District of Oak Bay

2016 Asset Management Report

OBMH-07 2015

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1 Introduction

Municipalities across Canada including the District of Oak Bay (the District) are challenged with maintaining aging infrastructure which demands substantial rehabilitation at a time of competing need and budgetary constraints. The District of Oak Bay is one of the oldest municipalities within the Capital Regional District and this is reflected in the age of the infrastructure assets that provide essential community services.

Opus International Consultants (Canada) Limited (Opus) was engaged by the District to provide a high level assessment of the current asset management practices, review the state of existing assets and provide advice on next steps to implement high priority asset management initiatives.

The purpose and expectations of this project are to:

1. Assess at a high level (overview);
    - Where is the District in terms of the information, finance, people, and assets necessary for good Asset Management (AM)?
    - How does the District obtain, analyze and use its asset data?
2. Provide Council with information on AM and what will be expected from them, including the process to implement AM.
3. Inform on next steps including an improvement plan to-do list and priorities, but not to write an asset management plan.

Our workplan is illustrated in the following diagram and has included a review of background information, providing an "Introduction to AM" workshop, research and assessment of asset management practices and current state of assets, an implementation workshop and reporting.

Opus has undertaken the project using an interactive methodology to create opportunities for transfer of knowledge to District staff on the principles and concepts of asset management, to increase the District's in-house capabilities and help staff to learn how to complete follow-up tasks such as writing and implementing a formal asset management plan.

The following information was provided by the District for background review:

- 2014 Financial Statements
- 2014 Annual Report
- 2014 Official Community Plan
- TCA (Tangible Capital Assets) Policy
- Fixed Asset Listing (TCA Data)
- New Account Codes – for AM
- 2012 Pavement Management Study
- GIS asset data

From this information and workshop discussions with staff, Opus completed a high level assessment on current asset management practices and current state of assets. Through this assessment, we have identified key gaps and recommended next steps for improvement.

2 Asset Management Assessment

2.1 Scope of Assessments

The project undertook two assessments. The first assessment was a measure of current asset management practices implemented at the District. An overview of outcomes and a summary of findings are presented in Sections 2.3 and 2.4 of this report. The second assessment was an analysis of the current state of the District's physical assets. Outcomes for that assessment are reported in Section 3.

2.2 Assessment of AM Practices

The assessment of the District's current asset management practices is based on a combined assessment tool that includes;

- The UBCM AM Framework related to the Gas Tax Funding program,
- The practice modules in the AMBC Roadmap, and
- Applicable components of ISO 55001:2014.

Figure 1 below, illustrates the interrelationship between the core elements for sustainable service delivery given in the UBCM AM Framework (i.e. Information, Finances, People, and Assets), and measurable parameters developed for the AM Roadmap and ISO 55001 standards.

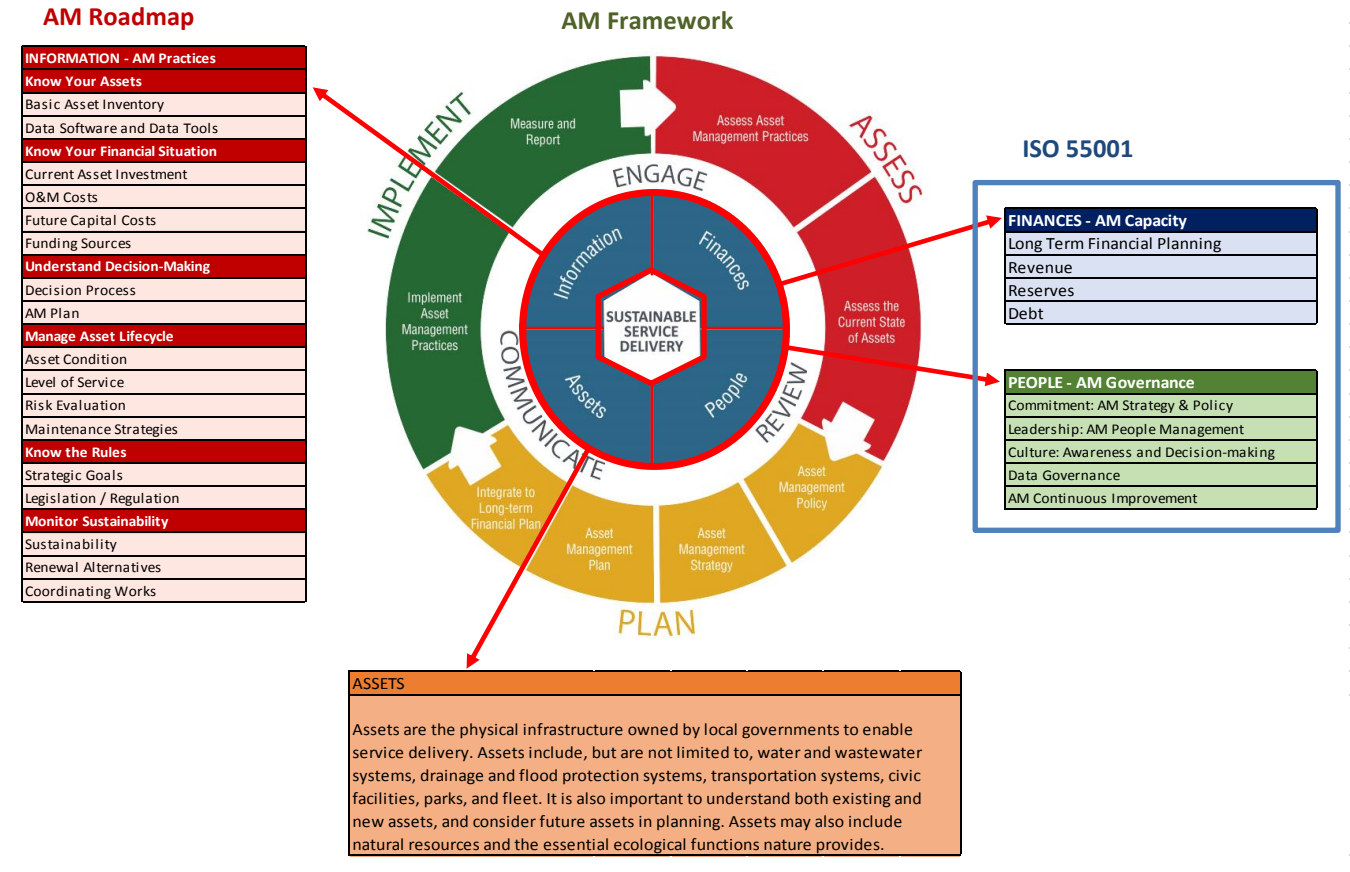


Figure 1 - Asset Management Framework and Assessment

2.3 Overview of Outcomes

A consultative workshop was held with staff to assess the current state of asset management practices at the District. A comprehensive list of statements and questions relating to AM Information, and the Finances and People to support AM Practices were evaluated and rated as either 1-None (or not started), 2-Started (but still in early stages of completion), 3-Progress (implementation or development is beyond the beginning stages but is not yet completed), or 4-Complete. These scores were then averaged to provide overall scores for the following categories:

Table 1: Summary of State of AM Practice

Element	Description	Score
Information	Asset Management Practices	2.3
	- Know your Assets	1.7
	- Know your Financial Situation	1.4
	- Understand Decision Making	2.1
	- Manage Asset Lifecycle	2.9
	- Know the Rules	3.1
	- Monitor Sustainability	2.8
Finances	Financial Capacity	2.2
People	Leadership and Commitment	1.8

These results are illustrated in Figure 2 below:

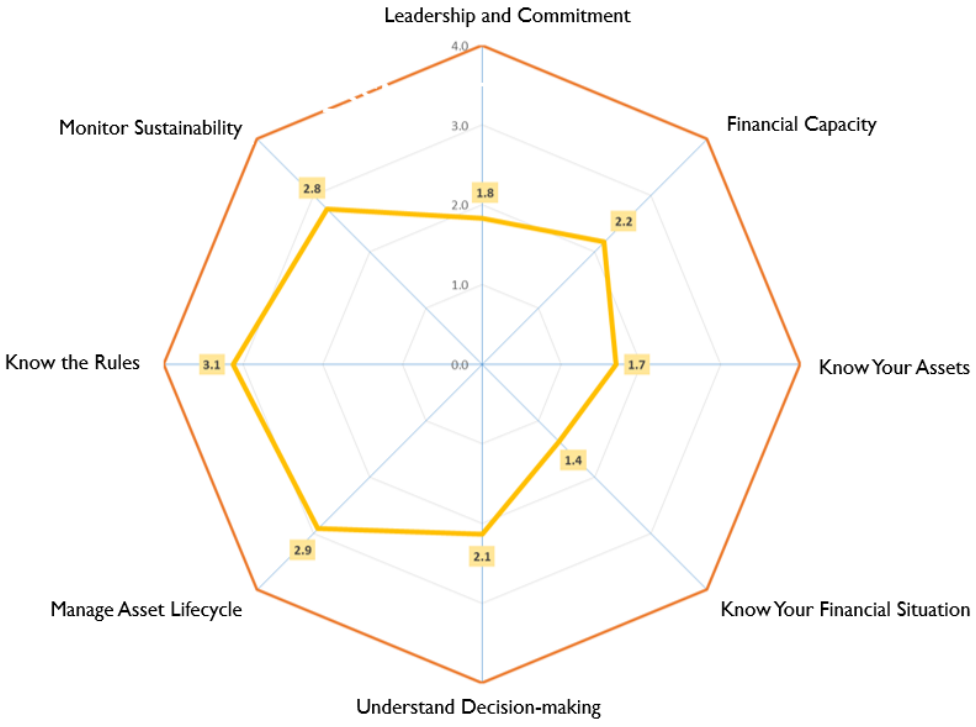


Figure 2 Asset Management Assessment – District of Oak Bay

The detailed assessment is provided in an analysis spreadsheet in Appendix A and summary comments and observations are detailed in the following sections.

2.4 Core Elements

2.4.1 Information

Know Your Assets

The District has an inventory of most of their assets, including accurate location data in GIS.

Improvements could be made to: fully populate key attribute fields; record data accuracy; and include asset components and sub components. Software systems and tools (e.g. GIS, Vadim, Tempest, and Water Modelling) could be better utilized for AM purposes and the District would gain considerable benefit from an integrated AM software tool.

Know Your Financial Situation

The District has researched lifespans used for other municipalities to establish estimates. They have a 5 year forecast for asset renewal projects and detailed short term financial plans to identify operations, maintenance and capital costs.

The following improvements could be made:

- Calculate current replacement costs for all asset components
- Record key assumptions, estimates and default values
- Track operations and maintenance costs separately and against individual assets
- Long term (20+ years) forecast for asset renewals
- Demand (growth) forecasts (impacts of future in-fill and build-out scenarios)
- Funding / Revenue estimates (short and long term)
- Considering risk in financial planning analysis

Understand Decision Making

The District has processes where decisions are made based on the information available to the decision-maker at the time. Whilst this is an acceptable approach for decisions of low to medium importance, decisions of medium to high importance should have a more robust, defendable and repeatable process. Improvements could be made to review and document key decision processes.

Additionally, the District has yet to develop Asset Management Plans (AMPs). These will document AM strategy and delivery of expected levels of service throughout the asset lifecycle. The process to develop and document AMPs will also identify gaps between current service capability and the required service capability to meet future demand.

Manage Asset Lifecycle

The District has a fairly good indication of the condition of their assets as well as the level of service and cost of service for their assets. They have a Preventative Maintenance Program and risk assessments for some assets. More could be completed to track work history against each individual asset.

Improvements could be made by developing more formal risk assessment processes and processes to determine criticality of assets. Asset risk and criticality should then be considered in operations, maintenance and renewal decisions to drive optimization. Maintenance strategies should be developed

and documented to include information regarding roles and responsibilities; maintenance options, methods, and protocols; decision criteria; performance indicators, review, etc.

Know the Rules

The District has documented procedures for communication and consultation with stakeholders and has consulted stakeholders on levels of service provided. Some staff are aware of relevant stakeholder groups and their expectations for management of the assets and delivery of services. Staff are generally aware of key legislation and regulations and compliance is monitored and measured.

Improvements could be made to ensure staff are aware of the strategic goals for the organization and generate (and communicate) clear connection between business goals, operational tasks, asset management goals, and the District's strategic and organizational goals.

Monitor Sustainability

The District has identified and documented sustainability goals for the organization and has considered social and environmental sustainability. Renewal alternatives for assets have been considered; however this is on a case by case basis and a documented procedure for considering alternatives in all relevant situations does not currently exist.

There are good efforts to coordinate work where possible and appropriate, with business groups consulting with each other on programs and planning for construction projects.

A general assessment of financial sustainability which considers the costs throughout the whole lifecycle of all assets should be completed to determine whether the current level of services is affordable.

2.4.2 Finances

In terms of Financial Capacity, the District has a reasonable level of debt which is relatively stable. There are reserves in place to buffer short term revenue fluctuations and dedicated reserves for future capital renewal.

Where the District needs to improve is with their long term financial planning. A financial plan is currently in place, but it lacks a robust analysis of long term investment needs to replace existing assets as they age and continue to deliver the expected levels of service. An initial high-level review of the existing asset data indicates that a significant gap may exist between current revenues levels and sustainable funding over the life of the assets for the current level of service. There is further information on this issue in Section 3.

Implementing a comprehensive long term financial plan based on up to date best available asset information is required to determine whether the debt levels, reserves, and revenue/funding meet the investment levels required to sustain the services long term. The plan should look forward 20 years or more and be integrated with the long term capital plan.

2.4.3 People

The analysis for the core element titled "People" is about AM Governance and the capacity of the District's "people" resources to implement asset management. The measured parameters considered the level of leadership and commitment in the organization, definition of roles and responsibilities, awareness of strategic goals and legislation, and staff capacity and capability.

The implementation of an asset management plan is the beginning of a new initiative for the District. AM practices will provide essential knowledge and understanding for decisions that can improve the management of assets and delivery of cost effective services in the future. As such, the District has yet to establish (to the desired level) the People element of AM, which includes AM Governance, Capacity & Practices, Leadership and Commitment. However the District is believed to be progressing several key elements such as:

- Providing strong leadership for and developing a culture of teamwork throughout the organization.
- Ensuring asset information is readily and consistently shared through formal and informal channels.
- Establishing a cross functional team that is effectively implementing AM, providing leadership and bridging across all departments in the organization.
- Designating a senior management champion that is tasked with the responsibility to ensure that an AM system and AM plans are developed and that AM practices throughout the organization are implemented, reviewed and continually improved.

District staff already complete tasks in their day-to-day work that include elements of AM but other aspects of good AM are yet to be implemented. Some additional time and effort may be required (at least initially) to improve how information is collected, recorded and used for decision making. One high priority task is collecting the required missing asset data. This is likely to require additional resources (staff, funding and equipment) to ensure the most critical data is collected and entered as soon as possible.

It is important to have staff at all levels involved in AM, especially getting started. In the start-up phase it can be expected that the workload will increase slightly for current staff to implement AM practices and improvements. However, once implemented, for the majority of staff AM should become part of everyday tasks and provide a more sustainable services to residents.

It is important to have an Asset Management Champion in a leadership role such as on the senior management team or a Council Representative for AM to ensure there is commitment and support to follow through with recommended improvement tasks.

Most District staff currently have limited knowledge of AM practices. In-house AM training would therefore be beneficial to increase the District's capability to identify and implement appropriate best practice and specifically to improve the use of information and tools for renewal strategies, investment planning and strategic decision making.

This project has initiated a Continuous Improvement process by assessing current practices and identifying improvement tasks. The District's long term goal (as stated in the 2014 Official Community Plan) is to implement a comprehensive Asset Management Strategy. This project begins that process. Eventually, as improvements are actioned and support for AM progresses, an AM Policy, AM Strategy, Framework and AM System (including defined roles and responsibilities) will be developed, and these will lead the District toward an affordable, sustainable future despite the inevitable aging of assets and need to fund replacements.

3 Current State of Assets

3.1 Asset Groups

The District has the following asset groups:

- **Sewer**
- **Water**
- **Storm**
- **Roads** (sidewalks, curb, trails)
- **Buildings**
- **Street Furniture** (benches, street lights, signs)
- **Parks and Recreation** (trees, sports fields, parks, recreation facilities)
- **Fleet**

3.2 Assessment Summary

The District's GIS data was used to assess the current state of assets. The information currently available for assets is incomplete; however sufficient data (and estimated data) was available to develop high level dashboard reports, within the scope of this project, for the sewer, water and storm utility assets.

The primary attributes required for each component from the dataset are;

- The installation date;
- The asset type and material type;
- The relevant size attributes required to price a replacement asset, and where available;
- The measured condition or assessed remaining life.

These dashboards are an indication only and are a snapshot of what the current available data represents. The replacement costs are based on unit rates from other municipalities on Vancouver Island and the renewal plan is based on replacement only, i.e. it does not include alternative rehabilitation strategies such as pipe lining. As more data is collected and verified, and unit costs are refined, the dashboard can be become a more accurate tool which can then be used for Renewal Planning and Strategies.

Dashboards are only shown for the sewer, water, and storm asset groups. Within these groups, condition, age, and projected renewals are only shown for the mains as this is the only asset type with sufficient reliable data.

The information provided/available for the other assets was not sufficient to complete an assessment and create a dashboard report at this stage.

The graph below shows the current replacement value of the three assessed asset groups: sewer, water, and storm.

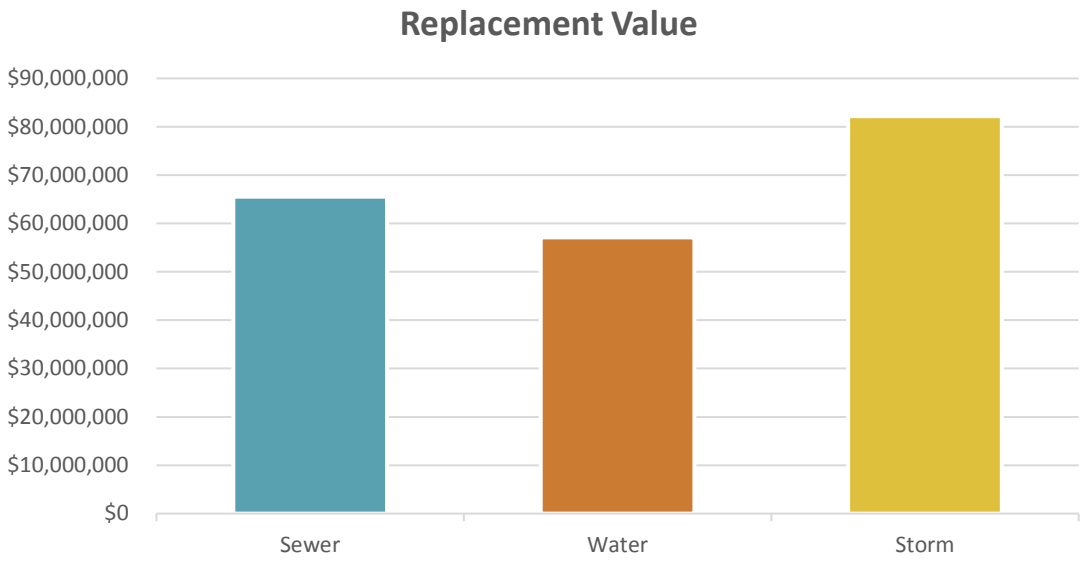


Figure 3 – Asset Replacement Value

3.2.1 Sewer Assets

The District has approximately $65.5M worth of sewer gravity mains, laterals and manholes based on current available data and estimated replacement unit costs. Many sewer assets were installed between 1912 and 1940, making them between 75 and 103 years old, which is over or very close to their expected life. Based on this age data, the majority of assets are in Poor and Fair condition and need to be replaced as soon as possible.

Condition assessments of the older mains is required immediately to confirm the expected remaining life of these assets. Replacements and/or renewals can then be programmed over an appropriate number of years, attending first to the most critical assets.

Refer to the dashboard overleaf for an overview of the sewer assets.

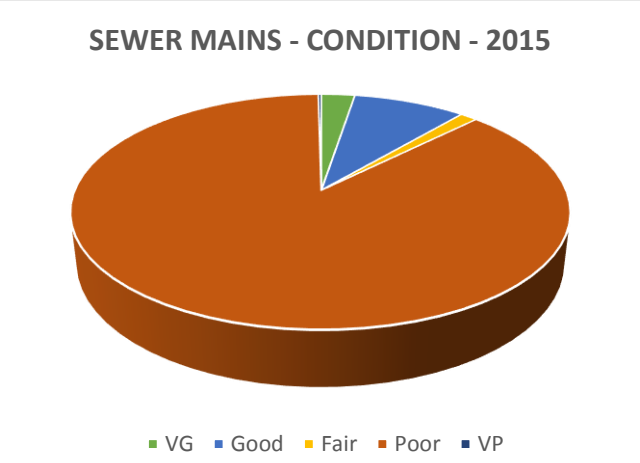
Table 2 – Key Issues and Recommendations for Improving Sewer Asset Data

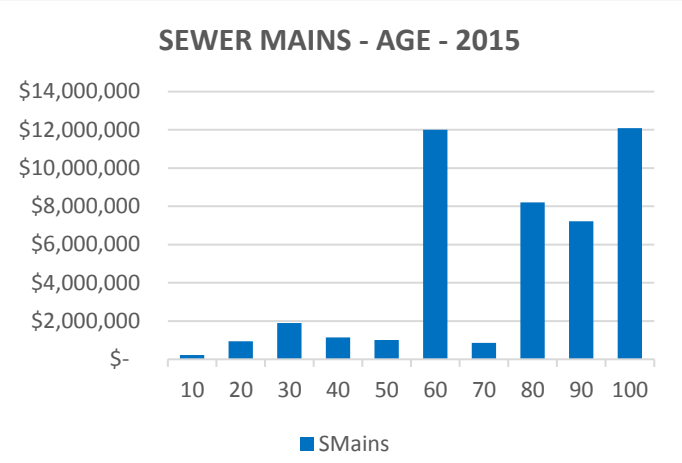
Main Issues	Recommendation
Assets at or near the end of their life do not have condition data.	Collect condition data on assets which are at or near the end of their life to development replacement/rehabilitation strategies.
Laterals and manholes do not have installation dates	Use install date of the closest main or the year that the house was built
Inconsistent data entries for material type	Use unique material codes (i.e. do not allow multiple spellings/codes for same material type such as having both “DI” and “Ductile Iron” in datasets, or “Unknown” as well as “Unk”, and both “Other” and “Oth”)

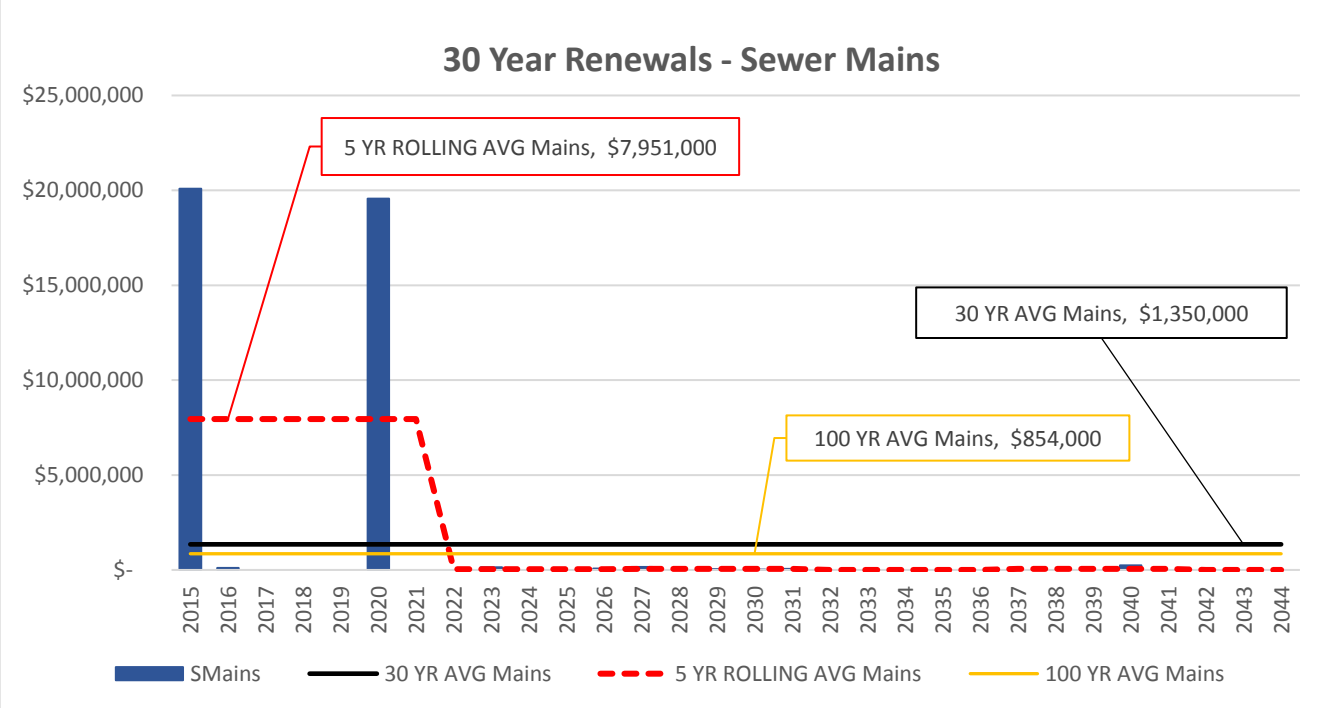
Oak Bay Sewer Assets

Assets	Quantity		Average Age in 2015	Average Useful Life	Average Condition	Current Replacement Cost of Oak Bay Sewer Assets($)	100 YR Average Per Annum Replacement Cost ($)
Gravity Mains	99.63	Km	72	75	3.75	$ 45,607,338	$ 854,020
Laterals	35.85	Km	65	82	3.19	$ 14,527,826	$ 228,360
Manholes	1316	No.	18	80	2.97	$ 5,408,534	$ 107,340
Network Total	**99.63**	**Km**	**66**	**77**	**3.56**	**$ 65,543,699**	**$ 1,189,720**

*Note that this assessment does not include pressurized mains, pumps, cleanouts, fittings, or valves. 850 m of gravity sewers were lined in 2010, this was not included in our analysis.







Notes:
The majority of the gravity mains that will need replacement in 2016 are vitrified clay pipes with an assumed installation date between 1912 and 1930. These pipes are already over, or within 5 years of, their expected life.

There are also 15 km of laterals that are due for replacement now, or in the near future. Condition assessments of the pipes in this group (and those for 2020) is required immediately to confirm expected remaining life of these assets. Replacements can then be programmed over an appropriate number of years, attending to the most critical first.

Only condition investigations can confirm if these assets are indeed close to the end of their life or whether at least some of them will have a longer lifespan and therefore replacement can be deferred for a number of years.

Additionally, no installation dates are recorded for manholes, which puts them into the current replacement year, until an estimated installation date or a remaining life value is entered. As an interim measure, an assumed date can be assigned equal to the installation date of the nearest sewer main.

3.2.2 Water Assets

The District has approximately $57M worth of water gravity mains, laterals, hydrants, valves, and meters based on current available data and estimated replacement unit costs. Many water assets were installed between 1920 and 1940, making them between 75 and 95 years old, which is over or very close to their expected life. Based on this age data, the majority of assets are in Poor and Fair condition and need to be replaced as soon as possible.

Condition assessments of the older mains is required immediately to confirm expected remaining life of these assets. Replacements and/or renewal (i.e. lining) can then be programmed over an appropriate number of years, attending to the most critical first.

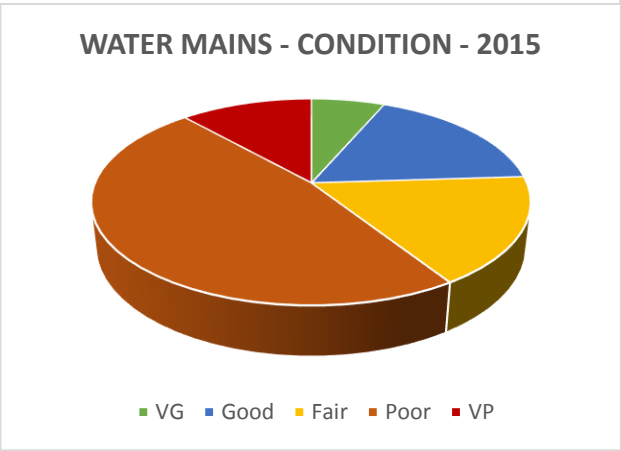
Refer to the dashboard overleaf for an overview of the water assets.

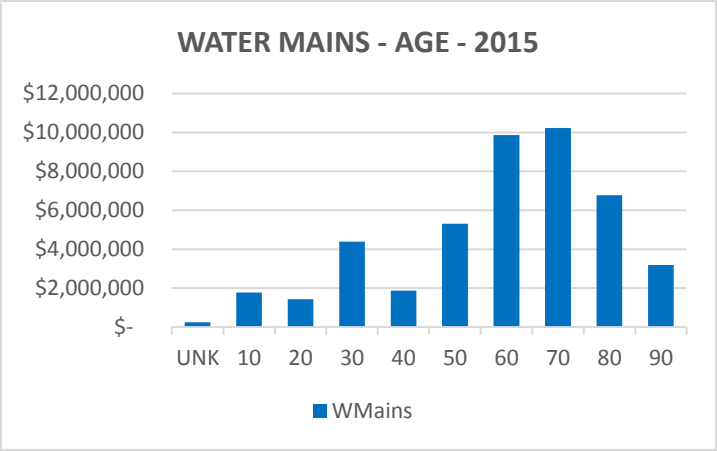
Table 3 – Key Issues and Recommendations for Improving Water Asset Data

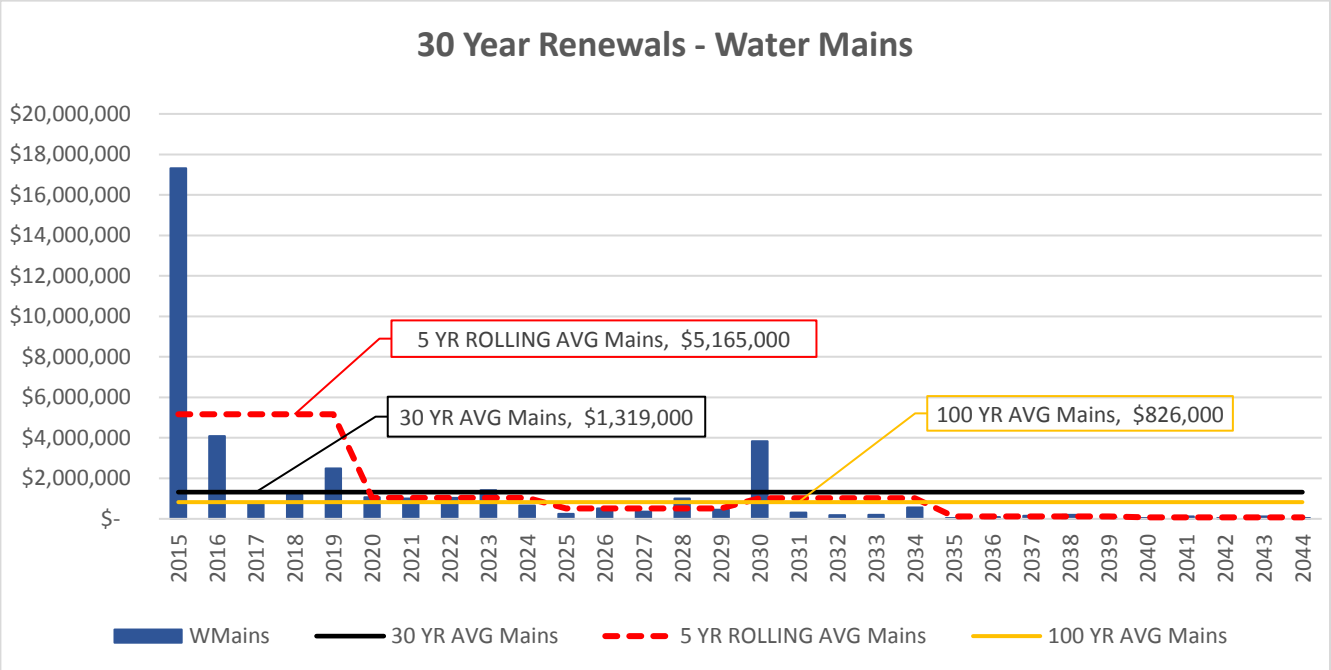
Main Issues	Recommendation
Assets at or near the end of their life do not have condition data.	Collect condition data on assets which are at or near the end of their life to development replacement/rehabilitation strategies. In the case of water pipes this will require disruption to service therefore a program for strategic sampling of aged sections of different pipe types should be designed and implemented.
Pipes that have been lined do not have an adjusted lifespan	There are many pipes that have been lined and therefore will last longer than shown in the dashboard. However, the lined pipes although recorded in the asset inventory (GIS) information need to be assigned a new lifespan equal to the lifespan of the lining at the date of they were lined. This will update the renewal program and defer a notable portion of the cost shown as overdue work in 2015 to being future work due at the end of the life of the liners.
Inconsistent data entries for material type	Use unique material codes (i.e. do not allow multiple spellings/codes for same material type such as having both “DI” and “Ductile Iron” in datasets, or “Unknown” as well as “Unk”, and both “Other” and “Oth”)

Oak Bay Water Assets

Assets	Quantity		Average Age in 2015	Average Expected Life	Average Condition	Current Replacement Cost: Oak Bay Water Assets ($)	100 YR Average Per Annum Replacement Cost ($)
Mains	115.18	Km	60	72	3.43	$51,588,125	$825,930
Laterals	4.38	Km	5	84	2.00	$1,349,044	$19,640
Hydrants	494	#	7	60	2.96	$2,602,775	$51,520
Valves	1073	#	6	25	2.93	$1,556,560	$52,040
Meters	165	#	3	15	1.55	$24,060	$1,490
Network Total	**115.18**	**Km**	**55**	**68**	**3.22**	**$57,120,564**	**$950,620**







Notes:
4 to 10 km of gravity water mains have been lined since 1988. Due to incomplete data this was not incorporated into the analysis. It is recommended that a new lifespan is assigned to all pipes that have been lined, effective from the date of lining and equal to the lifespan of the lining. This should defer a notable portion of the cost shown as overdue work in 2015, to actually being future work due at the end of the useful life of the pipe linings.

The majority of the gravity mains (82%) that will need replacement in 2015 are cast iron with an assumed installation date between 1920 and 1940. The typical useful life for cast iron mains is only 70 years therefore many of these water mains will most likely have some degradation and failures can be expected. It is recommended that pipe samples be taken to determine condition and that a replacement program be established to spread the cost impact of these impending replacements over a number of years. This is urgent as the potential cost impact of waiting until failures occur is significant.

Only condition investigations can confirm if these assets are indeed close to the end of their life or whether at least some of them will have a longer lifespan and therefore replacement can be deferred for a number of years.

3.2.3 Stormwater Assets

The District has approximately $82M worth of stormwater gravity mains, laterals, and manholes based on current available data and estimated replacement unit costs. Many water assets were installed between 1920 and 1940, making them between 75 and 95 years old, which is over or very close to their expected life. Based on this age data, the majority of assets are in Poor and Fair condition and need to be replaced as soon as possible.

Condition assessments of the older mains is required immediately to confirm expected remaining life of these assets. Replacements and/or renewal (i.e. lining) can then be programmed over an appropriate number of years, attending to the most critical first.

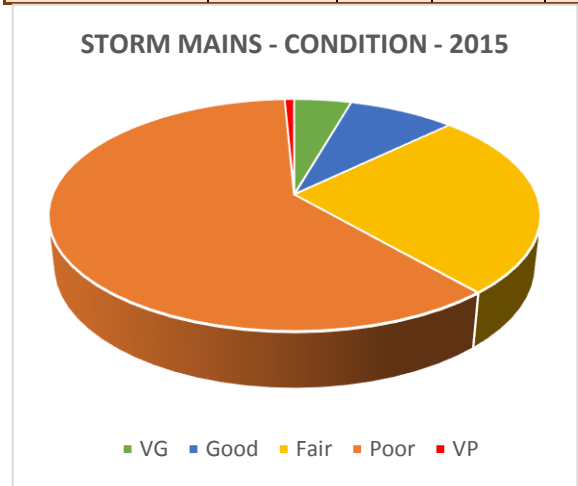
Refer to the dashboard overleaf for an overview of the storm assets.

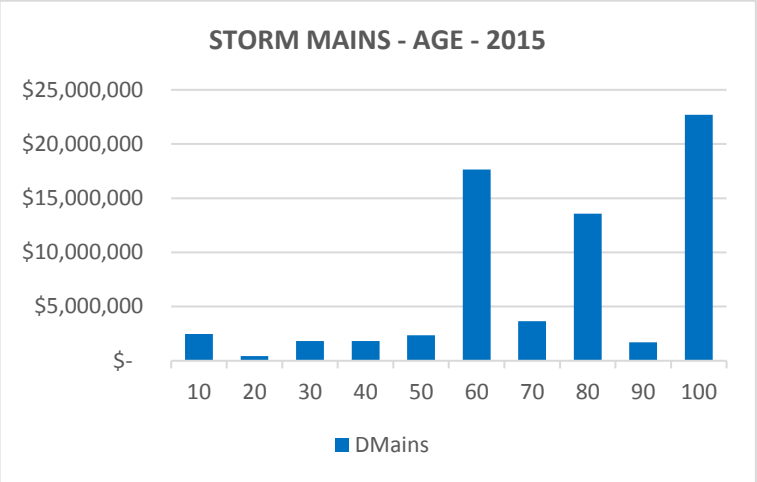
Table 4 – Key Issues and Recommendations for Improving Storm Asset Data

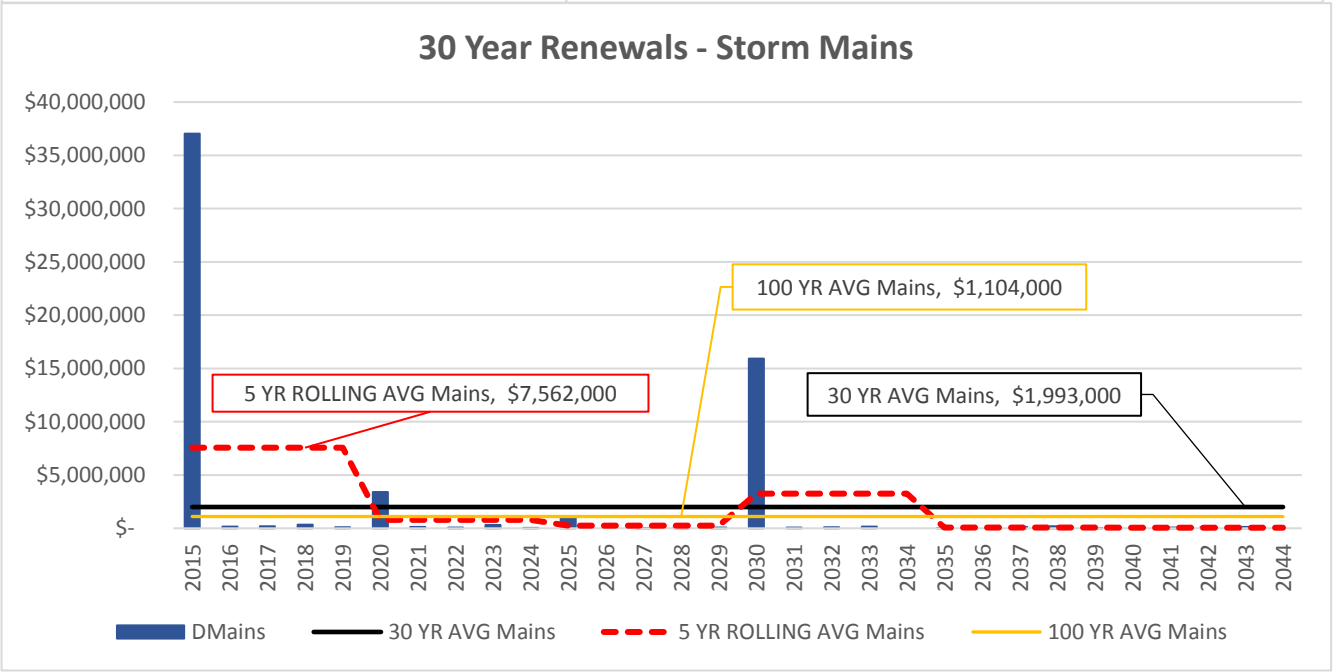
Main Issues	Recommendation
Assets at or near the end of their life do not have condition data.	Collect condition data on assets which are at or near the end of their life to development replacement/rehabilitation strategies.
Laterals and manholes do not have installation dates	Use install date of the closest main or the year that the house was built
Inconsistent data entries for material type	Use unique material codes (i.e. do not allow multiple spellings/codes for same material type such as having both “DI” and “Ductile Iron” in datasets, or “Unknown” as well as “Unk”, and both “Other” and “Oth”)
Inconsistent units of measurement used	Use only metric measurements in consistent units in numeric fields in inventory. Where it is desired to record imperial measurements or only imperial measurements are known, these should be recorded in a text field or an alternative number field (i.e. comments, notes, description fields or a user specified additional field) and the equivalent metric measurement recorded in the relevant size attribute field that is in metric units for all assets.
Storm water fittings are not labelled as ‘Active’ or ‘Abandoned’	Populate with available information

Oak Bay Storm Water Assets

Assets	Quantity		Average Age in 2015	Average Useful Life	Average Condition	Current Replacement Cost of Oak Bay Storm Assets ($)	100 YR Average Per Annum Replacement Cost ($)
Mains	140.60	Km	71	72	3.45	$68,506,553	$1,103,650
Laterals	20.23	Km	54	83	2.79	$8,281,651	$117,070
Manholes	1215	No.	N/A	80	2.90	$5,402,801	$105,250
Network Total	**160.83**	**Km**	**65**	**74**	**3.34**	**$82,191,005**	**$1,325,970**







Notes:
The majority (84%, 63 km) of the storm mains shown for replacement in 2015 are tile mains that are on average 90 years old being installed between 1920 and 1940. The typical useful life for tile mains is only 70 years therefore many of these Oak Bay storm mains will most likely have some degradation and failures can be expected.

It is recommended that pipe samples be taken to determine condition and that a replacement program be established to spread the cost impact of these impending replacements over a number of years. This is urgent as the potential cost impact of waiting until failures occur is significant.

Only condition investigations can confirm if these assets are indeed close to the end of their life or whether at least some of them will have a longer lifespan and therefore replacement can be deferred for a number of years.

Additionally, no installation dates are recorded for manholes. Until an estimated installation date or a remaining life value is entered. As an interim measure, an assumed date can be assigned equal to the installation date of the nearest sewer main.

3.2.4 Roads

The District hired a consultant to complete a Pavement Management Study in 2012 for its paved road network of approximately 105 km. It was recommended that the optimal budget level for maintaining this network is $1.3M per year (including preventative and reactive maintenance). It was concluded that the road network cannot be maintained at the current funding levels and without a significant increase in funding, the network condition will not improve and the District's backlog "debt" along with the annual maintenance costs will continue to climb. However, the $1.3M budget was not approved and the $300,000 annual budget remains for the 5 year program.

A high level review of this report and the GIS data was completed. The GIS data indicates that 92 km of paved road was constructed between 1920 and 1970 and only 5.4 km of this has been resurfaced. The other 14 km was constructed after 1982. Therefore, most of the pavement is between 45 and 95 years old.

The Pavement Management Study indicated a condition rating for each asset; however it has not been entered into the GIS database. It is recommended that the condition rating is entered into GIS and used as an indicator for the next pavement program, due by 2017. Based on the information and age of the utility assets described above, it is recommended that road reconstruction projects will be governed by and coordinated with utility upgrades.

If the District does not have a pavement treatment policy, it should consider reviewing how it treats its various roads, possibly treating major routes purely with asphalt and the local roads with chip seal.

The GIS sidewalk data indicates 142 km of sidewalk was constructed between 1920 and 1970 and only 2.8 km of those sidewalks were rebuilt, starting in 2009. In the interview workshop, District staff indicated an existing prioritized list of sidewalk reconstruction projects based on trip hazard risks. It is recommended that sidewalk reconstruction is based on trip hazard risks and coordinated with utilities and road works wherever possible.

Table 5 – Issues and Recommendations for Improving Road Asset Data

Issue	Recommendation
Pavement condition is not in the GIS database	Input pavement condition data into the GIS database.

3.2.5 Other Asset Groups

Other asset groups have not yet been assessed for an asset renewals forecast and state of the assets dashboard due to there being insufficient asset attribute information available in electronic format at this time. We note however the general overall status of asset data for these groups as follows;

- **Buildings** - Building Condition Assessments are currently being completed and TCA data does include building assets and current value. However information on type, size, condition, and age of building (such as style of construction, type of material, number of floors, separate age of building structure and roof, and relevant condition information etc.), is not sufficient at present to complete an analysis of condition, value, and forecast renewal timing and costs.
- **Street Furniture** - As this was a high level report, street furniture was not included in this assessment. However, it is noted that current GIS data does contain the locations and some attributes of bike racks, benches, speed signs, street lamps and lights.
- **Parks and Recreation** - GIS location data was provided for trees and canopies, and TCA data includes land assets and its current value. However no condition data is recorded and other key attributes required for analysis of renewal costs and timing are not available in a useable electronic format.
- **Fleet** - TCA data includes vehicle assets and their current value. However as this was a high level report, and Fleet is already managed in alignment with key AM Principles and reserve funds are based on calculated renewal needs, there was no need for additional renewal analysis, therefore Fleet was not included in this assessment

3.3 Data Improvements

The following table provides an overview of the completeness of provided Asset information.

Asset Class	Asset Type	Quantity	Install Date	Material	Condition	Size
Sewer	Mains	99.6	100%	100%	0%	100%
	Laterals	35.83	100%	26%	0%	64%
	Manholes	1316	2%	0%	0%	30%
Storm	Mains	140.6	99%	100%	0%	99%
	Laterals	20.2	100%	31%	0%	73%
	Manholes	1215	5%	1%	0%	40%
Water	Mains	115.2	100%	100%	0%	100%
	Laterals	4.4	54%	96%	0%	70%
	Hydrants	494	2%	N/A	0%	4%
	Valves	1073	4%	0%	0%	100%
	Meters	165	95%	N/A	0%	54%
Roads	No condition or area information to complete the analysis.					
Buildings	No condition or building area information to complete the analysis.					
Street Furniture	No condition or age information to complete the analysis.					
Fleet; Parks and Recreation	Not Provided					

Tasks to improve Asset Data are included in the improvement plan in Section 4.

4 Improvement Plan

4.1 Summary

This improvement plan is intended to outline the next steps that are required for the District to improve AM practices and inform the AM plan. It includes recommendations to improve the elements of Information, Finances, People, and Assets.

The assessments concluded that the District is beginning to implement AM practices. There are a few recommendations for increasing knowledge and capacity to undertake AM; however most of the recommendations are related to obtaining accurate information about the aging assets to inform renewal planning, decision making and sustainable funding.

4.2 Key Improvement Tasks

4.2.1 Information

Issue	Recommendation	Reason/Value	Priority (H,M,L)
Primary attributes not complete	Obtain or estimate missing primary attributes (age, material, and size) and enter into GIS	Where condition data is not available, age and material is used to calculate age based remaining life	**H**
Estimated useful life of each material type	Review and confirm estimated useful life for material types based on Oak Bay data history.	Age based remaining life is calculated from estimated useful life	**H**
Unit Rates may not reflect Oak Bay costs	Unit Rates to be updated by the District based on actual costs	Replacement costs will be more accurate to inform budget planning	**H**
Condition Data is not entered into GIS	Condition data to be collected entered into GIS and used to calculate remaining life	Remaining life of the asset will be more accurate for renewal planning and strategy	**H**
There are minimal data standards	Develop formal data standards to ensure data is readily useable	Provide structure and meaning to what data is recorded and make connections between data and decisions (gives purpose and improves usefulness)	**H**
Operations and maintenance costs are not reported separately	Maintain operations and maintenance costs against each asset	This will be achieved in the AM tool mentioned above	**H**
There is minimal collaboration to identify data improvements	Develop a process for all staff to be able to suggest data improvement ideas	It is important to involve all data users, maintainers and collectors in the process of defining data standards and uses	M
Existing data tools do not meet future desires	Identify the requirements of a new software tool and then source a tool which meets the requirements	Asset based cost tracking, data reporting, work scheduling etc are critical functionality for generating good AM decisions	M

Full cost of work completed for each asset is not recorded	Develop and utilize a system to document the cost of all work completed for each asset	This will be achieved in the AM tool mentioned above	M
There is no AM Plan	Develop an AM Plan	A plan collates all the key information in one working document for managing assets	M
A risk assessment has not been completed on existing assets	Complete a risk assessment to identify the most critical risks to the existing assets	High risk issues can be identified and addressed to improve levels of service	M
There is no comprehensive asset maintenance strategy	Develop an asset maintenance strategy indicating the maintenance options, methods and protocols.	Maintenance tasks will be optimized to best meet the AM Strategy (could also do Renewal Strategy as separate task)	M

4.2.2 Finances

Issue	Recommendation	Reason/Value	Priority (H,M,L)
Revenue is insufficient for long term sustainability	The long term financial plan can be used to determine the gaps in revenue and required funding	Informs decision makers for funding levels and priorities.	**H**
Long Term Financial Plan does not reflect the future costs of replacing existing assets	Develop a comprehensive long term financial plan based on up to date information. The plan should look forward 10 years or more and be integrated with the long term capital plan.	The long term financial plan can be used to determine the gaps in revenue and required funding and inform whether reserves and debt are at acceptable levels. Provides forewarning for planning and mitigation of adverse effects.	**H**

4.2.3 People: Governance, Leadership & Staff

Issue	Recommendation	Reason/Value	Priority (H,M,L)
There is no AM Policy	Develop an AM Policy	Demonstrate Leadership commitment and mandate for AM	**H**
There is no AM Strategy	Develop an AM Strategy	Detail on how AM will achieve Strategic goals , set AM objectives, assign governance responsibilities, and outline AM System structure and content	**H**
There is no AM Framework	Develop an AM Framework	Detail the framework/structure for implementing AM	M
There is no AM System	Develop an AM System	Develop and implement System components (documents, tools, processes etc.) to assist staff	M
Knowledge of AM varies with staff	AM Training for key staff and stakeholders	Develop a consistent approach to AM	M

There is no formal AM roles & responsibilities	Develop Roles and Responsibilities, and Organization Chart for AM	Clear accountability and direction for current and new staff regarding AM	M
Staff do not have sufficient time to achieve AM outcomes	Consider appointing an AM Champion (official), a Council Representative for AM	It is important to have staff at all levels involved in AM, especially getting started. AM must become part of everyday tasks to achieve the benefits.	M
Elected officials are not always aware of sustainable service delivery issues	Facilitate a workshop for elected representatives (suggest complete asset dashboards to use as basis for discussion of issues)	Awareness of issues is critical for decision-makers	M
Decision making is not always aligned with AM principles	Document decision making processes and compare it with AM principles	Understanding decision-making and improving the decision process as well as the support data are vital components for good stewardship/governance.	M
The public is minimally aware of sustainable service delivery issues	Involve the public in developing sustainable service delivery levels of service (LOS)	It is recommended that public consultation on LOS is held until true COS is known and LOC/COS options are defined	L

4.2.4 Assets

Asset Group	Recommendation	Reason/Value	Priority (H,M,L)
Sewer Assets	Complete condition assessments for assets identified as needing replacement in next 5 years (start with the oldest/most critical first).	Condition (and criticality) of assets can be used to identify a renewal strategy	**H**
Stormwater Assets	Complete condition assessments for assets identified as needing replacement in next 5 years (start with the oldest/most critical first).	Condition (and criticality) of assets can be used to identify a renewal strategy	**H**
Water Assets	Determine the lifespan of lined pipes and adjust the renewal projections	Many pipes have been lined but the expected lifespan has not been updated in the GIS dataset therefore the longer life is not reflected in renewal projections in this report	**H**
Water Assets	Design and implement a program for strategic sampling of aged sections of different pipe types (start with the oldest/most critical first).	Condition (and criticality) of assets can be used to identify a renewal strategy	**H**
Water Assets	Determine an estimated age for the laterals by assigning the age of nearby water mains	A refined water lateral renewal plan will be able to be developed.	M
Roads	Upload the condition data into GIS.	Data will be able to be more easily analyzed when developing the next road improvement program.	M

Roads	Develop a pavement treatment policy regarding when different pavement treatments will be used (asphalt, chip seal, etc.)	Using alternative treatments to asphalt can reduce lifecycle costs of roadways.	M
Buildings	Determine key attributes for buildings such as material, number of floors and age to determine the renewal plan for buildings.	Determining a renewal plan will aid in financial planning and service delivery.	M
Parks and Recreation	Identify all assets and their estimated age and replacement costs.	Determining a renewal plan will aid in financial planning and service delivery.	M
Fleet	Identify all assets and their estimated age and replacement costs.	Determining a renewal plan will aid in financial planning and service delivery.	M
Furniture	Determine the estimated age and replacement costs.	Determining a renewal plan will aid in financial planning and service delivery.	L

5 Next Steps

This report provides a review of the District's current asset management practices, a high-level review of its long-term asset renewal planning, and provides a prioritized list of asset management improvement tasks.

It is recommended that the improvement plan be implemented to facilitate evidence-based decision-making, and improve whole-of-life asset management at the District. Over time, the prioritization may change and new projects may be added to the improvement task list to match the District's priorities.

High priority tasks should have a budget estimate (staff time and/or cost), timeline, and a staff member assigned the responsibility for completing the task.

Priority tasks recommended for action in 2016/2017:

- Asset Data Improvements – primarily;
    1. Condition assessments of aged assets near the end of their life to determine realistic life expectancy
    2. Obtaining/populating data for core attributes of all assets – including updating lifespans for lined pipes
    3. Reviewing and updating lifespan and unit rate assessments
    4. Establishing data standards for core attributes and applying these consistently across all asset tables
- Cost Tracking – implement procedures for separately recording operations and maintenance costs, and for assigning maintenance costs to the assets worked on.
- Financial Plan – provide an evidence-based projection of asset renewal costs for at least a 20-year period, for each asset group individually and for all asset groups combined. Communicate outcomes and issues to Management and Council.
- Governance – make a start on getting key governance documents in place to responsibly manage infrastructure assets and work towards a sustainable state of service delivery. These documents include an AM Policy, Strategy, and an AM Framework or AM Plans.

Appendix A

Asset Management Practice Assessment

Ref	Elements of AM Practice	Level 4 Complete	Level 3 Progress	Level 2 Started	Level 1 None	Comment / Artefact	Current Level
1	**Know Your Assets**						
1.1	**Basic Asset Inventory**						
1.1.1	A complete asset Inventory exists is in excel or database format (i.e. data can be easily edited, and analysed electronically).		x				3
1.1.2	Accurate location data is available for all assets. Location data is easily accessible to all who require it.		x				3
1.1.3	Key attributes fields are fully populated (i.e. no blanks for age, size, material). Note that some values may be estimated or default values.			x			2
1.1.4	The accuracy of key attribute values populated in the database is recorded (i.e. users of data can easily tell that a value is measured/verified, estimated/assumed, or just a default value).			x			2
1.1.5	Major assets are broken down into components and sub components (components are parts of a major asset that have a different lifespan and/or they can be replaced separately from other components).			x		Example: Buildings - Yes, Pump Stations - No	2
1.1.6	Staff have a good understanding of what type of physical components should be included in the inventory as separable assets. Staff understand the difference between a "consumable" and a physical "asset".			x		Communication could be improved on components and separable assets	2
1.3	**Data Software and Data Tools**						
1.3.1	Datasets, software, and tools exist for storing data, analyzing data, and reporting on data for asset management purposes.			x		GIS, Financial, Water Modeling	2
1.3.2	The tools and software systems being used are appropriate and fully utilized (i.e. they have required functionality, can provide the desired outcomes, are well implemented, and all the capability required is be used).			x			2
2	**Know Your Financial Situation**						
2.1	**Current Asset Investment**						
2.1.1	Typical replacement unit rates exist for all main asset types and they are based on today's market rates and include material, plant, labour, engineering fees, administration costs, and all other applicable costs.			x		Tracking information for unit costs	2
2.1.2	A typical lifespan for each asset type is established and these lifespans are realistic for each asset type and based on local conditions, material types, and in-service situations (i.e. there is some assessment or measured data to verify lifespan estimates).		x				3
2.1.3	The current replacement cost is calculated for all asset components (i.e. current market/typical unit rate x asset size = replacement cost)				x		1
2.1.4	Details of all key assumptions and default values used in the calculation of the current replacement cost and the current depreciated value are recorded. These details are available to the people who use the calculation results for planning and operational decisions.				x		1
2.2	**O&M Costs**						
2.2.2	Maintenance costs can be reported separately from operational costs.				x		1
2.2.3	Full cost of work completed (labour and materials) is tracked and recorded against the individual asset(s) in a central electronic dataset, system, or spreadsheet.				x		1
2.2.4	The cost of work, once recorded, does not require a need for additional data processing. Appropriate systems and procedures are implemented and documented with regard to tracking of work history records (including costs linked to individual assets), generation of reports on separate operations and maintenance, and forecast of renewal costs for budget planning.				x		1

Ref	Elements of AM Practice	Level 4 Complete	Level 3 Progress	Level 2 Started	Level 1 None	Comment / Artefact	Current Level
2.3	**Future Capital Costs**						
2.3.1	A 20 year forecast for asset renewal costs exists.				x		1
2.3.2	A 5 year forecast for asset renewal projects exist. Asset history is interrogated and analysed when developing short term capital programs.		x				3
2.3.3	A study has been undertaken to identify what new assets will need to be built and when. Growth (demand) forecasts have been prepared and used consistently across the organisation.				x	No studies have been completed. Future goal includes being able to determine pipe upsizing through modelling.	1
2.3.4	All assumptions included in the costs estimates are documented and available to decision-makers using the forecast future capital costs				x		1
2.4	**Funding Sources**						
2.4.1	Detailed financial plans are prepared for a short term horizon (3-5 years). These plans identify projected operations, maintenance, and capital costs.	x					4
2.4.2	An estimate of revenue needed has been generated for the short (3-5 years) and long term (20 years) planning horizons.				x		1
2.4.3	List of assumptions and notes on key points that have been taken into account in the financial plan estimations.		x				3
2.4.4	There is consideration to the level of risk and vulnerabilities in the financial planning analysis.			x			2
3	**Understand Decision-Making**						
3.1	**Decision Process**						
3.1.1	Key decision processes that should be documented have been identified and a plan exists to evaluate and document how these key decisions are currently being made.				x		1
3.1.2	Key decision processes have been documented (including decision responsibility, inputs, criteria, tools, scoring methods).			x			2
3.1.3	Decision processes in place have been evaluated for their fairness, transparency, repeatability, and robustness. 'Desired decision processes have been identified and documented. Details of improvement gaps in decision processes have been prioritized into a list of tasks to action.			x			2
3.1.4	The personnel involved in managing the service regularly utilise both external and local performance measures in their decisions within a continuous improvement process.			x			2
3.2	**AM Plan**						
3.2.1	The organisation maintains asset management plan(s) that document the asset management strategy and delivery of the asset management objectives across the asset lifecycle of asset creation, acquisition, utilisation, maintenance enhancement and disposal				x		1
3.2.2	The Asset Management Plan indicates the degree of confidence of data reliability				x		1
3.2.3	The Asset Management Plan identifies gaps between current service capability and the required service capability to meet future demand.				x		1
3.2.4	The Asset Management Plan(s) has been communicated to all relevant stakeholders to the level of detail appropriate to their participation or business interests in the delivery of the plan				x		1

Ref	Elements of AM Practice	Level 4	Level 3	Level 2	Level 1		Current
		Complete	Progress	Started	None	Comment / Artefact	Level
4	**Manage Asset Lifecycle**						
4.1	**Asset Condition**						
4.1.1	The current condition of the assets is known from visual inspection or physical testing and it is rated (scored) and recorded against each individual asset. A condition rating (assumed or measured) is recorded for each asset in an electronic dataset.		x				3
4.1.2	There is a clear understanding of the data required to manage the condition of the asset and condition ratings are consistently applied.		x				3
4.1.3	Preventative maintenance, repairs, and replacement work history is being tracked, and recorded against individual asset(s) in an electronic dataset.				x		1
4.2	**Level of Service**						
4.2.1	A "Level of Service" statement exists for the service provided		x				3
4.2.2	Details about the quality and reliability of the service provided to customers/community are tracked; have been assessed; and outcomes recorded (consider where and when a service is available, how much of the service is being provided (quantity), and to what standard (quality)).		x				3
4.2.3	A high-level measure or indication of total cost for service is available; or could be estimated from recorded information on operations, maintenance, and capital costs)	x					4
4.2.4	Details about the true cost of the service being provided is being tracked; has been assessed; and outcomes recorded (consider whole of life costs - operations, preventative maintenance, repairs, replacement; and inclusive of plant, materials, labour, and overheads)	x					4
4.2.5	A high-level assessment has been made (or could easily be made from recorded information) of the comparative cost of service versus level of service provided.			x			2
4.3	**Risk Evaluation**						
4.3.1	A risk assessment on all asset groups was completed, according to a standardised risk framework, and is regularly reviewed to account for implemented changes. Critical and high risk assets are identified and known by staff.			x		Prioritized list of sidewalks to be replaced based on trip hazard	2
4.3.2	An assessment of risk to existing infrastructure has been conducted, and plans are in place to manage this risk. Design and construction of new assets consider climate change.				x		1
4.3.3	The criticality of assets drives optimisation of maintenance and renewal decisions				x		1
4.3.4	The results of risk assessments and the effects of risk control measures are considered and, as appropriate, provide input/feedback to the asset management plans.			x			2

Ref	Elements of AM Practice	Level 4	Level 3	Level 2	Level 1		Current
		Complete	Progress	Started	None	Comment / Artefact	Level
4.4	**Maintenance Strategies**						
4.4.1	An asset maintenance strategy exists or could easily be documented from existing recorded information such as maintenance standards or contracts, preventative maintenance schedules, standard operating procedures, decision protocols.			x		Preventative Maintenance Program (examples: pump station, flushing); no strategy	2
4.4.2	The asset maintenance strategy includes information regarding roles and responsibilities; how maintenance options are currently being decided and by whom; what the maintenance goals are; typical maintenance options, methods, and protocols; decision criteria and rules for evaluating maintenance options; what maintenance performance indicators are to be tracked and reported. A review process exists for the maintenance strategy, and this process includes review of the performance indicators that are being tracked to show if the strategy is achieving desired outcomes.				x		1
5	**Know the Rules**						
5.1	**Strategic Goals**						
5.1.1	Staff are aware of the strategic goals for the organization			x			2
5.1.2	Departmental Asset Management goals (management of service delivery and physical assets) are documented and they are linked to the organizations strategic goals			x			2
5.1.3	Staff are aware of relevant stakeholder groups and their expectations for management of the assets and delivery of services (Users of the asset, tax payers, First Nations, Environmental groups, etc.). An up to date list of stakeholders and their contact information is recorded and readily available to appropriate staff			x			2
5.1.4	Stakeholders have been consulted on levels of service to be provided		x				3
5.1.5	Documented procedures for communication/consultation with stakeholder groups exist.	x					4
5.1.6	Business level goals (business plan) are defined for each major asset group (transportation, water, sewer, etc.). 'Relationship between business group goals, asset management goals, and strategic goals has been discussed and is somewhat understood			x			2
5.2	**Legislation / Regulation**						
5.2.1	Relevant staff are aware of legislation and rules pertaining to their activities and the services provided.	x					4
5.2.2	There is a list of the key documents, legal obligations, standards, and policies that control or monitor the work activities, physical assets, and or the services provided. This list identifies those responsible for compliance.		x				3
5.2.3	Compliance with legislation, requirements and rules is measured/monitored and reported by staff.		x				3

Ref	Elements of AM Practice	Level 4 Complete	Level 3 Progress	Level 2 Started	Level 1 None	Comment / Artefact	Current Level
6	**Monitor Sustainability**						
6.1	**Sustainability**						
6.1.1	Sustainability goals have been identified and documented for the organization and for each service being provided (or asset group i.e. water, solid waste, transit etc.).	x					4
6.1.2	All of the sustainability projects and programs in progress or scheduled to be implemented, have been identified; are documented; and have been linked to the sustainability goals of the organization and the service area (asset group).			x			2
6.1.3	A general assessment of financial sustainability has been completed (is the current level of service affordable when you consider all costs through the whole lifecycle of the assets including the cost to replace the asset at the end of its economic life?)				x		1
6.1.4	A general assessment of environmental sustainability has been completed (Do any of the current activities and assets adversely impact the environment and can this be repaired and mitigated?)			x			2
6.1.5	A general assessment of social sustainability has been completed (Do the assets and services meet the community's needs and business needs as well as all things relating to lifestyle, character, and priorities of the community? How much consideration has been given to changing demands and community dynamics and whether current services will be appropriate for future social needs?)		x				3
6.2	**Renewal Alternatives**						
6.2.1	Viable alternatives are considered when developing an asset replacement program; assessing a capital project. The process for considering viable alternatives is known by staff involved but not documented. The assessment of options includes considerations of whole-of-life costs; impacts on operations, maintenance, and service delivery.		x				3
6.2.2	The process for considering alternatives is documented in a standard operating procedure.				x		1
6.3	**Coordinating Works**						
6.3.1	Consultation occurs between business groups/service areas/asset groups, to coordinate programs, planning, and construction of physical works projects.	x					4

Ref	Elements of AM Capacity	Level 4	Level 3	Level 2	Level 1		Current
	FINANCIAL CAPACITY	Very Good	Good	Fair	Poor	Comment / Artefact	Level
	FINANCES						
1	Long Term Financial Planning			x			2
2	Revenue			x			2
3	Reserves		x				3
4	Debt	x					4

Ref	Elements of AM Governance	Level 4	Level 3	Level 2	Level 1		Current
	LEADERSHIP & COMMITMENT	Complete	Progress	Started	None	Comment / Artefact	Level
1	**Commitment: AM Strategy & Policy**						
1.1	The organisation has an asset management policy that has been derived from, and is consistent with, the organisational strategic plan.				x		1
1.2	The organisation has an asset management strategy that has been derived from, and is consistent with, the asset management policy and the organisational strategic plan.				x		1
1.3	The organization has an asset management framework or guide document that provides sufficient information, direction and guidance for the production of asset management plan(s) and achievement of asset management objectives.				x		1
1.4	The organisation has established an asset management system, including to define and document the scope of and elements included or to be included in the completed asset management system.				x		1
2	**Leadership: AM People Management**						
2.1	The asset management roles, responsibilities, and authorities are defined, documented, and communicate to the relevant individuals.				x		1
2.2	Staff have the necessary time and capacity to achieve asset management outcomes and are implementing asset management as part of their jobs.			x			2
2.3	Staff have the necessary knowledge, skills and training to achieve asset management outcomes.			x			2
2.4	The established organisational structure is consistent with the achievement of the AM policy, strategy, objectives, and plans.				x		1
2.5	There is a strong leadership for and culture of teamwork throughout the organization and information is readily and consistently shared through formal and informal channels.		x				3
2.6	A cross functional team is in place that is effectively implementing asset management, providing leadership, and bridging siloes in the organization.		x				3
2.7	The organisation has established a senior management forum or a senior management champion that is tasked with the responsibility to ensure that an asset management system and plans are developed and asset management practices throughout the organization are implemented, reviewed and improved.		x				3

Ref	Elements of AM Governance	Level 4	Level 3	Level 2	Level 1		Current
	LEADERSHIP & COMMITMENT	Complete	Progress	Started	None	Comment / Artefact	Level
3	**Culture: Awareness and Decision-making**						
3.1	Staff are aware of all significant issues related to Asset Management and service sustainability in the community, and what is needed to address these issues.			x			2
3.2	Elected officials are aware of key community issues and future risks related to sustainable service delivery.			x			2
3.3	Members of the public are aware of the issues related to sustainable service delivery, and there is evidence these issues are considered in public decision making.			x			2
3.4	Decision making about assets and service delivery is informed with appropriate and timely information, is transparent, and is aligned with community priorities and long-term sustainable service delivery.			x			2
4	**Data Governance**						
4.1	There is a list of current datasets, software, and tools being used by each department or asset group. The purpose of each dataset, software application, and tool is known and documented.		x				3
4.2	The content of each dataset is known, documented, and shared.		x				3
4.3	There is collaboration across the organization to identify improvements such as eliminating unnecessary duplication of data, providing data in a more useful format, defining responsible person for management of the data, highlighting where integration of datasets is desired, sharing data, and identifying more efficient ways of using current tools and software.			x			2
4.4	The organisation has data standards to ensure consistent treatment of existing and new asset related data, and to guide data developments (such as an Asset ID protocol).			x			2
4.5	Where separate asset management information systems exist (e.g. accounting software TCA vs GIS), the organisation has ensured that the information provided by these systems is consistent.				x		1

Ref	Elements of AM Governance	Level 4	Level 3	Level 2	Level 1		Current
	LEADERSHIP & COMMITMENT	Complete	Progress	Started	None	Comment / Artefact	Level
5	**AM Continuous Improvement**						
5.1	A review of current asset management Practice and a Gap Assessment has been completed and documented.	x					4
5.2	The plan defines the method to monitor progress achieved on the plan and how to make plan updates. The AM improvement plan identifies key improvement tasks, assigns responsibility, timeline for completion and funding requirements.			x			2
5.3	Tasks in the improvement plan are graded high, medium or low priority. Priority of one task vs another has been assessed and scheduling is driven by whole of life cost/benefit and/or risk assessment.			x			2
5.4	High priority tasks have a budget estimate, timeline and responsible person assigned.				x		1
5.5	The asset management improvement plan has been funded and resources are allocated to complete improvement tasks.				x		1
5.6	The improvement plan is regularly updated using a method for prioritization that was documented; progress reports are provided to management.				x		1

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