



Transport
Roads & Traffic
Authority

Oral History Program

Sydney Harbour Bridge Tolling

Summary Report



Sydney Harbour Bridge Tolling

ISBN 978-1-921899-12-6

RTA/Pub. 11.077

Published March 2011

Interviews for this project were conducted by:

Sue Andersen and Mary Ann Hamilton

This report was researched and written by:

Playback Public History

Sue Andersen & Mary Ann Hamilton

Hurlstone Park NSW 2193

for:

Roads and Traffic Authority of NSW

Environment Branch

Level 17, 101 Miller St

NORTH SYDNEY NSW 2060

Telephone 131 782

Website www.rta.nsw.gov.au

RTA Oral History Program

Previous oral histories covering a range of topics can be purchased from the RTA Library:

Telephone (02) 8849 2486

Fax (02) 8849 2488

Email library@rta.nsw.gov.au

Web www.rta.nsw.gov.au/oralhistory

About this oral history...

Oral history has been described as ‘a picture of the past in people's own words’. It is based on stories by people who were involved in life's events, told in their own, passionate words. It adds to the official written history and gives us a more intimate and personal perspective on how, when and why things happened. Oral history is a means of communicating how individuals perceived and dealt with challenge, achievement and failure. It often reveals the unsung heroes, those actually responsible for innovations and important changes, and provides them with an opportunity to evaluate their actions in a wider occupational, social and political context.

The RTA established its Oral History Program in 1997 to investigate various topics of historical interest, and Sydney Harbour Bridge Tolling is the nineteenth thematic oral history to be undertaken as part of the program.

Aims of the project

The aim of the project was to prepare an accessible and engaging Summary Report on the history of the Sydney Harbour Bridge Tolling from its beginnings in 1932 when the bridge was opened, to 2009 when tolling on Sydney's icon went cashless. This meant that for the first time since its opening, toll collectors - the human face of the bridge - were no longer required.

This Summary Report includes archival research and the recollections of those who have been associated with tolling and the developments over the bridge's history. As well as this document, a broadcast quality compilation CD was produced that weaves together oral history material with an historical contextual narrative. The outputs form part of the broader RTA Oral History Program and compiled audio extracts in MP3 format are accessible to the public via the RTA's oral history web page at www.rta.nsw.gov.au/oralhistory. Importantly the project's outputs highlight the significant role that Sydney Harbour Bridge Tolling has played in the history of the RTA and in the broader Australian transportation history.

Project team

The project team comprised Public Historians Sue Andersen and Mary Ann Hamilton, with additional research provided by Sean Cosgrove and Gabrielle Kemmis. Compilation CD production was by Michael Finucan.

Methodology

The project proceeded in a number of stages to achieve key milestones and outcomes as required by the Project Brief. On commencement of work, meetings took place with the Project Manager to confirm the aims and objectives of the project and to provide background information on the Sydney Harbour Bridge Tolling.

Stage 1 of the project involved reviewing secondary source literature held by the RTA Library and some documents held at the State Library of NSW relating to the history and development of the Sydney Harbour Bridge and Tolling.

Contact was also made with oral history interviewees selected by the Project Manager from a large group of nominated potential interviewees. Interview times were organised with candidates and a questioning strategy was developed that would draw out further information on the key project themes and fill in gaps in the research that has been conducted to date.

Stage 2 of the project involved conducting eleven in-depth oral history interviews of up to two hours each recorded on professional quality digital audio equipment with current and former toll staff, including collectors and managers, technicians, and other relevant RTA staff. While working with a reasonably structured set of questions, the aim of the oral history was to evoke memory and experience rather than pursuing a set and predetermined line of questioning, while at the same time eliciting specific information on themes.

Each interview was transcribed and duplicated during Stage 3 of the project. Release documents were signed by the interviewee and interviewer and submitted with the transcripts, together with any additional research or material.

Stage 3 also included the duplication of the interviews onto DAT, CD(A) and MP3 formats for archiving. A copy of the recorded interview and other material was sent to the interviewees by the Project Manager.

The major component of Stage 4 of the project was the development of this Summary Report, which communicates the history of tolling on the Sydney Harbour Bridge in a clear and accessible way. The research undertaken for the project was woven together with oral history testimony into a strong and engaging history of tolling on the Sydney Harbour Bridge. It articulates the historical, social and political context and provides a comprehensive picture of the historical layers as tolling activities developed over time. The report articulates the challenges and achievements of the RTA and its staff and demonstrates the shared commitment of past and present staff to their job of assisting with the daily transportation needs of a growing city.

Stage 5 involved the production of a 76-minute compilation CD that provides an evocative and informative insight into tolling on the Sydney Harbour Bridge. It highlights thematic information and important historical developments in tolling activities. Personal testimony of interviewees adds colour to historical, technical and factual information. The linking narrative contextualises excerpts, introduces each interviewee and contributes to the production of a coherent, well integrated summary history of tolling activities on the Sydney Harbour Bridge.

Limitations

Undertaking the documentation of a history, which spans a significant time frame and many themes, is always a challenge. In this case, where the RTA's Oral History Program has limited resources for in-depth archival research and an extensive number of interviews it was impossible to cover all areas comprehensively in one document within the constraints of the project timeframe and resources.

This history gives an overview of over seventy years of tolling activity on the Sydney Harbour Bridge and the key achievements over this time. It can not provide a detailed account of each issue or event in the history of tolling on the Sydney Harbour Bridge, or every key development within the Authority's history. The limitations of the project have meant that the number of people interviewed and archival research undertaken had to be constrained. Also, all of the people interviewed for this project started

working in tolling on the Sydney Harbour Bridge from 1984 onwards, which means that stories and quotes have tended to be more weighted to this period of time.

In the absence of a dedicated audio studio and to facilitate the comfort and convenience of the interviewees, most were interviewed at their homes or workplaces. A limitation of this is that the recordings were made in a relatively uncontrolled audio environment and as a result there were inevitable interruptions to some interviews, and the acoustics of some of the spaces were not ideal.

Abbreviations

DMR	Department of Main Roads
DMT	Department of Motor Transport
RTA	Roads and Traffic Authority
CCT	Closed Circuit Television
ETC	Electronic Toll Collection

The authors gratefully acknowledge the assistance of the Project Manager in completing the Sydney Harbour Bridge Tolling Oral History. Thanks also to staff at the RTA Library who provided research materials for this project.

Particular thanks go to the eleven people interviewed for their valuable contribution to this project:

Richard Power, former Sydney Harbour Bridge Toll Collector, Group Leader and Controller, retired

Jude Singarayar, former Toll Collector and Union Delegate, retired

Janet Miller, former Sydney Harbour Bridge Toll Collector, Group Leader and Controller and now Senior Toll Officer

Ken McKay, former Sydney Harbour Bridge Toll Manager, retired

Dennis Murphy, former Sydney Harbour Bridge Toll Plaza Manager, still working with the RTA

Mark Di Val, Sydney Harbour Bridge Tolling Systems and Maintenance Manager

Peter Lardner-Smith, former Sydney Harbour Bridge Electronic Systems Engineer

Saeed Ghairahkhani, former Toll Group Leader and Controller, retired

Rudi Englert, former Toll Collector and Group Leader, retired

Brian Pearson, former RTA Chief Engineer (Bridges), retired

Chi Chiu, former Toll Collector and now Recovery Officer

Please note that the opinions expressed in the oral history interviews and summarised in this report are those of the individuals concerned and do not necessarily represent in whole or in part the position of the Roads and Traffic Authority of NSW.

Contents

Bridging the harbour	1
Evolution of tolling procedures.....	4
Tolling commences on the Sydney Harbour Bridge.....	4
The era of the car comes of age	12
The coming of the electronic age	19
Moving towards cashless tolling.....	26
Sydney Harbour Bridge goes cashless.....	34
Toll collecting on the Sydney Harbour Bridge 1980s to 2009	37
The Toll Masters/Managers	37
Sydney Harbour Bridge Toll Controllers.....	37
The Toll Supervisors/Group Leaders.....	39
The Toll Collectors.....	40
The cash counting room and security.....	43
The conditions for toll staff.....	45
Dealing with the public.....	48
The last manual toll collection shift on the Sydney Harbour Bridge	49
Conclusion.....	51
List of interviewees.....	53
Interviewees' biographies	54

Bridging the harbour

Since Sydney's early days one of the settlement's most beautiful assets, its large harbour, posed a great question as to how to connect its northern shores with the settlement's centre on the southern shores of the harbour.

In 1815, first colonial architect Francis Greenway mooted the need for a bridge to span the harbour and connect the north and south shores and by 1857 the first speculative drawings were completed by engineer Peter Henderson. In 1888 when Henry Parkes was considering the possibility of constructing a bridge in celebration of 100 years of the colony's settlement, such an ambitious project was still technically or financially unviable.

As the new century approached, the main part of the colonial settlement still lay on the south side of the harbour, yet there was a growing number of Sydneysiders residing to the north of the harbour. By the turn of the century many commuted by train or tram to Milsons Point where they caught a ferry into workplaces and facilities in the city's centre.

The growing need to unite the north and south of Sydney, together with engineering advances, prompted the government in 1900 to announce the first competitive tender for plans and designs for a bridge across the harbour. Nothing came of this incentive at this time and then in 1911 the scheme to bridge the harbour was rekindled and eventually the highly respected Engineer John Bradfield, was requested to submit a practical bridge design which would facilitate not only the crossing of the harbour but the requirement of shipping to pass underneath the bridge.

Bradfield's first designs recommended a cantilevered road and rail bridge stretching from Dawes Point to Milsons Point as it was seen as the only way to span such a distance. This concept was initially accepted, however Bradfield's further research in the USA in 1918 convinced him that an arch bridge design was an achievable and less expensive alternative. The bridge was to be a single arch bridge with a deck spanning 503 metres from Dawes Point to Milsons Point and 53 metres above the water. Provision was made for four rail tracks, pedestrian access and six lanes of traffic.¹

After protracted parliamentary discussion on the proposals, the Sydney Harbour Bridge Bill was finally passed in 1922.

Tenders were called on the proposed designs, both cantilever and arch designs. The contract was finally awarded in 1924 to Dorman, Long & Co., a British engineering company at an estimated cost of 4,217,721 pounds.

Consultant Engineer, Ralph Freeman, based his design on Bradfield's specifications but made significant alterations. This began a protracted and acrimonious debate over who was responsible for the bridge's design.

¹ 'Sydney Harbour Bridge: Spanning fifty years', *This Australia*, 1, no2 (1982), pp 41-49.

Work on excavation for the bridge began in January 1925 and later that year work began on the construction of approaches and spans. By 1926 the approaches were completed and the abutment towers were well under way. Next, in October 1928, construction of the steel arch began from both sides of the harbour. The steel sections were assembled on the ground and huge cranes hoisted each section into place and then riveted onto the existing structure. The two sections eventually met late in the afternoon of 19th August 1930.

The following morning those going to work on the ferries saw the Australian ensign flying from the jib of one creeper crane and the union jack from the other and they knew this great arch was joined.²

The suspended deck of the bridge that was to hold the roadway and rail tracks was completed by mid 1931 and instead of rail tracks on the eastern and western sides of the bridge, the eastern side was replaced with a tram track. By March 1932 the Sydney Harbour Bridge was finally completed and opened on Saturday 19th March 1932 by Governor Sir Phillip Game and Premier Jack Lang with the unanticipated interruption of Captain Francis de Groot, who usurped the Premier's role and cut the ribbon to mark this important event.

The way in which the construction of the bridge was financed was defined in the Sydney Harbour Bridge Bill. Two thirds of the cost of the bridge was to be paid for by the then Railway Commission and the remaining third of the cost was to be borne by rate payers residing in the City of Sydney and North Shore municipalities which were charged a betterment tax. This tax was levied from 1923, well before the bridge was opened for use.³

Financing the construction of the bridge was always a contentious issue, one that continued until the opening of the bridge. Agitation by various interest groups, such as the Tax Payers Association, the Graziers Associations and individual Councillors, had reached a peak by 1931. As a result the introduction of a users toll was being seriously considered by the newly elected Lang Government. By 1932 the imposition of a toll for the use of the bridge had been decided and new argument as to which users were to pay ensued. It was finally agreed that pedestrians would not be charged for their crossing of the bridge.⁴

The prospect of a toll on their new bridge enraged some Sydneysiders. Residents living just north of the city felt particularly put out by the fact that they would have to pay to use the bridge. Research conducted by the National Roads and Motorists' Association in late 1931 suggested that it would cost motorists an extra 30 pounds a year if they drove to the city daily from the North Shore, understandably unwelcome news to those who would be in this situation.⁵ Those living in the northern suburbs of Sydney also felt it unfair they should foot a substantial portion of the bill for the new bridge via their taxes (and pay a toll) as they felt it

² Ibid. p. 46.

³ Peter Spearritt, *The Sydney Harbour Bridge: A Life*. Sydney, UNSW Press 2007, p. 109.

⁴ Department of Main Roads, *Eighth Annual Report for Year ended 30th June, 1933* (Sydney, Alfred James Kent, 1933).

⁵ 'The Bridge: Motorists Oppose Toll', *Sydney Morning Herald*, 3 Oct. 1931, p. 11. On the arguments against the toll see also 'Bridge Toll: Kirribilli Protest', *Sydney Morning Herald*, 30 Sept. 1931, p. 11 and 'Letter to the Editor', *Sydney Morning Herald*, 2 Oct. 1931, p. 5.

would be used by, and benefit, those who lived outside of their municipality too.⁶

Thankfully for those in the northern parts of Sydney an amendment was made to the 1922 Bridge Act in 1932. The Sydney Harbour Bridge (Administration) Act stipulated that the municipalities adjacent to the bridge need only support the financing of the bridge until 31 December 1939. The Amendment also made it clear that the Sydney Harbour Bridge would be paid off by contributions from the Railway and Tramway Authorities according to a set rate for each ticket sold to travel across the bridge by either rail or tram,⁷ a toll which corresponded to that charged on the vehicular ferries used before the bridge was built and finally, any revenue that was accrued by properties let after having been purchased previously 'for bridge purposes'. As well as paying for the Sydney Harbour Bridge, it was expected that these sources of revenue would ensure enough money to maintain and light it well, and cover the costs associated with collecting tolls and administration.⁸



Sydney Harbour Bridge opening ceremony, 19th March 1932

Source - RTA Photo Library

⁶ See the comments made by North Sydney Council Mayor G. T. Clarke featured in Margaret Park (compiler) *Building a Bridge for Sydney: the North Sydney Connection* (North Sydney, North Sydney Council, 2000), p. 16.

⁷ It was established that .87d/train passenger and .95d/tram passenger would be contributed from each train and tram ticket bought to cross the bridge respectively. See Department of Main Roads, *Eighth Annual Report for Year ended 30th June, 1933* (Sydney, Alfred James Kent, 1933), p. 51.

⁸ For more detail on the financing organised to repay the bridge loan see Department of Main Roads, *Eighth Annual Report for Year ended 30th June, 1933* (Sydney, Alfred James Kent, 1933), pp. 50-51.

Evolution of tolling procedures

Tolling commences on the Sydney Harbour Bridge

After a full day of official ceremony and non-official celebrations on and off the bridge, the new crossing was opened to traffic from midnight on 19th March 1932. Twenty one thousand cars and 80,000 passengers made the historic crossing over the new bridge during the day after the opening.⁹

While four weeks prior to the opening of the bridge it announced that pedestrians could walk across the bridge for free, it was only three days before the opening of the bridge that the Lang Government announced that a toll would be charged for vehicles and passengers. It has been speculated that by delaying the announcement Premier Lang may have averted harsh criticism of the toll rates, which was lost in the celebratory mood of the opening event.

The large number of vehicles and passengers crossing the bridge during the first day indicates Sydneysiders were keen to be amongst those who took part in this historic occasion. In fact one man, George Skinner, queued at the railway ticket office for two days waiting to purchase the first ticket on the first train to cross the bridge. Ticket number 00001 was a treasured souvenir of that trip across the bridge in 1932.¹⁰



First cars to pay the toll on the Sydney Harbour Bridge

Source - State Library of NSW

⁹ Peter Spearritt, *Op Cit.* p. 47.

¹⁰ May Michael, *Sydney Harbour Bridge: Idea to Icon*. Ashgrove: Alpha Orion Press, 2006.

From the outset a sliding scale toll was levied on vehicles and passengers on the bridge. The toll ranged from 6 pence for cars, 3 pence for adult passengers, a penny for children. These days charging per head would seem a little excessive but this was the case when the bridge first opened. Brian Pearson who first joined the DMR as Bridge Engineer in 1947, recalled trips across the bridge just after it opened where his family had devised a clever method of reducing the family's toll cost:

Well my earliest memory is crossing the bridge, not frequently, but periodically, in my uncle's motorcar with my younger sister and brother, and mother. A blanket in the back seat of the car so that the three kiddies could get under it. And as a consequence the head count for travelling across the bridge was quite low...it was quite hilarious for us to be pushed under the blanket on each trip. (Brian Pearson SHBTOH CD10, 00:22)

Bike, trikes and motor cycles without side cars were charged 3 pence as were sulkies, buggies and light carts. Motorised and horse drawn vans and wagons were charged a shilling each. Heavier vehicles between 2 and 3 tons were charged 2 shillings and heavier vehicles 3 shillings. Horse and rider cost 3 pence a crossing and livestock were charged a tuppence to a penny a head. Built into the rail and tram tickets was a toll fee that was later reduced by a few pence.¹¹

15 MAR., 1932.] NEW SOUTH WALES GOVERNMENT GAZETTE, No 34.		983
SCHEDULE.		
	s.	d.
Motor cars and motor cycles with side cars attached	0	6 each.
Bicycles, tricycles and motor cycles without side cars	0	3 „
Sulkies and four-wheeled buggies and light carts hand propelled or drawn by one or more horses	0	3 „
Empty or loaded vans, lorries, drays, waggons or other vehicles, the tare weight of which does not exceed 2 tons	1	0 „
Empty or loaded vans, lorries, drays, waggons or other vehicles, the tare weight of which exceeds 2 tons but does not exceed 3 tons	2	0 „
Vehicles not otherwise specified	3	0 „
Where a second vehicle is attached to any of the above- mentioned vehicles, double the specified rates will be charged.		
Persons riding in or on any vehicle (other than the person driving such vehicle)—		
Adults	0	3 „
Children	0	1 „
Horse and rider	0	3 „
Horses or cattle (loose stock) per head	0	2 „
Sheep or pigs per head	0	1 „
Vehicles, the property of the Board of Fire Commissioners of New South Wales, the Commissioner of Police, and ambulances, will be exempt from payment of toll charges.		

The original Schedule of Tolls, reproduced from the NSW Government Gazette, 15th March 1932

The government reviewed its toll charges during 1934 and it was found that those vehicles most in need of toll relief were commercial vehicles. Accordingly those over 3 tons were reduced to 2 shillings, and those between 2 and 3 tons 1 shilling and 6 pence, and those under 2 tons were reduced to 9 pence. These charges came into force in September 1935 along with an abolition of charges for children under 14 years.

¹¹ Sydney Morning Herald, 16th March 1932, p. 13.

The variety of toll charges and categories indicates the diversity of traffic using the bridge in the first years after its opening. In fact, during its first year of operation, the bridge saw some exceptional users including a group of seven elephants from Wirth's Circus which were charged tuppence each to cross the Sydney Harbour Bridge in April 1932.

The toll was collected by a staff of toll collectors who can be seen in early photographs sporting a smart uniform including a flat-topped peaked cap, jacket and trousers and a leather satchel for cash collected and ticket issue appropriate to each category of crossing – vehicle and passenger.



Elephants and their mahouts at bridge toll bar, April 1932

Source – State Library of NSW

At the end of the day the ticket system was audited and reconciled with the takings of each collector. This not only provided information on takings but also the different categories of crossings.

Six collectors were stationed at the side of each road lane and collected the toll from vehicles crossing in both the northbound and southbound direction. Photographic evidence indicates that the six toll collectors were managed by a toll supervisor who was situated on the toll bar with the collectors. The six collectors were stationed directly over the Argyle Street overbridge which had been constructed for the Sydney Harbour Bridge approaches. This was the only toll collection point at this stage on the Sydney Harbour Bridge. The original toll administration building located on the side of the road near this point still survives today and is currently used by the bridge tow truck operators.¹²

For the first six months of tolling operations there were no toll booths or shelters to accommodate the Toll Collectors on the bridge. Toll staff had to stand in the open in all weathers to collect tolls on slightly raised concrete islands. Some protection was afforded by

¹² Peter Lardner-Smith, SHBTOH8, 3:55.

a steel pipe rail that partly surrounded the collector at waist height. After six months of open air collection a very simple wooden canopy was built across the width of the road and three cabin structures were built for collectors in between the lanes one and two, three and four, five and six.¹³

Peter Lardner-Smith joined the DMR in 1974 in the Mechanical Engineering Branch as an Electrical Engineer and has an extensive knowledge of the history of tolling on the Sydney Harbour Bridge. He commented on the conditions of early Toll Collectors:

The Collectors in between the other two lanes were still out in the open, but at least they had a roof over their heads but on a very windy day, a rainy windy day, they would have been just as drenched as they ever were. (Peter Lardner-Smith, SHBTOH7, 7:53)

In June 1934, strong circular shields were installed at either end of the islands to protect the collectors from traffic accidents. Also in this year experiments and discussions were undertaken to attend to the problem of collectors receiving electric shocks from static electricity generated by passing vehicles passing through the toll bar. In addition to the toll bar improvements, improved barricades were erected along the pedestrian walkways 'owing to the increasing number of fatalities occurring from footways of the bridge.'¹⁴



Sydney Harbour Bridge toll booths, 1949

Source - RTA Photo Library

¹³ Peter Lardner-Smith, SHBTOH8, 7:53

¹⁴ Department of Main Roads, *Ninth Annual Report for Year ended 30 June, 1934* (Sydney, Alfred James Kent, 1934), p.62.

In August 1937, bus services commenced from the North Shore to Sydney city. To accommodate the buses certain toll barriers and lanes were widened at the expense of the Omnibus Company. The journey was fixed at 3 pence.¹⁵

In the first three months of the bridge's opening, 1,128,000 vehicle crossings were documented through toll ticketing. In the following year vehicle crossings totalled 3,904,000. By the year ending June 1938 there were 6,842,000 vehicle crossings prompting the comment in the 1938 Department of Main Roads Annual Report:

...there has been a substantial progressive increase in traffic since the bridge was opened in March 1932, particularly so far as road traffic is concerned and there is evidence to show that this is indicative not only of an increase in the number of registered motor vehicles but also of the fact that vehicles registered are used to a greater extent than previously.¹⁶

The trend toward a steady increase of traffic across the bridge was dramatically reduced with the onset of WWII and the hardships associated with this event, including petrol restrictions. While the reduction in traffic and subsequent loss of toll revenue lasted during the war years, the end of the WWII saw a fast and significant revival of the popularity of the motor car and as a consequence, toll revenue became a major way in which the Sydney Harbour Bridge financed its loan and carried out maintenance. It also meant that in the late 1940s traffic congestion on the bridge began to emerge as a significant problem.

Thus post-war Sydney experienced a new phenomenon, that of having to withstand long queues during peak-hour before being able to pay the toll to cross the Sydney Harbour Bridge. The gradual removal of wartime petrol restrictions throughout 1946 enabled Sydneysiders to once again rely on their cars to see the sights of the city.¹⁷ By 1949 approximately 3,400 vehicles passed through the tolls in the morning peak hour that lasted from approximately 8.10am until 9.10am.

Travelling in the evening peak-hour in 1949 meant that an individual vehicle would become one of 3,100 vehicles also trying to get home between 5pm and 6pm.¹⁸ A photograph published in the Main Roads journal in June 1947 depicts four lanes of traffic in the morning peak-hour receding into the background as far as the eye can see.¹⁹ Cars, buses and trucks stand idle waiting to pay their toll, and enter the city to complete their daily business. Ensuring traffic was able to travel across the bridge as quickly as possible, became a high priority for those assigned the task of road and traffic management on the bridge at this time.

¹⁵ Department of Main Roads, *Twelfth Annual Report for Year Ended 30th June, 1937* (Sydney, Alfred James Kent, 1937), pp. 32-33.

¹⁶ Department of Main Roads, *Thirteenth Annual Report for Year Ended 30th June, 1938* (Sydney, Alfred James Kent, 1938), p. 42.

¹⁷ Department of Main Roads, *Twenty-First Annual Report for Year Ended 30th June, 1946* (Sydney, Thomas Henry Tennent, 1946), p. 26.

¹⁸ Department of Main Roads, 'Improved Toll Facilities, Sydney Harbour Bridge', *Main Roads*, Vol. 15 No. 2 (December 1949), p. 46.

¹⁹ Department of Main Roads, 'The Origin and Destination Survey of Road Traffic in the City of Sydney', *Main Roads*, Vol. 12 No. 4 (June 1947), p. 116.



Morning Peak Hour on Sydney Harbour Bridge.
Cards were issued to this traffic as quickly as it could pass through the Toll Barrier.

Source – Main Roads Journal, June 1947

In 1949 the DMR announced that the toll booths on Sydney Harbour Bridge would be receiving a much needed upgrade. The Twenty-Fourth Annual Report noted that the construction of new toll barriers was necessary ‘to relieve the congestion which now occurs, particularly in peak hours’.²⁰ Another six lanes were to be added to the pre-existing tolls meaning that there would now be twelve toll booths at which motorists could pay their toll. The toll booths were also set to be moved closer to the city, 400ft or 130 metres south of their previous position. Each booth was constructed around a timber frame and safety glass was used for the panelled windows, which allowed for a 360 degree view out of the cabin. The booths were long and slender with semi-circular ends facing each end of the bridge.²¹

The new toll booths had a number of important features. They were capable of accommodating the diverse number of vehicles that travelled across the bridge daily. Eight of the booths could accommodate vehicles up to 12ft (3.7 metres) in height, two booths could accommodate vehicles up to 15ft (4.6 metres) in height and two did not have accompanying roofs for occasions when very large vehicles made an appearance at the tolls. Concrete prows at each end of the toll booth and yellow traffic lines painted on the bitumen were design features intended to guide the traffic clearly and safely toward and through each booth lane. Neon lights also adorned each booth and indicated in large bright letters whether it was opened or closed to motorists.

²⁰ Department of Main Roads, *Twenty-Fourth Annual Report for Year Ended 30th June, 1949* (Sydney, Alfred Henry Pettifer, 1950), p. 36.

²¹ Department of Main Roads, ‘Improved Toll Facilities, Sydney Harbour Bridge’, *Main Roads*, Vol. 15 No. 2 (December 1949), p. 46.



Sydney Harbour Bridge toll booths, 1950

Source - RTA Photo Library

Richard Power, who worked as a Collector, Supervisor and later Controller on the Sydney Harbour Bridge Tolls offered a description of the way the concrete prow worked:

They looked just like the front of a boat. They were wide near the toll cabin and went down to a rounded point further out on the road about 4 metres away. The ones on the fixed toll cabins were made of concrete and were designed to be low at the approach point where the driver would first come to it and then they rose on an angle to the toll cabin. If the car's wheel went over the prow the momentum of the vehicle went along it and would slowly tip the car upwards onto its side so that it didn't hit the toll cabin...I can't recall ever seeing it happen though. (Richard Power SHBTOH CD1a, 37:08)

The booths were also designed to have some technological improvements; plans were made to ensure that they featured an intercommunication system which allowed each toll operator to speak to one another and, perhaps more importantly, their Supervisor. The new toll booths were completed in March 1950 and clearly had the capacity to deal with a substantial amount of traffic.²²

All through the 1950s it was apparent that the level of traffic using the Sydney Harbour Bridge was still showing a dramatic rise. By 1952 road users were outnumbering the rail and tram passengers that used the bridge.²³ An estimated 5,600 vehicles crossed the bridge at the

²² Department of Main Roads, 'Improved Toll Facilities, Sydney Harbour Bridge', *Main Roads*, Vol.15 No. 2 (December 1949),pp. 46-47.

²³ Department of Main Roads, *Report of the Department of Main Roads for the Year Ended 30th June, 1952* (Sydney, A. H. Pettifer, 1953), p. 48.

height of the day's peak-hour,²⁴ and the only quiet time Toll Collectors saw now was from approximately 3.00am until 6.50am when only two lanes (one in each direction) were open.²⁵ At all other times the tolls, and their collectors, oversaw a constant stream of traffic. In the 1951-52 financial year an astounding 16 million vehicles passed through the tolls which equated to approximately 44,000 vehicles each day.²⁶

Traffic in Sydney was at an all-time high by the mid 1950s. The DMR had to remain vigilant and continue to provide practical solutions to the problems associated with the ever-increasing volume of cars, buses and trucks using Sydney's roads, and in particular, the Sydney Harbour Bridge. Increased pressure was being placed upon the DMR to be at the ready with new designs and features that it could apply to the Sydney Harbour Bridge tolls to ensure that the traffic flowed across the bridge smoothly and that Sydney's traffic at large was well managed. Traffic levels were continuing to rise as more and more Sydneysiders chose to use their cars to get into and around town.



1958 traffic flow on the Sydney Harbour Bridge

Source - RTA Photo Library

²⁴ Department of Main Roads, 'Traffic Aids on the Sydney Harbour Bridge', *Main Roads* Vol. 17 No. 4 (June 1952), p. 97.

²⁵ Department of Main Roads, 'Toll Collecting at the Sydney Harbour Bridge', *Main Roads* Vol. 18 No. 4 (June 1953), p. 118.

²⁶ *Ibid*, p. 119.

The era of the car comes of age

As Sydneysiders bustled their way toward 1960 the DMR had to continually make changes to the way it managed Sydney's traffic as growing numbers of city-dwellers preferred the car as a form of transportation. By 1959, 270 out of 1,000 individuals owned their own motor vehicle. More importantly, car ownership was most prevalent in suburbs north of the city.²⁷ In 1958 the constant stream of cars, buses and trucks over the Sydney Harbour Bridge necessitated that the DMR dedicate an entire section of its annual report to the 'Control of Traffic' across the bridge.²⁸ A new traffic management plan was subsequently developed by the DMR, with the assistance of the Police. Lanes at the northern end of the bridge were made changeable according to the demands placed upon them at peak times. More lanes would be open to southbound traffic during the morning peak, while in the evening peak, more lanes would be open to northbound traffic. Rubber flaps placed upon the road alerted motorists to the changed traffic conditions.²⁹

The bridge and its tolls were obviously now one part of an increasingly intricate network of roads that ferried vehicles into and out of the city. Completion of the Circular Quay Overhead Roadway (Cahill Expressway) on 24th March 1958 encouraged yet more traffic onto the bridge and made the construction of six more toll booths essential. A total of 18 toll booths now stood on the Sydney Harbour Bridge.³⁰

A decision was made in 1958 to remove trams as a means of public transport in Sydney. According to Brian Pearson the government offered the tram tracks to the DMR at the time and because of increasing road traffic on the bridge the DMR decided that the tracks should be converted to two traffic lanes. Brian was the Engineer who oversaw this project.³¹

The tram lanes on the eastern side of the bridge were removed and two lanes (city bound) that could be used by road traffic were constructed in their place.³² Financed by money from the Sydney Harbour Bridge funds,³³ the project to convert the tram lanes began in June 1958 and was completed by June 1959.³⁴ The two new lanes were officially opened on 2 July 1959 by the Minister for Local Government and Highways, Hon. J. B. Renshaw.³⁵

The DMR invested vast amounts of money on construction not only on the access roads but also on the conversion of the tram tracks. They also had to deconstruct the large steel arch tram bridge from North Sydney to the Harbour Bridge. This structure was dismantled by

²⁷ Peter Spearritt, *The Sydney Harbour Bridge: A Life* (Sydney, UNSW Press, 2007), p. 120.

²⁸ Department of Main Roads, *Report of the Department of Main Roads for the Year Ended 30th June, 1958* (Sydney, Victor C. N. Blight, 1959), p. 52.

²⁹ Ibid, pp. 52-54.

³⁰ Department of Main Roads, *Report of the Department of Main Roads for the Year Ended 30th June, 1958*, p. 52.

³¹ Brian Pearson SHBTOH CD10, 3:07.

³² Department of Main Roads, *Report of the Department of Main Roads for the Year Ended 30th June, 1958*, p. 12.

³³ Ibid.

³⁴ Department of Main Roads, *Report of the Department of Main Roads for the Year Ended 30th June, 1959* (Sydney, Victor C. N. Blight, 1960), p. 62.

³⁵ RTA, *The Story of the Sydney Harbour Bridge* (Sydney, NSW RTA, 1989), p. 22.

the DMR and stored for future use on the order of the Commissioner for Main Roads of the day.³⁶



Early photo showing the tram tracks on the eastern side of the bridge

Source – RTA Photo Library

Brian reflected on the task of accommodating traffic straight into the city and across the Circular Quay roadway:

To travel straight ahead we had to design and build a bridge over the Argyle Cut...[this was the] second prestressed concrete bridge that the DMR had undertaken and the girders, I think they were 90ft long, were the longest girders in Australia at the time in prestressed concrete. So it was quite an event to work on the design of that bridge before I had to take over the construction side of things. (Brian Pearson SHBTOH CD10, 11:14)

Part of the works for the project was the construction of a Toll Collector's office at the Cumberland Street exit to the bridge. This was done in the interests of providing a safe and convenient passage for Toll Collectors to access the office and store the day's takings.

Also part of this upgrade was the design and construction of new toll booths on the northern side of the bridge. It was decided by the DMR that:

As there was insufficient space for additional toll gates on the southern approach, toll barriers to serve the requirements of the two new vehicle lanes were erected on the northern side of the harbour, in the vicinity of the former Milsons Point Tramway Station.³⁷

³⁶ Brian Pearson SHBTOH CD10, 11:14 & 17:59.

³⁷ Department of Main Roads, *Report of the Department of Main Roads for the Year Ended 30th June 1959*, p. 62.

Six toll cabins were constructed to serve the two new lanes of traffic. According to Brian Pearson, the DMR workshop was very proud of the design of the new toll booths which were modern in design and went some way to minimise the effects of exhaust fumes on collectors.

Peter Lardner-Smith commented:

In my view the 1958/59 toll cabins were the best looking ones every made because they had an art deco look about them. They were deep turquoise in colour and they had stain timber lateral slatting down the front, a very stylish over canopy and they really looked good...the Milsons Point Toll cabins are the oldest toll cabins that we have surviving [on the bridge] today. (Peter Lardner-Smith SHBTOH CD7, 18:51)

Privately owned vehicles at this time made up the vast majority of traffic that travelled across the bridge and outnumbered the public transport used (both rail and road) to get into and out of the city from the north.³⁸



1958/1959 toll cabin on southern approach to the Cahill Expressway
(note the bus ticket toll receipts visible through the window)

Source – Peter Lardner-Smith

³⁸

See the comments in, Department of Main Roads, *Report of the Department of Main Roads for the Year Ended 30th June, 1959*, p. 24. See also, Spearritt, Peter, *The Sydney Harbour Bridge*, p. 120.



1958/1959 toll cabin on northern approach

Source – RTA Photo Library (Brian Pearson collection)



Construction work proceeding on 1958/1959 toll cabins

Source – RTA Photo Library (Brian Pearson collection)

While the tolls on the Sydney Harbour Bridge generated considerable revenue for the DMR, increasing in 1959-1960 financial year by 21 per cent, the tolls used up 24 per cent of the bridge's budget for that year, just 1 per cent short of what it cost to maintain the bridge. The biggest expenditure was on the general costs associated with collecting tolls and the fact that 29 new Toll Collectors were employed to work the new toll booths built that year.

This batch of new employees raised the total figure of Toll Collectors employed on Sydney Harbour Bridge to 110.³⁹

In 1960, in another bid to relieve traffic congestion on the bridge, the tolls on vehicles using the bridge were modified. Passengers were no longer charged to ride across the bridge and cars now paid a single coin fare. This meant that vehicles could move more quickly through the toll gates. Cars and light trucks, which made up 93 per cent of the vehicles crossing the bridge, would now be charged one shilling. Previously the only single coin fare was for cars without passengers, which only made up 40 per cent of the bridge's traffic.⁴⁰

The new single coin charges were a huge success. The DMR stated in their annual report of 1960 that 'the object of the change was to facilitate payments by drivers and to simplify and expedite toll collection',⁴¹ which was most certainly achieved. A major factor, which enabled the new charges to fulfil their objective, was that less change had to be given by Toll Collectors once motorists became aware of the new and much simpler costs associated with using the bridge.

With the new simplified toll charges the DMR focussed its attention on researching the use of more modern technology that could be used in toll collection. By 1960 the DMR called for tenders for the installation of mechanical aids and it would not be long before toll booths were fitted with cutting edge technology of the day.⁴²

By January 1962 tickets were no longer issued to motorists informing them of their toll fare. As outlined in the DMR annual report, 'instead of tickets being issued by the Toll Collectors the amount of toll paid will be flashed on an indicator clearly visible to vehicle drivers'.⁴³ Also in 1962 cash registers were installed in each of the toll booths. According to Peter Lardner-Smith the register print out was probably used to reconcile each collector's cash takings.⁴⁴

The many changes to tolling significantly streamlined the process of toll collection and made the most of relevant technological advancements at the time.

By the late 1960s the DMR had released a document 'Specification No. P. 547: Specification for Toll Registration and Vehicle Detection Equipment' (undated, but probably between 1966 – 1969), outlining details of a tender for designers interested in supplying equipment for the next generation of tolling technology. The brief outlined the equipment desired by the DMR to assist in the detection and classification of vehicles that approached the toll booths. It also stipulated that the technology had to be capable of distinguishing vehicles that had been registered at the toll booths, yet had not paid their toll.⁴⁵

³⁹ Department of Main Roads, *Report of the Commissioner for Main Roads for the Year Ended 30th June 1960*, (Sydney, Victor C. N. Blight, 1961), p. 32.

⁴⁰ Ibid, p. 34.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Department of Main Roads, *Report of the Commissioner for Main Roads for the Year Ended 30th June 1961*, (Sydney, Victor C. N. Blight, 1962), p. 28.

⁴⁴ Peter Lardner-Smith SHBTOH CD7, 11:24.

⁴⁵ Department of Main Roads, 'Specification No. P. 547: Specification for Toll Registration and Vehicle Detection Equipment', c. 1960s, pp. 1-2.

The DMR had three basic requirements. Firstly it wanted to see designs of keyboards that could be used to register toll payments. It wanted the layout to be simple, have a button for each coin (2c, 5c, 10c, 20c) and three separate buttons E (exempt from toll), O (omnibus) and S (sundry).⁴⁶ Secondly it wanted remote toll registration equipment fitted with alarms that went off the moment tolls were not paid by vehicles. The DMR also desired vehicle detectors with 'sub-surface inductive loop detectors'; a system of wires located just under the surface of the bitumen that could count the number of vehicles moving through the tolls, register whether or not the motorist had paid, and had the capacity to recognise vehicles ranging from motor scooters to large semi-trailers.⁴⁷ Each toll lane was to be fitted with a vehicle detector, and two detectors would need to be installed in lanes with two-way tidal flow.⁴⁸

By 1970 a contract had been signed with British company, Plessey Telephone Company, for telephone networking and a billing system especially adapted for tolling. Each cabin was fitted with a keyboard and a dial-up phone set, which was connected to the Toll Controller's office and a centralised office where all toll taking activity was recorded and printed out at the end of a day. The phone dial-up was used by the collector to log into the system with a specific collector identification number and the keyboard allowed the collector to register each passing toll and toll category. By this stage there were four classes of vehicle; motor bike (5c), three wheeled vehicles (10c), four wheeled cars (20c) and heavy vehicles (40c). Each of these classes had a specific button on the keyboard, which produced 1 – 8 pulses according to which vehicle class key was hit. When the collector was finished his rostered time on, the close button was pushed to close the cabin down which in turn caused the printer to print the combined totals which would then be reconciled with the cash collected. At the end of the Toll Collector's shift they bagged up all their money and dropped it into a safe for recounting by the cash room staff. At the end of every day, at 2.30am, the Toll Controller on duty would go to the print room and collect all the printouts for the day and deliver it to the reconciliation clerk who checked the printout against each Toll Collector's records and takings.⁴⁹

At the time this PABX system was a marked improvement on earlier paper-based systems where there was a strong reliance on individual collector's honesty. Nevertheless it was quite a 'clunky' system in the way it operated as indicated by Peter Lardner-Smith who, in 1976, was brought on deck to maintain this electro-mechanical toll registration system:

There were virtually no electronics in this system at all. It was all chattering electrical relays...so there were literally thousands of these telephone relays at the Harbour Bridge chattering and clicking away like any modern telephone exchange would have sounded in those days. It was so hard to maintain because of the arcing. It was a 48 volt system with arcing on the electrical contact and this causes carbon and circuits were not perfect. The relays became tired, soldering connections became high resistance, and there were a number of mode failures of this system, all which produced errors. (Peter Lardner-Smith SHBTOH CD8, 27:20 & 29:02)

⁴⁶ Ibid, p. 2.

⁴⁷ Ibid, p. 1.

⁴⁸ Ibid, p. 2.

⁴⁹ Peter Lardner-Smith SHBTOH CD8, 32:14.



Toll collection panel

Source - RTA Photo Library

On the 4th July 1970, the method of tolling on the Sydney Harbour Bridge changed and in place of the north and south bound tolling system, one-way tolling was introduced. Tolls would now only be collected from southbound traffic and attracted a fee that, in most cases, was double the previous fee charged (20c). Those choosing to ride motorbikes, scooters and horse drawn carts however would have to pay more than double the original fares (5c instead of 2c). One way tolling both facilitated traffic flow on the bridge and in what must have been a welcome change for the DMR, it reduced the costs associated with toll collection by \$119,000. This change did mean however that less toll collecting personnel were required.⁵⁰

By 1970 the tolls remained the biggest source of income, and almost the second biggest source of expenditure on the Sydney Harbour Bridge. Road tolls provided 90.1 per cent of the bridge's income in the 1970-1971 financial year and made up 14.7 per cent of the expenditure on the bridge. Conversely the income from railway and omnibus usage across the bridge was only 6.5 per cent of the bridge's total income in 1970-71. This indicates that Sydneysiders were simply choosing to steer away from the public transport that was available to them. Cars, trucks and buses travelled across the bridge in ever-increasing numbers throughout the 1970s but there was obviously a limit to the number of toll booths that could be constructed and personnel that could be employed to service the bridge's motorists. The DMR would have to continue its pursuit of alternative avenues to improve the tolling process in the following decade.

⁵⁰ Department of Main Roads, *Supplement to Report of the Commissioner for Main Roads for the Year Ended 30th June, 1971* (Sydney, Department of Main Roads, 1971), p. 47.

The coming of the electronic age

On the 7th June 1970 a headline in the Sun-Herald proclaimed: 'Foldaway Toll Booths Next Month: The Bridge Gets Concertina Gates for One Way Pay'.⁵¹ Toll booths on the Sydney Harbour Bridge, as the newspaper headline suggested, were set to become semi-portable to adapt to the relentless demands of Sydney's traffic. In 1962 about 33 million vehicles crossed the bridge. Just ten years later approximately 50 million vehicles crossed the bridge in one year, equating to nearly one million vehicles per week. Not only was there a lot of traffic, the flow was what the engineers and policy makers at the DMR labelled as 'tidal'; referring to the peak directional waves of traffic that occurred daily. This tidal flow had to be factored into any traffic management plan. Thus in the early 1970s there were measures put in place whereby depending on the traffic demand at a particular time of day, extra lanes on the bridge were allocated in that direction. This facilitated this tidal flow pattern to enhance traffic flow on the bridge.⁵²

To enable the toll to be collected in this flexible lane allocation system, an ingenious solution was developed by the DMR, namely a set of movable toll booths which could be set in place on the extra south bound lanes during the morning peak period and then retracted for the peak northbound (untolled) traffic in the afternoon.⁵³



Movable toll booths

Source - RTA Photo Library

⁵¹ 'Foldaway Toll Booths Next Month: The Bridge Gets Concertina Gates for One Way Pay', *Sun Herald*, 7th June 1970, p. 51 and p. 84.

⁵² Department of Main Roads, 'Movable traffic devices', *Main Roads*, Vol. 39 No. 4 (June 1974), p. 117.

⁵³ *Ibid.*

The design consisted of seven booths, five of which were movable. An electrically operated battery tractor was used to move the booths. This machine was decided upon as the DMR needed a compact and manoeuvrable vehicle that fitted into a fixed booth on the eastern side of the bridge. Impressively, the little tractor could tow 25 tonnes at 4km/h on a flat surface. Even more noteworthy is that an experienced operator could rearrange the toll booths in the very tidy time of two minutes.⁵⁴

During his time as a Toll Collector and Controller on the Sydney Harbour Bridge, Richard Power frequently witnessed this morning ritual:

They were toll cabins 7, 8, 9, 10, 11 & 12...each morning around about 6:15...the RTA tow truck would arrive and one of the staff members would get out and go around the Supervisor's cabin into a tiny space which I think was nicknamed the garage, and in there was a battery operated towing machine that we called the tractor. They'd hop on that, slowly reverse it out, drive around to where the toll cabins were stacked, side by side, just like a stack of DVDs on edge. They would hook up to one of those and slowly drive across the bridge, after of course the north bound traffic had stopped...and of course around 10am depending on traffic the reverse would happen...And that was it, put the tractor away and off they'd go. (Richard Power SHBTOH CD1a, 39:08)

More movable toll booths were required after the Western Distributor was progressively opened in 1972. Studies conducted by the DMR indicated that the traffic moved best when two eastern booths of the southern toll plaza were open in peak periods. At all other times they were moved clear of traffic.⁵⁵ Movable median strips and changeable message signs were also added to the bridge in an effort to cater to the demands of Sydney's road users and guide vehicles across the bridge quickly and safely.⁵⁶ Clearly tolling had become a complex and technical process.

Another initiative to facilitate traffic flow and expedite toll collection, introduced in tandem with one way tolling, was the installation of four basic automatic coin collection and toll registration machines. The units were purchased from an American toll systems company and while they facilitated faster moving traffic and reduced staff requirements, they proved to be unreliable. There was a significant number of coin jam incidents especially during peak periods. By 1977, when Peter Lardner-Smith had established the Harbour Bridge Workshop at Ennis Rd, Milsons Point, it had become imperative for a more efficient and reliable system to be developed. This was one of the workshop's first research and development projects:

We built [the new automatic toll machines] quite cheaply and we had our own electronics in them and we interfaced them to our toll registration system, which we controlled ourselves, so the toll registration system was all home-grown. (Peter Lardner-Smith SHBTOH CD7, 5:14)

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ Ibid, pp. 117-119.



Automatic toll booth
Source – RTA Library

Ken McKay, who was Toll Manager for Sydney Harbour Bridge from 1987, reflected on the introduction of the automatic toll machines.

[The automatic toll machines] were only adopted in two toll booths on the north side and two on the south side, but it was a very good innovation. They could process traffic at the rate of up to 550, 600 vehicles an hour. Whereas a manually operated toll gate is 350-400 vehicles per hour. So that is a significant difference. (Ken McKay SHBTOH CD13, 39:42)

This 'home-grown' system was in place up until 1989 when a Queensland company, Toll Systems Technology produced a more reliable product. Notwithstanding the updates and improvements in the technology of automatic toll machines, there were still limitations as the machines were somewhat temperamental and required constant attention, especially when the general public attempted toll evasion by trying to pass off various foreign objects as a coin toll payment.

Toll Collector, Jude Singarayar recalled one such incident, "one day someone threw in a sausage and we had a terrible time cleaning it."⁵⁷

In a similar vein Ken McKay talked about other toll evasion schemes that were used in the years before the new coin counting machines were developed by DMR:

⁵⁷ Tags for the Memories: Technology Takes its Toll on Bridge Life', *Sydney Morning Herald*, 10 Jan. 2009, accessed via SMH.com.au hosted by Fairfax Digital, <http://www.smh.com.au/news/national/technology-takes-its-toll-on-bridge-life/2009/01/09/1231004286955.html>

A Luna Park token was about the same size as a 10c coin and our machines would recognise them because of the size. We were getting hundreds of these Luna Park tokens. We used to go over to Luna Park every couple of months and sell them back to them. (Ken McKay SHBTOH CD13, 55:22)

Somebody pointed out to me that since I was the manager, if you looked at that very carefully, it says 'Toll To Ken.' How about that, eh? We had hundreds of thousands of these made. They were very nicely done, but guess what? They're exactly the same mass, dimensions and metallic content as an English 2p coin. So you know what happened then? We found 2p coins going into our coin machines. And the word was that there were several – we don't know, we'll never know – flight stewards bringing them into the country and flogging them at a Neutral Bay Hotel. (Ken McKay SHBTOH CD13, 58:42)

By the end of the 1970s it became clear that the aging PABX system of recording toll registrations needed replacing. So in about 1980 the DMR purchased its first computer-based toll registration equipment, the Digital Equipment Corporation PDP 11/34. This particular computer was used elsewhere within the DMR for controlling traffic systems on traffic signal intersections and had proved very reliable. Software was developed for the computer to allow it to interface with existing systems. Peter Lardner-Smith pointed out that with the installation of this system there were far fewer errors in the registration of toll collection:

Our accountability became a whole lot sharper. That was demonstrated in a big way in 1984 when the police arrested a number of Toll Collectors in one hit based on our data...that gave us a benchmark as to how accurate the system had become and now the Toll Master who ran the bridge and his staff knew that the old problems were no longer an excuse for these errors. (Peter Lardner-Smith SHBTOH CD7, 48:50 & 50:45)

With the exception of several software upgrades, this computer system for tolling operations on the Sydney Harbour Bridge was in place until early 2000.

Aside from the significant technological changes to tolling during the 1970s and early 1980s, there was a major social change in the make-up of the Sydney Harbour Bridge workforce. In 1979 the first female Toll Collectors were appointed. Only two were recruited yet it was a significant development in the bridge's history.⁵⁸ The number of female Toll Collectors continued to increase over the following decades. Dennis Murphy first began working as a Toll Administration Officer in 1999 and recalled:

There were a lot of ladies working on the bridge as Toll Collectors...and I was amazed. Some of those ladies got the speed in collecting the money. They don't say much, they just flow them through, collect the money and give them the change, move them on. But they were very competitive with the men. (Dennis Murphy SHBTOH CD12, 22:37)

Janet Miller, who joined the RTA in 1995 as a casual Toll Collector soon gained permanency. She later became Group Leader and finally achieved the position as first and only female Toll Controller on the Sydney Harbour Bridge.

⁵⁸ Peter Spearritt, *The Sydney Harbour Bridge: A Life* (Sydney, UNSW Press, 2007), p. 122.

I'd say there was big resistance to having a woman controller...there had been men who were Group Leaders on the road that were saying, 'I won't take instruction from a woman'. But then when I was up there asking them to do things, they did as I asked. (Janet Miller SHBTOH CD6, 02:43 & 04:22)

Tolling and traffic congestion remained important issues for the DMR throughout the 1970s. Some Sydneysiders were of the opinion that the collection of tolls was a root cause of congestion on the bridge, while others were concerned with the increasing number of cars crossing the bridge to get into the city. One lobby group, the Australian Transport Study Group suggested in 1977 that the toll be raised to 50c to encourage people onto public transport and thus reduce the number of cars travelling into the city.⁵⁹ They were not the only group to suggest such measures: in 1982 the possibility of a \$4 toll to prompt people to use public transport was floated by many in Sydney.⁶⁰

The argument that to remove the tolls would speed up the flow of traffic on the bridge was defused by the DMR. Using as an example the four day Toll Collectors' strike of January 1980, where traffic remained as heavy as ever, they argued that removing the toll would not improve traffic flow. Traffic hazards, such as broken down cars were said to be more of an inconvenience and the root of traffic problems, rather than motorists having to slow down to stop and pay their toll.⁶¹ So, like it or not the toll was there to stay and for the moment would remain unchanged.

It did however increase dramatically in June 1987, when the toll for cars rose to \$1.00. Aware that it was a dramatic hike in the toll from 20c to \$1.00, toll staff on the bridge were concerned about the way in which the community might respond.

When it went up we were all very nervous. The staff were worried that they were going to be assaulted in some cases, so I spent a fair bit of time on the toll plaza that day wandering around...I remember a fellow named Ken was collecting tolls and a motorist came along and offered him an apple as well as the toll and he took the apple and the motorist said are you going to eat it and Ken said no it might be poisoned...We were also worried about how the toll staff were going to count the money...what happened was that the staff had a massive increase in the number of coins that they had to get rid of. It became such an issue that I agreed that they should no longer have to count the coins. (Ken McKay SHBTOH CD13, 43:45)

As a result of the increased coin collection toll staff were often spending most of their break counting coins. Union representatives took this issue to Ken McKay who then instituted a system whereby Toll Collectors counted only notes and instead of counting the coins that they collected they weighed the coins and noted the weight. The coins were later counted in a coin counting machine in the toll collecting office in Cumberland Street office.

By the mid-1980s planning was well underway for the construction of a tunnel under Sydney Harbour. In the Sydney Harbour Tunnel Environmental Impact Statement of 1986, Cameron McNamara estimated 'that an increase in the [Harbour Bridge] toll from 20c to \$1.00 in

⁵⁹ Ibid.

⁶⁰ '50 Years After – And Still Waiting for the Payoff', *The West Australian*, 16 March 1982, p. 52.

⁶¹ Department of Main Roads, 'Toll Collecting on the Sydney Harbour Bridge' *Main Roads*, December 1983, p. 110.

1987 would reduce two-way annual traffic by 2.5 per cent in the first year of the higher toll'. This reduction in traffic was expected to remain if the toll was indexed each year.⁶² The increased charges did result in a decline in southbound travellers across the bridge however, this was short lived.⁶³ Aside from periodically helping to relieve traffic congestion another by-product of the higher toll charge was that it increased the funds available in the Sydney Harbour Bridge Account.



Coin counting machine

Source - RTA Photo Library

The DMR Annual Report of the 1986-87 financial year explained 'The additional revenue from the increased Sydney Harbour Bridge Toll Charges will provide a source of funds for the construction of the Sydney Harbour Tunnel'.⁶⁴ Now the tolls, apart from helping to pay off the bridge loan (which occurred in 1988), were being used to finance a new major public work. On the 5th March 1989 a further toll increase from \$1.00 to \$1.50 generated even more revenue for the Sydney Harbour Tunnel.⁶⁵ By this time the DMR had undergone a restructure and was now the Roads and Traffic Authority (RTA).

⁶² The estimations of Cameron McNamara, *Sydney Harbour Tunnel Environmental Impact Statement* prepared for Transfield-Kumagai Joint Venture by Cameron McNamara Consultants, November 1986, are discussed in J. A. Black and U. Vandebona 'Research into Traffic Models for the Economic Evaluation of Private Sector Toll Roads and Tunnel Proposals in New South Wales', *Australasian Transport Research Forum*, p. 416.

⁶³ Department of Main Roads, *Commissioner for Main Roads Annual Report 1987-88* (Sydney, Department of Main Roads, 1988), p. 27.

⁶⁴ Department of Main Roads, *Commissioner for Main Roads Annual Report 1986-87* (Sydney, Department of Main Roads, 1987), p. 32.

⁶⁵ Roads and Traffic Authority New South Wales, *Annual Report 1988-89* (Sydney, RTA, 1989), p. 29. The RTA was established in 1989 and brought together the Department of Main Roads, Department of Motor Transport and Traffic Authority under one entity.

Coinciding with the RTA's decision to raise the cost of travelling across the bridge by road, was its decision to trial pre-paid methods of paying the toll. The trial was to last four months and the RTA announced that 'Periodic Toll Passes in the form of windscreen stickers, Pre-Paid Toll Tickets, Tokens and Toll Account Vouchers' would be used to denote those customers who had pre-paid.⁶⁶

Now the tickets were simply a tear off piece of paper and you gave it to the Toll Collector but the motorist had already paid for the tickets at a motor registry or service station. We didn't keep that up for long because they were not very popular with motorists...the tokens were very popular. (Ken McKay SHBTOH CD13, 58:11)



Toll token

Source - RTA Photo Library

The tokens were minted at the Royal Australian Mint and had an image of the Sydney Harbour Bridge with the Opera House in the background. On the other side of the coin was the Waratah, the floral emblem of NSW.

Tolling on the bridge had come a long way since it first began in 1932. Due to major technological advancements the process of paying the toll to cross the bridge was becoming faster and faster and by the 1990s, was aided by a number of gadgets. Now there was the option of pre-paying your toll. Yet would this work for everyone? And what was the best method for pre-paid travel across the bridge? The RTA grappled with these questions and many others into the early 1990s and beyond.

⁶⁶ Ibid.

Moving towards cashless tolling

Tolling on the Sydney Harbour Bridge emerged as a critical issue in the 1990s. By 1991 the Authority had decided that it was not economically, environmentally or socially sustainable to just build more roads to accommodate Sydney's traffic.⁶⁷ Brand new avenues of traffic management had to be pursued. The bridge tolls, and how they were priced and paid, became an important traffic management technique and Sydneysiders had to get used to the many changes about to come their way.

Despite the RTA's growing conviction that traffic congestion could not simply be dealt with by adding roads to the network, plans set in place in 1986 to construct a tunnel under the harbour came to fruition on 31 August 1992. On this day the Sydney Harbour Tunnel was opened which gave motorists an extra four lanes, two in each direction, to travel into and out of the city. The Authority took this opportunity to dedicate lane 7 on the bridge as a Bus Lane.

The tunnel's construction had been made possible by the revenue collected from tolls on the Sydney Harbour Bridge and the intricacies of the tunnel's financing were set out in the DMR's Annual Report of 1986-87. It was agreed that monthly payments, stipulated by the Net Bridge Revenue Loan Agreement, would be made to the Sydney Harbour Tunnel Company during construction. The first payment of \$2.5 million was made on 13 July 1987. These payments were set to continue until 1992 when the tunnel was scheduled to be completed. The NSW Government was then obliged to continue its monthly payments to the Company, under the same Agreement, until 2022 when the entire amount owing (\$222.6 million) was due to be paid. Once the government had fulfilled its financial obligations to the Company in 2022 they would assume ownership of the tunnel at no cost.⁶⁸ The NSW Government decided that travelling through the tunnel and across the bridge would be tolled at the same rate. This was to ensure that motorists did not flock to the cheaper route and thus ensured that the traffic was shared evenly between the two road systems. By 1995 the toll on both networks was \$2.00. The revenue from tolls taken at the Sydney Harbour Tunnel, like the revenue made via the bridge tolls, made its way into the Sydney Harbour Bridge Account.⁶⁹

Despite being a privately constructed and operated road, from the outset the RTA managed the toll collection for the Sydney Harbour Tunnel. Initially it was contracted to Wormald Security and later Chubb Security. Ken McKay oversaw the private contracting and supervision of toll collection by the Security Company on the tunnel and recalled the first day of operations:

They got all this money and they didn't know what do with it. They didn't have the means of accounting for the takings. We left them to it on day one but when it became a mess, I went over and sat with the Manager, I even loaned him one of our computers...and gave him the software to be able to bulk up all the dough

⁶⁷ Roads and Traffic Authority New South Wales, *Annual Report 1990-91*, (Sydney, RTA, 1991), p. 28.

⁶⁸ Department of Main Roads, *Commissioner for Main Roads Annual Report 1986-87* (Sydney, Department of Main Roads, 1987), p. 32.

⁶⁹ Peter Spearritt, *The Sydney Harbour Bridge*, p. 129; Doug Quail, 'Electronic Toll Collection on the Sydney Harbour Bridge', *Proceedings of the Application of New Technology to Transport Systems Conference*, (Melbourne, 1995), Vol. 2, p. 261.

and split it into denomination so it could be put in a form suitable for banking.
(Ken McKay SHBTOH CD14, 13:49)

Ken also noted that engaging a private company to collect tolls in the Sydney Harbour Tunnel did not cause any industrial unrest among the bridge Toll Collectors. The tunnel was perceived to be operated by a private entity and so did not threaten the bridge collectors' jobs.

The RTA subsequently discontinued contracting out of toll collection on the tunnel and its staff of Toll Collectors were deployed to collect tolls there.

A new tunnel was not the only change coming Sydneysiders' way though. In its 1990-91 Annual Report the RTA revealed that it was in the process of revolutionising how tolls were collected in Sydney to deal with the gridlock that often greeted motorists. It stated that:

Pricing mechanisms may also help to alleviate the economic and environmental costs of road congestion. We are investigating new technology, such as electronic toll collection, which replaces traditional toll collection procedures, and researching methods that vary the toll according to the time of day or level of congestion.⁷⁰

It did not take the RTA long to find an appropriate apparatus that enabled the process of electronic tolling to begin.

By the 1990s radio frequency identification technology was being utilised in a number of industries worldwide. An American system developed by Amtech was being used to keep track of stockyard animals and the U.S. had adapted this technology for use on their tollways. At the same time similar research was being conducted in Australia at the University of Adelaide although it had not taken on the application to tolling industry at the time. Both these groups demonstrated their products to the RTA and it was the Australian product that was selected for the trial.

The Sydney Harbour Bridge played host to the first trial of Electronic Toll Collection (ETC) in Australia. The pilot for ETC on the bridge was commissioned July 1993 and was trialled for two years.⁷¹ Digital Equipment Corporation (DEC) won the contract and supplied the RTA with 1,000 tags, six toll lane readers, microcomputers, software for the lane controllers and central computer, video cameras, video capture hardware cards and VCRs: all the equipment needed to test DEC's design out.⁷²

The electronic tag was a simple yet inspired piece of equipment. It was 3cm x 5cm tag with a thickness of only about 5mm. It did not require a battery to operate, instead being energised by the microwave radio beam signal power from the roadside ETag readers. It was encased in a plastic casing with Velcro on the back to secure it to the windscreen.⁷³ Housed inside

⁷⁰ Roads and Traffic Authority New South Wales, *Annual Report 1990-91*, (Sydney, RTA, 1991), p. 28.

⁷¹ Doug Quail, 'Electronic Toll Collection on the Sydney Harbour Bridge', p. 259 and Patrick Smith, 'Risk and Reward', *World Highways/Routes Du Monde* (January/February, 1996), pp. 66-67.

⁷² Peter Lardner-Smith, 'The Sydney Harbour Bridge Electronic Toll Collection Pilot Project', Roads and Traffic Authority of New South Wales, p. 121.

⁷³ See Fig. 4, Doug Quail, 'Electronic Toll Collection on the Sydney Harbour Bridge', p. 264.

the casing was a copper antenna. It was designed to use 'pulsed modulated backscatter radio frequency' and worked in the following manner:

- 1) A pulse of 921 MHz was emitted by the tag reader (attached to the toll booth itself) for 3msec at a rate of 15pulses/s.
- 2) The antenna in a tag of the 'beam path' (6m) was activated by the current induced by the reader.
- 3) The now-activated tag transmitted its tag ID (a ten digit number) to the tag reader, which passed the information to the Toll Booth Computer System.
- 4) The details were then downloaded and the tag ID was paired with the owner and account details of the user. The toll fare was then deducted from the account.

Impressively the response rate of the tag was less than 40msec, and it cost less than \$20 per tag to construct.⁷⁴



Original Sydney Harbour Bridge ETag, showing internal copper antenna and small integrated circuit above it, and Velcro mounting strips on outer casing

Source – Peter Lardner-Smith

Integrating ETC at the tolls was fairly easy. The three busiest lanes (the automatic lanes only) were chosen to host the new technology as they were open all day, every day.⁷⁵ To notify

⁷⁴ For a very thorough description of how the tag worked and an in depth explanation of the technology see Peter Lardner-Smith, 'The Sydney Harbour Bridge Electronic Toll Collection Pilot Project', pp. 122-123; see also Smith, 'Risk and Reward', p. 67; and George Kriflik (Ed.), 'Electronic Toll Collection Technology', *Contact* (October 1992), pp. 3-4.

motorists whether or not their payment had processed successfully the pre-existing lights and 'patron fare indicator[s]' at the toll lanes were utilised. A green light paired with the message 'Tag accepted' indicated to motorists that they could continue on their way. A green light could also be paired with the message 'Tag low balance'. Red lights accompanied the messages 'Tag black' and 'Tag invalid' for instances where stolen or faulty tags were used at the tolls.⁷⁶

There were two types of participants for the trial. Private motorists were asked to participate in the trial via invitations that were distributed by Toll Collectors. The RTA directly encouraged major fleet customers to participate by altering their pre-paid methods and moving from paper to the new electronic system; their payment terms would remain unchanged. Private motorists though, once they agreed to become part of the trial, had to pay \$40 in advance to set up a credit balance at the tolls. Monthly statements were then sent to private motorists so that they could keep tabs on their account. They were also required to make top-up payments when and if their account fell below a certain threshold.⁷⁷

Overall the trial was a success. In late 1994 an independent review of the entire system was conducted. It was found that the tags in cars were reliably read when travelling through the tolls at around 30km/h, even tags left in the boots of cars were read by the system. The system worked less well for buses and trucks as the tags were placed at the top of the windscreens in these vehicles. Thus it was deduced that the tag and reader needed to be distanced further from each other to function effectively, so it was decided that the best position for tags in trucks and buses was at the bottom of the windscreen.⁷⁸

Both fleet and private users were very satisfied with the new electronic system. A survey was done at the completion of the trial and questionnaires were sent to both fleet managers and private motorists. 279 private motorists and 32 fleet managers responded to the survey. Most private motorists were surprised by how good ETC was: 60 per cent believed that it was a lot better than they thought it would be. A huge 97 per cent stated that they would recommend ETC to their fellow bridge using friends, a figure that no doubt pleased those at the RTA immensely. Less pleasing was that only 88 per cent said that they would 'probably or definitely' use this system yet it was rationalised that this figure was due to the number of motorists that signed up to trial ETC but used the bridge infrequently. It was quite clear that ETC benefited regular users of the bridge more and this sentiment was supported by the fact that 97 per cent of fleet managers stated that their company would 'probably' use ETC in the future.⁷⁹

Toll Collectors had mixed reactions to the new system. Fears surrounding job security were understandably prevalent, yet on the positive side, Toll Collectors felt that implementing ETC meant that they would not have to store so much cash.

⁷⁵ Peter Lardner-Smith, 'The Sydney Harbour Bridge Electronic Toll Collection Pilot Project', p. 121.

⁷⁶ Doug Quail, 'Electronic Toll Collection on the Sydney Harbour Bridge', p. 263.

⁷⁷ Ibid, p. 265.

⁷⁸ Peter Lardner-Smith, 'The Sydney Harbour Bridge Electronic Toll Collection Pilot Project', p. 123; see also Doug Quail, 'Electronic Toll Collection on the Sydney Harbour Bridge', pp. 266-267.

⁷⁹ Doug Quail, 'Electronic Toll Collection on the Sydney Harbour Bridge', pp. 267-268.

Personal safety became more of an issue with the trialling of the ETC tags. Cars using this new tag were able to travel much faster through the toll booths (approximately 30km/h) creating safety concerns for toll staff who were vulnerable to fast travelling cars.⁸⁰ ETC changed the average day of a Toll Collector in other ways as well. Due to the implementation of a Video Enforcement System which was set up to detect those cars that had failed to pay their toll, collectors were no longer required to monitor and report on those motorists who had failed to pay their toll.⁸¹ They also had to learn how to deal with motorists who arrived at the toll booths with tags that had no credit.⁸²

At the end of the two-year trial the RTA decided to extend this particular ETC system and over the next six or so years 30,000 of these radio frequency identification tags were issued.

While it was a very good system, a few problems were found. One of these was identified with the move from Stop/Go traffic barrier to high speed lanes with the dedication of Lane 1 at Milsons Point to particular vehicles.



Multiple toll payment options on the Sydney Harbour Bridge

Source - RTA Photo Library

Peter Lardner-Smith recalled:

In 1990s when Lane 1 was dedicated to buses, taxis, hire cars and later on motor cycles, we needed to lower the angle that the transceiver was looking as it faced the approaching vehicle. There were limited places you could fit tags in the buses and this meant that the receiver started reading tags in the adjacent lanes. This started causing operation problems. (Peter Lardner-Smith, SHBTOH CD9, 18:32)

As well as these operational problems, by the late 1990s it was obvious that the Sydney Harbour Bridge computer based toll management system (the PDPII) was reaching its

⁸⁰ Doug Quail, 'Electronic Toll Collection on the Sydney Harbour Bridge', p. 267.

⁸¹ Peter Lardner-Smith, 'The Sydney Harbour Bridge Electronic Toll Collection Pilot Project', p. 125.

⁸² Doug Quail, 'Electronic Toll Collection on the Sydney Harbour Bridge', p. 267.

capacity and having difficulty dealing with three different methods of collecting and accounting for tolls - manual and automatic tolls and in particular the increasing ETag tolling.

I think it [the computerised toll management system] was built for a particular capacity of transactions and the communications links between all of these various pieces were less than reliable at times...it relies on all of these systems [manual, automatic and ETag Controller systems] being awake and working properly and talking to each other in a very timely manner for the motorist to get a good experience, as some would say a forgettable experience; and for you to get all the data in the system to ensure that you have collected all your cash properly or all your electronic toll money properly. (Mark Di Val SHBTOH CD15, 13:37)

Mark Di Val, who was responsible for the maintenance of the PDPII system and associated software, also noted that there were performance limitations with the computer system where hard discs were being clogged with information which led to system stoppages. Administratively the three systems were also producing a huge amount of work as the toll branch now not only had to manage toll accounts, but also the prepaid customer accounts and invoicing systems.

By the time we switched the old system off, we were producing a pile of A4 paper about four foot high every month. And the two girls who were operating the account side of things would have to fold those and put them into envelopes. I didn't envy them for that task. And on the hardware that we had at the time, the invoice run to produce those statements would take about 12 hours. (Mark Di Val SHBTOH CD15, 29:15)

In Sydney and throughout Australia an increasing number of toll roads were being constructed, the proceeds of which paid for the construction costs. Electronic tolling was clearly seen as the only way to deal with increasing demands of traffic load on these roads. It was also clear that any electronic tolling system must be interoperable, that is, the hardware for one toll system should be able to be used on any other toll road in the country and charge toll costs back to an individual account. The RTA kept the extended use of the original ETag system in place right up until April 2001 as it was awaiting the development of an Australia-wide interoperability Standard. Back in 1995 a committee had been established under the auspices of Standards Australia, charged with the development of a Standard for interoperability on toll collection. Peter Lardner-Smith was Chairman of the committee that comprised representatives from industry suppliers and toll road operators throughout Australia as well as government representatives from each state. After five years of research and investigation into various Standards, a specification for an Australian interoperability Standard had been agreed and developed.⁸³

Australia was the first country in the world to have interoperability on a national level with one account to one driver with one ETag on his windscreen, covering the entire breadth of Australia...and that works today with equipment sourced from multiple suppliers. (Peter Lardner-Smith SHBTOH CD8, 44:19)

From April 2001 to 2005 when the standard was finalised, an interim form of this interoperability standard was in place and electronic tolling on the Sydney Harbour Bridge changed over to this new system.

⁸³ Peter Lardner-Smith SHBTOH CD8, 24:05.

The RTA signed a contract with a consortium of companies, Q-Free of Norway and Abbey Group to supply, build and maintain a new e-toll system based on ...dynamic short-range communication [tags]...these were so called active tags, they had a battery in them. When they came under a reader that was transmitting, they would wake and have a...radio frequency dialogue...a secure dialogue with the reader. Once they finished that transaction they would go back to sleep...I think there was a lot more security around the transaction with the new style tags. (Mark Di Val SHBTOH CD15, 35:59)

In tandem with the introduction of the new ETag system was the development and installation of a new computer system and accompanying software. This was known as the Toll Registration System which was developed for the RTA by Mark Di Val. The system consisted of a number of Compaq servers that were located both at The Rocks and the Sydney Harbour Tunnel. It had a number of client applications such as the real time application used by the Controller which presented that officer with a tabular format of what was going on in each of the lanes. It recorded every category of transaction for cash taken and etoll registration. This system was in operation until 2009.

Along with the new computer system was the conversion to the new ETag system which required the gradual swapping over of old with new reader technology which was mounted on the toll booths. The old system ran at 900MHz while the new system ran at 5.8GHz. This meant that the new system read within a tight area thus eliminating the problem of cross-lane reading.⁸⁴

There were two toll increases during the early 2000s: \$2.20 in July 2000 and then to \$3.00 in January 2002.



Fully interoperable RTA ETag

Source - RTA Photo Library

⁸⁴ Mark Di Val SHBTOH CD15, 44:31.

Electronic tolling was seen as the only efficient way to deal with traffic demand. The benefits of ETag tolling quickly became obvious with about 2,000 vehicles per hour being able to pass through the ETag lanes as compared to about 500-600 vehicles per hour through the single coin transaction cash lanes. As the number of people embracing the new ETag system increased, the number of cash lanes on the bridge were decreased. This changeover was a gradual process taking place over much of the decade of the 2000s. In July 2007, the Sydney Harbour Tunnel converted to electronic tolling only.⁸⁵



Progressive conversion of toll lanes on the Sydney Harbour Bridge

Source - RTA Photo Library

While Australians are generally keen to take up new technology and the uptake of the ETag was high, the RTA was aware that it would still have to work hard at converting the general public to a fully ETag system.

Before the Authority could make the decision to switch to a cashless tolling system, 90 per cent or more vehicles using the Sydney Harbour Bridge would have to be using the ETag system.

⁸⁵ Peter Lardner-Smith, SHBTOH CD8 52:52.

Sydney Harbour Bridge goes cashless

The convenience and efficiency of electronic tolling was steadily recognised by commuters using the bridge, and the RTA converted more and more lanes to the ETag system enabling a smooth transition to a cashless system. During 2008 it was clear that the uptake of the ETags was sufficient to convert the bridge toll to a fully ETag system. The Sydney Harbour Bridge finally went cashless on Sunday 11 January 2009. This event meant a huge upheaval for toll staff working on the Sydney Harbour Bridge. Many of the positions were abolished and staff were offered a redundancy package or redeployment to office positions.

As well as the human resources aspect of going cashless, the RTA had a significant amount of work to do to prepare and install the infrastructure required for a fully electronic tolling system. This included installing gantries and Q-Free multi readers, video surveillance systems and traffic management systems.



Changeover to cashless tolling on the Sydney Harbour Bridge

Source - RTA Photo Library

Electronic toll payment functioned by registering and documenting the activity of the toll reader and each ETag which slates a payment back to the motorist's account. There are two payment systems in place with some accounts being prepaid via credit card or direct debit, and some accounts especially those with larger business concerns being post paid accounts where an invoice is sent to the company at the end of the month. Pieces of software such as

Crystal Report and Business Objects are used to report on a daily, weekly or monthly basis to ensure that accurate reconciliations occur.⁸⁶

Reconciliation is more complex than it ever was. In the current system the user pays a tag deposit of \$40 so if you have a million active tags out there, you have basically got \$40 million in tag deposits – that's not the correct figure...it's a challenge keeping track of what the current system is holding in terms of money. Plus we have a mix of prepaid and post paid accounts. So with post paid accounts we are actually providing a degree of credit until they pay their monthly account. (Mark Di Val, SHBTOH CD16, 7:56)

Mark Di Val commented that one of the biggest challenges is the age-old problem of equipment failure. He explained that if the multi-readers fail, which they do on occasion, they stop communicating with the other systems so there is a kind of blackout. The CCT camera is in a sense a backup as it records each vehicle registration going through, however it has to be manually matched up with a corresponding 'orphan tag read.'



Cashless tolling on the Sydney Harbour Bridge

Source - RTA Photo Library

Another challenge of the Tolling Branch is that it now has to manage a huge volume of customer accounts.

⁸⁶ Mark Di Val SHBTOH CD16, 7:26 & 7:56.

If you ask if it's cheaper to do electronic than have people collecting cash the answer would be 'no'. What we have spent on systems and people to manage accounts would far outweigh anything that we spent on a pool of cash collection staff. But the benefits are that you have a freer flowing motorway; the motorist doesn't have to slow down and stop and all the toll booths, so from a traffic management view there are obvious benefits. (Mark Di Val SHBTOH CD16, 29:27)

One of the most notable benefits of electronic tolling on the Sydney Harbour Bridge and other road networks is the ability to manage traffic and congestion through the levying of a time of day tolling or peak tolling.

In off-peak periods between 7.00pm and 6.30am the toll is \$2.50. In peak periods the toll is \$4.00 and during the middle of the day it falls to the standard \$3.00 payment. This has had the effect of reducing the total number of vehicles crossing the bridge during peak times and spreading the traffic load to other shoulder periods. This has had positive ramifications across the whole road network.⁸⁷

The RTA sees great potential for the electronic tolling system. There is strong interest in using the system to pay for goods and services such as parking, and in the future paying for petrol and drive-through fast food. In this system one could cross the Sydney Harbour Bridge, park at the Sydney Airport and buy a hamburger on the way back without having to reach for one's wallet or purse.⁸⁸

⁸⁷ Mark Di Val SHBTOH CD16, 31:30.

⁸⁸ Ibid.

Toll collecting on the Sydney Harbour Bridge 1980s to 2009

The Toll Masters/Managers

By the 1980s when the longest serving toll staff interviewed for this project started work on the bridge, the toll staffing structure on the Sydney Harbour Bridge was well established. Operations of tolling on the Sydney Harbour Bridge were managed by a Toll Master who had overarching responsibility for staffing, industrial relations issues, managing traffic issues, and the collection and accounting for tolls. The title of this position was changed to Manager Sydney Harbour Bridge Toll in 1987. Ken McKay instituted this change:

The title was a bit sexist, so I had it changed. I didn't think 'Toll Master' was appropriate. In fact there was a sign on the office door where I worked which said 'Toll Master', and one of my first initiatives was to rip it down. (Ken McKay SHBTOH CD13, 5:38)



View from Toll Controller's office at the southern toll plaza

Source - RTA Photo Library

Sydney Harbour Bridge Toll Controllers

Under the Toll Manager, there were two areas of responsibility. One was the toll office and its administration workers, including the staff in the cash counting room who were supervised by an Office Manager. Toll Controllers were responsible for toll collection on the Sydney Harbour Bridge and acted as 'the Manager's eyes and ears on the bridge', especially during the evening and night shifts when the manager was not on duty. The Toll Controllers kept a daily log of any incidents that may have occurred during the shift. The main responsibility of the Controller was to oversee the collection of tolls during the shift. They

ensured the security of the buildings and equipment and of all the money collected and stored on the premises. They also were required to manage the toll plaza and staffing levels according to the rostered shifts, frequently having to juggle staff if someone telephoned in sick.

As well they oversaw the opening and closing of toll booths, organised repairs of toll booths and collection equipment in booths, and any emergency situation.⁸⁹

At the southern toll plaza the Toll Controller's office was located on the top floor of the Sydney Harbour Bridge Toll Office on the eastern side of the plaza. A large set of windows overlooked both the fixed and mobile toll cabins and afforded views north up the bridge deck and south into the city. At Milsons Point toll plaza the Toll Controller's office was in a narrow building between the first and second set of cabins. Once again this office had good views of traffic and the plaza.⁹⁰



View from Toll Controller's office at the northern toll plaza

Source - RTA Photo Library

When the Sydney Harbour Tunnel was completed and became operational the north plaza controller's office was moved to a building at the northern approach to the tunnel and the Milsons Point toll plaza was monitored completely by CCT cameras.

The offices were fitted out with computer equipment used in the registration of toll collection, video/DVD recorders and also CCT cameras and monitors. This last equipment

⁸⁹ Richard Power SHBTOH CD2a, 13:29.

⁹⁰ Ibid CD2a, 29:57.

was used to record not only traffic movements but by the 1990s, the manual work of Toll Collectors who were subject to random sampling of their toll registrations as yet another check on the accuracy and security of the toll collection operations.⁹¹



Inside the Toll Controller's office at the southern toll plaza

Source - RTA Photo Library

The Toll Supervisors/Group Leaders

Supervisors, later known as Group Leaders, were accountable to the Toll Controller and were responsible for ensuring the smooth operation of the toll plaza, which included physically opening and closing lanes. They also attended to the automatic toll booths, changing the vaults when they became full, and dealt with any blockages and general trouble shooting on the bridge. As well they dealt with delivering change to collectors as they needed it. For many years it was the Supervisor that wrote deferred toll tickets for anyone who didn't have money to pay the toll. They were accommodated in their own cabin but by all accounts did not spend much time there:

They were on the go all the time...there was always something happening at peak hour – people running short of money, something happened to collection registration equipment, something happened here and there, they were on the go all the time. Every time the Supervisor moved from one booth to the other they had to cross an open lane of traffic so there was danger all the time. (Richard Power SHBTOH CD2a, 2:55)

⁹¹ Ibid CD2a, 31.59.



Sydney Harbour Bridge Deferred Toll Docket book

Source - RTA Photo Library

Initially the Supervisor's cabin on the south plaza was situated behind the most western toll cabin and it was later moved to the central toll cabin which meant that the Supervisors did not have to move across so many lanes of traffic.

The Toll Collectors

On the front line of toll collection on the Sydney Harbour Bridge were the Toll Collectors who manned the cabins on the north and south toll plazas and the Sydney Harbour Tunnel.

The Toll Collectors collected the toll from passing motorists, registered each transaction and were responsible for their takings until it was handed over to the Controller at the end of their shift. Up until the late 1990s, toll staff worked to a rotating roster where they would be allocated either morning, afternoon or night shift for the following two week period. The morning shift started at 6.30am until 2.30pm. The afternoon shift went from 2.30pm to 10.30pm and the night shift from 10.30pm to 6.30am. The morning shift was the busiest shift, closely followed by the afternoon shift when traffic was heading away from the city.



Inside the toll booth

Source - RTA Photo Library

Night shift was far and away the quietest shift which posed the challenge for some for staying awake and attentive.



Night shift on the Sydney Harbour Bridge

Source - RTA Photo Library

Jude Singarayar started as a Toll Collector in 1987 and was also a union representative for many years:

The night shift was difficult, the eight hours is like a month because there is less work, less motorists and you have to keep awake. There was this particular collector who fell asleep with his hand out the booth. And motorists are putting the money on his hand until he had a bunch of coins piled in his hands. Then one motorist came and looked and looked at him and he thought he was dead, so he rang the Controller and said, "It looks like your collector is dead and he has a handful of coins". The Controller came out to see and this fellow woke up and said, "I'm sorry, I'm sorry, I fell asleep". (Jude Singarayar SHBTOH CD4, 47:12)



Toll Collector during night shift on the Sydney Harbour Bridge

Source - RTA Photo Library

Following the opening of the tunnel, it was possible for workers to apply for a fixed shift. For many, this was a far more stable system of work and made it a little easier for the administration office to schedule the Toll Collectors who under the old system took frequent sick days.

The shifts were broken down into periods of between 45 minutes and two hours after which the Collectors took a half hour break to relieve them from the stress of collecting and also to count and secure their toll takings from that period. The length of the period on duty is dictated by the volume of traffic during a shift. Saeed Ghairahkhani who started as a Toll Collector in 1984 noted on the morning shift:

You would start collecting and within one hour you could have 20 or 50 kilos of coins to carry. If they stay in the cabin for two hours, they can't carry the tray of coins. So the break was after one hour, sometimes 45 minutes. That break is not ours because we had to go and count the money. (Saeed Ghairahkhani SHBTOH CD20, 00:25)



Toll Collector's cashbox and coin tray

Source - RTA Photo Library

At the end of the shift the Toll Collectors were required to count their toll takings again in the pay-in room and note it on a cash dissection form indicating how much they had collected in each denomination and this would then be matched up against a print out of toll registrations for each Toll Collector.

We put the coins into one big bag and we just weighed the bag. Everything was sealed, the bag was sealed with a special seal and it had a reference number on it. That was all recorded on the Toll Collector's form. And then a Group Leader, Supervisor, would oversee everything and sign off on it. And then all the money is put into what they call a drop chute, which is just a hole in the wall - it drops down into a safe. So it's a one-way drop chute. And then the next day, the cash room will collect that money out of the safe, and count that money. So we'll count the money one day after the event. (Dennis Murphy SHBTOH CD11, 9:14)

The cash counting room and security

Money collected at Milsons Point toll plaza was transferred to the cash counting room at the Sydney Harbour Bridge Toll office near the southern toll plaza by a contracted cash security company, initially Brambles and then Chubb.

There was a staff of 4 or 6 who counted the money and reconciled it against the dissection sheets and the toll registration printout. By the late 1980s the cash counting staff were grateful for the handful of coin counting machines that had relieved them of the job of having to count the coins by hand.

When it was in full swing it [the cash counting room] was very noisy. They had three or four large coin counting machines into which they would dump all the coins out of one bag or one stainless steel vault and they just rattled around while they counted the money and separated it into different denominations. It was a physical job, you not only had to be smart with figures...you also had to be strong and pick up every bag and coin vault not just once more than once all day. (Richard Power SHBTOH CD1a, 32:41)

Attention to formalised armoured security was not always the case as Ken McKay pointed out:

When I started, as a boy...as a junior clerk - one day they said, 'You're on pay escort duty, you've got to go up to the bank.' So I went in the car up to the Bank of New South Wales in Castlereagh Street, and they gave me a pistol and they said, 'You stand outside the bank with the pistol in your pocket.' I thought to myself, 'If you did that today, you'd be arrested.' When I got there [in 1987 as Manager Toll], we were doing our own banking, and some kid, you know, in a Kombi van would get in and take the money down to the Westpac Bank down at Wynyard. And I thought, 'This can't go on.' So that's when I engaged a contractor to do all the cash carrying for us. It was all fly by the seat of your pants stuff. (Ken McKay SHBTOH CD14, 52:35)



Toll Collectors' secure lockers

Source - RTA Photo Library

The system of counting the toll takings for each collector and reconciling this against the daily printout of registrations for each collector made for a very secure system. While small discrepancies were tolerated as a matter of human error, larger discrepancies were investigated by an Investigations Officer who would determine whether it was a matter for further criminal investigation. Most Collectors were honest in their dealings although a number of people were dismissed or prosecuted for stealing toll money. Rudi Englert started as a Toll Collector on the Sydney Harbour Bridge in 1989 and recalled:

I was there one day, when 12 o'clock the police came and took a collector to the station...he was a Group Leader actually – when he was on duty there was

money missing out of the automatics and they couldn't work out how because when you pull the vault out that little slide in the wall is shut and there is no way you can take money out of it. But he managed somehow to keep that little door open and he put his hand in and got the coins...one day they installed a camera and when he was on duty they watched him all night. He was on night shift then and that was it. They got him. It was only one of many. (Rudi Englert SHBTOH CD17, 11:42)

The conditions for toll staff

Besides the office spaces and the cash room, the bridge toll staff were provided with a recreation room and facilities at both Milsons Point and The Rocks. All staff had access to television, cooking facilities and other amenities during their breaks. It was also a place where toll staff relaxed during their shift breaks and got to socialise with each other. This seemed to have built a spirit of camaraderie between the Toll Collectors and other staff.

Another element that provided a sense of collegiality was the continuation of the tradition of toll staff wearing a uniform. In 1987, Toll Collectors wore tailor-made beige trousers of a heavier material in winter and lighter in summer and a beige business shirt. Uniforms went to an army green, then by 1995 the uniform was blue. Toll staff had bomber jackets and wet weather gear for winter and were required to wear steel capped safety shoes. In the interests of safety toll staff uniforms had silver fluorescent strips attached to them so they would stand out on the bridge.

That was changed to an orange vest that was done up at the front and eventually became a fluoro yellow pullover vest. The safety stripes were an OH&S hazard...because they could catch on door handles or whatever and the vest that opened at the front was deemed a hazard too if left open. (Janet Miller SHBTOH CD5, 6:29)



Early Toll Collector's hat

Source - RTA Photo Library

Collecting tolls on Sydney Harbour Bridge could be a demanding and challenging occupation both physically and emotionally. Their work involved standing in a confined space exposed to all weathers with their arm extended out of the booth for hours on end during the cold

winter months and the sunny summer's days. Some collectors interviewed mentioned the pollution. Jude Singarayar recalled that when he first arrived on the bridge in the late 1980s, pollution was a real issue, especially in relation to the State Transit buses. The exhaust pipes were located low down and the toll cabins at that point had no doors, so the exhaust fumes filled the booths whenever they went past.

You could feel the fumes you were inhaling and at the end of the day you felt very thirsty like drinking water all the time. (Jude Singarayar SHBTOH CD3, 6:10)

When the OH&S committee was set up in the early 1990s, it negotiated with management to improve these conditions by installing air purifiers and exhaust fans in the cabins.

Despite being provided with wet weather gear, rainy weather was also a challenge:

At the beginning the cabin conditions were so bad when it rains the water beats inside the cabins and you are virtually standing in water collecting tolls, everything is wet, your money and everything. People come with money \$10 you have got to [give change] – all the money is stuck together so it was really hard to work. (Jude Singarayar SHBTOH CD3, 49:21)

Another task of the OH&S committee was to find a solution to this problem and modify the cabins to limit the amount of exposure to rain. Conditions in the cabins were greatly improved with the replacement of the little electric bar heaters to more substantial heaters and air conditioning. One debatable improvement was the introduction of piped music or muzak into the cabin, which most interviewees found to be not particularly pleasant. Later, a radio station was broadcast, but there was some disagreement as to the preferred station.



Milsons Point toll booth

Source - RTA Photo Library

Finally the RTA allowed collectors to carry a small radio with them if they wished and could listen to any station they wanted. Being a Toll Collector on the Sydney Harbour Bridge required considerable patience and efficiency, particularly during peak traffic periods when motorists were preoccupied with getting across the bridge to work as fast as they could in heavy traffic. Collectors were often faced with aggressive and impatient drivers and had to develop high level customer service skills to deal with this. Some were also at the receiving end of physical abuse:

There was a truck driver, he was getting annoyed because he was getting delayed so when his turn came [to pay the toll], he grabbed the collector's arm and chewed – bit the two fingers...and he punched his eye. (Jude Singarayar SHBTOH CD3, 8:52)

Speeding motorists were one of the primary safety concerns faced by staff working on the deck of the bridge when often motorists were reluctant to fully stop to pay the toll. The problems ranged from Collectors having their arms pulled back inadvertently as a motorist kept the car moving while handing over the toll, to vehicles mounting the safety barriers.

Ken McKay recalled one incident where the barriers proved their worth. By this stage in the 1990s the concrete barriers had been replaced by steel barriers.

I remember not long after I got there, [in] the far left hand toll booth in the main toll plaza in The Rocks, ...a truck came down and mounted the barrier...And the truck went up the barrier and climbed up the glass, shattered the glass, but didn't enter the toll booth, so the Toll Collector just got a bit of glass on him, so he survived. It took about three hours to get the truck off [the booth]. I had to pull in a whopping big vehicle crane to get him off. It fouled up traffic for hours. (Ken McKay SHBTOH CD13, 22:40)

Initially there was only the red or green light system to regulate vehicle movement at the toll plaza. In the 1990s boomgates were installed to force motorists to come to a stop to pay the toll. There were also several versions of safety barriers to prevent cars colliding with the toll booths.

The threat of robbery was yet another OH&S hazard for those working on the Sydney Harbour Bridge. Saeed Ghairakhani recalled that while working as a Toll Controller, one of his female collectors was robbed in the following way:

A car pulled up at her booth and the man said, 'There's something wrong with my car, I can hear the sound', so she opened the door of her cabin leaving all the money on the tray. She went to the back of the car, went to the front of the car, looking under the car and this guy, he took all the money, put in the car without her seeing. She then came inside her cabin, she didn't even notice the money gone. The motorist said it was probably nothing and said, 'Thank you, thank you, you are very good, thank you.' And then left. Five minutes later, she called the controller and said, 'My money is gone.' (Saeed Ghairakhani SHBTOH CD19, 32:56)

Robberies took place from time to time throughout the history of tolling on the Sydney Harbour Bridge. Toll Collectors have been robbed at gunpoint and through trickery as Rudi Englert also mentioned.

The Collector gave change to the motorist. The fella got out of the car and said, 'Oh I dropped my money', and the collector opened the [cabin] door which he is not supposed to do and tried to give him a hand to look for the money. And while the collector looked for his money the man grabbed all the notes and he put them in the car, hopped in and he took off. And he was gone. And that was a stolen car too. (Rudi Englert SHBTOH CD18, 15:14)

By the 1990s toll booths were fitted with a security button which directly alerted police that a robbery attempt was in play. Collectors were instructed not to resist an attempted robbery but to hand over the money, not to look directly at the thief and to keep themselves safe.

The challenge to keep traffic flowing across the bridge was quite monumental at times as Dennis Murphy recalled:

A fire hydrant on the bridge, one of the main valves had busted, it was shooting water – just beside the toll booth – it was shooting water 20 or 30 feet up into the air. And this virtually just flooded the top plaza with water. So we had to block that lane. And then we had to try and get plumbers in as quickly as possible, stop the traffic from going down that lane. I had to arrange for tow trucks to come and start blocking some of the lanes off. And then we had to divert people away from it [the flooded lane] and put them into lanes that they would normally not travel in. We've had other incidents. We've had cars catch fire. It's surprising how many cars catch fire at a toll booth. (Dennis Murphy SHBTOH CD11, 16:28)

Dealing with the public

While the work was demanding and customers could be a source of stress for the toll staff, many were congenial and some were a delight. This was one of the reasons that Toll Collectors enjoyed their job as much as they did. Several people interviewed commented that they enjoyed chatting with the varied demographic who crossed the bridge on a regular basis. Jude Singarayar had become quite friendly with a number of regular customers who provided a source of amusement:

The funniest thing is the week the motorbike comes with the dog. This dog sit in front of the motorbike and this person comes to pay the toll, and the dog jumps off and waits until he pays the money and then he jumps back on again. And that dog has sunglasses and a cap on. (Jude Singarayar SHBTOH CD4, 33:36)

Many, many motorist, they still enjoy to say good morning because those people, sometimes they have no one can talk to so they see me, they say 'Good morning, how are you', happy! (Chi Chiu SHBTOH CD21, 51:10)

Toll Collectors and Group Leaders were at the coal face of any change in the tolling system, be that toll increases, or the introduction of automatic and electronic tolling. One of the particularly challenging times for toll staff was when the RTA advised staff that they would be introducing the electronic tagging system. Toll staff were often faced with irate customers whose ETags had failed to work whether that be through their misuse or a tag malfunction. During the introduction of electronic tolling many people had not installed their ETag correctly in their vehicle:

This lady came and said my tag is not working. She showed me the tag and straight away I knew that it was not her tag...she got very angry, she said, 'how long have you been working here, what's your name, don't you know what an ETag is?' I said, 'Madam, I will give you my name and you can complain anyway you like but madam, that is not an ETag, that is a garage remote control. The RTA has not implemented a system to work a garage remote on the harbour bridge.' (Jude Singarayer SHBTOH CD4, 41:34)

The Sydney Harbour Bridge tolling staff was a highly unionised workforce and had enlisted industrial action to guarantee their rights and conditions over the years in a number of issues, including the impact of toll rises on their work, salary campaigns and air pollution issues in the cabins. Industrial strike action was a persuasive weapon as the losses in toll revenue were very significant:

The DMR in those days was terrified that the toll would be compromised by industrial action of toll staff. They had been militant. We used to take the view, 'Well, when you're ready to come back to work, let us know.' But once the toll went up to \$1 – that's a 500 per cent increase – we didn't want to have any of that. See, when the toll was 20 cents, the daily revenue was about \$20,000. When the toll went to \$1, the daily revenue was \$100,000. That's what we're talking about. And to lose \$100,000 for every day the toll was not collected, was just not on. And that's how I got the job of going down there and using what ability I had to ensure that the staff were reasonably happy. (Ken McKay SHBTOH CD13, 8:03 & 11:13)

The introduction of electronic tolling on the Sydney Harbour Bridge was recognised by some as a threat to toll staff jobs. Early on the Public Service Association became involved in negotiating a change from manual toll collection to the expansion of the cashless system. Through the Union it was agreed that Sydney Harbour Bridge toll staff would not be sacked and the workforce would be reduced by natural attrition. From 1997 to 2009 when the Sydney Harbour Bridge went cashless, the number of Toll Collectors went from 120 to around 45.

As well there were Union delegates from the ranks of the Toll Collectors, Toll Controllers and Group Leaders who negotiated with RTA management to arrange suitable redundancy packages for those that wanted to leave and suitable job placements for those that chose to stay. Out of the 45 toll staff employed in 2009, 27 chose to take the redundancy package and 17 took up administration positions within RTA.

The last manual toll collection shift on the Sydney Harbour Bridge

The Sydney Harbour Bridge went cashless on Sunday 11th January 2009. The staff to work the last shift clearly remember this historic day.

Chi Chiu, known as 'Cash', was a veteran Toll Collector of 20 years and the person to collect the last cash toll on the bridge. He recalled the Roads Minister, Michael Daley MP presented the driver of the final cash vehicle with a commemorative ETag, an event recorded by most of the Sydney television networks:

It was just like normal, just people, they come here to pay the toll they say I missed you...they miss to pay the cash, you know, they miss the cabin...someone can talk to. I remember that one [the last motorist to pay the toll], that motorist, he said he had a tag, but he didn't use it...but we gave them a tag [for being the last to pay toll] with 100 [dollar] credit inside too as a souvenir. That was blue colour too. I was interviewed on Channel 10, Channel 2, yeah. (Chi Chiu SHBTOH CD22, 00:47)



Toll collector 'Cash' and Roads Minister, Michael Daley MP collect one of the last cash toll payments

Source - RTA Photo Library

While aware that this was a special occasion Cash noted that in many respects it was a normal collecting task. He couldn't really see what the traffic was doing, that was the job for the Traffic Controllers who at one point redirected traffic to use the ETag tolling lanes.

Saeed Ghairakhani was the Toll Controller who worked the last shift and recalled that the bridge was unusually quiet leading up to 8.00am when the last toll was to be collected. In fact he began to wonder whether there had been a traffic incident, until the CCT cameras picked up that there was a huge stream of cars banked back on the highway and the approaches to the bridge waiting for their chance to be the last cash paying customer on the Sydney Harbour Bridge.

RTA managers were there...the media, Channel 7, Channel 9, all wearing the ties, it's beautiful standing there...the last cars were coming slowly, ...then one kilometre...[at almost 8am] all of a sudden at 20 seconds to go it was like Formula One. (Saeed Ghairakhani SHBTOH CD20, 49:48)

From that day the position of Toll Controller, Group Leader and Toll Collector no longer existed. The Tolling Branch was restructured and its work refocussed from managing a large toll staff, to maintaining and administering the cashless ETag tolling system.

An example of this change in focus is Janet Miller, a former Toll Controller who now advises the general public on issues relating to cashless tolling and recouping unpaid tolls.

To commemorate the imminent end of the cash toll era on the Sydney Harbour Bridge, the toll staff organised a big Christmas Party in December 2008. It was held in a large hall in North Sydney and many current and former Controllers, Group Leaders and Toll Collectors attended. Most of the people interviewed felt sad about losing their job but the get-together provided an opportunity to reminisce and recollect some of the memorable characters and events that occurred in their history of collecting tolls on the iconic Sydney Harbour Bridge.

Conclusion

The Sydney Harbour Bridge toll has been collected on the deck of this historic bridge since it first opened to traffic in March 1932. The toll was intended to pay off the loan for the construction and maintenance of the bridge. The bridge loan was finally paid off in 1988 and since that date the toll collected on the bridge has continued to pay for the ongoing maintenance and upgrades of bridge toll collection systems. A decision was made that instead of abolishing the toll on the Sydney Harbour Bridge as was promised at its inception, monies would continue to be levied to pay for significant new infrastructure such as the Sydney Harbour Tunnel.

Over the 77 years of tolling on the Sydney Harbour Bridge there was a dedicated group of staff who collected tolls, supervised staff, managed traffic and motorists, as well as counted the huge daily revenue which came to tens of thousands of dollars per day by the end of the period of cash tolling. Increases in toll fees were instituted from time to time much to the consternation of the motorist in general and at times the toll collecting staff who had to deal with both irate customers and the intricacies of calculating appropriate change and dealing rapidly with the volume of coins needed for the set toll fee.

Early in the age of computers and electronic communications technology, the RTA embarked on a trial to test the efficacy of a new system of cashless tolling. The 1997 trial of electronic tag system of toll payment was deemed a success and was extended up until a superior ETag system was implemented in the early 2000s. The most important feature of this new system is that the readers are interoperable and can be used to pay tolls on all tollways in Australia. By 2009 the uptake of ETags by the public was sufficient to discontinue cash payment of tolls on the Sydney Harbour Bridge completely. The ETag technology brought with it other means of enhancing the movement of traffic on the bridge. Measures such as time of day tolling have not only improved traffic flow during peaks on the bridge, but throughout the traffic network. The technology has also brought the potential for the cashless payment of other goods and services using the ETag, such as paying for petrol and parking.

In the wake of the implementation of the electronic tolling system was the loss of human presence on the deck of the Sydney Harbour Bridge. With the introduction of cashless tolling, Toll Collectors, Group Leaders and Toll Controllers were no longer required and staff were either redeployed elsewhere in the RTA or provided with voluntary redundancy packages. This was the end of an era on the Sydney Harbour Bridge. No longer were motorists able to interact with a Toll Collector while crossing the bridge.

In this project, eleven tolling staff were interviewed, among them Toll Collectors, Toll Controllers, Group Leaders and Managers as well as several people involved in the technical aspects of the bridge and tolling system.

All interviewees, while accepting the march of technological progress, expressed a sense of sadness or nostalgia at the passing of an era when toll payment on the bridge went cashless. They all expressed their pride in their role and their pleasure at having worked on one of Australia's iconic structures. They enjoyed contact with the customers and their workmates and considered their workplace to be an idyllic or at least interesting setting:

Oh, I loved it very much...this is a good job...Yeah, I feel proud of it, it's very true. People say, 'you feel proud being Toll Collector', I say, 'I feel very proud to work on the Harbour Bridge'. And also, this job is very good for me, whenever we go holiday, you don't have to worry and have to catch up a lot of things that need to be done before or fallen behind after your holidays...you know, it's very, very good. You know when I work, I work very hard, when I go on holidays I just take the ID tag out of the computer and enjoy my holiday...you don't have to worry. (Chi Chiu SHBTOH CD21, 56:04)

I just loved the environment of the tolls. I loved it...I thought it was very old fashioned, like stepping back into the past. You opened this metal gate and you climbed up these metal stairs and there was a metal gantry...the person who does the wages was in an office that was like a cave, it was under the road and carved out of granite and that is where I was taken to first get signed up as an RTA employee. I loved it! (Janet Miller SHBTOH CD5, 2:23)

The best part of the job was meeting nice people, having a chat with them...you see all sorts of people, politicians, the ordinary people, musicians, technicians, plumbers...for the last 25 years I have seen many people, the same people over and over again. They become very friendly some I have seen when they were single, then they get married, they have children, the children get bigger and they drive the vehicle. So I have seen all that during my career there. (Jude Singarayar SHBTOH CD3, 23:11)

I'm very thankful for the RTA...All the rules and everything there was perfectly done. Nobody there disrespected you. Nobody discriminated against you. If you do your job, you know, you are always welcome, you are always loved by those people. (Saeed Ghairakhani SHBTOH CD19, 17:16)



Last day on the job for the Sydney Harbour Bridge toll staff

Source - RTA Photo Library

List of interviewees

<i>Name</i>	<i>Tape No.</i>	<i>Date</i>	<i>Place</i>	<i>Duration</i>
Richard Power	SHBTOH:CD1a	10/06/10	Manly	1:1:24
	SHBTOH:CD2a			56:54
Jude Singarayar	SHBTOH:CD3	22/04/10	Liverpool	57:47
	SHBTOH:CD4			18:25
Janet Miller	SHBTOH:CD5	03/05/10	North Sydney	48:12
	SHBTOH:CD6			33:04
Peter Lardner-Smith	SHBTOH:CD7	23/04/10 & 30/06/10	Chatswood	52:42
	SHBTOH:CD8			57:14
	SHBTOH:CD9			48:57
Brian Pearson	SHBTOH:CD10	30/04/10	Epping	57:09
Dennis Murphy	SHBTOH:CD11	05/05/10	North Sydney	59:08
	SHBTOH:CD12			59:34
Ken McKay	SHBTOH:CD13	07/05/10	Cambridge Pk	59:56
	SHBTOH:CD14			53:46
Mark Di Val	SHBTOH:CD15	11/05/10	North Sydney	1:06:01
	SHBTOH:CD16			45:52
Rudi Englert	SHBTOH:CD17	01/05/10	Erskine Park	58:38
	SHBTOH:CD18			52:36
Saeed Ghairakhani	SHBTOH:CD19	31/05/10	St Andrews	49:30
	SHBTOH:CD20			56:42
Chi Chiu	SHBTOH:CD21	09/08/10	Parramatta	60:23
	SHBTOH:CD22			15:28

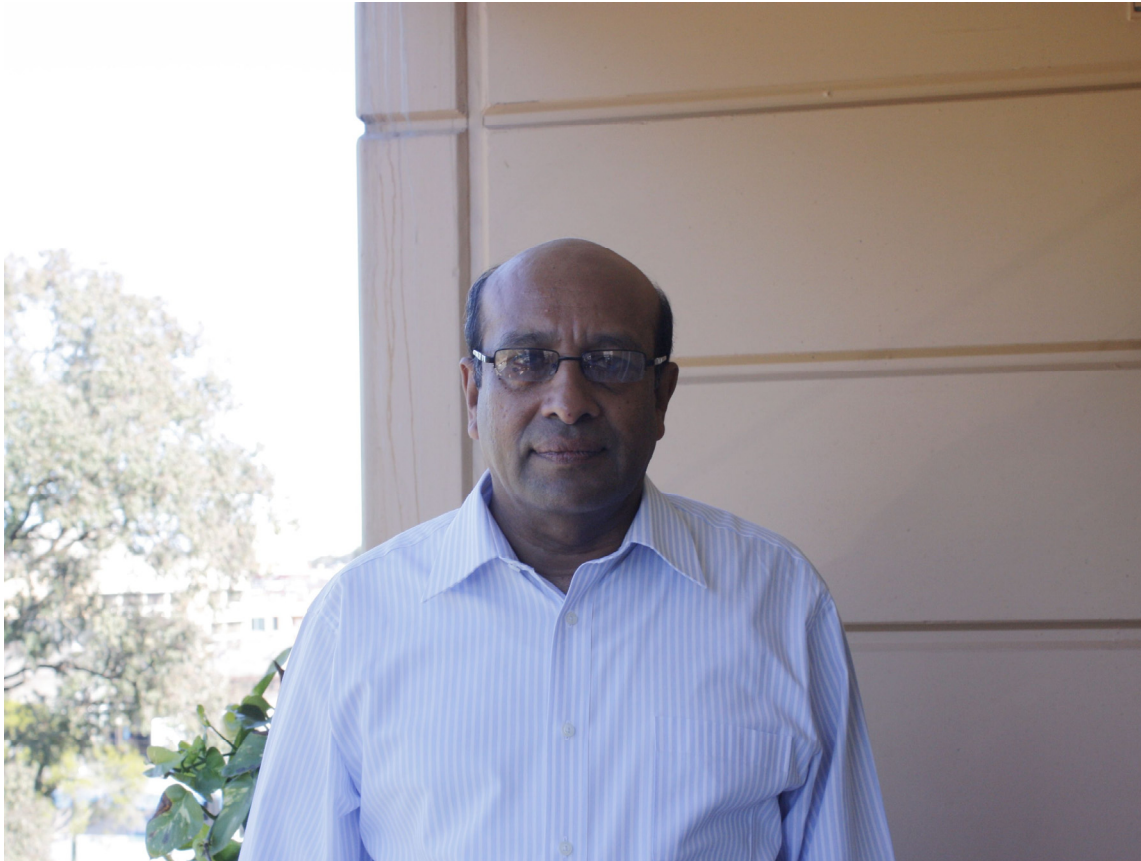
Interviewees' biographies

Richard Power



Richard began his career with the Toll operations on the Sydney Harbour Bridge in 1984 when his brother-in-law informed him of an upcoming position as a Toll Collector. Between 1984 and 2004 when Richard retired he served as a Toll Collector, a Toll Supervisor or Group Leader and finally spent many years as a Toll Controller. Richard has many good memories of his time as part of the toll collecting staff on the Sydney Harbour Bridge.

Jude Singarayar



Jude and his wife migrated from Sri Lanka in 1986. Not long after this Jude applied for a position as a Toll Collector on the Sydney Harbour Bridge and began working there on the 8th January 1987. Jude derived great pleasure from his interactions with the public over the 22 years he spent as a Toll Collector. In his role as union delegate for the Toll Collectors on the Sydney Harbour Bridge he fought for a fair deal for Collectors in the move to cashless tolling on the Harbour Bridge.

Janet Miller



British-born Janet Miller was living in Sydney in 1995 when her sister announced her upcoming wedding. To save the money for the fare back to England, Janet applied for a job as a part time Toll Collector on the Sydney. She came to love the work and applied for a permanent position. Over the next decade Janet was promoted to the position of Group Leader and then secured the role of the first female Toll Controller to work on the Sydney Harbour Bridge.

Ken McKay



Ken McKay commenced his career with the DMR in December 1955 as a Junior Clerk in the Staffing Section winding up the bundy clock. Like many at the time, Ken following the DMR clerical career structure, and worked in Narrandera and Parkes for a period. Before Ken could take up a position in upper management he was required to work in the Audit section, which he did for around a year. He then specialised in industrial relations, firstly as an Assistant Principal Industrial Officer and then served as Principal for quite some time before becoming Manager, Sydney Harbour Tolling in 1987.

Dennis Murphy



Dennis Murphy has had a long and fulfilling working history with the RTA. He commenced working for the DMT in November 1972 as a draftsman in the road safety area. Prior to that, Dennis had completed an apprenticeship as a fitter and machinist and toolmaker and also did a mechanical engineering certificate at TAFE that allowed him to secure a position with the organisation. In 1999, Dennis took up a position as Toll Administration Officer on the Sydney Harbour Bridge and has been working in this role for the last 10 years. As well as managing staff and rosters, he is required to deal with any incidents that occurred overnight and the day to day activities of tolling. Although it was 'full on' he enjoyed the challenge of this 24/7 operation.

Mark Di Val



Mark Di Val first began work for the RTA as a student and worked in the Traffic Signals Workshop at Rhodes. On finishing his degree in Engineering at UTS he worked at Garden Island and then won a position with the RTA working on computer programming on the Culway system of weighing heavy vehicles, and other traffic data systems. In 1998 he went to work on the trial e-toll system and his role grew to include responsibility for implementing and maintaining many of the computer-based systems for the cashless electronic tolling on the Sydney Harbour Bridge.

Peter Lardner-Smith



Peter Lardner-Smith began work as an engineer with the DMR in 1974 in the Mechanical Engineering Section. He first worked on designing master controllers, curve advisory speed measurement devices and vehicle odometers. In the mid 1970s Peter's duties came to include electrical maintenance of the old PABX toll registration system on the Sydney Harbour Bridge. With the coming of the computer age, Peter took on the conversion of this old system to a new computer-based registration system. He was also responsible for the design and implementation of the original automatic toll collection booths and was an important player in overseeing the implementation of the cashless electronic tolling system.

Saeed Ghairahkhani



Saeed Ghairahkhani left Iran, his place of birth, with a backpack. He first travelled to Romania and Thailand before settling in the Philippines for some time. He studied civil engineering at University there and also met his wife and started a family. Unable to return to Iran to live due to the war between his country and Iraq, Saeed and his family immigrated to Australia in 1984. Unable to secure a position in his field and needing to support himself and his family, he was successful at finding a position as a Toll Collector and commenced working on the Sydney Harbour Bridge in December that year. Two months after joining the organisation he was promoted to Supervisor and then after a year achieved another promotion to Toll Controller where he stayed for almost 25 years until he retired.

Rudi Englert



Born in Germany, Rudi Englert first came to Australia in 1957 for a short time and then returned permanently in 1970. He was a motor mechanic by trade and worked on heavy earth moving equipment in most parts of Australia, including the Snowy Mountains, Western Australia and then in Sydney. Needing a break from this kind of work, Rudi thought that a six-month period of working as a Toll Collector on the Sydney Harbour Bridge would be a welcome sojourn. He started in 1989, and after working in this role for only two weeks and liking the job more than he had expected, he was promoted to Group Leader. Although the work was hard and despite being offered a promotion to Toll Controller, Rudi stayed as a Group Leader until he retired in February 2008.

Brian Pearson



Brian began his career in Engineering in 1947 in the Bridge Section of the DMR working out of the DMR offices in Port Macquarie, Newcastle and Deniliquin before joining a private firm and working in South Africa. After marrying, he and his wife decided to return to Australia and Brian again found work with the DMR, supervising the conversion of the tram tracks on the Sydney Harbour Bridge. He later rose to the position of Chief Engineer (Bridges), and established the joint DMR / National Trust bridge heritage committee in 1980.

Chi Chiu



‘Cash’ started working on the Sydney Harbour Bridge as a Toll Collector in November 1991. He had immigrated to Australia from China in 1981 and ran many successful businesses including managing a restaurant for some time before applying for and securing a job on Sydney’s icon bridge. Cash loved his work as Toll Collector, and enjoyed the contact with people, the pace and responsibility of the work and being in the outdoors. In fact he was the person who collected the last cash toll on the Sydney Harbour Bridge when it went cashless on 11th January 2009.