the instruments utilised for the fabrication of components for the bridge. The tools and equipment used by Dorman Long Company in the fabrication and construction of the bridge are also illustrative of the processes used during the manufacture, installation and testing of the Bridge.

4.1.7 Social

NHL—Criterion G: The place has outstanding heritage value to the nation because of the place’s strong or special association with a particular community or cultural group for social, cultural or spiritual reasons

SHR—Criterion D: An item has strong or special association with a particular community or cultural group in NSW (or local area) for social, cultural or spiritual reasons.

National Heritage Values

- Since 1932, the bridge has been an internationally recognised symbol of modern Australia, and its iconic shape has been used as the inspiration for countless decorative objects, ornaments and tourist products.

- The bridge is synonymous with the names of a broad range of personalities associated with either its construction or subsequent history, eg Premier Jack Lang, De Groot, Paul Hogan.

State Heritage Values

- The bridge is a focal point for cultural events and national celebrations, as exemplified by the ‘Walk for Reconciliation’ in 2000, the Sydney Olympic Games in 2000, the Sydney Running Festival, Bicycle NSW’s Spring Cycle and the annual role it continues to play as part of New Year’s Eve and Australia Day celebrations.

- As a major public work of the time, the bridge represented a substantial investment by the taxpayers of New South Wales, and the toll still paid by motorists crossing the bridge is a constant reminder to the citizens of New South Wales of the huge cost burden imposed by its construction.

- The construction of the bridge affected the lives of almost a generation of workers, and its role during the Depression as the so-called ‘iron lung’ which provided employment and protected workers and their families from hardship or the dole is still remembered.

- The bridge was an important factor in the pattern of growth of metropolitan Sydney, particularly in allowing the opening up of the northern suburbs for residential development.

- The SHB Movable Heritage Collection contains items which are family heirlooms and memorabilia associated with the Sydney Harbour Bridge that were collected or retained by members of the public and which would continue to be considered valuable to the families of these people.

- The bridge provides a reference point for the families and descendants of those who worked on its design and construction, its opening and subsequent operation over seventy years.
Movable heritage items associated with the Sydney Harbour Bridge have a strong social significance for those who worked on the bridge, the staff of the RTA as the custodians of the bridge and to residents of Sydney who in the past watched the bridge being constructed and still use the bridge today.

4.1.8 Association

NHL—Criterion H: The place has outstanding heritage value to the nation because of the place’s special association with the life or works of a person, or group of persons, of importance in Australia’s natural or cultural history.

SHR—Criterion B: An item has strong or special association with the life or works of a person, or group of persons of importance in NSW’s cultural or natural history (or the cultural or natural history of the local area).

National Heritage Values

- The image of the bridge in its setting, including the Sydney Opera House and the harbour, is recognised internationally as an icon of Australia and the city of Sydney.

State Heritage Values

- The bridge has strong associations with Dr JJC Bradfield, who was primarily responsible for its conception, design and construction. Bradfield was the Chief Engineer, Sydney Harbour Bridge, City Transit and Metropolitan Railway Construction, and the leading figure in the development of Sydney’s transport system in the first part of the twentieth century.

- The construction of the bridge is also associated with the British team of engineers, Sir Ralph Freeman and contractors Dorman Long and Co. The bridge was the outstanding work of Freeman’s career but his contribution was marred by a dispute with Bradfield regarding who was actually responsible for its design.

- The bridge has strong associations with the families and descendents of the workers who built it, and who recognise its role during the Depression as the so-called ‘iron lung’ in providing employment and protection from hardship or the dole (see Figure 4.11).

- The items in the SHB Movable Heritage Collection are memorabilia of the ceremonies and celebrations for the Opening Day of the bridge and are associated with the people from all classes who participated in the Opening Day events and activities.

- The technical items and instruments within the SHB Movable Heritage Collection were used by staff and workers associated with the construction and maintenance of the Sydney Harbour Bridge, sometimes over many years.

4.2 Summary Statement of Significance

The following summary statements of significance condense the National and State heritage values of the bridge identified in the Sydney Harbour Bridge CMP 2009.

National Heritage Values

The Sydney Harbour Bridge is of outstanding heritage value as a feat of bridge engineering and construction, especially for a young nation that had previously not taken on a project of this scale and complexity. Even today, it continues to be the widest long-span bridge in the world and is recognised as the world’s largest steel arch bridge because of its combination of size, load bearing capacity and the difficulties overcome in its construction.
The bridge is a symbol of national pride. At the time of its construction, it represented progress and modernity and symbolised Australia’s industrial maturity, particularly as it was constructed with extensive use of Australian engineering expertise, materials and labour. For Australians, the bridge was seen as a great achievement and a symbol of hope at a time of the worldwide Depression.

The steel arched form, Art Deco inspired granite pylons and composite approach spans create an iconic and dramatic composition that consistently evokes a positive response from observers. The bridge is seen as a major element of one of the most internationally recognised views of Australia and the city of Sydney, which also comprises the Sydney Opera House, the harbour and its foreshores and the city skyline. Its iconic shape has been used as the inspiration for countless decorative objects, ornaments and tourist products.

The dramatic aesthetic quality of the bridge and its setting has, since the commencement of its construction, been an inspiration to artists, photographers and film makers. It has been and continues to be the subject of many works of Australian art, captured by acclaimed artists such as Grace Cossington Smith and Roland Wakelin.

**State Heritage Values**

The bridge is a monumental landmark in the centre of the city of Sydney and an important visual element in the cityscape when viewed from many key points around the harbour.

The bridge was the outcome of the personal vision and commitment of Dr JJC Bradfield, Chief Engineer, Sydney Harbour Bridge, City Transit and Metropolitan Railway Construction, and the leading figure in the development of Sydney’s transport system in the first part of the twentieth century. It is also associated with the British team of engineer Sir Ralph Freeman and contractors Dorman Long and Co. Its construction consumed a major portion of the public works capacity and budget of New South Wales, and was a very significant undertaking for the public sector at the time.

The bridge remains synonymous with the names of a broad range of personalities associated with either its construction or subsequent history, eg Premier Jack Lang, De Groot, Paul Hogan.

The approach span arches, slabs and retaining walls of the bridge are important examples of the use of in-situ reinforced concrete on a massive scale, combined with the fine scale use of the material for detail components, such as balustrades, step and brass relief decoration, and the scale and design of the viaducts forming the approach spans to the bridge are notable within the New South Wales context. The masonry pylons and abutments of the approach spans designed by the English architect Thomas Tait exhibit a sophisticated degree of Art Deco design influence comparable with other examples in Sydney and New South Wales.

The bridge has been in continuous use since 1932 as the main road and rail connection across Sydney Harbour. Together with the city railway system, it constituted a radical expansion of Sydney’s transportation network, and allowed a major acceleration in the development of the northern residential suburbs, particularly in the post-World War II years, as well as the extension of the Central Business District into North Sydney in the 1960s and 1970s.

The bridge approach spans provide the physical evidence of extensive urban redevelopment within The Rocks/Milsons Point precinct and the wider North Sydney precinct, where large parts of the early subdivision patterns and built forms were demolished prior to the construction of the bridge. The bridge approach spans and roadways (especially the Warringah Freeway at North Sydney) truncated established neighbourhoods, creating distinctive precincts whose land use and built form developed separately.

The construction of the bridge affected the lives of almost a generation of workers, and its role during the Depression as the so-called ‘iron lung’ which provided employment and protected workers and their families from hardship or the dole is still remembered.
The bridge became an early focal point for political tensions and national celebrations, starting with the 'De Groot' incident in 1932, and more recently the 'Walk for Reconciliation' in 2000, the Sydney Olympic Games in 2000, and the annual role it continues to play as part of New Year's Evening and Australia Day celebrations.

In terms of archaeological value, the surviving standing walls at Bradfield Park have the potential to yield further information about the early residential and commercial occupation of Milsons Point, and the archaeological remains in Dawes Point have the potential to yield further information about its early development, particularly the Dawes Point Battery and later alterations.

The SHB Movable Heritage Collection is significant as a collection of relics associated with the design, construction, official opening and ongoing operation of the bridge. The collection contains the only known relics of the temporary support structure utilised for the erection of the arch steelwork, and evidence of the operations carried out in England for the construction of the bridge.

The collection includes items which are significant as representative examples of the materials, technical instruments, technical documentation, components and manufacturing outputs associated with the construction of the Sydney Harbour Bridge. It also contains examples of unique and specialised documents and objects used in association with the Opening Day social activities and celebrations, which are themselves evidence of the social customs and attitudes of the time. The collection contains exhibits which showcase the wide range of objects, activities and publications inspired by or produced in association with the operations of the Sydney Harbour Bridge throughout its history.

Some exhibits in the collection also have value as relics of their period, illustrating aspects of the social context, and activities of Sydney at the time of the construction of the bridge. The SHB Movable Heritage Collection demonstrates the ways in which icons of the era were commemorated through retention of specific materials and objects, and illustrates the social importance of the bridge at the time of construction.

### 4.3 Grading of Significance

Different components of a place may make a different relative contribution to its heritage value. Loss of integrity or poor condition may also diminish significance. Specifying the relative contribution of an item or its components to overall significance provides a useful framework for decision-making about the conservation of and/or changes to the place. The NSW Heritage Office’s publication *Assessing Heritage Significance* (2001) sets out terms used to describe the degrees (or grades) of significance for different components of a place (see Table 1 below).

<table>
<thead>
<tr>
<th>Grading</th>
<th>Justification</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exceptional</td>
<td>Rare or outstanding element directly contributing to an item’s local and State</td>
<td>Fulfils criteria for Local or State listing</td>
</tr>
<tr>
<td>High (H)</td>
<td>High degree of original fabric. Demonstrates a key element of the item’s significance. Alterations do not detract from significance.</td>
<td>Fulfils criteria for Local or State listing</td>
</tr>
<tr>
<td>Moderate (M)</td>
<td>Altered or modified elements. Elements with little heritage value, but which contribute to the overall significance of the item.</td>
<td>Fulfils criteria for Local or State listing</td>
</tr>
<tr>
<td>Little (L)</td>
<td>Alterations detract from significance. Difficult to interpret.</td>
<td>Does not fulfil criteria for Local or State listing</td>
</tr>
<tr>
<td>Intrusive (I)</td>
<td>Damaging to the item’s heritage significance.</td>
<td>Does not fulfil criteria for Local or State listing</td>
</tr>
</tbody>
</table>

By applying the standard grading to the major components of the bridge, the arch, pylons and approach spans are of Exceptional significance and the approaches are of High significance. The
arch and pylons are the main recognisable components of the bridge and contribute directly to its significance. Although the approach spans are less significant structurally than the arch and the pylons, they form the connection to the shores on each side and are a vital component of the bridge. The approaches are of High significance because, although subsidiary to the arch section of the bridge and of less engineering interest, they are an integral part of the bridge construction.

4.3.1 Grading of Significance of Key Elements

The following grading of significance is taken from the Sydney Harbour Bridge CMP 2009 (Table 4.3 and Table 4.4 of the CMP).

4.3.2 Grading of Significant Forms

Table 2 Grading of Significant Forms (Source: CMP 2009)

<table>
<thead>
<tr>
<th>Bridge Component</th>
<th>Grading of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Setting</td>
<td>Exceptional</td>
</tr>
</tbody>
</table>
| The existing unobstructed views of the bridge and approach spans, including:  
  • views of the bridge end-on from the northern and southern approach roads;  
  • views of the bridge from ground level nearby and from the water; and  
  • views of the steel structure and pylons from deck level have been assessed as a bridge component of Exceptional significance in the CMP. |

4.3.3 Grading of Significant Fabric

Table 3 Grading of Significant Fabric (Source: CMP 2009)

<table>
<thead>
<tr>
<th>Bridge Component</th>
<th>Grading of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approaches</td>
<td></td>
</tr>
<tr>
<td>Old tollhouse near Argyle Street</td>
<td>High</td>
</tr>
<tr>
<td>1950s toll booths on the northern approach</td>
<td>Moderate</td>
</tr>
<tr>
<td>1970s toll collection office on northern approach</td>
<td>Little</td>
</tr>
<tr>
<td>Movable toll plazas, toll booths on the southern approach</td>
<td>Little</td>
</tr>
<tr>
<td>Road gantries and signage</td>
<td>Little</td>
</tr>
</tbody>
</table>

The RMS’s Heritage and Conservation Register provides the following statement of significance for the ‘Sydney Harbour Bridge, approaches and viaducts’.

*The approaches are of considerable significance to the State because, although subsidiary to the bridge itself and less engineering interest, they are an integral part of the bridge construction, an achievement of outstanding, international significance. All the fabric of the approaches dating from the original construction period is of considerable significance. It was on the northern and southern approaches that the Bridge was officially opened, the largest crowd ever seen in Sydney assembled and the De Groot incident took place. The viaducts, tunnels and bridges incorporated into the approaches are essential components of the most important single event in the development of Sydney’s transport system ie the building of the Sydney Harbour Bridge. They are part of Bradfield’s greatest achievement and, although less glamorous than the steelwork of the Bridge itself, they are the parts for which he was wholly and directly responsible. (Sydney Harbour Bridge Conservation Management Plan, 1998, RTA)*
The bridge, its pylons and its approaches are all important elements in townscape of areas both near and distant from it.

The curved northern approach gives a grand sweeping entrance to the bridge with continually changing views of the bridge and harbour. (Walker and Kerr 1974)

The bridge has been an important factor in the pattern of growth of metropolitan Sydney, particularly in residential development in post World War II years. In the 1960s and 1970s the Central Business District had extended to the northern side of the bridge at North Sydney which has been due in part to the easy access provided by the bridge and also to the increasing traffic problems associated with the bridge. (Walker and Kerr 1974)

4.4 Movable Heritage

The Godden Mackay Logan, SHB Toll Plazas—Movable Heritage Salvage Survey, March 2008 provides the following description and assessment. The report is included at Attachment D.

Much of the machinery and equipment and other movable items associated with the daily operation of Toll Collection relates to the collection, accounting and security of the cash collected, and a large proportion of such equipment is common to a range of activities involving coin-based cash, such gambling venues and public transport fares. The largely values of this type of equipment are largely associational, because it was used for the SHB, whilst its technological significance is not high.

The Automatic Toll Collection machines, however, were largely developed in-house by the RTA and have technological significance and, for this reason, a complete, operational machine is to be donated to the Powerhouse Museum.
5.0 Description of the Proposal

The following description of the proposal is derived from the *Sydney Harbour Bridge – Southern Toll Plaza Upgrade, Review of Environmental Factors* prepared by RMS in October 2012.

RMS proposes to remove the toll booths at the southern approaches to the SHB so that it can then realign and resurface traffic lanes on the Bradfield Highway.

The proposal's objectives are to improve the driver and passenger experience travelling between the SHB and the Western Distributor or northern CBD whilst minimizing environmental and heritage impacts by:

- simplifying traffic movements
- improving connectivity for buses
- improving operational flexibility for lane management on the SHB
- reducing road safety hazards

The proposal would generally involve realigning and rationalising the traffic lanes between the Sydney Harbour Bridge and the Western Distributor/northern CBD, removing the southern toll booths, reconfiguring the intersection of York and Grosvenor streets and widening the eastern offload ramp to York Street.

The number of traffic lanes at the existing toll plaza would be reduced so that the Sydney Harbour Bridge lanes transition to the Western Distributor lanes, to the Cahill Expressway and the various additional lanes that make up the onload/offload ramps to and from Grosvenor, Kent and Clarence streets.

Bus lanes would be established to the east of the general traffic lanes on the eastern ramp. This would involve extending the Sydney Harbour Bridge bus lane to York Street and establishing an additional bus lane beside it.

The intersection of York and Grosvenor streets would be reconfigured to enable general traffic access to the northern CBD via either the western ramp or the eastern ramp and to provide a signalised pedestrian crossing of Clarence Street on its approach to York Street.

General traffic movements northbound onto the Sydney Harbour Bridge would remain unchanged.

Bus readiness bays would be established on the eastern side of the eastern ramp. Bus readiness bays would enable buses approaching the city to commence outbound services in the PM peak to stop as close as possible to Wynyard. This would improve service reliability by minimising any delay to buses entering the Wynyard Precinct while minimising the number of buses in the CBD.

The proposal would provide flexibility in operation and includes devices to assist with both planned and unplanned lane closures.

Traffic from the Sydney Harbour Bridge main deck:

- to York Street (citybound) could be directed via either the eastern or via the western ramp in the 3 northbound/5 southbound and 2 northbound/6 southbound lane management configurations which typically operate during the morning peak.
Sydney Harbour Bridge—Southern Toll Plaza Upgrade—Heritage Impact Statement, October 2012

- to York Street (citybound) would be directed via the eastern ramp in the 4 northbound/4 southbound and 5 northbound/3 southbound lane management configurations which typically operate outside the morning peak.
- to Grosvenor Street (citybound) would be directed via the western ramp at all times.
- to the Western Distributor (southbound) would continue to be provided at all times.

Sydney Harbour Bridge Bus lane users, which include buses, taxis, hire cars and motorcycles, from the Sydney Harbour Bridge Lane 7 (the bus lane):

- to York Street or Grosvenor Street (citybound) would continue to use the eastern ramp at all times
- to the Western Distributor (southbound) would continue to be provided at all times.

General traffic from the Sydney Harbour Bridge Lane 8 (via Lane 7, the bus lane):

- to Grosvenor Street (citybound) would continue to be restricted during peak periods 6-10am and 3-7pm weekdays. Outside peak periods access would be available via the eastern ramp. This traffic would turn left from the bus lane.
- to York Street (citybound) would continue to be restricted during peak periods 6-10am and 3-7pm weekdays. Outside peak periods access would be available via the eastern ramp.
- to the Western Distributor (southbound) would continue to be restricted during peak periods 6-10am and 3-7pm weekdays.

Lane configurations for all users would be implemented to best manage the demand volumes to and from the Western Distributor, Cahill Expressway and the northern CBD via Clarence, Kent and Grosvenor streets.

The work would involve:

- Demolition and construction of traffic barriers and kerbs in the vicinity of the southern toll booths through to Grosvenor Street.
- Installation and repair of drainage between the toll plaza and Grosvenor Street.
- Removal of toll booth structures on the Bradfield Highway and associated redundant services and infrastructure such as the rail tracks used to slide the toll booths across the carriageway.
- Upgrade of underground services such as electricity and communications.
- Installation of services such as electricity and telecommunications for the new electronic lane control components including traffic cameras, moveable medians and changeable message signs in the vicinity of the toll plaza.
- Pavement repairs, construction and resurfacing between the southern abutment of the bridge, which is located at Cumberland Street, and Grosvenor Street.
- Installation of a new electronic directional signage system with various changeable message signs located on existing and new gantries between the northern bridge abutment (at Burton Street, Kirribilli) and Grosvenor Street.
• Installation of an upgraded lane control system to improve traffic and incident management capability.

• Reconstruction of new kerbs, signals, pavements and medians at the intersection of York and Grosvenor streets.

• Changes to roadway lighting between the Sydney Harbour Bridge and the Western Distributor.

• Reviewing and updating, where necessary, information and directional signage to match the proposed lane arrangements.

Construction is expected to take about 18 months.
6.0 Identification and Assessment of Heritage Impacts

The potential heritage impacts of the proposal and proposed mitigation strategies are considered below against the relevant policies contained in the CMP (quoted in bold italics).

Compliance with Policy 11—Maintaining Key Views of the Sydney Harbour Bridge in its Setting

CMP 2009 Policy

11.1—The significant physical and visual character of the Sydney Harbour Bridge within its harbour setting should be appropriately conserved.

11.2—Views and vistas to and from the Sydney Harbour Bridge to the north, south, east and west, should be maintained.

Discussion/Assessment

The proposal involves the removal of the southern movable and fixed toll booths and associated structure, and will alter the experience of driving south across the bridge and into the Sydney CBD.

However, the proposed works will not impact on the setting or overall physical and visual character of the bridge. The perception of the overall size of the bridge, arch, approaches and pylons will not be affected.

Compliance with Policy 13—Integrity of Original Design

CMP 2009 Policy

13.1—The clarity of the structural form and silhouette of the bridge, and its associated elements when viewed from key points around the harbour, should be maintained and not obscured.

13.4—The fabric and design integrity of the main components of the bridge, comprising the arch, hangers, roadway, pylons, approach spans, piers and approaches including tunnels, tenancy spaces and Milsons Point railway station, should be conserved.

Discussion/Assessment

The proposal would involve the removal of 1950s and later toll booths located on the southern approaches to the bridge, identified in the 2009 CMP as being of Moderate and Little significance.

The approaches have been significantly modified in the past in response to traffic volume increases and improvements in traffic management.

The proposed realignment of the approach lanes is a relatively minor intervention associated with the upgrade to respond to the current and future desired operational requirements of the bridge.

Although the demolition of these elements will have some physical impact on the bridge’s identified significance, the proposal will not involve any removal or intervention to fabric of high significance and will not affect the overall key attributes of the bridge including structural integrity, physical and visual character, and the setting.

Compliance with Policy 16—Records of Intervention and Maintenance

CMP 2009 Policy

16.1—All works to the Sydney Harbour Bridge should be appropriately recorded, and the records stored as part of the archival management.

Discussion/Assessment

An archival photographic recording of existing equipment and fabric associated with cash toll collection facilities has been carried out in accordance with the Heritage Branch guidelines for items of State heritage significance.

The recording includes a comprehensive coverage of the toll booths in their physical setting and relationship to the bridge, a compilation of available historical drawings and other documentary material held by the RMS, and a professional oral history program undertaken as part of the ongoing oral history strategy for the SHB.

These are stored at the RMS library at Parramatta.
Compliance with Policy 18—Management of Adaptation and Change

CMP 2009 Policy

18.1—All decisions for intervention and change should be evaluated in terms of the nature of the proposal, its purpose, long term context and how this relates to the identified cultural heritage values of the bridge. Protection and enhancement of the fundamental significant elements of the place through appropriate adaptation and change for new or additional necessary functions should be a key management goal.

Discussion/Assessment

The cessation of physical toll collection by bridge staff in 2009 brought to an end an historical activity that was an intrinsic part of the day to day operations of the bridge for 77 years (1932—2009). The toll booths are no longer required for their original purpose, and their removal will result in improved road user safety and traffic efficiency, improved travel time reliability for bus passengers and an improved driving surface on the Bradfield Highway.

The proposed upgrade works is essential given the high levels of traffic flow across the bridge, and to allow it to continue its historic function.

Compliance with Policy 19—New Development

CMP 2009 Policy

19.1—New development should enhance the function and use of the bridge without obscuring or damaging the integrity of the original design or significant fabric.

19.2—New work should be designed to respond to the character of the existing significant design and fabric.

Discussion/Assessment

New additions associated with the southern toll plaza upgrade include the introduction of a new electronic directional signage scheme with various changeable message signs located on existing and new gantries between the northern bridge abutment and Grosvenor Street.

These are required to replace the signage currently located on the southern toll booths. They are also required to improve the functionality and traffic flow on the bridge.

The addition of new variable message signs on new and existing gantries would have no visual or physical impact on the significance of the bridge given its location fixed to the existing gantries (which are of little significance).

There may be a new gantry installed at the existing location of the southern toll booths to replace the destination signage at the Western Distributor. The new gantry would be recessive in appearance given its lightweight construction and paint finish in dark ‘bridge’ grey colour to complement the steelwork of the bridge.

Compliance with Policy 21—Changes due to Operational Requirements

CMP 2009 Policy

21.1—Changes to the bridge due to the primary use of the bridge as a critical component of Sydney’s transport (road, rail, pedestrian and cycle) should be given priority over changes determined by the needs of secondary uses such as tourism and recreation.

21.2—Changes to the fabric essential to maintain this primary use do not obviate the requirement to assess and to minimise the impact of physical alterations on the cultural heritage significance of the bridge, particularly where these changes are

Discussion/Assessment

The proposal is justified on the grounds of improving road user safety, traffic efficiency, bus reliability and the ongoing primary use of the bridge as an essential component of Sydney’s transport network.

The removal of the southern toll booths, which are redundant as a result of the introduction of cashless tolls in 2009, is assessed as not adversely affecting the cultural heritage significance or overall structural form of the bridge.

Mitigation measures have been undertaken to record and allow future interpretation including an archival record and oral history interviews.

A representative example of a toll booth will also be salvaged and stored for future interpretation opportunities. The selection of
Compliance with Policy 26—Movable Items

CMP 2009 Policy
26.1—All equipment or elements considered redundant or surplus to requirements and assessed to be of heritage significance must be suitably archived and recorded on the RTA Heritage and Conservation Register.


Discussion/Assessment
The SHB Movable Heritage Collection comprises a range of equipment representative of the historic and ongoing function and operations of the bridge, including toll collection.

The SHB Toll Plazas Movable Heritage Salvage Survey, Godden Mackay Logan, March 2008 has identified movable heritage objects for retention in accordance with the Collections Management Policy.

These recommendations should be implemented in conjunction with the proposed scope of works, including the salvage of the automatic toll collection machines of varying types as these were largely developed in-house by the RTA (with later input by Toll Systems Technology PL), and have technological significance.

(See also ‘Compliance with Policy 37—Machinery and Equipment’ below).

Compliance with Policy 36—Interpretation Requirements

CMP 2009 Policy
36.1—Measures to appropriately interpret the major aspects of significance of the bridge should be considered in conjunction with all future proposals for change and development.

Discussion/Assessment
Interpretation of the cash toll collection booths in their context, their operation and purpose and the historic role of these redundant elements in the operations of the bridge and former labour practices should be integrated into the overall ongoing interpretation of the history of the bridge.

(See also ‘Compliance with Policy 26—Movable Items’ above).

Compliance with Policy 37—Machinery and Equipment

CMP 2009 Policy
37.1—The history and heritage significance of machinery and equipment specifically related to the bridge should be actively interpreted to the public.

Discussion/Assessment
The contents and layout of movable items in one of the fixed toll booths should be recorded and a representative set of booth furniture and equipment should be retained. Retention should include examples of external toll registration panels / boards, coloured-light indicators and any individual elements relevant to the daily operation of the toll booths.

The movable toll booths were the only example of their type when built. They were originally moved by tractor but were later converted to individual electric/hydraulic drive. The contents and layout of movable items in one booth should be recorded and a representative set of booth furniture and equipment should be retained.

The selection of which toll booth and components would be the most appropriate and practical example would need to be considered in more detail and take into account fabric condition and salvage feasibility.

The automatic toll collection machines of varying types, however, were largely developed in-house by the RTA and finally by private industry (Toll Systems Technology PL) and have technological
significance and, for this reason, a complete, operational machine
should be donated to the Powerhouse Museum.
Interpretation of the cash toll collection booths should be
integrated into the overall ongoing interpretation of the history of
the bridge.
(See also ‘Compliance with Policy 26—Movable Items’ above).
7.0 Conclusion and Recommendations

7.1 Conclusion

The proposed scope of works is a component of the proposed traffic management upgrade of the bridge that is essential to maintain its historic function as the main road connection across Sydney Harbour. The 2009 change to cashless toll collection has improved traffic flow and eased traffic congestion by allowing traffic to flow continuously across the bridge without the need to stop to pay the toll, especially through the Bradfield Plaza area.

The proposed removal of the southern toll booths is part of a proposal to realign lanes and rationalize the plaza aimed at improving traffic efficiency and safety for the quarter of a million people including 27,000 bus passengers who cross the SHB daily (excluding trains, cyclists and pedestrians).

The conversion to an exclusively electronic toll collection facility brought to an end the manual toll collection process by bridge staff (later supplemented by coin collection equipment) that had been an intrinsic part of the day to day operations of the bridge for 77 years. The toll booths are therefore now redundant, and pose an unnecessary traffic obstruction and a limitation on the ability to realign vehicle lanes.

Nevertheless, the SHB is a robust structure that is capable of incremental change to those ancillary elements that contribute to its function where such change is mandatory for it to continue this function and where there is no feasible alternative. This process of change has been under way since 1932 as the functional and operational demands upon the bridge have increased and evolved. The listing of the SHB on the SHR and NHL impose an obligation on all relevant parties to ensure that the impacts of this continuing change are rigorously assessed to ensure that its key cultural heritage values are not compromised.

The relocation of directional signage and the possible installation of a new signposting gantry south of the bridge are necessary for the continuation of its role as a safe and effective harbour crossing for the 160,000 vehicles that use it each day. The signage and gantry (if required) would be beyond the NHL and SHR listing curtilages, and will simply form a part of the complex arrangement of gantries and signage already in place.

Overall, the impact of the removal of the toll booths located on the southern approach to the SHB will be minimal given the relatively minor contribution that they make to the significance of the bridge as a whole. The identification and assessment of heritage impacts set out in Section 6, demonstrates that the proposed works will not result in a substantial adverse impact on the overall heritage values of the bridge.

Even though the work will result in only minimal impacts, appropriate mitigation measures have already been undertaken to record and interpret the fabric and process of toll collection so that the historical importance of this activity is not lost to future generations.

These measures include an archival photographic recording of the existing movable and fixed toll booths. A professional oral history has also been undertaken to capture the recollections of current and former bridge toll collection personnel for use in the interpretation of the history of toll collection.

Opportunities for interpretation of the cash toll collection process should also be considered as part of the overall interpretation strategy for the history of the bridge (it is understood that such a study has been commenced by the RMS).
In terms of fabric, a representative example of a toll booth (fixed and/or movable) should be retained and conserved as proposed by RMS (the selection of which toll booth would be the most appropriate and practical would need to be considered in more detail taking into account fabric condition and salvage feasibility). Moveable heritage items associated with the toll collection process should also be retained and opportunities for exhibition considered in accordance with the SHB Collections Management Policy.

7.2 Recommendations

The proposed scope of works, comprising the removal of the existing movable and fixed southern toll booths and the introduction of new directional and lane change signage (possibly including a new gantry), would have no substantial adverse impact on the heritage significance of the bridge as a whole. Nevertheless, appropriate mitigation measures should be undertaken to ensure that the fabric and process of toll collection is recorded and interpreted so that the historical importance of this activity is not lost to future generations.

It is recommended therefore that the following mitigative measures be implemented:

a) A representative example of a toll booth (fixed and/or movable) should be retained and conserved as proposed by RMS, and if feasible publicly exhibited at an appropriate location. From a heritage perspective, there is little distinction between the toll booths within the curtilage or outside, therefore there is not a heritage preference as to which toll booth (fixed or moveable) should be salvaged, either is appropriate. Therefore, the decision on the most appropriate toll booth to salvage can be a practical one taking into account the fabric condition (integrity and intactness) and salvage feasibility.

b) Opportunities for interpretation of the toll collection process over the 77 years since 1932, including the material collected as part of the oral history program, should be considered integrated into the overall ongoing interpretation of the history of the bridge.

c) The SHB Toll Plazas Moveable Heritage Salvage Survey (Godden Mackay Logan, March 2008) has identified movable heritage objects for retention in accordance with the Collections Management Policy. These recommendations should be implemented in conjunction with the proposed scope of works for moveable heritage items associated with the toll collection process.

d) The NSW Heritage Branch should be notified about the proposed works. This will inform them that the heritage impacts of the proposed works have been assessed as minimal given the relatively minor contribution the toll booths make to the heritage significance of the SHB as a whole, and that the heritage values of the SHB will not be adversely compromised.