

#### DETAILED ASSET MANAGEMENT PLAN

JULY 2021

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REV NO.	DATE	REVISION DETAILS	AUTHOR	REVIEWER	APPROVER
V1.10	July 2021	1st Detailed Asset Management Plan	Lloyd Perrin	Paul Shipway	Council

# ROADS ASSET REPORT CARD

## Description

The road network facilitates the movement of traffic within and through the Municipality of Central Elgin. The service objective is to provide a safe and reliable transportation network. Assets include:

- Culverts (under 3m')
- Roadbase/Surface (Low class bituminous, hot mix asphalt & gravel)
- Curb and Gutter
- Roadside signage



## **EXECUTIVE SUMMARY**

## 1.1 The Purpose Of The Plan

This plan details information about the Municipality of Central Elgin's Road Network assets and details the 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 the service over the 2022 to 2031 year planning period. The Detailed Asset Management Plan will link to a future Long Term Financial Plan which typically considers a 10 year planning period.

## 1.2 Asset Description

This plan covers the infrastructure assets that provide the municipal road network and is comprised of:

- The travelled portion of the roadway including road base and road surfaces (210 km)
- Roadside drainage for rural roadways with roadside ditches (159 km)
- Traffic signs (1,318)
- Concrete curb and gutter on urban roadways (41.42 km)

The above infrastructure assets have replacement value estimated at \$168.7 million.

This Detailed Asset Management Plan **does not** include the following assets as they are included in other or future dated plans:

- Storm Sewers
- Sidewalks and Trails
- Street Lighting
- Boulevard Landscaping

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## 1.3 Levels of Service

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

The main service consequences of the planned budget are:

- Reduced budget for renewal of roads assets
- Reduced rideability and level of service which may negatively affect customer satisfaction

### 1.4 Future Demand

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

- Donated assets acquired as a result of growth related development will create financial demands and budget pressures as donated assets will require maintenance, operations and future renewals.
- Globally, COVID 19 has affected both the supply chain and costs for services since February 2020. The pandemic has increased both the scarcity of materials and the financial costs to operate, maintain and renew assets. This trend is anticipated to remain in the short to medium term of this plan.

Demand will be addressed through 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 nonasset solutions, insuring against risks and managing failures.

- The municipality will continue to provide operational programs that are required to meet provincial legislation such as Ontario's Municipal Act, O.Reg 239/02, Minimum Maintenance Standards.
- The municipality will focus on programs that provide short term serviceability for assets that require renewal such as pulverizing road surfaces or applying tar and chip to improve the wearing surface. Typically these roads would be reconstructed and repaved, instead this treatment temporarily extends the service life of the asset.

### 1.5 Lifecycle Management Plan

#### 1.5.1 What Does It Cost

The forecast lifecycle costs necessary to provide the services covered by this plan includes operation, maintenance, renewal, acquisition, and disposal of assets. A summary output from this Detailed Asset Management Plan is the **10 year forecast of total outlays**, which for the Roads System Service Area is estimated as **\$ 73,702,624** or **\$ 7,370,263 on average per year**.

## 1.6 Financial Summary

#### 1.6.1 What Will It Do

Estimated **available funding for the 10 year period is \$ 63,400,752 or \$ 6,340,075 on average per year** as per the planned budget. This is **86.02% of the cost to sustain the current leve**l of service at the lowest lifecycle cost.

The infrastructure reality is that only what is funded in the budget can be provided. Informed decision making depends on the Detailed Asset Management Plan emphasizing the impacts and consequences of planned budgets on risks and the service levels provided.

The anticipated planned budget for the roads network leaves **a shortfall of \$ 1,030,188 on average per year** of the 10 year planned lifecycle costs required to provide services. This is shown in the figure below.



GRAPH 1.6.1 - FORECAST LIFECYCLE COSTS AND PLANNED BUDGETS

Graph values are in current dollars, 2021.

Central Elgin will provide roads network services for the following:

- Operation, maintenance, renewal and acquisition of base and surface of roadways, traffic signage, roadside drainage, concrete curb and gutter to meet service levels set by Central Elgin
  - Continue with an extensive road resurfacing program
  - $\circ$  Undertake renewals that are appropriately sized
  - $\circ$  Continue with gravel road conversion to Low Class Bituminous road surface

#### 1.6.2 What Cannot Be Done

Currently, there is not enough allocated budget to sustain services at the proposed standard or to provide new services being sought. Works and services that cannot be provided under present funding levels are:

- Renewal of existing failed assets such as roads with extreme potholing and poor ride comfort.
- Ensure that sufficient reserves exist to address emergencies such as a road failure without negatively impacting other services or programs.

#### 1.6.3 Managing the Risks

The present budget levels are insufficient to continue to manage risks in the medium term. The main risk consequences are:

• Lack of funds to address an emergency or unexpected failure of a road. Examples include flooding, slope failure, or culvert failure

Central Elgin will manage these risks within available funding by:

- Continue to undertake regular inspections of the road and drainage assets
- Seek grant and other funding opportunities from upper levels of government to advance projects that are at risk of failure

## 1.7 Asset Management Planning Practices

Key assumptions made in this Detailed Asset Management Plan are:

- Donated assets are known within the initial 5 year period of the plan. For years 6-10 assumption was made for the amount of donated assets based on the 3 year average for the time period preceding this plan.
- Maintenance and Operations dollars would not be decreased.

Assets requiring renewal are identified by modeling data from the Roads Needs Study and applying professional judgment.

• 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 is used to forecast the lifecycle costs for this Detailed Asset Management Plan. This plan is based on a medium confidence level of information.

## 1.8 Monitoring and Improvement Program

To improve Central Elgin's asset management practices the municipality will:

- Field verify data within the municipal asset register for roads
- Update the condition assessment of the road network assets
- Verify unit prices works based on current pricing





Central Elgin's 1998 Gravel Roads



Central Elgin's 2021 Gravel Roads



Central Elgin's 2021 Road Types



Belmont Road Types



Eastwood Road Types







New Sarum Road Types



Orwell Road Types



Port Stanley Road Types



Sparta Road Types

Union Road Types



## INTRODUCTION

## 2.1 Background

This Detailed Asset Management 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 Detailed Asset Management Plan is to be read with Central Elgin's planning documents. This includes the Strategic Asset Management Policy, (2021) along with:

- Municipality of Central Elgin Official Plan (March 2013)
- Municipality of Central Elgin 2019 State of the Infrastructure
- Asset Management Plan for Roads, Executive Summary Report

The Municipality of Central Elgin has historically employed asset management principals, processes and activities to allow the municipal road system assets to reach the end of their intended useful life. Strategically, the municipality has utilized return on investment measurements to determine what maintenance and renewal projects to undertake. These programs have allowed the municipality to utilize operational cost savings to fund renewal programs which have resulted in greater motorist satisfaction.

The infrastructure assets covered by this Detailed Asset Management Plan include road base and surface, roadside drainage for rural roadways with ditches, traffic signs and concrete curb and gutter on urban roadways. For a detailed summary of the assets covered in this Detailed Asset Management Plan refer to Table in Section 5.

The road infrastructure assets included in this plan have a total replacement value of \$168,770,000.

#### TABLE 2.1 - KEY STAKEHOLDERS IN THE ASSET MANAGEMENT PLAN

KEY STAKEHOLDER	ROLE IN ASSET MANAGEMENT PLAN
CENTRAL ELGIN COUNCIL	<ul> <li>Allocate resources to meet planning objectives in providing services while managing risks</li> <li>Support asset management initiatives necessary to improve knowledge and inform choices</li> <li>Fund the level of service desired over the whole-life of the asset</li> </ul>
CAO/CLERK	<ul> <li>Champion of supporting asset management principles for the organization</li> <li>Ensure that adequate resources are available to develop staff knowledge and skills to aid the implementation and continuous improvement of asset management practices</li> </ul>
SENIOR MANAGEMENT	<ul> <li>Set high level priorities for asset management development and raise awareness of this function with staff and outside contractors</li> <li>Support the Asset Management Driven Budget and Long Term Financial Plan</li> <li>Support the actions required in the Detailed Asset Management Plan to better manage assets and deliver service.</li> </ul>
FIELD STAFF/ OPERATIONAL STAFF	<ul> <li>Verify location and condition of assets</li> <li>Provide operational and maintenance services to assets</li> <li>Report to senior management any progress, deficiencies and effectiveness of operations and maintenance activities</li> </ul>
PROVINCE OF ONTARIO	<ul> <li>Sets policy for Roads Maintenance through legislation which outlines mandatory standards for condition and response times to maintenance deficiencies.</li> </ul>
EXTERNAL PARTIES (RESIDENTS, TOURISTS)	<ul> <li>Participate in facilitated conversation to allow the municipality to understand the communities' desired level of service</li> <li>Be supportive of the Detailed Asset Management Plan that may reduce levels of service for the communities desire to reduce taxation</li> </ul>

Central Elgin's organization structure for service delivery is detailed below:

FIGURE 2.1 - SERVICE DELIVERY ORGANIZATIONAL STRUCTURE



## 2.2 Goals and Objectives of Asset Ownership

Central Elgin's goal is to deliver a safe and effective road network while meeting all applicable legislation and regulation. Consideration will be given to the defined level of service when maintaining and renewing assets in the most cost effective manner for present and future consumers.

The key elements of infrastructure asset management are:

- Maintaining the municipal road system that will meet the requirements of Ontario's Municipal Act, O.Reg 239/02, Minimum Maintenance Standards.
- Providing a defined level of service and monitoring performance
- Taking a lifecycle approach to developing cost-effective management strategies for the long term that meet the defined level of service
- Managing the impact of growth through demand management and infrastructure investment
- · Identifying, assessing and appropriately controlling risks
- Align the Detailed Asset Management Plans and the future Long Term Financial Plan to plan for present and future costs and provide alternatives for funding
- Ensure legislative compliance

Key elements of the planning framework are:

- Levels of service specifies the services and agreed upon levels of service to be provided
- Risk Management Resiliency, Environmental, Climate, Human Safety, Financial, Reputation and Functional
- Future demand how this will impact on future service delivery and how this is to be met
- Lifecycle management Taking a lifecycle approach to developing cost-effective management strategies for the long term that meet the defined level of service
- 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 Central Elgin manages provision of the services
- Monitoring how the plan will be monitored to ensure objectives are met
- Asset management improvement plan how to increase asset management maturity

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

- International Infrastructure Management Manual 2015
- ISO 55000

#### ROADS DETAILED ASSET MANAGEMENT PLAN

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#### FIGURE 2.2 - ROAD MAP FOR PREPARING AN ASSET MANAGEMENT PLAN



## LEVELS OF SERVICE

## 3.1 Customer Research and Expectations

Central Elgin is committed to conducting an annual Level of Service survey to engage with its customers to determine their satisfaction with the services provided.

This Detailed Asset Management Plan is prepared to facilitate consultation prior to adoption of levels of service by the Municipality of Central Elgin. This Detailed Asset Management Plan is informed by a Level of Service Survey that was published on the municipal website, <u>www.centralelgin.org</u> and the municipality's Community Engagement Website, <u>www.letstalkcentralelgin.org</u>. The survey was also posted on the municipality's social media platforms including Facebook and Twitter. The survey was posted on these platforms for a six week period in December 2020 and January 2021.

The survey had a total of **504 respondents**, and assuming that the survey was completed by one member of a household this represents approximately **8%** of the municipality's households. A summary of the results of the Level of Service Survey can be found on the community engagement website. This Level of Service Survey was able to determine the public's general satisfaction with the current Level of Service that is being provided for the Roads Assets. Identifying the customers desired Level of Service assists Council 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.

Table 3.1 summarizes the results from the Central Elgin Customer Satisfaction Survey.

#### TABLE 3.1 - CUSTOMER SATISFACTION SURVEY LEVELS

PERFORMANCE MEASURE	SATISFACTION LEVEL				
	VERY SATISFIED	FAIRLY SATISFIED	SATISFIED	SOMEWHAT SATISFIED	NOT SATISFIED
Quality of the roads in Central Elgin are the same or better than neighbouring municipalities. (89%)	$\checkmark$				
Feeling of being safe travelling on Central Elgin roads. (79%)		$\checkmark$			
Rideability of roads are acceptable.		$\checkmark$			

## 3.2 Strategic and Corporate Goals

This Detailed Asset Management Plan is prepared under the direction of the Central Elgin Strategic Asset Management Policy which outlines Council's asset management vision, goals and objectives.

Central Elgin's mission is:

"To develop our municipality through responsible management and long range planning, while having regard for our urban, agricultural, tourist and recreational communities with a vision of economic stability."

Strategic goals have been set by the Municipality. The relevant goals and objectives and how these are addressed in this Detailed Asset Management Plan are summarized in Table 3.2.

GOAL	OBJECTIVE	HOW GOAL AND OBJECTIVES ARE ADDRESS IN THE ASSET MANAGEMENT PLAN
SAFE COMMUNITIES	• Reduce risk to Central Elgin's communities including people, property, and infrastructure	• Ensure that road system is adequately maintained and renewed in accordance with O.Reg 239/02
ADEQUATE, SUSTAINABLE & AFFORDABLE INFRASTRUCTURE	• Ensure service is adequately sized for both current and future use	• Renewal of roads assets will consider future capacity demands. Lifecycle costs will be considered with the goal to reducing Whole Life Costs.
STRONG LOCAL ECONOMY & SUSTAINABLE COMMUNITY	• Provide a reliable transportation network that supports the transport of goods	<ul> <li>Priority will be given to roads that serve a higher network use such as collector and arterial roads compared to low volume residential roads when funding limits the amount of investment.</li> </ul>
CONSERVATION & APPRECIATION OF OUR NATURAL ENVIRONMENT	• Ensure that maintenance, operations and renewal consider the natural environment.	<ul> <li>Utilize spot application of winter maintenance materials to be used only as needed.</li> <li>Expansion of the road network will be conducted under the Municipal Class Environmental Assessment Process.</li> </ul>
GOOD GOVERNANCE	• Identify the customers desired levels of service	<ul> <li>Perform an annual Level of Service survey with customers and report back to the customers with the results.</li> </ul>

#### TABLE 3.2 - GOALS AND HOW THEY ARE ADDRESSED IN THIS PLAN

## 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 services are outlined in Table 3.3.

#### TABLE 3.3 - LEGISLATIVE REQUIREMENTS

LEGISLATIVE	REQUIREMENT
ONTARIO MUNICIPAL ACT <u>O.REG 239/02</u> MINIMUM MAINTENANCE STANDARDS	Regulation clearly defines Technical Levels of Service and response times for municipal roadways. Including but limited to winter maintenance, pot hole repair etc.
ONTARIO HIGHWAY TRAFFIC ACT	Identifies speed zones, traffic signs, as well as responsibility for road closures.
ASSET MANAGEMENT PLANNING FOR MUNICIPAL INFRASTRUCTURE <u>O. REG 588/17</u>	Identifies the requirements for municipal asset management planning to assist municipalities better understand their infrastructure needs and inform infrastructure planning and investment decisions.
FISHERIES ACT	In-water work will comply with timing restrictions respecting fishery and fish habitat.



## 3.4 Customer Values

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

- 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

CUSTOMER VALUES	CUSTOMER SATISFACTION MEASURE	CURRENT FEEDBACK	EXPECTED TREND BASED ON PLANNED BUDGET
Reliable roads that are kept in relatively good condition.	Annual Level of Service Survey	Very satisfied	Customer satisfaction will decline
Winter maintenance is timely and adequate to support reliable transportation	Annual Level of Service Survey	Fairly satisfied	Trend to remain the same.

The service objective is to provide a safe, reliable transportation network to convey passenger and commercial traffic.

## 3.5 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

ConditionHow good is the service? ... What is the condition or quality of the service?FunctionIs it suitable for its intended purpose? ... Is it the right service?Capacity/ UseIs the service over or under used? ... Does Central Elgin 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.

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#### TABLE 3.5 - CUSTOMERS LEVEL OF SERVICE MEASURES

MEASURE TYPE	LEVEL OF SERVICE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BUDGET ON PLANNED BUDGET
CONDITION	Customers expect the condition of roads to generally be smooth with	Annual Level of Service     Survey	• Satisfied	• Trending down (minor)
	good rideability	• # of request for service from customers	• < 50 annually	• Trend will increase slightly
	Confidence levels		• Low	Trending upwards
			Relying on professional judgement only	Processes are being developed to track and compare Customer Service Requests year over year
FUNCTION	Is the road network reliable and able to adequately convey traffic	• Annual Level of Service Survey	• Very Satisfied	• Remain the same
	safely.	• <i>#</i> of customer service requests	• <10 annually	
		• # of insurance claims annually	<ul> <li>&lt; 3/year</li> <li>(5 year average)</li> </ul>	
	Confidence levels	Annual Level of Service     Survey	• High	Trending upwards Processes are being developed to track and
		• <i>#</i> of customer service requests	• Low	compare Customer Service Requests year over year.
		<ul> <li># of insurance claims annually</li> </ul>	• High	
CAPACITY	Is the road able to convey traffic with limited congestion	<ul> <li>Annual Level of Service Survey</li> <li>Monitor capacity with a regular comprehensive</li> </ul>	• Very Satisfied	Remain the same Technical data from traffic counts do not indicate any roads are nearing capacity constraints.
		traffic counting program		
	Confidence levels		• High	Remain the same Existing processes will continue to be utilized and monitored

## 3.6 Technical Levels of Service

Technical Levels of Service – Operational or technical performance measures are used to deliver customer values and effectively achieve Customer Levels of Service. 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 or a new service that did not exist previously. (i.e. widening a road, sealing an unsealed road, assumption of new developments)

#### **Operation**

The regular activities to provide services.

(i.e. winter maintenance, street sweeping, line painting, road needs study)

#### Maintenance

The planned and reactive 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. (i.e. road patching, unsealed road grading, hot mix paving, crack sealing)

#### Renewal

The activities that return the service capability of an asset up to that which it had originally provided. (i.e. replace existing infrastructure that has reached the end of its useful life)

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

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 Detailed Asset Management Plan.

TABLE 3.6 - TECHNICAL LEVELS OF SERVICE

PURPOSE OF ACTIVITY	ACTIVITY MEASURE	CURRENT PERFORMANCE *	RECOMMENDED PERFORMANCE **
	ACQUISITION		
Confirm donated assets conform to approved design and specifications	Municipal staff onsite to inspect and developer provides all detailed quality assurance testing as per specifications	100%	100%
	Budget	\$40,000	\$ 40,000
Ensure private roads are upgraded to municipal standards prior to assumption	Municipal staff approves design of road and verify road meets municipal standards.	100%	100%
	Budget	\$ Customer Funded	\$ Customer Funded
Convert gravel road surfaces to Low Class Bituminous	Annual conversion of 500m-1 km of gravel road/year based on planned budget	0%	100%
	Budget	\$0	\$ 750,000 per project
	OPERATION		
Reduce impact of winter storm events on motorists as per O.Reg 239/02	Inspect and document weather conditions, response times and actions	100%	100%
	Budget	\$2,625/km	\$2,625/km
Grading/dust control of gravel road to improve rideability and visibility as per O.Reg 239/02	Scheduled grading program Dust control applied twice annually	100%	100%
	Budget	\$1,176/km	\$1,176/km
Pavement marking to provide lane designation and assist in user safety as per Manual of Uniform	Apply pavement marking annually to entire road network	100%	100%
Traffic Control	Budget	\$965/km	\$965/km
Cut grass to provide visibility at intersections and along roads	roadside grass maintained @ 3.6m in spring and 1.8m in fall from edge of shoulder	100%	100%
	Budget	\$69.89/km	\$69.89/km
Trimming/ removal of trees to improve visibility and reducing liability	Based on site line inspection or customer service requests	100%	100%
	Budget	\$50,000 annually	\$50,000 annually

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PURPOSE OF ACTIVITY	ACTIVITY MEASURE	CURRENT PERFORMANCE *	RECOMMENDED PERFORMANCE **
	MAINTENANG	ĈE	
Cold/hot patching of pot holes to improve rideability as per O.Reg 239/02	Complete work identified in regular road patrols or customer service requests	100%	100%
	Budget	\$90,000 annually	\$90,000 annually
Complete crack sealing of road to reduce water infiltration into road base	Work identified in regular road patrols	0%	100%
	Budget	\$0 annually	\$30,000 annually
Shouldering of roads to eliminate drop off and assist user safety	Grade twice annually and as required based on inspection	100%	100%
	Budget	\$7,500 annually	\$7,500 annually
Clean roadside ditches of debris and sediment to ensure drainage functions properly	Work identified in regular road patrols	100%	100%
	Budget	\$142,000 annually	\$142,000 annually
Replace surface gravel lost due to traffic and winter control operations	Based on maintenance requirement to replace 25mm of gravel loss per year.	59%	100%
	Budget	\$233,000 annually	\$395,000 annually

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PURPOSE OF ACTIVITY	ACTIVITY MEASURE	CURRENT PERFORMANCE *	RECOMMENDED PERFORMANCE **
	RENEWA	L	
Improve gravel road bases to prepare for surface conversion to Low Class Bituminous	500 m to 1 km of gravel road converted per year	0%	100%
	Budget	\$0	\$750,000 per project
Resurface Low Class Bituminous roads to ensure road reaches intended useful life	/km per year	98%	100%
	Budget	\$285,000 annually	\$290,000 annually
Resurface High Class Bituminous roads to ensure road reaches intended useful	/km per year	97%	100%
life	Budget	\$800,000 annually	\$825,000 annually

\* 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's acknowledged that changing circumstances such as technology and customer priorities will evolve over time.



## FUTURE DEMAND

## 4.1 Demand Drivers

Drivers affecting demand include things such as changes in population, regulations, demographics, seasonal factors, consumer preferences and expectations, technology, economics and environmental awareness.

## 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 will include non-asset solutions, insuring against risks and managing failures.

Opportunities identified to date for demand management are also shown in Table 4.3. Further opportunities will be developed in future revisions of this Detailed Asset Management Plan.

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Growth (extension of services)	211 km of roads	Add 1km to 1.1 km of road annually	Will increase the demands and costs to the municipality to maintain the additional assets	Monitor maintenance activities and staff resources to ensure maintenance and operations meet O.Reg 239/02
Population	14,000	15,700	Population growth could potentially impact traffic volumes and the need for maintenance and operational activities to conform to Reg 239/02, Minimum Maintenance Standards.	Annually monitor traffic volumes and road condition to ensure compliance with O.Reg 239/02.

#### TABLE 4.3 - DEMAND MANAGEMENT PLAN

## 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 Central Elgin 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 will have a significant impact on the assets and services provided by Central Elgin. In the context of the Detailed 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 impacts are managed and responded to.

Central Elgin considers how to manage the existing assets given potential climate change impacts for the region

Risk and opportunities identified to date are shown in Table 4.5.1

CLIMATE CHANGE DESCRIPTION	PROJECTED CHANGE	POTENTION IMPACT ON ASSETS & SERVICES	MANAGEMENT
INCREASED LAKE LEVELS CAUSING BLUFF EROSION OF LAKE ERIE	Projected lake levels will stay the same or increase	Toe erosion of both the bluff and supporting grounds will cause the loss of road assets	Monitor top of bluff location and erosion impacts and close roads permanently as required
INCREASED AMBIENT TEMPERATURE DURING WINTER SEASON.	Temperature expected to increase 3 degrees over 10 years	Increased frequency of Lake affect snow events will increase demand/cost for winter control operations	Ongoing monitoring of weather conditions and respond to winter control events appropriately

#### TABLE 4.5.1 - MANAGING THE IMPACT OF CLIMATE CHANGE ON ASSETS & SERVICES

The way in which Central Elgin constructs new assets should recognize that there is opportunity to build in resilience to climate change impacts. Building resilience can have the following benefits:

- Assets will withstand the impacts of climate change
- Services can be sustained; and
- Assets that can endure the impacts of climate change may potentially lower the lifecycle cost and reduce their carbon footprint

#### TABLE 4.5.2 - BUILDING ASSET RESILIENCE TO CLIMATE CHANGE

NEW ASSET DESCRIPTION	CLIMATE CHANGE IMPACT ON THESE ASSETS	BUILD RESILIENCE IN NEW WORKS
NEW ROADS	Potential bluff erosion	No new roads will be constructed within the 100 year erosion hazard limit of the Lake Erie Shoreline.

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



## LIFECYCLE MANAGEMENT PLAN

The Lifecycle Management Plan details how Central Elgin plans to manage and operate the assets at the agreed levels of service (Refer to Section 3) while managing lifecycle costs.

## 5.1 Background Data

#### 5.1.1 Physical Parameters

The assets covered by this Detailed Asset Management Plan are shown in Table 5.1.1.

The Municipality of Central Elgin is a geographically large municipality comprised of approximately 39,350 hectares. Central Elgin borders the City of London, St. Thomas and the north shore of Lake Erie. Central Elgin's road network is comprised of 158.8 km of rural road and 51.4 km of urban roads for a total length of 210.2 km. Traffic volumes tend to be higher given Central Elgin's close proximity to St. Thomas and London. This increased activity results in higher maintenance demands and reduced reaction time to service as outlined in O. Reg 239/02, Minimum Maintenance Standards.

The road surface type of the of the assets included in this Detailed Asset Management Plan are shown in Figure 5.1.1.

#### TABLE 5.1.1 - ASSETS COVERED BY THIS PLAN

ASSET CATEGORY	DIMENSION (CENTRE LINE KM)	REPLACEMENT VALUE
RURAL GRAVEL ROAD	58.69 KM	\$27.42 M
RURAL LOW CLASS BITUMINOUS ROAD (TAR & CHIP)	93.2 KM	\$57.65 M
RURAL HIGH CLASS BITUMINOUS ROAD (ASPHALT)	6.9 KM	\$5.54 M
URBAN HIGH CLASS BITUMINOUS ROAD (ASPHALT) WITH STORM SEWER	41.42 KM	\$60.21 M
URBAN HIGH CLASS BITUMINOUS ROAD (ASPHALT) WITHOUT STORM SEWER	3.78 KM	\$3.01 M
URBAN LOW CLASS BITUMINOUS ROAD (TAR & CHIP)	6.20 KM	\$4.94 M
TOTAL	210.19 KM	\$168.77 M

All figure values are shown in current day dollars

#### 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
OLD DEXTER LINE	Due to Lake Erie Shoreline Bluff Erosion Old Dexter Line may need to be closed and abandoned.
BARNUMS GULLEY LINE	Due to Lake Erie Shoreline Bluff Erosion Barnums Gulley Line may need to be closed and abandoned.

The above service deficiencies were identified from ongoing bi-annual review of bluff erosion and its proximity due the travelled portion of the affected roads.

#### 5.1.3 Asset Condition

The Municipality of Central Elgin utilizes condition of assets for roads rather than age of asset. Condition is currently monitored by the completion of a comprehensive Road Inspection and Needs Study completed every three to five years. This condition assessment conforms to the Province of Ontario Roads Inventory Manual.

The Municipality of Central Elgin conducted its first Road Needs Study in 2003. The municipality has continued to evaluate the condition of the road network in 2008, 2013 and 2019. Road condition is evaluated during field inspection. The ratings for condition are either as a standalone value or incorporated into calculations performed by software applications. For each road section the road condition is either classified as a 'Now', '1 to 5' or '6 to 10' year need for maintenance, rehabilitation, or reconstruction for the following critical areas:

- Geometrics
- Surface Type
- Surface Width
- Capacity
- Structural Adequacy
- Drainage

The 'Time of Need' is a prediction of the time until the road requires reconstruction, not the time frame until action is required. Generally, the closer the timeline to reconstruction, the greater the deterioration of the road. For example, a road may be categorized as a '6 to 10' year need with a resurfacing recommendation. This road should be resurfaced as soon as possible to further defer the need for renewal or reconstruction and thus providing a greater return on investment.

Based on the 2019 Roads Needs Study the current System Adequacy of the Central Elgin Road network is 80% which indicates that 80% of the total length of the road network is in good condition and remainder is in poor condition. Of the 80% of the road system that is considered to be in good condition it should be noted that 12.5% of the system is comprised of roads that have a traffic volume of less than 50 vehicles per day. The Inventory Manual for Roads provides direction that roads with a traffic volume of less than 50 vehicles per day are deemed to be adequate, even if they have structural, geometric, or drainage deficiencies that may otherwise be identified as being in a 'Time of Need' that would require correction by maintenance or renewal.

If the 12.5% of low traffic volume roads is removed from consideration within the asset registry the municipality conservatively has a System Adequacy of 67.5%. This adjustment in reporting means 32.5% of the road system is considered to be in poor condition. The System Adequacy minimum target for a lower tier, urban and rural road systems was 60% when the Province provided annual conditional funding grants to municipalities. It should be noted that the Province of Ontario has not provided conditional funding to municipalities for road, maintenance and renewal since the late 1980's.

Figure 5.1.3 provides historical condition rating for the Road Asset since 2003.



#### FIGURE 5.1.3 - HISTORICAL ASSET CONDITION PROFILE

### 5.2 Operations and Maintenance Plan

#### 5.2.1 Operations

Operations include regular activities to provide services. Examples of typical operational activities include grading of gravel roads, application of dust control, debris and litter pick up, street sweeping, asset inspection, roadside grass cutting, tree removal, and pavement marking. Central Elgin exceeds the Minimum Maintenance Standards O.Reg 239/02 in regards to seasonal operational activities such as road ploughing, salting, sanding, and anti-icing. It should be noted that operational costs will continue to rise as a result of the donated assets and the need to perform operational maintenance based on the Technical Levels of Service and response times as noted in O.Reg 239/02.

#### TABLE 5.2.1 - OPERATIONS BUDGET TRENDS

YEAR	OPERATION BUDGET	
2020	\$ 1,346,633	
2021	\$ 1,346,633	
2022	\$ 1,346,633	

Operations staff have seen the long term benefit of employing asset management strategies and as a result embrace the culture of proactive timely maintenance programs such as hot mix patching, crack sealing and proactively monitoring the drainage systems and dealing with issues that will inevitably compromise the integrity of the road system.

The municipality monitors conditions of the roads asset during weekly road inspections and addresses any issues that can be dealt with by operations staff within the existing operations budget. Any major deficiencies that are noted are reported to management so that they can be assessed and plans developed to include the project in capital budgets. In addition to these regular inspections, the road system is inspected every 3 to 5 years using the criteria of the Province of Ontario Road's Inventory Manual. This process inspects and records the condition of each individual road segment reviewing over 55 parameters. This information is then imported into the municipality's digital asset management software system where condition and budgets can be modelled.

#### 5.2.2 Maintenance

Maintenance is the 'ongoing management of deterioration'. The purpose of planned maintenance is to ensure that the correct interventions are applied to an asset in a proactive manner to ensure it reaches its useful life. Proactive planned maintenance significantly reduces the occurrence of reactive maintenance which is always linked to a higher risk to human safety and significantly higher financial costs.

All municipalities are legislatively obligated to maintain their roads to the levels legislated by the Province as outlined in Ontario Regulation 239/02. Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition. Examples of typical planned maintenance activities include gravel resurfacing, hot mix and cold mix patching, curb and gutter replacement/repairs, guide rail maintenance, roadside ditching and culvert replacement, and traffic sign replacement.

The trend in maintenance budgets are shown in Table 5.2.1

YEAR	MAINTENANCE BUDGET
2020	\$ 2,889,727
2021	\$ 2,889,727
2022	\$ 2,889,727

#### TABLE 5.2.2 - MAINTENANCE BUDGET TRENDS

Maintenance budget levels are considered to be adequate to meet existing 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 Detailed Asset Management Plan. Maintenance dollars which represent expenditure that will facilitate a road asset being able to be functional and reach the end of its service life will also increase over time as a result of development that has happened over the past 20 to 30 years.

Proactive and reactive maintenance is conducted to ensure that the deficiency remedy and the timing for the response complies with Ontario Regulation 239/02 as identified in Appendix C.

#### 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 inventory. 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.



#### GRAPH 5.2.2 - OPERATION AND MAINTENANCE SUMMARY

#### 5.2.3 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 5.2.3

TABLE 5.2.3 - ASSET SERVICE HEIRARCHY

SERVICE HEIRARCHY	SERVICE LEVEL OBJECTIVE
ASSET CLASS ROADS	Asset network to provide transportation network.
ASSET SUB CLASS Road base, road surface, curb and gutter, cross culverts less than 3m diameter, roadside ditches	These subclasses make up the road asset class and will inform the overall Detailed Asset Management Plan for Roads

## 5.3 Renewal Plan

Renewals are defined as major works 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 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 typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 5.3. Asset useful lives were last reviewed in 2009

ASSET (SUB) CATEGORY	USEFUL LIFE
ROAD BASE	60 YEARS
 HIGH CLASS BITUMINOUS ROAD SURFACE (ASPHALT)	20 YEARS
LOW CLASS BITUMINOUS ROAD SURFACE (TAR AND CHIP)	6 YEARS
CULVERTS	60 YEARS

TABLE 5.3 - USEFUL LIVES OF ASSETS

The estimates for renewals in this Detailed Asset Management Plan were based on the Alternate Method. Useful lives will be reviewed in 2021.



#### 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, or
- To ensure the infrastructure is of sufficient quality to meet the service requirements

Central Elgin prioritises 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 lifecycle costs by replacement with a modern equivalent asset that would provide the equivalent service

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	WEIGHING
ASSET FAILURE	45%
RENEWAL OF ANOTHER ASSET CLASS (I.E. WATERMAIN, SANITARY SEWER MAIN) IMPACTING ROAD NETWORK	35%
SUBSTANDARD GEOMETRICS COMPROMISING PUBLIC SAFETY	10%
CAPACITY IMPROVEMENTS FOR TRAFFIC VOLUME AND CURRENT STANDARDS AND REGULATION	5%
REDUCED OPERATIONAL EXPENSES AS A RESULT OF RENEWAL	5%

TOTAL

100%

## 5.4 Summary Of Future Renewal Costs

Forecast renewal costs are projected to increase over time due to the addition of donated assets as a result of development. The forecast costs associated with renewals are shown relative to the planned renewal budget in Graph 5.4



GRAPH 5.4 - RENEWAL SUMMARY

The forecast renewal costs associated with the road network currently outpace the allocated budget. The municipality will need to defer renewal of some streets that are in poor condition. These streets include but are not limited to Cornell Blvd, Prospect St. Jamieson St., Orchard Street, and Washburn St. The horizontal infrastructure (water and sanitary sewer) under these streets is in good condition and do not require renewal. As a result, the municipality will perform remedial works including pulverizing and application of Low Cost Bituminous treatment to keep the roads serviceable in the short term 7-10 years. Without the additional funds for renewal Central Elgin will apply the above strategy to ensure roads reach their intended useful life and remain serviceable.

One major reconstruction project, Front Street slope stabilization project will be undertaken to ensure that the only access for approximately 65 residences will be maintained. This project is estimated at approximately \$3.7 million.

### 5.5 Acquisition Plan

Acquisitions are defined as the addition of assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity or serviceability. Acquisitions may result from growth, demand, social or environmental needs. Assets may also be donated to the Municipality of Central Elgin such as works constructed in new development. For Central Elgin the acquisition of roads assets will typically be those donated to the municipality as a result of new development.

#### 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. Proposed upgrade of existing assets from what currently exists (ie. conversion of a gravel road to low cost bituminous) will be undertaken with a lens of reducing whole life costs and ensuring long term sustainability of the assets and ability to pay for existing and future generations. Verified proposals can then be ranked by priority and available funds and scheduled in future works programs. The municipality does not contemplate the construction of new roadways or widening existing roadways due to capacity constraints. The priority ranking criteria is detailed in Table 5.5.1.

#### TABLE 5.5.1 - ACQUIRED ASSETS PRIORITY RANKING CRITERIA

CRITERIA	WEIGHING
DONATED ASSETS AS A RESULT OF NEW DEVELOPMENT	80%
ACQUISITION OF ASSETS AS A RESULT OF INCREASED SERVICEABILITY (IE. CONVERSION OF GRAVEL ROADS TO LOW COST BITUMINOUS SURFACED ROADS)	20%

TOTAL

100%

#### Summary of Future Asset Acquisition Costs

Forecast acquisition asset costs are summarized in Figure 5.5.1 and shown relative to the proposed acquisition budget.



GRAPH 5.5.1- ACQUISITION CONSTRUCTED SUMMARY

When Central Elgin commits to new assets, the Municipality must be prepared to fund future operations, maintenance and possible renewal costs. Central Elgin 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 Central Elgin. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Graph 5.5.2.

Acquisition of new assets funded from the tax supported budget will be kept to a minimum. Historically, Central Elgin annually invested \$16,000 to convert approximately 500 meters of gravel road to a Low Cost Bituminous Road (tar and chip) road surface. The annual conversion program is expected to reduce the operational and maintenance costs associated with keeping a gravel road serviceable such as grading, dust control, and replacement of lost gravel due to winter control operations and tire kick off. These operational savings can be then be directed to fund other asset needs.

When Central Elgin commits to new assets, the municipality must be prepared to fund future operations, maintenance and possible renewal costs. Central Elgin 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 municipality.

It should also be noted that over the planning period of this plan it is projected that the municipality will be adding approximately 10.26 km of residential street with a replacement value of approximately \$19.25 million (2021 dollars) as a result of new development. These acquired assets will trigger demands on maintenance. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Figure 5.5.2.

YEAR	PROJECT	ESTIMATE
2022	LINCOLN'S COVE (299M)	\$ 560,625
2022	OLD FIELD (295M)	\$ 553,125
2023	ROBIN RIDGE DRIVE (300M)	\$ 562,500
2023	FREEMAN COURT (347M)	\$ 650,625
2023	MACPHERSON COURT (91M)	\$ 170,625
2023	HELEN COURT (105M)	\$ 196,875
2023	КОКОМО ВЕАСН (300М)	\$ 562,500
2023	BREAKWATER BOULEVARD (350)	\$ 656,250
2023	SANDCASTLE KEY (210M)	\$ 393,750
2023	COMPASS TRAIL (488)	\$ 915,000
2023	KETTLE CREEK DRIVE SOUTH LOOP (340M)	\$ 637,500
2024	CABANA BAY (275M)	\$ 515,625
2024	SURFER COVE (165M)	\$ 309,375
2025	WASTELL EAST ROAD (844M)	\$ 1,582,500
2025	EAGLE RIDGE, PHASE 1 AND 2 (2755M)	\$ 5,165,625
2025	CANTERBURY PLACE, KARWOOD (115)	\$ 215,625
2026	CRAIGHOLME WEST 50 ACRES. (1935M)	\$ 3,628,125
2026	KETTLE CREEK GOLF (1054)	\$ 1,976,250

#### TABLE - 5.5.2 - ACQUISTION DONATED ASSETS

Graph values are shown in 2021 dollars.



GRAPH 5.2.2 - AQUISITION SUMMARY

Graph values are shown in 2021 dollars.

## 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 future long term financial plan.

TABLE - 5.6 -	ASSETS	IDENTIFIED	FOR	DISPOSAL
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ASSET	REASON FOR DISPOAL	TIME	DISPOSAL COSTS	OPERATIONS AND MAINTENANCE ANNUAL SAVINGS
BURNUM'S GULLEY LINE	LAKE BLUFF EROSION	TBD	\$ 10,000	\$ 0
MORTENSON ROAD	DOES NOT SERVE PURPOSE	2023	\$ 10,000	\$ 10,000

## 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 planned budget.

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



GRAPH 5.7 - LIFECYCLE SUMMARY

Graph values are shown in 2021 dollars.

The forecasted trend shows that Central Elgin has insufficient funding to maintain renewals at the optimum schedule. Significant infrastructure acquisitions due to growth related development will create an upward financial pressure for resources to enable Central Elgin to operate and maintain the assets at the current level of service which will further reduce funding for renewals. Without increased funding, levels of services will be reviewed and adjusted as they cannot be maintained. The planned budget is insufficient to ensure renewal goals are achieved which will inevitably:

- Decrease frequency of renewals and increase maintenance requirements
- Decrease level of service for other services if further funding is required to ensure legislative compliance

Operations and Maintenance programs will be the focus of public expenditure at the expense of the municipality's renewal program. This strategy provides the best 'Return on Investment' and while it will not eliminate the degradation of the overall system adequacy of the road system it will slow the rate of degradation.

## 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. The risk model Central Elgin follows can be found within the Strategic Asset Management Policy.

Risk Management is defined as the effects of uncertainty on the roads network assets and the service objectives. Proactively measuring and considering risk allows Central Elgin to make informed decisions to either mitigate these risks or to accept ownership of them. Central Elgin will proactively and explicitly consider risk associated with asset ownership and determine what risks should be accepted, avoided and mitigated.

The concept of risk is dynamic, iterative and responsive to change. To effectively manage risk Central Elgin must continuously consider its impact on the road network to make informed asset decisions. The types of risk considered are human safety, climate, financial, social, functional and environmental. Annually reviewing risks when completing the detailed asset management plan will ensure that risk is being considered, and that the most effective mitigation plan is being applied to the risk.

Central Elgin will develop and implement a formalized risk assessment process to identify risks associated with service delivery and to implement proactive strategies to mitigate risks to tolerable levels. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The municipality will utilize risk measurements such as frequency, probability, consequence, impact, likelihood and severity to analyze and inform the risk process. 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.

#### ROADS DETAILED ASSET MANAGEMENT PLAN



## 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 summarized 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
George St. Port Stanley	Physical	Loss of access to +500 homes
Currie Blvd. Port Stanley	Physical	Loss of access to +200 homes

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

## 6.2 Risk Assessment

Risk is defined as 'the effect of uncertainty on road assets'. Proactively measuring and considering risk allows 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.

#### FIGURE 6.2 - RISK MANAGEMENT PROCESS - ABRIDGED



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 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 Council of the Municipality of Central Elgin.

#### TABLE 6.2- RISKS AND TREATMENT PLANS

SERVICE OF ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING (VH, H)	RISK TREATMENT PLAN	RESIDUAL RISK	TREATMENT COSTS
RISK OF CLIMATE CHANGE IMPACTING LAKE BLUFF EROSION RATES	Bluff erosion will compromise structural stability of road paralleling lake bluff	VH	Monitor and close road as necessary	М	\$ 200, 000
RISK OF SLOPE FAILURE OF FRONT STREET	Front Street is a dead end street. One access for 78 homes. Street parallels high bluff and showing slope stability issues. Failure cuts off access to residents	VH	Reconstruct with slope stabilization and bin walls	L	\$ 3.7 Million

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

## 6.3 Infrastructure Resilience Approach

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

Central Elgin will monitor and report upon its resiliency stewardship measures that include recovery planning, financial capacity, climate change risk assessment and crisis leadership.

Central Elgin's current measure of resiliency are shown in Table 6.3 which includes the type of threats and hazards and the current measures that the organization takes to ensure service delivery resilience.

TREAT/HAZARD	ASSESSMENT METHOD	CURRENT RESILIENCE APPROACH
CLIMATE CHANGE/SHORE EROSION	REVIEW BY USE OF DRONE AND MAPPING SEMI-ANNUALLY TO TRACK EROSION RATES	MEDIUM
ROAD ASSET FAILURE	WEEKLY ROAD INSPECTIONS	HIGH
CAPACITY CONSTRAINTS	TRAFFIC COUNTING AND CONDUCTING TRAFFIC IMPACT STUDIES	HIGH
ROAD CONDITION DETERIORATING DUE TO WEATHER	REGULAR ROAD PATROLS DURING WINTER CONTROL OPERATIONS	HIGH

TABLE 6.3 - RESILENCE ASSESSMENT

## 6.4 Service and Risk Trade-Offs

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

#### 6.4.1 What Cannot Be Done

While the municipality can continue to meet the regulatory requirements for operations and focus on maintenance programs such as resurfacing, we will not be able to provide enough renewal projects to maintain the overall condition of the road network. Some of the projects that will not be able to be undertaken in the 10 year planning period are noted below;

- Reconstruction of Mapleton Line between Highbury and Yarmouth Centre Road
- Reconstruction of Cornell Drive
- Reconstruction of Brayside
- Reconstruction of Prospect St.
- Reconstruction of the remainder of 'Old Lynurst' including Nathan, Ryan and Vineden Streets.

#### 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 rideability of some local streets as a result of not being able to renew or reconstruct these streets.

#### 6.4.3 Risk Trade-Off

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

- Reduced customer satisfaction of motorists due to a poor quality of ride
- Potential increased risk to vehicles due to poorer rideability
- Increased operational and maintenance expenditures (i.e. responding to patching potholes)

These actions and expenditures are considered and included in the forecast costs.

## FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this Detailed Asset Management 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

FIGURE 7.1 - ANNUAL OPERATING AND MAINTENANCE EXPENDITURES



OPERATIONAL EXPENSES 2018 - 2020

OPERATIONS Locating storm assets, catch basin cleanout, and inspections

MAINTENANCE Repairs, and minor maintenance

OTHER Condition Inspection and risk assessment

### 7.1.1 Sustainability of Service Delivery

There are 2 key indicators of sustainable service delivery that are considered in the Detailed Asset Management Plan for this service area. The 2 indicators are the:

- 1. Asset Renewal Funding Ratio (Proposed renewal budget for the next 10 years/ forecast renewal costs for the next 10 years) and;
- 2. Medium Term Forecast Costs/Proposed Budget (Over 10 years of the planning period)

#### Asset Renewal Funding Ratio

#### Asset Renewal Funding Ratio 80.4%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years Central Elgin can expect to have 80.4 % of the funds required for the optimal renewal of assets.

#### Medium Term - 10 Year Financial Planning Period

This Detailed Asset Management 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 planned 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 **\$ 7,355,863** on average per year.

The **planned** (budget) operations, maintenance and renewal funding is **\$ 6,340,075 on average per year** giving a 10 year funding shortfall of **\$ 1,015,788 per year**. This indicates that **86.19%** of the forecast costs needed to provide the services documented in this Detailed Asset Management Plan are accommodated in the planned 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 Detailed Asset Management Plan and ideally over the 10 year life of the planned budget.

#### 7.1.2 Forecast Costs (Outlays) for Long Term Financial Plan

Table 7.1.2 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.

Central Elgin will manage the funding gap by developing this Detailed Asset Management 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 2021 dollar values.

	YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
	2022	\$ 16,000	\$ 2,327,750	\$ 2,808,399	\$ 2,000,000	\$ 0
	2023	\$ 16,000	\$ 2,347,069	\$ 2,827,153	\$ 1,100,000	\$ 20, 000
	2024	\$ 16,000	\$ 2,428,493	\$ 2,906,196	\$ 2,083,000	\$0
	2025	\$ 16,000	\$ 2,442,874	\$ 2,920,157	\$ 1,100,000	\$0
	2026	\$ 16,000	\$ 2,562,228	\$ 3,036,021	\$ 800,000	\$ O
	2027	\$ 16,000	\$ 2,658,336	\$ 3,129,319	\$ 1,186,000	\$ O
•	2028	\$ 16,000	\$ 2,675,710	\$ 3,146,184	\$ 2,700,000	\$ O
•	2029	\$ 16,000	\$ 2,693,083	\$ 3,163,050	<b>\$</b> 0	\$0
•	2030	\$ 16,000	\$ 2,710,457	\$ 3,179,916	\$ 1,283,000	<b>\$</b> 0
•	2031	\$ 16,000	\$ 2,727,830	\$ 3,196,781	\$0	\$0

TABLE 7.1.2 - FORECAST COSTS (OUTLAYS) FOR THE LONG-TERM FINANCIAL PLAN

## 7.2 Funding Strategy

The proposed funding for assets is outlined in the Central Elgin budget. The financial strategy of Central Elgin determines how funding will be provided, whereas the Detailed Asset management 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 Detailed Asset Management Plan are shown below.

The assets are valued at market rate prices based on 2020 construction values:

Replacement Cost (Current/Gross)	\$ 168,770,000
Depreciable Amount	\$ 168,770,000
Depreciated Replacement Cost	\$ 132,091,549
Depreciation	\$ 3,311,316

#### 7.3.2 Valuation Forecast

Asset values are forecast to increase as additional assets are added as a result of new development. It is widely accepted that 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.

Based on developments that are either under construction or within the planning process it is anticipated that the municipality will be acquiring through donation approximately 10.26 km of new residential streets within the 10 year planning period. This represents an increase of approximately 4.8% of the overall length of the road network. The replacement cost of these additional assets in 2021 dollars is approximately \$19.252 million or 11.4% of the current road network replacement cost.

#### FIGURE 7.3.2 - ASSET VALUATION



### 7.4 Key Assumptions Made In Financial Forecasts

In compiling this Detailed Asset Management Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this Detailed Asset Management 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 Asset Management Plan are:

• Replacement costs were based on 2019 replacement costs inflated to 2021 dollars based on the

- Construction Price Index
- There was adjustment in valuations for current economic and market conditions.

## 7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this Detailed Asset Management 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 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 Detailed Asset Management Plan is shown in Table 7.5.2.

#### TABLE 7.5.2 - DATA CONFIDENCE ASSESSMENT FOR DATA USED IN ASSET MANAGEMENT PLAN

DATA	CONFIDENCE ASSESSMENT	COMMENT
DEMAND DRIVERS	LOW	No formal process for driver identification and prioritization.
GROWTH PROJECTIONS	HIGH	Population and growth projection study provides good detail on rate of growth and location is guided by the municipality's Official Plan
ACQUISITION FORECAST	MEDIUM	Population and growth projections are verified to actual growth rates and identified development applications.
OPERATION FORECAST	MEDIUM	Future costs are extrapolated based on existing budgets and projected for system growth.
MAINTENANCE FORECAST	MEDIUM	Future costs are extrapolated based on existing budgets and projected for system growth.
RENEWAL FORECAST (ASSET VALUES)	MEDIUM	Renewal costs are based on calculations using average unit prices.
ASSET USEFUL LIVES	MEDIUM	Will be reviewed 2021 and updated in 2022
CONDITION MODELING	MEDIUM	Detailed road condition inspections completed every 3 to 5 years
DISPOSAL FORECAST	MEDIUM	Formal process is currently being developed.

The estimated confidence level for and reliability of data used in this Detailed Asset Management Plan is considered to be **medium** confidence level.

## PLAN IMPROVEMENT AND MONITORING

## 8.1 Status of Asset Management Practices

### 8.1.1 Accounting and Financial Data Sources

The Detailed Asset Management Plan utilizes accounting and financial data. The source of data is;

- Costs identified in the 2021 planned budget and actual expenditures from 2019 and 2020
- Project renewal costs identified in the plan were based 2019 to 2021 unit prices.

#### 8.1.2 Asset Management Data Sources

This Detailed Asset Management Plan also utilizes asset management data. The source of the data is the municipality's Asset management software (WorkTech).

### 8.2 Improvement Plan

It is important that Central Elgin recognize areas of their Detailed Asset Management Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this Detailed Asset Management Plan is shown in Table 8.2.



#### TABLE 8.2 - IMPROVEMENT PLAN

TASK NUMBER	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1	Improve reliability of data respecting acquisition of donated assets	Asset Management Department	None	January 1, 2022
2	Update Road Needs Study and condition data	Asset Management & Infrastructure/ Community Services Departments	\$ 30, 000	July 2022
3	Update Unit prices for renewal in WorkTech to reflect current commodity pricing.	Asset Management & Infrastructure/ Community Services Departments	None	January 1, 2022
4	Improve detail of Operations and Maintenance budgets to allow for more certainty in forecasting costs	Infrastructure/ Community Services & Finance Departments	None	October 2021

## 8.3 Monitoring and Review Procedures

This Detailed Asset Management Plan will be reviewed during the annual budget planning process for 2023 and revised to show any material changes in service levels, risks, forecast costs and planned budgets as a result of budget decisions.

The Detailed Asset Management 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 planned budget are incorporated into the Future Long Term Financial Plan once completed.

The Detailed Asset Management Plan has a maximum life of 1 year and is due for revision and updating by July 1st each year.

## 8.4 Performance Measures

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

- The degree to which the required forecast costs identified in this Detailed Asset Management 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 Asset Management 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 Organizational target (this target is often 90 100%).