



**Transport**  
Roads & Traffic  
Authority

# Windsor Bridge over the Hawkesbury River

Preliminary urban design and heritage review  
of options 1 and 3

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WINDSOR BRIDGE - PRELIMINARY URBAN DESIGN AND HERITAGE REVIEW FOR OPTIONS 1 & 3

PREPARED FOR THE RTA



JULY 2011

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## INTRODUCTION

# Chapter 1

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# 1. INTRODUCTION

This Preliminary Urban Design and Heritage Review of the bridge Options 1 and 3 for the crossing of the Hawkesbury River at Windsor, has been compiled by Spackman Mossop Michaels (SMM) for the Roads and Traffic Authority (RTA). This review has been prepared with the assistance of Godden Mackay Logan (GML), who have provided targeted heritage advice for the review to address the heritage issues relating to each option and in particular the concerns raised by the Heritage Council in their letter to the RTA dated the 7th December 2010.

## 1.1 PURPOSE OF THE REVIEW

The purpose of this review is two-fold in nature. The primary purpose is to give the RTA a better understanding of the urban design, landscape and heritage issues related to Options 1 and 3. This review brings together the urban design and heritage issues identified for these selected options within the environment in which they are located using background information from specialist studies previously conducted for the RTA. This review will be one of a number of inputs that will assist the RTA's selection of a preferred option for a new bridge crossing at Windsor, which is required due to the structural deterioration of the current bridge.

The secondary purpose of this review is to begin the process of identifying urban design and heritage objectives and principles that will ensure the bridge, and its approach roads, are physically, visually and operationally integrated with the surrounding environment. These draft urban design and heritage objectives and principles will provide a starting point for the RTA to build upon as they develop a concept design and the associated environmental assessment.

## 1.2 OVERALL PROJECT OBJECTIVES

The project objectives, revised by the RTA in July 2011, for replacement of the existing bridge at Windsor to provide a safe and reliable crossing of the Hawkesbury River are as follows:

OBJECTIVES	CRITERIA
To improve safety for motorists, pedestrians and cyclists	Meets the various design codes (eg traffic lane widths, shoulder widths and shared path widths). Meets a road speed of 60 km/hr. Ensures pedestrian safety.
To improve traffic and transport efficiency	Minimises queue length/delays. Improves performance of road network (level of service). Enables two heavy vehicles to pass on the bridge without waiting. Improves load capacity of the crossing to meet current load standards.
To improve the level of flood immunity	Provides a crossing that is above the 1 in 5 year flood event.
To meet long term community needs	Provides an efficient connection for local and regional traffic. Provides a pedestrian and cyclist connection to surrounding locations. Minimises impact on recreational spaces. Minimises impact of noise. Minimises impact to businesses and the shopping environment. Minimises impact on property access and need for acquisition. Provides a 100 year life span for the bridge structure.
To minimise the impact on heritage and the character of the local area	Minimises impact on Aboriginal and non-Aboriginal heritage and conservation areas. Protects the built heritage of the town and its setting. Minimises visual impact and impacts on the character of the local area.
To be a cost effective and an affordable outcome	Provide cost effective solution in terms of: <ul style="list-style-type: none"> <li>• Capital cost</li> <li>• Maintenance cost</li> <li>• Investment on return</li> </ul> Minimises the impact of construction in regards to length and timing.

### 1.3 REVIEW METHOD

The preparation of this review has involved:

- Analysis of the existing site conditions, through site visits and desktop review of current background studies.
- Identification of the key environmental, landscape, urban design and heritage values of Windsor.
- Identification of the primary urban design, landscape and heritage issues that could affect the design of the new bridge and its approach routes.
- Formulation of urban design, landscape and heritage objectives and principles, to inform the design and selection of a preferred bridge option and approach routes.
- Identification of urban design, landscape and heritage opportunities that could assist in reducing impacts of the new bridge crossing.

### 1.4 STRUCTURE OF THE REVIEW

The review is structured as follows:

- Chapter 1: Introduction - introduces the review and outlines the objectives and review method.
- Chapter 2: Analysis of Review Area - a brief description of the environmental factors provides the local environmental context of the review.
- Chapter 3: RTA Planning & Guidelines - a brief overview of the policies and guidelines which will oversee and provide direction throughout this review and overall planning process.
- Chapter 4: Description of Bridge Crossing Options - an overview of the options selection process to date and a review of the urban design and heritage considerations for Options 1 and 3.
- Chapter 5: Urban Design and Heritage Objectives & Principles - a set of specific objectives and principles are set out for future works associated with this project.
- Chapter 6: Urban Design and Heritage Review Summary - a set of opportunities for reducing impacts and a summary of the review.







**ANALYSIS OF REVIEW AREA**

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## 2. ANALYSIS OF REVIEW AREA

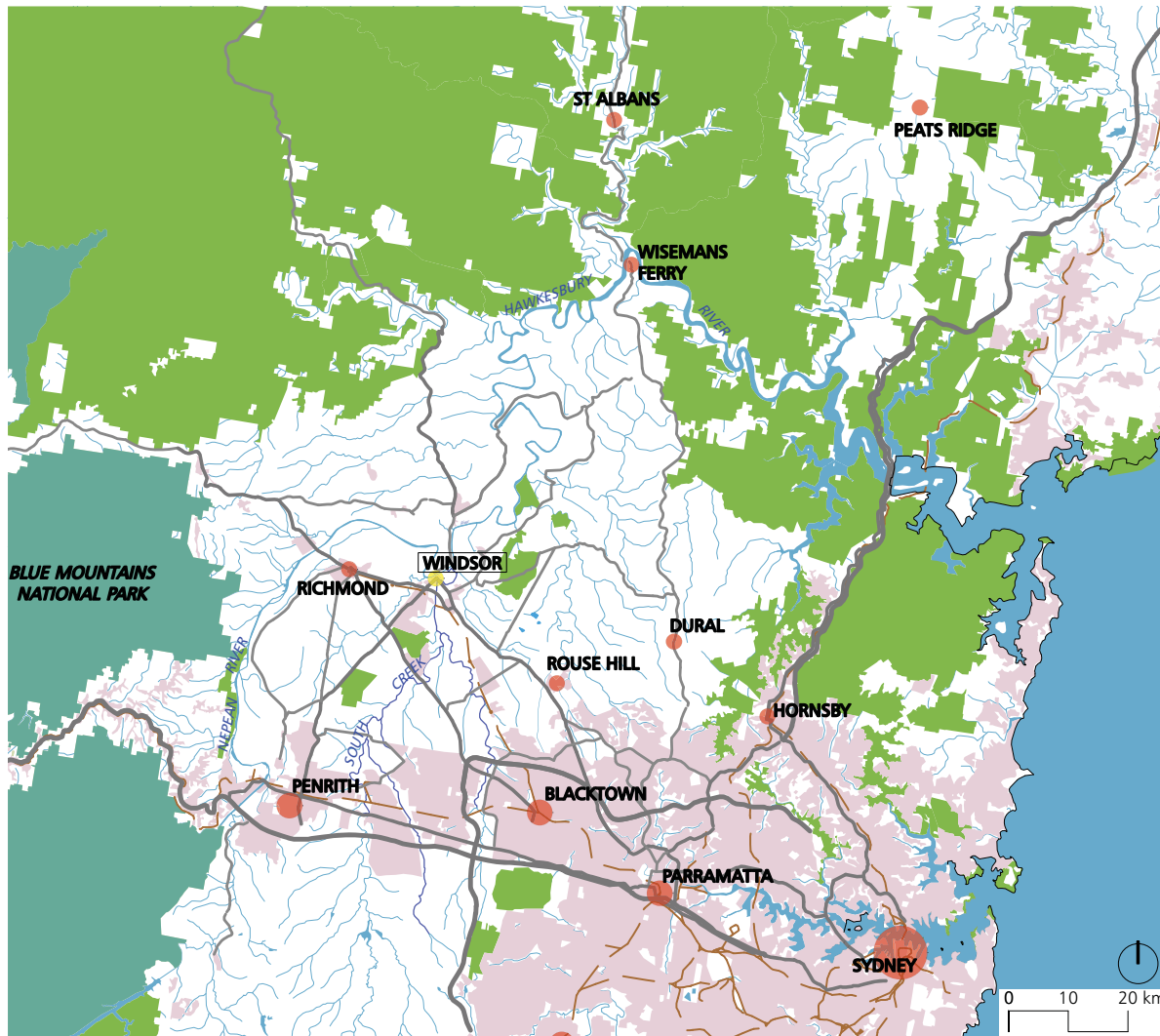


Figure 2.1: Regional context of Windsor

Source: GeoScience Australia.

### 2.1 THE REGIONAL CONTEXT

Windsor is located approximately 57 kilometres northwest of Sydney and 20 kilometres northeast of Penrith, within the Hawkesbury City Council Local Government Area (LGA). The Hawkesbury River has played an important part in the development of Windsor and the surrounding farming communities of Wilberforce and Pitt Town.

The historic rural town of Windsor is located on a ridge above the southern bank of the Hawkesbury River, on the outskirts of the Sydney Metropolitan Area. The area is bounded by the Blue Mountains and the Nepean Valley Floodplain and is defined by the major water courses of the Hawkesbury River and South Creek. This area prone to frequent flooding, the bridge crossing at Windsor is the oldest crossing of the Hawkesbury River and links the communities on either side. It also provides an important through route for the greater Sydney region with increasing usage due to the expansion of Sydney's metropolitan area to the north west. The town, located at the northern end of the Cumberland Plain, is surrounded by an area of undulating semi-rural countryside with fertile alluvial soils.

## 2.2 DESCRIPTION OF THE LOCAL CONTEXT

The immediate local context of local area includes the towns of Windsor, Pitt Town, Richmond and Wilberforce and the surrounding hinterland.

The existing road system of the region has evolved from the beginning of European settlement to serve an agricultural district and to connect some of the earliest towns in the colony to Sydney. Two major access roads run north-south through the region. These are Windsor Road, which connects Windsor to Parramatta and serves as an important entry route into Sydney and is a primary route to the Blue Mountains; and Richmond Road, connecting Richmond and areas between to Blacktown and to the Westlink M7 Motorway as illustrated in Figure 2.2.

The bridge crossing at Windsor is the oldest existing structure that crosses over the Hawkesbury River, and provides one of only two river crossings for the local population and visitors to the local area, the other being the Richmond Bridge at North Richmond.

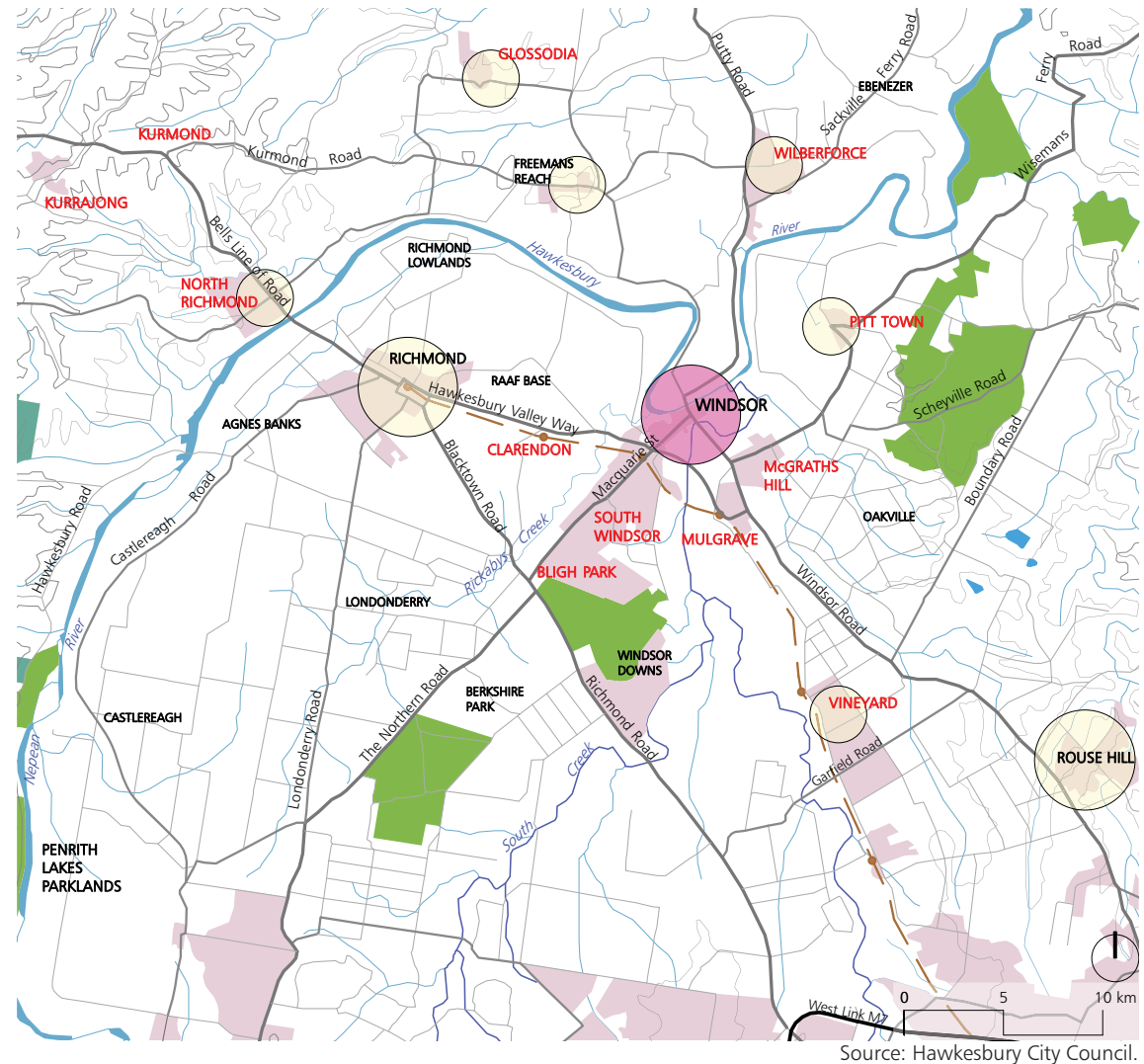


Figure 2.2: Local context of the Windsor Bridge review area



### 2.3 SETTLEMENT PATTERNS AND LAND USE

The review area lies within the Sydney Basin to the north west of the Sydney Metropolitan area and includes the town centres of Richmond and Windsor, villages of North Richmond, Vineyard, South Windsor, and small villages including Mulgrave/McGraths Hills, Glossodia, Wilberforce and Pitt Town.

The land use of the review area around Windsor comprises an extensive amount of pastoral landscapes and agricultural land which provides a significant resource to the Local Government Area (LGA) and the Sydney Metropolitan Region.

Locally, on the south side of the river the land uses are predominantly mixed uses including residential, commercial, professional rooms etc. Framing the open space of Thompson Square, which links to the open space along the river. The north side of the river is open farmland, with two dwellings located closed to the bridge approach.

#### Future Development

The LGA will need to accommodate approximately 5,000 additional dwellings by 2031, primarily within the existing urban areas as prescribed in the Department of Planning's North West Subregional Strategy. Urban growth is severely limited by the existing natural environment including, state and national parks, bushfire prone areas, aircraft noise, high value agricultural lands, flooding issues along the Hawkesbury River and limited development capacity within existing centres.

The population growth is generally stable, as identified in the 2001 and 2006 population census. However, there has been significant changes to the age structure which indicates an ageing population. This may generate substantial additional demand for services and facilities for older people as well as influencing housing types in the future.

Car dependency is high within the Hawkesbury LGA with 86.3% of households owning at least one car, while many have two or more vehicles.

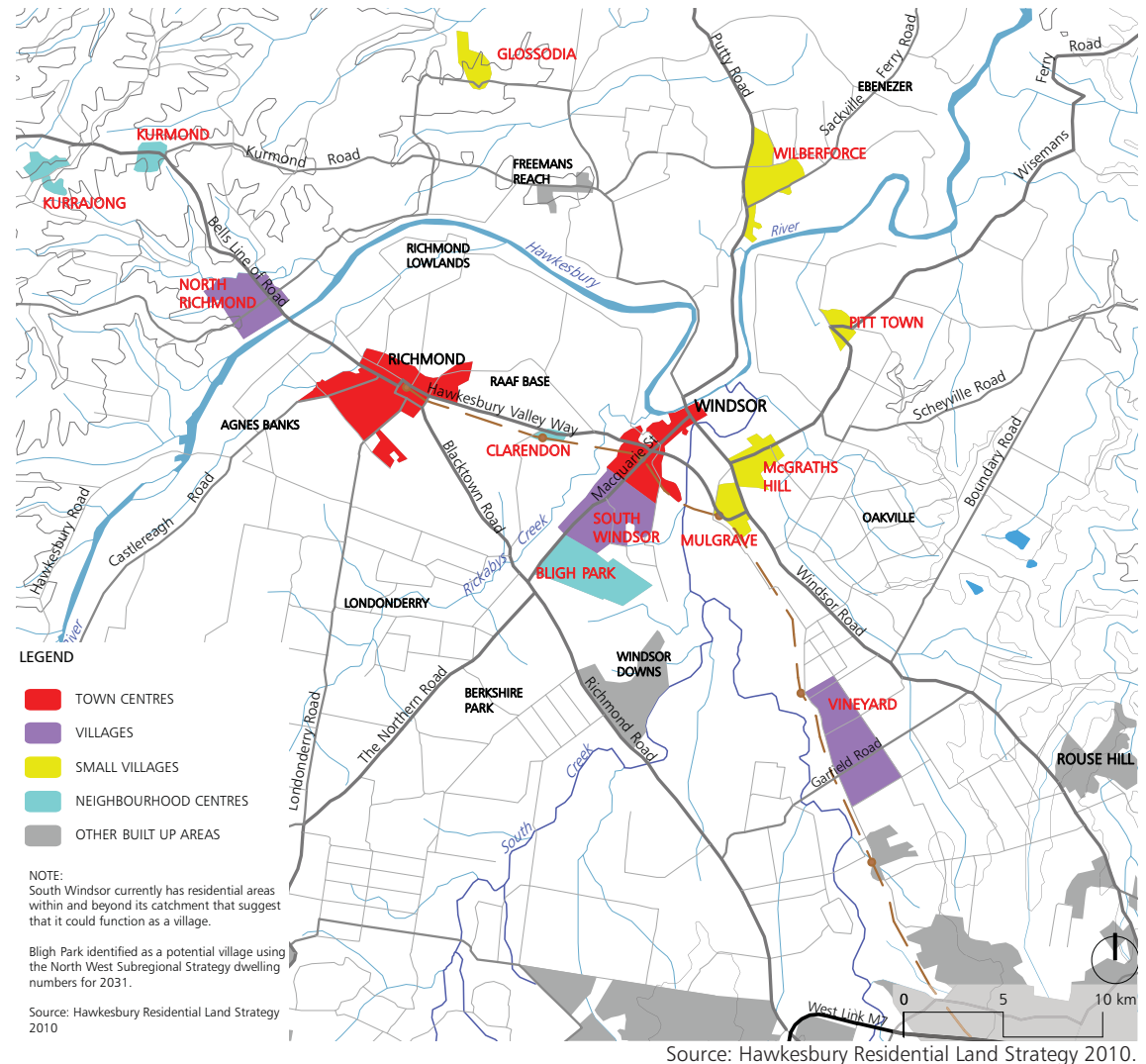


Figure 2.3: Key centres hierarchy



## 2.4 TRANSPORT AND LOCAL CONNECTIONS

The existing arterial road network through the Windsor region is provided by Windsor Road, Macquarie Street and Richmond Road south of the Hawkesbury River while Wilberforce Road, Putty Road and Bells Line of Road provide the key arterial connections north of the River.

The single track railway Blacktown to Richmond Line of the CityRail network, at present serves the area at half hour intervals with stations at Vineyard, Windsor, East Richmond and Richmond. Duplication of the Richmond Line is currently underway.

Windsor, East Richmond and Richmond Stations are all serviced by buses, providing interchange opportunities between public transport modes.

Bus services within the Hawkesbury LGA are operated by Westbus and Hawkesbury Valley Bus Services.

## 2.5 GEOLOGY AND SOILS

The Windsor Reach of the Hawkesbury River is dominated by the presence of the floodplain and consists of gently undulating rises with ground elevations ranging from five to twenty metres AHD. The geology is derived from Hawkesbury Sandstone and the area comprises soil profiles typical of an active floodplain with stream bank erosion and deposition. The area is subject to scour or sheet and rill erosion during floods and soils are deep brown sands and loams.

South Creek, a tributary of the Hawkesbury River, passes to the south of Windsor, under Windsor Road before curling around and entering the Hawkesbury River about one kilometre downstream of the existing bridge.

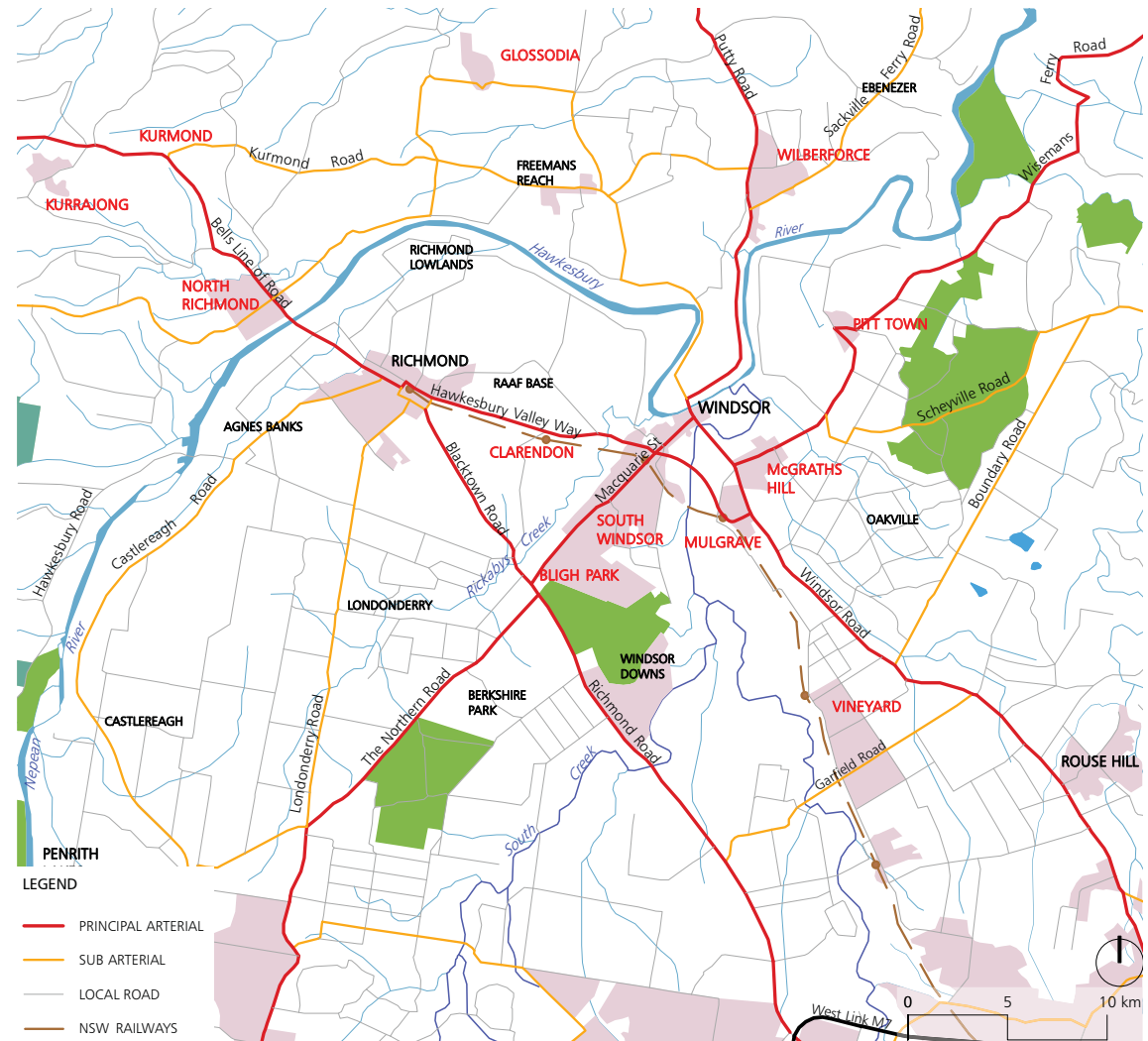


Figure 2.4: Transport and local connections

Source: Hawkesbury City Council.

## 2.6 HYDROLOGY AND DRAINAGE

The Hawkesbury-Nepean catchment covers approximately 22,000 km<sup>2</sup> extending from Goulburn in the south to the mouth of the Hawkesbury River at Broken Bay. The section of the Hawkesbury River at Windsor is freshwater tidal influenced by a saline intrusion from downstream estuaries and ocean waters.

The Hawkesbury Nepean Valley includes the area downstream of Warragamba Dam along the Nepean then Hawkesbury River and includes the Windsor area. The pattern of surrounding development has contributed to the unique flood behaviour of this valley, which can have an adverse impact on its surroundings during flood periods.

As shown in Figure 2.5, the majority of the urban area south of the Hawkesbury River is prone to at least 1:100 year flooding. Flooding is particularly prevalent in the south eastern area around North Richmond, Richmond, Windsor, South Windsor, Blight Park, Wilberforce and Pitt Town areas, South Windsor and Bligh Park.

The height of the current Windsor Bridge is seven metres (Australian Height Datum - AHD) making it subject to a one in two year flood event. The following levels have been identified as the markers for various flooding events at Windsor:

- 1:100 year flood - 17.3 metres AHD
- 1:50 year flood - 15.7 metres AHD
- 1:20 year flood - 13.7 metres AHD
- 1:10 year flood - 12.3 metres AHD
- 1:5 year flood - 11.1 metres AHD

Much of the township of Windsor is built on a ridge above the river, however, it has suffered from a number of major floods over the past two hundred years. The surrounding landscape is generally subject to a one in five or a one in ten year flood event. Both current approach roads, Windsor Road and Wilberforce Road, have sections of the road which are subject to a one in five year flood event.

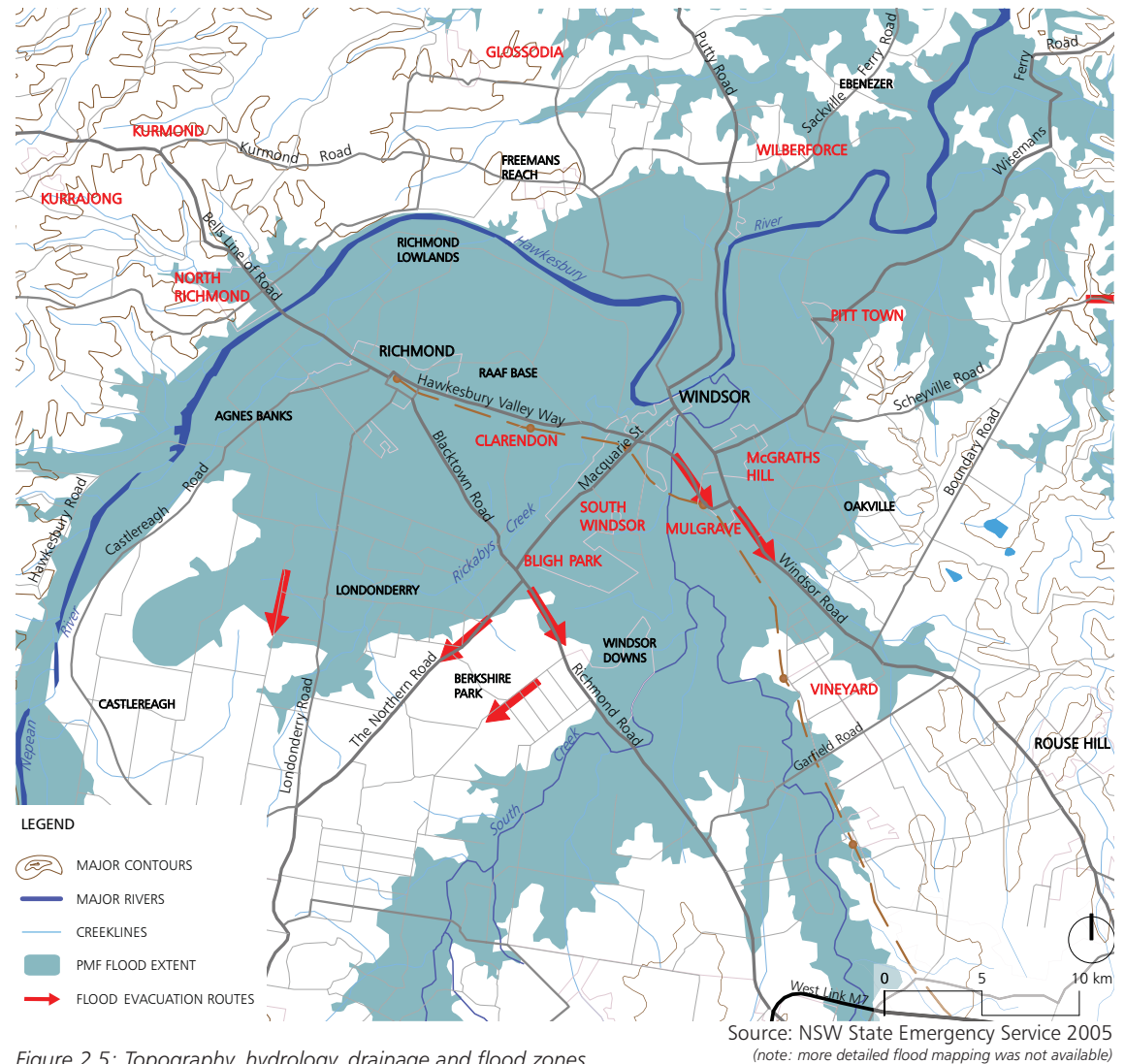


Figure 2.5: Topography, hydrology, drainage and flood zones

Land uses have impacted upon the quality of the water both within the Hawkesbury River and its tributary South Creek. Within the Windsor area, land uses such as rural activities, grazing, market gardens, intensive farming and both urban and industrial land uses have impacted on the water quality of the Hawkesbury River. In addition a number of sewage treatment plants discharged treated waters into the Hawkesbury River and its tributaries.

The results of water quality assessments generally demonstrate that pollutant levels at Windsor are close to or above levels recommended by the Healthy Rivers commission Guidelines.

## 2.7 LANDFORM AND TOPOGRAPHY

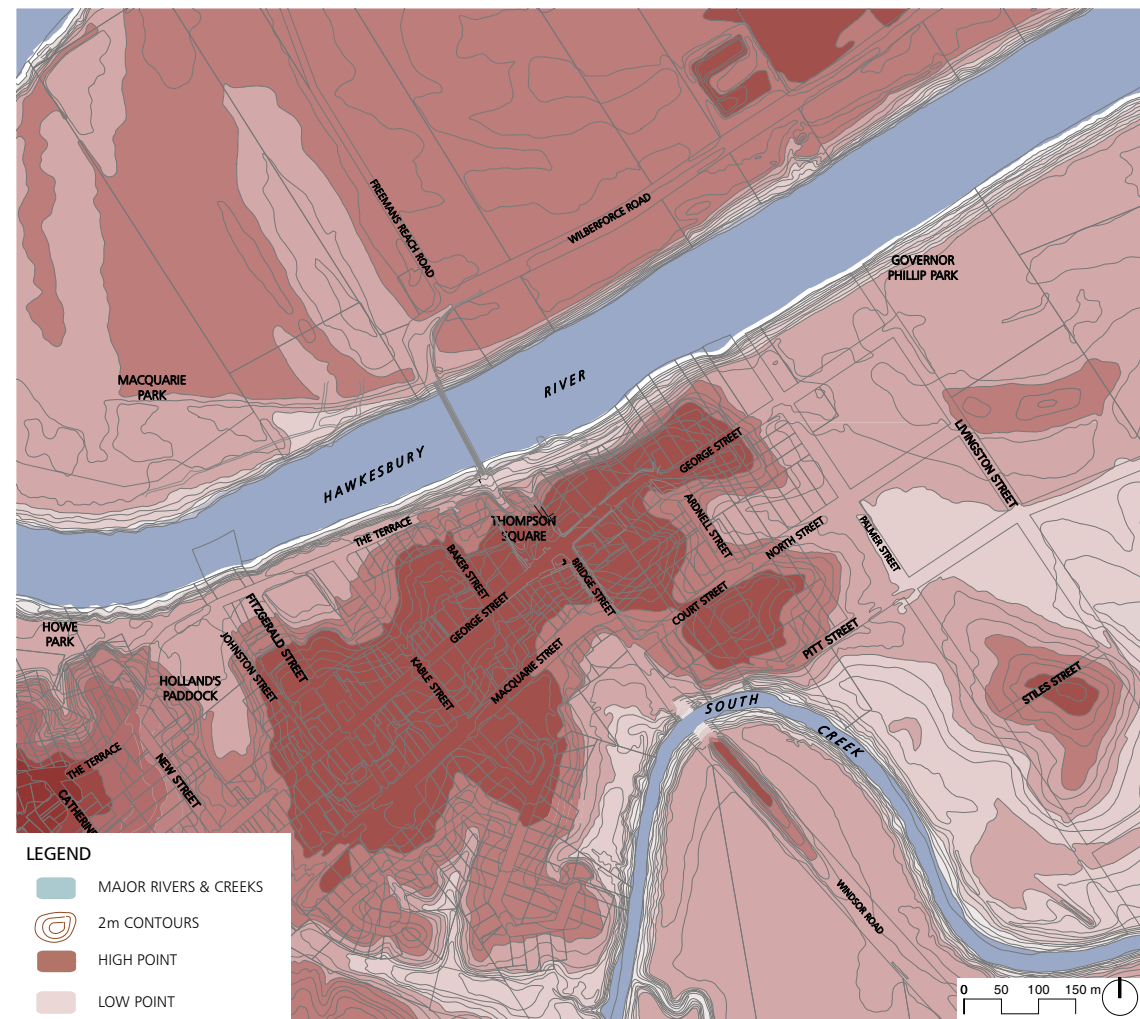
The review area lies within the Cumberland Lowland physiographic region, which forms the centre of the Sydney Basin. The Cumberland Lowlands are surrounded by the Hornsby Plateau to the northeast, the Blue Mountains Plateau to the west and the Woronora Plateau to the south.

The topography of the review area is generally characterised by gently sloping alluvial plain with occasional terraces or levees providing low relief. River beds and banks are common in the area, which in many parts is active floodplain. Local relief is mainly level and less than 10 metres with slopes generally less than 5%.

The existing bridge approach over the river through Thompson Square descends steeply from George Street to the river. The northern approach is less distinct being almost level with the bridge.

## 2.8 CLIMATE

Existing climatic conditions within the review area have been determined from the Richmond weather station approximately 3.5km west of Windsor. The annual average maximum temperature is 30 degrees celsius recorded in January and the annual average minimum temperature is 3.4 degrees celsius recorded in July. February is the wettest month with mean rainfall of 122mm and July is the driest month with mean rainfall of 34mm.



Source: Hawkesbury City Council.

Figure 2.6: Landform and topography



## 2.9 FLORA AND FAUNA

Since European settlement almost all of the natural habitat for native flora and fauna species within the review area have been cleared for development and agricultural purposes. Minimal remnant native vegetation exists along the Hawkesbury River, its tributaries and creek / drainage lines. This riparian vegetation is restricted to exotic grasslands, disturbed woodlands and Casuarina woodland, and is generally degraded by weed invasion and monocultures of species planted to protect the river bank from erosion. Given this highly degraded state of the natural environment, it is considered unlikely that any endangered ecological communities or threatened flora or fauna species exist or rely on habitat within the review area.

No endemic remnant vegetation exists along South Creek, however, the area has undergone a revegetation program over the past decade. There are a number of freshwater wetlands thirty metres south of South Creek, including two areas that have been identified in Sydney Regional Environmental Plan No. 20 (Hawkesbury-Nepean River No. 2-1997).

The aquatic habitats in the area have long been degraded through water pollution, the introduction of aquatic weed species and introduced fauna species, bank erosion and flooding. Native flora and fauna species however continue to inhabit the Hawkesbury River. One endangered species, the Trout Cod (*Maccullochella macquariensis*) has been identified as potentially existing within the waters around Windsor Bridge. Ninety three species of declared noxious weeds have been identified, many of which are aquatic species and therefore occur within the river or on adjacent banks within the review area.

## 2.10 BUSHFIRE PRONE AREAS

The Hawkesbury LGA contains significant areas of bushland which are important for biodiversity, but are also prone to bushfire. These areas are categorised as Category 1 high risk and therefore not suitable for extensive development in the future.

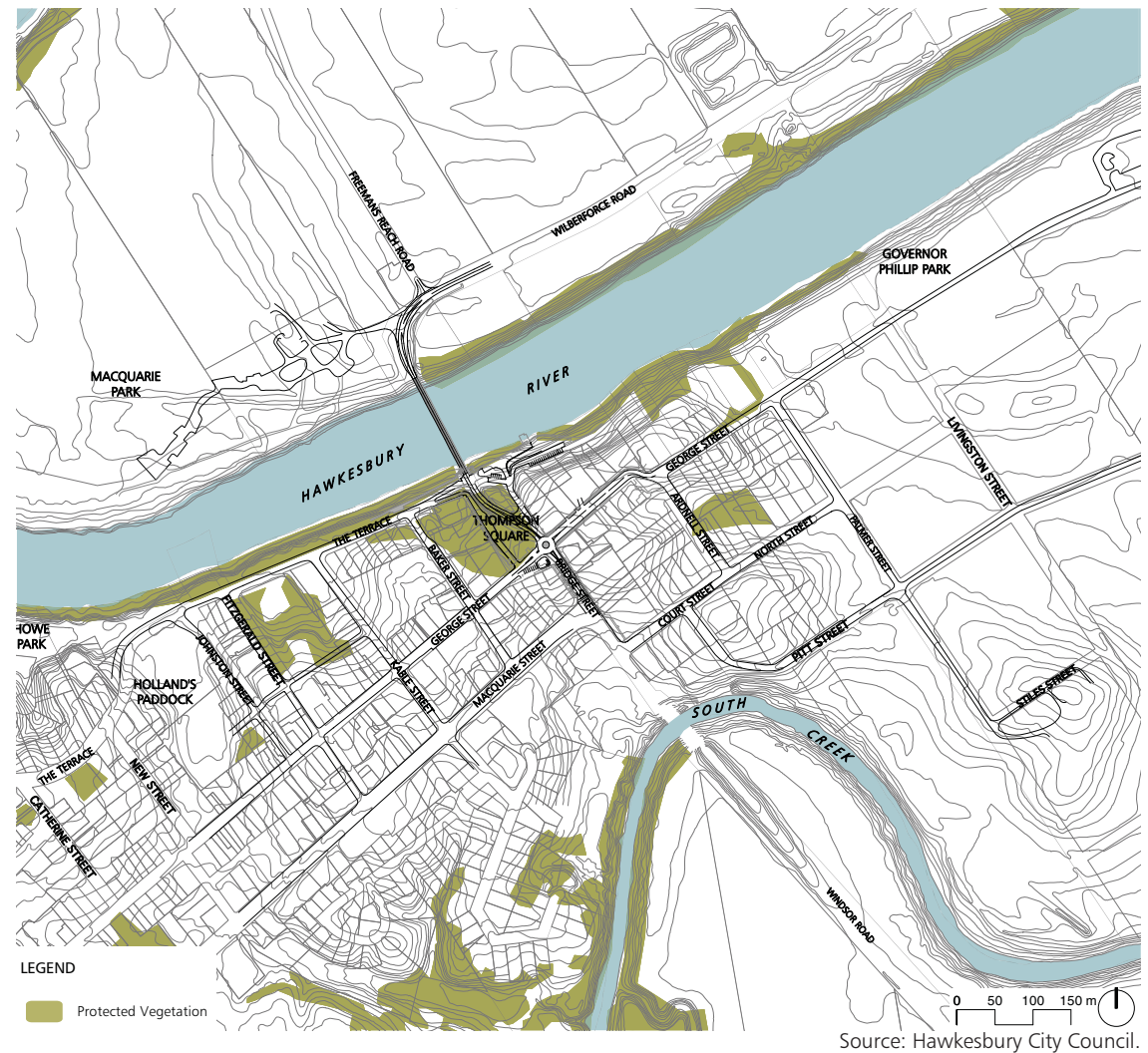


Figure 2.7: Biodiversity

## 2.11 LOCAL HERITAGE

### Aboriginal Occupation

Aboriginal people have probably resided in the Windsor area for tens of thousands of years. And although their traditional name is not known, we do know that they spoke the Darug language. Darug groups were believed to have lived in bands or communities of around fifty members each, and were highly mobile across the Cumberland Plain. Foods were gathered from the land and the rivers provided a rich variety of resources to the local community. Food was cooked lightly on open fires or in underground ovens.

Given this long history, there is a high likelihood of finding Aboriginal artefacts within the area. A number of assessments and investigations have been undertaken in the vicinity of Windsor Bridge. These include:

- A test and salvage excavation of the former Hawkesbury hospital site, about 800m south of Windsor Bridge, recovered sixty two flaked stone artefacts from twelve trenches. One naturally fractured quartzite pebble and one small un-worked quartz pebble were also recovered.
- Test excavations during the development of the Windsor flood evacuation route (located to the south west of Windsor Bridge) confirmed the presence of Aboriginal objects in subsurface deposits.
- Archaeological excavation on the site of the Hawkesbury Regional Museum extends more than a metre and revealed a Pleistocene sand body containing a very high density of Aboriginal artefacts.

### European Settlement

Windsor is a Macquarie town that was established at an existing village settlement known as Green Hills on the Hawkesbury River. The area was first visited by Europeans in 1789 as part of an expedition led by Governor Philip to find land suitable for growing food for the colony. The first official land grants were made in 1794, with 22 farms laid out by Lieutenant-Governor Major Grose. In 1798 the farming population was over 600.

Due to the poor state of the roads, the colony relied on the river transportation to get goods from the farmlands in the Windsor area into the colony well into the nineteenth century. A village known as Green

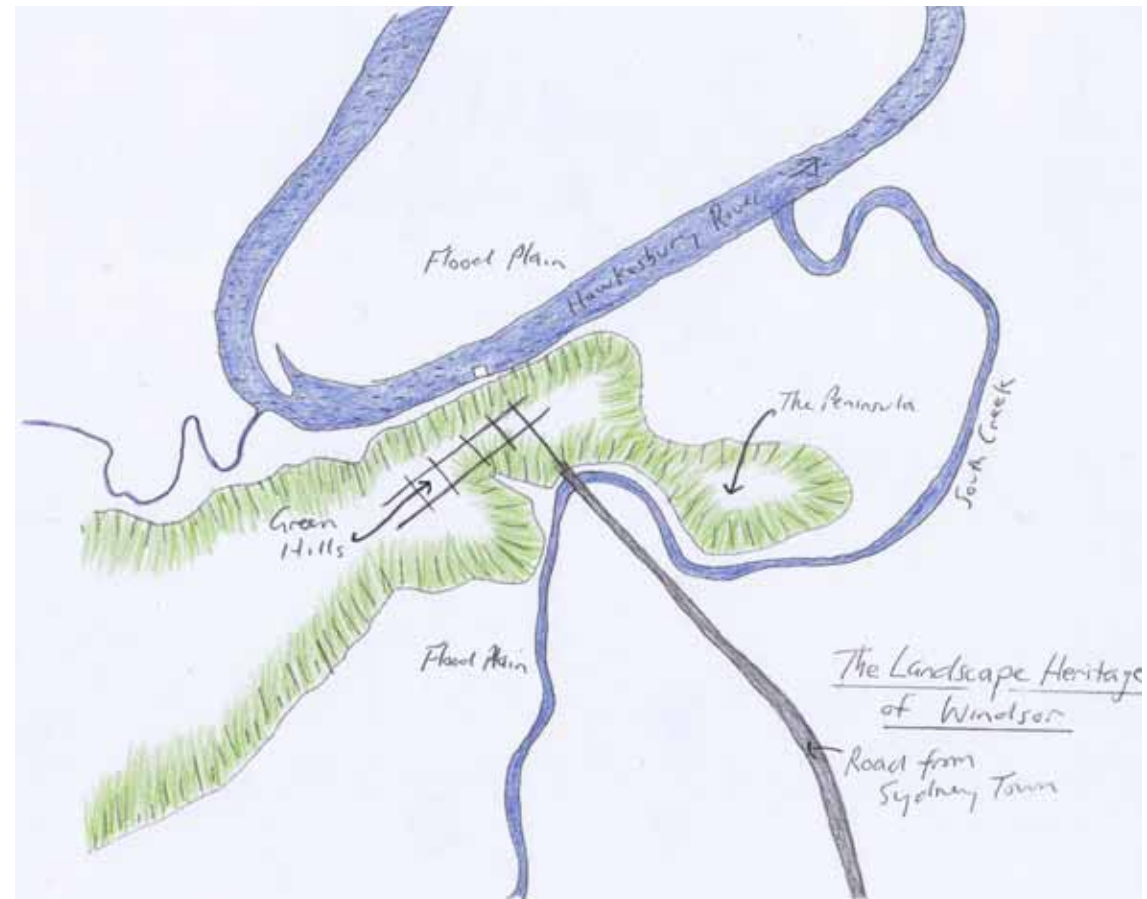


Figure 2.8: Green Hills c1795

Source: Godden Mackay Logan and Spackman Mossop Michaels 2011.



Hills developed on higher ground near one of the landing places along the Hawkesbury River. Commercial activity centred around the boat landing place on the river, which was located at the base of what was to be later formalised as Thompson Square. This commercial area contained a number of buildings.

In 1810 Governor Macquarie, under instructions from London, named five towns in the Hawkesbury area, namely Windsor, Castlereagh, Wilberforce, Pitt Town and Richmond. Macquarie designed the town centre of each town including the street layout, a public square, church, school and burial ground.

At Green Hills, the village's commercial centre was cleared of buildings to become one of the two public squares in Windsor, as laid out by Macquarie and James Meehan, Chief Surveyor for the colony, in 1810. Thompson Square was named after a prominent local businessman, Andrew Thompson, who died in 1810 before Macquarie's town was officially laid out. Thompson, who had arrived in Australia in 1791 as a convict, was well-respected for his contributions to the community and established a large granary, brewery and salt works in the area. He was appointed Chief Constable and later Magistrate by the Governor.

Over the decade following the town being laid out, Macquarie oversaw the establishment of many buildings in Windsor, including those around Thompson Square. A punt was established on the site of the current Windsor Bridge in 1814. Thompson Square continued to have an important function for the town of Windsor, as it remained the town's primary connection to the river.

This importance was reinforced by the construction of Windsor Bridge in 1874. The construction of the bridge was a much-needed project. After frequent flooding, the deck of the bridge was raised by 8 feet (2.5 metres) in 1896. The approach on the Wilberforce side of the river was also modified to allow greater ease of access to the bridge for horse-drawn drays. The original bridge approach on the Windsor side is believed to have been along Old Bridge Street (current name), before turning left to run parallel to the river. The current approach alignment through Thompson Square was established in 1934 to allow cars to negotiate the steep slope up into the town.



Figure 2.9: A painting of Green Hills from 1809

Source: Jack, I. 2010, Macquarie's Towns, Heritage Council of NSW, p37.



Figure 2.10: 'View of Windsor' as drawn by J. Lycett

Source: Jack, I. 2010, Macquarie's Towns, Heritage Council of NSW, p28.



Figure 2.11: Windsor in 1831

Source: Jack, I. 2010, Macquarie's Towns, Heritage Council of NSW, p41.

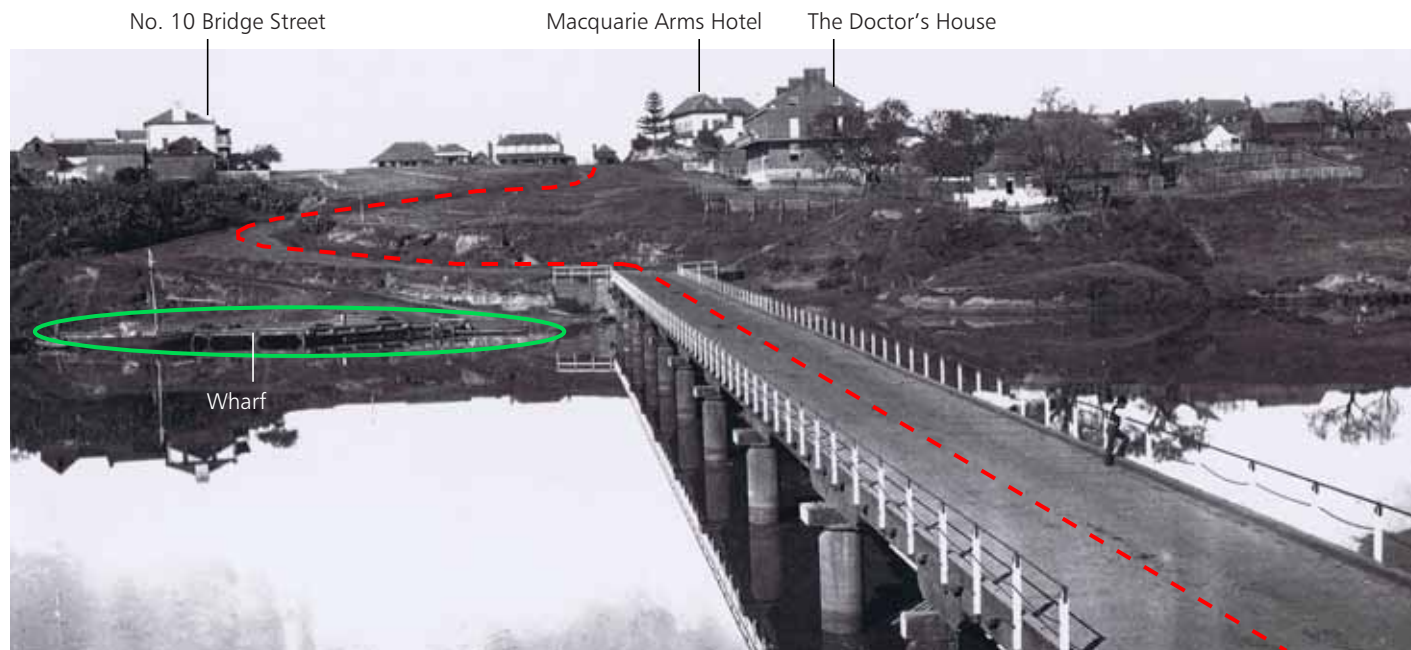


Figure 2.12: Looking across Windsor Bridge to the township of Windsor 1879

Source: Nichols. M, 2004 Hawkesbury Pictorial History.

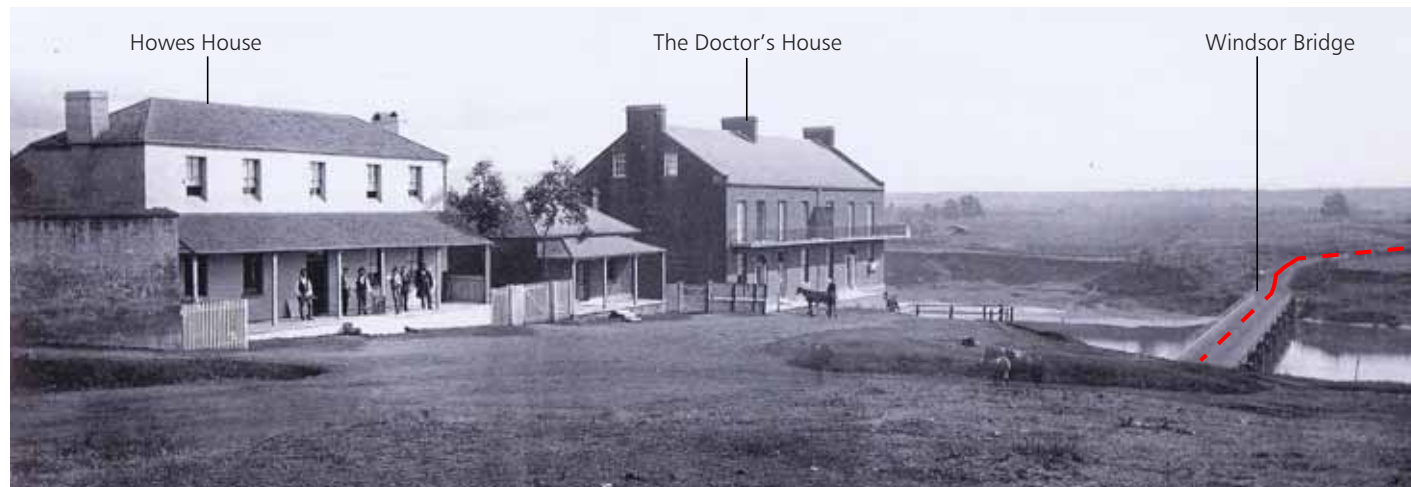


Figure 2.13: View of Thompson Square 1879

Source: Nichols. M, 2004 Hawkesbury Pictorial History.



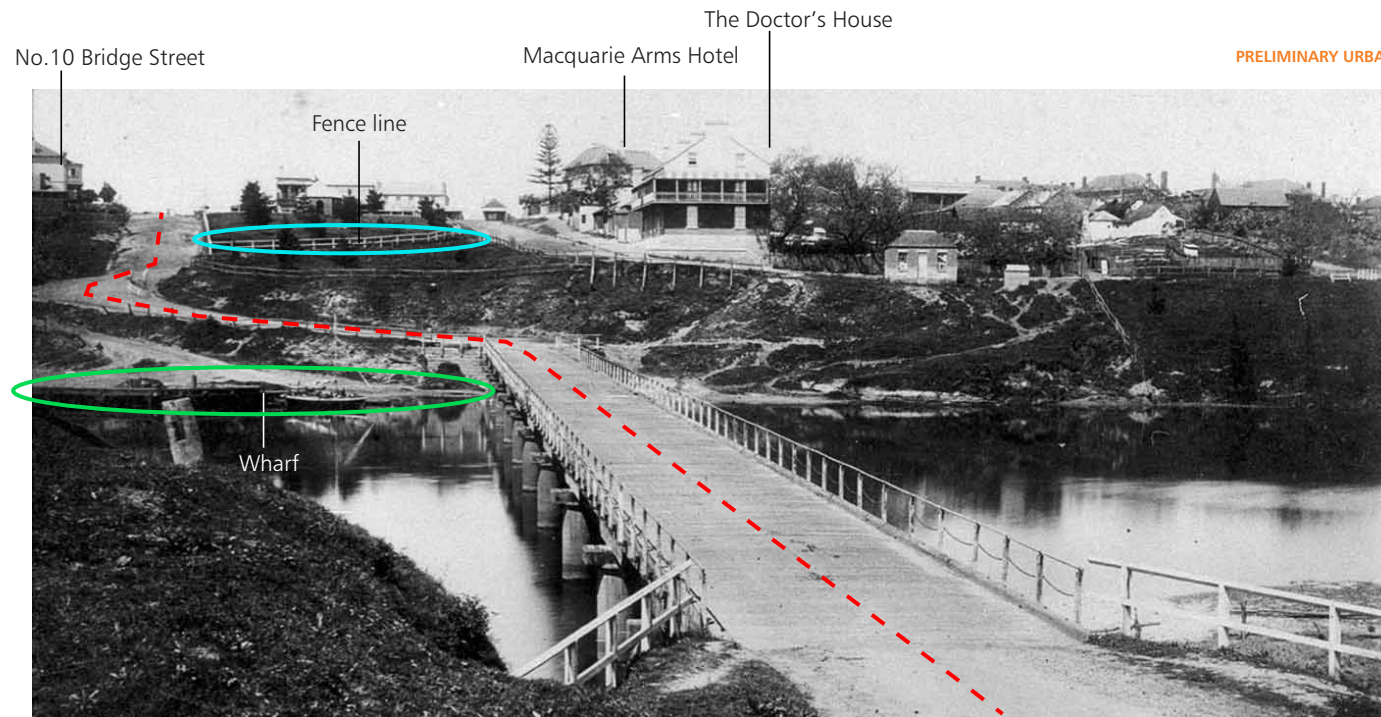


Figure 2.14: Windsor c1888

Source: State Library of NSW.



Figure 2.15: Windsor 2011

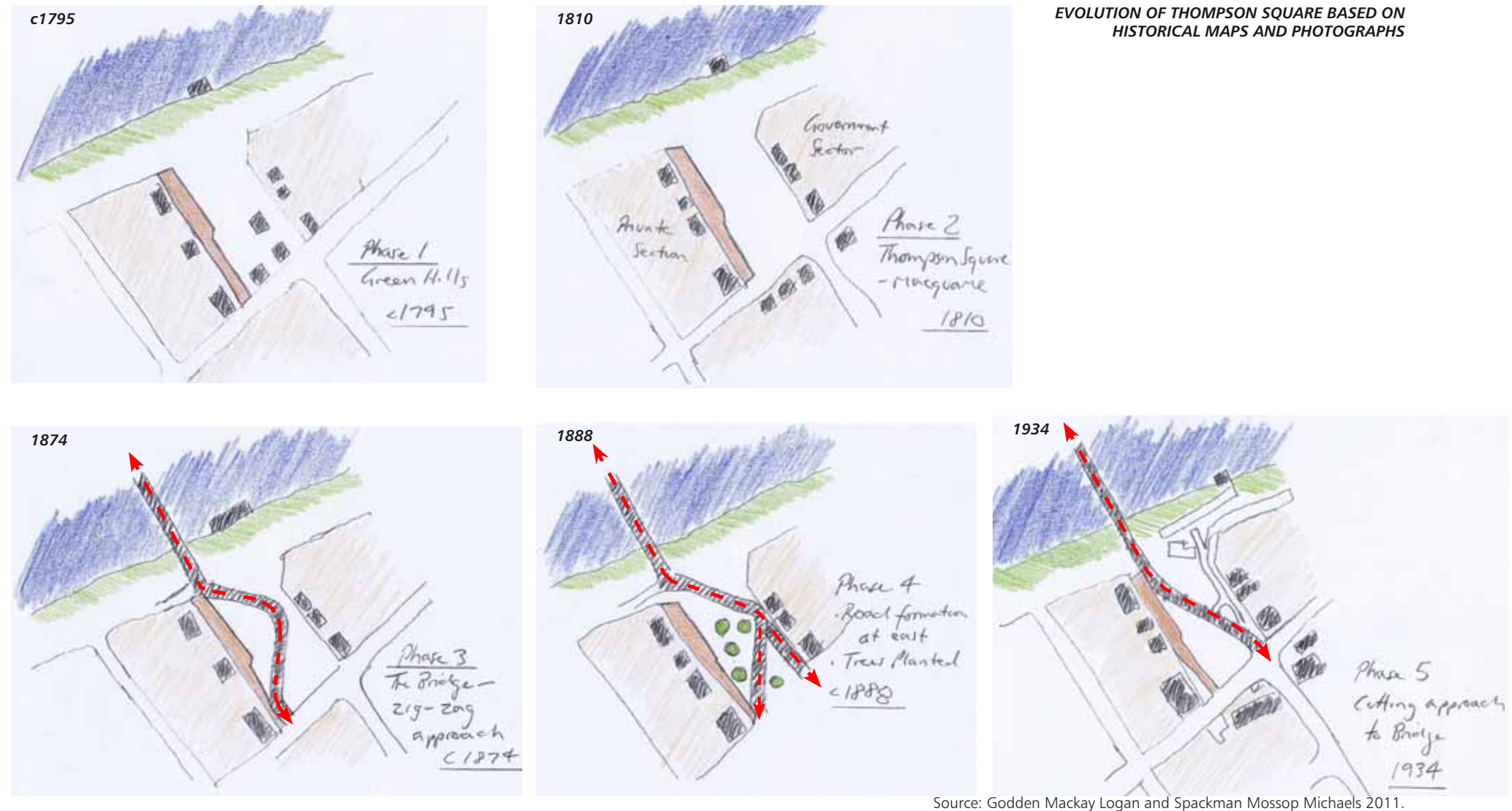


Figure 2.16: Evolution of Thompson Square





Figure 2.17: Opening of the New Bridge Over the Hawkesbury, at Windsor, NSW 1874

Source: State Library of Victoria.

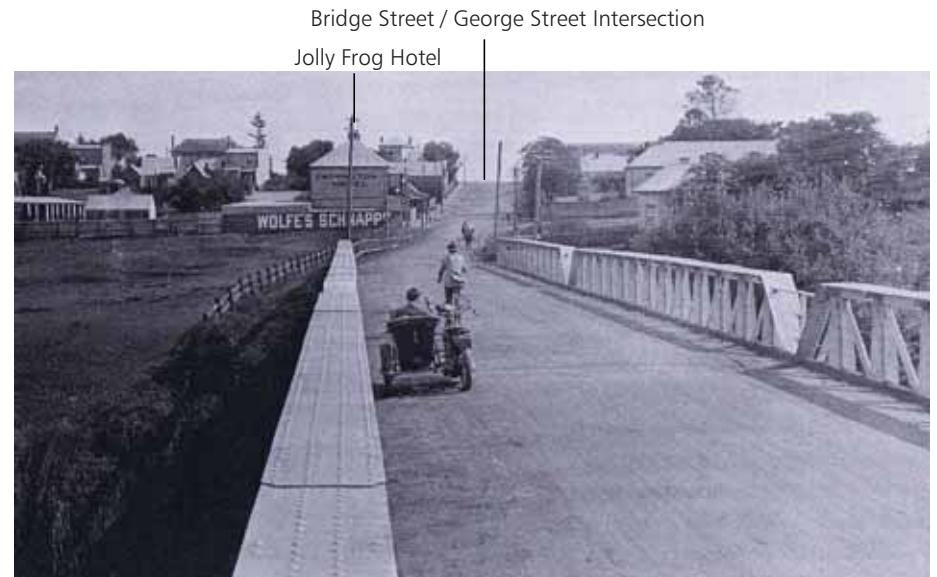


Figure 2.19: Approach to Windsor - Bridge Street from South Creek circa 1920s

Source: Nichols. M, 2004 Hawkesbury Pictorial History.



Figure 2.18: Windsor Bridge c1888, photographed by James Mills

Source: State Library of NSW.



Figure 2.20: View of The Terrace 1928

Source: Nichols. M, 2004 Hawkesbury Pictorial History.



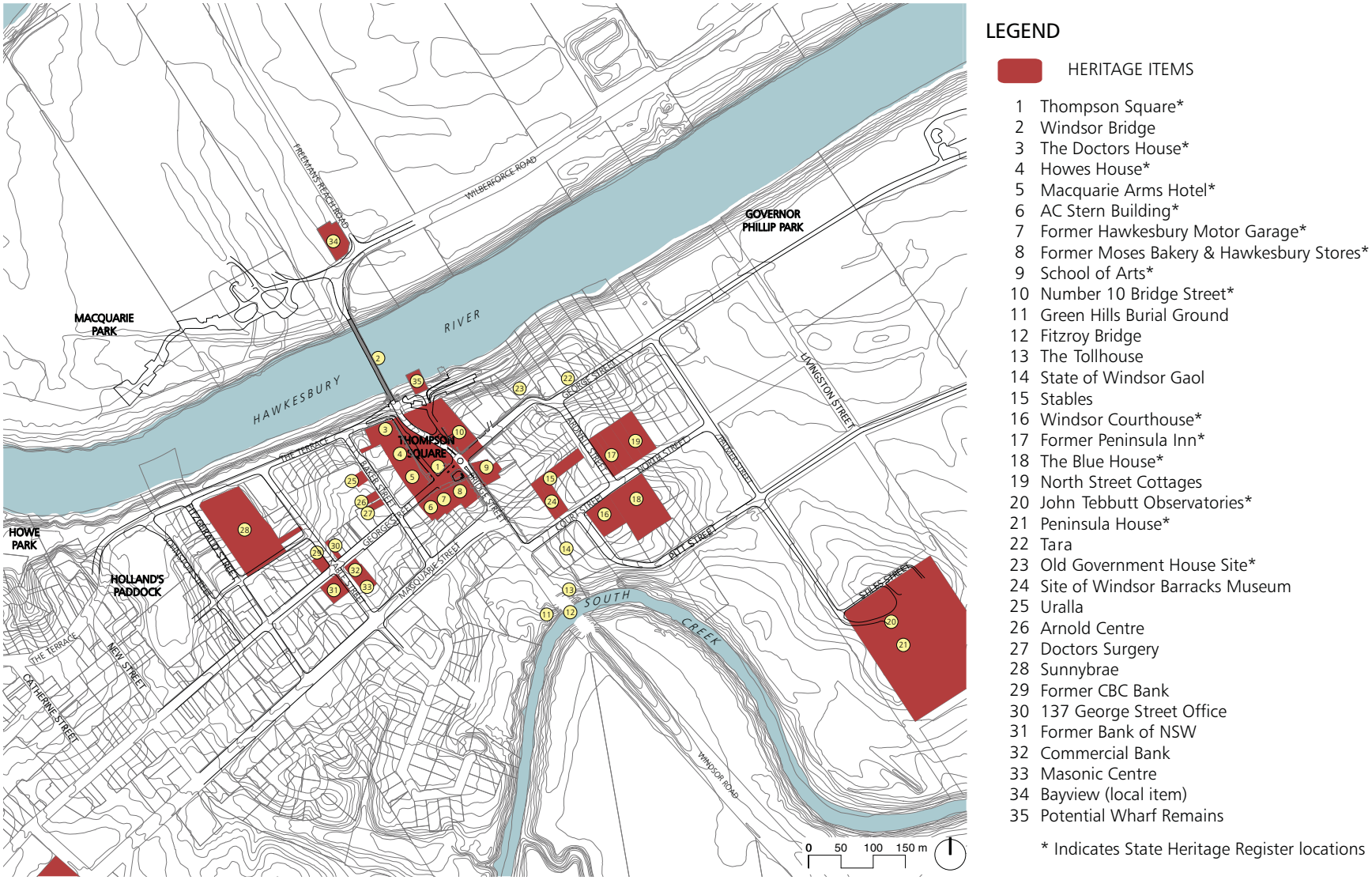


Figure 2.21: Windsor heritage listings.

WINDSOR AND WINDSOR BRIDGE TIMELINE					
1795	1810	1814	1874	1896	1934
Green Hills settlement established	Macquarie Town Plan	Windsor Wharf reconstructed	Low level bridge constructed	Bridge deck raised, bridge approach via Old Bridge Street	Current bridge approach established

Thompson Square is a State significant conservation area, listed on the State Heritage Register (SHR). It is listed for its significance as one of the oldest intact public squares in Australia and its ability to demonstrate the achievements of Governor Macquarie in town planning. The square and most of the buildings facing the square, including opposite on George Street, are protected under a blanket SHR listing for the conservation area. Most of the buildings surround the square are also listed separately on the SHR. Historical archaeological sites are also protected by the listing.

Other items of State heritage significance in Windsor include Tebbutt's Observatory and Peninsula House, which are located together on Palmer Street, southeast of the centre of town. The observatory, which comprises two buildings constructed in 1864 and 1879 by eminent local astronomer John Tebbutt, and the house, which was built by Tebbutt's father in 1845, are listed on the SHR under a single listing. Tebbutt's Observatory and Peninsula House are located on a rise with clear views north over the floodplains to the Hawkesbury River.

## 2.12 BUILT FORM OF WINDSOR

The town of Windsor is a typical Macquarie-era grid pattern, overlaid over a distinct topography that provides its picturesque qualities. The characteristic ridge street forms the High Street and is crossed by a regular pattern of steep secondary streets including Old Bridge Street and Thompson Square that terminate with views to the river. Uniquely, Windsor also has a foreshore street named The Terrace, with properties addressing the riverfront and Thompson Square, a distinctly urban open space located at the gateway to the town, connecting the river and main street.

## 2.13 CULTURAL AND SCENIC VALUES

Windsor Bridge is a significant part of the historical development and form of Windsor and the surrounding area. The bridge, which was assessed as being of State significance in the RTA Section 170 Heritage Register, has a high level of historical, technical, aesthetic and social value relating to it being the earliest extant bridge crossing of the Hawkesbury River, the early use of concrete in its 1922 extension, and its contribution to the identity of the local area.

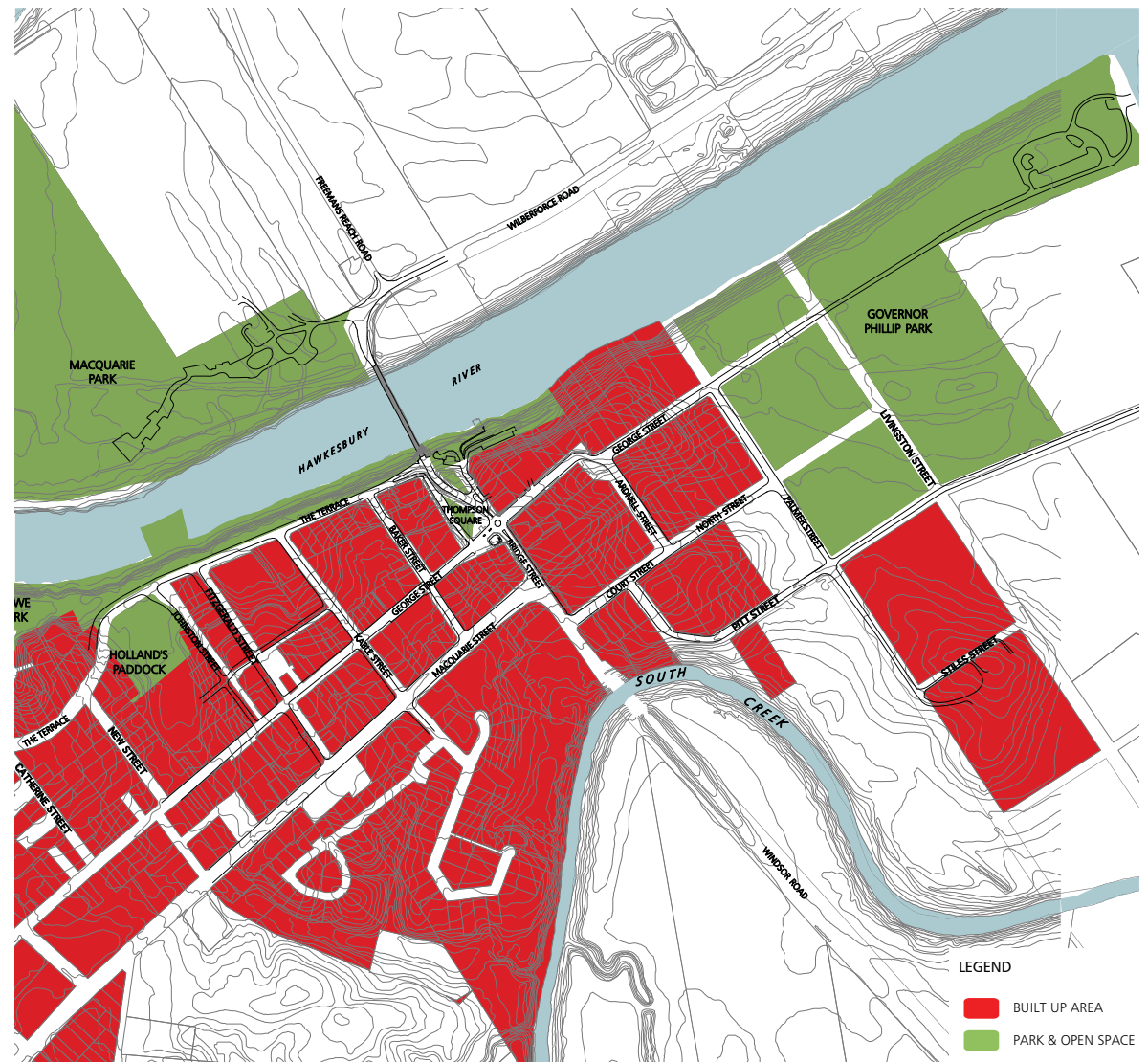


Figure 2.22: Built form of Windsor.



Its character has always been that of a low-lying bridge with minimal railings. In views of Thompson Square and Windsor from the northern side of the river, the bridge is an unobtrusive element in the landscape that contributes to the town's picturesque setting.

## 2.14 PARKS AND OPEN SPACE

### Thompson Square

Thompson Square was laid out as a public square by Governor Macquarie in January 1811 over the existing centre of the village of Green Hills. A collection of buildings sprung up around the square including hotels, a doctor's house and a number of shops. The construction of the wharf and approach in 1814 brought about the first record of changes to the Square, which included alterations to the river bank slope and installation of a turning area for carts at the wharf. Construction of a drain or drains through the centre of the Square was also undertaken at this time.

In 1874 the erection of the Windsor Bridge raised the approach above the wharf and altered the line of Bridge Street through the northwest corner of the square. The current approach road, which cuts through Thompson Square, was constructed in 1934. The works included cutting and infilling within the square to reduce the steepness of the road up into town. These works significantly altered the character of the square and remain in place today.

A refurbishment of Thompson Square was completed to celebrate the Bicentenary of the European settlement at Sydney Cove in 1988 (refer to figures 2.24 through 2.29). The memorial includes an anchor, symbolising the river trade between the productive farmlands of the Hawkesbury and Sydney on which the colony relied during the early days of the settlement.

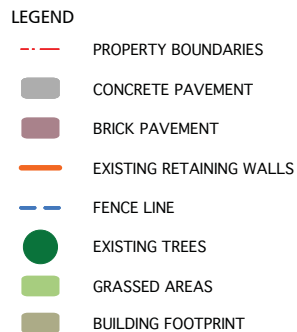


Figure 2.23: Thompson Square Park and open space area.



Figure 2.24: The intersection of Bridge Street and George Street looking southwest.



Figure 2.25: The southwestern edge of Thompson Square looking southeast.





Figure 2.26: Bridge Street cutting diagonally across Thompson Square.



Figure 2.27: The northeastern edge of Thompson Square looking southeast from Old Bridge Street





Figure 2.28: Thompson Square looking north from the corner of George Street and The Terrace.



Figure 2.29: Thompson Square looking northeast from the top of the cutting on Bridge Street.

**Governor Phillip Park**

This is a linear park with broad grassed banks, club house, boat launching ramp, car parking, playground, picnic and barbecue area and fenced in paddocks that serve as car parking during major events.

**Windsor Wharf Reserve**

This reserve contains a wharf and small ramp as well as an adjoining park and car parking facilities.

**Howe Park**

Howe park is a linear park beginning at Bridge Street to the east and adjoining Deerubbin Park in the west. The park has seating and picnic facilities.

**Deerubbin Park**

This park continues north along the Hawkesbury from Howe Park and stretches back to Cornwallis Road. It comprises of a number of sports fields, club house and open grassed areas (*Note: not shown on map*).

**Macquarie Park**

Macquarie Park with its broad sandy beaches, has been used for well over 100 years as a picnic spot but has had a chequered history due to the many floods that have damaged the area. Today a refurbished Macquarie Park House (built 1930) provides a café and seafood restaurant for visitors and the riverbanks have been replanted with stands of trees to provide pleasant picnic sites and grassy areas of recreational value.

**Holland's Paddock**

This open grassed park, with large established trees, is subject to flooding.

**McQuade Park**

McQuade Park includes sports grounds and childrens play ground. A section of McQuade Park has been annexed to form Memorial Park an area containing memorials dating from 1903 that commemorate those that served in the Boer War and in World War I and II (*Note: not shown on map*).

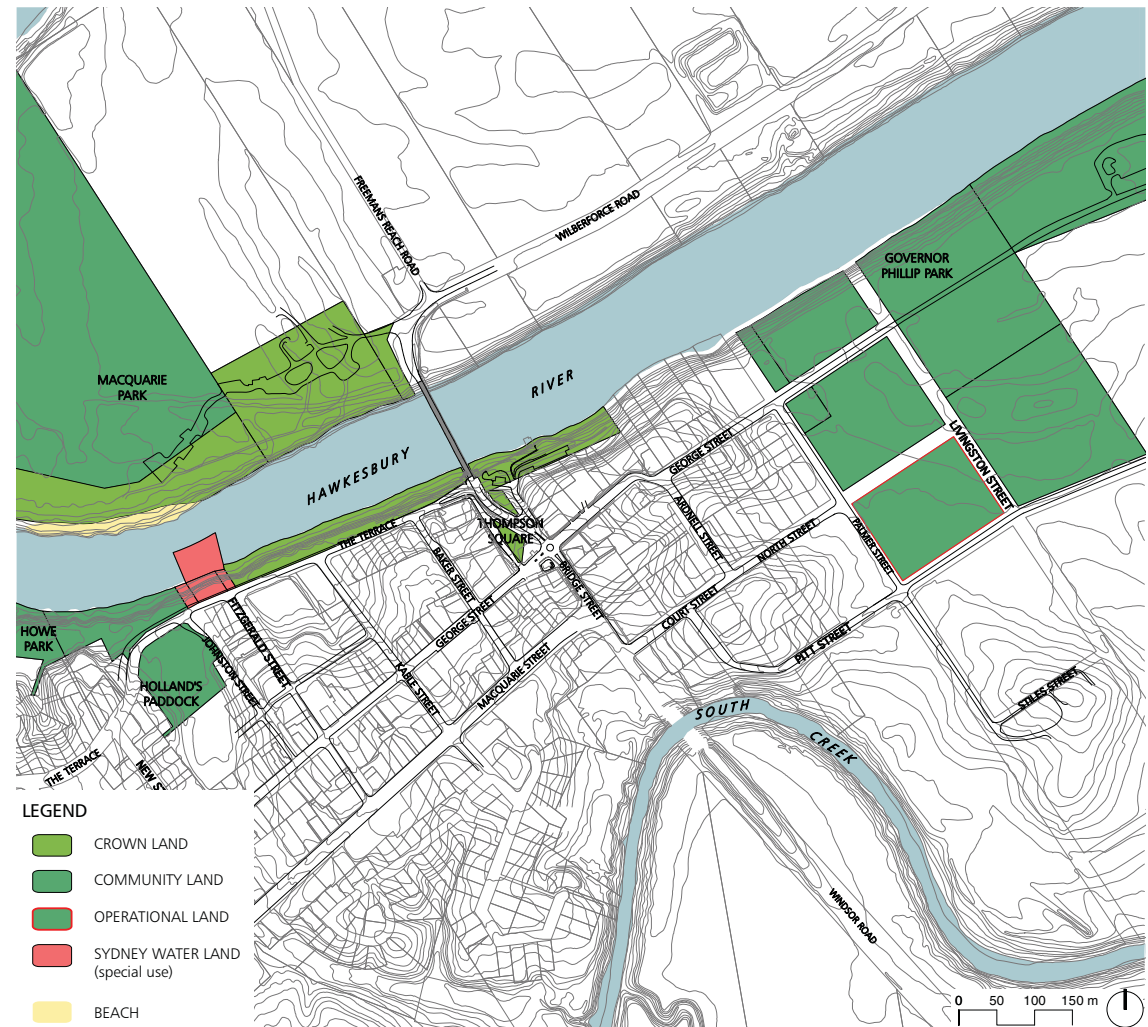


Figure 2.30: Local area parks and open space



### Hawkesbury River Recreation

The river trade on the Hawkesbury River was of great significance to the early growth of Sydney and played an essential role in the lives of settlers along the river for 150 years. Dotted with secluded river communities, the Hawkesbury River is navigable for over 100 kilometres with 1100 kilometres of foreshore fringe and is surrounded by National Parks. Today a variety of water based activities take place along the Hawkesbury River including:

- Hawkesbury River Canoe Classic - This is an 111 kilometre overnight race from Windsor Bridge to Brooklyn.
- Bridge to Bridge - The world's longest one-way powerboat race. Twice a year, November and May, these world renowned water ski and jet boat races takes place, attracting contestants from all over the world to compete in races that finish at the Windsor Bridge.
- Wakeboarding.
- River Cruises.
- House Boats.
- Riverboat Postman.
- Fishing.

### Cycleway Networks

There are a number of local cycle routes in Windsor that connect to Bridge Street and Thompson Square. The primary north-south connection is an on road cycleway along Windsor Road, Bridge Street across the Hawkesbury River connecting to Wilberforce Road.

The Terrace and Macquarie Street provide east-west access through Windsor. The Terrace is an on road cycleway along a low vehicular traffic route. The route along Macquarie Street is an off road cycleway along the southwest side of the street between Windsor Road and Hawkesbury Valley Way. Both of these routes provide access into the Windsor Town Centre.

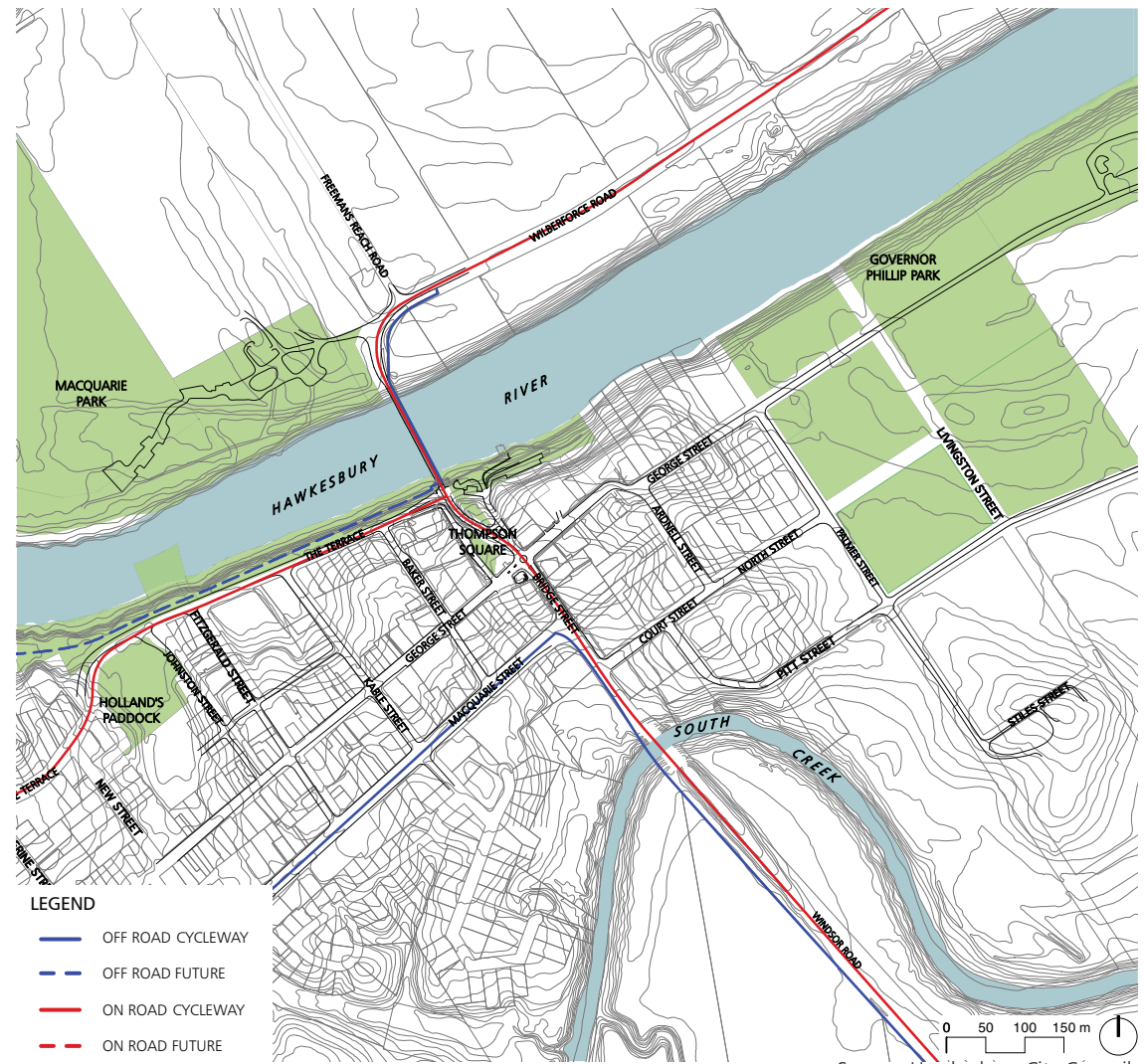


Figure 2.31: Existing and proposed cycleway network



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**RTA PLANNING & GUIDELINES**

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### 3. RTA PLANNING & GUIDELINES

This review has been prepared in accordance with the provisions contained in relevant RTA policies and guidelines including the following:

#### ***Beyond the Pavement***

The RTA's urban design policy, procedures and design principles outlines urban design principles. Those relevant to this review are as follows:

- Contributing to urban structure and revitalisation.
- Fitting into the urban fabric.
- Connecting modes and communities.
- Fitting within the landform.
- Responding to natural pattern.
- Incorporating heritage and cultural contexts.
- Designing an experience in movement.
- Creating self-explaining road environments.
- Achieving integrated and minimal maintenance design.

#### ***Bridge Aesthetics***

The following bridge design values are important considerations underlying the assessment and design process:

- Commitment to aesthetics.
- Context sensitive design.
- Comprehensive design process.
- Collaboration in the design team.
- Cost and aesthetics can be complementary.

#### ***Landscape Guidelines***

The following landscape guidelines are important considerations for the design process:

- Landscape should be safe.
- Landscape should be integrated into the project and the built and natural fabric.
- Landscape should be ecologically sound.
- Road landscape should add character and value to the built environment.
- Landscape should be cost effective.

#### ***Heritage Guidelines***

The RTA's heritage guidelines were prepared to ensure that the RTA identifies and takes appropriate action in relation to all heritage items which it manages and/or affects. Guidelines relevant to this review include:

- RTA has responsibility for the management of its heritage assets.
- Where replacement of heritage bridges are proposed, a comprehensive range of options should be considered.
- Minimum standards of maintenance and repair should be maintained for heritage assets.
- The community should be consulted regarding works that may affect heritage places.
- RTA has the responsibility to assess the environmental impacts of its projects, including heritage impacts.



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## DESCRIPTION OF BRIDGE CROSSING OPTIONS



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## 4. DESCRIPTION OF BRIDGE CROSSING OPTIONS

### 4.1 OVERVIEW

Following the announcement of the project by the NSW Government in June 2008, the RTA began to investigate the condition of the existing bridge and considered nine options to replace the existing bridge, as illustrated in Figure 4.1. A stakeholder workshop involving the RTA and representatives from Hawkesbury City Council, NSW Maritime, Heritage Branch of the Department of Planning and the Government Architects Office of the Department of Commerce was held in September 2009. The aim of the workshop was to review the nine options for Windsor Bridge. The following issues were considered for each of the options during the stakeholder workshop:

- Heritage and character of the local area.
- Local community needs such as pedestrian and cyclist connections, recreational space, loss of business and increased noise and pollution.
- Traffic and transport issues.
- Flood levels and flooding.
- Safety for motorists and pedestrians approaching and crossing the bridge.
- Cost effectiveness.

After the workshop the RTA published all nine options and descriptions of what each of these options generally involved. These descriptions, were updated by the RTA in June 2011 and are included on the following pages.



Figure 4.1: The nine options identified to replace the existing bridge (July 2009).

OPTIONS CONSIDERED								
OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 5	OPTION 6	OPTION 7	OPTION 8	OPTION 9
Downstream of existing bridge (High Level)	Downstream of existing bridge (Low Level)	Upstream of existing bridge (High Level)	Baker Street - upstream of existing bridge	Kable Street - from Windsor Road along Macquarie Street	Palmer Street	Court Street	Pitt Town Road	Rehabilitate the existing bridge

**Option 1 – downstream high level bridge**

Option 1 would:

- Provide a new three lane crossing located 35 metres downstream of the existing bridge along the alignment of Old Bridge Street.
- Be at a height to accommodate a 1-in-5 year flood event.
- Maintain the roundabout at George Street and establish a roundabout at the intersection of Freemans Reach Road and Wilberforce Road.
- Provide a 4.5 metre clearance for passage along The Terrace. This would allow access for light vehicles and service vehicles, including garbage trucks and coaches.
- Provide pedestrian access across the bridge and along the southern bank.
- Remove the current road through Thompson Square.

**Option 2 – downstream low level bridge**

Option 2 would:

- Provide a new three lane crossing located 35 metres downstream of the existing bridge along the alignment of Old Bridge Street.
- Be at a height to accommodate a 1-in-5 year flood event.
- Maintain the roundabout at George Street and establish a roundabout at the intersection of Freemans Reach Road and Wilberforce Road.
- Provide a 3.5 metre clearance for passage along The Terrace. This would allow access for light vehicles only.
- Provide pedestrian access across the bridge and along the southern bank.
- Remove the current road through Thompson Square.

**Option 3 – bridge immediately upstream of the existing bridge**

Option 3 would:

- Provide a new two or three lane crossing about 10 metres upstream of the existing bridge, primarily following the existing alignment through Thompson Square.
- Be at a height to accommodate a 1-in-5 year flood event.
- Keep the roundabout at George Street and the current alignment on Bridge Street.
- Create a curved bridge which would meet the existing alignment of Wilberforce Road.
- Provide pedestrian access across the bridge and along the southern bank.
- Provide sufficient clearance for passage along The Terrace which would allow access for light vehicles and service vehicles, including garbage trucks and coaches.
- Would create construction issues including potentially closing the bridge for a short period of time.

**Option 4 – Baker Street**

Option 4 would:

- Provide a new two or three lane crossing located about 70 metres upstream of the existing bridge, following the alignment of Baker Street in Windsor.
- Construct a traffic signalled intersection at Macquarie Street and Baker Street to allow traffic to travel along Baker Street crossing the new bridge before turning right through Macquarie Park and aligning with the existing Wilberforce Road. In order to provide the necessary lane width, parking along Baker Street would be removed.
- Provide access in 1-in-5 year flood event.
- Remove pedestrian and vehicle access along The Terrace at Baker Street or requires the installation of a controlled intersection.
- Require traffic control facilities at the southern entrance to the bridge to control traffic and pedestrian access along the southern bank of the river.
- Provide pedestrian access across the bridge.

**Option 5 – Kable Street**

Option 5 would:

- Provide a new two lane crossing located about 170 metres upstream of the existing bridge following the alignment of Kable Street in Windsor.
- Provide access in a 1-in-5 year flood event level.
- Remove pedestrian and vehicle access along The Terrace at Kable Street or installing a controlled intersection.
- Reconstruct the traffic signalled intersection at Macquarie Street and Kable Street to provide access for traffic to travel along Kable Street then cross the new bridge before turning right through Macquarie Park and aligning with the existing Wilberforce Road. In order to provide the necessary lane width, parking along Kable Street would be removed.
- Require traffic control facilities at the southern entrance to the bridge to provide traffic control and pedestrian access along the southern bank of the river.
- Provide pedestrian access across the bridge.

**Option 6 – Palmer Street**

Option 6 would:

- Provide a new two lane crossing located about 400 metres downstream of the existing bridge.
- Create a minor bypass of the Windsor town centre running on the edge of the township's urban/rural interface.
- Establish a T-intersection on Wilberforce Road on the northern side of the river.



- Create a new signalised T-intersection on Windsor Road north of Pitt Town Road, then create a new road which includes a new bridge crossing South Creek and road travelling parallel to Palmer Street.
- Require building a new 1.2 km length of approach road to the crossing, part of which would cut through the western edge of Governor Phillip Park.
- Provide access in a 1-in-5 year flood event.
- Remove access to George Street and Court/North Street, however access to Palmer Street would be maintained.
- Provide pedestrian access across the bridge and along the southern bank into Windsor.

#### **Option 7 – Court/North Street onto Palmer Street**

Option 7 would:

- Provide a new two lane crossing located about 400 metres downstream of the existing bridge.
- Create a minor bypass of the Windsor town centre with a new signalised intersection at the corner of Windsor Road and North/Court Street which would then run along North/Court Street before turning left down Palmer Street.
- Create a new crossing at the western edge of Governor Phillip Park leading onto the bridge with a new T-intersection on Wilberforce Road. North/Court Street would be sufficiently wide enough to support the realignment; however, parking may need to be restricted.
- Provide access in a 1-in-5 year flood event.
- Remove access to George Street from Palmer Street.
- Provide pedestrian access across the bridge and along the southern bank into Windsor.

#### **Option 8 – Pitt Town Road**

Option 8 would:

- Provide a new two lane crossing at Pitt Town, about six kilometres downstream of the existing bridge.
- Bypass the township of Windsor and require diverting traffic to turn down Pitt Town Road at the intersection with Windsor Road. Traffic would travel along the existing Pitt Town Road onto Bathurst Street and Punt Road.
- Provide a new viaduct or low embankment extending Punt Road across Bardenarang Creek and the adjacent floodplain to the Hawkesbury River.
- Cross the river to intersect with King Road at a T-intersection on the northern bank of the river. Traffic would then turn left (westbound) into King Road and intersect with Wilberforce/Singleton Road at the existing T-intersection at Wilberforce.

- Require a 9 km detour of the town of Windsor.
- Not provide pedestrian access given the isolation of the crossing from populated areas.
- Provide access in a 1-in-5 year flood event.

#### **Option 9 – refurbish the existing bridge**

Substantial works would be required to refurbish the existing bridge. The current Windsor Bridge has the following structural issues:

- Spalling of girders.
- Graphitisation of cast iron piers.

To refurbish the existing bridge two methods were considered,

#### **Option 9A**

Option 9A would:

- Not require the removal or replacing of the existing bridge deck.
- Retain the width of the traffic lanes as per the current bridge.
- Replace the bridge joints, concrete the bridge deck, install deck drainage and beams and add additional steel girders between the existing concrete beams. The cast iron piers would require strengthening by concrete encasement.
- Require closing the existing bridge for six months during the refurbishment.
- Not improve the flood immunity of the bridge.

#### **Option 9B**

This option would:

- Remove and replace the existing bridge deck.
- Remove and dispose of the existing super structure including the bridge deck. The rubble in the existing cast iron casings would be drilled out and replaced with a reinforced concrete infill to create permanently cased bored piles.
- Refurbish the bridge super-structure to include a head stock, beams and decking that would accommodate a wider road platform.
- Require closing the bridge for 12 months during the refurbishment.
- Not improve the flood immunity of the bridge.

## 4.2 OPTIONS SELECTED FOR URBAN DESIGN & HERITAGE REVIEW

Three of the options discussed in Section 4.1 were presented to the NSW Heritage Council in 2010, specifically Options 1, 3 and 6. The Heritage Council stated a preference for Option 6, a bypass east of the town, and indicated that Options 1 and 3 could not be supported due to the heritage impacts. An initial review of Option 6 identified adverse heritage impacts on the setting of Tebbutt's Observatory and impacts on Windsor itself by removing the historical entry point into the town as well as the requirement for extensive road embankment works to achieve the desired flood immunity.

Based on the information gathered for the nine alternatives through the stakeholder workshop and other RTA investigations, the RTA selected Options 1 and 3 for further review and decided not to pursue Option 6 or other bypass options.

Within Option 1 and 3 two potential heights for the bridge crossings were identified, an intermediate level and a high level. Both of these levels exceed the current bridge and approach roads in order to provide an appropriate level of flood immunity. This review generally takes into consideration the additional height above the existing condition and provides general observations on impacts that might occur due increased size of the crossings. Specific differences in impacts between the intermediate and high level bridge options are generally referred to in Chapter 6 of this review and will need to be evaluated by the RTA, in detail, during the next phase of the project.

This section provides a more detailed review that will provide a better understanding of potential issues associated with each option prior to the RTA selecting a preferred alternative. The review is based on the general alignment of strategic concept designs (indicative only) developed by the RTA, as illustrated on Figures 4.3 and Figure 4.4.

The two selected options being reviewed in this section are as follows:

### ***Option 1 - Downstream of existing bridge***

Provide a new three lane crossing located 35 metres downstream of the existing bridge along the alignment of Old Bridge Street.

### ***Option 3 - Upstream of existing bridge***

Provide a new two or three lane crossing about 10 metres upstream of the existing bridge, primarily following the existing alignment of Bridge Street through Thompson Square.



Figure 4.2: Selected Options 1 & 3.

### WINDSOR BRIDGE OPTION 1 REVIEW

This section provides a review of the strategic concept design for Option 1 and an overview of the urban design and heritage issues which relate to this option.

#### Description of the Bridge Crossing

- The bridge is set on a slightly skewed alignment across the river to facilitate the connection to a new intersection at Wilberforce and Freemans Reach Roads.
- The bridge provides for a two or three lane road configuration.
- The bridge height is elevated above the current bridge height to achieve a 1 in 5 year flood event immunity.
- A shared pedestrian and cyclist path is provided across the bridge.
- The George and Bridge Streets intersection is retained with potential for traffic signals to be installed.
- The 4 way intersection of the bridge approach road, Wilberforce Road, Freemans Reach Road and the Macquarie Park access road, could be configured as a signalised intersection.

#### Overview of the Urban Design Issues

- The alignment follows the Old Bridge Street alignment parallel to the northern edge of Thompson Square, utilising existing paved areas.
- The alignment impacts on access to three properties on Old Bridge Street on the northern side of Thompson Square.
- The increased height and width of the bridge approach road and abutment will have physical and visual impacts on Thompson Square.
- The bridge alignment is not completely parallel with the alignment of the old bridge nor perpendicular with the river.
- Some car parking spaces will be removed from the lower section of Old Bridge Street.
- A number of mature trees will be removed on the northern side of Thompson Square.
- The new alignment would provide a direct open space connection from George Street and the Terrace down to the river foreshore.

- The current Bridge Street alignment would be closed and incorporated into the parkland of Thompson Square.
- Vehicular, bicycle and pedestrian access will be retained to the wharf and adjoining foreshore areas under the new bridge.
- The bridge approach road and intersection at Freemans Reach and Wilberforce Roads will considerably impact on the turf farm adjacent to the northern bank of the river.
- The straighter, higher and flatter alignment of the bridge crossing will have the potential to increase vehicle speeds and potentially noise, within Thompson Square and the George Street precinct.
- A faster and more direct route may impact on the commercial operations of the retail precinct on George Street.

#### Overview of the Heritage Issues

- The alignment through Thompson Square retains the historical entry point into town, albeit with increased road size and traffic volumes.
- The alignment responds to the rectilinear form of Thompson Square.
- A new bridge and approach road would alter the character of the space by dominating the square, creating a strong visual separation between the open space and its important surrounding buildings.
- The bridge alignment allows views of Thompson Square from across the river to be retained.
- While filling in the existing cutting would partially reinstate the original form of Thompson Square, the bridge and approach road through the square would continue the separation between the buildings and public space of the square.
- The approach road in Thompson Square impacts on heritage building curtilages adjacent to the north eastern corner of the Square.
- The elevated approach road, including embankments and barriers is not consistent with the previous road alignments which have been either at grade or in cutting.
- Potential impacts on archaeological sites, likely to be of high significance, are possible both within Thompson Square and on the southern and northern foreshores of the river.



Figure 4.3: Option 1 - Strategic concept design of three-lane bridge



### WINDSOR BRIDGE OPTION 3 REVIEW

This section provides a review of the strategic concept design for Option 3 and an overview of the urban design and heritage issues which relate to this option.

#### Description of the Bridge Crossing

- The bridge is set on a curved alignment upstream of the existing bridge.
- The bridge provides for a two or three lane road configuration.
- The bridge height is elevated above the current bridge height to achieve a 1 in 5 year flood event immunity.
- A shared pedestrian and cyclist path is provided across the bridge.
- The bridge approach road through Thompson Square remains on the current bridge approach road alignment, albeit at a raised level.
- The George and Bridge Streets intersection is retained with potential for traffic signals to be installed.
- A 'T' intersection is provided at Freemans Reach Road near the point where the bridge approach road connects into Wilberforce Road.
- Access is also provided to Macquarie Park at a 'T' intersection closer to the bridge.

#### Overview of the Urban Design Issues

- The alignment follows the current Bridge Street alignment, diagonally across Thompson Square and therefore partially retains the current configuration of the Square.
- The bridge alignment is curved and not perpendicular with the river, contrasting with the alignment of the old bridge and the Macquarie street grid of Windsor.
- The elevated bridge height will require the new alignment through Thompson Square to be raised above the original Bridge Street level.
- The increased height and width of the bridge approach road and abutment will have physical and visual impacts on Thompson Square.

- The alignment will maintain the division of Thompson Square restricting physical and visual access between George Street and the river foreshore.
- The current Old Bridge Street alignment would remain unchanged.
- A number of mature trees will be removed through the middle of Thompson Square.
- Vehicular, bicycle and pedestrian access will be retained to the wharf and adjoining foreshore areas via Old Bridge Street.
- The bridge approach road and intersection at Freemans Reach and Wilberforce Roads will have limited impact on the turf farm adjacent to the northern bank of the river.
- The sweeping curve, and the higher and flatter alignment of the bridge crossing will have the potential to increase vehicle speeds and potentially noise, within Thompson Square and the George Street precinct.
- A faster route may impact on the commercial operations of the retail precinct on George Street.

#### Overview of the Heritage Issues

- The proposed alignment and its height perpetuates and compounds the existing adverse impact of the diagonal cutting across Thompson Square.
- The bridge and approach road, with its elevated height, will dominate Thompson Square, obstructing visual connections across the open space and to its significant surrounding buildings and alter the character of this significant historical town square to that of a busy thoroughfare.
- The height above ground level and at grade would have a severe impact on the curtilage and setting of the Doctor's House, far greater than the existing cutting.
- The bridge and approach road would partially obstruct views of Thompson Square from across the river.
- The elevated approach road, including embankments and barriers is not consistent with the previous road alignments which have been either at grade or in cutting.
- The alignment could have an impact on historical archaeological sites likely to be of high significance within Thompson Square and on the southern and northern banks of the river.



Figure 4.4: Option 3 - Strategic concept design of two-lane bridge



## DRAFT URBAN DESIGN AND HERITAGE OBJECTIVES & PRINCIPLES

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## 5. URBAN DESIGN AND HERITAGE OBJECTIVES & PRINCIPLES

### 5.1 INTRODUCTION

The following draft urban design and heritage objectives and principles have been prepared to ensure that the bridge and approach roads are physically, visually and operationally integrated with the surrounding environment. Important areas in which these draft objectives and principles can directly influence the subsequent concept design phase are; reducing physical and visual impacts, improving connectivity, preserving heritage and having a positive effect on the community.

### 5.2 URBAN DESIGN AND HERITAGE OBJECTIVES & PRINCIPLES

These objectives and principles have been developed to provide guidance for the concept design and environmental assessment phase of this project. These objectives and principles reference the RTA's *Beyond the Pavement* urban design policy and associated guidelines, and are based on an understanding of the existing landscape and urban values of the area and the landscape and urban design issues that affect, or are affected by, the bridge and approach roads.

It is envisioned that these objectives and principles will provide a foundation for integrating good urban design practice into all aspects of the concept design development, and also inform the detailed design and construction phases of the project.

**Objective:** Develop an integrated concept design that fits sensitively with the existing qualities and characteristics of Windsor and its Hawkesbury River setting.

*Design principles:*

- Maintain the landmark qualities of a bridge crossing at Windsor.
- Minimise the physical footprint and scale of the bridge, approach roads and associated intersections.
- Ensure the design and character of the bridge and associated roadworks are well integrated with the adjoining built areas, open space, historic and natural settings, rather than being a dominant feature.
- Minimise negative physical impacts on parklands, open space, the river and other foreshore areas adjacent to the bridge.
- Design all road and bridge elements carefully to integrate and coordinate with adjoining elements and structures. Materials and details to be robust, low maintenance and suitable for its purpose and place.
- Minimise the intrusion of road-related elements (fencing and water quality control measures) on the local landscape.

**Objective:** Enhance the existing amenity, visual character and cultural landscapes of Thompson Square and Windsor.

*Design principles:*

- Redevelop any residual road space as parkland to be integrated within Thompson Square.
- Maximise opportunities to enhance the connection between Thompson Square and the commercial area around the intersection of George Street and Bridge Street.
- Enhance views of Thompson Square and its buildings to and from the bridge and approach roads on both sides of the river.
- Retain, and where possible improve, views to important landmarks in particular the Hawkesbury River, Thompson Square and the historic buildings around the Square.

**Objective:** Maintain the integrity of cultural and historic buildings, structures, elements and spaces of Windsor.

*Design principles:*

- Maintain the physical and visual integrity of State-significant items including historical buildings, public spaces and their curtilage, particularly in Thompson Square.
- Preserve the integrity of heritage items and areas of cultural importance to the local community.
- Minimise the impact on historical archaeological sites, particularly those associated with Thompson Square.
- Enhance the setting of Thompson Square and its buildings.
- Minimise the impact on Aboriginal heritage sites and their associated heritage values.
- Minimise or avoid alterations to heritage items, except where the removal of intrusive elements would have a positive impact on their heritage significance.

**Objective:** Improve connectivity for vehicles, pedestrians and cyclists.

*Design principles:*

- Provide safe, direct and obvious connections between the bridge and approach roads with the local road network in Windsor.
- Provide generous and direct cycle and pedestrian connections across the bridge and enhance the existing pedestrian and cycle networks along the approach roads.
- Consider opportunities for public transport throughout the project.
- Maintain and enhance connections to the existing river edge and adjoining open space network.

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## URBAN DESIGN AND HERITAGE REVIEW SUMMARY



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## 6. URBAN DESIGN AND HERITAGE REVIEW SUMMARY

### 6.1 OPPORTUNITIES TO REDUCE IMPACTS

Options 1 and 3 in their current form would have a significant adverse urban design and heritage impact on Thompson Square. Based on the urban design and heritage objectives and principles in the previous chapter, there are potential opportunities to reduce these impacts. The following is an initial list of design opportunities, which should be investigated in the subsequent planning and design phase of this project. These design opportunities would potentially:

- Assist in the reduction of the heritage impacts on Thompson Square and its significant buildings and spaces.
- Help maintain the critical importance of Thompson Square as a functioning town square.
- Reduce the visual impacts on Thompson Square and the surrounding areas.
- Better integrate the new bridge into the river setting.
- Improve the recreation qualities around the river foreshore and Thompson Square.
- Reduce the impacts of increased traffic speed and associated noise on the amenity of this area of the Windsor township.
- Reduce potential impacts on the retail area on George Street opposite Thompson Square.
- Improve access to private properties on Old Bridge Street.
- Reduce the impact on the turf farm and the adjoining roads on the northern foreshore.
- Potentially reduce the capital and recurrent cost of the new bridge and its approach roads.

The following range of potential design opportunities which should be considered in the next phase of this project represents an initial list of items for consideration and should be expanded to incorporate other measures as they are identified:

- Reduce the height of the bridge and approach roads to a lower level to better integrate the structures into the landscape of the river and on either side of the river, but particularly in Thompson Square, and yet retain the necessary flood immunity and access under the bridge at The Terrace.
- Reduce the width of the bridge and approach roads from 3 lanes to 2 lanes and design using minimum lane widths, to reduce the footprint of the road on the foreshore areas, particularly in Thompson Square.
- Retain the roundabout on George Street to control traffic speeds and resulting noise impacts.
- Reduce the footprint of the intersection at Wilberforce and Freemans Reach Roads to a roundabout of a similar size to the George and Bridge Streets roundabout in Windsor.
- Minimise the areas of pavement, walls and other hard elements in the design to improve the integration of the road into the area.
- Ensure that all areas of residual road reserve, which are surplus to need, are incorporated into the adjoining parklands as additional public open space.
- Investigate the provision of rear access to the properties on the northeastern side of Thompson Square to reduce the required width of the approach road.
- Develop a landscape master plan for Thompson Square and the immediate vicinity to maximise the opportunities to protect, interpret and reinforce the heritage values, improve the visual character of the new arrangements, improve the recreational opportunities and the overall amenity of the area.

- Develop a landscape master plan for the northern foreshore to incorporate residual land into Macquarie Park, improve pedestrian and cyclist access through the area and improve the character and amenity of the northern foreshore.
- Consider a long-term bypass option to cater for the growth of Windsor and the surrounding area. This may reduce the pressure on routes through Windsor and Thompson Square and the need to provide a higher and wider Windsor Bridge.

### 6.2 REVIEW SUMMARY

The background analysis material, the overview of the two identified options, the urban design and heritage objectives and principles, and the design opportunities in this review assists in providing the RTA with the basis for the development of a preferred option for the Windsor Bridge replacement project. The issues identified in this review and other associated documents, which affect each of the two selected bridge crossing options, need to be thoroughly considered in order to ensure that the preferred option, which is ultimately selected, provides a tangible benefit to both the community of Windsor and the wider community of NSW. The value of Windsor as an historic and vibrant township must be carefully considered in order to effect a lasting and positive legacy for the town and the adjoining area.





## REFERENCES AND BIBLIOGRAPHY

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## REFERENCES AND BIBLIOGRAPHY

### WINDSOR BRIDGE

Governments Architects Office, December 2009. ***Landscape and Visual Impact Assessment for Proposed Bridge Options at Windsor***, Stage 2 Draft Report.

Heritage Concepts, July 2008. ***Baseline Aboriginal Assessment (Draft), proposed replacement of the Hawkesbury River Bridge*** (RTA No. 415).

LesryK Environmental Consultants, July 2008. ***Flora and Fauna Assessment***, Windsor Bridge.

RTA, March 2010. ***Windsor Bridge Replacement*** Short List of Option Selection-Draft.

RTA, November 2010. Community Update, ***Windsor Bridge over the Hawkesbury River***.

RTA, November 2009. ***Windsor Bridge over the Hawkesbury River, Report on Community Consultation***.

RTA, July 2009. ***Community Update, Windsor Bridge over the Hawkesbury River***.

### RTA GUIDELINES

RTA, August 2009. ***Beyond the Pavement: RTA Urban Design Policy, Procedures & Design Principles***.

RTA, November 2003 ***Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW***.

RTA, March 2004. ***RTA Heritage Guidelines, Version 2***.

RTA, ***Landscape Guideline***: Landscape design and maintenance guidelines to improve the quality, safety and cost effectiveness of road corridor planting and seeding.

### HAWKESBURY CITY COUNCIL

Hawkesbury City Council, ***Hawkesbury Local Environmental Plan*** 2009.

Hawkesbury City Council, ***Community Strategic Plan, Shaping Our Future 2010-2030***.

Hawkesbury City Council, ***Draft Residential Land Strategy***.

Westbus, ***Windsor & Richmond Bus Guide*** October 2009.

Hawkesbury City Council, ***Hawkesbury District Bicycle Network*** 2005.

Hawkesbury City Council, ***Mobility Plan 2010, Bike Plan and Pedestrian Access and Mobility Plan***.

### OTHER SOURCES

Environmental Partnership / Hawkesbury City Council, ***Windsor Foreshore Parks Incorporating the Great River Walk*** Adopted Plan of Management 2009.

Jack. M, ***Macquarie's Towns, The Heritage Council of New South Wales, Parramatta*** 2010.

Nichols. M, ***Hawkesbury Pictorial History***, Kingsclear books 2004.

WMA Water, ***Proposed Replacement of Windsor Bridge, Hydraulic Assessment*** October 2010.



