

Water Service Asset Management Plan

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1. EXECUTIVE SUMMARY

Introduction

The City is one of five major water purveyors operating within Kelowna's municipal boundaries. The City provides water service to approximately 65,000 of its 125,000 residents with the remainder of the City serviced primarily by four independent irrigation districts and 27 small, private suppliers. During the summer when peak water demand occurs the City Water Utility delivers 90 million litres per day to its customers. This asset management plan covers the infrastructure assets that serve the City Water Utility customers.

Managing our vital assets and infrastructure now and into the future will ensure the economic, social and environmental well-being of our City. By using sound asset management practices, Council and the community can be confident that there is an affordable, and sustainable plan to maintain, operate, replace assets and service growth and that the community will continue to receive safe reliable water in the long-term.

The Water Service

This asset management plan covers the infrastructure assets for the City of Kelowna's Water Utility. Water infrastructure is comprised of both linear and vertical assets including:

- Water mains, services, hydrants, meters and valves,
- Pressure Reducing Valves,
- Filling Stations,
- Reservoirs,
- Source Water Pump Stations,
- UV Disinfection Facilities,
- Booster Stations,
- Flow Control Stations.

These infrastructure assets have a current replacement value of approximately \$417 million.

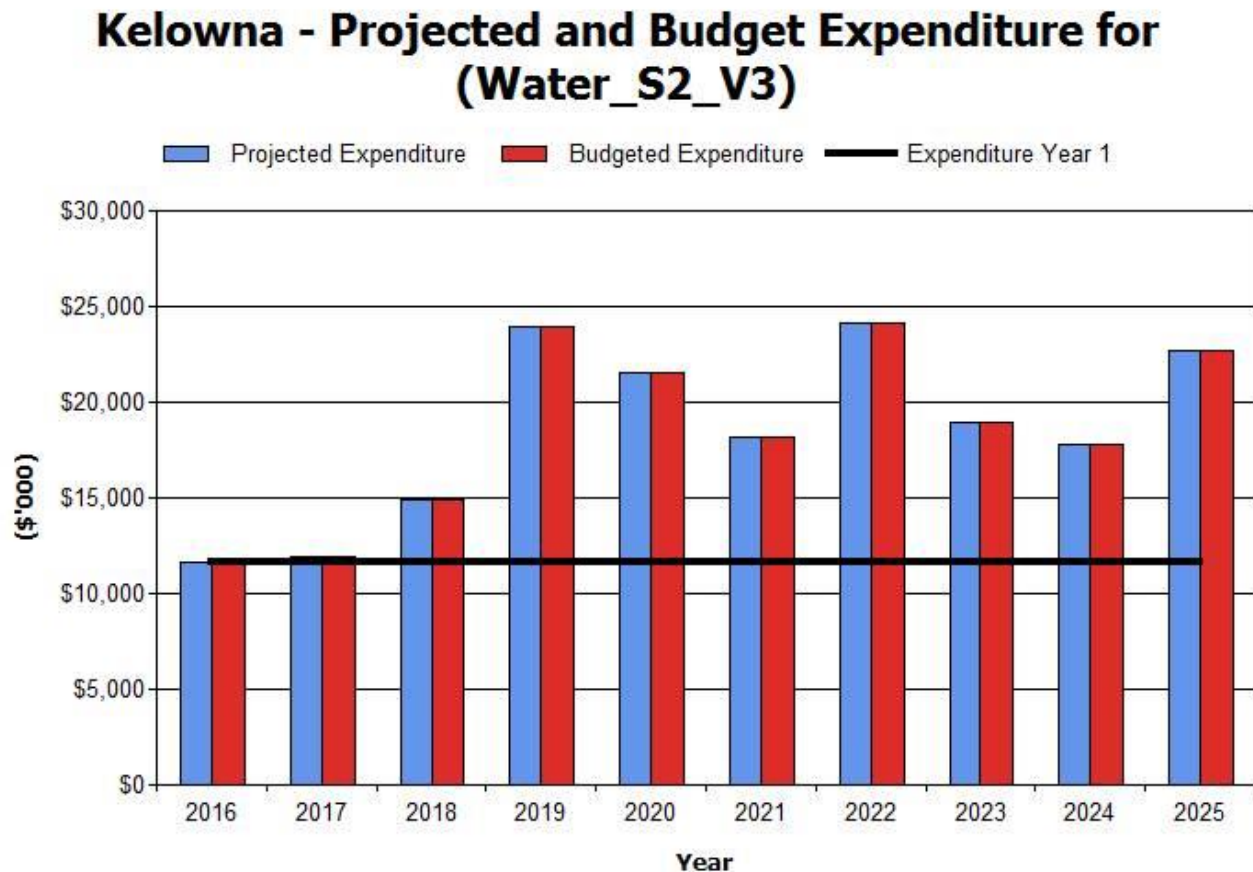
What does it Cost?

The projected expenditures necessary to provide Water service including operations, maintenance, infrastructure renewal and infrastructure to support growth over the next 10 years is \$157 million. Estimated available funding for this period is balanced against projected costs and provides 100% of funding required for service delivery (see figure below).

The costs and revenue for providing Water service are consistent with the City's Water Financial model which forecasts an annual rate increase of 2% to match inflation.

Water assets are depreciating faster than they are being renewed and on average the renewal expenditure is 62% of the depreciation rate. This renewal rate is adequate given that the Water assets are relatively new but renewal investment will need to increase in the next 20-years as the system ages. By planning early, the City can budget for these expenditures and mitigate the financial impacts to rate payers.

The next ten years will see Water asset stock increase by \$61 million as a result of infrastructure required to service growth and improve service levels. The increase in asset stock will contribute to an increase in operating and maintenance costs of approximately \$1.6 million within 10 years.



The above Figure shows the 10-year budget and expenditures. Projected expenditures are balanced against available budget and the Water Utility is 100% funded for the 10-year planning period.

What we will do?

Over the next 10-years \$32 million will be invested in infrastructure renewal. See Appendix B for a list of renewal expenditures. This includes residential water meters that are nearing the end of their service life and will need to be replaced at a cost of approximately \$11 million.

The City's 10-year plans for major growth related upgrades and system improvements totals \$70 million (Appendix C). This includes approximately \$20 million in contributed assets through the development of new subdivisions.

What is not in the Asset Management Plan?

The Province may regulate water filtration for water treatment. This would require investment of approximately \$134 million in filtration infrastructure. This expenditure is not part of this asset management plan and the Utility Planning Department is working with provincial regulators to defer or negate this requirement.

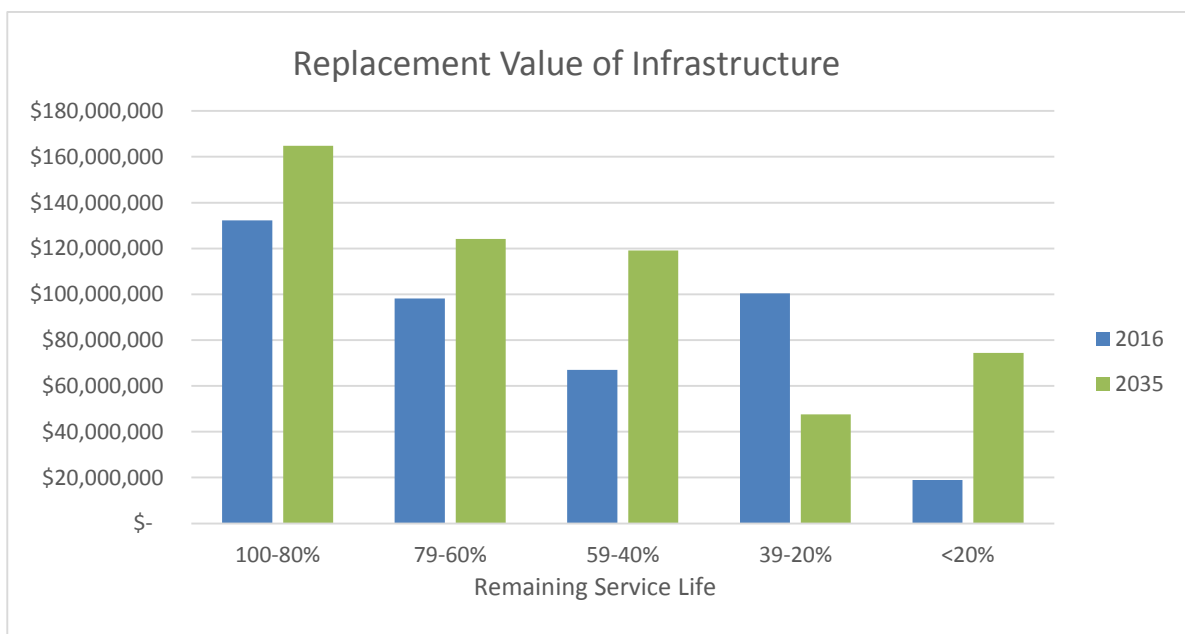
Over the next 20-years it is probable that the City may take ownership of infrastructure from other private water suppliers or irrigation districts that provide water service to Kelowna residents. This infrastructure is not part of this asset management plan.

Future updates to this asset management plan will respond to these and other changes so that the City is prepared to invest in infrastructure improvements while maintaining measured and predictable rates to the customer.

System Condition

The City Water Utility is a resilient and robust system that is maintained in a state of good repair. Pumping and treatment facilities have backup equipment to ensure continuous service delivery when equipment breaks down. Where possible, the watermains are interconnected to maintain flow and pressure during peak demand and to meet fire flow requirements. Interconnection also minimizes the impacts to customers in the event of pipe breaks.

The condition of water infrastructure is fair-to-good depending on the asset component, except for water meters, which are nearing the end of their service life and are scheduled for replacement within 10 years. The water system currently has \$19 million worth of assets with less than 20 percent of their remaining service life. These older assets may be at higher risk of failure and require more maintenance and condition assessment. Over the next 20 years the water system will age and the value of those assets with less than 20% service life remaining will increase to \$74 million or about 14% of the total system value. Projected renewal investment increases with time to achieve more sustainable levels by 2035.



The above Figure shows the replacement value of assets in specific age categories. The chart shows that the system will age over the next 20 years given the projected renewal investment.

Managing the Risks

As the system ages the City will need to manage the associated increased risk of infrastructure failure and service interruption. The City will manage these risks through condition assessment, regular maintenance and inspection of critical assets. The City is also investigating the purchase of a computerized asset management system that would improve efficiency of maintenance, track repair frequency and prioritize high risk assets for replacement.

The Water Utility is fully funded for the next 10-years and well positioned to address longer term asset renewal funding needs. If we don't plan for and manage future cost pressures, however, it is likely that we will have to reduce service levels in some areas, unless new sources of revenue are found. For the Water Utility, the service level reduction may include more frequent service interruptions (i.e. pipe breaks). The regulated treatment of Water should not be affected and the City is committed to exceeding regulatory standards.

Changes in water quality regulations, like the requirement for water filtration, presents a financial risk to the Water Utility. The City will continue to work in collaboration with provincial regulators to understand the need and timing of changes so that the City can plan in advance for the required infrastructure improvements.

Next Steps

As the system ages the City will need to manage the associated increased risk of infrastructure failure and service interruption. The City will manage these risks through condition assessment, regular maintenance and inspection of critical assets. The City is also investigating the purchase of a computerized asset management system that would improve efficiency of maintenance, track repair frequency and prioritize high risk assets for replacement.

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2. INTRODUCTION

2.1 Background

This asset management plan (AMP) covers all aspects of the municipal water supply system and is one of several asset management plans comprising the complete municipal asset stock. This plan demonstrates responsive asset management, compliance with regulatory requirements, and sustainable funding to provide the required levels of service over a 20-year planning period.

The AMP follows the format recommended in the International Infrastructure Management Manual¹ and is consistent with ISO 55000 – the internationally accepted standard for asset management practice.

This AMP will influence, and be influenced by, the following associated municipal documents.

- Council Policy 352 - Sustainable Municipal Infrastructure Policy
- Council Policy 342 - Tangible Capital Asset Policy
- 2030 Infrastructure Plan
- 10-Year Capital Plan
- 5-Year Financial Plan
- 20-Year Servicing Plan and Financial Strategy (amended July 2016)
- 2030 Official Community Plan

The infrastructure assets covered by this AMP are shown in Table 2.1. These assets are used to provide water service to approximately 65,000.

Table 2.1: Assets covered by this Plan

Asset category	Dimension	Replacement Value (millions)
Watermain	413 km	\$307
Booster Stations & PRV's	53	\$18
Meters	17036	\$11
Reservoirs	24	\$45
Source Water Pump Stations	4	\$17
UV Treatment Facilities	4	\$19
TOTAL		\$417

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

Key stakeholders in the preparation and implementation of this AMP are shown in Table 2.1.1. Further improvements to the plan will require ongoing consultation with stakeholders and have been marked as “future” in the table below.

Table 2.1.1: Key Stakeholders in the AMP

Key Stakeholder	Role in Asset Management Plan
Council	<ul style="list-style-type: none"> • Represent needs of community, • Ensure Corporation is financial sustainable, • Agree to levels of service and risk (future), • Approve the Asset Management Plan, • To ensure appropriate resources and funding are made available to support the Asset Management Plan.
City Manager and Senior Management	<ul style="list-style-type: none"> • To provide strategic advice and leadership in the management of infrastructure assets.
Infrastructure Engineering	<ul style="list-style-type: none"> • Develops short and long-range infrastructure capital plans. • Establish levels of service for assets and measure infrastructure performance. • Adapt to changing regulations and emerging issues as required. • Develop, implement and review the asset management program
Infrastructure Delivery	<ul style="list-style-type: none"> • Manage delivery of capital projects.
Civic Operations	<ul style="list-style-type: none"> • Maintenance and operations of City Infrastructure
Development Services	<ul style="list-style-type: none"> • Manages the delivery of developer built infrastructure.
Policy and Planning	<ul style="list-style-type: none"> • Community planning including OCP

2.2 Goals and Objectives of Asset Management

The City of Kelowna (corporation) exists to provide services to the community. Services are supported and provided by infrastructure assets. The City has acquired infrastructure assets by purchase, by contract, by construction and by contribution from developers and others to accommodate growth and meet levels of service.

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

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

2.3 Asset Management Plan Framework

A comprehensive Asset Management Plan (AMP) is a critical element of the infrastructure governance and will support strategic decision making and capital deliver. The key elements of the AMP are:

- Levels of service – specifies the services and levels of service to be provided,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Life cycle management – how we will manage our existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices,
- Monitoring – how the plan will be monitored to ensure it meets objectives,
- Asset management improvement plan.

2.4 Core and Advanced Asset Management

This AMP is prepared over a 20-year planning period in accordance with the International Infrastructure Management Manual. It is prepared to meet legislative requirements and the City's objectives for sustainable service delivery and long term financial planning and reporting. This AMP is considered a core asset management plan that uses a 'top down' approach where analysis is applied at the 'system' or 'network' level.

Future revisions of this AMP will move towards 'advanced' asset management using a 'bottom up' approach for gathering asset information for individual assets to support the optimization of activities and programs to meet agreed service levels. This will require more comprehensive data collection, asset maintenance and reporting. To facilitate this, the City is proposing the purchase of a computerized asset management system (AMS) in 2017 that would improve efficiency of maintenance, track repair frequency and prioritize high risk assets for replacement.

2.5 Community Consultation

This AMP is prepared to inform the community of the state of the City's Water assets. Future revisions of the AMP will incorporate community consultation on service levels and costs of providing the service. This will assist Council and the community in matching the level of service desired by the community and the community's ability and willingness to pay for the service.

3. LEVELS OF SERVICE

3.1 Strategic and Corporate Goals

This AMP is prepared to align with the corporate vision, mission and goals.

Corporate Vision:

To be the best mid-sized city in North America

Corporate Mission:

Leading the development of a safe, vibrant and sustainable city

Relevant goals and objectives and how these are addressed in this AMP are shown in Table 3.2.

Table 3.2: Corporate Plan and how these are addressed in this Plan

Goal	Objective	How Goal and Objectives are addressed in AMP
Performance excellence	The City is a high-performing, accountable Corporation that delivers on its plan.	Short, long-term Capital Plans are required to deliver world class infrastructure that is financially sustainable. The AMP is a long-term plan that will guide the City's capital investment over the next 20-years.
Responsive customer service	The City understands evolving needs and ensures services are appropriate and accessible.	The AMP will establish current and future LOS and use this information to direct capital investment to support service levels.
Engaged communities	The City listens and encourages full participation for the community to clarify needs and build neighbourhood identities.	The AMP will be reviewed with Council so that it reflects community priorities.
Pioneering leadership	The City finds better ways to deliver services to the community.	Through the development of the AMP the City reviewed innovative solutions to provide those services.
Strong financial management	Kelowna delivers on a multiple bottom line, balancing community priorities with resource realities.	The AMP is affordable and considers renewal, growth and service level improvements. This 20-year AMP is developed so that we can plan ahead for future cost pressures and mitigate the impacts to rate payers.

3.2 Legislative Requirements

Legislative requirements regulating Water system operation as follows:

Table 3.3: Legislative Requirements

Legislation	Requirement
Drinking Water Protection Act	Outlines requirements for water suppliers in terms of ensuring that the water supplied to their users is potable — and meets any additional requirements established by the Drinking Water Protection Regulation or by the water supply system's operating permit, as set by the local drinking water officer.
B.C. Drinking Water Protection Regulations	Sets out certain requirements for drinking water operators to ensure the provision of safe drinking water to their customers.
Local Government Act	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery.
Community Charter	Sets out the legal framework for the powers, duties and functions of municipal Corporations. Provides municipal Corporations with the authority to address existing and future community needs.
PSAB 3150 Accounting Standards	Tangible Capital Asset accounting standards for the public sector, including Municipalities.

3.3 Levels of Service

Levels of service measure how the community receives the service and whether the Water Utility is providing good service to its customers. In the 2015 Citizen Survey, residents listed drinking water quality as the second most important service (next to Fire protection) that the City provides. Residents also chose investment in drinking water as their top priority for infrastructure investment. Eight-two percent (82%) of residents are satisfied with the Water service but drinking water quality was noted as a primary area of improvement.

The levels of service measured in this asset management plan are:

Condition	Is the service maintained in a state of good repair?
Function/Quality	Does it meet users' needs?
Capacity	Does the service have adequate capacity?
Overall	Are customers satisfied with service?

The City's current and future service levels are detailed in Tables 3.4

Table 3.4: Level of Service

Service Attribute	Service Objective	Performance Measure Process	Current Performance	Expected position in 10 years based on projected investment							
Condition	Reliable service.	Service requests due to number of water outages>6 hours	0 complaints (2015)	Anticipate complaints related to water outages to remain below 10 per year.							
	System condition	Remaining Useful Life (age based). Replacement value assets with less than 20% remaining service life.	<div>Replacement Cost of Assets with <20% Remaining Service Life</div> <table><thead><tr><th>Year</th><th>Replacement Cost (\$)</th></tr></thead><tbody><tr><td>2016</td><td>20,000,000</td></tr><tr><td>2025</td><td>40,000,000</td></tr><tr><td>2035</td><td>75,000,000</td></tr></tbody></table>		Year	Replacement Cost (\$)	2016	20,000,000	2025	40,000,000	2035
Year	Replacement Cost (\$)										
2016	20,000,000										
2025	40,000,000										
2035	75,000,000										
Function <i>(Water Quality / Fit for Purpose)</i>	Water Quality	Number of water advisories.	0 advisories (2015)	0 advisories							
	Water Quality	Meet Regulations and Standards	Currently meet regulations and standards.	City is committed to meeting regulations and standards.							
	Water is aesthetically pleasing (taste, smell, look).	Service requests.	6 service requests (2015)	Less than 10 service requests per year							
Capacity	Water Pressure	Service requests.	25 complaints – related to water pressure (2015)	Less than 25 complaints.							
	System Capacity	Sufficient Capacity.	Operating at 90% of capacity at peak times.	Anticipate having adequate capacity and redundancy over the 10-year period.							
General	Overall Satisfaction with level and quality of services	2015 Citizen Survey	82%*	90%							

* Note: While all respondents were asked about drinking water, the City of Kelowna's water utility only provides drinking water to 52% of citizens. Given that the City Water Utility has not had a water quality advisory in 20 years, it is assumed that the communities concern over water quality is from areas of the City that are not serviced by the City's system. Interviews with residents connected to the City systems suggested a 90% overall service satisfaction.

4. FUTURE DEMAND

4.1 Demand Drivers

Drivers affecting demand include changes in population, demographics, housing densities, climate, social pressures, technological, economic factors and agricultural practices.

4.2 Demand Impact on Assets

The present position and projections for demand drivers that may impact future service delivery and utilization of assets are outlined in Table 4.3.

Table 4.3: Demand Drivers, Projections and Impact on Services

Demand drivers	Present position	Projection	Impact on services
Population	Current (2015) population 120,000	From 2015 to 2040 population increase 60,000	Demand increase
Demographics	Percentage population 65+ is 21%	Percentage population 65+ to increase to 26%	Slight reduction in water usage per household
Housing Density	Single Family – 61% Multi-Family – 39%	Single Family – 43% Multi-Family – 57%	Reduction in water demand
Climate Change	Snowpack	Reduction in snowpack	Impact unknown
Regulatory	Water Filtration not required	Water filtration required	Water Quality improvement
Per Capita Use	Impact on water use	Water conservation to reduce consumption	Reduce demand

4.3 Demand Management Plan

Demand for new services will be managed through a combination of upgrading existing assets and providing new assets to meet demand.

The 20 Year Servicing Plan and Financial Strategy was developed in conjunction with the 2030 OCP and accounts for most of the demand drivers except climate change.

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

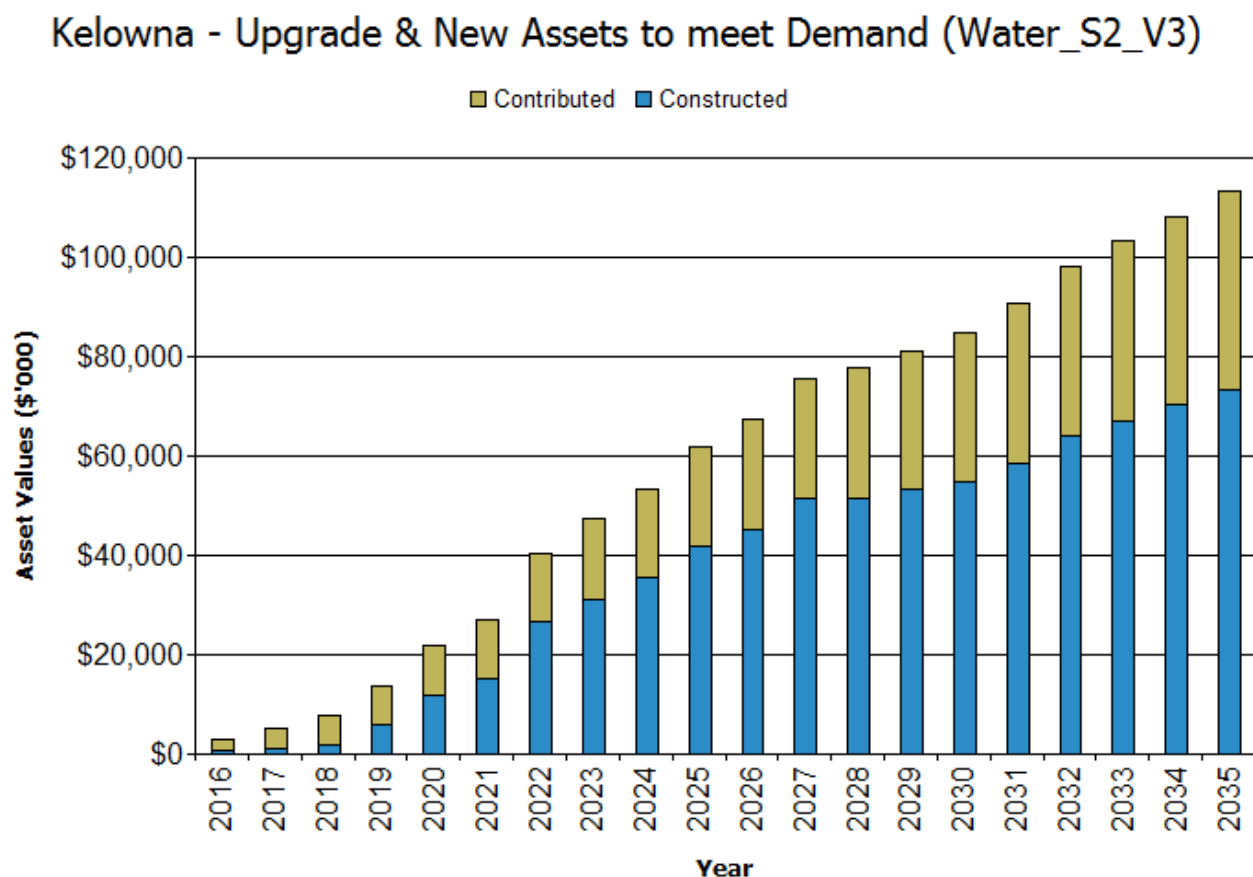
Table 4.4: Demand Management Plan Summary

Demand Driver	Impact on Services	Demand Management Plan
Population	Increase water demand	Upgrade existing and add new infrastructure to accommodate growth as per the 2030 Infrastructure Plan
Demographics	Slight decrease in water usage per household	No action
Housing Density	Increase in water demand for multiple dwellings in urban core	Renewal program to consider increasing water infrastructure capacity to meet the needs of increased housing density in urban core.
Climate Change	Impacts unknown at this time	Monitor impacts caused by climate change
Regulatory	Water Filtration Required.	Work with regulator to understand need and potential timing for improvements. Include in future iterations
Per Capita Use	Impact on water use	Water conservation to reduce consumption and reduce peak hour demand.

4.4 Asset Programs to meet Demand

New water infrastructure required to meet growth will be acquired from land development (contributed) and constructed by the City and developers (through our DCC program) as outlined in 20 Year Servicing and Financial Strategy. Figure 1 shows the cumulative value of new assets required to accommodate growth or improve service levels. A project listing is provided in Appendix C.

Figure 1: Upgrade and New Assets to meet Demand



Note: All costs are reported in current dollar values (net of inflation).

Over the next 20 years the Water asset stock will increase by \$113 million to accommodate growth and/or improve service levels. This represents a 27% increase in asset stock from the current replacement value of \$417 million. Acquiring these new assets will commit the City to fund ongoing operations, maintenance and renewal costs. These future costs are identified and considered in Section 5.

5. LIFECYCLE MANAGEMENT

Lifecycle management details how the City plans to operate, maintain, renew and replace assets at the agreed levels of service while optimizing life cycle costs.

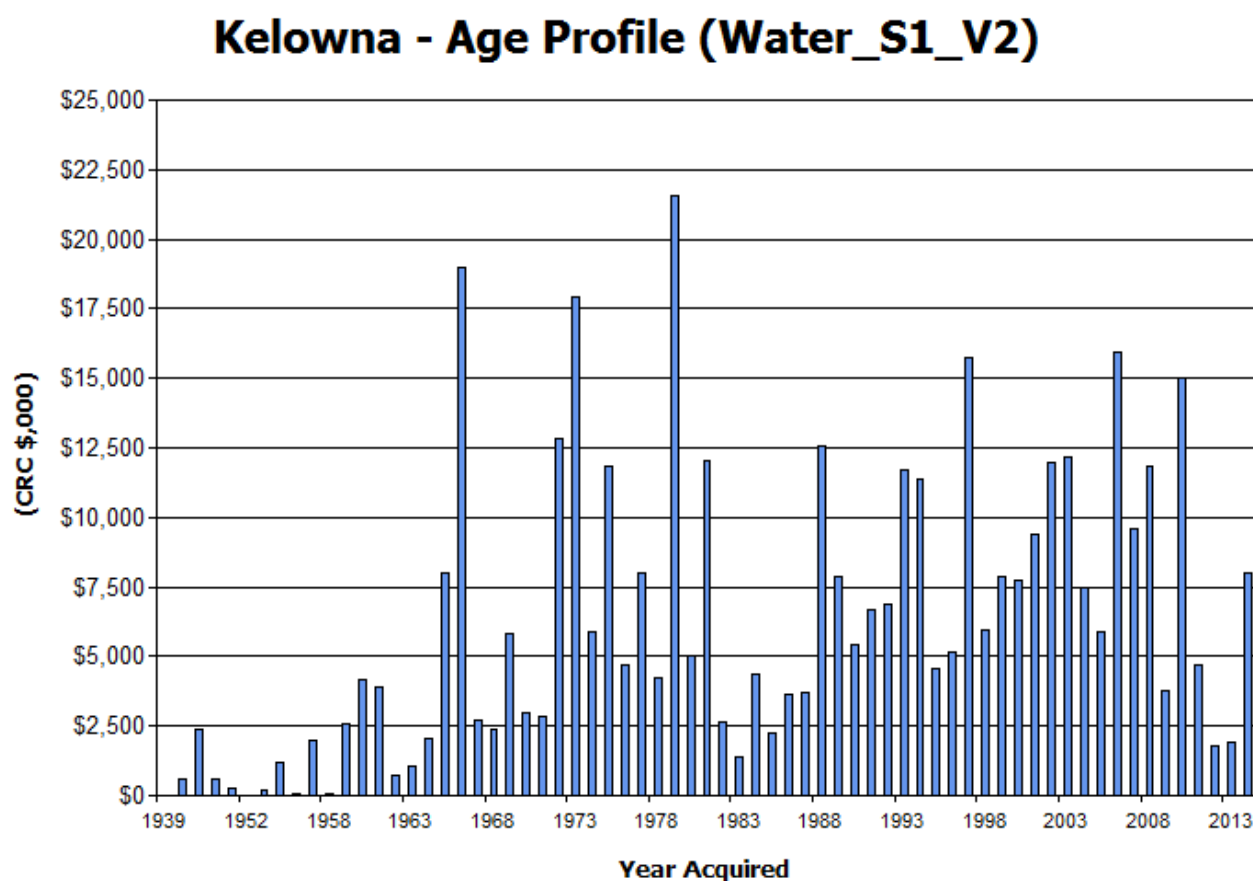
5.1 Background Data

5.1.1 Physical parameters

The infrastructure covered by this AMP were previously listed in listed in Table 2.1.

The age profile of the assets included in this AMP is shown in Figure 2. The graph shows the total value of assets for year acquired or last renewed in each year in current replacement values.

Figure 2: Asset Age Profile



5.1.2 Asset capacity and performance

Water services are generally provided to meet design standards as set out in the Subdivision, Development and Servicing Manual.

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

Table 5.1.2: Known Service Performance Deficiencies

Location	Service Deficiency	Cost (\$)
Altura Upgrade	Fire Flow	80,000
Fairway and Eagle Upgrade	Fire Flow	545,000
Young and Hazel Upgrade	Fire Flow	315,000
Vintage Terrace Upgrade	Fire Flow	154,000

The above service deficiencies are scheduled for replacement in the 10-year capital plan. Utility Planning is also reviewing system performance in 2017 and further deficiencies may be identified.

5.1.3 Asset condition

The percentage of remaining useful life of assets, determined from the asset age and theoretical service life, is used to assess the condition of the water assets. The assets are graded between 1 – 5 based on their remaining service life as shown in Table 5.1.3 and Figure 3.

Fig 3: Asset Condition Profile

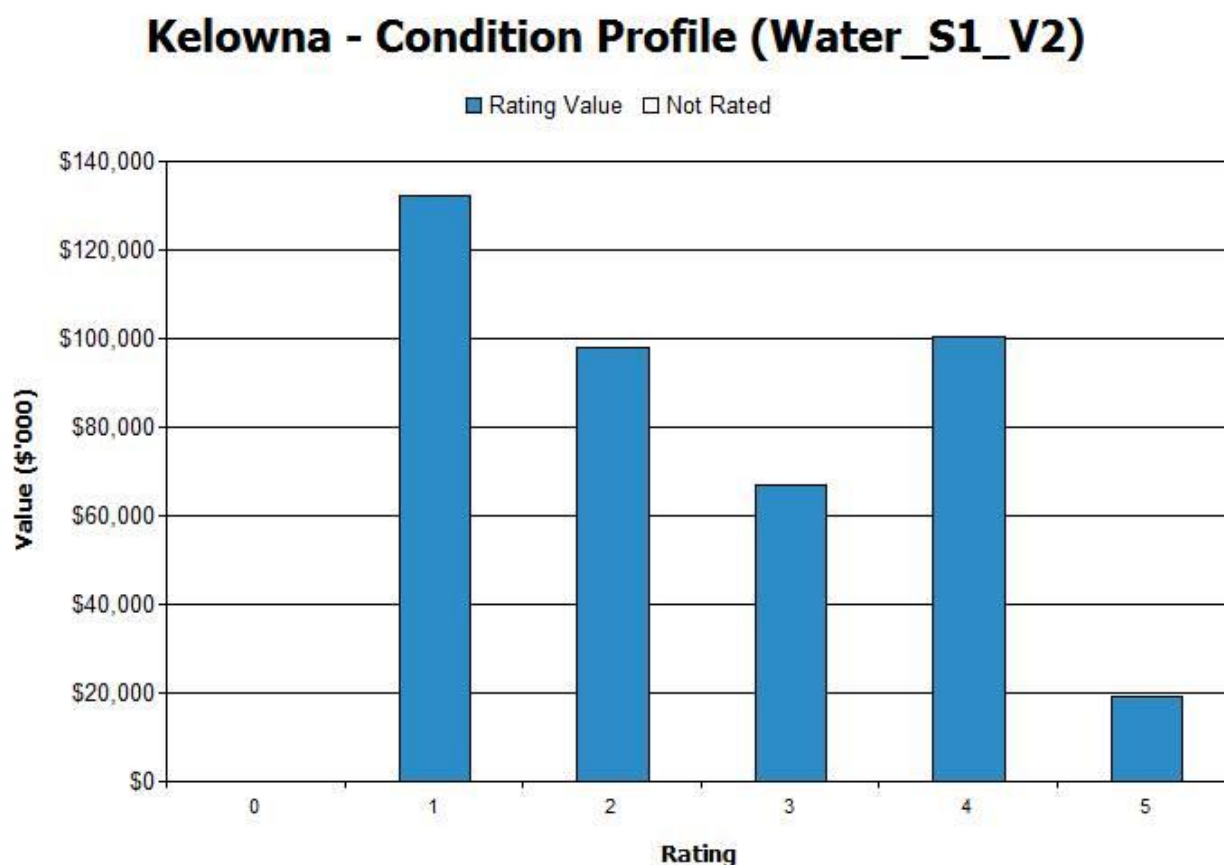


Table 5.1.3: Condition Grading Model

Condition Grading	% of Remaining Asset Useful Life
0	Assets not rated or unknown
1	80-100%
2	60-79%
3	40-59%
4	20-39%
5	<20%

Approximately 95% of the Water assets have more than 20% of their estimated useful life remaining and suggests that the Water system is in relatively good condition. The infrastructure that has less than 20% will be the focus of further condition assessment to plan renewal timing.

In the next 20 years, however, the percentage of assets with less than 20% of their remaining useful life is expected to increase 14% (\$74 million) which suggests renewal funding will need to increase. More detailed condition assessment will also be required to confirm asset condition and optimal renewal timing.

5.1.4 Asset valuations

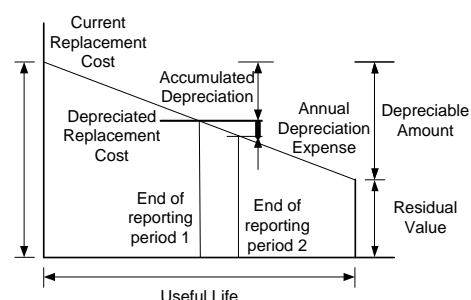
The asset values covered by this AMP are shown below. Assets are valued at current construction costs based (where possible) on actual tendered prices.

Key assumption made in preparing the valuations were:

- Asset renewal costs cover all restoration costs and there was no assumed efficiency for coordinated projects (i.e. water main completed at the same time as sewer and drainage project). This is a conservative assumption.

All terms are defined in Appendix F Glossary.

Current Replacement Cost	\$417 million
Depreciable Amount	\$417 million
Depreciated Replacement Cost ²	\$263 million
Annual Depreciation Expense	\$6.1 million



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

Rate of Annual Asset Consumption (Depreciation/Depreciable Amount)	1.5%
Rate of Annual Asset Renewal (Capital Renewal Budget (2016)/Depreciable amount)	0.4%
Rate of Annual Asset Upgrade (Capital Upgrades Depreciable amount)	0.2 %
Percentage annual increase in asset stock (% Upgrade + % Contributed)	0.7%
Asset Renewal as percentage of consumption (% Renewal/ % Consumption)	24%

Based on the 2016 expenditures, Water assets are being renewed at 24% of the rate they are being consumed. The renewal rate is adequate given the age of Water assets but renewal investment will need to increase in the long term to be sustainable. Over the next 10-years renewal investment will increase to \$3.25 million/yr or 42% of the system's annual depreciation. By 2035 renewal investment increases to \$5.5 million or 72% of the depreciable amount.

In 2016 the Water asset stock increased by \$2.9 million or 0.7% as a result of infrastructure required to service growth. The increase in asset stock will contribute to higher operating and maintenance costs and further renewal funding required in the future. Monitoring these indicators over time will indicate whether the City's physical operating capability is being maintained (i.e. Assets are being renewed as they are consumed on average).

These measures together with the sustainability measures in Section 6.1.1 provide valuable information for the City's strategic direction and objectives.

5.2 Infrastructure Risk Management Plan

A high level assessment of risks associated with service delivery from infrastructure assets has identified critical risks that may result in loss or reduction in service from infrastructure assets or a 'financial shock' to the City. Critical risks, being those assessed as 'Very High' - requiring immediate corrective action and 'High' – requiring prioritized corrective (Table 5.2). These risks are reported to management and Council.

Table 5.2: Critical Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Water System	Integration with other Water purveyors	M	Monitor and review. Develop plan to address this issue. Work with Water purveyors and provincial government.	M	Staff and Operational Resources.
Water System	Significant increase in required renewals over the longer term (20-year)	H	Regular update of asset management plans to inform Council and plan for future infrastructure cost pressures.	M	Staff and Operational Resources
Cedar Creek Pump Station	Pump motor failure at Cedar Creek.	H	Plan in place to upgrade Stellar Booster Station.	L	Included in 2030 Infrastructure Plan
Water Treatment	Regulation change (ex. Water filtration).	H	Monitor legislative changes and work with provincial authorities	M	Staff and Operational Resources.
Water System	Climate Change impacting on water quality and quantity.	M	Monitoring changes	M	Staff and Operational Resources.
Water System	Accuracy of estimate useful lives of water assets impacting renewal timing	M	Move away from age based estimates as a proxy for condition. Invest in asset management system to allow for better preventative maintenance and detailed condition assessment.	L	Staff and Operational Resources, Invest in asset management system (2017 provisional budget).
Water Network	Water Network model inaccuracy	M	Periodic review of water network adequacy including flow tests on hydrants.	L	Staff and Operational Resources.
Water Network	Transmission Main Failure	M	More thorough condition assessment for critical assets. Have repair parts in stocks.	L	Staff and Operational Resources.

Note * The residual risk is the risk remaining after the selected risk treatment plan is operational.

5.3 Operations and Maintenance

5.3.1 Operations and Maintenance

Operational expenses are continuous expenses required to provide a service, including power, fuel, staff, plant equipment and overhead.

Maintenance expenses include those 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.

Maintenance may be classified into reactive and planned work activities. Reactive maintenance is unplanned repair work carried out in response to asset failure and service requests. Planned maintenance is repair work that is identified and managed through scheduled maintenance management. Planned is preferable to reactive maintenance as it reduces costs and service disruption.

Actual past operational and maintenance expenditure is shown in Table 5.3.1. These costs include debt service costs for past operational expenditures

Table 5.3.1: Operating and Maintenance Expenditure Trends

Year	Operating and Maintenance Expenditure
2015	\$6,577,000
2014	\$6,385,000
2013	\$5,971,000
2012	\$6,154,000

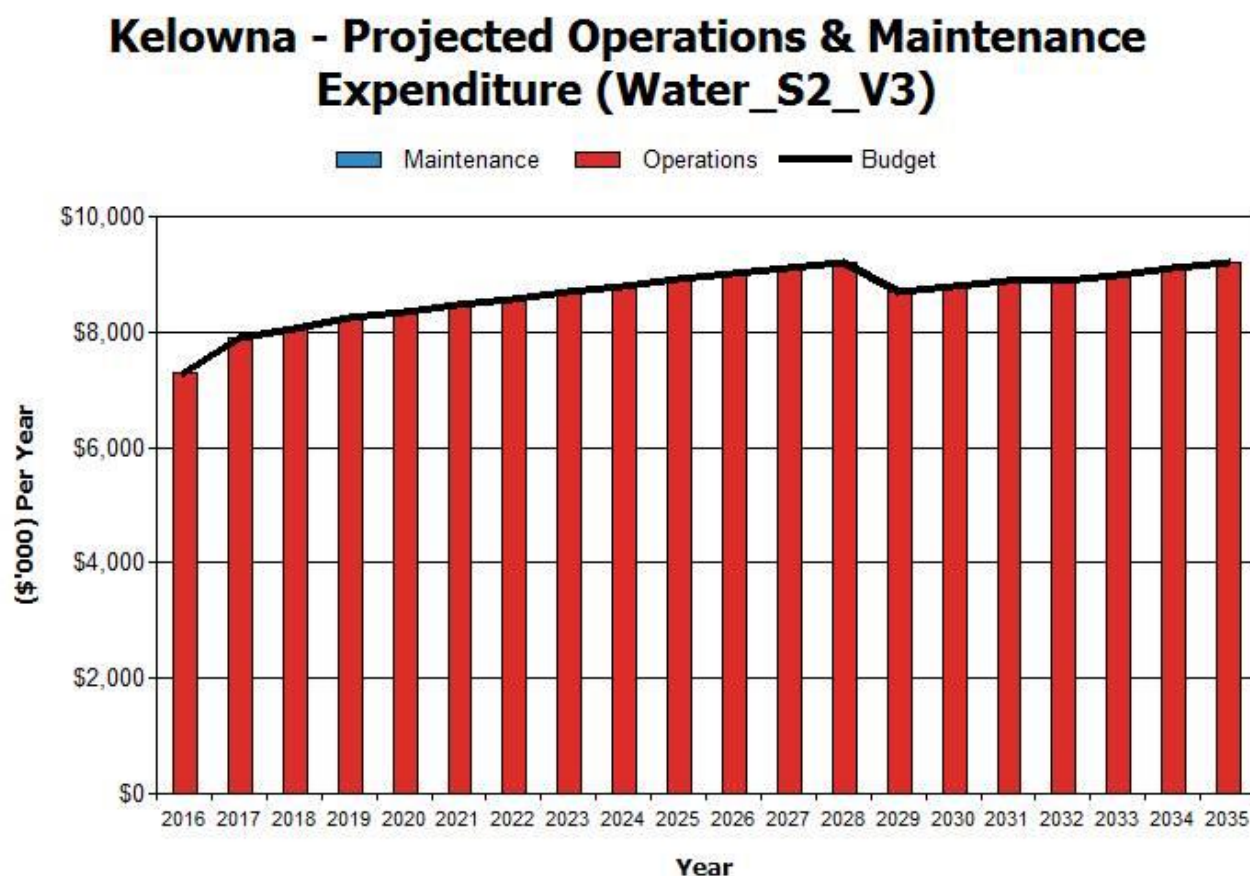
Operating and Maintenance expenditures have increased 6.5% over the past 4 years or about 1.5% on average annually.

5.3.2 Summary of future operations and maintenance expenditures

Future operation and maintenance (O&M) expenditures are forecast to increase to maintain the additional infrastructure required to service growth and improve service levels (Figure 4). The Water system will increase asset stock by approximately \$112 million to support growth or improve service levels in the next 20-years. The annual operating budget will need to increase by \$1.9 million to support this new infrastructure. The Water Utility Financial model adequately funds the expected O&M increase for the next ten years assuming an annual growth rate ranging between 1.38– 1.58%. Debt servicing for capital improvements is carried in the O&M budget and the drop in 2029 is caused by maturity of a loan.

Figure 4 shows the 20 year forecast operating and maintenance expenditures in real (current) dollar values (net of inflation). It reflects an increase over time due to the addition of new assets from increasing demand, growth and/or risk management control measures.

Figure 4: Projected Operations and Maintenance Expenditure



Note: All costs are reported in current dollars (net of inflation).

5.4 Asset Renewal

Renewal or replacement expenditures are 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. Work over and above restoring an asset to original service potential is considered to be new/upgrade expenditure.

5.4.1 Asset Renewal

The cost and timing of asset renewal was determined from the Asset Register by using the asset acquisition year and useful life to determine the renewal year. The asset renewal timing in this AMP is based on the assets theoretical expected service life and as such the actual renewal timing may differ depending on asset condition, risk and coordination with other infrastructure projects. Using asset age as a proxy for condition tends to be conservative and more detailed condition assessment is required to determine actual asset condition and renewal timing. Collection of this information would be made easier with the computerized asset management system. Renewal costs were determined from industry standards and best practice. Where asset historic costs were available, these costs were escalated to the current year using the Engineering New Record.

The asset useful lives used to develop projected asset renewal expenditures are shown in Table 5.4.1.

Table 5.4.1: Useful Lives of Water Assets

Asset SubGroup	Asset Type	Material/Component	Expected Life
Network	Watermain	AC	70
		CI	70
		COP	70
		DI	70
		GALV	70
		HDPE	80
		CONC	80
		PVC	100
		ST	80
		TL-DI	100
	Hydrant		50
	Meter		15
	PRV		50
	Filling Station		50
Facility	Reservoir	Base	70
	Pump Station UV Station Booster Station Flow Control Station	Base	50
		Structural	50
		Mechanical	25
		Electrical	25

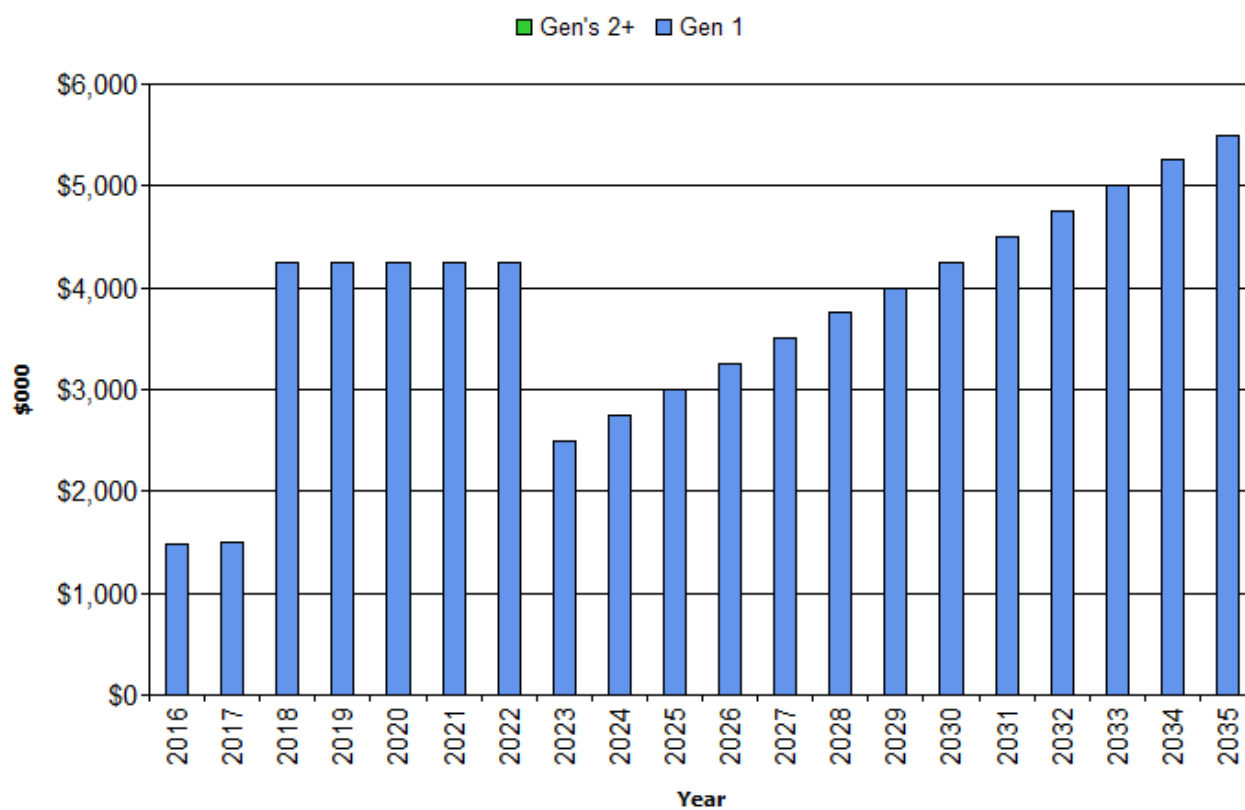
The theoretical asset useful life for each asset category was compared to the Canadian Infrastructure Report Card (2015) and adjustments were made to reflect actual service lives of the City's Water assets.

5.4.2 Summary of future renewal and replacement expenditure

Projected future renewal expenditures are forecast to increase over time as the Water assets near the end of their useful lives. There were peaks in development in the 1960's and 1970's and the supporting water infrastructure constructed at that time is now 40-50 years old and in many cases is nearing the end of its useful life. Figure 5 shows the projected average capital renewal expenditures over the 20-year planning period. These expenditures are expected to vary depending on the actual condition of the assets.

Fig 5: Projected Capital Renewal and Replacement Expenditure

Kelowna - Projected Capital Renewal Expenditure (Water_S2_V3)



Note: All costs are reported in current dollars (net of inflation).

Over the next 20-years there is approximately \$76 million worth of Water system renewal required. Residential water metres will be replaced between 2018 - 2022 at a cost of \$11 million. Beyond 2023 renewal expenditures are expected to increase as the system ages. By 2035, renewal expenditures are expected to be \$5.5 million/year.

It is important to note that these projects are based on theoretical service life and that actual renewal timing will be determined from infrastructure condition and risk of failure. There may be years where the renewal expenditure is not fully spent and the unspent funds will go into accumulated surplus to fund infrastructure renewal in future years.

5.5 Upgrade/New Assets

Upgrade/New assets are those works that create a new asset that did not previously exist, or works which upgrade or improve an existing asset beyond its existing capacity. They may result from growth or from an improvement to service levels (i.e. improved water quality). Assets may also be contributed to the City from land development.

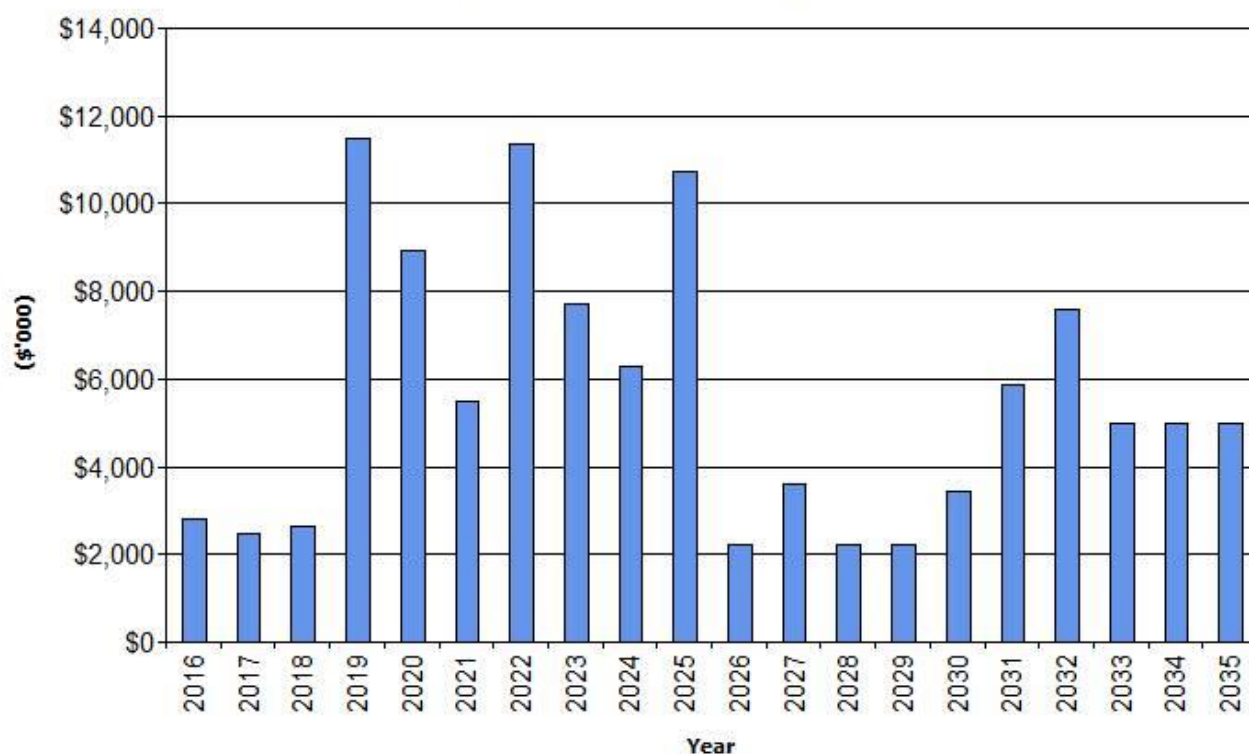
5.5.1 Summary of future upgrade/new assets expenditure

Projected Upgrade/New asset expenditures are summarized in Figure 6. The project list is provided in Appendix C. In total \$112 million worth of new asset expenditures are planned in the next 20 years. Approximately \$40 million are from developer contributed assets and \$72 million is required to accommodate growth as per the City's 10-Year Capital Plan.

Figure 6 shows the projected capital upgrade/new asset expenditures entered in Form 2C New-Upgrade Plan.

Fig 6: Projected Capital Upgrade to Support Growth Required by the 20-Yr Servicing Plan

Kelowna - Projected Capital Upgrade/New Expenditure (Water_S2_V3)



Note: All costs are reported in current dollars (net of inflation).

Expenditure on new assets in the City's capital works program are accounted for in the Water Utility financial model.

5.6 Asset Disposal

Disposal includes any activity associated with disposal of a decommissioned asset including sale, demolition or abandonment. For the most part, assets are disposed at the time of asset renewal and the disposal information is tracked and recorded in the asset registry.

For this AMP it is assumed that all disposed assets have no residual value.

5.7 Service Consequences and Risks

5.7.1 What is not in this asset management plan

There are no unfunded O&M activities or capital projects within the next 10 years except for the possibility of provincial regulations requiring water filtration as a form of water treatment. This would require investment of approximately \$134 million in filtration infrastructure. This expenditure is not part of this AMP and the Utility Planning Department is working with provincial regulators to defer or negate this requirement.

Water assets are depreciating faster than they are being renewed. This funding short fall is acceptable in the short-term because the water system is relatively new. Given current re-investment, however, the water system will age and this may increase the risk of infrastructure failure.

Over the next 20-years it is probable that the City may take ownership of infrastructure from other private water suppliers or irrigation districts that provide water service to Kelowna residents. This infrastructure is not part of this asset management plan.

Future updates to this AMP will respond to these and other changes so that the City is prepared to invest in the right infrastructure at the right time.

5.7.2 Service consequences

In the next 10 years there are no anticipated consequences for service levels. Over the longer-term if renewal funding levels does not increase as detailed in this AMP there may be service consequences. These may include:

- More frequent asset failure and service interruption,
- More reactive maintenance leading to higher costs.

5.7.3 Risk consequences

Over the next 10-years there is adequate funding for renewal projects. This AMP is developed using infrastructure service life estimates to quantify asset condition and renewal timing. By using this approach, there is risk that this plan may have missed infrastructure that is in poor or failing condition. This may create risk consequences for the City which are unknown at this time.

Future iterations of this AMP will benefit from improved processes and systems for collecting condition data and quantifying risk. Continuous improvement in the City's asset management practices will improve efficiency of service delivery and reduce risk of service interruption and/or deterioration.

6. FINANCIAL SUMMARY

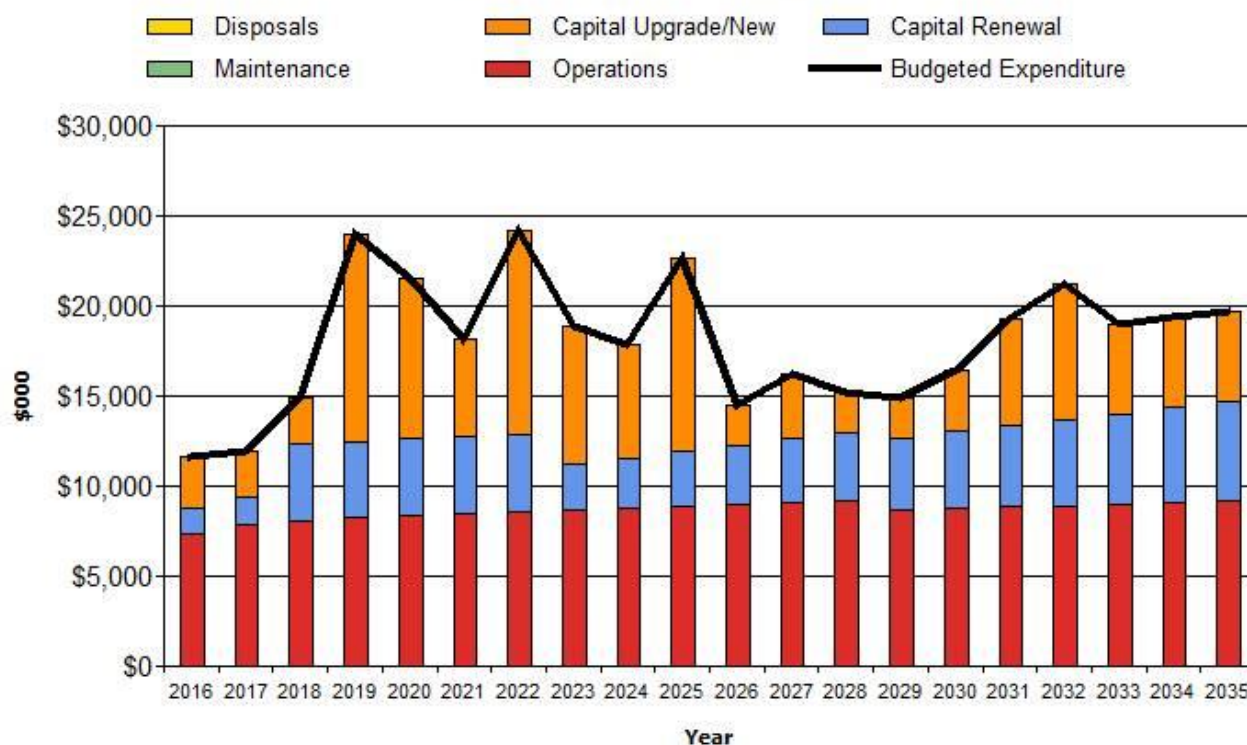
This section contains the financial requirements resulting from all the information presented in the previous sections of this AMP.

6.1 Financial Statements and Projections

The financial projections for operations, maintenance and capital expenditures for the next 20-year along with the projected budget are shown in Fig. 7. Figure 7 indicates that over the next 20 years there is adequate budget to fund operations, maintenance and capital expenditures assuming water rates increase with inflation which is projected to be 2% annually. Beyond 10 years the projections become less certain but the Water service is fully funded assuming there are no changes in regulatory requirements and the asset renewal requirements are as forecasted. This AMP will be update on a regular basis so that it captures emerging issues and leverages the best available data.

Fig 7: Projected Operating and Capital Expenditure

Kelowna - Projected Operating and Capital Expenditure (Water_S2_V3)



Note: All costs are reported in current dollars (net of inflation).

6.1.1 Sustainability of service delivery

There are four key indicators for service delivery sustainability that have been considered in the analysis of the services provided by this asset category. These include the asset renewal funding ratio, long term life cycle costs/expenditures and medium term projected/budgeted expenditures over 5 and 10 years of the planning period.

Asset Renewal Funding Ratio

Asset Funding Ratio 100%

The Asset Renewal Funding Ratio is the ratio of the of the asset renewal expenditure budgeted over a 10-year period relative to the projected asset capital renewal expenditures. The Asset Funding Ratio is an important indicator and reveals that over the next 10 years, the City is forecasting that it will have 100% of the funds required for renewal of assets.

Long term - Life Cycle Cost

Life cycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the asset life cycle. Life cycle costs include operations and maintenance expenditures and asset consumption (depreciation expense). The life cycle cost for the services covered in this AMP is \$14.4 million per year (average operations and maintenance expenditure plus depreciation expense projected over 10 years).

Life cycle costs can be compared to life cycle expenditure to give an initial indicator of affordability of projected service levels when considered with age profiles. Life cycle expenditure will vary depending on the timing of asset renewals. The life cycle expenditure over the 10-year planning period is \$11.6 million per year (average operations and maintenance plus capital renewal budgeted expenditure in LTTP over 10 years).

A shortfall between life cycle cost and life cycle expenditure is the life cycle gap. The life cycle gap for services covered by this asset management plan is -\$2.8 million per year.

Life cycle expenditure is 80% of life cycle costs.

The life cycle costs and life cycle expenditure comparison highlights the difference between present expenditures and the forecasted cost of providing the service over the long term. The cycle expenditure is less than the life cycle cost and as such is probable that rates will need to be increased beyond inflation in the long-term.

Knowing the extent and timing of any required increase in rates and the service consequences if funding is not available will assist the City in providing services to their community in a financially sustainable manner. This is the purpose of the asset management plans and long term financial plan.

Medium term – 10 year financial planning period

Projected operations, maintenance and capital renewal expenditure over the 10-year planning period provides more reliable data for the assessment of service and financial sustainability as this based on best estimate projections in the AMP. This AMP identifies the projected operations, maintenance and capital renewal expenditures required to provide water service to the community over a 10-year period.

The projected operations, maintenance and capital renewal expenditure required over the 10-year planning period is \$11.6 million on average per year. The estimated budget available for operations, maintenance and capital renewal funding is \$11.6 million on average per year. This indicates that the City expects to have 100% of the projected expenditures needed to provide Water service.

Medium Term – 5 year financial planning period

The projected operations, maintenance and capital renewal expenditure required over the first 5 years of the planning period is \$11.1 million on average per year.

Estimated (budget) operations, maintenance and capital renewal funding is \$11.1 million on average per year. This indicates that the City expects to have 100% of projected expenditures required to provide Water service.

Asset management financial indicators

Figure 7a compares the asset management financial indicators over the next 5 and 10 years and over the long-term life cycle of the asset category. Ideally, the financing indicators should be 100% for the first 5 years and close to 100% over the 10-year period and long-term. Anything less than this in the 5-10 year period would suggest funding levels below that required to sustain existing service levels. This graphs shows that the City's Water Utility is fully funded and well positioned to managed operation, maintenance and asset renewal.

The Long Term indicator suggests that rates may need to be increased beyond inflation to manage the increasing cost pressures from an aging system. This AMP projects an increase in renewal funding in anticipation of the future cost pressures to minimize rate impacts to the customers.

Figure 7A: Asset Management Financial Indicators

Kelowna - AM Financial Indicators (Water_S2_V3)

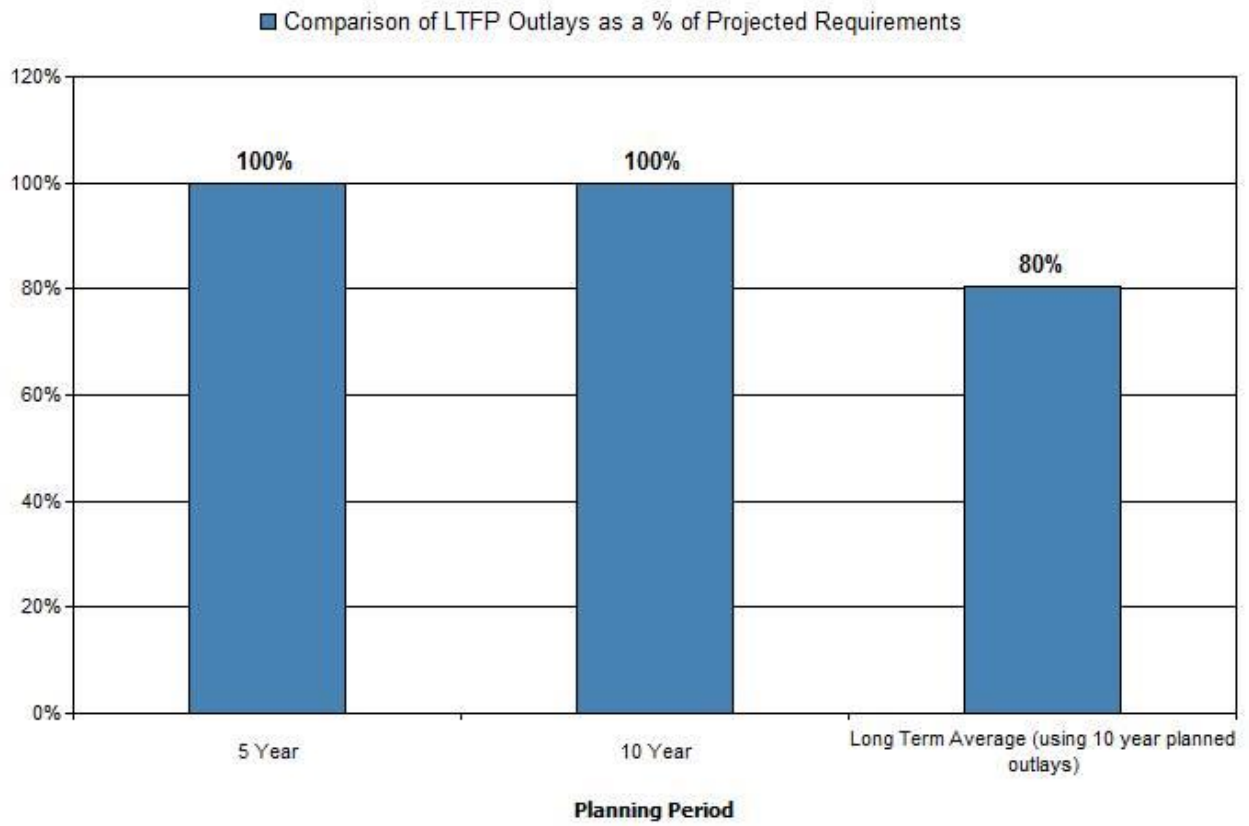
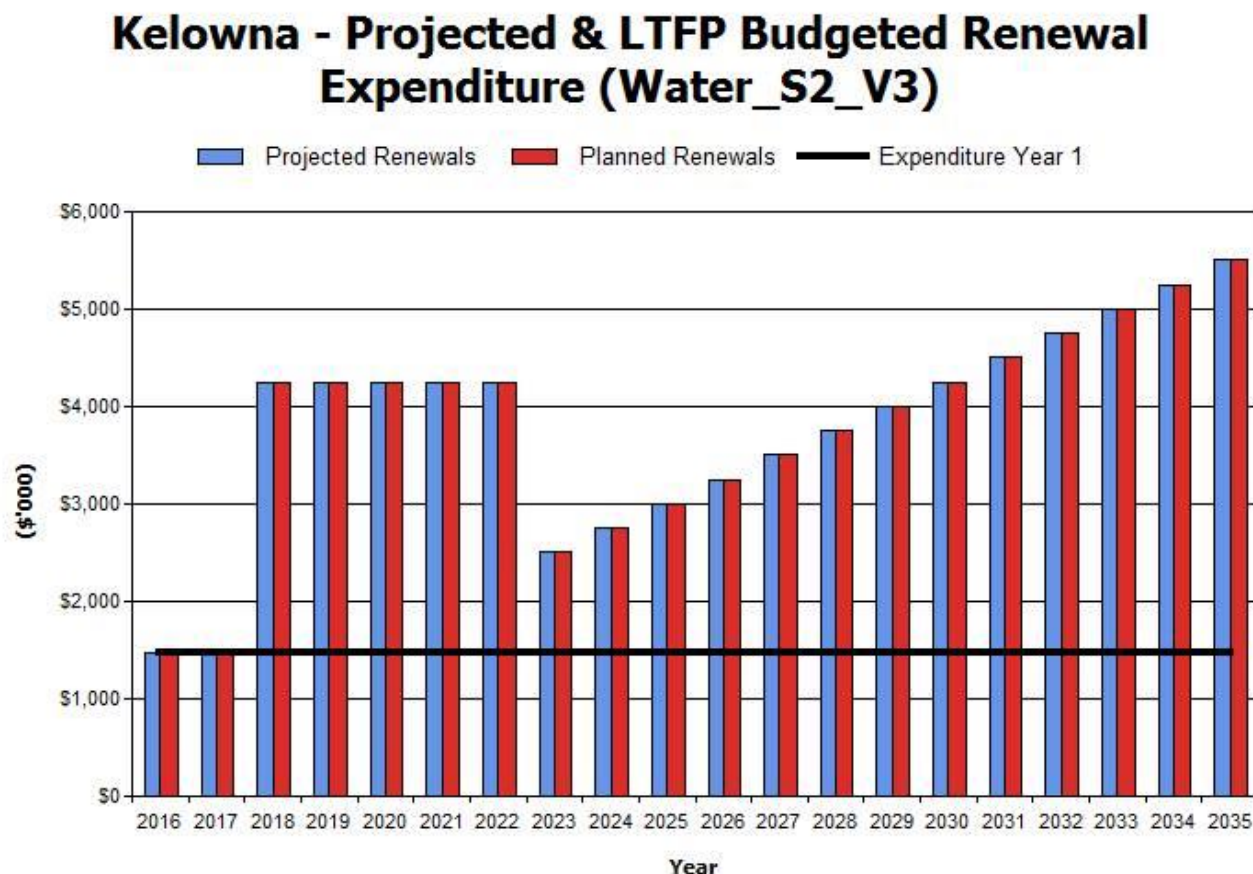


Figure 8 shows the Projected Renewal expenditure from Figures 5 compared to planned renewal expenditure from the long-term financial plan and current (year 1) expenditure. These renewal expenditures are accounted for in the water financial model and are fully funded.

Figure 8: Projected and Budgeted Renewal Expenditure



Note: All costs are reported in current dollars (net of inflation).

Table 6.1.1 shows that there is no shortfall between projected renewal expenditures and expenditure accommodated in Water Financial Model.

Table 6.1.1: Projected Expenditures and Budgeted Renewals and Financing Shortfall

Year End June 30	Projected Renewals (\$'000)	LTFP Renewal Budget (\$'000)	Renewal Shortfall Shortfall (- gap,	Cumulative Shortfall
2016	\$1,480	\$1,480	\$0	\$0
2017	\$1,495	\$1,495	\$0	\$0
2018	\$4,250	\$4,250	\$0	\$0
2019	\$4,250	\$4,250	\$0	\$0
2020	\$4,250	\$4,250	\$0	\$0
2021	\$4,250	\$4,250	\$0	\$0
2022	\$4,250	\$4,250	\$0	\$0
2023	\$2,500	\$2,500	\$0	\$0
2024	\$2,750	\$2,750	\$0	\$0
2025	\$3,000	\$3,000	\$0	\$0
2026	\$3,250	\$3,250	\$0	\$0
2027	\$3,500	\$3,500	\$0	\$0

2028	\$3,750	\$3,750	\$0	\$0
2029	\$4,000	\$4,000	\$0	\$0
2030	\$4,250	\$4,250	\$0	\$0
2031	\$4,500	\$4,500	\$0	\$0
2032	\$4,750	\$4,750	\$0	\$0
2033	\$5,000	\$5,000	\$0	\$0
2034	\$5,250	\$5,250	\$0	\$0
2035	\$5,500	\$5,500	\$0	\$0

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

6.1.2 Projected expenditures for long term financial plan

Table 6.1.2 shows the projected expenditures for the 10-year financial plan. O&M and capital for renewal and growth is fully funded.

Table 6.1.2: Projected Expenditures for the Wastewater AMP

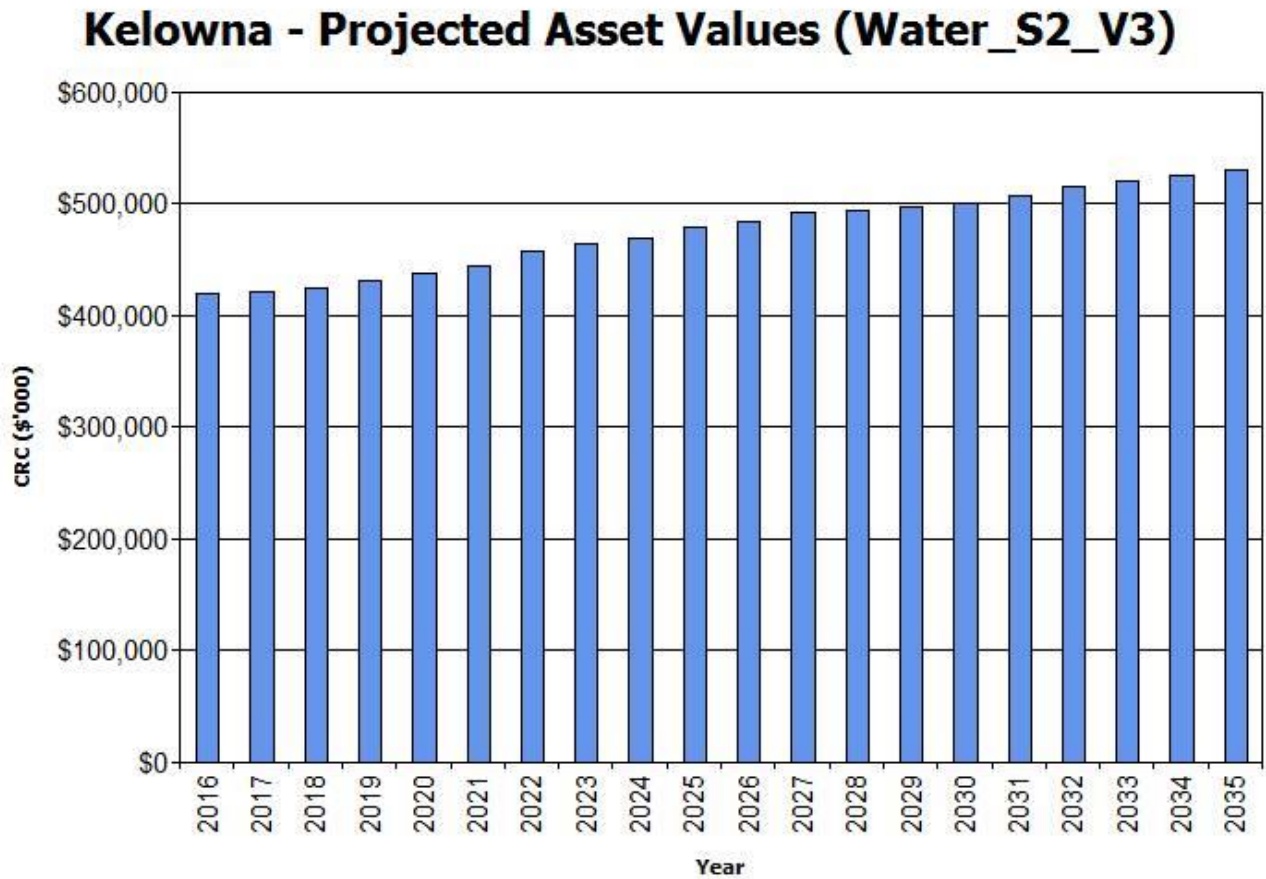
Year	Operations & Maintenance (\$000)	Projected Capital Renewal (\$000)	Capital Upgrade/ New (\$000)	Disposals (\$000)
2016	\$7,306	\$1,480	\$2,810	\$0
2017	\$7,906	\$1,520	\$2,485	\$0
2018	\$8,069	\$4,250	\$2,622	\$0
2019	\$8,235	\$4,250	\$11,471	\$0
2020	\$8,355	\$4,250	\$8,945	\$0
2021	\$8,463	\$4,250	\$5,480	\$0
2022	\$8,572	\$4,250	\$11,346	\$0
2023	\$8,681	\$2,500	\$7,716	\$0
2024	\$8,795	\$2,750	\$6,268	\$0
2025	\$8,908	\$3,000	\$10,746	\$0
2026	\$9,011	\$3,250	\$2,217	\$0
2027	\$9,115	\$3,500	\$3,600	\$0
2028	\$9,219	\$3,750	\$2,217	\$0
2029	\$8,681	\$4,000	\$2,218	\$0
2030	\$8,788	\$4,250	\$3,428	\$0
2031	\$8,897	\$4,500	\$5,860	\$0
2032	\$8,874	\$4,750	\$7,606	\$0
2033	\$8,985	\$5,000	\$5,000	\$0
2034	\$9,097	\$5,250	\$5,000	\$0
2035	\$9,210	\$5,500	\$5,000	\$0

Note: All values are reported in current dollars (net of inflation).

6.2 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to accommodate growth or improve service levels. Figure 9 shows the projected current replacement cost of assets is expected to increase by \$113 million to \$530 million over the planning period.

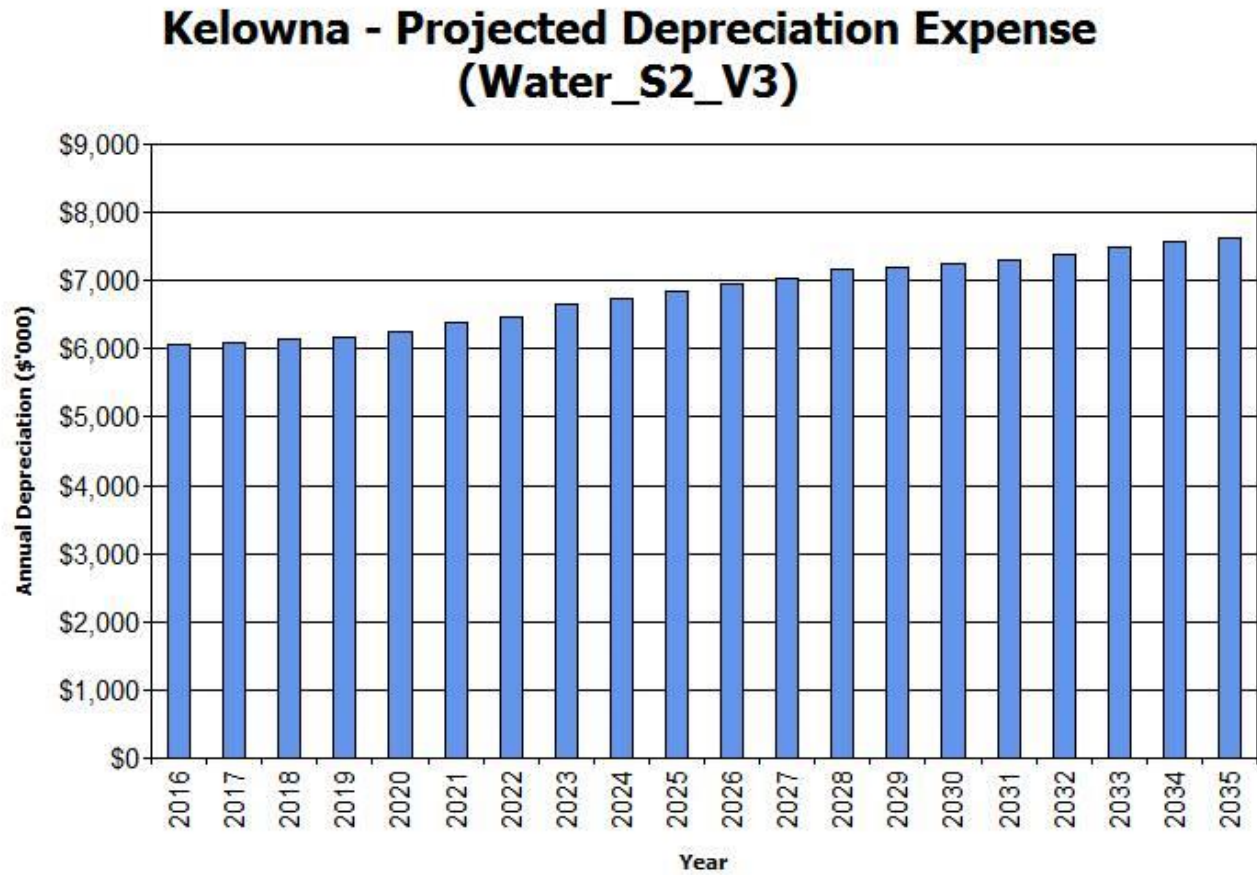
Figure 9: Projected Asset Values



Note: All costs are reported in current dollars (net of inflation).

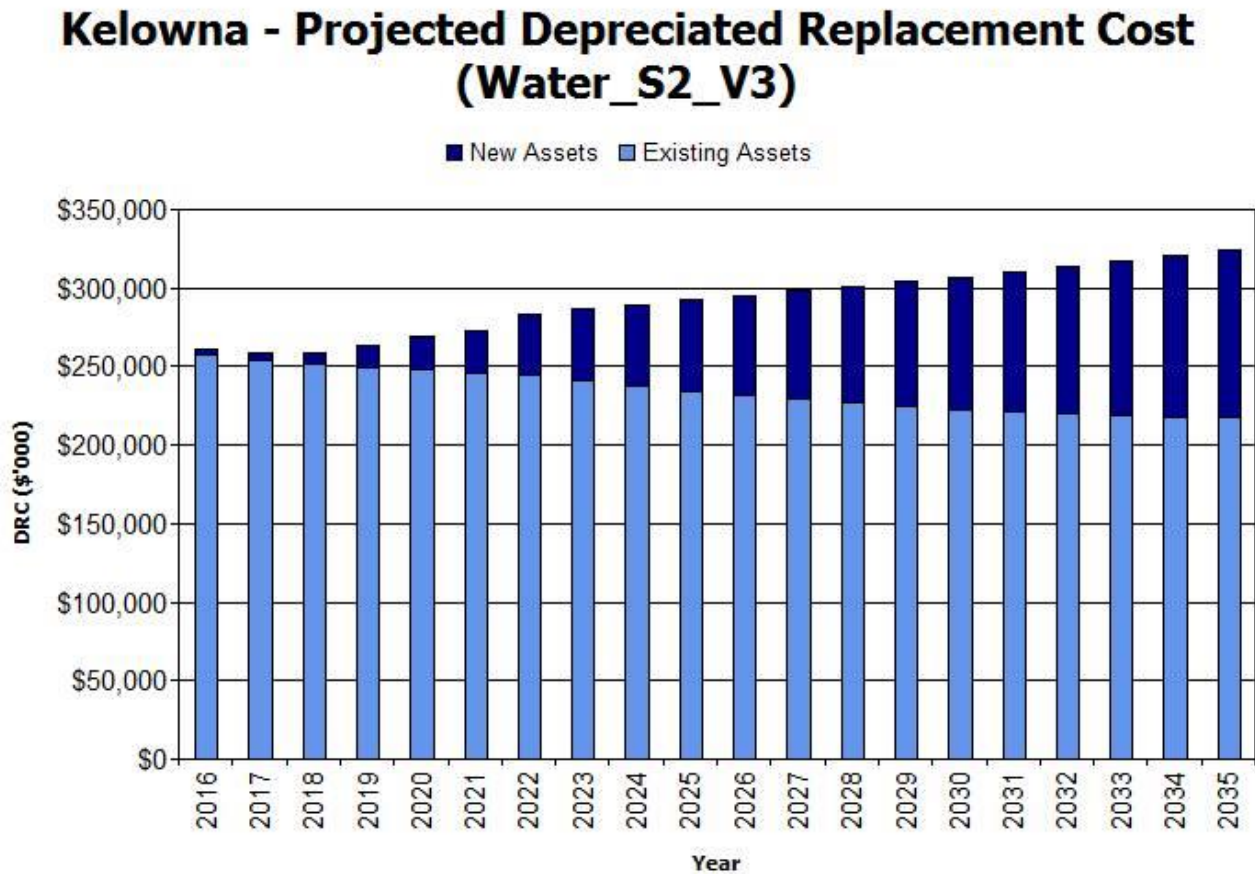
Figure 10 shows the projected depreciation expense for assets over the 20-year planning period. The increase in annual depreciation (\$1.6 million) is a result of contributed assets from developers and the construction of new assets and upgrade of existing assets to accommodate growth or improve service levels.

Figure 10: Projected Depreciation Expense



The depreciated replacement cost will vary over the forecast period depending on the rates of addition of new assets, disposal of old assets and consumption and renewal of existing assets. Figure 11 shows the projected replacement cost (carrying amount) for assets over the 20-year planning period. The depreciated replacement cost of contributed and new assets is shown in the darker colour and the depreciated replacement cost of existing assets is shown in the lighter colour. This figure shows that existing assets are being consumed faster than they are replaced and the addition of new assets is forecast to increase the depreciated replacement cost to \$315 million by 2035.

Figure 11: Projected Depreciated Replacement Cost



6.2 Key Assumptions made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this AMP.

Table 6.4: Key Assumptions made in AMP and Risks of Change

Key Assumptions	Risks of Change to Assumptions
Asset replacement timing is based on asset age and the theoretical asset useful life	Actual asset replacement timing may/will differ than these projections.
Asset condition is based on percent of theoretical asset useful life remaining	Actual condition of assets may be worse than anticipated and this may affect asset performance.
Replacement costs are based on industry cost estimates	Actual replacement costs may be more expensive
Legislative compliance will remain constant	Changes in legislation & regulation may increase operating and maintenance expenditures and trigger additional capital investment.
Asset registry is accurate and comprehensive.	Missing asset information may cause and underestimation of future O&M and Capital costs.

6.3 Forecast Reliability and Confidence

The expenditure and valuations projections in this AMP are based on best available data. Up to date and accurate data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale in accordance with Table 6.5.

Table 6.5: Data Confidence Grading System

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

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

Table 6.5.1: Data Confidence Assessment for Data used in AMP

Data	Confidence Assessment	Comment
Demand drivers	B	Based on local corporate knowledge, OCP, 20-yr Servicing Plan, Asset Registry
Growth projections	B	Population projections based on OCP
Operations expenditures	B	Municipal records – historically, operations expenditure and maintenance expenditure not separately identified
Operation and Maintenance expenditures	B	Actual expenditures used in water financial model
Projected Renewal Exp. -Asset Values	C	Asset values based on industry standards
-Asset residual values	C	Municipal assets are generally used to the end of their useful life and would not have a residual value of a material amount.
-Asset useful lives	C	Useful lives based on industry standards
-Condition modelling	C	Condition modeling base on asset age as a percentage of theoretical useful life

-Network renewals	C	Based on asset inventory registers and capital project Expenditures identified in 2030 Infrastructure Plan
Upgrade/New expenditures	B	Program expenditure projections are based on projects identified in 2030 Infrastructure Plan
Disposal expenditures	C	Not considered as part of this AMP. Assumed that there are no disposal expenditures.

Over all data sources, the data used in the preparation of this AMP is assessed at a medium confidence level.

7. PLAN IMPROVEMENT AND MONITORING

7.1 Improvement Program

The asset management improvement plan generated from this AMP is shown in Table 7.2.

Table 7.2: Improvement Plan

Task No	Task	Responsibility	Resources Required	Timeline
1	Implement Agresso FA for better financial reporting	Financial Services	Exiting staff	2016-17
2	Improve asset data collection	Infrastructure/Development Engineering	Existing Staff	2016-17
3	Implement Asset Management System	Infrastructure	Identified in 2017 budget	2017-18

7.2 Monitoring and Review Procedures

This AMP will be reviewed regularly and amended to recognize any material changes in service levels and/or resources available to provide those services as a result of budget decisions.

8. REFERENCES

Council Policy 352 - Sustainable Municipal Infrastructure Policy

Council Policy 342 - Tangible Capital Asset Policy

2030 Infrastructure Plan (April 2016)

2015 Financial Plan 5-Year Financial Plan

20-Year Servicing Plan and Financial Strategy (amended 2016)

2030 Official Community Plan

IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM

IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.

IPWEA, 2009, 'Australian Infrastructure Financial Management Guidelines', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMG.

IPWEA, 2011, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM

9. APPENDICES

Appendix A Projected 10-year Capital Renewal and Replacement Works Program

Appendix B Projected 10-year Capital Upgrade/New Works Program

Appendix C Abbreviations

Appendix D Glossary

Appendix A Projected 10-year Capital Renewal and Replacement Program

(\$000)

Year	Item	Description	Estimate
2016		Network Renewals	
	1	Renewal	\$1,480
	2		
2016		Total	\$1,480

2017		Network Renewals	
	1	Renewal	\$1,495
	2		
2017		Total	\$1,495

(\$000)

Year	Item	Description	Estimate
2018		Network Renewals	
	1	System Renewal	\$2,000
	2	Water Meter Renewal	\$2,250
2018		Total	\$4,250

2019		Network Renewals	Estimate
	1	System Renewal	\$2,000
	2	Water Meter Renewal	\$2,250
2019		Total	\$4,250

(\$000)

Year	Item	Description	Estimate
2020		Network Renewals	
	1	System Renewal	\$2,000
	2	Water Meter Renewal	\$2,250
2020		Total	\$4,250

2021		Network Renewals	
	1	System Renewal	\$2,000
	2	Water Meter Renewal	\$2,250
2021		Total	\$4,250

(\$000)

Year	Item	Description	Estimate
2022		Network Renewals	
	1	System Renewal	\$2,000
	2	Water Meter Renewal	\$2,250
2022		Total	\$4,250

2023		Network Renewals	
	1	System Renewal	\$2,500
	2		
2023		Total	\$2,500

(\$000)

Year	Item	Description	Estimate
2024		Network Renewals	
	1	System Renewal	\$2,750
2024		Total	\$2,750

2025		Network Renewals	
	1	System Renewal	\$3,000
	2		
2025		Total	\$3,000

Appendix B Projected Upgrade/New 10-year Capital Program

(\$000)

Year	Item	Description	Estimate
2016	1	Offsite & Oversize - Water	\$60
	2	Clifton Main Upgrade (sections: Rio-Boppart-PRV)	\$750
	3	Contributed Assests from Land Development (est.)	\$2,000
2016		Total	\$2,810

(\$000)

Year	Item	Description	Estimate
2017	1	Offsite & Oversize - Water	\$60
	2	Vintage Terrace Existing FF	\$200
	3	Contributed Assests from Land Development (est.)	\$2,000
	4	Water Meter - New Installations	\$150
	5	Ash & Uplands Pressure Reducing Valves	\$75
2017		Total	\$2,485

(\$000)

Year	Item	Description	Estimate
2018	1	Offsite & Oversize - Water	\$67
	2	Ethel Main Installation (Weddell-Clement)	\$405
	3	Contributed Assests from Land Development (est.)	\$2,000
	4	Water Meter - New Installations	\$150
2018		Total	\$2,622

(\$000)

Year	Item	Description	Estimate
2019	1	Offsite & Oversize - Water	\$67
	2	Skyline Booster Station	\$378
	3	Southcrest Transmission (Southcrest-Westpoint)	\$6,807
	4	Cedar Creek Transmission - Stage 1 Stellar Booster Station project 3(b)	\$2,069
	5	Contributed Assests from Land Development (est.)	\$2,000
	6	Water Meter - New Installations	\$150
2019		Total	\$11,471

(\$000)

Year	Item	Description	Estimate
2020	1	Offsite & Oversize - Water	\$67
	2	Developer Credit	\$245
	3	Southcrest Transmission (Adams-Southcrest)	\$6,483
	4	Contributed Assests from Land Development (est.)	\$2,000
	5	Water Meter - New Installations	\$150
2020		Total	\$8,945

(\$000)

Year	Item	Description	Estimate
2021	1	Offsite & Oversize - Water	\$67
	2	Young and Hazel Rd Existing FF deficiency	\$315
	3	Frost Pump Station and Reservoir System Upgrade	\$2,948
	4	Contributed Assests from Land Development (est.)	\$2,000
	5	Water Meter - New Installations	\$150
2021		Total	\$5,480

(\$000)

Year	Item	Description	Estimate
2022	1	Offsite & Oversize - Water	\$67
	2	Altura FF Upgrade	\$80
	3	Cedar Creek Transmission System Stage 2	\$9,049
	4	Contributed Assests from Land Development (est.)	\$2,000
	5	Water Meter - New Installations	\$150
2022		Total	\$11,346

(\$000)

Year	Item	Description	Estimate
2023	1	Offsite & Oversize - Water	\$67
	2	Royal View and Mountain Main Upgrade - DCC	\$5,499
	3	Contributed Assests from Land Development (est.)	\$2,000
	4	Water Meter - New Installations	\$150
2023		Total	\$7,716

(\$000)

Year	Item	Description	Estimate
2024	1	Offsite & Oversize - Water	\$67
	2	Knox Mountain Transmission System Upgrades	\$3,506
	3	Fairway Cr & Eagle Dr FF	\$545
	4	Contributed Assests from Land Development (est.)	\$2,000
	5	Water Meter - New Installations	\$150
2024		Total	\$6,268

(\$000)

Year	Item	Description	Estimate
2025	1	Offsite & Oversize - Water	\$67
	2	PZ 419 Storage Upgrade	\$6,108
	3	Crawford Supply (Southcrest to Vector)	\$2,421
	4	Contributed Assests from Land Development (est.)	\$2,000
	5	Water Meter - New Installations	\$150
2025		Total	\$10,746

Appendix C Abbreviations

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

Appendix D 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 Corporation'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 Corporation'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 Corporation'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 noncritical 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 Corporations 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 Corporation 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 Corporation, 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 Corporation.

Value in Use

The present value of future cash flows expected to be derived from an asset or cash generating unit. It is deemed to be depreciated replacement cost (DRC) for those assets whose future

economic benefits are not primarily dependent on the asset's ability to generate net cash inflows, where the entity would, if deprived of the asset, replace its remaining future economic benefits.

Source: IPWEA, 2009, AIFMG Glossary

Additional and modified glossary items shown *