CITY OF
Port Adelaide Enfield

STORM WATER ASSET MANAGEMENT PLAN 2020

STORMWATER ASSET MANAGEMENT PLAN 2020

Document Control					
Port Adelaide Enfield Council: Stormwater Asset Management Plan					
Rev No	Date	Revision Details	Author	Reviewer	Approver
1	Aug-2008	Adopted: Dec 2008	RK	GB	WI
2	May-2013	Adopted: June 2013	JN	GB	WI
3	Sept-2016	Adopted: November 2016	JN	GB / SD	WI
4	Sept-2020	Adopted: November 2020	JN	Stormwater Custodian Group	AM Steering Group
4.1	June-2021	Addendum: June 2021	JN	MB	AM Steering Group

CITY OF
Port Adelaide Enfield

TABLE OF CONTENTS

Executive Summary 4
1. Introduction 6
2. Strategic Context 8
Strategic and Corporate Goals 9
Strategic Alignment 10
3. How Much Do We Manage? 12
4. Monitoring the Condition of the network 14
Network age 15
Condition Inspections 16
5. Levels of Service 20
Customer research and Expectations 21
Technical Levels of Service 24
Minor (Underground) System and Pits 25
Major (Overland) System 25
Flood Mapping 26
Stormwater Management Plans 27
6. Demand on Services 28
Demand on Services 29
Demand – Specifically Climate Change 32
Future Demand - Looking ahead 34
7. Risk Management 36
8. What Does it Cost? 40
Required Maintenance 41
Keeping with Growth 42
Projecting Capital Expenditure for Long Term Planning 45
Capital Renewal Projections 45
Open Channel Upgrade works 47
Informing the Long Term Financial Plan 48
9. Financial Summary 50
10. Improvement Plan 52
Glossary 54
Addendum 62

EXECUTIVE SUMMARY

This fourth edition of the Stormwater Asset Management Plan (AMP) continues to advance the level of service delivered to the community. It will detail what infrastructure we have, why it needs to be maintained, and what is the most efficient way to manage this asset class to deliver a service that will protect our existing and future community.

This AMP reviews the infrastructure assets that form the Stormwater network, which have a combined Replacement value of $442.6 Million with a total Annual Depreciation expense of $4.7 Million.

Due to factors relating to urban infill, industry growth, and climate change, this AMP reports the urgency in preparing for these issues by increasing the capacity and flow rates within stormwater infrastructure across the Council area to mitigate the imposing impacts to our Community.

Council has completed a number of Stormwater Management Plan (SMP's) studies to capture the topography of the urban environment that may be prone to flooding. This information is used to enable appropriate planning and project costs for future works. The total estimated cost of known works identified in the completed SMP's is $123 million over the forecast period.

Much of the work identified within the SMP's will require upgraded and new infrastructure. Upgrading rather than replacing existing infrastructure to increase stormwater capacity and flowrates across all catchments within Council to meet the demand from urban infill and intensified rain events, has resulted in an Asset Renewal Funding Ratio of 47%.

Fundamentally, Asset Management is the projection of forthcoming works and ensuring the organisation has the required funding and resource capability to meet the projected demand. The expenditure projections within this AMP are consistent with the current Long Term Financial Plan (LTFP). This reflects cohesion between the SMP's, AMP, and LTFP when committing to the long term financial period.

INTRODUCTION

This Asset Management Plan (AMP) covers the infrastructure assets that provide the City of Port Adelaide Enfield community's Stormwater service. It details information about our drainage infrastructure assets and the actions required to provide an agreed level of service in the most cost effective manner.

The plan defines:

- the services to be provided,
- the cost in providing these services, and
- future funding required to continue meeting road management needs for our current and future communities.

Asset management plans are prepared by Council to demonstrate responsive management of assets (and services provided from assets), compliance with regulatory requirements under the Local government Act 1999, and to communicate funding needed to provide the required levels of service over a 10 year planning period.

This Asset Management Plan follows the format for AM Plans recommended in Section 4.2.6 of the IPWEA International Infrastructure Management Manual.

2 STRATEGIC CONTEXT

Strategic and Corporate Goals

The City of Port Adelaide Enfield is guided by the City Plan 2030. The vision of the City Plan is for:

"A city that values its diverse community and embraces change through innovation, resilience and community leadership"

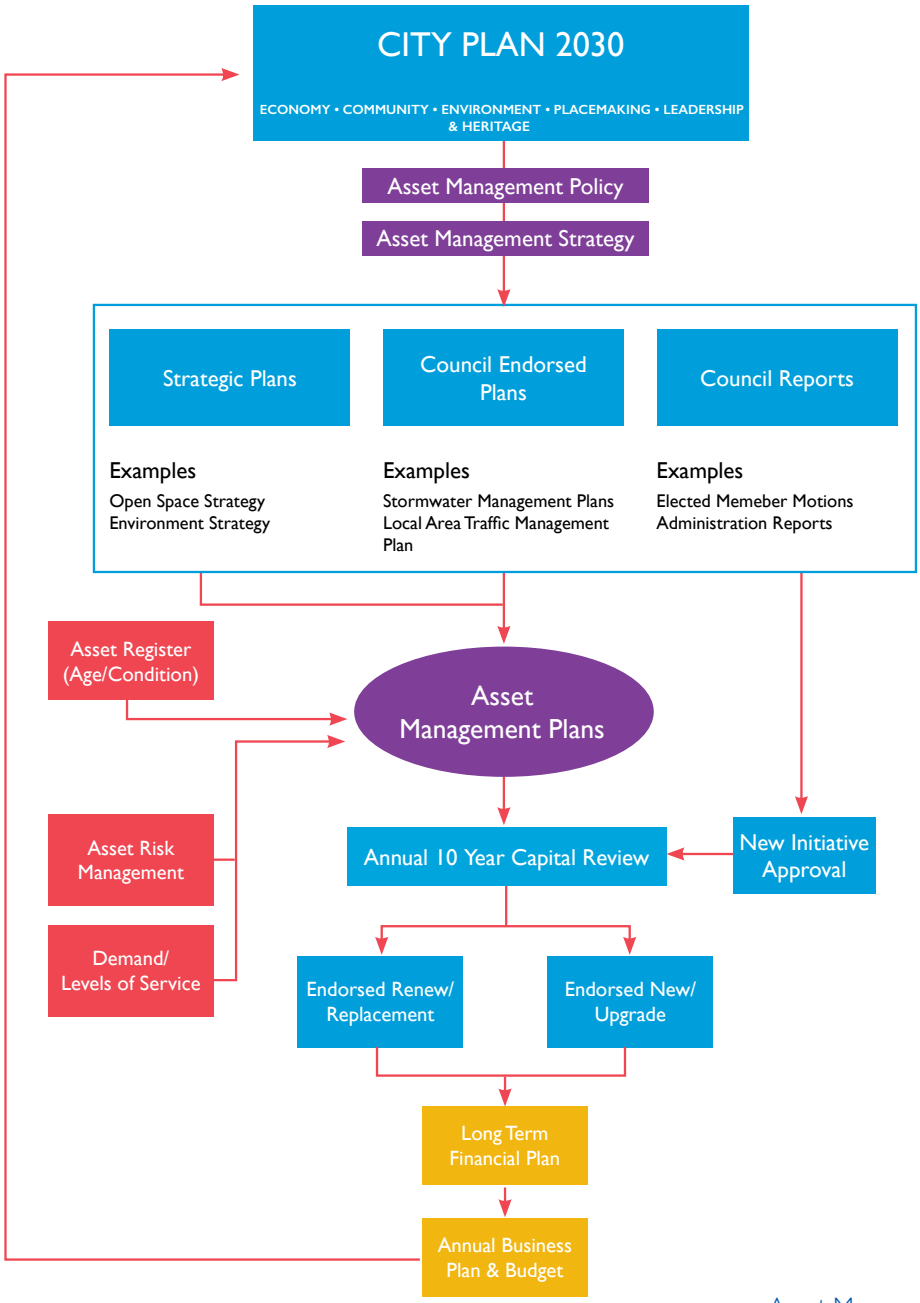
Strategic Alignment

This Stormwater Asset Management Plan 2020 primarily fits within the Leadership theme of the City Plan, contributing to decisions being made in a more strategic and accountable manner.

It also relates to a number of other Council documents including (but not limited to):

- City Plan
- Asset Management Strategy
- Long Term Financial Plan
- Annual Business Plan and Budget
- Environment Strategy
- Stormwater Management Plans

Adoption and implementation of the Stormwater Asset Management Plan 2020 will support the City of Port Adelaide Enfield to achieve the objectives of the City Plan 2030.



Relevant goals and objectives and how these are addressed in this Asset Management Plan are outlined below:

ECONOMY

We are a thriving economy and a business-friendly City

- That the infrastructure provided under this Asset Management Plan is successfully connecting business and industry to opportunity and prosperity.
- Sourcing goods and services locally is considered when undertaking procurement.

Prosperous • Connected • Growing

COMMUNITY

We are a safe, vibrant, inclusive and welcoming city for our residents, businesses and visitors alike

- To ensure that the infrastructure provided under this Asset Management Plans achieving a Level of Service that is expected by the community and its Elected Members.

Healthy • Inclusive • Cohesive

ENVIRONMENT and HERITAGE

We are a low carbon, water sensitive and climate resilient City and our built heritage is protected, embraced and celebrated

- Sustainability, water and energy efficiency are considered when upgrading assets

Distinctive • Adaptable • Sustainable

PLACEMAKING

We are a unique and distinctive collection of active places, created and cared for through strong partnerships

- To ensure that the infrastructure provided under this Asset Management Plan is delivering a safe environment for the community – ensuring access and linkage for people to conduct their life and business activities

Belonging • Accessible • Creative

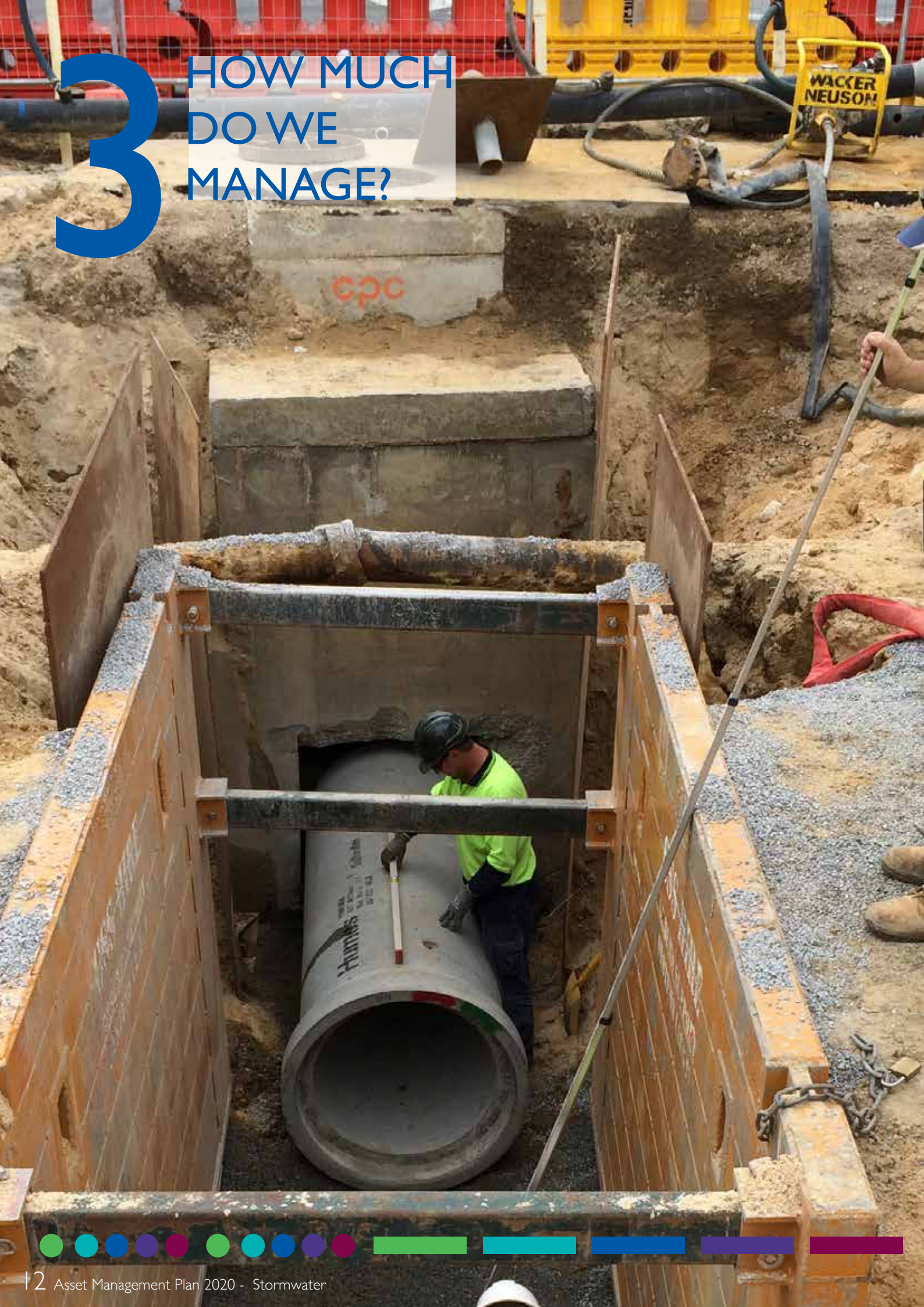
LEADERSHIP

We are an innovative, collaborative and high performing leader within local government

- To measure the organisation's performance through key financial indicators and accuracy of data and to advance Council's Asset Management Plan with a strategic improvement plan.
- To outline current levels of expenditure, and to identify projected funding requirements for future projects that will deliver sustainable infrastructure for the community.
- To connect this Asset Management Plan with the people, relevant organisations and businesses that make up the Port Adelaide Enfield community through Public Consultation and Community Survey.

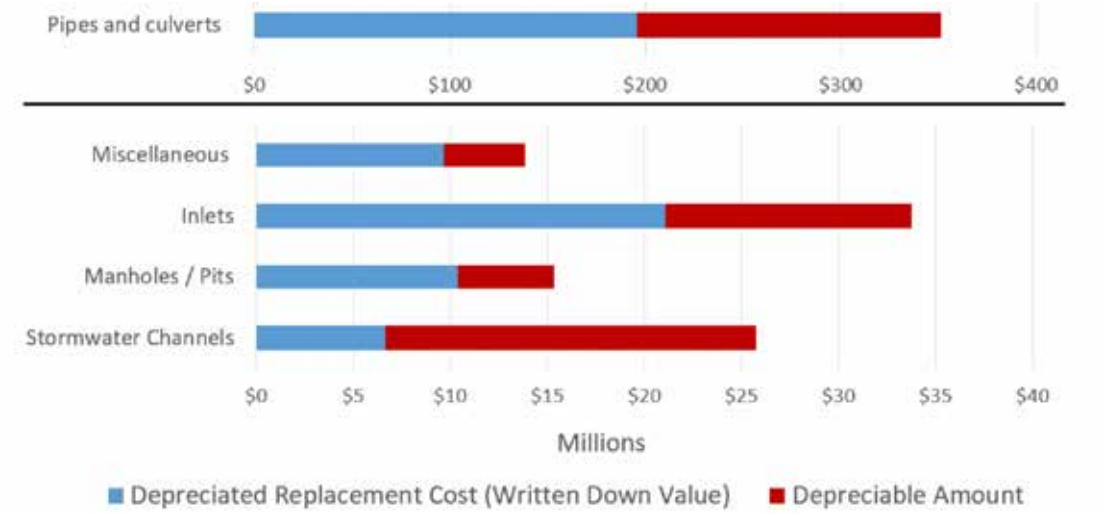
Strategic • Accountable • Engaged

3 HOW MUCH DO WE MANAGE?



Current Replacement Cost:	$442,695,000
Current Depreciation:	$197,044,000
Depreciatied Replacement Cost[1]	$245,651,000
Annual Depreciation Expense:	$4,765,000

Asset category	Length or Number	Replacement Value	Depreciated Replacement Cost (Written Down Value)	Depreciable Amount	% Consumed
Pipes and culverts	517.9 km's	$351,434,487	$195,545,934	$155,888,554	44%
Stormwater Channels	37 km's	$25,786,931	$6,655,659	$19,131,272	74%
Manholes / Pits	4,072	$15,324,144	$10,401,432	$4,922,712	32%
Inlets	10,267	$33,798,104	$21,103,156	$12,694,948	38%
Basin	90	$1,628,554	$1,538,913	$89,642	6%
Valve	21	$876,285	$767,399	$108,886	12%
Miscellaneous - GPT's, Trash Racks, Headwalls, Soak Pits	201	$13,847,219	$9,638,549	$4,208,670	30%
TOTAL		**$442,695,724**	**$245,651,042**	**$197,044,685**	



The above table and graph provides an indication of the depreciated amount (or that accounted as consumed) of the total Replacement Value for each asset category. It is worth noting -

- Stormwater Channels have a useful life of 60 years which today are 74% through their accounting lives.
- Culverts pre 1990 also have a 60 year useful life component.

[1] Also reported as Written Down Current Replacement Cost (WDCRC).

4 MONITORING THE CONDITION OF OUR NETWORK

Network Age

Chart 4.1: Network Age Profile

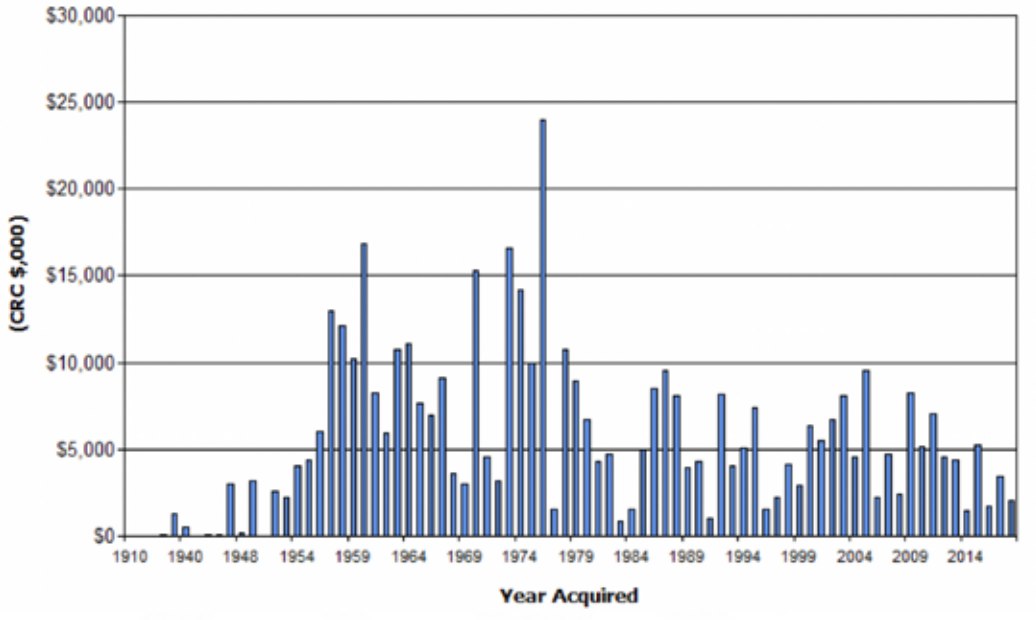


Chart 4.1 identifies Council's oldest conduits and pits dating back to the 1940's, with significant periods of network placement in the 1950's. Despite the era of when a lot of the council area was developed, administration is reasonably confident in the installation dates that have been captured and assigned to the stormwater asset stock. However, there may still be some pipe and pits locations that are not known.

In those rare occasions where additional infrastructure has been located through survey work, the details of the assets are captured into Council's Asset Management database and on associated GIS software.

Unlike other assets such as roads and footpaths, a lot of the stormwater network is very difficult to condition rate as it is hidden underground. The Closed-Circuit Television (CCTV) inspections of pipes can be difficult to budget for as restrictions such as debris and intruding tree roots need to be identified and cleared before the camera can undertake its work. Due to such limitations and the cost involved, the condition of the network can only be captured gradually, and usually in conjunction with other stormwater maintenance or road construction projects.

Condition Inspections

As the majority of stormwater infrastructure is under ground, it is expensive to regularly capture the condition of this asset. With life expectancy of the majority of stormwater concrete and PVC materials determined to be 100 years or greater, careful selection of conduits and pits based on age, size, and criticality are prioritised for proactive inspection. The useful life of assets are annually reviewed against other Council asset registers, industry standards, and manufacturer assigned lives.

As with all proactive inspections, all maintenance type CCTV inspections that result from identified flooding instances, are also reviewed and captured within Council Asset Management System.

A recent initiative to safeguard new road replacement is to proactively inspect all conduits and pits prior to road reconstruction or reseal works. A disjointed or cracked pipe will result in moisture disturbing the road base, causing early onset of damage to the road surface. This annual project also provides important information in reviewing the condition of infrastructure by age, varying soil types, and vehicle loadings. For example, the Clay soils in the east may cause service limitations through disjointed pipes with potential cracking. The Acid Sulphate Soils around the Port River in the Industrial zones may result in shorter lives due to the premature decay of concrete and steel.

The following image (4.1) are examples of damaged pipe captured as part of the road renewal program. These pipes were either replaced with new, or relayed to improve alignment and flow. By conducting the work prior to road replacement, will ensure the new road seal is protected from any future disturbance of service trenching, whilst also maintain the compaction rate of road base.

Further to proactive inspections, where requests are received for localised flooding events or through general field observations all CCTV inspections performed are captured to Council's Asset Management System and recorded in the Geographical Information System (GIS). Having this information mapped (refer image 4.2) allows future planning of works and also for confirmation reviews of asset performance.

In addition to audits of existing underground infrastructure, Council also performs rigorous inspections of new culverts during the casting, installation, and final product phase. Where culverts do not meet the requirements at any stage they are discarded (at the cost of the manufacturer or developer) and replaced with a new culvert. With the new stringent controls, it is expected that the culverts will achieve their full expected life of sixty years.

Image 4.1: Defective pipes captured through inspection prior to Road Renewal

Craig St Greenacres

- Significant cracking and surface damage in lateral pipe.
- Risk to pavement considered high due to traffic loading and movement above. This pipe runs laterally across Craig St at intersection.
- Pipe age = 59 Years / Concrete Condition = Poor

106193_36e0e53c-1e98-4664-9d3f-a0e44070b493_20190627_135930_485.jpg, 00:01:31, 2.40
Surface damage concrete, reinforcement visible from 12 o'clock to 12 o'clock

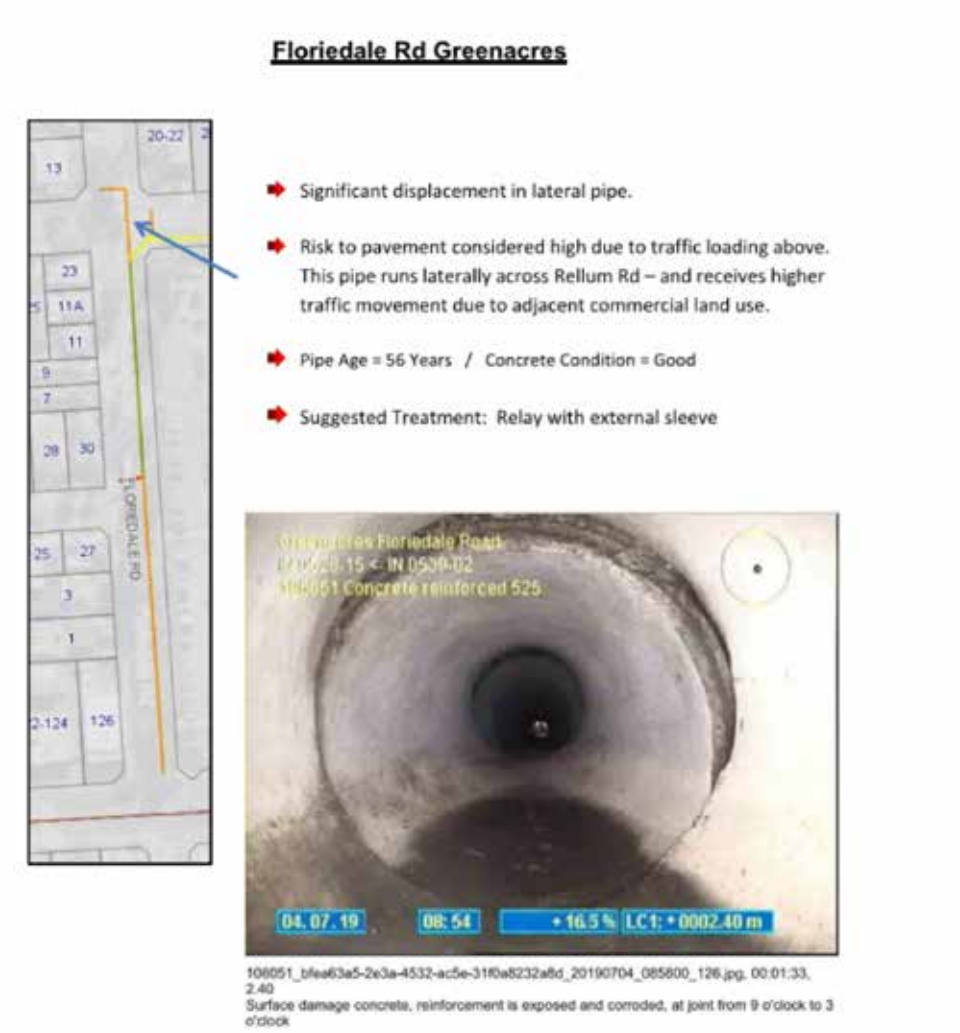


Image 4.2: Conduit Condition mapped in GIS

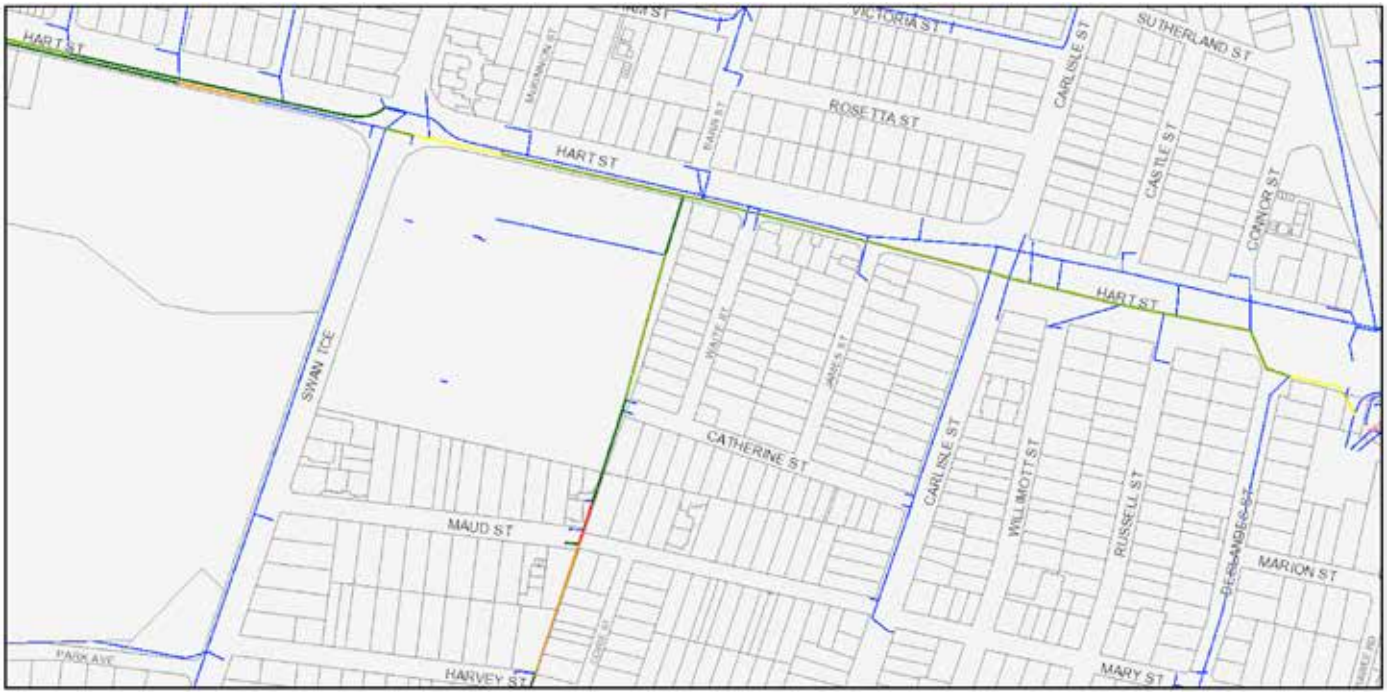


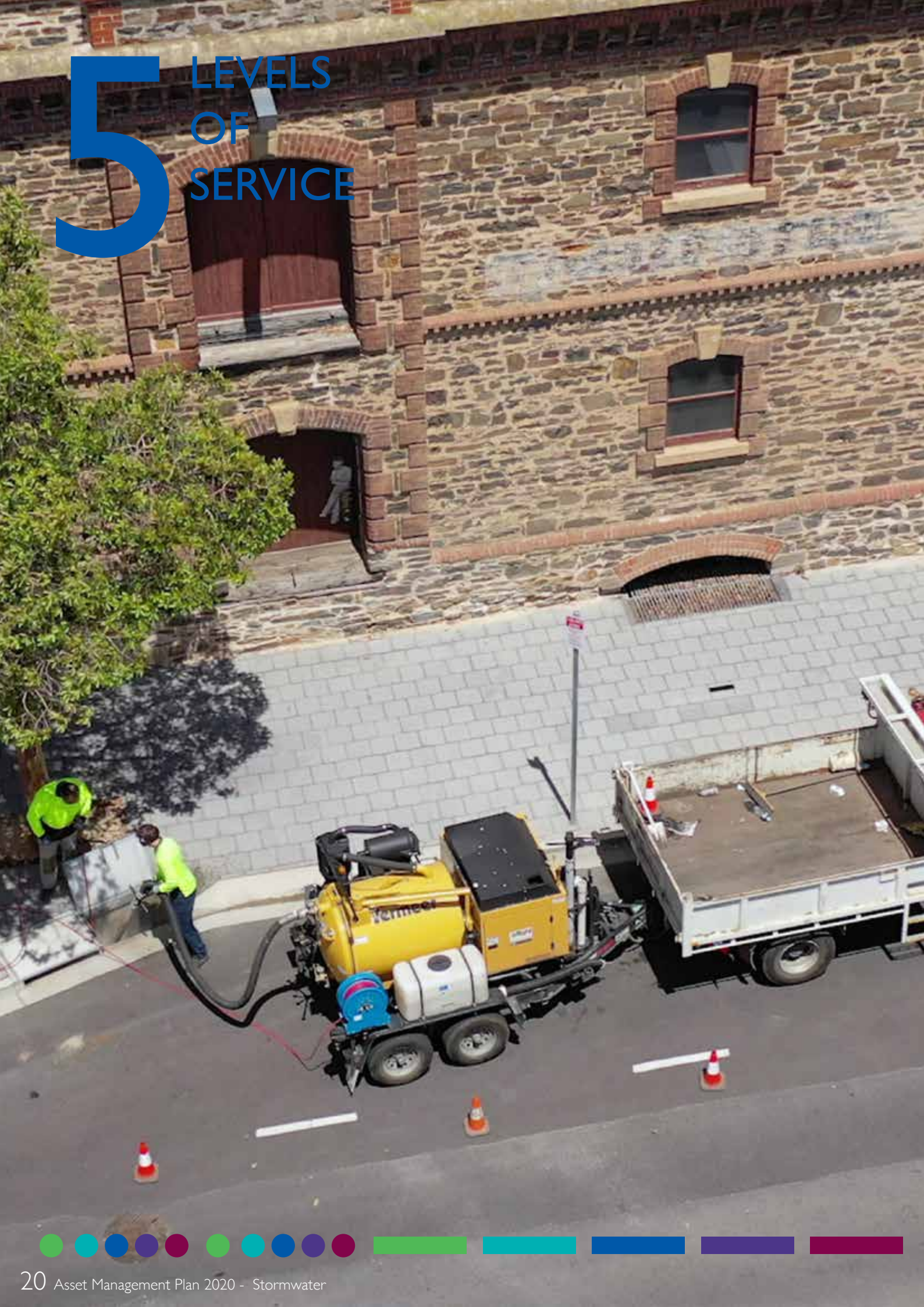
Image 4.2: Conduit Condition mapped in GIS

The above image demonstrates our ongoing condition rating of pipes and culverts. All inspections are captured in IPS (Asset Management System) and mapped in GIS.

Such condition data is important to maintain and analyse, as it will help with justifying any future adjustments to Useful Lives. Should Council increase the Useful Lives of its infrastructure, the depreciation value will reduce, and the renewal projections will be reconsidered for much later years. This will have a significant impact on the future expenditure projected for this asset.


LONG-REACH

5 LEVELS OF SERVICE



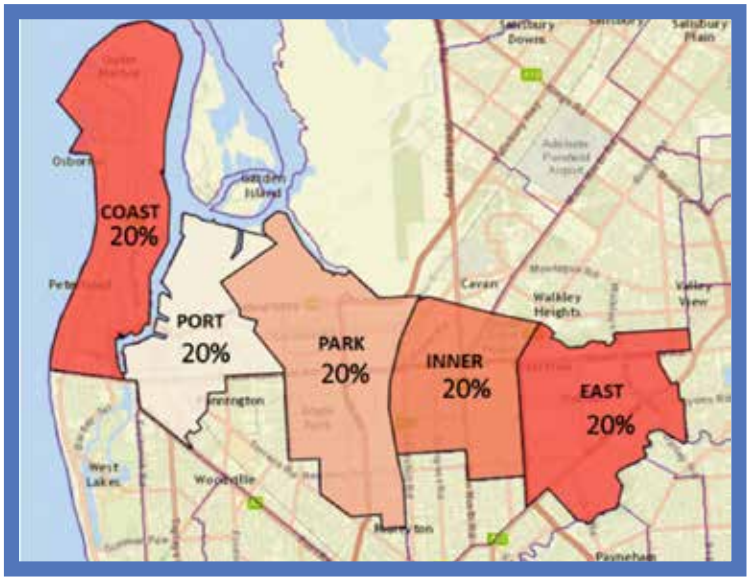
Customer research and Expectations

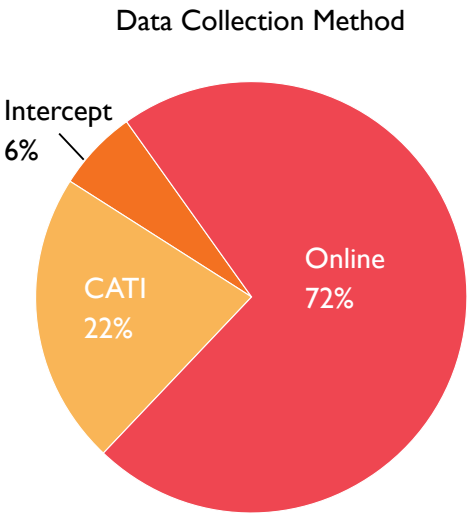
In 2019, a survey was undertaken to measure Community Perception of the varying services provided by Council. The survey asked participants to consider the level of importance of different services, and then advise their level of dissatisfaction with how Council provides this service.

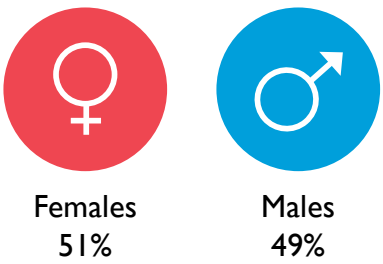
In order to collect the data, 401 households were invited to partake in a telephone interview. The survey targeted an equal number of households in each of the five SLA's (Statistical Local Area) in the Council area. These SLA's included:

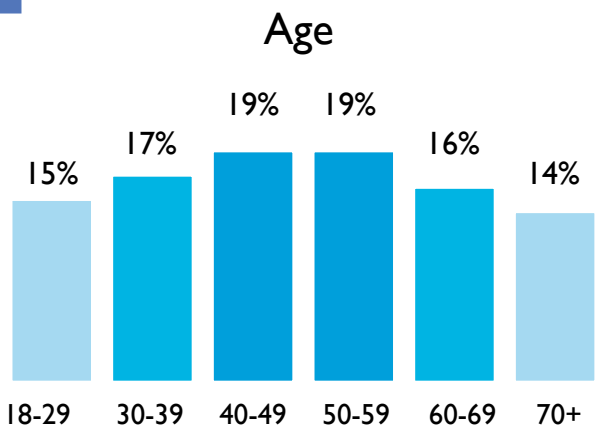
East = 81 Inner = 80 Coast=80 Parks = 80 Port = 80

Figure 3.1.1 Basic Customer survey for the City of Port Adelaide Enfield



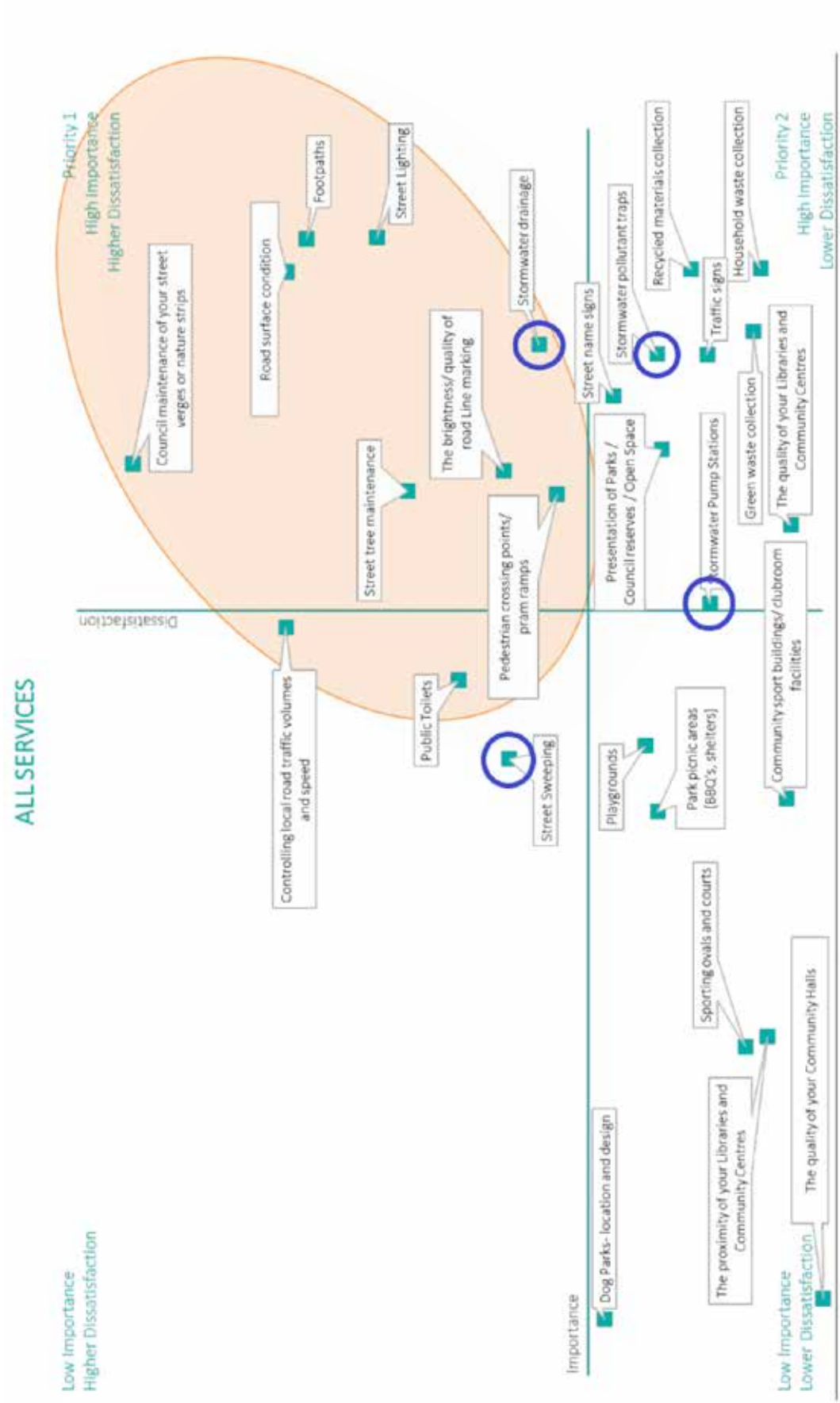






The following quadrant graph (chart: 5.1) shows the services surveyed, and the rating level of importance and associated level of dissatisfaction.

Chart 5.1: Community Perception Quadrant Survey



Referring to chart 5.1, when compared against all services provided by Council, Stormwater Drainage was perceived to have a high level of importance, along with a moderate level of dissatisfaction. It is worth noting the higher level of interest for Stormwater Pollutant traps as this indicates that the community has an interest in delivering initiatives and infrastructure that support a healthier environment.

The following chart 5.2 reviews the community's perception by each of the 5 Statistical Local Areas (SLA's). The Coastal and Port areas had the highest levels of dissatisfaction for stormwater drainage along with registering the higher levels of importance for the provision of Pump Stations.

Street Sweeping was included in the Stormwater category given its importance in removing leaf and other litter before entering and potentially blocking the underground drainage system. It should be acknowledged that the Community has a level of appreciation for this service.

Chart 5.2: Community Perception of Importance and Satisfaction for Council's Stormwater Services

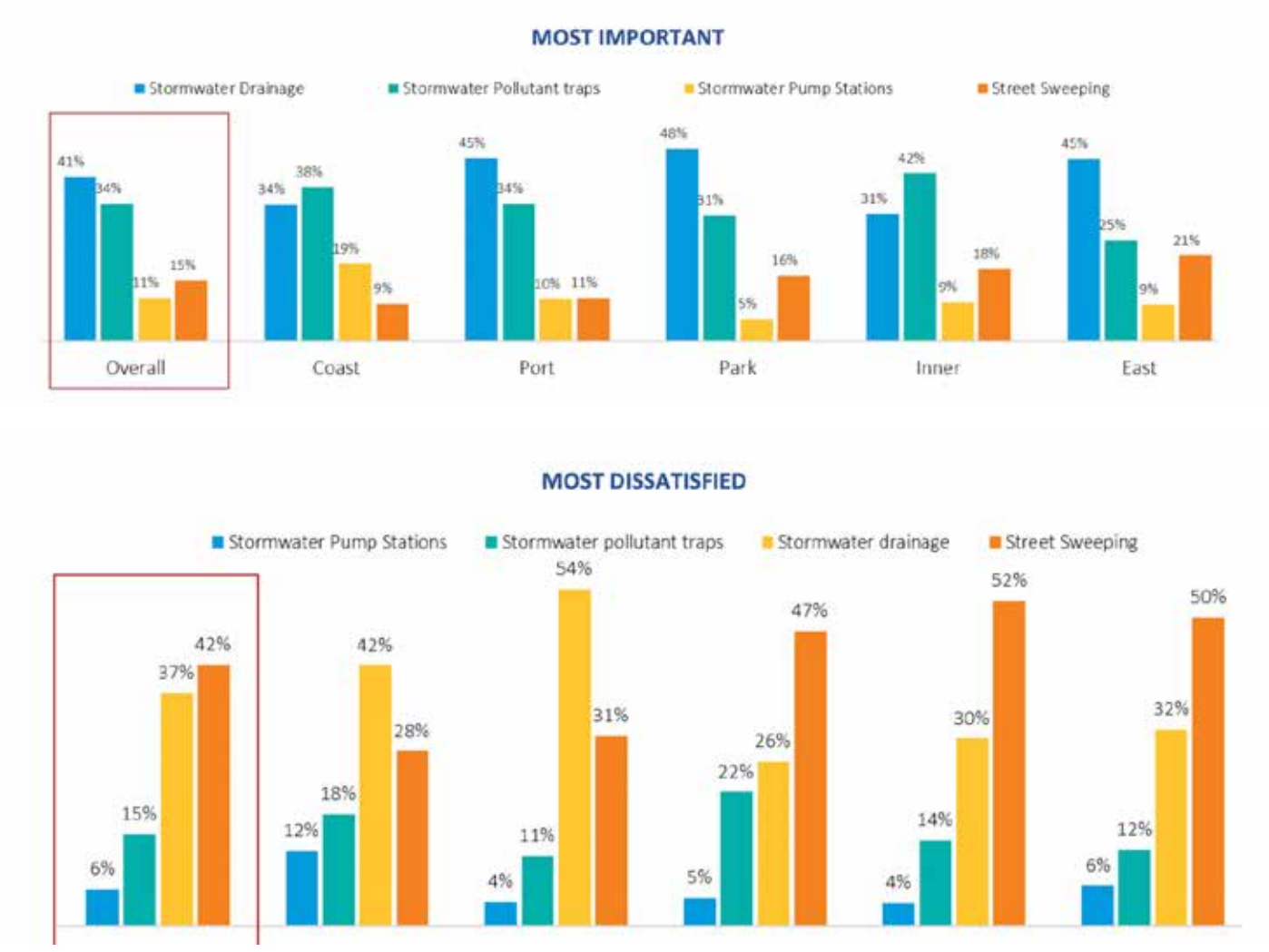
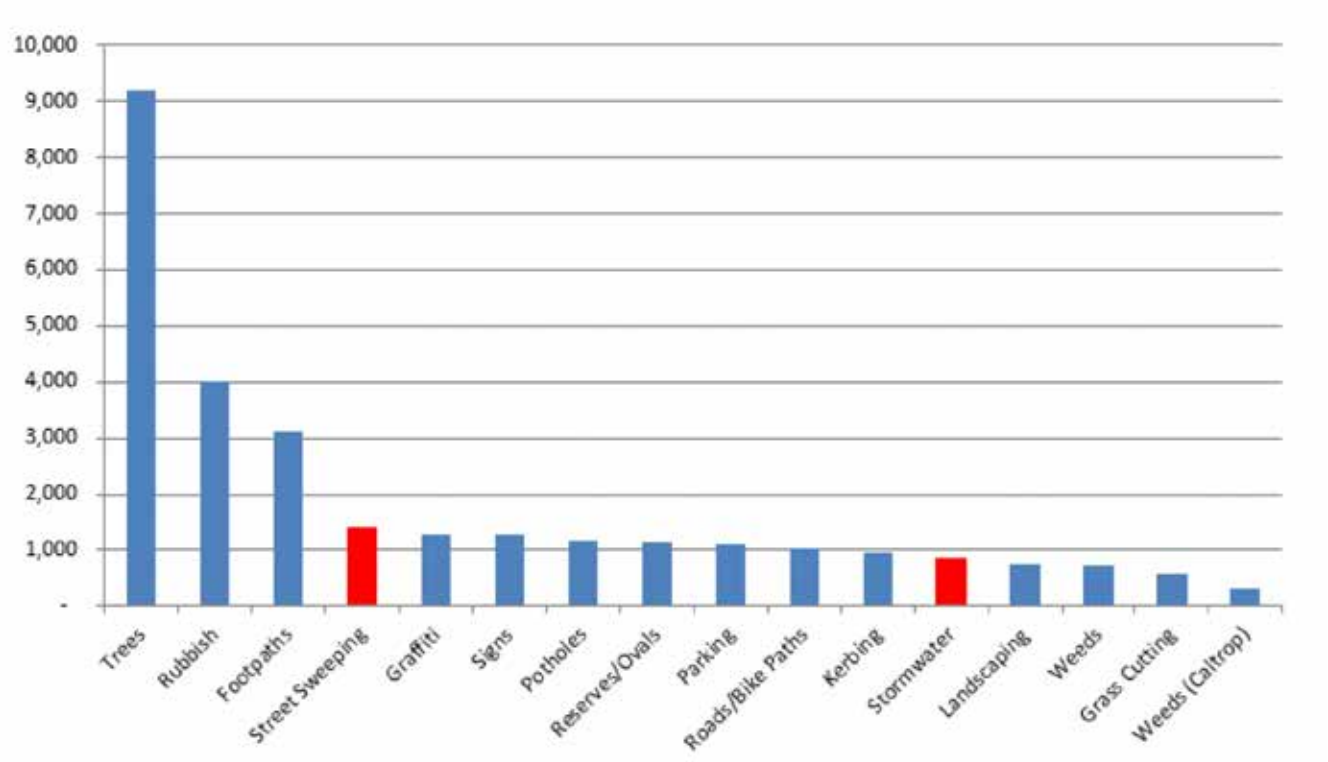


Chart 5.3: Number of Tasks from Customer Requests (2017/18 + 2018/19)



The above graph identifies the amount of work tasks created through customer requests over the last 2 year period. Although less tasks are created in comparison to trees, rubbish, and footpaths, a total of 850 tasks were created for stormwater enquires over this period – that equates to approximately 1.6 tasks per working day, just from customer enquiries.

Similar to chart 5.2 which depicts the level of importance and dissatisfaction scores across the 4 services surveyed, street sweeping incurs a higher level of interest from the community where approximately 2.7 tasks are created each working day from customer requests. The Parks, Inner, and East areas all have higher dissatisfaction with the street sweeping service.

Keeping in touch with community perceptions and monitoring number of customer requests justifies Pro-Active maintenance works to improve the serviceability of the stormwater network. Such proactive works includes routine cleaning soakage pits, vacuuming pits, and jetting underground pipes.

Technical Levels of Service

Urban stormwater drainage systems aim to achieve service levels consistent with the Australian Rainfall and Runoff (ARR 2016) Guidebook. ARR describes the traditional urban stormwater management philosophy as broken in to two categories; with one being the minor system and the other being the major system.

- The minor system (image 5.1) is designed to convey low flows safely via the pit and pipe infrastructure, and
- The major system (image 5.2) is designed to ensure the urban area (ie roads) can safely convey larger storm events.

Images 5.1 and 5.2 below demonstrate what is meant by the major/minor flow philosophy.

The stormwater drainage service level is the capacity of the infrastructure to cater for the runoff generated by design storm events.

Image 5.1: Controlled Minor System Flows

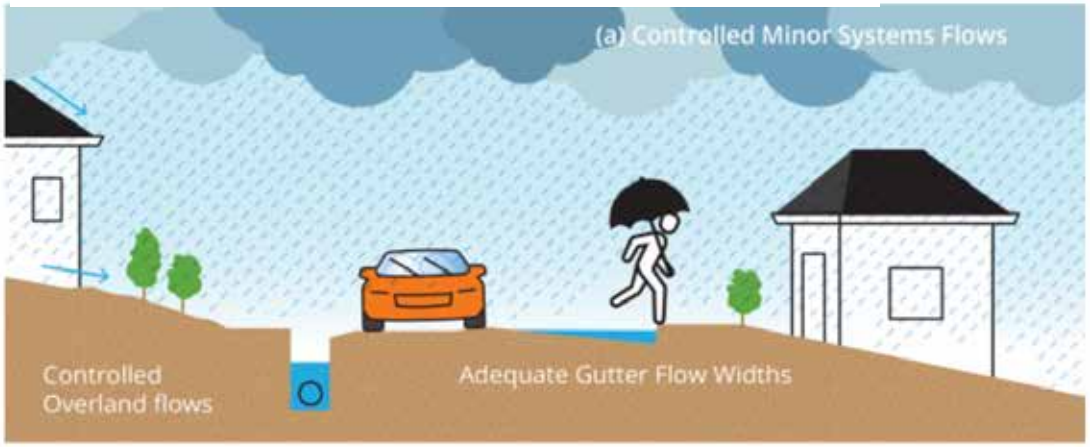
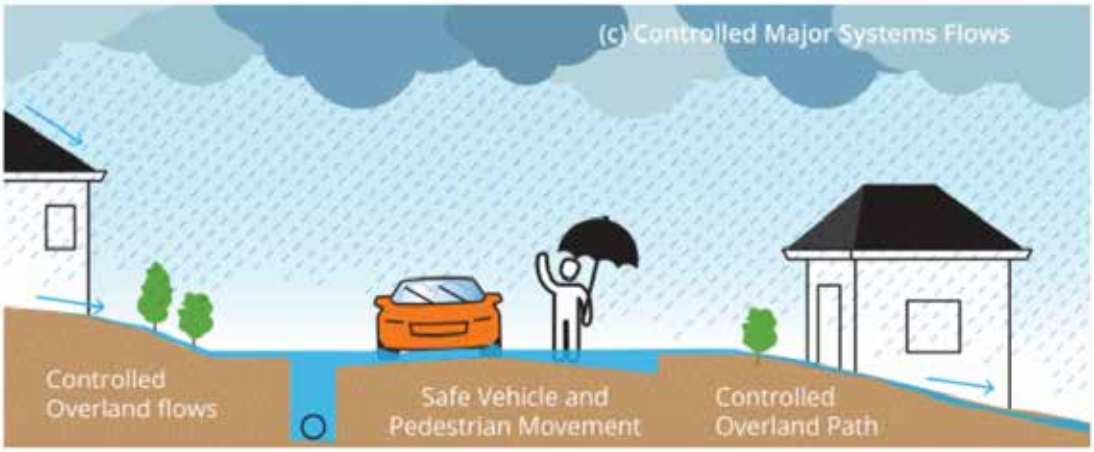


Image 5.2: Controlled Major System Flows



Major and Minor Design of a Street Stormwater System (ARR 2016)

Minor (Underground) System and Pits

The aim of the minor stormwater system of pits and pipes is to remove surface stormwater flows from the road network and convey them to the appropriate outlet system. The minor system is designed to cater for the 0.2 Exceedance per Year (EY) or 5 year Annual Recurrence Interval (ARI) design storm event.

When designing new infrastructure or upgrading existing infrastructure Council aims to achieve the following design criteria as the minimum service standard;

- Gutter flow width for 0.2 EY (5yr ARI) storms to be no greater than 2.5m (i.e. the width of water measured from the face of the kerb towards the centre of the road)
- Gutter flow width at pedestrian crossings for 0.2EY (5yr ARI) storms to be no greater than 1.0m
- Hydraulic grade line (HGL) for 0.2EY (5yr ARI) storms to be a minimum of 150mm below the water table.

Major (Overland) System

The major system typically comprises the road and footpath areas up to the property boundary lines as shown in image 5.2. The aim of the major system is to safely convey all stormwater above the capacity of the underground pipe system overland to the appropriate outlet point without above floor flooding of properties for all events up to and including a 1% Annual Exceedance Probability (AEP) storm (100yr ARI).

In all new developments the major system is designed to safely convey the 1% AEP design storm event with a minimum freeboard between the top of the predicted flood level and the property floor levels of no less than 200mm.

In some existing stormwater catchment areas it is not possible to cater for the 1% AEP design storm event within the major system. In this case the minor system may be designed to a higher standard (i.e. bigger pipes) to reduce the overland flow component or where this is not possible or economical a lower service standard may need to be adopted.

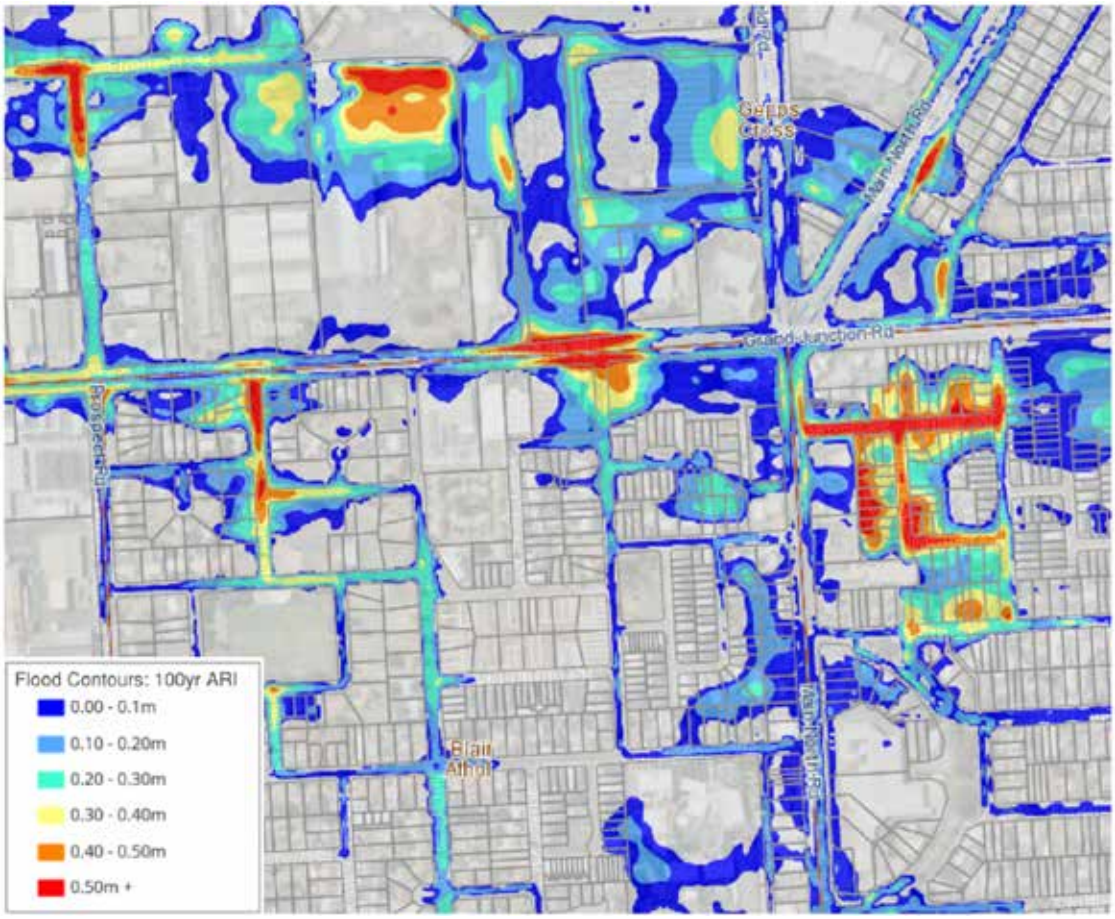
Flood Mapping

To enable appropriate design and planning for stormwater infrastructure, Council conducts stormwater management studies. These studies use two dimensional modelling of the urban land form to determine the areas that are prone to flooding – which could be due to surface contour levels, soil type, and deficiencies in existing stormwater infrastructure. The following image 5.3 is an example of a two dimensional map which highlights areas where water is predicted to pond during a 1% AEP peak design storm event.

The peak design storm event varies across catchments as the peak flows depend on the time of concentration for that particular catchment. The time of concentration is the time taken for stormwater to drain from the furthest upstream point to the downstream catchment outlet and is dependent on the length of flow, grade, and the roughness of pipes and channels used to convey the water.

The varying colours within image 5.3 depict ponded water depths as predicted by the two dimensional stormwater modelling. The dark blue areas are generally land area that pond water to a depth of 100mm and the red area depicts where water ponds to a depth of 500mm or greater.

Image 5.3: Two dimensional flood map with North Arm East Stormwater Catchment



Stormwater Management Plans

Stormwater Management Plans (SMP) are key stormwater planning documents that provide a strategic approach to flood management and planning of infrastructure upgrades to meet service levels. SMPs also provide information regarding required improvements to the quality of stormwater being discharged into the receiving environment.

To date Council have completed and endorsed the following SMP's; North Arm East (NAE), Torrens Rd Drainage Authority (TRDA), Lefevre Peninsula and Port River East. These plans cover approximately sixty five percent of the Council area and include the suburbs ranging from Outer Harbour to Semaphore South, Port Adelaide to Queenstown, and Dry Creek to Manningham.

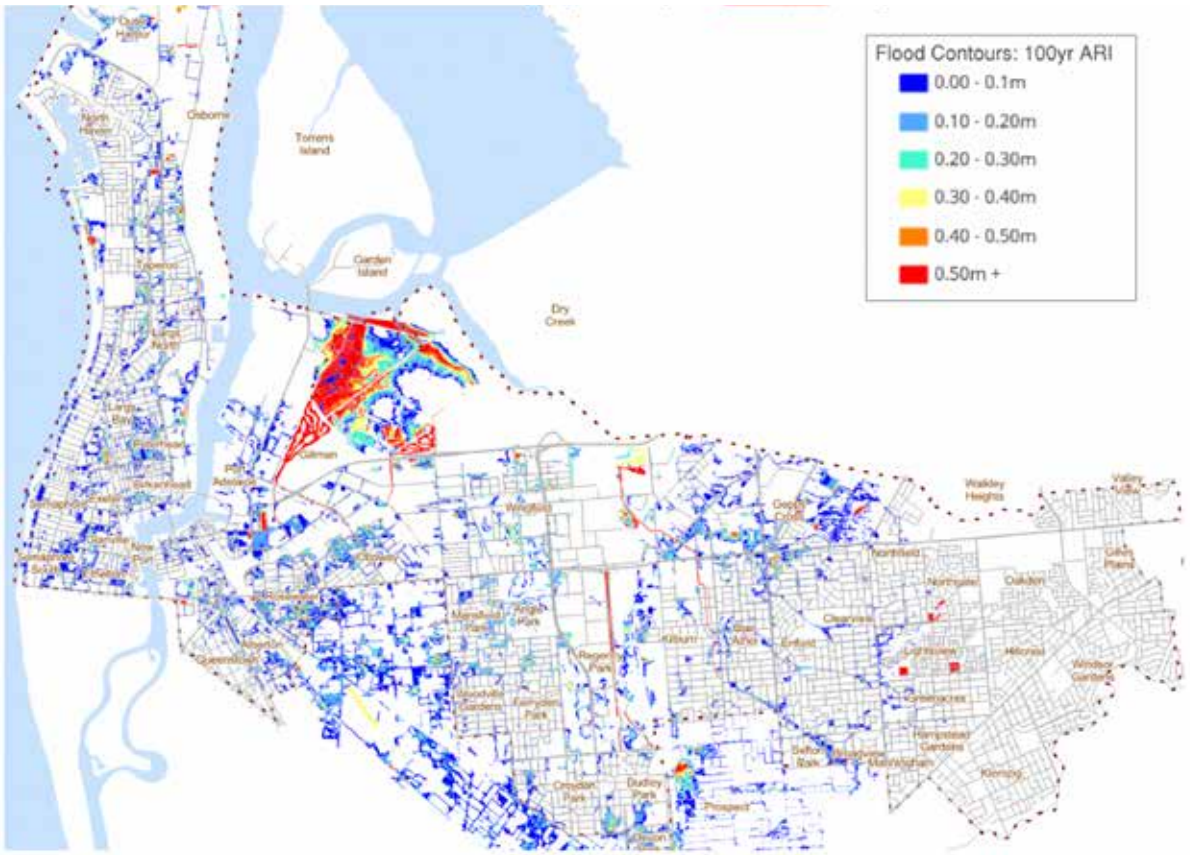
Council are currently in the process of undertaking a SMP for the Barker Inlet Central area which includes the North Arm West (NAW), Hindmarsh Enfield Prospect (HEP) and Dunstan Rd (NAW 5) catchments. This SMP covers the suburbs from Wingfield in the North to Ovingham in the South and is being prepared in conjunction with the City of Prospect and the City of Charles Sturt as this catchment receives stormwater contributions from both external Councils areas. Once completed this will bring the total Council area covered by approved stormwater management plans to 81%.

The only catchments which are not part of approved or in progress stormwater management plans are the Dry Creek and Torrens River catchments. Council are proposing to commence a stormwater management plan for the Torrens River catchments in the 20/21 financial year and are currently in discussions with City of Salisbury and City of Tea Tree Gully Councils to undertake the Dry Creek stormwater management plan as they hold majority of the catchment.

Flood mapping is produced as a part of the SMP process and is useful to highlight areas where the existing infrastructure does not meet the current design standards.

Image 5.4 presents the extent of flood mapping achieved through completed Stormwater Management Plans across the Council area.

Image 5.4: Extent of Current Flood Mapping from completed Stormwater Management Plans

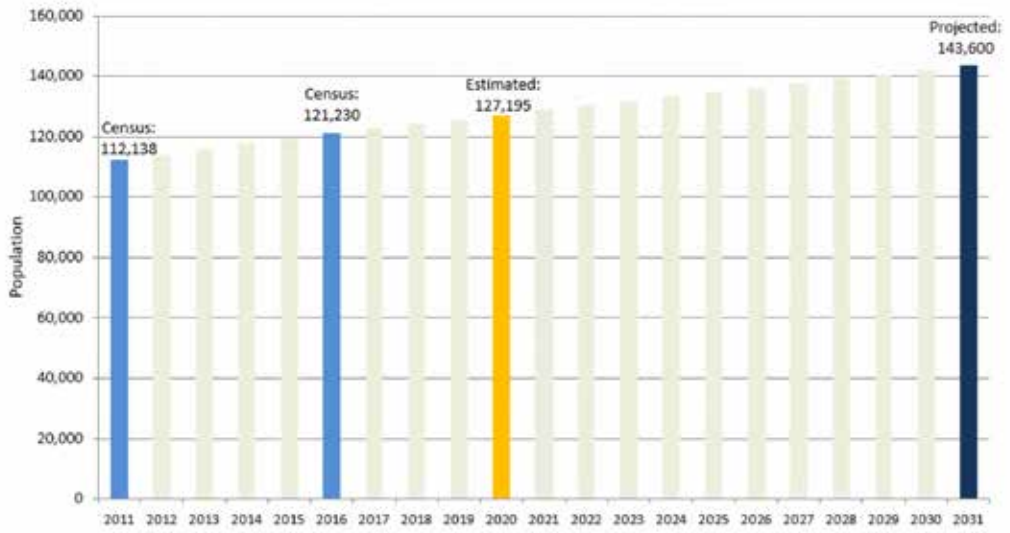


6 DEMAND ON SERVICES

To preserve and improve the liveability of our city we need to design, plan and manage our infrastructure assets in a strategic and innovative way that is focused on meeting the current and future needs of our diverse community. We also need to understand some of the key trends that will shape our city into the future. This includes understanding the impacts of projected demographic, environmental and technological changes.

Perhaps the most obvious demand driver is our ongoing population growth through urban infill. Our city has a growing population and with it an expanding local economy. This growth leads to an increase in demand for services and supporting infrastructure assets. The population at the 2016 Census was 121,230, an increase of 7.5% since the 2011 Census. The population is projected to continue to increase, with continued redevelopment of older areas and new land releases in Port Adelaide, Oakden, and Gilles Plains, with a projected population in 2031 of approximately 143,600 people.

Chart 6.1: Population estimates



The following images 6.1 and 6.2, demonstrate what the current population growth looks like across the City in the form of housing development. When considering future demand trends, it is interesting that the percentage of housing since 2010 has increased beyond the rate of 7.5% population growth since the Census in 2011. This identifies a potential social demand for smaller household sizes – where a potential trend of larger family allotments are now being divided into sole occupancy households.

Image 6.1: Residential Subdivisions approved since 2010

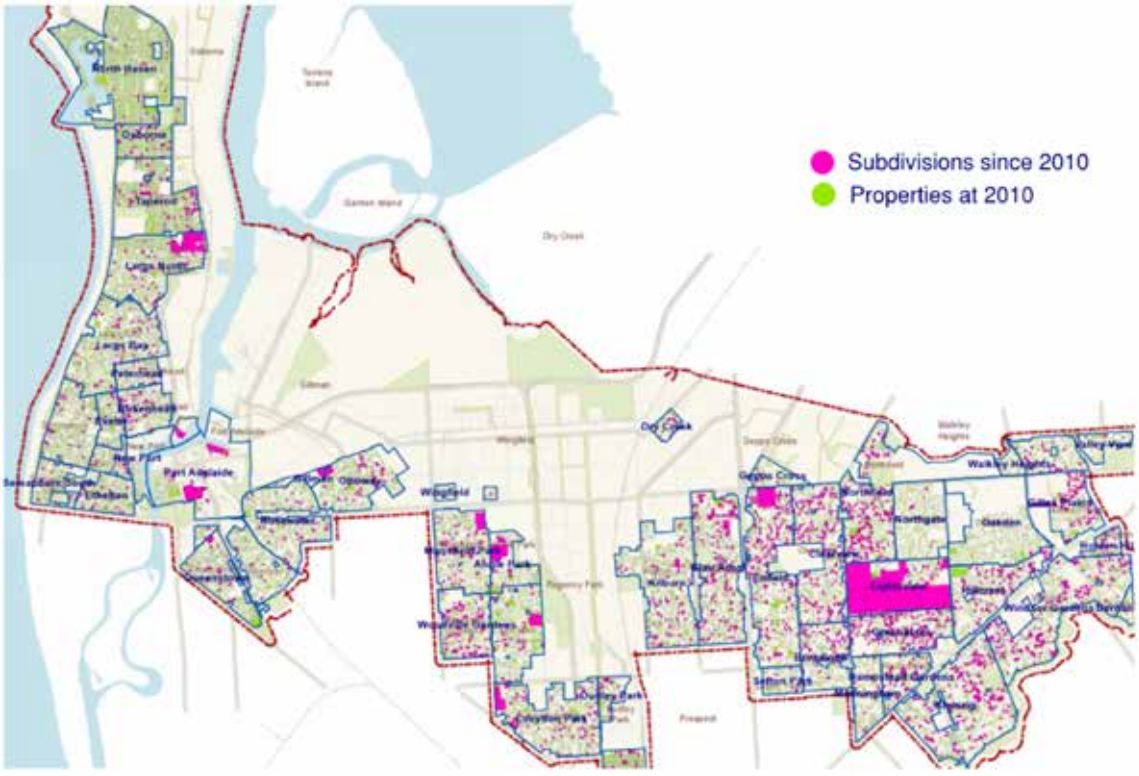
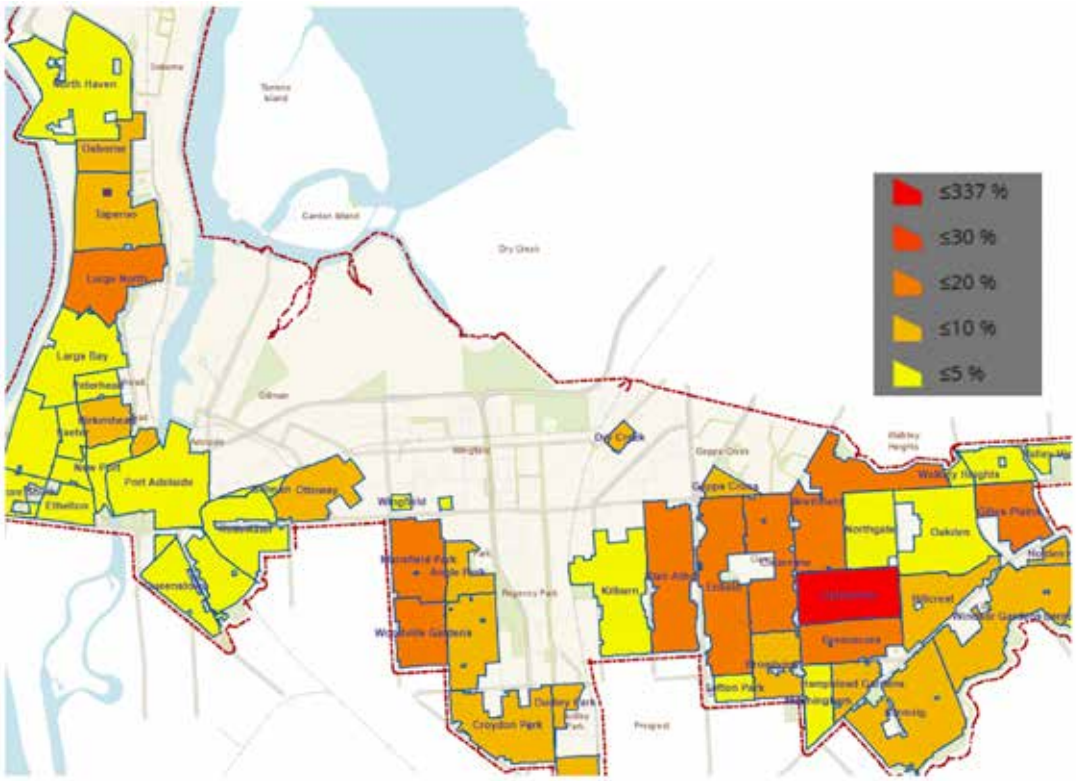


Image 6.2: Percent increase in properties by suburb since 2010



Demand on Services

The increase in drainage infrastructure in land developments constructed over the past 20 years is shown in image 6.3 below. The image clearly illustrates the demand from new infrastructure in the recently constructed Lightsview and Northgate suburbs in comparison to the surrounding older suburbs of Clearview, Greenacres and Northfield.

Through a lack of private back yard space and more roof and driveway areas, the higher density developments result in a reduction in natural drainage and an increase in hard stand run off. Built to current design standards additional underground pipework is required, along with detention basins to control the outflows into the lower capacity existing systems.

The additional infrastructure leads to increased maintenance costs to maintain it, and eventually renewal costs when it needs replacement.

Current standards for underground stormwater infrastructure intensify the design of pits and pipes to ensure:

- the 20% AEP (5yr ARI) storm flow within the pipe system will be contained, and
- the gutter flow widths will be limited to approximately 2.5metres.

This inevitably means that a higher number of side entry pits are required in new stormwater systems than what was previously provided in older networks in order to manage the stormwater flow widths in the streets.

Furthermore, the higher number of side entry pits and decreased use of the street storage in the 20% AEP (5yr ARI) storm means that bigger storm water flows are conveyed in the underground stormwater systems which then leads to larger underground pipes being required.

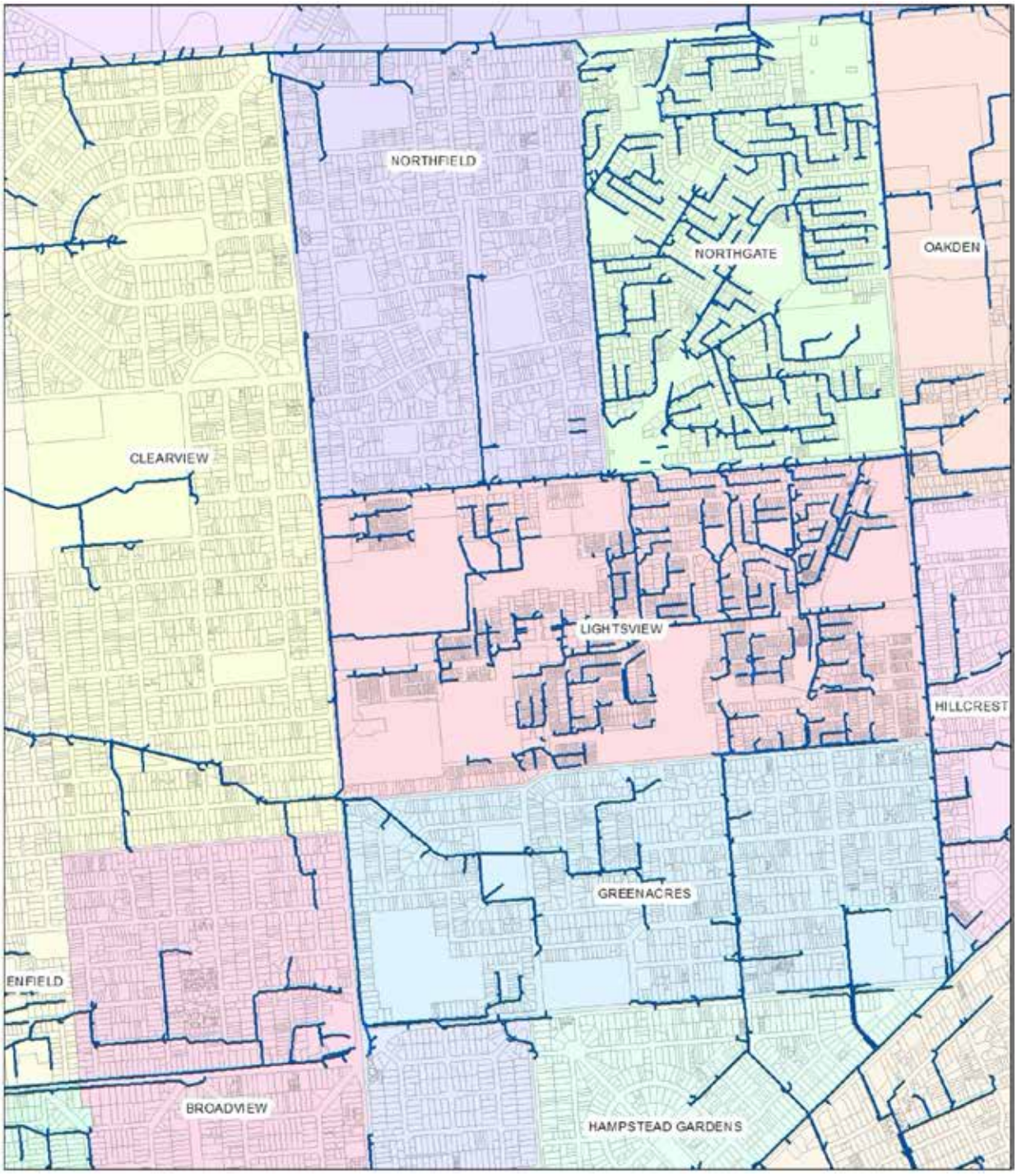
This is particularly evident when comparing the stormwater network in Clearview with the stormwater network in the recent Northgate and current Lightsview developments.

The older suburbs like Clearview (along with Northfield, and Greenacres) generally only have side entry pits located at low points where water tends to naturally fall. This often means a very limited pipe network connecting these pits to the outlet point.

Based on the current and new design standards factoring in climate change effects, it is reasonable to assume that in the future the stormwater network will be more pit and pipe intensive and will therefore mean that Council's stormwater infrastructure asset maintenance and renewal requirements will continue to increase. The percentage increase in new assets received through major land development and how this translates to an increase in maintenance budget is further discussed in Section 8.

The existing stormwater systems downstream of new developments are generally not designed to cater for the additional flow produced by these new developments, therefore a detention basin is often required to control the outflows into the existing stormwater network to prevent flooding issues.

Image 6.3: Comparison of drainage infrastructure for new developed suburbs to older existing suburbs



Demand – Specifically Climate Change

The cities of Port Adelaide-Enfield, Charles Sturt, and West Torrens [comprising the Western Adelaide Planning Region], are in collaboration and have designed the AdaptWest Climate Change Adaptation Plan – which is supported and funded by State, Commonwealth and local government departments and agencies. The plan addresses key priorities for local council operations and decision-making, and informs our community and key stakeholders about opportunities for practical action to adapt to our changing climate.

The AdaptWest Climate Change Adaptation Plan looks 50 years into the future and shows how our Western Region weather patterns will develop over the next few decades. In short:

- Average annual temperatures are likely to rise by up to 2°C;
- Average rainfall will decrease by up to 20%, while rainfall intensity will increase: for each degree of global warming, extreme daily rainfall may increase by 7%.
- Heatwaves – sequences of three or more consecutive days with average temperatures of at least 32°C, are projected to increase from 1 in 20 years under the baseline period to one in every 3-5 years.
- The global mean sea level rise could be as much as 0.26 m, as warming of the ocean results in a 1.4°C rise in global sea surface temperatures.

The combined effects of sea level rise, storm surge and high volumes of stormwater runoff following high intensity rainfall events leads to significant inundation of land, transport routes and commercial and industrial buildings. This has implications for the ongoing operation and viability of current business and industrial areas as well as those planned for potential future industrial development, particularly areas surrounding the Port River Estuary.

A number of investigations have been undertaken to better understand the impact of increases in rainfall intensity and sea level rise on the Port River Estuary.

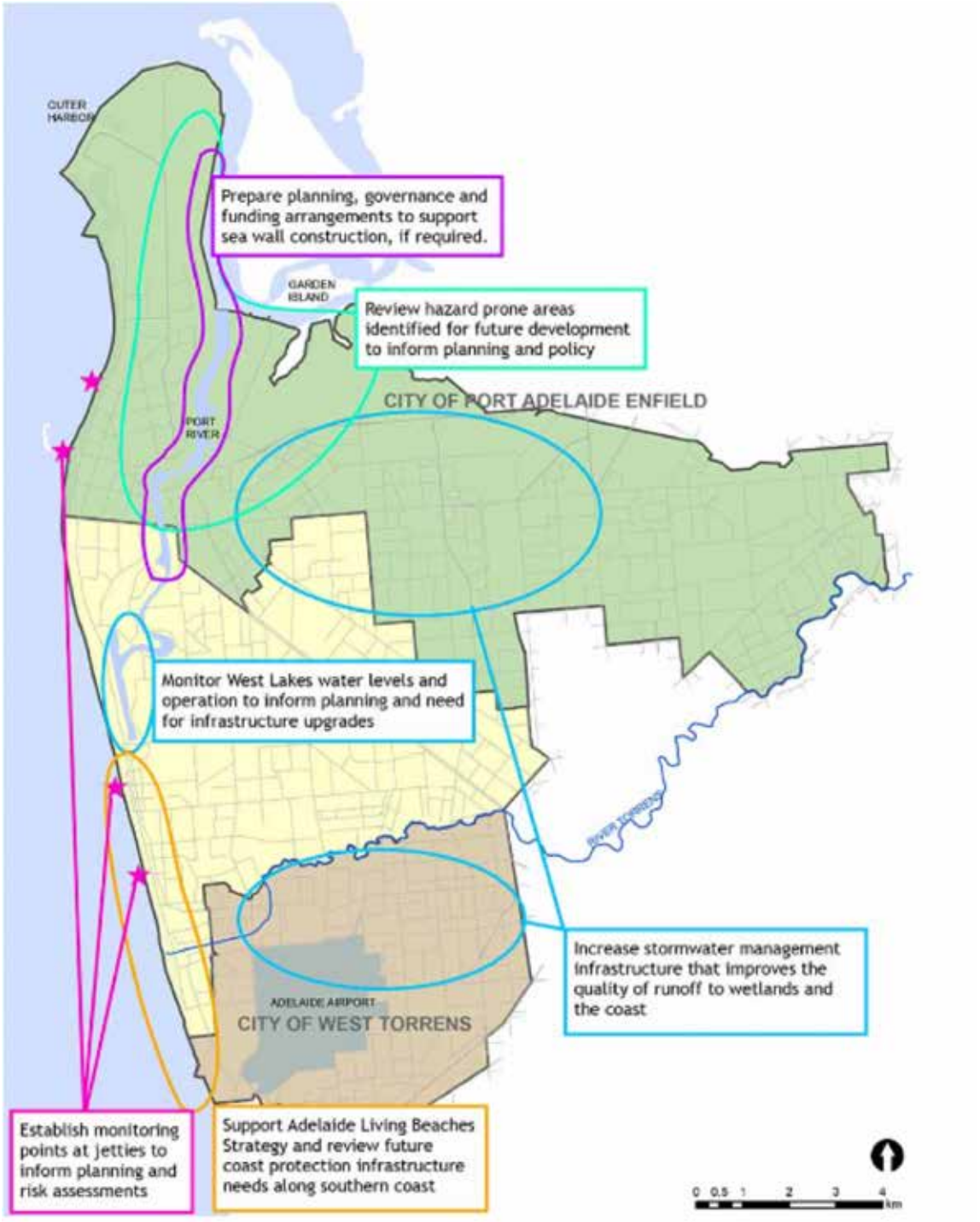
The Port Adelaide/LeFevre Peninsula Port Adelaide River Seawall Study estimated the potential damages from the combined impacts of sea level rise and land subsidence and recommended seawall infrastructure upgrades. Image 6.4 details such recommendations.

While many buildings in the Port River Estuary may be at risk of inundation in the future, some facilities such as the Australian Submarine Corporation have been constructed considering future sea levels.

An important adaptation option for further exploration by the Region is to limit further development or relocating development in hazard prone areas. The physical relocation of some assets and infrastructure away from high risk areas is expected to be necessary within a 20-year time frame – not long, given what's involved.

Source: www.adaptwest.com.au/

Image 6.4: Adapt West identified opportunities for Infrastructure, Planning, and Policy



Future Demand - Looking ahead

Drivers affecting demand include:

- climate change
- population change
- changes in demographics
- seasonal factors
- consumer preferences and expectations
- technological changes
- environmental awareness

A key Action of the Asset Management Strategy 2019-2024 has been to establish a Strategic Custodian Group to help identify and prepare for potential future demand factors that may impact the provision of Council services.

The following table is a list of future trends or factors that may impact the Stormwater asset class. These could identify a potential gap in Council's planning or resource allocation that could cause a risk to achieving the current level of service expected [or perceived] to be expected by the community.

Demand Driver Type	Primary Factor	Relationship	How this will impact current operations	Potential response (ie Residual Treatment)
Climate Adaptation	Higher intensity rainfall	Stormwater Management Plan	Increased potential for flooding and the need to manage	Increase storage capacity by increasing pipe size, Increase single SEP's to doubles, Install soakage pits Review Pump Station operating capacities
Climate Adaptation	Increased flowrates from hard stand areas created through land developments	Urban Design	Creation of storm water detention basins in existing open space. This will however reduce usable open space.	Monitoring and reviewing large residential developments to maximise opportunities for useable open space. Acquiring more land for open space
New Assets	Major Land Development	Asset Management	Increased resources required for asset management. Additional maintenance & asset renewal	Documenting new assets in IPS Increasing budget for maintenance & asset renewal Increase in staff resource for maintenance & capital works projects.
Urban Design	Increased hard stand area	Climate adaptation, Stormwater Management Plan, Development Plan	Increase for potential flooding due to existing infrastructure under capacity	Encourage the use of WSUD in developments to reduce runoff Include flood mapping in Development Planning to ensure land developments in flooded areas have the appropriate finished flood levels Require onsite detention/retention of stormwater to reduce runoff volume Increase drainage maintenance Increase capacity of stormwater infrastructure Increased maintenance to open channels to reduce weed growth enabling efficiency of water flow

Demand Driver Type	Primary Factor	Relationship	How this will impact current operations	Potential response (ie Residual Treatment)
Water Contamination, Environment Protection	Urban Infill	Urban Design, Stormwater Management Plans	Potential contamination will increase demand to filter runoff prior to entering the stormwater system	Minimise use of areas requiring hard pavements Use of alternative methods/materials to reduce run-off Water sensitive urban design (WSUD) Greater regulation of stormwater pollutant traps in private developments
Water Contamination, Environment Protection	Rubbish / Waste – Increased Population growth - likely to increase residential waste / litter	Waste Management	Increased maintenance to uphold amenity of streetscapes – ie street / path sweeping. Increased maintenance of stormwater system – particularly pollutant traps (GPT's and Trash Racks)	Waste Management Education programs Waste Levy increases. Increase Maintenance for more regular cleaning of trash racks and GPT's
Asset Management	Ageing or under-performing infrastructure	Long Term Financial Planning	Increased demand for replacement/new assets	Identify new/innovative approaches to address issues within existing areas. Upgrade existing or construct new assets – ie Pump Stations
Climate adaptation	Sea level rise	Urban Design	Peak storms and high tides preventing drainage	Storm valve installation, Conversion of gravity to pump systems, Increase detention opportunities through bigger pipes or land purchase for basins
Consumer preference	Increased percentage of subdivisions with greater number of sole occupancy homes	Urban design / Planning	Greater hard stand area and less permeable land	Review Planning design guidelines, Increase pipe cleaning and channel cleaning maintenance
Planning and Development	Increased density, poor design outcomes	Urban Design	Less opportunity for Council to shape urban development in the City Potential increase in residential complaints regarding localised flooding	Advocacy to State Government on changes to planning policy

7 RISK MANAGEMENT

A key Action of the Asset Management Strategy was to establish an Asset Management Risk Register that will Identifies critical risks that:

- Result in loss or reduction in service from infrastructure assets, or
- Present 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.

The following diagram demonstrates how the identification of risk will inform the Capital Works Program and be managed through departmental Section Plans and Risk register reviews.

Diagram7.1: Asset Services Risk Management Flow

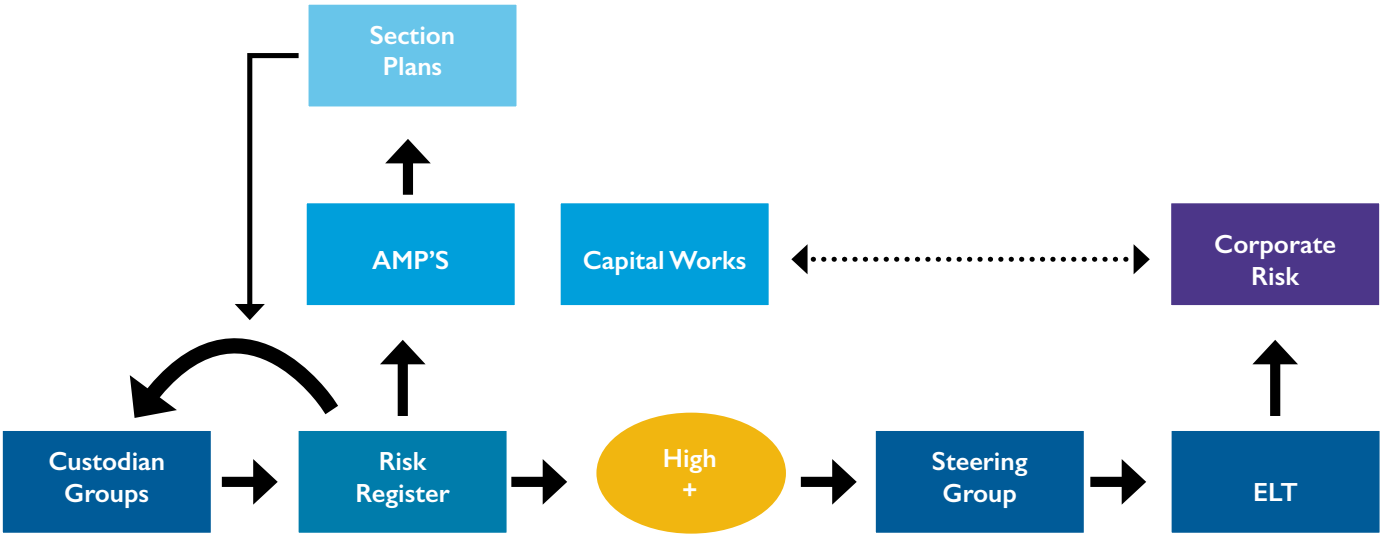
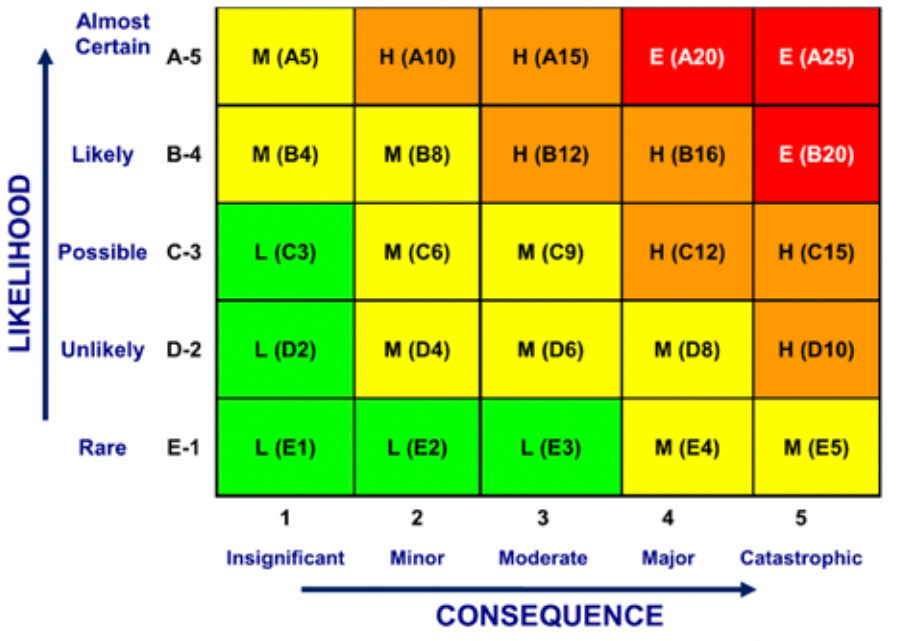


Chart 6.1: Population projection for the City of Port Adelaide Enfield



Risk Description	Consequence Category Desc	Inherent Risk	TreatmentControl	Residual Risk	Add TreatmentControl	Risk Acceptable
Community installing non standard stormwater outlets	Service Delivery & Leadership	MODERATE-A5	Continue trial position of Civil Works Officer - to rectify installation to Council standard	MODERATE-B4	Monitor trial position	Yes
Public safety around open channels	Safety & Physical Assets	HIGH-B12	Have identified higher risk areas and key locations and provided fencing.	MODERATE D6	Continue review locations where fencing may be required - through customer complaints Maintenance plan for old fence replacement	Yes
Culvert collapsing due to under design for vehicle loading	Safety & Physical Assets	HIGH-B16	Structural inspection of culverts under roads (ie channel crossings) based on age and criticality	HIGH-C12	Review locations based on heavy vehicle routes, review design loading. Program structural inspection of culverts under roads based on age, size, criticality.	No
Council lack of funding for SMP's	Community Wellbeing	HIGH-B16	Stormwater Management Plans are currently being undertaken Endorsed program of SMP's	MODERATE D4	Complete program of endorsed SMP's Review impact of Planning Code on drainage requirements Revisit existing SMP's Inform Elected Members of drainage trends	
Pump station under capacity	Community Wellbeing	HIGH-A10	Undertook Stormwater management plans to find shortfalls Doubled capacity at Hamilton PS Installing additional Pump at Mersey Built new pump station at Hargrave Built new pump station at Hart	LOW-E2	Midlunga pump station is 1/12 of the capacity required for a 20 yr ARI according to our own stormwater management plan, building of a new pump station to required capacity is required urgently. (<5yr ARI) Hamilton Requires upgrade (<5yr ARI) Install 2 more Pumps at Hack Pump Station to bring capacity to 10x375L/s pumps Increase pumping capacity at Carlisle (5-10 yr ARI) Upgrade Wellington Pump Station (check Port River SMP when complete)	Yes
Lack of access to stormwater infrastructure for ongoing maintenance	Service Delivery & Leadership	MODERATE-B4	Consult with Maintenance teams when reviewing Stormwater Engineering design of new land development projects - regarding accessibility for maintenance	LOW-C3	Improve expectations during initial master planning meetings with developers Review Statement of Requirements (SOR) to identify need for design awareness Engineering Drawings to be presented to Custodian Group	Yes
Vandalism of pump stations	Service Delivery & Leadership	HIGH-B12	Upgraded fences to prevent grafitti, and installed monitored security alarms in pump station buildings to prevent sabotage of electrical assets. Locks on electrical panels and sumps at minor pump stations.	LOW-D2	No additional treatment	Yes
Urban infill and impact on Council infrastructure	Service Delivery & Leadership	EXTREME-A20	Currently new developments assessed to ensure outflows from development are restricted to the capacity of existing infrastructure.	MODERATE D4	Review of impact from looming risk of planning legislation change that will impact Council's ability to review capacity issues All upgrade of existing systems to factor in future demand of increased run off from development, consider Stormwater masterplans.	Yes
Climate change and impact on current stormwater network capacity	Service Delivery & Leadership	MODERATE-B4	To factor higher intensity of rainfall events into network modelling and detailed design Maintain cleaning pipes to ensure network functions to capacity.	MODERATE-C6	Factor in new infrastructure to account for higher intensity rainfall events. Continue Stormwater Master Plan work. Continue maintenance work	Yes
The frequency of the large tidal events and damage on infrastructure	Community Wellbeing	HIGH-B16	Monitoring weather warnings. Emergency response activities, setting up transportable pumps in known risk areas. Establishing Non return Valves in known risk areas	MODERATE-B8	Review current capacity levels in under ground pipes, and ensure all Non Return Valves are installed in required locations. Ensure pipes are regularly cleaned to maintain capacity. Increase Emergency Response resources. Monitor Design Code to ensure new development FFL are appropriate to SMP studies	Yes

Risk Description	Consequence CategoryDesc	Inherent Risk	TreatmentControl	Residual Risk	Add TreatmentControl	Risk Acceptable
Pipe and culvert collapse causing damage to Council infrastructure	Safety & Physical Assets	HIGH-C12	Prioritise CCTV inspections based on age and size of conduits. CCTV inspection of all roads on Capital Program Recording of all CCTV undertaken to IPS.	MODERATE D6	Continue maintenance of program CCTV at catchment level	Yes
Unable to clean open earth channels maintenance due to seasonal impacts	Community Wellbeing	EXTREME-A20	Program of channel maintenance including mowing, spraying, cleaning.	MODERATE D6	Improve access through more and higher quality ramps, Continue structural Capital upgrade of channels as per endorsed SMP's	Yes
Developers dumping material on roadways that block council pipes	Service Delivery & Leadership	HIGH-A10	Any obvious illegal dumping reported to Community and Environmental Health to follow up under Walter Quality Act. If dumping identifies, Asset Maintenance will clean pipes at Council cost.	HIGH-A10	Strategic Action required for large development areas where individual builders carelessly silt and rubbish roads and drainage pits. Enforcement under Water Quality Act Community education	No
Financial risk uncertainty of useful life of assets	Service Delivery & Leadership	MODERATE-C	Continue of CCTV inspections to validate useful life. Capture information of failures to validate useful life	MODERATE D4	Continue with existing treatment	Yes
Pollution through lack of GPTs / Trash racks and maintenance	The Environment	EXTREME-A20	Have a network of Gross Pollutant Traps (GPT's) and Trash Racks Maintenance Program to clean GPT's and Trash Racks	LOW-D2	Continue with current program of cleaning.	Yes
Power outages at pump stations	Community Wellbeing	HIGH-C12	Backup Power Generators installed at all major Stormwater Pump Stations. Wellington, Archie Badenoch and Perkins have a good amount of detention. Hamilton Has a backup pump (started manually) Midlunga has a standpipe for connection of a mobile pump. Mersey, hack & soon lulu will have connection points for mobile generators as an additional backup Most pump stations have telemetry which will alarm in this circumstance, so that	MODERATE-B8	Install emergency generator connection points at Perkins & Archie Badenoch, completely replace Midlunga, incorporating an emergency generator connection point. Ensure that the new Naval Reserve PS has adequate detention and emergency power connection. Have a backup generator available at the depot capable of powering any of the minor pump stations	Yes
Pump station flooding	Service Delivery & Leadership	HIGH-C12	Was an issue at Mersey Rd, raised pump station floor and switchboard out of flood zone in addition to fixing pumps.	MODERATE D8	Build new pump station at Midlunga (its still an issue there) perform survey audit and ensure that all electrical boxes are out of the worst case 100 year flood levels.	Yes
Multiple Pump Failure at pump stations	Community Wellbeing	MODERATE D	Fixed Systemic Issues leading to pump failures. At Hack west we fixed the electrical system which was tripping the pumps by replacing the switchboard and wiring. Replaced the most problematic pumps in the network with new ones. Ensured that there are at least two pumps at each station to provide redundancy (except at Midlunga)	LOW-E2	Find root cause of the systemic 800L/s pump failures at Hart PS. Build new pump station at Midlunga with at least two pumps to ensure redundancy Retain external standby pumps at depot?	Yes

8 WHAT DOES IT COST?

Required Maintenance

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.

Maintenance includes all actions necessary for keeping an asset to an appropriate service condition – which includes pipe and culvert jetting, pit cleaning, channel mowing.

The following table 8.1 identifies the Actual Maintenance expenditure over the past 6 years. It is important to acknowledge that the budget amounts shown represent only Maintenance type activities, such as channel mowing, pipe and pit cleaning, and inspection work. Operational budget for Stormwater Management Plan studies and designs have been excluded from these values. These items can cost anywhere between $100,000 to $200,000 depending the size of the catchment.

Table 8.1: Actual Maintenance Expenditure Trends

Year	Maintenance
2014/15	$1,213,312
2015/16	$1,255,793
2016/17	$1,370,467
2017/18	$1,339,042
2018/19	$1,309,009
2019/20	$1,219,245

Table 8.2: Past Network Length by Material

Asset category	Length or Number		
	2012	2016	2020
Pipes and Culverts	461.50 Km's	477.53 Km's	518.9Km's
Stormwater Channels	36.5 Km's	36.92 Km's	37Km's
Inlets	10,110	10,267	10,931

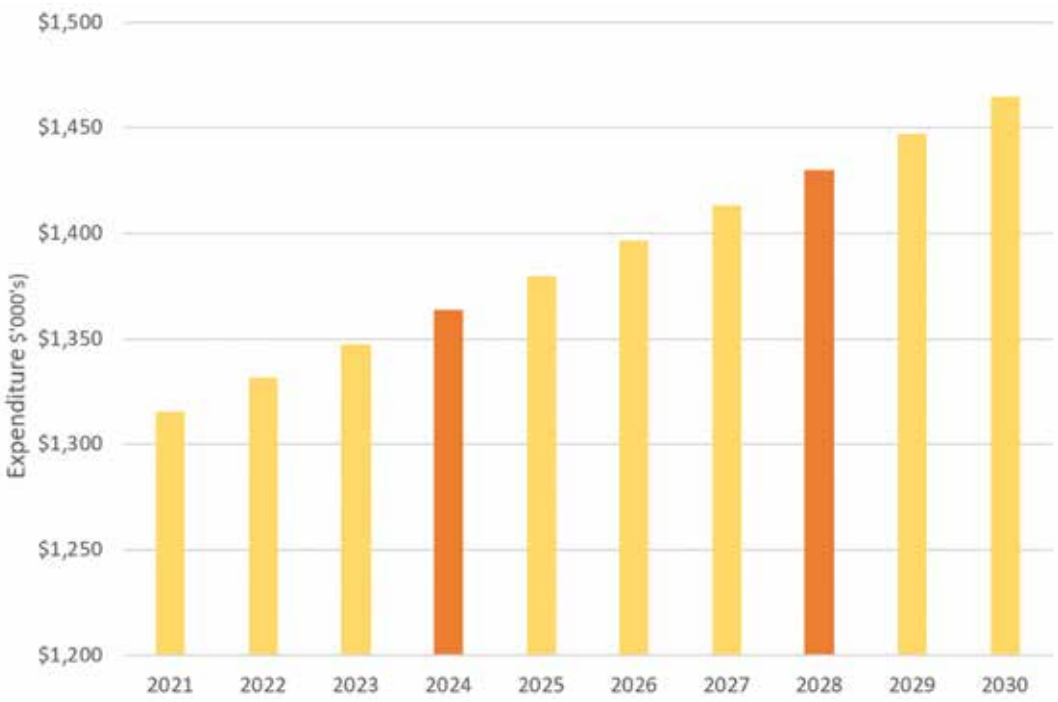
Keeping with Growth

The City of Port Adelaide Enfield presents considerable opportunity for Major Land Development across the entire Council area. Table 8.3 identifies the Major Land Developments since 2010, and what new developments will contribute to Council's asset register.

Council has fluctuating network growth from year to year which is difficult to trend, however chart 8.2 shows a projected conservative growth of 6% for pipes and culverts and 4% for stormwater inlets.

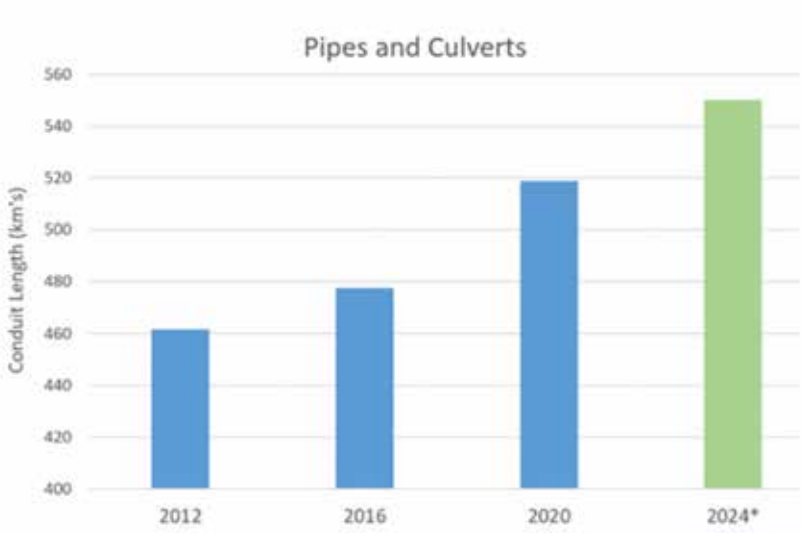
Should the network grow by a conservative 5% every 4 years (1.2% per year), then Maintenance expenditure should be increased at a similar rate. Using table 8.1 as a guide for an initial budget of $1.3M for the first year, the following chart 8.1 displays an annual increase of approximately $16,500 using a growth rate of 1.2% per year.

Chart 8.1: Project Maintenance Expenditure



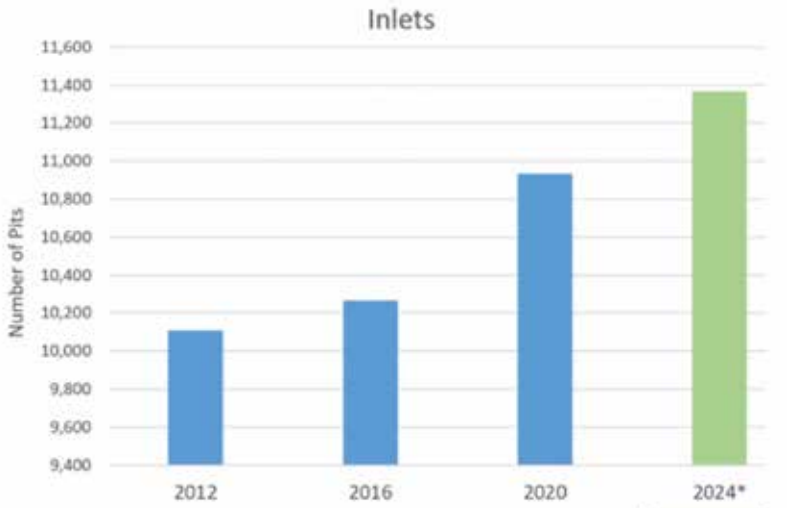

ROSEWATER CIR
FORD ST
NO THROUGH ROAD

Chart 8.2: Infrastructure growth projection



Pipes and Culverts	Growth		
	2012	2016	2020
Length	461.5	477.53	518.9
Percent Increase	0	3.5%	8.7%

Conservative Projection
2024
550
6%



Inlets	Growth		
	2012	2016	2020
Number	10,110	10,267	10,931
Percent Increase	0	1.6%	6.5%

Conservative Projection
2024
11368
4%

Table 8.3: Growth through Major Land Development

Major Land Development since 2010	New Major Land Developments
Lightsview	Dock 1
Northridge (Enfield High school)	Blair Athol Urban Redevelopment
Croydon Park TAFE site	Feltchers Slip
Angus Estate (Mansfield Pk Primary School)	Neptune Tce
Osmond Tce (Gilles Plains)	Strathmont Centre site (Oakden)

Projecting Capital Expenditure for Long Term Planning

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 required service potential.

Upgrade Works - is defined as works over and above restoring an asset to its original service potential. This includes a major shift in asset performance, such as increasing an existing pipe size, widening channels, and concreting earth channels.

Capital Renewal Projections

As discussed in Section 3, the Stormwater network is comprised of various infrastructure types, ranging from concrete pipes, culverts and pits, to open channels and other miscellaneous types such trash racks and headwalls. The majority of asset types have estimated useful lives of 100 to 120 years, however culverts (constructed pre 1990) and open channels have estimated useful lives of 60 years. Section 4 further identified that stormwater construction programs were well established in the 1950's, leading to a proportion of the existing network entering the remaining third of their useful lives. This particularly relates to the older culverts, and open channels.

Chart 8.3: Projected Aged Based Renewal vs Planned Renewal (LTFP)

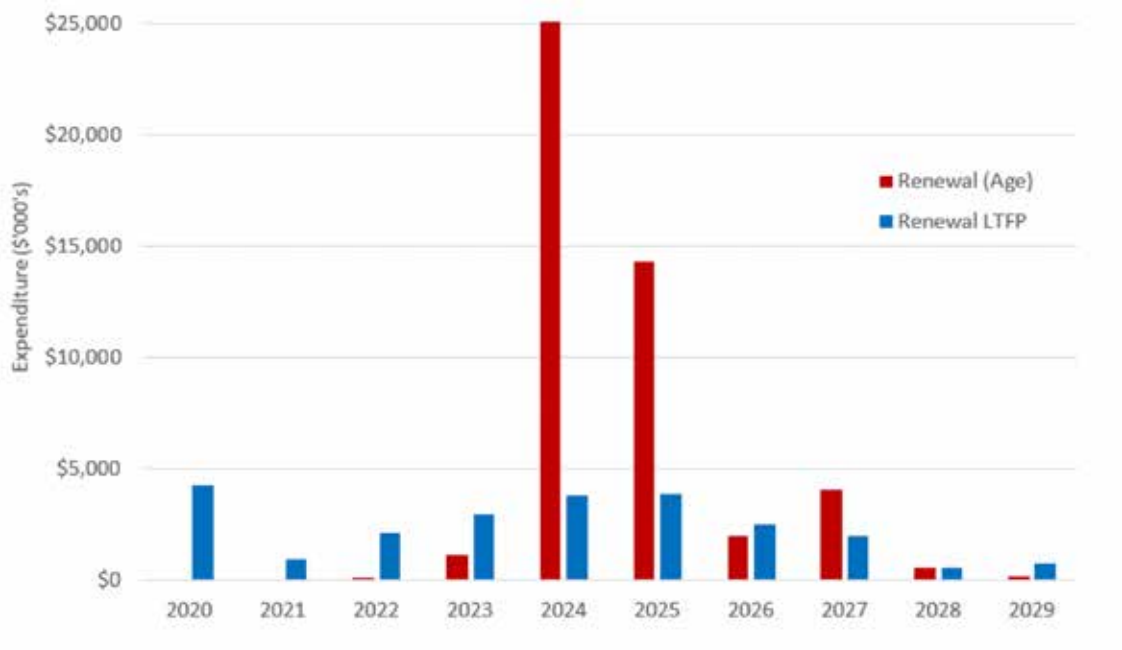
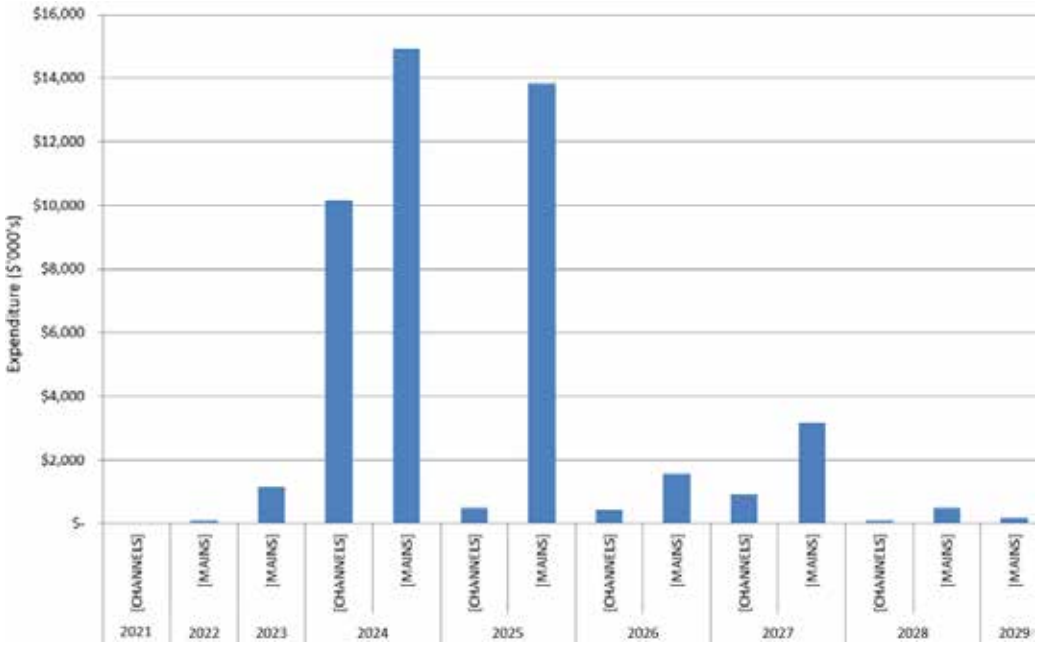


Chart 8.3 identifies a significant spike in anticipated renewal expenditure in 2024, when a substantial number of open channel and culvert assets are due for replacement. Selecting only these two asset types, and projecting the replacement of these over the next 10 years confirms the 2024 spike in chart 8.3 is the combination of this replacement cost.

Chart 8.4: Projected Renewal of Culverts (Mains) and Channels



As also discussed in Section 4, Council has previously performed proactive condition inspections on the older asset stock. In 2014, a CCTV project of all culverts aged 50 years or more revealed that the majority of culverts were in satisfactory condition. All culvert that was considered a risk have since been replaced. The following images show the condition of much of the 'older' culverts CCTV'd in 2014 remain structurally sound.

Open Channel Upgrade works

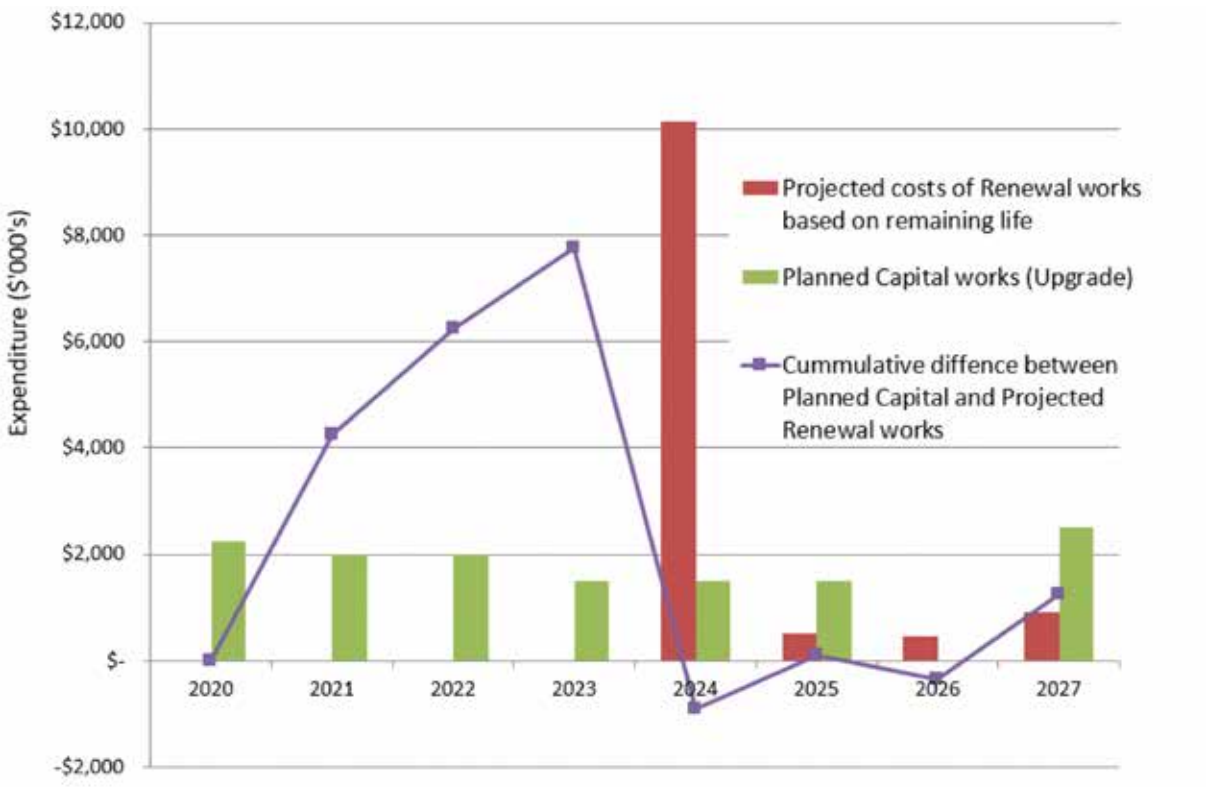
At the April 2018 Council meeting, it was reported that the total estimated cost of known works identified in the completed SMP's is $123 million. The projected 10 years Capital works program has budgeted an average of $1.9M to Channel upgrades across this period.

As discussed in Section 6, the performance of a catchment is highly dependent on how quickly water can be drained through the network. The flow capacity of downstream open channels has been identified as a limitation to upstream drainage; which is continually being intensified with urban infill and development. Regular maintenance to clean and remove debris and blockages is critical to maintaining the optimum flow capacity of open channels, thus managing the inherent Extreme Risk associated with them being blocked.

The commitment to the upgrade of the open channels is identified in Chart 8.5 below, where the upgrade works will effectively be replacing what currently exists with widening works to increase volumes, and improvements with concrete floors for increased flows.

The red column identifies the projected renewal of open channels based on estimated remaining life - with $10.15M of works due at 2024. The green bars represent the annual programmed works already budgeted within the LTFP across the ten year planning period. The purple line is the progress of the programmed works (i.e. green bars) to meet the projected renewal. The purple line is the cumulative value of the green minus the value of red per year.

Chart 8.5: Projected Open Channel Renewal through Capital Upgrade



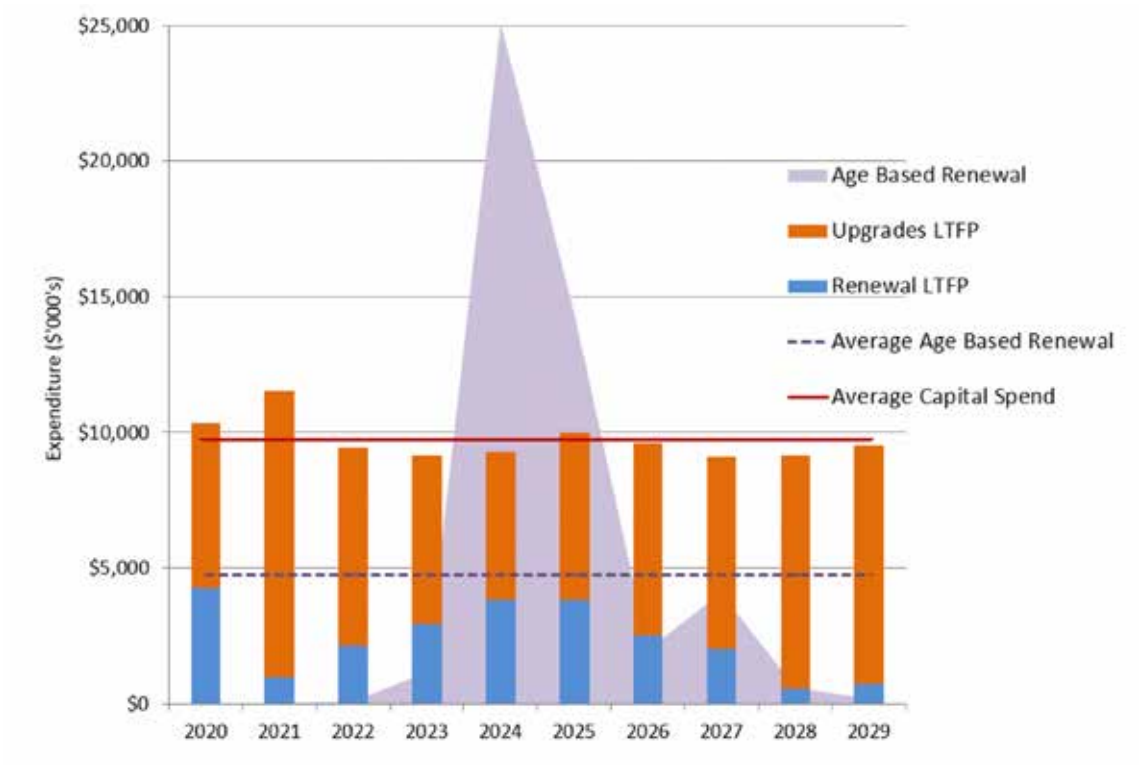
The purple line implies that the staging of works across the 10 year period is to remove the potential financial shock to the organisation before 2024. Fundamentally, Asset Management is the projection of forthcoming works and ensuring the organisation has the required funding and resource capability to meet the projected demand.

The varying levels of capital expenditure depicted in chart 8.5 as green columns is a result of balancing all Stormwater projects across Council within each year (eg. new pipes, pits, etc).

This form of proactive works planning has been applied across the network, ensuring a smoother long term spend over the forecast period of upgrade requirements as per the works identified by the suite of Stormwater Management Plans. The current works program aims to increase the capacity of the network, to ensure the system meets the design standards discussed in Section 5.

Chart 8.6 demonstrates the proposed capital spend in the LTFP. Although the average capital spend (red line) appears to be double the average spend based on remaining life based on age (purple dashed line), it is important to respect the urgency in increasing the capacity and flow rates across the Council area to mitigate the imposing impacts from new land divisions and rainfall intensity from climate change. This will require new and upgraded infrastructure – in line with the recommendations of the endorsed Stormwater Management Plans.

Chart 8.6: Capital Expenditure



Informing the Long Term Financial Plan

This Council uses the Asset Renewal Funding Ratio as it's indicator for Asset Management performance. The Asset Renewal Funding Ratio is defined as:

> **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 (LTFP) 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].

As represented in chart 8.3 (p.45), the planned capital renewal is significantly less than what is projected through the accounting age based method. Accordingly, the 10 year Asset Renewal Funding Ratio is calculated at 47%

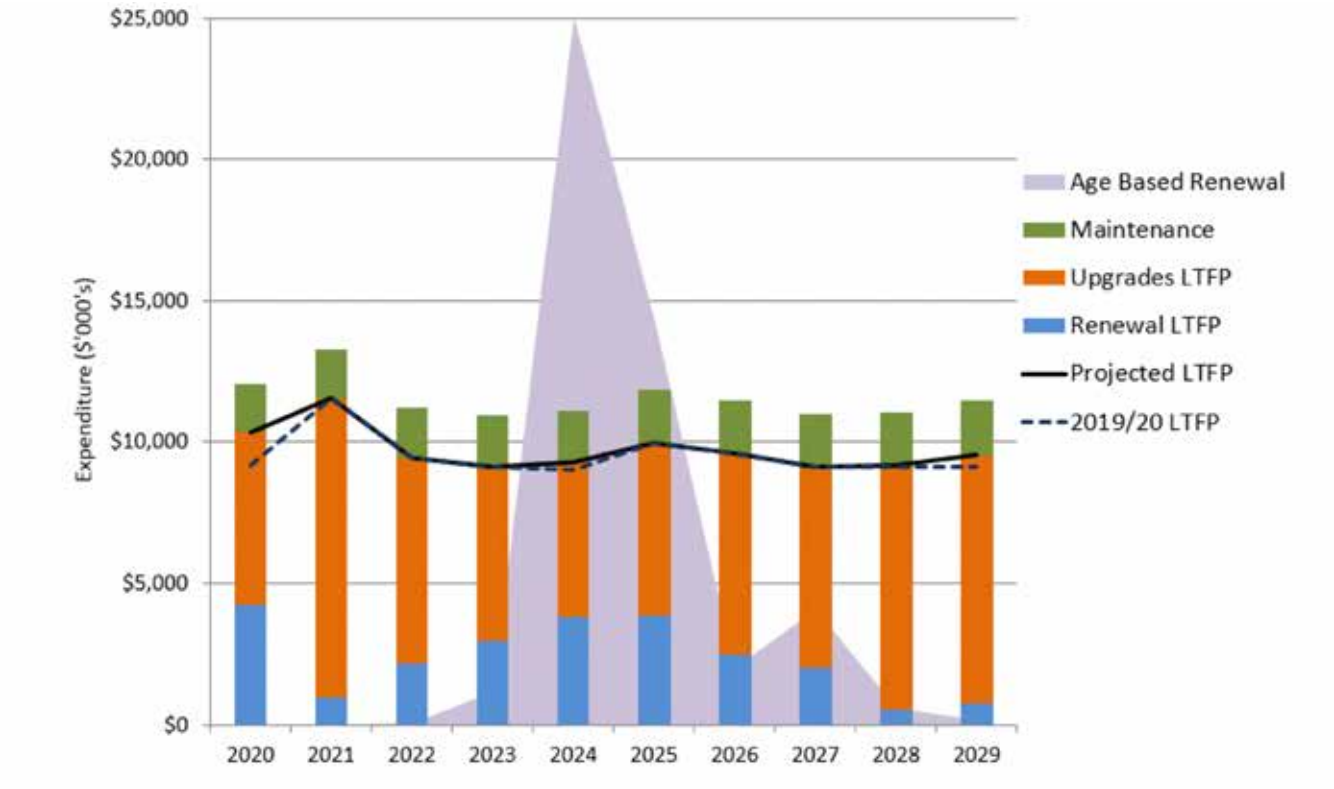
Although in accounting terms this suggests that the assets are not being renewed in line with their estimated useful life, in reality the assets approaching the end of their estimated useful life have either maintained structural integrity or are being replaced with upgraded size or materials that will improve their serviceability. This is explained from pages 45 to 48.

The majority of planned capital works that currently informs the LTFP has been directed by the research and modelling undertaken within the Stormwater Management Plans (SMP's). The current suite of SMP's have identified $123M worth of capital works – the majority of which is to increase capacity and flow which are classified as Capital Upgrade.

Chart 8.7 below demonstrates Council's planned capital and maintenance works against the projected aged based renewal requirement that influences a low renewal funding ratio.

The capital budget required by this edition of the Stormwater Asset Management Plan is consistent with the current LTFP. This reflects the planning of works and commitment to the long term financial period, where the capital program is reviewed annually in line with the works program directed by the suite of SMP's, along with other works identified through active field investigations.

Chart 8.7: Required Expenditure



9 FINANCIAL SUMMARY

YEAR END 30 JUNE	MAINTENANCE BUDGET	AGED BASED RENEWAL	LTFP RENEWAL BUDGET	LTFP UPGRADE BUDGET
2020/21	$1,728	$0	$4,240	$6,105
2021/22	$1,749	$0	$980	$10,550
2022/23	$1,770	$79	$2,150	$7,300
2023/24	$1,792	$1,144	$2,950	$6,200
2024/25	$1,814	$25,070	$3,550	$5,470
2025/26	$1,836	$14,335	$3,850	$6,145
2026/27	$1,859	$2,012	$2,495	$7,120
2027/28	$1,881	$4,098	$1,990	$7,125
2028/29	$1,905	$591	$550	$8,605
2029/30	$1,928	$178	$730	$8,805

All dollar values are in ($'000)'s

Please note that the above figures are in present value, and are subject to CPI increase each year

10 IMPROVEMENT PLAN

Item Ref	Item Description	Responsibility
1.	Develop a list of recently completed projects to visit during/after a significant storm event to determine the efficacy of the project improvement - in terms of flow widths and ponding in the street.	Custodian Group
2.	Further investigation into the useful live of pre 1990 Box Culverts – as per Section 8, p.38	Asset Planning
3.	Continue inspecting stormwater infrastructure as part of the road reseal and reconstructions program prior to commencing any associated road replacement works – as per Section 4, p.9.	Asset Planning
4.	Continue with proposed Stormwater Management Plans – as per Section 5, p.19.	Design
5.	Review the impact stormwater discharge is having on the environment and implement WSUD methods as required.	Design
6.	Review and consider with the intent to implement the priorities and actions as identified within the AdaptWest Climate Change Adaptation Plan - as per Section 6, p.25	Strategic Planning, Design, Custodian Group
7.	Continual review and update of the current Asset Management Risk Register – as per Section 7	Custodian Group, Governance Team (Risk)
8.	Continue to review and update the Strategic Demand, and implement such initiatives: • Encourage the use of WSUD in developments to reduce runoff • Include flood mapping in Development Planning to ensure land developments in flooded areas have the appropriate finished floor levels • Require onsite detention/retention of stormwater to reduce runoff volume	Design, Development Assessment, Strategic Planning
9.	Business review to consider increased maintenance to open channels to reduce weed growth enabling efficiency of water flow	Custodian Group

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, eg. 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, eg. 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, eg. 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 cashflow 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 arms 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, eg. 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.

Life Cycle Cost *

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

Life Cycle Expenditure

The Life Cycle Expenditure (LCE) is the average operations, maintenance and capital renewal expenditure accommodated in the long term financial plan over 10 years. Life Cycle Expenditure may be compared to average Life Cycle 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, eg 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 needs 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 eg 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 Council, eg. parks and playgrounds, footpaths, roads and bridges, libraries, etc.

Operations

Regular activities to provide services such as public health, safety and amenity, eg 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, eg 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 (eg 5, 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. 5, 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, eg public halls and theatres, childcare centres, sporting and recreation facilities, tourist information centres, etc.

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.

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, replacement of air conditioning equipment, etc. 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 (4 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.

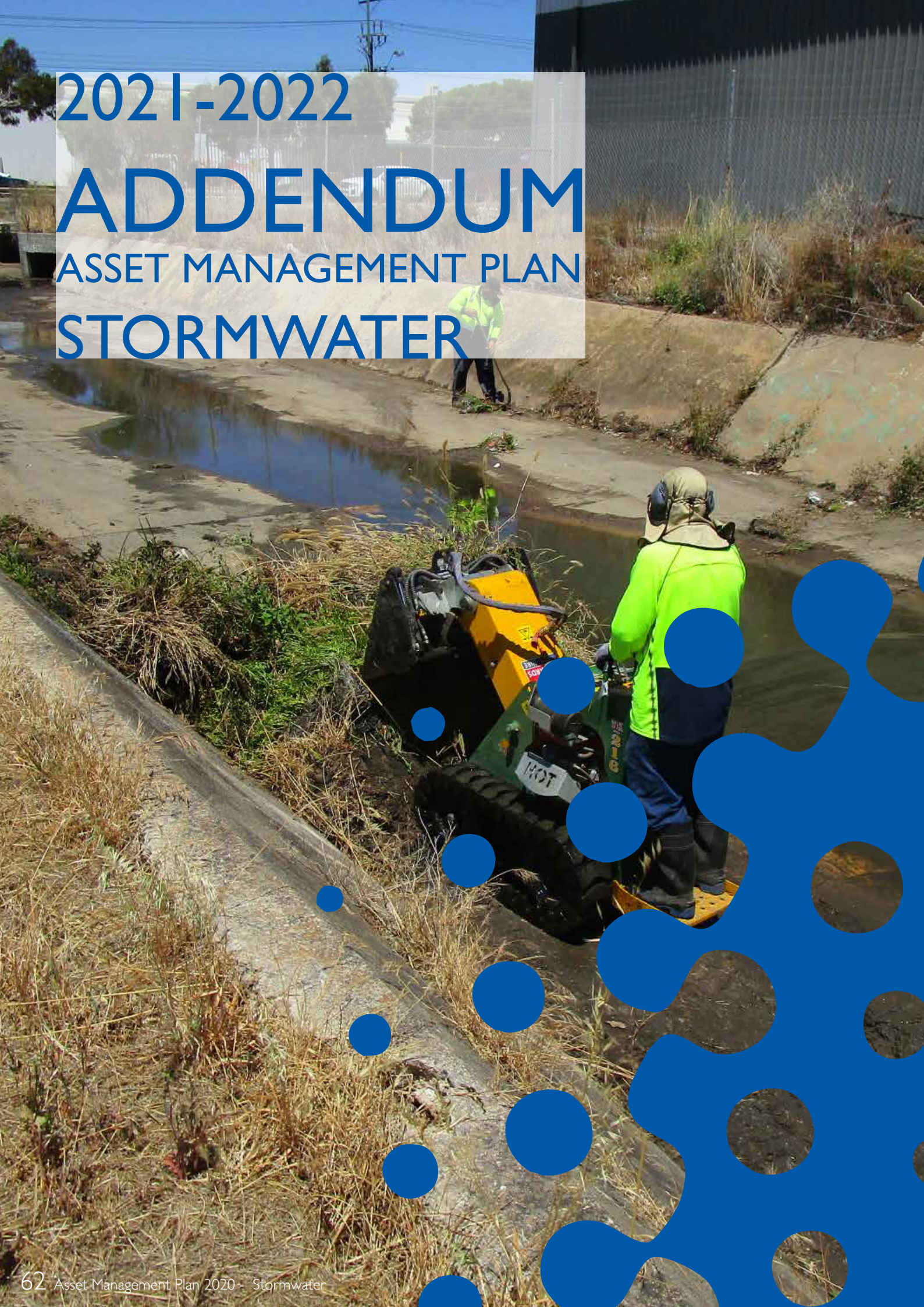
It is estimated or expected time between placing the asset into service and removing it from service, or the estimated period of time over which the future economic benefits embodied in a depreciable asset, are expected to be consumed by the Council.

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, Glossary

Additional and modified glossary items shown *



2021-2022 ADDENDUM ASSET MANAGEMENT PLAN STORMWATER

		Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 4 2024/25	Year 5 2025/26	Year 6 2026/27	Year 7 2027/28	Year 8 2028/29	Year 9 2029/30	Year 10 2030/31
Stormwater AMP	Upgrade/New	$10,550,000	$7,300,000	$6,200,000	$5,470,000	$6,145,000	$7,120,000	$7,125,000	$8,605,000	$8,805,000	
	Replacement	$980,000	$2,150,000	$2,950,000	$3,550,000	$3,850,000	$2,495,000	$1,990,000	$550,000	$730,000	
	Total	$11,530,000	$9,450,000	$9,150,000	$9,020,000	$9,995,000	$9,615,000	$9,115,000	$9,155,000	$9,535,000	
Pump Station AMP	Upgrade/New										
	Replacement	$290,000	$230,000	$155,000	$170,000	$175,000	$500,000	$155,000	$160,000	$82,000	
	Total	$290,000	$230,000	$155,000	$170,000	$175,000	$500,000	$155,000	$160,000	$82,000	
Total Combined AMP	Upgrade/New	$10,550,000	$7,300,000	$6,200,000	$5,470,000	$6,145,000	$7,120,000	$7,125,000	$8,605,000	$8,805,000	
	Replacement	$1,270,000	$2,380,000	$3,105,000	$3,720,000	$4,025,000	$2,995,000	$2,145,000	$710,000	$812,000	
	Total	$11,820,000	$9,680,000	$9,305,000	$9,190,000	$10,170,000	$10,115,000	$9,270,000	$9,315,000	$9,617,000	
Revised Budget											
Stormwater	Upgrade/New	$12,480,000	$6,000,000	$6,210,000	$5,770,000	$6,145,000	$7,120,000	$7,125,000	$8,605,000	$8,805,000	$9,000,000
	Replacement	$3,091,800	$3,550,000	$4,200,000	$3,550,000	$3,850,000	$2,495,000	$1,990,000	$550,000	$730,000	
	Total	$15,571,800	$9,550,000	$10,410,000	$9,320,000	$9,995,000	$9,615,000	$9,115,000	$9,155,000	$9,535,000	$9,000,000
Pump Stations	Upgrade/New	$1,500,000			$7,117,000	$7,115,000			$5,460,000	$5,460,000	
	Replacement	$710,000	$240,000	$155,000	$275,000	$215,000	$179,000	$200,000	$200,000	$200,000	$200,000
	Total	$2,210,000	$240,000	$155,000	$7,392,000	$7,330,000	$179,000	$200,000	$5,660,000	$5,660,000	$200,000
Revised Budget	Upgrade/New	$13,980,000	$6,000,000	$6,210,000	$12,887,000	$13,260,000	$7,120,000	$7,125,000	$14,065,000	$14,265,000	$9,000,000
	Replacement	$3,801,800	$3,790,000	$4,355,000	$3,825,000	$4,065,000	$2,674,000	$2,190,000	$750,000	$930,000	$200,000
	Total	$17,781,800	$9,790,000	$10,565,000	$16,712,000	$17,325,000	$9,794,000	$9,315,000	$14,815,000	$15,195,000	$9,200,000
	Variation	$5,961,800	$110,000	$1,260,000	$7,522,000	$7,155,000	-$321,000	$45,000	$5,500,000	$5,578,000	$9,200,000
		50%	1%	14%	82%	70%	-3%	0%	59%	58%	

Revised Budget with CPI adjustment											
Stormwater	Upgrade/New	$12,480,000	$6,090,000	$6,413,688	$6,063,116	$6,570,234	$7,745,848	$7,623,750	$9,691,812	$10,091,411	$10,494,900
	Replacement	$3,091,800	$3,603,250	$4,337,760	$3,730,340	$4,116,420	$2,714,311	$2,129,300	$619,465	$836,653	$0
	Total	$15,571,800	$9,693,250	$10,751,448	$9,793,456	$10,686,654	$10,460,159	$9,753,050	$10,311,277	$10,928,064	$10,494,900
Pump Stations	Upgrade/New	$1,500,000	$0	$0	$7,478,544	$7,607,358	$0	$0	$6,149,598	$6,257,706	$0
	Replacement	$710,000	$243,600	$160,084	$288,970	$229,878	$194,734	$214,000	$225,260	$229,220	$233,220
	Total	$2,210,000	$243,600	$160,084	$7,767,514	$7,837,236	$194,734	$214,000	$6,374,858	$6,486,926	$233,220
Revised Budget	Upgrade/New	$13,980,000	$6,090,000	$6,413,688	$13,541,660	$14,177,592	$7,745,848	$7,623,750	$15,841,410	$16,349,117	$10,494,900
	Replacement	$3,801,800	$3,846,850	$4,497,844	$4,019,310	$4,346,298	$2,909,045	$2,343,300	$844,725	$1,065,873	$233,220
	Total	$17,781,800	$9,936,850	$10,911,532	$17,560,970	$18,523,890	$10,654,893	$9,967,050	$16,686,135	$17,414,990	$10,728,120

CPI Index %		1.50%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
CPI Index factor		1.015	1.0328	1.0508	1.0692	1.0879	1.07	1.1263	1.1461	1.1661

10 Year Program

2021/2022	NEW	REPLACED	TOTAL
Adhoc outside of maintenance budget design and construction (Stormwater upgrade associated with road program upgrades)		$450,000	$450,000
Dover St (NAE) Including grants total investment $5,990,000 over 2 years)	$5,310,300		$5,310,300
Lefevre College St /Providence Place Lateral Drain Upgrade Construction	$1,200,000		$1,200,000
Lefevre Hamilton Ave Upgrades Detailed Design	$60,000		$60,000
Lefevre Jetty Rd Pump Station Upgrade Detailed Design	$250,000		$250,000
Birkenhead Naval Reserve Birkenhead - Detention Basin & Stormwater Upgrade including Lefevre Peninsula SMP - Continuation of Construction	$3,700,000		$3,700,000
Lefevre - Walker St Birkenhead Lateral Construction	$600,000		$600,000
Lefevre Wigley St System Design	$50,000		$50,000
NAE Open Channel Design	$80,000		$80,000
NAE State Sports Park Basin and Outlet Detailed Design	$100,000		$100,000
NAE Dover St - Non Return Valve Construction	$150,000		$150,000
NAE North Arm East Channel Upgrade Construction		$2,000,000	$2,000,000
New Haven Village		$541,800	$541,800
PRE - Hack St Quebec St Stormwater Upgrade Design	$50,000		$50,000
PRE - Lateral Drain Design - Old Port Rd Review Queenstown	$45,000		$45,000
PRE - Wellington St Upgrade of Wellington St Pump Station and GPT Design	$250,000		$250,000
Semaphoer Rd, Birkenhead - Drainage Study	$84,700		$84,700
Soakage Pits New and Upgrade as Required (Seafield St, Largs Bay) Construction	$300,000		$300,000
TRDA Eastern Parade Channel Upgrade Design	$100,000		$100,000
USMP Studies Torrens SMP Design		$100,000	$100,000
WSUD Projects Water Sensitive Urban Design Streetscape Projects Construction	$150,000		$150,000
Sub Total Cost of Proposed Construction	$12,480,000	$3,091,800	$15,571,800

2022/2023	NEW	REPLACED	TOTAL
Adhoc outside of maintenance budget design and construction (including Stormwater upgrade associated with road program upgrades)	$450,000		$450,000
All catchments GPT study (water quality study)		$100,000	$100,000
Design of upgrades in HEP Catchment	$100,000		$100,000
Design of upgrades in NAW catchment	$100,000		$100,000
Le Fevre - Kolapore Ave - Construction of Basin	$700,000		$700,000
Le Fevre - Mersey PS Catchment Study		$100,000	$100,000
Le Fevre - Wigley St to Military Rd Lateral Drain upgrade	$1,000,000		$1,000,000
NAE - Install new GPT	$300,000		$300,000
NAE - State Sports Park Basin Outlet Pipe	$750,000		$750,000
NAE - Upgrade concrete channel - Outlet to railway reserve		$2,000,000	$2,000,000
NAW - Upgrade design and HECRAS Modelling		$50,000	$50,000
New and Upgrades of Soakage Pits as required (Walcot St)		$1,000,000	$1,000,000
PRE - West St, Queenstown - Drainage upgrade	$300,000		$300,000
PRE Hack St - Quebec St Lateral Drain Upgrade	$700,000		$700,000
Review of existing and opportunities study (water Reuse)		$50,000	$50,000
TRDA - Eastern Parade - Construction of Raised Channel Side Walls	$1,000,000		$1,000,000
TRDA - Milburn St - Lateral Drain Construction	$600,000		$600,000
Water Sensitive Urban Design Projects		$150,000	$150,000
Works identified from various USMP studies		$100,000	$100,000
Total Cost of Proposed Construction	$6,000,000	$3,550,000	$9,550,000

2023/2024	NEW	REPLACED	TOTAL
ASR upgrades - Water reuse and water quality works	$150,000		$150,000
Dunstan Rd (NAW5) - Construction of upgrades	$400,000		$400,000
HEP - Construction of lateral drains	$500,000		$500,000
Lefevre - Upgrade Works	$500,000		$500,000
Lefevre - Mersey PS - Detailed Design of drainage upgrades	$100,000		$100,000
Lefevre - Review of soakage catchments in the Semaphore Area and options study to look at ways to better manage flooding	$50,000		$50,000
Lefevre Peninsula SMP - Kolapore Ave - Construction of Basin and Lateral Drain	$1,500,000		$1,500,000
Lefevre - Lulu Jetty Rd Main Upgrade Design	$110,000		$110,000
NAE - Localised Flooding review and design	$100,000		$100,000
NAE - State Sports Park - Basin construction		$1,500,000	$1,500,000
NAE - Construct system upgrades/Flood mitigation options	$300,000		$300,000
NAE - Upgrade concrete channel - railway reserve to GJ RD		$2,000,000	$2,000,000
NAW - Construction of upgrades	$400,000		$400,000
New and Upgrades of Soakage Pits as required	$800,000		$800,000
Port River East - Construction of lateral drains	$300,000		$300,000
PRE - Design of Lateral Drain - Portland Rd	$75,000		$75,000
PRE - Detailed Design of Wellington St Main	$75,000		$75,000
TRDA - Eastern Parade- Culvert Crossing removal upgrades		$500,000	$500,000
Various Locations - Design and construction outside of maintenance budget	$450,000		$450,000
Various Locations - Stormwater Asset condition rating and CCTV		$200,000	$200,000
Water Sensitive Urban Design streetscape projects	$300,000		$300,000
Works identified from various USMP studies	$100,000		$100,000
Total Cost of Proposed Construction	$6,210,000	$4,200,000	$10,410,000

2024/2025	NEW	REPLACED	TOTAL
NAE - Upgrade concrete channel - railway reserve to GJ RD		$1,000,000	$1,000,000
BIC - Construction of pipe upgrades	$400,000		$400,000
BIC - Construction of upgrades	$400,000		$400,000
NAE - Install new GPT	$250,000		$250,000
Install New GPT's	$250,000		$250,000
NAE - Construction of upgrades	$150,000		$150,000
Water reuse and water quality works	$150,000		$150,000
Lefevre - Mersey PS - Construction of lateral drains and basin	$1,000,000		$1,000,000
BIC - NAW Channel upgrade		$500,000	$500,000
Drainage Reserves	$50,000		$50,000
Water Sensitive Urban Design streetscape projects		$400,000	$400,000
New and Upgrades of Soakage Pits as required		$600,000	$600,000
Culvert upgrades		$500,000	$500,000
PRE - Drainage upgrades to Port local area discharging to Port River	$300,000		$300,000
PRE - Construction of Russell St Wetland/basin	$600,000		$600,000
Lefevre - Flap Gate Upgrade (TideFlex)	$120,000		$120,000
Localised Flood Mitigation Fund		$300,000	$300,000
PRE - Construction of Lateral Drain - Portland Rd	$500,000		$500,000
PRE - Construction of Main Drain Wellington St Pump Station	$1,000,000		$1,000,000
TRDA - Design and construct GPT - Florence Tce, Rosewater	$300,000		$300,000

2024/2025	NEW	REPLACED	TOTAL
Design			
Works identified from various USMP studies		$100,000	$100,000
NAE - Localised Flooding review and design		$100,000	$100,000
Lefevre - Review of hack st catchment and pump station efficiency		$50,000	$50,000
Update of Councils Digital Terrain Model	$150,000		$150,000
PRE - Design of Port Centre West Pump Station	$75,000		$75,000
PRE - Design of Port Centre East Pump Station	$75,000		$75,000
TOTAL	$5,770,000	$3,550,000	$9,320,000

2025/2026	NEW	REPLACED	TOTAL
Upgrade concrete channel - railway reserve to GJ RD		$1,000,000	$1,000,000
Construction of upgrades	$400,000		$400,000
Construction of upgrades	$400,000		$400,000
Install new GPT	$250,000		$250,000
Install New GPT's	$250,000		$250,000
Construction of upgrades	$150,000		$150,000
Water reuse and water quality works	$150,000		$150,000
Mersey Rd Catchment - Construction of lateral drains and basin	$500,000		$500,000
Open Channel upgrade		$500,000	$500,000
Drainage system upgrades and GPT's	$500,000		$500,000
Desilting of Whicker Rd Sediment Basin	$200,000		$200,000
Drainage upgrades to Port local area discharging to Port River	$300,000		$300,000
Culvert upgrades		$500,000	$500,000
Drainage Reserves	$50,000		$50,000
Water Sensitive Urban Design streetscape projects		$200,000	$200,000
New and Upgrades of Soakage Pits as required		$500,000	$500,000
Continuation of Lateral Drain Portland Rd	$500,000		$500,000
Port Centre West Pump Station Main and Laterals	$2,000,000		$2,000,000
Localised Flood Mitigation Fund		$300,000	$300,000
Upgrade pipe and outlet from Semaphore Rd Catchment		$500,000	$500,000
Works identified from various USMP studies		$100,000	$100,000
Localised Flooding review and design		$100,000	$100,000
Updating of Councils stormwater modelling to reflect changes in DTM	$300,000		$300,000
Detailed design of Hack St Stormwater Upgrades		$100,000	$100,000
Review of soakage catchments in the Semaphore Area and options study to look at ways to better manage flooding		$50,000	$50,000
Detailed Design of Commerical Rd Drainage Upgrade	$120,000		$120,000
Detailed Design of Providence Place Drainage Upgrade	$75,000		$75,000
TOTAL	$6,145,000	$3,850,000	$9,995,000

2026/2027	NEW	REPLACED	TOTAL
Upgrade pipe and outlet from Semaphore Rd Catchment		$500,000	$500,000
Nazar Reserve Detention Basin Construction	$1,200,000		$1,200,000
Construction of Aldinga St Wetland and Detention Basin	$1,600,000		$1,600,000
Construction of pipe works		$1,500,000	$1,500,000
Contiuation of Port Centre West Pump Station Mains and Laterals	$1,600,000		$1,600,000
New and Upgrade Soakage Pits	$600,000		$600,000
Localised Flood Mitigation Fund		$300,000	$300,000
Construction of pipe works	$1,500,000		$1,500,000
Land purchase	$500,000		$500,000
Design and Feasibility of Railway Tce Pump Station	$50,000		$50,000
Design and Feasibility of Charon Reserve pump station and detention basin	$70,000		$70,000
Design of stormwater upgrade Lipson Street		$50,000	$50,000
Outfall Channel Upgrade Northcote to GJ Rd		$75,000	$75,000
Design of stormwater upgrade		$70,000	$70,000
Total	$7,120,000	$2,495,000	$9,615,000

2027/2028	NEW	REPLACED	TOTAL
Upgrade pipe and outlet from Semaphore Rd Catchment + GPT + Tideflex valve		$1,000,000	$1,000,000
Localised Flood Mitigation Fund		$300,000	$300,000
New and Upgrade Soakge Pits	$600,000		$600,000
Nazar Reserve Lateral Drain and overflow construction	$600,000		$600,000
Construction of Aldinga St Wetland and Detention Basin and associated pipe works	$1,100,000		$1,100,000
Construction of rising main	$1,000,000		$1,000,000
Outfall Channel Upgrade Northcote to GJ Rd	$2,500,000		$2,500,000
Install new GPTs	$550,000		$550,000
Port Rd Median WSUD	$500,000		$500,000
Drainage Upgrades		$500,000	$500,000
Torrens River Lateral drain design		$40,000	$40,000
Water Resuse Strategy	$50,000		$50,000
Wetland operation investigation	$100,000		$100,000
Detention Basin Desgin	$75,000		$75,000
Charon Reserve Detention Basin	$50,000		$50,000
Detailed Design Drainge Upgrade		$150,000	$150,000
Total	$7,125,000	$1,990,000	$9,115,000

2028/2029	NEW	REPLACED	TOTAL
Providence Pl Drainage Works	$780,000		$780,000
Commerical Rd Drainage Upgrade	$720,000		$720,000
Lipson St New Drain	$320,000		$320,000
Charon Reserve Detention Basin	$1,360,000		$1,360,000
Port Centre East Pump Station Catchment Upgrades	$2,000,000		$2,000,000
Conversion of Soakage to Gavity Drainage	$1,500,000		$1,500,000
Install New GPT's	$250,000		$250,000
Localised Flood Mitigation Fund		$200,000	$200,000
New and Upgrades of Soakage Pits	$500,000		$500,000
Main Drain Upgrade	$650,000		$650,000
Replace GPTs		$300,000	$300,000
New Drainage Reserves		$50,000	$50,000
WSUD Locations	$50,000		$50,000
Hack St Pump Station	$75,000		$75,000
Port Centre West Pump Station Laterals	$300,000		$300,000
Conversion of Soakage to Gavity Drainage	$100,000		$100,000
Total	$8,605,000	$550,000	$9,155,000

2029/2030	NEW	REPLACED	TOTAL
Wellington St Drain Construction	$1,500,000		$1,500,000
Russel St Basin Upgrade	$500,000		$500,000
WSUD Construction	$300,000		$300,000
Port Centre East Pump Station Catchment Upgrades	$1,000,000		$1,000,000
Conversion of Soakage to Gravity Drainage	$1,500,000		$1,500,000
Jetty Rd - Pump station	$1,300,000		$1,300,000
Install New GPT's	$250,000		$250,000
Localised Flood Mitigation Fund		$200,000	$200,000
New and Upgrades of Soakage Pits	$500,000		$500,000
Main Drain Upgrade	$1,000,000		$1,000,000
Replace GPTs		$300,000	$300,000
New Drainage Reserves		$50,000	$50,000
WSUD Locations	$50,000		$50,000
Hack St Pump Station	$75,000		$75,000
Dunstan Rd Detailed design of Mitigation options from SMP	$100,000		$100,000
NAW Detailed design of Mitigation options from SMP	$100,000		$100,000
HEP Detailed design of Mitigation options from SMP	$100,000		$100,000
Port Centre West Pump Station Laterals	$300,000		$300,000
Detailed Design of Lateral Drain extenstions to reduce flow paths	$100,000		$100,000
Semaphore Rd Lateral Design	$30,000	$30,000	$60,000
Conversion of Soakage to Gravity Drainage	$100,000		$100,000
Local Area Flood Mitigation Investigations and Detailed Design		$150,000	$150,000
Total	$8,805,000	$730,000	$9,535,000

2030/2031	NEW	REPLACED	TOTAL
NAE Catchment Construction	$2,211,076		$2,211,076
PRE Catchment Construction	$574,713		$574,713
BIC Catchment Construction	$1,524,556		$1,524,556
Torrens River Construction	$1,067,921		$1,067,921
TRDA Construction	$973,877		$973,877
Lefevre Construction	$2,298,851		$2,298,851
Dry Creek Construction	$349,007		$349,007
Total	$9,000,000	$0	$9,000,000

CITY OF
Port Adelaide Enfield