ASSET MANAGEMENT CASE STUDY

May 2011

Asset Management Case Study

City of Merritt
May 2011

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1 Introduction

1.1 City of Merritt

The City of Merritt is located at the hub of the Coquihalla Highway system, in easy reach of Vancouver, Kamloops and the Okanagan. Merritt is the service centre for the ranch country of the Nicola Valley, and provides an excellent base for exploring the many outdoor recreational opportunities in the area.

The surrounding Merritt Forest District supports stands of Engelmann spruce, lodgepole pine, and subalpine fir at higher elevations; Douglas fir and ponderosa pine are found on the lower bench lands. Extensive grasslands also occur at low-elevation areas, particularly toward Merritt.

Since the completion of the Coquihalla highway system in 1990, the city's economy has grown and diversified, with the growth of tourism, recreation, transportation and home based occupations. There has been a steady influx of people relocating from urban areas, attracted by the lifestyle, low housing costs, and by opportunities for starting or expanding businesses.

The population of the city surpassed 8,000 in 1998, with a total of more than 15,000 in the whole service area. The result has been an expansion of the service sector, growth in housing demand, and an infusion of new entrepreneurial talent. Merritt's economy is based on several key sectors: forestry, agriculture, tourism, and mining.

While the traditional resource based economy has undergone restructuring, these industries remain a vital component of the local economy. Value added manufacturing is assuming greater importance, particularly within the forestry sector.

1.2 Infrastructure Assets

The City of Merritt plans, develops and maintains community infrastructure and associated services to support the economic, social and environmental well-being of the community. The infrastructure assets relating to this report have been grouped into seven asset groups and are listed below;

- Sewer Systems;
- Water Systems;
- Storm Sewers;
- Roads;
- Civic Buildings;
- Recreation Facilities; and
- Capital Equipment.

The City's infrastructure assets represent a sizeable investment by past, present and future generations.

Understanding the long-term implications of asset management decisions is vital to ensure that services are sustainable and to promote equitable and responsible distribution of costs for all generations.

1.3 Following on from Tangible Capital Assets Reporting

Recent changes to the accounting standards and the introduction of Public Sector Accounting Board 3150 (PSAB 3150) Assessment of Tangible Capital Assets (TCA), has required local government to change how they report Tangible Capital Assets on their Statement of Financial Position. It has also required that Tangible Capital Assets be amortized on the Statement of Operations.

Compliance to the new accounting standards required the City to undertake a significant amount of work. In doing so, the City now has an inventory and a historical based valuation of all their infrastructure assets. The degree of knowledge, completeness and detail in the inventory data for each asset group, varies. However all major assets and financially significant assets have a good level of base data known and documented.

1.4 Case Study Team

This Asset Management Case Study has been developed through a collaborative team approach. Qualified professional, financial and technical advisors from Opus International Consultants (Canada) Limited and representatives from the City of Merritt have assisted in the provision of information and preparation of this report.

Key individuals that were involved are:

- Bernadette O'Connor, International ET, Certified ETP, NZCE (Civil), Senior Asset Management Specialist;
- Martin Gordon, P.Eng, M.Sc.Eng, CMA, Senior Asset Management Consultant;
- Hamish Johnson, NZCE (Civil), Asset Management Consultant;
- Sonia Periard, B.Eng, Civil Engineer (EIT); and
- Shawn Boven, AScT, Public Works Manager.

1.5 Development Process

The purpose of this case study was to understand the City of Merritt's current state of knowledge about their assets and to map a way forward.

The case study process included an Asset Management Review and Gap Assessment. The project commenced with a meeting at Merritt and discussion of issues. This was followed with a review of existing documents and reports, research and completion of a questionnaire covering all notable aspects of asset management practices.

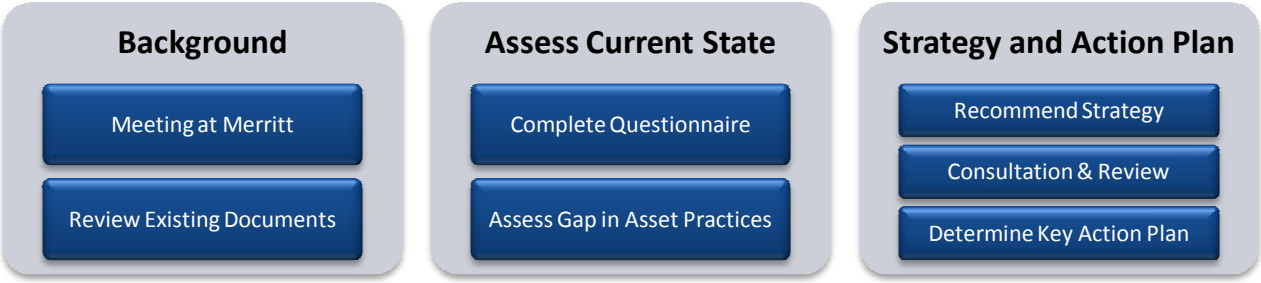
A summary of the current status of asset management within the City of Merritt was then compiled from the available data (refer Table 2-1). The outcome from this phase was then compared to the minimum requirements for a basic level of asset management practice (refer Figure 2-2).
The minimum requirements are those identified in the Asset Management BC Roadmap. A gap assessment was completed to identify the key areas for improvement in asset management practice (refer Section 3).

Following on from the gap assessment, a strategy customized for Merritt was developed (refer Section 4).

The outcomes were then reported to the City of Merritt for review. This provided opportunity for consultation and feedback to confirm findings and the appropriateness of the strategy going forward.

The outcomes from this consultation were then used to update the recommended strategy and create an initial asset management Action Plan (refer Section 5). The purpose of the Action Plan is to identify a number of key tasks that will assist the City to advance sustainable asset management.

The following diagram outlines the complete development process:



1.6 Document Organization

The Case Study Report has been structured into the following main sections:

- Section 1: Introduction, Development and Organization;
- Section 2: Status of Asset Management;
- Section 3: Gap Assessment Outcome;
- Section 4: Strategy Recommendations; and
- Section 5: Proposed Key Actions

2 Status of Asset Management

2.1 Review of Current Status

The City of Merritt has categorized their municipal infrastructure into seven asset groups which are listed in the introduction to this report.

It is likely that future versions of this document will incorporate individual detail for each asset group and may expand to include other groups or asset types within key groups. However for this initial review, the status of asset management practice has been completed as a high-level assessment across all asset groups, reporting average outcomes.

Table 2-1 below provides a summary of the City's current status of asset management practice.

Table 2-1 : Asset Management Status March 2011

Asset Group : All Assets (high-level assessment on overall status)		
AM Practice Area	**Current Status**	**AM Ranking**
Asset Inventory: Know Your Asset	The City has asset inventory for key asset groups, with **80%** completeness and **50%** accuracy. There are some asset groups that information is still required for and some data gaps however most of these data issues are known and a program for resolving the most significant data gaps has been identified. Most data is available electronically in GIS however several excel spreadsheets exist and are maintained separately.	Basic +
Financial Data: Know your Financial Position	Historical asset costs are recorded however current replacement costs are unknown. Operation and maintenance costs are known but only as combined values. Operational costs not separately recorded from maintenance and repair costs. Cost records also do not identify which specific asset or component they relate to. Therefore at this time, O&M costs cannot be used for condition tracking, deterioration modeling or to inform decisions regarding the optimal time for intervention. Initial long-term financial forecast and funding needs are understood at a basic level.	Basic

Asset Group : All Assets (high-level assessment on overall status)		
AM Practice Area	**Current Status**	**AM Ranking**
Financial Data: Know your Financial Position (continued)	The amount of revenue and revenue sources as well as funding sources is known. Details of potential revenue, funding policy, and funding constraints are unknown. Expenditure details, work history and activity records are available electronically however no distinction is made between maintenance costs and operational costs. Future operations and maintenance cost forecasts have not been developed beyond budgeting for immediate to short term needs in 2010 – 2014 Financial Plan. Financial performance is recorded using financial records.	Basic
Accountability: Understand Decision-making	Details of who the decision-makers are and how decisions are made are known but no formal process is documented. The number of FTEs required, roles and responsibilities, and work contracted out in relation to infrastructure assets have not been documented but could be provided. No formal information regarding external stakeholders is documented. However it is likely that key personnel could readily identify who these might be as and when any need arises to consult stakeholders. Services and products provided by suppliers are known and a Purchasing Policy exists that provides the procurement basis for those suppliers.	Basic *(but needs documentation)*
Stewardship: Manage your Asset Lifecycle	Information on the existing condition of assets is unknown with the exception of the sanitary sewer system which has been videoed. The use of condition data for modeling asset deterioration over time and improving predictions of remaining asset life for planning replacements and maintenance strategies is yet to be developed. Similarly, technical and operational levels of service are unknown. Therefore performance levels are also not currently tracked or measured in regard to level of service. There is however some compliance monitoring requirements for specific asset groups such as water quality. The City does have Master Studies relating to water and storm	Improvement Needed

Asset Group : All Assets (high-level assessment on overall status)		
AM Practice Area	**Current Status**	**AM Ranking**
	sewers. Merritt's Integrated Growth Strategy identifies the need for other Master Plans for assets such as sanitary sewers, transportation and parks and recreation. Furthermore, the City's 2010-2014 Financial Plan budgets for the development of such Master Plans. The identification and management of risk in relation to infrastructure asset groups is not currently known and is not recorded in an integrated system that would allow comparison across asset groups.	
Governance: Know the Rules	A comprehensive list of relevant legislation and regulation is not documented and therefore it is not known if compliance with all regulations has been achieved. Specific rules and guidelines for some asset groups are documented such as Guidelines for Drinking Water Quality, International Health Standards and the National Guide to Sustainable Infrastructure. Policy documents related to assets exist as do organizational goals and objectives relating to infrastructure. These are noted in the Official Community Plan. In addition an Asset Management Policy and an Asset Management Procedure exist. A management structure exists and roles and responsibilities are assigned. Details of health and safety issues and related management procedures are unknown.	Basic *(but needs documentation)*
Achieve Sustainability: Long-term Planning	Long-term forecast for operation and maintenance is not available. A strategy in support of long term sustainability or a review process for updating financial forecasts and policies does not exist. Currently there is no formal strategy documented for the specific monitoring and assessment of financial performance in regard to long-term sustainable practice.	Improvement Needed

Description of Rankings for Status of Asset Management:

Ranking	Description
Improvement Needed	Asset management practices below basic level or non-existent.
Basic	Asset management practices meet minimum requirements for basic level asset management
Intermediate	Asset management practices meet minimum requirements for intermediate level asset management
Advanced	Asset management practices meet or exceed minimum requirements for advanced level asset management

Refer to the Roadmap for detailed descriptions of each level of asset management practice.

2.2 Comparison of Current Status

The diagram on the following page provides a comparison between the current state of Asset Management at Merritt and the AMBC Roadmap.

- The green colored ticks indicate asset management practices that have been actioned and are at or near a compliance level for basic asset management.
- The orange colored ticks indicate asset management practice areas where some work is complete but additional work is required to achieve basic level asset management.
- The remaining unmarked modules are asset management practice areas that have yet to be implemented or evaluated.

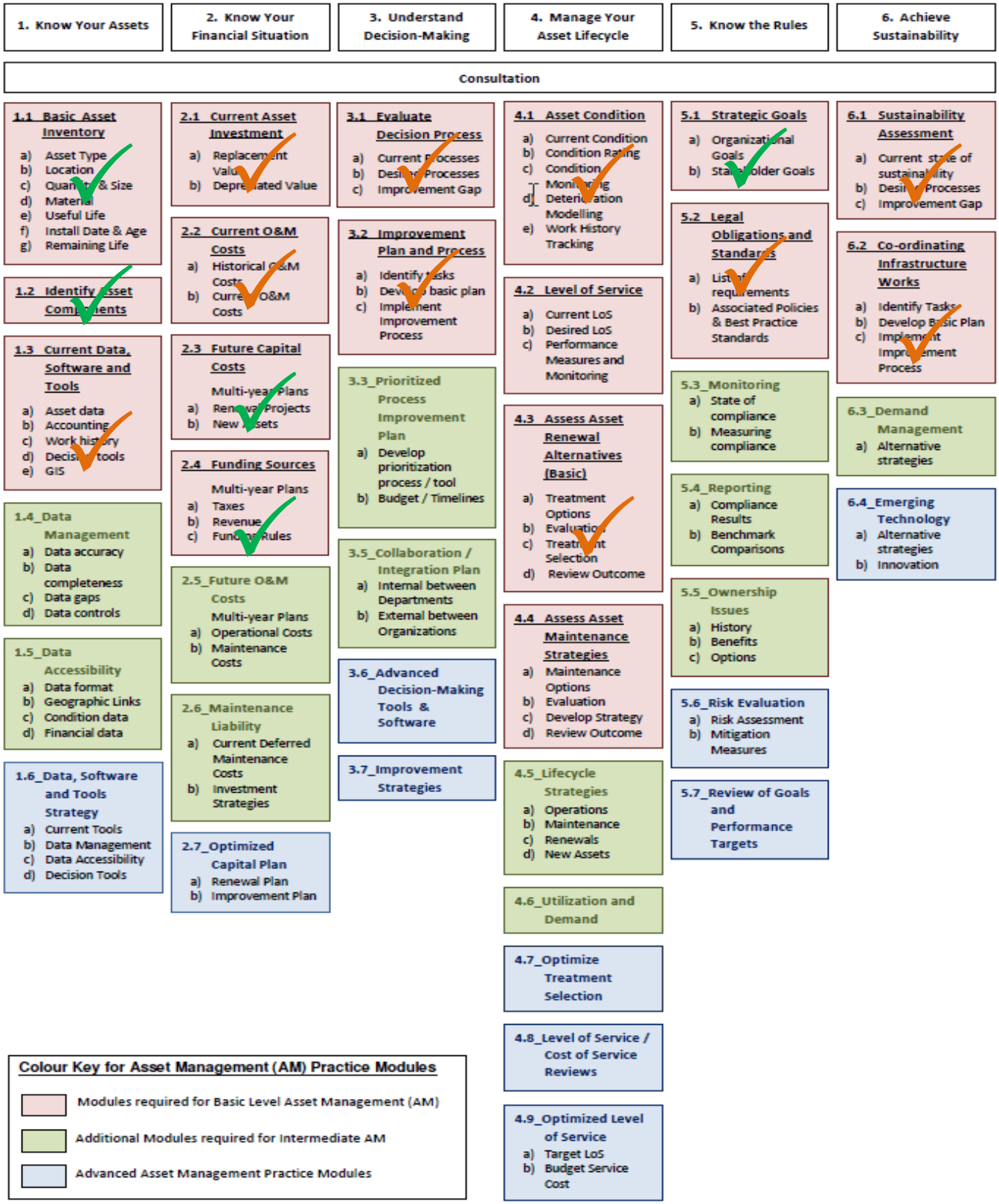


Figure 2-2 : Current Status compared to Asset Management BC Roadmap

3 Gap Assessment Outcome

3.1 Know Your Assets

The City has a reasonably good level of asset knowledge for key asset groups with 80% completeness. However the accuracy is only deemed to be 50% therefore confidence in using the data for decision-making would be low. Also, there are a number of asset groups that have very little documented information, although these are generally assets of lower priority and lower financial significance.

Asset Inventory data is critical for asset management. Compilation of an electronic inventory for each asset group creates a starting point which can be improved upon over time. This is true even if you only have data to support a relatively generic high-level listing and quantification of the assets. It is necessary therefore to ensure that at least a minimum level of asset inventory information exists for every group of assets of the same type. The tables below (Table 3-1 and Table 3-2) provide an assessment of the current gap between existing information and minimum requirements for basic level asset management.

Table 3-1 : Status of Asset Information March 2011 (Non Transportation Assets)

Asset Group	Asset Type	Location	Qty & Size	Material	Useful Life	Install Date	Rem Life
Sewer	Pipes						
	Manholes						
	PS Equipment						
Water	Pipes						
	Manholes						
	Fire Hydrants						
	Valves						
	PS Equipment						
Storm	Pipes						
	Manholes						
	PS Equipment						

Colour Key:	Accuracy	High	Medium	Low
Completeness	High			
	Medium			
	Low			

Table 3-2 : Status of Asset Information March 2011 (Transportation Assets)

Asset Group	Asset Type	Location	Qty & Size	Material	Useful Life	Install Date	Rem Life
Transport	Road Surface						
	Basecourse						
	SubBase						
	Bridges						
	Signs						
	Curbs						
	Catchpits						
	Barriers						
	Islands						
	Medians						
Parks							
Facilities							

The City has GIS data for most of the key asset groups and they have additional inventory information in spreadsheets.

The inventory details currently available need improvement to increase confidence. Using the current data for decision-making and future cost forecasts should take accuracy into account. It is not necessary however, to have detailed information on all asset groups, nor is it essential to have all attributes known with certainty.

The City is confident that they are aware of their data gaps and they already have a program for resolving the most significant data gaps.

3.2 Know Your Financial Position

The City of Merritt has completed PSAB 3150 reporting for Tangible Capital Assets and therefore has a good understanding of their financial position in terms of Historical values. However the current replacement value for assets is not recorded. Future forecasts with respect to capital renewal and new assets for most asset groups have been calculated for planning and budget purposes. These calculations however are high level, order of cost indications and more analysis will be required to improve confidence in these figures. None-the-less they do present an essential starting point.

There are some notable gaps in available information that need to be resolved for a more complete understanding of financial issues relating to the assets. The following table provides an indication of the status of documentation and knowledge regarding key financial elements:

Asset Group	Cost Element	Comment	Status
All Assets	Historic Value	*Financial records have historic values for PSAB TCA Reporting*	High
	Replacement Value	*Current replacement values are not recorded or readily available*	Low
	Depreciated value	*Not specifically detailed but could be calculated from available data*	Med
	Historic O&M	*Operation costs not separate from Maintenance costs*	Low
	Current O&M	*Operation costs not separated from Maintenance costs but totals for current budget are known as well as annual estimates to 2014*	Med
	Fwd Capital New Plan	*Information and budget estimates for some projects are identified and further details exist in asset group Master Plans but a long term forward plan for all asset groups is yet to be developed*	Med
	Fwd Renewal Plan	*This could be developed for main asset groups once current replacement values are known. Currently however there is not a formal long term forecast of likely asset replacement costs.*	Low
	Fwd Income Plan	*Financial records have income predictions but potential revenue may not have been explored. Analysis of asset deterioration relative to funding levels from IAMCP should be developed further to inform budget decisions and impact on performance and service levels.*	Med

The following gaps have been identified. Note that for most data issues it is not necessary to achieve 100% resolution of every gap for every asset group for a basic level of asset management practice. Some items can be scheduled for completion at a later date as part of an on-going improvement plan:

- Cost records for historical maintenance are combined with operational costs and they are not in a format that will allow analysis for the purpose of:
  - Identifying cost trends;
  - Indicating condition of assets;
  - Indicating rate of deterioration; or
  - Understanding the impact of cost fluctuations on funding needs.
- Work history and activity records do not currently:
  - Provide field verification of asset attributes;
  - Categorize the type of work undertaken or fault found;
  - Provide condition rating or comments for assets viewed on site;
  - Link to specific assets in the Asset Inventory;
  - Include or link to cost information; or
  - Produce an electronic record that could be linked to the GIS for mapping faults.

- Master studies have been completed for water and storm sewers and these are good asset management tools that move the City towards sustainable practice. However studies and master plans for other asset groups are yet to be developed. Also, issues relating to future operations and maintenance costs need more consideration. All future costs for new work, asset renewals and operations and maintenance must be known. These costs need to be considered together for an accurate understanding of the City's financial position now for the next 20 years; and
- Current and future funding needs are known at a basic level. However there is no evidence of a specific requirement on anyone to:
    - Actively explore funding options;
    - Determine details of potential revenue;
    - Define and document a funding policy specific to infrastructure assets; and
    - Identify and document funding constraints for optimal asset management.

3.3 Decision-Making

It is generally understood within the City that relevant people are aware of who makes what decisions and how those decisions are made. However there is no formal documentation of decision processes. The organization is therefore vulnerable to changes in personnel which may cause a loss in the understanding of decision processes.

Consistency in decision-making cannot be demonstrated without at least a checklist of things to consider. It is preferable however to have a written procedure so that the process can be fully explained. The following table provides an indication of the status of documentation and knowledge regarding key decision-making and decision-control elements:

Asset Group	Process Element	Comment	Status
All Assets	Decision-makers	*General awareness of who makes what decisions but no documentation. However, job descriptions will include some details on roles and responsibilities.*	Med
	Decision Processes	*There is no formal documentation on the basis, procedure or tools used for various decisions. However it is expected that this information could be easily articulated by the personnel involved.*	Low
	Integration	*There is no evidence of any formal processes for integrated or collaborative decision-making across different departments.*	Low
	Management Structure	*It is expected that this would be readily available or easily produced. The City organization is not large nor complex therefore lines of communication and responsibility/accountability are well known.*	Med
	Accountability	*Roles and responsibilities of personnel involved in managing assets are well known and documented in job descriptions. Identifying and assigning the best person to be accountable for each decision, when these decision processes are documented, will not be difficult.*	Med
	Procurement Policy	*A purchasing policy exists.*	High

There are a number of gaps in documentation and understanding of decision processes within the organization. The current status is not an issue with existing staff. However, because there are no documented decision processes, vulnerability exists should staff change or the City be challenged on its decision-making.

Decision outcomes are not easily audited, verified or able to be defended unless they have a documented process. In association with documenting the decision processes, there are other gaps that need improvement. These include:

- Clarification in recorded information generally;
- Formal list of who is accountable for what decisions;
- Whether any cross department collaboration should occur; and
- Details of functional relationships within the organization relating to decision making.

3.4 Manage Your Asset Lifecycle

The following table provides an indication of the status of documentation and knowledge regarding three main elements of asset lifecycle management:

Asset Group	Lifecycle Element	Comment	Status
All Assets	Levels of Service	*Anecdotally, levels of service can be defined by various operation and maintenance tasks, however, there does not exist any definitive statement or measure of the current level of service.*	Low
	Performance Measures and Monitoring	*As levels of service are undefined, related performance measures are also undefined. However, some compliance monitoring is done and recorded which provides an indication of performance for a few asset groups.*	Med
	Condition	*There is some condition monitoring of some assets occurring, such as sewer videoing. However, improvements in regard to structured programs, approved rating systems, analysis and outcome reporting etc are desired.*	Med

There are a number of gaps as indicated in the table above. The most critical gap is the lack of adequate definition of what level of service is being provided. Without a definition of the service being provided, it is difficult to identify opportunities for efficiency and cost reduction.

The resolution of gaps relating to definition of performance measures can only occur after levels of service are clearly defined.

The third gap however, relating to improving condition monitoring, documentation, analysis and reporting can and should be actioned as soon as practicable.

3.5 Know the Rules

The City staff involved with managing the assets is familiar with all the rules and regulations relating to the assets and activities. However there is no collated list of these references. Therefore vulnerability exists should current staff change. The City will be heavily reliant on the knowledge of new staff. Also, without suitable documentation, there is limited ability to audit and verify that all compliance matters are being adequately dealt with. The following table provides an indication of the status of documentation and knowledge regarding rules associated with management of assets:

Asset Group	Process Element	Comment	Status
All Assets	Legislation, regulation, guidelines, policy etc	*Operation and technical staff have a good understanding of the legal parameters governing asset activities. They are also aware of City policy, industry guidelines and organizational goals. However, references to this information have not been collated into a check list or document that could be used to ensure all compliance matters are being appropriately dealt with and attended to.*	Med
	Compliance Monitoring	*Some compliance monitoring is done and recorded. However until a comprehensive reference list of requirements is documented it will be difficult to verify if all necessary compliance is being completed. Also, there is no evidence that any formal procedures are documented for managing non-compliance issues.*	Med
	Stakeholders	*No formal information exists regarding who are stakeholders for the various asset groups and what their goals and expectations are. However, it is expected that details could readily be provided by existing key staff who are familiar with the stakeholders and what their areas of interest are.*	Med

The City's organizational goals are stated in corporate documents and known by relevant staff.

Stakeholder information is not documented and consultation is generally only on a case by case basis if and when a need to consult is identified.

The improvement gap relating to knowing the rules that the assets must be managed within, consists primarily of:

- Documentation of legislation and standards relating to the assets;
- Defining the requirements for monitoring; and
- Documenting the goals and objectives of relevant external stakeholder groups.

3.6 Sustainability

The City of Merritt does not currently have formal strategies relating to how infrastructure is to be managed to achieve sustainability of services.

The following table provides an indication of the status of documentation and knowledge regarding sustainability elements for asset management practice:

Asset Group	Process Element	Comment	Status
All Assets	Long Term Work and Cost Forecasts	*The City has some forward forecasts for new assets and renewal of aging assets. However, improvement is required especially with regard to realistic renewal forecasts and relating operations and maintenance forecasts to planned renewals and new asset construction.*	Med
	Asset Management Improvement Tasks	*This report includes an action plan for Asset Management Improvement Tasks. This is the first step and the process for reviewing the status of asset management practice and updating the improvement action plan should be repeated at least annually.*	High
	Strategies for Sustainability	*Some information in support of sustainable strategies for managing assets is included in the master studies. However, master studies need to be completed for other asset groups. Overall, more consideration of these issues is required.*	Med
	Financial Sustainability	*There is no strategy for monitoring and assessment of financial performance in a way that would measure if current practices are likely to be sustainable in the long term.*	Low

The primary gaps in the City's sustainable practices are therefore:

- That a procedure for collating all forecast costs together and reviewing these against revenue expectations for the purpose of assessing the sustainability of current practices does not currently exist. This assessment would be used to identify where changes in operations or levels of service should be considered prior to committing expenditure;
- Asset management gaps have been identified in this report, however a program and funding must be provided to implement the required actions. In addition to this there needs to be a commitment to review the status of asset management practices at least annually to update the improvement plan;
- There is improvement needed in the development of asset management strategies that support long term sustainability. Some currently exist but a holistic, coordinated approach is required; and
- There is no strategy or procedure in place to routinely assess whether current practices are likely to be financially sustainable.

4 Strategy Recommendations

4.1 Know Your Assets

Completion of data capture for key asset groups is in progress. The level of detail and the amount of cost to spend on asset inventory data should be relevant to the financial and operational significance of the assets. For low priority assets that are not financially significant, generic assumptions and estimates can be acceptable for implementing basic level asset management practice.

The data collection program should be reviewed against the indication that current asset inventory is only 50% accurate but is 80% complete for main asset groups. It is not recommended that significant money be spent on achieving 100% population of detail. But it is recommended that investigation and research be undertaken to improve the accuracy of the data. This can also be achieved by developing procedures (and implementing them), to record on-site details when maintenance work is being undertaken. These details can then be verified against the GIS and asset inventory records. A progressive improvement in the completeness and accuracy of asset data will occur therefore over time.

It is also clear that the City is using their corporate GIS to consolidate inventory data and this is commended as an appropriate course of action. A recommendation to further support this is to undertake a review of data sets within the organization. Use this review to identify overlaps in data and redundant databases. Following this, develop a strategy for long-term data management, data maintenance and data control.

4.2 Know Your Financial Position

Understanding the City's long term financial position is a pre-requisite to identifying how to optimize asset costs. Asset costs need to include all costs over the life of the asset. These are installation costs, operation expenses, maintenance costs and renewal or disposal costs.

Many long term financial plans are based only on capital works (new assets and replacing assets). Operations and maintenance costs are often grouped together and budgeted as a linear progression based on current needs. The complete picture of financial relationships between capital and operational budgets is not easily understood in such circumstances. It is important that forward funding and expense plans are incorporated into one overall plan that includes a realistic forecast of operations and maintenance costs.

Relationships between capital and operational budgets need to be visible in financial planning. These relationships include events such as:

- An increase in expenditure on preventative maintenance may reduce future renewal costs;
- A reduction in maintenance budgets may increase renewal projects because of shorter asset life spans; and

- Expenditure on new assets can impact operational costs and will increase future maintenance costs.

It is recommended that the City develop an integrated forward work plan. This plan must combine Capital Works (new and renewal) with Operations and Maintenance cost predictions.

It is also important that the City implements procedures to track maintenance costs separately from operational costs. This will involve changes to cost structures and charge codes. Ideally maintenance costs should also link to specific assets and be categorized by fault types. Change will therefore be required in the procedure for recording maintenance work. Implementation of these changes should not be onerous and consultation between all parties on the reason for the change is recommended.

It is quite urgent that some procedure to track maintenance costs by work type and by asset is implemented as soon as possible. Every task generates potential information that can be used for better decision making. And every day that passes without a system to capture this information is a lost opportunity.

It would be useful to have work history records available electronically provided they can be:

- Linked to a specific asset or assets;
- Categorized by work or fault type; and
- Linked to the total actual cost.

Other recommendations are to explore regular and innovative funding options, determine details of potential revenue, develop funding policies, and identify any funding constraints. Use this information to develop mitigation measures to maintain adequate funding levels. This will reduce the risk of increased maintenance backlog, poor asset performance or loss of service quality.

4.3 Decision-Making

Identifying and documenting decision-making processes, is an excellent way of clearly seeing where improvements can be made to the decision process.

Long-term sustainability is driven by decisions made today. For many assets there is a long period between today's decisions and seeing the eventual impact or consequence of that decision.

Good decision-making relies on the quality of people making the decision, the quality and completeness of the information that they have to base their decision on and the robustness and repeatability of the decision-making process that they use. For this reason we recommend that the City, as a matter of high importance, undertakes to document its key decision processes. It is not necessary to document every process that takes place. However, if you want to demonstrate consistency, transparency and accountability for any decision process it should be analyzed and formally documented.

To start, we recommend selecting just 4 or 5 of the main decisions that have a large financial impact such as:

1. Forward Work Programs – Who proposes the projects? Who decides the timing of when new assets will be built and old assets replaced?
2. Operations and Maintenance Budget – Who proposes this budget? What is it based on? Who approves it? (this can include several layers of approval) Who is accountable for the outcomes?
3. Who decides when to repair an asset and when to replace? Are there different people for different circumstances?
4. Who are the decision-makers regarding what treatment method is used on a particular asset?

After these initial decision processes have been documented, work should continue to progressively document other decision processes. These can be completed as part of an on-going improvement program. Only the decisions with a high impact need to be completed to attain the basic level of asset management practice.

An understanding of internal functional relationships will help with identifying accountability for decisions and checking if the right people are being tasked with making those decisions. It is recommended therefore that the functional relationships within the organization (as they relate to decision making), be reviewed and documented.

4.4 Manage Your Asset Lifecycle

A key part of managing assets throughout their lifecycle, is understanding what level of service is to be provided by those assets and what is the cost to provide that service. Once known, improvement strategies can be developed and implemented and the relationship between level of service and cost of service can be optimized.

Understanding the level of service and cost of service relationship is critical to the City providing services that are:

- Effective and aligned with community expectations, wants, and needs;
- Affordable and sustainable for the long term; and
- At the least whole of life cost.

The City does not have clearly defined level of service statements and it is recommended that this be undertaken. The first step is to define what is currently being provided. Later consideration can be given to desired level of service and what actions may be required to move from current to desired. However the starting point is to define current service being provided.

This will involve defining the following elements that comprise a measure of level of service:

- Quantity;
- Location;
- Availability; and
- Quality of Service.

The measure of quality of service needs to include consideration of legislative requirements and organizational goals as well as criteria relevant to each particular asset group. All criteria used to define the quality of service must be able to be measured so that performance achievements can be reported and tracked over time. Condition rating is one excellent indicator of quality of service therefore a formal system to rate the condition of assets should be implemented. Once existing levels of service are known, the cost of service can be determined. It is important to understand the relevant level of service/cost of service relationship to ensure that the current level of service being provided is affordable and sustainable long term.

Once the current level of service is documented, an assessment should be made of what performance measures could be used to monitor if the level of service being provided meets the necessary standard.

Condition data is extremely useful for many aspects of asset management, including but not limited to levels of service. Condition monitoring also provides a measure of asset deterioration and assists in estimating remaining life and decisions on treatment options and timing. However not all condition monitoring provides sufficient benefit relative to the cost to capture this information. It is recommended therefore that before any large scale projects for condition assessments are undertaken, that a strategy (and a prioritized schedule for capture and recording condition data) is developed. This strategy will balance the cost of various condition monitoring options against the use and benefit of that information. If the knowledge of asset condition will not have a significant benefit to decision-makers or prediction of future work needs then it should be a low priority on the schedule of condition data tasks.

At the basic level of asset management practice it is not necessary to have condition data for all assets. Focus should be on major assets and assets nearing the end of their expected life.

All condition data should be available electronically. Paper records are very difficult to analyze or to use for prediction assessments and therefore are of low benefit until they are available electronically.

4.5 Know the Rules

To demonstrate good governance, it is necessary to identify all applicable legislation and standards relating to the assets and show that these are being complied with or if not complied with, then what remedial action is being taken. Records should also exist in regard to what the

City's (and stakeholders of the assets) goals and objectives are for the assets. There should also be some means of tracking and reporting performance against these goals.

Organizational goals and objectives set the direction that the City wishes to take and what it intends to achieve. Having clear goals and objectives (both within the organization and of external stakeholders) provides focus and ensures that asset management practices work toward achievement of the desired outcomes for the City.

The recommended areas for improvement relative to what the City already has in place include improved documentation relating to:

- Legislative requirements, standards, policies, industry guidelines and all associated 'rules' that relate to the assets;
- Compliance monitoring and reporting procedures; and
- Information about expectations of external stakeholder groups.

Improved knowledge of stakeholder expectations is of lower importance to the documentation of key legislative requirements. However some understanding of stakeholder expectations is required even for a basic level of asset management practice. It is recommended that some actions are completed to improve current understanding.

4.6 Sustainability

The ultimate goal of implementing asset management practices is long term sustainability. This includes financial, environmental and social sustainability. Some specific asset management practices that will greatly assist sustainability include:

- Undertaking sustainability assessments;
- Long term financial forecasting;
- Deterioration modeling;
- Assessment of asset remaining lives;
- Program co-ordination;
- Staying informed with respect to future demand; and
- Reviewing emerging technologies that may be useful and cost effective.

It is recommended that the City considers development of a sustainability strategy. There are a number of initiatives and asset management practices that could greatly assist the City to advance towards sustainability. These improvement areas include:

- Collating all forecast costs and reviewing these against revenue expectations to:
  - Assess the sustainability of current practices; and
  - Identify where changes in operations or levels of service should be considered prior to committing expenditure.
- Ensuring that the improvement action plan identified in this report is implemented;

- Ensuring that a review of the status of asset management practices occurs at least annually to update the improvement action plan;
- Using a holistic, coordinated approach (across the whole organization), to develop asset management strategies that support long term sustainability; and
- Establishing a procedure for routinely assessing whether current practices are likely to be financially sustainable.

5 Proposed Key Actions

5.1 Know Your Assets

1. Continue program for completing asset inventory data;
2. Develop and implement procedures to record on-site inventory and condition details when maintenance work is being undertaken;
3. Develop procedures for verifying field information against GIS inventory data and updating records. Document procedure;
4. Review data sets within the organization. Identify overlaps in data and redundant databases; and
5. Develop a strategy for long-term data management, data maintenance and data control.

5.2 Know Your Financial Position

1. Review and extend current (2010 – 2014) Operations and Maintenance forward plan. Take into consideration new assets and asset replacements indicated in Capital Works Plans and Master Plans, and the impact these will have on maintenance and operations. Take into account also, the relationships and trade-offs between maintenance expenditure and requirement for renewals;
2. Develop an Integrated Forward Work Plan (IFWP) that combines the Operation and Maintenance Plan (refer above) with predicted capital costs for Asset Renewals and New Assets;
3. Determine historical operations and maintenance costs if possible in order to establish cost trends. Any information, even just totals per annum over the past 5 to 10 year period would provide some understanding of how costs have changed over time;
4. Implement procedure(s) by which operation costs can be tracked separately from maintenance costs for each component in order to better establish cost trends and predict future costs;
5. Implement systems, forms and procedure to enable work history and activity records to:
    - Be linked to specific assets that they relate to;
    - Record field verification of key attributes for updating the inventory;
    - Record some comment or rating for condition of assets viewed in the field;
    - Record the type of fault being repaired or work being auctioned;
    - Be linked to the cost for the work completed; and
    - Be recorded and available in electronic format.

6. Assign an action on someone to explore regular and innovative funding options and determine details of potential revenue, funding policy required, and any funding constraints. Report on the outcomes of this research and use the information to develop mitigation measures to prevent insufficient funding that could cause maintenance deferrals and poor asset performance or loss of service quality.

5.3 Decision-Making

Completion of the following decision-making tasks will improve the consistency and robustness of decisions made by the City:

1. Document the current decision processes. The documentation should include:

    - Details of who the decision-makers are (role, or position in organization);
    - Details of what data is considered and whether any analysis results are used to support the decision;
    - Details of how the decision is made;
    - Details of who is formally accountable for the decision outcomes;
    - Details of what cross department collaboration may be required; and
    - Details of functional relationships within the organization relating to the decision;

2. Establish a functional relationship and accountability chart. This would augment the organizational chart and show in detail:

    - The position roles or personnel who make the decisions;
    - The position roles that are responsible or accountable for the decisions;
    - Line reporting (management structure) relating to decision-making;
    - Line reporting relating to managing and planning for the assets; and
    - Line reporting relating to operating and maintaining the assets.

5.4 Manage Your Asset Lifecycle

The following tasks are recommended to improve management of assets throughout their lifecycle:

1. Define and document the current level of service being provided. At a later date consideration can be given to what the desired level of service might be and what changes would need to occur. However the starting point needs to be to define what service is being provided now and then to link this to the cost for providing that level of service;

2. Develop and implement a Condition Monitoring Strategy. This strategy should consider the relative benefit of the condition data compared to the cost of capturing that data and prioritize the condition programs accordingly; and

3. Define, document and implement performance monitoring appropriate to the defined levels of service.

5.5 Know the Rules

1. Identify and documentation a reference list or check list of rules relating to the assets. This check list should include:

    - Legislative requirements;
    - City Policies; and
    - Industry standards and guidelines.

2. Define and document the requirements for monitoring legislative compliance; and

3. Improve documented records of stakeholder interests and consultation including:

    - List who the internal and external stakeholders are for each asset group, and record their contact information;
    - Document what their interest is and what their goals are relevant to the assets; and
    - Develop, document and implement procedures for planned stakeholder consultation relating to goals, level of service targets and whenever decisions regarding assets may significantly affect them.

5.6 Sustainability

1. At least annually, collate all forecast costs and review these against revenue expectations to:

    - Assess the sustainability of current practices; and
    - Identify where changes in operations or levels of service should be considered prior to committing expenditure.

2. Implement the improvement action plan identified in this report;

3. Establish a procedure to annually review the status of asset management practices and update the improvement action plan;

4. Develop asset management strategies that support long term sustainability; and

5. Establish a procedure for:

    - Routinely assessing whether current practices are likely to be financially sustainable; and
    - Amending and updating financial forecasts, policies and asset management practices as necessary to achieve sustainability.

Owner's Management Checklist Tables

A. Know Your Asset Checklist

No.	Attribute	Known	Reference / File Name / Location
	Asset Inventory Data		
1.	List of Asset Components	Y / N	
2.	Essential attribute details for each component		
	a) Type of component	Y / N	
	b) Size, volume or key dimensions	Y / N	
	c) Material or type of construction	Y / N	not for all but for the most part.
	d) Lifespan expected for asset	Y / N	best guess.
	e) Install Date or current age	Y / N	
	f) Location details / description	Y / N	
3.	Completeness and accuracy of inventory records.		
	a) The details recorded in the asset inventory are accurate	Y / N	50% are accurate
	b) The details recorded in the asset inventory are complete	Y / N	80% are complete
	c) Details of what asset inventory information is missing has been assessed (knowledge gap)	Y / N	some gaps identified
	d) An approved program and funding exist to resolve any missing data (knowledge gaps)	Y / N	
4.	Plan records (hardcopy or GIS) showing location of all infrastructure and features	Y / N	

Owner's Management Checklist
Sustainable Infrastructure Asset Management

5.	Condition (note other details on method for measuring condition and condition standards are listed in the "Activity / Service" table).		
	a) Existing condition	Y / N	except sanitary sewer videoed
	b) Details of condition rating system	Y / N	
	c) Remaining economic life	Y / N	guessed installment date and lifespan
6.	Value of all infrastructure		
	a) Details of current day estimated replacement cost for each component of infrastructure	Y / N	
	b) Details of historical value of infrastructure at time of installation / construction and date applicable	Y / N	fairly good. current value pro-rated backwards.
	c) Details of land value	Y / N	right of ways.
7.	Details of systems and tools used for data management and record keeping in relation to management of the infrastructure and associated activities or services provided.		
	a) An asset inventory system detailing infrastructure components and key attributes is available in electronic format	Y / N	
	b) Infrastructure details are available on GIS	Y / N	excel spreadsheets not linked to GIS.
	c) The condition ratings of infrastructure components are recorded electronically	Y / N	

B. Lifecycle Plan Checklist

No.	Attribute	Known	Reference / File Name / Location
	Activity Data		
1.	Details of all legislation and regulations that impact on or relate in any way to the infrastructure (assets and components), land , activities or services provided		
	a) Details of all relevant legislation and regulations.	Y / N	
	b) Details of state of compliance relative to legal obligations	Y / N	
	c) Details of methods of measuring and recording compliance	Y / N	
2.	Details of all standards, guidelines and general requirements that impact on or relate in any way to the infrastructure (assets and components), land, activities or services provided.		
	a) Details of all relevant standards, guidelines or requirements	Y / N	Details of a few (ex. National Infraguide).
	b) Details of any compliance monitoring or performance measurement relating to any standards or requirements	Y / N	
3.	Details of what is being provided to whom – Levels of Service and related Performance.		
	a) Details of current levels of service	Y / N	
	b) Details of any compliance monitoring or performance measurement relating to current levels of service	Y / N	

Owner's Management Checklist
Sustainable Infrastructure Asset Management

4.	Details on utilization and demand		
	a) Details of the current level of utilization compared to design	Y / N	except water and storm sewer master plan.
	b) Details of design capacity	Y / N	
	c) Details of current understanding of demand for activity or use of asset components	Y / N	
	d) Analysis of future demand	Y / N	
5.	Details of risk assessment and management relating to the infrastructure and activity		
	a) Details of risk assessments relating to the infrastructure and activity	Y / N	
	b) Details of mitigation measures	Y / N	
6.	Details of health and safety issues relating to the infrastructure and activity.		
	a) Details of health and safety issues	Y / N	
	b) Details of health and safety management procedures	Y / N	

Owner's Management Checklist
Sustainable Infrastructure Asset Management

No.	Attribute	Known	Reference / File Name / Location
	Financial Data		
7.	Historical Operations and Maintenance costs for all Infrastructure.		
	a) Details of actual operations and maintenance expenditure for previous 5 years or more available as a total for activity	Y / N	Financial Records.
	b) Details of actual operations and maintenance expenditure for previous 5 years or more is available as a total per asset component	Y / N	
	c) Details of historical operational expense and maintenance expense are able to be reported separately	Y / N	
8.	Current Operations and Maintenance costs for all Infrastructure.		
	a) Details of current operational expense and maintenance expense are recorded	Y / N	Financial Records
	b) Details of current operational expense and maintenance expense are able to be reported separately	Y / N	
	c) Current expenditure is sufficient to maintain the asset components without generating deferred maintenance	Y / N	

9.	Details of any revenue applicable to activity or infrastructure.		
	a) Details of the amount of revenue and source	Y / N	
	b) Details of potential revenue	Y / N	
10.	Details of funding sources applicable to activity or infrastructure.		
	a) Details of funding source for operations expense	Y / N	Financial Records.
	b) Details of funding source for maintenance expense	Y / N	Financial Records.
	c) Details of funding source for asset renewals/replacements	Y / N	Except yes for taxes.
	d) Details of funding source for capital works (new assets and improvement upgrades)	Y / N	
	e) Details of any pre-approved budgets or cost predictions for future works	Y / N	Master Plan would be done to address this.
11.	Details of systems and tools used for data management and record keeping in relation to management of the infrastructure and associated activities or services provided.		
	a) Expenditure details are available electronically	Y / N	
	b) Work history, activity records are available electronically	Y / N	
	c) Details of any other tools and systems used in management of the infrastructure or activity	Y / N	

C. Governance Checklist

No.	Attribute	Known	Reference / File Name / Location
1.	Details of Stakeholders (interested parties, organizations, groups, community)		
	a) List all stakeholders with an interest in the assets, components, land, activity or services provided.	Y / N	Could be generated.
	b) Detail the scope of interest of each stakeholder group	Y / N	could be generated
	c) Detail the contact or liaison person for each stakeholder group	Y / N	could be generated.
2.	Details of all corporate policy documents that impact on or relate in any way to the infrastructure, land, activities or services provided.		
	a) Policy documents governing assets, activity or services	Y / N	listed in official Community Plan. (OCP).
	b) Policy documents governing the land	Y / N	zoning in OCP
	c) Policy documents governing expenditure and funding	Y / N	
	d) Policy documents governing procurement	Y / N	
	e) Details of any other relevant policy documents	Y / N	
3.	Details of the organizational goals and objectives relating to the infrastructure and service provided	Y / N	

Owner's Management Checklist
Sustainable Infrastructure Asset Management

4.	Details of management structure relating to the asset		
	a) Details of management structure, personnel and line reporting within corporation relevant to the assets	Y / N	
	b) Details of who are the decision-makers	Y/N	
5.	Resources relating to the asset		
	a) Details of number of FTEs required for operation and management of assets	Y / N	however # is insufficient
	b) Details of roles and responsibilities of relevant personnel in management structure for assets	Y / N	job title/description.
	c) Details of any work that is contracted out and reasons why	Y / N	could be provided.
6.	Suppliers for key products and services relating to the assets		
	a) Details of suppliers and what services or products they provide.	Y / N	could be provided.
	b) Details of procurement basis for key suppliers	Y / N	purchasing policy.

D. Sustainability / Forward Planning Checklist

No.	Attribute	Known	Reference / File Name / Location
1.	Forecasts for predictions of cost and timing of future works relating to the assets		
	a) Future Operations and Maintenance expense has been predicted for a minimum of 10 years or more	Y / N	
	b) Future capital expense has been predicted for a minimum of 10 years or more	Y / N	
	c) Future capital expense for renewals (replacing existing assets) and improvements (upgrades or new assets) can be separately reported	Y / N	
	d) Details of funding policy for each stage of asset lifecycle	Y / N	
	e) Details of funding constraints	Y / N	
2.	Details of monitoring, assessments and strategies to achieve sustainable management		
	a) Details of monitoring financial performance	Y / N	
	b) Details of review process for updating financial forecasts and policies to manage long term sustainability of assets	Y / N	
	c) Details of assessments completed to guide and support sustainable management	Y / N	
	d) Details of existing and required strategies in support of sustainable management	Y / N	

3.	Details of decision-making processes relating to the infrastructure and activity		
	a) Details of who makes what types of decisions relating to the infrastructure and activity	Y / N	
	b) Details of how decisions are made and any formal processes or tools that are used	Y / N	could be generated.
4.	Details of gap analysis and improvement plans in support of sustainable management		
	a) Details of asset management gap analysis	Y / N	
	b) List improvement tasks required to resolve gap in asset management information or processes	Y / N	
	c) Details of method of prioritizing improvement tasks	Y / N	