

# Appendix K

AM Plan Guidance  
Document



# Asset Management Plan Guidance Document (Draft)

## Document History

Version	Summary of Changes	Document Status	Date
0.1	Preliminary draft for preparation of pilot Water AM Plan	Draft	2022-06-10
0.2	Draft to Asset Management Working Group for review	Draft	2023-01-11
0.3	Revised with AMWG Comments	Draft	2023-03-14
0.4	Revised with input from pilot Water AMP	Draft	2023-03-27
0.5	Revised based on review of draft AM Strategy	Draft for AM Strategy	2023-05-25

## General

The Asset Management Plan (AM Plan) is a long term plan for the technical and financial management of the physical assets that support the provision of one or more services to the community, which answers the following questions:

- What assets are managed?
- What service delivery do the assets support?
- What are the levels of service?
- How are the assets performing?
- What are the future demands?
- What is the risk of asset failure?
- What are the required lifecycle activities and costs?
- What is the operational plan?
- How is climate change integrated?
- Is the current funding level sustainable?
- What is needed to improve the plan?

Saanich will develop first-generation AM Plans for each of the following nine asset types:

1. Drainage
2. Facilities
3. Information Technology
4. Natural Assets
5. Park & Trail Structures
6. Transportation
7. Vehicles & Equipment
8. Wastewater
9. Water

In the longer term, Saanich will consider transitioning its AM Plans from asset level plans to service level plans.



## Business Process for Developing the AM Plan

Step	Description
1	Assign Project Manager
2	Develop Project Charter
3	Review asset inventory and update based on existing information
4	Workshop 1 - Roles and responsibilities
5	Workshop 2 - Community Levels of Service
6	Workshop 3 - Technical Levels of Service
7	Workshop 4 - Service level risk matrix
8	Workshop 5 - Asset level risk - likelihood of failure (condition)
9	Workshop 6 - Asset level risk - impact of failure (criticality)
10	Workshop 7 - Asset level risk – likelihood x impact
11	Workshop 8 - Develop life cycle activities
12	Develop lifecycle costs
13	Write draft report
14	Review draft report
15	Write final report
16	Approval of final report

DRAFT



## Table of Contents

Each Saanich AM Plan will have the same structure and contents for District-wide consistency, as described below:

Section	Title	Description of Contents
	<b>Executive Summary</b>	High level summary for posting on Saanich external website.
<b>1</b>	<b>Introduction</b>	
1.1	Purpose	Describe the purpose of the plan and how it is linked to the AM Policy and AM Strategy.
1.2	Scope	Describe the assets included in the plan, and identify asset groups that share common lifecycle management activities and will have separate sections in the plan.
1.3	Roles & Responsibilities	Describe the Operational Units involved in managing this Asset Type, and the breakdown of roles & responsibilities.
1.4	Service Delivery Overview	Describe the vision, goals and approach of the Operational Unit(s) to delivery of the services supported by the assets included in the plan.
<b>2</b>	<b>Levels of Service</b>	
2.1	Services	Describe the community services supported by this asset type, and describe any internal service provision (i.e. services provided by one Operational Unit to another Operational Unit).
2.2	Service Delivery Objectives	Describe the service delivery objectives as set out in the District's OCP, Strategic Plan, or other strategic documents or plans.
2.3	Asset Management Objectives (Levels of Service)	<p>Describe the Legal Requirements, Community Levels of Service, and Technical Levels of Service using the AMBC Levels of Service Tool, where:</p> <ul style="list-style-type: none"> <li>• Legal Requirements: Define the requirements to comply with applicable laws.</li> <li>• Community LoS: Define the level at which the customer receives the service, from an experiential perspective.</li> <li>• Technical LoS: Define specific and quantifiable measures for service targets that are used by staff to meet legal requirements and achieve the Community LoS.</li> </ul> <p>Use one or more of the following characteristics to develop SMART (Specific, Measureable, Achievable, Relevant, Timebound) asset management objectives (levels of service):</p> <ul style="list-style-type: none"> <li>• Capacity/Availability</li> <li>• Quality</li> <li>• Reliability</li> <li>• Safety</li> <li>• Sustainability (environmental, climate mitigation and adaptation)</li> </ul>
<b>3</b>	<b>State of the Infrastructure</b>	
3.1	Inventory	List the asset groups and provide summary graphics for the asset attributes (i.e. location, quantity, size, material, installation date, and remaining life).
3.2	Condition	Describe the condition of the assets using the following types of condition and the scoring provided in Attachment 1: <ul style="list-style-type: none"> <li>• <b>Physical condition</b> – Assess physical condition using the applicable asset specific condition scale (e.g. Bridge Condition Index, Facility Condition Index, Pavement Condition Index, etc.) and then map the score to the Canadian Infrastructure Report Card (CRIC) scale, as</li> </ul>



Section	Title	Description of Contents
		<p>follows, or assess the physical condition directly using the CIRC scale.</p> <ul style="list-style-type: none"> <li>• <b>Capacity Condition</b> – Assess the capacity condition (also known as Capacity Versus Demand Utilization), which is the ability for the existing capacity to meet current and future demand within the planning horizon.</li> <li>• <b>Functionality Condition</b> – Assess the functionality condition, which is the ability to meet current and future service needs (e.g. health, safety, security, legislative etc.).</li> </ul>
3.3	Criticality	Describe asset criticality in terms of environmental, social, and financial criteria and scoring provided in Attachment 2. Criticality is assessed using the asset hierarchy, starting at the highest level of the hierarchy, and then individual assets are assigned the same criticality as the system they belong to or lower. After assessing all the criteria, the combined criticality score is the highest score from any of the criteria.
3.4	Replacement Value	Summary of unit costs, replacement value, useful life and annual average replacement funding.
3.3	Roles & Responsibilities	Identify and party responsible for various lifecycle activities.
<b>4</b>	<b>Future Demand</b>	
4.1	Climate Change	Describe potential impacts of climate change.
4.2	Population Growth	Describe potential impacts of population growth.
4.3	Industry Trends	Describe potential industry trends that may impact demand.
<b>5</b>	<b>Risk Management</b>	
5.1	Service Level Risk	<p>Develop a risk matrix for each service supported by the asset type, including:</p> <ul style="list-style-type: none"> <li>• Identify risk events</li> <li>• Assess likelihood of the event (scale of 1 to 5)</li> <li>• Assess impact of the event (scale of 1 to 5)</li> <li>• Calculate risk score as likelihood x impact (score from 0 to 25)</li> <li>• Identify methods to reduce risks (e.g. policy, inspection, maintenance, replacement, etc.)</li> <li>• Prioritize risk reduction methods for inclusion in the Financial Plan</li> <li>• Monitor and update risk management measures over time</li> </ul> <p>Identify and assess mitigation measures for reducing risk and assess the residual risk. Include mitigation measures to reduce risks in the capital and/or operating budgets (e.g. routine condition assessment programs, asset replacement at end of useful life, adding redundancy measures, developing emergency response plans, etc.).</p>
5.2	Asset Level Risk	<p>Determine Risk of Asset Failure, where:</p> <p>Asset Level Risk = Likelihood of Asset Failure (Condition Score) x Impact of Asset Failure (Criticality Score)</p> <p>Use the resulting Asset Level Risk score for prioritization of the capital budget.</p>



Section	Title	Description of Contents																																																							
		<p>Map risks using the Saanich Enterprise Risk Management Risk Priority Heat Map and ERM Risk Priority Scale shown below:</p> <p><b>Risk Priority Matrix (Heat Map)</b></p> <table border="1"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="5">IMPACT</th> </tr> <tr> <th>1 Negligible</th> <th>2 Minor</th> <th>3 Moderate</th> <th>4 Major</th> <th>5 Catastrophic</th> </tr> </thead> <tbody> <tr> <th rowspan="5">LIKELIHOOD</th> <th>5 Almost Certain</th> <td style="background-color: yellow;"></td> <td style="background-color: yellow;"></td> <td style="background-color: orange;"></td> <td style="background-color: red;"></td> <td style="background-color: darkred;"></td> </tr> <tr> <th>4 Likely</th> <td style="background-color: yellow;"></td> <td style="background-color: yellow;"></td> <td style="background-color: yellow;"></td> <td style="background-color: orange;"></td> <td style="background-color: red;"></td> </tr> <tr> <th>3 Possible</th> <td style="background-color: green;"></td> <td style="background-color: yellow;"></td> <td style="background-color: yellow;"></td> <td style="background-color: yellow;"></td> <td style="background-color: orange;"></td> </tr> <tr> <th>2 Unlikely</th> <td style="background-color: green;"></td> <td style="background-color: green;"></td> <td style="background-color: yellow;"></td> <td style="background-color: yellow;"></td> <td style="background-color: yellow;"></td> </tr> <tr> <th>1 Rare</th> <td style="background-color: green;"></td> <td style="background-color: green;"></td> <td style="background-color: green;"></td> <td style="background-color: yellow;"></td> <td style="background-color: yellow;"></td> </tr> </tbody> </table> <p><b>Risk Management Priorities</b></p> <table border="1"> <thead> <tr> <th>Priority Level</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td style="background-color: darkred;">EXTREME</td> <td> <ul style="list-style-type: none"> <li>Exposure to this level of risk would normally be immediately discontinued except only in extreme circumstances</li> <li>The City Manager / Chief Administrative Officer must be informed and take control of the management of this risk</li> </ul> </td> </tr> <tr> <td style="background-color: red;">VERY HIGH</td> <td> <ul style="list-style-type: none"> <li>Exposure to this level of risk would normally be immediately discontinued unless strategic imperatives dictate otherwise</li> <li>Improving the risk mitigation is required</li> <li>Senior management must be kept informed</li> </ul> </td> </tr> <tr> <td style="background-color: orange;">HIGH</td> <td> <ul style="list-style-type: none"> <li>Exposure to this level of risk should be discontinued as soon as practicable</li> <li>Improving the risk mitigation (if possible) is recommended</li> <li>Relevant management attention and action needed</li> </ul> </td> </tr> <tr> <td style="background-color: yellow;">MODERATE</td> <td> <ul style="list-style-type: none"> <li>Unnecessary exposure to this level of risk must be discontinued as soon as practicable</li> <li>Improving the risk mitigation is not required at this stage</li> <li>Mitigation control and responsibility must be specified</li> </ul> </td> </tr> <tr> <td style="background-color: green;">LOW</td> <td> <ul style="list-style-type: none"> <li>Exposure to this level of risk is acceptable without additional risk treatments and be subject to periodic review to ensure the risk does not increase</li> <li>Improving the risk mitigation is not required</li> <li>Can be managed by routine controls and procedures</li> </ul> </td> </tr> </tbody> </table>			IMPACT					1 Negligible	2 Minor	3 Moderate	4 Major	5 Catastrophic	LIKELIHOOD	5 Almost Certain						4 Likely						3 Possible						2 Unlikely						1 Rare						Priority Level	Description	EXTREME	<ul style="list-style-type: none"> <li>Exposure to this level of risk would normally be immediately discontinued except only in extreme circumstances</li> <li>The City Manager / Chief Administrative Officer must be informed and take control of the management of this risk</li> </ul>	VERY HIGH	<ul style="list-style-type: none"> <li>Exposure to this level of risk would normally be immediately discontinued unless strategic imperatives dictate otherwise</li> <li>Improving the risk mitigation is required</li> <li>Senior management must be kept informed</li> </ul>	HIGH	<ul style="list-style-type: none"> <li>Exposure to this level of risk should be discontinued as soon as practicable</li> <li>Improving the risk mitigation (if possible) is recommended</li> <li>Relevant management attention and action needed</li> </ul>	MODERATE	<ul style="list-style-type: none"> <li>Unnecessary exposure to this level of risk must be discontinued as soon as practicable</li> <li>Improving the risk mitigation is not required at this stage</li> <li>Mitigation control and responsibility must be specified</li> </ul>	LOW	<ul style="list-style-type: none"> <li>Exposure to this level of risk is acceptable without additional risk treatments and be subject to periodic review to ensure the risk does not increase</li> <li>Improving the risk mitigation is not required</li> <li>Can be managed by routine controls and procedures</li> </ul>
		IMPACT																																																							
		1 Negligible	2 Minor	3 Moderate	4 Major	5 Catastrophic																																																			
LIKELIHOOD	5 Almost Certain																																																								
	4 Likely																																																								
	3 Possible																																																								
	2 Unlikely																																																								
	1 Rare																																																								
Priority Level	Description																																																								
EXTREME	<ul style="list-style-type: none"> <li>Exposure to this level of risk would normally be immediately discontinued except only in extreme circumstances</li> <li>The City Manager / Chief Administrative Officer must be informed and take control of the management of this risk</li> </ul>																																																								
VERY HIGH	<ul style="list-style-type: none"> <li>Exposure to this level of risk would normally be immediately discontinued unless strategic imperatives dictate otherwise</li> <li>Improving the risk mitigation is required</li> <li>Senior management must be kept informed</li> </ul>																																																								
HIGH	<ul style="list-style-type: none"> <li>Exposure to this level of risk should be discontinued as soon as practicable</li> <li>Improving the risk mitigation (if possible) is recommended</li> <li>Relevant management attention and action needed</li> </ul>																																																								
MODERATE	<ul style="list-style-type: none"> <li>Unnecessary exposure to this level of risk must be discontinued as soon as practicable</li> <li>Improving the risk mitigation is not required at this stage</li> <li>Mitigation control and responsibility must be specified</li> </ul>																																																								
LOW	<ul style="list-style-type: none"> <li>Exposure to this level of risk is acceptable without additional risk treatments and be subject to periodic review to ensure the risk does not increase</li> <li>Improving the risk mitigation is not required</li> <li>Can be managed by routine controls and procedures</li> </ul>																																																								
<b>6</b>	<b>Lifecycle Management</b>																																																								
6.1	Existing Assets	Describe the lifecycle activities required over a 10-year period to maintain the current levels of service.																																																							
6.1.1	Planning & Analysis	Describe planning and analysis activities.																																																							
6.1.2	Design & Construction	Describe design and construction activities.																																																							
6.1.3	Operations & Maintenance	Describe operations and maintenance activities, including any required system or staff certifications, planned preventative maintenance and																																																							



Section	Title	Description of Contents
		processes for corrective maintenance, automated systems and alarms in place to notify operators of problems, reference to O&M manuals, list of authorized service agents, reference to emergency plans, and list of spare parts. Attach the detailed Operational Plan as Appendix D.
6.2	New Requirements for Future Demand	Describe new lifecycle activities required to support future demand.
<b>7</b>	<b>Funding Implications</b>	
7.1	Capital Costs	Provide the 10-year capital plan.
7.2	Operations & Maintenance Costs	Provide the 10-year operations and maintenance costs.
7.3	Financing Strategy	Describe how the 10-year funding needs will be financed.
<b>8</b>	<b>Plan Monitoring and Improvement</b>	
8.1	Improvement Plan	Describe actions for improving the AMP.
8.2	Monitoring and Review Procedures	Review timing and procedures.
	<b>Appendices</b>	
	Appendix A	Prioritized Capital Project List
	Appendix B	Location and Condition Maps
	Appendix C	Condition Photos
	Appendix D	Operational Plan (see Attachment 3)

## Attachments

1. Likelihood of Asset Failure (Condition) Criteria
2. Impact of Asset Failure (Criticality) Criteria
3. Operational Plan Content



# Asset Management Program



## Attachment 1 – Likelihood of Asset Failure (Condition) Criteria

Likelihood (Condition) Score	Saanich Enterprise Risk Management Framework	Physical Condition (Canadian Infrastructure Report Card Scale)	Capacity Condition “Capacity Versus Demand Utilization” *	Functionality Condition *
1	Rare - May occur in the next 3 years only in exceptional circumstances. Exceptionally unlikely even in the long-term future.	Very Good - The asset is fit for the future. It is well maintained, in good condition, new or recently rehabilitated.	Demand corresponds well with actual capacity and no operational problems experienced. Meets current and future capacity needs within planning horizon. No potential for climate change impacts.	The infrastructure in the system or network meets all program/service delivery needs in a fully efficient and effective manner (i.e. health, safety, security, legislative etc.). Redundancy available is more than 100%.
2	Unlikely - Could occur if circumstances change but not anticipated in the next 3 years. Could occur in 5-10 years.	Good - The asset is adequate. It is acceptable and generally within the mid-stage of its expected service life.	Demand is within actual capacity and occasional operational problems experienced. Low potential for climate change impacts.	The infrastructure in the system or network meets program/service delivery needs in an acceptable manner (i.e. health, safety, security, legislative etc.). Redundancy available is 100%.
3	Possible - Might occur in next 3 years under current circumstances but a distinct possibility that it won't occur. Could occur with the next 3-5 years.	Fair - The asset requires attention. The asset shows signs of deterioration and some elements exhibit deficiencies.	Demand is approaching actual capacity and/or operational problems occur frequently. Meets current capacity needs but not future without modifications. Some potential for climate change impacts.	The infrastructure in the system or network meets program/service delivery needs with some inefficiencies and ineffectiveness present (i.e. health, safety, security, legislative etc.). Redundancy available is between 25% and 99%.
4	Likely - Will probably occur within the next 3 years in most circumstances. Could occur within months to years.	Poor - There is an increasing potential for its condition to affect the service it provides. The asset is approaching the end of its service life, the condition is below the standard and a large portion of the system exhibits significant deterioration.	Demand exceeds actual capacity and/or significant operational problems are evident. High potential for climate change impacts.	The infrastructure in the system or network has a limited ability to meet program/service delivery needs (i.e. health, safety, security, legislative etc.). Redundancy available is less than 25%.
5	Almost Certain - Is expected to occur in the next 3 years unless circumstances change. Could occur within days to months.	Very Poor - The asset is unfit for sustained service. It is near or beyond its expected service life and shows widespread signs of advanced deterioration. Some assets may be unusable.	Demand exceeds actual capacity and/or operational problems are serious and ongoing. Does not meet current capacity requirements. Existing and ongoing climate change impacts.	The infrastructure in the system or network is seriously deficient and does not meet program/service delivery needs and is neither efficient nor effective (i.e. health, safety, security, legislative etc.). Redundancy available is 0%.

\*Based on *Connecting LOS, Risk and Cost – From Strategic to Tactical*, Town of Halton Hills, CNAM Conference 2022; added climate change impact criteria under Capacity Condition; added redundancy criteria under Functionality Condition.





## Asset Management Program



### Attachment 2 – Impact of Asset Failure (Criticality) Criteria \*

Impact (Criticality) Rating	Impact (Criticality) Level	Financial	Social				Environmental
			People	Business Operational Effectiveness	Legal and Regulatory	Reputation	
1	Insignificant (Not Critical)	The NET financial impact to Saanich is likely to be less than 0.5% of the annual operating budget.	Single or multiple staff unable to perform work for one day.  Injury (to staff or public) requiring no medical treatment.	Minor, but noticeable, change in service from the public's perspective.	No regulatory impact.  Minor complaint / incident resolved by management.	No impact on reputation.  No media coverage	Minor leak, non-contaminating.
2	Minor (Low Criticality)	The NET financial impact to Saanich is likely to be between 0.5 - 2% of the annual operating budget.	Single or multiple staff unable to perform work for a period of one week.  Minor injury (to staff or public) requiring first aid only.	Intermittent loss of services to the public of less than 3 hours.  Intermittent interruption of IT systems / email less than once per month.	Activity does not follow relevant established industry / provincial / national guidelines.  Isolated complaint / incident where there is a threat of legal action, resolved by management.	Minimal customer sensitivity and damage to reputation.  Limited local community coverage.	On site release contained immediately.
3	Moderate (Moderate Criticality)	The NET financial impact to Saanich is likely to be between 2 - 10% of the annual operating budget.	One staff member with serious long-term injury / illness connected with Saanich endeavours.  Injury (to staff or public) requiring hospitalization to one or more persons.	Frequent loss of services to the public of between 3 hours and a week.  Routine interruptions of IT systems / email each week.  A noticeable change in normal service quality to the public.	Activity does not meet the requirements of relevant industry / provincial / national standards exposing Saanich to possible litigation risks.  Significant level of complaints / incidents where there is a high threat of legal action, resolved by management.	Moderate customer sensitivity and damage to reputation impacting noticeably on business activities.  Significant local community coverage	On site release contained with outside assistance.  No damage to flora / fauna and short-term effects on soil, water and air.



## Asset Management Program



Impact (Criticality) Rating	Impact (Criticality) Level	Financial	Social				Environmental
			People	Business Operational Effectiveness	Legal and Regulatory	Reputation	
4	Major (High Criticality)	The NET financial impact to Saanich is likely to be between 10-50% of the annual operating budget.	<p>Multiple staff with serious long-term injury / illness connected with Saanich endeavours.</p> <p>Serious injury to one or more persons (to staff or public) resulting in a permanent disability.</p>	<p>Loss of basic services to the public for a period longer than a week.</p> <p>A very noticeable change in normal service quality.</p>	<p>Non-compliance with legislation/regulations trigger material fines, penalties and restrictions on operations.</p> <p>Contract dispute results in significant loss of productivity and legal action.</p> <p>Senior employees charged for breaches / fraud.</p>	<p>Significant customer sensitivity and damage to reputation.</p> <p>Province wide Media coverage.</p>	<p>Off-site release with no long-term effects.</p> <p>Limited damage to flora/fauna, soil /water.</p>
5	Catastrophic (Extreme Criticality)	The NET financial impact to Saanich is likely to be greater than 50% of the annual operating budget.	<p>Substantial permanent loss of Saanich staff resources.</p> <p>Deaths (to staff or public).</p>	<p>Total inability to provide basic services to public for an extended period.</p> <p>Complete operational failure of a critical system for a sustained amount of time.</p>	<p>Total failure to meet relevant legislation and regulations leading to dismissal of Council or Board</p>	<p>Very high customer sensitivity and irreparable damage to reputation.</p> <p>National / International media coverage.</p>	<p>Toxic release off site with long term effects.</p> <p>Substantial / long term damage to flora / fauna, soil / water.</p>

\*Based on *Enterprise Risk Management Framework, Step 2 – Ranking Risk Impacts*, District of Saanich, 2022.



## Attachment 3 - Operational Plan Content

Section	Subsection	Description
Purpose		Purpose of the document
Vision		Describe the operations and maintenance team vision
Services	External	Identify the services provided to the community, and refer to the AM Plan for Levels of Service
	Internal	Identify the services provided to internal departments
Organization Chart		Describe the Operations & Maintenance team.
Certifications	System	Describe any system certifications
	Operators and Trades	Describe any operator or trades certifications
Operations & Maintenance	Operations	Describe operational activities
	Maintenance	Describe the planned preventative maintenance program, and processes for corrective maintenance
	Workflows	Develop business process workflows for each maintenance activity
	Inspection Forms	Describe and provide templates for data collection and inspection forms.
	Automated Systems and Alarms	Describe automated system and alarms in place to notify operators of problems
	Manuals	List reference O&M manuals
	Service Agents	List authorized service agents
	Spare Parts Inventory	Inventory of assets and authorized replacement parts
Monitoring & Reporting		Describe processes and procedures for data collection, analysis, review and reporting. Describe calibration procedures for monitoring equipment. Describe alarm conditions and process for response to alarms.
Emergency Procedures		Refer to or describe emergency plans
Staff Competency		Describe a training plan for all staff, and the resources in place to provide ongoing training and development
Improvement Plan		Identify actions for continuous improvement