

Western Australian Auditor General's Report



Safe and Viable Cycling in the Perth Metropolitan Area



Report 22: October 2015

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ISSN: 2200-1913 (Print)
ISSN: 2200-1921 (Online)

WESTERN AUSTRALIAN AUDITOR GENERAL'S REPORT

**Safe and Viable Cycling in the Perth
Metropolitan Area**

Report 22
October 2015



**THE PRESIDENT
LEGISLATIVE COUNCIL**

**THE SPEAKER
LEGISLATIVE ASSEMBLY**

SAFE AND VIABLE CYCLING IN THE PERTH METROPOLITAN AREA

This report has been prepared for submission to Parliament under the provisions of section 25 of the *Auditor General Act 2006*.

Performance audits are an integral part of the overall audit program. They seek to provide Parliament with assessments of the effectiveness and efficiency of public sector programs and activities, and identify opportunities for improved performance.

This audit looked at whether there is suitable infrastructure and support to ensure cycling is a safe and viable mode of transport in the Perth metropolitan area.

My report finds that government has gradually improved cycling infrastructure in the Perth metropolitan area. Cycling has become a more viable mode of transport, however there has been a lack of informed planning and sustained funding. Without these elements and cooperation by local governments, the cycle network will remain incomplete and safety levels will be less than desirable.

I wish to acknowledge the staff at the Department of Transport, Main Roads and the Road Safety Commission for their cooperation with this audit. I also thank the various stakeholders, including the 2 800 plus people that responded to our survey, for taking the time to help inform this report.

A handwritten signature in black ink, appearing to read 'C. Murphy'.

COLIN MURPHY
AUDITOR GENERAL

14 October 2015

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Auditor General's Overview

It is hard to think of an activity with more benefits than cycling, for cyclists and for the wider community. There are clear economic, health and environmental benefits. Increases in the number of people cycling can for instance help to reduce traffic congestion, lower vehicle emissions and reduce health costs through a healthier and more physically active community.



Cycling infrastructure and safety has received considerable media attention in recent years. The community interest in this audit became obvious when we received a record number of responses to our online survey, as well as a range of community submissions. Our survey asked the community about issues facing cyclists and motorists sharing roads, and connectivity between pathways, roads and destinations.

The popularity of cycling is evident early in the morning when large groups cycle around the Swan River and on weekends when riders head to the hills, the beachfront and river foreshores. Although popular, cycling is not yet a major transport option.

In other countries, such as Denmark and the Netherlands, cycling is a major form of transport. This is generally due to well-designed and well-connected cycling infrastructure and cycling safety education and promotion programs.

To promote cycling as a transport option, the Government produced the first bicycle network plan in 1985 and a second, more comprehensive plan in 1996. For many years, there was minimal progress, but this began to change around 2000 through an increased focus on cycling infrastructure. The latest *Western Australian Bicycle Network Plan* was adopted in 2014.

We found that completion of cycle paths along major transport corridors and more clearly defined cycle routes through local neighbourhoods was critical to cycling becoming a significant mode of transport. Local routes provide a way to cycle from home to school or work, to the shops, library or park, or public transport hubs. It is also important that these routes allow cyclists of all abilities and ages to ride safely.

While it is not feasible to construct dedicated cycle paths through established inner city areas, there is scope to upgrade existing facilities to current national standards, and to ensure new facilities use current good practice designs and will accommodate future demand. Maintenance of facilities to national standards is also important.

Transport agencies and local governments require greater knowledge of where people are cycling, along with the collection of timely and consistent crash data. Improved data collection will allow state and local governments to work together to construct and maintain safer cycling routes and ultimately reduce the number of crashes involving cyclists. Safety issues are a disincentive to increased cycling.

Earlier this year I completed an audit on *Main Roads Projects to Address Traffic Congestion*. Perth's worsening traffic congestion is requiring Main Roads to make significant changes to the way its business currently functions.

Removing impediments to the growth in cycling will assist Main Roads and the Department of Transport to create a truly integrated transport network. This will be critical as Perth continues to expand to an estimated population of 3.5 million by 2050. Collaboration between stakeholder groups and state and local governments will also be essential to cycling's future.

Executive Summary

Introduction

This report provides an assessment of whether there is suitable infrastructure and support to enable cycling to be a safe and viable mode of transport in the Perth metropolitan area.

Our focus was on the planning and management of the Perth metropolitan cycle network by the Department of Transport (DoT) and Main Roads Western Australia (Main Roads), to determine whether it covers the main transport routes and is well-connected and maintained. We also examined actions by these agencies and the Road Safety Commission (RSC) to ensure cycling is safe, convenient and viable. We used an open public survey to obtain community views on the issues we examined.

Overview

Around a quarter of Western Australians ride a bicycle in a typical week, and almost half ride at least once a year¹. Bicycle sales have exceeded car sales for more than a decade in Australia, with over 1.3 million bicycle imports reported in 2013-14².

People cycle for many reasons, including commuting, shopping, errands, recreation and training. Related benefits include reductions in demand for parking, transport cost, greenhouse gases, and noise, and improvements in air quality and health. Cycling is also relatively inexpensive and can form a significant component of an integrated transport system.

Perth's dry climate and flat terrain make cycling an ideal transport option. These advantages are reflected in the rate of cycling in WA, which the Australian Bicycle Council found to be 5.6 percentage points higher than the national rate of 17 per cent of people cycling at least once per week. However, this is much lower than many European countries where cycling is a mainstream form of travel. For instance, the Netherlands, Germany and Denmark have cycling participation rates of up to 38 per cent³ of all trips in some municipalities.

The priority given to cycling in Europe is evident from a combination of policy measures endorsed by the European Parliament that have resulted in increases in cycling⁴. These include: well-designed cycling infrastructure, safety education and promotion programs, widespread traffic calming, and improved connections with public transport systems.

Safety concerns are one of the reasons cycling remains a minor form of transport in WA. In a Royal Automobile Club of WA (RAC WA) community survey in 2015, safety was one of the main reasons people gave for not cycling more often. Cyclists have a wide range of ages and skills and therefore need a variety of facilities to ensure cycling is a safe, convenient and viable mode of transport.

Cyclists are one of the most vulnerable road users, having little or no physical protection. Thirty-eight cyclists died on WA roads in the ten years from 2005 to 2014 and the number of cyclist fatalities rose from three in 2012 to eight in 2014. People make only two per cent of trips by bicycle, but cyclists constitute around four per cent of the total road deaths. The Road Safety Commission (RSC) reported a further 1 099 were seriously injured between 2004 and 2013. The Commonwealth Government Bureau of Infrastructure Transport and Regional Economics (BITRE), estimated that the social cost to the community of road trauma was \$3 million per death, and \$264 000 per hospitalised injury⁵.

¹ Australian Bicycle Council (2015). National Cycling Participation Survey 2015.

² Bicycle Industries Australia and Cycling Promotion Fund (2014). *Annual Report 2013-2014*.

³ Ministerie van Verkeer en Waterstaat (2009). *Cycling in the Netherlands*.

⁴ European Parliament Directorate-General for Internal Policies (2010). *The Promotion of Cycling*.

⁵ BITRE (2014). *Impact of Road Trauma and Measures to Improve Outcomes*. Report 140.

Perth's cycle network is a series of routes on roads and paths. Principal Shared Paths (PSPs) are the arterial paths along railway lines, freeways and highways owned by the State Government. The majority of the cycle network belongs to Local Government Authorities (LGAs).

LGAs are responsible for 94 per cent of the road network and provide almost 3 000 km of Recreational Shared Paths (RSPs). These are often along beachfronts and river foreshores. There are also small sections of dedicated cycle paths, such as along the South Perth river foreshore. LGAs provide over 7 000 km of footpaths as well as local bicycle routes on local roads and paths.

A number of strategies, plans and policies have supported the development of cycling networks and infrastructure in WA since the 1970s. DoT released the most recent, the *Western Australian Bicycle Network Plan 2014-2031* (WABN Plan), in March 2014. Similar to previous plans, the WABN Plan aims to make cycling in WA 'safe, connected, convenient and a widely-accepted form of transport'⁶.

For cycling to be a safe, convenient and viable mode of transport a well-constructed and maintained arterial and local scale network should connect to key community facilities and employment centres. Connected means a cyclist can get from point A to point B in a safe and convenient manner on any kind of path or route.

The WABN Plan has a vision to double cycle trips in Perth, prioritises the finishing of bike paths for cyclists within 15 km of central Perth and encourages LGAs to implement bike plans. In 2014-15, the state spent \$11.2 million on the Western Australian bicycle network. This represents 1.1 per cent of the total \$1 045 million⁷ spent on expanding and improving the efficiency of the road network in WA.

DoT coordinates the activities of agencies in delivering cycling facilities. Main Roads expands, constructs and maintains the PSP network and provides standards and guidelines for local cycling infrastructure constructed by LGAs. The Public Transport Authority (PTA) constructs PSPs in conjunction with railway extensions and facility upgrades, such as car and bike parking and the RSC works with these agencies to coordinate the state's road safety efforts.

Audit Conclusion

The State Government has gradually improved cycling infrastructure in the Perth metropolitan area. Cycling has become a more viable mode of transport, however there has been a lack of informed planning and sustained funding. Without these elements and cooperation by local governments, the cycle network will remain incomplete and safety will be less than desirable.

DoT has not yet compared the economic, environmental, health and social benefits provided by cycling and other transport options. However, it is clear that increasing the number of people cycling will help to reduce traffic congestion and realise other social benefits.

Economic modelling found that the return on WA investment in cycling infrastructure produced community benefits of 3.4 to 5.4 times the costs incurred⁸. In 2013, cycling on the Kwinana Freeway segment of the PSP network transported the equivalent of approximately one quarter of a freeway lane's worth of vehicle traffic.

Only 48 per cent of the planned PSP cycle network is complete and well maintained. Of the existing routes, many do not connect well because some sections have not been built, and older paths need upgrading if they are to cater for increasing demand.

⁶ Department of Transport (2014). *Western Australian Bicycle Network Plan 2012*.

⁷ Department of Transport audited financial statements 2014-15 and Main Roads audited financial statements 2014-15.

⁸ RAC WA (2012). *The Economic Cycle: A Business Case for Investment in Cycling in Western Australia*.

A planned review of local routes, including within the Perth Central Business District (CBD) needs to be completed. Local government roads and paths vary in design and level of maintenance, which do not always comply with relevant Australian standards, Main Roads, Austroads, and other good practice guidelines, and create conflicting and less safe conditions for cycling. LGAs have lacked detailed guidance to inform planning, design and maintenance of cycling infrastructure and require up-to-date and better practice advice.

DoT has yet to complete a detailed implementation plan of WABN Plan priorities and transport agencies have not outlined funding requirements for each of the key actions. This is likely to jeopardise the timely completion of a well-connected cycle network.

Government is unable to measure progress against its objective to double the number of cycling trips in WA by 2019 as data on where people are cycling is measured only on limited routes. In addition, many crashes involving cyclists are not reported. More comprehensive knowledge is necessary to plan and prioritise cycling infrastructure, improve safety, and increase the rate of cycling.

Transport agencies have placed limited emphasis on strategies to improve public awareness about cycling safety. Well designed and targeted safety campaigns and education are important if cycling is to become a more common and safe mode of transport.

Key Findings

The priority arterial cycle network is incomplete

Sections of the arterial cycle network along major transport routes within 15 km of the Perth CBD are incomplete. Over the last 30 years state transport agencies have constructed approximately 172 km of the arterial PSP cycle network along major transport routes, of which 93 km is within 15 km of the Perth CBD. The State Government's WABN Plan outlines 185 km of additional PSP routes to be constructed by 2031. Critically, many of the gaps are on priority routes along railway lines and freeways, and within the busy CBD. As a result, cyclists must either choose alternate, less safe routes, or choose not to cycle.

Transport agencies have invested \$143 million in cycling infrastructure in the ten years since 2004, of which \$100 million was spent on the PSP network but only \$20.3 million was spent on priority routes. The budget for priority PSP routes has been halved to around \$7 million per year in the forward estimates period to 2018, even though it is the first key action in the WABN Plan. DoT has advised that an additional \$34 million has been budgeted for other major road project cycling infrastructure in the next four years.

Other PSP sections such as around the Fremantle Port and Cedric Street may not be constructed due to planning uncertainties. Designs and funding are not available for these sections. DoT has also identified that separate funding is required for other incomplete sections of the network. For example, the estimated cost to construct a new Causeway shared path is \$50 million. This funding has not been included in the current or forward estimates. Continued gaps in the cycling network impact the connectivity and safety of cycling.

Cycle routes through the CBD are minimal

Past planning and development has resulted in five PSP routes that lead to the outskirts of the CBD but few dedicated cycle paths through or within the city. DoT and respondents to our survey identified the CBD as a significant safety risk for cyclists as they must cycle on the road. The minimal infrastructure and high vehicle and pedestrian traffic make the environment unsafe and inconvenient for cycling.

The local cycle network is inconsistent and unconnected

Local cycling routes to connect with the PSP network, community facilities and employment centres have historically not been well planned. Our observations and submissions received from the public have shown that the local routes vary in design and construction. Out of date and/or non-mandatory guidance provided by transport agencies may be one of the causes. The result is an inconsistent and unconnected local cycle network, which limits the integration of cycling into the broader transport system.

Main Roads maintain PSP routes well, but local paths and roads which are the responsibility of LGAs vary significantly in condition. Poorly maintained cycling infrastructure puts the safety of cyclists and other network users at risk.

Incomplete data and analysis on cyclist movements and crashes limits planning

The WABN Plan has a vision to double the number of cycling trips in WA within five years to 2019, but currently progress is only measured with data from a limited number of fixed bike counters. There is a lack of comprehensive knowledge and public reporting to the Perth community about where people are cycling. Main Roads and DoT collect good information on PSPs and RSPs leading into the CBD, but only a handful of LGAs collect data on local paths and roads. This means that transport agencies and local governments lack the information they need when planning cycling infrastructure.

Crash data is inconsistent between agencies. The Western Australian Police (WA Police) collect cycle crash information. The Department of Health also has data on cyclists that attend hospital after a crash. Our comparison of hospital and WA Police data suggests that only 21 per cent of crashes involving cyclists, and requiring hospital treatment may be reported to WA Police. RSC has stated that it would benefit greatly from access to linked crash data that follows an individual's crash from incident, through to reporting and medical attention. Without good data, agency efforts to improve cyclist safety rely on a subset of information only.

The gaps in planning will delay growth in cycling and the societal benefits that cycling provides

The Government's transport planning framework has been in draft form since 2013 and has not been finalised. Until this strategic planning is complete, the WABN Plan remains a stand-alone document and investments in cycling will be made in isolation and not as part of prioritisation of all transport options.

DoT did not compare the economic, environmental, health and social benefits provided by each transport option. This limits the ability of DoT to improve uptake of cycling as a part of addressing traffic congestion in Perth. It also means that potential savings on health services calculated by RAC WA of up to \$522 per 1 000 km cycled over 10 years⁹, have not been considered in transport planning.

The WABN Plan does not have an implementation schedule, agencies have not outlined funding requirements for WABN actions and there is no public reporting of outcomes. The

⁹ Ker, I. (2012). *A Business Case for Investment in Cycling in Western Australia*.

priority PSP routes earmarked in 1996 and local connecting routes are not complete. As noted above, expenditure on cycling infrastructure has also been significantly reduced in the forward estimates. With over \$93 million of additional works unfunded, this creates a risk that key WABN Plan actions will not be completed within planned timelines.

Investment to promote cyclist safety has been minimal and sporadic. The State Government ran two cyclist safety campaigns, *Be Aware Share* in 1998, and *Share Our Roads* in 2014-15. RSC noted that these campaigns were not as successful compared to the higher investment and longer term campaigns focused on reducing speed and drink driving. The *Share Our Roads* campaign will continue but RSC recognise that this effort is not enough on its own. Without intensive measures to improve public awareness and education in cycling safety, achievement of mutual respect by all road users will be difficult.

DoT runs *TravelSmart* programs, which commenced in the 1990s, and provide tools and resources to promote active transport in households, schools and work places. Program evaluation results have shown that it was effective in promoting local cycling trips and to school and work. For example, there was a 140 per cent increase in cycling trips in Marangaroo from 2001 to 2003.

Recommendations

1. In the next six months DoT should prepare and publish a:
 - a. WABN Plan implementation schedule and funding requirements
 - b. progress report on WABN Plan actions.
2. In the next 12 months, DoT should implement an improved strategy to collect, monitor and analyse data on cycling participation to inform planning and safety.
3. In the next two years:
 - a. DoT should identify demand for transport options to inform and finalise a transport planning framework for Perth, which integrates all forms of transport
 - b. DoT and Main Roads should provide detailed construction and maintenance guidelines for cycling infrastructure to local government
 - c. DoT should progress the review and development of Local Bicycle Routes in conjunction with LGAs
 - d. the State Government should consider developing a central crash and hazard reporting facility for the public to record safety concerns that relate to cycling infrastructure
 - e. DoT and RSC should work together to develop public awareness strategies to target safe cycling and mutual respect among all road users.
4. In the next five years, DoT and Main Roads should support and promote existing and new cycling infrastructure, including innovations being trialled by local government, to improve participation in cycling.

Agency responses

Department of Transport and Main Roads

The Transport Portfolio (Department of Transport, Main Roads and the Public Transport Authority) has valued the opportunity to review the delivery and ongoing management of a safe and sustainable cycling network. Good progress has been made in recent years with many of the key initiatives within the Western Australian Bicycle Network Plan (WABN). In particular, the expansion of the Principal Shared Path Network has progressed and in recent months a demonstration bike boulevards program has been initiated to deliver a safer and more connected local bike route network.

The Transport Portfolio accepts the recommendations and will undertake the actions below to address the findings (in addition to the current WABN action list).

- The Transport Portfolio will finalise an implementation schedule and explore funding and resourcing options by the end of 2015. In addition a functional review within the Transport Portfolio is underway to ensure that the needs of cycling for transport are well covered to deliver the committed outcomes.
- The initial WABN annual report will be published in late 2015. This will be expanded in 2016 and will be published on an annual basis.
- A counting and monitoring strategy was completed in 2014 and an implementation strategy will be developed by the end of 2016. Further development work on the finer grain local bike routes will be required beyond that point.
- The Transport Portfolio, in partnership with the Department of Planning, is developing a transport plan for Perth at a population of 3.5m. This plan will explore demand options with a variety of scenarios to be tested based on moving people and moving freight principles along with a strong connection to land use.
- DoT and Main Roads will explore options in providing cycle path asset maintenance and construction guidance to Local Government through WALGA and IPWEA.
- The local bike routes review is progressing with the bike boulevards demonstration program, and a revised cycling network is being developed as part of the planning for Perth at a population of 3.5m with a visionary approach.
- The government agencies involved in cycling will explore the options for an improved crash reporting system for cycling.
- DoT and the Road Safety Commission will continue to work in partnership to improve education and awareness strategies and campaigns.
- An improved communication plan is being developed for the WABN and will be implemented over the coming months.
- An innovations review panel will be established with a variety of stakeholders to support the review of new ideas and encourage the trialling of innovative options through demonstration projects with before and after studies.

Road Safety Commission

The RSC acknowledges the findings and recommendations as detailed in these documents.

The RSC is aware of the shortcomings in sources of cyclist crash data and reporting. While the RSC does not collect its own data, and thereby relies on the collection mechanisms of other agencies, we are working with other agencies to improve the quality of the data and subsequent analysis. We are confident that the measures we are currently looking to put into place will close many of the gaps in cycling crash data across the agencies.

Audit focus and scope

The audit objective was to assess whether there is suitable support and infrastructure to enable cycling to be a safe and viable mode of transport in the Perth metropolitan area.

This was a narrow scope performance audit, conducted under section 18 of the *Auditor General Act 2006* and in accordance with Australian Auditing and Assurance Standards. Narrow scope performance audits have a tight focus and generally target agency compliance with legislation, public sector policies and accepted good practice.

Our lines of inquiry were:

- Is there a well-connected and maintained cycle network that covers the main metropolitan transport routes?
- Are suitable actions in place to enable cycling to be a safe, convenient and viable mode of transport?

We focused on the activities of DoT and Main Roads to develop the Perth cycle network and promote cycling as a mode of transport. Particularly we looked at progress made by the Transport agencies against the 2014 WABN Plan actions that are relevant to the Perth metropolitan area. We also examined the role of RSC in providing road safety advice and education campaigns.

We did not look at actions by local government, or actions that promote cycling outside of the Perth metropolitan area.

In undertaking the audit we:

- reviewed plans, policies, strategies, guidelines, budgets, crash and hazard data, bicycle count data, bicycle network plans, meeting minutes and other documents from DoT and Main Roads
- reviewed reports and other documents from RSC
- analysed emergency department and hospital inpatient bicycle crash data from the Department of Health from 2004 to 2015
- reviewed WA Police policies and fatal and serious crash data from 2004 to 2014
- interviewed stakeholders, community groups, four LGAs, universities and key agencies with a role in developing safe and viable cycling in Perth
- reviewed published national and international literature on cycling
- attended a workshop organised by DoT to explore innovative cycling solutions for Perth
- conducted site visits to view existing and proposed cycling infrastructure
- conducted a survey from March to April 2015 to gather community opinion on cycling infrastructure and safety in the Perth metropolitan area. Results are shown in Appendix 1. The number of respondents, at 2 828, was the highest number that had responded to our surveys to date
- reviewed submissions from the community and stakeholders.

Background

In the 1970s, the State Government recognised the need to provide facilities for cyclists within the Perth metropolitan area. Since the 1980s, state governments have supported the creation of a network of cycle paths with each successive report or bike plan recognising the need for a network of connected cycling infrastructure – refer Appendix 2.

The 1975 *Cycleways for Perth* report recognised many of the issues that remain in 2015:

'Cycleways should lead to activity centres such as...parks, shops, schools, libraries, local employment centres and transport interchanges', and 'should avoid arterial roads wherever possible because bicycles are incompatible with high-speed, high-volume traffic...'

The 1985 *Perth Metropolitan Region Bikeplan* provided detail of infrastructure requirements and design while the 1996 *Perth Bicycle Network Plan* (PBN Plan) identified the engineering works and funding required to complete a broad scale cycle network.

The 2014 *Western Australian Bicycle Network Plan 2014-2031* (WABN Plan) guides the expansion of cycling facilities and focuses on moving people via a network of connected cycling infrastructure. The first key action of the WABN Plan is the completion of the Principal Shared Path (PSP) network within 15 km of the Perth CBD by 2023.

The Department of Transport (DoT) is responsible for ensuring the delivery of WABN Plan key actions in partnership with the state's Transport Portfolio agencies, Department of Planning (DoP) and local governments. DoT coordinates agency activities to deliver cycling facilities, distributes grant funding and evaluates its own effectiveness in achieving the State Government's cycling objectives. DoT responsibilities include to:

- define a network of strategic bicycle routes
- develop a strategy for the development of the PSP network
- implement Connecting Schools and Connecting Stations pilot projects
- monitor and report on bicycle use
- fund infrastructure construction to fill selected gaps in the cycle network
- encourage cycling and integrate promotion with health campaigns and *TravelSmart* programs.

Main Roads is responsible for the expansion, construction and maintenance of the PSP network and traffic signals. It is also responsible for approving line markings for all roads and a review of traffic management guidelines on local roads that involves regulatory devices.

The Road Safety Commission (RSC) is the agency responsible for the state's road safety initiatives, including the *Towards Zero Road Safety Strategy*. RSC provides road safety advice and runs road safety awareness campaigns.

Local Government Authorities (LGAs) are responsible for providing and maintaining bicycle infrastructure on local roads and paths. With assistance from DoT, they prepare local bicycle plans that integrate with the WABN Plan and neighbouring LGA plans. LGAs should also use Main Roads and DoP guidelines and standards to ensure the design of roads, parks and other council facilities include adequate consideration of cyclists.

The priority arterial cycle network is incomplete

We are now some 30 years beyond the first bicycle network plan and nearly 20 years on from the comprehensive 1996 PBN Plan. Main Roads and DoT have completed almost half of the planned PSP routes, however significant gaps along major transport routes and within the Perth CBD remain. These gaps impact the connectivity and safety of cycling.

The planned Principal Shared Path network is 48 per cent complete, and serious connectivity gaps remain

DoT, Main Roads and PTA have completed only 48 per cent of the arterial network. Of 357 km of paths outlined in the WABN Plan, approximately 172 km are complete. Figure 1 and Appendix 3 show the completed and planned paths within 15 km of the CBD. Map 4 on page 45 of the WABN Plan shows the same detail for the greater Perth metropolitan area. DoT and Main Roads collated the data in Appendix 3 specifically for this audit. It provides an indication of the extent of achievement against the first WABN key action to complete PSP routes.



Source: DoT, October 2015

Figure 1: Map of constructed and proposed PSP projects 2014 to 2023

However, priority routes along the five railway lines are incomplete, paths cross busy intersections along freeways, sections are in need of upgrade, and river crossings often lack adequate paths. There is also a risk some sections, such as around the Fremantle Port, may not be constructed due to planning uncertainties. The arterial cycle network is therefore not complete, which limits the integration of cycling into a sustainable transport system.

Table 1 shows the investment in cycling by transport agencies since 2004. Investment in this period has averaged \$14 million per year, however expenditure has occurred in peaks and troughs as highlighted. Of the \$143 million invested, transport agencies have spent around \$100 million on the PSP network. Of this \$20.3 million was spent on the sections identified as priority PSP routes in the WABN Plan shown in Figure 1. The non-PSP funding included expenditure on grants to LGAs, network safety improvements, the state blackspot program, and bicycle parking.

Year	DoT (\$)	Main Roads (\$)	PTA (\$)	Total (\$)
2004-2005	7 103 576	11 563 274	1 140 000	19 806 850
2005-2006	5 435 964	9 039 365	12 000	14 487 329
2006-2007	2 403 799	1 290 000	1 670 000	5 363 799
2007-2008	2 504 165	1 905 000	389 000	4 798 165
2008-2009	2 866 347	24 076 698	293 000	27 236 045
2009-2010	2 473 701	12 116 369	403 000	14 993 070
2010-2011	3 006 889	3 200 000	1 079 440	7 286 329
2011-2012	2 751 881	8 224 000	857 463	11 833 344
2012-2013	2 972 089	7 400 000	680 000	11 052 089
2013-2014	12 282 442	13 560 000	0	25 842 442
Total	43 800 853	92 374 706	6 523 903	142 699 462

Source: DoT, Main Roads and PTA

Table 1: Cycling infrastructure expenditure in Perth by transport agencies

DoT has identified other missing sections that require separate funding. These retrofitted sections can average up to \$3 million per kilometre. This compares unfavourably with costs of around \$1 million per kilometre for the current Gateway project linking the Perth Airport. The estimated costs at current construction rates of these sections are:

- \$50 million – new crossing to replace the existing Causeway shared RSP
- \$28 million – the Glendalough Station to Hutton Street section of the Mitchell Freeway PSP is in the detailed design process, which will conclude in late 2015. The project will cost about \$15 million per kilometre, due to the number of structures and the need to fully separate busy cycle and pedestrian paths
- \$15 million – the Cranford Avenue crossing along the Kwinana Freeway PSP
- unknown cost for the Swan River crossing on the Midland rail line but a concept design is in progress.

The budget for priority PSP routes until 2018 has been halved to around \$7 million per year in the current forward estimates period. This budgeted expenditure is inadequate to complete the PSP works identified above. An additional \$34 million has been budgeted for other major road project cycling infrastructure in the next four years.

Main Roads is responsible for preparing designs for the incomplete sections of the PSP network. These include areas where uncertain planning limits Main Roads’ ability to design

cycle routes, such as the Fremantle Port and the busy Cedric Street freeway crossing. This means that some sections of the priority PSPs identified in the WABN Plan are likely to remain unfunded and incomplete despite recognition as key cycling transport corridors.

Gaps in connectivity contribute to unsafe cycling infrastructure. Respondents to our community survey on cycling infrastructure and safety in Perth identified their top three unsafe cycling locations, which are collated in Table 2. Six of these, as highlighted, matched gaps in connectivity along PSP routes.

Hotspot	Location of Safety Concern	Number of Respondents
1	Hutton St intersection on Mitchell Freeway PSP	147
2	CBD (St Georges Tce – 45, Elizabeth Quay – 45, Barrack St – 31*)	124
3	Stirling Hwy	94
4	Welshpool Rd	80
5	Curtin Ave from Mosman Park to Cottesloe	78
6	West Coast Hwy and West Coast Drive	61
7	Causeway	57
8	Tydeman Rd, North Fremantle	53
9	Cedric St intersection on Mitchell Freeway PSP	50
10	Mounts Bay Rd	42

Source: OAG survey

*Total is greater than the three hotspots as respondents were able to identify other hotspots.

Table 2: Community cycling safety concerns identified along priority PSP routes

Case Study – Causeway cycling infrastructure



The 1975 *Cycleways for Perth* report identified the need for cycling infrastructure on the Causeway and Narrows Bridges. Main Roads investigated options to redesign the Causeway in 2009, but no further action has occurred. The bridge remains a safety concern as seen in Figure 2 and Table 2 and a barrier to increasing cycling journeys into the CBD from the south-eastern suburbs.

Figure 2: A section of the Causeway shared path is narrow and does not meet Austroads guidelines of a minimum shared path width of three metres

Cycle routes through the CBD are minimal

One of the important missing links in the PSP network is within the Perth CBD. Five PSP routes lead to the outskirts of the CBD but within the CBD cycling infrastructure is minimal. The lack of dedicated cycle paths has meant that cyclists are only able to cycle on the road. The minimal infrastructure, and high vehicle and pedestrian traffic, make the environment unsafe and inconvenient for cycling.

DoT recognises the CBD as Perth's main crash hotspot. Figure 3 shows the numerous locations of reported crashes in the CBD. As indicated in Table 2, respondents to our survey also identified the CBD as a main safety concern.



Source: DoT

Figure 3: Map showing crashes in the Perth CBD from 2006 to 2010

The City of Perth, Main Roads and the Metropolitan Redevelopment Authority are leading a number of projects within the CBD to improve the flow of cyclists and other road users. For example, paths are under construction around Elizabeth Quay, Barrack Street and Roe Street. The City of Perth is also adding line markings and signage to cater for cycling.

While these projects will start to address the connectivity issues between PSPs and within the CBD, they will not, in isolation, ensure the safety of cyclists. They also create their own safety concerns as shown in Figure 4.

Case Study – Impact of roadworks on cycling infrastructure

During the Elizabeth Quay development cyclists and pedestrians had to share a temporary path along the Esplanade. Main Roads' Guidelines recommend path widths of three metres. However, the path was only 1.3 metres wide at some points we measured.



Figure 4: Temporary shared path provided during the Elizabeth Quay construction

The local cycle network is inconsistent and not well-connected

Local cycle networks are poorly planned

Local cycling routes to connect with the PSP network, community facilities, employment centres and businesses vary in design, construction and levels of maintenance. Transport agencies provide non-mandatory guidelines and funding for local network infrastructure and maintenance but LGAs are responsible for the local cycle network. The result is an inconsistent, unconnected and unsafe cycle network.

DoT developed the Local Bicycle Route (LBR) network in the 1990s to provide cycle options along neighbourhood streets and paths. However, the LBRs do not always connect with activity centres such as community facilities, shops, libraries, schools, universities, sport centres, public transport, employment centres and industries. Unfortunately, this means that the WABN Plan's intent to connect cycling infrastructure with activity centres has yet to be achieved.

Existing LBRs are also not always safe for cyclists. Macrae Road in Applecross is an example of a route developed to transport cyclists along neighbourhood streets parallel to Canning Highway. As Figure 5 shows, motorists also use Macrae Road to avoid Canning Highway. Main Roads recorded 24 cyclist crashes along Macrae Road between 2006 and 2014.



Figure 5: Morning peak hour along Macrae Road in Applecross

Respondents to the OAG survey shared concerns about cycling on busy roads with 67 per cent stating they felt unsafe cycling on roads. Half of the respondents said the reason they did not ride more often was due to the fear of sharing the road with motor vehicles. Respondents also highlighted the need for less busy local routes:

‘Shared paths are safe and convenient but it is often difficult to get to the shared paths safely along roads and road ways are dangerous for young or inexperienced riders.’

In comparison to Perth, authorities elsewhere in the world have introduced road safety measures to encourage cycling in local areas. For instance, traffic is discouraged in some residential areas in the Netherlands by setting a speed limit of 30 km per hour. This is achieved by speed reducing measures such as speed humps, road narrowing signage that indicates that cars are guests, and changing the road space allocation to provide more space for cyclists in a shared environment.

Main Roads recently allocated \$3 million in 2015-16 for a bicycle boulevards program that will cover a number of demonstration projects in Perth. Discussions are underway to work towards continuing the program from 2016-17 onwards as a new component of the LBR network. The existing PBN program would then be modified to a bike plan development and shared path program.

The WABN Plan requires DoT, in partnership with Main Roads, LGAs and stakeholder groups, to review local cycling routes. Once the LBR reviews are complete, modifying and constructing new routes will require cooperation with, and between LGAs. The Transport Portfolio has advised that funding of around \$1.35 million per year is available through its Perth Bicycle Network grant scheme and must be matched by LGAs. It is important LGAs prioritise their own investment in local community transport options.

The City of Stirling has already reviewed its own LBRs, and produced a draft of possible routes that connect to the Mitchell Freeway PSP, beachfront RSP and community facilities. The City of Stirling plans to work with adjoining LGAs to promote continuity between local cycling networks.

Improved advice is needed to encourage LGAs to plan and construct local cycling infrastructure

The quality of local cycle infrastructure and signage is variable in design, construction and levels of maintenance. This lack of conformity often puts cyclist awareness and skill to the test – see examples of cycling risks in Figure 6.

Main Roads provide LGAs with non-mandatory standards and guidelines for cycling infrastructure. However, Main Roads’ policies, standards and guidelines such as their *Policy for Cycling Infrastructure 2000* require revision to align with the most recent good practice guidelines on traffic management and road safety for cycling.

DoT and Main Roads have also developed the *Guideline for Developing a Bike Plan* for public comment and a detailed *Local Area Traffic Management Cycling Guidelines for Western Australia*. These references will be useful tools to encourage LGAs to adopt suitable and consistent infrastructure design and construction standards, and should decrease the need for project by project input from transport agencies.

Examples of shared path safety issues

Common safety issues often caused by poor planning on local shared paths include:

- encroaching sand
- cracking due to tree roots, service vehicles driving on paths and water damage
- paths that end abruptly
- drainage grates or other obstacles.



Figure 6: Some examples of poor cycling infrastructure on local shared paths in Perth

Main Roads is working with LGAs to standardise cycling infrastructure in Perth, while still allowing flexibility in design to accommodate local needs.

In the last ten years, 27 of the 30 metropolitan LGAs have prepared local bike plans. Figure 7 shows examples of good cycling infrastructure in use in the Perth metropolitan area. Several LGAs have also trialled innovative cycling infrastructure – see examples in Figure 8. With suitable evaluation, a range of novel infrastructure can continue to be trialled by LGAs, and if successful, promoted by DoT and Main Roads for widespread use.

Examples of good cycling infrastructure

Examples of good cycling infrastructure include:

- green paint at areas of potential conflict on roads and paths
- dedicated on-road cycle lanes with a barrier to prevent motorists encroaching
- secure bike parking and end-of-trip facilities.



Figure 7: Some examples of suitable cycling infrastructure used in Perth

Examples of innovative cycling infrastructure

Examples of innovative cycling infrastructure:

- 'armadillo' cycle lane dividers – City of Fremantle
- head start boxes at intersections – City of Perth
- cycle lanterns at traffic signals
- cyclist and pedestrian junction speed reduction at City West Train Station.



Figure 8: Innovative cycling infrastructure trialled in Perth

LGAs require support to promote preferred LBRs away from busy arterial roads and to provide advice to cyclists on how best to access and use these routes. The South Australian Department of Transport, Planning and Infrastructure provides a good example with their interactive *Cycle Instead Journey Planner*. This online tool generates cycling routes using Adelaide's network of main roads, bike lanes, local streets and off-road paths. DoT is currently exploring options for a journey planner and is updating the mapping of existing shared paths as a starting point.

Maintenance of local cycling infrastructure is variable

Main Roads has maintenance responsibilities for PSPs and arterial roads while LGAs are responsible for other shared paths and roads. As shown by Figure 6 (page 20), LGAs vary in their commitment to maintaining bike paths and cycling routes.

DoT maintains an automated online hazard reporting system, which is utilised well. Hazard reports are forwarded to Main Roads for PSPs, and LGAs for local paths.

Main Roads conduct weekly inspections of each PSP by vehicle, record maintenance issues and maintains PSPs to a high standard.

Local governments manage shared paths as one component of their asset management systems. DoT requires LGAs to conduct annual maintenance checks of any paths constructed using *Perth Bicycle Network* grant funding. LGAs will consider maintenance and safety issues as they arise. However, the cost of major path repairs means that problems are not always promptly addressed.

Major works on and adjacent to cycle networks can also make cycling less safe, particularly in busy areas such as the CBD. Some information on path detours, closures and maintenance issues is available on the Main Roads website. However, this typically only provides information for major projects that impact PSP routes and is not always updated to reflect changes in path conditions.

Some information is also available through individual LGA websites for major shared path detours, closures and on maintenance issues, but like the Main Roads website, these are inadequate for community members wishing to know timeframes and alternate routes for cycle journeys. DoT and Main Roads may find it useful to work with the WA Local Government Association, who advocate on behalf of the state's LGAs, to assist in developing a more detailed community information resource. Another alternative might be to adapt a route planning facility, such as the *Cycle Instead Journey Planner* used in South Australia, to include path detour, closure and maintenance issues.

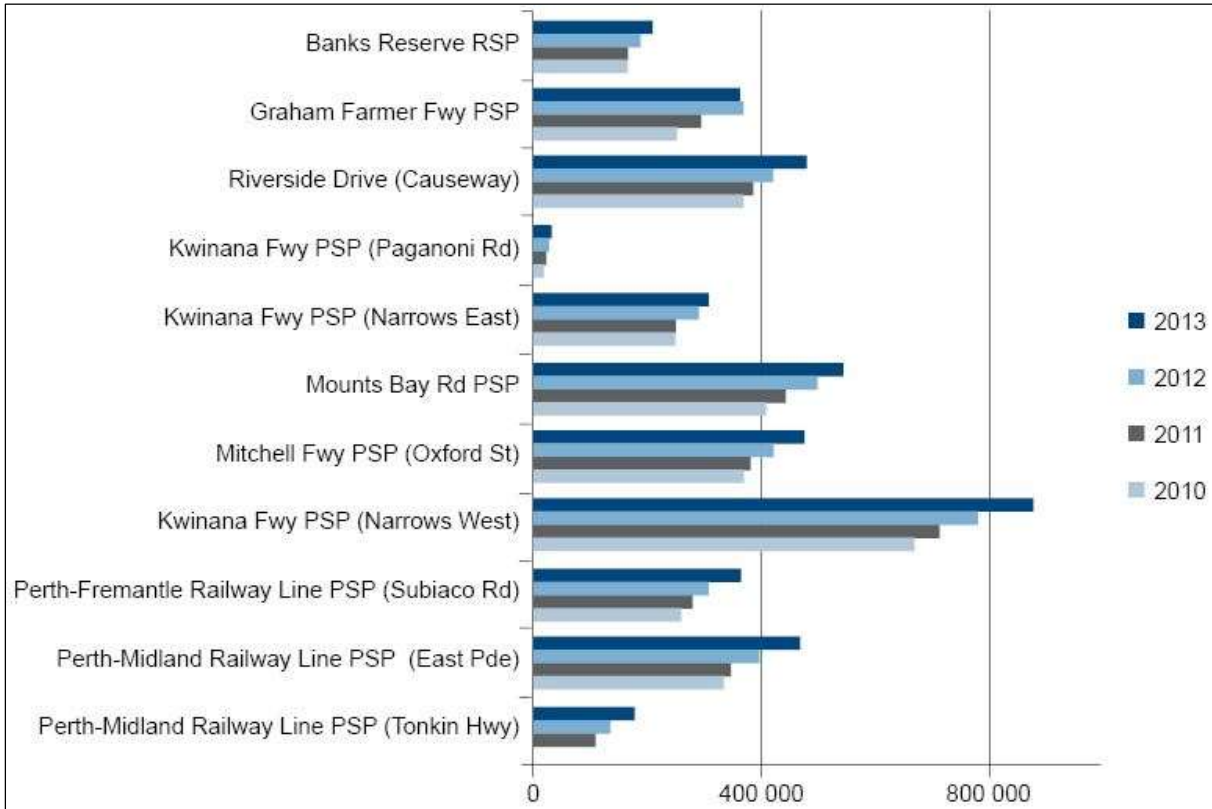
Incomplete data and analysis on cyclist movements and crashes limits planning

DoT aims through the WABN Plan to double the number of cycling trips in WA by 2019, largely through the provision of suitable infrastructure. Achieving this objective requires a good knowledge of where people cycle so that infrastructure decisions will deliver safe and suitable cycling routes. Currently, there are major gaps in the data needed to make these decisions.

Planning decisions are based on incomplete data

There is a lack of comprehensive knowledge of cyclists' routes and destinations, particularly at the local government level. Main Roads and DoT have 30 permanent bike counters, 19 of which are on PSPs and 11 on RSPs leading into the Perth CBD. Private companies also collect mobile fitness application data and LGAs may collect local data. However, there is no central repository for this data, and minimal analysis and reporting of the information. Transport agencies and local governments are thus unable to consider all available data to inform planning.

The data from Main Roads and DoT provides good information about the use of the arterial cycle network, particularly of cycling routes into the CBD. Figure 9 shows that there has been a gradual increase in cyclists using these routes. In 2013, cyclists used the well-connected high quality Kwinana Freeway PSP at 'Narrows West' and 'Narrows East' 2.8 times more than the poorer quality less connected Mitchell Freeway PSP. The Narrows West section near the CBD is the most frequently used PSP segment in Perth.



Source: DoT and Main Roads

Figure 9: Perth Bicycle Network annual bike counts for PSPs 2010 to 2013

But this data is only a subset of journeys by bicycle, which means that use of other infrastructure by cyclists is not measured. Eighteen per cent of our survey respondents cycled

mostly on roads and a further 66 per cent cycled on a combination of paths and roads. Not all these cyclists would be included in the PSP data held by Main Roads and DoT.

Table 3 shows recent analysis of mobile fitness application data by Edith Cowan University and provides valuable information about cycling movement throughout Perth. Even though this data captures only a segment of the population, it shows popular routes used by these cyclists. Routes include a combination of PSPs, RSPs, other shared and cycle paths, and roads. It would be useful for DoT to use this or similar data in future planning activities.

Paths	Roads
Narrows Bridge PSP (247 000)	Hackett Drive, Crawley (155 000)
Burswood RSP between Resort Drive and Taylor Street, Victoria Park (203 000)	Curtin Avenue, Mosman Park (146 000)
Riverside Drive RSP between Narrows Bridge and Kings Park Avenue (136 000)	Mill Point Road, South Perth (133 000)
Como PSP between Canning Bridge and Thelma Street (114 000)	Kings Park Avenue (119 000)
Alfred Cove RSP between Cunningham Street and Lentona Road (111 000)	Melville Beach Road, Applecross (103 000)

Source: Blake and Perkins (2015)¹⁰

Table 3: Busiest roads and paths used in 2013 by recreational cyclists using mobile fitness application data (Strava: total number of cyclists over one year)

Standardised crash information will help agencies identify and address safety issues

WA Police and Main Roads collect crash information to inform infrastructure requirements and road safety planning. However, a combination of under-reporting of crashes involving cyclists, problems with linking data between agencies, and the length of time taken to collate and analyse data, means that transport agencies are unable to make best use of crash data to improve cyclist safety.

Some data for crashes involving cyclists is collected but it is not complete. This includes:

- when informed, WA Police attend fatal and serious crashes, which include serious bodily harm or where property damage to all involved parties exceeds \$3 000
- WA Police and the Insurance Commission of Western Australia (ICWA) have an online portal for the public to report crashes that involve a motor vehicle
- if a cyclist receives treatment at an emergency department or when admitted as an inpatient, the hospital may record some crash information.

The online portal cannot be used by the public to report crashes that do not involve a motor vehicle. There is no other facility for cyclists to report crashes.

The WA Police crash data showed 2 575 cyclist crashes for the five years from 2006 to 2010. However, for a similar period from July 2005 to June 2010, Perth metropolitan hospital emergency departments reported 12 086 cyclist crashes. This suggests that WA Police and ICWA may receive reports of only 21 per cent of more serious crashes involving cyclists.

Main Roads’ mapping of WA Police cyclist crash data in Appendix 4 shows that fatal and serious crashes occur anywhere across the road and cycle network in the Perth metropolitan

¹⁰ Blake and Perkins (2015). *Preferred Recreational Cycling Routes in Perth, Western Australia*. Edith Cowan University.

area. Of 2 828 respondents to our community survey, 20 per cent (559) said they had a bicycle crash in 2014. Only 12 per cent of these people reported their crash to WA Police despite over 30 per cent involving a motor vehicle and 22 per cent receiving treatment at an emergency department or admission to hospital.

The above data highlights that the scale of unreported crash information involving cyclists is significant. RSC has stated that it would benefit greatly from access to linked crash data that follows an individual's crash from incident, through to reporting and medical attention.

Complete data is important to gain a comprehensive knowledge of where safety concerns exist, and guide future planning for cycling infrastructure. Improved knowledge of crash locations and contributing factors will also inform campaigns to raise public awareness and education initiatives. We discuss this later in the report.

The gaps in planning will delay growth in cycling and the societal benefits that cycling provides

There are significant gaps in the State Government's transport planning framework for Perth. This means that transport agencies and stakeholders may not be able to integrate cycling effectively into the Perth metropolitan area transport network. Infrastructure planning to date has also neglected the safety awareness and education components needed to achieve DoT's plan to double cycling trips by 2019 and to make cycling a viable mode of transport.

The state's transport planning framework has not been finalised

The *Moving People Network Plan* (MPNP) was drafted in 2013. DoT advised in June 2015 that it will be replaced with a new plan guided by the Department of Planning's (DoP) *Perth and Peel @3.5 Million Plan*. In the interim, the development of an integrated transport network for the state will be difficult. Investments in cycling may continue to be made in isolation of other transport options.

The MPNP was to function as a strategic transport planning and policy document that put active transport needs into a regional and local context. The WABN Plan was one of the 'key building blocks for moving people'. However, the MPNP focused on the road network and public transport. DoT did not compare the economic, environmental, health and social benefits provided by each transport option and has therefore limited its ability to meet its objectives of influencing consumer transport choices and minimising traffic congestion.

Increasing the number of people choosing to cycle plays a part in helping to reduce traffic congestion. In 2013, the Kwinana Freeway was the most frequently used segment of the PSP network and transported an equivalent of approximately one quarter of a freeway lane's worth of vehicle traffic. The Commonwealth Government Bureau of Infrastructure Transport and Regional Economics (BITRE) estimated the total cost of avoidable urban congestion in Perth was expected to reach \$2.1 billion by 2020 without significant investment in transport infrastructure¹¹.

As outlined in the WABN Plan, other benefits of cycling include:

- transport – reduced demand for parking, convenient, time saving in congested areas
- environmental – reduced greenhouse gases, improved air quality, noise reduction
- health – associated with increased physical activity
- social and economic – increased social interaction, affordable transport.

RAC WA in its 2012 report, *The Economic Cycle: A Business Case for Investment in Cycling in Western Australia*, recognised the advantages of cycling. Its economic modelling found the return on investment in cycling infrastructure produced community benefits of 3.4 to 5.4 times the costs incurred. Financial returns were calculated as nearly twice the costs incurred because people who cycle more spend less on travel costs, and gains in health and fitness result in savings on health services.

A community survey conducted by RAC WA in 2015 identified investment in cycling infrastructure as the highest priority for the State Government in order to help encourage more

¹¹ BITRE (2007). *Estimating urban traffic and congestion cost trends for Australian cities*. Working Paper No 71.

people to cycle more often. One of the main reasons people state for not cycling more often is a perception that cycling is unsafe.

The *Australian National Cycling Strategy 2011-2016*¹² identified cycling promotion as the first, infrastructure as the second, and integrated planning as the third of six key strategies to increase participation in cycling. The strategy advocated for cycling to be considered in all relevant transport and land use planning activities.

The WABN Plan remains WA's stand-alone document to guide expansion of cycling and cycling facilities. We expected the WABN Plan to be supported by a business case to outline funding requirements, an implementation schedule for key actions and public reporting on outcomes. However, none of this exists.

Action to improve Perth's cycle network has been limited to surges in activity. Without detailed implementation planning and funding commitment, there is a risk that the current level of activity may not result in completion of the key actions through the life of the WABN Plan within the state's intended timeframes.

A review of the WABN Plan is due in 2016. DoT has committed to providing the WABN Implementation Reference Group (IRG) and the community with a status report on the WABN Plan by the end of 2015. The IRG comprises agencies and stakeholders who oversee the implementation of key actions of the WABN Plan. Information on progress will be useful to inform the community, who are often unaware of new cycling infrastructure nor why some roads have cycling facilities while others do not.

There is minimal focus on improving public awareness about cycling safety

The WABN Plan focuses on infrastructure measures to grow cycling in WA. While improved infrastructure is a critical part of addressing safety, it is not the entire solution. Enhancing public awareness of the vulnerability of cyclists and promoting mutual respect amongst road and path users is essential.

The importance of safety was evident in our community survey and has been the topic of numerous research studies in Australia and internationally. For example, the Monash University Accident Research Centre investigated the behaviour of cyclists and their interactions with motorists in Canberra. The researchers recommended a series of improvements to make cycling safer, which included: greater connectivity of bike lanes, driver education, and efforts to reduce cyclist and driver confusion in relation to road rules¹³.

However, these are not new issues. The State Government's 1975 *Cycleways for Perth* report stated that bicycles 'are incompatible with high-speed, high-volume traffic'.

The state's *Towards Zero Road Safety Strategy* recommends actions to educate the community. RSC has recently funded research into urban design for cycling safety. The research findings will contribute to government efforts to improve road safety, such as identifying gaps in regulations and standards that need addressing to ensure safety of road and path users. For example, Main Roads has used cycle lanterns at traffic signals for around ten years (Figure 8, page 22). Motorists are required to give way to pedestrians at intersections but do not usually need to give way to bicycles, as they are regarded as vehicles. Where cycle lanterns have been installed so far, cyclists have full priority as motorised traffic is held with a red turning arrow. A change in legislation may be required if cyclists are to have the same crossing rights at traffic lights as pedestrians.

¹² Australian Bicycle Council (2010). *Australian National Cycling Strategy 2011-2016*.

¹³ Johnson, M., Chong, D., Carroll, J., Katz, R., Oxley, J. and Charlton, J. (2014). *Naturalistic Cycling Study: Identifying Risk Factors for Cyclists in the Australian Capital Territory*. Report No. 322, Monash University Accident Research Centre.

RSC has also run two dedicated cyclist safety campaigns. These were the *Be Aware Share* campaign in 1998 and the \$300 000 *Share Our Roads* campaign in 2014. The latest campaign used printed advertisements, as shown in Figure 10, and safety signs on PSPs.



Figure 10: 2014 *Share Our Roads* campaign advertisement

The RSC's evaluation of the *Share Our Roads* campaign showed that it reached just 31 per cent of WA residents, compared with 93 per cent for drink driving behaviour and 77 per cent for speeding enforcement campaigns run in 2013. RSC advised that consistent campaign effort is required to achieve lasting behaviour change by the community to improve cycling safety.

The OAG survey found that 23 per cent of the crashes reported by respondents did not involve any obstacle. Of 8 139 hospital inpatients over ten years from July 2004 to June 2014, four per cent of crashes were collisions with other cyclists and 31 per cent with vehicles, but 57 per cent did not involve any obstacle. The results suggest better safety education for cyclists would be useful in reducing the number of crashes.

There are very few formal education programs in cycling. Some examples include:

- the State Government's School Drug Education and Road Aware (SDERA) offer road safety education modules for children. SDERA estimate that only around 30 per cent of schools use the voluntary program materials provided
- AustCycle provide practical cycling skills training on a fee paid basis
- RAC WA gave 534 free road safety presentations to schools in 2014, which included a cycling component.

Other than the *TravelSmart* programs discussed below, investment by the State Government to promote cycling as a form of transport has been minimal and sporadic. DoT's *Cycle Instead* initiative ceased in 2010, leaving short activities such as *Bikeweek*, *Ride2Work* and other recreational or sporting events to promote cycling.

DoT's *TravelSmart* programs, which commenced in the 1990s, and PTA's bike parking at train stations, are examples of effective schemes to promote local cycling trips and to school and work. *TravelSmart* highlights local transport options and utilises health goals to promote active transport.

Case Study – *TravelSmart* programs

DoT's *TravelSmart* programs provide tools and resources to promote active transport in households, schools and work places. *TravelSmart* was delivered to over 200 000 households across Perth from 2000 to 2004. Program evaluation at the end of this period proved that it was both a simple and cost effective method of increasing cycling participation. Cycle trips increased by 58 per cent, ranging from 25 per cent in Subiaco to 140 per cent in Marangaroo.

More recently, *TravelSmart's Your Move* Cockburn project was provided to over 10 000 households in 2013-14, in partnership with the City of Cockburn and Department of Sport and Recreation. Project outcomes included installation of 32 bike parking rails and 510 direction and cycle safety signs.



Source: DoT

Figure 11: *Your Move* direction and safety signage

Two high level cycling meetings were held in March 2015. The first event, hosted by the Minister for Transport, was attended by Dutch transport planners, Transport Portfolio executives, and WABN Implementation Reference Group (IRG) members. The Premier and Minister for Road Safety then hosted a cycling workshop with staff from transport agencies, RSC and Department of Health, and advocacy groups.

Both events highlighted the need for sustained education, safe infrastructure and promotion. RSC was charged with reviewing possible education options, which included the Dutch system of commencing education initiatives at the age of four to 'foster lifelong learnings and benefits'.

OAG survey comments further supported the need for a combination of suitable cycling infrastructure and education:

'I believe driver (and cyclist) education of their rights and responsibilities to sharing the road and better infrastructure can improve the safety of cycling.'

'Cycle lanes on the roads with bikes painted in them and or more bike paths are drastically needed. Education programs for motorists would help.'

'I would also like to see bike shops give copies of cyclist road rules with every bike sold, as I was very foggy about some of the newer rules when I got my bike.'

Education and safety awareness for all road users, including cyclists, are vital components of any action to reduce crashes and the risk of critical and fatal injuries.

Appendix 1: OAG cycling survey results

Question 1: What is the postcode of your primary residence? – All 2 828 respondents answered this question.

Question 2: Are you male or female?

Answer choices	Responses (%)
Male	66.12
Female	33.88

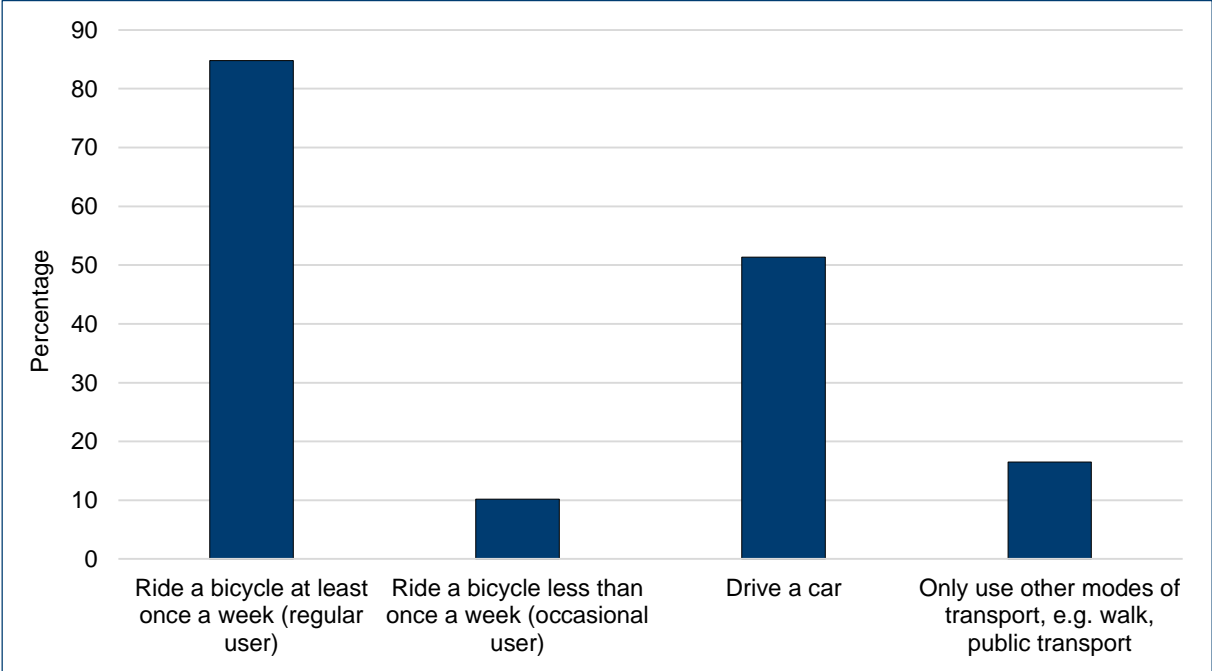
Number of respondents that answered this question: 2 828

Question 3: Age group?

Answer choices	Responses (%)
12 or under	0.18
12-24	4.70
25-34	23.97
35-44	28.71
45-54	26.10
55-64	11.53
65 or over	4.31
I prefer not to answer	0.50

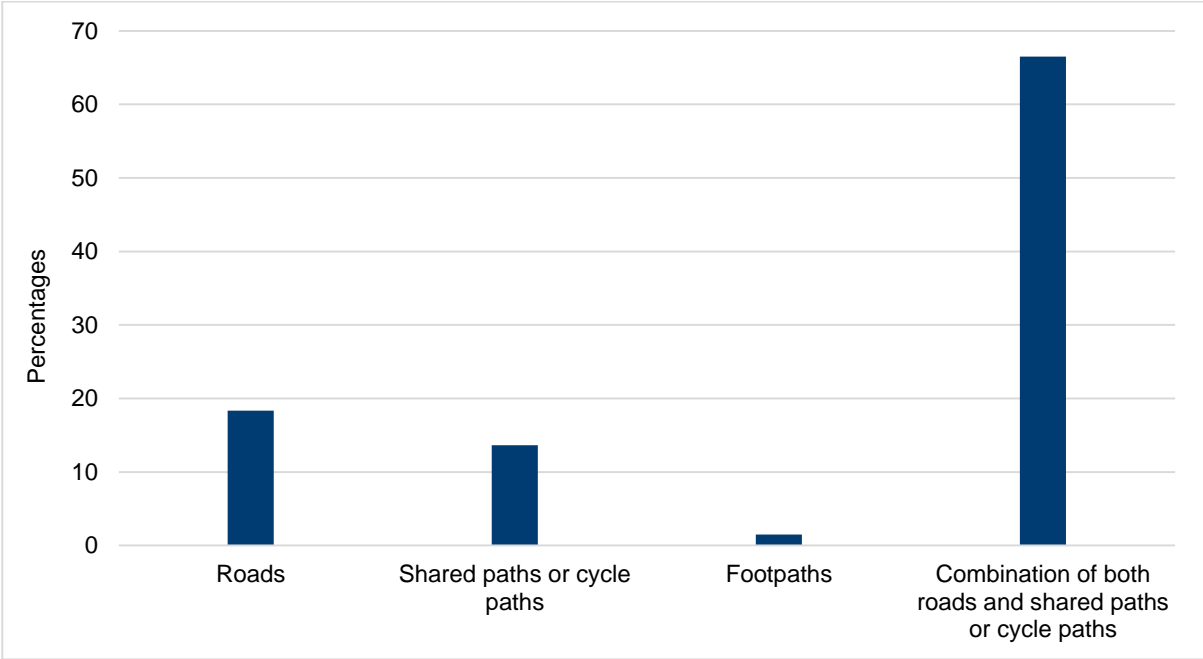
Number of respondents that answered this question: 2 828

Question 4: Do you (please select all responses that apply)?



Number of respondents that answered this question: 2 828

Question 5: If you cycle, do you cycle mostly on?



Number of respondents that answered this question: 2 656

Question 6: On average, how often do you cycle?

Answer choices	Responses (%)
6-7 days per week	14.59
4-5 days per week	35.86
1-3 days per week	38.29
Less than once a week but more than once a fortnight	5.27
Once a fortnight or less but more than once a month	2.08
Once a month	1.59
Less than once a month	2.05
Never	0.27

Number of respondents that answered this question: 2 638

Question 7: Why do you choose to cycle (please select all responses that apply)*?

Answer choices	Responses (%)
Do not have a driver's licence	1.21
To commute to work	59.29
To do errands, get groceries and/or do shopping	22.82
For recreation or leisure	62.24
For exercise or training	80.52
Other	5.84

Number of respondents that answered this question: 2 638

*Total is greater than 100 per cent as respondents were able to select more than one option

Question 8: Have you ever received cycle skills training?

Answer choices	Responses (%)
Yes, as an adult	21.65
Yes, as a child	30.17
Never	48.18

Number of respondents that answered this question: 2 638

Question 9: Have you been involved in a crash that resulted in an injury to you (minor or severe) or damage to your bicycle in 2014?

Answer choices	Responses (%)
Yes	19.63
No	78.51
Yes, I had multiple bicycle crashes in 2014	1.86

Number of respondents that answered this question: 2 634

Question 10: Was your bicycle crash with?

Answer choices	Responses (%)
A vehicle while cycling on the road	30.59
Another cyclist while cycling on the road	7.69
Another cyclist while cycling on a shared path or footpath	10.20
A pedestrian while cycling on a shared path or footpath	3.40
Another obstacle, e.g. dog, pole, parked car	12.88
No obstacle and only involving you	23.43
Other or for those with more than one crash in 2014	11.81

Number of respondents that answered this question: 559

Question 11: Did you report your bicycle crash to the WA Police?

Answer choices	Responses (%)
Yes	11.99
No	88.01

Number of respondents that answered this question: 559

Question 12: Which of the following applies to your bicycle crash?

Answer choices	Responses (%)
I attended a WA hospital to receive emergency treatment	16.82
I was admitted to a WA hospital as an inpatient	4.83
I did not go to hospital	78.35

Number of respondents that answered this question: 559

Question 13: How safe do you think cycling is on roads in the Perth metropolitan area?

Answer choices	Responses (%)
Very safe	0.18
Safe	7.61
Neither safe nor unsafe	25.46
Unsafe	49.66
Very unsafe	17.09

Number of respondents that answered this question: 2 773

Question 14: How safe do you think cycling is on shared paths in the Perth metropolitan area?

Answer choices	Responses (%)
Very safe	8.74
Safe	49.02
Neither safe nor unsafe	23.16
Unsafe	16.44
Very unsafe	2.64

Number of respondents that answered this question: 2 768

Question 15: Do you think cycling is a good alternative for commuting to work that will help reduce traffic congestion in the Perth metropolitan area?

Answer choices	Responses (%)
Yes	91.43
No	2.24
Maybe	6.33

Number of respondents that answered this question: 2 766

Question 16: What, if anything, stops you from cycling more often (please select all responses that apply)*?

Answer choices	Responses (%)
Lack of confidence or cycling skills	3.17
Lack of safe bike routes	48.23
The bike paths suddenly stop/I'm forced to ride on the street	43.21
Fear of sharing the roads with motorists	50.24
Lack of end of trip facilities (showers, lockers, secure bike parking)	23.37
Having the required equipment	1.71
Too time consuming compared to other modes of transport	9.06
Lack of fitness	3.64
Don't own a bike	1.97
Nothing stops me from cycling more often	22.35
Other	14.38

Number of respondents that answered this question: 2 747

*Total is greater than 100 per cent as respondents were able to select more than one option

Question 17: Do you think cyclists are a hazard when they share roads with motor vehicles and paths with pedestrians, in Perth? Please briefly provide your opinion and your main reasons.

Answer choices	Responses (%)
Yes	51.22
No	48.78

Number of respondents that answered this question: 2 782

Question 18: Are there any 'hot spots' that are a danger to cyclists in the Perth metropolitan area? If there are, please briefly list or describe up to three locations you think are the most dangerous – Answered 1 898 – Skipped 930

Question 19: Do you have any other brief comments regarding the adequacy of the cycling network in Perth? – Answered 1 860 – Skipped 968

Question 20: Do you have any other brief comments about whether cycling is safe, convenient and viable mode of transport in Perth? – Answered 1 647 – Skipped 1 181

Appendix 2: A summary of the history of planning for cycling infrastructure in Perth

Date	Report or Plan	Main Aspects of the Report or Plan
1975	<i>Cycleways for Perth</i>	<ul style="list-style-type: none"> • report produced by the Cycleways Advisory Committee for the State Government • outlined the problems faced by cyclists in Perth • almost no cycling specific facilities existed at the time • presented illustrative guidelines and examples for use by local decision-makers to provide 'safe, efficient, and enjoyable cycleway facilities', beginning with a practical plan to construct shared paths along the Swan River foreshore.
1985	<i>Perth Metropolitan Region Bikeplan</i>	<ul style="list-style-type: none"> • two key themes: safety and enjoyment; education and enforcement • provided detail of infrastructure requirements and design • recommended end-of-trip facilities and education of motorists to be aware and considerate of cyclists.
1996	<i>Perth Bicycle Network Plan</i>	<ul style="list-style-type: none"> • regarded by the State Government as the 'first comprehensive plan for the provision of cycling facilities within the Perth metropolitan area' • identified engineering works and funding to complete a broad scale cycle network by constructing missing links and upgrading existing links • recognised that providing segregated cycling facilities on the majority of streets was neither practical nor necessary • requested cycling be actively incorporated into the planning and design of roads and streets.
2014	<i>Western Australian Bicycle Network Plan 2014-2031</i>	<ul style="list-style-type: none"> • guides the expansion of cycling facilities to provide a 'safe and sustainable cycling network which ties in with key activity and attraction areas' • change in strategic direction to a network focus of moving people via a connected network of cycle routes • recognises the importance of collaboration between State Government, local government, and the cycling community • links with the <i>National Cycling Strategy 2011-2016</i>.

Appendix 3: Distance of constructed Principal Shared Paths (PSP)

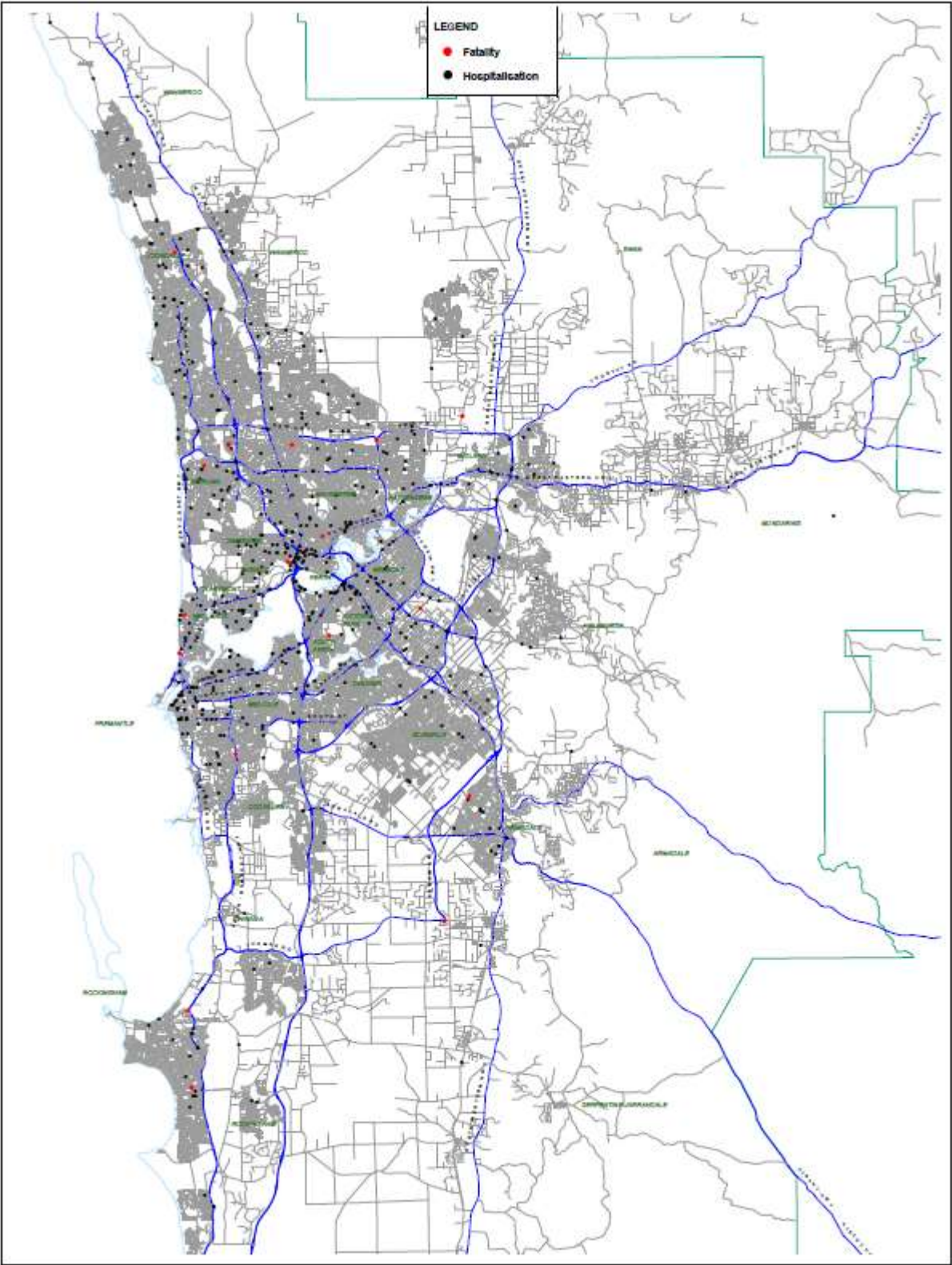
Distance of PSP existing at Perth Bike Network Plan (1996)			
	Total	Within 15km	Outside 15km
Distance of PSP (close to standard)	7.20	7.20	0.00
Distance of PSP (not to standard)	3.20	3.20	0.00
Total Distance of PSP (1996)	10.40	10.40	0.00

Total distance of PSP at present (2015)			
	Total	Within 15km	Outside 15km
Additional PSP constructed (since 2012)	23.40	21.10	2.30
PSP constructed to standard (1996-2012)	135.90	61.05	74.85
Distance of PSP (2015) – to standard	159.30	82.15	77.15
Distance of non-standard PSP	12.30	11.20	1.10
Total Distance of PSP (2015)	171.60	93.35	78.25

Total distance of entire PSP network (2031)			
	Total	Within 15km	Outside 15km
Additional PSP constructed (since 2012)	23.40	21.10	2.30
Additional PSP programmed (funded)	49.60	26.10	23.50
Additional future PSP (unfunded)	135.35	42.25	93.10
PSP constructed to standard (1996-2012)	135.90	61.05	74.85
Distance of PSP (entire) – to standard	344.25	150.50	193.75
Distance of non-standard PSP	12.30	11.20	1.10
Total Distance of PSP (2031)	356.55	161.70	194.85

Source: DoT, October 2015

Appendix 4: Location of fatal and serious cycle crashes from 2009 to 2014 in Perth



Source: Main Roads

Auditor General's Reports

Report Number	Reports	Date Tabled
21	Opinions on Ministerial Notifications	8 October 2015
20	Agency Gift Registers	8 October 2015
19	Opinions on Ministerial Notifications	27 August 2015
18	Controls Over Employee Terminations	27 August 2015
17	Support and Preparedness of Fire and Emergency Services Volunteers	20 August 2015
16	Follow-On: Managing Student Attendance in Western Australian Public Schools	19 August 2015
15	Pilbara Underground Power Project	12 August 2015
14	Management of Pesticides in Western Australia	30 June 2015
13	Managing the Accuracy of Leave Records	30 June 2015
12	Opinions on Ministerial Notifications	25 June 2015
11	Regulation of Training Organisations	24 June 2015
10	Management of Adults on Bail	10 June 2015
9	Opinions on Ministerial Notifications	4 June 2015
8	Delivering Essential Services to Remote Aboriginal Communities	6 May 2015
7	Audit Results Report – Annual 2014 Financial Audits	6 May 2015
6	Managing and Monitoring Motor Vehicle Usage	29 April 2015
5	Official Public Sector Air Travel	29 April 2015
4	SIHI: District Medical Workforce Investment Program	23 April 2015
3	Asbestos Management in Public Sector Agencies	22 April 2015
2	Main Roads Projects to Address Traffic Congestion	25 March 2015
1	Regulation of Real Estate and Settlement Agents	18 February 2015

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