

The Role of Operations and Maintenance in Asset Management



A Sustainable Service Delivery Primer

2019

A companion document to Asset Management for Sustainable Service Delivery: A BC Framework



The Role of Operations and Maintenance in Asset Management is one of a series of primers developed to expand upon concepts in Asset Management for Sustainable Service Delivery: A BC Framework. Other primers, and the BC Framework are available on the Asset Management BC website: www.assetmanagementbc.ca.

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Asset Management Framework and Primers

This primer is one of a series of primers that are provided to expand upon concepts in *Asset Management for Sustainable Service Delivery: A BC Framework* (the "Framework"). While the content in this primer can be used alone, we recommend reading it in conjunction with the Framework. The other primers can also provide additional context and insight into the asset management process.

Primers in this Series

- Land Use Planning and Asset Management
- Integrating Natural Assets into Asset Management
- Climate Change and Asset Management
- The Role of Operations and Maintenance in Asset Management

Who Should Read This?

The *Asset Management Framework and Primer* series is designed for local government staff. Asset management is an inherently multidisciplinary process. This content is relevant for all departments / disciplines involved in asset management.

Introduction

Societally, we are very good at building new shiny things and using them, not so good at maintaining the good quality stuff we already own. We all recognize how we've become a disposable society. Is this what we want for our municipal infrastructure, too?

- Bill Sims, Director of Engineering
and Public Works at the City of
Nanaimo

Why does Operations and Maintenance Matter?

For many years, local governments have had to reduce operating and maintenance budgets, creating a situation of insufficient maintenance planning, analysis, and activities. Insufficient maintenance typically leads to underperforming assets that cause increased risks, potential service disruptions, and premature asset failure. The net result is a strain on organizations and either a higher lifecycle cost of delivering the expected level of service, or a decreased level of service.

Most operations and maintenance (O&M) staff in British Columbia local governments estimate that a large majority of their maintenance activities are reactive rather than proactive and that 85 to 90 percent of maintenance time is spent on fixing things about to break or are broken. The most immediate way to defer capital replacement and reinvestment expenditures is to improve maintenance. Moving from a reactive to a proactive mode can extend the service life of the asset, improve service reliability and performance, and reduce costs.

Making decisions about optimizing maintenance and the timing of asset renewal, replacement, or decommissioning requires tracking maintenance information - including costs - separately from operations information. Most local government budgets combine operations and maintenance costs. Tools and systems for tracking costs separately are typically only used by larger communities, however, scalable tools and techniques are available and suitable for use in smaller communities.

In addition to employing tools and systems for optimizing O&M, increased collaboration among internal organizational departments can also improve outcomes. Including staff responsible for asset operations and maintenance throughout processes of design and procurement - from early stages through to commissioning - is critical to achieving objectives for service delivery and the and lowest lifecycle cost.

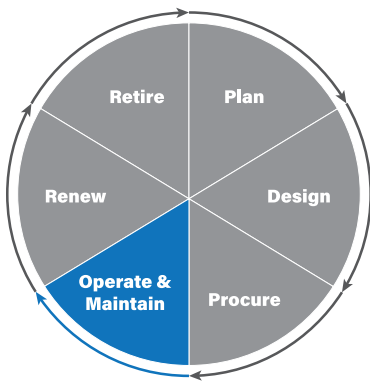
Purpose of this Primer

This primer is designed to accomplish three objectives:

1. Demonstrate the importance of O&M activities in the lifecycle of the asset and the process of asset management
2. Make the case for proactive maintenance to improve service delivery and reduce lifecycle costs
3. Provide guidance to improve your organization's O&M practices and align them with the asset management process

Community assets are diverse. The type of assets owned, demands placed upon them, and the condition the assets are in will depend on local context and geography. Assets include engineered assets such as roads, water systems, sewer systems, community buildings, and other standard infrastructure, as well as natural assets such as wetlands, streams and lakes and unique features such as coastlines. The O&M activities that occur will be specific to a community or asset, but the general principles outlined in this primer can be universally applied.

O&M and Asset Management



With increasing cost pressures, service demands, and unsustainable funding approaches, communities are beginning to realize they need to change the way they think about managing their assets, recovering revenues, and delivering services. Embracing an asset management mindset has a number of benefits for local governments:

- Robust information to support decision-making
- Effective and reliable delivery of critical services – today and into the future
- Reduced lifecycle costs of service delivery
- Enhanced value of a community's investment in assets over their lifecycle
- Defensible prioritization of limited resources using a consistent and repeatable system
- Improved financial planning and better management of unfunded liability associated with renewing or replacing aging engineered assets
- Alignment of organizational and community objectives with technical and financial decisions and actions
- Demonstrated stewardship that builds confidence with constituents, customers, and other stakeholders

Asset management is a process of making informed decisions about assets that consider cost, risk, and service. Asset management is not limited to the replacement of aging assets. Continuous improvement of O&M activities is a key component of the asset management process as O&M practices can significantly impact asset lifecycle costs, management of risk, and service delivery performance.

Well-planned and executed operations allow local governments to deliver their services efficiently, effectively, and economically. In the asset management context, this requires the local government to set service delivery priorities through budgeting and infrastructure planning and investment processes. It also means ensuring decisions are based on 'value for money,' ensuring that

the appropriate quality and quantity of resources are dedicated to the activity to meet the intended purpose.

Regular and proactive maintenance is key to maximizing service life and minimizing service disruptions. Neglecting the maintenance of infrastructure by deferring it to future years may be an easy option in the short term, but this creates a false economy. Over time, unplanned maintenance can take more staff time, be more costly than planned maintenance, and reduce the service life or compromise the function of assets. Inadequate maintenance can lead to service disruptions and customer dissatisfaction.

Thinking about O&M as part of your overall asset management practices can help your organization improve service delivery and see greater benefits from asset management. Continuous improvement of O&M activities, and consideration of O&M throughout all stages of the asset lifecycle can help achieve a number of local government goals:

- Reduce long-term operating costs through decisions made during design and construction, such as reduced annual energy costs due to strategic equipment selection, or reduced maintenance requirements due to efficient design
- Defer capital costs by extending the life of existing infrastructure
- Ensure service levels are achieved, assets are functioning as planned, and unexpected service disruptions are minimized
- Protecting and preserving the environment, for example, by anticipating environmental impacts of maintenance equipment or adapting operational activities
- Adapting to the impact of a changing climate on assets through modified O&M activities
- Reducing risks to core services delivered by natural assets

O&M AND CLIMATE CHANGE

Climate change will have an impact on built and natural assets in many communities because the conditions in which assets operate are changing. Depending on the impacts in your community, your assets may face greater wear and tear through changes in rainfall patterns, wind, intense storms, and changes in temperature highs and lows. At the most extreme end, the risk of fire or flooding may increase and potentially overwhelm or destroy existing infrastructure. Recognizing these impacts, climate change may reduce asset service life if O&M activities are not adapted to changing conditions. This is why it is critical to review O&M practices from time to time: “business as usual” may compromise the condition of assets if the activities that worked in the past are no longer appropriate.

O&M activities can play an important role in helping communities adapt to and mitigate climate change. Proactive maintenance will help ensure that infrastructure and natural assets function as intended. For example, climate change will result in increased intensity of storms in many areas, which can also result in more debris in storm drains and creeks. Regular clearing of stormwater drainage can help reduce the risk of flooding due to blockage. Maintaining the function of rivers and streams and keeping them clear of debris can reduce reliance on the built stormwater system.

The equipment and chemicals used in O&M can also play a role reducing greenhouse gas emissions and environmental pollutants. For example, many communities are investing in energy-efficient vehicles and reducing their dependence on pesticides.

Check out the *Climate Change and Asset Management* primer for more information on this topic.

Key Concepts

O&M are often considered together, and most local government budgets do not separate operations and maintenance into separate categories. As a result, most communities do not have a good understanding of the costs or levels of investment in operations versus maintenance activities.

Operations and maintenance serve different functions in the life of an asset and without a good understanding of how much is invested in each, it is difficult to track the effectiveness of individual O&M activities in optimizing the service life of assets. This section reviews what is meant by operations and maintenance, identifies the types of challenges that many communities are currently facing, and presents the case for approaching these activities in a new way.

Operations

Operations is defined by the Auditor General for *Local Government Act* as the design or implementation of the programs, services, policies, or systems, and related procedures of a local government. Operations refers to the day-to-day activities required to provide service delivery to residents, businesses, schools, and other users.

CHALLENGES

Operations activities use significant staff and financial resources and are often prioritized because they have a direct and immediate impact on the services provided. For example, the speed and scale of snow clearing has an immediate impact on the level of service of roads. If operations activities are cut back, the public and staff usually notice the impacts quickly. However, there is often not enough time or resources devoted to regular review and refinement of operations activities to optimize service life. It is not uncommon for operations tasks to be done because “that’s how we’ve always done it.” The risk with this approach is that many of the conditions have changed over time.

Operations requirements are impacted by many factors, such as land use planning, demand management, design, availability of natural assets, environmental conditions, and the design of assets. Consider the following scenarios and how they may impact operations:

- **Fast population growth and a high rate of development** will increase the demand for services. Depending on the asset, this may increase wear and tear or reduce the service life that was expected when the asset was first built, as well as reduce the capacity of assets to provide the service required.
- **Urban form and land uses** may result in pressure on natural assets (or loss of natural assets) that deliver important services, reducing their capacity to function optimally.
- **Land use planning decisions** will dictate the type of infrastructure that is required, which informs the types of O&M activities that will be performed by your organization.
- **Changes in rainfall patterns and storms due to climate change** can put pressure on stormwater management systems. The risks associated with asset failure become more significant over time.
- In a community facing a **shrinking population**, the full capacity of an asset may no longer be needed.
- As **technology advances**, assets like community buildings and fleet equipment are becoming increasingly automated and complex. Specific skill sets are needed to effectively operate and maintain these assets.
- **Under-resourcing maintenance of an asset** can increase the resources needed to operate it and create a cascading negative effect on other assets. For example, a lack of street cleaning not only impacts the lifecycle of roads and the transportation system, street debris and buildup may make its way into the stormwater system, clogging pipes and catchbasins, and negatively impacting the receiving waterbodies.
- **Decisions made during the annual budget process** may reduce resources available for operations.

From the time that an asset is built or installed to when it is retired, a community will usually experience significant changes, like those described in these scenarios.

THE CASE FOR A NEW APPROACH

Through asset management, local governments regularly collect data on assets and review how services are delivered to ensure optimal use of resources. This improves the overall understanding of the condition of assets and where investments are needed to inform operations activities and improve outcomes, including extending the service life of assets. Without strong asset management processes, an organization may be doing too much, too little, or the wrong things for today's context.

Maintenance

Maintenance involves functional checks, monitoring, testing, measuring, servicing, repairing or replacing of necessary equipment, infrastructure, and supporting utilities so that assets can perform the required functions and achieve the intended service delivery objectives throughout the expected life of the asset.

There are two major categories of maintenance:

1. Proactive maintenance
 - Preventive (i.e., scheduled) maintenance describes activities where materials, equipment, or facilities are inspected, maintained, and protected before they breakdown or other problems arise.
 - Predictive maintenance describes the use of sensor data to monitor a system and continuously evaluate it against historical trends to predict failure before it occurs.
2. Reactive maintenance
 - Corrective maintenance describes activities where equipment is repaired or replaced because it is worn, malfunctioning, or broken.

Preventive and predictive maintenance are proactive and work to prevent breakdown, reduce wear, improve efficiency, and extend the life of asset components. Taking a proactive approach to maintenance can be more cost-effective than relying on corrective maintenance. While, corrective maintenance is necessary, it should be minimized because it creates unpredictable spikes in costs and can interrupt service delivery. Investing in proactive maintenance can help reduce the need for costly capital reinvestment by maximizing the service life of assets.

CHALLENGES

Maintenance activities are highly vulnerable to budget cuts because the impact of reduced maintenance may not be felt for years until assets begin to show wear or breakdown. Because of this, most communities under-resource the maintenance of their natural and engineered assets. Decision-makers have few incentives to increase spending on maintenance because the benefits are over the long-term. Communities facing resource pressures often prioritize immediate needs (operations) over long-term needs (proactive maintenance). In many communities, staff spend most of their time on corrective maintenance that is the result of historically underfunding proactive maintenance.

Adequately maintaining assets not only improves the physical quality and extends the life of assets, it also provides regular information about the condition and servicing requirements of assets. The consequences of under-resourcing proactive maintenance can be reduced service life of assets, increased corrective maintenance, service interruptions, and failures. The financial costs of these consequences are significant. Deferring needed maintenance when the problem is small can lead to much higher costs later when larger fixes or full asset replacements are needed.

When it comes to natural assets, the financial consequences of under-resourcing maintenance can be significant. As an example, well-functioning creeks, ditches, and wetlands can play a major role in stormwater management. When these natural assets are removed or become damaged through development, the resultant flooding can create property damage and health consequences. The cost of rehabilitating a failing natural asset or replacing a natural asset with built infrastructure is far higher than the relatively minor investment in proactive maintenance. When natural assets are not cared for, then built infrastructure will have to work harder. Well-functioning natural assets can also reduce the burden of service delivery on built infrastructure.¹

Inadequate maintenance has economic consequences beyond a local government's budget. For example, poor roads increase damage to cars, leading to higher costs for drivers. The inverse is also true, well-maintained infrastructure works to support the overall economy and attract investment to the community, creating new opportunities and jobs when additional workers are needed.

¹ Check out the *Natural Asset Management primer* for more information on this topic.

The Case for a Revised Approach

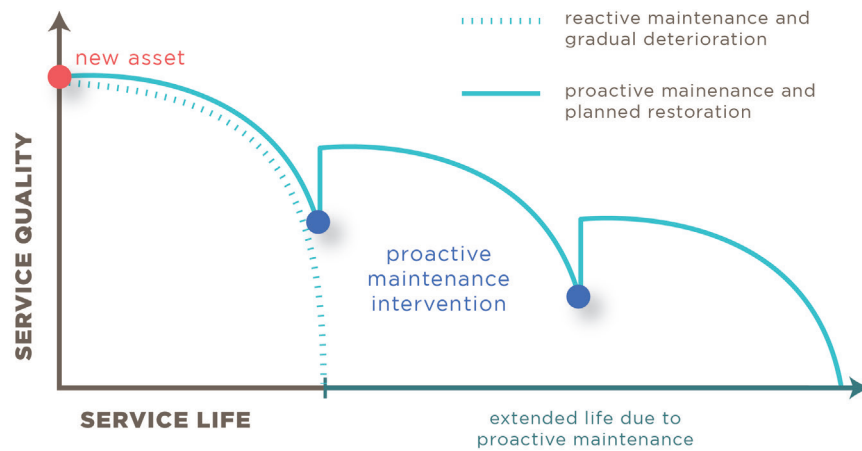
Proactive maintenance can be used to help assets reach full service life potential which reduces the average annual capital reinvestment costs and ensures that assets perform to their intended purpose. This type of maintenance can potentially defer future capital replacement costs in cases where appropriate maintenance can extend the service life of an asset beyond its expected potential.

One study looked at the economic case of preventative maintenance for buildings owned by a telecom company.² The study found that conducting preventive maintenance at industry-recommended standards led to a 545% return-on-investment (ROI) compared to not doing any preventive maintenance. The primary reason for this high ROI was the increase in service life of equipment, which allowed the company to use their existing equipment longer and defer investments. The other reason is that capital costs for infrastructure and equipment are very high, while annual maintenance costs are comparatively low. The impact of a small investment in maintenance can have large implications for capital investments when the lifecycle of an asset can be extended through maintenance activities and new capital investments can be deferred.

Educating council on the need for proactive maintenance is the first step to generating the buy-in necessary to adequately resource these activities. A commitment to asset management can help generate the necessary buy-in because the process includes collecting information on assets and making decisions in a way that considers the trade-offs between service, cost, and risk. Established asset management processes can provide the data and information needed to articulate the business case of investing in proactive maintenance. The prioritization of maintenance is a key trade-off decision.

Proactive maintenance provides regular information about the condition and function of assets, making it easier to anticipate investments in infrastructure and avoid surprises. Proactive maintenance can also equip council and staff with important information about assets and how they are maintained to better communicate with the public about how operational decisions are made.

² Jones Lange LaSalle, *Determining the Economic Value of Preventative Maintenance*, ND.
<http://www.sitemason.com/files/b2tJra/Preventive%20Maintenance.pdf>



Key Takeaways

O&M practices can be improved continuously to increase the efficiency, effectiveness, and reliability of service delivery, as well as to improve decisions around assets. Local governments with a good understanding of their assets can integrate O&M into asset management incrementally. A solid baseline for this is having information about the community's assets, including their functions, the services they provide, the resources needed to maintain their assets, and the risks facing service delivery, including impact and criticality.

Including O&M knowledge and information in asset management processes can inform questions and decisions such as:

- Does the current level of maintenance maximize service life?
- Are current operational levels adequate to achieve service delivery goals?
- Should an asset be maintained, replaced, or retired?
- Are new assets being acquired? What are the O&M implications of new assets and how will we plan for those needs?
- How can we optimize O&M through design, construction, and procurement decisions?
- Do we continue to provide the current level of service or does the level of service need to be changed?
- What are the costs and benefits of delivering services differently?
- How does this activity impact the overall system?

Improving Asset Management Through O&M

O&M is an integral part of asset management. Here the Asset Management Framework shows how O&M activities are considered throughout the asset management process to improve your community's overall asset management.

O&M in asset management requires continuous improvement to support service delivery. It is not an activity that can be done once and never again. It requires regular review and consideration.

Integrating natural assets with the BC Asset Management Framework



ASSET MANAGEMENT PRACTICES

Review O&M practices to better understand their economy, efficiency, and effectiveness.

ASSETS

Assess the human and financial resources required to maintain the desired level of service and identify gaps in resources provided for O&M to address any service gaps.

ASSET MANAGEMENT POLICY

Formalize your organization's commitment to improving O&M.

ASSET MANAGEMENT STRATEGY

Document where improvements in the efficiency and effectiveness of O&M are needed and how the organization will make these improvements.

ASSET MANAGEMENT PLAN

Develop work plans, processes, and / or procedures to achieve the improvements in O&M activities identified in the asset management policy and strategy.

LONG TERM FINANCIAL PLAN

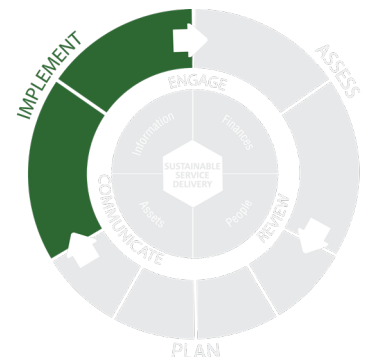
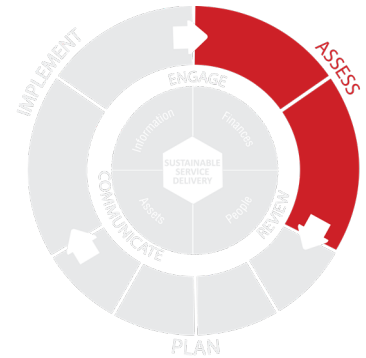
Include O&M objectives in long-term financial planning and consider full lifecycle costs when planning and prioritizing capital projects.

IMPLEMENT AM PRACTICES

Implement the O&M objectives identified in the PLAN activities.

MEASURE AND REPORT

Measure your organization's performance in achieving strategic objectives and service delivery goals. Report to staff, council, and the public, as needed.



The following sections outline, step-by-step, an approach to improving O&M through asset management. Following these steps will provide your department, and your organization, with a strong understanding of how O&M fits into your service goals and what resources are needed to achieve your O&M objectives while improving your asset management practices. Documenting what you find through this process will equip you with important information for communicating about O&M to your Chief Administrative Officer, council, and the public.

Starting from Scratch

If you're not sure if your organization is ready to start this process, we recommend getting managers from different departments together to discuss and document, at a broad level, what challenges each department is facing when it comes to O&M. Using the challenges that are documented as a starting point, go through the ASSESS stage to identify how these steps might help address those challenges.

ASSESS

ASSESS ASSET MANAGEMENT PRACTICES

Review O&M practices to better understand their economy, efficiency, and effectiveness.

Assessing existing O&M practices is a meaningful exercise to understand the types of activities and practices that are already in place and, more important, why they are in place. It can shed light on areas that have been forgotten or neglected—for example, some assets may have O&M practices that were initiated decades ago and are only still in place because “that’s how it’s always been done”. Other areas may require far more maintenance resources than currently provided for. Assessing existing practices provides a much-needed refresh and gives staff the opportunity to identify what is working, what is not working, and what activities may be redundant.

O&M practices extend beyond infrastructure assets and include natural assets that provide important services for your community. Don’t forget to consider natural assets when completing this review.

Activities

Complete a review of your organization's O&M practices. This may be alongside the completion of an asset management assessment. The following are some questions to consider in your review:

- How consistent are current operations practices? How consistent are maintenance practices? Are these practices documented? Are roles and responsibilities clearly understood?
- What proportion of maintenance is currently corrective and what proportion is proactive?
- How well do current maintenance activities help maximize the service life of major asset categories? Are there gaps?
- What are the procedures for cost and budget management, health and safety, regulatory requirements, and security?
- What are your organization's risk management / tolerance policies and practices? Does your team understand the positive and / or negative impacts of current maintenance effort decisions?
- Are lifecycle costs considered in asset decisions?
- Are the O&M implications of materials, climate, and new technologies considered in decisions about assets?
- What plans, processes, or procedures are in place to help your team prepare for changes in the future? E.g., changes related to regulation, service levels, or climate.

Who Should Do This?

The answer to this question depends on your community. Ideally, each department that delivers services should review their approach to O&M at regular intervals that make sense for your community. This should also be done collectively, as part of an organization-wide process so that priorities for limited financial and human resources are established based on service and risk outcomes, rather than departmental priorities. Lessons learned through this review can then be shared with other departments.

ASSESS THE CURRENT STATE OF ASSETS

Assess the human and financial resources required to optimize the life of the asset and maintain the desired level of service. Identify gaps in resources provided for O&M to address any service gaps.

For many assets, O&M is a vital component of delivering a desired level of service, mitigating risk and ensuring affordability. Local governments need to know what human and financial services are required to deliver a particular level of service to make informed decisions during their budgeting process, and to be aware of any risks to the level of service due to under-resourcing. Human resource requirements need to consider not only the number of person-hours required but also technical skills needed for changing technology.

In these activities, both infrastructure and natural assets should be assessed. O&M for natural assets can reduce reliance on infrastructure assets and may be more cost-effective and environmentally sustainable in the long run.

Activities

- Review and document the current desired level of service for each asset category and identify any service level gaps between current and desired, e.g., there is demand for frequent garbage pick-up in parks, but the current budget and service contract does not allow for the additional service.

This review may examine existing service demands, maintenance schedules, user complaints, operating or maintenance contracts, service delivery agreements with user groups, dependency with other assets, and implications of asset failure.

- Review current O&M activities and identify which activities are necessary to mitigate risk (i.e. safety, asset failure, or compliance with regulations) and if any need to be changed to address gaps.
- Review the resources currently provided to support service levels and risk mitigation for each asset category by reviewing staff time, equipment and materials costs, and contractor costs for O&M. Review skill sets available to determine if additional knowledge or skills are required.

Evaluate whether any gaps identified in the previous activity can be addressed through existing resources. Document gaps that require additional resources to address.

- Use the reviews and resourcing to identify potential improvements. Consider energy-saving strategies and innovative practices or technologies that could be put in place within the current budget. If extra resources would be required, consider the costs and benefits of implementing improvements compared to maintaining the status quo.

Who Should Do This?

Departmental managers and / or staff involved in operations and maintenance. Documentation of the review is not enough and training / coaching can add significant value as part of the process. One of the key components of this process is understanding, at a staff level, how O&M activities support service levels and what resources are needed to achieve this.

ASSESSING SERVICING IMPLICATIONS OF LAND USE DECISIONS

Once you've completed the ASSESS stage, you and your team will want to get started on making use of the findings right away. We recommend going through the PLAN and IMPLEMENT stages. However, you may be able to implement some of findings of the ASSESS stage immediately or be able to skip some steps depending on what stage your organization is at. For example, while reviewing your operating activities, staff may identify a better or faster way of accomplishing a task, or you might find that some activities are no longer necessary. These types of learnings can be implemented right away through updating your work planning, educating staff, and implementing the changes.

Implementing these immediate changes is a great way to get traction and keep up your momentum while you continue to move forward with your asset management practice.

PLAN

ASSET MANAGEMENT POLICY

Formalize your organization's commitment to improving O&M.

An asset management policy can direct staff to optimize operations, prioritize proactive maintenance, continuously improve O&M practices, and set the direction to prioritize the consideration of lifecycle costs in decisions around assets.

Activities

- Include a commitment in your organization's asset management policy to maximize the service life of assets through proactive maintenance programs. The policy can identify specific principles that aim to extend asset service life and reliability, improve operational efficiency, improve resiliency to climate change, and / or inform infrastructure decision-making. Continuous improvement should be part of this commitment. This can be done through staff training, succession planning, reviewing resource availability and skills, and service levels.

Where necessary, this commitment should be accompanied by an allocation of resources for the implementation of proactive maintenance programs (if they do not already exist).

- Describe the organization's philosophy or approach to communicating with the public about service levels and O&M activities. The purpose of doing so is to ensure that elected officials and staff understand how, when, and why the local government is communicating with the public. This will help increase the consistency of communication about service levels and O&M activities and support the local government's goals of being transparent and trustworthy.

Who Should Do This?

The development of an asset management policy should be done by a cross-functional team that includes public works and engineering, finance, planning, and other relevant departments. This team should include a staff member whose role includes oversight of O&M activities.

For more information about cross-functional teams, check out the *Asset Management Framework*.

ASSET MANAGEMENT STRATEGY

Document where improvements in the efficiency and effectiveness of O&M are needed and how the organization will make these improvements.

An asset management strategy can be used to establish broad organizational objectives for O&M and provide direction for specific asset management plans. A strategy can also be used to outline how O&M practices support asset management goals.

Activities

- As part of developing your organization's asset management strategy, use information collected through the ASSESS activities to develop O&M-related strategies for corporate goals and each major asset category. For example, a strategy may be to maintain assets to full service-life, run-to-fail, or pursue capital reinvestment. The strategy will be dependent on O&M needs and costs, the criticality of the asset and impacts of failure, the age of the asset, and the desired level of service. The results of the ASSESS activities may be used to inform a new asset management strategy or update an existing one.
- Based on the areas of improvement that you identify in the ASSESS stage, develop O&M-related objectives to help you improve in those areas. Asset management strategy objectives may be related to O&M topics such as:
 - Responsiveness
 - Reliability
 - Cost effectiveness
 - Current and future maintenance Performance targets
 - Asset condition performance
 - Labour resources
 - Stocking parts & consumables
 - Regulatory reporting
 - Health and safety
 - Environmental impacts
 - Customer service
 - Communication with the public
 - Security
 - Insurance coverage/claims

Who Should Do This?

The cross-functional team involved in developing the asset management policy.

ASSET MANAGEMENT PLAN

Develop work plans, processes, and / or procedures to achieve the improvements in O&M activities identified in the asset management policy and strategy.

Your organization's asset management plans, operational work plans, procedures, and other processes will operationalize the O&M objectives identified in previous steps. Staff will use these to guide O&M activities.

Activities

- For each asset category, determine the appropriate maintenance and replacement strategy (e.g. proactive replacement, run to failure, etc.).
- For each major asset category, review operations procedures to ensure they are appropriate for the current and near future circumstances. Identify critical operational practices required to optimize the life of the asset.
- Develop or review and update procedures for all major or critical assets that aim to optimize asset function.
- Identify opportunities to reduce environmental impact of O&M or to use O&M to achieve environmental sustainability goals, e.g., through waste reduction, improved procurement of materials and services, material re-use, new technologies, and use of natural assets.

Who Should Do This?

Managers and / or directors involved in developing and updating plans, procedures, and other processes. Operations and maintenance staff will have a significant role in reviewing and updating O&M procedures. Once complete, any changes should be communicated to all staff involved in implementing the activities.

LONG-TERM FINANCIAL PLAN

Integrate O&M objectives in long-term financial planning and consider full lifecycle costs when planning and prioritizing capital projects.

Long-term financial plans should consider full lifecycle considerations in the planning, prioritization, and evaluation of capital projects and their operating budgets. Consideration should also be given to the cost impacts of currently under-resourcing O&M through reduced service-life, unplanned maintenance, and service disruptions. If the protection and improvement of natural assets is not currently a priority in your community, consider the cost impact if your natural assets decline or fail and an investment in built infrastructure is needed to replace their functions.

Activities

- Update the long-term financial plan to include specific programs/plans/initiatives needed to improve O&M service delivery. These should be based on findings from the ASSESS activities and align with the asset management policy, strategy, and plans. Resources for staff training to provide better O&M should also be included.
- Complete lifecycle cost analysis (including impacts to staff time) when prioritizing and evaluating capital and operating budgets.
- Where relevant or necessary, consider developing additional revenue sources to increase funding for O&M, such as user charges.

Who Should Do This?

This step should include managers/directors of departments that resources are being allocated to, as well as staff from the finance department. Some of these activities will be done as needed or on an ongoing basis.

IMPLEMENT

IMPLEMENT ASSET MANAGEMENT PRACTICES

Implement the O&M objectives identified in the PLAN activities.

- Train staff on new or updated policy, strategy, plans, and procedures.
- Provide for staff training to improve O&M practices, if required.
- Implement public communications on ongoing operations as outlined in the asset management policy. Public communication should focus on areas where the public has a role to play in O&M, where education can help support the smooth functioning of assets and reduce wear and tear. This will be different in each community. For example, if litter is a problem in your parks, your community may implement a public education campaign on the environmental impact of littering and the cost to the local government. If improper disposal of waste is an issue, then your communications and education efforts will focus on that.

Metro Vancouver's "Unflushables" campaign is a great example of a public campaign aimed at educating the public on their role in helping maintain assets.

Who Should Do This?

Department managers / directors and their teams.

STRENGTHENING ASSET MANAGEMENT THROUGH O&M

Regular O&M activities can be leveraged to collect data for asset management planning. Staff who are already in the field for O&M activities can collect information on asset attributes, condition, and other characteristics that can be used to develop the organization's asset inventory.

Operations and maintenance staff can also provide critical information about asset performance, which can be used to inform decisions about risk management or asset renewal. These types of information should be integrated into the asset management data system to have the best impact.

MEASURE AND REPORT

Measure your organization's performance in achieving strategic objectives and service delivery goals. Report to staff, council, and the public, as needed.

Measuring and reporting on successes and challenges is key to learning and improving. It is part of overall asset management and O&M practices are part of this. A tool such as AssetSMART 2.0 or the Sustainable Service Delivery Assessment Tool can be used to track progress in asset management.

Activities

- Review the actions identified in the asset management policy, strategy, and plans and monitor which ones are achieved, which ones are in the process of being achieved, and which are no longer relevant or cannot be achieved.
- Develop and track indicators that will support reporting to council by service area, for example, targets for service life, operating cost reductions, asset performance, and employee engagement as well as general progress measures around current performance and future preparedness. The *Service Sustainability Assessment Tool* includes these types of progress measures.
- Communicate results of measurement processes with staff and council and work. Meetings with internal stakeholders can be used to re-establish priorities and maintain momentum in achieving objectives.
- Communicate messages with the public through tools such as the annual report and leverage other engagement opportunities to include operational and climate resiliency messages that are relevant for broader dissemination.

Who Should Do This?

The cross-functional asset management team should initiate the assessment of actions, with support from managers / directors in all relevant departments.

COMMUNICATING BENEFITS & SUCCESS (COMMUNICATE, ENGAGE, REVIEW)

Communication and engagement about O&M are key to equipping decision-makers with an understanding of the connection between asset capital investments, O&M activities, costs, asset performance, and service delivery. It is only with this understanding that decisions can be made for reducing demand or improving the function of assets through capital or O&M investments.

The key audiences are staff, council, and the public, though not all of the stakeholders require the same information. Communications should be targeted to delivering the right information to the right person. Council should have the information it needs to make decisions about resources and projects, while staff should understand how asset management, and O&M as part of it, is part of the organization's culture. The public should understand how their actions impact the performance of assets and lifecycle costs and have enough information about how assets are operated and maintain to feel confident in council and staff.

In general, the organization should strive to communicate broadly about the benefits of proper O&M, the roles and responsibilities of the local government and the public, and the successes and challenges the organization faces in working towards its goals. A communications strategy for asset management can include direction on communicating about O&M.

CONTINUOUS IMPROVEMENT

The process outlined in this primer provides step-by-step instructions for enhancing O&M practices and better aligning O&M and asset management initiatives. But the process does not end when you get to the end of the steps. Reviewing this Primer from time to time will help keep your organization's information and practices up to date. Just as asset management is a continuous process, so is O&M and operational plans and practices should be updated when new information indicates that changes are required.

O&M: IT'S EVERYBODY'S JOB

O&M is not just up to a local government. The public regularly interacts with infrastructure and services. When users understand how they play an important role in helping assets, the job of the local government becomes much easier. When they don't, assets may wear out sooner than expected, or even be damaged or destroyed.

The experience of the City of Grand Forks provides an illustrative example. The City was having issues with its sewer lift station and staff submitted a capital request to council to fund an upgrade to the lift station. Upon further investigation, it was found that the issues could be traced to a single home near the lift station where someone was flushing diapers down the toilet instead of disposing of them properly. The City learned that they did not need a new lift station, instead, they need to better communicate with residents about what can and cannot be flushed down the toilet, and they needed proactive maintenance and inspection to catch the problem sooner.

Helpful Resources

Asset Management for Sustainable Service Delivery, A BC Framework

<https://www.assetmanagementbc.ca/framework/>

Peter Olson and David Wessel, The Case for Spending More on Infrastructure Maintenance, 2017.

<https://www.brookings.edu/blog/up-front/2017/01/31/the-case-for-spending-more-on-infrastructure-maintenance/>

IPWEA, International Infrastructure Management Manual, 2015.

<https://www.ipwea.org/publications/ipweabookshop/iimm>

Asset Management BC, Asset Management Roadmap, 2011.

<https://www.assetmanagementbc.ca/resources/>

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<http://publications.gc.ca/collections/Collection/P25-5-2-2000E.pdf>

Indigenous Services Canada, Maintenance Management Plan for Drinking Water and Wastewater Systems in First Nations Communities, 2014.

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Informing the Future: The Canadian Infrastructure Report Card, 2016.

www.canadianinfrastructure.ca

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https://www.ubcm.ca/assets/Funding~Programs/Asset~Management/UBCM_2016_AssetManagementReport_Final_V2_Web.pdf

World Economic Forum and The Boston Consulting Group, Strategic Infrastructure: Steps to Operation and Maintain Infrastructure Efficiently and Effectively (Executive Summary), 2014.

http://reports.weforum.org/strategic-infrastructure-2014/executive-summary/?doing_wp_cron=1548795426.3225820064544677734375