ASSET MANAGEMENT PLAN

Road Network

Roads AMP Alternate Pavement Management Software

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Contents

1.0 EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

This Asset Management Plan (AM Plan) details information about infrastructure assets with actions required to provide an agreed level of service in the most cost-effective manner while outlining associated risks. The plan defines the services to be provided, how the services are provided and what funds are required to provide over the 10 year planning period. The AM Plan will link to a Long-Term Financial Plan which typically considers a 10 year planning period.

1.2 Asset Description

This plan covers the infrastructure assets that provide Road Network Services

The Road network comprises: lane kilometers

- 45,632 Lane meters of Arterial Roads
- 44,820 Lane meters of Collector Roads
- 156,805 Lane meters of Local Roads
- 8,413 Lane meters of intersections and turning lanes
- Total of 255,671 Lane meters of road assets
- Sidewalk, curb and gutter, trail and lane assets are not included in this asset management plan

The above infrastructure assets have replacement value estimated at $149,162,561

1.3 Levels of Service

The allocation in the planned budget is sufficient to continue providing existing services at current levels for the 10 year planning period.

The main service consequences of the Planned Budget are:

- Roads that have a deteriorated surface will continue to deteriorate to achieve the most useful life possible before any major treatment is applied
- With maintaining the overall network Pavement Quality Index (PQI) of 65 the arterial and collector streets will be prioritized over the local streets

1.4 Future Demand

The factors influencing future demand and the impacts they have on service delivery are created by:

- Development – Commercial, Industrial, and residential development
- Land Use Changes- intensification of density
- Increased tourism
- Weather and water table fluctuation – impact on maintenance and renewal
- Road deterioration based on age and traffic volume

These demands will be approached using a combination of managing existing assets, upgrading existing assets and providing new assets to meet demand. Demand management practices may also include a combination of non-asset solutions, insuring against risks and managing failures.

- New and renewed roads will be designed to appropriately accommodate future demand
- Continued use of Pavement Management Software to maintain the overall network PQI at the level of service through suggested maintenance, renewal and replacements
- Periodic updates of the transportation master plan to project the required upgrades

- Maintenance including pothole repair, crack sealing
- Operation activities including street sweeping and snow removal

1.5 Lifecycle Management Plan

1.5.1 What does it Cost?

The forecast lifecycle costs necessary to provide the services covered by this AM Plan includes operation, maintenance, renewal, acquisition, and disposal of assets. Although the AM Plan may be prepared for a range of time periods, it typically informs a Long-Term Financial Planning period of 10 years. Therefore, a summary output from the AM Plan is the forecast of 10 year total outlays, which for the Road Network is estimated as $83,758,304 or $8,375,831 on average per year.

1.6 Financial Summary

1.6.1 What we will do

Estimated available funding for the 10 year period is $82,110,000 or $8,211,000 on average per year as per the Long-Term Financial plan or Planned Budget. This is 98.03% of the cost to sustain the current level of service at the lowest lifecycle cost.

The infrastructure reality is that only what is funded in the long-term financial plan can be provided. The Informed decision making depends on the AM Plan emphasising the consequences of Planned Budgets on the service levels provided and risks.

The anticipated Planned Budget for Road Network leaves a shortfall of $-164,831 on average per year. The forecast lifecycle costs compared with the planned budget are shown in the figure below.

Forecast Lifecycle Costs and Planned Budgets

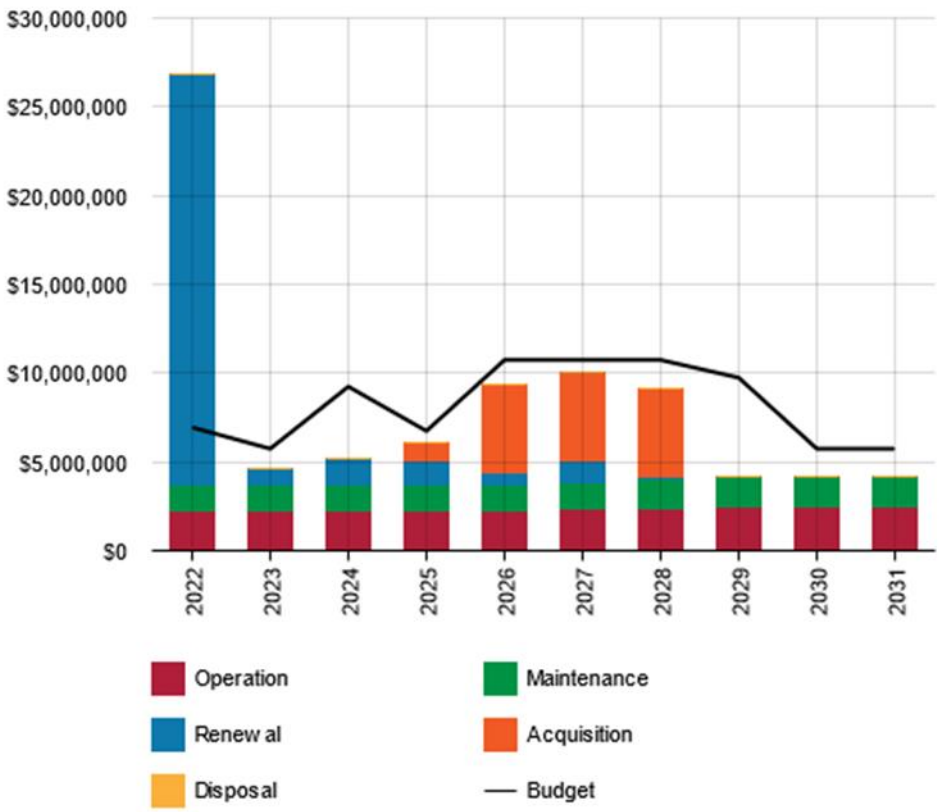
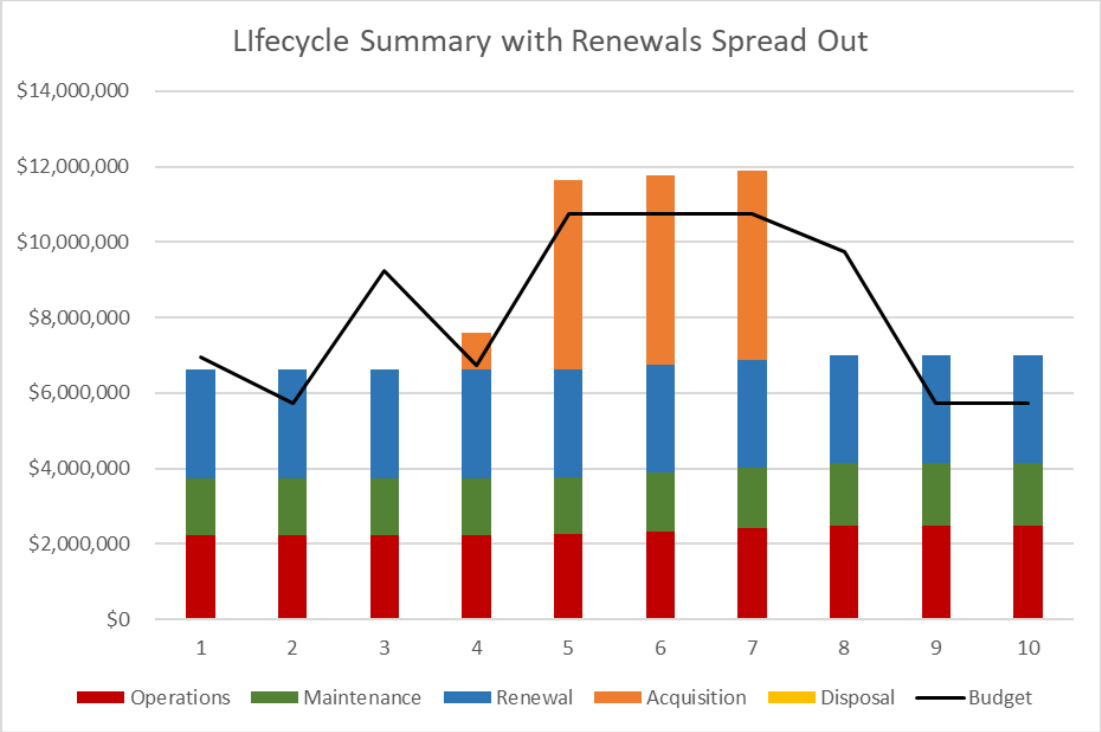


Figure Values are in current dollars.

The renewal spike is caused by the selection of roads that have a PQI less than 65 as that is the current overall network average. Many of these sections do not require immediate renewal as a PQI below 65 is acceptable for the lower road classifications. The renewals shown in 2022 ($23,125,000) can and will be split into remaining 9 years and will bring the average required renewal per year to $2,870,500 which is slightly over the planned renewal budget. Based on the previous Pavement Management Software reports and testing our PQI has remained relatively stable at 65 since 2016 with an average renewal budget of $3,500,000 a year. This is shown in the figure below.



We plan to provide Road Network services for the following:

- Operation, maintenance, renewal and acquisition of Roads to meet service levels set by the City of Cold Lake in annual budgets.
- Major renewals within the 10 year planning period include:
  - Street Improvement Program $2,000,000 Annually
  - 11 street from 8 Avenue to 11 Avenue (11 Street Underground Infrastructure Upgrades and Road Rehabilitation project) 2022 $750,000
  - 16 Avenue from 6 street to city limits (16 Avenue sewer replacement) 2022 $450,000
  - Lakeshore Drive from 10 Street to 8 Avenue (Lakeshore Drive Infrastructure Improvements) 2024 $1,500,000
  - Highway 55 Road improvements 2024 $2,000,000
  - 25 Street Road Improvements (English Bay to Points West access) 2029 $2,000,000
  - 16 Street Road Improvements (16 avenue to Forest Drive) 2029 $2,000,000
- Major acquisitions within the 10 year planning period include:
  - Highway 28 South widening enhancements 2025 through 2028 $16,000,000
- Operation and Maintenance activities within the 10 year planning period include:
  - Street sweeping

- Pothole repair
- Snow removal
- Reporting on snow management
- Line painting
- Dust control
- Sign maintenance and replacement
- Crack sealing / Spray patching / Slurry sealing

1.6.2 What we cannot do

We currently do allocate enough budget to sustain these services at the proposed standard or to provide all new services being sought. Works and services that cannot be provided under present funding levels are:

- Increase the overall network PQI
- Pave the remaining gravel roads

1.6.3 Managing the Risks

Our present budget levels are sufficient to continue to manage risks in the medium term.

The main risk consequences are:

- Property damage due to insufficient funding to ensure road network services can be maintained at current levels
- High cost reactive maintenance will increase financial shock and divert funds from other services

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

- Ensure future development is appropriately sized and financial risk mitigated
- Improve data confidence through donated acquisition process and condition assessment practices
- Ensure Council and the public are adequately informed to the risks and financial obligations and responsibilities of long lived assets
- Perform maintenance and operation activity to maintain current performance

1.7 Asset Management Planning Practices

Key assumptions made in this AM Plan are:

- The acquisitions are based on the Transportation plan and community growth
- Renewals are suggested by service levels, Asset PQI in the Pavement Management Software and budget allocation
- Age and condition information is based on Pavement Management Software as well as the asset registry . Pavement Management Software data is collected using multiple tests completed every 3 years
- Sidewalks, street signs, street lights, traffic lights and Laneways are not included

Assets requiring renewal are identified from either the asset register or an alternative method.

- The timing of capital renewals based on the asset register is applied by adding the useful life to the year of acquisition or year of last renewal,
- Alternatively, an estimate of renewal lifecycle costs is projected from external condition modelling systems and may be supplemented with, or based on, expert knowledge.

The Alternate Method based on external modelling using the Pavement Management Software program using the current network PQI of 65 to forecast the renewal lifecycle costs for this AM Plan.

This AM Plan is based on a reliable level of confidence information.

1.8 Monitoring and Improvement Program

The next steps resulting from this AM Plan to improve asset management practices are:

- Improve reliability of Pavement Management Software by implementing yearly updates
- Develop Level of Service survey and reporting to improve customer engagement
- Increase usability of Pavement Management Software by implementing additional modules
- Update the plan to include the sidewalk, trail and lane assets
- Increased system operation practices that are digitally documented and integrated into city works to better track information such as spending, resources, areas of concern, time frames for service initiation to completion
- Improve practices to provide resiliency of new assets to climate change

2.0 Introduction

2.1 Background

This AM Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the planning period.

The AM Plan is to be read with the Road Network planning documents. This should include the Asset Management Policy and Asset Management Strategy, where developed, along with other key planning documents:

- Transportation Master Plan 2014
- City of Cold Lake Engineering Standards and Specifications 2020
- City of Cold Lake Asset Management Policy 206-AD-19
- Council's Strategic Plan 072-AD-01
- Council's Projected 10 year Capital Plan
- City of Cold Lake Economic Development Strategy – March 2019
- City of Cold Lake Levels of Service
- City of Cold Lake Strategic Plan
- Cityworks
- 2017 Growth Study
- Current Road System Analysis through pavement management software
- Area Structure Plans
- Asset Optimizer for the asset registry and financial background
- Offsite levy bylaw 281-AD-07
- Snow removal Policy 103-OP-08

Asset management is currently in its infancy at the City of Cold Lake and this is the first Asset Management plan for the roads network.

The infrastructure assets covered by this AM Plan include roads For a detailed summary of the assets covered in this AM Plan refer to Table in Section 5.

These assets are used to provide Road Network services.

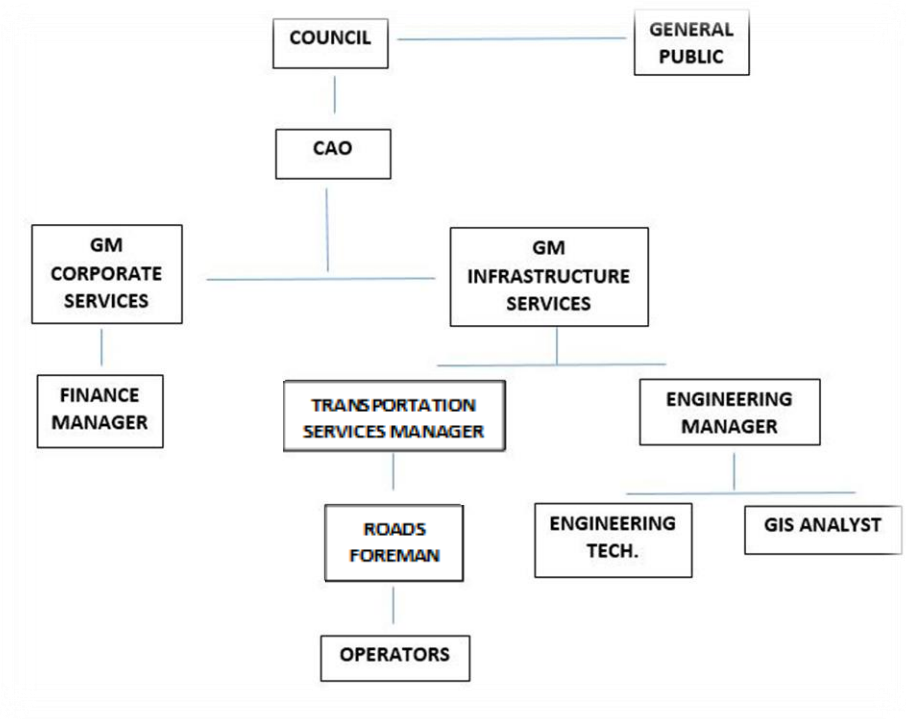
The infrastructure assets included in this plan have a total replacement value of $149,162,561

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 2.1.

Table 2.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
City Council	■ Represent needs of community/shareholders, ■ Allocate resources to meet planning objectives in providing services while managing risks, ■ Ensure service sustainable.
CAO/Management	■ Represent needs of the community/ shareholders/ administration, ■ Allocate resources to meet planning objectives in providing services while managing risks ■ Ensure the service is sustainable ■ Ensure that adequate resources are available to develop staff knowledge and skills to aid the implementation and continuous improvement of asset management practices ■ Set high level priorities for asset management development and raise awareness of this function to staff and outside contractors ■ Support the Asset Management Driven budget (10 year) and long term financial plan (5 year)
Administration	■ Operate and maintain the Road network ■ Report to CAO and Management progress, deficiencies and effectiveness of operations and maintenance activities ■ Verify location and condition of assets
Province of Alberta	■ Sets policy for roads through legislation which outlines mandatory standards and practices

Our organisational structure for service delivery from infrastructure assets is detailed below,



2.2 Goals and Objectives of Asset Ownership

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

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are

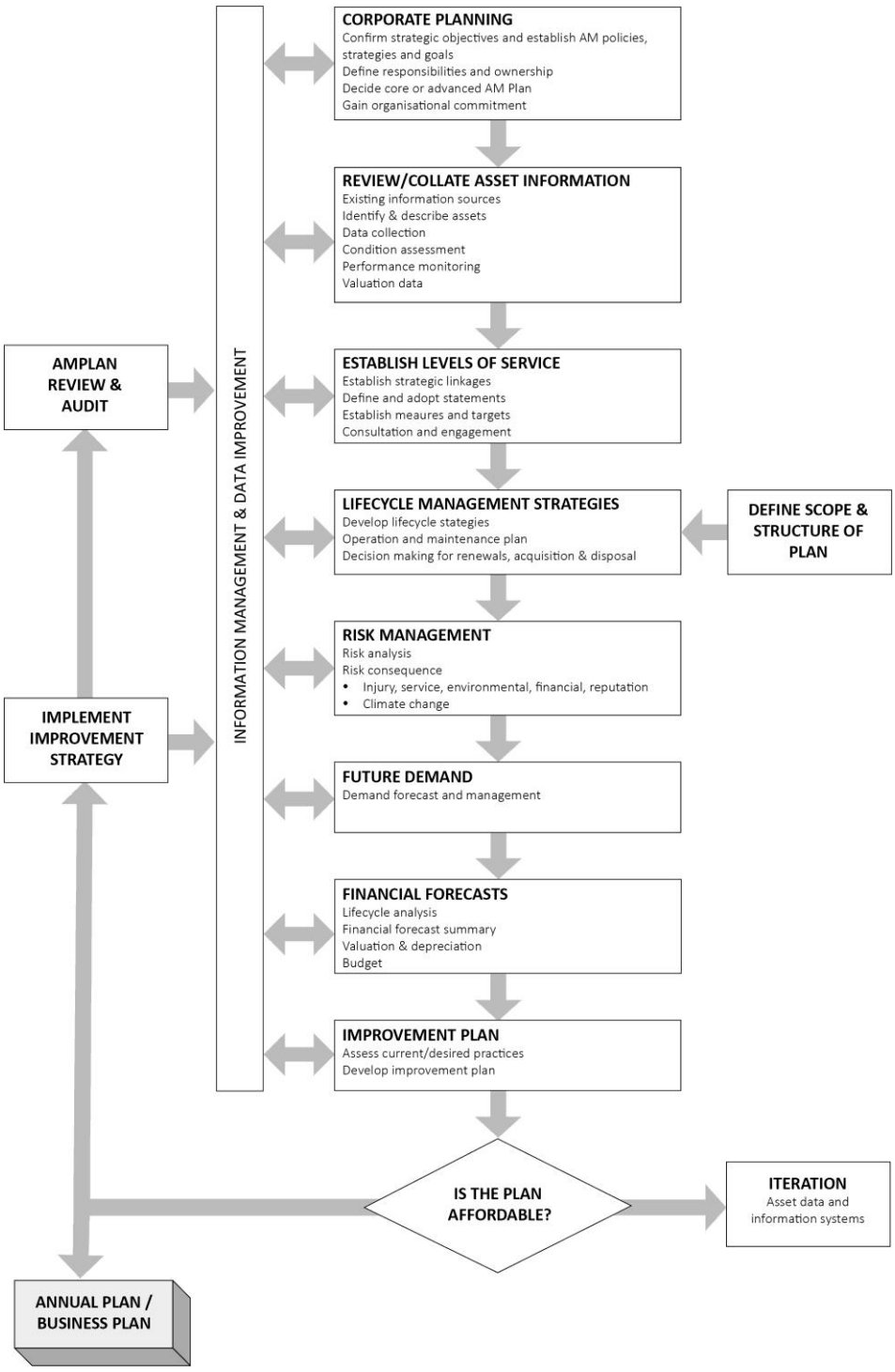
- Levels of service – specifies the services and levels of service to be provided,
- Risk Management,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 [1]
- ISO 55000[2]

A road map for preparing an AM Plan is shown below.

Road Map for preparing an Asset Management Plan
Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



[1] Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2| 13
[2] ISO 55000 Overview, principles and terminology

3.0 LEVELS OF SERVICE

3.1 Customer Research and Expectations

This AM Plan is prepared to facilitate consultation prior to adoption of levels of service by the City of Cold Lake. Future revisions of the AM Plan will incorporate customer consultation on service levels and costs of providing the service. This will assist the City of Cold Lake and stakeholders in matching the level of service required, service risks and consequences with the customer's ability and willingness to pay for the service.

We currently have no research on customer expectations. This will be investigated for future updates of the AM Plan.

3.2 Strategic and Corporate Goals

This AM Plan is prepared under the direction of the Road Network vision, mission, goals and objectives.

Our vision is:

To make Cold Lake a sustainable, diverse and vibrant community

Our mission is:

"To maintain a strong balance between expanding and modernizing old infrastructure to provide excellent municipal services while delivering expanded updated economic development strategies, infrastructure maintenance programs and capital projects for new and renewed infrastructure to accommodate growth and diversity."

Strategic goals have been set by the Road Network. The relevant goals and objectives and how these are addressed in this AM Plan are summarised in Table 3.2.

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

Goal	Objective	How Goal and Objectives are addressed in the AM Plan
Sustainability	Maintain and renew existing while adding the new infrastructure within budget	Maintenance will continue as per service levels and budgets, work to provide projected renewal 10 year asset plans, provide implementation plans, report to Council on funding required for renewal
Excellent Services	Ensure the Road network function and traffic flows as expected and intended	Maintain Service Levels, prepare emergency response plans, education the public on the road network
Growth and Diversity	Provide new or modernized services	Work to provide projected new and upgrade 10 year asset plans, report to Council on funding requirements

3.3 Legislative Requirements

There are many legislative requirements relating to the management of assets. Legislative requirements that impact the delivery of the Road Network service are outlined in Table 3.3.

Table 3.3: Legislative Requirements

Legislation	Requirement
Municipal Government Act	Preparation of annual financial statements for immediately preceding year
Public Sector Accounting Board	Standards on how to account for and report on tangible capital assets in governmental financial statements

Canada- Alberta Gas Tax Fund Agreement	Alberta and Canada agreement to "Work in collaboration to develop the approach to Asset management based on where Alberta is today." Alberta to provide a "Outcomes Report"
Alberta Environment and Parks	Code of Practice

3.4 Customer Values

Service levels are defined in three ways, customer values, customer levels of service and technical levels of service.

Customer Values indicate:

- what aspects of the service is important to the customer,
- whether they see value in what is currently provided and
- the likely trend over time based on the current budget provision

Table 3.4: Customer Values

Service Objective:

Customer Values	Customer Satisfaction Measure	Current Feedback	Expected Trend Based on Planned Budget
Ride is smooth	Average PQI of the network	No customer complaints	Remain the same or slight increase
Road is paved	All of the road network is paved	Currently 98.4% of the road network is paved	Remain the same or slight increase
Traffic Congestion	Traffic counts do not exceed the recommended volume for each functional class	No roads are over capacity	Expected to remain at current levels provided planned acquisitions are completed

3.5 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

Condition How good is the service … what is the condition or quality of the service?

Function Is it suitable for its intended purpose …. Is it the right service?

Capacity/Use Is the service over or under used … do we need more or less of these assets?

In Table 3.5 under each of the service measures types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

These are measures of fact related to the service delivery outcome (e.g. number of occasions when service is not available or proportion of replacement value by condition %'s) to provide a balance in comparison to the customer perception that may be more subjective.

Table 3.5: Customer Level of Service Measures

Type of Measure	Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	Road assets are kept in good repair	% of road assets with PQI greater than 40	Currently 87% of the road network has a PQI greater than 40	Remain the same
	Confidence levels		High (Professional Judgement supported by extensive data)	High (Professional Judgement supported by extensive data)
Function	All Roads are paved	% of roads that are paved	Currently 98.4% of the road network is paved	Remain the same of slight increase
	Confidence levels		High (Professional Judgement supported by extensive data)	High (Professional Judgement supported by extensive data)
Capacity	Traffic Congestion	% of roads that exceed the design traffic volumes	no roads exceed the design traffic volumes	Remain the same
	Confidence levels		High (Professional Judgement supported by extensive data)	High (Professional Judgement supported by extensive data)

3.6 Technical Levels of Service

Technical Levels of Service – To deliver the customer values, and impact the achieved Customer Levels of Service, are operational or technical measures of performance. These technical measures relate to the activities and allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

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

Service and asset managers plan, implement and control technical service levels to influence the service outcomes.[3]

Table 3.6 shows the activities expected to be provided under the current 10 year Planned Budget allocation, and the Forecast activity requirements being recommended in this AM Plan.

Table 3.6: Technical Levels of Service

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
TECHNICAL LEVELS OF SERVICE				
Acquisition Inspection and review of proposed designs	Ensure assets are sustainable and fit for purpose	Inspection to ensure the assets constructed or acquired conform to expected standards for condition, quality, resiliency and function	100%	100%
	What is the purpose of the Activity	Describe the Measure being used for performance monitoring	The Acquisitions that can be provided within the current Planned Budget restraints	The Acquisitions that we would like to do as per the Lifecycle Forecast
		Budget	$16,000,000	$16,000,000
Operation Street Sweeping	Remove debris from the driving surface. Reduce contamination in storm drainage system	# of times entire road network is swept	In 2022 the streets were swept 3 times	Once annually and biweekly rotation there after
Line Painting	Ensure the pavement markings are visible to increase safety and traffic flow	% of lines requiring paint completed annually	In 2022 all lines requiring paint were completed	All lines requiring paint to be completed
Dust Control	Reduce the amount of dust produced on gravel roads	% of gravel roads completed annually	In 2022 all gravel roads were completed	All gravel roads to be completed
Snow Removal	Allow a safe and clear driving surface for residents	# of times entire road network has snow removal	In the 2021 and 2022 winter season the road network was cleated 5 times	As required snow removal policy and amount of snow
		Budget	$2,241,000	$2,339,340
Maintenance Crack Seal	Fill cracks in the road caused by	% of road network crack sealed annually	In 2022 15% of the road network was crack sealed	It is recommended to crack seal 10% pf the road network

[3] IPWEA, 2015, IIMM, p 2|28.

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
	expansion and contraction			
Pothole filling	Fill hazards formed in road surface	# of potholes filled annually	In 2022 57 potholes were filled	As required
Pavement Management Program	Maintain the optimal surface condition through slurry sealing, micro surfacing, and spray patching	% of road network included in the Pavement Management Program annually	Currently 2% of the road network receives treatment	Treat 2% of the road network
		Budget	$1,500,000	$1,566,000
Renewal Mill and Overlay	Rehabilitate the surface of the road	% of road network milled and overlayed annually	In 2022 1.6% of the road network was mill and overlaid	As recommended by Pavement Management Software
Full Reconstruction	Rehabilitate the entire structure of the road	% of road network fully reconstructed	In 2.3% of the road network was fully reconstructed	As required for repairs to other infrastructure or recommended by Pavement Management Software
		Budget	$2,870,000	$2,870,491
Disposal	Permanent Road Removal / Closure	% of Roads removed annually	0%	0%
		Budget	$0	$0

Note: * Current activities related to Planned Budget.

** Expected performance related to forecast lifecycle costs.

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

4.0 FUTURE DEMAND

4.1 Demand Drivers

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

4.2 Demand Forecasts

The present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented.

4.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 4.3.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can 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 AM Plan.

Table 4.3: Demand Management Plan

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Population Growth	15,661	2.5% growth rate	Increase demand for all services	Education will continue to the public through brochure development and during Public Works Day.
Land Use Changes	Increasing densities and rezoning	Downtown re-purposing to mixed uses and lower density areas transition to higher density	Increase Traffic volumes more maintenance and need for upgrades	Education will continue to the public through brochure development and during Public Works Day.
Weather and water table fluctuation	Current annual rain fall 234mm and snowfall 146 cm	Increased storm severity, warmer summers	Road assets will flood more with higher intensity events causing surface issues. Temperature fluctuations impact strength and longevity of pavement. Increased operation costs to complete snow removal	Tracking through rain gauges and government tracking websites

4.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 5.4.

Acquiring new assets will commit the Road Network to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the long-term financial plan (Refer to Section 5).

4.5 Climate Change Adaptation

The impacts of climate change may have a significant impact on the assets we manage and the services they provide. In the context of the Asset Management Planning process climate change can be considered as both a future demand and a risk.

How climate change impacts on assets will vary depending on the location and the type of services provided, as will the way in which we respond and manage those impacts.[4]

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

[4] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

5.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Road Network plans to manage and operate the assets at the agreed levels of service (Refer to Section 3) while managing life cycle costs.

5.1 Background Data

5.1.1 Physical parameters

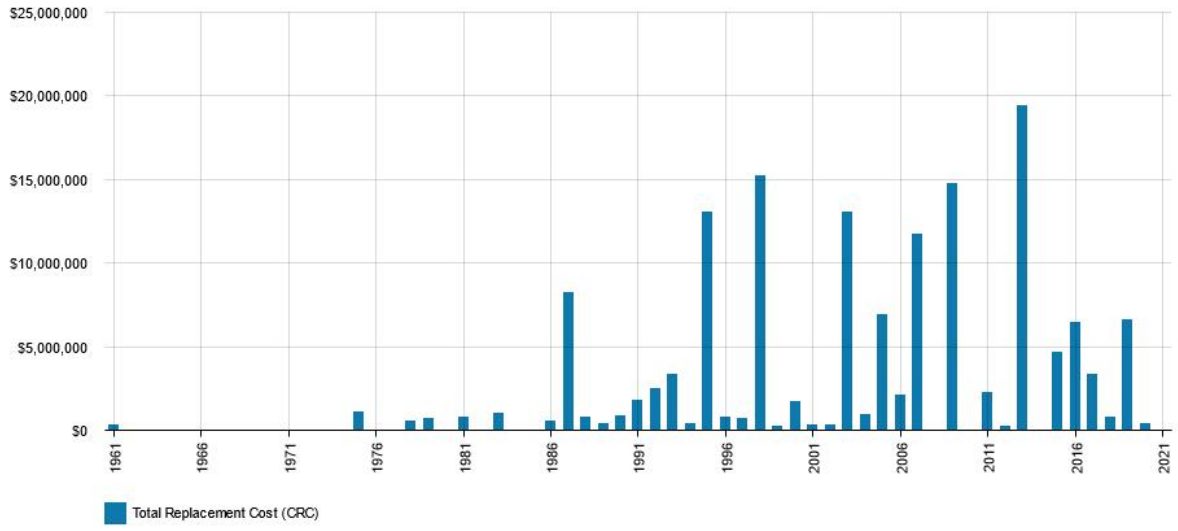
The assets covered by this AM Plan are shown in Table 5.1.1.

The assets included in this AM Plan are roads consisting of Arterial, Collector, Local, and Intersections and turning lanes. Lanes and sidewalks are not included in this AM Plan.

The age profile of the assets included in this AM Plan are shown in Figure 5.1.1.

Table 5.1.1: Assets covered by this Plan

Asset Category	Dimension	Replacement Value
Arterial Roads	45,632 lane meters	$26,622,544
Collector Roads	44,820 lane meters	$26,148,809
Local Roads	156,805 lane meters	$91,482,929
Intersections and turning lanes	8,413 lane meters	$4,908,279
TOTAL		**$149,162,561**



All figure values are shown in current day dollars.

Asset acquisition date is based on the registry as Pavement Management Software does not have an option for date installed. As most of the assets are built after 1996 which is within the 25 year projected useful life, we should not see any major increase in need replacements until 2032. The older assets are left to fail to get the most out of their useful life or an install date was assumed when entered into the registry. The asset performance is also confirmed by testing to determine the remaining useful life and required rehabilitation by Pavement Management Software.

5.1.2 Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. 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
Road Sections with PQI less than 40	Portions of Lakeshore Drive have the lowest PQI of the entire network. Upgrades are planned along with the other infrastructure.
Veterans Drive	Currently being used as a dangerous goods route while not classified as a dangerous goods route
Subdivisions with single access	Should road maintenance or and emergency happen on the single access the subdivision will be cut off from the rest of the road network

The above service deficiencies were identified from service requests, the Pavement Management Software and professional experience.

5.1.3 Asset condition

Condition is currently monitored Pavement Management software performance testing completed every 3 years using a falling weight defelectometer and visual analyzation.

Condition is measured using a 1 – 5 grading system[5] as detailed in Table 5.1.3. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system may be used at a more specific level, however, for reporting in the AM plan results are translated to a 1 – 5 grading scale for ease of communication.

Table 5.1.3: Condition Grading System

Condition Grading	Description of Condition
1 (PQI > 80)	**Very Good**: free of defects, only planned and/or routine maintenance required
2 (60 > PQI > 80)	**Good**: minor defects, increasing maintenance required plus planned maintenance
3 (40 > PQI > 60)	**Fair**: defects requiring regular and/or significant maintenance to reinstate service
4 (20 > PQI > 40)	**Poor**: significant defects, higher order cost intervention likely
5 (PQI < 20)	**Very Poor**: physically unsound and/or beyond rehabilitation, immediate action required

59,622.5 lane meters or 23.3% Are condition 1 (PQI greater than 80)

95,416.5 lane meters or 37.3% Are condition 2 (PQI greater than 60 and less than 80)

67,292.8 lane meters or 26.3% Are condition 3 (PQI greater than 40 and less than 60)

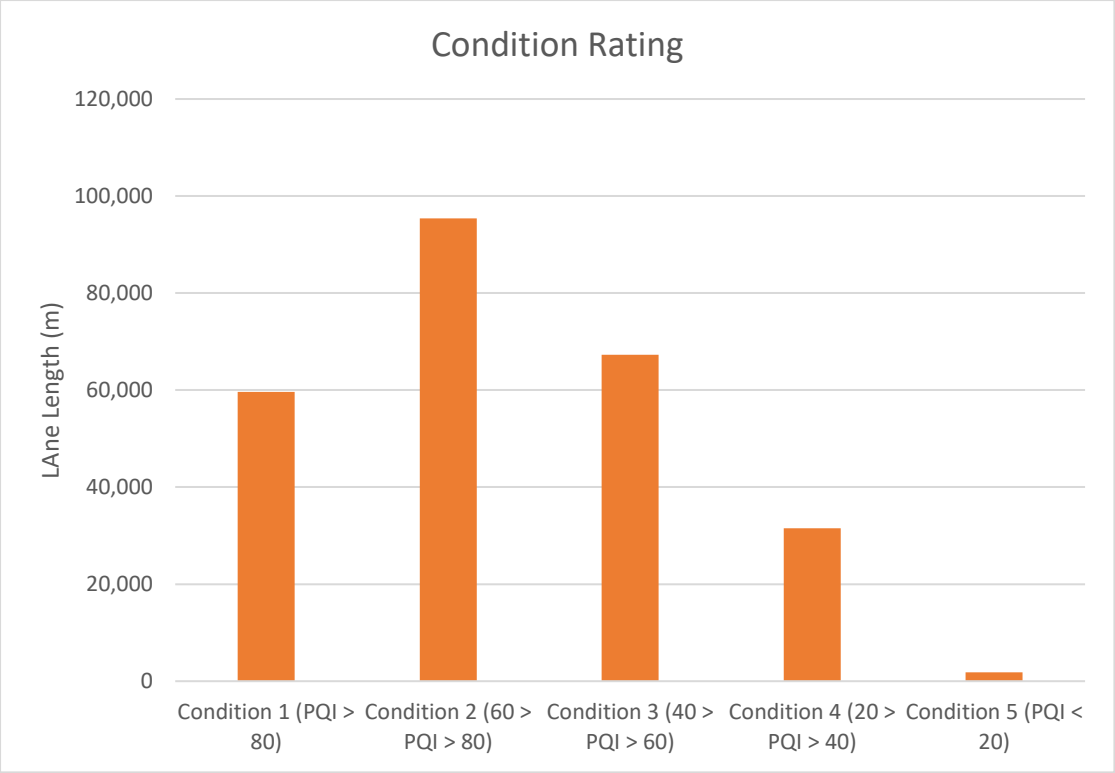
31,498.8 lane meters or 12.3% Are condition 4 (PQI greater than 20 and less than 40)

1,840.9 lane meters or 0.7% are condition 5 (PQI less than or equal 20)

The condition profile of our assets is shown in Figure 5.1.3.

[5] IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Figure 5.1.3: Asset Condition Profile



5.2 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection, and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, asphalt patching, and equipment repairs.

The trend in maintenance budgets are shown in Table 5.2.1.

Table 5.2.1: Maintenance Budget Trends

Year	Maintenance Budget $
2021	$1,500,000
2022	$1,500,000
2023	$1,500,000

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

Assessment and priority of planned and reactive maintenance is undertaken by staff using experience, judgement and the pavement management software.

Asset hierarchy

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

The service hierarchy is shown is Table 5.2.2.

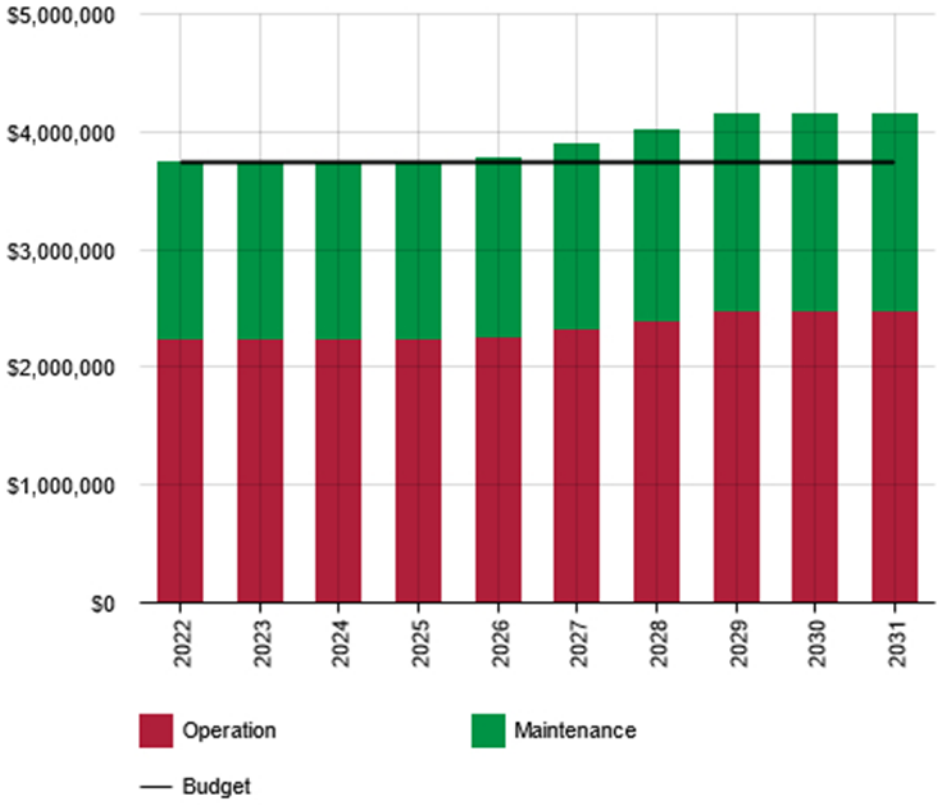
Table 5.2.2: Asset Service Hierarchy

Service Hierarchy	Service Level Objective
Asset Class	Asset network to provide road services to customers
Arterial Roads	To enable large volumes of traffic to travel from major points in the city
Collector Roads	To connect arterial roads to local roads and higher density developments
Local Roads	Provide direct connection to properties and collector roads

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. Figure 5.2 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 5.2: Operations and Maintenance Summary



All figure values are shown in current day dollars.

At the current funding level there will be sufficient funding to maintain operations. Additional funds will be required as new assets are acquired to continue providing the current levels of service to all the roads. Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) should be included in the infrastructure risk management plan.

5.3 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The estimates for renewals in this AM Plan were based on the alternate Method.

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 5.3. Asset useful lives were last reviewed on 2022.

Table 5.3: Useful Lives of Assets

Asset (Sub)Category	Useful life
Roads	25 Years
Gravel	100 years

5.3.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground).[6]

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[7]

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 5.3.1.

Table 5.3.1: Renewal Priority Ranking Criteria

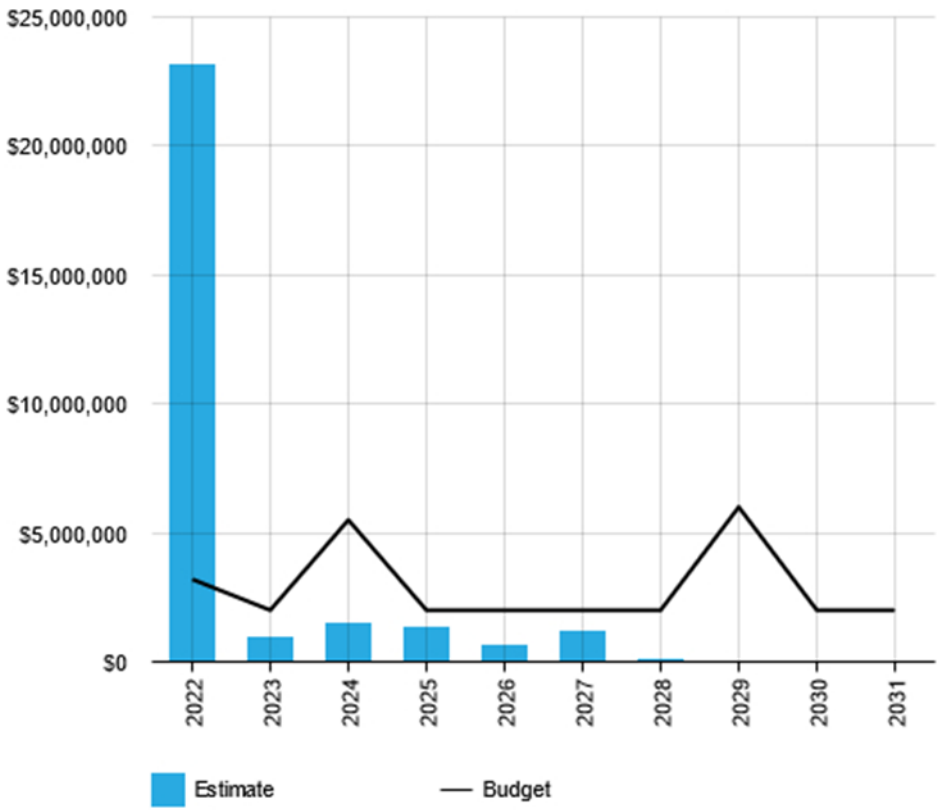
Criteria	Weighting
Renewal recommendation by administration with Pavement Management Software	65%
External impacts (underground replacement, growth, etc.)	25%
Asset failure	10%
Total	**100%**

5.4 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 5.4.1. A detailed summary of the forecast renewal costs is shown in Appendix D.

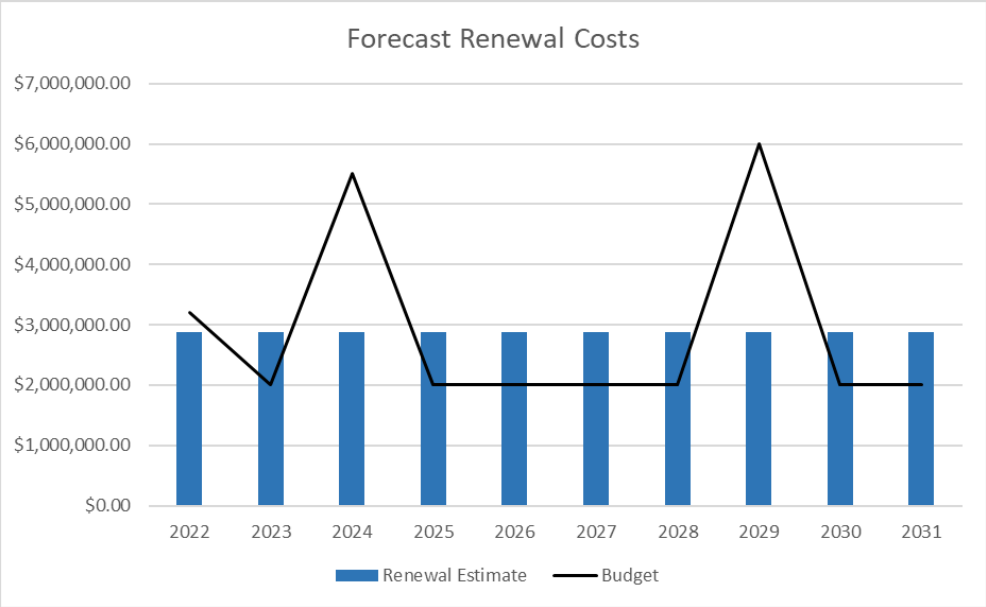
[6] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[7] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Figure 5.4.1: Forecast Renewal Costs



All figure values are shown in current day dollars. New graph

The above graph shows the roads that require a renewal based on the Pavement Management Software Decision Tree with PQI lower than 65. Many of these sections do not require immediate renewal as a PQI below 65 is acceptable for the lower road classifications. These costs are subsequently spread over the 10 year planning period by Pavement Management Software to help maximize the budget provided against the recommended renewal options. The adjusted annual renewal cost is $2,870,500. This is shown in the figure below and in Appendix D. Without the Pavement Management Software the estimate of forecast renewals based on a 25 year useful life without intermediate maintenance and renewals (crack sealing, Mill and Overlay) jumps to $43,406,000 in 2022 or $4,340,600 per year.



5.5 Acquisition Plan

Acquisition reflects are new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated to the Road Network.

5.5.1 Selection criteria

Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Entities needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed in Table 5.5.1.

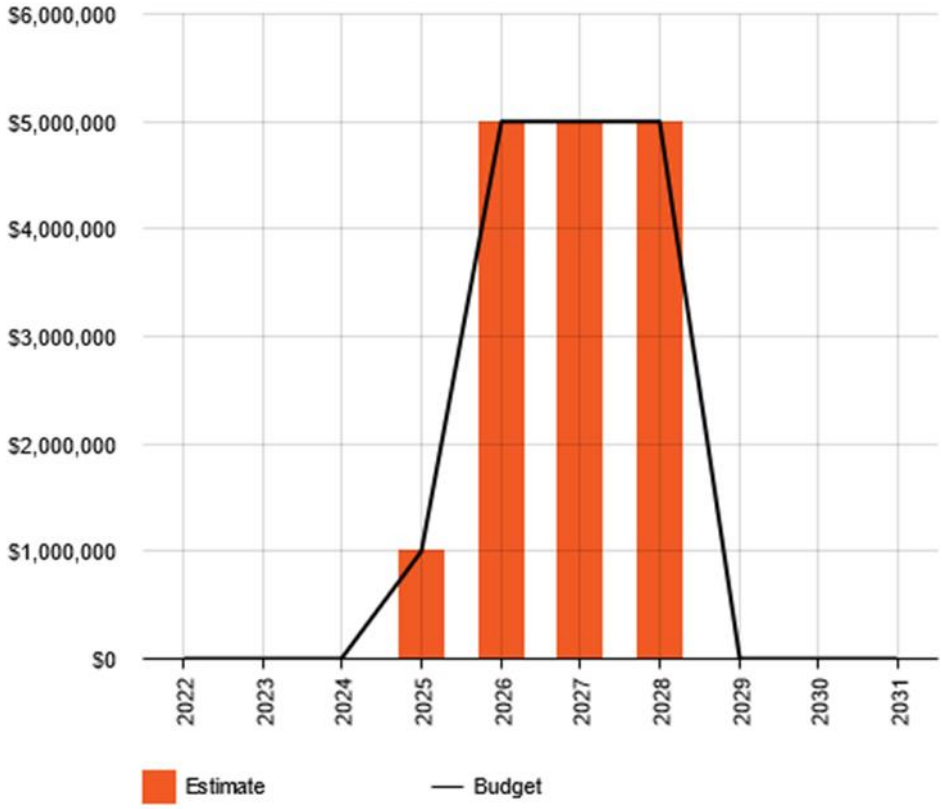
Table 5.5.1: Acquired Assets Priority Ranking Criteria

Criteria	Weighting
Growth Contributed Assets	90%
New Service Requests	10%
Total	**100%**

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised / summarized in Figure 5.5.1 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

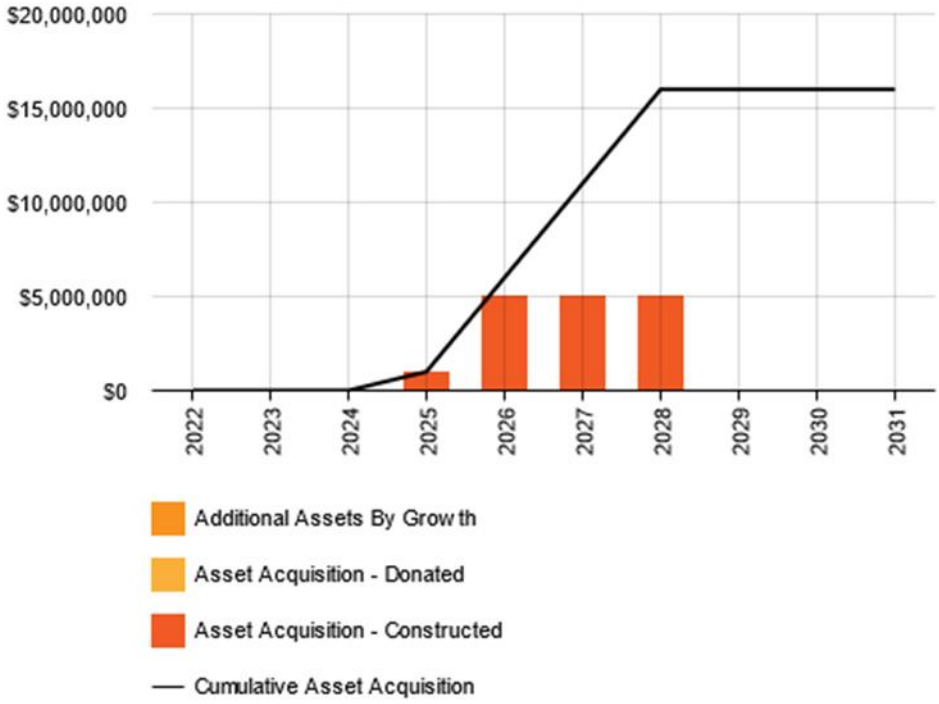
Figure 5.5.1: Acquisition (Constructed) Summary



All figure values are shown in current day dollars.

When an Entity commits to new assets, they must be prepared to fund future operations, maintenance and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the Entity. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Figure 5.5.2.

Figure 5.5.2: Acquisition Summary



All figure values are shown in current dollars.

Expenditure on new assets and services in the capital works program will be accommodated in the long-term financial plan, but only to the extent that there is available funding.

Within the next 10 years the planned acquisitions include the next phase of the Highway 28 South Enhancements happening through 2026 to 2028. Acquiring these assets will impact the operations and maintenance budget by increasing the total length of roads in the network.

The City of Cold Lake anticipates six (6) new subdivisions (Parkview, Lakewood, west of HSB- "Heights of English Bay", Lefebvre Heights, Tri City, Colonial) in the near term that will add 1800 lm of road network as donated assets. These contributed assets are estimated at $2,740,000 and will require additional operational and maintenance resources to ensure level of service can be maintained. These estimated donated acquisitions are not included the graphs above as a firm timeline of acquisition to the City of Cold Lake cannot be given.

Continued asset acquisition without sustainable funding allocation for operations and maintenance will require the City to lover its level of service and increase the likelihood of high cost reactive maintenance and the need for premature renewals.

5.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 5.6. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Table 5.6: Assets Identified for Disposal

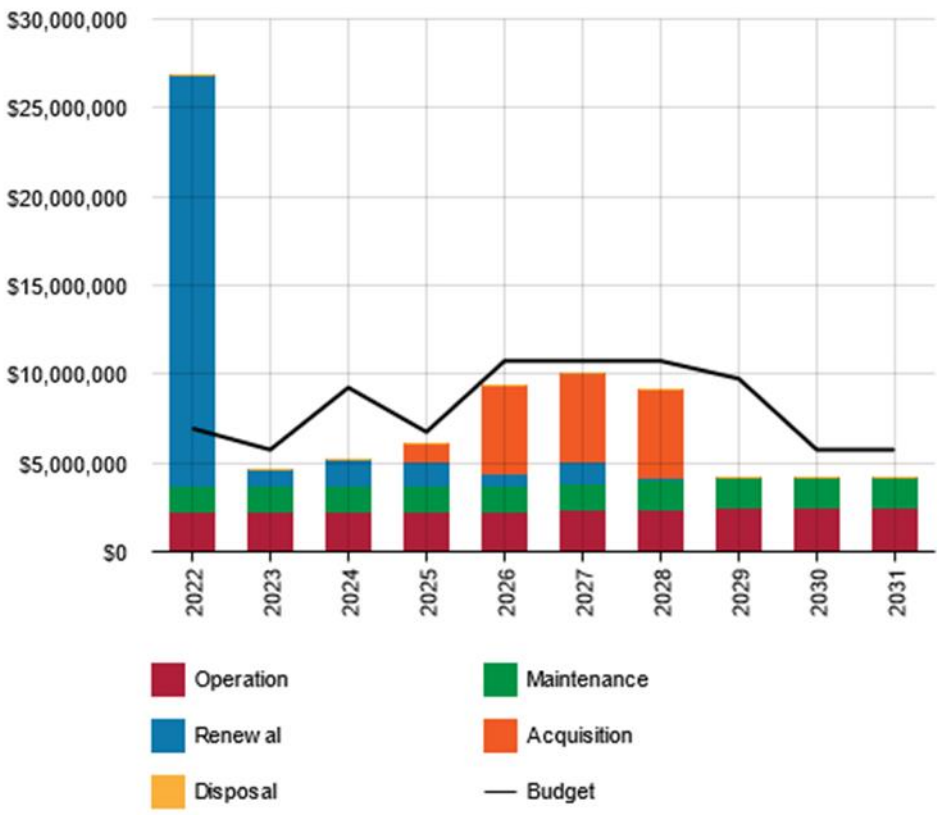
Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
Highway 28 South Service Roads	Highway 28 Widening	2026	Currently included in the Highway 28 Acquisition Costs	Maintenance will be increased due to the added lane lengths to the highway corridor

5.7 Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 5.7.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

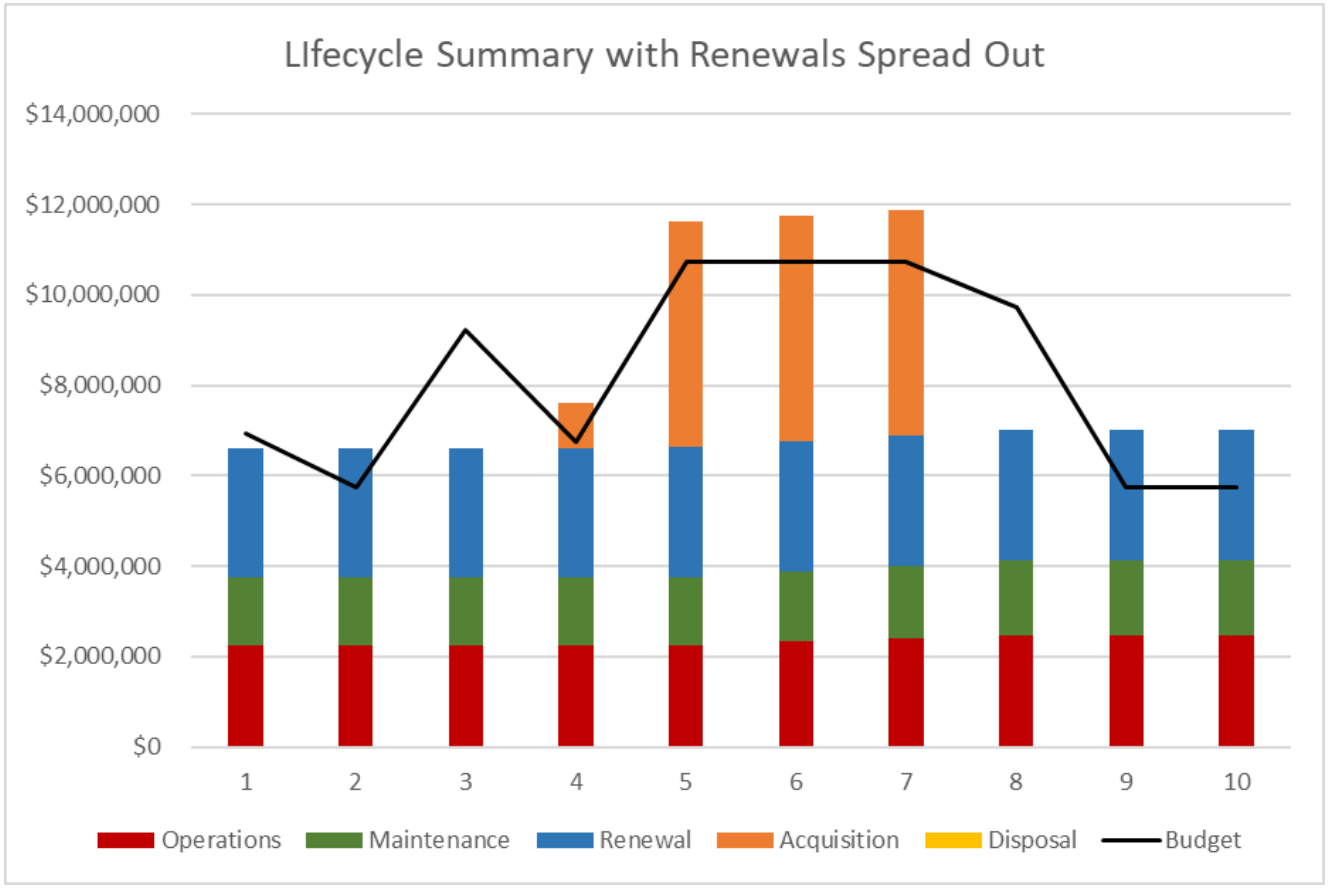
The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 5.7.1: Lifecycle Summary



All figure values are shown in current day dollars.

The renewal spike is caused by the selection of roads that have a PQI less than 65 as that is the current overall network average. Many of these sections do not require immediate renewal as a PQI below 65 is acceptable for the lower road classifications. The renewals shown in 2022 ($23,125,000) can and will be split into remaining 9 years and will bring the average required renewal per year to $2,870,500 which is slightly over the planned budget. Based on the previous Pavement Management Software reports and testing our PQI has remained relatively stable at 65 since 2016 with an average renewal budget of $3,500,000 a year. A graph showing the above observations is available below and in Appendix F.



6.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk'[8].

An assessment of risks[9] associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 6.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 6.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Single Access to Subdivision	End of Life / Other infrastructure upgrades	No access to subdivision
Highway 28	End of Life	Reduced lanes for major artery
Highway 55	End of Life	Reduced lanes for major artery
Veterans Way	End of Life	Main Access to 4 Wing

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

6.2 Risk Assessment

The risk management process used is shown in Figure 6.2 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

[8] ISO 31000:2009, p 2

[9] REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

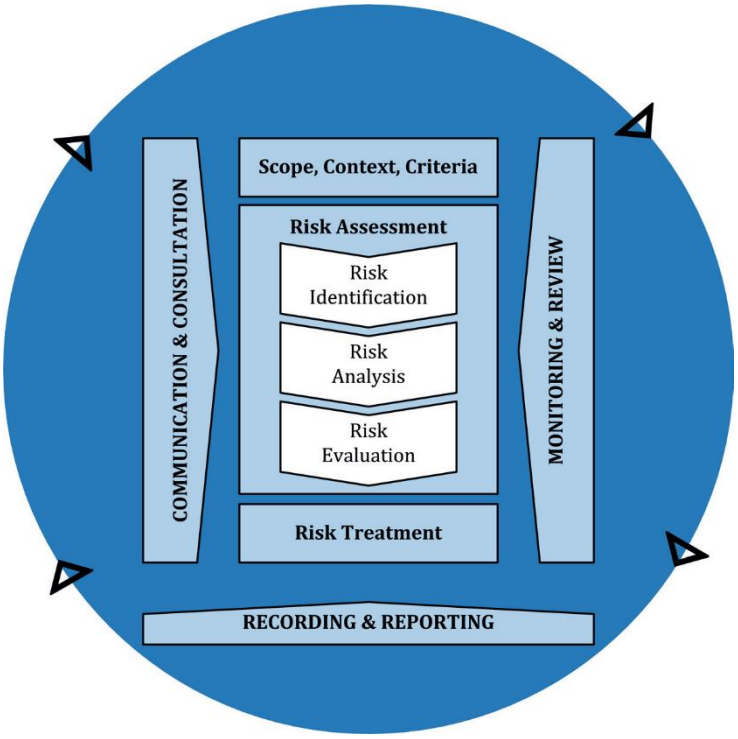


Fig 6.2 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks[10] associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management and the City of Cold Lake.

Table 6.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Single access to subdivision	Road Failure / Pipe Failure below road	High	Regular Maintenance / develop additional accesses	High	$100,000
Highway 28	Road Failure / Pipe failure below road	High	Regular Maintenance and prioritize renewals	High	$100,000

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

[10] REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service.

Resilience recovery planning, financial capacity, climate change risk assessment and crisis leadership.

Our current measure of resilience is shown in Table 6.3 which includes the type of threats and hazards and the current measures that the organisation takes to ensure service delivery resilience.

Table 6.3: Resilience Assessment

We do not currently measure our resilience in service delivery. This will be included in future iterations of the AM Plan.

6.4 Service and Risk Trade-Offs

The decisions made in adopting this AM Plan are based on the objective to achieve the optimum benefits from the available resources.

6.4.1 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years. These include:

- Cannot increase the overall network PQI
- Pave the remaining gravel roads

6.4.2 Service trade-off

If there is forecast work (operations, maintenance, renewal, acquisition or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- Reduced services levels as new roads are acquired

6.4.3 Risk trade-off

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

- Reduced overall PQI with increased potholes and maintenance costs

These actions and expenditures are considered and included in the forecast costs, and where developed, the Risk Management Plan.

7.0 FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this AM Plan. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

7.1 Financial Sustainability and Projections

7.1.1 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in the AM Plan for this service area. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years), and
- medium term forecast costs/proposed budget (over 10 years of the planning period).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio[11] 99.98%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have 99.98% of the funds required for the optimal renewal of assets.

The forecast renewal work along with the proposed renewal budget, and the cumulative shortfall, is illustrated in Appendix D.

Medium term – 10 year financial planning period

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

This forecast work can be compared to the proposed budget over the first 10 years of the planning period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 10 year planning period is $6,775,831 average per year.

The proposed (budget) operations, maintenance and renewal funding is $6,611,000 on average per year giving a 10 year funding shortfall of $-164,831 per year. This indicates that 97.57% of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget. Note, these calculations exclude acquired assets.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately 1.0 for the first years of the AM Plan and ideally over the 10 year life of the Long-Term Financial Plan.

7.1.2 Forecast Costs (outlays) for the long-term financial plan

Table 7.1.3 shows the forecast costs (outlays) required for consideration in the 10 year long-term financial plan.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the long-term financial plan.

A gap between the forecast outlays and the amounts allocated in the financial plan indicates further work is required on reviewing service levels in the AM Plan (including possibly revising the long-term financial plan).

[11] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

We will manage the 'gap' by developing this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community.

Forecast costs are shown in 2022 dollar values.

Table 7.1.2: Forecast Costs (Outlays) for the Long-Term Financial Plan

Year	Acquisition	Operation	Maintenance	Renewal	Disposal
2022	0	$2,241,000	$1,500,000	$23,123,600	0
2023	0	$2,241,000	$1,500,000	$897,065	0
2024	0	$2,241,000	$1,500,000	$1,473,090	0
2025	$1,000,000	$2,241,000	$1,500,000	$1,303,803	0
2026	$5,000,000	$2,255,900	$1,510,000	$640,481	0
2027	$5,000,000	$2,330,400	$1,560,000	$1,159,631	0
2028	$5,000,000	$2,404,900	$1,610,000	$107,237	0
2029	0	$2,479,400	$1,660,000	0	0
2030	0	$2,479,400	$1,660,000	0	0
2031	0	$2,479,400	$1,660,000	0	0

7.2 Funding Strategy

The proposed funding for assets is outlined in the Entity's budget and Long-Term financial plan.

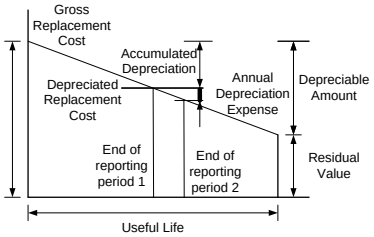
The financial strategy of the entity determines how funding will be provided, whereas the AM Plan communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

7.3 Valuation Forecasts

7.3.1 Asset valuations

The best available estimate of the value of assets included in this AM Plan are shown below. The assets are valued at at cost to replace service capacity based on installation costs and inflation rate applied to the initial construction costs:

Replacement Cost (Current/Gross)	$149,162,561
Depreciable Amount	$149,162,561
Depreciated Replacement Cost[12]	$50,686,556
Depreciation	$5,966,502.0



7.3.2 Valuation forecast

Asset values are forecast to increase as additional assets are added to service.

Additional assets will generally add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs due to future renewals. Any additional assets will also add to future depreciation forecasts.

[12] Also reported as Written Down Value, Carrying or Net Book Value.

7.4 Key Assumptions Made in Financial Forecasts

In compiling this AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are:

- Budget will continue to be provided based on the 10 year plan
- Original asset values recorded are from install year
- The asset cost info was derived from the Pavement Management Software using the 2022 construction rates

7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale[13] in accordance with Table 7.5.1.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%
B. High	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 ± 10%
C. Medium	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 ± 25%
D. Low	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 ± 40%
E. Very Low	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 7.5.2.

Table 7.5.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	High	The Demand Drivers and Growth Projections are based on previous development extrapolation and future development studies.
Growth projections	High	

[13] IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

Acquisition forecast	Low	Acquisition forecast is rated as a low due to the uncertainty with when developers will develop within Cold Lake
Operation forecast	High	Operation and maintenance forecasts are rated high as we are currently meeting the desired service levels.
Maintenance forecast	High	
Renewal forecast - Asset values	High	Asset Values are rated high based on the newly implemented asset optimizer system which updated all asset costs and the previous information available in the Pavement Management Software using the 2022 construction costs.
- Asset useful lives	High	Useful lives and condition modelling is rated as high due to the prediction modelling completed by Pavement Management Software to provided a reliable degradation estimate and current condition of the assets.
- Condition modelling	High	
Disposal forecast	High	Disposal forecast is rated high as we do not expect any of the assets to be disposed of within the planning period

The estimated confidence level for and reliability of data used in this AM Plan is considered to be High.

8.0 PLAN IMPROVEMENT AND MONITORING

8.1 Status of Asset Management Practices[14]

8.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is Asset Optimizer Program, the 2022 10 year capital budget, the 2022 operations and maintenance budgets, Pavement Management Software, the Transportation Master Plan.

8.1.2 Asset management data sources

This AM Plan also utilises asset management data. The source of the data is from the Asset Optimizer program, the Drainage master plan, the GIS database and 2021 levels of service.

8.2 Improvement Plan

It is important that an entity recognise areas of their AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AM Plan is shown in Table 8.2.

Table 8.2: Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline
1	Determine Customer Values	Management and council	Public survey	2025
2	Improve customer levels of service descriptors	Management and council	Improved customer values	2026
3	Continue updating Pavement Management Software information	Management and council	Public survey, continued recording of current activities	2025
4	Coordinate renewals of roads with other underground assets	City staff and management	GIS mapping of all assets	2025
5	Incorporate sidewalk curbs and gutters, trails and lanes	City staff and management	GIS mapping of assets, increased confidence in financials	2027
6	Improve practices to provide resiliency of new assets to climate change	City staff and management	Research and understanding of climate impacts to assets	2026
7	Improve operating and maintenance planning to include future acquisitions	City staff and management	Approved asset management plans.	2025
8	Documentation into digital record for better tracking, specific areas of concern, and work completion time frames	City staff and management	Cityworks tracking for all staff	2025
9				
10				

[14] ISO 55000 Refers to this as the Asset Management System

8.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of 4 years and is due for complete revision and updating within 1 year of each City of Cold Lake election.

8.4 Performance Measures

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

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 100%).

9.0 REFERENCES

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- Transportation Master Plan, City of Cold Lake, https://coldlake.com/en/city-hall/plans-reports-and-studies.aspx
- 2021 City of Cold Lake Service Levels
- Economic Development Strategy 2019, City of Cold Lake, https://coldlake.com/en/city-hall/plans-reports-and-studies.aspx
- City of Cold Lake Business plan 2015, City of Cold Lake, https://coldlake.com/en/city-hall/plans-reports-and-studies.aspx
- Municipal Development Plan 2021, City of Cold Lake, https://coldlake.com/en/city-hall/plans-reports-and-studies.aspx
- Intermunicipal Development plan 2021, City of Cold Lake, https://coldlake.com/en/city-hall/plans-reports-and-studies.aspx

10.0 APPENDICES

Appendix A Acquisition Forecast

A.1 – Acquisition Forecast Assumptions and Source

The City of Cold Lake anticipates six (6) new subdivisions (Parkview, Lakewood, west of HSB- "Heights of English Bay", Lefebvre Heights, Tri City, Colonial) as donated assets

A.2 – Acquisition Project Summary

The project titles included in the lifecycle forecast are included here.

Highway 28 South Enhancements 2025 $1,000,000
Highway 28 South Enhancements 2026 – 2028 $5,000,000 per year

A.3 – Acquisition Forecast Summary

Recommend using NAMS+ Outputs Summary for Acquisition

Table A3 - Acquisition Forecast Summary

Year	Constructed	Donated	Growth
2022	0	0	0
2023	0	0	0
2024	0	0	0
2025	$1,000,000	0	0
2026	$5,000,000	0	0
2027	$5,000,000	0	0
2028	$5,000,000	0	0
2029	0	0	0
2030	0	0	0
2031	0	0	0

Appendix B Operation Forecast

B.1 – Operation Forecast Assumptions and Source

Assumed that no additional assets will be donated to the City of Cold Lake through development. The operations forecast is based on the annual operations budget.

B.2 – Operation Forecast Summary

Recommend using NAMS+ Outputs Summary for Operation

Table B2 - Operation Forecast Summary

Year	Operation Forecast	Additional Operation Forecast	Total Operation Forecast
2022	$2,241,000	0	$2,241,000
2023	$2,241,000	0	$2,241,000
2024	$2,241,000	0	$2,241,000
2025	$2,241,000	$14,900	$2,241,000
2026	$2,241,000	$74,500	$2,255,900
2027	$2,241,000	$74,500	$2,330,400
2028	$2,241,000	$74,500	$2,404,900
2029	$2,241,000	0	$2,479,400
2030	$2,241,000	0	$2,479,400
2031	$2,241,000	0	$2,479,400

Appendix C Maintenance Forecast

C.1 – Maintenance Forecast Assumptions and Source

Assumed that no additional assets will be donated to the City of Cold Lake through development. The Maintenance forecast is based on the annual operations budget.

C.2 – Maintenance Forecast Summary

Recommend using NAMS+ Outputs Summary for Maintenance

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Table C2 - Maintenance Forecast Summary

Year	Maintenance Forecast	Additional Maintenance Forecast	Total Maintenance Forecast
2022	$1,500,000	0	$1,500,000
2023	$1,500,000	0	$1,500,000
2024	$1,500,000	0	$1,500,000
2025	$1,500,000	$10,000	$1,500,000
2026	$1,500,000	$50,000	$1,510,000
2027	$1,500,000	$50,000	$1,560,000
2028	$1,500,000	$50,000	$1,610,000
2029	$1,500,000	0	$1,660,000
2030	$1,500,000	0	$1,660,000
2031	$1,500,000	0	$1,660,000

Appendix D Renewal Forecast Summary

D.1 – Renewal Forecast Assumptions and Source

The renewal forecast is based on the Pavement Management Software program and the current roads that have a PQI below 65 and the year that each section will be below 65. This information is based on the previous years actual costs to rehab the roads.

D.2 – Renewal Project Summary

The project titles included in the lifecycle forecast are included here.

Lakeshore Drive infrastructure Improvements 2024 $1,500,000
16 Avenue Infrastructure Improvements 2022 $450,000
11 Street Underground Improvement and Road Rehabilitation 2022 $750,000
Highway 55 Road improvements 2024 $2,000,000
25 Street Road improvements 2029 $2,000,000
16 Street(16 Avenue to Forest Heights) 2029 $2,000,000
Annual Street Improvement Program $2,000,000

D.3 – Renewal Forecast Summary

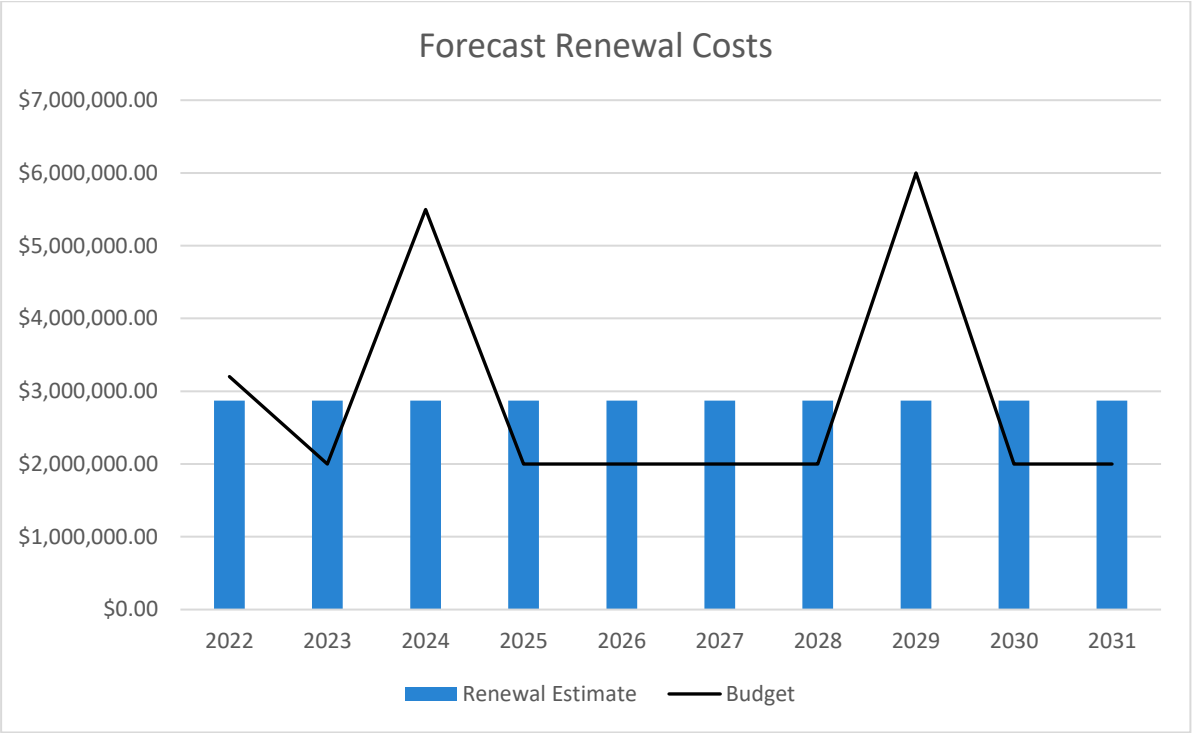
Recommend using NAMS+ Outputs Summary for Renewal

Table D3 - Renewal Forecast Summary

Year	Renewal Forecast	Renewal Budget
2022	$23,123,600	$3,200,000
2023	$897,065	$2,000,000
2024	$1,473,090	$5,500,000
2025	$1,303,803	$2,000,000
2026	$640,481	$2,000,000
2027	$1,159,631	$2,000,000
2028	$107,237	$2,000,000
2029	0	$6,000,000
2030	0	$2,000,000
2031	0	$2,000,000

Table D3A – Renewal Forecast Summary

Year	Renewal Forecast	Budget
2022	$2,870,490.60	$3,200,000.00
2023	$2,870,490.60	$2,000,000.00
2024	$2,870,490.60	$5,500,000.00
2025	$2,870,490.60	$2,000,000.00
2026	$2,870,490.60	$2,000,000.00
2027	$2,870,490.60	$2,000,000.00
2028	$2,870,490.60	$2,000,000.00
2029	$2,870,490.60	$6,000,000.00
2030	$2,870,490.60	$2,000,000.00
2031	$2,870,490.60	$2,000,000.00



D.4 –Renewal Plan

10 Year renewal plan provided by Pavement Management Software

Appendix E Disposal Summary

E.1 – Disposal Forecast Assumptions and Source

Highway 28 South Enhancements will include the disposal of the service roads and the cost is included in the acquisition summary

E.2 – Disposal Forecast Summary

Recommend using NAMS+ Outputs Summary for Disposal

Table E3 – Disposal Activity Summary

Year	Disposal Forecast	Disposal Budget
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0

Appendix F Budget Summary by Lifecycle Activity

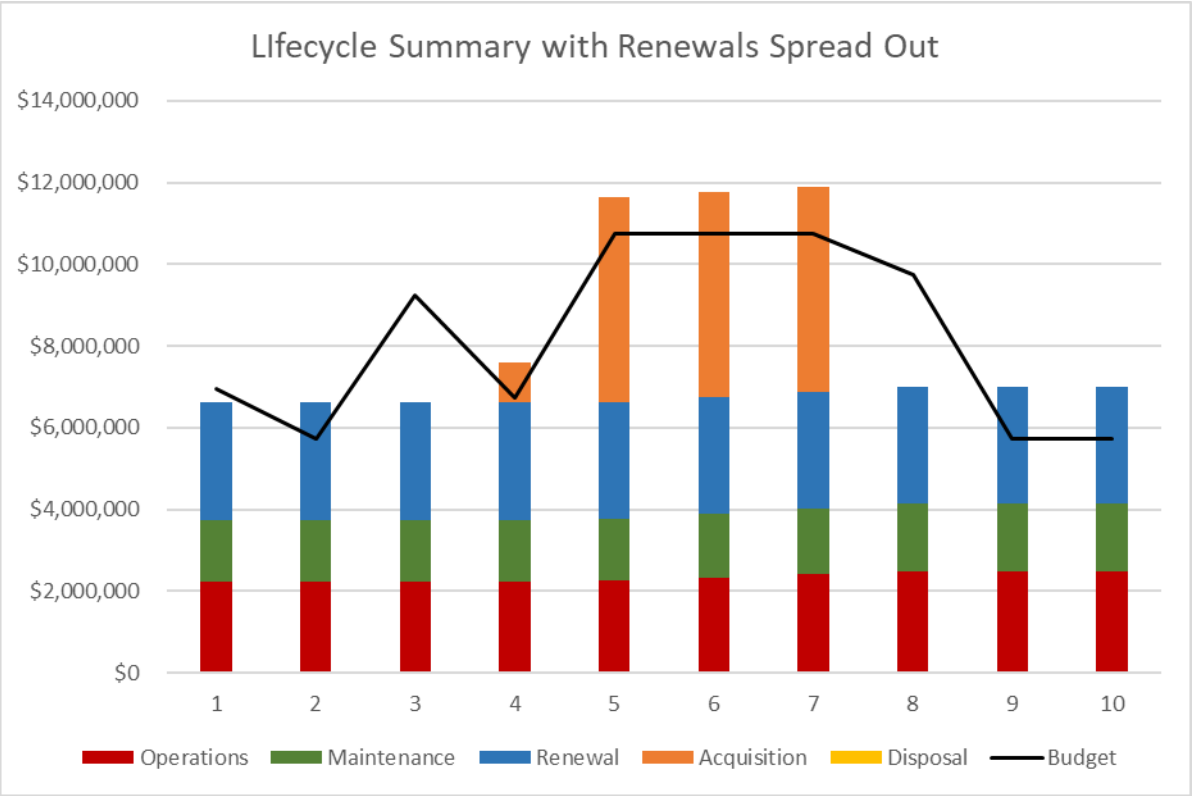
The assumptions as noted in Appendix A-E remain for the total budget summary.

Table F1 – Budget Summary by Lifecycle Activity

Year	Acquisition	Operation	Maintenance	Renewal	Disposal	Total
2022	0	$2,241,000	$1,500,000	$3,200,000	0	$6,941,000
2023	0	$2,241,000	$1,500,000	$2,000,000	0	$5,741,000
2024	0	$2,241,000	$1,500,000	$5,500,000	0	$9,241,000
2025	$1,000,000	$2,241,000	$1,500,000	$2,000,000	0	$6,741,000
2026	$5,000,000	$2,241,000	$1,500,000	$2,000,000	0	$8,241,000
2027	$5,000,000	$2,241,000	$1,500,000	$2,000,000	0	$8,241,000
2028	$5,000,000	$2,241,000	$1,500,000	$2,000,000	0	$8,241,000
2029	0	$2,241,000	$1,500,000	$6,000,000	0	$9,741,000
2030	0	$2,241,000	$1,500,000	$2,000,000	0	$5,741,000
2031	0	$2,241,000	$1,500,000	$2,000,000	0	$5,741,000

Table F2 – Budget Summary by Lifecycle Activity with Renewals Spread Over 10 years

Year	Acquisition	Operations	Maintenance	Renewal	Disposal	Budget
2022	$0.00	$2,241,000.00	$1,500,000.00	$2,870,490.60	$0.00	$6,941,000.00
2023	$0.00	$2,241,000.00	$1,500,000.00	$2,870,490.60	$0.00	$5,741,000.00
2024	$0.00	$2,241,000.00	$1,500,000.00	$2,870,490.60	$0.00	$9,241,000.00
2025	$1,000,000.00	$2,241,000.00	$1,500,000.00	$2,870,490.60	$0.00	$6,741,000.00
2026	$5,000,000.00	$2,255,900.00	$1,510,000.00	$2,870,490.60	$0.00	$10,741,000.00
2027	$5,000,000.00	$2,330,400.00	$1,560,000.00	$2,870,490.60	$0.00	$10,741,000.00
2028	$5,000,000.00	$2,404,900.00	$1,610,000.00	$2,870,490.60	$0.00	$10,741,000.00
2029	$0.00	$2,479,400.00	$1,660,000.00	$2,870,490.60	$0.00	$9,741,000.00
2030	$0.00	$2,479,400.00	$1,660,000.00	$2,870,490.60	$0.00	$5,741,000.00
2031	$0.00	$2,479,400.00	$1,660,000.00	$2,870,490.60	$0.00	$5,741,000.00


LIfecycle Summary with Renewals Spread Out
$14,000,000
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$0
1
2
3
4
5
6
7
8
9
10
Operations
Maintenance
Renewal
Acquisition
Disposal
Budget