



Getting Started | Toolkit User Guide

QUICK START TOOLS AND TEMPLATES FOR BUILDING AN
ASSET MANAGEMENT PROGRAM

TOOLKIT OVERVIEW

Any municipality can begin practicing asset management with the information they already have.

The tools in this toolkit have been designed to help kick-start municipalities who are in the early stages of their asset management journey, or to support others with continuous improvement of their asset management programs. The purpose of these tools is to provide a low-barrier path to municipalities to build foundations of asset management practices and thinking.

Asset management practices should be tailored to suit an organization, so these tools should be used as guidelines or support where needed – not as prescribed approaches that must be conformed to.

The user guide includes description of processes and templates. An excel workbook with editable templates and tools accompanies this user guide.



Throughout the toolkit user guide, this icon represents linkages between service, risk and cost.

| Getting Started Toolkit | |
|---|--|
| Tool | Description |
| 1. ASSET INVENTORY | |
| <i>User Guide</i> | |
| How to develop an inventory for asset management | An overview of what information should be included in an asset inventory, where to get the information from, and how to use your TCA inventory to build an asset management inventory. |
| <i>Tools</i> | |
| Asset inventory field descriptions | A list of fields in an asset inventory with descriptions and examples. |
| Sample asset codes | Categories and sub-categories of codes that can be used in asset inventories. |
| Asset inventory template | An editable sample template for developing an asset inventory for asset management. |
| 2. LEVELS OF SERVICE | |
| <i>User Guide</i> | |
| How to define levels of service | A description of a process for defining levels of service with basic and anecdotal information. |
| <i>Tools</i> | |
| Level of service template | An editable sample worksheet for documenting levels of service. |
| Level of service example | An example completed level of service worksheet. |

| 3. RISK MANAGEMENT | |
|--|---|
| <i>User Guide</i> | |
| How to manage risks | A description of a process for the management of risks. This process is applicable to both asset and strategic risks. |
| How to assess asset risks | A description of a process for identifying and ranking asset risks with basic and anecdotal information. |
| How to assess strategic risks | A description of a process for identifying and ranking strategic risks. |
| <i>Tools</i> | |
| Sample consequence and likelihood table | An example of consequence and likelihood definitions. |
| Asset risk register template | An editable template for recording and ranking risks to service delivery. |
| Risk register example | An example completed risk register. |
| 4. COSTS | |
| <i>User Guide</i> | |
| How to understand costs | A description of the process of understanding costs and what needs to be included. |
| <i>Tools</i> | |
| Asset replacement forecast summary template | An editable template for a summary level asset replacement forecast. |
| Capital plan template | A basic editable template for a ten year capital plan. |
| 5. IMPLEMENTING ASSET MANAGEMENT | |
| <i>User Guide</i> | |
| How to develop a first asset management plan | A sample outline for an asset management plan. |
| Implementing asset management through the budget process | How to incorporate considerations of service, risk, and cost throughout the budget process. |
| Implementing asset management through the community planning process | How to incorporate considerations of service, risk, and cost into master planning and municipal development plans. |
| Implementing asset management through public communication and engagement | Incorporating asset management information into community surveys and annual reports. |
| 6. CONTINUOUS IMPROVEMENT | |
| <i>User Guide</i> | |
| How to assess and improve your asset management practices | A process for conducting an assessment of asset management practices and a template for planning for improvement. |
| Overview of asset management resources | A review of the major publicly available asset management resources that identifies the scope and focus of each resource. |

1 Asset Inventory



1.1 HOW TO DEVELOP AN INVENTORY FOR ASSET MANAGEMENT

Consider using your tangible capital asset inventory to get started. Your municipality will have a basic inventory of tangible capital assets (TCA) in compliance with PS 3150. If you are starting from scratch with building an asset inventory for asset management, it can be helpful to leverage the TCA inventory. Here are some tips for using your TCA inventory as a starting point:

- » Ensure that the person managing the TCA inventory and the person compiling the asset management inventory have frequent conversations, especially when first developing your asset inventory. Discuss and understand unique information needs, sources of information, and limitations in accuracy or completeness.
- » In order to keep things simple in the beginning, you may wish to keep your TCA inventory and your asset management inventory separate. Although having integrated systems is the ideal situation, this requires a good understanding of information needs, information use, and strong communication between departments. It may be desirable to develop separate systems that inform each other in the beginning, and considering integration of systems later.
- » If the TCA inventory is housed within financial software, export your TCA information into an excel workbook (if you do not have an asset management system).
- » Wherever possible, use consistent asset categories, asset identifiers, asset classes and asset descriptions between the TCA inventory and any asset management information. This can create efficiencies for updating both inventories (but is not necessary if it will create more work for you).
- » Consider updating your TCA register to include updated information on remaining life, condition, etc., as you collect information for asset management.

Consolidating Information Needed for Asset Management

WHAT DO WE OWN?

A listing of all of the assets owned. This list is usually organized by category, so that it can be presented at a summary level or a detailed level, depending on what the information is needed for. Discrete assets may be broken down into components. Linear assets (roads, pipes) are broken into segments, often corresponding to intersections, segments between fittings, or pre-determined lengths. Assigning each asset a unique name or identifier helps the process of tracking.

WHERE IS IT?

The physical location of assets. This may be the coordinates of an asset (or points along the asset for linear assets), or simply the address or description of the asset. Spatial information may be represented in GIS.

WHAT ARE THE ATTRIBUTES?

Relevant descriptors of the asset, such as size, type, material, make, model, etc. Information that will be relevant for planning capital projects or maintenance should be recorded.

WHEN WAS IT INSTALLED?

The year the asset was constructed, purchased, or put into service.

WHAT DID IT COST?

The total cost of the asset when it was constructed or purchased. Includes the cost of design. For

assets contributed by developers, this is the cost of the asset to the developer or an estimated cost based on unit rates.

WHAT WILL IT COST TO REPLACE?

The total cost of replacing the asset in today's dollars. Includes costs of design, construction, surface rehabilitation, etc.

WHAT CONDITION IS IT IN?

The ability of the asset to perform as it is intended. This usually refers to **physical condition**, however demand condition and functional condition are also useful for asset management.

Demand condition is the ability of the asset to provide a capacity that meets the needs (e.g. a swimming pool that is consistently overcrowded has a poor demand condition).

Functional condition is whether the asset is functioning as it was originally intended (e.g. a building with a malfunctioning HVAC system has a poor functional condition).

HOW LONG WILL IT LAST?

The estimated number of years the asset will last. This is often estimated by adding the estimated useful life to the year of installation, and subtracting the current year. There are available theoretical useful life guidelines for TCA reporting. In asset management, the estimated useful life should be adjusted to reflect the actual asset condition, use, or material where possible.

Possible Sources of Information

- » As-built drawings
- » Purchase records
- » Maintenance manuals
- » Historic drawings
- » Cost data: unit construction costs from guides such as RSMeans, Engineering News Record, or from local unit rates of recently tendered projects
- » Physical condition: condition assessment reports, asset break or repair history, operator knowledge
- » Demand condition: use patterns, operator knowledge
- » Functional condition: operator knowledge
- » Tangible Capital Asset inventory
- » Design drawings
- » Air photos or historic records
- » Operators or staff (can provide information and can verify existing records)
- » Engineering reports or plans

TIPS ON GETTING STARTED

- » If you choose to start with one or a few asset categories, start with the asset categories that have the biggest value or potentially pose the biggest risk of failure.
- » Set up your inventory with all the fields, even if you don't currently have information available to fill the fields.
- » Field verification of information can be very useful when setting up your inventory. This can also be a good time to collect observations about condition, maintenance, etc.
- » Storing asset information in GIS provides an easy way to access information and allows for export of spreadsheets as needed. If you don't have GIS resources, consider the use of a cloud-based GIS subscription service that can be tailored to your needs.



Asset Inventory Field Descriptions

| | Field | Description | Example | Notes |
|-----------------|-------------------|--|--|--|
| What do we own? | Asset Codes | The code, or class for the type of asset. | Engineered structures - xxx Water - W | Your TCA register may use asset classes, so you may choose to use the same ones. You may also choose to assign different codes based on the department structures or budget alignment. You may have a sub-class as well. |
| | Asset ID | Unique identifier for the asset | xxx.xxxxxxx.xx | May be automatically generated by software or assigned based on a system. |
| | Asset Extension | An extension on the unique identifier | .xx | You may use an extension when retiring and replacing an asset with a new asset. |
| Where is it? | Location | The physical location of the asset. This may be coordinates of the asset, or may be described as two points (from x to y) for linear assets. | From 1st Ave & Main St. to 2nd Ave. & Main St. | May represent this information in GIS. Not all of these descriptors are required - choose what makes sense for you. |
| | Municipal Address | The municipal address of where the asset is fixed or stored. | 123 Main Street | |
| | Legal Description | Legal description of the land where the asset is fixed or stored. | Lot 16, Block 4, Plan 804 3167 | |

| What are the attributes? | Material | The material the asset is made from | PVC | For assets made of more than one material, record the predominant material or separate the asset into component parts (e.g. base and surface for a road) |
|---------------------------------|----------------|---|------|--|
| | Quantity | The amount of the asset (length, size, volume, etc.) | 108 | If these numbers are not easily accessible from GIS or CAD, you may want to start by estimating them and improve the accuracy in the future. |
| | Quantity units | The units the quantity is measured in | m | |
| | Year Installed | The year the asset was installed or acquired | 1987 | This information should be available through your TCA register. |
| | Year Renewed | The year of major renovation or renewal that will extend the life of the asset. | 2006 | Put N/A for assets that have not had renewals conducted. |
| | Age | The current year minus the date of installation | 28 | |
| | Make | The manufacturer of the asset | Ford | Required for equipment and vehicles only |
| | Model | Model of the asset | F150 | Required for equipment and vehicles only |

| | | | | |
|-------------------------------|-----------------------------|---|--|---|
| What will it cost to replace? | Historic cost | The cost of the asset when it was acquired. | \$15,000 | Include cost of design. For contributed assets, use estimated cost based on unit rates. This information is optional, and not required for asset management. |
| | Replacement unit cost | Cost per unit to replace, in the same unit as the quantity. | \$325 | Can be based on recent projects or on publicized rates. May not be relevant for all asset types. |
| | Replacement value | Total quantity multiplied by the replacement unit cost. | \$35,100 | Unit cost x quantity |
| What condition is it in? | Physical condition rating | A rating of the physical condition of the asset | May be Failed/Poor/Fair/Good, or may be a specific number based on assessment. | For all condition ratings, use a system based on the data that you have or can easily collect. Refer to "Asset Management Condition Grading Standards" by the Saskatchewan Ministry of Municipal Affairs for a concise guide on standards you may consider using. |
| | Functional condition rating | A rating of whether the asset is functioning as intended. | | |
| | Demand condition rating | A rating of whether the asset is meeting the required demand. | | |
| How long will it last? | Expected service life | Theoretical service life of the asset | 50 | |
| | Remaining service life | Estimated number of years until the asset fails | 40 | This may be based on the expected service life and the age, or based on actual renewal, performance and condition data. |

GETTING STARTED TOOLKIT

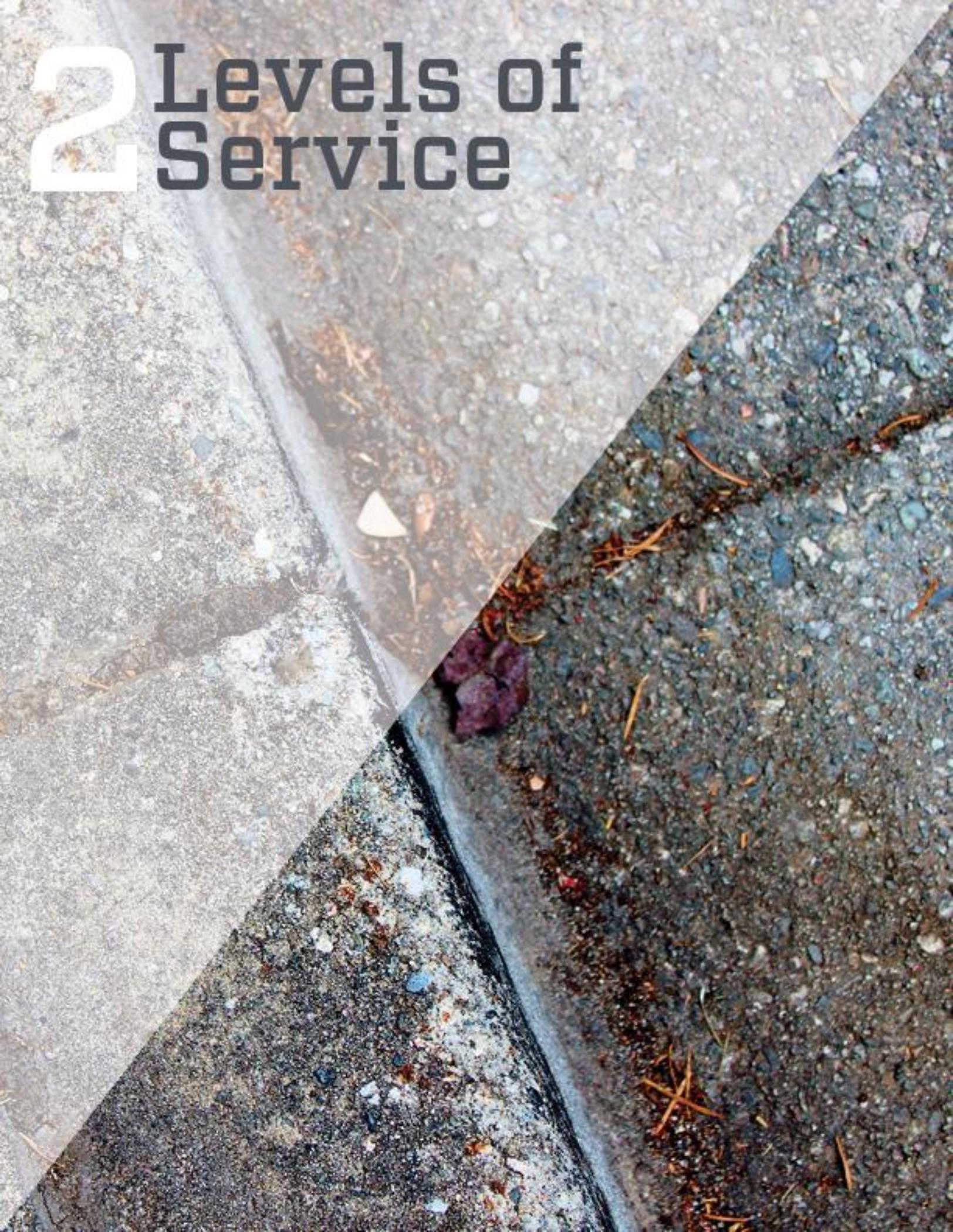
| | | | | |
|------------------------------|------------------------------|---|---|--|
| | Remaining service life basis | How service life was estimated | Expected life/ actual condition | |
| | | | | |
| Source of information | Sources | List of sources of information | List all relevant sources of information | |
| | Accuracy | Notes about the accuracy of information | Rating of the accuracy of information, highlighting areas that need to be improved. | |

| Example Categories | |
|--------------------|---|
| Major | |
| Code | Category |
| W | Water |
| S | Sanitary |
| D | Storm |
| R | Roads |
| Minor | |
| Code | Sub- Category |
| Water lines | |
| P | Main |
| SV | Service Line |
| Water Points | |
| HYD | Fire Hydrant |
| FT | Fitting |
| PV | Pressure Reducing Valve |
| NS | Pumphouse (Pump, lift, transfer stations) |
| | Reservoir |
| | Treatment Plant |
| | Water Tank |
| | Truck Fill |
| | Meter Chamber |
| FM | Flow Meter |
| CV | Control Valve |
| SS | Sampling Station |
| V | Valve |
| Sanitary Lines | |
| FM | Forcemain |
| P | Pressure Main |
| MN | Main |
| SV | Service Line |
| Sanitary Points | |
| CO | Cleanout |
| NS | Lift Station |
| | Lagoons |
| MH | Manhole |
| VL | Valve |
| TP | Treatment Plant |

GETTING STARTED TOOLKIT

| | |
|------------------------|------------------|
| AR | Air Relief Valve |
| MR | Flow Meter |
| PU | Pump Station |
| Drainage Lines | |
| CU | Culvert |
| DI | Ditch |
| P | Main |
| SV | Service Line |
| Drainage Points | |
| MH | Manhole |
| CB | Catch Basin |
| LS | Lift Station |
| OUT | Outfall |
| WET | Wetlands |
| DP | Detention Pond |
| Roadways Lines | |
| LN | Lanes |
| RD | Roads |
| Roadway Points | |
| BD | Bridges |
| CRB | Curb and Gutter |
| MU | Multi-Use Path |
| SW | Sidewalk |
| SN | Road Signs |
| SL | Street Lights |
| TL | Traffic Lights |

2 Levels of Service



2.1 HOW TO DEFINE LEVELS OF SERVICE

STEP 1 Define service categories and assets

- » What types of service do you provide?
- » What assets are required to provide those services?

STEP 2 Define primary customer groups

- » What are the main groups with different service needs in your community?

STEP 3 Develop indicators of the community/customer experience

- » What are the attributes of the service that the main community / customer groups care about?
- » What indicators can be used to describe the quantity, quality, and/or reliability of these services in a way that members of the community can understand?

STEP 4 Determine the current level of service

- » What is your current performance on these indicators?
- » What is your source of information and how confident are you in its completeness and accuracy?
- » What do your citizen surveys say about how you're doing?

STEP 5 Identify target level of service

- » In which areas should you be providing a higher level of service?
- » In which areas are you currently providing the desired level of service? How do you know?
- » Are there areas where you could provide a lower level of service, while still meeting the needs of community and customer groups?
- » What is the quantity, quality, and/or reliability of service that you will need to provide or sustain in the future?
- » What do your corporate plans, such as the Municipal Development Plan say about what you will need for capacity or quantity?
- » Are there regulation changes pending that might require a different level of service in the future?

STEP 6 Identify capital, operational, and maintenance activities required to meet the target level of service

- » Where there are gaps between the current level of service and the desired level of service, what capital projects could be used to close the gap? What operational projects?
- » Which projects will close the gap most cost effectively? Most sustainably? When will they be needed?
- » What projects will be needed to maintain current levels of service, and deal with pressures of growth or deteriorating assets? What capital projects? What operational projects?
- » How accurate is the information you're using to inform your decision? Is it appropriately accurate?

STEP 7 Determine the costs of meeting the targets and affordability



- » What are the costs of capital and/or operational projects needed to maintain or improve levels of service?
- » What are the main cost drivers (i.e. what makes up the biggest portion of your costs)? Which of these can be controlled?
- » How do these costs compare to current levels of funding?
- » How might your funding levels change in the future?
- » Are your target levels of service affordable based on expected future funding or reserves?

STEP 8 Adjust your target level of service until it is affordable



- » What levels of service are affordable based on reasonably expected levels of funding?
- » What funding scenarios are required to make these affordable?

STEP 9 Review the accuracy, completeness, and reliability of your information and identify if improvements are needed.

- » Where will improved accuracy about services, current performance, funding, or costs improve your decision making about service affordability?
- » What level of effort would be required to improve the accuracy of information?
- » Is the level of improvement in decision making worth the level of effort required to improve the accuracy of information?



TIPS ON GETTING STARTED

- » Work through the process as a cross-functional team, to ensure all relevant information is considered from the beginning, and to build a common understanding of services.
- » Attempt to answer every question, even if you can only partially answer them with anecdotal information.
- » Pilot the process with one or two service areas, and use these as examples for other service areas.
- » Costs can be estimated at a high level the first time, in order to develop a full picture of the relationship between services and costs. Then, additional work can be done in the future to refine costs to inform specific decisions.
- » Look at various community engagement, feedback reports, or complaint logs to identify what is important to members of the community.

| Level of Service | | | |
|--|------------------------|---|-----------------------------|
| Date updated: | | | |
| Completed by: | | Note: this template links level of service and cost | |
| Service Category: | | Annual service area budget: | |
| Assets providing services: | | | |
| Major asset components | Replacement value | Expected remaining life | Condition |
| | | | |
| Primary customer groups: | | | |
| CUSTOMER LEVELS OF SERVICE | | | |
| Service attributes that matter to customers | Current performance | Desired performance (current) | Type of Adjustment Required |
| | | | |
| ASSET PERFORMANCE INDICATORS | | | |
| Asset | Indicator | Current performance | Desired performance |
| | | | |
| OPERATIONS AND MAINTENANCE ACTIVITIES REQUIRED TO DELIVER SERVICES | | | |
| Current O&M activities | Current annual cost | Adjustment required | Cost impacts |
| | | | |
| New O&M activities | Rationale | | Cost impacts |
| | | | |
| Capital Projects | Estimated cost impacts | Priority (H,M,L) | Notes/considerations |
| | | | |
| Information Type | Source | Accuracy | Improvements required |
| | | | |

| Level of Service - Example | | | |
|--|---|--|---|
| Date updated: | Sep-15 | | |
| Completed by: | Team member names | Note: this template links level of service and cost | |
| Service Category: | Recreation | Annual service area budget: | |
| Assets providing services: | 1 Leisure centre with swimming pool, 1 skating arena | | |
| Major asset components | Replacement value | Expected remaining life | Condition |
| Leisure centre building | | 20 years | Fair |
| Pool equipment | | 5 years | |
| Arena building | | 15 years | |
| Arena equipment | | 15 years | Excellent |
| Primary customer groups: | General public, teams, school groups | | |
| CUSTOMER LEVELS OF SERVICE | | | |
| Service attributes that matter to customers | Current performance | Desired performance (current) | Type of Adjustment Required |
| Facilities are open reliably | Unexpected closures are very rare | Maintain | None |
| Facilities are clean | Very few customer complaints re: cleanliness | Maintain | None |
| Facilities are in good repair | Some complaints regarding paint chipping and general worn appearance | Improve | O&M - paint facility and increase frequency of minor repairs |
| Facilities are uncrowded | Fair/Poor - ice arena is consistently booked and does not meet demand | Improve | Capital - new facility required |
| ASSET PERFORMANCE INDICATORS | | | |
| Asset | Indicator | Current performance | Desired performance |
| Leisure centre building | Facility physical condition | Fair | Good |
| Pool equipment | Equipment breaks and downtime | Good | Good |
| Arena building | Facility physical condition | Fair | Good |
| Arena equipment | Equipment breaks and downtime | Good | Good |
| OPERATIONS AND MAINTENANCE ACTIVITIES REQUIRED TO DELIVER SERVICES | | | |
| Current O&M activities | Current annual cost | Adjustment required | Cost impacts |
| Daily cleaning | \$40,000 | maintain | \$0 |
| Quarterly pool equipment service | \$28,000 | maintain | \$0 |
| Quarterly arena equipment service | \$28,000 | maintain | \$0 |
| Quarterly facility repairs | \$16,000 | increase frequency to bi-monthly | Estimated add'l \$4,000/year |
| Summary of adjustments required | | | +\$4,000/year |
| New O&M activities | Rationale | | Cost impacts |
| Annual roof cleaning and inspection | Roof is aging and condition needs to be monitored | | Additional \$6,000/year |
| Capital Projects | Estimated cost impacts | Priority (H,M,L) | Notes/considerations |
| Build new arena | \$700,000 | Medium | Will have O&M impacts |
| Paint facility | \$8,000 | High | Planned for 2016 |
| Information Type | Source | Accuracy (H,M,L) | Improvements required |
| Performance information | Anecdotal | Medium | The condition of the pool equipment should be inspected as it nears its expected end of life. |

3 Risk Management



3.1 HOW TO MANAGE RISKS

This process is a process for risk management, and is applicable for both asset and strategic risks.

- | | |
|---------------|--|
| STEP 1 | Establish context |
| | <ul style="list-style-type: none"> » What boundaries will you use for your risk assessment? (i.e. asset system, service area, department, etc.) » What timeframe will you use? |
| STEP 2 | Identify and assess risks |
| | <ul style="list-style-type: none"> » Refer to detailed process on identifying and assessing risks. |
| STEP 3 | Identify and select risk-controls |
| | <ul style="list-style-type: none"> » What are the possible actions you can take to reduce or control risks? » Are there capital project options? » Are there operational responses? » What would it take to implement each of the controls? » What level of risk reduction would you get from implementing the control? » Which options will give you the most reduction in risk for the lowest level of investment? |
| STEP 4 | Implement risk controls |
| | <ul style="list-style-type: none"> » Include projects in your business plans, operational plans, and capital plans. |
| STEP 5 | Monitor and adapt |
| | <ul style="list-style-type: none"> » How well did the risk control projects work? » Have levels of risk changed? » Are there new risks, or risks that have been eliminated? » What changes are needed to continue to monitor and manage risks? |



A NOTE ON CONDITION ASSESSMENTS

The purpose of conducting an asset condition assessment is to improve your understanding of the likelihood of an asset failing. Condition assessments can be expensive and time consuming, and should be focused to ensure they add value to decision making. Consider focusing condition assessments on:

- » Critical assets that are difficult to observe (e.g. siphons, major water or sewer mains, etc.)
- » Assets that have exceeded their estimated useful life, or are scheduled for replacement in the next 5 – 10 years
- » Roads, due to a short lifespan and significant benefits of conducting targeted maintenance
- » Critical building components
- » Potential health and safety issues

3.2 HOW TO IDENTIFY AND ASSESS ASSET RISKS

STEP 1 Define the scope of your assessment

- » What type of assets will be included in your risk assessment (i.e. water, sewer, roads, etc.)
- » What timeframe will your assessment cover? (recommended is 10 years, with an emphasis on the first 5 years)

STEP 2 Identify high level objectives for asset system



- » What does the system need to provide? (i.e. safety, accessibility, etc.)
- » Some of these objectives may be common to all asset systems, while some may be specific to only one asset system.
- » These objectives should align with levels of service.
- » Assign a weighting between 0 and 1 for each objective that indicates how important the objective is compared to the other objectives.

STEP 3 Define consequences and likelihood

- » For each of the objective areas, develop a definition of consequence along a four point scale, with one being the lowest impact and four being the highest impact.
- » Develop this table in conversations with others to make sure that all the people conducting the assessment agree on the definitions.
- » Develop a table to define likelihood along a four point scale, with one being the lowest likelihood and four being the highest likelihood.

STEP 4 Identify asset risks

- » What are the possible undesirable events, occurrences, or conditions that may hinder the ability of the assets to deliver intended services (e.g. water pipe breaking, road surface failing, pump failing, etc.)
- » Identify the root cause of these events by asking 'why?' again and again, until the root cause is revealed.

STEP 5 Assess the risks

- » Using the consequence table and likelihood definitions, identify the likely consequence and likelihood of each risk.
- » Use available information, experience, and data to inform your scoring.
- » Record the scores in the risk register.

STEP 6 Calculate the risk score



- » Multiply the weighted consequence and likelihood score to arrive at a total score for each risk (see example at the end of this Risk Management section).
- » Sort the risk register from the highest to lowest risk score.
- » Review the ranking to check if it makes sense. If not, revisit the weighting values for each consequence category. Test out different weighting factors to see what the impact on the ratings is.
- » What could you do to reduce the impact or likelihood of each risk? What will be the cost?
- » Which risks will you choose to manage? What level of risk will you accept? What is your risk tolerance?



TIPS ON GETTING STARTED

- » Repeat the process for each service area (e.g. water, recreation, roads, etc.).
- » Answer these questions together as a cross-departmental team, making sure to include someone from operations or public works who deals with the assets on a daily basis.
- » After answering the questions with anecdotal information, identify what data or information you have to support the opinions of the group. If you find that you don't have data to confirm the risks with the highest impact and likelihood, do some further investigation (i.e. targeted condition inspection or impact modelling).

MATERIAL: Ductile iron **SIZE:** 200 mm **LENGTH:** 109 m

LIKELIHOOD OF FAILURE: HIGH

AGE: 40 years

THEORETICAL USEFUL LIFE: 100 years

CONDITION: poor, corroded

ESTIMATED FUTURE DEMAND: unchanged

Even though the pipe should have 60 years of life left, it is a good candidate for replacement.

IMPACT OF FAILURE: HIGH

LOCATION: Beneath major roadway

SERVICE AREA: 40 homes and an elementary school

SERVICE IMPACT IN EVENT OF FAILURE: Significant pressure reduction, insufficient fire flows

FINANCIAL IMPACT OF FAILURE: The cost of emergency replacement will likely be twice the cost of proactive replacement

OVERALL RISK RANKING: HIGH

EXAMPLES
IN RISK
ASSESSMENT:

A STORY OF
TWO WATER
MAINS

MATERIAL: Asbestos Cement **SIZE:** 150 mm **LENGTH:** 85 m

LIKELIHOOD OF FAILURE: HIGH

AGE: 70 years

THEORETICAL USEFUL LIFE: 70 years

CONDITION: Fair, very few recorded breaks

ESTIMATED FUTURE DEMAND: unchanged

IMPACT OF FAILURE: LOW

LOCATION: Accessible grass covered ROW

SERVICE AREA: 20 homes

SERVICE IMPACT IN EVENT OF FAILURE: No major immediate impact; break can be isolated and service continued

FINANCIAL IMPACT OF FAILURE: The cost of emergency replacement will likely be slightly higher than cost of proactive replacement

OVERALL RISK RANKING: MEDIUM

| Sample Consequence Table | | | | | | |
|--------------------------|---|---|--|--|--------|---|
| Category | 1 | 2 | 3 | 4 | Weight | Notes |
| Operational Impacts | Requires semi annual monitoring or repair | Requires monthly monitoring or repair | Requires weekly monitoring or repair | Unable to maintain or operate OR repair requires greater than one week | 0.6 | Reactive operational effort above what is routine |
| Environment | Short term irritant (i.e. Dust) | Prolonged irritant (i.e. Dust) OR Aesthetic impact | Release of deleterious substances to environment (i.e. Hydraulic fluid, diesel fuel, etc.) | Release of deleterious substances to environment that result in a fine | 0.8 | O&G, fines to waterway, etc. Dust control Noise |
| Safety | Near miss | Minor injuries that do not require medical consultation | Injuries require medical consultation | Many people with major injuries OR fatality | 1 | Consider all road users - pedestrians, bikes, vehicular. Roads, lights, signs, etc. |
| Travel Time | Travel time is increased for a period of < 48 hours | Travel time is increased for a period of 48 hours - one month | Travel time is increased for period of one month - four months | Travel time is increased for period of > four months | 0.6 | |

GETTING STARTED TOOLKIT

| | | | | | | |
|-----------------------------------|---|---|--|---|-----|--|
| Accessibility | Short term access interruption <10 mins (no alternate route) OR less than 10 households | Short term access interruption 10 min - 1 hour | access interruption 1 - 24 hours | Service interruption to emergency services OR >24 hours | 0.8 | Access to residences, goods, services, emergency services, other civic services. High weight. Assumption - no alternate route (if there is an alternate route, this is captured under Travel Time) |
| Service Delivery - Comfort | Minor decrease in ride comfort and increase in noise levels | Moderate decrease in ride comfort and noise levels. Obstructions visible but alteration in path and speed are not required. | Decreased speed required. Occasional alteration of path. | Frequently alter driving path. Vehicle damage. Major decrease in ride comfort and noise level | 0.8 | |
| Reputation | One off localized negative publicity | Short term regionalized negative publicity | Prolonged regionalized negative publicity | Prolonged major reputation damage, prolonged reports in national news | 0.4 | |
| Financial | <\$5k | >\$5k-\$100k | \$100k-\$1M | >\$1M | 0.8 | Reactive costs |

| Sample Likelihood Table | | | | |
|-------------------------|--|--|--|---|
| Likelihood | 1 | 2 | 3 | 4 |
| | Improbable | Possible | Likely | Almost Certain |
| | Could happen, but probably never will except under exceptional circumstances | The event might occur at some time as there is a history of this event occurring | There is strong possibility of this event occurring as there is a frequent history of occurrence | Very likely. Expected to occur in most circumstances. |

| Ranking Matrix | | | | | |
|----------------|-------------|---|---|----|----|
| Likelihood | Consequence | | | | |
| | | 1 | 2 | 3 | 4 |
| | 1 | 1 | 2 | 3 | 4 |
| | 2 | 2 | 4 | 6 | 8 |
| | 3 | 3 | 6 | 9 | 12 |
| | 4 | 4 | 8 | 12 | 16 |

For an example on how to move through your asset risk assessment, refer to page 26.

Risk Register

Assessment Scope

Date Last Modified:

Note: Scores are given between 1 and 4 (lowest to highest). Each category holds a weighting from 0 - 1.

Consequence

Likelihood

Risk Treatment

| Number | Undesirable Event | Why? | Why? | Consequence - Notes | Operational Impacts | Enviro | Safety | Travel Time | Access | Service Delivery - Comfort | Reputation | Financial | Weighted Consequence Score | Score | Risk Score | Current Mitigating Actions | Possible Mitigating Actions | General Notes |
|--------|-------------------|------|------|---------------------|---------------------|--------|--------|-------------|--------|----------------------------|------------|-----------|----------------------------|-------|------------|----------------------------|-----------------------------|---------------|
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
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| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |
| | | | | | | | | | | | | | 0.00 | | 0.00 | | | |

3.3 AN EXAMPLE RISK ASSESSMENT

The following example shows how to move through the risk assessment process, step by step. The purpose of this example is to illustrate how to fill out the asset risk register.

(Note that special attention should be paid to the sections on Understanding Risk in the Handbook and Risk Management in the User Guide – risk assessment and risk comparison is a complex undertaking and represents one of the components of asset management and informed decision making).

STEP 1 | DEFINE THE SCOPE

Asset type: County roads

Assets included:

- » Road segment A: rural gravel road with shallow ditches on both sides. Road is the single access point for 4 homes.
- » Road segment B: gravel road used by heavy industrial traffic
- » Road segment C: paved road with moderate volume of traffic

STEP 2: IDENTIFY OBJECTIVES.

Road system objectives: safety, accessibility, comfort.

Assigned weighting:

- » Safety - 1.0
- » Accessibility - 0.8
- » Comfort - 0.6

These selected weighting values indicate that 'safety' is the most important objective, 'accessibility' is second, and 'comfort' is third.

Note that these weighting values are assigned based on judgement of people conducting the risk assessment. Values are selected between 0 and 1.

STEP 3: DEFINE CONSEQUENCES AND LIKELIHOOD

CONSEQUENCES

Develop a scale of descriptions of negative impacts for **each** of the selected objectives, with 1 being the lowest level of impact and 4 being the highest level. These will differ from community to community, so they need to be defined before beginning the risk assessment.

| Objective | 1 | 2 | 3 | 4 |
|---------------|---|---|---------------------------------------|---|
| Safety | Near miss | Minor injuries that do not require medical consultation | Injuries require medical consultation | Many people with major injuries OR fatality |
| Accessibility | Short term access interruption <10 mins (no alternate route) OR less than 10 households | Short term access interruption 10 min - 1 hour | access interruption 1 - 24 hours | Service interruption to emergency services OR >24 hours |

| Objective | 1 | 2 | 3 | 4 |
|-----------|---|---|--|---|
| Comfort | Minor decrease in ride comfort and increase in noise levels | Moderate decrease in ride comfort and noise levels. Obstructions visible but alteration in path and speed are not required. | Decreased speed required. Occasional alteration of path. | Frequently alter driving path. Vehicle damage. Major decrease in ride comfort and noise level |

LIKELIHOOD

The likelihood table only has one scale, but these definitions should still be reviewed and tailored to your context before beginning the risk assessment.

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Improbable | Possible | Likely | Almost Certain |
| Could happen, but likely never will except under exceptional circumstances. | The event might occur at some time as there is a history of this event occurring. | There is strong possibility of this event occurring as there is a frequent history of occurrence. | Very likely. Expected to occur in most circumstances. |

STEP 4: IDENTIFY ASSET RISKS

Some potential undesirable events that might impact the assets in the scope of the assessment (road segments A, B, and C) are identified, as well as their root cause:

| Event | Root Cause |
|------------------------------------|--|
| 1. Washout of road A | Culvert blocks frequently and leads to flooding during major storm events. |
| 2. Failure of road B surface | Road B gets heavy industrial traffic and gravel surface does not last. |
| 3. Potholes on road C | Freeze/thaw cycles combined with heavy, fast-moving traffic in the spring. |
| 4. Surface deterioration of road A | Insufficient maintenance budget to maintain road over the past two years. |

These risks and their root causes are recorded in the risk register.

STEP 5: ASSESS THE RISKS

For each event, determine which will be the consequences (the categories of objectives) and to what level (score based on the table of definitions). If an objective is not impacted, its score will be 0.

| Event | Safety (weight 1.0) | Accessibility (weight 0.8) | Comfort (weight 0.6) | Weighted Consequence (sum of score x weight) | Likelihood (scale of 1 – 4 based on table) |
|------------------------------------|------------------------|-------------------------------|-------------------------|--|--|
| 1. Washout of road A | 1 | 4 | | 4.2 | 2 |
| 2. Failure of road B surface | 2 | | 3 | 3.8 | 2 |
| 3. Potholes on road C | 3 | | 4 | 6.4 | 3 |
| 4. Surface deterioration of road A | | | 3 | 1.8 | 4 |

STEP 6: CALCULATE THE RISK SCORE

| Event | Weighted Consequence | Likelihood | Total Risk Score (Consequence x Likelihood) |
|------------------------------------|-------------------------|------------|--|
| 1. Washout of road A | 4.2 | 2 | 8.4 |
| 2. Failure of road B surface | 3.8 | 2 | 7.6 |
| 3. Potholes on road C | 6.4 | 3 | 19.2 |
| 4. Surface deterioration of road A | 1.8 | 4 | 7.2 |

Based on the assessment, the greatest risk to providing service and achieving objectives is the occurrence of potholes on road C. The next step would be to identify what actions should be used to manage the risk by reducing both the likelihood and the consequence of the risk.

3.4 HOW TO IDENTIFY & ASSESS STRATEGIC RISKS

STEP 1 Identify high level objectives for the organization

Examples of high-level objectives include:

- » Rate stability
- » Prudent use of debt
- » Maintain or increase levels of service
- » Accessible and available information

STEP 2 Define consequences and likelihood

- » For each of the objective areas, develop a definition of consequence along a four point scale, with one being the lowest impact and four being the highest impact.
- » Develop this table in conversations with others to make sure that all the people conducting the assessment agree on the definitions.
- » Develop a table to define likelihood along a four point scale, with one being the lowest likelihood and four being the highest likelihood.

STEP 3 Identify strategic risks

- » What are the possible undesirable events, occurrences, or conditions that may hinder the ability of the organization to achieve strategic objectives? (e.g. loss of key staff, excessive growth, loss of grant funds, major asset failures, etc.)
- » Identify the root cause of these events by asking why again and again, until the root cause is revealed.

STEP 4 Assess the risks

- » Using the consequence table and likelihood definitions, identify the consequence and likelihood of each strategic risk.
- » Use available information, experience, and data to inform your scoring.
- » Record the scores in the risk register.

STEP 5 Calculate the risk score

- » Multiply the consequence and likelihood score to arrive at a total score for each risk.
- » Sort the risk register from the highest to lowest risk score.

4 Costs and Funding



4.1 HOW TO UNDERSTAND COSTS AND FUNDING

STEP 1 Establish context

- » What boundaries (i.e. service types, asset types, timeframes, etc.) will you use to do your cost assessment?
- » What boundaries did you use for your risk management?
- » What categories did you use to define levels of service?
- » What are the boundaries of your budgets? Do these boundaries align with risk management and levels of service?

STEP 2 Understand current costs and cost drivers

- » What was the annual capital and operational expenditure for the last five years?
- » What percentage of capital spending was driven by:
 - » Growth
 - » Increasing level of service
 - » Regulatory requirements
 - » Managing risk to level of service
- » What trends in costs are apparent?



STEP 3 Understand future costs

- » What additional costs will you encounter to replace assets as they fail over the next 20 years? (NOTE: Refer to the tool on developing your Asset Replacement Forecast)
- » What additional costs will you encounter to maintain or increase your level of service?
- » What cost savings will you experience from reducing levels of service?
- » What capital/operational costs will you encounter to manage asset and strategic risks?
- » What costs will you encounter to meet regulatory requirements?
- » Document costs and the timing of costs in a long-term (10 year) capital plan. You might start by assuming your current costs continue as a baseline, and then increasing or decreasing them to account for asset replacement, levels of service projects, or risk management projects.
- » How does the future plan compare to past trends?



STEP 4 Understand funding sources

- » What has been your annual revenue for the last 5 years? What was the revenue source?
- » How will your sources of revenue change over the next 20 years?
- » How does your annual projected funding compare to your annual projected expenses?
- » In which years will you have surpluses and in which years will you be short on funding?
- » Can you afford your projected expenses?
- » How will you manage debt and reserves to smooth out funding requirements?

STEP 5 Iterate levels of service and risk

- » If your projects are not affordable, what changes to your level of service or risk management are needed to reduce costs?
- » What is the impact of reducing levels of service or reducing risk control actions?



TIPS ON GETTING STARTED



- » Understanding costs is often the point where you bring together service and risk.
- » Use the templates on levels of service and risk to identify capital projects that might be required in the future.
- » When making decisions to either cut or increase spending, understand the short and long-term impacts to service and risk.

HOW TO DEVELOP AN ASSET REPLACEMENT FORECAST

The Role of an Asset Replacement Forecast

An asset replacement forecast is a long-term estimate of what it will cost each year to replace assets as they fail. These plans are typically based on the following assumptions:

- » That assets will need to be replaced when they reach the end of their theoretical useful life
- » That the full cost of replacing the asset will occur in the year the asset is replaced

The asset replacement forecast is not a plan designed to be implemented – it is a forecast that provides information. It doesn't reflect how the future will actually play out: assets don't usually fail right at the end of their theoretical useful life, circumstances will change (such as desire to increase level of service, or accommodate growth or development), and you will want to replace some assets proactively before they break.

The asset replacement forecast is meant to be a high-level scan. The purpose of the forecast is to provide:

- » A long term view of when assets might fail
- » A view on when peaks of costs might be encountered if not managed
- » An understanding of strategic risks related to asset failure or financial sustainability
- » Information to help you determine how much you want to contribute to reserves to manage financial risks
- » A tool for communication about the long term requirements of infrastructure with council and the public

4.2 HOW TO DEVELOP AN ASSET REPLACEMENT FORECAST

STEP 1 Prepare your asset inventory to build your forecast

- » Ensure your inventory lists the majority of the major assets.
- » Ensure your inventory includes estimated remaining life and replacement value.

STEP 2 Determine theoretical infrastructure deficit

- » For each asset still in service that has passed its useful life, enter the full replacement value in the current year (in today's dollars).

STEP 3 Project future costs

- » In a spreadsheet, develop a long term (20+ years) forecast that accounts for the replacement cost of each asset in the year after it has finished its useful life.
- » Calculate the annual average lifecycle investment for each asset (replacement value of the asset divided by the expected useful life of the asset).
- » Calculate the subtotal of asset replacement costs for each asset category (e.g. water, roads, etc.).

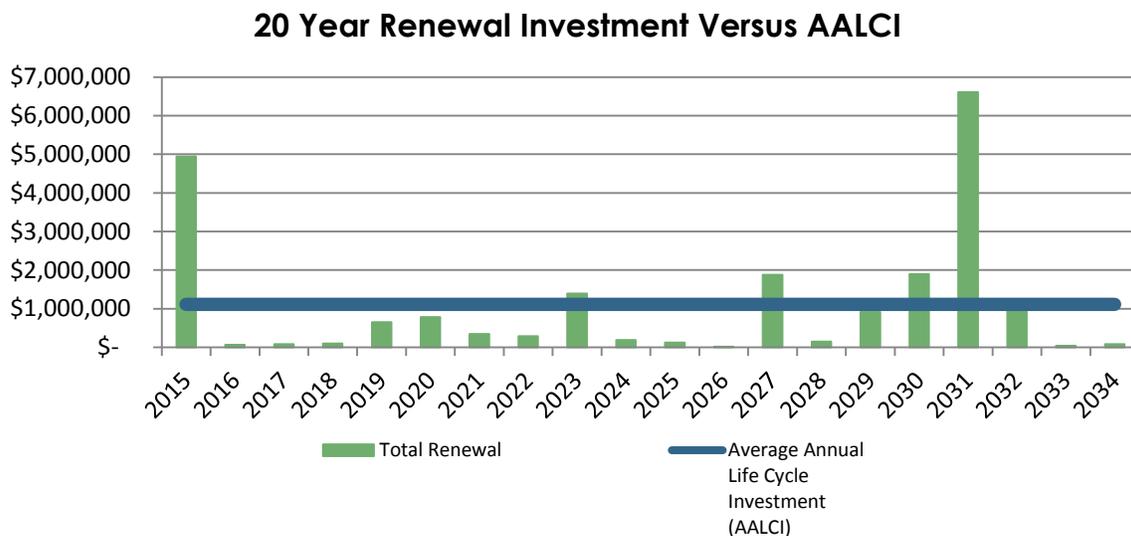
STEP 4 Create a summary for all assets owned

- » Compile a summary of the total asset replacement costs for each asset category.
- » Graph the total costs to illustrate the current infrastructure deficit and the total costs for each year.
- » Calculate the Total Annual Average Lifecycle Investment (AALCI) for all assets (sum of the AALCI for each asset).

STEP 5 Review, communicate, and apply learning

- » Review the forecast to identify any potential errors.
- » Identify significant strategic risks (i.e. big spikes in spending, concentrated areas of asset failure, etc.).
- » Compare current total annual funding with the average replacement value estimated.
- » Communicate the results with decision makers (senior management and council).

Sample Output of Summary-level Asset Replacement Forecast



5 Implementing Asset Management



5.1 SAMPLE ASSET MANAGEMENT POLICY

1. PURPOSE AND SCOPE

The purpose of this policy is to ensure that [**Your community name**] implements the practice of asset management in order to achieve:

[Insert your community's asset management objectives. These should be specific to your community, related to your vision, risks, and opportunities.]

2. DEFINITIONS

[State the definitions that your community has selected for key terms. Expand on the list below as required.]

Asset management – the process of making decisions about the use and care of infrastructure to deliver services in a way that considers current and future needs, manages risks and opportunities, and makes the best use of resources.

Asset maintenance – regular activities conducted to keep an asset functioning in its intended state. Maintenance activities are not considered capital investments.

Asset renewal – the replacement, refurbishment, or major maintenance of an asset that represents a capital investment and substantially extends the life of an asset.

Capital plan - A multi-year plan (10+ years) that identifies the capital infrastructure projects and their cost to address the current and future service objectives.

Long term financial plan - A plan that documents the process of aligning financial capacity with long-term service objectives.

3. PRINCIPLES

[State the principles that your community will adhere to]

Examples:

Stability – [Your community name] will manage our assets in a manner that is stable over the long term and is consistent with the long term community objectives and minimizes

Forward Looking – [Your community name] shall operate in a manner that takes into account the financial effects on future generations and considers changing community circumstances and external economic risks.

Value - [Your community name] will implement asset management practices that ensure public resources are put to the best possible use and that the full cost of asset ownership is considered in decision making.

4. POLICY STATEMENTS

4.1 Asset Acquisition

Decisions to acquire new assets will be based on an understanding that the asset supports the long term goals of the community and that the full life cost of ownership has been considered and incorporated into future operating and financial plans.

4.2 Asset Maintenance

For each asset, efficient maintenance strategies will be implemented that considers sustaining the desired service levels and seeks to minimize risk and the life cycle cost of ownership.

4.3 Asset Renewal/Replacements

Decisions to renew or replace an asset will consider risk (probability and consequences of asset failure), life cycle cost and the impacts to the level of service.

4.4 Funding for Asset Renewals/Replacements

A long term financial plan will be maintained which considers the renewal and replacement of existing infrastructure and the impact to taxation and user fees.

The timing for asset renewal/replacement will balance risk with cost and levels of service.

The long term financial plan will identify how asset renewals/replacements will be financed, whether be it through current revenues, reserve funds or borrowing.

4.5 Asset Disposal

The utilization and function of all assets will be considered periodically together with the cost of operating and maintaining. Assets will be disposed of where it is determined that community resources can be applied to other uses with greater benefit.

5. ROLES AND RESPONSIBILITIES

| POSITION | DELEGATION/TASK |
|-----------------------|--|
| <p>Council</p> | <ul style="list-style-type: none"> » Endorse Asset Management Policy. » Comply with Asset Management Policy. » Approve the planning and budgeting of assets. |
| <p>Staff</p> | <ul style="list-style-type: none"> » Plan and budget asset acquisitions and maintenance. » Document items into the asset register. » Coordinate maintenance of assets. » Coordinates the disposal of assets. |

6. REFERENCES

List any references here.

5.2 HOW TO CREATE AN ASSET MANAGEMENT STRATEGY

An asset management strategy documents your organization's approach to asset management. It identifies where you are currently at with your practices related to asset management, where you would like to be, and how you will get there. The asset management strategy does not need to be a long and detailed document – ideally it is something that is a concise and easy reference for everyone involved in asset management.

STEP 1 Establish a baseline

- » In a cross-functional team, conduct an assessment of your asset management practices. There are existing self-assessment tools to support this function, such as AssetSMART or the NAMS maturity assessment.

STEP 2 Develop asset management objectives

- » What is the vision for your community?
- » What are the biggest opportunities or strategic risks (see strategic risk tool) to achieving the vision?
- » How can asset management enable the achievement of the vision, or the management of risks?
- » What are the corresponding objectives for asset management?

STEP 3 Identify individual strategies for each objective.

- » What are the steps that need to be taken in the next five years to move toward each of the objectives defined?

STEP 4 Outline a corporate approach to asset management for the next five years

- » Who are the primary stakeholders?
- » How does asset management connect to other corporate initiatives?
- » How will service areas be defined for asset management?
- » What does each service area need to do in the next five years to move asset management forward?
- » Who will be responsible for moving forward with asset management in each service area?
- » Will an asset management plan be developed? For which service areas? What format will it follow?

STEP 5 Communicate the strategy

- » Ensure all stakeholders are aware of the strategy, how it impacts them, and where to access it.

STEP 6 Use and update the strategy

- » Implement the strategy.
- » Continue to assess your asset management practices on an annual basis to measure progress against the baseline.
- » Update your strategy as needed to reflect progress or learning.

Example objectives and strategies

Objectives should be high-level, but specific in nature and should speak directly to the challenges and opportunities in your community. Examples of objectives include:

- » Reduce lifecycle costs of major infrastructure
- » Reduce frequency of road reconstruction
- » Defensible prioritization for replacement of assets
- » Improve the availability of information for decision-making

Strategies are steps to achieve each objective. These are also high-level but specific. Example:

Objective:

Reduce lifecycle costs of major infrastructure

Strategies:

- » Begin pilot test with roads
- » Quantify lifecycle cost with current capital and maintenance regime
- » Identify alternative approaches for capital construction and maintenance, and the impacts on lifecycle costs
- » Select an optimal regime to reduce lifecycle costs

5.3 HOW TO CREATE AN ASSET MANAGEMENT PLAN

STEP 1 Identify a champion and a team to create the plan.

- » The plan should incorporate perspectives of engineering, planning, operations, and finance.
- » The champion will be the one to bring people together and move the plan forward.

STEP 2 Identify your objectives

- » What is the scope of this plan? Which service area(s) will it cover? Which assets?
- » Why does your organization want this asset management plan?
- » What questions do you need it to answer? What objectives does it need to achieve?
- » What decisions will be informed by the plan?

STEP 3 Identify your audience

- » Who will use the plan when it's finished?
- » How will they use the plan?
- » How frequently will they reference it?

STEP 4 Develop an outline and format for your plan

- » How will you organize information to meet the needs of your audience?
- » Is there an existing framework that will work for you? (see sample outline below)

STEP 5 Pull together the available information into the outline

- » What do you know about service, risk, and cost related to the assets? Completing the service, risk, and cost templates will help with filling out the asset management plan.
- » What data do you have, and what anecdotal and experiential knowledge do you have?
- » Pull together available information, and review/refine as a team.

STEP 6 Identify gaps or weaknesses in the plan and document priorities for improving the plan

- » How well does your current plan meet your objectives?
- » Are there areas where improved accuracy or completeness of data would improve decision-making?
- » What level of effort would be required to improve the information?
- » Is the improvement in decision making worth the effort of improving the information?
- » What are the top two priorities for improving information?

STEP 7 Communicate the plan with all stakeholders in the organization

- » Identify specific stakeholders and the relevant parts of the plan to communicate with them.
- » Expect the plan to be a living document, that continues to evolve as more information is gathered.

STEP 8 Ensure the plan is accessible to all stakeholders who need it

- » Ensure those making related decisions are aware of the outcomes of the plan and where to access the plan.

STEP 9 Use and update the plan

- » Reference the plan for decision-making.
- » Implement actions and projects as identified by the plan.
- » Review the success of the plan against the plan's objectives.
- » Update the plan as information is improved and projects are implemented.

Asset Management Plan Outline

| SECTION | DESCRIPTION |
|----------------------------|---|
| Executive Summary | Overview of key content |
| Assets | Summary of assets owned, the replacement value of these assets, and what is known about their condition. |
| Service | Services provided Levels of service – currently delivered and targets Level of service trends based on current investment levels |
| Risk | Summary of main asset risks and risk mitigation plans Risk trends based on current investment levels Summary of significant strategic risks (e.g. major assets failing, costs of asset replacement, staff turnover, etc.) |
| Costs and funding | Plan identifying all major projects required to deliver target levels of service and mitigate asset and strategic risks Review of funding adequacy and strategies to increase revenues or reduce costs where required. |
| Asset management practices | Overview of current systems, processes, and procedures used to manage assets Prioritized improvements to these systems, processes, and procedures |
| Plan timeframe and review | Timeframe for plan review and update |

Some Notes About Asset Management Plans

An asset management plan is a document that combines information about assets, services, risks, and costs so that the information is accessible for decision making.

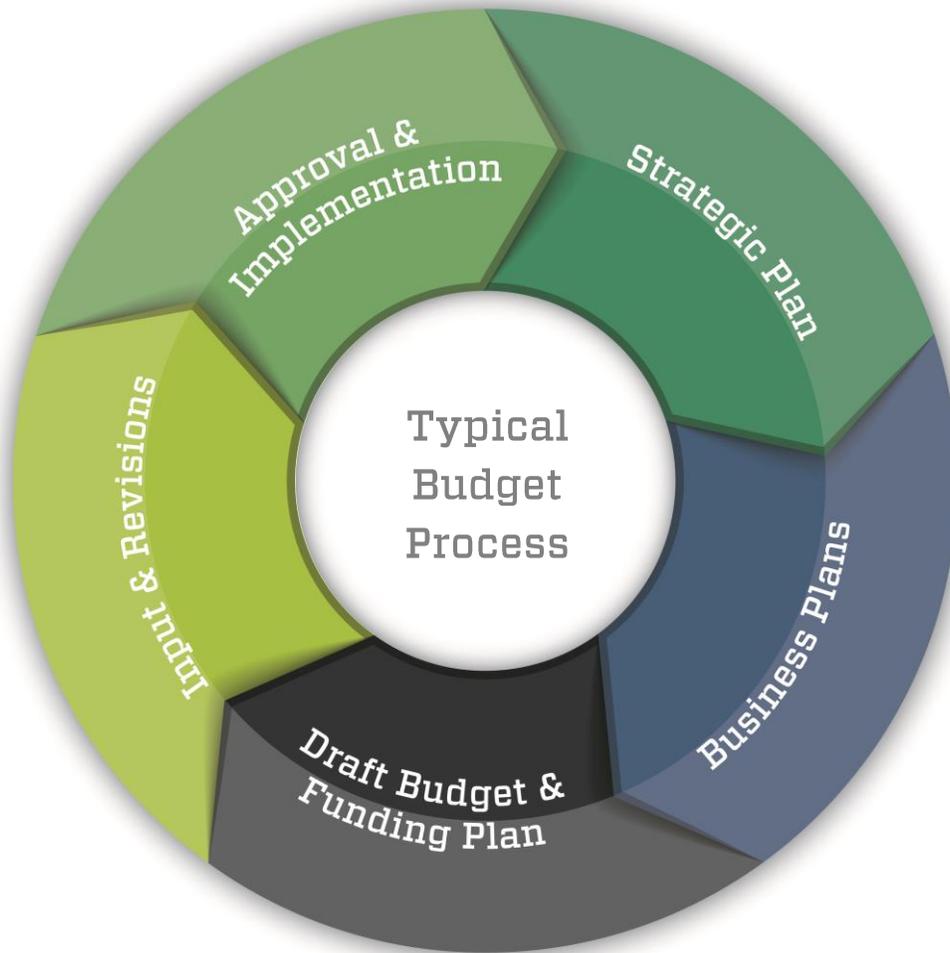
The **process** of collecting and combining information into an asset management plan can be very informative for those involved, and if the plan is used or implemented, it will help build the resilience of the community.

In the past, many municipalities across Canada have incorrectly assumed that 'doing asset management' was 'writing an asset management plan'. After the plan was completed, the project was over. These plans typically sit on the shelf and are forgotten about within in a few years.

An asset management plan can be very useful but is not necessary. The ultimate goal is to have access to information and clear communication about assets, services, risks, and costs. Some municipalities may choose to arrange and communicate this information in a combination of other ways – such as through the long term capital plan, operations business plans, corporate strategies, etc.

A scan of published asset management resources shows that there are many different frameworks and approaches to developing asset management plans. The right one is the one that makes sense for your municipality, and includes considerations of service, risk, and cost.

5.4 HOW TO IMPLEMENT ASSET MANAGEMENT THROUGH THE BUDGET PROCESS



WHAT TO DO:

1. Include considerations of service, risk, and cost at each stage of the budget process.
2. Use whatever information is available at the time.
3. If there are gaps in important information, include actions to fill those data gaps in your budget.

Implementing Asset Management at Each Stage of the Budget Process

| STAGE | CONSIDERATIONS | INPUTS |
|--|---|---|
| <p>Strategic Planning</p> | <p>LOS: What level of service do we need to provide to the community?</p> <p>Risk: What are the risks to being able to provide that level of service? What is an acceptable level of risk?</p> <p>Cost: What can we afford?</p> | <ul style="list-style-type: none"> » Current community LOS performance » Costs of providing LOS » Significant risks to delivering LOS » Financial outlook » Community plans and consultations |
| <p>Business Plan (for each department or service area)</p> | <p>LOS: What levels of service does our department contribute to delivering? What are our current levels of service? What are the target levels of service? In the short term? Long term?</p> <p>Risk: What are the risks to delivering that level of service? Short term? Long term? What needs to be done to manage risks that are beyond an acceptable level of risk? (short term, long term) What are our priorities?</p> <p>Cost: What is the cost of delivering levels of service and managing risk? What capital projects are needed and what are the operational impacts? How will the plan be paid for?</p> | <ul style="list-style-type: none"> » Strategic priorities » Current community LOS performance and target LOS performance » Long term asset replacement forecasts » Risk register » Risk management plan(s) » Capital plan of projects accounting for growth or increase in LOS » O&M plan, including O&M for new capital projects » Projected funding for capital and O&M |
| <p>Draft Budget (Operations and Capital) and Funding Plan</p> | <p>LOS: What levels of service take priority?</p> <p>Risk: What projects and activities are required for risk management? What are the risk trade-offs of re-prioritizing projects?</p> <p>Cost: What is affordable? What other sources of revenue might be available? What are the impacts if funding doesn't come through?</p> | <ul style="list-style-type: none"> » Business plans » Risk and service impacts of each project » Revenue projections » Asset management process improvements required (e.g. information to be collected, training for staff, etc.) |
| <p>Input and revisions</p> | <p>LOS: Does council and the community agree with the service priorities? Are the service/cost/risk trade-offs clear? Are they acceptable?</p> <p>Risk: Are risk management strategies in alignment with priorities?</p> <p>Cost: What is the community willing to pay?</p> | <ul style="list-style-type: none"> » Service and risk impacts of the draft budget and funding plan » Possible variances in level of service and corresponding cost and risk |
| <p>Approve and implement</p> | <p>Monitor implementation success and actual impacts to service, risk, and cost. Update data to reflect upgrades.</p> | |

5.5 HOW TO IMPLEMENT ASSET MANAGEMENT THROUGH COMMUNITY PLANNING PROCESSES

Municipal Development Plan (MDP)

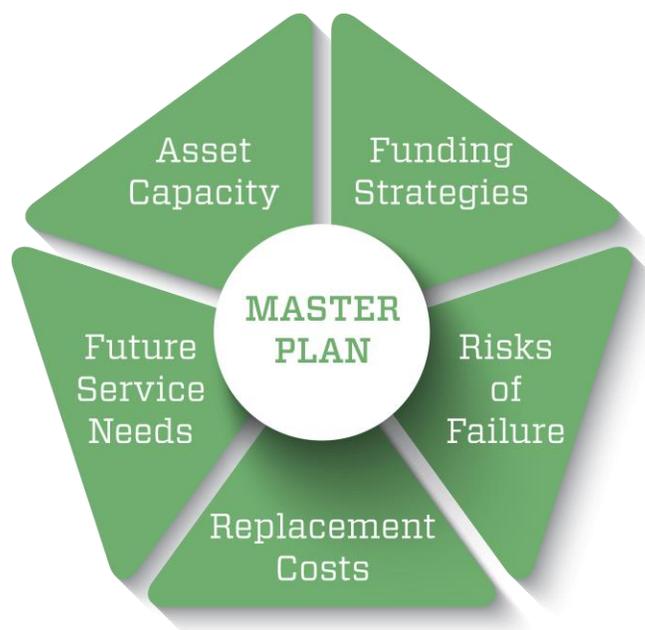
As a vision and set of policies that guide how your community will develop in the future, the MDP provides a great opportunity to incorporate up-front thinking that will influence long term affordability and sustainability.

WHAT TO DO:

1. Acknowledge the need to maintain and replace critical infrastructure into the future.
2. Consider the implications of servicing development when planning land use.
3. Look at trends in community demographics and results of community consultation to anticipate changes to service requirements or revenues.

Master Planning Process

Municipalities often create master plans for major services, such as utilities or transportation. These plans focus on the development of new infrastructure, but for the most effective planning of capital projects, they should include replacement or upgrades of existing infrastructure.



WHAT TO DO:

1. Conduct a risk assessment of the current system by listing all the potential risks and ranking the impact and likelihood of each risk.
2. Identify upgrades or replacements required to mitigate risks.
3. Identify where service levels need to increase and what projects are required to provide for this increase.
4. Prioritize projects and identify where projects can be coordinated to allow for efficiencies or cost reduction.

Design Standards

Design standards or guidelines establish the level of service that will be provided by the municipality. Even when assets are contributed by developers or industry, the municipality will be responsible for the ongoing operations and maintenance, the asset renewal, and the ultimate replacement.

WHAT TO DO:

1. Review your current design standards with an eye to how they establish level of service (e.g. road widths and cross sections, park standards, etc.).
2. Consider how well aligned your current standards are with the level of service you are aiming to provide or maintain, and whether they are affordable.
3. Update or revise design standards to reflect levels of service, to ensure that new assets built or contributed will meet a consistent service standard.

5.6 HOW TO IMPLEMENT ASSET MANAGEMENT THROUGH COMMUNICATION AND ENGAGEMENT PROCESSES

Community Satisfaction Survey

WHAT TO DO:

1. Identify groups in your community with different service requirements (e.g. industry, urban residents, rural residents, etc.).
2. Include questions in your survey that help you to understand specifically what level of service each group expects, what they are willing to pay for, and what level of service they perceive they are getting.
3. Use your survey results to monitor your levels of service over time.

Annual Reporting

WHAT TO DO:

1. Embrace the opportunity to communicate with the community what services have been delivered, at what level, what it costs to provide services, and what it will take to maintain services in the future.

Orientation of new staff or council

WHAT TO DO:

1. Introduce the importance of asset management to the organization.
2. Provide a high level summary of assets owned, key services delivered and major risks and risk management strategies to every elected official or staff member.
3. Provide staff members with further detailed information about their roles and responsibilities related to asset management.

6 Continuous Improvement



6.1 HOW TO ASSESS AND IMPROVE YOUR ASSET MANAGEMENT PRACTICES

STEP 1 Assess where your asset management practices are at

- » Conduct the assessment as a team to ensure that perspectives from across the organization or department are included;
- » Use an existing tool, such as AssetSMART to conduct a structured assessment, or
- » Use the basic assessment and improvement plan template below.

STEP 2 Identify objectives for improving your asset management practices.

- » What decisions will your organization need to make in the next few years about delivering services, managing risks, or costs and funding? What will help inform these decisions?
- » What are your biggest strategic risks to resilience, and what actions or processes are needed to help you manage these risks?
- » Are our objectives specific enough to know when they have been achieved?

STEP 3 Identify priority actions for the short term (next year) and medium term (three years) to achieve your objectives.

- » What actions are required to achieve your top objectives?
- » What actions or process improvements would improve the use of asset management information in decision making?
- » What resources (people and financial) are required to implement these actions?
- » Is the value of these actions worth the investment of people and financial resources?
- » What other existing processes, projects, or initiatives can be leveraged to most efficiently achieve these objectives?

STEP 4 Develop an asset management improvement plan or project plan

- » How will the actions be funded?
- » Who will be responsible?
- » What is the timeframe?
- » What are the measures of success?

STEP 5 Implement and monitor

- » How well did the action work to help you achieve your objectives?
- » What can be learned for implementing future objectives?

6.2 ASSET MANAGEMENT ASSESSMENT AND IMPROVEMENT TEMPLATE

1. Assessment of Current Practices

| Assessment Category | Information | Systems and Processes | Knowledge and Skills | Connection to Decision Making |
|--|-------------|-----------------------|----------------------|-------------------------------|
| <i>Rank each on a scale of 1-4: [1] – not in place, [2] – key improvements needed, [3] – functional, [4] - optimal</i> | | | | |
| Asset information | | | | |
| Understanding of levels of service | | | | |
| Strategic risk management | | | | |
| Asset risk management | | | | |
| Understanding costs and funding | | | | |
| Understanding service, risk, and cost trade-offs | | | | |

2. Objectives for Improving Asset Management Practices

Objective (what do you want to achieve?):

Driver (why is this objective important?):

Objective 2:

Driver:

Objective 3:

Driver:

3. Short-term Improvement Plan (one year)

| Action | Related objective(s) | Connection to Decision Making | Internal and External Resources Required | Responsible | Indicator of Success |
|--------|----------------------|-------------------------------|--|-------------|----------------------|
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |

4. Medium term improvement plan (three years)

| Action | Related objective(s) | Connection to Decision Making | Internal and External Resources Required | Responsible | Indicator of Success |
|--------|----------------------|-------------------------------|--|-------------|----------------------|
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |

OVERVIEW OF ASSET MANAGEMENT RESOURCES

The Excel toolkit contains a review of existing publicly available asset management resources. All of these resources have been referenced in the development of this handbook and toolkit. This review will tell you the name of the documents, the focus of each document, and the depth of information in each resource.

This review can be useful when trying to identify where to get more information on asset management, and in identifying if a resource will have the information you need before making a decision to pay for it (some resources are only available for purchase).