

The background image shows a vibrant city waterfront scene. In the foreground, a black swan swims gracefully in the water. To its left, a boat is partially visible, its hull covered in dense, handwritten graffiti in various colors. The middle ground is filled with a large, diverse crowd of people gathered along the water's edge, some sitting on the grass and others standing. In the background, a city skyline is visible under a clear sky, featuring several tall buildings and a large white tent-like structure. The overall atmosphere is one of a lively public event or festival.

# **WATER INFRASTRUCTURE** ASSET MANAGEMENT PLAN





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# 1. EXECUTIVE SUMMARY

## Context

Water infrastructure assets provide services to the entire Adelaide City Council (Council) area from flood protection to road users, people, and property in city streets to the provision of recreational and amenity facilities in the Adelaide Park Lands such as the iconic Torrens Lake. The Council area will undergo considerable change over the next 10 years with Council driving an activation of public spaces, significant increases in residents and people visiting the city resulting in greater residential density, demand on open space and connectivity driven by an emphasis on pedestrians, cyclists, and public transport.

To deliver these services, Council manages a portfolio of water infrastructure assets including an underground stormwater drainage network providing flood protection to road users, people, and property during rainfall events, a network of watercourses providing amenity and supporting ecosystems and biodiversity through the Park Lands, and group of Weirs, boat landings, earth retaining structures, and environmental equipment supporting Torrens Lake and Environs, Adelaide's iconic recreational space.

This Asset Management Plan (AM Plan) outlines how Council will manage the Water Infrastructure Asset Class to provide and measure level of service, react to demand in growth and service levels, identifying, assessing, and controlling risks associated with operating the assets, and outline a Long Term Financial Plan (LTFP) for the operation, maintenance, renewal, and enhancement of the Water Infrastructure Asset Class.

The Council's stormwater drainage network is a fully developed system in good condition, providing accessibility and flood protection to city streets and buildings in both minor and major rainfall events. With greater demand on Adelaide's open spaces and community attitudes shifting towards environmental sustainability, there will be significant demand for new water infrastructure assets in the areas of environmental and amenity improvements such as wetlands, water sensitive urban design, pollutant removal, and water quality treatment. The major issues associated with the management of existing water infrastructure assets focus around the renewal of significant degraded watercourses in the Park Lands and the unknown condition of submerged earth retaining structures in Torrens Lake.

*The City of Adelaide Strategic Plan 2016 - 20* seeks to deliver outcomes for the city and its community in alignment with the following four themes:

- Smart;
- Green;
- Liveable; and
- Creative.

This AM Plan will ensure that management of water infrastructure will underpin the Adelaide economy, lifestyle, experience, and way of life outlined in Council's *Strategic Plan 2016 - 20*.

The Water Infrastructure Asset Class contains a diverse collection of infrastructure assets providing a number of services over the entire Council area. With varying economic life, condition, capacity, age, function, and asset consumption attributes, these assets are best managed in the following three asset categories:

- |   |                                  |
|---|----------------------------------|
| 1. <b>Stormwater drainage network</b>                 | Replacement cost \$92.6 million  |
| 2. <b>River Torrens and watercourse assets</b>        | Replacement costs \$29.8 million |
| 3. <b>Environmental and wastewater infrastructure</b> | Replacement cost \$4.7 million   |

These infrastructure assets have a total replacement value of \$127.1 million.

In general, the majority of Council's stormwater drainage network is in good condition with little demand for renewals or enhancements over the short to medium term. Council's River Torrens and watercourse assets however are generally in poor condition and will require significant renewal of existing assets over the short to medium term. In general, the majority of the environmental and wastewater asset group are new assets in very good condition however shorter useful lives will demand ongoing asset renewal over the short to medium term. This asset group will have significant growth of enhancement assets over the short to medium term particularly in the areas of wetlands and water sensitive urban design facilities.



## The Water Infrastructure Service

The Water Infrastructure Asset Class comprises:

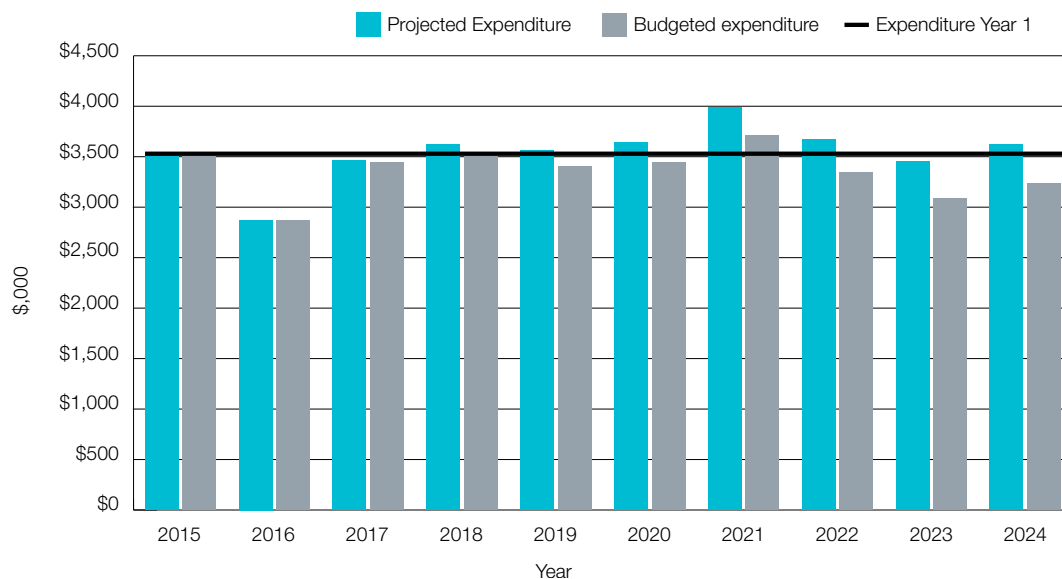
- Underground stormwater drainage network (138.7 kilometres pipes, 3,919 inlet pits, 981 manholes, and 2,202 nodes);
- Creeks and open channel watercourses (7.51 kilometres);
- Stormwater storage basins (nine basins);
- Gross pollutant traps (14 units);
- Weirs (three);
- Torrens Lake earth retaining structures (2.3 kilometres);
- Torrens Lake water mixers (17 units);
- Torrens Lake boat ramps / landings (10);
- Biological Filtration System (one facility);
- Sedimentation basins (two basins);
- Water quality monitoring equipment (six sites);
- Sewer infrastructure (five locations); and
- Water sensitive urban design (six facilities).

## What does it cost?

The projected outlays necessary to provide the services covered by this AM Plan includes operations, maintenance, renewal, and upgrade of existing assets over the 10-year planning period is \$3.5 million on average per year.

Estimated available funding for this period is \$3.4 million on average per year which is 95% of the cost to provide the service. This is a funding shortfall of \$0.18 million on average per year. Projected expenditure required to provide services in the AM Plan compared with planned expenditure currently included in the 2014 - 15 LTFP are shown in the graph below.

**Figure 8: Projected and LTFP Budgeted Expenditure for Water Infrastructure**



Total water infrastructure portfolio assets	(\$,000)
10-year total cost (10-year operations, maintenance, renewal, and upgrade project expenditure)	\$35,427
10-year average cost	\$3,543
10-year total LTFP budget (10-year operations, maintenance, renewal, and upgrade LTFP budget)	\$33,599
10-year average LTFP budget	\$3,360
10-year AM financial indicator	95%
10-year average funding shortfall	-\$183

## What we will do

We plan to provide water infrastructure services for the following:

- Operation, maintenance, renewal, and upgrade of stormwater drainage network, River Torrens and watercourse assets and environmental and wastewater infrastructure to meet service levels set by Council in annual budgets;
- Renewal of more than 3.2 kilometres of watercourses and open channel drains in the South and East Park Lands, renewal of several boat landings in Torrens Lake, renewal of more than 400 metres of earth retaining structures in Torrens Lake within the 10-year planning period; and
- Construction of a new wetland in Victoria Park and water sensitive urban design facilities around the city, installation of three new gross pollutant traps in North Adelaide and the South Park Lands, and installation of two temporary water storages in Park 16 and Park 20 associated with the *Brown Hill Keswick Creek Stormwater Management Plan* subject to endorsement by the State Government's Stormwater Management Authority and funding agreements with the State and Federal Governments.

## What we cannot do

There is adequate funding to provide all existing services at the desired service levels and to provide infrastructure assets to deliver new services.

We do not have enough funding under present funding levels to provide adequate operations and maintenance to future infrastructure assets delivering new services at the desired service levels. Works and services that cannot be provided under funding levels (average \$0.18 million per annum) are:

- Maintenance of the future Victoria Park wetland;
- Operation and maintenance of three new gross pollutant traps;
- Operation and maintenance of future water sensitive urban design facilities; and
- Operation and maintenance of future Torrens Lake Cyanobacteria Management System.

## Managing the risks

There are risks associated with providing the service and not being able to complete all identified activities and projects.

We have identified major risks as:

- Insufficient operations and maintenance for Council's future Victoria Park wetlands and water sensitive urban design facilities reducing effectiveness of these facilities in providing the desired level of service;
- Insufficient operations and maintenance for Council's future gross pollutant traps / trash racks in Park 11, Park 20, and Park 17 reducing the effectiveness of pollutant interception for Torrens Lake and Park Lands Creek;

- Low level of confidence in unit rates and valuation of major infrastructure assets during 2013 - 14 revaluation process may result in inadequacies in LTFP renewal projections. Renewal costs in Three-year Asset Renewal Plan has been updated to mitigate this risk in the short term;
- Current Operations and Maintenance Plan for water infrastructure assets not fully implemented resulting in accelerated consumption of some asset groups; and
- Unknown condition of submerged earth retaining structures in Torrens Lake may require renewal works to be brought forward if assets are found to be in very poor condition. Submerged earth retaining structures within the Riverbank development will be prioritised to synergise with the proposed Riverbank works.

We will endeavour to manage these risks within available funding by:

- Managing lifecycle costs of Victoria Park wetlands and water sensitive urban design facilities during the feasibility and design to minimise operational and maintenance costs;
- Reviewing operation and maintenance of Council's full portfolio of gross pollutant traps to determine more cost effective ways to provide the service such as service contracts delivering economy of scale cost savings;
- Comprehensive review of unit rates and valuation of major infrastructure assets including comparisons with project handover financial information 2009 - 14 and desktop revaluation in 2016 - 17;
- Full implementation of Operations and Maintenance Plan for water infrastructure assets to ensure assets are delivering required level of service at acceptable asset consumption rates; and
- Undertaking an underwater condition assessment of existing submerged earth retaining structures in Torrens Lake to quantify remaining life and inform the LTFP.

## Confidence levels

This AM Plan is based on medium level of confidence information assessed based on the following:

- Valuation of assets may not reflect true fair value resulting in a short term understatement of depreciation;
- Asset renewal forecasts have been based on like for like renewals without lifecycle assessment and detailed assessment of services to be provided;
- Existing asset performance levels have been based on condition or age only. A more detailed assessment on function and capacity is required to determine the performance of assets in meeting community levels of service; and
- Operations and maintenance expenditure is based on a reactive maintenance strategy and does not reflect operations and maintenance levels to assets which will deliver lowest lifecycle cost in provision of services.

## The next steps

The actions resulting from this AM Plan are:

- Undertake a review of unit rates and valuation of major infrastructure assets for the Water Infrastructure Asset Class during 2016 - 17 including sensitivity analysis and comparisons with project handover costs to determine the impact of the accuracy of 2014 unit rates on asset sustainability and LTFP;
- Review of customer and technical levels of service during 2016 - 17 including a new community level of service survey to ensure that service delivery performance is meeting community expectations;
- Undertake a review and analysis of renewal and maintenance strategies for stormwater drainage infrastructure assets during 2017 - 18 to determine optimal renewal intervention points to deliver services at lowest lifecycle costs;
- Undertaking a comprehensive underwater condition assessment of existing submerged earth retaining structures in Torrens Lake during 2016 - 17 to determine remaining life for comparison with existing Renewal Plan based on asset age; and
- Implement inspection, maintenance, and reporting activities outlined in the Operational and Maintenance Plan for water infrastructure assets which are currently not undertaken during 2016 - 17.

## Questions you may have

### What is this plan about?

This AM Plan covers the infrastructure assets that serve the Council community's water infrastructure needs. These assets include wastewater infrastructure, stormwater drainage infrastructure, water courses and water storages, Torrens Lake infrastructure, and environmental infrastructure such as gross pollutant traps and biological filtration equipment throughout the community area that enable people to be protected from major rainfall events; access streets, footpaths, public spaces, and buildings during minor rainfall events, safely access water storages and watercourses, attend events serviced by wastewater infrastructure, and enjoy natural habitats and ecosystems provided for by water sensitive urban design and environmental improvement infrastructure.

### What is an Asset Management Plan?

Asset management planning is a comprehensive process to ensure delivery of services from infrastructure is provided in a financially sustainable manner.

An AM Plan details information about infrastructure assets including actions required to provide an agreed level of service in the most cost effective manner. The plan defines the services to be provided, how the services are provided, and what funds are required to provide the services.

### Is there a funding shortfall?

The majority of Council's older water infrastructure assets have been constructed, maintained, and renewed by Council over a 90-year period. Council is currently providing adequate operational, maintenance, and renewal funding which meets asset consumption rates.

There are a number of recently acquired water infrastructure assets constructed from government grants particularly in the area of water quality treatment and water sensitive urban design. Prior to accepting these assets, Council was aware of ongoing operations, maintenance, and replacement needs and these assets have been included in this plan.

Our present funding levels are insufficient to continue to provide existing services at current levels in the medium term however funding of operation and maintenance of new services will create a funding shortfall of 10-year average \$182,000 per annum.

### What options do we have?

Resolving the funding shortfall involves several steps:

1. Improving asset knowledge so that data accurately records the asset inventory, how assets are performing, and when assets are not able to provide the required service levels;
2. Improving our efficiency in operating, maintaining, renewing, and replacing existing assets to optimise lifecycle costs;
3. Identifying and managing risks associated with providing services from infrastructure;
4. Making trade-offs between service levels and costs to ensure that the community receives the best return from infrastructure;
5. Identifying assets surplus to needs for disposal to make saving in future operations and maintenance costs;
6. Consulting with the community to ensure that water infrastructure services and costs meet community needs and are affordable;
7. Developing partnership with other bodies, where available to provide services; and
8. Seeking additional funding from governments and other bodies to better reflect a 'whole of government' funding approach to infrastructure services.



### **What happens if we don't manage the shortfall?**

It is likely that we will have to reduce service levels in some areas, unless new sources of revenue are found. For water infrastructure, the service level reduction may include reduction of the frequency of emptying gross pollutant traps, design of Victoria Park wetlands, and water sensitive urban design facilities which provide a lower level of service (environmental sustainability) at a lower operating and maintenance cost. Reduction in maintenance in other areas may accelerate the consumption of some asset groups.

### **What can we do?**

We can develop options, costs, and priorities for future water infrastructure services, consult with the community to plan future services to match the community service needs with ability to pay for services, and maximise community benefits against costs.

### **What can you do?**

We will be pleased to consider your thoughts on the issues raised in this AM Plan and suggestions on how we may change or reduce its water infrastructure mix of services to ensure that the appropriate level of service can be provided to the community within available funding.

## 2. INTRODUCTION

### 2.1 Background

This AM Plan is to demonstrate responsive management of assets (and services provided from assets), compliance with regulatory requirements, and to communicate funding needed to provide the required levels of service over a 20-year planning period.

The AM Plan follows the format for AM plans recommended in Section 4.2.6 of the *International Infrastructure Management Manual*<sup>1</sup>.

The AM Plan is to be read with the organisation's *Asset Management Policy*, *Asset Management Strategy*, and the following associated planning documents:

- *Draft City of Adelaide Strategic Plan 2016 - 20\**
- *The Corporation Plan 2012 - 16 One City One Team*
- *Active City Strategy 2011*
- *Smart Move Transport and Movement Strategy 2012 - 22*
- *Community Land Management Plans* (various)
- *Adelaide Park Lands Management Strategy*
- *Development Plan Adelaide (City) – 2014*
- *International Infrastructure Management Manual 2011*
- *Conduit Inspection Reporting Code of Australia WSA 05-2013*
- *Condition Assessment and Asset Performance Guidelines – IPWEA-NAMS.AU Practice Note 5 - Stormwater Drainage*
- \*(and any future strategic plans adopted by Council)

1. IPWEA, 2011, Sec 4.2.6, *Example of an Asset Management Plan Structure*, pp 4|24 – 27.

This infrastructure assets covered by this AM Plan are shown in Table 2.1. These assets are used to provide flood protection and accessibility during major and minor rainfall events, safe, appropriate, and attractive water bodies for recreational use, wastewater infrastructure to support events in the Park Lands, sustainable reuse of stormwater and wastewater, and environmental / habitat enhancement services to the community.

**Table 2.1: Assets covered by this Asset Management Plan**

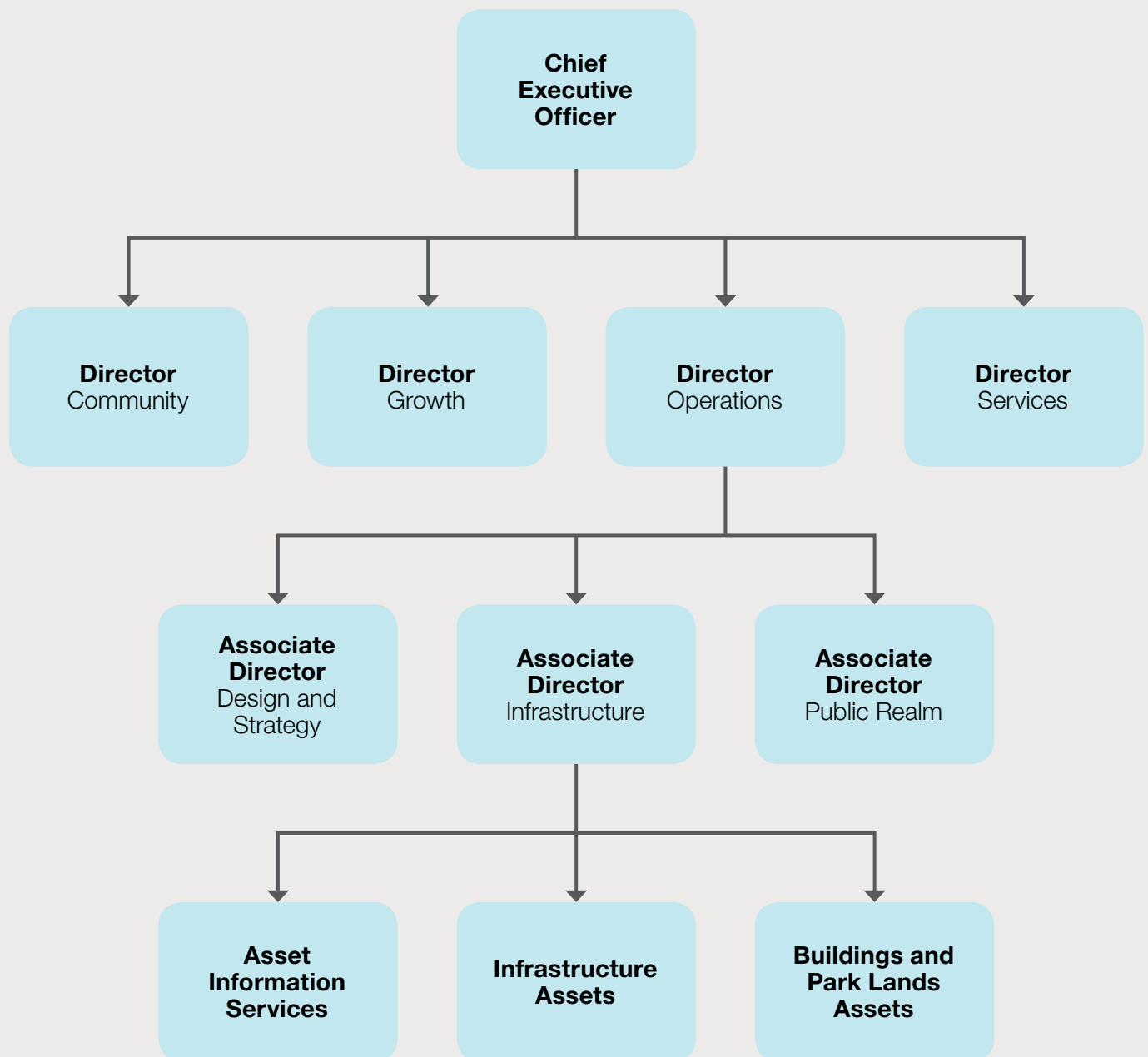
Asset category	Dimension	2013 - 14 Replacement value
Stormwater mains	119.1 kilometres mains pipes	\$64,800,000
Stormwater inlet pits and pipes	3,919 inlet pits	\$15,300,000
	19.62 kilometres inlet pipes	\$5,600,000
Stormwater manholes	981 manholes	\$3,140,000
Stormwater nodes	2,202 nodes	\$3,880,000
Stormwater channels	7.51 kilometres open channels	\$8,810,000
Stormwater storage basins	9 basins	\$1,240,000
Gross pollutant traps	14 units	\$2,330,000
Weirs	3 weirs	\$8,780,000
Torrens Lake macrophytes	18,500 square metres	\$1,100,000
Torrens Lake earth retaining structures	2.3 kilometres	\$8,600,000
Torrens Lake water mixers	17 units	\$422,000
Boat ramps / landings	10 no	\$1,180,000
Biological Filtration System	1 facility	\$400,000
Sedimentation basins	2 basins	\$380,000
Water quality monitoring equipment	6 sites	\$79,272
Sewer infrastructure	5 locations	\$271,306
Water sensitive urban design	6 facilities	\$779,757
<b>TOTAL</b>		<b>\$127,131,077</b>

Key stakeholders in the preparation and implementation of this AM Plan are: Shown in Table 2.1.1.

**Table 2.1.1: Key Stakeholders in the Asset Management Plan**

Key stakeholder	Role in AM Plan
Elected Members	<ul style="list-style-type: none"> <li>• Represent needs of community / shareholders;</li> <li>• Allocate resources to meet the organisation's objectives in providing services while managing risks; and</li> <li>• Ensure organisation is financial sustainable.</li> </ul>
CEO / Directors	Executive Management endorsement, sign off and executive ownership.
Associate Director Infrastructure	Review and approval of the AM Plan.
Asset Consultant Water	Development, implementation, and maintenance of the AM Plan to meet community levels of service.
Adelaide community who receive services from water infrastructure	Provide feedback on asset performance, new service demand, desired level of service, agreed level of service, and future service planning.
Public Realm Program	Cleaning and Infrastructure Maintenance teams operate and maintain the infrastructure managed under the AM Plan to meet technical levels of service.
Strategy and Innovation Program	Development of annual business plan and budget and Strategic Management Plan review.
Finance and Businesses	Funding for LTFP.
City Sustainability and Park Lands Program	Development of sustainable service delivery outcomes involving renewal and enhancement of water infrastructure assets.
State Government (A and MLR NRMB, SA Water, EPA, DPTI, Planning SA)	Project partner in the implementation of water infrastructure enhancement projects, operational activities and strategic planning.
Catchment councils	Project partners in the development stormwater management plans impacting water catchments in the Adelaide Metropolitan Area.
Service authorities	Project partners in the joint renewal of infrastructure assets in the Public Realm.

The organisational structure for service delivery from infrastructure assets is detailed below:





## 2.2 Goals and Objectives of Asset Management

The organisation exists to provide services to its community. Some of these services are provided by infrastructure assets. We have acquired infrastructure assets by 'purchase', by contract, construction by our staff, and by donation of assets constructed by developers and others to meet increased levels of service.

Our goal in managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance;
- Managing the impact of growth through demand management and infrastructure investment;
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service;
- Identifying, assessing, and appropriately controlling risks; and
- Having a LTFP which identifies required, affordable expenditure, and how it will be financed<sup>2</sup>.

## 2.3 Plan Framework

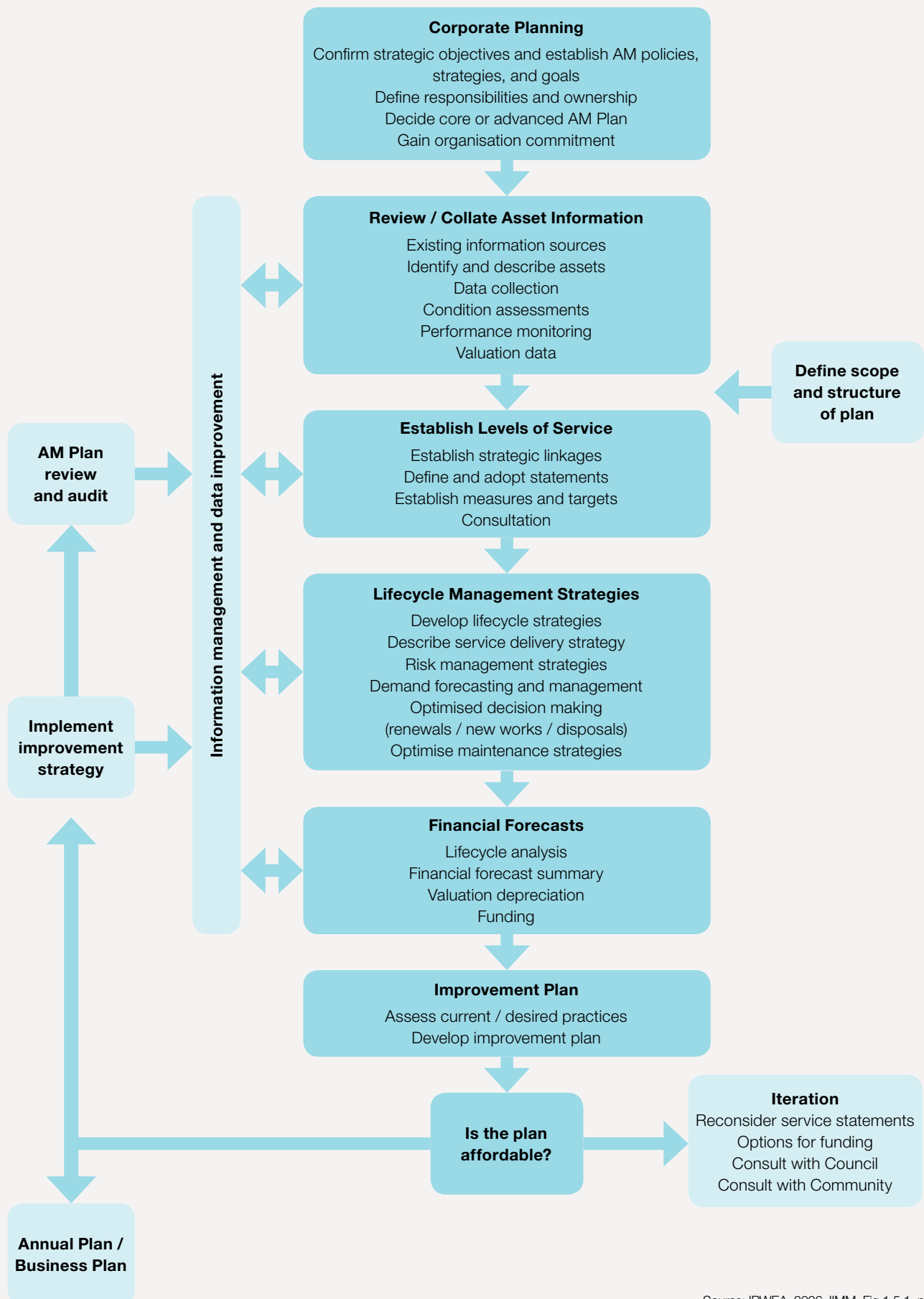
Key elements of the plan are:

- Levels of service – specifies the services and levels of service to be provided by the organisation;
- Future demand – how this will impact on future service delivery and how this is to be met;
- Lifecycle management – how Council will manage its existing and future assets to provide defined levels of service;
- Financial summary – what funds are required to provide the defined services;
- Asset management practices;
- Monitoring – how the plan will be monitored to ensure it is meeting organisation's objectives; and
- Asset Management Improvement Plan.

A road map for preparing an AM Plan is shown on the following page.

2. Based on IPWEA, 2011, IIMM, Sec 1.2 p 1|7.

## Road Map for preparing an Asset Management Plan



Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11.

## 2.4 Core and Advanced Asset Management

This AM Plan is prepared as a 'core' AM Plan over a 20-year planning period in accordance with the *International Infrastructure Management Manual*<sup>3</sup>. It is prepared to meet minimum legislative and organisational requirements for sustainable service delivery and long term financial planning and reporting. Core asset management is a 'top down' approach where analysis is applied at the 'system' or 'network' level.

Future revisions of this AM Plan will move towards 'advanced' asset management using a 'bottom up' approach for gathering asset information for individual assets to support the optimisation of activities and programs to meet agreed service levels in a financially sustainable manner.

## 2.5 Community Consultation

This 'core' AM Plan is prepared to facilitate community consultation initially through feedback on public display of draft asset management plans prior to adoption by the Council / Board. Future revisions of the AM Plan will incorporate community consultation on service levels and costs of providing the service. This will assist the Council / Board and the community in matching the level of service needed by the community, service risks, and consequences with the community's ability and willingness to pay for the service.

3. IPWEA, 2011, IIMM.

# 3. LEVELS OF SERVICE

## 3.1 Customer Research and Expectations

During late 2014, IPWEA released *Practice Note 8 – Levels of Service and Community Engagement* outlining a process for undertaking level of service engagement and consultation outlining a five step process to develop, negotiate, and implement agreed levels of service with the community. This includes undertaking community consultation in three levels: Level 1 – identifying what customer's value, Level 2 – seeking inputs to levels of service, and Level 3 – seeking agreement to levels of service.

During 2015, Council undertook community consultation on Level 2 – seeking inputs to levels of service based around assumed levels of importance for services provided. This methodology was required due to limited time frames and Council's community consultation strategies and methodologies. Given that all Council infrastructure service levels were to be measured, there was a limit on the number of services to be measured and for the Water Infrastructure Asset Class, consultation was limited to the following three services measured under the city streets and Park Lands community consultation categories:

1. Performance of Council's stormwater management system in supporting access to pedestrians, cyclists, and vehicle users on Council's footpaths, cycle paths, and roadways during minor rainfall events.
2. Performance of Council's stormwater management system in protecting people and property during major rainfall events.
3. Performance of Council's River Torrens and Park Lands watercourse in supporting recreation, education, and environmental services.

Results of the survey and comparisons with previous level of service measures undertaken in 2009 and 2011 are outlined below:

### City Streets - Stormwater and Flooding

Council's stormwater management system providing access for pedestrians, cyclists, and motorists to Council footpaths, cycle paths, and roadways during minor rainfall events is considered sufficient by 65% of participants.

This is a similar performance measure to previous years where respondents provided a 72% performance rating in 2011 and 67% in 2009 however these measures were based on the stormwater management system as a whole including minor and major stormwater events.

Only 39% of respondents agreed that Council's stormwater management system protected properties from flooding during major rainfall events however 59% of respondents could not provide a response to this measure as they had not experienced significant rainfall events in the city which is not unexpected given that major rainfall events are rare. The last stormwater event exceeding one in 20 year ARI occurred in November 2005, more than 10 years ago.

### Park Lands – River Torrens, Creeks, and Watercourses

Overall, 76% of respondents were satisfied with Park Lands creeks and watercourses with 78% satisfied that they were safe to be near watercourses and 73% satisfied that watercourses were well maintained. Most respondents based their measure on the River Torrens and other Park Lands recreational lakes therefore the measure more than likely does not reflect that for watercourses in general located in the Park Lands.

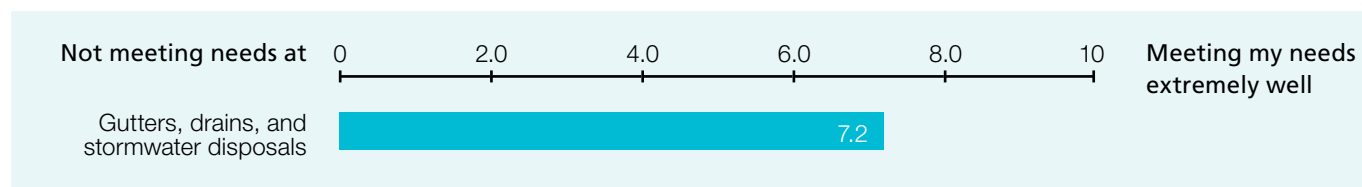
In 2011, the respondents measured the performance of the River Torrens and Park Lands creeks at only 61% with water quality in Torrens Lake cited as need for improvement as the lake had received significant negative media attention between 2008 and 2011 with regular lake closures due to blue green algae outbreaks. Implementation of Torrens Task Force recommendations and the River Torrens Water Quality Improvement Program has seen significant improvements in water quality and no lake closures over the last three years.

While there has been continued improvement in level of service for users of the Torrens Lake precinct, watercourses in the Park Lands are significantly degraded and in many cases are not providing the services intended particularly in the areas of safety, water quality, recreation, habitat, and biodiversity.

Given the limitations on the methods of community consultation undertaken and measurement of actual levels of service outside the requirements outlined in *Practice Note 8 – Levels of Service and Community Engagement*, the community and technical levels of service outlined in this plan have been developed using the best information available from the 2009, 2011, and 2015 community consultation measures.

**Figure 3.1: 2011 Community Satisfaction Survey Levels**

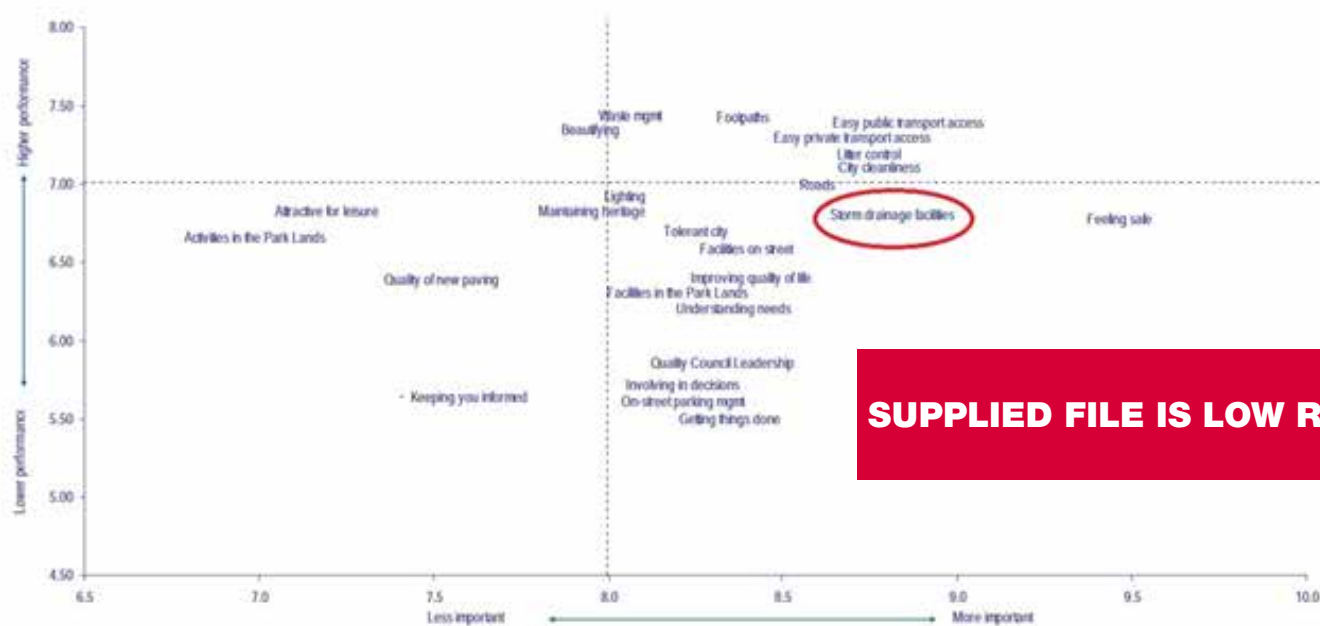
**City Streets – Mean Performance Scores**



**City Park Lands – Mean Performance Scores**



**Figure 3.2: 2009 Community Satisfaction Survey Levels**



The organisation uses this information in developing its Strategic Plan and in allocation of resources in the budget.



## 3.2 Strategic and Corporate Goals

The content of this AM Plan was prepared in early 2014 under the direction of *The City of Adelaide Strategic Plan 2012 - 16* and associated *Corporation Plan 2012 - 16* and reflects the goals and aspirations of the previous Council term (November 2010 - October 2014).

With the election of the new Council in October 2014, a new *Council Strategic Plan 2016 - 20* was under development in December 2015 during the finalisation of this AM Plan.

From the preliminary information available, the following Council vision, mission, goals, and objectives associated with community services provided by water infrastructure assets have been identified.

Our vision is:

**Adelaide is a smart, green, liveable, boutique city full of rich experiences**

Our primary goal is:

**To strengthen the City economy by growing the number of people living, working, playing, visiting, and studying in the City every day**

As the capital city of South Australia, Adelaide has a vital role to play in shaping the future of our state.

We face unprecedented changes arising from major global, national, and local trends. Reassuringly, our proven record of creativity, innovation, and social transformation sees our city well placed to lead the state in meeting these changes.

Our plan is to enrich Adelaide's lifestyle and boost its growth by becoming one of the world's smartest cities with a globally connected and opportunity rich economy.

We will be one of the world's first carbon neutral cities and a global leader in sustainability and responding to environmental change.

Adelaide will always be a distinctively unique capital city that supports a balanced lifestyle and a strong community. Our authentic and diverse range of experiences will be internationally renowned.

Our mission:

To achieve the vision, Council has adopted four key outcomes which will guide the organisations projects, plans, policies, and strategies including this AM Plan. The four outcomes / mission statements are:

- **Smart** – A world smart city with a globally connected and opportunity rich economy;
- **Green** – One of the world's first carbon neutral cities and an international leader in environmental change;
- **Liveable** – A diverse and welcoming capital city with an enviable lifestyle and strong community; and
- **Creative** – A city of authentic and internationally renowned experiences.

Relevant organisational goals and objectives and how these are addressed in this AM Plan are identified below.

**Table 3.2: Organisational Goals and how these are addressed in this Asset Management Plan**

(Preliminary City of Adelaide Strategic Plan 2016 - 20)

Theme	Objective	Actions	How actions are addressed in AM Plan
Smart	Total businesses in the city will grow from 5,000 to over 5,300 and workers from 89,000 to 94,000 by 2020, on the way to 7,000 businesses and over 102,000 workers by 2040.	Build upon the growing laneway and entrepreneurial culture in the city by rejuvenating primary laneways and pedestrian connections. Priorities for completion by 2018 will be the Adelaide Railway Station to Adelaide Central Market link and Rundle Mall laneways including Gawler Place.	Ensure Council's stormwater management system provides effective management of stormwater run-off during minor rainfall events to maintain vehicle, pedestrian, and bicycle accessibility to pedestrian connections. Use collected stormwater run-off for passive irrigation of green spaces.
Green	Reduce city carbon emissions by 35% from the 2006 - 07 baseline, on the way to an 80% real reduction by 2040.	Enhance biodiversity in the Park Lands and strengthen their role in achieving a carbon neutral city.	Plant more than 135,000 new plants as part of the Park Lands Creek Renewal Project in the South Park Lands
	Green space and greenery in the built up areas of the city to increase by 100,000 square meters by 2020 on the way to a real reduction in city temperatures by 2040.	Increase public and private greening with street trees, gardens, community gardens, green walls, and roofs, vegetable gardens on street verges providing incentives where appropriate.	Use collected stormwater run-off to passively irrigate rain gardens, bio-retention basins, trees, and landscaped areas in roadways and street verges.
	By 2020, aquatic native plants on the Torrens Lake floor to increase from almost zero to 7,500 square metres as we progress toward improved aquatic health and a high diversity of native fish species in the Torrens River by 2040.	Improve the ecological value of watercourses and biodiversity in the Park Lands.	Provide water detention along Park Lands watercourses to support diverse habitat and biodiversity. Create a habitat corridor in the south Park lands as part of the Park Lands Creek Renewal Project.
		Reduce storm water run-off and pollution into the Torrens River through integrated catchment management and water sensitive urban design.	Manage Council's existing suite of gross pollutant traps on stormwater drains to intercept pollutants from reaching the River Torrens water body. Remove nutrients from receiving waters through water sensitive urban design such as rain gardens and bio-retention basins in streets and Park Lands.
	A comprehensive integrated water management measure has been developed and influences our work.	Continue to work with the State Government and other councils to reduce stormwater and other pollutants into the River Torrens catchment.	Work with the State Government and eastern region councils to implement pollutant interception and water quality initiatives outlined in the <i>Torrens Task Force Recommendations</i> and <i>Eastern Region Urban Stormwater Management Plan</i> .

**Table 3.2: Organisational Goals and how these are addressed in this Asset Management Plan** *continued*

Theme	Objective	Actions	How actions are addressed in AM Plan
Liveable	The number of people living in the city will grow from 23,000 to 28,000 by 2020, on the way to 50,000 by 2040.	Create world-class infrastructure by adopting a three-year rolling capital works program for the city and Park Lands to ensure all new and existing infrastructure are delivered and maintained to high quality standards incorporating technology, heritage, arts, and green elements.	Ensure that water infrastructure renewal and enhancement projects deliver high quality multi-objective outcomes including rain gardens to improve water quality, stormwater reuse for passive irrigation of green spaces, and biodiversity along watercourses that promotes indigenous heritage.
		Work with neighbouring councils and the State Government to enhance the facilities, attractions, landscapes, and movement networks in the Park Lands to meet the needs and expectations of growing high density communities living in and near the city.	Manage stormwater flow paths in the Park Lands to provide unimpeded pedestrian and cyclist movement. Work with the State Government and neighbouring councils to incorporate habitat, biodiversity, educational, and recreational opportunities as part of the South Park Lands Stormwater Management Project.
Creative	The number of people attending events in the city and Park Lands has grown 5% by 2020, on the way to 15% growth by 2040.	Work with neighbouring councils and the State Government to enhance the role of the Park Lands in supporting artistic, sporting, and recreational activities.	Work with the State Government and other catchment councils to renew watercourses in the south and east Park Lands to support recreational and cultural events in those Parks.
	A detailed measure of the number of people creating and actively participating in arts, culture, sport, and recreation activities has been developed and influences our work.	Promote the role of the Park Lands in increasing levels of physical activity through formal and informal sport and recreation opportunities.	Develop formal and informal pathways for pedestrians and cyclists during the renewal of Park Lands Creek in the South Park Lands. Develop mounding along the watercourse to support organised sport in the adjacent playing fields.
	The number of people that are visiting the city each day for shopping, leisure or entertainment will grow from 111,000 to 117,000 by 2020, on the way to 128,000 by 2040.	Work with the State Government in the development of the Riverbank Precinct including the Festival Plaza upgrade, the Adelaide Convention Centre redevelopment, the South Australian Health and Biomedical Precinct, and planning for the old Royal Adelaide Hospital redevelopment.	Work with the State Government in implementing the Torrens Task Force and River Torrens water quality improvement programs to improve water quality in Torrens Lake to support the Riverbank Precinct redevelopment. Ensure flood protection is provided to the old Royal Adelaide Hospital site.

### 3.3 Legislative Requirements

The organisation has to meet many legislative requirements including Australian and State legislation and State regulations. These include:

**Table 3.3: Legislative Requirements**

Legislation	Requirement
<i>Local Government Act 1999</i>	Sets out role, purpose, responsibilities, and powers of local governments including the preparation of a LTFP supported by asset management plans for sustainable service delivery.
<i>National Construction Code 2014</i>	Sets out minimum standards for stormwater management for property developments.
<i>Environment Protection Act 1993</i>	Outlines a number of requirements for the management of water infrastructure at Adelaide City Council including algaecide treatment of water bodies, water quality of stormwater discharge, and dredging of watercourses.
<i>Environmental Protection (Water Quality) Policy 2003</i>	Defines what is acceptable for discharge as stormwater and sets water quality standards for stormwater receiving waters.
<i>Adelaide Plains Water Allocation Plan (groundwater) – when available</i>	Plan for the management, conservation, and development of ground water resources in the Adelaide metropolitan area.
<i>Western Mount Lofty Ranges Water Allocation Plan 2013</i>	Regulates the amount and use of water extracted from the River Torrens and other water courses in the Adelaide City Council area.
<i>Natural Resource Management Act 2004</i>	Sets out responsibilities and powers of local government for the management of natural waterways and management requirements for surface and ground water in the Adelaide metropolitan area.
<i>Emergency Management Act 1994</i>	Requires lifeline utilities to function at the fullest possible extent during and after an emergency and to have plans for such functioning (business continuity plans).
<i>Development Plan – Adelaide (City) 2014</i>	Governs development within the city of Adelaide, regulates on-site stormwater management, detention, and reuse for developments.
<i>Local Government Stormwater Management Act 2007</i>	Outlines the Stormwater Management Agreement between State and Local Governments, establishment of the Stormwater Management Authority, and preparation of stormwater management plans.
<i>Brown Hill Keswick Creeks Stormwater Management Plan 2012</i>	Outlines Council's responsibilities under the approved Stormwater Management Plan for the Brown Hill Keswick Creek catchments and the relevant orders issued by the Stormwater Management Authority.
<i>Eastern Region Stormwater Management Plan (future)</i>	Will outline Council's responsibilities under the future Stormwater Management Plan for the Eastern Region catchments (First to Fifth Creeks).
<i>SA Strategic Plan 2011 and 30-year Plan for Greater Adelaide 2010</i>	Outlines water quality and water sustainability targets for metropolitan Adelaide including water use, stormwater reuse, and wastewater reuse initiatives.

The organisation will exercise its duty of care to ensure public safety in accordance with the *Infrastructure Risk Management Plan* linked to this AM Plan. Management of risks is discussed in Section 5.2.

### 3.4 Community Levels of Service

Service levels are defined service levels in two terms: customer levels of service and technical levels of service.

Community levels of service measure how the community receives the service and whether the organisation is providing community value.

Community levels of service measures used in the AM Plan are:

<b>Quality</b>	<b>How good is the service?</b>
<b>Function</b>	<b>Does it meet users' needs?</b>
<b>Capacity / utilisation</b>	<b>Is the service over or under used?</b>

The organisation's current and expected community service levels are detailed in Tables 3.4 and 3.5. Table 3.4 shows the agreed expected community levels of service based on resource levels in the current LTFP and community consultation / engagement.

#### Community Outcomes

- **Smart** – Providing flood protection to properties and infrastructure and effective management of stormwater run-off during minor rainfall events to maintain vehicle, pedestrian, and bicycle accessibility to pedestrian connections. Use collected stormwater run-off for passive irrigation of green spaces (stormwater drainage network assets).
- **Green** – Creeks, watercourses, and flood mitigation basins through the Park Lands which are safe, accessible, and support a range of outcomes including natural ecosystem biodiversity and habitat, water quality, conservation, and reuse (River Torrens and watercourse assets).
- **Liveable** – Provide water infrastructure which provides multi-objective outcomes such water quality and passive irrigation of green spaces such as rain gardens, landscaping, and bio-retention basins in city streets and the Park Lands (environmental and wastewater infrastructure).
- **Creative** – Creeks and watercourses in the south and east Park Lands which support passive recreation through pathways and cycle ways along creek lines, facilities which support organised recreation around sporting fields and support for cultural events and education experiences. Improve water quality in Torrens Lake to support recreation and the Riverbank Precinct redevelopment (River Torrens and watercourse assets).



**Table 3.4: Community Level of Service**

Service attribute	Service objective	Performance measure process	Current performance	Expected position in 10 years based on current LTFP
COMMUNITY LEVELS OF SERVICE				
Quality	SAFETY – Torrens Lake and watercourses are safe for the public to be near.	Customer satisfaction surveys relating to Torrens and watercourse safety.	Community satisfied with performance. Confidence level – Low.	Assessment on lowest lifecycle cost and agreed sustainable level of service yet to be carried out.
		Pathway service requests relating to safety of watercourses in the Park Lands.	3 - 5 reported incidents of watercourse safety per annum. Confidence level – High.	Assessment on lowest lifecycle cost and agreed sustainable level of service yet to be carried out.
	AMENITY – Torrens Lake and Park Lands watercourses are well maintained.	Customer satisfaction surveys relating to how well Torrens Lake and Park Lands watercourses are maintained.	Community satisfied with performance. Confidence level – Low.	Assessment on lowest lifecycle cost and agreed sustainable level of service yet to be carried out.
	AMENITY – Council's stormwater management system is maintained in a functioning condition with minimum blockages of pipes and pits.	Pathway service requests relating to Catchpit gutter is blocked – flooding or Catchpit gutter drain – smelly or Catchpit problem – damaged.	81 Pathway 'Catchpit gutter is blocked' requests per annum (average last 3 years). 26 Pathway 'Catchpit gutter drain – smelly' requests per annum (average last 3 years). 31 Pathway 'Catchpit problem – damaged' requests per annum (average last 3 years). Confidence level – High.	Assessment on lowest lifecycle cost and agreed sustainable level of service yet to be carried out.

**Table 3.4: Community Level of Service** *continued*

Service attribute	Service objective	Performance measure process	Current performance	Expected position in 10 years based on current LTFP
COMMUNITY LEVELS OF SERVICE				
Function	Water quality in Torrens Lake meets minimum standard for recreational use.	Monthly (winter) and twice weekly (summer) water quality measurements in Torrens Lake and recreational lakes.	Torrens Lake has met secondary contact recreational use over the last 3 years.  Confidence level – High.	Assessment on lowest lifecycle cost and agreed sustainable level of service yet to be carried out.
	AMENITY – Council's stormwater management system providing access for pedestrians, cyclists, and motorists to Council footpaths, cycle paths, and roadways during minor rainfall events.	Customer satisfaction surveys relating to how well access to footpaths, cycle paths, and roadways is maintained during minor rainfall events.	65% community satisfied with performance.  Confidence level – High.	Assessment on lowest lifecycle cost and agreed sustainable level of service yet to be carried out.
Capacity / utilisation	Council's stormwater management system protects properties from flooding during major rainfall events.	Customer satisfaction surveys relating to how well Council's stormwater management system protects properties from flooding during major rainfall events.	39% community satisfied with performance.  Confidence level – Low.	Assessment on lowest lifecycle cost and agreed sustainable level of service yet to be carried out.
	Provide an appropriate level of water sensitive urban design facilities in the city and North Adelaide.	Customer satisfaction surveys relating to how well Council is delivering water sensitive urban design services.	Community not satisfied with the number of water sensitive urban design facilities in the city and North Adelaide.  Confidence level – High.	Assessment on lowest lifecycle cost and agreed sustainable level of service yet to be carried out.

### 3.5 Technical Levels of Service

Technical levels of service - supporting the community service levels are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities that the organisation undertakes to best achieve the desired community outcomes and demonstrate effective organisational performance.

Technical service measures are linked to annual budgets covering:

- Operations – the regular activities to provide services such as opening hours, cleansing, mowing grass, energy, inspections;
- Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition (e.g. road patching, unsealed road grading, building and structure repairs);
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. frequency and cost of road resurfacing and pavement reconstruction, pipeline replacement, and building component replacement); and
- Upgrade – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).

Service and AM Plan, implement and control technical service levels to influence the customer service levels.<sup>4</sup>

Table 3.5 shows the technical level of service expected to be provided under this AM Plan. The agreed sustainable position in the table documents the position agreed by the Council / Board following community consultation and trade-off of service levels performance, costs, and risk within resources available in the LTFP.

**Table 3.5: Technical Levels of Service**

Service attribute	Service objective	Activity measure process	Current performance *	Desired for optimum lifecycle cost **	Agreed sustainable position ***
TECHNICAL LEVELS OF SERVICE					
Operations	Stormwater inlet pits are free of sediment and debris.	Review of performance of inlet pit cleaning program reports.	Not currently measured.	Assessment has not been carried out.	Assessment has not been carried out.
	Gross pollutant traps are emptied at optimum frequency.	Reported cleaning frequency and mass of material removed	Cleaning frequency below scheduled maintenance program frequency.	Assessment has not been carried out.	Assessment has not been carried out.
	Maximise operating times of Torrens Lake water mixers over the summer period.	Reported operational times for all 17 Torrens Lake water mixers.	Currently meets performance requirements.	Assessment has not been carried out.	Assessment has not been carried out.
		Budget \$487,203 year.			

Note: \* Current activities and costs (currently funded).

\*\* Desired activities and costs to sustain current service levels and achieve minimum lifecycle costs (not currently funded).

\*\*\* Activities and costs communicated and agreed with the community as being sustainable (funded position following trade-offs, managing risks, and delivering agreed service levels).

**Table 3.5: Technical Levels of Service** *continued*

Service attribute	Service objective	Activity measure process	Current performance *	Desired for optimum lifecycle cost **	Agreed sustainable position ***
TECHNICAL LEVELS OF SERVICE					
Maintenance	Inspection and maintenance of water infrastructure assets is undertaken as per Maintenance Plan.	Review of performance water infrastructure inspection and maintenance program reports.	Not currently measured.	Assessment has not been carried out.	Assessment has not been carried out.
	Torrens Lake water body is managed to meet adequate water quality and water levels, minimise sediment and pollutants to preserve flora and fauna, and suitability for secondary recreational uses.	Torrens Lake Weir control system and electrical system weekly, monthly, and quarterly inspection and maintenance is carried out.  Torrens Lake water quality levels are suitable for recreational secondary contact.	Torrens Lake Weir control system and electrical system maintenance program is implemented.  Torrens Lake water quality does not meet minimum standards during some periods over the summer months.	Assessment has not been carried out.	Assessment has not been carried out.
		Budget \$307,759 year.			
Renewal	Renewal of assets is undertaken at the optimal time in the lifecycle.	Assets are renewed when required under the LTFP.	Not currently measured.	Assessment has not been carried out.	Assessment has not been carried out.
	Renewal assets are delivered efficiently and fit for purpose.	Project handover costs are within 15% of projected asset renewal costs in the LTFP.	80% of projects completed over the last 5 years - does not meet performance standard.	Assessment has not been carried out.	Assessment has not been carried out.
		Budget \$1,444,000 year.			
Upgrade / new	New assets are delivered efficiently and fit for purpose.	Project handover costs are within 15% of projected asset renewal costs in the LTFP.	20% of projects over the last 5 years - does not meet performance standard.	Assessment has not been carried out.	Assessment has not been carried out.
		Budget \$797,000 year.			

Note: \* Current activities and costs (currently funded).v

\*\* Desired activities and costs to sustain current service levels and achieve minimum lifecycle costs (not currently funded).

\*\*\* Activities and costs communicated and agreed with the community as being sustainable (funded position following trade-offs, managing risks, and delivering agreed service levels).

## 4. FUTURE DEMAND

### 4.1 Demand Drivers

Drivers affecting demand include population change, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, and environmental awareness.

### 4.2 Demand Forecast

The present position and projections for demand drivers that may impact future service delivery and utilisation of assets were identified and are documented in Table 4.3.

### 4.3 Demand Impact on Assets

The impact of demand drivers that may affect future service delivery and utilisation of assets are shown in Table 4.3. Further research will be required to determine the full impact of these demand drivers on the services delivered by water infrastructure assets and this work will be undertaken during the next revision of this AM Plan.

**Table 4.3: Demand Drivers, Projections, and Impact on Services**

Demand drivers	Present position	Projection	Impact on services
Population growth	22,750 persons.	38,300 persons (2034).	Little impact on Council's existing levels of service for stormwater management however greater demand on providing services around water sensitive urban design and environmental initiatives. Increased demand on Park Lands facilities will require some areas of the Park Lands which do not meet Council's 10-year ARI minor storm to be provided with additional infrastructure.
Infill development	High density commercial and residential development throughout the Central Business District with medium density development in North Adelaide.	Significant increase in high density residential development in the central business district and North Adelaide to accommodate population and residential dwelling density growth targets. While this will result in increased overall stormwater run-off volumes and flow rates, it will be offset by other Council initiatives such as construction of green space.	Little impact of Council's stormwater infrastructure which has been designed for an assumed high level of run-off. Together with infill development in upstream catchment areas, will result in increased flows in receiving watercourses increasing erosion and damage to habitats.



**Table 4.3: Demand Drivers, Projections, and Impact on Services** *continued*

Demand drivers	Present position	Projection	Impact on services
Environmental initiatives	Focus on interception of gross pollutants and sediments in the River Torrens, watercourses and other water bodies. Management of water quality risk through accessibility controls.	Community focus on improved water quality in Council's water storages and watercourses through implementation of water quality initiatives to improve the quality of water in water storages and water courses both at source and in-line treatment. Implementation of numerous water quality initiatives for Torrens Lake. Gross pollutant interception on stormwater drains discharging to the Patawalonga Catchment.	Provision of new infrastructure and monitoring / treatment processes to achieve water quality targets in water storages and water courses which meet community demand including construction of wetlands. Support the implementation of green infrastructure through water sensitive urban design initiatives in roads and open space.
Catchment wide flood mitigation initiatives	Significant number of properties and infrastructure at risk of flooding in the First to Fifth Creeks, Brown Hill Creek, and Keswick Creek catchments including areas of the South and East Park Lands.	Work with other catchment councils to implement catchment wide flood mitigation initiatives. Implementation will include the structural works in the Cities of Adelaide, Campbelltown, Burnside, Norwood / Payneham / St Peters, Mitcham, Unley, and West Torrens.	Temporary flood storages are to be constructed in the South Park Lands to mitigate the contribution of one in 100 year ARI flows in Park Lands Creek to the Keswick Creek downstream watercourse.
Riverbank Precinct	Completion of Adelaide Oval redevelopment, River Torrens pedestrian bridge and commencement of the Adelaide Convention Centre expansion, SAHMRI building, and the new Royal Adelaide Hospital. More than one million people attended football games at Adelaide Oval during 2014.	Significant investment in the Riverbank precinct with redevelopment of the Adelaide Festival Centre precinct, Adelaide Casino expansion, completion of Adelaide Convention Centre, Royal Adelaide Hospital, University of Adelaide Medical School, and University of South Australia Medical Research facilities.	Significant increase in demand for recreational opportunities along the River Torrens corridor and high water quality in Torrens Lake. Demand will drive increased services in services provided by River Torrens infrastructure and environmental infrastructure (water quality).

**Table 4.3: Demand Drivers, Projections, and Impact on Services** *continued*

Demand drivers	Present position	Projection	Impact on services
Environmental sustainability	Council currently reuses stormwater to irrigate significant areas of the Park Lands under a multiple extraction, 410 ML water license from the Western Mount Lofty Ranges prescribed watercourses. There are a small number of water sensitive urban design facilities in city roads and Park Lands.	<i>Community and SA Strategic Plan / 30-year Plan for Greater Adelaide</i> demands for greater reuse of stormwater and wastewater in the Council area. Work jointly with the State Government to restore depleted water resources such as groundwater resources beneath the Adelaide Plains.	Provision of new infrastructure to capture, treat and reuse collected stormwater and wastewater. Develop partnerships with water users in the community to jointly exploit water reuse opportunities.
Climate change	Water infrastructure currently designed for historical rainfall regime and environments including design of stormwater management system and pollutant interception infrastructure.	Climate change will impact the performance of existing infrastructure in managing service levels associated with decreased rainfall event frequency and overall stormwater run-off volumes and higher stormwater run-off flow rates. Greater demand for green infrastructure in the Public Realm to address higher average temperatures and the heat island effects on city streets and open spaces.	Higher stormwater run-off flows will reduce current levels of service with respect to flood protection and accessibility during minor and major rainfall events. Greater demand for water sensitive urban design infrastructure to provide irrigation water to green infrastructure.

## 4.4 Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets, and providing new assets to meet demand and demand management. Demand management practices include non-asset solutions, mitigating risks, and managing failures.

Non-asset solutions focus on providing the required service without the need for the organisation to own the assets and management actions including reducing demand for the service, reducing the level of service (allowing some assets to deteriorate beyond current service levels) or educating customers to accept appropriate asset failures<sup>5</sup>. Examples of non-asset solutions include providing services from existing infrastructure such as aquatic centres and libraries that may be in another community area or public toilets provided in commercial premises.

Opportunities identified to date for demand management are shown in Table 4.4. Further opportunities will be developed in future revisions of this AM Plan.

**Table 4.4: Demand Management Plan Summary**

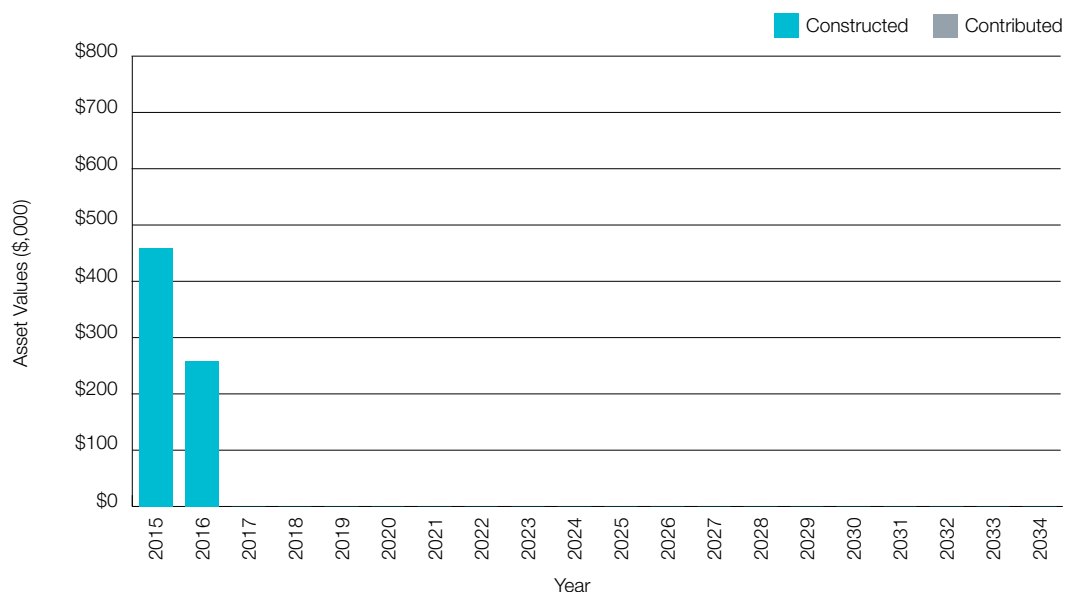
Demand driver	Impact on services	Demand Management Plan
Population numbers	Increased residential and visitor numbers to the city require higher stormwater drainage network levels of service in some areas.	Areas of the Park Lands will be subjected to higher usage from residents and visitors to the city requiring higher levels of protection from flooding during minor and major rainfall events.
Customer preferences	Demand for higher levels of service in the areas of environment and amenity of River Torrens and watercourse assets, water conservation, and water sensitive urban design (Riverbank Precinct).	Improved water quality levels in Torrens Lake particularly during the summer period utilising dilution flows, algaecide treatment, and macrophyte replanting. Greater reuse of stormwater including managed aquifer recharge schemes and greater use of Torrens Lake water during the winter months. Water sensitive urban design initiatives in city streets and open spaces to passive irrigation to landscaped areas.
Government policy	Emphasis placed on water quality, integrated stormwater management plans, reuse of stormwater and wastewater, and implementation of water sensitive urban design.	Implementation of catchment wide flood protection initiatives ( <i>Brown Hill Keswick Creek Stormwater Management Plan</i> and <i>Eastern Region Stormwater Management Plan</i> ). Partner with Federal and State Government to deliver water sensitive urban design and storm water reuse outcomes.
Weather patterns / climate change	Less frequent rainfall events however greater prevalence of high intensity rainfall events.	Higher levels of flood protection will be required at critical areas of the city. Greater emphasis on water sensitive urban design providing passive irrigation to landscaped areas.
Development intensity	Some areas of high density residential development within the city and North Adelaide will increase demand on open space.	Higher levels of service will be required for public safety, amenity, and environmental standards provided by River Torrens and watercourse assets in the Park Lands. Implementation of catchment wide flood protection initiatives ( <i>Brown Hill Keswick Creek Stormwater Management Plan</i> and <i>Eastern Region Stormwater Management Plan</i> ).

5. IPWEA, 2011, IIMM, Table 3.4.1, p 3/58.

## 4.5 Asset Programs to meet Demand

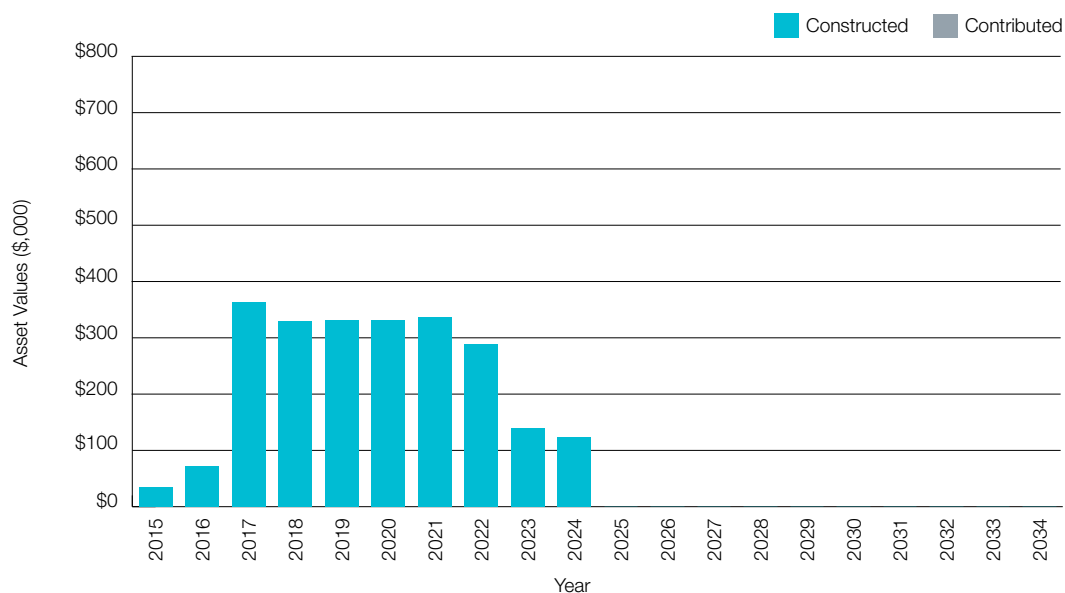
The new assets required to meet growth will be acquired free of cost from land developments and constructed / acquired by the organisation. New assets constructed / acquired by the organisation are discussed in Section 5.5. The cumulative value of new contributed and constructed asset values are summarised in Figure 1A to 1C.

**Figure 1A: Upgrade and New Assets to meet Demand – Stormwater Drainage Network**



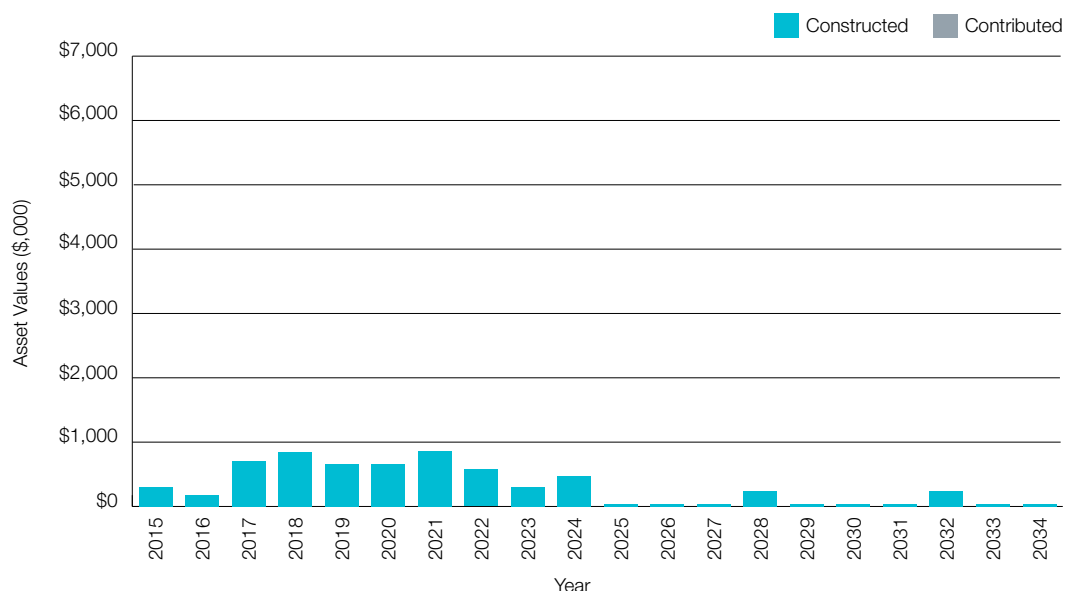
New assets required for Council's stormwater drainage network infrastructure all occur in Year 1 and Year 2 of the plan and involve the provision underground stormwater infrastructure (inlet pits, pipes and manholes) in Jeffcott Street, North Adelaide and the open space areas of Council's ERGO Residential Development in Frew Street and Sturt Street to provide the required level of service for flood protection and accessibility during minor and major rainfall events.

**Figure 1B: Upgrade and New Assets to meet Demand – River Torrens and Watercourses**



The new assets required for Council's River Torrens and watercourse assets all occur in the first 10 years of the plan as part of the temporary water storages to be constructed in the South Park Lands as part of the structural components of the *Brown Hill Keswick Creek Stormwater Management Plan 2012*. Temporary flood storages in the South Park Lands are proposed in Park 16 and Park 20.

**Figure 1C: Upgrade and New Assets to meet Demand – Environmental and Wastewater**



The new assets required for Council's environmental and wastewater infrastructure assets predominantly occur in first 10 years with the construction of the Victoria Park Wetland in Park 16 as part of the *Victoria Park Master Plan* and associated structural component of the *Brown Hill Keswick Creek Stormwater Management Plan 2012*. Each year of the 20-year plan includes construction of new water sensitive urban design infrastructure and the plan also includes construction of new gross pollutant traps on stormwater drains in the south of the city.

Acquiring these new assets will commit the organisation to fund ongoing operations, maintenance, and renewal costs for the period that the service provided from the assets is required. Operations and maintenance costs will increase on average by \$65,000 per annum over the next 10 years. These future costs are identified and considered in developing forecasts of future operations, maintenance, and renewal costs in Section 5.

# 5. LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the organisation plans to manage and operate the assets at the agreed levels of service (defined in Section 3) while optimising lifecycle costs.

## 5.1 Background Data

### 5.1.1 Physical parameters

The assets covered by this AM Plan are shown in Table 2.1.

Council's Water Infrastructure Asset Class contains a diverse collection of water related infrastructure assets providing a wide range of services over the entire Council area. Taking into account economic life, condition, capacity, age, function, purpose, and asset consumption rates, these assets are best managed in three distinct asset groups: stormwater drainage network, River Torrens and watercourse assets, and environmental and wastewater infrastructure.

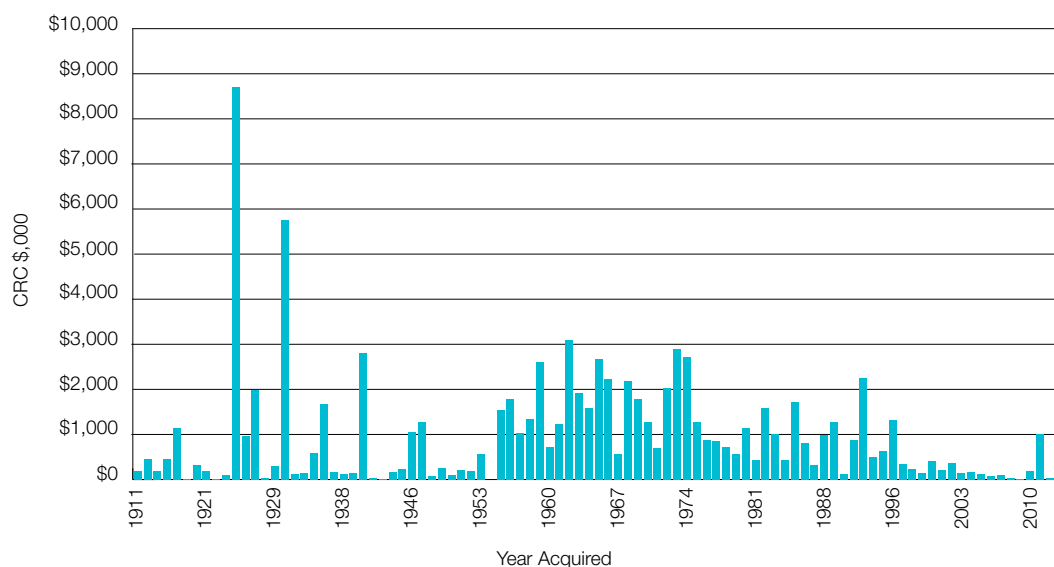
The largest group by total asset replacement cost (73%) is the stormwater drainage network which consists of a network of underground pipes, interception pits, inspection manholes, and junctions. The stormwater network services almost all streets and laneways in Adelaide and North Adelaide as well as some areas of the Park Lands and together with street kerb and gutter, provides flood protection to properties during major rainfall events and accessible streets and footpaths during minor rainfall events. Stormwater drainage network assets generally have economic lives in excess of 120 years, are on average in fair condition across the age profile, and providing adequate level of service.

The River Torrens and watercourse asset group are a group of water bodies located exclusively in the Park Lands and make up 23% of the total replacement cost for water infrastructure assets. This group provides earth lined and stone / concrete lined watercourses and temporary water storages through the Park Lands which are safe, accessible, and support natural ecosystems and promote biodiversity. The group also contains the Torrens Lake water body's and their systems of weirs, boat landings, and earth retaining structures which provide accessible water-bodies with water quality fit for secondary recreational contact and use. The infrastructure assets contained in the group have similar asset lives of 100 years for weirs and channels, however earth retaining structures in Torrens Lake have an economic life of less than 50 years.

The third category of assets are the environmental and wastewater infrastructure group which comprise of a diverse group of assets contributing to only 4% of the total Water Infrastructure Asset Class replacement cost. This group of assets typically have short economic lives or contain components with short economic lives. The assets include wastewater infrastructure in the Park Lands to support the staging of events with the remainder of the group consisting of equipment and facilities providing water quality improvements or associated with the sustainable use of water. Assets include gross pollutant traps, biological filtration plant, water mixers and aerators, biological retention basins, sedimentation basins, wetlands, floating islands, water monitoring equipment, and water sensitive urban design facilities. The group provides water quality improvement services to water bodies in the Park Lands and external receiving waters and sustainable reuse of stormwater and wastewater in accordance with prescribed water management plans for ground and surface water through Adelaide.

The age profile of the assets include in this AM Plan is shown in Figures 2A to 2C. Age profiles have been developed from actual acquisition dates from all asset groups.

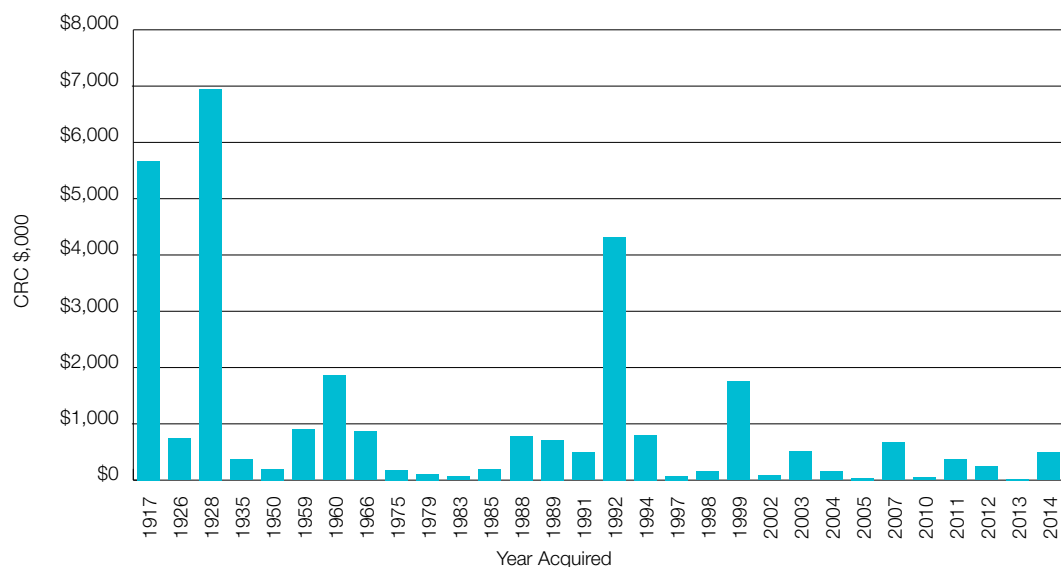
**Figure 2A: Asset Age Profile – Stormwater Drainage Network**



The age profile shown in Figure 2A indicates that the planned installation stormwater drainage network commenced in the mid 1920's after a major flood inundated Adelaide, with construction curtailed during the Great Depressions and War Years due to lack of resources and materials. The majority of the network was constructed between 1953 and 1983.

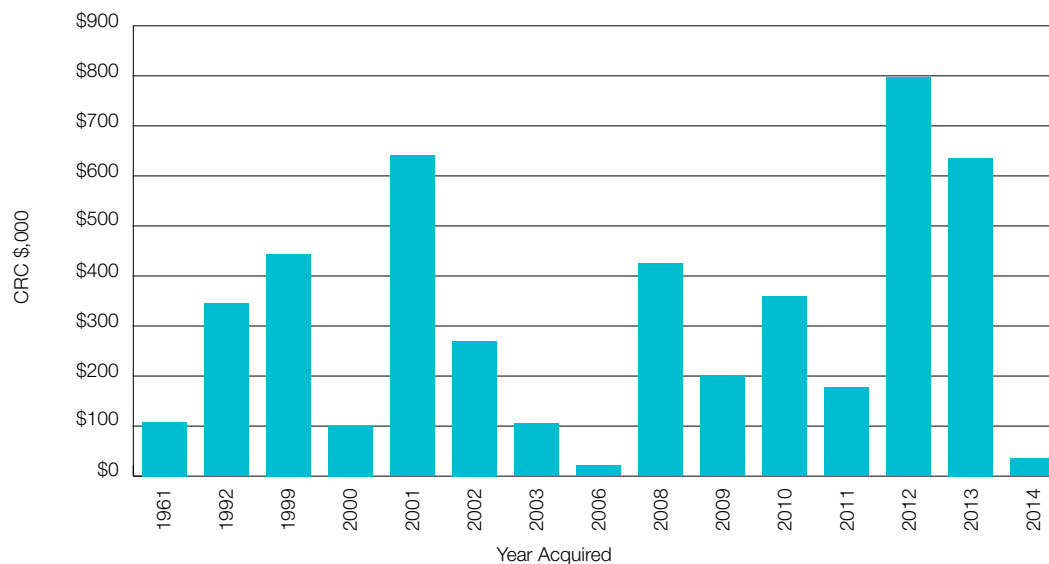


**Figure 2B: Asset Age Profile – River Torrens and Watercourses**



The age profile shown in Figure 2B indicates that a significant proportion of the asset group was constructed prior to 1928 which included Torrens Lake Weir and Park Lands watercourses. The installation of earth retaining structures in Torrens Lake commenced in the late 1950's and continued until the early 1990's and it is this group of assets which must be managed carefully in the future. The significant asset acquisitions of 1992 and 1999 are temporary water storages in the Western Park Lands.

**Figure 2C: Asset Age Profile – Environmental and Wastewater**



The age profile shown in Figure 2C indicates that the majority of assets in this group were acquired in the last 20 years with more than 50% of the assets acquired in the last six years. Many of these assets and components have economic lives of less than 10 years therefore many second and third generation assets will be renewed in the LTFP. The majority of new services for the Water Infrastructure Asset Class such as wetlands, water sensitive urban design facilities, gross pollutant traps, and water quality treatment equipment will be managed within this group.

Plans showing the water infrastructure assets are:

- Council's GIS Layer for stormwater assets showing stormwater drainage network infrastructure including inlets, manholes, nodes, and mains
- Council's GIS Layer for stormwater assets showing River Torrens and watercourses asset infrastructure including channels, storage basins, stormwater miscellaneous (water mixers, gross pollutant traps)

## 5.1.2 Asset capacity and performance

The Council's services are generally provided to meet design standards where these are available.

Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

**Table 5.1.2: Known Service Performance Deficiencies**

Location	Service deficiency
Torrens Lake water body (Torrens Lake Weir to Albert Bridge)	Excessive levels of Cyanobacteria during summer and Escherichia Coli after rainfall events prevent access to the Torrens Lake water body for recreational and commercial use.
Melbourne Street stormwater drain (Low point adjacent Newlands Lane)	Underground drainage network has less than one in 10-year ARI capacity causing excessive ponding on the roadway surface during minor rainfall events.
Jeffcott Street stormwater drainage (Barton Terrace to Montefiore Hill)	Lack of stormwater run-off interception infrastructure (Ward Street to Montefiore Hill) and lifted stone kerb and gutter (tree roots) result in excessive ponding of water in the Jeffcott Street road carriageway during minor rainfall events.
Park Lands Creek (Park 16 to Park 20)	Existing creek channel has insufficient capacity to convey design flows, has deep vertical sides at some locations, erosion has undermined tree roots in Park 16, 17, and 20, has exposed services traversing the channel, transports large sediment loads and is prone to blockage by debris from upstream catchments and the Park Lands.
Botanic Creek (Park 15 to Park 13)	Existing creek channel has insufficient capacity to convey design flows to the one in 10-year ARI standard and sediment from Park 15 and Park 15 continues to deposit in Park 13 and Park 14. Large visitor numbers to these Parks at various times of the year requires a higher level of flood protection particularly in Park 13.
Torrens Lake Weir	Weir gate seals continue to leak water from Torrens Lake during the summer months resulting in falling water levels during times of little inflow into Torrens Lake from upstream catchments.

The above service deficiencies were identified from stormwater catchment analysis (Melbourne Street and Jeffcott Street) and flood plain analysis (Botanic Creek – *First to Fifth Creeks Flood Plain Study*, Park Lands Creek – *Brown Hill Keswick Creek Stormwater Management Plan*). Water quality in the Torrens Lake water body and leakage of water through the Torrens Lake Weir gate seals were identified through normal operation of the infrastructure.

### 5.1.3 Asset condition

Condition is monitored for the most critical assets within the Water Infrastructure Asset Class which are Council's stormwater drainage network, Torrens Lake weirs, and some environmental equipment which accounts for more than 80% of total water infrastructure replacement costs. Council's stormwater drainage network assets are inspected by CCTV using *Conduit Inspection Reporting Code of Australia WSA 05-2013* under *IPWEA-NAMS.AU Practice Note 5 – Stormwater Drainage*. Torrens Lake Weir has weekly, monthly, and quarterly condition assessments as well as real time diagnostics monitoring the health of water level monitoring sensors and gate movement sensors and proximity switches.

Condition assessment of stormwater drainage network assets was undertaken in 2014. The assessment involved CCTV video inspection of more than 35 km of stormwater mains identifying and inventory of defects and determining a serviceability and structural condition index score for each segment of stormwater main. A large sample of trunk mains were inspected which were representative of the age profile of the asset class. Around 75% of the network was found to have Condition Grade 3 under the *Conduit Inspection Reporting Code WSA 05-2013* with the remaining infrastructure equally graded at Condition Grade 2 and Condition Grade 4. The condition assessment found that new stormwater drainage network infrastructure condition declines from Condition Grade 1 through to Condition Grade 3 fairly quickly and operates for the majority of its lifecycle at Condition Grade 3 before rapidly depreciating to Condition Grade 4 and Condition Grade 5.

The condition of the remaining environmental and wastewater infrastructure and River Torrens and watercourse assets have been calculated using straight line depreciation based on Asset Age. It is proposed that watercourse channels and Torrens Lake submerged earth retaining structures will undergo condition assessment as part of this AM Plan.

Condition is measured using a one to five grading system<sup>6</sup> as detailed in Table 5.1.3.

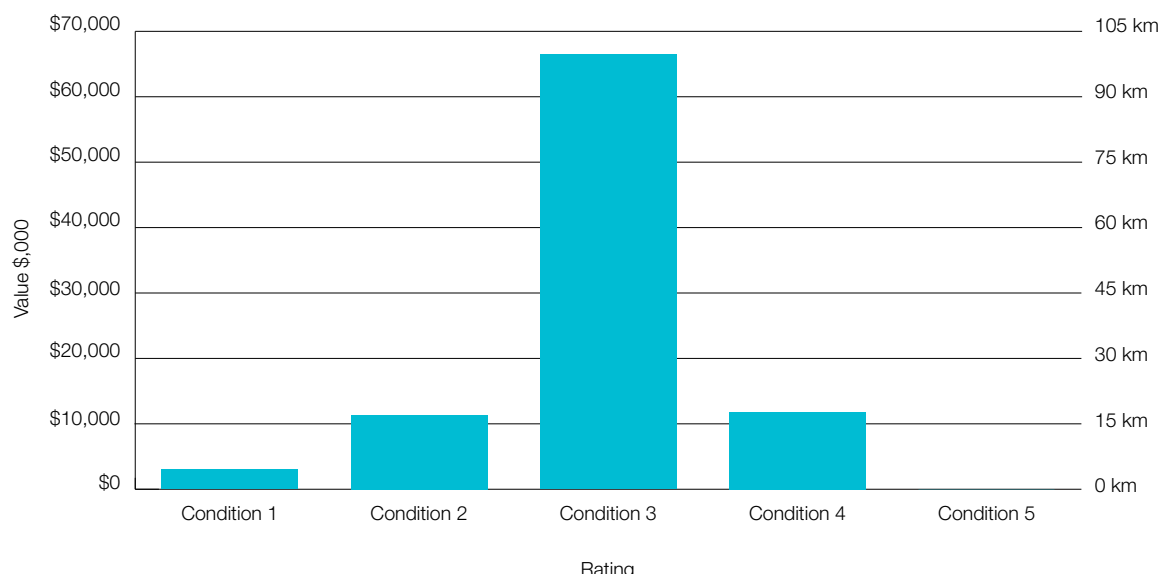
**Table 5.1.3: Simple Condition Grading Model**

Condition grading	Description of condition
1	<b>Very Good:</b> only planned maintenance required.
2	<b>Good:</b> minor maintenance required plus planned maintenance.
3	<b>Fair:</b> reactive maintenance plus planned maintenance required.
4	<b>Poor:</b> significant renewal / rehabilitation required.
5	<b>Very Poor:</b> physically unsound and / or beyond rehabilitation.

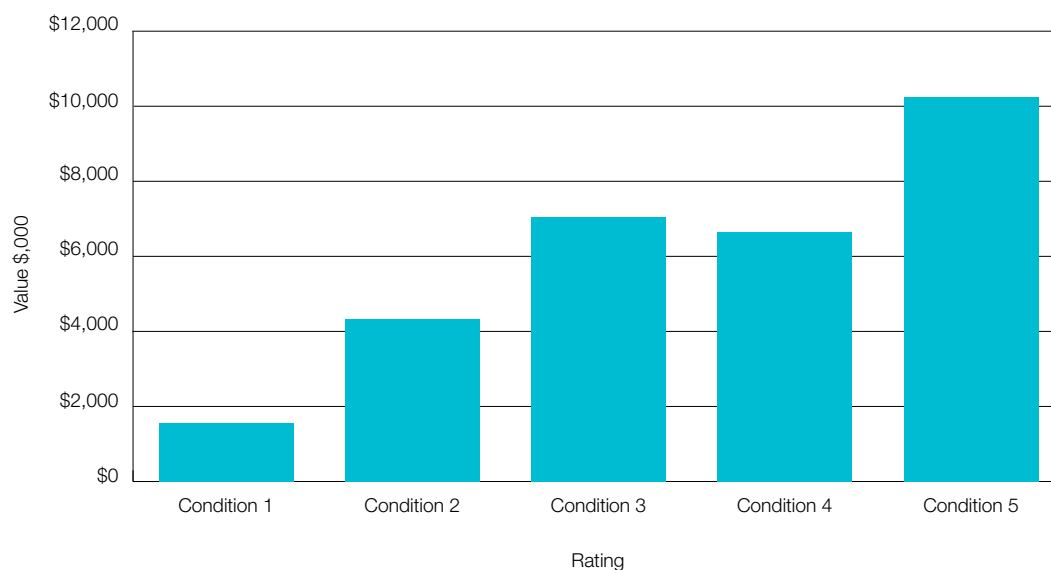
6. IPWEA, 2011, IIMM, Sec 2.5.4, p 2|79.

The condition profile of our assets is shown in Figures 3A to 3C.

**Fig 3A: Asset Condition Profile – Stormwater Drainage Network**

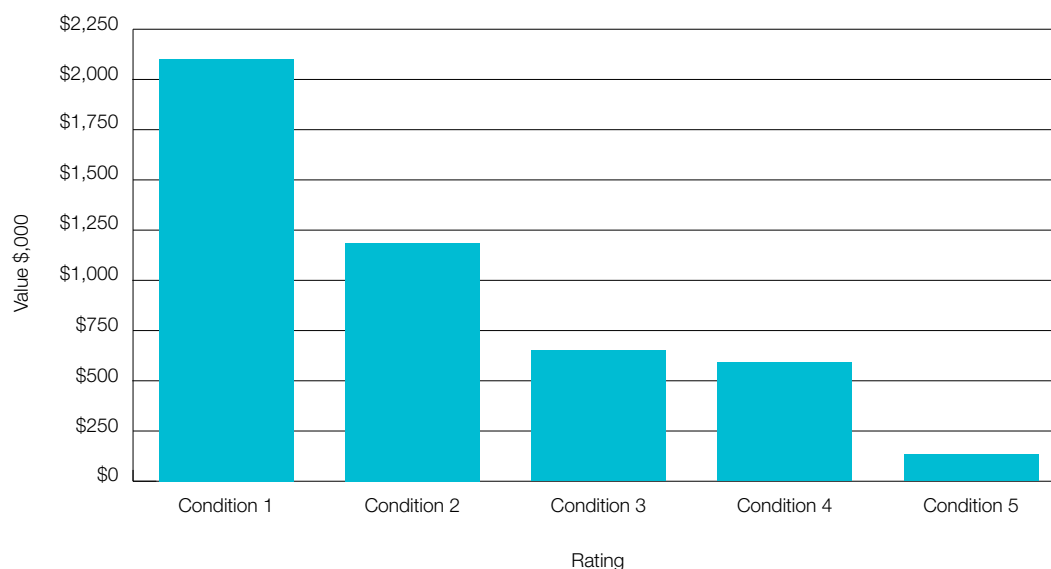


**Fig 3B: Asset Condition Profile – River Torrens and Watercourses**



The majority of Condition Rating for River Torrens and watercourse assets are in Condition Grade 3 to Condition Grade 5 with the largest group of assets by replacement cost (34%) having Condition Grade 5. Graph 3B reflects the very poor condition of watercourses observed in the Park Lands, particularly the south Park Lands, and the uncertainty of the condition of the submerged earth retaining structures in Torrens Lake, many of which, based on age, are approaching the end of their economic lives. Although the condition of these assets have been interpreted as Condition Grade 5, the assets are still performing their primary function and the condition rating is more a trigger for undertaking a thorough condition assessment of these assets during 2015. If the condition assessment reflects the age profile then the condition profile indicates significant investment in renewal of River Torrens and watercourse assets over the next few years.

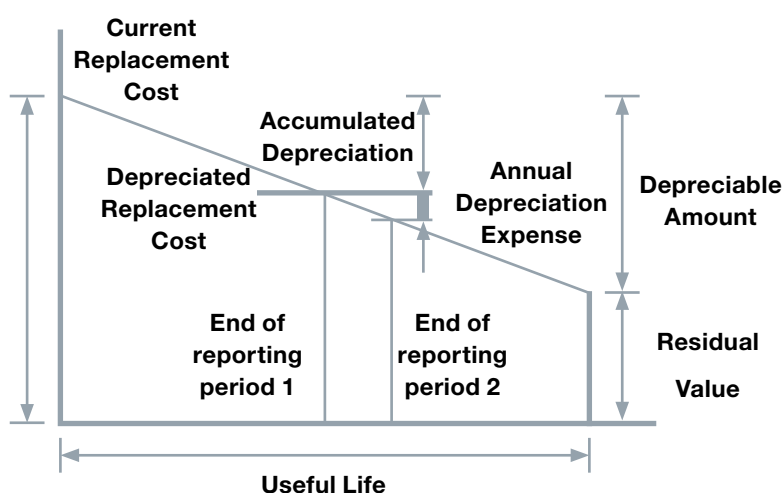
**Fig 3C: Asset Condition Profile – Environmental and Wastewater**



The condition profile for environmental and wastewater infrastructure is almost the inverse of the profile for River Torrens and watercourses with the majority of these assets (70%) having Condition Grade 1 or Condition Grade 2, reflecting that a large proportion of this asset group has been acquired over the last six years. Most of these assets or their components have very short useful lives in comparison with the remainder of the Water Infrastructure Asset Class therefore this condition profile will rapidly change over the next 10 years. Indeed, this asset group will require significant ongoing renewal expenditure despite that a majority of assets are in very good condition as many of the components will be renewed twice over the LTFP due to short economic lives.

#### 5.1.4 Asset valuations

The value of assets recorded in the asset register as at 30 June 2014 covered by this AM Plan is shown below. Assets were last revalued at June 2014 based on unit rates for linear and point assets with specialised facilities such as Weirs valued separately. Assets are valued at Fair Value at cost to replace service capacity based on brownfield replacement costs.



Valuation data for the Water Infrastructure Asset Class is shown in the table below for the three asset groups.

Valuation information	Stormwater drainage network	River Torrens and watercourse assets	Environmental and wastewater infrastructure	TOTAL
Current replacement cost	\$92,700,000	\$29,800,000	\$4,660,000	<b>\$127,100,000</b>
Depreciable amount	\$92,700,000	\$29,800,000	\$4,660,000	<b>\$127,100,000</b>
Depreciated replacement cost <sup>7</sup>	\$49,000,000	\$10,000,000	\$3,160,000	<b>\$62,300,000</b>
Annual depreciation expense	\$760,000	\$490,000	\$250,000	<b>\$1,500,000</b>

Useful lives for this asset group were updated in September 2014 by the Asset Systems Team with little input or consultation with the relevant Asset Managers. Useful lives for this asset group were last updated in February 2007, with the seven and a half year period between valuations due to organisational change and alternative leadership direction. It is proposed to update unit rates and valuations on a two to three year frequency as part of this AM Plan.

Key assumptions made in preparing the valuations were:

- Valuations have been based on the assumption that there was little change in unit rates between 2007 and 2014;
- Valuations of critical assets for the River Torrens and watercourses such as Weirs and submerged earth retaining are based on application of a financial inflationary index above the 2007 valuations for those assets; and
- Information on actual project handover costs and project feasibility estimates were not used in deriving these valuations due to operational constraints.

There appears to be only small changes in valuations between 2007 values and the 2014 valuations. Comparisons between actual project handover costs for similar assets (stormwater pipes, inlet pits, manholes, gross pollutant traps, and watercourses) between 2009 and 2014 and the proposed 2014 valuations indicate that the 2014 valuations are unlikely to predict fair value replacement costs. Furthermore, a number of water infrastructure renewal projects over the last two years planned with budgets derived by indexed 2007 valuations have been shown to be short of funds when preconstruction estimates and market tender quotations are received. Renewal costs in the first three years of the LTFP in this document have been inflated to closer match true replacement costs.

It is proposed to undertake a review of valuations and unit rates used to determine water infrastructure asset valuations in 2016 - 17.

Various ratios of asset consumption and expenditure have been prepared to help guide and gauge asset management performance and trends over time.

<sup>7</sup> Also reported as Written Down Current Replacement Cost (WDCRC).

Value	Stormwater drainage network	River Torrens and watercourses	Environmental and wastewater	TOTAL Asset Class
Rate of annual asset consumption (depreciation / depreciable amount)	0.83%	1.7%	5.3%	<b>1.2%</b>
Rate of annual asset renewal (capital renewal expenditure / depreciable amount)	0.03%	2.8%	4.1%	<b>0.83%</b>
Rate of annual asset upgrade	0.04%	0.39%	6.8%	<b>0.37%</b>
Rate of asset upgrade (including contributed assets)	0.04%	0.39%	6.8%	<b>0.37%</b>
Asset renewals as percentage of annual consumption	3.23%	169%	76.4%	<b>69.6%</b>
Percentage increase in asset stock	0.04%	0.39%	6.8%	<b>0.37%</b>

In 2015 the organisation plans to renew overall water infrastructure assets at 69.6% of the rate they are being consumed and will be increasing its asset stock by 0.37% in the year. However it is important note that the rate of renewal is well below 100% due to a very small amount of renewals required within the stormwater drainage network group due to a favourable condition assessment which resulted in an extension of useful life and delay of renewals beyond the 20-year LTFP. Indeed, the asset renewals as percentage of consumption is only 3.23% for the stormwater drainage network which has by far the largest depreciable value. This calculation highlights the fallibility of this indicator and reflects an asset group in very good condition with little renewal expenditure required in the immediate future therefore the level of required expenditure falls well short of the annual depreciation charge. Asset renewals as percentage of consumption is very much driven by River Torrens and Watercourse Asset Class with a rate of 169%. This calculation highlights the fallibility of this indicator and reflects an asset group in poor condition with significant renewal expenditure required in the immediate future therefore the level of required expenditure greatly exceeds the annual depreciation charge.

The percentage increase in asset stock due to demand for new services (0.37%) is quite low overall and reflects a very small growth (0.04%) in stormwater drainage network assets, the largest proportion of the total asset class by depreciable value. The growth rate is very much driven by increases in environmental and wastewater infrastructure group assets (6.5%) reflecting demand for new services in the areas of water quality, water sensitive urban design, and support for environmental rebuilding and sustainability.

### 5.1.5 Historical Data

Adelaide City Council, Australia's oldest Local Government organisation, has been an exemplary recorder of information and in particular, historical information on the acquisition of infrastructure assets. This information includes feasibility assessments, design calculations, drawings, and construction records. The information is available in electronic and paper records indexed under asset category. For water infrastructure assets, this information commences in the 1880's with the construction of the original Torrens Lake stepped weir however most of the historical information dates back to the 1910's.

Council created its first asset registers with geographical attributes in the mid 1990's as a requirement of *Australian Accounting Standard 27* where asset attributes were recorded electronically for the first time with unit rates, useful lives, and estimated remaining lives applied to asset components to determine fair value, consumption rates, and the depreciated value of Council's asset class. These original asset registers have evolved into the registers informing the NAMS Register today. Valuations of water infrastructure assets have been updated in 1997, 2002, 2007, and more recently in 2014.



Capital renewal handover information has also been recorded by Council over the last 17 years and provides the basis for asset register upgrade (acquisitions and disposals), review of unit rates and valuations, and financial reconciliation with Council's capital works budget. Asset component cost handover is an important source of information as they provide current unit rates and asset valuations that can be benchmarked with those of the last valuation and of which were used to set the project budget and they can record historical actual construction costs for assets which are difficult to value.

While Council retains excellent historical records in capital renewal projects over the last 100 years, the same cannot be said about operational and maintenance costs. Maintenance and operational costs have only recently been recorded for asset category and asset locations making it extremely difficult for Asset Managers to quantify the maintenance cost component of asset lifecycle costs and in turn, predict the optimal renewal time for infrastructure assets. Improvements in recording and allocation of maintenance costs for water infrastructure assets will form a critical part of the Asset Management Improvement Plan moving forward.

Council has managed water infrastructure assets under IIMM AM plans for the last 16 years. The infrastructure has been managed under previous AM plans compiled in 1998, 2000, and 2008.

## 5.2 Infrastructure Risk Management Plan

An assessment of risks<sup>8</sup> associated with service delivery from infrastructure assets has identified critical risks that will result in loss or reduction in service from infrastructure assets or a 'financial shock' to the organisation. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk, and develops a Risk Treatment Plan for non-acceptable risks.

Critical risks, being those assessed as 'Very High' - requiring immediate corrective action and 'High' - requiring prioritised corrective action identified in the *Infrastructure Risk Management Plan*, together with the estimated residual risk after the selected treatment plan is operational are summarised in Table 5.2. These risks are reported to management and Council / Board.

**Table 5.2: Critical Risks and Treatment Plans**

Service or asset at risk	What can happen	Risk rating (VH, H)	Risk Treatment Plan	Residual risk *	Treatment costs
Torrens Lake Weir	Structural stability failure of Torrens Lake Weir – maximum probable flood.	High	Increase the stability of Weir using rock bolts.	Low	\$550,000
Torrens Lake Weir	Structural stability failure of Torrens Lake Weir – Weir gate failure.	High	Increase the stability of Weir using rock bolts.	Low	\$550,000
Torrens Lake Weir	Loss of Torrens Lake water body – Weir gate failure.	High	Reprogram PLC and rewire circuit breakers. Implement inspection / testing program.	Medium	\$30,000
Torrens Lake	Contaminated water / water body closed to users – Cyanobacteria.	Very High	Develop and implement sodium percarbonate management plan for Torrens Lake.	Medium	\$40,000
Torrens Lake	Torrens Lake sediment buildup / obstruction to lake users.	High	Develop and implement a strategic sediment management plan for Torrens Lake.	Medium	\$490,000

Note \* The residual risk is the risk remaining after the selected Risk Treatment Plan is operational.

## 5.3 Routine Operations and Maintenance Plan

Operations include regular activities to provide services such as public health, safety, and amenity, e.g. cleansing, street sweeping, operating water mixers in Torrens Lake, and emptying of pollutants intercepted in Council's suite of gross pollutant traps.

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again. For example, stormwater grated inlet pits or manhole pits that fail and require replacement, or seals on Torrens Lake weir gates which fail to provide adequate leakage protection.

### 5.3.1 Operations and maintenance plan

Operations activities affect service levels including quality and function through cleaning of stormwater inlet pits, removal of collected pollutants from Council's suite of gross pollutant traps and operation of water mixers, water quality equipment, and the control of water level in Torrens Lake.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating such as stormwater inlet pit grates, manhole covers, defects in pipe systems, servicing of water mixer units, calibration of water quality monitoring equipment, and maintenance of the Weir gate control and electrical systems. Maintenance may be classified into reactive, planned, and specific maintenance work activities.

Reactive maintenance is unplanned repair work carried out in response to service requests and management / supervisory directions.

Planned maintenance is repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure / breakdown experience, prioritising, scheduling, actioning the work, and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

Specific maintenance is replacement of higher value components / sub-components of assets that is undertaken on a regular cycle including servicing of water mixer pumps and motors, and rotation of Weir Gate motors. This work falls below the capital / maintenance threshold but may require a specific budget allocation.

Actual past maintenance expenditure is shown in Table 5.3.1.

**Table 5.3.1: Maintenance Expenditure Trends**

Year	Maintenance expenditure	
	Planned and specific	Unplanned
2012	\$142,401	\$74,608
2013	\$150,945	\$79,084
2014	\$207,933	\$99,827

Planned maintenance work is currently 67.6% of total maintenance expenditure.

Improvements in the accounting of maintenance expenditure over the last 12 months have resulted in a more accurate calculation of maintenance costs during 2014 when compared to the levels of expenditure in 2012 and 2013. Although a 33% increase in expenditure levels are reported between 2013 and 2014, the 2014 expenditure is a more accurate level of maintenance to meet existing levels of service.

Maintenance expenditure levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels based on existing level of service KPIs. Where maintenance expenditure levels are such that will result in a lesser level of service, the service consequences and service risks have been identified, and service consequences highlighted in this AM Plan and service risks considered in the *Infrastructure Risk Management Plan*.

It is proposed that reactive maintenance will be carried out in accordance with response levels of service detailed in Appendix A when agreement on these service levels are reached with Public Realm. Current levels of service are likely below these targets given the increase in reactive maintenance required to Council's stormwater drainage network in particular.

### 5.3.2 Operations and maintenance strategies

The organisation will operate and maintain assets to provide the defined level of service to approved budgets in the most cost-efficient manner. The operation and maintenance activities include:

- Scheduling operations activities to deliver the defined level of service in the most efficient manner;
- Undertaking maintenance activities through a planned maintenance system to reduce maintenance costs and improve maintenance outcomes. Undertake cost-benefit analysis to determine the most cost-effective split between planned and unplanned maintenance activities (50 – 70% planned desirable as measured by cost);
- Maintain a current Infrastructure Risk Register for assets and present service risks associated with providing services from infrastructure assets and reporting 'Very High' and 'High' risks and residual risks after treatment to management and Council / Board;
- Review current and required skills base and implement workforce training and development to meet required operations and maintenance needs;
- Review asset utilisation to identify under-utilised assets and appropriate remedies, and over-utilised assets and customer demand management options;
- Maintain a current hierarchy of critical assets and required operations and maintenance activities;
- Develop and regularly review appropriate emergency response capability; and
- Review management of operations and maintenance activities to ensure Council is obtaining best value for resources used.

### 5.3.2.1 Asset hierarchy

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information, and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery.

The organisation's service hierarchy for water infrastructure assets is shown in Table 5.3.2.

**Table 5.3.2: Asset Service Hierarchy – Water Infrastructure Assets**

Service hierarchy	Service level objective
Torrens Lake – Weir / water level	Retain static water level in Torrens Lake AHD 20.85 ± 0.10 m at all times.
Torrens Lake – Water quality	Minimise number of days that the Torrens Lake water body is closed for recreational use due to poor water quality.
Torrens Lake – Earth retaining structures	Ensure submerged earth retaining structures in Torrens Lake are maintained and renewed to avoid structural failure and bank collapse.
Stormwater drainage network – Surface flow paths	Ensure all surface flow paths in city road reserves, easements, and Park Lands are retained and unobstructed and provide maximum flood protection to properties.
Stormwater drainage network – Trunk mains	Ensure all stormwater trunk mains are operating at greater than 80% capacity to minimise flooding to properties and obstruction to road users.
Park Lands watercourses	Minimise the occurrence of obstructions in water courses which diverting creek flows onto adjacent roadways and open space.
Stormwater detention basins	Ensure Council's stormwater detention basins remain fully operational at all times.
Stormwater drainage network – Major catchment low points	Operate pipes, inlet pits, and manholes at minimum 80% capacity to minimise flooding of roadways and provide maximum protection to properties adjacent low points with significant upstream catchment area.
Stormwater drainage network – Park Lands roads	Minimise vehicle and bicycle obstructions on Park Lands road ways due to flooding caused by failed stormwater drainage infrastructure.
Pollutant management	Operate Council's suite of gross pollutant traps to maximise the interception of litter and organic material from receiving watercourses.

### 5.3.2.2 Critical Assets

Critical assets are those assets which have a high consequence of failure but not necessarily a high likelihood of failure. By identifying critical assets and critical failure modes, organisations can target and refine investigative activities, maintenance plans, and capital expenditure plans at the appropriate time.

Operations and maintenance activities may be targeted to mitigate critical assets failure and maintain service levels. These activities may include increased inspection frequency, higher maintenance intervention levels. Critical assets failure modes and required operations and maintenance activities are detailed in Table 5.3.2.1.

**Table 5.3.2.1: Critical Assets and Service Level Objectives**

Critical assets	Critical failure mode	Operations and maintenance activities
Torrens Lake Weir	Failure of Weir Control System to maintain water level in Torrens Lake.	Ensure <i>Torrens Lake Weir Maintenance Plan</i> is executed and Weir control system is operated in accordance with operational manual.
Torrens Lake earth retaining structures	Structural failure of section of retaining wall resulting in partial collapse of Torrens Lake bank.	Ensure regular structural and condition inspections are undertaken on all earth retaining structures in Torrens Lake and appropriate maintenance and renewal activities are carried out.
Stormwater detention basins West Park Lands	Structures fail to restrict flow to downstream receiving networks.	Ensure regular inspection and maintenance of Detention Basin structures and water control infrastructure.
Park Lands Creek South Park Lands	Obstruction in watercourse or culverts under roadways divert creek flow onto adjacent Park Lands and roadways.	Ensure regular inspection and maintenance Park Lands Creek watercourse channel and remove overgrown vegetation and build-up of sediment and debris.
Stormwater trunk mains	Structural collapse of major trunk main.	Ensure regular CCTV inspection and structural condition rating of pipe network are carried out and each pipe segment remains above Condition Grade 4 (WSA 05-2013) for nominated critical trunk mains.
Stormwater drainage network – Major low points	Blockage of low point outlet drains – flooding of adjacent properties and roadway.	Increase inspection and cleaning of stormwater interception pits at major low points to minimise likelihood of blockage.

### 5.3.2.3 Standards and specifications

Maintenance work is carried out in accordance with the following Standards and Specifications:

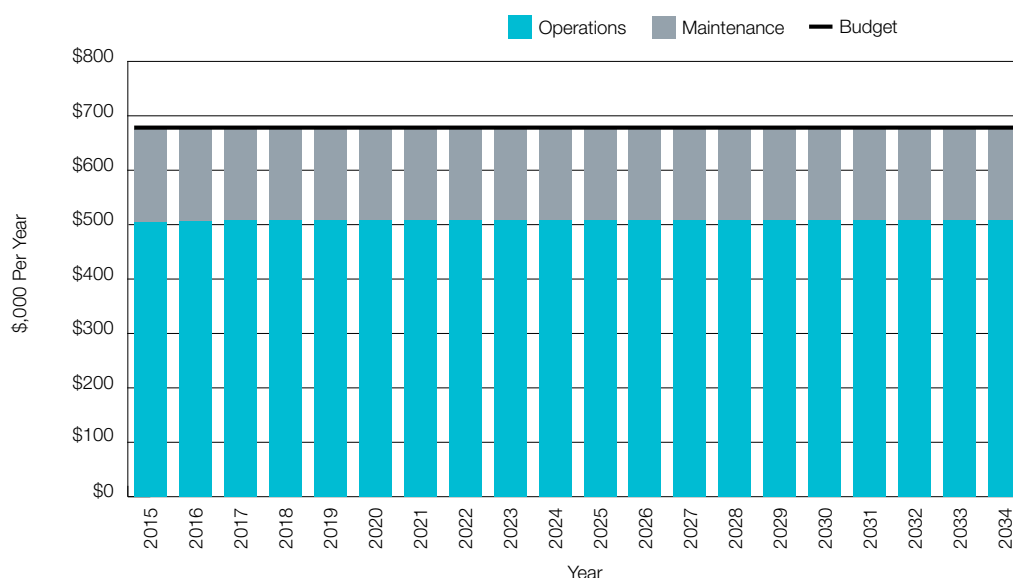
- *Adelaide City Council City Works Guidelines (ACC2012 / 166255);*
- *Adelaide City Council Urban Elements Catalogue (TRIM TBA);*
- *Adelaide City Council Water Infrastructure Customer and Technical Levels of Service Scheduled Maintenance Performance Guidelines April 2012 (ACC2015 / 109884);*
- *Adelaide City Council Water Infrastructure Reactive Maintenance Performance Guidelines (May 2015) (ACC2015 / 102146);*
- *Torrens Lake Weir Maintenance Plan (2009 / 02497-1);*
- *Torrens Lake Water Mixers – Otterbine Maintenance Manual*  
*<http://www.otterbine.com/assets/main/extranet/2011SpecForms/SubTritonMixSpecForm.pdf>; and*
- Gross pollutant trap – manufacturers maintenance manuals (various).

### 5.3.3 Summary of future operations and maintenance expenditures

Future operations and maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Figures 4A to 4C. Note that all costs are shown in current 2014 - 15 dollar values (i.e. real values).

**Figure 4A: Projected Operations and Maintenance Expenditure – Stormwater Drainage Network**

(Expenditure is based on 2014 operations and maintenance expenditure levels)



Operations and maintenance expenditure for the stormwater drainage network to maintain ongoing service levels will be met by current budget funding levels as shown on the graph. Maintenance levels will be reviewed as part of this plan to ensure that stormwater drainage assets are renewed at the optimum time in the lifecycle to ensure services are delivered at lowest lifecycle costs.

**Figure 4B: Projected Operations and Maintenance Expenditure – River Torrens and Watercourses**

(Expenditure is based on 2014 operations and maintenance expenditure levels)

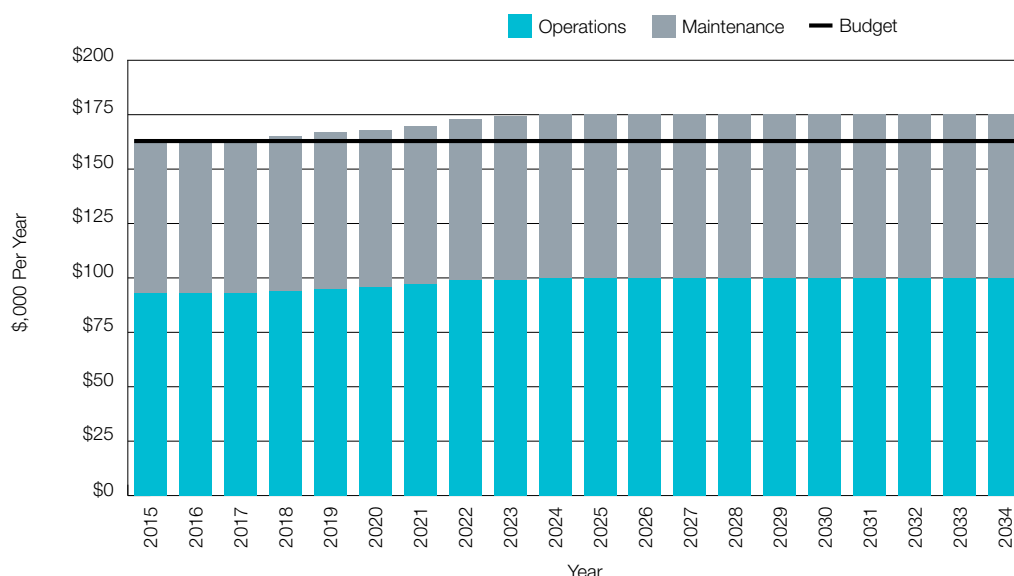


Figure 4B indicates a gradual shortfall of budgeted expenditure for operations and maintenance of River Torrens and watercourses assets over time. This shortfall is attributed to the acquisition of new assets over the first 10 years of the AM Plan and in particular the installation maintenance and operation of temporary water storages in the south Park Lands proposed under the *Brown Hill Keswick Creek Stormwater Management Plan*. Overall, operational and maintenance costs for this asset group are quite low (approximately \$175,000 per annum) and it is planned to address this low shortfall (\$10,000 per annum) through either design of infrastructure based on lower operational and maintenance costs or to look at efficiencies in existing maintenance practices.

**Figure 4C: Projected Operations and Maintenance Expenditure – Environmental and Wastewater**

(Expenditure is based on 2014 operations and maintenance expenditure levels)

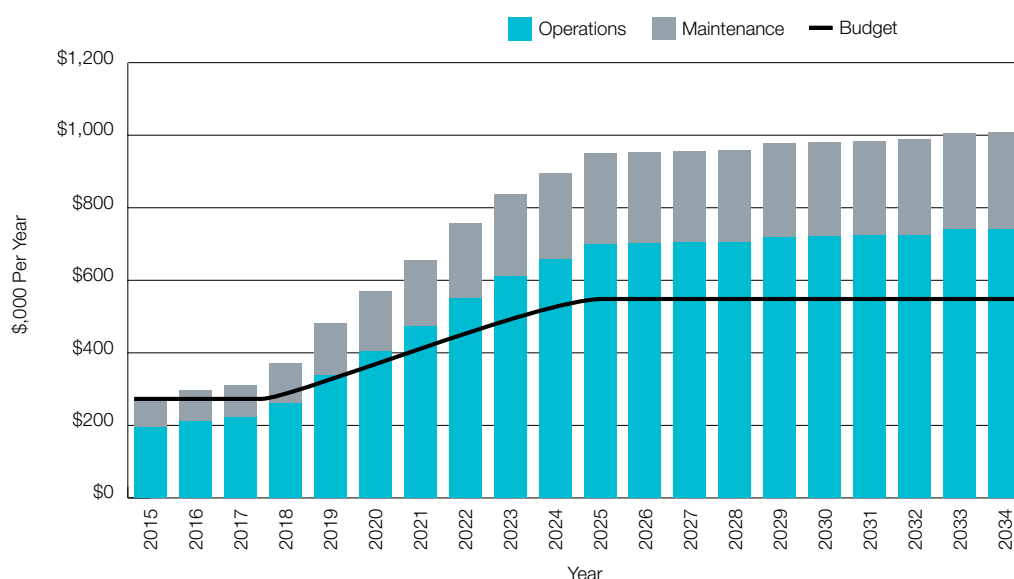


Figure 4C indicates a significant shortfall of budgeted expenditure for operations and maintenance of environmental and wastewater assets over time. As a young asset group with a relatively low replacement cost and high operation and maintenance to replacement cost ratio (6%), this shortfall is attributed to the significant increase in operation and maintenance costs from acquisition of new assets over the LTFP such as *Brown Hill Keswick Creek Stormwater Management Plan* temporary water storages, water sensitive urban design facilities, and installation of new gross pollutant traps. The significantly high shortfall will need to be addressed through a combination of increased budget allocation, design of infrastructure based on lower operation, and maintenance costs and achieve efficiencies in existing maintenance practices such as combining contracts for emptying of gross pollutant traps.

Deferred maintenance, i.e. works that are identified for maintenance and unable to be funded, are to be included in the risk assessment and analysis in the *Infrastructure Risk Management Plan*.

Maintenance is funded from the operating budget where available. This is further discussed in Section 6.2.

## 5.4 Renewal / Replacement Plan

Renewal and replacement expenditure is major work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original or lesser required service potential. Work over and above restoring an asset to original service potential is upgrade / expansion or new works expenditure.

### 5.4.1 Renewal plan

Assets requiring renewal / replacement are identified from one of three methods provided in the 'Expenditure Template':

- Method 1 uses Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year; or
- Method 2 uses capital renewal expenditure projections from external condition modelling systems (such as Pavement Management Systems); or
- Method 3 uses a combination of average network renewals plus defect repairs in the Renewal Plan and Defect Repair Plan worksheets on the 'Expenditure template'.

Method 1 was used for the majority of this AM Plan however condition modelling systems (Method 2) was used for Council's stormwater drainage network. The useful lives of assets used to develop projected asset renewal expenditures are shown in Table 5.4.1. Asset useful lives were last reviewed in June 2014<sup>9</sup>. Many assets contained within the Water Infrastructure Asset Class consist of components with various useful lives. An indicative useful life has been nominated for those assets in the following table.

9. TRIM Ref ACC2014/143801 2014 Stormwater Valuation



**Table 5.4.1: Useful Lives of Assets**

Asset subcategory	Useful life
Stormwater drainage network – Concrete pipes and pit structures	Pipes and pits 125 years, grates and pit lids 70 years
Stormwater drainage network – uPVC pipes	50 years
Stormwater drainage network – Pump stations	40 years
River Torrens assets – Earth retaining structures	50 years
River Torrens assets – Weirs	80 years
River Torrens assets – Boat landings / ramps	40 years
River Torrens assets – Detention basins	80 years
Watercourses – Lined and unlined channels	100 years
Environmental – Water mixers	20 years
Environmental – Gross pollutant traps	40 years
Environmental – Biological filtration plant	15 years
Environmental – Floating islands	5 years
Environmental – Bio-retention basins	50 years
Environmental – uPVC sewer infrastructure	50 years
Environmental – Water quality monitoring equipment	15 years
Environmental – Sedimentation basins	80 years

## 5.4.2 Renewal and replacement strategies

The organisation will plan capital renewal and replacement projects to meet level of service objectives and minimise infrastructure service risks by:

- Planning and scheduling renewal projects to deliver the defined level of service in the most efficient manner;
- Undertaking project scoping for all capital renewal and replacement projects to identify:
  - the service delivery 'deficiency', present risk, and optimum time for renewal / replacement,
  - the project objectives to rectify the deficiency,
  - the range of options, estimated capital, and lifecycle costs for each options that could address the service deficiency,
  - and evaluate the options against evaluation criteria adopted by the organisation,
  - select the best option to be included in capital renewal programs;
- Using 'low cost' renewal methods (cost of renewal is less than replacement) wherever possible;
- Maintain a current Infrastructure Risk Register for assets and service risks associated with providing services from infrastructure assets and reporting 'Very High' and 'High' risks and residual risks after treatment to management and Council / Board;
- Review current and required skills base and implement workforce training and development to meet required construction and renewal needs;
- Maintain a current hierarchy of critical assets and capital renewal treatments and timings required; and
- Review management of capital renewal and replacement activities to ensure Council is obtaining best value for resources used.

### Renewal ranking criteria

Asset renewal and replacement is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a section of stormwater drain which has structurally failed and collapsed); or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. section of watercourse has eroded sides making it dangerous for the public to access)<sup>10</sup>.

It is possible to get some indication of capital renewal and replacement priorities by identifying assets or asset groups that:

- Have a high consequence of failure;
- Have a high utilisation and subsequent impact on users would be greatest;
- The total value represents the greatest net value to the organisation;
- Have the highest average age relative to their expected lives;
- Are identified in the AM Plan as key cost factors;
- Have high operational or maintenance costs; and
- Where replacement with modern equivalent assets would yield material savings<sup>11</sup>.

10. IPWEA, 2011, IIMM, Sec 3.4.4, p 3|60.

11. Based on IPWEA, 2011, IIMM, Sec 3.4.5, p 3|66.

The ranking criteria which is proposed to be used to determine priority of identified renewal and replacement proposals is detailed in Table 5.4.2.

**Table 5.4.2: Renewal and Replacement Priority Ranking Criteria**

Criteria	Weighting
Asset condition (economic life)	60%
Asset capacity / utilisation	15%
External partnership / cost share	15%
Council joint project (e.g. streetscape)	10%
<b>TOTAL</b>	<b>100%</b>

#### Renewal and replacement standards

Renewal work is carried out in accordance with the following Standards and Specifications.

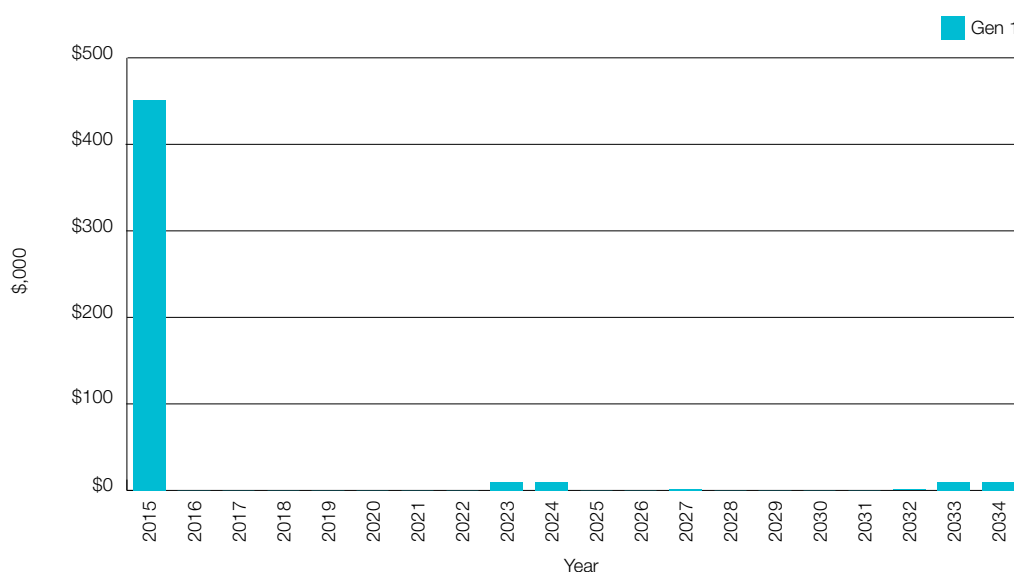
- *Adelaide City Council City Works Guidelines;*
- *Adelaide City Council Urban Elements Catalogue and Adelaide Design Manual* when endorsed for general use;
- *Adelaide City Council Standard Drawings – Stormwater Elements Dwg No. A1/74/1;*
- *Australian Rainfall and Run-off 1999;*
- Relevant Australian Standards (e.g. *AS3600-2009 Design of Concrete Structures*); and
- *National Construction Code 2012.*

### 5.4.3 Summary of future renewal and replacement expenditure

Projected future renewal and replacement expenditures are forecast to increase over time as the asset stock increases from growth of services and donated assets. The expenditure is summarised in Figures 5A to 5C. Note that all amounts are shown in real values.

The projected capital renewal and replacement program is shown in Appendix B.

**Fig 5A: Projected Capital Renewal and Replacement Expenditure – Stormwater Drainage Network**



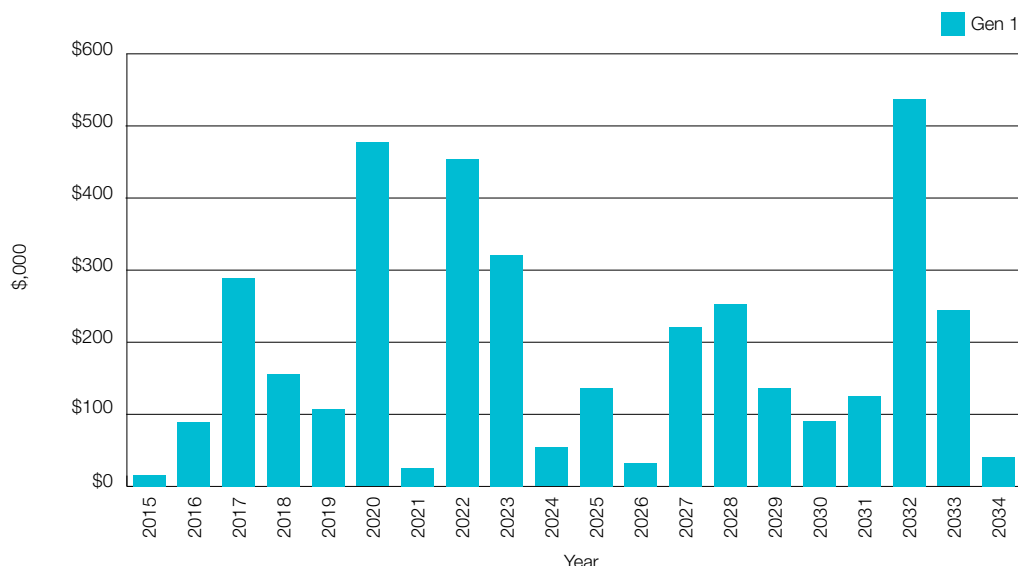
Although stormwater drainage network assets comprise more than 70% of the total Water Infrastructure Asset Class replacement cost and asset depreciation in excess of \$760,000 per annum, there are very few assets requiring renewal over the next 20 years. This analysis is based on the 2014 CCTV condition assessment which graded the majority of assets at condition grade three with remaining life of all assets in excess of 20 years other than a small asset component group with a 10-year useful life. The \$450,000 renewal for the 2014 - 15 financial year is for the renewal of a 380 metre long failed section of earthenware stormwater drain and associated manholes in Rundle Mall. Average annual renewal expenditure for this asset group is only 3% of asset consumption.

**Fig 5B: Projected Capital Renewal and Replacement Expenditure – River Torrens and Watercourses**



Figure 5B indicates that significant renewal expenditure is required for River Torrens and watercourses assets to meet a large number renewals falling due over the next 15 years with annual expenditure exceeding 169% of annual asset consumption. Indeed, the majority of asset renewals for the Water Infrastructure Asset Class as a whole will be River Torrens and watercourse assets. The majority of renewals involve the replacement of First Creek Culvert earth retaining structure (2015), renewal of watercourse channels in the south and east Park Lands, and renewal earth retaining structures in Torrens Lake (Albert Bridge to University Footbridge). Renewals decisions for these assets have been based on Method 2 assessments of the First Creek Culvert and watercourse channels in the East and South Park Lands. Condition of earth retaining structures in Torrens Lake is based on age. The graph also indicates a number of second generation renewals required which are the replacement of components of the Torrens Lake Weir gate control system and electrical system.

**Fig 5C: Projected Capital Renewal and Replacement Expenditure – Environmental and Wastewater**



Given the relative short useful lives of environmental and wastewater infrastructure, Figure 5C is dominated by Generation 2 and Generation 3 renewals. Compared to the other two asset categories, this group will require fairly consistent annual renewal expenditure as evidenced from this graph where on average, annual renewal expenditure will account for 76% of annual depreciation expense despite depreciated replacement cost remaining at close to 70% of current replacement cost. It is important to note that this asset group will undergo significant growth of new assets over the next 20 years, some components of which will require renewal before 2034.

Deferred renewal and replacement, i.e. those assets identified for renewal and / or replacement and not scheduled in capital works programs, are to be included in the risk analysis process in the Risk Management Plan.

Renewals and replacement expenditure in the organisation's capital works program will be accommodated in the LTFP. This is further discussed in Section 6.2.

## 5.5 Creation / Acquisition / Upgrade Plan

New works are those works that create a new asset that did not previously exist, or works which upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. Assets may also be acquired at no cost to the organisation from land development. These assets from growth are considered in Section 4.4.

### 5.5.1 Selection criteria

New assets and upgrade / expansion of existing assets are identified from various sources such as Councillor / Director or community requests, proposals identified by strategic plans or partnerships with other organisations. Candidate proposals are inspected to verify need and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and available funds and scheduled in future works programs. The proposed future priority ranking criteria is detailed below.

**Table 5.5.1: New Assets Priority Ranking Criteria**

Criteria	Weighting
Public safety	30%
Legislative requirement	15%
External partnership State / Local Government (Riverbank Precinct, Stormwater Management Plans)	15%
Community demand	25%
<i>City of Adelaide Strategic Plan 2016 - 20</i>	15%
<b>TOTAL</b>	<b>100%</b>

### 5.5.2 Capital investment strategies

The organisation will plan capital upgrade and new projects to meet level of service objectives by:

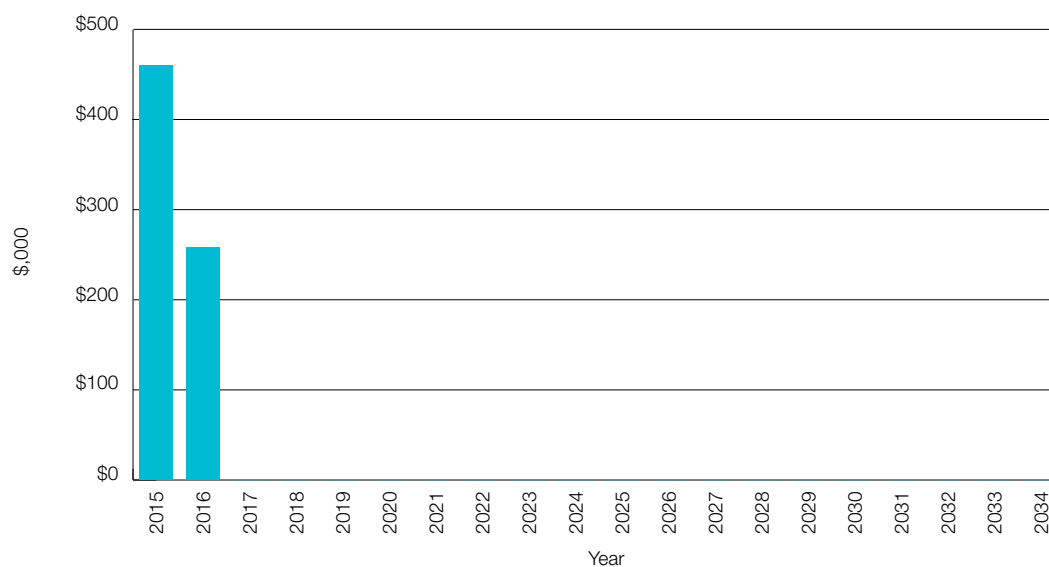
- Planning and scheduling capital upgrade and new projects to deliver the defined level of service in the most efficient manner;
- Undertake project scoping for all capital upgrade / new projects to identify:
  - the service delivery 'deficiency', present risk, and required timeline for delivery of the upgrade / new asset,
  - the project objectives to rectify the deficiency including value management for major projects,
  - the range of options, estimated capital, and lifecycle costs for each options that could address the service deficiency,
  - management of risks associated with alternative options,
  - and evaluate the options against evaluation criteria adopted by Council,
  - select the best option to be included in capital upgrade / new programs;
- Review current and required skills base and implement training and development to meet required construction and project management needs; and
- Review management of capital project management activities to ensure Council is obtaining best value for resources used.

Standards and specifications for new assets and for upgrade / expansion of existing assets are the same as those for renewal shown in Section 5.4.2.

### 5.5.3 Summary of future upgrade / new assets expenditure

Projected upgrade / new asset expenditures are summarised in Figures 6A to 6C. The projected upgrade / new capital works program is shown in Appendix C. All amounts are shown in real values.

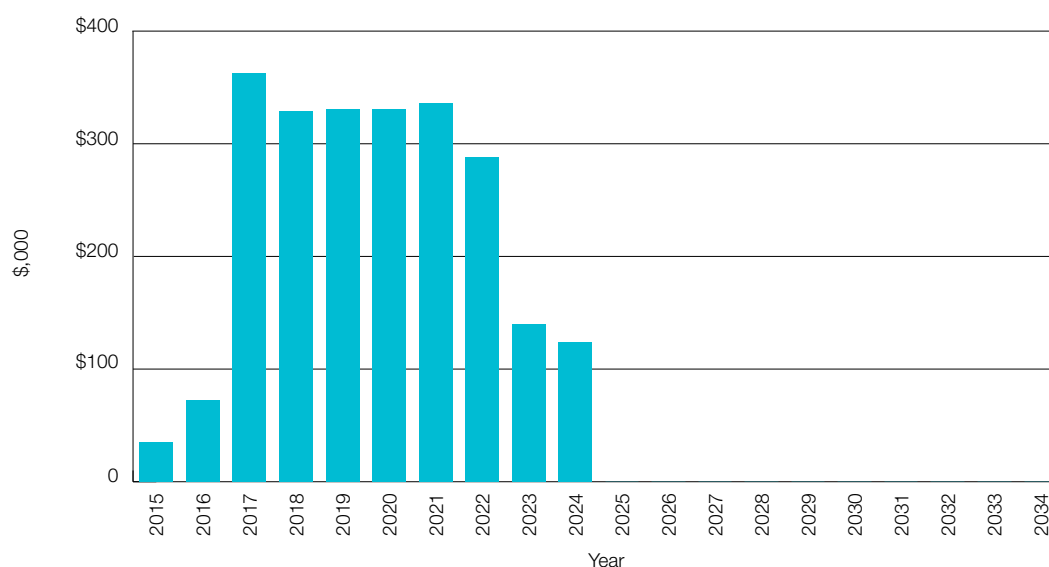
**Fig 6A: Projected Capital Upgrade / New Asset Expenditure – Stormwater Drainage Network**



Council's stormwater drainage network is a fully developed stormwater management system which provides adequate service to the Adelaide and North Adelaide communities with little demand for new or upgraded assets. This is certainly reflected in Figure 6A with only \$700,000 of new stormwater drainage infrastructure proposed over the 20-year period and all in the first two years of the plan. The proposed upgrades to the asset group are Jeffcott Street Drainage (2014 - 15), Victoria Park Drainage (2014 - 15, 2015 - 16, 2016 - 17), and Council's Ergo Development Drainage (2015 - 16).



**Fig 6B: Projected Capital Upgrade / New Asset Expenditure – River Torrens and Watercourses**



River Torrens and watercourse assets are similar to stormwater drainage network assets in that the asset base is fully developed in providing the services required. While there would be a low expectation for new assets to be acquired within this group, there are a significant group of new assets proposed during the first 10 years of the plan. These assets include expenditure for temporary water storages in the south Park Lands in Park 16 and Park 20 associated with the *Brown Hill Keswick Creek Stormwater Management Plan 2012*. The new assets will only result in a 0.4% per annum growth of the asset base over the long term.

**Fig 6C: Projected Capital Upgrade / New Asset Expenditure – Environmental and Wastewater**

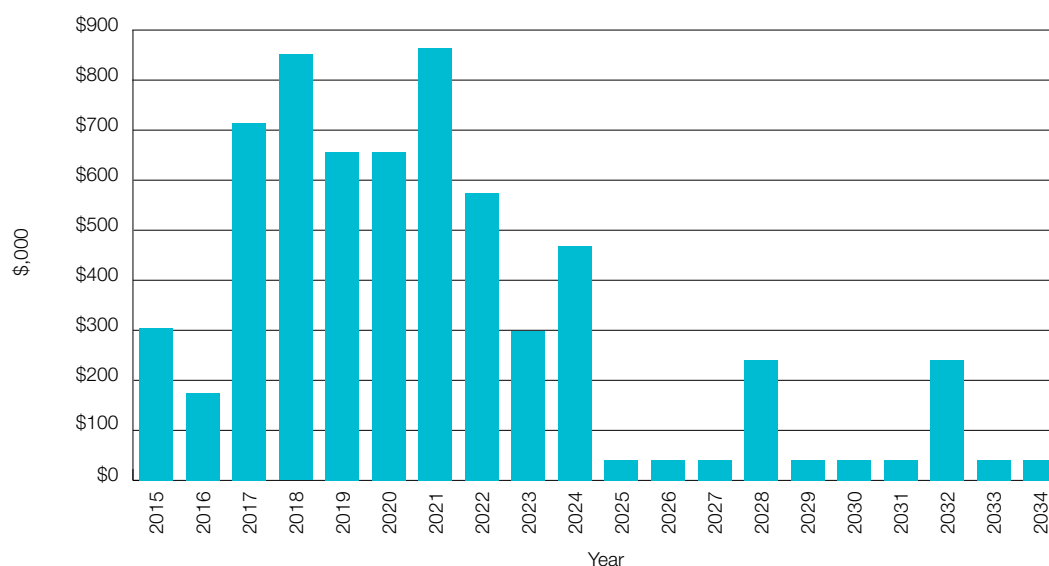


Figure 6C highlights the significant growth of assets within this group, particularly over the first 10 years of the plan. Given the relatively young asset group and low current replacement cost, the growth rate of the asset group due to new assets is around 6.5% per annum. Growth of assets within this group is due to the demand for new services in the areas of water sensitive urban design, wetlands, water quality improvement and gross pollutant interception. The largest contribution to the growth of new assets is the Victoria Park wetland.

Expenditure on new assets and services in the organisation's capital works program will be accommodated in the LTFP. This is further discussed in Section 6.2.

## 5.6 Disposal Plan

Disposal includes any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. There are no water infrastructure assets which have been identified for possible decommissioning and disposal. Any future assets requiring disposal will be further reinvestigated to determine the required levels of service and see what options are available for alternate service delivery, if any. Any revenue gained from asset disposals is accommodated in Council's LTFP.

Where cashflow projections from asset disposals are not available, these will be developed in future revisions of this AM Plan. There are no assets proposed to be disposed during the life of this plan.

## 5.7 Service Consequences and Risks

The organisation has prioritised decisions made in adopting this AM Plan to obtain the optimum benefits from its available resources. Decisions were made based on the development of three scenarios of AM plans.

**Scenario 1** – What we would like to do based on Asset Register data.

**Scenario 2** – What we should do with existing budgets and identifying level of service and risk consequences (i.e. what are the operations and maintenance and capital projects we are unable to do, what is the service and risk consequences associated with this position). This may require several versions of the AM Plan.

**Scenario 3** – What we can do and be financially sustainable with AM plans matching LTFPs.

The development of Scenario 1 and Scenario 2 AM Plans provides the tools for discussion with the Council and community on trade-offs between what we would like to do (Scenario 1) and what we should be doing with existing budgets (Scenario 2) by balancing changes in services and service levels with affordability and acceptance of the service and risk consequences of the trade-off position (Scenario 3).

### 5.7.1 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years based on little change to existing operational and maintenance budgets. These include:

- Additional operations and maintenance of a number of new assets created over the next 10 years within the environmental and wastewater group. This will include maintenance of water sensitive urban design facilities (vegetation, filter media, and surfaces), Victoria Park Wetlands (sedimentation, vegetation, and educational infrastructure), gross pollutant traps (frequency of removal of material from units), and floating islands (vegetation).

### 5.7.2 Service consequences

Operations and maintenance activities, and capital projects that cannot be undertaken, will maintain or create service consequences for users. These include:

- Lower level of service for new assets created over the next 10 years within the environmental and wastewater group. These could include loss of amenity, habitat, and water quality (Victoria Park Wetlands), reduced water quality, and higher risk of blockage from debris in receiving waters from reduction in frequency of cleaning of gross pollutant traps.

### 5.7.3 Risk consequences

The operations and maintenance activities and capital projects that cannot be undertaken may maintain or create risk consequences for the organisation. These include:

- Possible damage to reputation from the media / community by not providing desired level of service from new assets created over the next 10 years within the environmental and wastewater group. For example, if weed invasion is not managed over the first five years of the construction of the Victoria Park Wetlands, or water sensitive urban design facilities in city streets which are devoid of vegetation due to lack of maintenance.

These risks have been included with the *Infrastructure Risk Management Plan* summarised in Section 5.2 and Risk Management Plan's actions and expenditures included within projected expenditures.

# 6. FINANCIAL SUMMARY

This section contains the financial requirements resulting from all the information presented in the previous sections of this AM Plan. The financial projections will be improved as further information becomes available on desired levels of service and current and projected future asset performance.

## 6.1 Financial Statements and Projections

The financial projections are shown in Figures 7A to 7C for projected operating (operations and maintenance) and capital expenditure (renewal and upgrade / expansion / new assets). Note that all costs are shown in real values.

**Fig 7A: Projected Operating and Capital Expenditure – Stormwater Drainage Network**

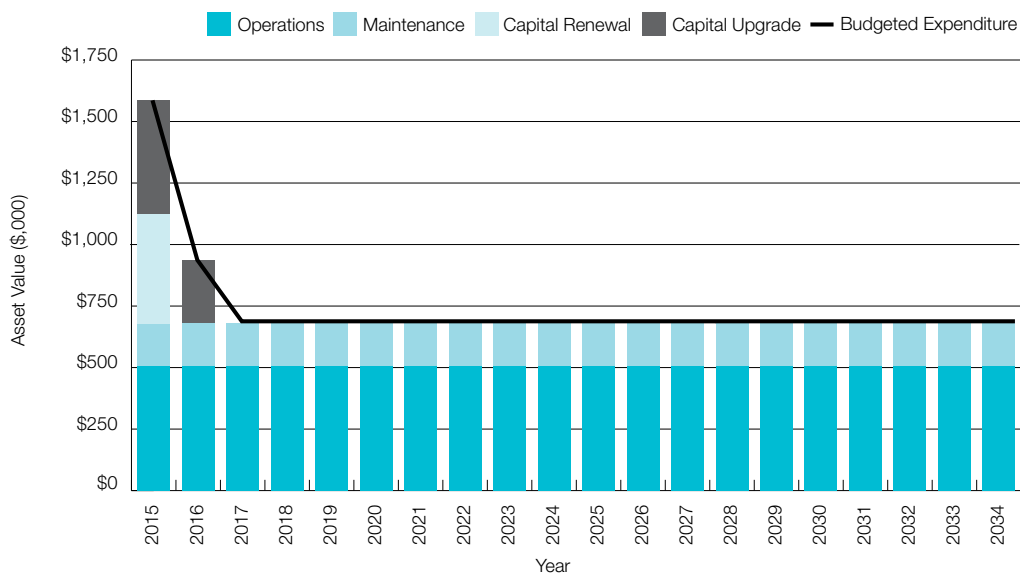


Figure 7A indicates that renewal, new / upgrade, operations, and maintenance of stormwater drainage network assets are fully funded over the LTFP to ensure that service levels for stormwater flooding and accessibility to properties and public spaces are maintained over the length of the plan. Additional renewal and new assets in Year 1 and Year 3 of the plan are for the installation of underground stormwater infrastructure in Victoria Park, Jeffcott Street, and the Ergo Apartments as previously noted.

**Fig 7B: Projected Operating and Capital Expenditure – River Torrens and Watercourses**

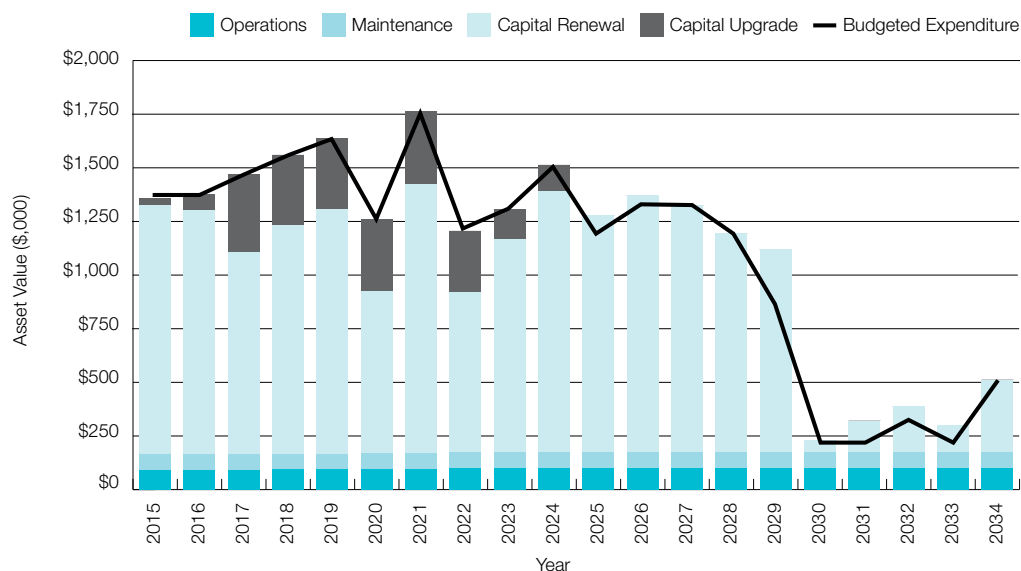
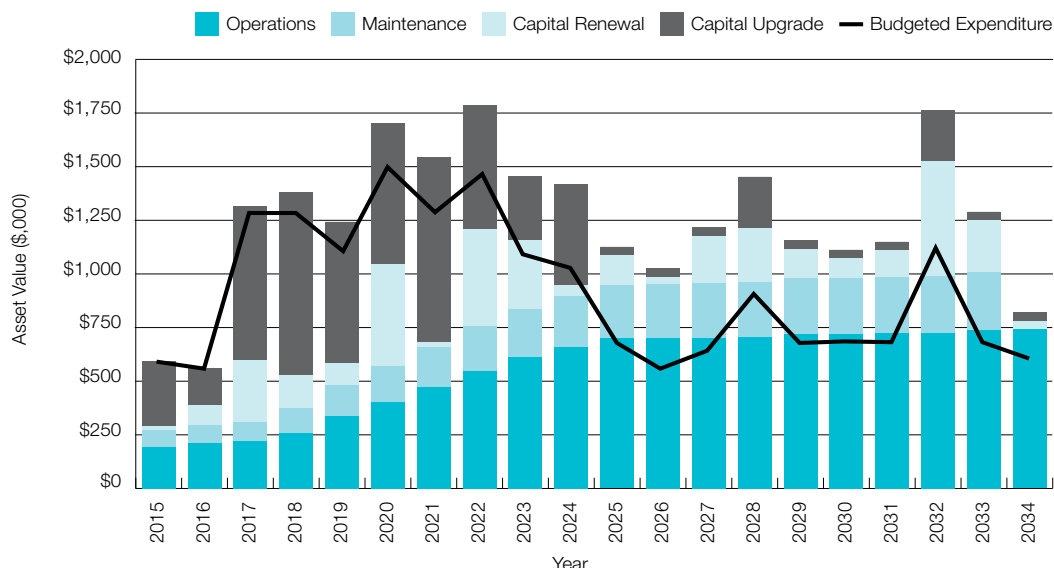


Figure 7B indicates that renewal, new / upgrade, operations, and maintenance of River Torrens and watercourse assets are more than 95% funded over the LTFP to ensure that service levels for recreation and amenity in the River Torrens corridor and safety and environmental sustainability of water courses and temporary flood storages in the Park Lands are maintained over the length of the plan. Additional new assets over the first 10 years of the plan are for the installation of temporary flood storages in the south Park Lands associated with the *Brown Hill Keswick Creek Stormwater Management Plan* and the high rate of renewals over the first 15 years of the plan reflect the renewals falling due for watercourses in the south and east Park Lands as well as earth retaining structures in Torrens Lake. The relatively small shortfall in budget funding over the final 10 years of the plan reflects the increase in maintenance and operations costs associated with the creation of new assets over the first year of the plan.

**Fig 7C: Projected Operating and Capital Expenditure – Environmental and Wastewater**



The graph indicates that renewal, new / upgrade, operations, and maintenance of environmental and wastewater infrastructure assets are around 90% funded over the first five years of the plan however this rate falls to just over 50% over the last 10 years of the plan. It is important to note that renewals and capital upgrade / new assets are fully funded over the 20-year term of the plan and that the shortfall is due to unfunded operations and maintenance of new assets created in the first 10 years of the plan. Unfortunately these costs are significant because a characteristic of this particular asset group is high operations and maintenance costs as a proportion to current replacement costs therefore any increase in the asset base will magnify additional operations and maintenance costs. In addition to this multiplier, the asset group will undergo significant increase in replacement cost over the next 10 years with the addition of the Victoria Park wetlands, water sensitive urban design facilities, and gross pollutant traps.

Actual increases in operations and maintenance costs for these assets may of course not apply to the existing operating / maintenance cost to replacement cost ratio and predicted increases in these costs may be exaggerated however methods of reducing these forecast costs will be explored during the term of the plan. As indicated previously, if the additional operating and maintenance costs are not funded then there will be a reduction in levels of service for amenity and environmental sustainability of water bodies in the city.

### 6.1.1 Sustainability of service delivery

There are four key indicators for service delivery sustainability that have been considered in the analysis of the services provided by this asset category, these being the Asset Renewal Funding Ratio, long term lifecycle costs / expenditures, and medium term projected / budgeted expenditures over five and 10 years of the planning period.

#### Asset Renewal Funding Ratio

Asset Renewal Funding Ratio <sup>12</sup> (stormwater drainage network)	102%
Asset Renewal Funding Ratio <sup>13</sup> (River Torrens and watercourses assets)	100%
Asset Renewal Funding Ratio <sup>14</sup> (environmental and wastewater infrastructure)	100%

The Asset Renewal Funding Ratio is the most important indicator and reveals that over the next 10 years, Council is forecasting that it will have:

- 100% of the funds required for the optimal renewal and replacement of its stormwater drainage network assets;
- 100% of the funds required for the optimal renewal and replacement of its River Torrens and watercourses assets; and
- 100% of the funds required for the optimal renewal and replacement of its environmental and wastewater infrastructure assets.

#### Long term - lifecycle cost

Lifecycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the asset lifecycle. Lifecycle costs include operations and maintenance expenditure and asset consumption (depreciation expense). The lifecycle cost for the services covered in this AM Plan is:

- Stormwater drainage network: \$1,444,000 per year (average operations and maintenance expenditure plus depreciation expense projected over 10 years);
- River Torrens and watercourse assets: \$662,000, per year (average operations and maintenance expenditure plus depreciation expense projected over 10 years);
- Environmental and wastewater: \$794,000, per year (average operations and maintenance expenditure plus depreciation expense projected over 10 years); and
- Total water infrastructure assets: \$2,900,000, per year (average operations and maintenance expenditure plus depreciation expense projected over 10 years).

Lifecycle costs can be compared to lifecycle expenditure to give an initial indicator of affordability of projected service levels when considered with age profiles. Lifecycle expenditure includes operations, maintenance, and capital renewal expenditure. Lifecycle expenditure will vary depending on the timing of asset renewals. The lifecycle expenditure over the 10-year planning period is

- Stormwater drainage network: \$740,000 per year (average operations and maintenance plus capital renewal budgeted expenditure in LTFP over 10 years). This expenditure is well below (51%) average costs because very few asset renewals for this asset group fall due over the term of the plan;
- River Torrens and watercourses assets: \$1,200,000 per year (average operations and maintenance plus capital renewal budgeted expenditure in LTFP over 10 years). This expenditure is well above (181%) average costs because a number of assets with large renewal costs fall due over the term of this plan;
- Environmental and wastewater infrastructure: \$557,000 per year (average operations and maintenance plus capital renewal budgeted expenditure in LTFP over 10 years). This expenditure is well below (70%) average costs because operations and maintenance costs over the last 10 years of the plan are unfunded. Renewal costs are fully funded; and
- Total water infrastructure assets: \$2,497,000, per year (average operations and maintenance plus capital renewal budgeted expenditure in LTFP over 10 years). Overall expenditure is below (86%) average costs and the shortfall is close to unfunded operations and maintenance for environmental and wastewater infrastructure however this is only by chance. The difference

in average cost and expenditure is more a reflection of when assets fall due over the life of the plan when compared to the average values over lifecycles of the assets.

A shortfall between lifecycle cost and lifecycle expenditure is the lifecycle gap. The lifecycle gap for services covered by this AM Plan is -\$403,000 per year (-ve = gap, +ve = surplus).

- Stormwater drainage network : -\$704,000 per year (-ve = gap, +ve = surplus). This shortfall is not valid as all lifecycle costs falling due over the life of the plan are fully funded and the deficit is a reflection of when the renewals fall due over the life of the plan compared to average lifecycle costs;
- River Torrens and watercourse assets: \$537,000 per year (-ve = gap, +ve = surplus). This surplus is not valid as all lifecycle costs falling due over the life of the plan are only 95% funded with a small shortfall due to additional operations and maintenance costs of new assets created in the first 10 years of the plan. The surplus is a reflection of when the renewals fall due over the life of the plan compared to average lifecycle costs;
- Environmental and wastewater infrastructure: -\$237,000 per year (-ve = gap, +ve = surplus). This shortfall reflects the unfunded additional operations and maintenance costs of new assets created over the term of the plan; and
- Total water infrastructure assets: -\$403,000 per year (-ve = gap, +ve = surplus). This overall shortfall is not valid as all lifecycle costs falling due over the life of the plan are fully funded and the deficit is a reflection of the difference in average cost and expenditure and unfunded operations and maintenance costs. The true shortfall is around -\$230,000 reflecting the unfunded additional operations and maintenance costs of new environmental and wastewater assets created over the term of the plan.

Long term lifecycle expenditure is 51% of lifecycle costs for stormwater drainage network assets, 181% of lifecycle costs for River Torrens and watercourses assets, and 70% of lifecycle costs for environmental and wastewater assets which result in 86% of lifecycle costs for the total Water Infrastructure Asset Class. Ideally, these ratios should be 100% however as explained above, the reasons for the large variance in cost / expenditure ratios is that lifecycle costs falling due over the life of the plan vary significantly to the average cost over the lifecycles of the assets.

The lifecycle costs and lifecycle expenditure comparison highlights any difference between present outlays and the average cost of providing the service over the long term. If the lifecycle expenditure is less than that lifecycle cost, it is most likely that outlays will need to be increased or cuts in services made in the future.

Knowing the extent and timing of any required increase in outlays and the service consequences if funding is not available will assist organisations in providing services to their communities in a financially sustainable manner. This is the purpose of the AM plans and LTTP.



### Medium term – 10-year financial planning period

This AM Plan identifies the projected operations, maintenance, and capital renewal expenditures required to provide an agreed level of service to the community over a 10-year period. This provides input into 10-year financial and funding plans aimed at providing the required services in a sustainable manner.

These projected expenditures may be compared to budgeted expenditures in the 10-year period to identify any funding shortfall. In a core AM Plan, a gap is generally due to increasing asset renewals for ageing assets.

Comparison between 10-year operational, maintenance, and capital renewal expenditure required to that budgeted in the LTFP is outlined in the following table for each asset group as well as the total Water Infrastructure Asset Class to meet existing service levels.

	Stormwater drainage network	River Torrens and watercourse assets	Environmental and wastewater infrastructure	Total Water Infrastructure Asset Class
10-year operational, maintenance, and capital renewal expenditure required on average per year	\$727,000	\$1,210,000	\$743,000	\$2,680,000
10-year operational, maintenance, and capital renewal budget expenditure on average per year	\$740,000	\$1,200,000	\$557,000	\$2,497,000
10-year funding shortfall per year	+\$13,000	-\$10,000	-\$186,000	-\$183,000
10-year financing indicator – % of projected 10-year expenditure needed to provide services	102%	99%	75%	93%

The comparison indicates that over the 10-year term, Council is funding 93% of lifecycle costs across the entire Water Infrastructure Asset Class with full funding of lifecycle costs for stormwater drainage network and River Torrens and watercourse assets however only 75% of environmental and wastewater infrastructure assets. The average overall \$183,000 per year shortfall is fully attributed to the additional projected costs for operations and maintenance of new environmental and wastewater infrastructure, the majority of which are acquired in the first 10 years of the plan.

### Medium term – 5-year financial planning period

Comparison between five-year operational, maintenance, and capital renewal expenditure required to that budgeted in the LTFP is outlined in the following table for each asset group as well as the total Water Infrastructure Asset Class to meet existing service levels.

	Stormwater drainage network	River Torrens and watercourse assets	Environmental and wastewater infrastructure	Total Water Infrastructure Asset Class
Five-year operational, maintenance, and capital renewal expenditure required on average per year	\$769,000	\$1,255,000	\$478,000	\$2,502,000
Five-year operational, maintenance, and capital renewal budget expenditure on average per year	\$781,000	\$1,250,000	\$416,000	\$2,447,000
Five-year funding shortfall per year	+\$12,000	-\$4,000	-\$62,000	-\$54,000
Five-year financing indicator – % of projected 10-year expenditure needed to provide services	102%	100%	87%	98%

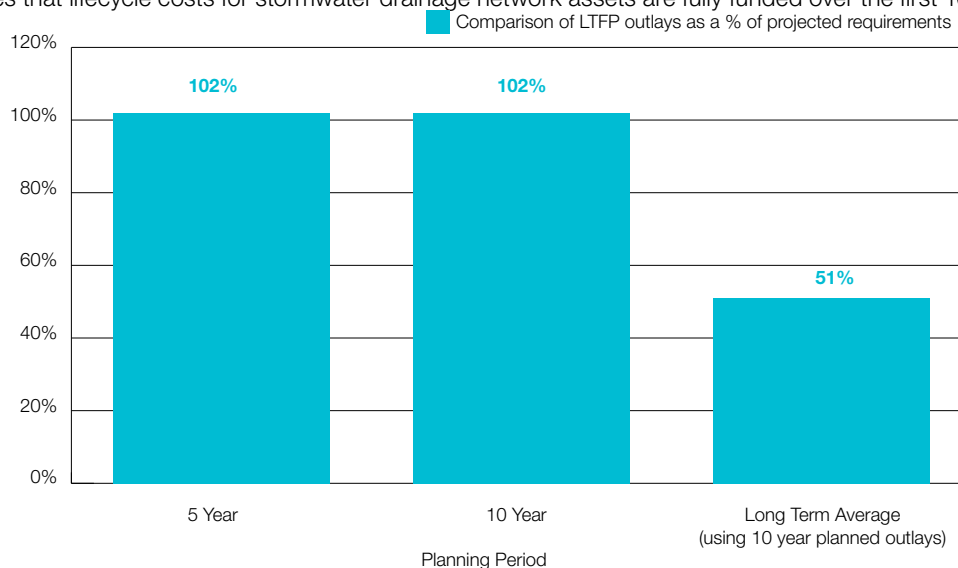
The comparison indicates that over the five-year term, Council is funding 98% of lifecycle costs across the entire Water Infrastructure Asset Class with full funding of lifecycle costs for stormwater drainage network and River Torrens and watercourse assets however over 85% of environmental and wastewater infrastructure assets. The average overall \$62,000 per year shortfall is fully attributed to the additional projected costs for operations and maintenance of new environmental and wastewater infrastructure, with around 40% of those new assets acquired over the five-year period.

### Asset management financial indicators

Figures 7-1A to 7-1C shows the asset management financial indicators over the 10-year planning period and for the long term lifecycle.

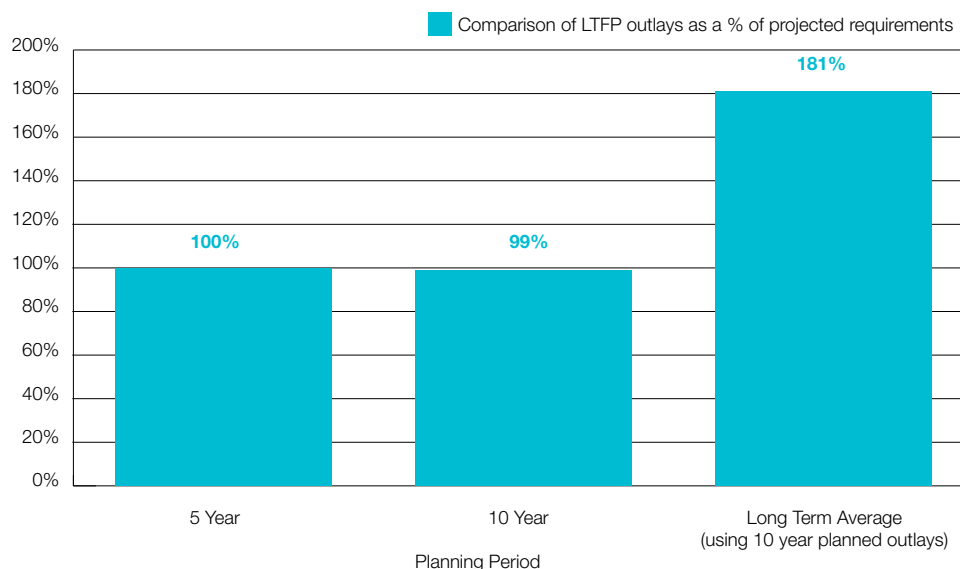
#### Figure 7-1A: Asset Management Financial Indicators – Stormwater Drainage Network

The graph indicates that lifecycle costs for stormwater drainage network assets are fully funded over the first 10 years of the



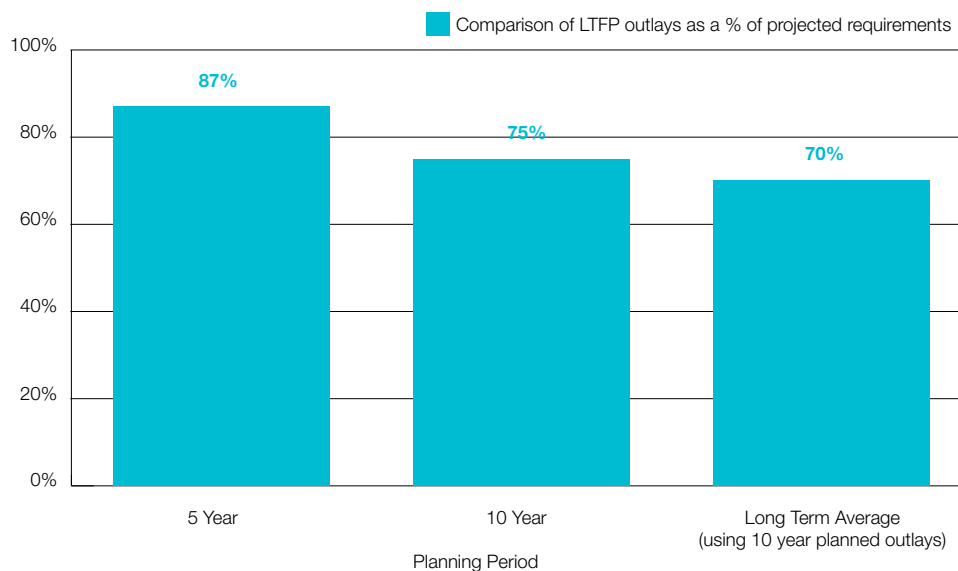
plan however only 51% of required lifecycle costs are funded in the long term. The long term ratio (51%) is invalid in this case as it does not take into account the timing of required renewals. This asset group is most certainly subjected to the same rate of asset consumption however the recent CCTV condition survey has resulted in only a small number of renewals required over the term of the plan. Therefore projected long term average lifecycle costs are more than double than that actually required and budgeted for over the term of the plan. 100% of actual required lifecycle costs are funded over the term of the plan.

**Figure 7-1B: Asset Management Financial Indicators – River Torrens and Watercourses**



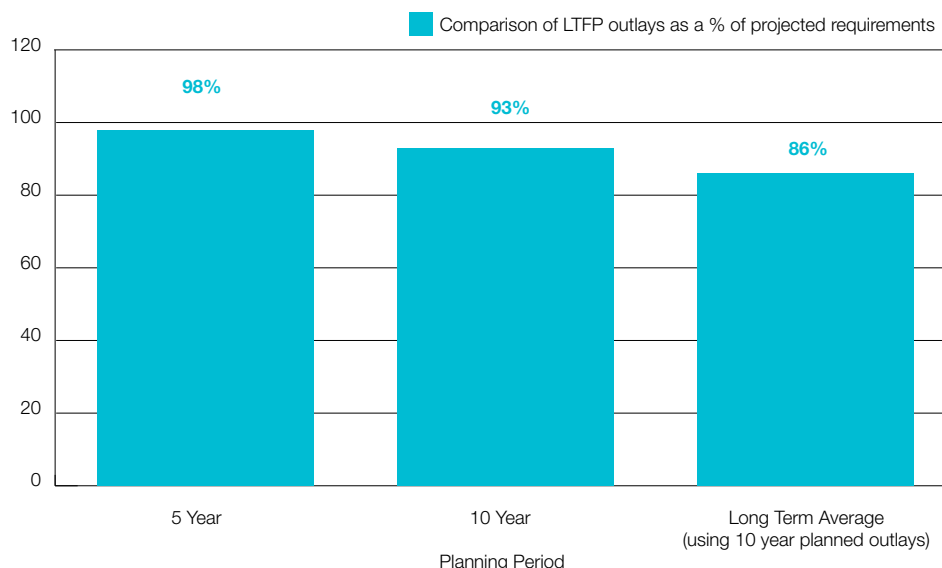
The graph indicates that lifecycle costs for River Torrens and watercourse assets are fully funded over the first 10 years of the plan however it appears that the plan proposes to overfund lifecycle costs in the long term. The long term ratio (181%) is invalid in this case as it does not take into account the timing of required renewals. Unlike the stormwater drainage network group, this asset group has a disproportionate of renewals falling due over the term of this plan therefore expenditure well above (181%) the average required lifecycle costs will be needed over the term of the plan. Despite this elevated expenditure, we will still only meet 95% of all lifecycle costs as there is a small amount of unfunded additional operations and maintenance resulting from the acquisition of new assets over the first 10 years of the plan.

**Figure 7-1C: Asset Management Financial Indicators – Environmental and Wastewater**



The graph indicates that lifecycle costs for environmental and wastewater assets show a gradual reduction of funding of required expenditure. All renewals are fully funded over the short and long term however disproportionate additional operations and maintenance costs resulting from significant acquisition of new assets over the term of the plan are not funded and this unfunded amount increases as Council acquires more assets through Year 1 to Year 10 of the plan resulting in a declining sustainability indicator. It is proposed to address the shortfall in operations and maintenance costs for this asset group as discussed elsewhere in the plan.

**Figure 7-1D: Asset Management Financial Indicators – Total Water Infrastructure Asset Class**

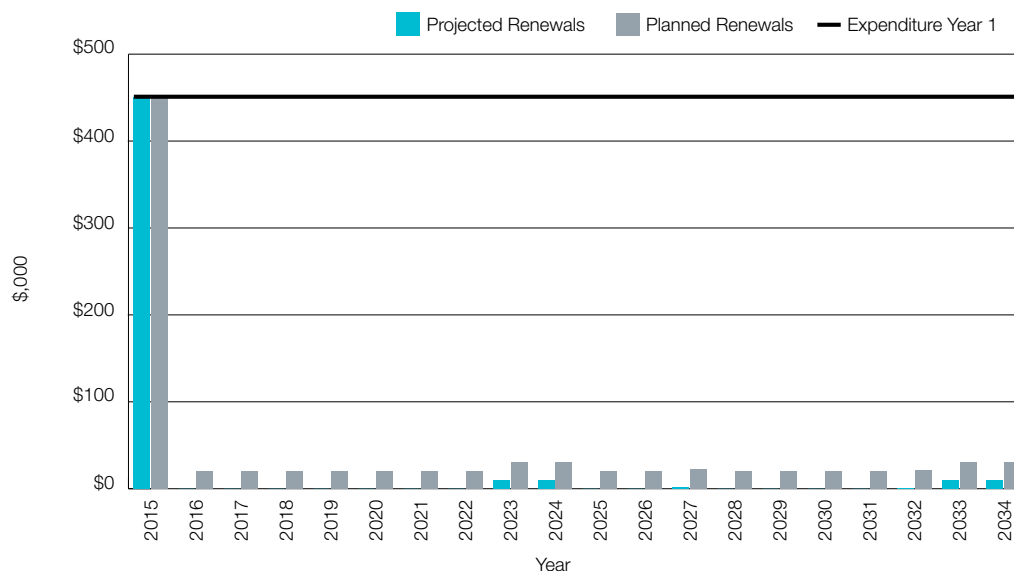


The graph indicates that lifecycle costs for the total Water Infrastructure Asset Class show a gradual reduction of funding of required expenditure. All renewals are fully funded over the short and long term however disproportionate additional operations and maintenance costs resulting from significant acquisition of new assets over the term of the plan for environmental and wastewater infrastructure assets and some watercourse assets are not funded and this unfunded amount increases as acquire more assets through Year 1 to Year 10 of the plan resulting in a declining sustainability indicator. It is proposed to address the shortfall in operations and maintenance costs for this asset group as discussed elsewhere in the plan.

Providing services from infrastructure in a sustainable manner requires the matching and managing of service levels, risks, projected expenditures and financing to achieve a financial indicator of approximately 1.0 for the first year of the AM Plan and ideally over the 10-year life of the LTFP.

Figures 8A to 8C shows the projected asset renewal and replacement expenditure over the 20 years of the AM Plan. The projected asset renewal and replacement expenditure is compared to renewal and replacement expenditure in the capital works program, which is accommodated in the LTFP.

**Figure 8A: Projected and LTFP Budgeted Renewal Expenditure – Stormwater Drainage Network**



The graph indicates that majority of renewal expenditure for stormwater drainage network assets occurs in Year 1 (Rundle Mall stormwater drain replacement) and is fully funded. An allocation of \$20,000 per annum has been allocated in the budget which are funds that Council applies to renewal a small number of stormwater drainage assets each year which are identified through reported service failures and subsequent identification of structural failure not identified in the Asset Register for example, replacement of collapsed manhole or replacement of broken cast iron inlet pit grates. The small amount of renewal activity beyond Year 1 reflects the timing of required renewals for this asset group and that required renewals commence beyond the end of the plan time frame.

**Figure 8B: Projected and LTFP Budgeted Renewal Expenditure – River Torrens and Watercourses**

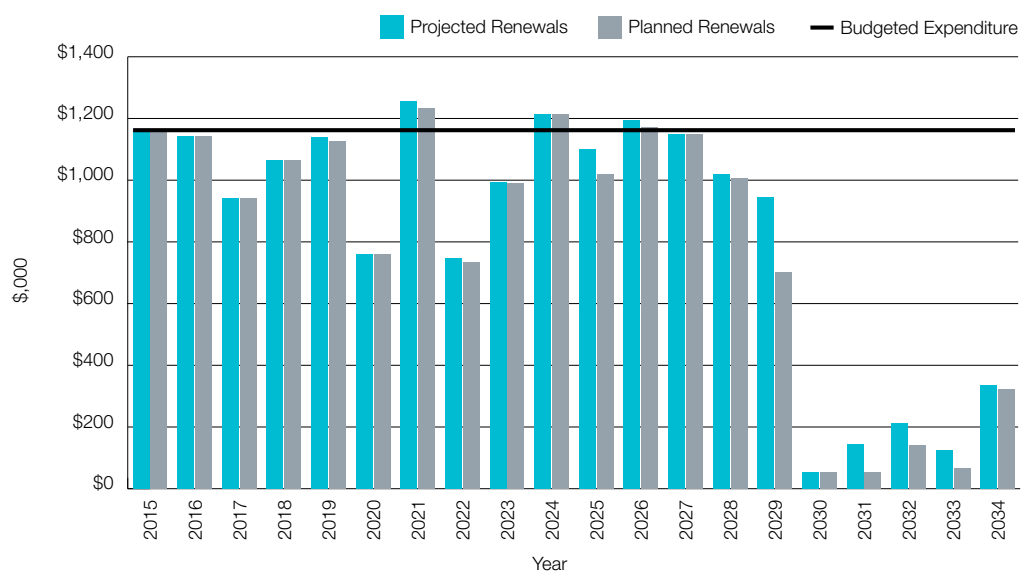


Figure 8B indicates a consistent level of elevated renewal of River Torrens and watercourse assets over the first 15 years of the plan which is a reflection of the timing of required renewals for this asset group. Budget expenditure has been allocated for the majority of renewals, particularly in the first 10 years of the plan. Required renewals revert back to average expenditure after Year 15.



**Figure 8C: Projected and LTFP Budgeted Renewal Expenditure – Environmental and Wastewater Infrastructure**

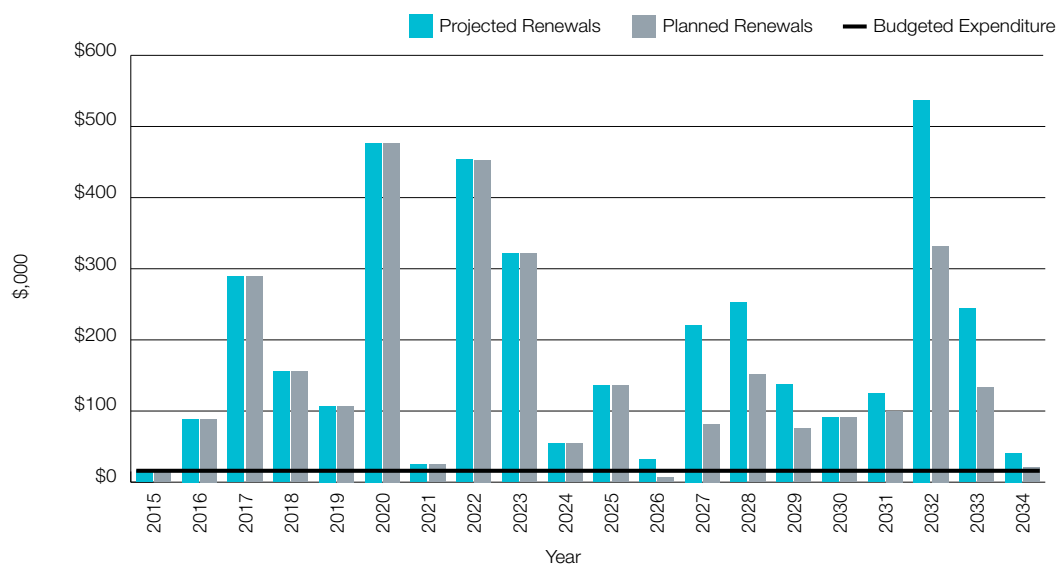


Figure 8C shows that over the first 10 years of the plan, budgeted renewal expenditure for environmental and wastewater infrastructure typically meets the majority of required renewal expenditure. This group consists of assets with relatively shorter useful lives than that of the other two groups and such, the renewal plan contains Generation 2 and Generation 3 renewals over the time frame of the plan.

Tables 6.1.1A to 6.1.1C shows the shortfall between projected renewal and replacement expenditures and expenditure accommodated in LTFP. Budget expenditures accommodated in the LTFP or extrapolated from current budgets are shown in Appendix D.

**Table 6.1.1A: Projected and LTFP Budgeted Renewals and Financing Shortfall – Stormwater Drainage Network**

Year	Projected renewals (\$,000)	LTFP renewal budget (\$,000)	Renewal financing shortfall (\$,000) (-ve gap, +ve surplus)	Cumulative shortfall (\$,000) (-ve gap, +ve surplus)
2015	\$450	\$450	\$0	\$0
2016	\$0	\$20	\$20	\$20
2017	\$0	\$20	\$20	\$40
2018	\$0	\$20	\$20	\$60
2019	\$0	\$20	\$20	\$80
2020	\$0	\$20	\$20	\$100
2021	\$0	\$20	\$20	\$120
2022	\$0	\$20	\$20	\$140
2023	\$10	\$30	\$20	\$160
2024	\$10	\$30	\$20	\$180
2025	\$0	\$20	\$20	\$200
2026	\$0	\$20	\$20	\$220
2027	\$0	\$20	\$20	\$240
2028	\$0	\$20	\$20	\$260
2029	\$0	\$20	\$20	\$280
2030	\$0	\$20	\$20	\$300
2031	\$0	\$20	\$20	\$320
2032	\$0	\$20	\$20	\$340
2033	\$10	\$30	\$20	\$361
2034	\$10	\$30	\$20	\$380

Note: A negative shortfall indicates a financing gap, a positive shortfall indicates a surplus for that year.

The cumulative surplus (\$380,000) is a result of an annual \$20,000 expenditure budget allocated to in the budget to renew a small number of stormwater drainage network assets each year which are identified through reported service failures and subsequent identification of structural failure not identified in the Asset Register.

**Table 6.1.1B: Projected and LTFP Budgeted Renewals and Financing Shortfall – River Torrens and Watercourses**

Year	Projected renewals (\$,000)	LTFP renewal budget (\$,000)	Renewal financing shortfall (\$,000) (-ve gap, +ve surplus)	Cumulative shortfall (\$,000) (-ve gap, +ve surplus)
2015	\$1,162	\$1,162	\$0	\$0
2016	\$1,141	\$1,141	\$0	\$0
2017	\$943	\$943	\$0	\$0
2018	\$1,066	\$1,066	\$0	\$0
2019	\$1,139	\$1,126	-\$12	-\$12
2020	\$759	\$759	\$0	-\$12
2021	\$1,255	\$1,232	-\$22	-\$35
2022	\$746	\$734	-\$12	-\$47
2023	\$993	\$991	-\$2	-\$49
2024	\$1,215	\$1,215	\$0	-\$49
2025	\$1,102	\$1,018	-\$84	-\$133
2026	\$1,194	\$1,172	-\$22	-\$155
2027	\$1,150	\$1,150	\$0	-\$155
2028	\$1,019	\$1,005	-\$14	-\$169
2029	\$944	\$702	-\$242	-\$411
2030	\$55	\$55	\$0	-\$411
2031	\$145	\$55	-\$90	-\$501
2032	\$212	\$141	-\$71	-\$572
2033	\$124	\$67	-\$57	-\$629
2034	\$336	\$324	-\$12	-\$641

Note: A negative shortfall indicates a financing gap, a positive shortfall indicates a surplus for that year.

The table shows that required renewal expenditure for River Torrens and watercourse assets is generally funded by budget expenditure over the first 15 years of the plan. There is a small accumulated deficit of \$169,000 over this 15-year period however this figure is well within the confidence levels of the forecast expenditure over that period of time.

**Table 6.1.1C: Projected and LTFP Budgeted Renewals and Financing Shortfall – Environmental and Wastewater**

Year	Projected renewals (\$,000)	LTFP renewal budget (\$,000)	Renewal financing shortfall (\$,000) (-ve gap, +ve surplus)	Cumulative shortfall (\$,000) (-ve gap, +ve surplus)
2015	\$16	\$16	\$0	\$0
2016	\$89	\$89	\$0	\$0
2017	\$289	\$289	\$0	\$0
2018	\$156	\$156	\$0	\$0
2019	\$107	\$107	\$0	\$0
2020	\$477	\$477	\$0	\$0
2021	\$25	\$25	\$0	\$0
2022	\$454	\$453	\$0	\$0
2023	\$321	\$321	\$0	\$0
2024	\$54	\$54	\$0	\$0
2025	\$136	\$136	\$0	\$0
2026	\$32	\$7	-\$25	-\$25
2027	\$221	\$82	-\$139	-\$164
2028	\$253	\$151	-\$102	-\$266
2029	\$137	\$75	-\$62	-\$328
2030	\$91	\$91	\$0	-\$328
2031	\$125	\$100	-\$25	-\$353
2032	\$537	\$332	-\$205	-\$558
2033	\$244	\$133	-\$112	-\$669
2034	\$41	\$21	-\$20	-\$690

Note: A negative shortfall indicates a financing gap, a positive shortfall indicates a surplus for that year.

The table shows that required renewal expenditure for environmental and wastewater infrastructure assets is fully funded by budget expenditure over the first 10 years of the plan. Accumulated deficits commence after Year 11 of the plan when second and third generation renewals inflate the accumulated deficit to almost \$700,000. Reallocation of renewal expenditure budget will be required to eliminate this gap.

Providing services in a sustainable manner will require matching of projected asset renewal and replacement expenditure to meet agreed service levels with the corresponding capital works program accommodated in the LTFP.

A gap between projected asset renewal / replacement expenditure and amounts accommodated in the LTFP after Year 11 indicates that further work is required in the Asset Management Improvement Plan on reviewing service levels in the AM Plan to manage required service levels and funding to eliminate any funding gap.

## 6.1.2 Projected expenditures for LTFP

Table 6.1.2 shows the projected expenditures for the 10-year LTFP.

Expenditure projections are in 2014 - 15 real values.

**Table 6.1.2A: Projected Expenditures for LTFP (\$,000) – Stormwater Drainage Network**

Year	Operations (\$,000)	Maintenance (\$,000)	Projected capital renewal (\$,000)	Capital upgrade / new (\$,000)	Disposals (\$,000)
2015	\$504	\$171	\$450	\$460	\$0
2016	\$505	\$171	\$0	\$258	\$0
2017	\$505	\$171	\$0	\$0	\$0
2018	\$505	\$171	\$0	\$0	\$0
2019	\$505	\$171	\$0	\$0	\$0
2020	\$505	\$171	\$0	\$0	\$0
2021	\$505	\$171	\$0	\$0	\$0
2022	\$505	\$171	\$0	\$0	\$0
2023	\$505	\$171	\$10	\$0	\$0
2024	\$505	\$171	\$10	\$0	\$0
2025	\$505	\$171	\$0	\$0	\$0
2026	\$505	\$171	\$0	\$0	\$0
2027	\$505	\$171	\$0	\$0	\$0
2028	\$505	\$171	\$0	\$0	\$0
2029	\$505	\$171	\$0	\$0	\$0
2030	\$505	\$171	\$0	\$0	\$0
2031	\$505	\$171	\$0	\$0	\$0
2032	\$505	\$171	\$0	\$0	\$0
2033	\$505	\$171	\$10	\$0	\$0
2034	\$505	\$171	\$10	\$0	\$0

**Table 6.1.2B: Projected Expenditures for LTFP (\$,000) – River Torrens and Watercourses**

Year	Operations (\$,000)	Maintenance (\$,000)	Projected capital renewal (\$,000)	Capital upgrade / new (\$,000)	Disposals (\$,000)
2015	\$93	\$70	\$1,162	\$35	\$0
2016	\$93	\$70	\$1,141	\$72	\$0
2017	\$93	\$70	\$943	\$363	\$0
2018	\$94	\$71	\$1,066	\$329	\$0
2019	\$95	\$72	\$1,139	\$331	\$0
2020	\$96	\$72	\$759	\$331	\$0
2021	\$97	\$73	\$1,255	\$336	\$0
2022	\$99	\$74	\$746	\$288	\$0
2023	\$99	\$75	\$993	\$140	\$0
2024	\$100	\$75	\$1,215	\$124	\$0
2025	\$100	\$75	\$1,102	\$0	\$0
2026	\$100	\$75	\$1,194	\$0	\$0
2027	\$100	\$75	\$1,150	\$0	\$0
2028	\$100	\$75	\$1,019	\$0	\$0
2029	\$100	\$75	\$944	\$0	\$0
2030	\$100	\$75	\$55	\$0	\$0
2031	\$100	\$75	\$145	\$0	\$0
2032	\$100	\$75	\$212	\$0	\$0
2033	\$100	\$75	\$124	\$0	\$0
2034	\$100	\$75	\$336	\$0	\$0

**Table 6.1.2C: Projected Expenditures for LTFP (\$,000) – Environmental and Wastewater**

Year	Operations (\$,000)	Maintenance (\$,000)	Projected capital renewal (\$,000)	Capital upgrade / new (\$,000)	Disposals (\$,000)
2015	\$194	\$79	\$16	\$305	\$0
2016	\$211	\$85	\$89	\$175	\$0
2017	\$221	\$89	\$289	\$714	\$0
2018	\$260	\$112	\$156	\$851	\$0
2019	\$339	\$141	\$107	\$656	\$0
2020	\$405	\$165	\$477	\$656	\$0
2021	\$472	\$184	\$25	\$864	\$0
2022	\$549	\$207	\$454	\$575	\$0
2023	\$611	\$225	\$321	\$299	\$0
2024	\$658	\$236	\$54	\$469	\$0
2025	\$699	\$251	\$136	\$40	\$0
2026	\$701	\$252	\$32	\$40	\$0
2027	\$703	\$253	\$221	\$40	\$0
2028	\$705	\$254	\$253	\$240	\$0
2029	\$719	\$259	\$137	\$40	\$0
2030	\$721	\$260	\$91	\$40	\$0
2031	\$723	\$261	\$125	\$40	\$0
2032	\$725	\$262	\$537	\$240	\$0
2033	\$739	\$267	\$244	\$40	\$0
2034	\$741	\$268	\$41	\$40	\$0

## 6.2 Funding Strategy

After reviewing service levels, as appropriate to ensure ongoing financial sustainability projected expenditures identified in Section 6.1.2 will be accommodated in the Council's 10-year LTFP.

## 6.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by Council and from assets constructed by land developers and others and donated to Council. Figures 9A to 9C shows the projected replacement cost asset values over the planning period in real values.

**Figure 9A: Projected Asset Values – Stormwater Drainage Network**

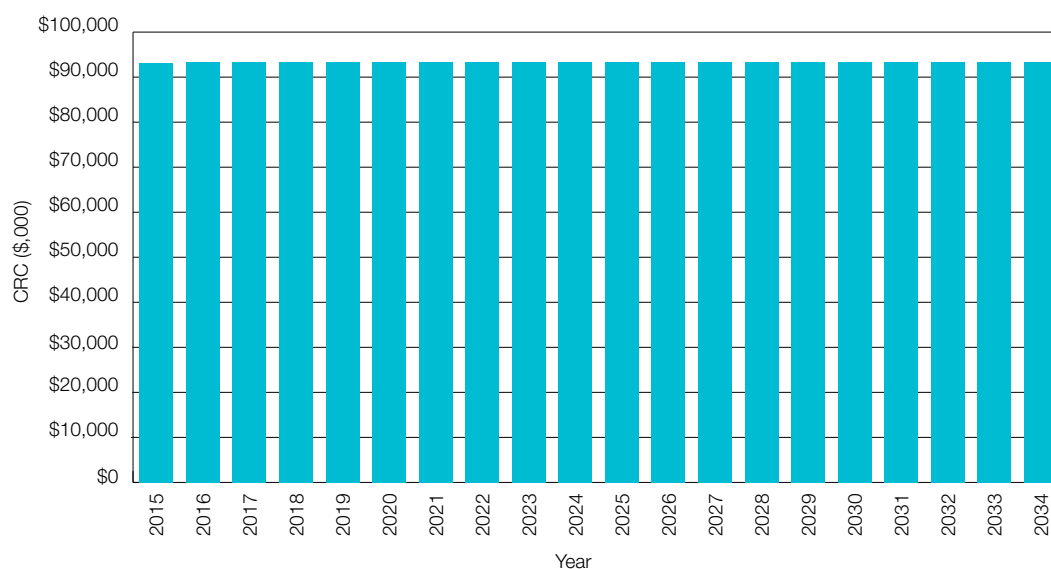


Figure 9A indicates uniform projected asset values for stormwater drainage network assets as expected given that minimal new / upgraded assets are proposed over the term of the plan. Future endorsement and implementation of the Adelaide Design Manual may result in future increases in infrastructure values as additional stormwater capture may be required to accommodate surface materials which may not provide similar hydraulic characteristics to existing road, kerb, and water table infrastructure.



**Figure 9B: Projected Asset Values – River Torrens and Watercourses**



Figure 9B indicates a slight gradual increase in projected asset values for River Torrens and watercourse assets due to the modest acquisition new assets (temporary water storages in the south Park Lands) over the first 10 years of the plan. Projected asset values normalise at \$34 million after Year 10 of the plan.

**Figure 9C: Projected Asset Values – Environmental and Wastewater**

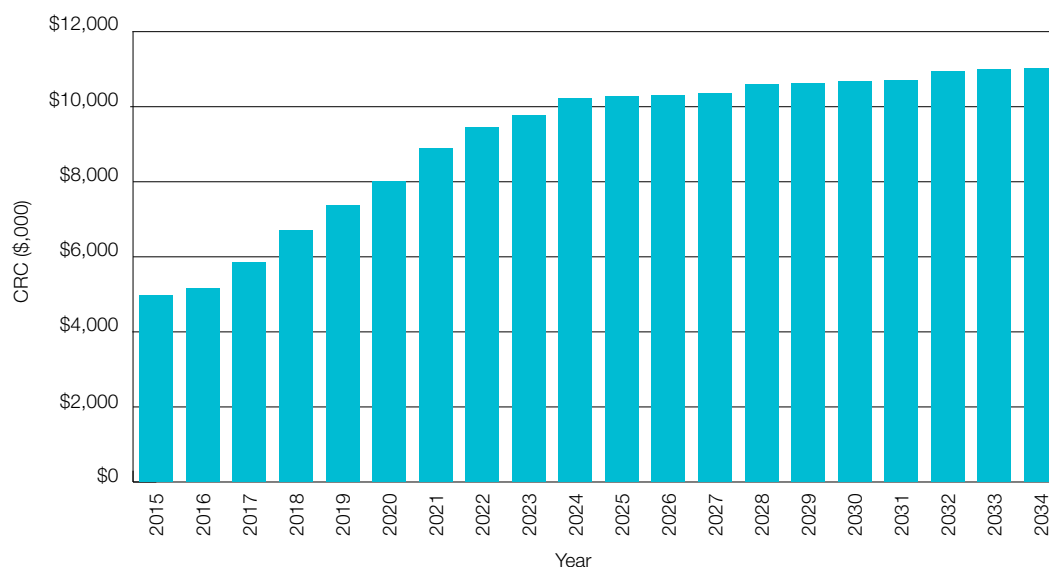


Figure 9C indicates a rapid increase in projected asset values for environmental and wastewater infrastructure assets over the first 10 years of the plan followed by a more modest increase in values after Year 10. The graph reflects the rapid increase in overall replacement costs as the Victoria Park Wetlands, new water sensitive urban design facilities, and new gross pollutant traps are acquired at an accumulated replacement cost over the 10-year period which is equivalent to the total replacement cost in Year 1. After Year 10, modest acquisition new assets (new gross pollutant traps and water sensitive urban design facilities) result in gradual increase in projected asset values over the final 10 years of the plan. Overall, projected asset values more than doubles over the term of the plan at an average annual growth rate of 6.5%.

Depreciation expense values are forecast in line with asset values as shown in Figures 10A to 10C.

**Figure 10A: Projected Depreciation Expense – Stormwater Drainage Network**

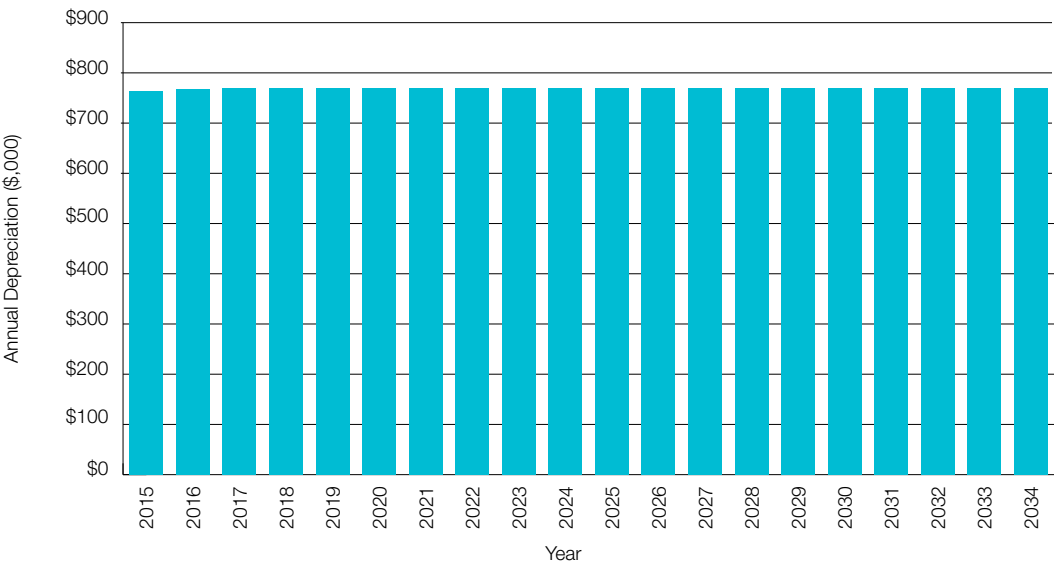


Figure 10A indicates a uniform projected depreciation expense for stormwater drainage network assets as expected given that minimal new / upgraded assets are proposed over the term of the plan.

**Figure 10B: Projected Depreciation Expense – River Torrens and Watercourses**

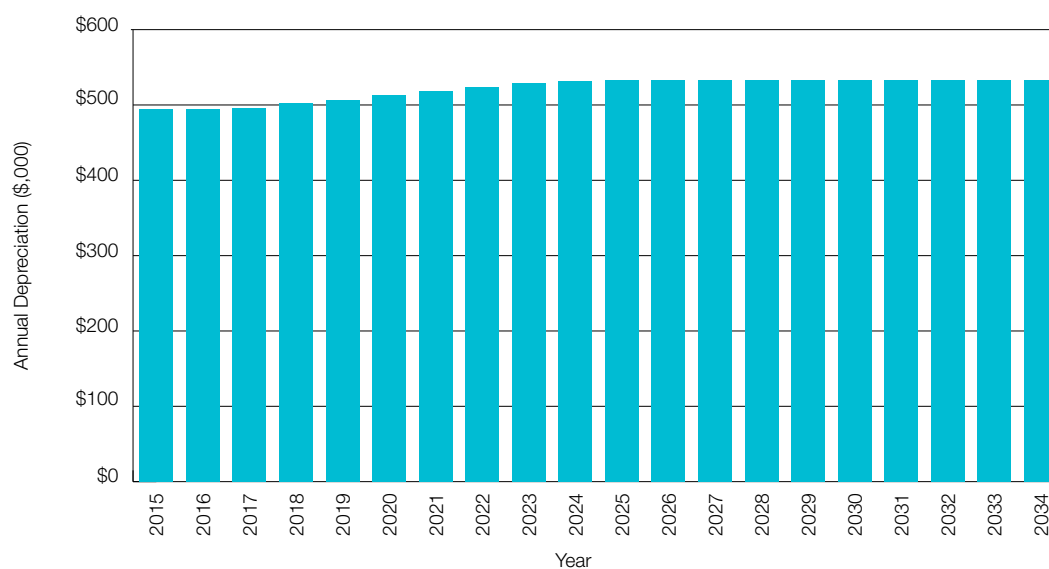


Figure 10B indicates a slight gradual increase in projected depreciation expense for River Torrens and watercourse assets due to the additional depreciation from the modest acquisition new assets (temporary water storages in the South Park Lands) over the first 10 years of the plan. Projected depreciation expense normalises at \$530,000 after Year 10 of the plan.

**Figure 10C: Projected Depreciation Expense – Environmental and Wastewater**

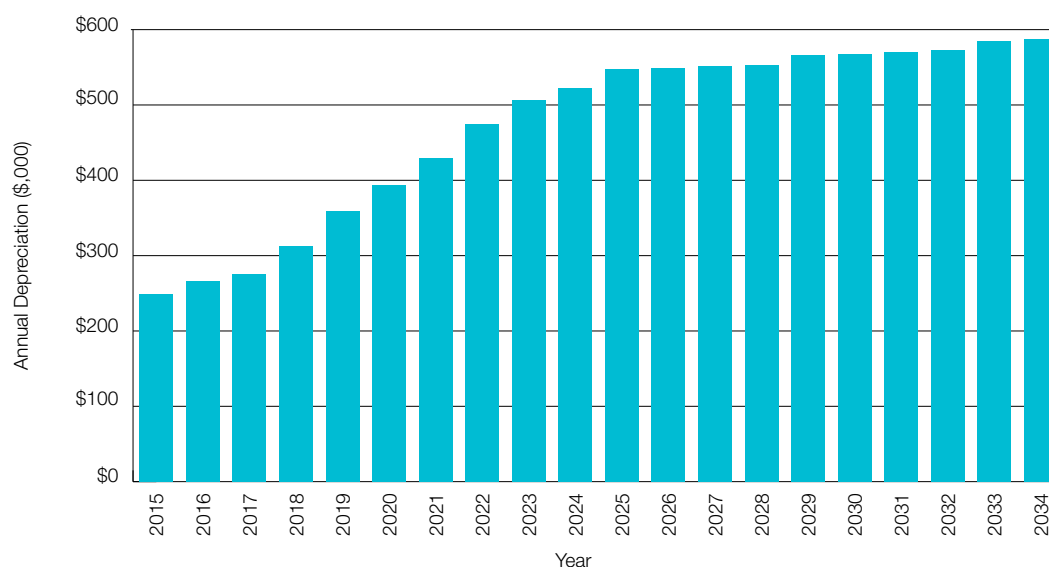
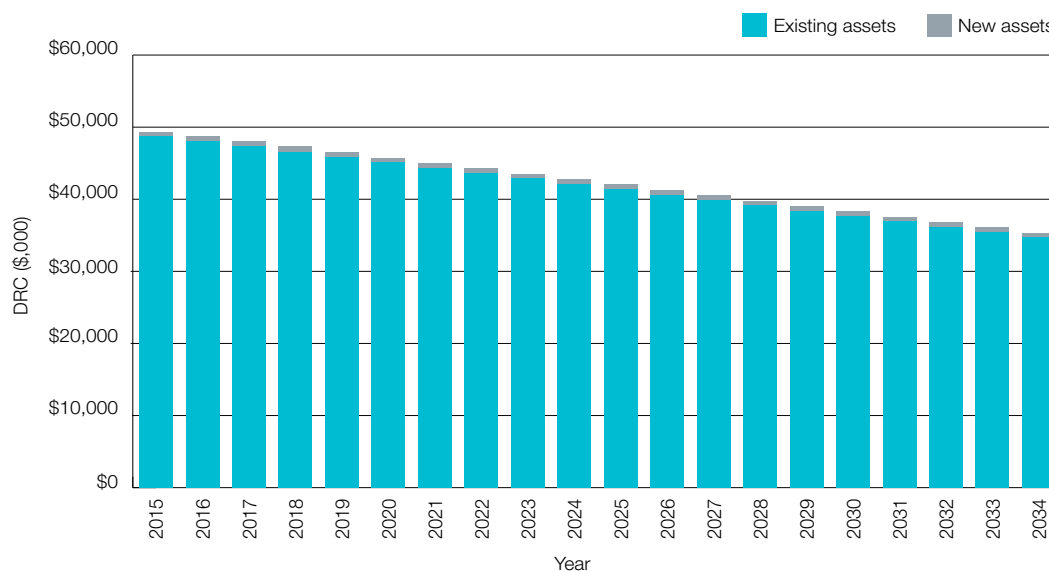


Figure 10C indicates a rapid increase in projected depreciation expense for environmental and wastewater infrastructure assets over the first 10 years of the plan followed by a more modest increase in values after Year 10. The graph reflects the rapid increase in additional depreciation expense as overall replacement costs rapidly increase due to the acquisition of new assets in the first 10 years (Victoria Park Wetlands, new water sensitive urban design facilities, and new gross pollutant traps). After Year 10, modest acquisition new assets (new gross pollutant traps and water sensitive urban design facilities) result in gradual increase in depreciation expense over the final 10 years of the plan. Overall, projected depreciation expense more than doubles over the term of the plan at an average annual growth rate of 6.5%.

The depreciated replacement cost will vary over the forecast period depending on the rates of addition of new assets, disposal of old assets, and consumption and renewal of existing assets. Forecast of the assets' depreciated replacement cost is shown in Figure 11A to 11C. The depreciated replacement cost of contributed and new assets is shown in the darker colour and in the lighter colour for existing assets.

**Figure 11A: Projected Depreciated Replacement Cost – Stormwater Drainage Network**



The graph indicates a steady decline of projected depreciated replacement cost for stormwater drainage network assets over the time frame of the plan from 52% in Year 1 to around 40% in Year 20 with little contribution from new assets. The decline in projected depreciated cost is a result of continued asset consumption over the life of the plan with little asset renewal activity and has been brought about by the timing of the required renewals falling beyond the time frame of the plan. Renewal of water infrastructure assets is based on economic lives determined by optimal renewal at lowest lifecycle costs, therefore the projected depreciated replacement cost will continue to decline until such time that renewals fall due after Year 20.

While the shape of the graph is similar to an asset base which is depreciating with insufficient renewal expenditure, the reasons for a declining depreciated replacement cost in this case is not expenditure funding levels but more related to timing of projected capital renewals. Depreciated Replacement Cost will decline to a level where it is most efficient to implement capital renewal.

**Figure 11B: Projected Depreciated Replacement Cost - River Torrens and Watercourses**

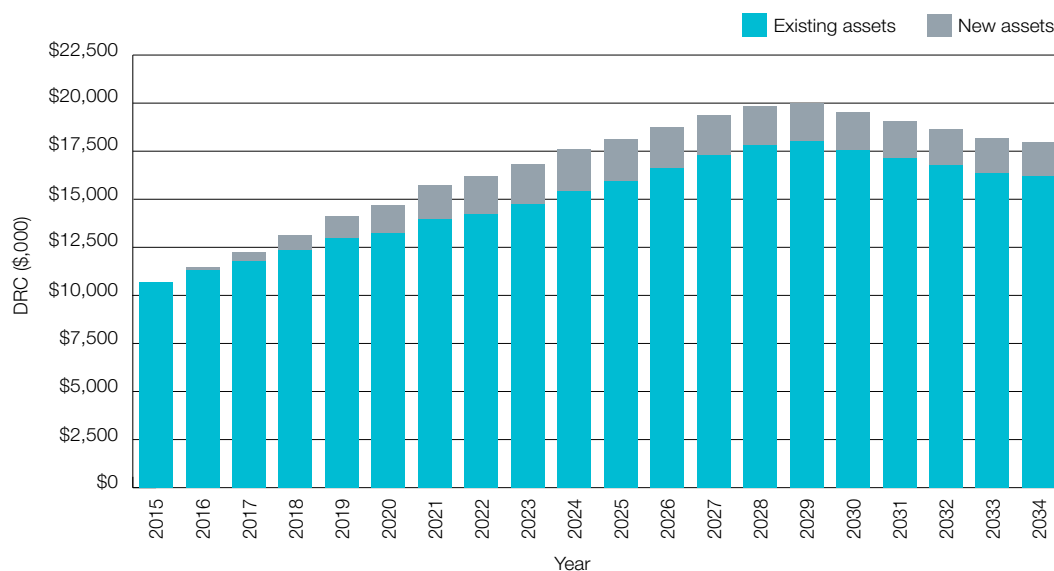


Figure 11B indicates a steady increase of projected depreciated replacement cost for River Torrens and watercourse assets over the time frame of the plan from 35% in Year 1 to more than 55% in Year 15 due to an elevated level of renewal of assets falling due within the first 15 years of the plan. There is also a modest contribution to depreciated replacement cost from new assets accumulated over the first 10 years of the plan (temporary flood storages in the South Park Lands). The increase in projected depreciated cost is a result of continued asset consumption over the life of the plan with elevated asset renewal and has been brought about by the timing of a significant value of required renewals falling within the first 15 years of the plan. Projected Depreciated Replacement cost declines after Year 15 as required renewal levels fall below average annual renewal levels.

While the initial shape of the graph is similar to an asset base which is depreciating with excessive renewal expenditure, the reasons for an inclining depreciated replacement cost in this case is not excessive expenditure funding levels but more related to timing of projected capital renewals.

**Figure 11C: Projected Depreciated Replacement Cost - Environmental and Wastewater**

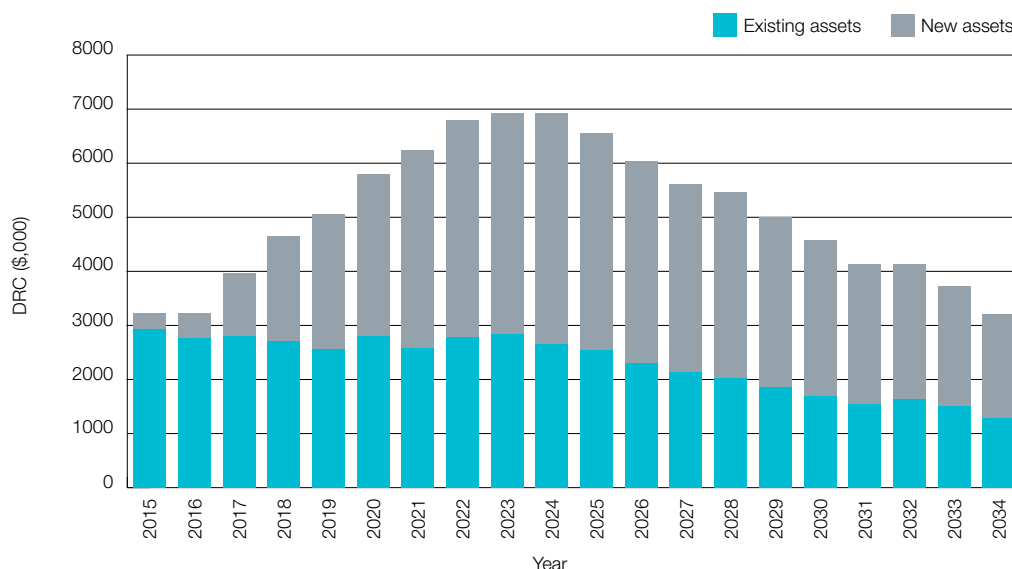


Figure 11C indicates a steady increase in overall projected depreciated replacement cost for environmental and wastewater infrastructure assets over the first 10 years of the plan however all of increases are a result of the acquisition of a high value new infrastructure over this period which flood the asset base with high value, new undepreciated assets. The reason why these new assets have such an impact on overall depreciated replacement cost is that the replacement cost of the new assets in the first 10 years of the plan is more than initial replacement cost of the original asset base in Year 1 where depreciated replacement cost more than doubles from \$3,150,000 in Year 1 to almost \$7,000,000 in Year 10. Depreciated replacement cost declines after Year 10 as the rate of new asset acquisitions slow in the last 10 years of the plan.

Depreciated replacement cost of the existing asset base in Year 1 actually declines over the time frame of the plan from around \$2,900,000 in Year 1 to \$1,200,000 in Year 20. The decline in this projected depreciated cost is a result of continued asset consumption over the life of the plan with the correct level of renewal activity reflects that the initial asset base is relatively young and starting from high level of depreciated replacement cost (68% of replacement cost). Depreciated replacement cost will continue to decline to a level where it is most efficient to implement capital renewal at optimal renewal time.



## 6.4 Key Assumptions Made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this AM Plan and in preparing forecasts of required operating and capital expenditure and asset values, depreciation expense, and carrying amount estimates. It is presented to enable readers to gain an understanding of the levels of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan and risks that these may change are shown in Table 6.4.

**Table 6.4: Key Assumptions Made in AM Plan and Risks of Change**

Key assumptions	Risks of change to assumptions
Expenditure forecasts based on accurate valuations of assets.	Expenditure forecasts are likely to be underestimated given the integrity of the asset valuation process and confidence of asset values for water infrastructure.
Useful lives of individual assets have been based on the assumption that economic life is equivalent to physical life.	Optimal renewal decision making analysis and determination of the optimal renewal / maintenance mix for some water infrastructure assets may determine economic lives which are much shorter than assumed useful lives resulting in required renewal expenditures being brought forward in the LTFP.
Renewal, operations, and maintenance expenditure budgets remain constant in real terms over the time frame of the plan.	A reduction in renewal, operations, and maintenance expenditure budgets will result in reduction in reliability and levels of service from water infrastructure assets.
Maintenance Plan for water infrastructure assets will be executed by Public Realm and external service providers.	If Public Realm do not implement a Maintenance Plan then current service levels will not be achieved and assets may have consumption rates higher than that assumed in the plan.

## 6.5 Forecast Reliability and Confidence

The expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a five level scale<sup>15</sup> in accordance with Table 6.5.

**Table 6.5: Data Confidence Grading System**

Confidence grade	Description
A Highly reliable	Data based on sound records, procedures, investigations, and analysis, documented properly and recognised as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$ .
B Reliable	Data based on sound records, procedures, investigations, and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing, and / or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$ .
C Uncertain	Data based on sound records, procedures, investigations, and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$ .
D Very Uncertain	Data is based on unconfirmed verbal reports and / or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy $\pm 40\%$ .
E Unknown	None or very little data held.

15. IPWEA, 2011, IIMM, Table 2.4.6, p 2|59.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 6.5.1.

**Table 6.5.1: Data Confidence Assessment for Data used in Asset Management Plan**

Data	Confidence assessment	Comment
Demand drivers	Reliable	Demand drivers have been sourced from a number of Council strategic plans and policies including <i>Park Lands Management Strategy</i> , community land management plans, <i>Active City, City of Adelaide Strategic Plan 2016 - 20</i> and <i>State Government 30-year Plan for Greater Adelaide</i> .
Growth projections	Reliable	Provided by Council's Strategic Plan and <i>30-year Plan for Greater Adelaide</i> . Reflects growth projections over last five years.
Operations expenditures	Reliable	Operations expenditures for the Water Infrastructure Asset Class provided by Public Realm have been identified reviewed and quantified / justified.
Maintenance expenditures	Uncertain	Maintenance expenditures for the Water Infrastructure Asset Class provided by Public Realm have insufficient information to be identified for each asset type, type of work carried out, and justification of costs as required in the Maintenance Plan for water infrastructure assets.
Projected renewal expenditures - Asset values	Very Uncertain	Low confidence in asset values due to unknown methods of revaluation resulting in similar asset values to those carried out seven years previously. Asset values are likely to be undervalued when compared to current asset handover values and valuations (economic analysis) carried out as part of feasibility investigations for future asset renewals.
- Asset residual values	NA	There are no asset residual values used in this plan.
- Asset useful lives	Reliable	Useful lives for 80% of water infrastructure assets by replacement cost based on detailed condition analysis and determination of remaining life. All assets within the asset class have accurate acquisition dates derived from Council design and construction records.
- Condition modelling	Highly Reliable	Modelling of condition of stormwater drainage network (80% of water infrastructure assets by replacement cost) undertaken by CCTV Inspection to WSA 05-2013 and IPWEA:NAMS Practice Note 5.
- Network renewals	Reliable	High confidence of condition and predicted renewal date. Inspection and investigation of network renewals in this plan confirmed assets in very poor condition and due for renewal.
- Defect repairs	NA	There are no specific defect repairs identified as part of this plan.
Upgrade / new expenditures	Reliable	Values based on sound economic analysis from feasibility and concept design investigations and recent construction costs from project handovers.
Disposal expenditures	NA	There are no disposal expenditures used in this plan.

# 7. PLAN IMPROVEMENT AND MONITORING

## 7.1 Status of Asset Management Practices

### 7.1.1 Accounting and financial systems

Council's corporate finance system is Technology One Enterprise Suite Finance System. Finance transactions relating to asset management including operations, maintenance, and renewal and capitalisation expenditures are all managed by this system. Financial forecasting including compilation of LTFPs are undertaken by Council's Finance and Risk Program.

#### Accountabilities for financial systems

Responsibility for Council's Technology One Enterprise Suite Finance System is Council's Finance and Risk Program. Asset Managers are responsible for financial data input and financial forecasts of future capital renewal expenditure.

#### Accounting standards and regulations

The following accounting standards and regulations have been used in compiling this plan:

- *Australian Infrastructure Financial Management Guidelines 2010;*
- *Australian Accounting Standard AASB-113 Fair Value Measurement;* and
- *Australian Accounting Standard AASB-116 Property Plant and Equipment.*

#### Capital / maintenance threshold

Corporate policy for capitalisation threshold is \$5,000. This policy is currently under review.

#### Required changes to accounting financial systems arising from this AM Plan

Accurate recording of operations and maintenance costs against assets.

### 7.1.2 Asset management system

There is uncertainty on the current focus of asset management systems at Council with Hansen IMS and Road Assessment and Maintenance Management (RAMM) systems both used for recording asset registers and managing asset renewal, depreciation, and maintenance. Neither of these systems could provide up to date asset information required to provide accurate Asset Register data for this AM Plan.

In the interim, water infrastructure asset registers have been transferred to an excel spreadsheet TRIM Ref ACC2015 / 102170.

#### Asset registers

A complete set of water infrastructure asset registers for undertaking the renewal forecasting for this AM Plan was compiled in 2013 - 14 in an Excel spreadsheet.

These asset registers were modified with acquisitions and disposals from most of the capital handover information in compiling the Asset Register for this plan. Corporate asset registers will still be require updating with project handover information in the future.

#### Linkage from asset management to financial system

Selection of a Corporate Asset Management System will need to incorporate linkage with Council's Technology One Financial System particularly in the area of capturing actual operations, maintenance, and renewal expenditures to log against assets in the proposed Corporate Asset Management System.

## Accountabilities for asset management system and data maintenance

Council's Asset Systems Team is responsible for management of the Asset Management System and data maintenance. Asset Managers and Public Realm staff are responsible for providing data and information for this system including asset handover information for updating asset registers, financial and works information for operations and maintenance, and planning of future renewal expenditures.

## Required changes to asset management system arising from this AM Plan

A clear direction on a future Corporate Asset Management System framework is currently being developed and it is understood that this will likely be a group of integrated systems rather than a single Corporate Asset Management System. It will be very important to consult with the end users (Asset Managers and Public Realm) during the selection process.

## 7.2 Improvement Plan

The Asset Management Improvement Plan generated from this AM Plan is shown in Table 7.2.

**Table 7.2: Improvement Plan**

Task no.	Task	Responsibility	Resources required	Timeline
1	Review of unit rates and asset valuations for Water Infrastructure Asset Class.	Asset Consultant Water / Asset Systems Team	Internal	6 months
2	Undertake condition assessment of submerged earth retaining structures in Torrens Lake.	Asset Consultant Water	Specialised Consultant	12 months
3	Review AM Plan for Water Infrastructure Asset Class.	Asset Consultant Water / Public Realm	Internal	9 months
4	Analyse renewal / maintenance mix for water infrastructure assets to determine economic life of assets based on optimal renewal at lowest lifecycle costs.	Asset Consultant Water / Public Realm	Internal	12 months
5	Undertake CCTV condition assessment of other stormwater drainage network assets such as inlet pits and manholes.	Asset Consultant Water	Specialised Consultant	24 months
6	Undertake condition assessment of River Torrens and watercourse assets other than submerged earth retaining structures in Torrens Lake.	Asset Consultant Water	Specialised Consultant	24 months
7	Analyse water infrastructure asset registers, correct 2014 RAMM conversion data errors, lost data and ensure 2009 - 14 handover data is present.	Asset Consultant Water / Asset Systems Team	Internal	3 Months
8	Finalise conversion of Hansen IMS asset registers to ARC-View GIS databases.	Asset Consultant Water / Asset Systems Team	Internal	3 Months
9	Undertake customer satisfaction / community levels of service assessment survey for infrastructure assets, building assets, and open space assets using <i>IPWEA Practice Note 8</i> .	Infrastructure Management Team	External	12 months
10	Agree on and implement <i>Reactive and Scheduled Maintenance Plan's</i> KPIs including compilation of customer complaints and reactive maintenance activities carried out.	Public Realm, Customer Service, Asset Consultant Water	Internal	12 months

## 7.3 Monitoring and Review Procedures

This AM Plan will be reviewed during annual budget planning processes and amended to recognise any material changes in service levels and / or resources available to provide those services as a result of budget decisions.

The AM Plan will be updated annually to ensure it represents the current service level, asset values, projected operations, maintenance, capital renewal and replacement, capital upgrade / new and asset disposal expenditures, and projected expenditure values incorporated into the organisation's LTFP.

The AM Plan has a life of four years (Council election cycle) and is due for complete revision and updating within 12 months of each Council / Board election.

## 7.4 Performance Measures

The effectiveness of the AM Plan can be measured in the following ways:

- The degree to which the required projected expenditures identified in this AM Plan are incorporated into Council's LTFP;
- The degree to which one to five year detailed works programs, budgets, business plans, and organisational structures take into account the 'global' works program trends provided by the AM Plan;
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks, and residual risks are incorporated into the Council's Strategic Plan and associated plans; and
- The Asset Renewal Funding Ratio achieving the target of 1.0.

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## 9. APPENDICES

<b>Appendix A</b>	Maintenance Response Levels of Service
<b>Appendix B</b>	Projected 10-year Capital Renewal and Replacement Works Program
<b>Appendix C</b>	Projected 10-year Capital Upgrade / New Works Program
<b>Appendix D</b>	LTFP Budgeted Expenditures Accommodated in AM Plan
<b>Appendix E</b>	Abbreviations
<b>Appendix F</b>	Glossary



## Appendix A: Maintenance Response Levels of Service

### Headwalls



## Appendix A: Maintenance Response Levels of Service *continued*

### Stormwater Manholes



## Appendix A: Maintenance Response Levels of Service *continued*

### Activity specification

Stormwater manholes.

### Activity objectives (What work is included?)

To maintain stormwater manhole chambers and pit covers ensuring a safe standard of footpath / road and to notify external asset owners (i.e. Telstra) of hazardous pit covers.

### Activity definition (What we do?)

Dangerous pit covers maintenance includes:

- Replacing missing pit covers;
- Realign misaligned pit covers;
- Removing trip and slip hazards; and
- Notification of hazardous pit covers to asset owner.

### Performance defects (What do we look for?)

- Missing pit covers;
- Horizontal and vertical misaligned pit covers;
- Trip hazard; and
- Slip hazard.

### Key performance indicators (What do we look for?)

80% compliance with performance standards.

## Appendix A: Maintenance Response Levels of Service *continued*

### Performance standards – dangerous pit covers intervention levels and required response time

#### Defect – Broken / Missing Pit Covers

Area	Any
High risk	1 day
Medium risk	3 days
Low risk	7 days

#### Defect – Horizontal Misalignment

Area	Step height >50 mm	Step height 25 - 50 mm	Step height < 25 mm
High risk	1 week	1 month	3 months
Medium risk	1 month	3 months	6 months
Low risk	3 months	6 months	12 months

#### Defect – Vertical Misalignment

Area	Misalignment >50 mm	Misalignment 25 - 50 mm	Misalignment < 25 mm
High risk	1 week	1 month	3 months
Medium risk	1 month	3 months	6 months
Low risk	3 months	6 months	12 months

#### Defect – Trip Hazard

Area	Height > 30mm	Height 10 - 30mm	Height < 10mm
High risk	3 day	2 weeks	Monitor
Medium risk	1 week	1 month	Monitor
Low risk	1 month	2 months	Monitor

#### Defect – Slip Hazard

Area	Surface > 25% by area for the 20m length	Surface 5 - 25% by area for the 20m length	Surface <5% by area for the 20m length
High risk	1 week	1 month	3 months
Medium risk	2 weeks	2 months	6 months
Low risk	1 month	3 months	12 months



## Appendix A: Maintenance Response Levels of Service *continued*

### Stormwater Inlet Pits



## Appendix A: Maintenance Response Levels of Service *continued*

### Activity specification

Stormwater inlet pits.

### Activity objectives (What work is included?)

To maintain the stormwater network to ensure effective movement of stormwater run-off throughout the city of Adelaide.

### Activity definition (What we do?)

Stormwater maintenance includes:

- Replace missing dangerous inlet grate;
- Repair misaligned, collapsed or broken pit covers / lids; and
- Repair broken, collapsed pipes.

### Performance defects (What do we look for?)

- Missing, collapsed or broken pit covers;
- Broken / collapsed pipes; and
- Misaligned inlet grate.

### Key performance indicators (What do we look for?)

80% compliance with performance standards.

### Performance Standards – Stormwater Intervention Levels and Required Response Time

Defects	Intervention level	Action to be taken	Response time	
			Hazardous	Non hazardous
Missing, collapsed or broken pit covers / grate	Any	Replace	1 day	1 week
Broken / collapsed pipes	Any	Replace	1 day	1 week
Misaligned inlet grate	Any	Repair	1 day	1 week

## Appendix A: Maintenance Response Levels of Service *continued*

### Torrens Lake Water Mixers (Aerators)



## Appendix A: Maintenance Response Levels of Service *continued*

### Activity specification

Torrens Lake water mixers (aerators).

### Activity objectives (What we do?)

Council aims to effectively maintain Torrens Lake aerators to ensure they remain operational.

### Activity definition (What work is required?)

There are 14 aerators installed in the Torrens Lake that are in operation between September and May.

Work under this activity includes:

- Maintaining the power supply to aerators;
- Removal of aerators for repairs;
- Servicing / oil changes;
- Respond to aerator disruption after major storms;
- Clear debris from aerators; and
- Replacement of any worn or broken parts.

### Performance defects (What do we look for?)

- Power supply defects:
  - Loss of power supply;
  - The power supply is not adequate and / or is faulty; or
  - The power line to the aerator has been cut.
- Motor defects:
  - Aerator motor is not operating; or
  - Motor is not operating at full capacity.

### Performance standards (What is required?)

#### Power Supply Defects

Refers to the supply of power to the aerator.

In standard	Compulsory intervention
The power supply is active at the required level.	The power supply is faulty or not active.

#### Motor Defects

Refers to the operation of them motor.

In standard	Intervention
The motor is operating at manufacturer's specification.	The motor is not operating at required capacity.



## Appendix A: Maintenance Response Levels of Service *continued*

### Defects and interventions (What is required?)

Power supply defects	High
Within standard	No intervention.
Intervention	Within 10 working days of first report.
Compulsory intervention	Within 5 working days of first report.

Motor defects	High
Within standard	No intervention.
Intervention	Within 10 working days of first report.
Compulsory intervention	Within 5 working days of first report.

Structural defects	High
Within standard	No intervention.
Intervention	Within 10 working days of first report.
Compulsory intervention	Within 5 working days of first report.

### Performance standards (What is required?)

- Electrical inspections should be carried daily during operating months (September to May) to ensure aerators are operating;
- Scheduled preventative maintenance on aerators should be carried out every 12 months;
- Records of repairs and maintenance to be documented and records kept;
- 'First report' is the time when Council becomes aware of an issue; and
- Aerators deemed a significant risk must be attended to within one hour of first report during business hours, or within one hour of the next working day if reported outside of business hours (7.00am to 6.00pm).

### Key performance indicators (What do we look for?)

- 90% compliance with the performance standard; and
- An annual reduction in complaints and injuries.

## Appendix A: Maintenance Response Levels of Service *continued*

### Torrens Lake Earth Retaining Structures



## Appendix A: Maintenance Response Levels of Service *continued*

### Torrens Lake Boat Landings





## Appendix A: Maintenance Response Levels of Service *continued*

### Gross Pollutant Traps



## Appendix A: Maintenance Response Levels of Service *continued*

### Activity specification

Gross pollutant traps.

### Activity objectives (What we do?)

Council aims to effectively maintain gross pollutant traps to ensure they remain sufficiently clear to enable pollutants to be trapped.

### Activity definition (What work is required?)

Works under this activity include:

- Scheduled inspections;
- Removal of silt, vegetation rubbish, and debris; and
- Reinforce and or repair deteriorating structures / nets.

### Performance defects (What do we look for?)

- Debris build-up defects:
  - Build of silt, vegetation rubbish, and debris.
- Structural defects:
  - Net is worn or ripped;
  - Net is partially or completely removed from trap; or
  - The net mountings are loose, or damaged.

### Performance standards (What is required?)

#### Debris Build-up Defects

Refers to the build-up of debris in gross pollutant traps.

In standard	Intervention	Compulsory intervention
Pollutant net is 0% - 20 % full.	Pollutant net is 20% - 40 % full.	Pollutant net is more than 40 % full.

## Appendix A: Maintenance Response Levels of Service *continued*

### Defects and interventions (What is required?)

Debris build-up defects	High
Within standard	No intervention.
Intervention	Within 20 working days of first report.
Compulsory intervention	Within 5 working days of first report.

Structural defects	High
Within standard	No intervention.
Intervention	Within 15 working days of first report.
Compulsory intervention	Within 5 working days of first report.

### Performance standards (What is required?)

- Scheduled emptying of gross pollutant traps must be carried out every six months;
- Records of repairs and maintenance to be documented and records kept;
- 'First report' is the time when Council becomes aware of an issue;
- Gross pollutant traps that pose a significant risk must be cordoned off using barrier mesh for repairs; and
- Unsafe gross pollutant traps must be attended to within one hour of first report during business hours, or within one hour of the next working day if reported outside of business hours (7.00am to 6.00pm).

### Key performance indicators (What do we look for?)

- 90% compliance with the performance standard; and
- An annual reduction in complaints and injuries.

## Appendix A: Maintenance Response Levels of Service *continued*

### Gross Pollutant Traps - Full



**Gross Pollutant Traps - Full - Compulsory Intervention**



**Gross Pollutant Traps - Full - Compulsory Intervention**



## Appendix A: Maintenance Response Levels of Service *continued*

### Torrens Lake Weir





## Appendix A: Maintenance Response Levels of Service *continued*

### Activity specification

Torrens Lake Weir.

### Activity objectives (What we do?)

Council aims to maintain the Torrens Lake Weir to ensure it remains operational.

### Activity definition (What work is required?)

Work under this activity includes:

- Scheduled inspections;
- Maintaining the power supply to Weir;
- Servicing / oil changes;
- Replacement of any worn or broken parts; and
- Maintenance of pedestrian bridge.

### Performance defects (What do we look for?)

- Electrical defects:
  - There is no power at the Weir;
  - The power supply is not adequate and / or is faulty;
  - Electronic control system is not operating; and
  - Electronic gauges and warning system in not operating.
- Mechanical defects:
  - Water gates are not closed correctly;
  - Water gates will not freely open and close; and
  - Manual opening and closing mechanism is not moving freely.
- Structural defects:
  - Significant cracks in cement;
  - Debris build-up affecting water flow; and
  - Hand rail is not securely fixed to Weir.
- Structural defects (pedestrian bridge):
  - Worn, broken, loose or missing parts;
  - Loose or missing bolts securing timber planks;
  - Timber rot or visible cracking, warping, bowing or splitting of timber;
  - Bent, missing or damaged rail guards; and
  - Vandalism.

## Appendix A: Maintenance Response Levels of Service *continued*

### Performance standards (What is required?)

- Scheduled preventative maintenance on the Torrens Lake Weir should be carried out monthly or as scheduled due to mechanics or electronics;
- Records of repairs and maintenance to be documented and records kept;
- 'First report' is the time when Council becomes aware of an issue; and
- If the Torrens Lake Weir is deemed a significant risk, it must be attended to within immediately (one hour) of first report in or out of business hours.

### Performance standards (What is required?)

#### Electrical Defects

Refers to the electronic gauges and controls that operate the Weir.

In standard	Compulsory intervention
Gauges and controls are operating.	Gauges and controls are not operating.

#### Mechanical Defects

Refers to gates that regulate the flow of water through the Weir.

In standard	Intervention	Compulsory intervention
Water gates open and close freely and correctly.	Water gates do not fully open or close.	Water gates are not opening or closing.

#### Structural Defects

Refers to the structural integrity of the Weir.

In standard
Weir has no cracks or debris build up.

### Defects and interventions (What is required?)

Electrical defects	High
Within standard	No intervention.
Intervention	Within 12 hours of first report.
Compulsory intervention	Within 6 hours of first report.

## Appendix A: Maintenance Response Levels of Service *continued*

Mechanical defects	High
Within standard	No intervention.
Intervention	Within 2 working days of first report.
Compulsory intervention	Within 1 working days of first report.

Structural defects	High
Within standard	No intervention.
Intervention	Within 15 working days of first report.
Compulsory intervention	Within 5 working days of first report.

### Key performance indicators (What do we look for?)

- 90% compliance with the performance standard; and
- An annual reduction in complaints and injuries.

## Appendix A: Maintenance Response Levels of Service *continued*

### Weirs Below Torrens Lake



## Appendix A: Maintenance Response Levels of Service *continued*

### Stormwater Detention Basins





## Appendix A: Maintenance Response Levels of Service *continued*

### Watercourses



## Appendix B: Projected 10-year Capital Renewal and Replacement Works Program

10 year Renewal & Replacement Program - Stormwater Drainage Network								
Asset ID	Sub Category	Asset Name	From	To	Rem Life (Years)	Planned Renewal Year	Renewal Cost (\$)	Useful Life (Years)
216696	Stormwater Network	Main	225	155	0	2015	\$172,399	100
214685	Stormwater Network	Main	300	43	0	2015	\$39,222	100
214683	Stormwater Network	Main	300	64	0	2015	\$58,378	100
216113	Stormwater Network	Main	450	1.2	0	2015	\$1,282	100
216221	Stormwater Network	Main	450	10	0	2015	\$10,689	100
216126	Stormwater Network	Main	450	10.9	0	2015	\$11,650	100
216109	Stormwater Network	Main	450	12.4	0	2015	\$13,254	100
216212	Stormwater Network	Main	450	12.8	0	2015	\$14,487	100
216124	Stormwater Network	Main	450		0	2015	\$14,752	100
216105	Stormwater Network	Main	450		0	2015	\$14,109	100
216117	Stormwater Network	Main	450	3.7	0	2015	\$3,954	100
216210	Stormwater Network	Main	450	4.3	0	2015	\$13,040	100
216115	Stormwater Network	Main	450	4.6	0	2015	\$4,917	100
214940	Stormwater Network	Main	450	5	0	2015	\$5,345	100
216223	Stormwater Network	Main	450	5.5	0	2015	\$5,879	100
216128	Stormwater Network	Main	450	5.7	0	2015	\$6,092	100
217107	Stormwater Network	Main	450	5.8	0	2015	\$6,199	100
216130	Stormwater Network	Main	450	6.9	0	2015	\$7,376	100
216214	Stormwater Network	Main	450	8	0	2015	\$8,551	100
216107	Stormwater Network	Main	450	8.6	0	2015	\$9,192	100
216119	Stormwater Network	Main	450	9	0	2015	\$9,620	100
216132	Stormwater Network	Main	450	9.4	0	2015	\$10,048	100
216216	Stormwater Network	Main	450	9.7	0	2015	\$10,369	100
Subtotal							\$450,805	
SMPK016"B"	Stormwater Network	Inlet	1.0x1.0x1.5 m		8	2023	\$5,481	10
SW1-A	Stormwater Network	Main	150 mm Media	84.9 m2	8	2023	\$2,122	10
SW2-A	Stormwater Network	Main	150 mm Media	92.5 m2	8	2023	\$2,312	10
Subtotal							\$9,914	
C4	Stormwater Network	Pump Station	1800x1200 Lid		9	2024	\$7,452	10
PS003	Stormwater Network	Pump Station	Control - Electrical		9	2024	\$2,630	10
Subtotal							\$10,082	
Program Total							\$470,801	









## Appendix C: Projected Upgrade / New 10-year Capital Works Program

### Stormwater Drainage Network

Year	Description	Estimate (\$,000)
2015	Jeffcott Street drainage	\$135
	Victoria Park drainage improvements	\$325
<b>2015</b>	<b>TOTAL</b>	<b>\$460</b>
2016	Ergo Apartments stormwater	\$108
	Victoria Park drainage improvements	\$150
<b>2016</b>	<b>TOTAL</b>	<b>\$258</b>

### River Torrens and Watercourse Assets

Year	Description	Estimate (\$,000)
2015	Brownhill Keswick Creek	\$35
2016	Brownhill Keswick Creek	\$72
2017	Brownhill Keswick Creek	\$363
2018	Brownhill Keswick Creek	\$329
2019	Brownhill Keswick Creek	\$331
2020	Brownhill Keswick Creek	\$331
2021	Brownhill Keswick Creek	\$336
2022	Brownhill Keswick Creek	\$288
2023	Brownhill Keswick Creek	\$140
2024	Brownhill Keswick Creek	\$124
<b>2015 - 24</b>	<b>TOTAL</b>	<b>\$2,349</b>

### Environmental and Wastewater Infrastructure



Year	Description	Estimate (\$,000)
2015	Brownhill Keswick Creek	\$65
	Water sensitive urban design	\$40
	Gross pollutant trap	\$200
<b>2015</b>	<b>TOTAL</b>	<b>\$305</b>

## Appendix C: Projected Upgrade / New 10-year Capital Works Program *continued*

### Environmental and Wastewater Infrastructure *continued*

Year	Description	Estimate (\$,000)
2016	Brownhill Keswick Creek	\$135
	Water sensitive urban design	\$40
<b>2016</b>	<b>TOTAL</b>	<b>\$175</b>
2017	Brownhill Keswick Creek	\$674
	Water sensitive urban design	\$40
<b>2017</b>	<b>TOTAL</b>	<b>\$305</b>
2018	Brownhill Keswick Creek	\$611
	Water sensitive urban design	\$40
	Gross pollutant trap	\$200
<b>2018</b>	<b>TOTAL</b>	<b>\$851</b>
2019	Brownhill Keswick Creek	\$616
	Water sensitive urban design	\$40
2020	Brownhill Keswick Creek	\$616
	Water sensitive urban design	\$40
<b>2019 - 20</b>	<b>TOTAL</b>	<b>\$1,312</b>
2021	Brownhill Keswick Creek	\$624
	Water sensitive urban design	\$40
	Gross pollutant trap	\$200
<b>2021</b>	<b>TOTAL</b>	<b>\$864</b>
2022	Brownhill Keswick Creek	\$535
	Water sensitive urban design	\$40
2023	Brownhill Keswick Creek	\$535
	Water sensitive urban design	\$40
<b>2022 - 23</b>	<b>TOTAL</b>	<b>\$1,150</b>
2024	Brownhill Keswick Creek	\$229
	Water sensitive urban design	\$40
	Gross pollutant trap	\$200
<b>2024</b>	<b>TOTAL</b>	<b>\$469</b>

## Appendix D: Budgeted Expenditures Accommodated in LTFP

NAMS.PLUS3 Asset Management		Adelaide CC								
© Copyright. All rights reserved. The Institute of Public Works Engineering Australasia										
Stormwater Drainage_S1_V1 Asset Management Plan		 								
First year of expenditure projections		2015 (financial yr ending)								
<b>Asset values at start of planning period</b> Current replacement cost \$92,662 (000) Depreciable amount \$92,662 (000) Depreciated replacement cost \$49,117 (000) Annual depreciation expense \$764 (000)		Calc CRC from Asset Register \$92,661 (000) This is a check for you.								
<b>Planned Expenditures from LTFP</b> 20 Year Expenditure Projections Note: Enter all values in current 2015 values		<b>Operations and Maintenance Costs for New Assets</b> Additional operations costs 0.54% Additional maintenance 0.18% Additional depreciation 0.62% Planned renewal budget (information only) You may use these values calculated from your data or overwrite the links.								
Financial year ending	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Expenditure Outlays included in Long Term Financial Plan (in current \$ values)										
<b>Operations</b>										
Operations budget	\$273	\$273	\$273	\$273	\$273	\$273	\$273	\$273	\$273	\$273
Management budget	\$161	\$161	\$161	\$161	\$161	\$161	\$161	\$161	\$161	\$161
AM systems budget	\$70	\$70	\$70	\$70	\$70	\$70	\$70	\$70	\$70	\$70
<b>Total operations</b>	\$504	\$504	\$504	\$504	\$504	\$504	\$504	\$504	\$504	\$504
<b>Maintenance</b>										
Reactive maintenance budget	\$79	\$79	\$79	\$79	\$79	\$79	\$79	\$79	\$79	\$79
Planned maintenance budget	\$91	\$91	\$91	\$91	\$91	\$91	\$91	\$91	\$91	\$91
Specific maintenance items budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total maintenance</b>	\$171	\$171	\$171	\$171	\$171	\$171	\$171	\$171	\$171	\$171
<b>Capital</b>										
Planned renewal budget	\$450	\$20	\$20	\$20	\$20	\$20	\$20	\$20	\$30	\$30
Planned upgrade/new budget	\$460	\$258	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Non-growth contributed asset value</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Asset Disposals</b>										
Est Cost to dispose of assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Carrying value (DRC) of disposed assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Additional Expenditure Outlays Requirements (e.g from Infrastructure Risk Management Plan)										
Additional Expenditure Outlays required and not included above	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Operations	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Maintenance	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital Renewal	to be incorporated into Forms 2 & 2.1 (where Method 1 is used) OR Form 28 Defect Repairs (where Method 2 or 3 is used)									
Capital Upgrade	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
User Comments #2										
Forecasts for Capital Renewal using Methods 2 & 3 (Form 2A & 2B) & Capital Upgrade (Form 2C)										
Forecast Capital Renewal from Forms 2A & 2B	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Forecast Capital Upgrade from Form 2C	\$460	\$258	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0



## ns & Watercourses\_S1\_V1 Asset Management Plan

First year of expenditure projections **2015** (financial yr ending)

### River Torrens & Watercourses

#### Asset values at start of planning period

Current replacement cost	\$29,805	(000)
Depreciable amount	\$29,805	(000)
Depreciated replacement cost	\$10,013	(000)
Annual depreciation expense	\$494	(000)

Calc CRC from Asset Register

\$29,805 (000)

This is a check for you.

#### Operations and Maintenance Costs for New Assets

	% of asset value
Additional operations costs	0.31%
Additional maintenance	0.23%
Additional depreciation	1.66%
Planned renewal budget (information only)	

You may use these values  
calculated from your data  
or overwrite the links.

#### Planned Expenditures from LTFP

#### 20 Year Expenditure Projections

Note: Enter all values in current

2015 values

Financial year ending	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000

#### Expenditure Outlays included in Long Term Financial Plan (in current \$ values)

#### Operations

Operations budget	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30
Management budget	\$42	\$42	\$42	\$42	\$42	\$42	\$42	\$42	\$42	\$42
AM systems budget	\$21	\$21	\$21	\$21	\$21	\$21	\$21	\$21	\$21	\$21
<b>Total operations</b>	<b>\$93</b>	<b>\$93</b>	<b>\$93</b>	<b>\$93</b>	<b>\$93</b>	<b>\$93</b>	<b>\$93</b>	<b>\$93</b>	<b>\$93</b>	<b>\$93</b>

#### Maintenance

Reactive maintenance budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Planned maintenance budget	\$70	\$70	\$70	\$70	\$70	\$70	\$70	\$70	\$70	\$70
Specific maintenance items budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total maintenance</b>	<b>\$70</b>	<b>\$70</b>	<b>\$70</b>	<b>\$70</b>	<b>\$70</b>	<b>\$70</b>	<b>\$70</b>	<b>\$70</b>	<b>\$70</b>	<b>\$70</b>

#### Capital

Planned renewal budget	\$1,162	\$1,141	\$943	\$1,066	\$1,126	\$759	\$1,232	\$734	\$991	\$1,215
Planned upgrade/new budget	\$35	\$72	\$363	\$329	\$331	\$331	\$336	\$288	\$140	\$124
<b>Non-growth contributed asset value</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

#### Asset Disposals

Est Cost to dispose of assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Carrying value (DRC) of disposed assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

#### Additional Expenditure Outlays Requirements (e.g from Infrastructure Risk Management Plan)

Additional Expenditure Outlays required and not included above	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Operations	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Maintenance	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

#### Capital Renewal

to be incorporated into Forms 2 &amp; 2.1 (where Method 1 is used) OR Form 28 Defect Repairs (where Method 2 or 3 is used)

Capital Upgrade	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
User Comments #2										

#### Forecasts for Capital Renewal using Methods 2 & 3 (Form 2A & 2B) & Capital Upgrade (Form 2C)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Forecast Capital Renewal from Forms 2A & 2B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forecast Capital Upgrade from Form 2C	\$35	\$72	\$363	\$329	\$331	\$331	\$336	\$288	\$140	\$124

## Water & Wastewater\_S1\_V1 Asset Management Plan

First year of expenditure projections **2015** (financial yr ending)

### Environmental & Wastewater

#### Asset values at start of planning period

Current replacement cost	\$4,665	(000)
Depreciable amount	\$4,665	(000)
Depreciated replacement cost	\$3,160	(000)
Annual depreciation expense	\$249	(000)

Calc CRC from Asset Register

\$4,665 (000)

This is a check for you.

#### Operations and Maintenance Costs for New Assets

	% of asset value
Additional operations costs	5.54%
Additional maintenance	2.15%
Additional depreciation	5.35%
Planned renewal budget (information only)	

You may use these values  
calculated from your data  
or overwrite the links.

### Planned Expenditures from LTFP

#### 20 Year Expenditure Projections

Note: Enter all values in current **2015** values

Financial year ending	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000

#### Expenditure Outlays included in Long Term Financial Plan (in current \$ values)

#### Operations

Operations budget	\$174	\$174	\$174	\$174	\$205	\$235	\$265	\$295	\$325	\$355
Management budget	\$17	\$17	\$17	\$17	\$17		\$17	\$17	\$17	\$17
AM systems budget	\$4	\$4	\$4	\$4	\$4		\$4	\$4	\$4	\$4
<b>Total operations</b>	<b>\$194</b>	<b>\$194</b>	<b>\$194</b>	<b>\$194</b>	<b>\$226</b>	<b>\$239</b>	<b>\$286</b>	<b>\$316</b>	<b>\$346</b>	<b>\$376</b>

#### Maintenance

Reactive maintenance budget	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12
Planned maintenance budget	\$67	\$67	\$67	\$67	\$83	\$93	\$100	\$105	\$110	\$115
Specific maintenance items budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

<b>Total maintenance</b>	<b>\$79</b>	<b>\$79</b>	<b>\$79</b>	<b>\$79</b>	<b>\$95</b>	<b>\$105</b>	<b>\$112</b>	<b>\$117</b>	<b>\$122</b>	<b>\$127</b>
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#### Capital

Planned renewal budget	\$28	\$89	\$289	\$156	\$107	\$477	\$25	\$453	\$321	\$54
Planned upgrade/new budget	\$305	\$175	\$714	\$851	\$656	\$656	\$864	\$575	\$299	\$469

<b>Non-growth contributed asset value</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
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#### Asset Disposals

Est Cost to dispose of assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Carrying value (DRC) of disposed assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

#### Additional Expenditure Outlays Requirements (e.g from Infrastructure Risk Management Plan)

Additional Expenditure Outlays required and not included above	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Operations	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Maintenance	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

#### Capital Renewal

to be incorporated into Forms 2 &amp; 2.1 (where Method 1 is used) OR Form 28 Defect Repairs (where Method 2 or 3 is used)

Capital Upgrade	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
User Comments #2										

#### Forecasts for Capital Renewal using Methods 2 & 3 (Form 2A & 2B) & Capital Upgrade (Form 2C)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Forecast Capital Renewal from Forms 2A & 2B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forecast Capital Upgrade from Form 2C	\$305	\$175	\$714	\$851	\$656	\$656	\$864	\$575	\$299	\$469

**TABLE DATA NOT SUPPLIED**

## Appendix E: Abbreviations

<b>AAAC</b>	Average annual asset consumption
<b>AM</b>	Asset management
<b>AM Plan</b>	Asset management plan
<b>ARI</b>	Average recurrence interval
<b>ASC</b>	Annual service cost
<b>BOD</b>	Biochemical (biological) oxygen demand
<b>CRC</b>	Current replacement cost
<b>CWMS</b>	Community wastewater management systems
<b>DA</b>	Depreciable amount
<b>DRC</b>	Depreciated replacement cost
<b>EF</b>	Earthworks / formation
<b>IRMP</b>	Infrastructure risk management plan
<b>LCC</b>	Lifecycle cost
<b>LCE</b>	Lifecycle expenditure
<b>LTFP</b>	Long term financial plan
<b>MMS</b>	Maintenance management system
<b>PCI</b>	Pavement condition index
<b>RV</b>	Residual value
<b>SoA</b>	State of the assets
<b>SS</b>	Suspended solids
<b>vph</b>	Vehicles per hour
<b>WDCRD</b>	Written down current replacement cost

## Appendix F: Glossary

### Annual service cost (ASC)

- 1) Reporting actual cost  
The annual (accrual) cost of providing a service including operations, maintenance, depreciation, finance / opportunity, and disposal costs less revenue.
- 2) For investment analysis and budgeting  
An estimate of the cost that would be tendered, per annum, if tenders were called for the supply of a service to a performance specification for a fixed term. The annual service cost includes operations, maintenance, depreciation, finance / opportunity, and disposal costs, less revenue.

### Asset

A resource controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity. Infrastructure assets are a sub-class of property, plant, and equipment which are non-current assets with a life greater than 12 months and enable services to be provided.

### Asset category

Sub-group of assets within a class hierarchy for financial reporting and management purposes.

### Asset class

A group of assets having a similar nature or function in the operations of an entity, and which, for purposes of disclosure, is shown as a single item without supplementary disclosure.

### Asset condition assessment

The process of continuous or periodic inspection, assessment, measurement, and interpretation of the resultant data to indicate the condition of a specific asset so as to determine the need for some preventative or remedial action.

### Asset hierarchy

A framework for segmenting an asset base into appropriate classifications. The asset hierarchy can be based on asset function or asset type or a combination of the two.

### Asset management (AM)

The combination of management, financial, economic, engineering, and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.

### Asset renewal funding ratio

The ratio of the net present value of asset renewal funding accommodated over a 10-year period in a Long Term Financial Plan relative to the net present value of projected capital renewal expenditures identified in an Asset Management Plan for the same period [AIFMG Financial Sustainability Indicator No 8].

### Average annual asset consumption (AAAC)\*

The amount of an organisation's asset base consumed during a reporting period (generally a year). This may be calculated by dividing the depreciable amount by the useful life (or total future economic benefits / service potential) and totalled for each and every asset OR by dividing the carrying amount (depreciated replacement cost) by the remaining useful life (or remaining future economic benefits / service potential) and totalled for each and every asset in an asset category or class.



## **Borrowings**

A borrowing or loan is a contractual obligation of the borrowing entity to deliver cash or another financial asset to the lending entity over a specified period of time or at a specified point in time, to cover both the initial capital provided and the cost of the interest incurred for providing this capital. A borrowing or loan provides the means for the borrowing entity to finance outlays (typically physical assets) when it has insufficient funds of its own to do so, and for the lending entity to make a financial return, normally in the form of interest revenue, on the funding provided.

## **Capital expenditure**

Relatively large (material) expenditure, which has benefits, expected to last for more than 12 months. Capital expenditure includes renewal, expansion, and upgrade. Where capital projects involve a combination of renewal, expansion, and / or upgrade expenditures, the total project cost needs to be allocated accordingly.

### **Capital expenditure - expansion**

Expenditure that extends the capacity of an existing asset to provide benefits, at the same standard as is currently enjoyed by existing beneficiaries, to a new group of users. It is discretionary expenditure, which increases future operations and maintenance costs, because it increases the organisation's asset base, but may be associated with additional revenue from the new user group, e.g. extending a drainage or road network, the provision of an oval or park in a new suburb for new residents.

### **Capital expenditure - new**

Expenditure which creates a new asset providing a new service / output that did not exist beforehand. As it increases service potential it may impact revenue and will increase future operations and maintenance expenditure.

### **Capital expenditure - renewal**

Expenditure on an existing asset or on replacing an existing asset, which returns the service capability of the asset up to that which it had originally. It is periodically required expenditure, relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. As it reinstates existing service potential, it generally has no impact on revenue, but may reduce future operations and maintenance expenditure if completed at the optimum time, e.g. resurfacing or resheeting a material part of a road network, replacing a material section of a drainage network with pipes of the same capacity, resurfacing an oval.

### **Capital expenditure - upgrade**

Expenditure, which enhances an existing asset to provide a higher level of service or expenditure that will increase the life of the asset beyond that which it had originally. Upgrade expenditure is discretionary and often does not result in additional revenue unless direct user charges apply. It will increase operations and maintenance expenditure in the future because of the increase in the organisation's asset base, e.g. widening the sealed area of an existing road, replacing drainage pipes with pipes of a greater capacity, enlarging a grandstand at a sporting facility.

## **Capital funding**

Funding to pay for capital expenditure.

## **Capital grants**

Monies received generally tied to the specific projects for which they are granted, which are often upgrade and / or expansion or new investment proposals.

## **Capital investment expenditure**

See 'capital expenditure' definition.

**Capitalisation threshold**

The value of expenditure on non-current assets above which the expenditure is recognised as capital expenditure and below which the expenditure is charged as an expense in the year of acquisition.

**Carrying amount**

The amount at which an asset is recognised after deducting any accumulated depreciation / amortisation and accumulated impairment losses thereon.

**Class of assets**

See 'asset class' definition.

**Component**

Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.

**Core asset management**

Asset management which relies primarily on the use of an asset register, maintenance management systems, job resource management, inventory control, condition assessment, simple risk assessment, and defined levels of service, in order to establish alternative treatment options and long-term cash flow predictions. Priorities are usually established on the basis of financial return gained by carrying out the work (rather than detailed risk analysis and optimised decision-making).

**Cost of an asset**

The amount of cash or cash equivalents paid or the fair value of the consideration given to acquire an asset at the time of its acquisition or construction, including any costs necessary to place the asset into service. This includes one-off design and project management costs.

**Critical assets**

Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.

**Current replacement cost (CRC)**

The cost the entity would incur to acquire the asset on the reporting date. The cost is measured by reference to the lowest cost at which the gross future economic benefits could be obtained in the normal course of business or the minimum it would cost, to replace the existing asset with a technologically modern equivalent new asset (not a second hand one) with the same economic benefits (gross service potential) allowing for any differences in the quantity and quality of output and in operating costs.

**Deferred maintenance**

The shortfall in rehabilitation work undertaken relative to that required to maintain the service potential of an asset.

**Depreciable amount**

The cost of an asset, or other amount substituted for its cost, less its residual value.

**Depreciated replacement cost (DRC)**

The current replacement cost (CRC) of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset.

**Depreciation / amortisation**

The systematic allocation of the depreciable amount (service potential) of an asset over its useful life.

**Economic life**

See 'useful life' definition.

**Expenditure**

The spending of money on goods and services. Expenditure includes recurrent and capital outlays.

**Expenses**

Decreases in economic benefits during the accounting period in the form of outflows or depletions of assets or increases in liabilities that result in decreases in equity, other than those relating to distributions to equity participants.

**Fair value**

The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arm's length transaction.

**Financing gap**

A financing gap exists whenever an entity has insufficient capacity to finance asset renewal and other expenditure necessary to be able to appropriately maintain the range and level of services its existing asset stock was originally designed and intended to deliver. The service capability of the existing asset stock should be determined assuming no additional operating revenue, productivity improvements, or net financial liabilities above levels currently planned or projected. A current financing gap means service levels have already or are currently falling. A projected financing gap if not addressed will result in a future diminution of existing service levels.

**Heritage asset**

An asset with historic, artistic, scientific, technological, geographical or environmental qualities that is held and maintained principally for its contribution to knowledge and culture and this purpose is central to the objectives of the entity holding it.

**Impairment loss**

The amount by which the carrying amount of an asset exceeds its recoverable amount.

**Infrastructure assets**

Physical assets that contribute to meeting the needs of organisations or the need for access to major economic and social facilities and services, e.g. roads, drainage, footpaths, and cycleways. These are typically large, interconnected networks or portfolios of composite assets. The components of these assets may be separately maintained, renewed or replaced individually so that the required level and standard of service from the network of assets is continuously sustained. Generally the components and hence the assets have long lives. They are fixed in place and are often have no separate market value.

**Investment property**

Property held to earn rentals or for capital appreciation or both, rather than for:

- a) Use in the production or supply of goods or services or for administrative purposes; or
- b) Sale in the ordinary course of business.

## Key performance indicator

A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection, and customer satisfaction.

## Level of service

The defined service quality for a particular service / activity against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental impact, acceptability, and cost.

## Lifecycle cost (LCC) \*

### 1. Total LCC

The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation, and disposal costs.

### 2. Average LCC

The LCC is average cost to provide the service over the longest asset lifecycle. It comprises average operations, maintenance expenditure plus asset consumption expense, represented by depreciation expense projected over 10 years. The LCC does not indicate the funds required to provide the service in a particular year.

## Lifecycle expenditure

The lifecycle expenditure (LCE) is the average operations, maintenance, and capital renewal expenditure accommodated in the *Long Term Financial Plan* over 10 years. LCE may be compared to average lifecycle cost to give an initial indicator of affordability of projected service levels when considered with asset age profiles.

## Loans / borrowings

See 'borrowings'.

## Maintenance

All actions necessary for retaining an asset as near as practicable to an appropriate service condition, including regular ongoing day-to-day work necessary to keep assets operating, e.g. road patching but excluding rehabilitation or renewal. It is operating expenditure required to ensure that the asset reaches its expected useful life.

- **Planned maintenance**

Repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure / breakdown, criteria / experience, prioritising scheduling, actioning the work, and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

- **Reactive maintenance**

Unplanned repair work that is carried out in response to service requests and management / supervisory directions.

- **Specific maintenance**

Maintenance work to repair components or replace sub-components that need to be identified as a specific maintenance item in the maintenance budget.

- **Unplanned maintenance**

Corrective work required in the short-term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.

## Maintenance expenditure \*

Recurrent expenditure, which is periodically or regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the required level of service. It is expenditure, which was anticipated in determining the asset's useful life.

## **Materiality**

The notion of materiality guides the margin of error acceptable, the degree of precision required, and the extent of the disclosure required when preparing general purpose financial reports. Information is material if its omission, misstatement or non-disclosure has the potential, individually or collectively, to influence the economic decisions of users taken on the basis of the financial report or affect the discharge of accountability by the management or governing body of the entity.

## **Modern equivalent asset**

Assets that replicate what is in existence with the most cost-effective asset performing the same level of service. It is the most cost efficient, currently available asset which will provide the same stream of services as the existing asset is capable of producing. It allows for technology changes, and improvements and efficiencies in production and installation techniques.

## **Net present value (NPV)**

The value to the organisation of the cash flows associated with an asset, liability, activity or event calculated using a discount rate to reflect the time value of money. It is the net amount of discounted total cash inflows after deducting the value of the discounted total cash outflows arising from e.g. the continued use and subsequent disposal of the asset after deducting the value of the discounted total cash outflows.

## **Non-revenue generating investments**

Investments for the provision of goods and services to sustain or improve services to the community that are not expected to generate any savings or revenue to the organisation, e.g. parks and playgrounds, footpaths, roads and bridges, and libraries.

## **Operations**

Regular activities to provide services such as public health, safety, and amenity, e.g. street sweeping, grass mowing, and street lighting.

## **Operating expenditure**

Recurrent expenditure, which is continuously required to provide a service. In common use the term typically includes, e.g. power, fuel, staff, plant equipment, on-costs, and overheads but excludes maintenance and depreciation. Maintenance and depreciation is on the other hand included in operating expenses.

## **Operating expense**

The gross outflow of economic benefits, being cash and non-cash items, during the period arising in the course of ordinary activities of an entity when those outflows result in decreases in equity, other than decreases relating to distributions to equity participants.

## **Operating expenses**

Recurrent expenses continuously required to provide a service, including power, fuel, staff, plant equipment, maintenance, depreciation, on-costs, and overheads.

## **Operations, maintenance, and renewal financing ratio**

Ratio of estimated budget to projected expenditure for operations, maintenance, and renewal of assets over a defined time (e.g. five, 10, and 15 years).

## **Operations, maintenance, and renewal gap**

Difference between budgeted expenditures in a Long Term Financial Plan (or estimated future budgets in absence of a Long Term Financial Plan) and projected expenditures for operations, maintenance, and renewal of assets to achieve / maintain specified service levels, totalled over a defined time (e.g. five, 10, and 15 years).

**Pavement management system (PMS)**

A systematic process for measuring and predicting the condition of road pavements and wearing surfaces over time and recommending corrective actions.

**PMS score**

A measure of condition of a road segment determined from a pavement management system.

**Rate of annual asset consumption \***

The ratio of annual asset consumption relative to the depreciable amount of the assets. It measures the amount of the consumable parts of assets that are consumed in a period (depreciation) expressed as a percentage of the depreciable amount.

**Rate of annual asset renewal \***

The ratio of asset renewal and replacement expenditure relative to depreciable amount for a period. It measures whether assets are being replaced at the rate they are wearing out with capital renewal expenditure expressed as a percentage of depreciable amount (capital renewal expenditure / DA).

**Rate of annual asset upgrade / new \***

A measure of the rate at which assets are being upgraded and expanded per annum with capital upgrade / new expenditure expressed as a percentage of depreciable amount (capital upgrade / expansion expenditure / DA).

**Recoverable amount**

The higher of an asset's fair value, less costs to sell and its value in use.

**Recurrent expenditure**

Relatively small (immaterial) expenditure or that which has benefits expected to last less than 12 months. Recurrent expenditure includes operations and maintenance expenditure.

**Recurrent funding**

Funding to pay for recurrent expenditure.

**Rehabilitation**

See 'capital renewal expenditure' definition above.

**Remaining useful life**

The time remaining until an asset ceases to provide the required service level or economic usefulness. Age plus remaining useful life is useful life.

**Renewal**

See 'capital renewal expenditure' definition above.

**Residual value**

The estimated amount that an entity would currently obtain from disposal of the asset, after deducting the estimated costs of disposal, if the asset were already of the age and in the condition expected at the end of its useful life.

**Revenue generating investments**

Investments for the provision of goods and services to sustain or improve services to the community that are expected to generate some savings or revenue to offset operating costs, e.g. public halls and theatres, childcare centres, sporting and recreation facilities, tourist information centres.

**Risk management**

The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.

**Section or segment**

A self-contained part or piece of an infrastructure asset class.

**Service potential**

The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset. A measure of service potential is used in the not-for-profit sector / public sector to value assets, particularly those not producing a cash flow.

**Service potential remaining**

A measure of the future economic benefits remaining in assets. It may be expressed in dollar values (Fair Value) or as a percentage of total anticipated future economic benefits. It is also a measure of the percentage of the asset's potential to provide services that is still available for use in providing services (Depreciated Replacement Cost / Depreciable Amount).

**Specific maintenance**

Replacement of higher value components / sub-components of assets that is undertaken on a regular cycle including repainting or replacement of air conditioning equipment. This work generally falls below the capital / maintenance threshold and needs to be identified in a specific maintenance budget allocation.

**Strategic Longer-Term Plan**

A plan covering the term of office of councillors (four years minimum) reflecting the needs of the community for the foreseeable future. It brings together the detailed requirements in the Council's longer-term plans such as the *Asset Management Plan* and the *Long Term Financial Plan*. The plan is prepared in consultation with the community and details where the Council is at that point in time, where it wants to go, how it is going to get there, mechanisms for monitoring the achievement of the outcomes, and how the plan will be resourced.

**Sub-component**

Smaller individual parts that make up a component part.

**Useful life**

Either:

- a) The period over which an asset is expected to be available for use by an entity, or
- b) The number of production or similar units expected to be obtained from the asset by the entity.

It is estimated or expected time between placing the asset into service and removing it from service, or the estimated period of time over which the future economic benefits embodied in a depreciable asset, are expected to be consumed by the organisation.

**Value in use**

The present value of future cash flows expected to be derived from an asset or cash generating unit. It is deemed to be depreciated replacement cost (DRC) for those assets whose future economic benefits are not primarily dependent on the asset's ability to generate net cash inflows, where the entity would, if deprived of the asset, replace its remaining future economic benefits.

Source: IPWEA, 2009, AIFMG Glossary

**Additional and modified glossary items shown \***

