

PI18/00018/A1

10 May 2018

The Hon Robert Brown MLC
Chair
Portfolio Committee No. 5 - Industry and Transport
Legislative Council
Parliament House
Macquarie Street
Sydney NSW 2000

Dear Mr Brown

Parliamentary Inquiry into the Windsor Bridge Replacement Project. Responses to Questions on Notice and Supplementary Questions

Please find enclosed Roads and Maritime Services' responses to the Questions taken on Notice and supplementary questions arising from the first day of hearings on 13 April 2018.

I would like to thank the Committee for the opportunity to make a presentation and hope that the information provided will assist in the Committee's deliberations.

If you require clarification please do not hesitate to contact me.

Yours sincerely

Ken Kanofski
Chief Executive

PORTFOLIO COMMITTEE NO.5 – INDUSTRY AND TRANSPORT

INQUIRY INTO THE WINDSOR BRIDGE REPLACEMENT PROJECT

Legislative Council

Responses to Questions on Notice

1. What other approach roads are below the 1 in 3 recurrence interval. (Referred to Windsor Road). Could you take it on notice and let us know at what locations Windsor Road floods?

The design of the replacement bridge at its northern end was determined by the existing level of the northern approach road. The design level of the road for the new replacement bridge is 9.8 metres; Wilberforce Road has levels ranging from 8.4 metres to 10.8 metres, the low point being 8.4 metres. Analysing flood data and working back to the level of the approach road, it was estimated that the recurrence interval was 1 in 3. The existing Windsor Bridge was estimated to have a recurrence interval of 1 in 2.

The three year average recurrence interval (ARI) flood event is not a typical event undertaken in flood modelling practice. In this case it was used to assess flood resilience levels where the replacement bridge meets the northern approach road.

Windsor Road between McGraths Hill and Fitzroy Bridge over South Creek crosses the South Creek floodplain and is therefore subject to flooding. It has a low point of 6.7 metres Australian Height Datum (AHD). The surrounding area is generally inaccessible during a 1-in-5 or 1-in-10 year flood event. Both existing approach roads, Windsor Road and Wilberforce Road, have sections of the road that are inaccessible in a 1-in-5 year flood event.

The Jim Anderson Bridge over South Creek (Windsor Flood Evacuation Route) offers an alternative route to section of Windsor Road and offers an immunity of up to the 1 in 100 year flood level of 17.3m AHD.

2. How much has been spent to date on the project? Can the Committee get an itemised account of where funds have been spent? Will you please take on notice to provide the Committee with an itemised list of that expenditure?

As at the end of March 2018, a total of \$31,350,970 has been spent on the project.

A breakdown of these costs is as follows:

Project Management	\$4,565,533
Community Engagement	\$401,113
Concept Design phase	\$10,505,254
Environment and heritage studies	\$9,399,121*
Property acquisition	\$315,533
Detailed design phase and post approval works	\$6,164,416*
Total to 31 March 2018	\$31,350,970

*These amount includes heritage studies for both pre and post approval phases.

3. How much has been spent on heritage?

A total of \$7,464,683.62 has been spent on 'Heritage' issues to date. It should be noted that this includes pre approval studies as well as post approval heritage and archaeological surveys, salvage and monitoring as part of the Conditions of Approval.

This total also includes costs associated with a civil contractor providing assistance to the archaeological team.

4. How often does RMS undertake survey monitoring of the bridge deck?

Surveillance Officers undertake a visual inspection of the whole road network in the Region twice a week. This includes Windsor Bridge.

Survey monitoring and a visual inspection of the existing bridge deck is undertaken every six months.

A yearly level 3 visual inspection by bridge inspectors is also undertaken. This is a more detailed inspection of bridge elements including underwater inspections.

5. **Mr Iain Macleod, Project Services Manager of the Project Management Team 3 of RMS, indicated in this email that I have a copy of that from 1994 to date bridge maintenance has cost just over \$57,000. If no-one here is able to tell us if that is correct, was Mr Macleod wrong, for whatever reason, or was that amount correct? That was in an email sent on 28 June 2013 at 8.51 a.m.**

Maintenance funding is not allocated specifically towards the existing Windsor Bridge. Funds are sourced from a general maintenance budget and therefore data specifically related to Windsor Bridge is not able to be sourced from 1994 to 2013.

The figures quoted in the above question are considered to be the average yearly spend on inspections and maintenance rather than an accumulated total value.

6. Since 1994 how much have you spent on maintenance of the bridge?

Refer question 5.

The Final Business Case for the project, dated November 2017 in Section 2.1.8, quotes that Roads and Maritime Services currently spends approximately \$50,000.00 per annum on access and Level 3 inspections for the existing Windsor Bridge and up to \$100,000 per annum on intermediate repairs (e.g. concrete spalling).

7. What volume of traffic can you say justifies a bypass at Pitt Town, and how does this compare with the volume of traffic at Windsor?

Roads and Maritime Services is progressing planning for the proposed Pitt Town bypass due to rapid residential development in the immediate area. The proposal will reduce traffic through the town centre and improve traffic flow and safety for road users.

Traffic modelling suggests that if that project (Pitt Town Bypass) opened in 2017 it would carry 2,700 vehicles per day (based on current through traffic). Current Annual average daily traffic (AADT) at Windsor Bridge is 21,600. It should be noted that the objective of the Pitt Town Bypass is to realign the road corridor so through traffic doesn't travel into the town centre, avoiding the need to negotiate two 90 degree turns to travel through the town.

8. Was the bridge costed at all in 2008?

In June 2008 the NSW Government announced funding of \$25 million for a replacement bridge. This was a preliminary estimate only which did not include the bridge approaches.

9. Does the RMS have plans to widen the Fitzroy Bridge over South Creek?

A study of this part of the road network examined this section of Windsor Road, but did not identify widening of the bridge as a priority.

PORTFOLIO COMMITTEE NO.5 – INDUSTRY AND TRANSPORT

INQUIRY INTO THE WINDSOR BRIDGE REPLACEMENT PROJECT

Responses to Supplementary Questions to Roads & Maritime Services

1. Of the 20,000 vehicle movements per day, what percentage are heavy vehicles i.e. in excess of 5 tonnes?

Of the average weekly traffic figures, approximately 10% are classified as heavy vehicles (rigid and articulated).

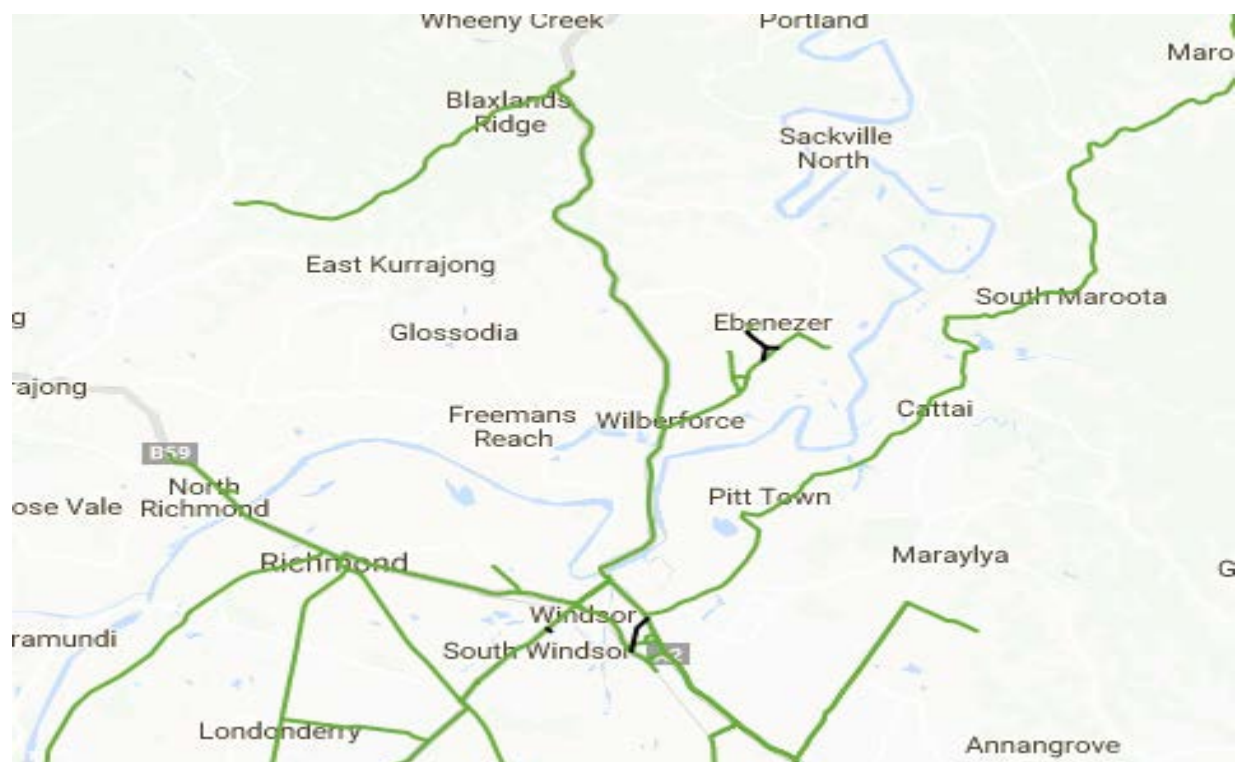
- a. Where is that traffic going to and/or coming from?

The Strategic Forecasting Model shows that of these, 8% are travelling to/from Putty Road north of Kurrajong Road- Bull Ridge Road approximately 14 km to the north of Windsor.

The remainder could be considered as travelling locally.

Of the Heavy vehicles crossing the bridge from the north, the Strategic Forecasting Model shows around 75% travel south-east along Windsor Road.

The map below shows the key approved routes for B-Doubles in the area. It is an extract from the RMS document 'NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) map'.



2. What is the percentage of “local” traffic and “through” traffic? I.e. coming to or from Sydney suburbs to Hunter Valley via the Putty Road?

An origin destination survey carried out as part of the 2012 EIS showed through traffic to be 64 per cent in the morning peak and 51 per cent in the afternoon peak.

The survey demonstrated that the majority of motorists using the existing Windsor Bridge travel towards and along Windsor Road towards and from Parramatta and Sydney City in the morning and afternoon.

Trip Type	AM Peak	PM Peak
Through	64%	51%
Arriving from outside the study area	17%	19%
Departing from inside the study area	12%	20%
Within the study area	6%	9%

3. What are the anticipated traffic counts for the new bridge?

The updated Traffic Study (2017 Table 4.5) shows the forecast annual weekday traffic as follows:

- **2026** 25,000
- **2036** 28,000

4. **What advice was provided by the Government Architects Office in 2008 and 2009 in relation to planning for the Windsor Bridge and surrounding area?**

a. **What was the Department's response?**

2008

The Government Architects Office (GAO) was engaged in 2008 by the former Roads and Traffic Authority (RTA) to provide advice to the design development of a new bridge at Windsor, delivering a report in October 2008 titled *Urban Design Strategy for Bridge over Hawkesbury River at Windsor*.

Tasks undertaken by the GAO included contextual analysis, visual impact assessment, providing recommendations for design refinements, and preparation of an urban design strategy for alignment Options 1 and 2 (being a high and low level bridge on the same alignment within Thompson Square, approx. 20m downstream of the existing bridge).

Key outcomes from GAO's advice, as contained in the report, included:

- Recommendation not to pursue a four lane bridge option on the alignment of Options 1 and 2.
- Identification and consideration of an increased number of bridge structure design options.
- Direct influence on the selection of a bridge structure design (Option E) which offered several urban design benefits: a lowered bridge height, a reduced number of piers, a streamlined appearance and reduced visual bulk, and a narrow bridge alignment more in keeping with the scale and magnitude of surrounding streets and public open space.
- Adoption of the Urban Design Strategy developed by GAO, which formed the basis for further design development of the project (This is clearly illustrated in Section 4 of the report, listing the urban design principles and key urban design features).

2009

In 2009, the GAO delivered a report titled *Landscape and Visual Investigation for Bridge Options at Windsor - Stage 2 Report*, December 2009. This report presented an investigation of the visual impacts of two alignment options (Option 1 and Option 6).

As part of their investigation, GAO developed urban design concepts for both Option 1 and Option 6, guided by the urban design strategy and design principles they had developed in 2008 (*Urban Design Strategy for Bridge over Hawkesbury River at Windsor* report).

Recommendation of the GAO report (Section 5):

While Option 6 is preferred from an urban design point of view both options are considered tenable provided that substantial landscape treatments are included as part of the project, particularly option 1, where reinstatement of Thompson Square is required.

5. In your evidence, you state that the project allows for the re-unification of Thompson Square for the first time in 84 years, increasing the size of the park by around 500 square metres.

- a. Is there evidence of road alignments across the Square that pre-date 1934?

The information requested regarding the historic road alignments through Thompson Square can be found in the *'Thompson Square and Windsor Bridge Replacement Program Project Area, Windsor NSW – Strategic Conservation Management Plan (SCMP)'* prepared for RMS by the Austral AHMS Joint Venture (AAJV), dated January 2018. Also refer *'Thompson Square and Windsor Bridge Replacement Program Historical and Maritime Archaeological Research Design'* prepared for RMS by AAJV, dated September 2016.

- b. How does the proposed bridge structure re-unify the square given its scale and visual impact, both within the Square and to sightlines from the Square to the oldest continuously cultivated agricultural land in Australia?

The Final Urban Design and Landscape Plan (UDLP) states that Thompson Square is currently broken into distinct parts, rather than acting as a cohesive civic space. The new bridge structure and southern road approach are located on the eastern edge of the square forming its eastern boundary. Works will reunify the square into a cohesive place.

Section 3.2 of the UDLP Objective 1 of the Urban Design and Landscape Plan outlines the Urban Design Objectives and Principles. Objective 1 seeks to 'Develop an integrated concept design that fits sensitively with the existing qualities and characteristics of Windsor and its Hawkesbury River setting'. Section 3.3 outlines bridge design objectives and principles. The features proposed in the UDLP are focussed on integrating the land in the square with landscaping and stair access arrangements.

The UDLP states that sightlines directly down the Thompson Square parkland towards the river and out over the land north of the project area, would be retained and potentially enhanced with the possibility of increasing the extent of the visibility of the river from some locations. Views towards Windsor and Thompson Square from the expanded parkland area and proposed pathways on the northern foreshore would be enhanced, particularly from the pathways near the foreshore.

- c. What calculations and plans specifically identify the location of the additional area the RMS believes will be added to Thompson Square?

Calculations were based on 'grassed usable park areas' only and did not include existing or proposed footpath areas. Results are shown in the table below.

Existing Thompson Square		Proposed Thompson Square	
West of Bridge St	1,563m ²	Proposed adjacent footpaths and stairs	502m ²
East of Bridge St	1,154m ²	Existing footpath area	83m ²
Unusable area	713m ² (includes batters)		
Footpath area	83m ²		
Total usable park area	2,717m ²	Total usable park area	3,197m ²
Additional Land			480m². (500m²)

			rounded)
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6. In your evidence you state that RMS completed detailed design and a number of preconstruction activities as part of the planning conditions, and are now doing the tender assessment process, with a view to award the construction contract in late May.

a. Will this be an alliance contract or a “design, develop and construct” contract?

The Windsor Bridge Replacement Project will be a ‘Construct Only’ contract.

b. In what document is the contract budget allocation recorded? What is this allocation called?

The budget allocation is published in Budget Paper No 2 – Infrastructure Statement (P125)

c. Are any recurrent funds being used to deliver this project?

No. All funds are Capital Expenditure (no recurrent funding) allocated specifically to the Windsor Bridge Project

d. If so, where is this information recorded and what is it called?

Not applicable

e. Please identify all companies engaged at any time to undertake detailed design for this project and the contract arrangements with those companies, including tender price, variations and final amount paid.

Jacobs Group has been responsible for the detail design since 1 December 2015. A breakdown of costs as at end of March 2018 is shown below. There are also numerous sub-consultants that provide specialist geotechnical, estimating, architectural and environmental services to Jacob’s in its role delivering the detail design.

	<i>Amount Paid (exc GST)</i>
<i>Contact Price</i>	<i>\$4,505,106.32</i>
<i>Variations</i>	<i>\$3,399,675.80</i>
<i>Revised Contract Value</i>	<i>\$7,904,782.12</i>

7. What are the current standards in regards to lane widths for bridges such as the proposed bridge?

The Austroads Guide to Road Design allows lane widths for urban arterial roads to vary between 3.0 – 3.5m depending on heavy vehicle volumes and speed (Table 4.3, Guide to Road Design – Geometric Design, Part 3).

Australian Standard AS 5100 – Bridge Design, Part 1 specifies:

13.4 Road bridge carriageway widths

Road bridge carriageway widths shall be as specified by the relevant authority, based on a consistent level of service along a section of the roadway, taking into consideration—

- (a) road geometry;
- (b) traffic volumes and composition, terrain, climatic conditions;
- (c) the bridge locality; and
- (d) Austroads Guide to Road Design.

8. How many bridges does the RMS have responsibility for, and how many are no longer within code?

RMS has responsibility for approximately 5,600 bridges and culverts. RMS has analysed and tested its bridges for Higher Mass Limit (HML) loadings and found that only 125 of the bridges that RMS has responsibility do not meet the HML Semi trailer (45.5 tonne) loading.

9. Will the proposed bridge be within code in regards to lane widths?

The proposed laneway widths of 3.3m are considered to comply with Australian Standards.

10. How many bridges under RMS management meet ‘none of today’s standards’, as far as safety and crossings themselves for distance and cyclists”?

a. Please specifically identify these bridges in a comparative table indicating degree of non-compliance and schedules for replacement.

RMS is responsible for 5,600 bridges and culverts. The information required to answer this question is not retained by RMS in its Bridge Information System. It will require extensive field surveys and analysis which would exceed the timeframe of this inquiry.

Bridge replacement is dependent on a number of factors. Information from inspections is used to observe the condition of bridges and ‘whole of life’ assessments are undertaken to determine a bridges ability to deliver its required levels of service.

If a bridge does not meet its required level of service and its repair costs are excessive, then a decision is made to examine options to either replace the bridge or undertake bridge renewal to extend its life.

11. At what river height would the proposed bridge be closed?

a. What river height is a 1 in 3 and a 1 in 2 flood immunity level?

The flood frequency for the new bridge would be around three years Average Recurrence Interval (ARI) compared to two years ARI for the existing bridge.

However, if a decision is made to close the bridge at deck level then this height would equate to 9.8m AHD. This height represents the lowest road level between abutment B and the northern roundabout at RL 9.8m AHD. If the intervention height is 0.5m below minimum soffit level then that height would equate to RL 7.5m AHD.

The new bridge level is 2.8 metres higher than the existing bridge. A flood assessment determined the number and duration of earlier floods that closed the bridge would be halved with the new bridge replacement.

The three year and two year ARI flood event is not a typical event undertaken in flood modelling practice. In this case it was used to assess flood immunity levels where the replacement bridge meets the northern approach road, as well as investigating low points along these roads.

12. How will the traffic from Macquarie Street wishing to travel north be affected by this project?

The updated Traffic Study (2017) shows that traffic out of Macquarie Street western approach travelling north to Bridge Street is unlikely to be adversely impacted by this project.

In 2026 and 2036 morning peak (AM), delay to traffic movement out of Macquarie Street is expected to be similar (average 16 seconds per vehicle) to 2026 do nothing condition (average 16 seconds per vehicle) and 2036 do nothing condition (average 17 seconds per vehicles).

In 2026 afternoon peak (PM), delay to this movement is expected to be slightly longer (average 36 seconds per vehicle) than 2026 do nothing condition (average 32 seconds per vehicle). In 2036 afternoon peak (PM), delay to this movement is expected to be slightly shorter (average 42 seconds per vehicle) than 2036 do nothing condition (average 44 seconds delay per vehicle).

13. How will the traffic exiting from George Street West be affected by this project?

The existing roundabout at the George Street / Bridge Street intersection will be replaced with traffic signals as part of the project.

In 2026 the AM peak, delay to George Street western approach traffic is expected to be longer (average 27 seconds per vehicle) than 2026 do nothing condition (9 seconds). In 2036 AM peak, delay is expected to be longer (average 28 seconds per vehicle) than 2036 do nothing condition (average 10 seconds delay per vehicle).

In 2026 PM peak, delay is expected to be shorter (average 66 seconds per vehicle) than 2026 do nothing condition (average 349 seconds per vehicle). In 2036 PM peak, delay is expected to be shorter (average 67 seconds per vehicle) than 2036 do nothing condition (average 780 seconds per vehicle).

14. How will the traffic wishing to enter Macquarie Street from Bridge Street be affected by this project?

In 2026 and 2036 the AM peak, delay to Bridge Street traffic turning right to Macquarie Street is expected to be slightly shorter (average 24 seconds per vehicle) than 2026 do nothing condition (average 27 seconds per vehicle) and 2036 do nothing condition (average 28 seconds per vehicle).

In 2026 PM peak, delay is expected to be longer (average 64 seconds per vehicle) than 2026 do nothing condition (average 45 seconds per vehicle). In 2036 PM peak, delay is expected to be longer (average 69 seconds per vehicle) than 2036 do nothing condition (average 48 seconds per vehicle).

The above information should be considered in the context of the total project traffic conditions. In some instances, such as the 'do nothing' scenarios compared to the current condition, the delay is slightly shorter for particular movements. This is due to signal timing redistribution in line with increased traffic volumes.

The delay at approach and entire intersection levels were also investigated and in both instances the delay for 'do nothing' is longer than the current condition.

15. Will sections of the box drains and/or the sumps be damaged during any proposed construction?

Parts of the three box drains will be impacted by the construction however these will be salvaged. RMS plans to explore opportunities to provide heritage interpretation of the box drain items at a suitable location such as the Windsor Museum.

One brick sump will be impacted (upper sump). Five brick courses will be salvaged and the remainder of the sump protected.

16. How will it be known if the brick barrel drains are damaged during construction or as a result of traffic vibrations once built over?

The Brick Barrel Drains will be closely monitored by engineering and archaeological staff during construction. This requirement has been documented in the project management plan.

Protection measures have been designed so that loadings will be transferred beyond the Brick Barrel Drain through a piling system that will transfer forces to below the level of the drain.

The design has been discussed and reviewed by NSW Office of Environment and Heritage.

Appendix A

Existing and Proposed Design of Thompson Square

Comparison of Thompson Square Parkland Space

(Existing and proposed design)

Existing Thompson Square areas: West of Bridge St = 1,563m² East of Bridge St = 1,154m² Unusable area = 713m² (includes steep batters as shown in red below) Footpath area = 83m² (as shown magenta below) Total usable park area = 2,717m² (as shown in green below)	Proposed Thompson Square areas: Proposed adjacent footpaths and stairs= 502m² (as shown in cyan below) Existing footpath area = 83m² (as shown magenta below) Total usable park area: 3,197m² (as shown in green below)
	