



Asset Management Newsletter

THIRTEENTH EDITION – WINTER 2015 ISSUE



Feature Article: The Renewed Gas Tax Agreement and Asset Management, Part Two

Glen Brown, General Manager, Victoria Operations, UBCM



On May 22, 2014, it was announced that the Administrative Agreement on the Federal Gas Tax Fund in British Columbia (the GTA) had been signed between Canada, British Columbia and UBCM, taking effect as of April 1, 2014.

The GTA provides the administrative framework for the delivery of federal Gas Tax funding to British Columbia local governments and other recipients over the next ten years.

Within the GTA, it is clearly articulated that asset management, and its implementation by local governments, is a priority by all parties. There is recognition by all levels of government that asset management is integral in providing local government services, and managing the infrastructure needed to support those services, in a sustainable manner.

Annex B, section 7 of the GTA states;

The Parties agree that strengthening Local Government capacity to undertake Asset Management is integral to building strong cities, communities and regions, and agree to support Asset Management practices in all Local Government jurisdictions during the term of the

Agreement. Schedule F (Asset Management) provides more details on the approach agreed upon by the Parties.

SCHEDULE F – Asset Management, identifies the approach;

The Parties agree that the approach to integrated community sustainability planning under the First Agreement was effective in increasing the capacity of the diverse range of Local Governments in British Columbia to enhance their community's sustainability.

Building on that success, the Parties wish to maintain the program's support for building Local Government capacity to take an integrated, long-term approach to plan, build and maintain strong sustainable communities, while providing a particular focus on strengthening Asset Management within those communities.

Asset Management is a key underpinning of community sustainability because it can inform a range of investment, servicing and community planning decisions, which support maximizing Local Government investment in services and related infrastructure.

Local Governments in British Columbia exhibit varying degrees of capacity to undertake Asset Management activities and integrate Asset Management into their operational and policy decision-making frameworks. Consequently, an approach that recognizes these varying capacities will be most effective in supporting the full range of Local Governments as they work to begin or strengthen their Asset Management activities.

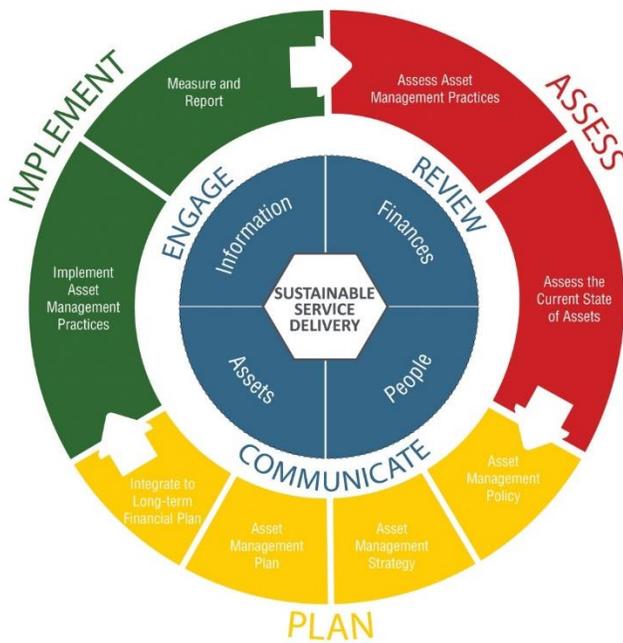
Given this, the partnership committee will develop an Asset Management framework to guide Local Governments in meeting their Asset Management commitment under this

Agreement. The framework will support all Local Governments to build and strengthen Asset Management over the term of the Agreement while recognizing the varying capacities of Local Governments and the range of ongoing Asset Management activities.

In meeting the asset management goals within the GTA, there are two key actions in Schedule F that support strengthening local government asset management capacity:

- The development of an Asset Management Framework
- Identifying that there are Local Government Asset Management Commitments under the Agreement

Asset Management for Sustainable Service Delivery – A BC Framework



See www.assetmanagementbc.ca

With approval from the GTA Partnership Committee, UBCM, in partnership with Asset Management BC and the Province, developed “Asset Management for Sustainable Service Delivery – a BC Framework” (the Framework) that fulfills the requirements under Section 7 of Annex B and Schedule F of the GTA, but also serves as a stand-alone document that provides strategic direction for asset management and its implementation in BC

The approach identified under the GTA and integrated into the Framework is in strong alignment with the current ‘BC Approach’ which is being led by Asset

Management British Columbia (AMBC) - an organization that is a provincial and national leader in building awareness, education, development of tools and resources, and supporting integration and collaboration with respect to asset management. The Framework identifies accepted best management practices that have been endorsed internationally, as well as best management practices that have been developed and endorsed by BC local government practitioners.

The Framework has been developed to recognize the diversity of BC’s communities. The Framework also recognizes that asset management, and the best practices that support asset management, must be scalable to community size, character and capacity. It focuses on desired outcomes rather than prescribing specific methodologies, thereby allowing local governments to develop and implement an approach that can be measured and incremental, tailored to the individual needs and capacity of individual local governments.

The Framework for Asset Management describes asset management as a process, providing a guide to the why, what and how of asset management. The Framework is further supported by additional tools and resources available on the AMBC website, as well as tools and resources that are available on AMBC partner websites.

For local governments looking for strategic direction and/or guidance with asset management, and meeting their GTA asset management commitment, the Framework becomes the principal resource.

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Local Government Commitments to Asset Management under the GTA

In addition to the development of the Framework, the GTA Partnership Committee also established and approved local government commitments to Asset Management under the GTA. In keeping with Schedule F, the commitments recognize the varying capacities of local governments and the range of ongoing asset management activities. The approach is to support local government, not prescribe, and allow individual local governments to develop an asset management approach that meets their individual needs and capacity. The Framework becomes the tool that provides direction and guidance with asset management best practice.

Local government asset management commitments under GTA are captured as three separate steps or actions. They include:

Step 1 – Establishing an Asset Management Baseline

To support local governments in their efforts to improve asset management practices, and to support asset management objectives within the GTA, baseline level information is required.

Establishing baseline data on the ‘status’ of asset management within individual local governments is critical in gaining a comprehensive understanding of current capacity to implement and identifying those areas/actions/activities that need to be addressed, as well as establishing priorities. It is also critical in the development of performance measurements, supporting local governments in monitoring/measuring improvements and value within the process.

Step 2 – Developing an Implementation Plan under the GTA

Local governments, with an understanding of current status with respect to Asset Management (after completion of Step 1), will then be required to develop a ‘moving forward’ or Implementation Plan.

The Implementation Plan will focus on how the local government will strengthen their respective asset management process over the life of the GTA and identify actions/activities and milestones.

There is no ‘approval’ of an Implementation Plan, but rather, the Framework will provide guidance with respect to asset management goals/objectives, as well as to the scalability of asset management actions/activities.

Step 3 – Asset Management Reporting

Step 3 involves reporting on the status of the Implementation Plan. Reporting would be integrated into UBCM reporting requirements under the Community Works Fund Agreement – and the Outcomes Report (March 31, 2018 and March 31, 2023).

At this time, the GTA Partnership Committee is developing standardized reporting templates for each step. These templates will be integrated into the annual and/or outcome reporting that is required under the GTA. The Step 1 – Establishing an Asset Management Baseline template will be part of the annual reporting requirement in 2016. Step 2 – Developing an Implementation Plan under the GTA template will be part of the annual reporting requirement in 2017. Step 3 – Asset Management Reporting will be part of the annual reporting requirement in 2018 and 2023 as a component of the Outcome Reports. These templates will be made available to local governments in 2015.

For any further questions on the Renewed Gas Tax Agreement, please contact Program staff by e-mail at gastax@ubcm.ca or by phone at 250-356-5134.



If you have specific questions regarding asset management under the GTA, please contact Glen Brown by email at gbrown@ubcm.ca

New Position

Congratulations to **Liam Edwards** who has been appointed Executive Director, Local Government Infrastructure and Finance Branch, Ministry of Community, Sport and Cultural Development. Liam has been an active participant with **Asset Management BC** and will take even a more significant role in his new function. Liam replaces Glen Brown who is now General Manager, Victoria Operations for the Union of British Columbia Municipalities (UBCM).



Fort Saskatchewan Road Corridor Asset Management Optimization

*Bradley McDonald, Manager, Utility Services,
City of Fort Saskatchewan*

*Chris Lombard, P. Eng. MBA, Senior Asset Manager,
Tetra Tech Inc.*

Introduction

The City of Fort Saskatchewan ("the City") is committed to managing its infrastructure assets responsibly by seeking the best value approach in achieving the optimal combination of costs, risks, performance and sustainability. Tetra Tech EBA ("Tetra Tech") was retained in 2012 by the City for a multi-year assignment to create an Asset Management System for the 162 centreline-km of roadway, and the 280km long underground utility network (water, sanitary & storm sewer). The objective was to provide optimized renewal and replacement decisions for the right-of-way requirements across the multiple asset groups.

A customized, off-the-shelf analysis software was the primary analysis engine used to complete the study. The data, analysis and results were all integrated within a GIS. Following the pavement needs analysis, existing sanitary, storm and water pipe locations, meta-data and year of pipe replacement were imported into the analysis software which was then programmed so that utility projects were coordinated with pavement renewal projects.

The resultant capital plan presented an optimized and coordinated plan including cost estimates and dates for the renewal and replacement of the City's roadway, water, sewer and storm system for the period 2014 to 2033. Some of the key innovations developed in this project were:

- Spatial coordination and optimization of infrastructure work between roads and utilities, resulting in a projected 5% saving in City capital expenditures over 30 years.
- Defining the pricing of multiple asset interventions and use of life-cycle cost optimization to identify the least cost intervention strategies across multiple asset classes.
- Development of a GIS-based asset inventory to serve as the central store of asset information.



- Assisting the City to articulate target levels of service in the context of overall long-term financial sustainability.

Breaking Down the Asset Management Silos

Municipal road and utility departments commonly employ piecemeal or "silo-based" planning which results in e.g., project delays or utility staff making cuts into newly-paved roads to perform a utility pipe or service connection replacement. This results in an irate public that rightly questions whether their tax dollars are spent in the most efficient manner.

The opportunity therefore exists to improve and optimize the coordination between the capital and O&M interventions on especially roads, water, sewer and storm assets to minimize disruption and cost. This project presents one of the first known examples of how a road and utility asset management system were created to act synergistically whereby road right-of-way capital interventions are coordinated and optimized to minimize disruption and life cycle costs, as presented in Figure 1 (shown on page 5).

Use of Locally Calibrated Highway Development and Management (HDM) Performance Models

The roadway analyses employed current best practices and pavement management principles including life cycle cost analysis. The distresses used in this evaluation were modeled using locally calibrated HDM (Highway Development and Management) performance models to predict the pavement condition in terms of individual distresses. This method of prediction provides a much more accurate and defensible approach to the treatment selection phase of the project.

Imbuing Linear Assets with “Spatial Awareness”

The project team was able to add “spatial awareness” to the road corridor and its underground utilities by the creation of GIS polygons (Figure 3) and associating all linear assets in a polygon with one another. These polygons provided the necessary spatial link from the road corridor to the underground utilities, which accomplished a number of important things: Firstly, the in-filling of data to bridge data gaps and secondly, the cross asset optimization between the utility rehabilitation program and the road rehabilitation program.

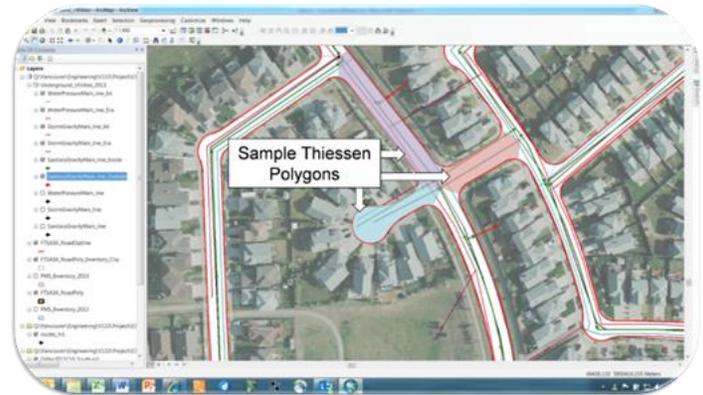
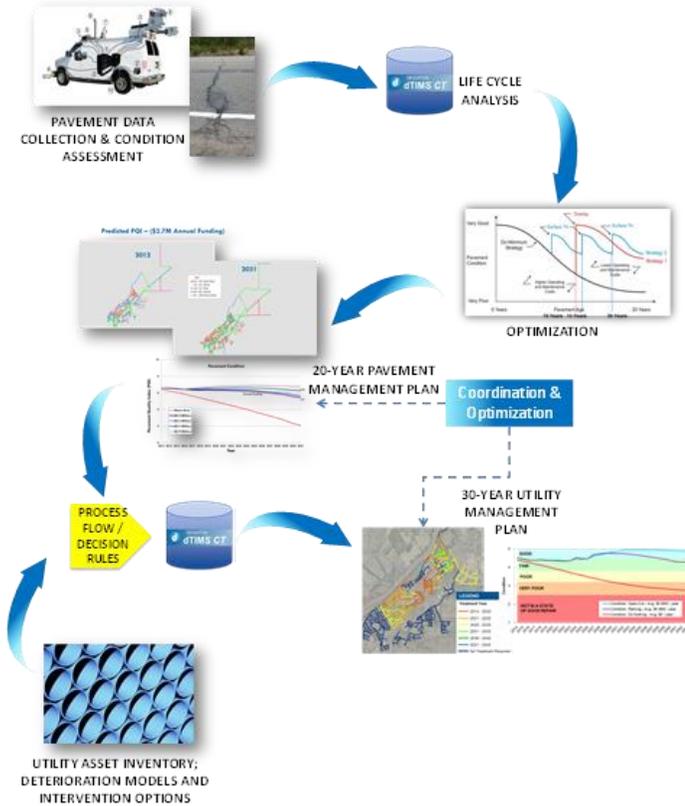


Figure 3: Creation of Thiessen Polygons to Associate Linear Assets per Polygon

Pipe Intervention Process Flow

While performance models such as the HDM model exists for roadways, no such well-defined model exists for predicting the performance of underground utilities. The project team defined the intervention process flow governing the decision-making on when and how to intervene on the pipes leveraging off best practices identified in the recent Water Environment Research Foundation (WERF) documents on condition assessment and cost information for drinking water and wastewater pipes. Figure 4 (shown on page 6) presents the pipe intervention process flow applied in this analysis.

The pipe intervention process flow will be refined in the future based on the results of pipe condition surveys. True condition assessment will improve the prediction of life expectancy of a pipe class or individual pipe section. This will ensure that the model is not overly conservative (which could result in the premature replacement of pipes) and that high risk pipes are prioritized.

Figure 1: Synergistic connection of road and utility AM systems

The individual distresses are then averaged or “rolled” into an overall network performance, based on a Pavement Quality Index (PQI). The PQI uses a 0 to 10-scale to relate the overall condition of a pavement as calculated from a combination of three key performance indicators.

Figure 2 demonstrates the PQI, from very good to very poor, for each roadway classification as well as for the paved network as a whole. It is important to note that the road network that is in poor to very poor condition represents the network backlog or “debt” and signifies a significant financial burden for the City.

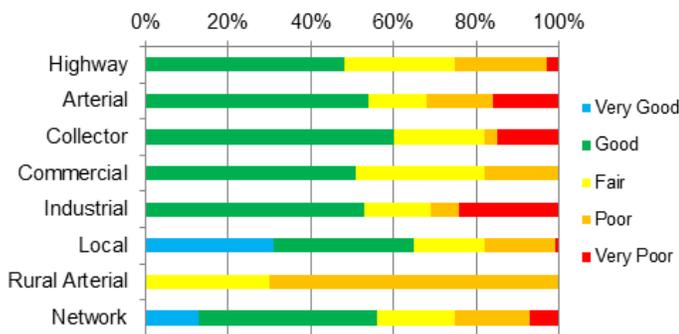


Figure 2: PQI Distribution by Road Class

Figure 7 presents the recommended open-cut replacement program for the City’s water mains in five – year increments.

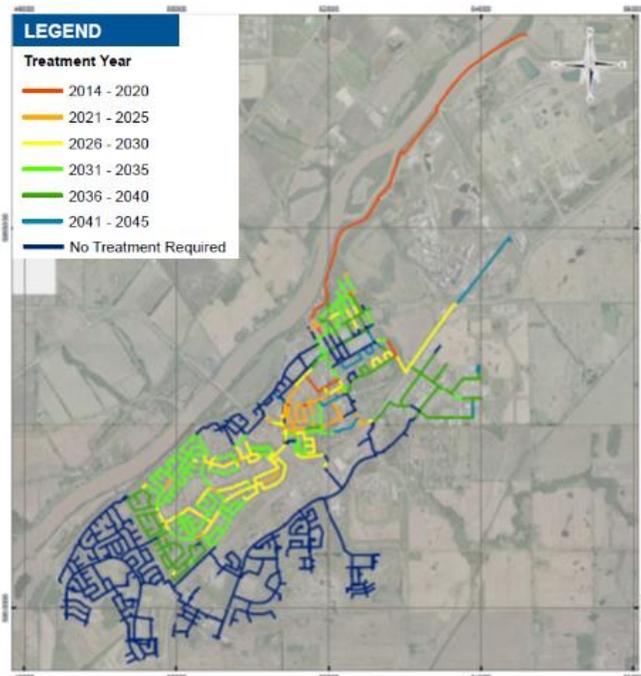


Figure 7: Water Pipe Open Cut Replacement Program

Annual savings in approximately five percent of the capital budget could be generated through coordinating and optimizing the interventions on the road and utility networks, which in the City’s case translated into approximately \$85,000 per year. Another benefit of the coordinated works is the elimination of cuts and patches in pavement, which are commonly one of the leading contributors to the accelerated deterioration of a road surface.

Conclusion

The project outputs helped to answer the following questions on financial sustainability for the City’s road corridor assets:

Is our City’s long-term financial performance and position sustainable by meeting planned long-term service and infrastructure levels and standards without unplanned increases in rates or disruptive cuts to services?¹

This project employed a number of innovations to address the financial sustainability and asset management challenges often faced by municipalities in

¹ Definition from Local Government Australia (2012): Financial Sustainability Information Paper No 1 – Financial Sustainability. Adelaide, SA

Canada. The intent of this article was to highlight these innovations and provide a framework for other municipalities that may want to implement it for themselves

Watershed Health, Resilient Rainwater Management, and Sustainable Service Delivery: How they are Connected?

*By Kim A Stephens, M.Eng, P.Eng, Executive Director Partnership for Water Sustainability in BC
In collaboration with Peter Law and Derek Richmond, Directors, Partnership for Water Sustainability in BC and Glen Brown, General Manager – Victoria Operations, UBCM*



Local governments in BC are challenged with the question of how best to move forward with asset management and protection of watershed health in light of two considerations: a changing climate; and community expectations to provide higher levels-of-service at reduced levels-of-cost.

The unfunded ‘infrastructure liability’ is a driver for local governments to consider longevity, focus on what happens after developers hand-off municipal infrastructure, get it right at the front-end, and prepare for the future. Climate change is part of the liability equation – adaptation has level-of-service implications for infrastructure.

Cascading Objectives for Inter-Regional Collaboration

The Partnership for Water Sustainability is facilitating an inter-regional collaboration initiative within the Georgia

Basin. The initiative is connecting the cascading objectives for Watershed Health, Resilient Rainwater Management, and Sustainable Service Delivery.

Collaboration is guided by this mantra:

“Through sharing and learning, ensure that where we are going is indeed the right way”.

A guiding principle for collaboration is to leverage ‘science-based understanding’ of the relationship between land use changes and resulting stream health and financial liability consequences. A desired outcome is to influence community planning by means of an environmentally adaptive approach.

Local governments on the east coast of Vancouver Island and in the Lower Mainland are ‘learning by doing’ to implement affordable and effective science-based practices to achieve:

- Watershed Health: Protect and/or restore hydrologic integrity
- Resilient Rainwater Management: Mimic the natural water balance
- Sustainable Service Delivery: Integrate natural systems thinking and adaptation to a changing climate into asset management

Launched in 2012, the Georgia Basin Inter-Regional Education Initiative helps local government champions in each region understand what the other regions are doing, what works and what does not.

Protect and /or Restore Hydrologic Integrity

Watershed Health is a function of how the landscape is altered by humans. A primary measure is the condition of aquatic ecosystems in stream corridors. Altering the land surface short-circuits the water cycle. The result: either too much or too little flow in streams. ‘Design with Nature’ requirements for land development maintain a watershed’s hydrologic integrity.

Mimic the Natural Water Balance

Resilient Rainwater Management accounts for all the rainfall-days per year. Emphasis is on soil-water interaction, how rainwater reaches streams via three pathways (surface runoff, lateral interflow in shallows soils, and deep groundwater), and performance targets for ‘design with nature’ solutions. These address the implications for both water supply and drainage. The technical foundation is the ‘Water Balance

Methodology’. This integrates the site with the watershed, stream and groundwater aquifer.

Integrate Natural Systems Thinking & Adaptation to a Changing Climate into Asset Management

Sustainable Service Delivery builds on the principles of Asset Management. It integrates land use, infrastructure servicing, financial and ecological planning. Emphasis is on the **Levels-of-Service** that assets provide, and ‘what level is affordable’ over time. Nature is an asset and provides ‘services’. The benefits and value of ‘design with nature’ solutions grow over time.

Restore Watershed Health in the Built Environment

In 2014, two landmark developments provided local governments with a fresh impetus to do business differently:

- BC’s new Water Sustainability Act, passed in May 2014; and
- Asset Management for Sustainable Service Delivery: A BC Framework, released in December 2014.

Accepted ‘standards of practice’ - especially those for engineering, planning and finance - influence the form and function of the Built Environment. Implementing green infrastructure, turning the clock back, shifting the ecological baseline, and creating a watershed legacy will ultimately depend on the nature of changes in standards of practice.

Do Business Differently

Released in 2008, Living Water Smart: British Columbia’s Water Plan is a call to action to prepare for climate change, live water smart and build greener communities. Living Water Smart has 45 actions and targets. Asset Management for Sustainable Service Delivery: A BC Framework achieves this Living Water Smart policy objective:

“Governments will develop new protocols for capital planning that will look at the life-cycle costs and benefits of buildings, goods and services.”

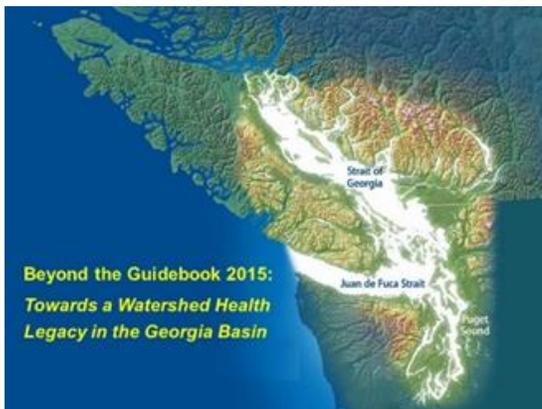
Reference: p 69, Living Water Smart

The term Sustainable Service Delivery was coined in 2010. It was introduced by the Province to integrate financial accountability, infrastructure sustainability and service delivery.

The 'Worth Every Penny Workshop' hosted by the Regional District of Nanaimo in September 2010 initiated the branding of the concept.

Towards a Watershed Health Legacy in the Georgia Basin

In 2002, the Province adopted the Water Balance Methodology as the technical foundation for *Stormwater Planning: A Guidebook for British Columbia*. The Guidebook vision is that community development activities and further alteration of the Built Environment will result in cumulative benefits, not impacts. In 2002, the Guidebook identified a path forward for local governments.



The 'Beyond the Guidebook Series' documents the progress of local government champions who are leading implementation of changes in practice. It takes time to make a difference. Doing business differently and making a difference is a building block process. Later in 2015, the Partnership will be rolling out the third in the series.

Titled Beyond the Guidebook 2015: Towards a Watershed Health Legacy in the Georgia Basin, this guidance document will present a framework for integration of the cascading objectives for watershed health, resilient rainwater management, and sustainable service delivery. It will also provide the springboard to the 2016-2017 program for inter-regional collaboration.

A Look Ahead

Implementing 'design with nature' standards of practice at the site scale – so that benefits accumulate and mimic the natural Water Balance at a watershed scale – ultimately means that communities will be more resilient during periods when there is either too much or too little rain. Community champions have a role to play in collaborating with local government decision-makers to achieve this outcome.

Asset Management for Sustainable Service Delivery

A BC Framework illustrates a holistic and integrated approach to asset management. It identifies natural services and the use of natural resources – and how they are part of / integrated into the overall services provided at a local government level.



Is Climate Change Part of Your Asset Management Strategy?

Climate Change is an issue of growing significance as part of our asset management strategies. Do you have a climate change action plan? Have you carried out work respecting climate changes impacts on your infrastructure? Then share it with other BC communities.



The BC Climate Action Toolkit provides the latest news; information and strategic guidance to help BC local governments successfully reduce greenhouse gas emissions and strengthen our communities. The community is being broadened to include all our infrastructure and address asset management processes.

Go to www.toolkit.bc.ca and join the discussion group.

Find climate change resources for addressing infrastructure and risk management issues on www.assetmanagementbc.ca.

Is Asset Management a Fad? An Opinion.

Wally Wells P. Eng. Asset Management BC

What are the benefits, short and long term, of asset management? Is it just another file on the side of our desk when we have time to get to it? Well that is the “thinking” of many, so let’s talk about some of the benefits of the process.

First asset management is not a task but a process. And as long as we own assets; it never ends. Hence, it is an on-going continuous process. Too much emphasis is placed on the “Asset Management Plan”. The PLAN is only a part of the overall process. The PROCESS deals with all of the components necessary to refocus our business process to properly manage our infrastructure within the built environment in our communities that is all the physical infrastructure that supports all the services we deliver. The irony is that many communities have successfully used the principles of asset management and long term funding formulas for many years for fleet management but failed to use the same business process for all other asset groups.

Asset Management represents a change in our current business process, not something new. By calling it ‘asset management’ rather than ‘managing our assets’ we have highlighted and called attention to a long-standing and growing problem of aging and failing infrastructure that we never properly funded.

For our municipal governments and regional districts, budgeting process has always focused on current operations and maintenance without much attention to asset rehabilitation, adequate repair, and replacement. After decades of this practice, we have growing problem in 4000 communities across Canada that we finally must face up to.

Fortunately, through groups like Asset Management BC and our partner Associations, many tools, references and guides are now able to help with the process. These are available at www.assetmanagementbc.ca. The most recent addition is the Asset Management: Framework for Sustainable Service Delivery.

The Chief Administration Officer of one of our very progressive communities was heard to tell staff “Asset Management is what we do. It is our day job.” Let’s hope we all get there and soon.

In 20 years, we should not be talking about asset management but just doing it as part of our daily business. Then we have sustainable service delivery. We all need to get there!

CNAM 2015 in Vancouver - See you there!



The program is set with near 50 very diverse presentations plus keynote speakers. The opening night ‘get acquainted’ will be hosted at the Vancouver Aquarium. An excellent national conference focusing on all aspects of integrated asset management is waiting for you.

Registration is now available on-line. Keynote speakers include;

- **Gord Hume**, author of “Taking Back our Cities” and a previous City Councillor,
- **Dr. Anna Robak**, Technical Principal - Global Asset Management, Opus International,
- **Allen Mapstone**, JRA Associates and a lead trainer for the IPWEA NAMS program here in Canada and,
- **Dr. Mark DeVolder**, Synergy Sense - change management.

Their biographies and detailed program are on the CNAM website at www.cnam.ca under the conference tag. Register now for reduced rates and take advantage of special rates at the Marriot Pinnacle Downtown hotel. The networking opportunities with like-minded people from across Canada and other countries is, in itself, worth the price of admission. Then you also get the benefit of the learning experience from great presentations.

See you there.

Upcoming Events

BC Water & Waste Association with GFOA BC

February 26, 2015

WaterBreaks Webinar: The Sustainable Foundation

How the District of North Vancouver implemented an integrated asset management approach to infrastructure management

Webinar Asset Management

www.bcwwa.org

Public Works Association of BC

February 26, 2015

Introduction to Public Works Vancouver Island

Victoria Public Works

www.pwabc.ca

Planning Institute of BC

April 16-17, 2015

Annual Conference

Washington State Convention Centre

Seattle WA

www.pibc.bc.ca

Canadian Network of Asset Managers

May 11-14, 2015

8th Annual Networking Conference and Workshops

Vancouver Marriott Pinnacle

Vancouver, BC

www.cnam.ca

BC Water and Waste Association

May 27 – 30, 2015

43rd Annual Conference and Trade Show

Kelowna, BC

www.bcwwa.org

Government Financial Officers Association of BC

May 27 – 29, 2015

Annual Conference

Penticton BC

www.gfoabc.ca

Federation of Canadian Municipalities

June 5-8, 2015

Annual Conference and Trade Show

Shaw Convention Centre

Edmonton AB

www.fcm.ca

Canadian Water Summit

June 25, 2015

6th Annual Canadian Water Summit

Vancouver, BC

www.watersummitt.ca

Public Works Association of BC

September 21 - 23, 2015

Annual Conference and Trade Show

Penticton, BC

www.pwabc.ca

Union of British Columbia Municipalities

September 21 – 25, 2015

Annual Convention

Vancouver Conference Centre

Vancouver, BC

www.ubcm.ca

Centre for Advancement of Trenchless Technology

November 17 – 19, 2015

Conference and Trade Show

Executive Airport Plaza, Hotel & Conference Center,
Richmond/Vancouver, BC

www.cattevents.ca

Tips and Tactics: ISO 55000 – The Canadian Context

*By Bernadette O'Connor and Barbara Rober
Opus International Consultants (Canada) Ltd*

With all the various standards, frameworks, guides, roadmaps, and manuals available for Asset Management, Canadian Municipalities could be excused for wondering which one to follow? How do they connect together? Do they connect? Which one is best for us? This article sets out to briefly explain the inter-relationship and purpose of the following key documents for Asset Management;

- **ISO 55000 Series** (International Standard)
- **AMF** (Asset Management Framework) – refer lead article in this issue of newsletter
- **IIMM** (International Infrastructure Management Manual)
- **AM Roadmap** (Asset Management BC Roadmap and Guide for Implementing AM for Canadian Municipalities)

ISO 55000 (International)

This International AM Standard consists of two parts;

- ISO 55001 – AM Management Systems **Requirements**
- ISO 55002 – AM Management Systems **Guidelines** for the application of ISO 55001

The focus of these documents is to outline good practice (not necessarily best practice), and therein identify **what** an organization needs to have in place to meet a minimum certifiable standard of Asset Management practice. The style of the documents is similar to the quality assurance standard ISO9001 and the environmental management standard ISO14001 (that some people may be familiar with).

The Key components of the standard are shown in Figure 1 and outlined below;



Figure 1: ISO 55000 Components of AM Management Systems

The key components of Planning, Operation, Performance Evaluation, and Improvement are encircled by Organizational Context and Leadership, and in the centre of all AM components is Support.

- Understand Organizational Context (Section 4)
 - What is your business/strategic AM Plan/strategy
 - Understand stakeholders needs, expectations
 - Define the scope (what assets)
 - Define and document
- Leadership (Section 5)
 - Demonstrated commitment
 - AM Policy
 - Strategic AM Plan
 - Roles, responsibilities and authorities

- Planning (Section 6)
 - AM System
 - Asset Planning (Objectives, Plans)
- Operation (Section 8)
 - Operational Planning and Control
 - Management of Change
 - Outsourcing / Contract Management
- Performance Evaluation (Section 9)
 - Monitoring, measurement, analysis and evaluation
 - Internal audit
 - Management review
- Improvement (Section 10)
 - Nonconformity and corrective action
 - Preventive action
 - Continual improvement
- Support (Section 7)
 - Resources
 - Competence
 - Awareness
 - Communication
 - Information
 - Documentation

AM Framework (BC)

In a similar way the AM Framework (AMF) document support requirements for the Federal Gas Tax Fund in British Columbia (GTA) and outlines **what** an organization with good asset management practices will have in place. This framework document provides the BC context for the Federal Gas Tax Fund requirements. There are other similar Framework documents that outline Asset Management requirements in other Canadian Provinces.



Figure 2: AM Framework for Gas Tax Agreement in BC

The key components of the AMF can generally be related to the components of ISO 55000 as follows;

ISO 55000	AM Framework
Organizational Context	Engage
Leadership	Communicate
Planning	Plan
Operation	Implement
Performance	Assess
Improvement	Review
Support	Core Elements

This table shows the relationship of main components but there are many other connections between parts of the standard (ISO) and the framework (AMF) throughout both documents.

IIMM (International)

This manual for infrastructure management is an international document. It differs from the international standard (ISO 55000) in level of detail and focus. The IIMM is primarily about **how** to do asset management.

The key components of the IIMM are;

- Introduction to Infrastructure AM
 - Introduction
 - AM Drivers and Benefits
 - Defining AM
 - The AM Process
- Understanding and defining requirements
 - Strategic Context & AM Policy
 - Developing & Monitoring LOS
 - Forecasting Future Demand
 - Establishing Base Asset Knowledge
 - Assessing Asset Condition
 - Identifying Critical Assets & Business Risks
- Developing AM Lifecycle Strategies
 - Decision making techniques
 - Developing Operational Strategies & Plans
 - Developing Maintenance Strategies & Plans
 - Developing Capital Investment Strategies & Plans
 - Financial & Funding Strategies
- AM Enablers
 - AM Teams
 - AM Plans
 - Information Systems & Tools
 - Service Delivery Models
 - Quality Management
 - Continuous Improvement

AM Roadmap (Canada)

Although developed in BC the AM Roadmap is a simplified version of the IIMM document and is equally applicable to any asset owner, and particularly to Canadian Municipalities. It is an ideal beginner's guide, giving practical information on **how** to do asset management. It is consistent with all the principles and requirements in both ISO 55000 and the AMF, as well as the IIMM. It does however breakdown the elements of AM into modules of practice, which helps users to more easily identify one or two key areas to get started on implementing or improving AM in their organization, and getting results. The key components of the AM Roadmap for a basic level of AM Practice are;

- Know your Assets
 - Basic Asset Inventory
 - Asset Components
 - Data, Software, and Tools
- Know Your Financial Position
 - Current Asset Investment
 - Current O&M Costs
 - Future Capital Costs
 - Funding Sources
- Understand Decision Making
 - Evaluate Decision Making
 - Improvement Plan & Process
 - Prioritizing Improvements
- Manage Your Lifecycle
 - Asset Condition
 - Level of Service
 - Assess Renewal Alternatives
 - Assess Maintenance Strategies
- Know the Rules
 - Strategic Goals
 - Legislation, Regulation, Policy & Standards
- Monitor Sustainability
 - Sustainability Assessment
 - Coordinating Infrastructure Works

Both the IIMM and the AM Roadmap provide targets for Basic, Intermediate, and Advanced levels of AM Practice. Currently the detailed guide document for the AM Roadmap only includes AM Practice Modules that are required for Basic Level AM whereas the IIMM provides guidance on all levels of AM Practice.

It is expected that Intermediate and Advanced practice modules will be added to the AM Roadmap when needed by Canadian municipalities and organizations.

Discussion and Application

Both the IIMM and the AM Roadmap existed before the ISO 55000 standard was written, however the universal principles of AM are the foundation of all these and this is why they all connect and support each other. Future document updates for the IIMM and the AM Roadmap will undoubtedly include terminology from ISO 55000 to strengthen consistency across the documents. Document structures may also become more aligned, and additions made to content.

They are none-the-less both excellent resource documents on **how** to do the AM practice required by ISO 55000 and the AM Framework.

Another framework to mention is the seven questions of AM listed in the InfraGuide document - Innovation and Best Practices (Managing Infrastructure Assets and Decision Making and Investment Planning). These are;

1. What do you have and where is it?(Inventory)
2. What is it worth? (Costs/replacement rates)
3. What is its condition and expected remaining service life? (Condition and capability analysis)
4. What is the level of service expectation, and what needs to be done? (Capital and operating plans)
5. When do you need to do it? (Capital and operating plans)
6. How much will it cost and what is the acceptable level of risk(s)? (Short- and long-term financial plan)
7. How do you ensure long-term affordability? (Short- and long-term financial plan)

Both the IIMM and the AM Roadmap provide detail on how to answer these questions, as does the InfraGuide document referred to. However the IIMM and AM Roadmap provide additional useful information on implementing and improving integrated AM business practices in a broader context.

These seven questions are often used for communication of AM concepts to people unfamiliar with AM and they have been used as a general framework for AM Plan documents.

Conclusion

The principles and key concepts of AM are universal and this provides consistency and connectivity between standards, manuals, roadmaps, and frameworks.

AM guides provide flexibility for organizations to identify the most appropriate practice for their circumstances, community, assets, and priorities. This recognizes that there is no standardized best-practice-one-size-fits-all template that can be equally effective for all organizations. Each organization's circumstances and needs are unique. But there are reputable guides for beginners through to advanced practitioners to help you with both the **what** and the **how** to implement and improve asset management.

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Asset Management: Questions and Answers

Responses provided by Editorial Panel

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