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1. EXECUTIVE SUMMARY

1.1 What the council provides

Wodonga Council provides a range of man-made physical infrastructure assets to manage rainfall and runoff across the municipality.

This plan documents the council’s existing stormwater drainage infrastructure to deliver the service in a financially sustainable manner. The plan focuses primarily on stormwater drainage pits and pipe assets.

The council provides, operates and maintains the following stormwater assets:

- Pipelines and interconnected culverts;
- Pits, covers, inlets and outlets;
- Pollution and drainage control devices; and
- Retention/Detention basins and wetlands.

The council also regulates overland flow paths across properties to manage rare high intensity rainfall events.

By providing, renewing, maintaining and operating the stormwater drainage assets, enables council to:

- Reduces the risk of flooding of public and private property to design/acceptable levels;
- Reduces public health and safety risk from flooding and;
- Protects downstream environments though managing stormwater quality and velocity.

1.2 What it costs

The total annual life cycle cost of the existing infrastructure is mainly associated with the stormwater drainage network around roads and property rainfall runoff control. This is essentially managed by the underground pit and pipeline drainage system.

The extent to which stormwater assets are operated, maintained, renewed and upgraded to meet service levels is tied to the annual operating and capital budgets.

The total life cycle cost of an asset is determined from the capital cost of installing through to its disposal, inclusive of operating and maintenance costs over time. This currently results in an annual life cycle cost of 1.6 per cent of the asset replacement value.

The current capital cost of new stormwater drainage is currently $92,000 with the average operational cost of maintenance and cleaning $184,000 per year. Operational costs are very low due to the relatively young stormwater drainage assets. The long term capital renewal cost will rise to $1 million dollars in the next 30 to 40 years and the associated repair and maintenance costs are estimated to rise to at least $368,000 per annum.

The pit and pipe stormwater drainage system has a total replacement value of $92 million with an average life of 100 years which equates to a long term average annual renewal cost of 1 per cent of the asset replacement value. Council assets are relatively young with adequate renewal works expenditure of $92,000 per year is less than 10 per cent of the long term annual depreciation rate of $1 million.
The current annual operating and renewal cost of $276,000 per year is composed of $92,000 (capital renewal) and $184,000 in operational costs for repair and cleaning.

The peak long term capital renewal, maintenance and operating (daily) life cycle costs will occur in the next 30 to 40 years with an estimated total annual life cycle cost of $1.36 million in today’s dollars.

### 1.3 Plans for the future

The council plans to operate and maintain the stormwater drainage network to:

1. Maintain existing stormwater assets to provide a safe and functional drainage system;
2. Manage the impact of growth; and
3. Replace and upgrade ageing/deteriorated infrastructure.

### 1.4 Measuring performance

Stormwater assets will be maintained in a reasonably adequate structural condition with the original hydraulic design capacity essentially maintained over the course of the assets service life.

Defects found or reported may impact on the assets’ function, service life, capacity and safety, with repair and cleaning works implemented on a prioritised basis. At times, the existing pit/pipe infrastructure may not achieve desired standards, and subsequent upgrading works will need to be considered in the annual capital works program, subject to the level of risk and cost.

#### 1.4.1 Function

The council’s stormwater drainage network is maintained in partnership with other levels of government and stakeholders to manage rainfall runoff in a controlled sustainable manner.

Stormwater infrastructure assets are maintained at a level that provides reasonably reliable and functioning assets that will operate safely and reduce the likelihood of flood in accordance with acceptable design standards.

Key functional objectives include:

- Ensuring effective stormwater drainage system designs meet structural, hydraulic and environmental requirements; and
- Ensuring stormwater drainage systems are installed in accordance with construction standards.

#### 1.4.2 Safety

The majority of stormwater drainage assets are located below ground and hence are more difficult to maintain and inspect than surface assets such as roads. Typically, stormwater drainage infrastructure assets are very robust and are designed with adequate hydraulic capacity and with a structural capacity of more than 100 years.

Safety is mainly associated with:

- Ensuring adequate standards are implemented to meet flood exceedance probabilities; and
- Maintaining the network to achieve designed hydraulic capacity.
1.4.3 Reliability

For the stormwater drainage network, reliability is defined as a consistent level of structural and hydraulic service that is maintained by ensuring that assets function as designed and the system performs in a consistent and reliable manner.

Reliability is associated with regular proactive cleaning, and identifying assets for future renewal and systematic replacement before they fail the service level.

The council cleans and maintains stormwater pits, pipes, wetlands, retention basins and drainage channels to maximise the likelihood that the stormwater drainage network performs as designed to manage flows.

Unusually high rainfall events can dislodge, move and concentrate street debris which can block pipes and pits during a storm event. This is managed to an extent by regular street sweeping.

Works are prioritised within the constraints of the annual budget.

1.5 Community consultation

Community consultation is a part of council’s responsibility to ensure services align with the needs of the community. Physical infrastructure assets are provided to support services for the community.

This Stormwater Drainage Asset Management Plan is based on historical, technical and perceived levels of service. For stormwater drainage assets, the service provided is mainly associated with an effective and reliable stormwater drainage system that manages rainfall runoff in accordance with annual exceedance probability requirements generally achieved.

The process for the initial Stormwater Drainage Asset Management Plan is:
1. Prepare the initial Stormwater Drainage Asset Management Plan;
2. Submit the for consideration by internal departments and executive; and
3. Submit the initial Stormwater Drainage Asset Management Plan for consideration/adoption by the council.
4. Submit for consideration by the water authorities and the community.

Historical levels of service have been used in this Stormwater Drainage asset plan, whereas an Advanced Asset Management Plan requires the asset custodian to quantify the desired and affordable services to be delivered through detailed community consultation.

In the future, a particular asset owner/custodian would incorporate community consultation by:
5. Seeking community input to determine Levels of Service;
6. Considering community comment, upgrading and finalising an Advanced Asset Management Plan;
7. Submitting the Advanced Asset Management Plan for internal consideration; and
8. Submitting the Advanced Asset Management Plan to the council to consider and adopt.

1.6 Key findings

The production of this Stormwater Drainage management asset plan coincides with an extensive data cleansing project in 2015-2016, resulting in significantly improved data quality.
Stormwater assets are essentially subsurface assets that are generally difficult to inspect. Therefore there is a reliance on determining performance based on historical industry asset information. Concrete pipe and pit assets are generally very durable and robust with a lifespan of about 100 years. Subsurface pipe surveys will be required in the future to verify the condition/performance and asset value.

Wodonga has relatively young stormwater drainage assets with early stormwater pipe/pit systems installed in the early 1950s. The current written-down asset value impacted from age/deterioration indicates that, on average, the stormwater drainage assets are only two-thirds through their asset life. The current demand for asset renewal from failure, due to age and poor condition is negligible. As expected, the relatively young stormwater drainage assets are currently generating only 10 per cent of the long term average asset renewal demand.

Over the last 10 years data confirms increasing customer requests coinciding with higher than average annual rainfall which may be related to climate change. Customer service requests range from just over 100 to 500 per year with the average being 300 requests per year. It appears that the current level of maintenance is adequate for average rainfall events.

A consistent standard for stormwater drainage infrastructure design has been applied for many years. In recent years, Wodonga Council and other similar authorities have adopted a consistent standard approach to designing and constructing stormwater drainage by applying the Infrastructure Design Manual, which has assisted developers and designers.
2. INTRODUCTION

2.1 Background

This Stormwater Drainage Asset Management Plan demonstrates responsive management of assets to comply with regulatory requirements and to communicate current and future funding to provide the current level of service.

The Stormwater Drainage Asset Management Plan is to be read in conjunction with the Road Management Plan and the Infrastructure Design Manual.

Wodonga's stormwater drainage management across the municipality can be broadly broken into:

- Pit and pipe infrastructure stormwater drainage system;
- Urban Water Sensitive Urban Design, wetlands, retarding basins; and
- Flood and waterway management.

This plan considers the major infrastructure stormwater drainage assets, generically identified as the stormwater drainage pit/pipe assets. Dams and wetlands that assist with stormwater detention, retention and water treatment are assets that – once established – generally require only maintenance and cleaning, rather than replacement, such as the pit/pipe network. Environmental devices such as trash racks and siltation/pollution control devices are part of the pit/pipe network.

Floodway and waterway management is initially addressed by planning and engineering departments through the use of flood studies either commissioned by the council or required as part of development proposals. Resulting stormwater drainage infrastructure and planning overlays, along with input from the Catchment Management Authority enables the overall catchments to be managed.

This Stormwater Drainage Asset Management Plan covers the following major infrastructure assets (see Table 2.1.1).

Table 2.1.1 Assets covered by this plan, valuation data for 2016-2017

<table>
<thead>
<tr>
<th>Asset category</th>
<th>Replacement asset value ($)</th>
<th>Current asset value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pits</td>
<td>18,176,781</td>
<td>12,732,435</td>
</tr>
<tr>
<td>Pipes</td>
<td>73,088,903</td>
<td>48,349,585</td>
</tr>
<tr>
<td>Culverts</td>
<td>437,891</td>
<td>321,062</td>
</tr>
<tr>
<td>Headwalls</td>
<td>348,890</td>
<td>245,483</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>92,052,465</strong></td>
<td><strong>61,648,565</strong></td>
</tr>
</tbody>
</table>

Notes:
1) Large/major culverts are considered within the Bridge and Major culvert asset plan
2) Open roadside channels/table drains are contained within the Road asset plan
3) Wetlands and detention/retention control devices to be valued in the future asset plan
The key stakeholders in this Drainage infrastructure and asset management plan are:

**Table 2.1.2 Stakeholders involved in this plan**

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset custodian</td>
<td>Regulatory authority responsible for the care and control of the stormwater drainage network to service community service needs</td>
</tr>
<tr>
<td>Asset management</td>
<td>Responsible for development of Stormwater Drainage Asset Management Plan and renewal modelling</td>
</tr>
<tr>
<td>Executive</td>
<td>Management - responsible for corporate review</td>
</tr>
<tr>
<td>Councillors</td>
<td>Council authority - Approval of Stormwater Drainage Asset Management Plan</td>
</tr>
<tr>
<td>Community</td>
<td>General public - Service level recipients</td>
</tr>
</tbody>
</table>

### 2.2 Goals and objectives of asset management

Wodonga Council exists to provide services for its community and some of these services are underpinned by infrastructure assets. The council has built some infrastructure assets, purchased others, or acquired assets from developers.

The council’s goal in managing infrastructure assets is to meet the required level of service in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Taking a life-cycle approach;
- Developing cost-effective management strategies for the long term;
- Providing a defined level of service and monitoring performance;
- Understanding and meeting the demands of growth through demand management and infrastructure investment;
- Managing risks associated with asset failures;
- Using physical resources sustainably; and,
- Continuously improving asset management practices.

This Stormwater Drainage Asset Management Plan is prepared under the direction of the council’s vision, mission, goals and objectives.

Wodonga Council’s vision is:  
*Wodonga is a progressive, well-planned, growing city that is affordable, offers an abundance of opportunities and led by strong empathetic stewardship*

Wodonga Council’s mission is:  
*We will strengthen our community in all that we do*
Table 2.2 Wodonga Council’s goals and how these are addressed in this plan

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Outcome objective</th>
<th>Strategic action</th>
<th>Priorities and actions</th>
<th>How they are addressed in AMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable and forward-looking</td>
<td>Protect, enhance and manage our unique natural and built environments, planning for growth. Demonstrating leadership and stewardship now and into the future.</td>
<td>Implement strategies and allocate resources to continue ongoing delivery and management of the council’s assets across the city.</td>
<td>Deliver a strategic resourced and informed program to renew, upgrade and build community assets to meet the current and future needs of the community.</td>
<td>This plan contributes to the long term management and improvement of council assets in terms of strategic asset planning. Asset condition and general defect data has been collected and used for this plan and passed onto engineering.</td>
</tr>
</tbody>
</table>

2.3 Plan framework

Key elements of the plan are:

- Levels of service – specify the services and levels of service to be provided by the council;
- Future demand – how this will impact on future service delivery and how this is to be met;
- Life cycle management – how the council will manage its existing and future assets to provide the required services;
- Financial summary – what funds are required to provide the required services;
- Asset management practices – to manage and maintain assets;
- Monitoring – how the plan will be monitored to ensure it is meeting the council’s objectives; and
- Asset management improvement plan.

2.4 Core and advanced asset management

This plan is prepared as a core-to-intermediate asset management plan, in accordance with the International Infrastructure Management Manual. The plan contains more than the minimum requirements of a basic plan, with legislative and organisational requirements for sustainable service delivery along with, long-term financial planning and reporting.

Future revisions of this plan will move towards advanced asset management using a ‘bottom up’ approach, with additional information on individual assets and programs to meet agreed service levels.
3. LEVELS OF SERVICE

3.1 Customer research and expectations

Wodonga Council participates in the Victorian Local Government Customer Satisfaction survey which benchmarks the performance of most councils across Victoria. This extensive telephone survey polls residents to determine the importance of a service and the council’s performance of that service.

The survey below is not specific to Wodonga Council’s stormwater drainage assets, however an overall perspective can be gained on the general performance of pit and pipe assets as they form a critical part of the road network.

Table 3.1.1 Victorian Community Satisfaction Survey 2017

<table>
<thead>
<tr>
<th>Rating area</th>
<th>Importance level</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wodonga Council</td>
<td>Regional Average</td>
</tr>
<tr>
<td>Local Roads and Paths</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>Wodonga Council overall performance for all services</td>
<td>60</td>
<td>58</td>
</tr>
</tbody>
</table>

The 2017 Victorian Community Satisfaction Survey data indicates that Wodonga is performing well compared to the average regional and state performance index. The road network contains the pit/pipe infrastructure assets which channels rainfall runoff from properties and roads. The performance of the road assets is associated with the stormwater/drainage network.

In addition to the above survey, the council uses its own customer service request system for tracking and actioning requests from the public and council staff. The system is also used to initiate work requests that have resulted from infrastructure inspections and service requests.

The level of service to respond varies, depending on the type and urgency of the request. One service level for stormwater assets has been identified in the Road Management Plan, which has been advertised to the community through the legislated Road management act and Local Government 1989, section 223 process.

Over 13,000 requests for services were lodged with the council in 2016. Approximately one-third of these requests are attributed to infrastructure asset repairs, including bridges and major culverts. The 2016 monthly customer performance indicates an average response falls within the required timeframe of 90 per cent, with only three monthly records just below the performance target of 90 per cent.

Wodonga Council regularly inspects road pit stormwater drainage assets and identifies maintenance issues and schedules the necessary repairs in accordance with the intervention levels set in the Road Management Plan.

The council sought community input on levels of service to be delivered. Public community consultation occurred during 2017 for the existing Road Management Plan. The plan was reviewed and updated as required, in accordance with the Road Management Act 2004 and also the Road Management Regulations 2005.
Table 3.1.2 Stormwater/drainage service requests (June to July)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td>12</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Maintenance</td>
<td>119</td>
<td>63</td>
<td>109</td>
<td>219</td>
<td>412</td>
<td>333</td>
<td>177</td>
<td>168</td>
<td>179</td>
<td>224</td>
<td>200</td>
</tr>
<tr>
<td>Damage</td>
<td>39</td>
<td>48</td>
<td>58</td>
<td>280</td>
<td>50</td>
<td>162</td>
<td>92</td>
<td>46</td>
<td>120</td>
<td>29</td>
<td>92</td>
</tr>
<tr>
<td>Subtotal</td>
<td>162</td>
<td>117</td>
<td>173</td>
<td>504</td>
<td>477</td>
<td>515</td>
<td>281</td>
<td>216</td>
<td>304</td>
<td>263</td>
<td>301</td>
</tr>
</tbody>
</table>

From 2010 to 2012, rainfall was 24 per cent to 49 per cent higher than the 20-year average annual rainfall of 614mm per year. A significant increase of 65 per cent in maintenance requests from 2010 to 2012 correlates with increased rainfall. In 2008 rainfall was 20 per cent less than the average, coinciding with a reduction in the number of requests. Therefore, proactive management of stormwater requests could be undertaken by looking at the predicted annual rainfall for the coming year. Additional resources would need to be allocated to enable additional maintenance and cleaning.

3.2 Legislative requirements

Wodonga Council has a range of legislative requirements to meet, including Commonwealth and state legislation, and state regulations.

Table 3.2 Legislative requirements

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local Government Act 1989</strong></td>
<td>Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by infrastructure and asset management plans for sustainable service delivery.</td>
</tr>
<tr>
<td><strong>Road Management Act 2004</strong></td>
<td>Enables the council to set out its own specific Road Management Plan and intervention levels. This enables councils to manage their network to provide a safe and responsive network for the public, in order to manage their civil liability. Road authorities lost their immunity through the removal of nonfeasance which gave rise to the 2004 legislation in Victoria.</td>
</tr>
<tr>
<td><strong>Road Management (General) Regulation 2005</strong></td>
<td>Sets out additional matters for the review and amendment of a Road Management Plan not contained in the 2004 Road Management Act for consultation with the community. The regulation also prescribes certain matters that must be recorded on a register of public roads and provides for the protection of roads and property. Additionally, the regulation prescribes particulars for a condition report and incident report, as well as making provision for infringement notices, fees and charges. It also identifies certain provisions when a road authority may exercise its power in relation to advertisements on roads, and confers certain appeal rights.</td>
</tr>
</tbody>
</table>
3.3 Current levels of service

Wodonga Council has defined service levels in two terms. Community levels of service relate to how the community receives the service in terms of safety, quality, quantity, reliability, responsiveness, cost/efficiency and legislative compliance. Supporting these are operational or technical measures of performance developed to support community levels of service.

Table 3.3 Current service levels

<table>
<thead>
<tr>
<th>Key performance measure</th>
<th>Level of service</th>
<th>Performance measure process</th>
<th>Performance engineering target</th>
<th>Current performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMMUNITY LEVELS OF SERVICE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>Adequate collection and disposal of stormwater</td>
<td>Customer service requests</td>
<td>Less than 300 requests per year</td>
<td>301 total requests based on the 10 year average</td>
</tr>
<tr>
<td>Function</td>
<td>Ensure networks performs as intended</td>
<td>Customer maintenance service requests</td>
<td>Less than 200 requests per year</td>
<td>200 maintenance requests per year based on 10 year average</td>
</tr>
<tr>
<td>Safety</td>
<td>Provide an acceptable safe network</td>
<td>Number of requests for upgrading</td>
<td>Less than 9 ‘new / upgrade’ requests per year</td>
<td>9 requests based on the 10-year average</td>
</tr>
<tr>
<td><strong>TECHNICAL LEVELS OF SERVICE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Manage the quality of the network by renewing and upgrading in a timely manner</td>
<td>Adequate capital works program targeted and implemented to maintain or upgrade the network</td>
<td>Annual capital works budget proposed and implemented</td>
<td>2016-2017 annual capital works budget expended</td>
</tr>
<tr>
<td>Stormwater maintenance</td>
<td>Provide targeted inspection and cleaning services in cost-effective manner</td>
<td>Adequate operational stormwater drainage budget determined</td>
<td>Proactive repair and inspections prior to seasonal winter wet less than 200 requests</td>
<td>Reduction in maintenance requests, 200 requests per year</td>
</tr>
<tr>
<td>Safety</td>
<td>Flooding to residences</td>
<td>Known flooding issues identified/ addressed as budget permits</td>
<td>Progressively eliminate known flooding to properties during low to moderate rainfall intensity events</td>
<td>Current known flood prone areas identified</td>
</tr>
</tbody>
</table>
3.4 Desired levels of service

At present, indications of desired levels of service are obtained from various sources including the Victorian Customer Satisfaction Survey, residents' feedback to councillors and staff, the number of service requests and correspondence. The council has yet to quantify desired levels of service. This will be done in future revisions of this plan.

4. FUTURE DEMAND

4.1 Demand forecast

Factors affecting demand include population change, changes in demographics, seasonal factors, consumer expectations, economic factors, environmental aspects etc.

Wodonga Council’s stormwater assets are relatively young with a median age of 22 years and an estimated service life of 100 years. The earliest pipe installation was approximately 1948; hence the oldest pit/pipe asset in the network is only two-thirds through its asset life.

Wodonga has had considerable population growth over the last 60 years starting in the 1950s, with the current growth rate at approximately 2 per cent. The pipe/pit network will increase in proportion to the population as the demand for housing grows, and the subsequent need for stormwater infrastructure within the road network is required.

Figure 4.1 Historical and predicted population growth
The current average expansion of the asset base is 1.6 per cent for the stormwater network, based on the expansion rate over the past 20 years.

Demand factor trends and impacts on service delivery are summarised, refer Table 4.1.

### Table 4.1 Demand factors, projections and impact on services

<table>
<thead>
<tr>
<th>Demand factor</th>
<th>Present position (June 2016)</th>
<th>Previous growth rate</th>
<th>Expected growth rate</th>
<th>Projection for 2026</th>
<th>Impact on services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>39,844</td>
<td>~1.7 per cent (1990 ~27,307)</td>
<td>2.1 per cent</td>
<td>~49,024</td>
<td>Assets continue to increase with expected population increase</td>
</tr>
<tr>
<td>Road Network (sealed and gravel)</td>
<td>480 km</td>
<td>13 per cent (1990 ~130 km)</td>
<td>3 per cent</td>
<td>~620 km</td>
<td>Increasing road pavement, kerb, seal assets</td>
</tr>
<tr>
<td>Bridge and Major Culverts</td>
<td>72</td>
<td>0.6 per cent (1990 ~ 64)</td>
<td>1.8 per cent</td>
<td>~88</td>
<td>Increasing asset stock, growth expected to be in culverts</td>
</tr>
<tr>
<td>Stormwater</td>
<td>~ 338km</td>
<td>3 per cent (~6km per year)</td>
<td>1.6 per cent</td>
<td>~396 km</td>
<td>Increased maintenance and operating costs</td>
</tr>
</tbody>
</table>

### 4.2 Changes in technology

Technology changes are forecast to have little effect on the delivery of stormwater drainage services covered by this plan. Recent changes in technology relate to extending an asset’s service life by pipe relining or using directional boring to enable pipe/s to be installed without trenching in congested areas.

In recent years the adoption of sub-450mm diameter plastic stormwater pipes to replace heavy concrete pipes is becoming standard practice, however the long term durability of plastic in the field is still to be validated. In general, concrete products are likely to be the preferred materials for stormwater pipes greater than 450mm diameter and for pits.

### Table 4.2 Changes in technology and forecast effect on service delivery

<table>
<thead>
<tr>
<th>Technology change</th>
<th>Effect on service delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction of sub-450mm diameter plastic pipes</td>
<td>Negligible impact on service delivery if installed in accordance with manufacturer and council requirements.</td>
</tr>
<tr>
<td>Introduction of lined plastic pipes and concrete pipes</td>
<td>Extend the life of the pipe assets increasing service life</td>
</tr>
<tr>
<td>Directional boring is becoming more common and can accommodate up to 300mm diameter pipes</td>
<td>Improved technique to renew pipes in congested areas.</td>
</tr>
</tbody>
</table>

Relining of concrete pipes is now a relatively common practice to extend the life of the asset. Pipe relining has been applied generally more commonly applied to small, sub-450mm diameter pipes, but this technology is also being applied to larger diameter pipes as it reduces the need for costly excavation and full replacement.
4.3 Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and also providing new assets to meet growth. Demand management practices include non-asset solutions, insuring against risks and managing failures. Opportunities identified to date for demand management are shown in Table 4.3. Further opportunities will be developed in future revisions of this infrastructure and asset management plan.

Table 4.3 Demand Management Plan summary

<table>
<thead>
<tr>
<th>Demand driver/Service activity</th>
<th>Demand management plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>New land developments driven by population growth</td>
<td>All new developments will be managed through the planning and engineering subdivision process with Development Control Plans enabling contributions from new developments allocated to new stormwater drainage systems</td>
</tr>
<tr>
<td>Ongoing ageing infrastructure</td>
<td>Renewal and repair associated with deterioration will increase over time as the assets continue to age and the quantity increases from growth.</td>
</tr>
</tbody>
</table>

4.4 New assets from growth

The new assets required to meet growth will be acquired mainly from land developments, with negligible new stormwater assets generated by council works. New assets are expected to follow similar rates of annual growth of approximately 1.6 per cent which equates to an increase in the asset length of approximately 6km per year.

Major trunk stormwater drainage infrastructure will be required in new catchment areas such as the Leneva growth area. Development control plans and drainage/flood studies assist with managing stormwater runoff in a controlled manner.

Acquiring new assets will commit the council to fund ongoing operations and maintenance costs. These future costs are identified and considered in developing forecasts of future operating and maintenance costs.
5. **Life Cycle Management Plan**

The life cycle management plan details how the council plans to manage and operate the assets at the agreed levels of service (defined in section 3) while optimising life cycle costs.

### 5.1 Background data

The assets covered by this infrastructure and asset management plan are shown in Table 5.1.

**Table 5.1 Asset summary**

<table>
<thead>
<tr>
<th>Category</th>
<th>Number or length</th>
<th>Asset replacement value (per cent)</th>
<th>Asset current value (per cent)</th>
<th>Annual deterioration (per cent) rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pits</td>
<td>10,115</td>
<td>19.3</td>
<td>20.1</td>
<td>1</td>
</tr>
<tr>
<td>Pipes</td>
<td>9,928 (338 km)</td>
<td>79.7</td>
<td>78.9</td>
<td>1</td>
</tr>
<tr>
<td>Culverts</td>
<td>34</td>
<td>0.6</td>
<td>0.6</td>
<td>1</td>
</tr>
<tr>
<td>Headwalls</td>
<td>333</td>
<td>0.4</td>
<td>0.4</td>
<td>1</td>
</tr>
</tbody>
</table>

The age distribution of the council’s assets is shown below.

**Figure 5.1 Typical age distribution of the council’s stormwater drainage assets based on pipe age.**

1) Pipe age is the largest asset component in the stormwater system and the age distribution is expected to be similar to other asset components.
5.1.2 Asset capacity and performance

Wodonga Council’s services are generally provided to meet design standards where these are available. Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

Table 5.1.2 Known service performance deficiencies

<table>
<thead>
<tr>
<th>Location</th>
<th>Service deficiency</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park Lane levee bank</td>
<td>Flooding to residential property/s</td>
<td>Currently being addressed</td>
</tr>
<tr>
<td>Cypress Court</td>
<td>Flooding to residential property/s</td>
<td>Flooding rare, ~1:100</td>
</tr>
<tr>
<td>Cambourne Court</td>
<td>Flooding to residential property/s</td>
<td>Once-off occurrence</td>
</tr>
<tr>
<td>Ware Avenue</td>
<td>Flooding to residential property/s</td>
<td></td>
</tr>
</tbody>
</table>

The service deficiencies noted in Table 5.1.2 were identified from historical engineering flood knowledge, customer requests and flood studies undertaken on major river/creek systems. The likelihood of flooding within the Wodonga municipality is relatively low, given the historical planning of developments across the municipality. Further reviews and updating of information will be required in the future.

5.1.3 Asset condition

The condition distribution of the council’s assets is based on the age profile of the assets, Figure 5.1 with the profile transformed into a smoothed profile as identified in Figure 5.1.4 to enable predictive modelling.

The assumption of a linear relationship between age and condition is a common industry assumption that is based on the performance of the concrete pipe and pit material and reinforced concrete, with an asset service life of 100 years.

The biggest impact on the performance of pipes is based on the quality of the installation and the pipe joint type. Flush jointed pipes are prone to misalignment and practices have now changed with the adoption of socketed pipes, which are highly resistant to pipe / joint displacement.

Asset condition is typically measured using a zero to 10 rating system. Descriptions for each rating are described below.
Table 5.1.3. Rating description of condition ('Moloney' condition rating scale)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>New asset.</td>
</tr>
<tr>
<td>1</td>
<td>Near new structure, in excellent condition.</td>
</tr>
<tr>
<td>2</td>
<td>Structure in excellent condition, with very slight/negligible signs of deterioration.</td>
</tr>
<tr>
<td>3</td>
<td>Structure in very good condition, with minor deterioration, with no loss of service.</td>
</tr>
<tr>
<td>4</td>
<td>Asset in good overall condition with some obvious signs of deterioration evident, some slight impairment to service.</td>
</tr>
<tr>
<td>5</td>
<td>The asset is in an overall fair condition, deterioration would be obvious, some loss of service evident, maintenance costs starting to rise.</td>
</tr>
<tr>
<td>6</td>
<td>A structure in fair to poor condition, with obvious deterioration and service loss occurring and increasing maintenance costs.</td>
</tr>
<tr>
<td>7</td>
<td>Structure in poor overall condition, deterioration high and limiting service. Loss of structural strength commences in various areas of the structure, possibly giving rise to load limiting.</td>
</tr>
<tr>
<td>8</td>
<td>Very poor structure with serviceability heavily impacted, maintenance costs high and asset requiring prompt attention for consideration of renewal, loss of structural strength possibly in one or more areas.</td>
</tr>
<tr>
<td>9</td>
<td>Structure in extremely poor overall condition with severe serviceability problems, definite loss of structural strength in several key areas.</td>
</tr>
<tr>
<td>10</td>
<td>Asset no longer in service, structural failure, no longer providing service.</td>
</tr>
</tbody>
</table>

In stormwater drainage assets, the pipe assets contain almost 80 per cent of the total asset value and hence their condition distribution is the main renewal driver. The adopted smoothed age-based condition profile broken into the 11 ‘Moloney’ condition rating scale is represented by the following graph.

The intervention level of condition nine is applied to stormwater drainage assets, where the asset has negligible remaining service life and remaining value is very low. The extremely low percentage of condition nine assets, implies minimal renewal expenditure requirements.
Whilst stormwater drainage asset renewal is primarily driven by the condition of the asset, there are random, miscellaneous issues, we term probabilistic damage/renewal that occurs outside the regular maintenance and deterioration associated with aged infrastructure. The current expenditure is $92,000 per year.

5.1.4 Asset valuations

The value of assets as at 2016-2017 covered by this Stormwater Drainage Asset Management Plan is summarised below. Assets were valued in 2015-2016 based on an extensive asset data review along with visual photographic aerial inspections. Assets are valued at greenfield rates in accordance with the Victorian Auditor General’s Office requirements:

- Current replacement cost $92,052,465;
- Depreciated replacement cost (written down value) $61,648,565; or
- Annual Depreciation $948,986.

The 50-year forward projection graph demonstrates the effect on the overall asset condition as indicted by the red line. The level of funding predicted to maintain all assets below the intervention level of condition nine increases, which is consistent with the current young asset profile and ongoing aging infrastructure. Plateauling of the proposed renewal expenditure starts to occur from around 2060. The maximum renewal expenditure has been determined at $1 million per year over an asset base of approximately $100 million, which is consistent with the 100-year asset service life.
Table 5.1.4 presents a simplified approach to asset sustainability indicators, but provides a guide. The calculation of the industry long term sustainability indicator of renewal expenditure to the deterioration of the asset, assumes assets of a normal distribution. In reality, stormwater assets of Wodonga council are relatively young and currently have minimal renewal requirements. At this time only a very small percentage of assets have reached the end of their service life and costs from maintenance and cleaning are $184,000.

The calculated 0.1 per cent long term consumption being met by renewal is misleading. The real demand is not equivalent to the average rate of consumption as Wodonga Council assets are very young. The real demand is the rate at which the assets are currently expiring. Renewal demand based on current levels of expenditure is estimated at 0.01 per cent which is the current average renewal expenditure of $92,000 divided by the asset replacement value $92,052,465.

Table 5.1.4 Asset sustainability indicators

<table>
<thead>
<tr>
<th>Asset sustainability indicators (per cent)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual asset consumption (annual depreciation/current replacement value)</td>
<td>1.0</td>
</tr>
<tr>
<td>Annual asset renewal (average annual renewal expenditure/current replacement value)</td>
<td>0.1</td>
</tr>
<tr>
<td>Annual asset expansion/upgrade (average annual asset growth/current number of structures)</td>
<td>1.8</td>
</tr>
<tr>
<td>per cent of long term consumption being met by renewal funding (less than 100 per cent means that the</td>
<td>0.1</td>
</tr>
<tr>
<td>average long term renewal is not being met by current renewal funding)</td>
<td></td>
</tr>
</tbody>
</table>
For Wodonga, there are negligible stormwater drainage assets currently expiring, as the oldest assets are less than the adopted total service age of 100 years. At the present time the annual renewal funding from the capital works program is very small and appropriate at approximately $92,000 per year.

### 5.2 Risk management plan

An assessment of risks associated with service delivery from infrastructure assets has identified critical risks to the council. A risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should an event occur, the resulting risk rating and the development of a risk treatment plan for non-acceptable risks.

Critical risks, being those assessed as ‘Very High’ - requiring immediate corrective action and ‘High’ – requiring prioritised corrective action. The risk identified in the infrastructure risk management plan are summarised in Table 5.2, which have been qualitatively assessed as low to medium risks.

**Table 5.2 Critical risks and treatment plans**

<table>
<thead>
<tr>
<th>Asset at risk</th>
<th>Risk</th>
<th>Risk rating</th>
<th>Risk treatment plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBD flooding</td>
<td>Pit/Pipe blocked</td>
<td>Low</td>
<td>Cleaning of pits and street sweeping</td>
</tr>
<tr>
<td>Isolated flooding to residences</td>
<td>Pit/Pipe blocked</td>
<td>Low to Medium</td>
<td>Systematic programmed inspections of the network</td>
</tr>
<tr>
<td>Property/Land flooding</td>
<td>Pit/Pipe blocked, Flood prone land</td>
<td>Low</td>
<td>Street sweeping and selective pit cleaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Implementation of capital projects to provide higher protection</td>
</tr>
<tr>
<td>Flooding to residences</td>
<td>Pit/Pipe blocked, Flood prone property</td>
<td>Low, Medium</td>
<td>Street sweeping and selective pit cleaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Implementation of capital projects to provide higher protection</td>
</tr>
</tbody>
</table>

### 5.3 Routine maintenance plan

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the stormwater assets need cleaning or they fail and need immediate repair to make the asset operational again.

#### 5.3.1 Maintenance plan

Maintenance includes reactive, planned and cyclic maintenance work activities.

Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions. Generally this type of maintenance is more expensive than cyclic and planned maintenance.
Planned maintenance is repair work that is identified and managed through a maintenance management system. Maintenance activities include inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting. For stormwater assets this would encompass cleaning and repair.

Cyclic maintenance is generally the replacement of higher value components/sub-components of assets that is undertaken on a regular cycle. For stormwater drainage, cyclic maintenance could be regular tree root removal, inspection of CBD pipes and pits to reduce the likelihood of flooding in high intensity rainfall events.

The table below includes both the cost for repairs and cleaning. A review of invoices indicates that 35 per cent of the annual costs can be attributed to cleaning works. Over the last ten years the total annual operating and maintenance cost has been $184,000, with the estimated average annual maintenance cost at $119,600 and cleaning $64,400.

Maintenance expenditure trends are shown in Table 5.3.1.

**Table 5.3.1 Maintenance expenditure trends**

<table>
<thead>
<tr>
<th>Stormwater</th>
<th>Cleaning and maintenance $</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016</td>
<td>173,325</td>
</tr>
<tr>
<td>2014-2015</td>
<td>176,635</td>
</tr>
<tr>
<td>2013-2014</td>
<td>179,695</td>
</tr>
<tr>
<td>2012-2013</td>
<td>208,379</td>
</tr>
<tr>
<td>2011-2012</td>
<td>196,389</td>
</tr>
<tr>
<td>2010-2011</td>
<td>173,325</td>
</tr>
<tr>
<td>2009-2010</td>
<td>180,679</td>
</tr>
<tr>
<td>2008-2009</td>
<td>177,936</td>
</tr>
<tr>
<td>2007-2008</td>
<td>186,366</td>
</tr>
<tr>
<td>2006-2007</td>
<td>148,968</td>
</tr>
</tbody>
</table>

Maintenance and operational expenditure levels are reasonably consistent over the last 10 years. The rise in operational expenditure in 2010 to 2013 occurred during years of unusually high rainfall above the long term average. The rise in expenditure indicates that proactive cleaning to negate unexpected high intensity rainfall events may not be occurring and therefore service levels may be at a level that is generally satisfactory for average rainfall events.
Assessment and prioritisation of reactive and cyclic/planned maintenance is undertaken by Council staff using inspection information, experience and judgement. The road management plan identifies several stormwater drainage intervention levels and the frequency of inspection.

5.3.2 Standards and specifications

Maintenance work is generally performed on concrete pipes and pits and hence the maintenance specifications and standards applied are associated with concrete.

The extract below from the current 2017 road management plan identifies the frequency of inspections for Collector, Service and Local roads. The frequency has been determined on the basis of risk with programmed inspections occurring at three, six and 12 months respectively.

In relation to stormwater drainage assets, the service time for Drainage pit lid for ‘making safe’ is 10 business days for either, Collector, Service and Local roads.

Table 5.3.2 Frequency of inspections

<table>
<thead>
<tr>
<th>Asset group*</th>
<th>Hierarchy category</th>
<th>Inspection type, frequency and department responsible to undertake inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Programmed</td>
</tr>
<tr>
<td>Sealed roads</td>
<td>2. Collector</td>
<td>Three months</td>
</tr>
<tr>
<td></td>
<td>3. Service</td>
<td>Six months</td>
</tr>
<tr>
<td></td>
<td>4. Local access</td>
<td>Twelve months</td>
</tr>
</tbody>
</table>

Pits and pipes are cleaned following maintenance requests from the public and from works programs to areas of known root infestation and high leaf build up. The CBD is also targeted for regular cleaning as a proactive means of ensuring the network performs at its maximum level.

The standards for the design and sizing of pipes and pits is contained within the Infrastructure Development Plan which is based on the application of the engineering design guide Australian rainfall and runoff.

5.3.3 Summary of future costs

Future maintenance costs are forecast to trend in line with the value of the asset stock as it increases in size. Maintenance costs have stayed relatively stable in the last ten years with slight increases in periods of higher than average annual rainfall. An annual increase in maintenance and cleaning costs of between 1 to 2 per cent per annum is expected, but this will rise with climate change as more high intensity rainfall events are expected to occur in summer periods.

Deferred planned maintenance works are generally projects where maintenance has been deferred due to a lack of budget, these are generally of low risk and considered as requests are received.
Maintenance is funded from the council’s operating budget which is further discussed in Section 6.2.

5.4 Renewal/replacement plan

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

5.4.1 Renewal plan

Asset renewal expenditure is estimated based on the remaining life obtained from the asset register with an allowance for renewal from probabilistic events associated with a range of random causes.

The general priority ranking criteria for renewal projects is detailed below. Essentially high importance is assigned to failure that has the potential to result in flooding to commercial premises and residential homes and lower priority associated with flooding to paddocks and land.

Table 5.4.1 Renewal risk priority ranking criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Importance/ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged failing pipe network within CBD that will likely result in flooding to CBD streets and/or commercial establishments</td>
<td>High to Medium</td>
</tr>
<tr>
<td>Aged failing pipe network within commercial/industrial zone</td>
<td>High to Medium</td>
</tr>
<tr>
<td>Aged failing pit/pipe network that may result in residential flooding</td>
<td>Medium</td>
</tr>
<tr>
<td>Aged failing pit/pipe network that may result in flooding and erosion to land</td>
<td>Low</td>
</tr>
</tbody>
</table>

Renewal is typically undertaken using ‘low-cost’ renewal methods where practical. The aim of ‘lowcost’ renewals is to restore the service potential or future economic benefits of the asset by renewing the assets at a cost less than the cost of full replacement. Examples of low cost renewal include pipe relining and other similar techniques if the structural integrity of the pipe is adequate and the hydraulic capacity is adequate.

5.4.2 Renewal standards

Renewal work is carried out in accordance with the following standards and specifications:
- Infrastructure Design Manual;
- Hydraulic design manuals and Australian Rainfall and Runoff; and
- Manufacturers’ specifications.
5.4.3 Summary of future costs

Future renewal costs are forecast to increase over time as the asset stock ages. The asset stock is relatively young with the median asset construction date of 1995. The long term average annual depreciation or maximum renewal liability of approximately $1 million / annum will not occur for approximately 30 to 40 years. The costs are summarised in the Figure 5.4.3.

Figure 5.4.3 Projected 20-year renewal costs

Over the next 20 years the current annual renewal expenditure will need to increase, alternatively without increased expenditure, the percentage of failed assets over the intervention level is estimated to rise to 3 per cent. If the current level of renewal funding of $92,000 per year was not increased some 300 failures will arise over the next 20 years that may lead to flooding of properties and residences.

Renewal expenditure, as estimated by the grey columns, will need to gradually increase to negate progressive failure of the stormwater system. Renewal demand is estimated at over $450,000 in 20 years. This equates to an annual increase of approximately $20,000 per annum above the current annual renewal of $92,000.

Deferred renewals are those assets identified for renewal and not scheduled for renewal in the capital works programs. Currently council does not have any significant deferred renewal other than those non-renewal projects which are upgrade and age related ongoing renewal, as identified in the following section.

Renewals are to be funded from the council’s capital works program and grants, where available. This is further discussed in Section 6.2.
5.5 Creation/acquisition/upgrade plan

Asset creation/acquisition/upgrade are works that create new assets that did not previously exist. At times works which upgrade or improve an existing asset beyond its existing hydraulic and/or structural capacity can also fall into the creation/acquisition/upgrade category. These types of assets may occur from growth, social or environmental needs. Assets are typically acquired at no cost to the council from land development during the creation of subdivisions. These assets from growth are considered in Section 4.4.

5.5.1 Selection criteria

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

Table 5.5.1 New assets priority ranking criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Importance/ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding due to undersized network pipes. Inundation occurring on regular basis at unacceptably high Annual Exceedance Probability to the residence/s</td>
<td>Medium</td>
</tr>
<tr>
<td>Inundation to residences every 5 to 10 years due to poorly designed stormwater drainage network</td>
<td>Medium</td>
</tr>
<tr>
<td>Infrequent flooding due to residence built in flood zone prior to establishment of flood mapping and levels</td>
<td>Low to Medium</td>
</tr>
<tr>
<td>Inappropriately located low set residence built on low side of steep road gradient where overland flow path occurs, contrary to good building practice.</td>
<td>Very Low</td>
</tr>
</tbody>
</table>

Four projects have been identified in section 5.1.2 with an estimated cost of $285,000. Currently flooding at four sites during periods of very high rainfall infrequently occurs, the exception being Ware Avenue which has a slightly higher recurrence of flooding. Priorities may be influenced by the level of grant funding available as in the case of the Park lane levee bank, which is externally funded for $70,000 with $30,000 from the council. *Note: Park Lane is not in the 2017-2027 Capital Plan as funding has already been allocated and carried over from the previous financial year.*

5.5.2 Standards and specifications

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

5.5.3 Summary of future costs

Council's 10-year capital plan is reviewed during the annual budget cycle and the following stormwater drainage upgrade projects have been included in the 2017-2027 Capital Plan:

- Cypress Court Levee – House Creek;
• Anne Street Drainage – Easement;
• Ware Avenue Drainage – resolve flooding issues; and
• 30A Brockley Street – Stormwater drain replacement.

Projects will be scheduled in the long term capital plan in consideration of their potential risk and in consideration of other budget priorities.

New assets and services are to be funded from the council’s capital works program and grants where available. This is further discussed in Section 6.2.

5.6 Disposal plan

Disposal is any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6. These assets will be further reinvestigated to determine the required levels of service and see what options are available for alternate service delivery, if any.

Table 5.6 Assets identified for disposal

<table>
<thead>
<tr>
<th>Asset</th>
<th>Reason for disposal</th>
<th>Timing</th>
<th>Cash flow from disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos pipes</td>
<td>Inadequate hydraulic capacity and/or ongoing maintenance issues</td>
<td>Subject to failure and identification of maintenance issues.</td>
<td>To be determined on case by case basis</td>
</tr>
<tr>
<td>Flood prone sites</td>
<td>Pipes of inadequate capacity</td>
<td>Subject to 10 year capital plan</td>
<td>To be determined</td>
</tr>
</tbody>
</table>

The council uses approved contractors with respect to the removal of asbestos pipes for the correct OHS and disposal requirements. At this time the stormwater drainage assets are relatively new and disposal of any stormwater / drainage asset is infrequent and generally associated with infrequent and minor failures.

6. FINANCIAL SUMMARY

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

6.1 Financial statements and projections

The following projected financial costs are based on the extrapolation of existing operational and renewal expenditures, modelling and typical stormwater drainage asset performance. A key aspect of the financial predictions are based on the estimated asset life before intervention. All projections exclude inflationary effects and costs are in today’s dollars and excludes the small percentage of network growth.

The total financial projections consider the operating costs associated with maintenance and
cleaning and also the ongoing renewal costs from ageing infrastructure. At this time there are no significant deferred renewal projects and the only additional costs are those flood improvement projects at an estimated cost $285,000 for drainage upgrading.

Financial renewal projections are shown in Figure 6.1 for the next 20 years. It is suggested in the short term that the council increases its renewal expenditure from $92,000 per annum by an additional 4 per cent annually until 2022 and then increase annual expenditure by 7 per cent until 2037. In 20 years the renewal expenditure will need to rise to approximately $460,000 per annum. Annual renewal will ensure that the likelihood of flooding is significantly reduced or negated in the majority of cases as assets are replaced in a timely manner before complete failure occurs.

In terms of operating costs (cleaning and maintenance) the current average annual operating expenditure $184,000 is currently adequate. A 1 to 2 per cent annual increase in funding to cover progressively aging assets and increasing maintenance as asset approach end of life is recommended.

**Figure 6.1 Projected 20-year capital expenditure**

![Projected 20-year capital expenditure](image)

### 6.1.1 Life cycle costs

Life cycle costs are the average annual costs to manage/maintain the asset and deliver the required service level/s. Life cycle costs include maintenance and asset consumption (depreciation) expense.

The life cycle cost per pipe and pit from cradle to grave starts from the initial installation through to its eventual replacement. The ‘replacement’ of the asset could be a lower cost option, such as pipeline relining, as opposed to a straight asset replacement. To simplify the process, the main life cycle cost components are considered below, assuming the typical pipe replacement approach.

The operating costs below are estimated costs for the complete network to be maintained and cleaned. At the moment operating costs are half the rates indicated below as the majority of the network has not aged and is not experiencing the expected maintenance from an averaged aged and well established system.
Table 6.1.1 Life cycle costs summary

<table>
<thead>
<tr>
<th>Life cycle component</th>
<th>Life cycle cost/yr</th>
<th>Total Life cycle cost ~ 100 years as a percentage of the original replacement cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERATING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning</td>
<td>0.127%</td>
<td>Average annual cost to clean and ensure the asset operates as intended</td>
</tr>
<tr>
<td>Maintenance/repair</td>
<td>0.237%</td>
<td>Average annual cost to repair and maintain the assets for its design / service life</td>
</tr>
<tr>
<td>Subtotal</td>
<td>0.4%</td>
<td>Total operational cost</td>
</tr>
<tr>
<td>CAPITAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renewal</td>
<td>1%</td>
<td>Average greenfield replacement cost, inclusive of trenching and installation, similar to depreciation costs</td>
</tr>
<tr>
<td>Disposal</td>
<td>0.2%</td>
<td>Assume 20% of replacement cost</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1.6%</td>
<td>Annual cost of operating and renewal as a % of the original cost of supply and installation.</td>
</tr>
</tbody>
</table>

The long term life cycle cost table indicates a replacement and disposal cost of 1.2 per cent per annum with operating costs at 0.4 per cent. For the entire asset network of $92 million, the average cleaning and maintenance costs for an average aged pipe / pit network the maintenance and cleaning costs are estimated at $368,000. For Wodonga the assets are relatively young and have not aged and hence the current operating costs are on average $184,000 per year.

The current drainage network has a total life cycle cost of only 1.4 per cent per annum compared to an aged system in 50 years where the life cycle costs will be 1.6 per cent of the Greenfield replacement value. Currently Wodonga’s network is relatively young and assets are incurring a reduced operational cost of only 50 per cent of expected costs.

The annual network cost over the short term (five years) is estimated at $184,000 to $204,000 for cleaning and maintenance with renewal costs at $92,000 to $112,000.

From a current life cycle cost perspective, Wodonga Council’s annual expenditure to maintain and renew its drainage assets is $276,000 and rising to $315,000 per annum in five years.

6.2 Funding strategy

Projected expenditure identified in Section 6.1 with funded from council’s operating and capital budgets. The funding strategy is detailed in the council’s 10-year long term financial plan.
6.3 Valuation forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by the council from assets constructed by land developers and assets donated to Council.

Valuation of drainage assets are essentially based on the assets, quantity, age and an applicable unit rate. Annual review of unit rates of assets are benchmarked with other councils along with consideration of building price index changes.

The rate of asset growth is directly proportional to the growth of assets from subdivisions associated with population growth rates of around 2 per cent, which translates to an average growth in drainage assets of 1.6 per cent.

Excluding the effects of inflation the real value of drainage assets will continue to increase at approximately 1.6 per cent per annum. The asset replacement value will rise by 1.6 per cent whilst the current written down value will rise by approximately 0.6 per cent per annum, as the annual asset depreciation rate is approximately 1 per cent.

6.4 Key assumptions made in financial forecasts

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

In 2015-2016 an extensive review of over 23 spreadsheets of drainage information was undertaken including analysis and updating of the original underlying Access database. This resulted in an improved valuation result and provided cleansed and verified data for uploading into the corporate asset management system IPS, previously known as Hansen.

In 2016-2017 the unit rates and assets were revised, which resulted in a revaluation increment of $982,177 with the total asset replacement Greenfield value being $92,052,465.

Key assumptions made in this infrastructure and asset management plan are:

- The identified asset service life of 100 years has not been verified but adopted based on local and industry knowledge;
- There is a slight asset backlog in the order of 5 per cent that have not been captured from plans;
- The assumption of a linear relationship between age and condition; and,
- The condition of Wodonga Council’s underground assets has not been verified in terms of a direct relationship between age and actual condition and hence the current valuation may be understated as asset life and condition may be conservative.
Accuracy of future financial forecasts may be improved in future revisions of this infrastructure and asset management plan by the following actions.

- Investigation of actual service life and hence potential reduction in the rate of depreciation, subject to a statistical and subsurface condition data collection and analysis exercise;
- Continued improvement in data capture and storage with resources provided through Infrastructure and works, rather than strategic assets; and,
- Ongoing improvement in data quality utilising coordinate information to determine pipe lengths for 2018.

7.1 Accounting/financial systems

The accounting and financial systems used include:

- INFOR Public Sector (IPS) previously known as Hansen Asset Management corporate software;
- Finance 1 from Technology One; and,
- Moloney Asset Management Software.

7.2 Asset management systems

The accounting management systems used include:

- Current valuation information has been undertaken in spreadsheet form. An extensive review in 2015-2016 using excel;
- No electronic and data exchange occurs between Moloney or Hansen/IPS Software systems;
- Asset Planning is responsible for the production of asset valuation information and asset recording to provide valuation and basic asset information to assist Engineering department; and,
- A transition from the Moloney Asset Management System to Hansen/IPS is currently occurring.

7.3 Information flow requirements and processes

The key information flows into this infrastructure and asset management plan are:

- The asset register data on size, age, value, remaining life of the network;
- The unit rates for categories of work/material;
- The adopted service levels;
- Projections of various factors affecting future demand for services; and,
- Data on new assets acquired by the council.

The key information flows from this infrastructure and asset management plan are:

- The assumed works program and estimated trends;
- The resulting budget, valuation and depreciation projections; and,
- The useful life analysis.

These will impact the long term financial plan, strategic business plan, annual budget and departmental business plans and budgets.
8. PLAN FOR IMPROVEMENT AND MONITORING

8.1 Improvement plan

The Stormwater Drainage asset management improvement plan generated from this infrastructure and asset management plan is shown in Table 8.1.

The main areas for improvement is of a corporate asset valuation module and associated register and improvement of data. The main improvement area for reconsideration is the asset service life. This would require detailed analysis and survey condition data before extending asset life to 120 years from the current 100-year life.

Table 8.1 Improvement plan

<table>
<thead>
<tr>
<th>Task No</th>
<th>Task</th>
<th>Responsibility</th>
<th>Resources required</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Continue to develop valuation module within IPS</td>
<td>Strategic Assets</td>
<td>$10,000</td>
<td>2018</td>
</tr>
<tr>
<td>2</td>
<td>Upload 2016/17 asset data into corporate system</td>
<td>Information Services</td>
<td>Existing resources</td>
<td>2017-2018</td>
</tr>
<tr>
<td>3</td>
<td>Identified data improvements incorporated into 2017 valuation</td>
<td>Strategic Assets</td>
<td>Existing resources</td>
<td>2017-2018</td>
</tr>
<tr>
<td>4</td>
<td>Investigate potential to extend asset life to 120/140 years based on detailed subsurface condition survey data</td>
<td>Strategic Assets</td>
<td>$60,000</td>
<td>2018-2019</td>
</tr>
<tr>
<td>5</td>
<td>Include in database Wetlands, attenuation assets, eg detention, retention basins etc</td>
<td>Strategic Assets</td>
<td>Existing resources</td>
<td>2017-2018</td>
</tr>
<tr>
<td>6</td>
<td>Review and upload any backlogged stormwater drainage pit/pipe assets</td>
<td>Infrastructure &amp; Works</td>
<td>Existing resources</td>
<td>2017-2018</td>
</tr>
<tr>
<td>7</td>
<td>Review and adjust valuation rates as required for annual financial reporting</td>
<td>Strategic Assets</td>
<td>Existing resources</td>
<td>2017-2018</td>
</tr>
<tr>
<td>8</td>
<td>Development of SRSS database reporting for Infrastructure and Works and Strategic Assets</td>
<td>Strategic Assets and Information service</td>
<td>Existing resources</td>
<td>2017-2018</td>
</tr>
</tbody>
</table>

8.2 Monitoring and review procedures

This Stormwater Drainage Asset Management Plan will be reviewed during annual budget preparation and amended to recognise any changes in service levels and/or resources available to provide those services, as a result of the budget decision process.

An asset plan is a dynamic plan and has a life of three years with annual review and updating recommended.
9. REFERENCES

2. Wodonga Council, *2016-2017 and 2017-2018 Annual Plan and Budget*; and