

ACT AUDITOR–GENERAL’S REPORT

**MAINTENANCE OF SELECTED
ROAD INFRASTRUCTURE ASSETS**

REPORT NO. 5 / 2017

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The Speaker
ACT Legislative Assembly
Civic Square, London Circuit
CANBERRA ACT 2601

Dear Madam Speaker

I am pleased to forward to you a Performance Audit Report titled 'Maintenance of Selected Road Infrastructure Assets' for tabling in the Legislative Assembly pursuant to Subsection 17(5) of the *Auditor-General Act 1996*.

Yours sincerely



Dr Maxine Cooper
Auditor-General
9 June 2017

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SUMMARY

Overall conclusion

Aging road assets and budget limitations have resulted in a backlog of road pavement repairs. Reducing this backlog will likely take years and is best guided by a long-term strategy. Additionally, attention needs to be given to replacing old traffic signal components and a comprehensive inspection program for community paths developed and implemented. Roads ACT, given the lack of a comprehensive inspection plan, have adopted a practical risk based approach to managing paths, although this needs updating.

The overall sound governance and strategic asset management framework supports Roads ACT in undertaking its maintenance activities. Roads ACT's progression of an initiative for integrating engineering and environmental considerations in managing streetlighting maintenance is recognised. However, more routine improvements in the delivery of its maintenance activities are needed, including giving particular attention to how data collection and storage, and the subsequent development of operational plans, are managed.

Chapter conclusions

GOVERNANCE

Overall sound governance arrangements are in place to support road infrastructure asset maintenance activities. However, these could be improved by strengthening risk management practices and performance reporting. While there are effective risk identification practices in place to identify key risks, the appropriateness of some of the mitigation strategies outlined in Roads ACT's Risk Register need to be reassessed.

Roads ACT's Business Plan can be improved by incorporating the operational delivery targets that Roads ACT works towards for each asset class. The accountability indicators relating to road maintenance are appropriate. However, public reporting on maintenance could be improved by including additional indicators on the condition of road infrastructure assets. Additional accountability indicators relating to paths maintenance also need to be developed and publically reported.

STRATEGIC ASSET MAINTENANCE PLANNING

Roads ACT's Strategic Asset Framework and the 2013 Strategic Asset Management Plan align with the requirements of the ACT Government's Asset Management Guidelines. Priority needs to be given to updating the 2013 Strategic Asset Management Plan to ensure the ACT Roads completion target date of June 2017 is met.

The Strategic Asset Management Plan is supported by operational plans. Most of these are out-of-date and there is no such plan for road pavement. Operational procedures have relied on the corporate knowledge of long-term staff. This approach creates an unnecessary risk of procedures being undertaken inadequately should key staff resign.

The Integrated Asset Management System (IAMS) is not routinely updated with data for all asset types resulting in a reliance on the use of offline paper asset condition data. This needs to be addressed to maximise efficiencies from having IAMS.

Consideration of environmental issues associated with maintenance can be improved by Roads ACT maintenance contracts (or service standards for in-house staff) specifying environmental requirements. Without these there are inadequate environmental controls.

When a query or complaint is received from the community, Roads ACT need a formal process for providing feedback when work has been undertaken to address the issue.

ROAD PAVEMENT

While Roads ACT reported in their 2015-16 annual report that 90 percent of territorial roads in the ACT were in good condition, there is a significant maintenance backlog for road pavement. This backlog has increased by more than 400 percent since 2010-11 and amounts to approximately two million square meters of road pavement needing maintenance (equivalent to 9.0 percentage of the total road pavement) which Roads ACT estimated would cost \$53 million in 2015-16 and increase to \$71 million in 2019-20.

The management of this backlog, while unlikely to be addressed in the short-term, needs to be guided by a long-term strategy and would be supported by Roads ACT addressing shortcomings in its practices, including developing and implementing an operational plan for the maintenance of road pavement, specifying quality standards for maintenance work and improving monitoring arrangements for maintenance activities.

COMMUNITY PATHS

A comprehensive inspection program covering community paths in the Territory is needed to reduce the risk of major maintenance in the long term and extend the useful life of paths. In the absence of such a program, Roads ACT has used a risk based approach and undertakes inspections in high priority locations which cover 26 (24 percent) of Canberra's 110 suburbs and in response to complaints. In the absence of a comprehensive inspection program, targeting inspections and reactive maintenance at high priority locations is appropriate, however, these locations were last reviewed in 2010 presenting a risk that some suburbs that should be included are not.

Roads ACT achieved the majority of its internal performance (service level) targets relating to

maintenance of community paths most of the time in 2015-16. While these along with other aspects of its maintenance activities can be improved, a major challenge for Roads ACT will be maintaining community paths as they rapidly age given budgetary limitations. There is a need for an assessment of future maintenance costs to be updated and included in the Transport Canberra and City Services' Strategic Asset Management Plan and this information used to inform budget proposals.

TRAFFIC SIGNALS

The majority of signal assets are operating beyond their design life and need replacing. A replacement schedule to guide this is needed.

The management of traffic signal maintenance activities could be improved by Roads ACT updating their strategic plan for the maintenance of traffic signals (last updated in 2005), improving contract management arrangements and better monitoring maintenance activities.

Replacing incandescent lanterns with Light Emitting Diodes (LEDs) in traffic signals is a progressive initiative that achieves several objectives; increasing longevity of lights, road safety and reducing greenhouse gas emissions.

STREETLIGHTS

Arrangements for the maintenance of streetlights will change in late 2017 with this being done under an Energy Performance Contract with the private sector operator. There is a focus on achieving energy efficiencies.

Roads ACT will need to monitor this contract, as is its practice, to make sure its benefits are realised. Also, information from the contractor on the condition of streetlights will need to be promptly updated in IAMS, something that is currently lacking. A new operational plan is needed which could be developed to align with the new contract arrangements.

Key findings

GOVERNANCE

Paragraph

The 2015-16 draft *Roads and Infrastructure Business Plan* complied with some key requirements of the Transport Canberra and City Services Directorate's *Strategic Planning and Reporting Framework*. However, it did not identify Roads ACT's contribution to key ACT Government priorities, business objectives that were linked to the Transport Canberra and City Services Directorate's Corporate Plan or performance targets that would assist in managing its budget.

2.25

Roads ACT's reporting on its accountability indicators shows that a high percentage of territorial roads are in good condition and customer survey results, for the most

2.29

part, show high levels of satisfaction with the public road network (noting that this is likely to include reasons other than maintenance).

During 2011-12 to 2015-16 the reported average percentage of road resurfaced was 3.6 percent for territorial roads and 2.4 percent for municipal roads, significantly below (by 28 percent and 40 percent respectively) their respective targets of five percent and four percent. 2.32

The four accountability indicators for the maintenance of road infrastructure (percentage of territorial roads in good condition, percentage of customers satisfied with the public road network, annual percentage of territorial roads resurfaced and annual percentage of municipal roads resurfaced) provide an indication of whether road surfaces are being maintained and are therefore relevant to assessing whether the ACT Government's goal of having 'well-maintained infrastructure' as set out in *The Canberra Plan* is being achieved. 2.35

While the accountability indicators and targets for the maintenance of roads are relevant they can be improved by including indicators on the percentage of distressed roads; percentage of road pavement that exceeds its optimal age and the timeliness of road maintenance activities. 2.38

There are no accountability indicators which provide information on whether the ACT Government's goal of having 'well-maintained infrastructure' has been achieved in relation to community paths. The two accountability indicators for community paths (*annual increased length of community paths (km)* and *customer satisfaction with access to cycle and walking paths*) do not provide information on the condition of community paths or the progress of maintenance work on these paths. 2.39

Roads ACT's Risk Register conforms to the key principles of the Australian New Zealand Risk Management Standard ISO31000:2009. The risks, the impact of these risks, responsibility for managing the risks, controls in place to address these risks and actions to be taken to address these risk, and officers responsible for monitoring and reviewing these risks are recorded in Roads ACT's Risk Register. 2.43

While Roads ACT's Risk Register conforms to the key principles of the Australian New Zealand Risk Management Standard ISO31000:2009, it can be improved by more detailed analysis on treatment of risks before including specific actions to reduce the risks relevant to the maintenance of infrastructure to an acceptable level. 2.49

Roads ACT advised that neither business unit risks, divisional risks (Roads ACT) or directorate risks were reported to the Executive Director, Infrastructure, Planning and Operations, Risk Management Committee or Executive Leadership Team every six months as required by the Risk Management Framework. 2.51

The monthly Stewardship Report provided to the Executive Leadership Team of the Transport Canberra and City Services Directorate contains a significant amount of 2.65

information on Roads ACT's management of feedback and complaints, business continuity review and test results, financial performance against budget and debtors (where relevant). However, the report does not clearly show the extent to which planned performance is being achieved against the accountability indicators relevant to Roads ACT or performance measures in the Roads ACT Business Plan. Furthermore, the Stewardship Report does not address the key risks specifically relating to Roads ACT. The inclusion of such information would provide the Executive Leadership Team with more comprehensive information.

The Finance Report provides financial information at a Divisional level to sufficiently allow the City Services Directorate and Roads ACT to adequately manage their maintenance budget. 2.71

Roads ACT contracts reviewed as part of this audit included appropriate requirements (as considered by the Subject Matter Expert) that support effective contract management practices for roads (reseal and asphalt overlay), community paths, streetlights and traffic signals such as: quality and compliance requirements; project plans and programs of work; performance and reporting requirements; payment and invoicing arrangements. However, some were inadequate with respect to environmental requirements. 2.75

STRATEGIC ASSET MAINTENANCE PLANNING

Paragraph

The Strategic Planning and Development Section advised that the 2016-19 Strategic Asset Management Plan, due to be updated by December 2016, is currently behind schedule, with a final version now expected by June 2017. Until that time the 2013 Strategic Asset Management Plan remains operational. 3.4

Roads ACT appropriately considered the potential impacts from growth and demand changes on the ACT and in response have included in the Strategic Asset Management Plan proposed strategies (not all of which are direct asset solutions) such as increasing utilisation of existing assets and focussing community path maintenance to known aged care establishments in response to an ageing population 3.12

Transport Canberra and City Services have identified service levels for roads and other road infrastructure asset classes relating to maintenance regimes and inspection frequency. The service levels reflect consideration given to asset sustainability, customer expectations, quality requirements and public safety. 3.18

Roads ACT advised that environmental conditions are monitored and reported through the Environment Manager (and team) within Roads ACT who responds to land management issues as required; contractor requirements such as environmental management plans and requirements for necessary approvals/licences. 3.25

Roads ACT has not developed a procedure for environmental management of road infrastructure assets that would support maintenance activities and outline environmental controls. On a day to day basis, Roads ACT needs to ensure that 3.29

maintenance contracts (or service standards for in-house staff) include environmental requirements. Without these there are inadequate environmental controls.

Asset lifecycle management plans within Roads ACT are adequate and support maintenance planning to sustain existing assets. Lifecycle management occurs for each asset class including strategies (such as maintenance planning, assessment criteria and repair methods) and maintenance programmes developed that aim for the lowest lifecycle cost of an asset whilst maintaining required service levels. 3.35

A review of the three Operational Plans in existence highlighted that much of the content was historical, contextual information and included obsolete data. Whilst the operational plans did contain some practical information such as a Condition Assessment Index, the documents are not used as a day to day procedural guide for staff. 3.42

The lack of current comprehensive operational plans for each asset class presents a risk that Roads ACT are unable to ensure that existing assets are being managed and maintained efficiently and effectively and that they fully support the delivery of services. It also presents a risk that in the loss of long-term staff with corporate knowledge there will be limited, if any, current operational procedures known. 3.46

While the information held within IAMS is useful and mostly reliable, it is not routinely complete for all asset types. Roads ACT could reduce its reliance on the use of offline asset condition data if the practices of updating IAMS improved. For example, Roads ACT have not specified any required timeframes for field maintenance staff to update asset condition after defects are addressed, resulting in frequent incomplete data. 3.59

There is no electronic link between the Access Canberra’s Client Record Management (CRM) system and Roads ACT systems. Although members of the public are able to select an option to receive feedback, there is no formal process for providing feedback on maintenance enquiries. 3.70

ROAD PAVEMENT

Paragraph

The amount of planned and unplanned maintenance was examined in this audit and it was found that in 2014-15, 58 percent was planned and 42 percent was unplanned. In 2015-16 the levels of planned versus unplanned was more even with 52 percent unplanned and 49 percent planned maintenance. 4.9

The reasons for deletion or rollover of programmed road resurfacing are not adequately documented by Roads ACT. For example, the notes included in the resurfacing program only state that the resurfacing item is either deleted from the program or moved to 2016-17. 4.30

The lack of an operational plan for road maintenance, combined with Roads ACT not having specifications or guidelines for unplanned maintenance, presents a risk 4.36

that road maintenance practices may not reflect contemporary practices and standards. Developing an operational plan could be done in conjunction with the Strategic Asset Management Plan review process in 2017.	
Contract management for the five-year resealing (chip sealing) contract, which ended in June 2016, was undertaken by an external consultant. The subsequent contract has maintained this arrangement.	4.40
The specification used in the Roads ACT asphalt contract makes cross reference to the NSW Roads and Maritime Services QA Specification for Heavy Duty Dense Graded Asphalt (R116) which the Subject Matter Expert considered best practice.	4.43
In 2015-16, approximately two thirds of the asphalt resurfacing and patching had been undertaken by in-house Roads ACT road maintenance crews, while the balance had been undertaken by one of the contractors of the panel of five contractors selected for this work. This is consistent with other jurisdictions.	4.48
Roads ACT's monthly Productivity Reports are produced to track time and cost of planned and unplanned maintenance. These reports do not report on the unit cost for in-house asphalt work that would be useful to compare results with contractors and help assess cost effectiveness. The tracking of planned activities via the annual report on road surfacing could also be improved through including the Program item number for chip sealing in the annual maintenance program.	4.52
Between 2011-12 and 2015-16 the budget for road maintenance increased by approximately 24.1 percent.	4.56
Roads ACT have calculated the level of road infrastructure asset backlog for 2015-16 to be 2 104 909m ² , a growth of over 400 percent since 2010-11. This is based on the gap between the target resurfacing rates and the actual amount of resurfacing undertaken.	4.59
Funds received in 2015-16 and 2016-17 from the Federal Government as part of its Roads to Recovery program allowed the projected growth in the backlog to halt but did not allow the backlog to be reduced. Roads ACT anticipates that the backlog will continue to grow in 2017-18.	4.60
In its draft information paper to Cabinet, Roads ACT predicted the value of maintenance backlog works to grow from approximately \$53 million in 2015-16 to \$71 million in 2019-20.	4.64
Roads ACT is seeking ways in which to reduce the backlog such as trialling of alternative road surfacing methods using recycled materials. For example used printer toner, which is included in the final asphalt mix to extend the life of road surface and lower life cycle costs. While this is recognised, given the importance of the issue, a long-term strategy is warranted.	4.70

Roads ACT have undertaken inspections of territorial and municipal roads in accordance with service level standards. They have also responded to approximately 1 338 damage or defect reports relating to potholes and edging, and fixed the damage within one week, 85 percent of the time. 4.75

The ACT Government’s performance target for road resurfacing was met in 2015-16 as a direct result of additional funding through the Roads to Recovery Program. However, prior to 2015-16, these resurfacing targets had not been met for some time (2010-11 for territorial roads and 2007-08 for municipal). The targets for the percentage of customer satisfaction and territorial roads in good condition have also been met. 4.77

The percentage of territorial roads in good condition is greater than 86 percent. The results have remained around 89 percent from 2011-12 to 2015-16 which indicates that a high proportion of ACT roads provide good ride comfort. It also means the ride quality on 11 percent of territorial roads is rated as fair to poor. 4.78

In 2012 the ARRB advised that if the current resurfacing rate of territorial roads in the ACT was to remain unchanged the resulting increased age of the roads would increase the risk of rapid pavement deterioration. 4.84

ARRB (2015) advised that by 2023 road condition deterioration would increase (cracking going from 19 to 34 percent, rutting from 11 to 17 percent and rough roads from 11 to 18 percent). And, also further advised that if the current resurfacing rate of territorial roads in the ACT was to remain unchanged the risk of rapid pavement deterioration will increase. This highlights the importance of preventative maintenance. 4.86

COMMUNITY PATHS Paragraph

Maintenance of community paths could be improved by developing a renewal program for the timely replacement of older sections of community paths, across the Territory. 5.15

The Roads ACT *Asset Management Operational Plan for Community Paths* is out of date and does not have information on operating costs, resource requirements or environmental impacts associated with the maintenance of community paths. This information can be used to assist in effectively managing maintenance activities. 5.20

Of Canberra’s 110 suburbs, 26 (24 percent) include locations assessed as high priority by Roads ACT for undertaking planned inspections of community paths. The planned inspections are in accordance with the priority rating for the location. However, since 2010, Roads ACT has not reviewed locations for their priority rating (based on the frequency of use and pedestrian mix, past compensation claims and pedestrian ‘generators’ such as shopping centre precincts) which determines the frequency of inspections. 5.28

There is no systematic approach for conducting inspections of the condition and safety of community paths that are not in high priority locations. As a result, Roads ACT is unable to reliably determine whether paths not in high priority locations (approximately 77 percent of community paths in Canberra) need to be maintained for safety or to expand their life span. A systematic approach would assist in avoiding higher costs resulting from a failure to identify and rectify small defects before they become large.	5.35
Information recorded in the Transport Canberra and City Services Integrated Asset Management System (IAMS) on community paths is updated on completion of repairs and maintenance. IAMS provides important management information and is extensively used to guide maintenance activities.	5.39
The Concrete Works Panel for the maintenance of community paths was established through an open tender process and in accordance with ACT Government's requirements ('Standard Conditions of Contract and Tenders').	5.44
Contract documentation was reviewed for six of the ten contractors on the Concrete Works Panel. For these six contractors, there was sufficient documentation of compliance with the requirements of the Concrete Works Panel, including the schedule of rates, approved temporary traffic management plans and progress reports on maintenance work. However, there were no environmental management plans to address adverse environmental impacts of the works and specify how these impacts will be addressed.	5.47
Roads ACT does not verify that the concrete used in community paths complies with the Design Standard strength requirements. Instead, Roads ACT relies on the strength quoted in the concrete supplier dockets provided by contractors which indicate the strength of the concrete mix.	5.49
Information on the maintenance of community paths is recorded in the Transport Canberra and City Services' Integrated Asset Management System (IAMS). Roads ACT (Road Maintenance Section) uses monthly management (productivity) reports produced from IAMS to monitor the costs of community path maintenance against budget.	5.51
While the Roads ACT 2013 <i>Strategic Asset Management Plan</i> identifies that there is a 'rapidly aging profile of the community path asset' and that 'this is forecast to become a significant budget constraint for Roads ACT', if the non recurrent funding provided in 2011-12 and 2012-13 is disregarded, the annual maintenance budget has remained relatively stagnant since 2011-12. Furthermore, the length of community paths increased by 13 percent over this period.	5.57
According to the <i>Community Path and Cycle Lane Project List</i> ' around 100 (67 percent) of the potential community paths upgrade projects were in high priority locations. In the 2016-17 Budget, Roads ACT was allocated \$1.5 million in funding for the construction of new paths but no funds have been allocated for these projects in the forward years from 2017-18 to 2019-20. Assessing the likely cost of	5.62

these maintenance requests would allow Roads ACT to develop a more accurate budget for forward years.

Roads ACT achieved the majority of its performance (service level) targets relating to maintenance of community paths most of the time in 2015-16. Inspections were carried out in higher risk areas every one or two years, repairs or work (trip hazards) were addressed within seven business days (83 percent of the time) and complaints in relation to high use and pedestrian areas were addressed within five or seven days respectively (83 percent of the time). However, there was no evidence that the replacement of paving or concrete in general or shopping areas was occurring within the target timeframe of ten business days. 5.64

TRAFFIC SIGNALS

Paragraph

Currently around 70 percent of traffic signals have been converted to LED. Roads ACT advised that they expect to convert the remainder by 2024, subject to funding, and expect that this will reduce electricity consumption by about 60 percent per site. This also has a consequential affect on road safety as fewer repairs means a reduction in disruption to traffic. 6.17

While the increasing risk of obsolescence of traffic signal components was identified by Roads ACT in 2005, and 2013 (as 36 percent of their traffic signal sites were older than their useful life of 25 years), a comprehensive replacement schedule for all components has not been developed. Without a comprehensive replacement schedule, for all traffic signal components, the frequency of faults will increase as the components age beyond their design life, resulting in increased risks to road safety. 6.21

Roads ACT’s operational plan (titled (2005) *Strategic Plan for Traffic Signals in the ACT*) met the majority of the requirements of an operational plan, however it lacked information on staffing and resourcing requirements (including training) which impacts on Roads ACT effectively planning for resource allocation. It has not been updated since 2005 and may therefore not reflect contemporary practices. 6.31

The delivery of traffic signals maintenance has historically been outsourced under contract with Ecowise Services (Australia) Pty Ltd (Ecowise) which was awarded the Traffic Signal Maintenance Contract in July 2016 for a three year period with two consecutive one year extensions possible. Roads ACT advised that it has not sought to deliver this service in-house due to the very specific expertise requirements which are not widely available in the labour market place 6.33

The traffic signals contract includes a requirement for environment management plans. The Contractor’s procedure for Traffic Signal and Cameras – Maintenance and Repair (Procedure T 102) was noted to include a section on environmental hazards and controls for Detector Loop installation, taking into account potential noise, air, and water pollution 6.40

However, the following deviations from good contract management for managing 6.41

traffic signals existed:

- In the monthly progress report for July 2016, the Preventative (planned) Maintenance undertaken for the month was different to that of the Preventative (planned) Maintenance Program. Roads ACT advised that the contractor has been given flexibility in undertaking Preventative (planned) Maintenance. However, Roads ACT does not track Preventative (planned) Maintenance undertaken against the Program based on monthly reports.
- The monthly report provided to Roads ACT by Ecovise includes the number of faults for the month, it does not identify the number of critical or major faults.
- Roads ACT do not reconcile at the end of each year the monthly reports against the Maintenance (planned) Program to check that all planned work was completed. There is the potential for preventative maintenance on traffic signals not to be undertaken as programmed which creates a risk to the serviceability of traffic signals and in turn public safety.

Reports provided by the contractor for the maintenance of traffic signals include information that aligns with contract requirements such as faults repaired, routine services completed, response times and the status of spare items; however, the monitoring of service levels for traffic signals could be improved through the inclusion of response times (between advice of fault and the repair) and the number of major faults. 6.52

The levels of service for traffic signals were reviewed during the audit however, as not all the service levels for traffic signals are monitored and reported, results could not be validated. 6.53

STREETLIGHTS

Paragraph

On 27 August 2016, the ACT Government released a Request for Proposal for the ACT Streetlights Project (Energy Efficiency and Smart City Upgrades) with the intention to enter into a Energy Performance Contract (to commence in the second half of 2017) with a private sector operator. 7.5

The Northrop superintendent (the contractor responsible for maintenance inspections) holds data on streetlight defects, gathered through the inspection regime as well as the asset condition resulting from maintenance undertaken, in an offline database. This data is only periodically updated by Roads ACT into IAMS and there are no defined timeframes for the updating of it into IAMS. 7.27

The Operational Plan is an internal document that supports the broader *Roads ACT Strategic Asset Management Plan*. The plan provides a detailed description of how Roads ACT defines the level of service in relation to streetlights and the policies and issues for the maintenance of streetlights. However, the most recent version of the plan is dated 2013 and should have been reviewed in 2015 based on its own periodic review timeframes. 7.29

While Roads ACT has committed to transferring the complete management of streetlights to a service provider via a energy performance contact, an operational plan is still required that details how this contract will be managed and addresses areas such as key objectives/outcomes of the contract, how asset data will be maintained, staffing and resource requirements and processes for monitoring contract outcomes. This information is needed for Roads ACT to effectively manage it operations. 7.33

Monthly streetlight inspections have been undertaken. However, the service level for responding to public complaints has only been partially met. The service level for repairs within 10 days was met approximately 91 percent of the time whereas the repair of cable faults within 35 days was delayed approximately 33 percent of the time. 7.48

Unplanned maintenance is carried out in response to reported problems, outages or defects (e.g. repair vandalism, damage or luminaire outages). Data from IAMS and response time data from Access Canberra showed that in 2015-16 there were approximately 4 041 public enquiries made regarding streetlights of which 3 773 enquiries related to damaged or defective streetlights. 7.49

Roads ACT monitors the performance of ActewAGL through monthly reporting and invoicing provided to Roads ACT through the Northrop superintendent and the ActewAGL key performance indicator portal. The key performance indicator for quality was the percentage of system availability being more than 98 percent. For the 2014-15 financial year, the average service availability was 98.2 percent. 7.50

Recommendations

RECOMMENDATION 1 ROADS ACT'S BUSINESS PLAN

Roads ACT's *Roads and Infrastructure Business Plan* should specify Roads ACT's contribution to key ACT Government priorities, business objectives that link to the Transport Canberra and City Services Directorate's Corporate Plan and include relevant performance targets that relate directly to the performance of road infrastructure assets (such as accountability indicators and key service level targets).

RECOMMENDATION 2 ACCOUNTABILITY INDICATORS FOR ROADS AND PATHS MAINTENANCE

Roads ACT should develop accountability indicators with related targets for the percentage of distressed roads; distressed paths; percentage of road pavement that exceeds its optimal age; percentage of paths that exceeds their optimal age; and the timeliness of road maintenance activities.

RECOMMENDATION 3 RISK MANAGEMENT

Roads ACT should:

- a) undertake a detailed analysis of risk treatments before including specific actions (to reduce the risks relevant to the maintenance of infrastructure) in its Risk Register; and
- b) amend the Risk Management Framework to require information on risks to be reported to the Transport Canberra and City Services Division Head Executives, Executive team and nominated Risk Manager every six months.

RECOMMENDATION 4 REPORTING TO THE EXECUTIVE LEADERSHIP TEAM

Roads ACT should improve its reporting to the Executive Leadership Team by developing a report that includes information relating to Directorate priorities; human resource management; operations; financial management; progress reporting against planned levels of performance; and key risks relating to Roads ACT.

RECOMMENDATION 5 ENVIRONMENTAL MANAGEMENT PLANS

Roads ACT should:

- a) require environmental management plans be prepared for both contracted and in-house maintenance work; and
- b) include environmental management plans, in their maintenance contracts, which address the adverse environmental impacts of the work on community paths and specify how these impacts will be addressed.

RECOMMENDATION 6 OPERATIONAL PLANS

Roads ACT should:

- a) have up-to-date, comprehensive operational plans for all road infrastructure asset classes;
- b) develop an operational plan for road pavement;
- c) update its *Asset Management Operational Plan for Community Paths in the ACT* to include information on the staff, resources and estimated costs to maintain community paths and the environmental impacts of maintenance work; and
- d) develop a new operational plan for streetlights that reflects the new arrangements resulting from the Energy Performance Contract.

RECOMMENDATION 7 TIMELY DATA ON ASSET CONDITION

Roads ACT should:

- a) update the condition of all road infrastructure assets into IAMS (or its equivalent) within set timeframes;
- b) continue to work on a means of capturing asset condition reports directly from the field; and
- c) provide training and guidance to staff on the use of IAMS (or its equivalent).

RECOMMENDATION 8 CUSTOMER FEEDBACK

Roads ACT should develop a process for providing timely feedback to customers when work has been undertaken as a result of a customer query or complaint.

RECOMMENDATION 9 RECORDS MANAGEMENT

Roads ACT should:

- a) document its reasons as to why a road resurfacing project is deleted or rolled-over from one year to the next; and
- b) maintain contract management records on asphalt contracts to demonstrate achievement of the required quality of asphalt compaction.

RECOMMENDATION 10 REPORTING ON ROAD RESURFACING

Roads ACT should:

- a) improve the monthly productivity reports to include the unit cost for in-house asphalt work; and
- b) amend the annual key performance indicator report on road resurfacing (prepared for the Director of Roads ACT) to include the Program item number and the planned quantity against each road section.

RECOMMENDATION 11 ADDRESSING THE BACKLOG

Roads ACT should develop a long-term strategy for reducing the road maintenance backlog.

RECOMMENDATION 12 MAINTAINING COMMUNITY PATHS

Roads ACT should develop and implement a:

- a) renewal program for the timely repair of defects across the Territory; and
- b) planned program of inspections of the condition and safety of community paths that are not in high priority locations. The frequency of inspections should be sufficient to reliably determine whether maintenance of paths is needed.

RECOMMENDATION 13 HIGH PRIORITY OF LOCATIONS OF COMMUNITY PATHS

Roads ACT should review the list of high priority locations of community paths, and their priority rating, on a biennial basis and update the *Asset Management Operational Plan for Community Paths* and *Strategic Asset Management Plan* for the results of these reviews.

RECOMMENDATION 14 QUALITY CONTROL

Roads ACT should implement a system of verifying that concrete used by contractors to maintain community paths comply with ACT Government design standards.

RECOMMENDATION 15 COST OF MAINTAINING AND UPGRADING COMMUNITY PATHS

Assessments of the future costs of maintaining and upgrading community paths and the related funding requirements should be updated and included the Transport Canberra and City Services *Strategic Asset Management Plan*.

RECOMMENDATION 16 SERVICE LEVEL TARGETS

Roads ACT should maintain records of the timeliness of the replacement of paving or concrete in general and for shopping areas and monitor whether replacements are made within target timeframes.

RECOMMENDATION 17 TRAFFIC SIGNAL REPLACEMENT SCHEDULE

Roads ACT should develop a comprehensive traffic signal component replacement schedule.

RECOMMENDATION 18 CONTRACT MANAGEMENT FOR TRAFFIC SIGNAL MAINTENANCE

Roads ACT's contract management for traffic signal maintenance should:

- a) include a review of the monthly progress report;
- b) require that the number of critical or major traffic signal faults be reported by the contractor on a monthly basis; and
- c) undertake an annual reconciliation to ensure all planned maintenance has been completed.

RECOMMENDATION 19 MONITORING TRAFFIC SIGNAL MAINTENANCE PERFORMANCE

Roads ACT should, on a monthly basis, monitor maintenance undertaken against the agreed preventative maintenance program and service level targets for traffic signal maintenance.

RECOMMENDATION 20 IMPROVING TRAFFIC SIGNAL PERFORMANCE REPORTING

Roads ACT should require the contractor responsible for traffic signal maintenance to report on the:

- a) number of major faults reported to be less than one per traffic signal per year in the monthly report; and
- b) elapsed time between being advised of the fault and the completion of the repair in the monthly report.

Agency response

In accordance with subsection 18(2) of the *Auditor-General Act 1996*, the Transport Canberra and City Services Directorate was provided with a:

- draft proposed report for comment. All comments were considered and required changes were reflected in the final proposed report; and
- final proposed report for further comments. As part of this process, the Directorate was offered the opportunity to provide a statement for inclusion in the Summary chapter.

Transport Canberra and City Services Directorate response:

Transport Canberra and City Services (TCCS) welcomes the performance audit on selected Road Infrastructure Assets and looks forward to implementing its recommendations. This audit was undertaken shortly after the formation of TCCS (1st July 2016) during the transition from Territory and Municipal Services. As such a number of documents available at that time which could be considered out-of-date have since been updated or are being updated as part of business as normal. Notwithstanding this, TCCS is committed to addressing the findings of the report and has already undertaken tangible steps to start implementing the proposed recommendations.

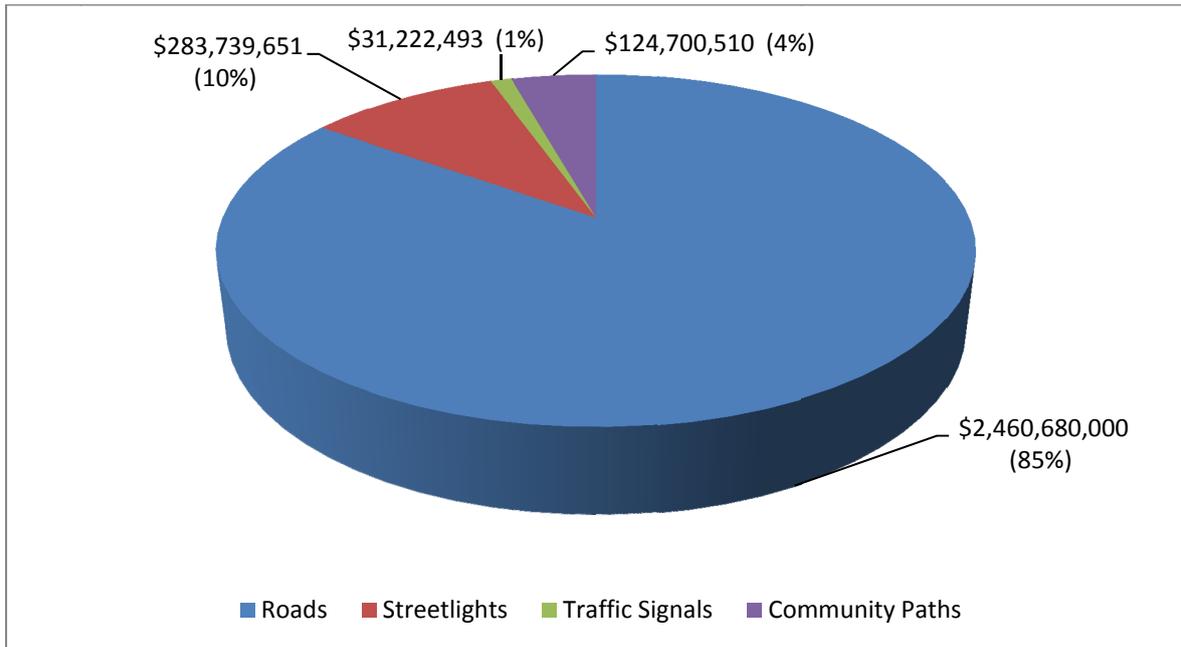
1 INTRODUCTION

- 1.1 This chapter provides background information on road infrastructure assets that are managed by Roads ACT, a division within the Transport Canberra and City Services Directorate. It also presents the audit objective, scope, criteria, approach and method.

Background

- 1.2 The Transport Canberra and City Services Directorate plays a key role in building and maintaining Canberra's social, cultural and economic capital and delivers a diverse range of services to the community. Its key priorities in relation to road infrastructure assets are to:
- progress capital works projects to maintain a safe and efficient road network;
 - improve heavy vehicle access to road network;
 - improve road safety; and
 - increase road maintenance, including landscaping at Majura Parkway and Pialligo Avenue.
- 1.3 Roads ACT, a business unit within the Transport Canberra and City Services Directorate, is responsible for planning, managing and maintaining the road infrastructure assets (road pavement, traffic signals, community paths (footpaths and cycle paths) and streetlights) that are the subject of this audit.
- 1.4 Road infrastructure assets (that are the subject of this performance audit) make up \$2.9 billion of the total \$29.92 billion in ACT Governments assets. Of these assets roads account for approximately \$2.4 billion (85 percent of road infrastructure assets), refer to Figure 1-1.

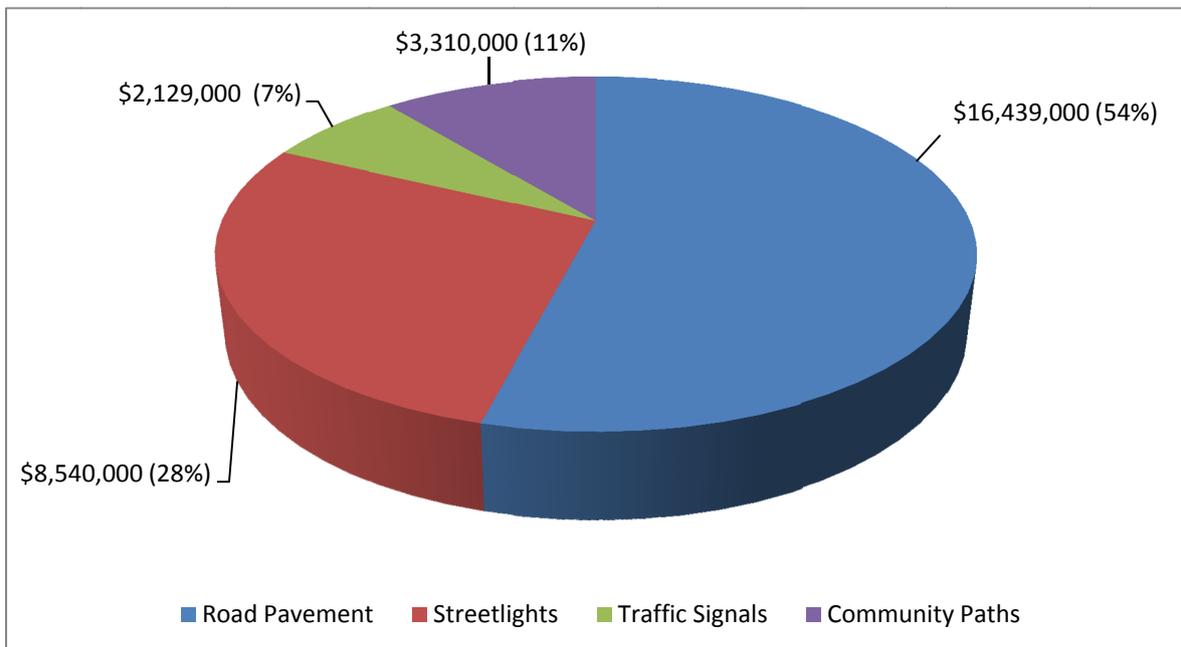
Figure 1-1 Road infrastructure net asset value for 2015-16



Source: 2015-16 TAMS Annual Report

1.5 In 2015-16 expenditure on the maintenance of these road infrastructure assets was approximately \$31 million. As shown in Figure 1-2 the majority of this spending related to road pavement (54 percent) and streetlights (28 percent).

Figure 1-2 Road infrastructure asset maintenance expenditure for 2015- 16



Source: Roads ACT 10-year activity summary

- 1.6 Roads ACT is responsible for managing and maintaining:
- 3 100 km of roads (equivalent to 6 700 lane kms);
 - 2 533 km of community paths in 106 suburbs, consisting of 2 190 km of footpaths and 343 km of off-road cycle paths;
 - approximately 79 000 streetlights; and
 - 316 traffic signals and 48 signalised pedestrian crossings.
- 1.7 A key challenge facing Roads ACT is maintaining the condition of road infrastructure assets to meet service levels as defined in their Strategic Asset Management Plan, given that many of these assets are ageing and for some, nearing the end of their useful lives.

Previous Audit Office reviews

- 1.8 The ACT Audit Office performance audit report *Road and Street light Maintenance* was tabled in 1997. It found, in part, that:
- inadequate maintenance funding may have reduced the useful life of ACT roads; past maintenance funding shortfalls had been estimated at between \$24m and \$36m;
 - action had been taken by increasing funding for programmed works;
 - contracting maintenance work to the private sector had been economically advantageous to the ACT Government and although the efficiency of the maintenance work performed by in house resources had significantly improved since 1992 further improvements to the in-house function would result in an estimated annual saving of \$300 000;
 - road accident data and road condition measures indicated that ACT road surfaces were of a safe standard; and
 - streetlight maintenance was not economical with potential savings from introducing competitive tendering estimated at \$400 000 annually.

Previous internal audit reviews

- 1.9 Two internal audits, relating to road infrastructure assets, were conducted by Territory and Municipal Services in the period 2012-16. These are outlined below, however they were not reviewed as part of this audit:
- Asset Management and Planning dated 2012; and
 - IAMS Data Quality and Integrity dated 2013.

Audit objective and scope

- 1.10 The objective of this audit is to provide an independent opinion to the Legislative Assembly on the effectiveness of Roads ACT maintenance of road infrastructure assets.
- 1.11 Road infrastructure assets include road pavements, streetlights, traffic signals, community paths (pathways and cycle lanes). Maintenance can include planned¹ and unplanned² works.
- 1.12 This audit did not consider maintenance of bridges, stormwater infrastructure or government owned car parks; the effect of road asset maintenance on road safety; procurement processes or arrangements for contracted maintenance delivery; processes for asset acquisition; causes of deteriorating asset condition or the initial causes of deterioration such as environmental factors.

Audit criteria, approach and method

- 1.13 This audit examined the maintenance of road infrastructure assets through considering the following criteria:
- Is the planning approach adopted by Roads ACT in regard to road infrastructure asset maintenance sound?
 - Has Roads ACT adequately implemented its road infrastructure maintenance program?
 - Has Roads ACT evaluated its road infrastructure asset maintenance program?
- 1.14 The audit adopted the Office's Performance Audit Methods and Practices (PAMPr) and related policies, practice statements and guidance papers. These policies and practices have been designed to comply with the requirements of the *Auditor-General Act 1996* and relevant professional standards (including *ASAE 3500 – Performance Engagements*).
- 1.15 The audit team complied with relevant ethical requirements and drew conclusions on the audit objective through the following approach and method:
- interviewing staff within Roads ACT who are responsible for;
 - strategic road infrastructure asset planning, managing the maintenance of road infrastructure assets, and staff responsible for delivering the maintenance program;
 - managing contracts in relation to road asset infrastructure maintenance;
 - ensuring that the environmental impacts of road maintenance are managed;

¹ Planned maintenance is maintenance work that has been identified to occur based on a needs assessment.

² Unplanned maintenance is reactive and is maintenance work that has been identified through defect reporting.

- keeping ACT citizens informed about maintenance activities and collecting feedback on performance;
 - reviewing plans, policies and procedures relating to the maintenance of road infrastructure assets; and
 - analysing Roads ACT data including that on performance targets relating to the condition of road pavements and community paths.
- 1.16 The Audit Office engaged a private firm, O'Connor Marsden and Associates, to undertake the audit. This firm provided a subject matter expert, Mr Roy Abeygoonawardana to provide opinion on the planning and implementation of road infrastructure assets, particularly in regards to roads. Mr Abeygoonawardana is a former civil engineer with extensive experience in road construction and maintenance, as well as 13 years' experience in the engineering assurance section of NSW Roads and Maritime Services.
- 1.17 Mr Abeygoonawardana has specialist experience and skills in asset management and maintenance, road network and route analysis and engineering auditing. Mr Abeygoonawardana has significant experience with major road construction and road rehabilitation projects in Australia and has worked on various projects throughout Australia and abroad, including: Solomon Islands, Papua New Guinea, Sri Lanka, and Nigeria.

2 GOVERNANCE

- 2.1 This chapter examines the governance arrangements implemented by the Transport Canberra and City Services Directorate from 1 July 2016 and the former Territory and Municipal Services Directorate before 1 July 2016.
- 2.2 On 1 July 2016 the Territory and Municipal Services Directorate merged with the Capital Metro Agency to form the new Transport Canberra and City Services Directorate. As a result, the Transport Canberra and City Services Directorate became responsible for road infrastructure, including the maintenance of roads and community paths. Prior to 1 July 2016, these responsibilities resided with the Territory and Municipal Services Directorate.

Summary

Conclusions

Overall sound governance arrangements are in place to support road infrastructure asset maintenance activities. However, these could be improved by strengthening risk management practices and performance reporting. While there are effective risk identification practices in place to identify key risks, the appropriateness of some of the mitigation strategies outlined in Roads ACT's Risk Register need to be reassessed.

Roads ACT's Business Plan can be improved by incorporating the operational delivery targets that Roads ACT works towards for each asset class. The accountability indicators relating to road maintenance are appropriate. However, public reporting on maintenance could be improved by including additional indicators on the condition of road infrastructure assets. Additional accountability indicators relating to paths maintenance also need to be developed and publically reported.

Key findings

	Paragraph
The 2015-16 draft <i>Roads and Infrastructure Business Plan</i> complied with some key requirements of the Transport Canberra and City Services Directorate's <i>Strategic Planning and Reporting Framework</i> . However, it did not identify Roads ACT's contribution to key ACT Government priorities, business objectives that were linked to the Transport Canberra and City Services Directorate's Corporate Plan or performance targets that would assist in managing its budget.	2.25
Roads ACT's reporting on its accountability indicators shows that a high percentage of territorial roads are in good condition and customer survey results, for the most part, show high levels of satisfaction with the public road network (noting that this	2.29

is likely to include reasons other than maintenance).

During 2011-12 to 2015-16 the reported average percentage of road resurfaced was 3.6 percent for territorial roads and 2.4 percent for municipal roads, significantly below (by 28 percent and 40 percent respectively) their respective targets of five percent and four percent. 2.32

The four accountability indicators for the maintenance of road infrastructure (percentage of territorial roads in good condition, percentage of customers satisfied with the public road network, annual percentage of territorial roads resurfaced and annual percentage of municipal roads resurfaced) provide an indication of whether road surfaces are being maintained and are therefore relevant to assessing whether the ACT Government's goal of having 'well-maintained infrastructure' as set out in *The Canberra Plan* is being achieved. 2.35

While the accountability indicators and targets for the maintenance of roads are relevant they can be improved by including indicators on the percentage of distressed roads; percentage of road pavement that exceeds its optimal age and the timeliness of road maintenance activities. 2.38

There are no accountability indicators which provide information on whether the ACT Government's goal of having 'well-maintained infrastructure' has been achieved in relation to community paths. The two accountability indicators for community paths (*annual increased length of community paths (km)* and *customer satisfaction with access to cycle and walking paths*) do not provide information on the condition of community paths or the progress of maintenance work on these paths. 2.39

Roads ACT's Risk Register conforms to the key principles of the Australian New Zealand Risk Management Standard ISO31000:2009. The risks, the impact of these risks, responsibility for managing the risks, controls in place to address these risks and actions to be taken to address these risk, and officers responsible for monitoring and reviewing these risks are recorded in Roads ACT's Risk Register. 2.43

While Roads ACT's Risk Register conforms to the key principles of the Australian New Zealand Risk Management Standard ISO31000:2009, it can be improved by more detailed analysis on treatment of risks before including specific actions to reduce the risks relevant to the maintenance of infrastructure to an acceptable level. 2.49

Roads ACT advised that neither business unit risks, divisional risks (Roads ACT) or directorate risks were reported to the Executive Director, Infrastructure, Planning and Operations, Risk Management Committee or Executive Leadership Team every 2.51

six months as required by the Risk Management Framework.

The monthly Stewardship Report provided to the Executive Leadership Team of the Transport Canberra and City Services Directorate contains a significant amount of information on Roads ACT's management of feedback and complaints, business continuity review and test results, financial performance against budget and debtors (where relevant). However, the report does not clearly show the extent to which planned performance is being achieved against the accountability indicators relevant to Roads ACT or performance measures in the Roads ACT Business Plan. Furthermore, the Stewardship Report does not address the key risks specifically relating to Roads ACT. The inclusion of such information would provide the Executive Leadership Team with more comprehensive information. 2.65

The Finance Report provides financial information at a Divisional level to sufficiently allow the City Services Directorate and Roads ACT to adequately manage their maintenance budget. 2.71

Roads ACT contracts reviewed as part of this audit included appropriate requirements (as considered by the Subject Matter Expert) that support effective contract management practices for roads (reseal and asphalt overlay), community paths, streetlights and traffic signals such as: quality and compliance requirements; project plans and programs of work; performance and reporting requirements; payment and invoicing arrangements. However, some were inadequate with respect to environmental requirements. 2.75

Governance

2.3 The Australian National Audit Office's (ANAO's) Better Practice Guide *Strengthening Performance through Good Governance* (June 2014) states that governance arrangements and practices:

... are designed and operate to provide visibility of results, to the entity's leadership, the government, the Parliament and the community and conform with applicable legislative and policy requirements as well as public expectations of openness, transparency and integrity.

2.4 The ANAO's Better Practice Guide *Successful Implementation of Policy Initiatives* (October 2014) defines governance as:

... the arrangements and practices which enable an entity to set its direction and manage its operations in order to discharge its accountability obligations and assist in the achievement of expected outcomes. Governance encompasses many facets, including leadership, policies, relationships and control and accountability measures.

Roles and responsibilities

- 2.5 The Minister for Transport and City Services has Executive responsibility for road infrastructure. Responsibility for the day-to-day public administration of road infrastructure resides with the Director-General, Transport Canberra and City Services Directorate. Before 1 July 2016, this responsibility resided with the Director-General, the Territory and Municipal Services Directorate.
- 2.6 The Director-General, Transport Canberra and City Services Directorate, is supported by the Deputy Director-General (City Services). City Services' operations include the Roads ACT business unit. Roads ACT's responsibilities include (but are not limited to) the construction and maintenance of road infrastructure assets.
- 2.7 Within Transport Canberra and City Services Directorate, Roads ACT reports to the Deputy Director-General, City Services who is a member of the Executive Leadership Team. The Executive Leadership Team sets the strategic direction for the Transport Canberra and City Services Directorate and is a key decision-making group in this directorate. It includes the Director-General, Deputy Director-General (City Services) and Deputy Director-General (Transport Canberra).
- 2.8 The Executive Leadership Team is supported by several senior management committees. These committees and their roles are shown in Table 2-1 to provide contextual information. The operation of these committees was not considered as part of the audit.

Table 2-1 Role of Transport Canberra and City Services Directorate's senior management committees

Committee	Role of the committee
Audit Committee	Oversees governance, risk and internal control environment.
Finance Committee	Provides a strategic coordination role in financial decisions and facilitate Executive Leadership Team decisions and recommendations.
Capital Works Committee	Oversees the capital works program budget and project management.
Information and Communications Technology Committee	Advises the Executive Leadership Team on information and communication technology strategy and policy.
Strategic asset management Committee	Advises the Executive Leadership Team on asset management and policy.
Workplace Health and Safety Steering Committee	Provides leadership and direction in the management of workplace health and safety across TCCS.
Transport Canberra and City Services Consultative Committee	Provides a forum for consultation between Transport Canberra and City Services and unions.
Risk Management Committee	Oversees the risk management processes within Transport Canberra and City Services and reports to the Executive Leadership Team and Audit Committee on key risks.

Source: ACT Audit Office compiled the information in this figure using information from the TAMS 2016 Annual Report

Strategic and corporate planning

- 2.9 *The Canberra Plan - Towards our Second Century* (The Canberra Plan) outlines the ACT Government's goals and vision.
- 2.10 During the annual budget process, ACT Government agencies, in consultation with Ministers, set out what they plan to achieve in the coming financial year to contribute to achieving ACT Government priorities and the longer term vision for the Territory.
- 2.11 This process includes each agency setting performance measures (strategic indicators and accountability indicators) and related targets that are publicly reported annually in its statement of performance included in its annual report. Accountability indicators and related targets which show planned levels of performance are included in the annual budget of each ACT Government directorate. The subsequent reporting of actual results against planned levels of performance in the statement of performance and inclusion of this information in the directorate's annual report is an important means of facilitating accountability for, and monitoring of, performance.
- 2.12 These performance measures are often complemented by internal performance measures which are used by the agency to monitor its performance.
- 2.13 The Canberra Plan has seven themes that reflect the ACT Government's priorities. These are:
- quality health care;
 - a fair and safe community;
 - excellent education, quality teaching;
 - skills development a strong, dynamic economy;
 - a vibrant city and great neighbourhoods;
 - a sustainable future; and
 - high-quality services.
- 2.14 Under the theme of 'a vibrant city and great neighbourhoods', the Canberra Plan states that:
- The ACT Government will concentrate on improving municipal services with additional resources from the Strategic Infrastructure Investment Program. The focus will be on improving facilities and maintenance of roads and supporting infrastructure around Civic and town centres, and on long-term planning and provisioning for maintenance. Funding has been provided for ... major pavement improvements.
- Well-maintained infrastructure is crucial to support a strong and dynamic economy. The ACT Government has developed asset management plans that consider life-cycle costs which assists in determining the necessary investments in assets such as roads, bridges and stormwater infrastructure.

2.15 Strategic and corporate planning documents are produced by Transport Canberra and City Services including:

- *Transport Canberra and City Services Corporate Plan;*
- *Transport Canberra and City Services Strategic Asset Management Framework;*
- *Roads ACT Strategic Asset Management Plan;* and
- *Roads ACT Business Plan.*

Corporate Plan

2.16 The Transport Canberra and City Services' *Strategic Planning and Reporting Framework* states that:

Each year the TAMS [now Transport Canberra and City Services] Executive Leadership Team (ELT) reviews the Corporate Plan to ensure it continues to provide the broader strategic direction for the Directorate. As part of the review of the TAMS Corporate Plan ELT considers:

- the current and projected financial position of TAMS;
- the organisational structure and workforce capability requirements;
- the vision, mission and goals of TAMS;
- how the ACT Public Service (ACTPS) values are being reflected in TAMS; and
- the government's key priorities, division priorities and across Directorate focus areas for the next financial year.

2.17 The Transport Canberra and City Services *2016-17 Corporate Plan* was in draft at the time of the audit. The TAMS *2015-16 Corporate Plan* (the Corporate Plan) was therefore reviewed and found to have addressed the areas required by the Transport Canberra and City Services *Strategic Planning and Reporting Framework*.

Road ACT's business plan

Compliance with the Transport Canberra and City Services Directorate's *Strategic Planning and Reporting Framework*

2.18 Under the Transport Canberra and City Services *Strategic Planning and Reporting Framework*, Roads ACT is required to undertake a business planning process each financial year to identify its 'key deliverables'. It does this by developing a Business Plan which is referred to as the *Roads and Infrastructure Business Plan*.

2.19 The Transport Canberra and City Services Directorate's *Strategic Planning and Reporting Framework* guides the development of business plans. Under this framework, all business plans are to include:

- key business risks and opportunities for the upcoming year;
- key objectives of the business unit, aligned to the goals reflected in the *Transport Canberra and City Services Corporate Plan*;

- key ACT Government and division priorities where applicable;
 - key initiatives that focus primarily on service provision;
 - relevant risk controls and business continuity arrangements;
 - people management strategies needed to achieve business objectives;
 - strategies to meet workplace health and safety responsibilities;
 - key performance measures, including relevant strategic and accountability indicators where applicable, that demonstrate overall business unit performance; and
 - performance targets for each measure that ensure the business unit does not exceed its approved budget.
- 2.20 Roads ACT operated without an approved business plan in 2015-16 (12 months), as its 2015-16 *Roads and Infrastructure Business Plan* was not approved for use by the Deputy Director-General of City Services until 1 July 2016.
- 2.21 While Roads ACT operated without an approved business plan in 2015-16, its draft 2015-16 *Roads and Infrastructure Business Plan* was reviewed by Roads ACT in December 2015 and progress against its performance targets was monitored.
- 2.22 The Roads ACT draft 2015-16 *Roads and Infrastructure Business Plan* complied with some of the requirements of the Strategic Planning and Reporting Framework that are listed in paragraph 2.19. Specifically, the Business Plan:
- linked to the Directorate’s risk register and business continuity plan;
 - contained key initiatives that focused primarily on the provision and improvement of services;
 - included people management strategies needed to achieve business objectives; and
 - clearly identified strategies to meet workplace health and safety responsibilities.
- 2.23 However, the Roads ACT draft 2015-16 *Roads and Infrastructure Business Plan* did not comply with other requirements of the Transport Canberra and City Services Directorate’s *Strategic Planning and Reporting Framework*. The Business Plan did not:
- include objectives that were clearly linked to the goals in the *Transport Canberra and City Services Corporate Plan*;
 - identify key ACT Government priorities and how Roads ACT planned to contribute to achieving these; or
 - include performance targets that ensured that Roads ACT did not exceed its approved budget.

- 2.24 Furthermore, while performance measures were included in Roads ACT's draft 2015-16 Business Plan, these were not sufficient to 'demonstrate overall business performance' as required by the Transport Canberra and City Services Directorate's *Strategic Planning and Reporting Framework*. The inclusion of accountability indicators and key service level targets relating to roads infrastructure would better meet this requirement.
- 2.25 The 2015-16 draft *Roads and Infrastructure Business Plan* complied with some key requirements of the Transport Canberra and City Services Directorate's *Strategic Planning and Reporting Framework*. However, it did not identify Roads ACT's contribution to key ACT Government priorities, business objectives that were linked to the Transport Canberra and City Services Directorate's Corporate Plan or performance targets that would assist in managing its budget.

RECOMMENDATION 1 ROADS ACT'S BUSINESS PLAN

Roads ACT's *Roads and Infrastructure Business Plan* should specify Roads ACT's contribution to key ACT Government priorities, business objectives that link to the Transport Canberra and City Services Directorate's Corporate Plan and include relevant performance targets that relate directly to the performance of road infrastructure assets (such as accountability indicators and key service level targets).

Performance measures

- 2.26 As mentioned at paragraph 2.4, governance includes 'accountability measures' (performance measures) and these help to improve the visibility of results and meet public expectations of openness and transparency. Consistent with this, as explained at paragraph 2.9, The Canberra Plan outlines the ACT Government's goals and vision which are supported by plans of ACT Government agencies and involve the setting of performance measures (strategic indicators and accountability indicators) and related targets.
- 2.27 The following sections consider the accountability indicators for the maintenance of road and community paths.

Publicly reported performance on the maintenance of roads

- 2.28 Table 2-2 shows the four accountability indicators relating to maintenance of road infrastructure (excluding bridges). Territory and Municipal Services Directorate's performance in relation to these indicators was publicly reported in statements of performance included in its annual reports from 2011-12 to 2015-16.

Table 2-2 Accountability indicators on the maintenance of roads

No	Accountability indicator	Target	2011-12	2012-13	2013-14	2014-15	2015-16	5-year average
1	Percentage of territorial roads in good condition (Note 1)	>86%	88%	89%	89%	89%	90%	89%
2	Percentage of customers satisfied with the public road network	>70%	85%	64%	61%	90%	85%	77%
3	Annual percentage of territorial roads resurfaced	5%	3%	4%	3%	3%	5%	3.6%
4	Annual percentage of municipal roads resurfaced (Note 2)	4%	2%	2%	2%	2%	4%	2.4%

Source: ACT Budget Papers and statements of performance for the Territory and Municipal Services Directorate.

Note 1: Territorial roads are high traffic arterial roads

Note 2: Municipal roads collector and local access roads managed and operated by the Transport Canberra and City Services Directorate

2.29 Roads ACT's reporting on its accountability indicators shows that a high percentage of territorial roads are in good condition and customer survey results, for the most part, show high levels of satisfaction with the public road network (noting that this is likely to include reasons other than maintenance).

2.30 The performance target of having more than 86 percent of roads in good condition was reported as being consistently achieved from 2011-12 to 2015-16 with the average percentage over that time being 89 percent. Furthermore, the percentage of customers satisfied with the public road network (which has a target of 70 percent) was reported as being achieved during most years between 2011-12 to 2015-16, with an average satisfaction rate over that time of 77 percent.

2.31 Although a high proportion of territorial roads were reported as being in good condition, apart from 2015-16 where road resurfacing performance targets were met due to additional funding from the Roads to Recovery Program, road resurfacing performance has been reported as being significantly less than target levels of performance from 2011-12 to 2015-16.

2.32 During 2011-12 to 2015-16 the reported average percentage of road resurfaced was 3.6 percent for territorial roads and 2.4 percent for municipal roads, significantly below (by 28 percent and 40 percent respectively) their respective targets of five percent and four percent.

Relevance of accountability indicators for the maintenance of road infrastructure

2.33 As previously noted in paragraph 2.14, under the theme of ‘a vibrant city and great neighbourhoods’, the Canberra Plan states that:

Well-maintained infrastructure is crucial to support a strong and dynamic economy. The ACT Government has developed asset management plans that consider life-cycle costs which assists in determining the necessary investments in assets such as roads, bridges and stormwater infrastructure.

2.34 The four accountability indicators for the maintenance of road infrastructure are shown in Table 2-2.

2.35 The four accountability indicators for the maintenance of road infrastructure (percentage of territorial roads in good condition, percentage of customers satisfied with the public road network, annual percentage of territorial roads resurfaced and annual percentage of municipal roads resurfaced) provide an indication of whether road surfaces are being maintained and are therefore relevant to assessing whether the ACT Government’s goal of having ‘well-maintained infrastructure’ as set out in *The Canberra Plan* is being achieved.

2.36 Furthermore, the reporting on ‘the percentage of roads in good condition’ was consistent with reporting in other Australian jurisdictions and the target percentages for road resurfacing was based on the estimated useful life of road pavement.

2.37 However, the audit also determined that performance monitoring could be improved by the inclusion of the following indicators (noted in other Australian jurisdictions):

- Percentage of distressed roads: This would provide information on whether there is a backlog of maintenance that needs to be performed. Information on the condition of roads could be provided using information recorded in IAMS (cracking, roughness, skid data, rut depth, texture depth and deflection);
- Percentage of road pavement that exceeds its optimal age: Information on age of road pavement would provide information on the age and condition of the road network; and
- Timeliness of road maintenance activities – Roads ACT has specified levels of service for road maintenance, including the timeliness of these activities. Further information on these services is provided at paragraph 4.71. Information on the extent to which the maintenance program is completed within targeted timeframes would assist in identifying areas where the timeliness of maintenance needs improvement.

2.38 While the accountability indicators and targets for the maintenance of roads are relevant they can be improved by including indicators on the percentage of distressed roads; percentage of road pavement that exceeds its optimal age and the timeliness of road maintenance activities.

Publicly reported performance on the maintenance of community paths

- 2.39 There are no accountability indicators which provide information on whether the ACT Government's goal of having 'well-maintained infrastructure' has been achieved in relation to community paths. The two accountability indicators for community paths (*annual increased length of community paths (km)* and *customer satisfaction with access to cycle and walking paths*) do not provide information on the condition of community paths or the progress of maintenance work on these paths.
- 2.40 The inclusion of accountability indicators which provide information on the condition of community paths, similar to those which are being used and have been recommended for roads (Recommendation 2), would improve reporting on the condition of community paths and the progress of maintenance work on these paths.
- 2.41 These accountability indicators could, for example, include reporting on the percentage of community paths in good condition, percentage of customers satisfied with community paths, percentage of community paths resurfaced (as is done for roads maintenance) along with reporting of percentage of distressed community paths, percentage of community paths that exceed their optimal age and the timeliness of community path maintenance.

RECOMMENDATION 2 ACCOUNTABILITY INDICATORS FOR ROADS AND PATHS MAINTENANCE

Roads ACT should develop accountability indicators with related targets for the percentage of distressed roads; distressed paths; percentage of road pavement that exceeds its optimal age; percentage of paths that exceeds their optimal age; and the timeliness of road maintenance activities.

Risk management

- 2.42 The Australian New Zealand Risk Management Standard ISO31000:2009 provides principles, guidelines and a framework and process for managing risk. It can be used by any organisation regardless of its size, activity or sector.

Management of risks

- 2.43 Roads ACT's Risk Register conforms to the key principles of the Australian New Zealand Risk Management Standard ISO31000:2009. The risks, the impact of these risks, responsibility for managing the risks, controls in place to address these risks and actions to be taken to address these risk, and officers responsible for monitoring and reviewing these risks are recorded in Roads ACT's Risk Register.

- 2.44 Roads ACT's Risk Register (June 2016) identifies twenty risks consisting of one 'extreme' risk, eight 'high' risks and eleven 'medium' risks across various risk categories covering strategic, operational, people and business process and systems risks. The one 'extreme' risk is *death or permanent injury as a result of a workplace incident*.
- 2.45 Four risks that are relevant to the maintenance of infrastructure are documented in Roads ACT's Risk Register. These are:
- an inability to maintain infrastructure at a sustainable level;
 - insufficient funding to manage assets resulting in asset deterioration;
 - the failure of the Integrated Asset Management System (IAMS) and general information systems; and
 - insufficient funding to provide core services.
- 2.46 For each risk, the Risk Register shows the risk controls, actions to be taken to reduce the risk and whether these controls reduce the risk are adequate or whether further action is needed.
- 2.47 For example, to reduce the risk of *insufficient funding to manage assets resulting in asset deterioration*, the actions to be taken are:
- examining mitigation strategies such as reduced levels of service in Roads Maintenance;
 - funding strategy, better use of funding options;
 - all current assets to be inspected and condition recorded for benchmarking purposes;
 - investigate other State and Territory Road Maintenance programs; and
 - discuss discretionary and non-discretionary fees and charges.
- 2.48 Whilst these actions are valid, further detail on treatment strategy, implementation and cost benefit analysis is required before the controls are formally adopted in the Risk Register as moving from "Has room for improvement" to "Adequate". Assessing the control effectiveness risk as adequate without properly considering all elements of risk mitigation presents a risk that Roads ACT's ability to effectively treat a risk may be insufficient.
- 2.49 While Roads ACT's Risk Register conforms to the key principles of the Australian New Zealand Risk Management Standard ISO31000:2009, it can be improved by more detailed analysis on treatment of risks before including specific actions to reduce the risks relevant to the maintenance of infrastructure to an acceptable level.

RECOMMENDATION 3 RISK MANAGEMENT

Roads ACT should:

- a) undertake a detailed analysis of risk treatments before including specific actions (to reduce the risks relevant to the maintenance of infrastructure) in its Risk Register; and

2.50 Table 2-3 shows the risk reporting arrangements detailed in the *TAMS Risk Management Framework*.

Table 2-3 Risk reporting arrangements

Risk	Reports to	Frequency	Reporting Requirements
Business unit risks	Executive Director, Infrastructure, Planning and Operations	Six-monthly	Business units will report identified business unit risks to their Divisional risk management group. Project Managers will report identified project risks and any identified risk owner to the project steering committee or the sponsoring manager/executive.
Divisional risks (Roads ACT)	Risk Management Committee	Six-monthly	Divisions will report identified divisional risks to the Director-General via the Risk Management Committee. Project Managers will report identified project risks and any identified risk owner to the Project Steering Committee or sponsor manager/executive
Directorate risks (TCCS)	Executive Leadership Team	Six-monthly	The Risk Management Committee Chair will report identified risks to the Executive Leadership Team. Project Managers will report identified project risks and any identified risk owner to the project steering committee or the sponsoring manager/executive.

Source: *TAMS 2013 Risk Management Framework*

2.51 Roads ACT advised that neither business unit risks, divisional risks (Roads ACT) or directorate risks were reported to the Executive Director, Infrastructure, Planning and Operations, Risk Management Committee or Executive Leadership Team every six months as required by the Risk Management Framework.

2.52 In May 2017 Roads ACT advised that a new Risk Management Framework had been adopted by the business unit in December 2016. This new framework requires that

identified risks should be reported to the Division Head Executives, Executive Team or nominated Risk Manager. However, no timeframes for the reporting of risk have been articulated.

- 2.53 The Australian National Audit Office's (ANAO's) Better Practice Guide *Strengthening Performance through Good Governance* (June 2014) states:

For risk management to be effective, there should be an emphasis on ongoing actions and outcomes. Risk management is not just a paper-based exercise that occurs once a year; rather, it needs to be actively implemented, monitored and adjusted if required. This is because experience shows that changes to the severity of risks and the emergence of significant new risks are not always well managed by public sector entities.

- 2.54 Not including timeframes for the regular reporting of risk does not allow for the identified risks to be actively monitored and adjusted if required.

RECOMMENDATION 3 RISK MANAGEMENT

Roads ACT should:

- b) amend the Risk Management Framework to require information on risks to be reported to the Transport Canberra and City Services Division Head Executives, Executive team and nominated Risk Manager every six months.

Budget funding and financial management

- 2.55 The Transport Canberra and City Services Directorate's budget is settled during the annual budget process. During each budget cycle, Transport Canberra and City Services Directorate's business units, including Roads ACT, provide details of their budget requirements to the Executive Leadership Team.
- 2.56 In settling the annual budget requirements for Roads ACT, consideration is given to the previous year's budget, inflation and new initiatives.
- 2.57 Under the Commonwealth Government's Roads to Recovery Program funds are provided to improve road infrastructure. In 2014-15, Roads ACT successfully bid for funds from the Australian Government's Roads to Recovery Program and received \$7.1 million in 2015-16 and \$6.2 million for 2016-17 for the maintenance of roads, community paths and traffic signals.
- 2.58 Table 2-4 shows the maintenance budget from 2013-14 to 2015-16 (excluding Australian Government funding from the Roads to Recovery Program) for road pavement, community paths, streetlights and traffic signals.

Table 2-4 Maintenance expenses budget from 2013-14 to 2015-16 excluding the Australian Government's Roads to Recovery funding

2013-14		2014-15		2015-16	
Budget (\$)	Actual (\$)	Budget (\$)	Actual (\$)	Budget (\$)	Actual (\$)
26 467 000	26 433 000	30 457 000	31 951 000	31 917 000	31 076 000

Source: Roads ACT – 10-Year Activity Summary.

- 2.59 Further information on the maintenance expenses budget and actual expenses for the infrastructure assets considered in this audit is provided at paragraph 4.53 (road pavement), paragraph 5.52 (community paths), paragraph 6.41 (traffic signals) and paragraph 7.42 (streetlights).
- 2.60 The Executive Leadership Team has overall responsibility for the financial management of the Directorate. The Director, Roads ACT is responsible for the management of budgets for Roads ACT. The Finance Committee provides a strategic coordination role in Executive Leadership Team finance decisions and recommendations.
- 2.61 The Director, Roads ACT uses a monthly finance report prepared by the Transport Canberra and City Services Directorate's Finance section to monitor expenses against the allocated budget. The report includes Roads ACT's:
- expenses and revenue and budgeted expenses and revenue;
 - revenue and expenses for each section in Roads ACT; and
 - spending on employees, consultants and contractors, electricity, telecommunications, training and repairs and maintenance of roads, community paths and streetlights.
- 2.62 The Transport Canberra and City Services Directorate's Executive Leadership Team uses the monthly Stewardship Report (discussed from paragraph 2.63) and the Transport Canberra and City Services Directorate's Finance Committee uses the monthly Finance Report (discussed from paragraph 2.68) to monitor the operations of the directorate, including Roads ACT.

Stewardship Reports provided to the Executive Leadership Team

- 2.63 The monthly Stewardship Report provided to the Executive Leadership Team covers the four divisions of the Transport Canberra and City Services Directorate. Information relating to Roads ACT is provided as part of the reporting on the Infrastructure, Roads and Public Transport Division.
- 2.64 The Stewardship Report covers:
- *Directorate priorities* such as election commitments, strategic and divisional priorities and significant issues;
 - *Governance*, including risk, media and communications, legislative compliance, management of complaints and business continuity management;

- *Human Resource Management*, including staffing profiles and workers' compensation;
- *Operations*, including asset acceptance and capital works program; and
- *Financial management*, including budget performance and emerging issues (for example, cost pressures).

2.65 The monthly Stewardship Report provided to the Executive Leadership Team of the Transport Canberra and City Services Directorate contains a significant amount of information on Roads ACT's management of feedback and complaints, business continuity review and test results, financial performance against budget and debtors (where relevant). However, the report does not clearly show the extent to which planned performance is being achieved against the accountability indicators relevant to Roads ACT or performance measures in the Roads ACT Business Plan. Furthermore, the Stewardship Report does not address the key risks specifically relating to Roads ACT. The inclusion of such information would provide the Executive Leadership Team with more comprehensive information.

2.66 For example:

- Roads ACT's Business Plan has a target of 75 percent of its staff attending a 'manual handling awareness program' and for 200 staff training days to occur in 2015-16. However, there was no reporting via the Stewardship Report on progress made by Roads ACT against these targets even though *serious injury to a person* and *inability to provide and sustain a skilled and capable workforce* are described in the Stewardship Report as *high* and *medium* risks respectively ; and
- a failure to understand community expectations is described in the Stewardship Report as a high risk, yet commentary in the Stewardship Report is limited to *management of feedback and complaints* and *telephone calls logged*. There is no reporting on whether any community engagement action has occurred.

2.67 In May 2017 Roads ACT informed the Audit Office that, since the transfer of the business unit from the Territory and Municipal Services Directorate to the Transport Canberra and City Services Directorate the Stewardship Report was no longer in use. However, Transport Canberra and City Services were currently considering the development and implementation of a similar document but this had not yet occurred.

RECOMMENDATION 4 REPORTING TO THE EXECUTIVE LEADERSHIP TEAM

Roads ACT should improve its reporting to the Executive Leadership Team by developing a report that includes information relating to Directorate priorities; human resource management; operations; financial management; progress reporting against planned levels of performance; and key risks relating to Roads ACT.

Finance Report provided to the Finance Committee

- 2.68 A Finance Report covering all four divisions within Transport Canberra and City Services is tabled at the monthly Finance Committee meeting. It contains budget updates, year-to-date financial results and key financial matters for monitoring.
- 2.69 The Finance Report includes summarised information which highlights major issues for consideration by the Finance Committee. For example, 'keynote issues' for all business units and the Directorate's year-to-date performance is summarised in the report. This information is followed by the 'financial watch list' which outlines project changes which are expected to have a significant impact on cash projections for TCCS.
- 2.70 The Finance Report largely focuses on actual expenditure against budgets and includes explanations for variances from budget. It also contains information on staffing and related costs, emerging budgetary issues, tracking of audit findings from financial statement audits and trading statements for each business unit.
- 2.71 The Finance Report provides financial information at a Divisional level to sufficiently allow the City Services Directorate and Roads ACT to adequately manage their maintenance budget.

Management of procurement

- 2.72 The Transport Canberra and City Services Directorate has a *Contract and Procurement Management Framework* that outlines:
- the procurement process including: planning, seeking offers, evaluation and selection, and purchasing;
 - procurement arrangements with Shared Services;
 - roles and responsibilities relating to the management of contracts; and
 - contract management practices.
- 2.73 The Transport Canberra and City Services Directorate, in conjunction with Shared Services ICT, has an electronic Contract Management System. It contains information on all the Transport Canberra and City Services Directorate contracts valued at greater than \$5 000.
- 2.74 The Transport Canberra and City Services Directorate also has a Contract and Procurement Management Framework that supports the ACT Government procurement guidelines in developing maintenance contracts. The Transport Canberra and City Services Directorate use the ACT Government Procurement and Capital Works Standard Conditions of Contract and Tender in developing contracts. In general, the procurement guidelines require agencies to pursue value for money when undertaking any procurement, with regard given to ethical behaviour, risk, effective competition and whole of life costs. Transport Canberra and City Services works in consultation with the ACT Government Procurement

Unit in preparing tenders and contracts which are then managed by the business units, such as Roads ACT.

- 2.75 Roads ACT contracts reviewed as part of this audit included appropriate requirements (as considered by the Subject Matter Expert) that support effective contract management practices for roads (reseal and asphalt overlay), community paths, streetlights and traffic signals such as: quality and compliance requirements; project plans and programs of work; performance and reporting requirements; payment and invoicing arrangements. However, some were inadequate with respect to environmental requirements.

3 STRATEGIC ASSET MAINTENANCE PLANNING

- 3.1 This chapter provides an overview on the Strategic Asset Maintenance Planning process and the extent to which key elements of the maintenance planning process are reflected in the Strategic Asset Management Plan that is produced every three years.

Summary

Conclusion

Roads ACT's Strategic Asset Framework and the 2013 Strategic Asset Management Plan align with the requirements of the ACT Government's Asset Management Guidelines. Priority needs to be given to updating the 2013 Strategic Asset Management Plan to ensure the ACT Roads completion target date of June 2017 is met.

The Strategic Asset Management Plan is supported by operational plans. Most of these are out-of-date and there is no such plan for road pavement. Operational procedures have relied on the corporate knowledge of long-term staff. This approach creates an unnecessary risk of procedures being undertaken inadequately should key staff resign.

The Integrated Asset Management System (IAMS) is not routinely updated with data for all asset types resulting in a reliance on the use of offline paper asset condition data. This needs to be addressed to maximise efficiencies from having IAMS.

Consideration of environmental issues associated with maintenance can be improved by Roads ACT maintenance contracts (or service standards for in-house staff) specifying environmental requirements. Without these there are inadequate environmental controls.

When a query or complaint is received from the community, Roads ACT need a formal process for providing feedback when work has been undertaken to address the issue.

Key findings

	Paragraph
The Strategic Planning and Development Section advised that the 2016-19 Strategic Asset Management Plan, due to be updated by December 2016, is currently behind schedule, with a final version now expected by June 2017. Until that time the 2013 Strategic Asset Management Plan remains operational.	3.4
Roads ACT appropriately considered the potential impacts from growth and demand changes on the ACT and in response have included in the Strategic Asset Management Plan proposed strategies (not all of which are direct asset solutions) such as increasing utilisation of existing assets and focussing community path	3.12

maintenance to known aged care establishments in response to an ageing population

Transport Canberra and City Services have identified service levels for roads and other road infrastructure asset classes relating to maintenance regimes and inspection frequency. The service levels reflect consideration given to asset sustainability, customer expectations, quality requirements and public safety. 3.18

Roads ACT advised that environmental conditions are monitored and reported through the Environment Manager (and team) within Roads ACT who responds to land management issues as required; contractor requirements such as environmental management plans and requirements for necessary approvals/licences. 3.25

Roads ACT has not developed a procedure for environmental management of road infrastructure assets that would support maintenance activities and outline environmental controls. On a day to day basis, Roads ACT needs to ensure that maintenance contracts (or service standards for in-house staff) include environmental requirements. Without these there are inadequate environmental controls. 3.29

Asset lifecycle management plans within Roads ACT are adequate and support maintenance planning to sustain existing assets. Lifecycle management occurs for each asset class including strategies (such as maintenance planning, assessment criteria and repair methods) and maintenance programmes developed that aim for the lowest lifecycle cost of an asset whilst maintaining required service levels. 3.35

A review of the three Operational Plans in existence highlighted that much of the content was historical, contextual information and included obsolete data. Whilst the operational plans did contain some practical information such as a Condition Assessment Index, the documents are not used as a day to day procedural guide for staff. 3.42

The lack of current comprehensive operational plans for each asset class presents a risk that Roads ACT are unable to ensure that existing assets are being managed and maintained efficiently and effectively and that they fully support the delivery of services. It also presents a risk that in the loss of long-term staff with corporate knowledge there will be limited, if any, current operational procedures known. 3.46

While the information held within IAMS is useful and mostly reliable, it is not routinely complete for all asset types. Roads ACT could reduce its reliance on the use of offline asset condition data if the practices of updating IAMS improved. For example, Roads ACT have not specified any required timeframes for field 3.59

maintenance staff to update asset condition after defects are addressed, resulting in frequent incomplete data.

There is no electronic link between the Access Canberra's Client Record Management (CRM) system and Roads ACT systems. Although members of the public are able to select an option to receive feedback, there is no formal process for providing feedback on maintenance enquiries. 3.70

Context

- 3.1 The ACT Government's draft *Strategic Asset Management Guidelines* guides agencies in planning for the acquisition, use and disposal of infrastructure and public assets.
- 3.2 At an agency level, asset management involves developing medium to long term plans that consider the purpose of assets, where they are to be located and what condition they need to be in. Agencies are required to prepare a Strategic Asset Management Plan to manage asset performance, capability and condition, in accordance with the assets operational requirements.

Roads ACT's Strategic Asset Management Plan

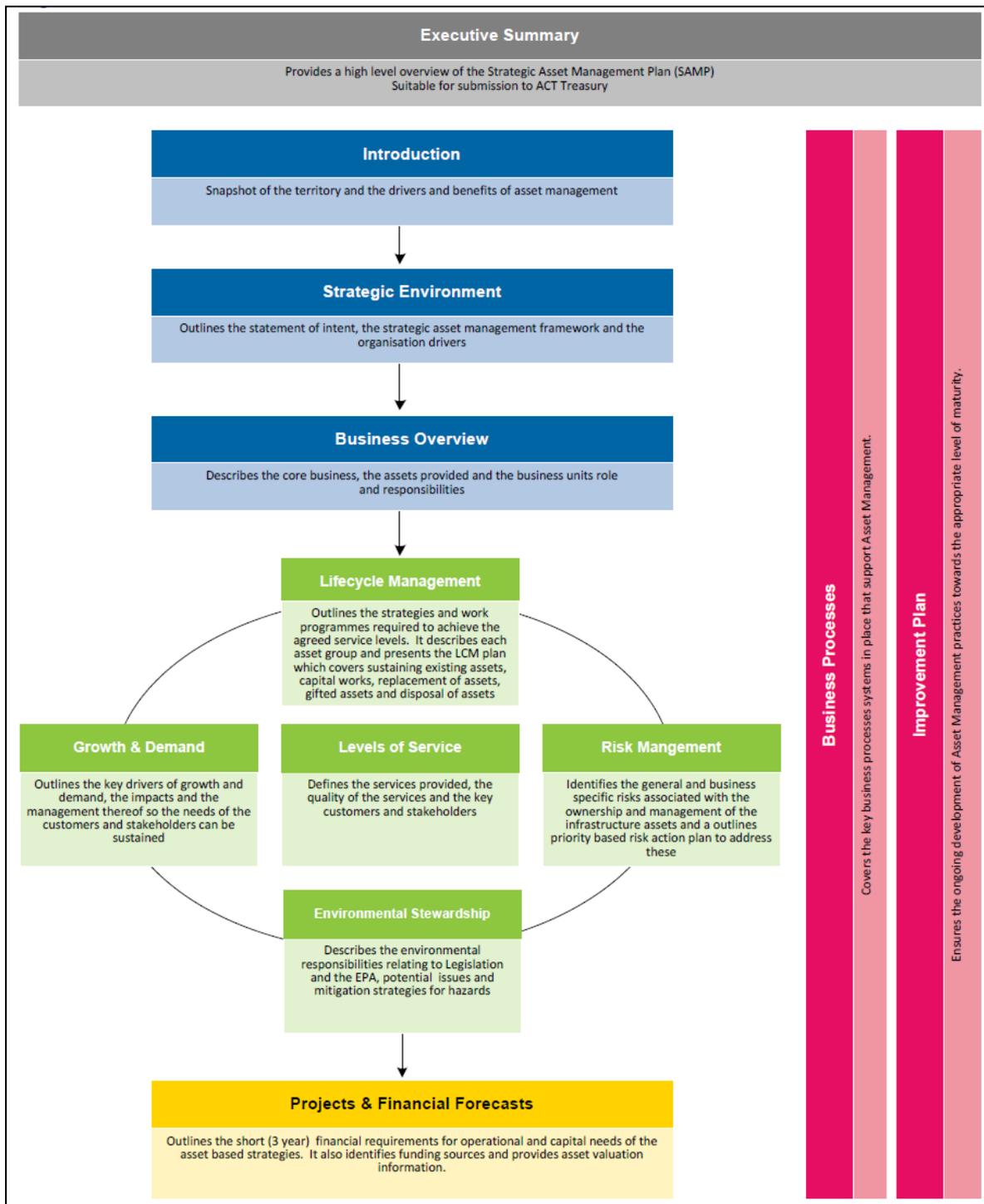
- 3.3 A three-year Strategic Asset Management Plan was developed in 2013 by the Strategic Planning and Development Section within Roads ACT.
- 3.4 The Strategic Planning and Development Section advised that the 2016-19 Strategic Asset Management Plan, due to be updated by December 2016, is currently behind schedule, with a final version now expected by June 2017. Until that time the 2013 Strategic Asset Management Plan remains operational.
- 3.5 The Strategic Asset Management Plan was examined during the audit and found to:
 - contain sufficient detail outlining the approach for asset management;
 - meet the requirements of key Government policies (such as the ACT Government's Strategic Asset Management Guidelines); and
 - target strategies and work programmes for each asset group.
- 3.6 In addition the Strategic Asset Management Plan includes:
 - the desired outcomes for each of the assets as outlined in the Lifecycle Management Section;
 - established goals and priorities for the assets as outlined in the Lifecycle Management Section and the Projects and Financial Forecast Section;

- consideration of asset condition and past maintenance history as outlined in the Lifecycle Management and Growth and Demand Sections;
- budget and funding sources for assets as outlined in the Projects and financial Forecast Section and Lifecycle Management Section;
- strategies to address maintenance backlog as outlined in the Lifecycle and Risk Management Sections;
- details of ownership and responsibility for assets as outlined in the Business Processes section ; and
- consideration of any environmental impact of maintenance undertaken as outlined in the Environmental Stewardship Section.

3.7 The Strategic Asset Management Plan includes a number of different sections as outlined in Figure 3-1. The sections within the Strategic Asset Management Plan cover all asset classes and the Lifecycle Management section includes a Lifecycle Plan for each of the road infrastructure assets. Key sections of the Strategic Asset Management Plan include:

- **risks and risk management strategies** including information on the Transport Canberra and City Services risk management framework (including the approach and risk matrix) and Roads ACT risk register relating to strategic asset management. Risks relating to asset management are outlined in the Risk Management and Lifecycle Sections of the SAMP. Risk management is discussed further at paragraph 2.42.
- **trends in growth and demand** and the strategies identified to support future outcomes (further commentary on Roads ACT's consideration of growth and demand is located at paragraph 3.8);
- **levels of service** for each asset class which outline the services to be provided by Roads ACT, service targets, key customers and stakeholders (further commentary on Roads ACT's development of levels of service is located at paragraph 3.13);
- **environmental stewardship** which describes the environmental obligations that Roads ACT has in undertaking its duties, including any specific legislative requirements, and the environmental impact mitigation strategies which are built into day to day asset management activities undertaken by Roads ACT (further commentary on Roads ACT's environmental stewardship activities is located at paragraph 3.19); and
- **lifecycle management** for each asset group which outlines the broad strategies and work programmes required to meet the levels of service and meet changes in growth and demand (further commentary on Roads ACT's lifecycle management activities is located at paragraph 3.30).

Figure 3-1 Roads ACT's Strategic Asset Management Plan 2013



Source: Roads ACT's Strategic Asset Management Plan 2013

Consideration of growth and demand

3.8 In their 2013 Strategic Asset Management Plan, Roads ACT stated that:

Planning for future growth and demand is required to provide economically sustained services to meet the future needs of the Territory and its visitors .

Growth and demand planning allows for the identification and quantification of areas within the Territory that are likely to experience significant pressures...

... Changes in growth can affect traffic flows due to commuting, increase in heavy commercial vehicles due to increased demand for goods and services, etc. This essentially leads to an increase in the volume of traffic in the network and changes in the location of traffic movements.

Demand for road services can be influenced by other issues such as alternative modes of transport, climate change and costs of transport.

3.9 The population for the ACT, as outlined by the Australian Bureau of Statistics in 2013, is expected to increase from 375 100 people at 30 June 2012 to between 904 100 (high growth) and 612 400 (low growth) in 2061.

3.10 At the current rate of population growth, an underlying demand for housing is estimated. It is proposed that new land will be released in Greenfield (undeveloped land in a city or rural area) suburbs to support this demand. The development of new suburbs results in new road infrastructure assets being gifted to Transport Canberra and City Services which will result in increased future asset maintenance and costs.

3.11 Roads ACT considered growth and demand requirements within the Lifecycle management plans for each asset class including reference to gifted assets. For example the:

- increase in community paths through gifted assets and capital works identified to improve linkages for pedestrians and cyclists, many of which are funded through capital works; and the projected future maintenance costs of new and existing paths based on the life of the asset;
- increased need for traffic signals as a result of increased traffic volumes including growing numbers of vehicles, pedestrians and cyclists that present traffic conflicts and hazards; the future costs of signal enhancement and controller replacement based on the life of the asset;
- increase of roads through gifted assets and road infrastructure improvement such as the widening and duplication of roads, which are funded through capital works; and the predicted future maintenance costs based on the life of the asset and the maintenance treatment; and
- increased number of streetlights through gifted assets and capital upgrades to existing assets such as bulk lamp replacement and projected future maintenance costs based on the life of the asset.

3.12 Roads ACT appropriately considered the potential impacts from growth and demand changes on the ACT and in response have included in the Strategic Asset Management Plan proposed strategies (not all of which are direct asset solutions) such as increasing utilisation of existing assets and focussing community path maintenance to known aged care establishments in response to an ageing population

Levels of service

3.13 Asset management planning enables a balance to be determined between the cost of the service and the level of the service delivered (i.e. the price/quality relationship). Well defined levels of service can be used to:

- inform customers of the current level of service provided and any proposed changes to level of service and the associated costs;
- measure performance against these defined levels of service;
- develop asset management strategies to deliver the required level of service;
- identify the costs and benefits of the services; and
- enable customers to assess suitability, affordability and equity of the services offered.

3.14 The Strategic Asset Management Plan notes that the levels of service for Roads ACT are driven by:

- the external environment which includes legislative and other external requirements that impose minimum standards;
- the internal environment which includes strategic goals and objectives, availability of resources and financial constraints; and
- the customer environment which includes customer expectations of the quality of service, balanced against the price they are willing and able to pay for that service.

3.15 These drivers influence the decisions that Roads ACT make regarding the range, quality and quantity of services provided to the community.

3.16 Levels of service are identified in the Strategic Asset Management Plan. These targets are specific for each asset group and outline how they will be measured and reported, performance as at 2013 (when the Strategic Asset Management Plan was developed, and the target service levels specified for the next six years).

3.17 Further commentary on levels of services set and performance against these levels is detailed throughout the report (refer to chapters four to seven).

3.18 Transport Canberra and City Services have identified service levels for roads and other road infrastructure asset classes relating to maintenance regimes and inspection frequency. The service levels reflect consideration given to asset sustainability, customer expectations, quality requirements and public safety.

Environmental stewardship

3.19 There are a number of adverse environmental effects that can occur in the process of undertaking road infrastructure development. These effects can be generated during the construction phase, operational use and maintenance of the road network.

3.20 Roads ACT is required to consider environmental impacts by the following legislation:

- *Environment Protection and Biodiversity Act 1999* ;
- *Environment Protection Act 1997* ;
- *Environment Protection Regulation 2005* ;
- *National Environment Protection Measures*; and
- *Water Resources Act 2007*.

3.21 The Environmental Stewardship section of the Strategic Asset Management Plan identified potential environmental issues and mitigation strategies (related to maintenance activities). Examples of these are outlined in Table 3-1.

Table 3-1 Examples of identified environmental issues related to maintenance

Potential Environmental Issue	Mitigation Strategy
Dust which can affect vegetation health along the edge of the earthworks area	<ul style="list-style-type: none"> - Wheel washing for trucks leaving development sites - Spraying down areas (with water or mixture of chemical additive) to control dust emissions - Monitoring at site boundaries - Dust management plan - Re-grading and compaction - Spray seal (where warranted)
Sediment runoff which can enter waterways, streams and rivers	<ul style="list-style-type: none"> - Wheel washing for trucks leaving development sites - Spraying down areas (with water or mixture of chemical additive) to control dust emissions - Monitoring at site boundaries - Dust management plan - Re-grading and compaction - Spray seal (where warranted)
Threatened flora and fauna from the development of infrastructure	<ul style="list-style-type: none"> - Have regard to identified communities during planning phases - Specialist advice - Appropriate construction and operational procedures - Construction of fauna fencing

Source: Roads ACT's 2013 Strategic Asset Management Plan

3.22 In 2014, an environmental manager was employed by Roads ACT to assess the environmental impacts of road maintenance practices and to assist in reducing the negative environmental consequences arising from maintenance.

3.23 As a result of this appointment, Roads ACT has adopted approaches in maintaining road infrastructure assets that attempt to reduce the impact of maintenance activities on the environment. For example:

- introducing more energy efficient, long life LED bulbs for traffic signals;
- the new Streetlights Project which is seeking an operator to manage streetlights and achieve savings in both energy and maintenance costs; and
- trialling the use of using recycled materials, such as used printer toner, included in the final asphalt mix, during road resurfacing. The asphalt trialled is low carbon asphalt consisting of recycled road pavement and recycled printer toner. Approximately 160 tonnes of asphalt was laid, saving 2.24 tonnes of carbon dioxide. Roads ACT will monitor the sites performance over the next few years and make an assessment as to the performance.

- 3.24 Audit identified through its review that environmental issues are recorded within the Integrated Asset Management System (IAMS). For example, areas identified as containing contaminated waste are recorded in IAMS for future monitoring and to ensure contractors and Roads ACT workers are aware for any future maintenance or asset replacement activity
- 3.25 Roads ACT advised that environmental conditions are monitored and reported through the Environment Manager (and team) within Roads ACT who responds to land management issues as required; contractor requirements such as environmental management plans and requirements for necessary approvals/licences.

Environmental management plans

- 3.26 Protecting the environment in line with the Strategic Asset Management Plan and legislative requirements, Roads ACT is required to monitor the impact that the road infrastructure maintenance program has on the environment and where necessary make improvement to minimise any damage caused. The Strategic Asset Management Plan outlines the consideration of environmental impacts resulting from maintenance work, whether the services are delivered through contractors or in-house.
- 3.27 Environmental management plans describe how an action might impact on the natural environment in which it occurs and set out clear commitments from the entity undertaking the action on how those impacts will be avoided, minimised and managed so that they are environmentally acceptable. This aides in the monitoring of maintenance activities and provides a level of assurance that environmental impacts are minimised.
- 3.28 Environmental management plans are submitted on an ad hoc basis for some maintenance work undertaken on road infrastructure assets but are not formally required for work performed by contractors or in-house crews. Further information on environmental management plans for Road Pavement and Community Paths maintenance is discussed in paragraphs 4.44 and 5.47.
- 3.29 Roads ACT has not developed a procedure for environmental management of road infrastructure assets that would support maintenance activities and outline environmental controls. On a day to day basis, Roads ACT needs to ensure that maintenance contracts (or service standards for in-house staff) include environmental requirements. Without these there are inadequate environmental controls.

RECOMMENDATION 5 ENVIRONMENTAL MANAGEMENT PLANS

Roads ACT should:

- a) require environmental management plans be prepared for both contracted and in-house maintenance work; and

Lifecycle management

- 3.30 Roads ACT state in the Strategic Asset Management Plan that lifecycle management is:
- ... the process of managing an asset from the initial identified need through to asset disposal. Lifecycle asset management encompasses asset management strategies and practices associated with an asset or group of assets that result in the lowest lifecycle cost ...
- 3.31 The Strategic Asset Management Plan categorises the lifecycle of road infrastructure assets into five areas:
- sustaining existing assets through planned and unplanned maintenance;
 - replacing existing assets through renewal and rehabilitation strategies;
 - growing the asset base through enhancing the services delivery or service standard;
 - gifted assets from subdivision development; and
 - disposing of assets when they reach the end of their useful life or fail to deliver the level of service required.
- 3.32 The Strategic Asset Management Plan includes a Lifecycle document for each asset class. The documents cover a number of areas for each asset including: asset value, asset service standards (current and target), asset age and physical condition, asset utilisation, asset functionality, asset financial performance, data confidence and reliability, key risks and asset strategies which include maintenance planning and assessment criteria. Some examples of which are:
- asset description which includes the asset type and asset components. For example, community paths include footpaths and cycle paths; traffic signals includes six components (such as the controller, lantern and vehicle detectors) and streetlights include the column, cabling and the lamps;
 - asset value which includes the asset quantity, gross replacement cost and depreciated replacement cost; and
 - asset age and physical description. For example, the Lifecycle document for community paths uses a map to show the age of community paths by suburb.
- 3.33 The Lifecycle documents also cover off on strategies for meeting growth in service demand, gifted assets/disposal of assets and expenditure forecasting. In conjunction with the SAMP, these documents form the core of delivery strategy for each asset class.
- 3.34 Asset lifecycle management that aims for the lowest lifecycle cost of an asset is good asset maintenance/management practice. Assets decrease in condition over time, however having good maintenance practices applied (lowest lifecycle cost) reduces the risk of failure.

3.35 Asset lifecycle management plans within Roads ACT are adequate and support maintenance planning to sustain existing assets. Lifecycle management occurs for each asset class including strategies (such as maintenance planning, assessment criteria and repair methods) and maintenance programmes developed that aim for the lowest lifecycle cost of an asset whilst maintaining required service levels.

3.36 Further information relating to lifecycle management (specifically maintenance planning, assessment criteria and maintenance programs) is located in each of the asset class chapters.

Operational plans

3.37 The Transport Canberra and City Services Strategic Asset Management Framework states that:

... business units will establish and maintain management processes to regularly monitor and assess the assets for which they are responsible. Operational plans enable Roads ACT to ensure that existing assets are being managed and maintained efficiently and effectively and that they fully support the delivery of services. The physical, operational, functional and financial performance of assets will be monitored continually, and processes established to both address any performance deficiencies, and to improve performance.

3.38 In general, operational plans should contain:

- clear objectives;
- activities to be delivered;
- quality standards;
- desired outcomes;
- staffing and resource requirements; and
- a process for monitoring progress.

3.39 In addition, the Transport Canberra and City Services Strategic Asset Management Framework also states that Operational Plans seek to address:

- environmental impacts;
- energy and water consumption efficiency of the assets operations;
- arrangements for monitoring asset performance;
- operational training; and
- estimated operating costs.

3.40 In Roads ACT, Operational Plans are prepared by business unit staff. The Strategic Asset Management Plan requires Operational Plans to be developed for all key assets and updated at least every four years.

- 3.41 The current status of Operational Plans for the road asset group is outlined in Table 3-2. At the time of the audit, only one Operational Plan was current and in the case of road pavement, there was no operational plan.

Table 3-2 Status of Operational Plans as at September 2016

Asset Class	Operational Plan Status
Road Pavement	No Operational Plan
Streetlights	Operational Plan dated 2013 – current and soon due for renewal
Community Paths	Operational Plan dated 2010 – out of date
Traffic Signals	Operational Plan dated 2005 – out of date

Source: Asset Operation Plans for Streetlights, Community Paths and Traffic Signals

- 3.42 A review of the three Operational Plans in existence highlighted that much of the content was historical, contextual information and included obsolete data. Whilst the operational plans did contain some practical information such as a Condition Assessment Index, the documents are not used as a day to day procedural guide for staff.
- 3.43 Roads ACT management advised that asset maintenance practices are historical, well understood, had not changed significantly over time and there has been limited staff turnover.
- 3.44 Roads ACT has a low (permanent) staff turnover, for example both the recently retired Director of Roads ACT and the Manager of Road Maintenance have worked for Roads ACT in excess of 15 years. The retiring Director of Roads ACT has been replaced by the long-standing Manager of Road Maintenance.
- 3.45 Transport Canberra and City Services 2015-16 Annual Report identifies that 28 percent of employees are aged 55 and over, some of which work in Roads ACT. Roads ACT have a large number of long term, highly skilled staff that are critical to the effective maintenance of road infrastructure assets. However, the risk to loss of corporate knowledge into the future is not clearly articulated in the Roads ACT risk register
- 3.46 The lack of current comprehensive operational plans for each asset class presents a risk that Roads ACT are unable to ensure that existing assets are being managed and maintained efficiently and effectively and that they fully support the delivery of services. It also presents a risk that in the loss of long-term staff with corporate knowledge there will be limited, if any, current operational procedures known.

RECOMMENDATION 6 OPERATIONAL PLANS

Roads ACT should:

- a) have up-to-date, comprehensive operational plans for all road infrastructure asset classes;

Maintenance programs

- 3.47 A maintenance program is a collection of maintenance projects that will be undertaken within a given period – generally one year and listed against a timeline. Details of a project can include: location, activity types, cost and duration. A good maintenance program will provide the most effective treatments to the overall asset, with total cost kept within the budget, in order to achieve the minimum whole of life cost of the asset.
- 3.48 Asset information should be held on a common database and any changes to the asset condition updated as soon as possible to provide managers with a complete picture of asset condition and performance. This enables managers to make informed decisions regarding the maintenance program.
- 3.49 Planned maintenance:
- is a more cost effective option than unplanned maintenance as it is focused on preventing asset failure rather than fixing it; and
 - prolongs the life of the asset.
- 3.50 Roads ACT have a maintenance program for roads, streetlights and traffic signals but have not developed a program for community paths maintenance. The existing programs vary in style and complexity and include, to varying degrees, the following:
- priorities that are consistent with the Strategic Asset Management Plan;
 - schedules of programmed work that address routine, periodic and rehabilitation treatments;
 - the updating of asset condition; and
 - strategies to minimise negative impact to users.

Further detail on the maintenance programs of each asset class are detailed in Chapters four to seven.

Maintaining data on assets

- 3.51 Since 2009, Roads ACT has utilised an Integrated Asset Management System (IAMS). The IAMS is an asset information and management system used to maintain and manage all roads asset data. IAMS is able to store and record maintenance information from the notification of issue or creation of work order, through to the updating of asset condition on completion of maintenance work.
- 3.52 IAMS is hosted on the Shared Services ICT infrastructure. Transport Canberra and City Services state that the database server is a Unix box and the Application Server is a Windows box. Associated documentation (such as photos, PDF etc) is stored against assets, and is held on an enterprise storage server.

- 3.53 Backups of IAMS is the responsibility of Shared Services Team and includes 'everything' contained within IAMS i.e. the data in the database and the documents associated to the data in the database. The backup arrangements for the offline databases kept by Roads ACT were not reviewed in the audit.
- 3.54 There is some inefficiency in how IAMS is used throughout the asset maintenance process. In a number of cases once the road maintenance area received a notification indicating that maintenance was complete they proceeded to transfer the process to paper form, this is largely due to the practices staff are familiar and comfortable with. Asset condition is later updated in IAMS, however this is often significantly delayed and the maintenance information is kept on hard copy records prior to updating.
- 3.55 Particular issues were identified with the capture of asset data in relation to traffic signals and streetlights. This is discussed in detail at paragraphs 6.22 and 7.22.
- 3.56 Audit evidenced that Roads ACT uses the information held within IAMS, as well as offline asset condition data to inform the maintenance programs for roads, community paths, streetlights and traffic signals. This includes the defect database for streetlights, Roads Maintenance Sections progress tracking and reporting database and maintenance programs, and traffic signal maintenance reporting and summary data. These have been developed to cater for the specific needs in the business units, and prior to development and implementation of IAMS. Roads ACT have identified the issue of uploading asset data into IAMS. Some of the problems arise from the inability to load asset condition data in the field. Transport Canberra and City Services has included system upgrades to allow mobile data entry by end of 2016 as part of its Infrastructure Asset Data Management Strategy 2014-2019.
- 3.57 In response to this, work was undertaken in 2014 by the then Territory and Municipal Services on the development of a product called MapCapture. MapCapture is an application that would enable field maintenance staff to update asset condition in real time.
- 3.58 While some development work was undertaken in 2014, this was halted due to security and integration issues. There has been no further progress on the development of MapCapture or any alternatives.
- 3.59 While the information held within IAMS is useful and mostly reliable, it is not routinely complete for all asset types. Roads ACT could reduce its reliance on the use of offline asset condition data if the practices of updating IAMS improved. For example, Roads ACT have not specified any required timeframes for field maintenance staff to update asset condition after defects are addressed, resulting in frequent incomplete data.

Planned update to the IAMS system

- 3.60 Completeness of data was also identified as an issue during a 2013 internal audit conducted by the Territory and Municipal Services Directorate 'IAMS data quality and integrity audit'.
- 3.61 As a result of this, and other identified issues with IAMS, the ACT Government advertised a request for tender in April 2017 seeking an Asset Management System to:
- ... replace the aging (end of life Jul 2017) locally hosted Asset Management System (AMS) with a contemporary, modern user interface AMS with a preference to be 'onshore cloud hosted' for TCCS...
- 3.62 The tender's statement of requirements includes reference, but is not limited to, field user accessibility and interface with CRM, that would address additional issues raised during this audit (see paragraphs 3.56 and 3.70).
- 3.63 The request for tender closes in June 2017 and the contract is expected to commence in November 2017.

RECOMMENDATION 7 TIMELY DATA ON ASSET CONDITION

Roads ACT should:

- a) update the condition of all road infrastructure assets into IAMS (or its equivalent) within set timeframes;
- b) continue to work on a means of capturing asset condition reports directly from the field; and
- c) provide training and guidance to staff on the use of IAMS (or its equivalent).

Obtaining community feedback

- 3.64 Transport Canberra and City Services outline in the Customer Services Charter that it considers engagement with the community essential in delivering services and encourage customers to provide feedback to inform the way those services are delivered in line with the requirements of its Customer Service Charter.
- 3.65 Roads ACT manages its customer contact through Access Canberra. Access Canberra provides ACT residents various communication channels including online at the Access Canberra Website, a telephone call centre as well and full service shopfronts.
- 3.66 When customer enquiries are received regarding road infrastructure assets and assessed as requiring action, they are logged by Access Canberra into Access Canberra's Client Record Management (CRM) System and recorded in IAMS. Once the matter is entered into IAMS the system allocates the work request accordingly.

- 3.67 Staff at Access Canberra have triage guidelines that outline what action needs to be taken according to asset type and the severity or urgency of the issue. Once the matter is entered into IAMS the system automatically allocates the work to an area within Roads ACT. Under some circumstances, if the request is urgent, Access Canberra call the relevant Roads ACT staff to advise them of the problem as well as log the matter into the IAMS system.
- 3.68 When work is completed, the matter is finalised in IAMS but may not be closed out in Access Canberra's CRM system. Access Canberra staff can only provide feedback to members of the public when Roads ACT advise that work has been completed. For example, the CRM system will show items as open when they may have been completed by Roads ACT.
- 3.69 Detail of the time taken by Roads ACT to respond to defects reported through Access Canberra is discussed for each asset throughout the report.
- 3.70 There is no electronic link between the Access Canberra's Client Record Management (CRM) system and Roads ACT systems. Although members of the public are able to select an option to receive feedback, there is no formal process for providing feedback on maintenance enquiries.

RECOMMENDATION 8 CUSTOMER FEEDBACK

Roads ACT should develop a process for providing timely feedback to customers when work has been undertaken as a result of a customer query or complaint.

- 3.71 Transport Canberra and City Services takes part in an annual customer survey run by an independent market and social research firm that involves local governments across Australia. The results are benchmarked and reviewed by Transport Canberra and City Services through a presentation to the ELT by the research firm that undertook the survey. This provides Transport Canberra and City Services with an idea of how it is performing in relation to similar agencies in other jurisdictions.
- 3.72 Overall, Transport Canberra and City Services report the level of customer satisfaction with the public road network is high at over 85 percent (target is >70 percent) and 91 percent (target is 85 percent) of customers reported as being happy with access to cycle and community paths.
- 3.73 However, as detailed in the Territory and Municipal Services Directorate- Final Audit Management Report for the year ended 30 June 2016:
- No information was included in the statement of performance submitted to the Audit Office for review on how customer satisfaction was measured. Information such as the method used to measure 'customer satisfaction', number of customers surveyed, sampling methodology, satisfaction rating scale, period over which results were measured, results against the rating scale should have been provided to show how results were measured.

3.74 In 2016, ACT residents rated the road network as one of the best nationally. In regards to satisfaction with road construction and maintenance, Transport Canberra and City Services was rated in the 87th percentile. Customer satisfaction with ACT community paths was ranked in the 94th percentile in 2016 when benchmarked against results for local government

4 ROAD PAVEMENT

4.1 This chapter examines the arrangements implemented by Roads ACT to manage the maintenance of road pavement.

Summary

Conclusion

While Roads ACT reported in their 2015-16 annual report that 90 percent of territorial roads in the ACT were in good condition, there is a significant maintenance backlog for road pavement. This backlog has increased by more than 400 percent since 2010-11 and amounts to approximately two million square meters of road pavement needing maintenance (equivalent to 9.0 percentage of the total road pavement) which Roads ACT estimated would cost \$53 million in 2015-16 and increase to \$71 million in 2019-20.

The management of this backlog, while unlikely to be addressed in the short-term, needs to be guided by a long-term strategy and would be supported by Roads ACT addressing shortcomings in its practices, including developing and implementing an operational plan for the maintenance of road pavement, specifying quality standards for maintenance work and improving monitoring arrangements for maintenance activities.

Key findings

	Paragraph
The amount of planned and unplanned maintenance was examined in this audit and it was found that in 2014-15, 58 percent was planned and 42 percent was unplanned. In 2015-16 the levels of planned versus unplanned was more even with 52 percent unplanned and 49 percent planned maintenance.	4.9
The reasons for deletion or rollover of programmed road resurfacing are not adequately documented by Roads ACT. For example, the notes included in the resurfacing program only state that the resurfacing item is either deleted from the program or moved to 2016-17.	4.30
The lack of an operational plan for road maintenance, combined with Roads ACT not having specifications or guidelines for unplanned maintenance, presents a risk that road maintenance practices may not reflect contemporary practices and standards. Developing an operational plan could be done in conjunction with the Strategic Asset Management Plan review process in 2017.	4.36

Contract management for the five-year resealing (chip sealing) contract, which ended in June 2016, was undertaken by an external consultant. The subsequent contract has maintained this arrangement.	4.40
The specification used in the Roads ACT asphalt contract makes cross reference to the NSW Roads and Maritime Services QA Specification for Heavy Duty Dense Graded Asphalt (R116) which the Subject Matter Expert considered best practice.	4.43
In 2015-16, approximately two thirds of the asphalt resurfacing and patching had been undertaken by in-house Roads ACT road maintenance crews, while the balance had been undertaken by one of the contractors of the panel of five contractors selected for this work. This is consistent with other jurisdictions.	4.48
Roads ACT's monthly Productivity Reports are produced to track time and cost of planned and unplanned maintenance. These reports do not report on the unit cost for in-house asphalt work that would be useful to compare results with contractors and help assess cost effectiveness. The tracking of planned activities via the annual report on road surfacing could also be improved through including the Program item number for chip sealing in the annual maintenance program.	4.52
Between 2011-12 and 2015-16 the budget for road maintenance increased by approximately 24.1 percent.	4.56
Roads ACT have calculated the level of road infrastructure asset backlog for 2015-16 to be 2 104 909m ² , a growth of over 400 percent since 2010-11. This is based on the gap between the target resurfacing rates and the actual amount of resurfacing undertaken.	4.59
Funds received in 2015-16 and 2016-17 from the Federal Government as part of its Roads to Recovery program allowed the projected growth in the backlog to halt but did not allow the backlog to be reduced. Roads ACT anticipates that the backlog will continue to grow in 2017-18.	4.60
In its draft information paper to Cabinet, Roads ACT predicted the value of maintenance backlog works to grow from approximately \$53 million in 2015-16 to \$71 million in 2019-20.	4.64
Roads ACT is seeking ways in which to reduce the backlog such as trialling of alternative road surfacing methods using recycled materials. For example used printer toner, which is included in the final asphalt mix to extend the life of road surface and lower life cycle costs. While this is recognised, given the importance of the issue, a long-term strategy is warranted.	4.70

Roads ACT have undertaken inspections of territorial and municipal roads in accordance with service level standards. They have also responded to approximately 1 338 damage or defect reports relating to potholes and edging, and fixed the damage within one week, 85 percent of the time. 4.75

The ACT Government's performance target for road resurfacing was met in 2015-16 as a direct result of additional funding through the Roads to Recovery Program. However, prior to 2015-16, these resurfacing targets had not been met for some time (2010-11 for territorial roads and 2007-08 for municipal). The targets for the percentage of customer satisfaction and territorial roads in good condition have also been met. 4.77

The percentage of territorial roads in good condition is greater than 86 percent. The results have remained around 89 percent from 2011-12 to 2015-16 which indicates that a high proportion of ACT roads provide good ride comfort. It also means the ride quality on 11 percent of territorial roads is rated as fair to poor. 4.78

In 2012 the ARRB advised that if the current resurfacing rate of territorial roads in the ACT was to remain unchanged the resulting increased age of the roads would increase the risk of rapid pavement deterioration. 4.84

ARRB (2015) advised that by 2023 road condition deterioration would increase (cracking going from 19 to 34 percent, rutting from 11 to 17 percent and rough roads from 11 to 18 percent). And, also further advised that if the current resurfacing rate of territorial roads in the ACT was to remain unchanged the risk of rapid pavement deterioration will increase. This highlights the importance of preventative maintenance. 4.86

Context

4.2 Roads ACT is responsible for maintaining approximately 3 100km of roads (6 700 lane km), which are classified according to functionality using the AUSTROADS classification system. Out of this 3 100 kilometres, about 800 kilometres are within AUSTROADS Classes 1, 2, 3 and 6 (high traffic arterial roads) categorised as territorial roads. The balance, 2 300km, are predominantly AUSTROADS Classes 7 and 8, categorised as municipal roads

4.3 The 6 700 lane kilometres of sealed roads within the ACT typically have a service life between 25-30 years. Roads ACT advise that over 70 percent of the road network was built prior to 1985 and requires regular maintenance.

4.4 Roads ACT state in the Roads Lifecycle Plan that:

... the primary purpose of the road pavement surface is to provide a safe, smooth ride, and maximise the lifecycle of the road pavement as a whole. The type of pavement surface adopted is dependent on the traffic volume and mix of traffic (light vehicle/heavy vehicle ratio) using the road. As well as traffic loadings, extent of turning movements, noise, safety and appearance are also significant factors in the determination of pavement surface.

4.5 Damage to road pavements occurs over time as a result of the impact of traffic, particularly heavy vehicles and environmental factors. As the road surface wears and ages, small cracks develop in the pavement which allows water to enter the underlying surface of the pavement. This, combined with the continual stress imposed by the flow of traffic, weakens the road pavement. If this happens potholes, major cracks and deformation of the road pavement occurs and could ultimately result in the failure of the road pavement

4.6 While building new roads or augmenting existing roads to meet growth is important, maintaining the existing road network is equally important to retain the social and economic benefits they already provide. Without proper, effective and timely maintenance, the road network eventually deteriorates resulting in expensive, longer-term costs to both Government and road users.

4.7 Roads ACT outline in the Strategic Asset Management Plan that it seeks to sustain the condition and performance of ACT roads at acceptable levels over the long term and to do this cost effectively. If well maintained, the road pavement can last 60 to 70 years before requiring rehabilitation.

4.8 Without regular maintenance, road costs increase and road condition deteriorates. Over reliance on unplanned maintenance to fix problems such as potholes and patching may save money in the short term but will be less effective than resurfacing. Resurfacing, which falls under planned maintenance, is a more cost-effective option than rebuilding a road.

4.9 The amount of planned and unplanned maintenance was examined in this audit and it was found that in 2014-15, 58 percent was planned and 42 percent was unplanned. In 2015-16 the levels of planned versus unplanned was more even with 52 percent unplanned and 49 percent planned maintenance.

4.10 The Australian Road Research Board (ARRB) is the leading provider of road research and best practice workshops in Australia. They provide research, consulting, products and information services to the road and transport industry. The organisation's members consist of state, territory and federal government road agencies in Australia, who established the organisation as a means of cooperating to undertake research of national importance that they could not justify carrying out individually.

4.11 Specifically in relation to this audit, ARRB's capabilities cover road operations including:

- Materials testing, pavement and surfacing technology and national guidelines;
- infrastructure asset management;

- impacts of climate change;
 - land transport resources, data and information; and
 - knowledge transfer and capacity building.
- 4.12 In addition, ARRB applies research outputs to develop equipment that collects road and traffic information, and software that assists with decision-making across road networks.
- 4.13 Standards Australia, which publishes the Australian Standards, and the AUSTROADS which is the peak body of state and territory roads authorities are the two organisations that set the standards for road maintenance and design. However, they do not have the ability to undertake road condition assessments. The Australian Road Research Bureau is the accepted and accredited organisation for undertaking such work, used by various road authorities (unless they have the capabilities to do that themselves such as NSW Roads and Maritime Services).

Developing a maintenance program for road pavement

- 4.14 Roads ACT needs to maintain territorial roads in a way that maximises road user safety and asset life while minimising whole-of-life costs. In order to deliver on these objectives, Roads ACT needs to develop a maintenance program that will best meet these outcomes.
- 4.15 A maintenance program is a collection of maintenance projects that will be undertaken within a given period – generally one year and listed against a timeline. Details of a project can include: location, activity types, cost and duration. A good maintenance program will provide the most effective treatments to the overall asset, with total cost kept within the budget, in order to achieve the minimum whole of life cost of the asset.
- 4.16 As stated in the Roads Lifecycle plan:
- ... road pavement deterioration can be slowed significantly by applying the right maintenance at the right time. Regular preventative maintenance to keep road surfaces water tight, regulating surface shape and strengthening failing materials are a few techniques to reduce pavement deterioration.
- 4.17 Roads ACT advise that the consequence of non-action is costly pavement rehabilitation. Therefore, the Road Maintenance Program consists of planned and unplanned maintenance designed to achieve these outcomes.
- 4.18 Roads ACT's road maintenance program consists of planned and unplanned maintenance. The main activities included in planned road maintenance are: resealing using chip seals; asphalt resurfacing; Thin Open Graded Asphalt Surfacing (TOGAS); and, asphalt patching for pavement remediation prior to resealing or resurfacing. The main activities included in unplanned road maintenance are: pothole patching; asphalt patching; and minor road repair.

Identifying required maintenance

- 4.19 Roads ACT commissions ARRB (who is the accepted service provider on various road and traffic related issues including road condition assessments) to assess the surface and pavement condition of territorial roads on a three-year cycle with one third of the road network assessed each year. The assessment of road condition is undertaken using a vehicle mounted machine. Roads ACT has also commissioned VicRoads (the Victorian Government roads authority) to measure skid resistance on a three-year cycle.
- 4.20 Roads ACT have adopted a Pavement Condition Index (PCI) to identify road maintenance priorities. A PCI is an evaluation method used to determine the condition of a road network.
- 4.21 Roads ACT advised that their PCI approach:
- ... reflects the worst of all parameters and not their average that tends to soften the impact of the worst (and best) parameters. In summary, the current practice of PCI for the territorial roads is in which every condition parameter is equally important. This method is closer to the real life practice in which essentially different parameters are interpreted separately and decisions are based on the worst ones. This method has already gained wider support and acceptance by several major road authorities in Australia.
- 4.22 This PCI is an appropriate approach that identifies priorities for the road maintenance program.
- 4.23 Roads ACT in conjunction with ARRB are considering assessments of Pavement Remaining Life (based on deflections, which is an indicator of structural strength) and Surface Remaining Life (based on surface age, cracking, and texture) as additional means of identifying high priority projects.
- 4.24 The Roads ACT Lifecycle plan for Road Pavement and ARRB identify that Road pavement condition assessments include assessments of:
- roughness which represents ride quality and can be indicative of the serviceability and structural condition of the road pavement. Roughness can be attributed to the level of traffic and a range of other factors such as poor drainage allowing water to seep through the surface of the road pavement;
 - rutting which characterises the transverse profile of a road surface. A rut is defined as a longitudinal depression that forms in a wheel path of a road. Rut depth is the maximum displacement in the road surface, either across a wheel path or across lane width;
 - cracking which is generally attributed to environmental factors and the volume and type of traffic. Once cracks start to appear the road will deteriorate at a faster rate;
 - texture which is important on high speed roads as it affects how fast water drains away from the road; and

- skid resistance which is the level of friction available at the contact patch between a road surface and vehicle tyre during acceleration, braking and cornering manoeuvres.

4.25 The condition of municipal roads is assessed by Roads ACT through visual inspections on an approximate three-year cycle.

Development of the maintenance program

4.26 Prior to the beginning of a financial year (in approximately May), ARRB provides Roads ACT with a proposed (draft) annual road maintenance program for territorial roads. This proposed program is based on the results of the condition assessment as well as the anticipated budget for road maintenance for the financial year as advised by Roads ACT.

4.27 Prior to finalising the program, Roads ACT also considers other factors in determining priorities and timing. These factors include:

- the results of visual inspections to verify pavement condition;
- reports of recurrent pavement failure (in order to minimise routine maintenance);
- complaints from members of the public via Access Canberra as well as requests from members of the Legislative Assembly on behalf of constituents; and
- if future upgrades are planned and whether there are concurrent works being undertaken in the vicinity (in order to minimise the impact on the public).

4.28 The proposed program is reviewed by Roads ACT and projects prioritised on the following basis:

- 1st maintenance work to improve skid resistance (for safety reasons);
- 2nd maintenance work to address cracking as a means of preserving the asset; and
- 3rd maintenance works that address roughness or rutting as these affect ride quality.

Rollover of maintenance activities

4.29 Each year Roads ACT prepares its resealing and asphalt resurfacing program in line with available funding. Some work programmed is not delivered and is either deleted from the program or rolled over to the following year's program.

4.30 The reasons for deletion or rollover of programmed road resurfacing are not adequately documented by Roads ACT. For example, the notes included in the resurfacing program only state that the resurfacing item is either deleted from the program or moved to 2016-17.

4.31 Assessing and documenting the adequacy of the progress of the road resurfacing program is important as it provides transparency around maintenance decisions and may inform future planning for maintenance work.

RECOMMENDATION 9 RECORDS MANAGEMENT

Roads ACT should:

- a) document its reasons as to why a road resurfacing project is deleted or rolled-over from one year to the next; and

Recorded information on road pavement

4.32 Data on asset condition of all planned and unplanned road maintenance is maintained in the Integrated Asset Management System (IAMS) and used to inform the maintenance undertaken and includes:

- inspection results including road pavement type, lane length (km) and area (sqm) for each AUSTRROADS class such as classes 1, 2, 3 and 6 (high traffic arterial roads); and
- public enquiries through Access Canberra and reported defects including type of defect, number of defects, inspection date, estimated and actual cost of maintenance.

4.33 Further detail on IAMS in relation to maintaining data on assets and the extent to which this data drives maintenance activities is provided paragraph 3.51.

Operational Plan

4.34 Roads ACT does not have an operational plan for road pavement maintenance. Roads ACT advised that asset management practices for road pavements had not changed significantly over time and that practices were historical and well understood.

4.35 The Roads Maintenance Section within Roads ACT have low levels of staff turnover and reliance is placed on the knowledge of long term staff members when developing the road pavement maintenance program. Refer to paragraph 3.44 for further detail.

4.36 The lack of an operational plan for road maintenance, combined with Roads ACT not having specifications or guidelines for unplanned maintenance, presents a risk that road maintenance practices may not reflect contemporary practices and standards. Developing an operational plan could be done in conjunction with the Strategic Asset Management Plan review process in 2017.

RECOMMENDATION 6 OPERATIONAL PLANS

Roads ACT should:

- b) develop an operational plan for road pavement;

Delivering maintenance

4.37 Planned and unplanned road maintenance is undertaken using contracted out arrangements and in-house crews as outlined in Table 4-1.

Table 4-1 Planned and unplanned maintenance program

Unplanned Maintenance - Reactive (public complaints, unplanned inspections)	Planned Maintenance - Annually Programmed			
Pothole patching Asphalt heavy patching Minor pavement repair	Re-sealing (chip sealing)	Asphalt Re-surfacing and Patching		Thin Open Graded Asphalt (TOGAS)
In-house	Contract (5 Year)	Panel of 5 contractors	In-house	Annual contracts as required

Source: Roads ACT

Planned maintenance work

4.38 There are three main packages of planned maintenance work procured through competitive tendering:

- resurfacing using chip seal 5-year contract, selected through an Expression Of Interest/Request For Tender process, established in 2016 and expires in 2021;
- asphalt resurfacing and patching utilising a panel of five contractors (only two are ACT based) that were selected by open/pre-qualified tender, established in September 2014 and expires in September 2017; and
- Thin Open Grade Asphalt (TOGAS) tender for the selection of one contractor for a lump sum contract through open/pre-qualified tender, established in October 2016 and expires in February 2018.

4.39 The reseal and asphalt overlay contracts outline a number of requirements including:

- time and cost information and progress reporting;
- records of hold point releases and test results on bitumen;
- approved TTM's (Temporary Traffic Management plans) for each specific reseal location;
- schedule of payment claims;
- inspection and test plans;

- compliance to NSW RMS specifications and the provision of quality management records;
- project quality plan and programs of work; and
- safety and environment management plans.

4.40 Contract management for the five-year resealing (chip sealing) contract, which ended in June 2016, was undertaken by an external consultant. The subsequent contract has maintained this arrangement.

Records of hold point releases and test results on bitumen

4.41 Roads ACT does not require asphalt compaction testing to verify contractor claims. Poor quality asphalt or poorly laid asphalt can adversely affect the life of a road. Roads ACT reviews documents appended to the contractor's invoices such as asphalt delivery docket which contain the asphalt batch number (which can be used for traceability), type of asphalt, and weight; and area and thickness of asphalt. Similar records were available for works undertaken by in-house crews. There was no testing undertaken to verify achievement of required asphalt compaction.

4.42 Roads ACT verbally advised that it gains assurance for the quality of asphalt compaction based on the number of times the roller passes over the road surface and the fact that there were no major failures in asphalt works undertaken. A better practice would be to verify the achievement of required asphalt compaction as stated in the contract.

Compliance to NSW RMS specifications

4.43 The specification used in the Roads ACT asphalt contract makes cross reference to the NSW Roads and Maritime Services QA Specification for Heavy Duty Dense Graded Asphalt (R116) which the Subject Matter Expert considered best practice.

RECOMMENDATION 9 RECORDS MANAGEMENT

Roads ACT should:

- b) maintain contract management records on asphalt contracts to demonstrate achievement of the required quality of asphalt compaction.

Safety and Environmental Management Plans

4.44 Whilst an environment management plan was available for the five-year resealing (chip sealing) contract that ended in June 2016 there were no other instances where environmental management requirements were clearly stated for road maintenance contractors or in-house crews undertaking road maintenance. This issue is discussed further at paragraph 3.29.

Unplanned maintenance work

- 4.45 Unplanned maintenance, consisting mainly of pothole patching, minor pavement strengthening and corrections using asphalt patching, is undertaken by in-house Roads ACT road maintenance crews done on a reactive basis triggered by public complaints received through Access Canberra and identified by Roads ACT staff while undertaking other duties in the field.
- 4.46 Roads ACT use in-house crews for resurfacing and patching due to low dollar value and that the crews:
- provide some competition in an industry with limited availability in the ACT; and
 - act as a backup resource when emergencies arise as well as when contractors are not available.
- 4.47 The practice of maintaining in-house crews is consistent with practices in other jurisdictions. In-house teams are used to mitigate the risk of contractors being unavailable or being unwilling to complete small maintenance tasks as well as maintaining some specialist skills within the organisation
- 4.48 In 2015-16, approximately two thirds of the asphalt resurfacing and patching had been undertaken by in-house Roads ACT road maintenance crews, while the balance had been undertaken by one of the contractors of the panel of five contractors selected for this work. This is consistent with other jurisdictions.
- 4.49 Time, cost and output of road pavements are tracked by internal productivity reporting.
- 4.50 Road Maintenance Section within Roads ACT produces monthly Productivity Reports which keep track of time and costs for planned and unplanned maintenance. The Productivity Reports are reviewed by the Roads Maintenance Manager for decision making purposes. The Productivity Report does not report on the unit cost for in-house asphalt work compared with contract costs for asphalt work. Using the database, it is possible to compute the unit cost variance, which in turn would assist the Roads Maintenance Manager in determining the most appropriate and cost effective approach for asphalt resurfacing.
- 4.51 An annual key performance indicator report is prepared for the Roads Director, with percentages of territorial and municipal roads resurfaced. This report also contains a list of road sections chip sealed or asphalt resurfaced with date and quantity. The asphalt resurfacing list contains the item number from the Annual Road Maintenance Program for each road section, however the chip sealing list does not contain this information. There should be consistency in the data recorded for road resurfacing as inconsistencies can impact the tracking of planned activities.

- 4.52 Roads ACT's monthly Productivity Reports are produced to track time and cost of planned and unplanned maintenance. These reports do not report on the unit cost for in-house asphalt work that would be useful to compare results with contractors and help assess cost effectiveness. The tracking of planned activities via the annual report on road surfacing could also be improved through including the Program item number for chip sealing in the annual maintenance program.

RECOMMENDATION 10 REPORTING ON ROAD RESURFACING

Roads ACT should:

- a) improve the monthly productivity reports to include the unit cost for in-house asphalt work; and
- b) amend the annual key performance indicator report on road resurfacing (prepared for the Director of Roads ACT) to include the Program item number and the planned quantity against each road section.

Cost to maintain road pavement

- 4.53 Without regular maintenance, the whole-of-life cost for roads increase and road condition deteriorates. Resurfacing is a more cost effective option than rebuilding a road. Maintaining a road with preventative seals (also called Chipseal) costs approximately \$10 per m², repairing a road with preventative asphalt surface costs approximately \$70 per m², whereas replacing a road with a new replacement asphalt surface (rehabilitation) and foundation costs approximately \$300 per m².
- 4.54 The pavement deterioration can be slowed significantly by applying the right maintenance at the right time. Regular preventative maintenance to waterproof road surfaces, regulating surface shape and strengthening failing materials are a few techniques to reduce pavement deterioration. The consequence of non-action is costly pavement rehabilitation.
- 4.55 The road pavement maintenance budget for the past five years from 2011-12 to 2015-16 is outlined in Table 4-2 (excluding Roads to Recovery funding).

Table 4-2 Road maintenance budget 2011-12 to 2015-16

	2011-12 \$000	2012-13 \$000	2013-14 \$000	2014-15 \$000	2015-16 \$000
Road Pavements	15 263	15 934	14 357	18 050	18 951

Source: Roads ACT 10 Year Activity Summary

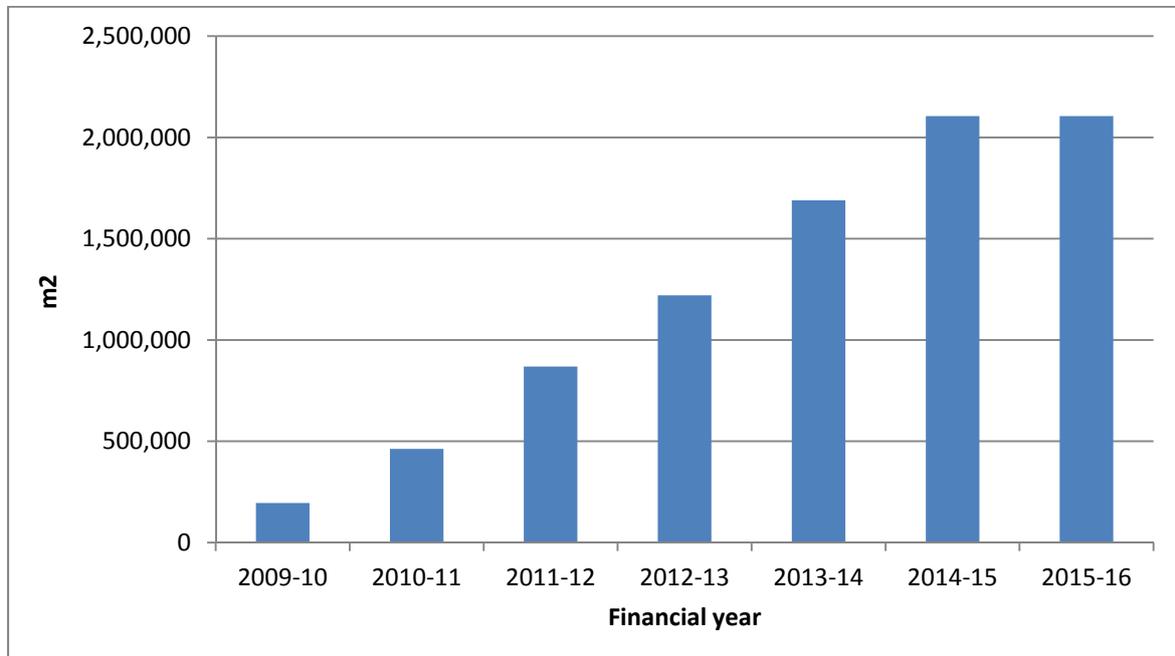
- 4.56 Between 2011-12 and 2015-16 the budget for road maintenance increased by approximately 24.1 percent.

Performance in maintaining road pavement

Road maintenance backlog

- 4.57 In 2014-15, 3.4 percent of territorial roads and 2.2 percent of municipal roads were resurfaced and almost 400 000m² of road resurfacing work deferred in that year.
- 4.58 ARRB in its *Comparative Study and Investigation into Road Resurfacing Programs within Main Roads Authorities and selected Local Councils* (December 2012) concluded that for most of the road authorities, the extent of their resurfacing programmes were lower than the desired optimal level.
- 4.59 Roads ACT have calculated the level of road infrastructure asset backlog for 2015-16 to be 2 104 909m², a growth of over 400 percent since 2010-11. This is based on the gap between the target resurfacing rates and the actual amount of resurfacing undertaken.
- 4.60 Funds received in 2015-16 and 2016-17 from the Federal Government as part of its Roads to Recovery program allowed the projected growth in the backlog to halt but did not allow the backlog to be reduced. Roads ACT anticipates that the backlog will continue to grow in 2017-18.
- 4.61 This increase in the road pavement maintenance backlog is demonstrated in Figure 4-1.

Figure 4-1 Roads ACT Road maintenance backlog



Source: Roads ACT

4.62 Roads ACT prepared a draft Cabinet Information Paper (CIP) for Cabinet in October 2015 entitled '*A sustainable maintenance strategy for roads*'. This paper was never submitted to Cabinet as:

... a decision was made to take a shortened version (as a presentation, rather than a paper) to the Transport Reform Sub Committee (TRSC). The TRSC decided that as Roads to Recovery funds were being used to 'top up' the resurfacing budget, the funding issue would not present itself for a further 12 to 18 months and so requested that presentation of the CIP to Cabinet be delayed until nearer the time funding would be required.

4.63 The paper highlighted the significant costs associated with the continued deferral of road maintenance and the importance of avoiding future costs by investing in the maintenance of road infrastructure at a more sustainable level. The paper stated:

- i) In order to address current performance gaps in road resurfacing, the majority of the additional allocation of \$17.75million from the Roads to Recovery fund was to be used for preventative road resurfacing maintenance in 2015-16 and 2016-17;
- ii) an additional increase in funding would be required from 2017-18 onwards to continue providing preventative road resurfacing at a more sustainable level; and
- iii) from 2017-18 onwards, annual increases to the road maintenance budget should reflect the rising costs of materials and labour within the construction Industry.

4.64 In its draft information paper to Cabinet, Roads ACT predicted the value of maintenance backlog works to grow from approximately \$53 million in 2015-16 to \$71 million in 2019-20.

4.65 While a verbal presentation of the paper was made to the Transport Reform Sub Committee in November 2015, no presentation of the Cabinet Information Paper has been made to Cabinet regarding a sustainable maintenance strategy for roads since that time.

4.66 However, Roads ACT advised that a funding request, based on the draft information paper, was submitted as part of the 2017-18 budget process to:

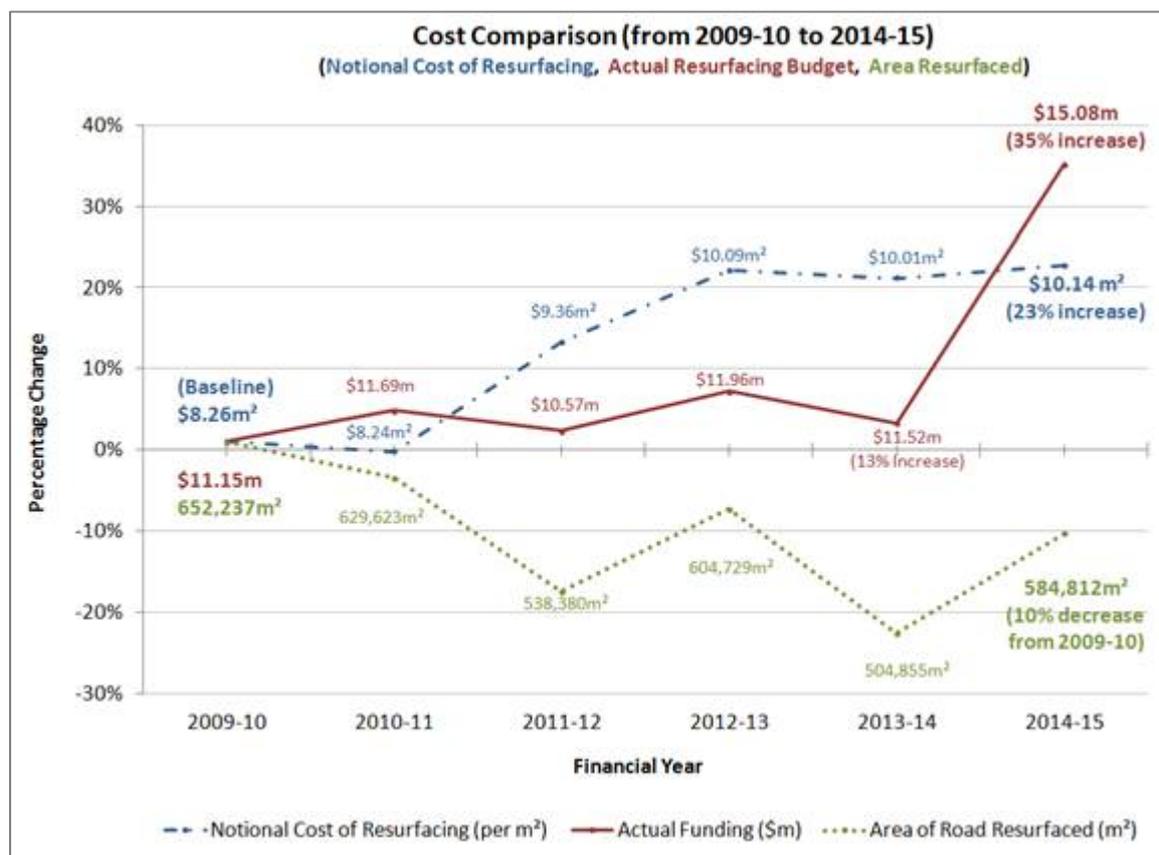
... increase the funding allocated to the road resurfacing programme, to replace the commonwealth 'Roads to Recovery' funding and to achieve a sustainable road resurfacing programme that achieves the annual road resurfacing targets. This in turn, will deliver improved roads within the ACT and reduce future maintenance costs to the ACT Government.

4.67 The proposal sought an additional \$1.5 million per year to 2020-21, approximately \$4 million less per year than the 'Roads to Recovery' program provided.

4.68 The draft information paper provided Figure 4-2. From 2009-10 to 2012-13, labour and material costs associated with road resurfacing have increased by approximately 20 percent whilst the budget has increased around 13 percent over the same period. The budget increased in 2014-15 by approximately \$6 million using additional road to Recovery funding, which will result in a 35 percent overall increase.

4.69 During the same period, productivity (or the amount of roads resurfaced) has decreased by approximately 12 percent on average over the 5-year period, resulting in a substantial backlog of around 2 million m².

Figure 4-2 Notional Cost of Resurfacing Vs Actual Resurfacing Expenditure



Source: Roads ACT, *A Sustainable Maintenance Strategy for Roads*

4.70 Roads ACT is seeking ways in which to reduce the backlog such as trialling of alternative road surfacing methods using recycled materials. For example used printer toner, which is included in the final asphalt mix to extend the life of road surface and lower life cycle costs. While this is recognised, given the importance of the issue, a long-term strategy is warranted.

RECOMMENDATION 11 ADDRESSING THE BACKLOG

Roads ACT should develop a long-term strategy for reducing the road maintenance backlog.

Evaluation of Maintenance

Internal Measurement and Reporting

Level of Service

4.71 The Roads ACT Strategic Asset Management Plan includes three levels of service for road maintenance as shown in Table 4-3.

Table 4-3 Levels of service for road pavement maintenance 2015-16

Maintenance items	Levels of service 2015-16 Target	Levels of service 2015-16 Actual
Routine maintenance		
Field inspections	3 yearly for territorial and municipal roads	Target levels of service met.
Potholes and edging	Repaired within 1 week	85 percent
Heavy patching	1-12 months based on priority	Heavy patching is an annual program of 1-12 months. Target levels of service met.

Source: Roads ACT *Strategic Asset Management Plan 2013*

4.72 Roads ACT has largely met the service level requirements outlined in the SAMP for road pavement maintenance with two of the three targets fully met and the other met 85 percent of the time.

4.73 The appropriateness of the service level targets for road maintenance were reviewed during this audit (the measurement of the target was not reviewed) and it was found that:

- the inspection frequency service level target (such as 3 yearly for territorial and municipal roads) is appropriate and field inspections of territorial and municipal roads were undertaken in line with the service level target.
- service level targets relating to response times for heavy patching, potholes and edging were appropriate.

4.74 The actual levels of service were validated during the audit through a review of data held in IAMS, Access Canberra, inspection reports and ARRB asset condition reporting and found:

- In 2015-16 there were approximately 3 051 public enquiries made regarding Road Pavement. Approximately 1 338 of those enquiries related to potholes ;
- Roads ACT had met the heavy patching program level of service.
- Roads ACT had repaired the potholes and edging within one week 85 percent of the time and defects were repaired between one and two weeks 93 percent of the time.

4.75 Roads ACT have undertaken inspections of territorial and municipal roads in accordance with service level standards. They have also responded to approximately 1 338 damage or defect reports relating to potholes and edging, and fixed the damage within one week, 85 percent of the time.

External Reporting

4.76 Table 4-4 shows Roads ACT's performance against its four accountability indicators for road pavement over the last five years. Figure 4-3 shows resurfacing for territorial and municipal roads.

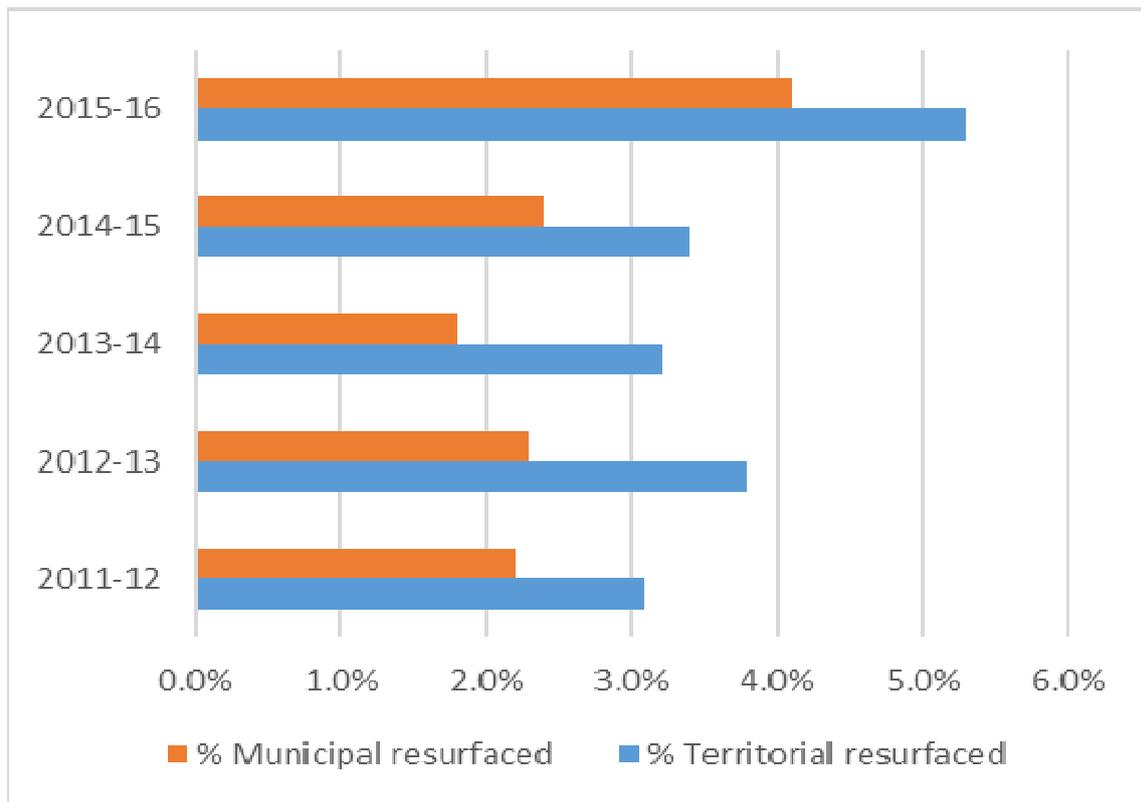
Table 4-4 Road pavement accountability indicator results 2011-12 to 2015-16

Accountability Indicator	Target (unchanged since 2011-12)	2011-12	2012-13	2013-14	2014-15	2015-16
a. % territorial roads resurfaced	5%	3%	4%	3%	3%	5%
b. % municipal roads resurfaced	4%	2%	2%	2%	2%	4%
c. % customers satisfied with public road network	>70%	85%	64%	61%	90%	85%
d. % territorial roads in good condition	>86%	88%	89%	89%	89%	90%

Source: Territory and Municipal Services Annual Reports 2011-12 to 2015-16

4.77 The ACT Government's performance target for road resurfacing was met in 2015-16 as a direct result of additional funding through the Roads to Recovery Program. However, prior to 2015-16, these resurfacing targets had not been met for some time (2010-11 for territorial roads and 2007-08 for municipal). The targets for the percentage of customer satisfaction and territorial roads in good condition have also been met.

4.78 The percentage of territorial roads in good condition is greater than 86 percent. The results have remained around 89 percent from 2011-12 to 2015-16 which indicates that a high proportion of ACT roads provide good ride comfort. It also means the ride quality on 11 percent of territorial roads is rated as fair to poor.

Figure 4-3 Road resurfacing – territorial and municipal roads 2011-12 to 2015-16

Source: Annual Reports and Productivity Data 2011 - 2016

4.79 The quality of the road pavement accountability indicators was considered during the audit and were found to be appropriate as:

- Roads ACT has calculated the amount of resurfacing that needs to be completed each year in order to sustain ACT roads at an acceptable level to be 5 percent for territorial roads and 4 percent for municipal roads based on asset age and the road pavement life; and
- The percentage of roads in good condition is based on the International Road Roughness Index (IRR) which measures deviations in the longitudinal road profile. The service standard for good road condition is defined by the International Roughness Index as a road with an IRR less than 4.2m per km. The IRR is measured as part of the condition assessments of territorial roads undertaken each year by ARRB on behalf of Roads ACT.

4.80 In 2012, Roads ACT commissioned ARRB to benchmark the percentage of road resurfacing undertaken in the ACT against other states and territory road authorities as well as two major councils.

4.81 Table 4-5 outlines the results for state and territory roads and Table 4-6 outlines the results for municipal and council roads (as examined by the ARRB).

Table 4-5 Percentage of road resurfacing (state and territorial roads)

Year	ACT (Territorial roads)	NT	NSW	QLD	SA
2008-09	NA	5.29	10.10	7.35	6.38
2009-10	4.6	4.99	11.22	7.18	5.85
2010-11	5.7	4.12	9.59	NA	NA
2011-12	3.1	4.63	NA	NA	NA

Source: ARRB Study 2012, ACT data from Roads ACT

Table 4-6 Percentage of road resurfacing (municipal and council roads)

Year	ACT (Municipal roads)	Rockdale City Council, NSW (Council roads)	Bankstown City Council, NSW (Council roads)
2008-09	3.4	2.09	0.91
2009-10	2.9	1.87	0.51
2010-11	2.0	2.60	0.24
2011-12	2.2	0.53	N/A

Source: ARRB Study 2012, ACT data from Roads ACT

- 4.82 ARRB found that for the majority of road authorities and councils, the current level of road resurfacing for state and territorial roads was substantially lower than levels achieved in other jurisdictions. For example, in 2011-12 the ACT resurfaced 5.7 percent of territorial roads whereas NSW resurfaced 9.59 percent of its equivalent roads.
- 4.83 Regarding municipal and council roads, ARRB found that the level of road resurfacing by the ACT for municipal roads was higher than the councils assessed in the report.
- 4.84 In 2012 the ARRB advised that if the current resurfacing rate of territorial roads in the ACT was to remain unchanged the resulting increased age of the roads would increase the risk of rapid pavement deterioration.

4.85 In 2015, Roads ACT engaged ARRB to undertake to model what the territorial road condition would be by 2023 (in line with best practice) based on its existing condition data and if road maintenance spending remained relatively constant. The study found that the road condition would deteriorate and the deterioration would increase:

- the length of roads with more than 5 percent cracked area increasing from 19 percent of the total network currently affected to 34 percent;
- the length of road with 8mm average rutting would increase from 11 percent to over 17 percent of the total road length; and
- the proportion of rough roads would increase from 11 percent to 18 percent.

4.86 ARRB (2015) advised that by 2023 road condition deterioration would increase (cracking going from 19 to 34 percent, rutting from 11 to 17 percent and rough roads from 11 to 18 percent). And, also further advised that if the current resurfacing rate of territorial roads in the ACT was to remain unchanged the risk of rapid pavement deterioration will increase. This highlights the importance of preventative maintenance.

5 COMMUNITY PATHS

5.1 This chapter examines the arrangements implemented by Roads ACT to manage the maintenance of community paths.

Summary

Conclusion

A comprehensive inspection program covering community paths in the Territory is needed to reduce the risk of major maintenance in the long term and extend the useful life of paths. In the absence of such a program, Roads ACT has used a risk based approach and undertakes inspections in high priority locations which cover 26 (24 percent) of Canberra's 110 suburbs and in response to complaints. In the absence of a comprehensive inspection program, targeting inspections and reactive maintenance at high priority locations is appropriate, however, these locations were last reviewed in 2010 presenting a risk that some suburbs that should be included are not.

Roads ACT achieved the majority of its internal performance (service level) targets relating to maintenance of community paths most of the time in 2015-16. While these along with other aspects of its maintenance activities can be improved, a major challenge for Roads ACT will be maintaining community paths as they rapidly age given budgetary limitations. There is a need for an assessment of future maintenance costs to be updated and included in the Transport Canberra and City Services' Strategic Asset Management Plan and this information used to inform budget proposals.

Key findings

	Paragraph
Maintenance of community paths could be improved by developing a renewal program for the timely replacement of older sections of community paths, across the Territory.	5.15
The Roads ACT <i>Asset Management Operational Plan for Community Paths</i> is out of date and does not have information on operating costs, resource requirements or environmental impacts associated with the maintenance of community paths. This information can be used to assist in effectively managing maintenance activities.	5.20
Of Canberra's 110 suburbs, 26 (24 percent) include locations assessed as high priority by Roads ACT for undertaking planned inspections of community paths. The planned inspections are in accordance with the priority rating for the location. However, since 2010, Roads ACT has not reviewed locations for their priority rating (based on the frequency of use and pedestrian mix, past compensation claims and	5.28

pedestrian ‘generators’ such as shopping centre precincts) which determines the frequency of inspections.

There is no systematic approach for conducting inspections of the condition and safety of community paths that are not in high priority locations. As a result, Roads ACT is unable to reliably determine whether paths not in high priority locations (approximately 77 percent of community paths in Canberra) need to be maintained for safety or to expand their life span. A systematic approach would assist in avoiding higher costs resulting from a failure to identify and rectify small defects before they become large. 5.35

Information recorded in the Transport Canberra and City Services Integrated Asset Management System (IAMS) on community paths is updated on completion of repairs and maintenance. IAMS provides important management information and is extensively used to guide maintenance activities. 5.39

The Concrete Works Panel for the maintenance of community paths was established through an open tender process and in accordance with ACT Government’s requirements (‘Standard Conditions of Contract and Tenders’). 5.44

Contract documentation was reviewed for six of the ten contractors on the Concrete Works Panel. For these six contractors, there was sufficient documentation of compliance with the requirements of the Concrete Works Panel, including the schedule of rates, approved temporary traffic management plans and progress reports on maintenance work. However, there were no environmental management plans to address adverse environmental impacts of the works and specify how these impacts will be addressed. 5.47

Roads ACT does not verify that the concrete used in community paths complies with the Design Standard strength requirements. Instead, Roads ACT relies on the strength quoted in the concrete supplier dockets provided by contractors which indicate the strength of the concrete mix. 5.49

Information on the maintenance of community paths is recorded in the Transport Canberra and City Services’ Integrated Asset Management System (IAMS). Roads ACT (Road Maintenance Section) uses monthly management (productivity) reports produced from IAMS to monitor the costs of community path maintenance against budget. 5.51

While the Roads ACT 2013 *Strategic Asset Management Plan* identifies that there is a ‘rapidly aging profile of the community path asset’ and that ‘this is forecast to become a significant budget constraint for Roads ACT’, if the non recurrent funding provided in 2011-12 and 2012-13 is disregarded, the annual maintenance budget 5.57

has remained relatively stagnant since 2011-12. Furthermore, the length of community paths increased by 13 percent over this period.

According to the *Community Path and Cycle Lane Project List* ' around 100 (67 percent) of the potential community paths upgrade projects were in high priority locations. In the 2016-17 Budget, Roads ACT was allocated \$1.5 million in funding for the construction of new paths but no funds have been allocated for these projects in the forward years from 2017-18 to 2019-20. Assessing the likely cost of these maintenance requests would allow Roads ACT to develop a more accurate budget for forward years. 5.62

Roads ACT achieved the majority of its performance (service level) targets relating to maintenance of community paths most of the time in 2015-16. Inspections were carried out in higher risk areas every one or two years, repairs or work (trip hazards) were addressed within seven business days (83 percent of the time) and complaints in relation to high use and pedestrian areas were addressed within five or seven days respectively (83 percent of the time). However, there was no evidence that the replacement of paving or concrete in general or shopping areas was occurring within the target timeframe of ten business days. 5.64

Context

- 5.2 Community paths consist of footpaths and cycle paths and include public pavements around shopping centres and town centres. These are used by pedestrians, cyclists and low speed motorised mobility devices (electric wheelchairs and mobility scooters or buggies that cannot travel over ten kilometres per hour).
- 5.3 Roads ACT is responsible for maintaining community paths in the ACT, except for those located at the Australian National University, University of Canberra, some Commonwealth departments (Defence, Education and Health), Commonwealth land, land managed by the National Capital Authority (NCA) and private leases.
- 5.4 Roads ACT maintains approximately 2 870 kilometres of community paths in Canberra's 110 suburbs. These consist of 2 430 kilometres of footpaths and 440 kilometres of off-road cycle paths and, in 2015-16, cost approximately \$3 million to maintain.
- 5.5 Users of community paths need to be able to walk or ride on these paths in safety. Paths should therefore be free of trip hazards, obstructions and debris (broken glass, gravel deposited from storms and water). Community paths should not be excessively slippery or steep.

- 5.6 To keep users safe, community paths should be repaired in a timely manner when damage or other defects occur. Damage and other defects to community paths may result from aging infrastructure, adverse weather conditions, heavy vehicles or tree roots lifting the paths.
- 5.7 Information on community paths including their size, type, condition, reported defects, inspections and repairs and maintenance is recorded in the Transport Canberra and City Services' Integrated Asset Management System (IAMS).

Developing a maintenance program for community paths

- 5.8 A maintenance program is a series of maintenance projects that are planned to be undertaken within a given period (generally within one year). It typically includes information on the location, activity types, cost and duration of the maintenance projects.
- 5.9 As discussed in Chapter 3 Road Pavement, a comprehensive planned maintenance program keeps paths in a satisfactory condition and safe for all users.
- 5.10 As the majority of community paths in the Territory are concrete based, preventative maintenance cannot be undertaken, as there are no preventative actions such as resurfacing available. As a result, only corrective actions such as path replacement or repair can be undertaken in response to identified defects.
- 5.11 To identify defects, Roads ACT need to develop a comprehensive inspection program across the Territory. This issue is discussed further from paragraph 5.21.
- 5.12 The Roads ACT *Asset Management Operational Plan for Community Paths in the ACT (2010)* (the Roads ACT Operational Plan) states that Roads ACT is:
- ... targeting areas such as high use paths, locations where significant numbers of compensation claims have resulted and where there is a high number of elderly persons using the paths for inspection and repairs. This strategy is providing the best impact for the available maintenance funding.
- 5.13 The *Lifecycle Management – Community Paths* section of the Transport Canberra and City Services *Strategic Asset Management Plan' (June 2013)*, identifies a potential asset renewal program that would gradually replace older sections of paths across the Territory. It states that:
- ... the expected benefits include:
- (i) reduced requirements for planned and routine maintenance; and
 - (ii) forward planning and potential integration of the renewal program into the capital works program and long term planning of the asset.
- 5.14 Roads ACT has a list of planned capital upgrade projects for community paths, however, it does not have a renewal program for the timely replacement of older sections of community paths across the Territory.

- 5.15 Maintenance of community paths could be improved by developing a renewal program for the timely replacement of older sections of community paths, across the Territory.

RECOMMENDATION 12 MAINTAINING COMMUNITY PATHS

Roads ACT should develop and implement a:

- a) renewal program for the timely repair of defects across the Territory; and

Operational plan for community paths

- 5.16 The Roads ACT *Asset Management Operational Plan for Community Paths in the ACT* (2010) has a detailed description of service levels for community paths with policies and issues relating to the maintenance of community paths. However, the most recent version of this plan is dated 2010. Under the plan's review timeframes, it should have been reviewed three times since 2010. Refer to Recommendation Six (a) for a recommendation in relation to this matter.
- 5.17 The Roads ACT *Asset Management Operational Plan for Community Paths in the ACT* contains information on:
- the objectives of the Operational Plan;
 - high priority locations and frequency of inspections;
 - maintenance activities;
 - key outcome areas (such as reduction in risks to users of paths and a reduced maintenance backlog);
 - community path assets;
 - repair methodology for concrete paths; and
 - a process for monitoring progress.
- 5.18 However, the Roads ACT *Asset Management Operational Plan for Community Paths in the ACT* does not include information on:
- estimated operating costs;
 - environmental impacts of maintenance activities; and
 - staffing and resource requirements.
- 5.19 This information is needed for Roads ACT to effectively manage its operations, including managing its operations to budget, preventing a backlog of maintenance and addressing the environmental impact of maintenance work.

- 5.20 The Roads ACT *Asset Management Operational Plan for Community Paths* is out of date and does not have information on operating costs, resource requirements or environmental impacts associated with the maintenance of community paths. This information can be used to assist in effectively managing maintenance activities.

RECOMMENDATION 6 OPERATIONAL PLANS

Roads ACT should:

- c) update its *Asset Management Operational Plan for Community Paths in the ACT* to include information on the staff, resources and estimated costs to maintain community paths and the environmental impacts of maintenance work; and

Identifying required maintenance

- 5.21 Maintenance projects for community paths are identified primarily from:
- planned inspections in locations assessed as high priority by Roads ACT. The high priority locations cover 26 (24 percent) of the Territory's 110 suburbs; and
 - community feedback provided through Access Canberra and observations of field officers from Roads ACT.

- 5.22 In relation to high priority locations, the Roads ACT Operational Plan states:

... All suburbs are given a ranking based on the frequency of use and pedestrian mix, higher usage areas receive early treatment followed by suburbs with less usage and so on. In time it can be expected that all suburbs will have been systematically inspected and repaired...

Based on frequency of use, past compensation claims, and pedestrian generators such as shopping centre precincts, Strategic Asset Management identified 26 suburbs as high replacement priorities... Other community paths located within the Territory are inspected and scheduled for replacement on a reactive basis.

- 5.23 Maintenance projects are prioritised based on recorded defects and their associated risk rating identified during inspections, community feedback and observations of field officers from Roads ACT.

High priority locations

- 5.24 High priority locations cover approximately 24 percent of all community paths. These are mainly identified through demographic characteristics of a suburb such as the age of residents, mobility needs, disability needs of residents and location (for example, near schools and hospitals).

- 5.25 According to the Roads ACT Operational Plan, high priority locations are based on:

- frequency of use and pedestrian mix;
- past compensation claims; and

- pedestrian ‘generators’ such as shopping centre precincts.

5.26 High priority locations are assigned a priority rating which determines the frequency of inspections of community paths. The high priority locations and frequency of inspections are shown in Table 5-1.

Table 5-1 High priority locations and frequency of inspections of community paths

High priority locations	Priority	Inspection frequency
City centre (Civic)	1	1 year
Town centres (Woden, Belconnen, Tuggeranong, Gungahlin)	2	2 years
Community facilities (hospitals, nursing homes, aged care facilities, hospices, schools and entertainment facilities)	2	2 years
Group Centres (Braddon, Phillip, Dickson, Belconnen, Erindale and Jamison)	3	3 years
Local centres (Local suburban shops offering limited shopping facilities)	3	3 years
Industrial centres (Fyshwick, Mitchell, Hume)	3	3 years
Cycle paths	3	3 years
Residential areas	4	4 years

Source: Roads ACT Asset Management Operational Plan for Community Paths in the ACT (2010)

5.27 Planned inspections of community paths in high priority locations include the reduction of any potential trip hazards (comprising of vertical displacements of 12 to 35 mm or greater) by a mechanical pavement grinder. Additionally, visual inspections are conducted by field officers from Roads ACT. Under the Roads ACT Operational Plan defects in community paths are risk rated and prioritised as shown in Table 5-2.

Table 5-2 Risk rating assigned to defects in community paths

Risk rating	Definition
Very high to extreme risk	Defect could result in injury to users or damage to property
High risk	Defect is a potential hazard in an area of frequent use by pedestrians
Low to medium risk	Defect could cause problems in low use areas
Very low risk	Defect assessed to be a very low risk

Source: Roads ACT Asset Management Operational Plan for Community Paths in the ACT (2010).

5.28 Of Canberra’s 110 suburbs, 26 (24 percent) include locations assessed as high priority by Roads ACT for undertaking planned inspections of community paths. The planned inspections are in accordance with the priority rating for the location. However, since 2010, Roads ACT has not reviewed locations for their priority rating (based on the frequency of use and pedestrian mix, past compensation claims and pedestrian ‘generators’ such as shopping centre precincts) which determines the frequency of inspections.

- 5.29 As assessments of high priority locations and their priority rating will become outdated as the population density and needs of residents change, the priority locations and risk ratings for inspections need to be reviewed on a sufficiently regular basis so they are kept up to date and meet the criteria listed in paragraph 5.25.

RECOMMENDATION 13 HIGH PRIORITY OF LOCATIONS OF COMMUNITY PATHS

Roads ACT should review the list of high priority locations of community paths, and their priority rating, on a biennial basis and update the *Asset Management Operational Plan for Community Paths* and *Strategic Asset Management Plan* for the results of these reviews.

Identification of maintenance in lower priority locations

- 5.30 The Roads ACT Operational Plan discusses lifecycle management for community paths and estimates that:

... 60% of the asphalt and concrete paths network will reach or exceed the expected life span of 50 years by 2030. The existing inspection systems are expected to identify areas when path replacement is required.

- 5.31 A planned program of inspections assists in the timely identification of where the replacement of community paths is needed. A planned program also assists in the detection of areas where maintenance is needed to prevent the early deterioration of paths. The Transport Canberra City Services *Strategic Asset Management Plan* identifies the financial benefits of timely identification and rectification of defects:

It is economical to repair lower priority defects before they become larger defects... It should be noted that failing to address the existing and on-going backlog could result in the accrual of a significant backlog by 2022...

- 5.32 A planned program of inspections is not performed for community paths in locations that have not been assessed by Roads ACT as high priority. These lower priority locations represent approximately 77 percent of community paths in Canberra. For these locations, Roads ACT relies on the reporting of defects by members of the public that have been lodged as a complaint through Access Canberra, or defects reported by field officers from Roads ACT.

- 5.33 Roads ACT has identified areas where its approach to inspections could potentially be improved. The Transport Canberra City Services *Strategic Asset Management Plan* states that:

Roads ACT is currently considering a revision to the current inspection regime, which could allocate a condition rating to paths as part of the routine and planned inspections. This information could greatly assist in assessing the physical condition of the asset group as a whole, as well as evaluating the amount of funding that is required to be spent in order to maintain the network to the required level of service.

- 5.34 The Director of Roads ACT advised that an updated version of the Roads ACT Operational Plan, currently in draft form, includes a condition rating system for paths. This draft was

not sufficiently developed for an assessment to be made by the Audit Office at the time of the audit fieldwork.

- 5.35 There is no systematic approach for conducting inspections of the condition and safety of community paths that are not in high priority locations. As a result, Roads ACT is unable to reliably determine whether paths not in high priority locations (approximately 77 percent of community paths in Canberra) need to be maintained for safety or to expand their life span. A systematic approach would assist in avoiding higher costs resulting from a failure to identify and rectify small defects before they become large.

RECOMMENDATION 12 MAINTAINING COMMUNITY PATHS

Roads ACT should develop and implement a:

- b) planned program of inspections of the condition and safety of community paths that are not in high priority locations. The frequency of inspections should be sufficient to reliably determine whether maintenance of paths is needed.

Recorded information on community paths

- 5.36 Defects identified from planned inspections, community feedback and observations of field officers from Roads ACT are recorded in the Integrated Asset Management System (IAMS). IAMS automatically generates a work order which is issued to Roads ACT maintenance staff and provides the basis for the management of work undertaken by contractors. Information on the condition of community paths recorded in IAMS is used to inform the maintenance undertaken. This information includes:
- the length and area of community paths in Canberra. Other information such as driveways, pram crossings and vehicle crossings is also recorded;
 - inspection results for high priority locations and the path type (asphalt, concrete, pavers etc) quantity, condition and defects in these locations; and
 - information on defects reported by members of the public or reported by field officers from Roads ACT. This includes the type of defect, number of defects, inspection date and the estimated and actual cost of maintenance.
- 5.37 On completion of the maintenance work, Works Orders are 'closed off' within IAMS and the defect is recorded in IAMS as having been repaired.
- 5.38 IAMS contains information on community paths size, condition, reported defects, inspections, repairs which allows Roads ACT to monitor and manage maintenance work.
- 5.39 Information recorded in the Transport Canberra and City Services Integrated Asset Management System (IAMS) on community paths is updated on completion of repairs and maintenance. IAMS provides important management information and is extensively used to guide maintenance activities.

5.40 Information recorded in IAMS is discussed further at paragraphs 5.42 and 5.51.

Delivering maintenance

Contracts for maintenance of community paths

5.41 Roads ACT contracts out all maintenance of community paths through a Concrete Works Panel. The Concrete Works Panel has ten suppliers, was established in December 2015 and expires in November 2017.

5.42 Information on community paths including their size, type, condition, reported defects, inspections and repairs and maintenance is recorded in IAMS. Roads ACT uses this information to monitor maintenance work on community paths.

5.43 When there are a sufficient number of defects identified for a work order to be issued, draft work orders are provided to several contractors on the Concrete Works Panel for a price quotation. Roads ACT assess these quotations and a final work order is issued. The successful Contractor is selected on set evaluation criteria which include price and the availability of the contractor to undertake the work.

5.44 The Concrete Works Panel for the maintenance of community paths was established through an open tender process and in accordance with ACT Government's requirements ('Standard Conditions of Contract and Tenders').

5.45 A standard panel contract for maintenance has been established. The panel contract includes:

- the standard of quality that is required for community paths ('ACT Standard Drawing - DS13 Standard Path Details');
- an environmental management plan which addresses adverse environmental impacts of the works and specifies how these will be addressed;
- a work health and safety and rehabilitation plan;
- a schedule of rates;
- the approved temporary traffic management plans; and
- time and cost information and progress reporting of maintenance works.

5.46 The required standard of quality for community paths, is specified in the panel contract as the *Design Standards for Urban Infrastructure*, Section 13: *Pedestrian and Cycle Facilities* and *ACT Standard Drawing - DS13 Standard Path Details*. These standards were examined during the audit by the Subject Matter Expert and assessed to be appropriate as they addressed usual areas of path design such as width, depth, crossfall, concrete grade, joints details and spacing (for expansion joints and weakened plane joints) and base materials.

- 5.47 Contract documentation was reviewed for six of the ten contractors on the Concrete Works Panel. For these six contractors, there was sufficient documentation of compliance with the requirements of the Concrete Works Panel, including the schedule of rates, approved temporary traffic management plans and progress reports on maintenance work. However, there were no environmental management plans to address adverse environmental impacts of the works and specify how these impacts will be addressed.

RECOMMENDATION 5 ENVIRONMENTAL MANAGEMENT PLANS

Roads ACT should:

- b) include environmental management plans, in their maintenance contracts, which address the adverse environmental impacts of the work on community paths and specify how these impacts will be addressed.

Quality of concrete used to maintain community paths

- 5.48 The quality of concrete to be used in the maintenance of community paths is detailed in the *ACT Standard Drawing - DS13 Standard Path Details*.
- 5.49 Roads ACT does not verify that the concrete used in community paths complies with the Design Standard strength requirements. Instead, Roads ACT relies on the strength quoted in the concrete supplier dockets provided by contractors which indicate the strength of the concrete mix.
- 5.50 It may be uneconomical for Roads ACT to undertake regular testing of the strength of concrete used in community paths, particularly where small volumes are involved. However, relying solely on suppliers to use concrete that meets strength requirements presents a higher risk of sub-standard repairs, particularly where contractors are aware that no verification of concrete strength will be performed. As any use of sub-standard concrete may not be detected, or become evident, for a long time after the maintenance work has been performed, it may not be possible to hold the contractor to account for sub-standard maintenance work.

RECOMMENDATION 14 QUALITY CONTROL

Roads ACT should implement a system of verifying that concrete used by contractors to maintain community paths comply with ACT Government design standards.

Management reporting on the performance of maintenance contractors

- 5.51 Information on the maintenance of community paths is recorded in the Transport Canberra and City Services' Integrated Asset Management System (IAMS). Roads ACT (Road Maintenance Section) uses monthly management (productivity) reports produced from IAMS to monitor the costs of community path maintenance against budget.

Cost to maintain community paths

- 5.52 The cost of maintenance work on community paths varies according to the type of repair. For example, under the Current Panel Contract (which ceases in November 2017) the cost of maintenance work on footpaths ranges from approximately \$133 per m² to \$301 per m²; vehicular crossings from approximately \$189 per L/m to \$223 per L/m; and pram crossings averaging \$1 005 per item.
- 5.53 The length of community paths and their annual maintenance budget over the past five years from 2011-12 to 2015-16 is outlined in Table 5-3.
- 5.54 The community paths maintenance budget in 2011-12 and 2012-13 included an additional \$1.6 million per annum to:

... assist in realising the Sustainable Transport Plan objectives to... provide improved cycling and walking infrastructure for users in the ACT.

Table 5-3 Length of community paths and their annual maintenance budget

	2011-12	2012-13	2013-14	2014-15	2015-16
Maintenance budget	\$5 000 000	\$4 300 000	\$3 324 000	\$3 776 000	\$3 310 000
Length of community paths	2 533 km	2 633 km	2 729 km	2 820 km	2 870 km
Maintenance budget per km	\$1 973 per km	\$1 633 per km	\$1 218 per km	\$1 339 per km	\$1 153 per km

Source: Roads ACT 10-Year Summary and Annual Reports for the Territory and Municipal Services Directorate³.

- 5.55 Community paths created by the Land Development Agency and private developers as part of the development of sub-divisions are gifted to Transport Canberra and City Services for management by Roads ACT. When community paths are gifted to Transport Canberra and City Services, the Roads ACT's Road Maintenance Section is responsible for their maintenance, including responding to reported defects. Community paths have increased in recent years due mainly to residential land developments.
- 5.56 The Transport Canberra and City Services *Strategic Asset Management Plan* identifies a backlog of low priority maintenance projects valued at approximately \$4.8 million and notes that maintenance budgets focus on high and medium priority works. It states that:

It is economical to repair lower priority defects before they become larger defects... It should be noted that failing to address the existing and on-going backlog could result in the accrual of a significant backlog by 2022...

... the rapidly aging profile of the community path asset is forecast to become a significant budget constraint for Roads ACT, which is likely to require a significant capital investment in the future.

³ The Territory and Municipal Services Directorate merged with the Capital Metro Agency to form the new Transport Canberra and City Services Directorate (TCCS) from 1 July 2016. TCCS became responsible for the maintenance of community paths from 1 July 2016. Prior to 1 July 2016, these responsibilities resided with the former Territory and Municipal Services Directorate.

- 5.57 While the Roads ACT 2013 *Strategic Asset Management Plan* identifies that there is a ‘rapidly aging profile of the community path asset’ and that ‘this is forecast to become a significant budget constraint for Roads ACT’, if the non recurrent funding provided in 2011-12 and 2012-13 is disregarded, the annual maintenance budget has remained relatively stagnant since 2011-12. Furthermore, the length of community paths increased by 13 percent over this period.
- 5.58 As indicated previously at paragraphs 5.21, defects may be identified from planned inspections, community feedback and observations of field officers from Roads ACT. These may require maintenance or, in more severe cases, the replacement or upgrading of paths.
- 5.59 Community members may also report areas where community paths need to be upgraded and, for example, may suggest that paths be widened or built to improve connectivity between residential areas and common trip destinations such as schools, aged care, public transport and health facilities.
- 5.60 In November 2016, Roads ACT advised that there were 150 requested upgrade projects that would require in excess of \$6.0 million to complete.
- 5.61 However, Roads ACT advised that:
- All requests are accepted (regardless of merit) and assessed against established criteria. Not all are supported, but are recorded in cumulative priority order.
- Location alone does not determine priority... The number of requests will continue to rise indefinitely as more requests are received and assessed. This does not imply that all should, or could, ever be implemented.
- 5.62 According to the *Community Path and Cycle Lane Project List* ‘ around 100 (67 percent) of the potential community paths upgrade projects were in high priority locations. In the 2016-17 Budget, Roads ACT was allocated \$1.5 million in funding for the construction of new paths but no funds have been allocated for these projects in the forward years from 2017-18 to 2019-20. Assessing the likely cost of these maintenance requests would allow Roads ACT to develop a more accurate budget for forward years.

RECOMMENDATION 15 COST OF MAINTAINING AND UPGRADING COMMUNITY PATHS

Assessments of the future costs of maintaining and upgrading community paths and the related funding requirements should be updated and included the Transport Canberra and City Services *Strategic Asset Management Plan*.

Performance in maintaining community paths

5.63 The seven levels of service for the maintenance of community paths is disclosed in the Transport Canberra and City Services *Strategic Asset Management Plan* is shown in Table 5-4.

Table 5-4 Levels of service for community paths

No.	Maintenance items	Levels of service 2015-16 Target	Levels of service 2015-16 Actual
Routine maintenance			
1	Repair or make safe	Trip hazard > 15 mm within 7 business days	83%
2	If paving or concrete to be replaced – general/shopping centres	Within ten business days	No evidence of monitoring
Response to public complaints			
3	Complaints in high use district	Fixed within five business days	83%
4	Complaints of a potential hazard in high pedestrian area	Fixed within seven business days	83%
5	Complaints in low use areas	Fixed within six months	Not audited
Inspection frequency			
6	Very high risk areas – Civic	Yearly inspections	Yearly inspections performed
7	Town centres aged care units	Every two-year inspections	Inspections performed every two years

Source: TCCS *Strategic Asset Management Plan* June 2013.

5.64 Roads ACT achieved the majority of its performance (service level) targets relating to maintenance of community paths most of the time in 2015-16. Inspections were carried out in higher risk areas every one or two years, repairs or work (trip hazards) were addressed within seven business days (83 percent of the time) and complaints in relation to high use and pedestrian areas were addressed within five or seven days respectively (83 percent of the time). However, there was no evidence that the replacement of paving or concrete in general or shopping areas was occurring within the target timeframe of ten business days.

RECOMMENDATION 16 SERVICE LEVEL TARGETS

Roads ACT should maintain records of the timeliness of the replacement of paving or concrete in general and for shopping areas and monitor whether replacements are made within target timeframes.

6 TRAFFIC SIGNALS

6.1 This chapter examines the arrangements implemented by Roads ACT to manage the maintenance of traffic signals.

Summary

Conclusion

The majority of signal assets are operating beyond their design life and need replacing. A replacement schedule to guide this is needed.

The management of traffic signal maintenance activities could be improved by Roads ACT updating their strategic plan for the maintenance of traffic signals (last updated in 2005), improving contract management arrangements and better monitoring maintenance activities.

Replacing incandescent lanterns with Light Emitting Diodes (LEDs) in traffic signals is a progressive initiative that achieves several objectives; increasing longevity of lights, road safety and reducing greenhouse gas emissions.

Key findings

Currently around 70 percent of traffic signals have been converted to LED. Roads ACT advised that they expect to convert the remainder by 2024, subject to funding, and expect that this will reduce electricity consumption by about 60 percent per site. This also has a consequential affect on road safety as fewer repairs means a reduction in disruption to traffic.

Paragraph

6.17

While the increasing risk of obsolescence of traffic signal components was identified by Roads ACT in 2005, and 2013 (as 36 percent of their traffic signal sites were older than their useful life of 25 years), a comprehensive replacement schedule for all components has not been developed. Without a comprehensive replacement schedule, for all traffic signal components, the frequency of faults will increase as the components age beyond their design life, resulting in increased risks to road safety.

6.21

Roads ACT's operational plan (titled (2005) *Strategic Plan for Traffic Signals in the ACT*) met the majority of the requirements of an operational plan, however it lacked information on staffing and resourcing requirements (including training) which impacts on Roads ACT effectively planning for resource allocation. It has not been updated since 2005 and may therefore not reflect contemporary practices.

6.31

The delivery of traffic signals maintenance has historically been outsourced under contract with Ecowise Services (Australia) Pty Ltd (Ecowise) which was awarded the Traffic Signal Maintenance Contract in July 2016 for a three year period with two consecutive one year extensions possible. Roads ACT advised that it has not sought to deliver this service in-house due to the very specific expertise requirements which are not widely available in the labour market place

6.33

The traffic signals contract includes a requirement for environment management plans. The Contractor's procedure for Traffic Signal and Cameras – Maintenance and Repair (Procedure T 102) was noted to include a section on environmental hazards and controls for Detector Loop installation, taking into account potential noise, air, and water pollution

6.40

However, the following deviations from good contract management for managing traffic signals existed:

6.41

- In the monthly progress report for July 2016, the Preventative (planned) Maintenance undertaken for the month was different to that of the Preventative (planned) Maintenance Program. Roads ACT advised that the contractor has been given flexibility in undertaking Preventative (planned) Maintenance. However, Roads ACT does not track Preventative (planned) Maintenance undertaken against the Program based on monthly reports.
- The monthly report provided to Roads ACT by Ecowise includes the number of faults for the month, it does not identify the number of critical or major faults.
- Roads ACT do not reconcile at the end of each year the monthly reports against the Maintenance (planned) Program to check that all planned work was completed. There is the potential for preventative maintenance on traffic signals not to be undertaken as programmed which creates a risk to the serviceability of traffic signals and in turn public safety.

Reports provided by the contractor for the maintenance of traffic signals include information that aligns with contract requirements such as faults repaired, routine services completed, response times and the status of spare items; however, the monitoring of service levels for traffic signals could be improved through the inclusion of response times (between advice of fault and the repair) and the number of major faults.

6.52

The levels of service for traffic signals were reviewed during the audit however, as not all the service levels for traffic signals are monitored and reported, results could not be validated.

6.53

Context

- 6.2 Roads ACT's *Strategic Plan for Traffic Signals in the ACT* (the 2005 Strategic Plan for Traffic Signals) describes a traffic signal as a visual signal to control the flow of traffic. It is a signalling device usually positioned at a road intersection or pedestrian crossing to indicate when it is safe to drive, ride or walk, using a universal colour code. Traffic signals are valuable devices for the control of vehicle and pedestrian traffic in circumstances where these could potentially conflict with each other.
- 6.3 Traffic signals are installed at intersections, pedestrian crossings, road crossing and flood warning sites. The asset is considered by the public as a high importance assets for the road network. New signalised intersections and crossings are progressively installed in the ACT, with around 10 signals installed each year. In 2015-16 Roads ACT maintained 321 Traffic signals and 48 signalised pedestrian crossings.
- 6.4 To manage traffic flow, Roads ACT use SCATS (i.e. Sydney Coordinated Adaptive Traffic System), an electronic urban traffic control system. The system is used in over 27 countries and is designed to deliver measurable reductions in road travel times and delays
- 6.5 Traffic Signal assets are expected to be operational at all times. The percentage of time a Traffic Signal asset is fully operational is an indication of its performance. A vehicle colliding with a traffic signal pedestal or, occasionally, the signal controller itself is the causes of most damage to traffic signals. This may be as a consequence of a vehicle/vehicle collision or due to a single vehicle losing control, an event that is more likely to occur in wet weather. The damage caused varies and depends upon such things as the speed of impact, size of vehicle, type and number of signal lanterns damaged.

Developing a maintenance program for traffic signals

- 6.6 The *2013 Traffic Signals Lifecycle* plan (developed as part of the *2013 Roads ACT Strategic Asset Management Plan*) states that:
- ... much of the signal assets continue to operate beyond their design life and it is expected that faults will increase. The satisfactory performance of the assets despite their age may be attributed to the proper maintenance and the local environmental condition such as the dry climate extending the life of the assets. Generally, other road agencies have reported significant increases in faults after ten years of signal operation.
- 6.7 Roads ACT's *2013 Traffic Signals Lifecycle Plan* details the expected useful life for each component of a traffic signal, as listed in Table 6-1.

Table 6-1 Expected useful life for traffic signal components

Component	Sub-component or Type	Estimation of Service Life
Controller	N/A	10-15 years 10 years (RMS)
Vehicle Detectors	Loop detectors	5 years
	Detector card	10-15 years (NZTA)
Lantern assembly	LED Lamp	10 years
	Housing	15 years
Pedestrian facilities	Audit-tactile unit	5-10 years (MRWA) 3-5 years (RMS)
	Lantern assembly (lamp)	10 years
	Lantern assembly (housing)	15 years
Civil Structures	Foundation	100 years
	Posts and masts arms	25-35 years (MRWA)
	Conduits and cable pits	40 years
Electrical and communication	Electrical and telecommunication wiring	20 years
	Uninterruptible power supply (UPS)	10 years (MRWA) 5-7 years (RMS)

Source: Roads ACT 2013 Strategic Asset Management Plan

6.8 The Lifecycle Plan for traffic signals also details the condition grades and associated percentages for signalised intersections, as listed at Table 6-2.

Table 6-2 Condition assessment of traffic signals in 2013

	Very Good 0-5 years	Good 6-10 years	Satisfactory 11-25 years	Replacement required >25 Years
Percentage of signalised intersection in different condition grades	19%	25%	21%	36%

Source: Roads ACT 2013 Strategic Asset Management Plan

Planned maintenance program

- 6.9 Planned maintenance for traffic signals is identified based on the following:
- minor inspections which are undertaken every four months by a contractor engaged by Roads ACT to manage maintenance of traffic signals; and
 - major inspections which are undertaken every 12 months by the contractor engaged by Roads ACT to manage maintenance of traffic signals. Major inspections consist of the minor service as well as adjusting, lubricating, cleaning or replacing wearing parts and consumables.
- 6.10 Planned maintenance for traffic signals includes a Preventative Maintenance Program that plans, schedules and records the preventative maintenance of traffic signals and is to include a program for the bulk changing of lamps⁴.
- 6.11 The Preventative Maintenance Program includes a schedule of works, developed by the contractor following planned inspections, and is submitted to Roads ACT for approval. The schedule of works is to align wherever possible with the bulk lamp changing program so that maintenance is efficiently coordinated.
- 6.12 The 2005 Strategic Plan for Traffic Signals articulates Roads ACT's commitment to reducing green house gas emissions in the way it manages traffic signals:
- ... ACT Government aims to minimise ... green house gas emissions within the ACT. In compliance with this policy, Roads ACT has embarked on a Traffic Signal upgrade program, which involves the replacement of the incandescent lanterns used earlier in Traffic Signals with cost effective and more efficient Light Emitting Diodes (LEDs) and associated hardware...
- 6.13 LEDs are low voltage low current devices and have significant benefits through their long lamp life which results in reduced:
- maintenance;
 - traffic delays caused by repair equipment interrupting traffic flows at intersections;
 - electric bills; and
 - risk for technicians and motorists due to reduction of time spent replacing burned out lamps at intersections.
- 6.14 A capital upgrade program for the replacement of obsolete Traffic Signal lanterns is in place to replace incandescent and quartz halogen lamps by more energy efficient and long lasting LED lamps with a design life of 7 to 10 years. While this program was reviewed as evidence of Roads ACT's commitment to reducing the environmental impact of its activities, its achievements under this program were not examined as the program relates to capital upgrades and not maintenance.

⁴ Bulk changing of lamps occurs by the end of their design lives which is 24 months for quartz halogen lamps.

6.15 Roads ACT advised that of the:

... 288 signal sites, 80 (approximately one third) feature either incandescent or halogen lanterns. A typical four way intersection is outfitted with 22 signal lanterns, each lantern housing several signals. Upgrade costs vary depending on intersection size and complexity, however they can be around \$37,500 per site, so with 80 sites it is estimated that to complete the program would cost around \$3m.

This program envisages to upgrade about 3-4 signal locations to LED lanterns, using around \$400,000 per annum which will take around 8 years to complete, which is within their design life of around 10 years.

6.16 The ACT Government aims to minimise greenhouse gas emissions within the ACT. In response to this, Roads ACT is replacing its incandescent lanterns with Light Emitting Diodes (LEDs).

6.17 Currently around 70 percent of traffic signals have been converted to LED. Roads ACT advised that they expect to convert the remainder by 2024, subject to funding, and expect that this will reduce electricity consumption by about 60 percent per site. This also has a consequential affect on road safety as fewer repairs means a reduction in disruption to traffic.

6.18 The 2005 Strategic Plan for Traffic Signals highlighted the following in relation to the aging traffic signal asset base:

The average age of traffic signal assets is currently in the 15-30 year age grouping and the degree of unreliability of the system will increase gradually. This fact, with the current hardware replacement program of 1-2 sites per year will result in a significant obsolescence issue into the future.

6.19 This issue had not been addressed by 2013 when the 2013 Traffic Signals Lifecycle Plan (the most up to date plan) stated that:

currently 36% (102) of ACT signal sites are of age 25 years and older. If these signal assets (especially controllers) continue to operate beyond their design life it is expected that faults will increase significantly. These aged assets shall be replaced gradually and the replacement strategy shall focus on the replacement of critical parts (i.e. controller) rather than the whole signal asset. It is therefore proposed to proactively replace the aged controllers (25 years and older) and later the controllers of 11-25 years would require replacement. About ten sites shall be replaced per year. At the end of this 25 year period, a new cycle of replacement will have to be developed.

6.20 Although Roads ACT undertakes an annual capital upgrade program to refurbish traffic signals, this is limited and there is no comprehensive traffic signal component replacement schedule, that would identify timeframes for the replacement of individual components. A draft version of the 2017 Traffic Signals Lifecycle Plan recognised that while some progress towards the replacement of traffic signal components:

The majority of the signal assets continue to operate beyond their design life and it is expected that faults will increase. As this occurs it may become more difficult to obtain replacement components.

- 6.21 While the increasing risk of obsolescence of traffic signal components was identified by Roads ACT in 2005, and 2013 (as 36 percent of their traffic signal sites were older than their useful life of 25 years), a comprehensive replacement schedule for all components has not been developed. Without a comprehensive replacement schedule, for all traffic signal components, the frequency of faults will increase as the components age beyond their design life, resulting in increased risks to road safety.

RECOMMENDATION 17 TRAFFIC SIGNAL REPLACEMENT SCHEDULE

Roads ACT should develop a comprehensive traffic signal component replacement schedule.

Unplanned maintenance program

- 6.22 Defects are identified by the police, Roads ACT field officers, the Sydney Coordinated Adaptive Traffic System (SCATS) which is an electronic control system for traffic signals, and by the public through Access Canberra. These usually result in unplanned maintenance work. Unplanned maintenance needs to be in accordance with the response times outlined in Table 6-3 (the achievement of Roads ACT against these targets is discussed at paragraph 6.45).

Table 6-3 Traffic signal faults - expected response times

Element	1 Hour – Urgent	4 Working Hours	8 Working Hours	16 Working Hours
General	All out / on flash multiple displays / no displays stuck in phase	Serious complaints		General complaints
Computer Alarms	Includes complete signal failure, power loss, traffic signal system freeze.	Loss of interface with SCATS system or invalid RAM.	Partial failure as the intersection is still operating but would be running a phase for longer than necessary or missing a phase as the detector was not operating.	
Lamps (per colour in a signal group)	0 or 1 Operating	2 reds out 1 red arrow out		1 or more operating
Signal Lanterns	Swung (conflict)	Swung (no conflict), not operating or other damage.		
Pedestals	Knocked down or dangerously leaning greater than 20 degrees	Minor damage or leaning less than 20 degrees		
Controllers	Knocked down / door open	Minor damage		
Cables & Conduits	Exposed / hanging / damaged			
Detectors	No call		Permanent call – not operating correctly	
Lenses/Visors/Louvres/ Target Boards				Missing or damaged.

Source: 2005 Strategic Plan for Traffic Signals in the ACT

Recorded information on traffic signals

6.22 The defects identified through contact made with Access Canberra are loaded into IAMS and forward to the Traffic Management and Safety Section for unplanned maintenance. The asset condition is then updated into IAMS.

- 6.23 However, the updating of asset condition into IAMS after planned maintenance does not occur in a systematic or formalised way. There are no defined timeframes for when IAMS should be updated and asset condition data is held offline in traffic signals maintenance reporting and summary data.
- 6.24 The potential risks of not maintaining up-to-date asset data on IAMS is discussed at paragraph 3.51.

Operational plan

- 6.25 Roads ACT has developed an operational plan which outlines the day to day operational needs for maintaining traffic signals. Unlike the other asset classes, where this plan is referred to as the Operational Plan, it is referred to as the *Strategic Plan for Traffic Signals* (December 2005).
- 6.26 The 2005 *Strategic Plan for Traffic Signals in the ACT* (the 2005 Strategic Plan for Traffic Signals) is an internal document that supports the broader *Roads ACT Strategic Asset Management Plan*. The plan provides a detailed description of how Roads ACT defines the level of service in relation to traffic signals and the policies and issues for the maintenance of traffic signals. The most recent version of the plan is dated 2005.
- 6.27 The 2005 Strategic Plan for Traffic Signals does not include details of how regularly it should be reviewed, however the *Roads ACT Strategic Asset Management Plan* outlines that operational plans should be reviewed at least every four years. Therefore, the Strategic Plan for Traffic Signals should have been reviewed three times based on this timeframe (refer to Recommendation 6).
- 6.28 A review of the 2005 Strategic Plan for Traffic Signals identified that it included the majority of the general areas expected to be included in an operational plan, as well as those identified in the *Territory and Municipal Services Strategic Asset Management Framework*:
- clear objectives;
 - activities to be delivered;
 - quality standards;
 - desired outcomes;
 - a process for monitoring progress;
 - environmental impacts including energy and water consumption efficiency of the assets operations;
 - arrangements for monitoring asset performance;
 - operational training; and
 - estimated operating costs.

- 6.29 However, the 2005 Strategic Plan for Traffic Signals did not include information on:
- staffing and resourcing; or
 - operational training.
- 6.30 Roads ACT's operational plan (titled (2005) *Strategic Plan for Traffic Signals in the ACT*) met the majority of the requirements of an operational plan, however it lacked information on staffing and resourcing requirements (including training) which impacts on Roads ACT effectively planning for resource allocation. It has not been updated since 2005 and may therefore not reflect contemporary practices.
- 6.31 This issue is discussed further at paragraph 3.37 and includes a recommendation to address identified shortfalls

Delivering maintenance

- 6.32 The delivery of traffic signals maintenance has historically been outsourced under contract with Ecowise Services (Australia) Pty Ltd (Ecowise) which was awarded the Traffic Signal Maintenance Contract in July 2016 for a three year period with two consecutive one year extensions possible. Roads ACT advised that it has not sought to deliver this service in-house due to the very specific expertise requirements which are not widely available in the labour market place

Contract for maintenance of traffic signals

- 6.33 The audit examined the tender evaluation and contract award process. This confirmed that there was compliance with the selection criteria during the tender evaluation process and ACT Government procurement guidelines had been followed.
- 6.34 The awarded contract detailed that Ecowise must provide maintenance for all existing ACT traffic signals. Services to be provided include:
- Preventive maintenance;
 - Remedial maintenance;
 - Bulk changing of lamps;
 - Rectification of faults;
 - Replacement of assets; and
 - Reporting.
- 6.35 In addition, the contract outlines a number of reporting requirements through the production of a Monthly Summary Report. It is a precondition to payment of the invoice that an electronic copy of the Monthly Work Summary Report for the month be submitted with each invoice. The Contractor must summarise all maintenance tasks performed each

month and provide a Monthly Summary Report (to be submitted in excel) to the Directorate's Contract Officer. The report must include the following:

- daily work records;
- maintenance recommendations;
- maintenance program report;
- spare Items status report;
- traffic management plans implemented; and
- issues.

6.36 The contract specification outlines the work activities and maintenance periods required to maintain the signalised site to a standard acceptable to Roads ACT. Service age of all signal sites and lamp age for incandescent lamps as well as quartz halogen lamps were specified in the contract agreement.

6.37 The contract requires the contractor to provide a Preventative (planned) Maintenance Program to plan, schedule and record the planned maintenance in coordination with the Bulk Change Program (light bulbs are changed when nearing the end of their design life). This maximises the opportunity for maintenance works to be undertaken while the contractor is already at the location. It was evidenced that the contractor had provided a list of traffic signal sites to be treated each month to Roads ACT which had been subsequently accepted.

6.38 The Contract is managed by Roads ACT Traffic Management and Safety Branch. Contract adherence examined was observed to occur in the following areas:

- Provision of monthly progress reports which include work undertaken on Preventative Maintenance. Traffic Signal inspection and repair data (through monthly reporting) is provided to TCCS by Ecowise and includes:
 - number of traffic signal faults for the month and percentage of faults per day;
 - the type of traffic signal fault or maintenance undertaken, such as bulk lamp change or reactive defect maintenance;
 - traffic signal site location and maintenance code;
 - repair cost for each maintenance type;
 - reactive maintenance undertaken including repair times; and
 - detail of lamp faults including total numbers of lamp, number of faults and percentage of faulty lamps.
- Provision of a fault sheet report (which can be verified from the SCATS Log).
- Provision of a traffic control plan including the traffic control to be adopted and the preventative maintenance program for the current contract, with a list of Traffic Signal sites to be treated each month.
- Provision of quality records through contractor maintenance and repair documentation.

- 6.39 The traffic signals contract includes a requirement for environment management plans. The Contractor's procedure for Traffic Signal and Cameras – Maintenance and Repair (Procedure T 102) was noted to include a section on environmental hazards and controls for Detector Loop installation, taking into account potential noise, air, and water pollution
- 6.40 However, the following deviations from good contract management for managing traffic signals existed:
- In the monthly progress report for July 2016, the Preventative (planned) Maintenance undertaken for the month was different to that of the Preventative (planned) Maintenance Program. Roads ACT advised that the contractor has been given flexibility in undertaking Preventative (planned) Maintenance. However, Roads ACT does not track Preventative (planned) Maintenance undertaken against the Program based on monthly reports.
 - The monthly report provided to Roads ACT by Ecowise includes the number of faults for the month, it does not identify the number of critical or major faults.
 - Roads ACT do not reconcile at the end of each year the monthly reports against the Maintenance (planned) Program to check that all planned work was completed. There is the potential for preventative maintenance on traffic signals not to be undertaken as programmed which creates a risk to the serviceability of traffic signals and in turn public safety.

RECOMMENDATION 18 CONTRACT MANAGEMENT FOR TRAFFIC SIGNAL MAINTENANCE

Roads ACT's contract management for traffic signal maintenance should:

- a) include a review of the monthly progress report;
- b) require that the number of critical or major traffic signal faults be reported by the contractor on a monthly basis; and
- c) undertake an annual reconciliation to ensure all planned maintenance has been completed.

Cost of maintaining traffic signals

- 6.41 The Traffic Signal maintenance budget for the past five years from 2011-12 to 2015-16 is outlined in Table 6-4. This shows a budget increase of approximately 8.5 percent over a five-year period.
- 6.42 In the 2013 *Traffic Signals Lifecycle Plan*, Roads ACT reported the number of traffic signals as 282. In 2016 Roads ACT advised the number of traffic signals had increased by 39 to 321 traffic signals (14 percent).

Table 6-4 Traffic signals maintenance budget 2011-12 to 2015-16

	2011-12 \$000	2012-13 \$000	2013-14 \$000	2014-15 \$000	2015-16 \$000
Traffic Signals Annual Budget	1 950	2 000	2 000	2 084	2 129

Source: Roads ACT 10 Year Activity Summary

6.43 Roads ACT advised that the maintenance cost for Traffic Signals (as calculated at June 2016) was approximately \$3 425 per site per year. Potential upgrades through new technology that can reduce the cost of power and communication in operating traffic signal sites are adopted by Roads ACT where feasible. For example, the adoption of LED technology to replace incandescent lantern lamps and quartz halogen lamps.

Performance in maintaining traffic signals

6.44 The Roads ACT *Strategic Asset Management Plan* includes three levels of service for traffic signals as outlined in Table 6-5.

Table 6-5 Service levels for traffic signals

Maintenance Items	Target Levels of Service (LoS)	Actual Levels of Service (LoS)
Preventative Maintenance		
Minor service	Every 4 months	Not monitored by TCCS
Bulk Lamp replacement	Incandescent lamps every 12 months Quartz-halogen lamps every 2 years LED's every 10 years	Not monitored by TCCS
Routine Maintenance		
Reactive	1 hour – Urgent (Cat 1) 4 hour – (Cat 2) 8 hour – (Cat 3) 16 hour – (Cat 4)	Partially met

Source: TCCS Strategic Asset Management Plan 2013

6.45 The actual levels of service reported in Table 6-5 were reviewed however, these could not be validated as they are not all monitored or reported.

6.46 The key performance indicator for traffic signals is for major or critical faults to be less than 1 per Traffic Signal per year. Critical or major faults are those that can significantly compromise the safety and operation of the site.

- 6.47 Based on audit’s review of response time data provided by Access Canberra, Traffic Signal defects were resolved in <1 week 96 percent of the time. However, the contractor is required to attend to various types of Traffic Signal faults within specified response times of between 1 and 16 hours. Achievement against these targets could not be verified as the data provided by Access Canberra did not provide a sufficient level of detail.
- 6.48 Audit’s review of the afterhours call outs for the month of July 2016 showed that there were 16 instances where flashing lights needed to be repaired. According to the traffic signal response times flashing lights require repair within 1hr for urgent matters, 4 hours for serious complaints and 16 hrs for general complaints. Of the 16 instances of flashing lights, 11 were repaired within 1 hour (68.7 percent). For the remaining five instances, 4 were repaired within 4 hours and one took 5 hours.
- 6.49 The reporting from the contractor includes the start and finish times for the repairs , such as maintenance on an audio driver unit commencing at 10.30 and completing at 13.00. However, it does not indicate the length of time between being advised of the fault and commencing the repair – which is part of the response time. Roads ACT does not have a system to routinely monitor contractor response times.
- 6.50 Whilst the Traffic and Safety Management section provide a monthly traffic safety report to the Roads ACT Director which details major and minor faults rectified (monthly and year to date) as a total number, it does not measure this against the number of sites e.g. fault/per site/year.
- 6.51 Reports provided by the contractor for the maintenance of traffic signals include information that aligns with contract requirements such as faults repaired, routine services completed, response times and the status of spare items; however, the monitoring of service levels for traffic signals could be improved through the inclusion of response times (between advice of fault and the repair) and the number of major faults.
- 6.52 The levels of service for traffic signals were reviewed during the audit however, as not all the service levels for traffic signals are monitored and reported, results could not be validated.

RECOMMENDATION 19 MONITORING TRAFFIC SIGNAL MAINTENANCE PERFORMANCE

Roads ACT should, on a monthly basis, monitor maintenance undertaken against the agreed preventative maintenance program and service level targets for traffic signal maintenance.

RECOMMENDATION 20 IMPROVING TRAFFIC SIGNAL PERFORMANCE REPORTING

Roads ACT should require the contractor responsible for traffic signal maintenance to report on the:

- a) number of major faults reported to be less than one per traffic signal per year in the monthly report; and
- b) elapsed time between being advised of the fault and the completion of the repair in the monthly report.

7 STREETLIGHTS

7.1 This chapter examines the arrangements implemented by Roads ACT to manage the maintenance of streetlights.

Summary

Conclusion

Arrangements for the maintenance of streetlights will change in late 2017 with this being done under an Energy Performance Contract with the private sector operator. There is a focus on achieving energy efficiencies.

Roads ACT will need to monitor this contract, as is its practice, to make sure its benefits are realised. Also, information from the contractor on the condition of streetlights will need to be promptly updated in IAMS, something that is currently lacking. A new operational plan is needed which could be developed to align with the new contract arrangements.

Key findings

	Paragraph
On 27 August 2016, the ACT Government released a Request for Proposal for the ACT Streetlights Project (Energy Efficiency and Smart City Upgrades) with the intention to enter into a Energy Performance Contract (to commence in the second half of 2017) with a private sector operator.	7.5
The Northrop superintendent (the contractor responsible for maintenance inspections) holds data on streetlight defects, gathered through the inspection regime as well as the asset condition resulting from maintenance undertaken, in an offline database. This data is only periodically updated by Roads ACT into IAMS and there are no defined timeframes for the updating of it into IAMS.	7.27
The Operational Plan is an internal document that supports the broader <i>Roads ACT Strategic Asset Management Plan</i> . The plan provides a detailed description of how Roads ACT defines the level of service in relation to streetlights and the policies and issues for the maintenance of streetlights. However, the most recent version of the plan is dated 2013 and should have been reviewed in 2015 based on its own periodic review timeframes.	7.29
While Roads ACT has committed to transferring the complete management of streetlights to a service provider via a energy performance contact, an operational plan is still required that details how this contract will be managed and addresses	7.33

areas such as key objectives/outcomes of the contract, how asset data will be maintained, staffing and resource requirements and processes for monitoring contract outcomes. This information is needed for Roads ACT to effectively manage its operations.

Monthly streetlight inspections have been undertaken. However, the service level for responding to public complaints has only been partially met. The service level for repairs within 10 days was met approximately 91 percent of the time whereas the repair of cable faults within 35 days was delayed approximately 33 percent of the time. 7.48

Unplanned maintenance is carried out in response to reported problems, outages or defects (e.g. repair vandalism, damage or luminaire outages). Data from IAMS and response time data from Access Canberra showed that in 2015-16 there were approximately 4 041 public enquiries made regarding streetlights of which 3 773 enquiries related to damaged or defective streetlights. 7.49

Roads ACT monitors the performance of ActewAGL through monthly reporting and invoicing provided to Roads ACT through the Northrop superintendent and the ActewAGL key performance indicator portal. The key performance indicator for quality was the percentage of system availability being more than 98 percent. For the 2014-15 financial year, the average service availability was 98.2 percent. 7.50

Context

7.2 As at August 2016 Roads ACT were responsible for the management of approximately 79 000 Territory owned streetlights.

7.3 The 2013 Roads ACT *Asset Management Operational Plan for Streetlights in the ACT* (the Operational Plan) defines a streetlight as:

... any approved [s]treetlight placed in the road reserve or open space to provide public lighting in accordance with the standard at the time of placement.

7.4 Territory owned streetlights are those that are placed within the road reserve (area directly next to a road) or open space and that are constructed from concrete, wood or steel of a mixture of these materials. Streetlights are provided to assist in reducing crime and injury within the built-up area by illuminating areas to assist road and footpath users.

7.5 On 27 August 2016, the ACT Government released a Request for Proposal for the ACT Streetlights Project (Energy Efficiency and Smart City Upgrades) with the intention to enter into a Energy Performance Contract (to commence in the second half of 2017) with a private sector operator.

- 7.6 Under the Energy Performance Contract it is intended the contractor will be required to design, construct and commission, guarantee, monitor and verify the agreed cost and energy saving measures, and provide follow-up services and general scheduled and reactive maintenance during the term of the contract. Specifically, the operator will be required to:
- ensure the total cost to the Territory does not exceed current expenditure on Territory streetlight assets;
 - ensure efficient, cost effective operation and maintenance (including electricity costs) of the streetlight network, so to improve overall outcomes to the Territory;
 - implement a self funded energy efficiency upgrade over the contract period, which aims to maximise energy efficiency of the streetlight network through reduced energy consumption, and to reduce operation and maintenance costs for the streetlight network;
 - implement a strategic approach to the energy efficiency upgrade, which balances the remaining useful life of current assets and the savings achieved through reduced costs from upgraded assets;
 - establish a flexible Smart City ‘backbone’ for future ACT Smart City application as part of the energy efficiency upgrade; and
 - develop a strategic approach to the roll out of potential Smart City applications.

Developing a maintenance program for streetlights

- 7.7 All streetlight poles and post assets within the ACT are depreciated using a straight line with an asset depreciation life of 70 years. However, their serviceability can often exceed this timeline, and a number of streetlights located in the original inner north and inner south suburbs remain serviceable to this day.
- 7.8 The maintenance of streetlights is currently delivered by the following two entities:
- Northrop Consulting Engineers Proprietary Limited (for maintenance inspections); and
 - ActewAGL (for the delivery of maintenance activities).
- 7.9 In addition to conducting maintenance inspections, Northrop Consulting are contracted by Roads ACT to undertake a Superintendent role to administer the ActewAGL contract and ensure that contractual obligations are performed (noting that the maintenance contract with ActewAGL expired in June 2016, this issue is discussed further at Paragraph 7.12).
- 7.10 Roads ACT advised that streetlight maintenance has been procured in the ACT by a single select contract with ActewAGL Distribution (ActewAGL), a partnership of Jemena Networks and ActewAGL Distribution Ltd.

- 7.11 The ActewAGL contract has been exempt from competitive tendering since the outsourcing of the maintenance commenced in 1989. ActewAGL was the original utility owner operator and had established linkages with the distribution network Roads ACT management advised that the procurement at the initial letting stage was subject to a value for money.
- 7.12 The current ActewAGL five-year contract was initially entered into on 7 July 2009 and was extended in June 2014 to 30 June 2016. Since 1 July 2016, in the absence of a further contract extension, ActewAGL have acted in goodwill, delivering maintenance activities under the terms and conditions of the original contract.

Identifying required maintenance

- 7.13 A streetlight maintenance program is developed based on condition inspections of steel poles and luminaries. These inspections are undertaken by the superintendent contractor, Northrop Consulting Engineers Pty Ltd. The inspections required are outlined in the Operational Plan and include:
- monthly inspections for all streetlight assets;
 - inspection of wooden poles every 5 years; and
 - inspection of steel poles every 10 years.
- 7.14 Streetlight faults are also identified via:
- Roads ACT maintenance crews while inspecting other assets or carrying out other duties;
 - the general public through contact with Access Canberra; and
 - ActewAGL whilst undertaking maintenance on streetlights.
- 7.15 The Operational Plan specifically discusses how streetlight condition is assessed and considered for repair against the condition assessment criteria outlined in Table 7-1. For example, if a wooden pole is condemned then it is either replaced or steel peg bolted placed into the concrete, or in the case of a steel pole, when it's damaged it is replaced.

Table 7-1 Streetlight Condition Assessment Criteria

Type	Assessment Criteria	Repair Method
Pole Wood	Condemned	Replace or “Spike and Nail” Steel peg bolted to foundation of the post
Pole Concrete	Damage	Replace
Pole Steel	Damaged	Replace
Luminaires	Damaged	Replace
Lamp	Not serviceable (age, etc)	Replace
Cable	Blown	Replace
	Damaged	Repair or replace

Source: 2013 Asset Management Operational Plan for Streetlights in the ACT

7.16 Streetlights are considered for repair or replacement in line with both the condition assessment criteria detailed in Table 7-1 and the associated response times and service standards. These service standards are outlined in Table 7-2.

Table 7-2 Streetlight Response Time Service Standards

Issue/Attribute	Service Standards
Emergency make safe	2 hours (after report)
Large Area Streetlights - An area of frequent high pedestrian use with a high danger to pedestrians, will cause damage to persons/property	Repair within 3 day (after report)
Low to Medium Risk - Damaged streetlight requiring replacement, though substantially still in place	Repair or replace within 10 calendar days (after report)
Low to Medium Risk - Standard lamp replacement	Repair or replace within 10 calendar days (after report)
Accident replace streetlight column	Replace within 35 calendar days (after report)
Wooden pole replacement	Replace within 60 calendar days (after report)
Standard Cable fault	Repair or replace within 35 calendar days (after report)
Hard surface cable fault	Negotiable
Very Low risk, non conforming streetlight, and visual damage (non structural)	Take no action

Source: 2013 Asset Management Operational Plan for Streetlights in the ACT

7.17 Northrop Consulting Engineers Proprietary Limited (Northrop) contract was entered into on 1 July 2008 through open tender and was extended in 2014 until June 2016 in parallel with the ActewAGL contract.

- 7.18 The contract outlines a range of requirements including: inspections and administration of streetlights and reporting. Insurance requirements are also outlined, all of which were reviewed during the audit and assessed as having been met.
- 7.19 Northrop is to undertake inspections of all streetlight assets across the Australian Capital Territory once per month and are required to ensure that
- one quarter of the light are inspected each week; and
 - results of the completed inspections are communicated electronically to ActewAGL (the maintenance contractor) at least once per week.
- 7.20 Requests for maintenance regarding the operations or safety of streetlights made by road maintenance crews, members of the public through the Access Canberra website, telephone contact centre or ACT Government shopfronts are uploaded into the Integrated Asset Management System (IAMS) as well as forwarded to the Northrop Superintendent.

Recorded information on streetlights

- 7.21 The Operational Plan states that IAMS data is used to inform the maintenance undertaken and includes the location of streetlights and the associated attributes, such as:
- asset number;
 - column type, height and material;
 - outreach arm and mounting; and
 - luminaire and lamp type and maintenance history.
- 7.22 The updating of asset condition into IAMS after maintenance is undertaken does not occur in a systematic or formalised way. There are no defined timeframes for when IAMS should be updated and asset condition data is held offline in a defect database.
- 7.23 Further detail on IAMS in relation to maintaining data on assets and the extent to which this data drives maintenance activities is provided in paragraph 3.51.
- 7.24 In addition to data in IAMS, streetlight data is maintained in an offline database maintained by the Northrop Superintendent (and monitored by Roads ACT). This database includes:
- defect id; asset number; work order number; location;
 - comments associated with the type of defect including the source of the defect, such as inspector or public enquiry; and
 - the date of reported defected and the required completion date.
- 7.25 Based on this collective defect data, work orders are prepared and issued by Northrop to ActewAGL on a daily basis outlining the maintenance to be undertaken.

- 7.26 Roads ACT advised that when appointed, the new Contractor responsible for the management of streetlights (resulting from the Request for Proposal process) will be expected to operate similar, but most likely improved, data sharing arrangements with Roads ACT. It is envisaged the successful tenderer will operate their own asset management system with real time (or close to) interface with IAMS to maintain synchronisation
- 7.27 The Northrop superintendent (the contractor responsible for maintenance inspections) holds data on streetlight defects, gathered through the inspection regime as well as the asset condition resulting from maintenance undertaken, in an offline database. This data is only periodically updated by Roads ACT into IAMS and there are no defined timeframes for the updating of it into IAMS.
- 7.28 Recommendation 7 in Chapter 3 addresses this issue.

Operational Plan

- 7.29 The Operational Plan is an internal document that supports the broader *Roads ACT Strategic Asset Management Plan*. The plan provides a detailed description of how Roads ACT defines the level of service in relation to streetlights and the policies and issues for the maintenance of streetlights. However, the most recent version of the plan is dated 2013 and should have been reviewed in 2015 based on its own periodic review timeframes.
- 7.30 This issue is discussed further at paragraph 3.37.
- 7.31 A review of the Operational Plan identified that it included the majority of the general areas expected to be included in an operational plan, as well as those identified in the Transport Canberra and City Services Strategic Asset Management Framework:
- clear objectives;
 - details of maintenance activities including frequency of inspections;
 - key outcome areas;
 - asset data;
 - repair methodology for streetlights; and
 - a process for monitoring progress.
- 7.32 The Operational Plan did not include information on:
- estimated operating costs;
 - staffing and resource requirements; or
 - environmental impacts.

- 7.33 While Roads ACT has committed to transferring the complete management of streetlights to a service provider via a energy performance contract, an operational plan is still required that details how this contract will be managed and addresses areas such as key objectives/outcomes of the contract, how asset data will be maintained, staffing and resource requirements and processes for monitoring contract outcomes. This information is needed for Roads ACT to effectively manage its operations.

RECOMMENDATION 6 OPERATIONAL PLANS

Roads ACT should:

- d) develop a new operational plan for streetlights that reflects the new arrangements resulting from the Energy Performance Contract.

Delivering maintenance

- 7.34 Maintenance for streetlights is delivered through planned and unplanned maintenance activities, both of which are funded from recurrent funding.
- 7.35 Planned maintenance of streetlights is currently carried out to a predetermined schedule.
- 7.36 All other works are considered to be capital upgrade works, which were out of scope of this audit. However, they do have the ability to affect maintenance costs. These include:
- armour cable replacement. This project is for the replacement of old streetlighting cabling in order to increase public safety from accidental electrocution and reduce the risk of a large number of streetlighting outages. This issue has been determined as being of a high safety risk to Transport Canberra and City Services operations;
 - energy efficient streetlight upgrade. It is estimated that there are currently over 6 000 mercury vapour lights, throughout most Canberra suburbs that require replacement;
 - arterial road infill program. This includes requests by the community to install lighting in areas where lighting has not been previously installed. This is an ongoing program of upgrades based on an assessment/prioritisation of customer requests; and
 - streetlight upgrade program with approximately 80 upgrade projects identified.

Contract Management

ActewAGL contract for maintenance activities

- 7.37 The ActewAGL contract outlines the rates that are to be applied to the work undertaken, monthly management fee and Key Performance Indicators. In addition, there are a number of insurance requirements outlined, all of which were reviewed during the audit and assessed as having been met.

- 7.38 Work orders are issued to ActewAGL on a daily basis by the Northrop superintendent.
- 7.39 The ActewAGL streetlights maintenance contract requires:
- safety management plans and quality records which is provided through contractor Work Health and Safety reporting;
 - attendance at contractor meetings with the Superintendent Contractor;
 - adherence to Key Performance Indicators linked to time performance and payment which is monitored through invoicing and system availability data ; and
 - time and cost information aligned with payment details and program of work which is provided through defect data and invoicing.
- 7.40 These requirements were reviewed during the audit and were assessed as having been met.
- 7.41 Northrop also conduct verification inspections on samples of the defects list received by ActewAGL. The Northrop superintendent undertakes inspections of samples of defects that are identified by ActewAGL to verify the defect type and confirm the need for maintenance/repair.

Cost to maintain streetlights

- 7.42 The streetlight maintenance costs (excluding the costs of the Northrop superintendence costs) for the past five years from 2011-12 to 2015-16 are outlined in Table 7-3. This shows a spend increase of approximately 24 percent over a five-year period due to additional lights installed for Greenfield, Brownfield and infill developments; and recurrent base funding increases by CPI annually plus growth at approximately 2 percent of the asset replacement cost.

Table 7-3 Streetlight maintenance costs (excluding superintendence costs) 2011-12 to 2015-16

	2011/12 \$000	2012/13 \$000	2013/14 \$000	2014/15 \$000	2015/16 \$000
Streetlights	6 520	6 571	5 882	7 181	8 075

Source: Roads ACT 10 Year Activity Summary

Monitoring of maintenance activities

- 7.43 During the audit a number of the contracting arrangements attached to the Northrop contract were reviewed. It was found that regular reporting of activities is carried out with detailed reports being produced on the activities performed by Northrop including:
- activities carried out which are detailed in the defects database and includes defect identification, asset number, defect type, maintenance comments, date of request and date of completion;

- monthly contractor meetings between Roads ACT and Northrop were evidenced in a review of meeting minutes over a 6-month period. The meetings between Roads ACT and Northrop cover:
 - safety and Work, Health and Safety matters which includes notifiable incidents, training, asbestos matters, safety inspections and audits;
 - maintenance and ongoing activities which includes outstanding defects, temporary traffic management plans, armoured cable identified, work orders issued, cable faults detected and tree trimming issues;
 - administration and computing matters which covers the contract, associated prequalification, computer systems, power supply and new business; and
 - design and installation issues which covers column and LED light replacement, column defects, bulk lamp changes, matters specific to different types of lamps and different locations for example, bridge lighting in Coppers Crossing and armoured cable in Ainslie.
- maintenance performance by ActewAGL against the maintenance contract Key Performance Indicators through:
 - the ActewAGL key performance indicators portal which includes performance information against all 39 key performance indicators, detail of response time for maintenance, the number of defects, system availability and associated payment percentage as outlined in the contract and fee adjustments in accordance payment penalties linked to service availability as outlined in the contract; and
 - weekly outstanding and overdue notification from Northrop to Roads ACT which details the number of defects issued to ActewAGL for the following week, the number of defects that have been repaired in the previous week, the overall total over defects outstanding, and the number of the defects which are overdue.

Northrop audits of maintenance work

7.44 As required under the Northrop maintenance contract:

The Superintendent will audit by field inspections 10% of the enquiry results within 2 working days of the advice being provided by the Maintenance Contractor. The field inspection audit will be representative of the types of faults reported from the enquiries, and confirm quality of workmanship, materials and attribute data.

7.45 Results of these audits are reported during monthly meetings held between Roads ACT, ActewAGL and Northrop. Minutes of these monthly meetings for the period 2015-16 were reviewed during the audit and it was found that except for Feb 2016 (where a workplace health and safety audit was undertaken instead of field inspections) audits were conducted each month on a variety of streetlight components.

Performance in maintaining streetlights

7.46 The Roads ACT Strategic Asset Management Plan includes four levels of service for streetlights maintenance as shown in Table 7-4.

Table 7-4 Streetlights levels of service

Maintenance Items	Target Levels of Service (LoS)	Actual Levels of Service (LoS)
Routine Maintenance		
Streetlight inspections on territorial roads	Every month	LoS met
Streetlight inspections on municipal roads	Every month	LoS met
Response to public complaints		
Lamp faults fixed within 10 working days		91%
Cable faults fixed within 35 working days		Partially met

Source: Roads ACT *Strategic Asset Management Plan*

- 7.47 The actual levels of service reported in Table 7-4 were validated during the audit. Based on the review of data from Access Canberra and defects reported in IAMS, it was found that Roads ACT responded to urgent streetlight faults reported to Access Canberra 91 percent of the time.
- 7.48 Monthly streetlight inspections have been undertaken. However, the service level for responding to public complaints has only been partially met. The service level for repairs within 10 days was met approximately 91 percent of the time whereas the repair of cable faults within 35 days was delayed approximately 33 percent of the time.
- 7.49 Unplanned maintenance is carried out in response to reported problems, outages or defects (e.g. repair vandalism, damage or luminaire outages). Data from IAMS and response time data from Access Canberra showed that in 2015-16 there were approximately 4 041 public enquiries made regarding streetlights of which 3 773 enquiries related to damaged or defective streetlights.
- 7.50 Roads ACT monitors the performance of ActewAGL through monthly reporting and invoicing provided to Roads ACT through the Northrop superintendent and the ActewAGL key performance indicator portal. The key performance indicator for quality was the percentage of system availability being more than 98 percent. For the 2014-15 financial year, the average service availability was 98.2 percent.
- 7.51 The contract with ActewAGL outlines that payment deductions are to apply if the service availability requirements are not met. Audit observed through the review of invoices and key performance indicators that this payment penalty had been applied by Roads ACT in line with contract requirements. For example, when the system availability is <95 percent then ActewAGL received 95 percent of the payment. In the monthly key performance indicator reporting of system availability for 20 Sep 16 – 19 Oct 16, the system availability was 94.84 percent with attributed raw costs of \$448 798.17. Based on the payment reduction arrangements in the contract, ActewAGL received payment of \$426 358.26

which is 95 percent of the raw costs which aligns to payment penalties of service availability being <95 percent.

- 7.52 The Access Canberra data for urgent and non-urgent matters collectively shows that repairs were attended to within 10 days 91 percent of the time. This is a result of the collective score for non-urgent <1 week and 1-2 weeks' resolution for streetlights being 0.85 and 0.08 respectively. For urgent the collective score for <1 week and 1-2 weeks' resolution for streetlights is 0.83 and 0.08 respectively (equating to 91 percent which is the figure the level of service relates to).
- 7.53 ActewAGL maintains performance data within the ActewAGL's Portal which includes 39 types of maintenance activities and related performance data. During the audit, we reviewed records across all 39 maintenance activities and related performance data. A sample of records for the period 19 November 2016 to 20 February 2017 were reviewed which found that within the time period, ActewAGL were successful in meeting their performance indicators 81 percent of the time.
- 7.54 However, for the same sample tested, it was also observed that of the 43 cable fault defects requiring repair, only 67 percent were repaired within the Level of Service target of 35 working days. Thus, 14 of the 43 i.e. 33 percent were repaired in a time period longer than the targeted 35 working days. Therefore, based on the sample tested, the contractor is failing to meet the Service Target on cable fault defects approximately 33 percent of the time.
- 7.55 In June 2017 ActewAGL advised that:

Some defect repairs were delayed because ActewAGL was waiting on advice from the Superintendent/principal before addressing the repairs.

Audit reports

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Report No. 02 – 2017	2016 ACT Election
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Report No. 08 – 2016	Annual Report 2015-16
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