



Asset**WORKS** QUICK GUIDE

Asset Management 101

A Step by Step Asset Management Plan

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Bridges, roads, parks and even sewage and garbage management are things we all take for granted but greatly affect us when they are not working to the levels we have come to expect. We all rely on infrastructure assets to enjoy our quality of life regardless of whether those assets are managed at the municipal, county, state or federal levels.

There is no one-size-fits-all approach for agencies determining how to best manage their assets. Agencies vary in their level of asset management maturity, as well as funding, resources, and user demands on the infrastructure they are responsible for.

This guide attempts to provide a broad overview of the new discipline of Asset Management for local, state and federal agencies. It will cover what Asset Management is and why we need it, best practices for building your own asset management plan, and includes a list of resources to help you learn more.



The Need for Asset Management

Due to tight budgets, recessions and other priorities, asset management professionals across North America are now facing some significant challenges due to aging infrastructure and lack of funding.

Asset managers in the **United States** are facing a crisis situation from the looming insolvency of the Highway Trust Fund—which provides most of the funding for transportation projects in the United States—with estimates that the fund will become bankrupt by summer 2014 due to declining revenues from the gas tax, unless other sources of revenue are found or mandated by Congress¹.

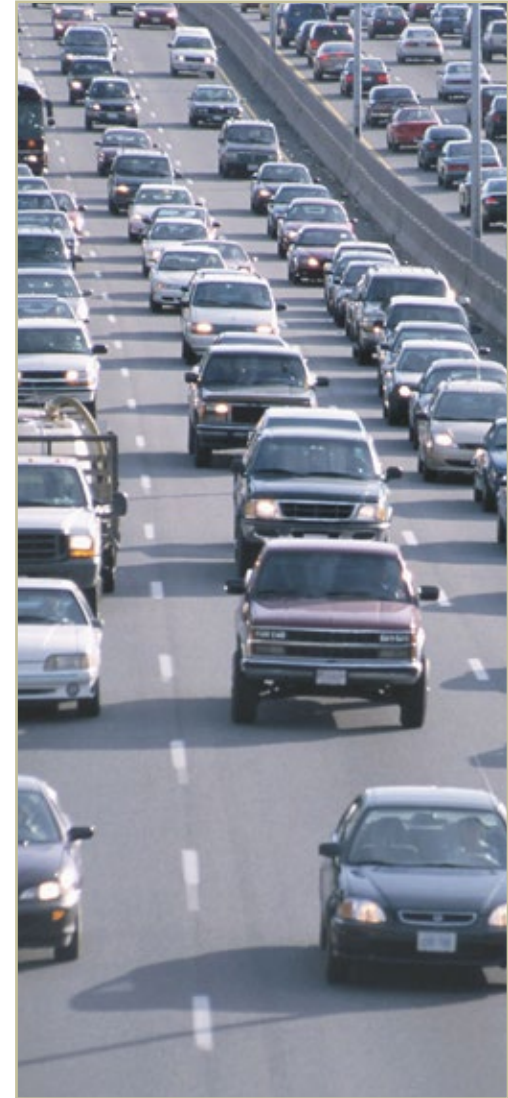
In **Canada**, as a result of significant investments in infrastructure in the 1950s and 1960s², many assets are now reaching the end of their maximum useful life. Much of the infrastructure is in a state of underinvestment due to funding cutbacks and has been deteriorating for some time.

Just as our quality of life has benefited from decisions made by past generations, the quality of life for future generations will be based on decisions that we make today. As the previous examples illustrate, if we continue down the path we are currently on, the quality of life for our children and grandchildren is at risk. However, **if we follow the principles of Asset Management, we can change the path we are on** and leave our children with a healthy infrastructure rather than a costly burden.

What is Asset Management?

If there is anything that we have learned from the current state of our infrastructure and the myriad of budget and funding issues we see today, it is that we need to get better at planning for the future. This is where the discipline of Asset Management comes in.

Asset Management can be defined in a variety of ways, but at its core it is a business plan for the services that city, county, state and federal organizations provide to their communities. In other words, we need to know what we've got, how much it costs to run it, at what standard of service and how do we repair and maintain it in a cost-effective manner going forwards for future generations? Asset Management provides the methodologies and tools to answer these questions.

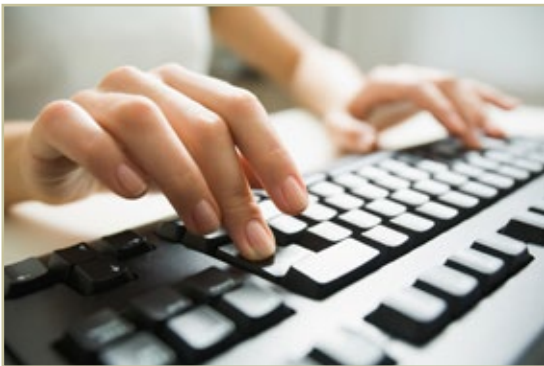


Next Steps

Asset Management Planning

A sset Management Planning will provide your agency with best practices for the operation and maintenance of assets so money can be used wisely in the future. A good plan sets out what you've got, what you need to do, how you're going to do it, and how much it will cost.

Be careful not to get too technical and detailed in your Asset Management plan. This can bog you down and derail your plan. Instead, focus on creating a high level analysis that sets out where you are now, what your options are for the future, and what you want to achieve in that future⁴.



Components of Asset Management

The International Infrastructure Management Manual outlines seven key components of Asset Management³:

- Life Cycle Approach
- Cost-Effective Management Strategies
- Defined Level of Service
- Demand Management
- Risk Management
- Sustainable Use of Physical Resources
- Continuous Improvement

Step 1

Completing an Asset Inventory

An asset inventory or register is your starting point and will become the basis of your Asset Management plan. You need to know what assets you have, where they are, what their value is, when they were built and how long their predicted lifespan is. An asset registry can be kept in Microsoft Excel, or within an Asset Management software system or other tool.

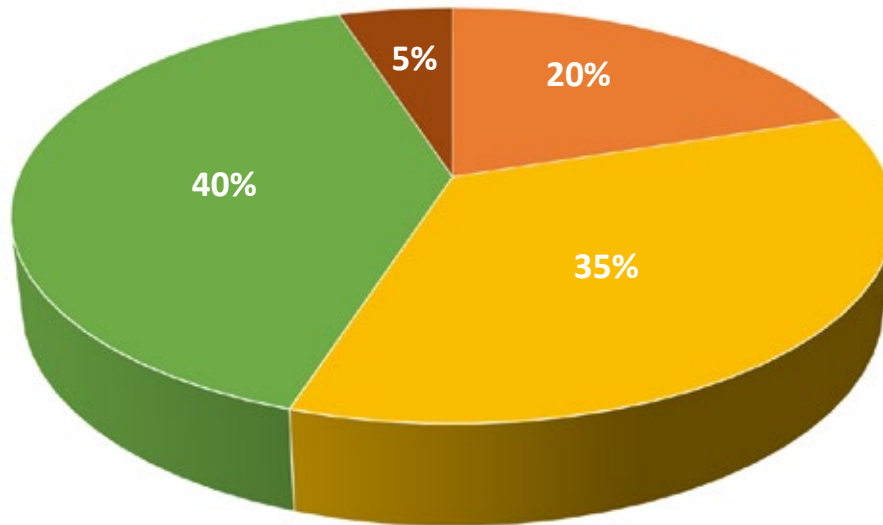
You'll also want to consider breaking down your asset register into segments and components for easier management. Segments group portions of an asset that would be replaced at the same time. Segments could be anything relevant to that asset, such as block-by-block for roads or manhole-to-manhole for a sewer. For example, a road might be separated into one block segments. Within that segment, there could be different components such as road surface, curb, gutter and sidewalk. Because a road surface and a sidewalk have different lifespans, it's helpful to consider them as separate components when planning renewal and repair options for the future.



Step 2

Understanding Capital Costs vs Life Cycle Costs

The capital cost of an asset is how much it costs to purchase or build it. In the past, the capital cost of an item may have been the only cost that was reflected in a budget. However, the initial cost of an asset typically only makes up 20% of its full life cycle cost, with the other 80% comprised of maintenance, operating and disposal costs⁵.



Asset Life Cycle Costs

- Initial Cost (20%)
- Maintenance Cost (35%)
- Operating Cost (40%)
- Disposal Cost (5%)

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Using a life cycle cost approach will give you a significantly different and more accurate budget than just considering the capital cost of an asset. This in turn leads to greater sustainability for the assets you are building as there are no surprise maintenance costs down the road that don't have funding allocated to them. The life cycle cost of an asset can be calculated from the time an asset is being considered until that asset is disposed of.

Life cycle costs can also be thought about as what it costs to provide or maintain a service. For example, what are the long term costs of a bridge that allows commuters to cross from one side of a river to the other? You would need to consider things like how often is that bridge going to need to be inspected for safety, how often will it need preventive maintenance and at what intervals over its life span, and if it will need to be expanded in the future due to increased traffic from projected population growth.

When calculating life cycle costs make sure to think about the following possible costs for each asset:

- Planning and design costs
- Capital costs
- Operating and maintenance costs
- Rehabilitation and renewal costs
- Disposal costs
- Financial management costs
- Condition and performance modeling costs
- Audit costs
- Review costs

Step 3

Setting Levels of Service

Life cycle costs are directly tied to the levels of service that are provided by an agency. In other words, how often something is used will have an impact on how long it lasts before needing renewal or replacement. Infrastructure only exists to provide services so the idea is to determine what you (or your users) want and then make sure the infrastructure supports those goals.

Determining a level of service for an asset is always a balancing act between the benefits that a higher level of services would provide and what that higher level of service costs versus what an acceptable lower level of service would cost. Simply put, what are you prepared to pay for the service?

You can use the levels of service to outline the overall quality, function, capacity and safety of the service being provided. The technical requirements of maintaining that service will dictate the operating, maintenance, and renewal activities that need to occur going forward.

In order to assess levels of service you need to consider:

- The level of service you are currently providing
- The annual cost of that service
- If the current level of service is expected to change
- If there is funding to support changes in expected levels of service
- If the current level of service is meeting the expectations of your users or community

Risk Management and Levels of Service

Levels of service can assume a different light when thought about in conjunction with risk management. In general, lower levels of service may generate higher levels of risk. In the case of a gravel road whose low level of service means that it develops the occasional pothole, the risk might be deemed acceptable. Conversely a bridge collapse or water treatment system failure due to low levels of service could be catastrophic. In this type of situation, a higher level of service is likely the more cost-effective alternative when compared against the enormous costs—both in terms of money and human life—generated when infrastructure fails.

Considering risk management can help to provide clear priorities when an agency is deciding how to allocate its budget and future spending.



Step 4

Applying Cost Effective Management Strategies

“In managing existing infrastructure, a great outcome is attained when the desired level of service in terms of the level of safety, physical condition, and capacity are provided reliably at the minimum life cycle cost,” explains Gordon Sparks, professor of civil engineering at the University of Saskatchewan. “[D]oing the right thing, at the right time, involves knowing and actually doing the most cost-effective maintenance, repair, rehabilitation or replacement activity at the right time throughout the entire life cycle of the asset”⁶.

Taking this approach is to practice cost-effective management strategies.

Applying cost-effective management strategies can provide very significant benefits, such as 20% to 40% reductions in life cycle costs⁷.

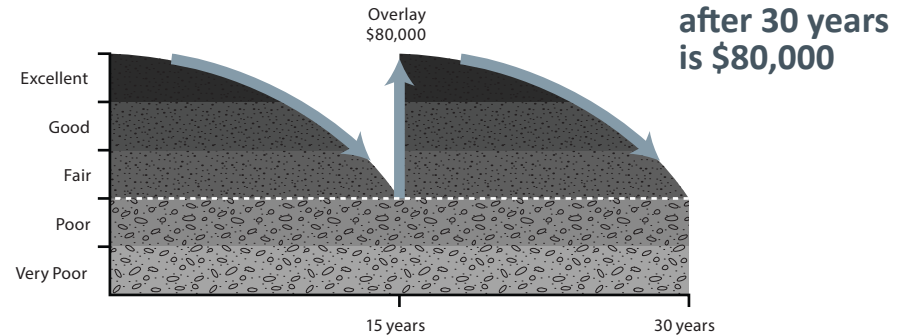
Maintenance, renewal and replacement efforts can be approached in two ways. The first way is a reactive approach or waiting until something is broken to fix it. This can be a common approach to asset management particularly when budgets are tight and funding is difficult to get. However, taking this approach may actually lead to more costs in the end.

“Applying cost-effective management strategies can provide very significant benefits, such as 20% to 40% reductions in life cycle costs”

For example, it costs twice as much to fix a 30-year old road that requires a full overlay than it costs to apply two surface treatments to that same road at the right intervals over its lifetime⁸. Both result in the same end—an older road that is still safe and usable—but the latter option represents a much better use of funds.

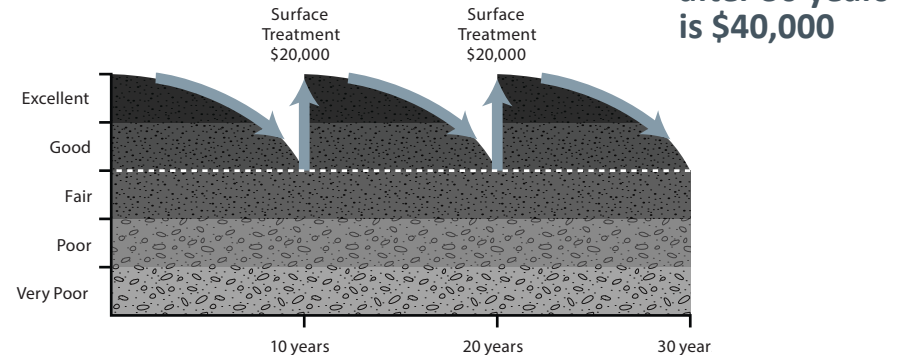
This approach of applying maintenance at the right time is a preventive or proactive approach and, to be effective, your Asset Management plan will need to be based on these cost-effective management principles.

Reactive Approach



Source: "Pavement Management: A Guide for Local Officials (Delaware) p. 2-16

Proactive Approach (Cost-Effective Management)



Source: "Pavement Management: A Guide for Local Officials (Delaware) p. 2-16

Step 5

Executing Long-Term Financial Planning

As you build out your Asset Management plan, it will naturally translate into long-term financial planning which will help you identify what your priorities are, what you can afford or can't afford and any challenges or obstacles that you need to surmount in order to realize your desired levels of service. Since your plan already includes the full cost of your assets over their lifetimes, taking this approach to financial planning can, to some extent, remove the annual budgeting process and replace it with a long-term management plan. It gives organizations a tool to ensure that their goals can be met, and that they themselves can remain viable and sustainable for the long term good of the community.

With budget constraints likely to remain tight for the foreseeable future, a long-term financial plan will help you to determine which of your objectives are feasible, which are the most important and if you are going to be able to maintain your priority assets over the long term.



Step 5

Moving Forward with Asset Management

Once you have an Asset Management plan, it will become your primary decision-making tool. You'll probably even wonder how you functioned without one.

Asset Management can be a daunting but necessary process to undertake. Asset managers are facing pressure from legislation like MAP-21 and GASB34, lack of funding and resources and, perhaps most importantly, risks generated by old and failing infrastructure. The best way to tackle and resolve these challenges is to apply Asset Management principles.



Sources

¹“Crucial transportation projects could be halted if Congress fails to act.” T4America Blog. April 30, 2014. <http://t4america.org/2014/04/30/long-planned-transportation-projects-could-go-back-on-the-shelf-if-congress-fails-to-act/>

²“Asset Management Getting Started Guide.” Government of Saskatchewan. <http://www.municipal.gov.sk.ca/Growth-Development/MunicipalAssetMgmt/AssetMgmtGuide>

³“International Infrastructure Management Manual 2011 Edition.” New Zealand Asset Management Support (NAMS). 2011. <http://www.nams.org.nz/pages/273/international-infrastructure-management-manual-2011-edition.htm>

⁴“Asset Management Getting Started Guide.” Government of Saskatchewan. <http://www.municipal.gov.sk.ca/Growth-Development/MunicipalAssetMgmt/AssetMgmtGuide>

⁵“Full Length: Municipal Asset Management and Saskatchewan.” SK Government Relations. January 23, 2012. <http://youtu.be/agPOLCPL4nw>

⁶“Finding the “Sweet Spot”: Managing Public Sector Infrastructure.” Gordon Sparks. Public Sector Digest. August 22, 2007. <http://www.publicsectordigest.com/articles/view/373>

⁷ Ibid.

⁸“Asset Management Getting Started Guide.” Government of Saskatchewan. <http://www.municipal.gov.sk.ca/Growth-Development/MunicipalAssetMgmt/AssetMgmtGuide>

Enterprise Asset Management (EAM) Solution

As agencies begin moving towards an Asset Management approach, they need tools to help them store, measure, manage and interpret assets and their data. AssetWorks EAM is a powerful Asset Management system that will help you achieve the objectives determined in your Asset Management plan.

AssetWorks EAM handles day-to-day tasks like work order management and real-time labor tracking for preventive maintenance of assets. The system can also manage inspection recording and future planning—such as complete life-cycle analysis and capital budgeting. Assets can be viewed on a real-time map and information is processed and analyzed using a combination of dashboards and powerful reports. AssetWorks EAM offers robust functionality to help agencies perform Asset Management work in the most efficient and cost-effective manner possible.

For more information on how AssetWorks EAM Solution can help you improve Asset Management, [click here](#).

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Asset Management Tools need to be able to help you answer these questions:

- What are your assets?
- Where are your assets?
- What are your assets worth?
- What is the condition of your assets?
- What is the remaining lifespan of your assets?
- What should you renew, repair or replace first?

Resources

United States

AASHTO Transportation Asset Management Guide: A Focus on Implementation

This thorough executive summary is focused on transportation asset management and includes examples of Asset Management plans and four in-depth case studies.

<http://www.fhwa.dot.gov/asset/pubs/hif13047.pdf>

Asset Management and Preventive Maintenance

This resource page from the EPA contains several guides—from best practices in Asset Management to how to build an Asset Management team—all targeted for personnel involved in managing public water systems.

<http://water.epa.gov/type/drink/pws/smallsystems/managementhelp.cfm>

Transportation Asset Management

This video from the U.S. Department of Transportation Federal Highway Administration provides a good overview of Asset Management and the philosophy behind it.

http://youtu.be/ep3j7f__LuM

International Infrastructure Management Manual

This 400 page in-depth manual contains a Quick Guide which explains each of the Asset Management functions in simple terms and points readers to the appropriate place in the complete manual for further reading. It also features case studies across a wide range of sectors and countries, and a glossary of Asset Management terms.

<http://www.nams.org.nz/pages/273/international-infrastructure-management-manual-2011-edition.htm>

An Anatomy of Asset Management

This is a free, very readable ebook from the Institute of Asset Management which introduces the whole discipline of Asset Management. While the US is in the process of adopting MAP-21, the United Kingdom has followed a similar Asset Management initiative since 2008.

<https://theiam.org/what-is-asset-management/anatomy-asset-management>

AASHTO MAP-21 Resource Center

Contains summary, Q&A, and resources all relating to the implementation and requirements of MAP-21.

<http://map21.transportation.org/Pages/default.aspx>

Resources

Canada

Asset Management Toolkit

This Asset Management toolkit by the Ontario Ministry of Infrastructure includes valuable resources such as a lifecycle Costing Primer, Self-Assessment Checklist, and Asset Inventory Tipsheet.

http://www.moi.gov.on.ca/en/infrastructure/building_together_mis/tools.asp

Asset Management Roadmap

This roadmap was designed by Asset Management British Columbia and details the steps required for building your Asset Management plan.

http://www.civicinfo.bc.ca/Library/Asset_Management/AM_Roadmap/Roadmap_Diagram--AMBC--Sept_23_2011.pdf

Asset Management Getting Started Guide

A concise overview of Asset Management by the Government of Saskatchewan.

<http://www.municipal.gov.sk.ca/Growth-Development/MunicipalAssetMgmt/AssetMgmtGuide>

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Regulations and Standards Defined

GASB34

States and local government are required to begin reporting all financial transactions, including the value of capital assets in their annual financial reports on an accrual accounting basis.

MAP-21

Each state is required to develop a risk-based asset management plan for the National Highway System (NHS) to improve or preserve the condition of the assets and the performance of the system.

State of Good Repair (SGR)

Designed by the Federal Transit Authority (FTA) to make sure that all aspects of the nation's bus and rail systems are maintained properly for safety and efficiency, the SGR includes objective standards for measuring and reporting the condition of capital assets, including equipment, rolling stock, infrastructure, and facilities.

ISO 55000 and PAS-55

Emerging international standards are aimed to make industry more efficient as well as break down barriers to international trade.