



## 2016 CNAM Conference Concurrent Sessions

**\*Please note that there will be three(3) concurrent sessions running during each time slot with multiple presentations.**

**Tuesday, May 10, 2016**

**Selling the Message/ Communication/ Community Engagement**

**10:30am – 12:30pm**

**Engaging the Community in Infrastructure Investment**

*Joel Shaw, City of Kelowna*

*The City of Kelowna recently updated their long-term infrastructure plan which is named the 2030 Infrastructure Plan and covers the planning horizon from 2016-2030. With a forecasted infrastructure investment of approximately \$1 billion over the next 15 years, it was important to get the community engaged in the discussion. The challenge was communicating the rather complex process of infrastructure investment in meaningful and simple language that the community understood. The City used an online tool, Citizen Budget, to help educate and receive feedback from the community to help staff and council make informed decisions. This presentation will outline the development of the 2030 Infrastructure Plan and the community engagement process.*

**Vancouver: Beyond the Technical into the Strategic**

*Michel Desrochers, City of Vancouver*

*The City of Vancouver (home to 600,000 residents) revamped its Capital Asset Program starting in 2010. Two key goals stated at the outset were: a) to extend the planning horizon from the mid-term (3-4 years) to longer-term (10 years); and b) to improve what and how information was shared with senior management, elected officials and the public. The City developed a new overarching framework and classification system to help tell the story of long-term capital asset planning and management. Feedback to date indicates that the public better understands the world of capital planning and decision-makers feel more comfortable as they make their decisions.*

**Telling the Asset Management Story**

*Leanne Brannigan, Region of Peel*

*A sound technical basis is critical for success in asset management, but so is the establishment of relationships and confidence throughout the organization. Corporate Asset Management (CAM) at the Region of Peel has built the technical framework for data driven tri-annual infrastructure reporting, the generation of capital budget recommendations and risk-centric prioritization of infrastructure needs. So how do you communicate and interpret these complex ideas to tell the asset management story so that the organization understands the results, needs and priorities at all levels? This presentation will touch on the technical side of asset management at Peel, but will focus on the development of the reporting metrics, the levels of reporting and how they have changed over*



time and have enhanced the successful building of relationships and confidence at all organizational levels; ultimately influencing corporate decision making and priority setting.

### **Applying the Principles of Natural Asset Management**

*Dave Newman, Town of Gibsons*

*The Town of Gibsons has recognized, formally and in practice, that nature and the ecosystems services that it provides are fundamental and integral parts of Gibsons' infrastructure systems. These natural assets reduce the need for engineered infrastructure and the associated financing required; while maintenance and operational budgets are needed for natural assets, budgeting for future replacement is not required providing an appropriate stewardship plan has been put into place. As well as other valuable natural assets, the Town is the main stakeholder for the sustainable use of the Gibsons Aquifer, which provides high quality untreated drinking water to the Town, and three major creeks that are a major part of the Town's rainwater management system. The Town has begun the process of inventorying and incorporating these assets into the Town's asset management plans. The Gibsons Aquifer has been fully inventoried, valued and a regular operations and maintenance program has been put in place to ensure the aquifer will be in a condition to serve future build out of the Town. Significant work is also underway on Charman Creek which is being incorporated into the Town's rainwater management system. Benefits include reversing the urbanization of the creek while enhancing upstream ponds and wetlands to provide a natural alternative for rainwater management and conveyance.*

**Tuesday, May 10, 2016**

### **Getting Started with/ Re-energizing AM**

**10:30am – 12:30pm**

#### **Public Works Asset Management Plan for a Smaller Municipality – Town of Orangeville**

*Thomas Uda, GHD*

*Aman Singh, GHD*

*The Town of Orangeville developed an Asset Management Plan to inform long range planning for the Town's Public Works assets. The AM Strategy and Plan provides a rational framework to manage assets while balancing levels of service and costs at an acceptable level of risk.*

*The AM Plan improved inventory and valuation of the Town's roads, water, and wastewater assets, and identified funding shortfalls particularly for the roadway network. The AM Plan findings were presented to Town Council, and Council endorsed the recommendation to approve the AM Plan. The AM Plan enabled the Town to successfully apply for and receive funding through the Ontario Community Infrastructure Fund.*

### **Make Asset Management Happen!**

*Erik Naczynski, Enbridge Gas Distribution*

*Enbridge is on a journey to implement asset management, not just to satisfy our regulator, but because it just makes sense. We have made changes in our organization with the creation of new roles and accountabilities with specifically designated asset management positions to provide clarity on asset related decisions. Enbridge is creating processes that establish a direct linkage between risk assessment to capital planning and budgeting with*



fully documented processes that sustain a robust asset management system. New tools are being implemented to aid in the decision making process. This includes revamping the risk assessment methodology portfolio optimization and a centralized risk register and project register.

### **Innovation in PARK Asset Management**

*Marion Rabeau, City of Burlington*

*The City of Burlington is a mid-sized city with a population of approximately 175,000. The value of the park infrastructure in the City, across 130 different sites, is approximately \$150 million. This presentation will outline how the Parks and Open Space Section created a PARK asset management system, through cross-departmental collaboration and innovation.*

*In 2014, there was no consolidated inventory of asset data except for PSAB information. The data was in various formats with no consistency related to condition or attributes. The Parks and Open Space Section started by conducting comprehensive inventories and condition assessments, digitizing of assets in GIS, creating asset hierarchies, life cycle models, unit costing for rehabilitation and replacements and synchronization with decision support software.*

*This presentation will talk about challenges, opportunities, successes and technology and describe how this new information is being leveraged for service delivery with internal customer departments (e.g. Parks & Recreation) as well as external agencies (e.g. School Boards and Joint Venture Partnerships).*

### **Metro Vancouver's Asset Management Enhancements: It's about Information and Work Processes**

*Debbie Brown, Metro Vancouver*

*Karen Leung, Metro Vancouver*

*Terry Martins, GM BluePlan Engineering Limited*

*Metro Vancouver's Water and Liquid Waste Utilities provide services to customers through a complex network of infrastructure assets. Both Utilities have been practicing elements of asset management for years and MV continues working toward integrating and improving its AM work practices. MV defined several steps towards enhancing AM for both Utilities beginning with a review of information management and work processes:*

- Understanding AM needs of all stakeholders to define a data management plan and asset registry giving staff access to better information to make decisions.*
- Auditing AM work processes in a consistent manner to ensure information and system integration is in place to support effective decision making processes.*
- Defining asset hierarchies, functional integration, and implementation plans to build an environment of data and processes that support MV's long-term AM.*

*This presentation summarizes this initiative and how it fits into the overall Asset Management program.*



Tuesday, May 10, 2016

## Governance/ Strategic Management

10:30am – 12:30pm

### Taking Asset Management to the Next Level

*Mike Hausser, City of Cambridge*

*Cambridge has supported a tradition of successful innovation and leadership in Asset Management on Water/Sewer/Roads services since 2005. Through corporate re-structuring in 2015, the Asset Management group is now advancing to be a Corporate resource with a new mandate that enables Asset Management practices to be embedded in all Cambridge municipal services. This session will focus on the how this change is being incorporated into all business units that link life-cycle needs needed to sustain municipal services with Council decisions, operations day-to-day activities, capital re-investments, and desired/legislated levels of services.*

### Driving Change through Managing Our Assets

*Nigora Yulyakshieva, P.Eng., City of Regina*

*Garret Ruiters, P.Eng., City of Regina*

*Katie Geoghegan, City of Regina*

*The City of Regina will review a brief history of investment decisions and trade-offs that have shaped the current state of our roadways, water, wastewater, and drainage infrastructure. Speakers will outline lessons learned and how the City is addressing the long-term impacts faced today. The presentation will cover the approaches used by the City's Roadways & Transportation and Water Works departments, and also how partnership between the two areas is creating better outcomes for City of Regina residents. The presentation will also outline the City's journey in developing an integrated asset management approach to guide its future decisions.*

### Working Towards a New Regional Municipal Government: The Need to Fast Track Asset Management to Develop a Regional Consolidated Infrastructure Plan

*Earl MacKenzie, Town of New Glasgow*

*Based on the Report of the Nova Scotia Commission on Building Our New Economy (February 2014), in August 2015 four participating municipal units (PMUs) in the County of Pictou, NS made application for a voluntary amalgamation of boundaries. These PMUs include the Municipality of the County of Pictou, the Town of New Glasgow, the Town of Pictou, and the Town of Stellarton. The 2014 report cites a need for consolidation of municipal governance structures to enable "integration and streamlining of services to business, reductions in regulatory burden, and the better alignment of tax policies with economic growth objectives." Governance optimization will improve efficiency and effectiveness in delivering future municipal services. Provision of an organizational will allow for planning and management of economic growth and work to reverse current declining demographic trends. Instituting long term and prioritized municipal infrastructure together with an associated funding plan, harmonizing land use policies and controls and seeking new employment opportunities will enhance*



*the local economy and social condition. The PMUs were required to fast track the collection of asset information and provide an asset replacement valuation to support the application for amalgamation.*

### **The Role of Asset Management in Shrinking Times**

*Justin Waugh-Cress, P.Eng., Cumberland County*

*Chris McNeil, MPA., Nova Scotia Department of Municipal Affairs*

*Kelsey Green, P.Eng., Opus International*

*For many municipalities, increasing demands for services, future growth and expanding infrastructure have been key drivers for implementing asset management. However, asset management can play just as important a role in the opposite case, when demands for services are decreasing. In some parts of the country, changing demographics due to the out-migration of younger people to larger urban areas is having a profound impact on rural municipalities. In these cases, the tax base is simply no longer viable to support full municipal services, and dissolution or amalgamation with adjacent communities is the only solution. Before this happens, major capital investments need to be identified and well understood so that the transition of assets can be suitably planned and managed. This presentation examines the role of asset management in situations like this drawing on experiences from three recent case studies of municipalities facing dissolution.*

**Tuesday, May 10, 2016**

**Where are you now? Taking a look back at the last 10 years (case studies)**

**1:30pm – 3:00pm**

### **An update on AM navigation over the past 8 years: Empowering Billion Dollar Decisions through Leveraging Information Technology in Asset Governance**

*Jude Rohan, City of Coquitlam / Canadian Information Processing Society, BC*

*The overall effectiveness of asset management and its ability to meet the set objectives are pinned to a single point: informed decisions. Empowering decision making to achieve the set objectives is the center of works carried out by the presenter over the last 8 years. The presenter, with a combined \$8 billion asset dealing experience, will show how asset management concepts and complex multi- criteria are modelled to empower informed decision making and ensure success under an elaborate asset governance model.*

*The presentation will share presenter's navigational experiences: the progresses and challenges in continued navigation over the last 8 years on asset management, and will deliver an update of the works completed. The audience will learn how feasible asset management outcomes are, and how best to overcome institutional challenges and set progress.*

*The presentation will include experiences and showcase developed and operating models on:*

- a) Concept and modelling of condition;*
- b) Concept and modelling of risk (update of previous presentation);*
- c) Concept and modelling of optimized replacement including value-for-money (update of previous presentation);*



d) Concept and modeling of levels of service and cost of service;

e) Concept of data management, information dissemination and performance: spatial portals, dashboards, Critical Success Factors (CSF) and Key Performance Indicators (KPI);

f) Concept and modelling of sustainable financing, and

g) Successes and challenges of working with cross-functional teams in the past 8 years.

### **Using Levels of Service to Determine the Real Costs of Maintaining "Gold Star" Assets**

*Jamie Rozema-Stinson, City of Calgary Parks*

*Follow up on Customer Levels of Service in Calgary Parks (previously presented in 2011 at CNAM in Burnaby). The session will provide a brief refresher on how customer level of service (LOS) have been implemented in Calgary Parks. Since 2011 Calgary Parks has tied the LOS model to assets and operating unit costs to demonstrate the effects of budget realities in municipalities. For example, how does reducing services to one group of assets affect the overall level of service to the park itself? This comprehensive LOS model looks to quantify that effect. We will also discuss how the LOS model has been adapted in Calgary Parks to forecast operating funds required to maintain newly built parks assets and to ensure that those costs are considered in the design development stage.*

### **When In Doubt... Calgary Roads' 10-Year Asset Management Journey**

*Kai Li, The City of Calgary*

*Sean Buckley, The City of Calgary*

*The Roads Business Unit in the City of Calgary started its Roads Asset Management Program (RAMP) in 2006. We stumbled along in the past 10 years; made great progress in some areas and failed in some. We would like to share our lessons learned in: Building the asset registry; Complying with Tangible Capital Asset (TCA); and Meeting Asset Management core requirements.*

**Tuesday, May 10, 2016**

**Governance/ Strategic Management**

**1:30pm – 3:00pm**

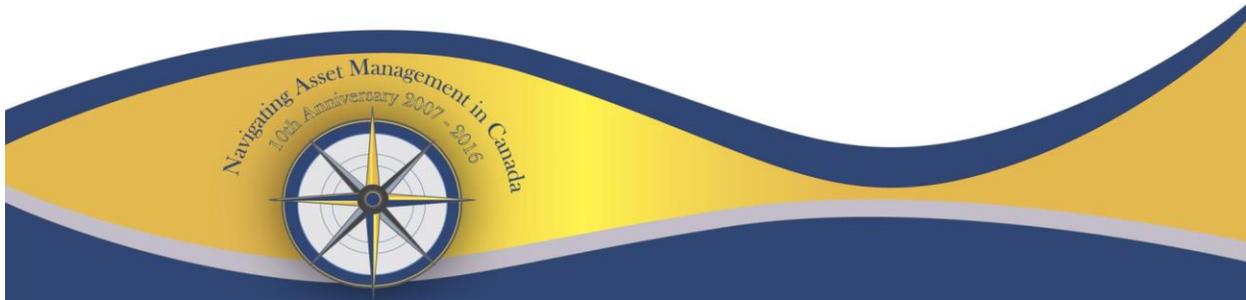
### **Canadian Infrastructure Report Card (CIRC)**

*Steve Wyton, The City of Calgary*

### **Whose Job is it Anyway?**

*Stephen Hove, City of Calgary*

*Bernadette O'Connor, Opus International Consultants (Canada) Limited*



*A case study on benchmarking against the new ISO 55000 series and successful Governance Structures for AM. The City of Calgary has been advancing in asset management governance corporate-wide, and had many documents, tools, processes and practices already implemented before the new ISO 55001 standard came into place. Therefore in 2015, the City decided to benchmark their AM practices against the new international standard. The project also included a review of key AM governance documents; AM Policy AM Strategy AM Framework. This presentation reports the process undertaken and outcomes achieved from benchmarking against ISO 55001 and updating the City's governance documents. We will also discuss the benefits of aligning with ISO 55001 versus certification. And we will elaborate on effective governance strategies, obtaining and maintaining corporate commitment, what leadership in AM looks like from a practical perspective, and the role of governance documents within the AM landscape of the organization.*

### **What has the UK Asset Management Industry Learned Over the Past 10 Years?**

*Jon Greensill, SEAMS Ltd*

*We reflect on the past 10 years of regulated asset investment planning in the UK from three key sectors, Water, Road and Rail. Each highlights a different path taken with positives and negative results. At one end is UK regulated water industry which was one of the earliest, and still may be the largest, user of a strong regulated asset management framework with strong links from prices through to levels of service. We consider how the latest focus on Totex / Output Delivery Incentives will work. More recently the UK government has change its approach to asset management governance on the strategic roads network, an asset base valued as one of the top ten largest in the world. By introduction of a "roads regulator" and setting a new government owned company does this signal the intention to fully privatise the roads network and could this be a model adopted elsewhere?*

**Tuesday, May 10, 2016**

**Education/ Research**

**1:30pm – 3:00pm**

### **State of Practice of Asset Management Education in Canada**

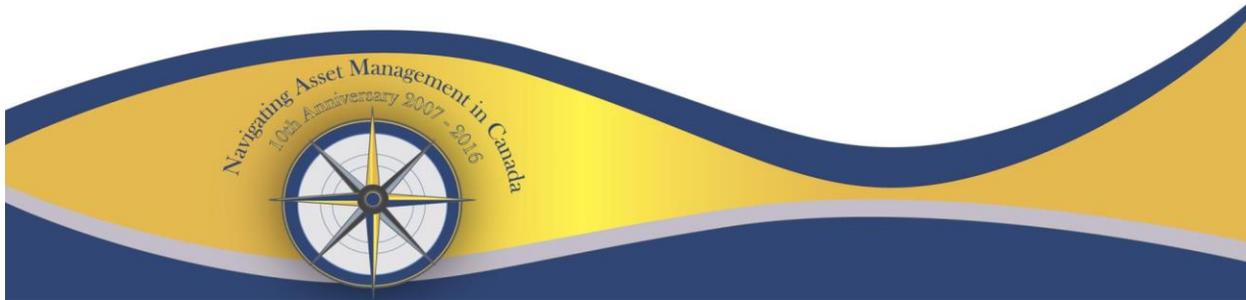
*Dana Vanier, The University of British Columbia*

*Asset management in Canada is evolving and there is a growing need to formalize the education of practitioners in Canada. UBC is one of the first universities in Canada and the world to offer a Master degree in this domain of Urban Systems. Two courses are dedicated to the engineering related to the new program in the Master of Engineering Leadership (MEL.ubc.ca). A survey of existing courses at Canadian universities and colleges is provided.*

### **New Directions for Asset Management**

*Wally Wells P. Eng., Asset Management BC*

*Asset Management BC is a 'Network of Practice' providing free assistance and resources to All. Similar practice areas now existing in Yukon, NWT, Ontario, Alberta and most recently Atlantic Canada. The presentation will update all on current work and subject matter including the Sustainable Service Delivery Framework: A BC approach, significant recent and on-going work on integration of natural resources into an asset management strategies, risk and consequences, climate change and 'preaching'*



*the message.....how to communicate results. The presentation will conclude on an update of the regional and national network and the challenge we all can answer.*

### **Criticality Assessments to Prioritize Work and Develop a Business Case for Funding in the MUSH Sector**

*David Albrice, RDH Group*

*Matthew Branch, RDH Group*

*All asset-intensive organizations share a common challenge: insufficient funds for sustainable stewardship of their asset portfolio. When organization's grapple with this challenge they find that it contains two interconnected problems: a) the "Criticality Problem" - how much money will the organization realistically need over period 'x'? b) the "Priority Problem" - how should the organization optimize the distribution of its limited budget? These challenges are further compounded when the organization cannot get funding to conduct detailed condition health studies on all its critical assets and must rely on statistical models or other "shortcuts". This session presents a case study of a criticality model that was used to identify an organization's unfunded liabilities and develop a compelling business case for additional funding for prioritized projects.*

**Wednesday, May 11, 2016**

### **Levels of Service**

**10:00am – 12:00pm**

### **Determining the Asset Level of Service of Fire Stations Using a Star Quality Rating**

*Pinky de la Cruz, City of Calgary*

*Jennifer Ouyang, City of Calgary*

*In 2014, The Calgary Fire Department with support from CH2MHill and Corporate Asset Management, embarked on a project to determine the asset level of service required for 36 of its fire stations using a Star Quality Rating methodology. This approach used the same general concept used in the hotel industry to determine the required quality, maintenance and replacement regime for its fire stations. Using a cross-functional team, the Star Quality approach ensured that the attributes required by citizens, firefighter and management from a fire station are captured and assessed objectively for future decisions on asset maintenance, major rehabilitation or replacement. The project was completed in mid 2015. The Star Quality Rating scores were utilized to identify and prioritize the lifecycle and replacement plan for the fire station both in the short-term and in the long-term. Further, because the project involved various stakeholders (Firefighters, Operations Chiefs, Fire Management, maintenance planners, capital project managers etc.), it proved valuable in gaining engagement and buy-in from staff and management. CFD also developed a better understanding of user requirements that will aid the organization in future fire station design. The Star Quality Rating approach is being rolled out in 2015 to the rest of the facilities to obtain a complete view of the department's facilities assets for a complete and holistic asset management planning.*

### **Tying Level of Service to an Informed Budgeting Process for Solid Waste Management Services in Toronto**

*Dharmen Dhaliyah, P.Eng, PMP, MMP, CMRP, Manager Asset Management, City of Toronto*

*Terry Martins, P.Eng., Partner, Asset Management, GM BluePlan Engineering*



Supporting Toronto's strategic objectives these objectives, SWMS introduced an initiative to implement an asset management framework and best practices for assets supporting SWMS program areas. The SWMS Framework is focused on making informed decisions on assets supporting service delivery. SWMS can analyze funding strategies against the condition/performance of assets, asset maintenance and most importantly the LOS provided to residents. Presented will be an example on budgeting for collection truck replacement where management see impacts of varying capital budgets on average trucks on the road daily resulting from predicted maintenance. If the fleet is older and not enough trucks are replaced, tools predict less trucks on the road, LOS impacts include later pick-ups, more overtime and higher annual fleet maintenance costs. The AM environment is helping SWMS achieve broader City goals of service delivery improvement, financial sustainability, operational excellence and enterprise culture and is now feeding their budgeting process.

### **Region of Halton: Understanding the Tradeoffs between Levels of Service, Cost of Service and Risk**

*Aman Singh, GHD Limited*

*Pious Maposa, Region of Halton*

*Roop Lutchman, GHD Limited*

Municipalities are collecting large amounts of asset-related data and information to understand the current condition and performance of their infrastructure systems including how the infrastructure support the services the municipalities provide. At the same time discussions around levels of service and risk are becoming increasingly common. The Region of Halton's Public Works Division (the Division) has established a Strategic Levels of Service (LOS) and Risk Management Framework) to inform capital programming activities and forecast short, medium and long term funding requirements. The LOS and Risk framework will form part of the Regional's decision making process and will ultimately dictate asset lifecycle strategies and investment levels across the Divisional assets. A key outcome of this project was an understanding of the trade-offs between LOS, Risk and Cost of Service and how this translates to changes in asset integrity profiles over time.

### **York Region's Approach to Transportation Asset Management Planning**

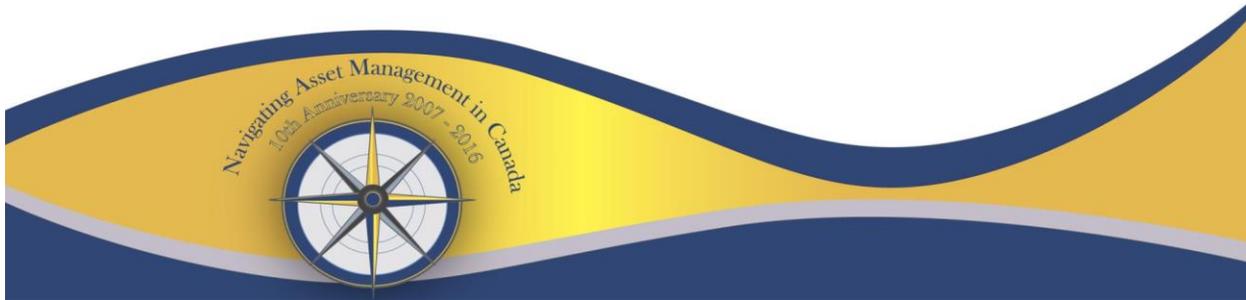
*Sherif Kinawy, KPMG LLP*

*Jim Lee, York Region*

*Mehran Kafi Farashah, York Region*

The Regional Municipality of York's Transportation Services Department manages a portfolio of assets representing Traffic, Transit, Roads, and Fleet. Managing these assets at a regional level involves a diverse set of stakeholders with different perspectives and inconsistent data sources. To develop an asset management plan for Roads and Pavement, and another for Bridges and Structures, York Region worked with KPMG's asset management team to consolidate information from the Transportation Master Plan, Strategic and Capital Plans, and the Bridge Management and Pavement Management Systems. The teams also focused on creating more integrated levels of service (LOS) that tied strategic objectives to customer and technical performance measures.

*In this session, we will outline the method used to develop these asset management plans, highlight the main challenges, and describe the approaches used to overcome these challenges.*



Wednesday, May 11, 2016

## Linking Financial Planning to Asset Management

10:00am – 12:00pm

### **Moving Beyond Asset Management into Sustainable Public Budgeting**

*Chris Champion, Institute of Public Works Engineering Australasia*

*It is not enough to develop an asset management plan for your organization. The end game is funded, affordable and acceptable levels of service delivery. We need to use asset management as the foundation for sustainable public budgeting. This presentation will discuss how our financial statements need to present a true account of the (declining?) value of our infrastructure capital. It is not enough to record and depreciate historical costs. The critical means and important metrics that we need to target to achieve sustainable public budgets will be presented. We need to link asset management to long term financial planning. These principles are critical to sustainably financing and funding your infrastructure services.*

### **What Does Our Tax Dollar Buy Us?**

*Melissa Osborne, City of Windsor*

*Brad Campbell, Assetic*

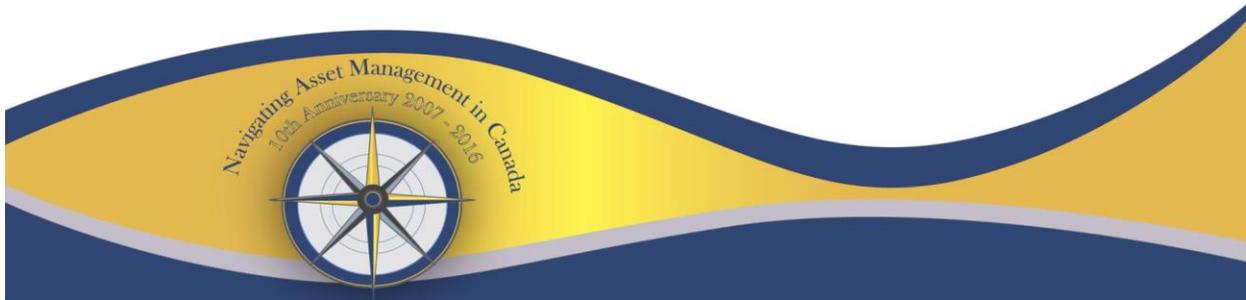
*The City of Windsor developed their Levels of Service and Risk templates including obtaining current LOS and Risk data for several assets, including roads. What quickly became evident is that without knowing the impact various funding models would have on their assets over a longer period of time it was not feasible to set goals for LOS. The ability to provide such information to Council would also provide for a better dialogue with Council and residents to bring clarity to how defined levels of service, risk and funding relate to each other. In November 2015 Administration was able to bring forward to Council, 4 funding models which projected the expected condition of the road network over the next twenty years. The decision on which funding model was most acceptable thereby defining the Levels of Service and Risk to be anticipated and achievable.*

### **On the Road to Utopia “Advanced Integrated Capital Planning”**

*Mike Hausser, P.Eng, City of Cambridge*

*Ronnie Flannery-Guy, AquaData*

*The City of Cambridge, in partnership with Aquadata have successfully implemented a decision support system that embraces the Asset Management principles of a balanced approach through life-cycle modeling of inter-related but independent systems and their asset components. Alignment of optimal renewal interventions of water/sewer/drainage/road infrastructure in the same location balanced with multiple funding source limitations and risk encompassing probabilistic statistical methodologies. The implementation of InfraModex has taken Cambridge's short and long-term asset management planning to the next level of sophistication. This has enabled further refinements and confidence in long-range financial planning and help communicate funding requirements in efforts to attain sustainability of acceptable levels of service to the community. This session will provide insight into the logistics and technology that Cambridge is using and how it will be applied to all asset classes in the Municipality going forward.*



## **An Optimized Approach to Integrating Asset Management with Fiscally Responsible Planning**

*Tara Gudgeon, HBSc, City of Brantford*

*Geoff Linschoten, C.E.T, CMM III,*

*The City of Brantford has established the importance of integrating static, stand alone documents such as Master Servicing and Transportation Master Plans, Official Plans, and DC Background Studies with State of Good Repair programming for existing assets. The City developed an optimized approach that: -Significantly reduces resources required to produce the City's annual capital budget and increase confidence with Council. -Allows for rapid re-analysis of investment needs without resource intensive rework. -Provides a repeatable and systematic approach and remain viable for subsequent budgets. This session serves to demonstrate how the City's investment in defining a repeatable business process, defining and formalizing lifecycle strategies (replacement and rehabilitation), condition strategies and risk standards has allowed their internal stakeholders to shift limited resources away from inefficient manipulation of information into an optimized infrastructure analytics approach to capital planning.*

**Wednesday, May 11, 2016**

**Innovative Practices (Field Services)**

**10:00am – 12:00pm**

### **Applied Asset Management of Water System Control Valves: Halifax Water Case Study**

*Cameron White, Bsc Eng, Pure Technologies Ltd*

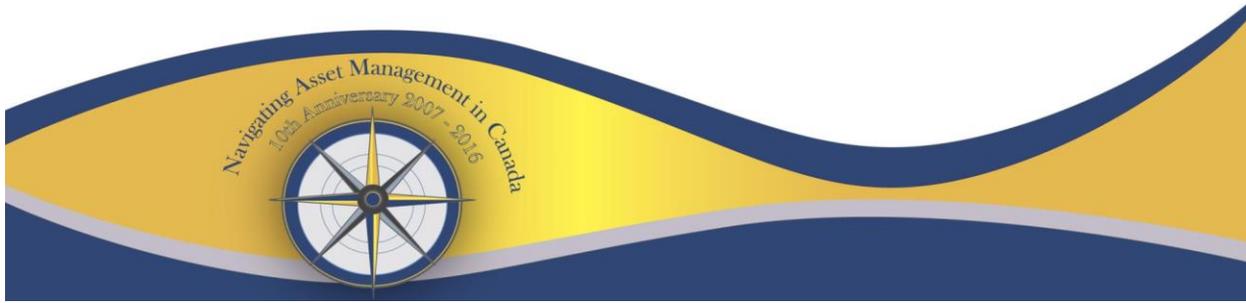
*Control valves play a major role in a water systems operation by allowing operators to isolate certain sections of the system and control the direction of water flow. Halifax Water has experienced unexpected system hydraulic performance and a larger number of customers effected by shutdowns due to inoperable control valves. Faced with these challenges Halifax Water systematically determined which critical valves were suspected to be inoperable and then conducted a pilot project with Wachs Water Services to evaluate and repair the subject valves.*

*In this presentation, we will discuss the value of control, describe a step by step asset management approach to managing control valves and highlight the economic return of the Halifax Water valve project. Control valve asset management programs produce immediate results by identifying and documenting the valve inventory, delivering detailed valve physical, locational, and operational data, and executing high value repairs rather than expensive and disruptive replacements.*

### **Extending the Life of the Angus L. Macdonald Bridge**

*Thomas McNutt, COWI Bridge*

*The Angus L. Macdonald Bridge is a major suspension bridge that crosses Halifax Harbour and connects Dartmouth and Halifax in Nova Scotia, Canada. After almost 60 years of service, the aging bridge deck has reached the end of its functional service life. Therefore, the owner, Halifax Harbour Bridges, decided to replace the entire suspended superstructure including the hangers. The entire suspended structure will be replaced sequentially during night closures while the bridge will be open for traffic during the day. Following the replacement of deck segments, the deck will be raised to increase the navigation channel clearance by 2.1 m at midspan. This presentation will provide*



*an overview of the project and an update on the current status at the time of the conference, as well as some of the challenges that have been encountered during fabrication and erection.*

### **Trenchless Rehabilitation Technology: A Significant Key to Infrastructure Salvation**

*Kevin Bainbridge, Robinson Consultants*

*Harry Krinas, City of Hamilton*

*A number of Cities and Utilities have begun to increase their revenues as a result of the many reports and studies identifying the infrastructure deficit, but are we in a position to implement programs to efficient use these funds to improve buried infrastructure service levels and risks exposure. The studies and reports have played, and will continue to play a significant role in influencing governments (at all levels) on the need for infrastructure investment, however there has been little discussion on how to intervene on this infrastructure when the investments dollars start to increase. Trenchless Technologies, both rehabilitation and new installation are a significant key to address the required amount of work on an annual basis through its ability to dramatically reducing the financial, environmental and socioeconomic impacts associated with fixing buried infrastructure. As important as it is to increase the financial investment into water, wastewater and storm water infrastructure, so to is the importance of take the next steps toward the efficient use of these financial investments. The increased financial investment will not fix the infrastructure it will only pay for it, we need to begin to invest in technology and developing programs versus projects to physically address the infrastructure though all and every means possible. This presentation will look at how Trenchless Technologies can play a key role in a utilities ability to reduce the infrastructure deficit and sustain buried infrastructure over time.*

### **Apply Condition Based Maintenance and Other Techniques to Reduce & Optimize Plant Shutdowns**

*Warren Rodgers, CMRP, Nova Scotia Power*

*Industry has come to believe the annual shutdown is necessary to accomplish preventive maintenance on the equipment and realize improved OEE and throughput afterward. Embracing reliability concepts and the approach and value that condition-based maintenance brings to monitoring equipment, may just make shutdowns an activity of the past. This topic leverages both condition-based maintenance and best practices from project management to provide a means to optimize and reduce plan shutdowns.*

**Wednesday, May 11, 2016**

### **Risk Based Planning and Decision Making**

**1:30pm – 3:30pm**

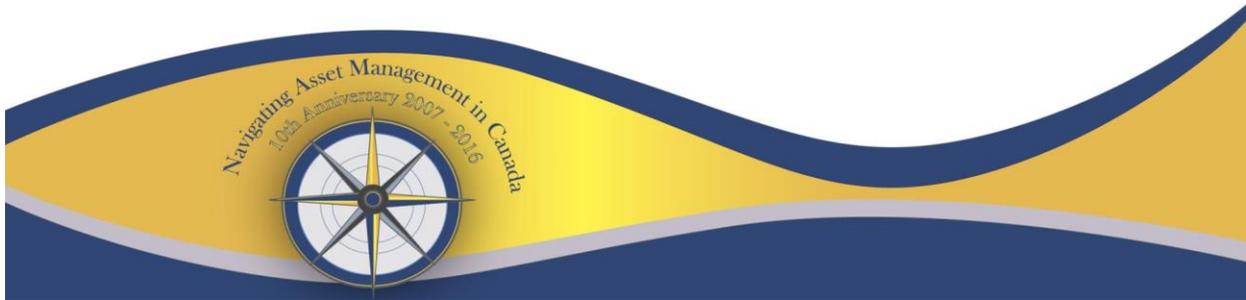
#### **Managing Risks in Trunk Sewers**

*Roop Lutchman, GHD Limited*

*Imran Motala, Region of Peel*

*Aman Singh, GHD Limited*

*The Region decided to formalize its renewal and replacement planning approach by incorporating risk management into the process. The key focus for the project was to develop a long term strategy to manage and reduce risk*



through proactive capital and operational planning using the J100 RAMCAP risk management process. The Region was able to leverage the previous risk work done on its water mains and use existing technology core systems (CMMS, GIS & Hydraulic modeling) for risk development. The Region was also able to validate its current capital program and demonstrate benefits in the form of deferred capital costs.

### **What Happens If We Don't and What Happens If We Do? Making an Explicit Relationship Between Budgets and the Performance of Infrastructure Systems.**

*Bill Garibaldi, City of Waterloo*

*Milos Posavljak, City of Waterloo*

*Nick Larson, GM BluePlan Engineering*

*The City of Waterloo is establishing fundamental processes that will be used to understand infrastructure needs and support the development of a comprehensive asset management plan to ensure the services that the City provides through their infrastructure systems can be sustained over the long term. The processes revolve around determining performance measures for each asset group and then establishing explicit relationships between the capital/operating budgets and the impact on the performance measures. These processes will enable City staff to provide evidence-based answers when decision makers ask "What happens if we don't and what happens if we do spend this money on this asset?" A core element of the process are analytical tools that use non-proprietary database programming to query existing data in their native sources. The tools are considered to be "professionally managed", meaning they are tools that help staff make decisions rather than being black boxes that make decisions for staff.*

### **Robust, Repeatable Risk Assessment for Making Decisions**

*Kelly Martin, City of Ottawa*

*The City of Ottawa has been actively documenting the risk profiles of assets through an internally developed, GIS-based process. Over the last couple of years, several risk assessment studies were completed by external consultants and the City was looking to internalize the process in order to adopt it in a consistent manner as well as day to day business processes. This session presents the method adopted and developed by the city to evaluate the risk of bridges, bridge culverts, retaining walls, overhead structures, noise barriers, watermains, roads, sidewalks, pathways, buildings, parks, forcemains (and the ongoing work to retrofit previously completed assessments of sanitary sewers, storm sewers, and culverts). The novelty of the approach is that the City has automated the process through which the consequence, likelihood and risk of failure are calculated at the individual segment or asset level. That automation is captured in a script that is ran through the ESRI GIS application on an as-required timeline through internal resources. This session presents a high level overview of the process, how the outputs are used, as well as key findings and observations captured as the solution was developed.*

### **Failure Probability of Water Treatment Assets**

*Russ Munro, City of Saskatoon*

*This paper presents the results of the author's research into the relationship between asset age and probability of functional failure for water treatment assets at the Saskatoon Water Treatment Plant (WTP). The results demonstrated that age-based failure does not apply to water treatment assets under a proactive maintenance regime. To complete the study, WTP asset failure data were analyzed using Weibull functions and found to be more*



likely to have early failure than later. This is in line with similar research done in other industries. Most importantly it demonstrates that not all assets are more likely to fail with age and that more robust risk strategies may need to be employed in order to help asset managers be sustainable.

**Wednesday, May 11, 2016**

### **Funding Our Actions**

**1:30pm – 3:30pm**

#### **Are Our Water Systems at Risk?**

*John Weninger, Urban Systems*

*The BC Water & Waste Association (BCWWA), together with Urban Systems, has recently assessed the financial capacity of local governments to maintain, renew and replace our existing water and wastewater infrastructure. Released in February 2015, the report "Are Our Water Systems at Risk?" highlights the need for communities to develop and implement integrated asset management processes to assess the state of infrastructure, evaluate risks, and set priorities for investment in water and wastewater assets. The report shows that water and wastewater fees are not covering the full cost of service delivery in many communities and many local governments are vulnerable, as they have not set aside sufficient reserve savings to buffer unexpected changes. The report provides metrics from individual communities for comparison and is intended to guide conversations among elected officials, utility managers, and water users about their own policies and priorities for asset management planning, infrastructure renewal and investment.*

#### **Ensuring Roadway and Utility Financial Sustainability Through Right-Of-Way Capital Planning & Optimization**

*Jack Graziosi, City of Vaughan*

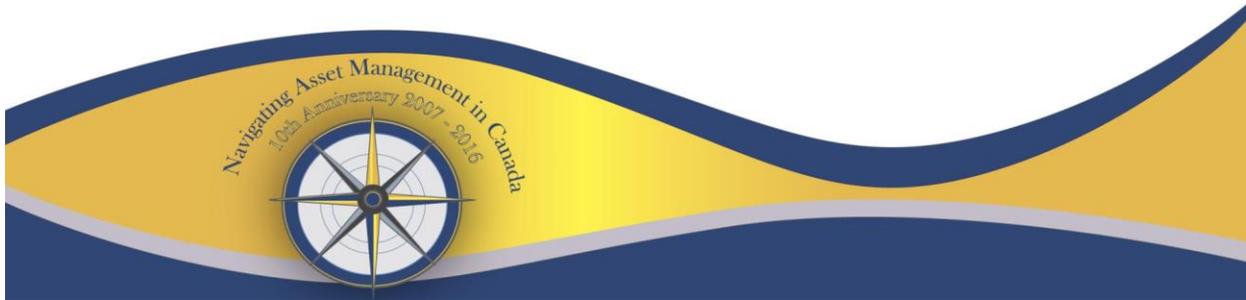
*Chris Lombard, AECOM*

*Municipal rights-of-way are typically comprised of complex, interconnected systems of infrastructure assets including roadways, bridges, water, sanitary sewers, stormwater pipes, sidewalks, valves and chambers, to name a few. Municipal decision makers are tasked with making the best use of available financial and human resources to manage these assets at an acceptable level of service. Often, the operation, maintenance, renewal and replacement of different asset classes are managed by diverse operating entities or 'silos' within an organization. The authors were retained by the City of Vaughan, Ontario, Canada in 2015 for an assignment to create an AMS for the 565 centreline-km of roadway, and the 2,865 km miles long underground utility network. The objective was to provide optimized renewal and replacement decisions for the right-of-way requirements across the multiple asset groups. This project was highly innovative and addressed the financial sustainability and AM challenges often faced by agencies around the world.*

#### **Financing Integrated Water Resource Management: Rate Development**

*Cathie O'Toole, Halifax Regional Water Commission*

*In 2007, the Halifax Regional Water Commission (HRWC) became the only regulated, integrated water resources management (water, wastewater and stormwater) utility in Canada. HRWC is a public utility and is regulated under the Public Utilities Act by the Nova Scotia Utility and Review Board (NSUARB). In 2012, HRWC submitted its first application for service rates under the new Cost of Service Strategy methodology, and proposed stormwater*



rates based on parcel impervious area measures. In addition, HRWC submitted an application for adoption of a Regional Development Charge (RDC) to ensure equitable distribution of cost responsibilities among new and existing users. This discussion will report on the evolution of HRWC's approach to financing integrated water resource management. It outlines major issues addressed at the NSUARB hearings on both methodological approaches and rate revenue requirements, and discusses lessons learned for financial planning under regulation of integrated water resource management and associated rate setting.

### **Funding a More Robust and Resilient Stormwater System: Mississauga's Stormwater Charge Program**

*Victoria Kramkowski, City of Mississauga*

*Municipalities are facing increased pressures on their stormwater infrastructure and are struggling to provide existing and enhanced service to residents. As a result, many municipalities are examining stormwater charges as a means of financing stormwater infrastructure. To date, the City of Mississauga is the largest municipality in Canada to implement a stormwater charge. This presentation will outline the process of developing and implementing the charge, including the rationale behind the type of assessment used, credit programs, outreach approaches, and administration. The presentation will also include feedback received from the public and other stakeholders and how this feedback was addressed, with an overall focus on lessons learned.*

**Wednesday, May 11, 2016**

### **Innovative Practices (Data Management)**

**1:30pm – 3:30pm**

#### **Asset Management of Sewers Utilizing CCTV**

*Jack Graziosi, City of Vaughan*

*This presentation will provide an overview of the City of Vaughan's approach into implementing a City-Wide CCTV inspection program leveraging both existing technology (GIS) and resources. This provided an opportunity to better understand system needs for its 1,700km of sanitary and storm sewers, in a cost-effective manner. CCTV has recently been used as an adaptable and predictive solution to better understand maintenance needs as well as develop capital investment planning by predicting asset condition and performance over time. The Pipeline Assessment Certification Program (PACP) framework was utilized to standardize pipe defects in a repeatable process. The CCTV data also became an invaluable source for verification of the existing pipe infrastructure data. In addition to defect observations, database submissions included information on pipe material, diameter and length, that enabled corrections to the central GIS database, and improved data quality overall.*

#### **Historical Closed Circuit Television (CCTV) Data Migration Project for the Halifax Regional Water Commission**

*Courtney MacMullen, SEG Consulting*

*Alex Wojcik, SEG Consulting*

*Charlotte Wyatt, SEG Consulting*

*CCTV pipe inspection data plays an important role in quantifying and projecting asset management plans within the Halifax Regional Water Commission (HRWC). Like many jurisdictions, the HRWC had a repository of CCTV reports in PDF file format. The HRWC reached out to SEG Consulting to develop an approach to converting their*



CCTV data to a GIS format. Having the data in GIS would enable it to be a foundational data source within their Operational Maintenance Management System. After evaluating various methods, SEG Consulting developed a series of customized scripts to automate the full extraction of data from the reports. Not only was SEG able to process a high percentage of the reports, the scripts were able to extract virtually all data from the reports into survey lines and observation points. The final deliverable included an ArcGIS Project and a web-based application with the data symbolized according to NASSCO standards.

### **What to Do with a Million Problems?**

*James Jorgensen, GM BluePlan Engineering*

*Imran Motala, Region of Peel*

Many municipalities and utility providers have a large amount of sewer CCTV information. Often, this information spans many years and is held in a variety of formats. New CCTV information is continually collected through structured programs, often moving through the entire asset base in a systematic fashion. Working as a combined project team, XCG Consultants, GM BluePlan and the Region of Peel have been exploring ways to make best use of the Regions historic CCTV. Combined with other data sets, including historic flow survey information, groundwater level data, topographical overland flow routing analysis and property ages, the work has focused on adapting the Regions CCTV inspection program, based on sound decision making, to target sewers that are more likely to have condition or performance issues that require intervention and mitigation.

### **All Pipes: A Collaborative Initiative**

*Christian Lee, Regional Municipality of York*

*Andrew Turvey, Regional Municipality of York*

*Jennifer Chung, Regional Municipality of York*

The All Pipes program is a collaborative program involving nine Local Area Municipalities (LAM) and York Region to bring forth a new approach to data-sharing. Software solutions are being implemented that allow data to be readily shared and integrated into one overarching database, that is then shared by all partners. QA/QC checks are incorporated directly into the data transfer process in an effort to improve data quality. The Region is working closely with each Local Area Municipality to ensure the All Pipes program best supports each Local Areas's business needs like water supply, water quality, wastewater servicing, and wastewater treatment. One Region, One system.

**Thursday, May 12, 2016**

### **Innovative Practices (Cost Savings, Process Enhancements, Data Management)**

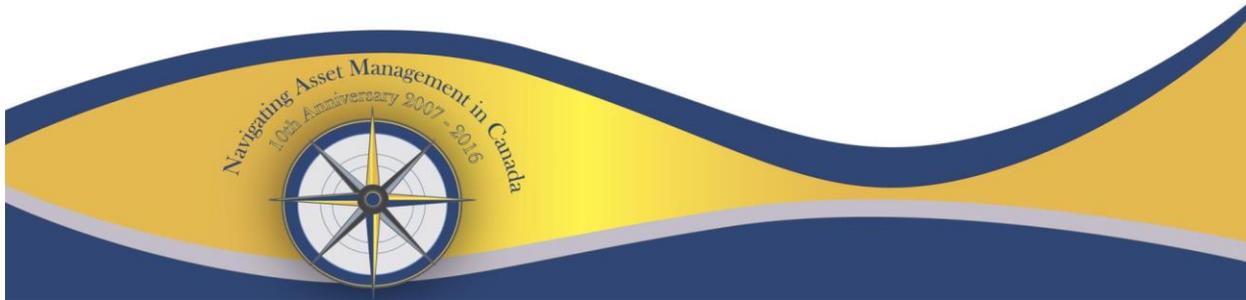
**10:30am – 12:30pm**

#### **Lean Six Sigma & Asset Management in Fredericton**

*Murray Jamer, City of Fredericton*

*Alicia Keating, City of Fredericton*

*The City of Fredericton has successfully implemented a meaningful asset management program since 2008 and is continuing to improve its asset management program through participation in FCM's Leadership in Asset*



Management Program (LAMP). A key to the City's approach has been long term financial plans for both the City's General Fund and Water & Sewer Fund, with asset management as a cornerstone of these long term plans. As well, the City has implemented a Lean Six Sigma program as a way to reduce waste and improve service delivery. With more than \$6.5 million in savings produced to date, this efficiency initiative has become closely linked to the asset management program. The savings have allowed an aggressive renewal program at a time of declining revenues. Also, the Lean Six Sigma tools are useful in improving asset management processes and evaluating levels of service.

### **Asset Management for Marine Structures**

*Sean S. Smith, ASCT, Port Metro Vancouver*

*Port Metro Vancouver manages a large portfolio of marine structures, which have a variety of designs and material types, and which must remain functional despite the challenges of a harsh marine environment. The Port's Asset Management Group has embarked on a mission to develop an asset management program for marine structures which includes risk factors and business value, as well as condition ratings, as a means of maximizing the lifespan and value of these investments which have significance to the national economy. The Port seeks to push the frontiers for inspection methods, testing, and treatment and repair strategies, and become an international leader in Asset Management for marine structures. This presentation summarizes our goals and our progress in this voyage to date.*

### **The Value of an Integrated Work Management System**

*Nigel D'Souza, Ontario Clean Water Agency*

*Mohammad Qureshi, Ontario Clean Water Agency*

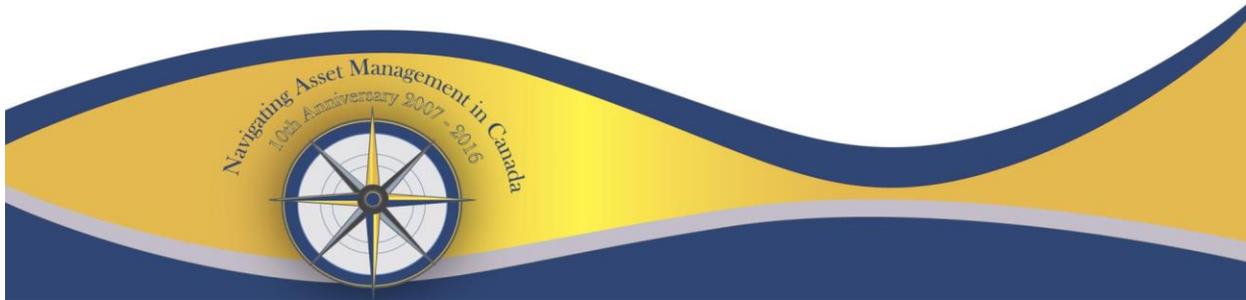
*Municipalities are under increasing pressure to have a sound asset management plan to ensure they have sustainable infrastructure. One component to achieving a sound asset management plan is "listening to assets" through data and technology. Technology tools are essential to managing services and infrastructure in our increasingly sophisticated industry. OCWA's previous WMS was designed to deliver enhanced practices and technology to support the water and wastewater operations and maintenance services we provide to more than 550 client sites across Ontario. Although the system met the agency's business needs at the time, there was an opportunity to re-evaluate our needs and assess whether a technology upgrade was required and viable. We will present a case study of the path to implementation and successful design including a mobile solution through smart phones and tablets with integrations to streamline data entry and access; providing a long term foundation for continued success.*

### **Laying the Foundation for a Sustainable Asset Management IT Solution**

*Atif Khan, City of Hamilton*

*Daniel Olsen, CH2M*

*Hamilton Water's existing asset management (AM) approach was developed in 2007 and has since been tested and refined through several water and wastewater condition assessments. In 2014, Hamilton Water embarked on an initiative to review and enhance their AM business processes and procedures including those associated with level of service, risk, lifecycle analysis, condition assessment/standards, etc. Throughout this initiative, the Utility has focused on the following key considerations: -Evaluate existing AM processes-Optimize the use of existing IT systems; -Ensure improved processes are feasible to implement;-Ensure improved processes better support*



decision making; -Simplify/standardize processes where possible, without removing value. Based on the enhanced business processes, functional requirements for an AM information system were developed that will directly be used to support the enhanced business processes. Hamilton is now reviewing options for an AM information IT solution including a strategy to integrate and leverage data within existing IT systems including SCADA, CMMS, GIS, and financial software.

Thursday, May 12, 2016

### Innovative Practices (Technology)

10:30am – 12:30pm

#### **Seeing the Big Picture: A Geographic Approach to Asset Maintenance & Rehabilitation**

*Jason Winter, City of Kitchener*

*Asset managers must regularly make decisions about maintenance and rehabilitation (M&R) based on sparse data about the condition of their infrastructure assets, the relative risk of failure of these assets, their initial costs and life cycle costs of maintenance. Historically, it has been very difficult for municipalities to optimize the selection of M&R investments each year, in a short or long (multi-year) planning horizon. The planning and forecasting of the repair or renewal of road, water distribution and wastewater collection networks in an integrated fashion is challenging because it requires the collection and analysis of field data on each asset's condition/health and maintenance history, as well as related geographical, environmental and sociological data. Taking a geographic information system (GIS)-based approach enhances the decision-making process by allowing municipalities to visualize the relationships between assets. This enables them to effectively prioritize corridor rehabilitation of their infrastructure using GIS tools to perform model calculations and spatial analytics. Esri Canada and the City of Kitchener have established a GIS-centric asset management framework that supports the efficient management of municipal infrastructure while leveraging the City's investment in Esri technology, applications and data. This presentation will provide an overview of the framework that consists of an ArcGIS geodatabase data model, as well as asset life cycle, asset risk and integrated decision support models which enable intelligent, data-driven decisions on infrastructure replacements and rehabilitation.*

#### **Region of Waterloo Aligns Business Processes & Technology for Comprehensive Building & Equipment Asset Management**

*Robb Dods, Region of Waterloo*

*Recently, the Region of Waterloo has gone through a reimplementation of Archibus to upgrade to the latest version, take advantage of other software capabilities and implement best practice facilities asset management processes within the system. Through this process, our team identified a number of deficiencies in our business processes. Some, we were able to improve through changes to the configuration of Archibus and others, we needed to step back and look at our own processes and procedures to make improvements before we could take full advantage of the functionality of the system. We are now able to use Archibus to develop a full inventory of all Regional buildings with components and equipment assets categorized for reporting by asset type. We track staff time and costs against assets and have introduced a mobile application that allows tradespeople to receive and complete their work in the field with access to detailed asset records and work history. At the same time, we have improved our maintenance and administration processes for increased efficiency, depth and accuracy of data.*



Thursday, May 12, 2016

## Innovative Practices (Miscellaneous)

10:30am – 12:30pm

### **How Parks Canada is Targeting Asset Investments to Ensure Future Canadians can Enjoy their Natural and Cultural Heritage"**

*Anna Robak, Technical Principal, Global Asset Management, Opus International Consultants (Canada) Ltd.*

*Catherine Grenier, Director Investment Planning and Portfolio Management, Parks Canada*

*Karen Robichaud, Manager, Transportation Engineering, Fredericton, Opus International Consultants (Canada) Ltd.*

*The Parks Canada Agency needed a defensible way of identifying and securing their most important assets, including national and World Heritage sites, highways, historic canals, and park facilities, because its asset portfolio was degrading due to constrained funding. The Agency investigated how other asset owners prioritise their investments and eventually selected a form of multi-criteria analysis known as the Asset Prioritisation Index (API). We will share how our special project team developed the API, engaging staff across all business functions and testing the results in a series of pilot studies. We will showcase how the API supports decision-making by enabling integrated perspectives and macro-level strategies; increasing transparency and credibility; and raising awareness, promoting forward thinking and making asset stewardship a collective management responsibility at the Agency. The API is now being applied across the Agency's diverse portfolio and \$3.1 billion of projects. Thanks to its robust development and application, the API will ensure Canadians will continue to enjoy our natural and cultural heritage well into the future.*

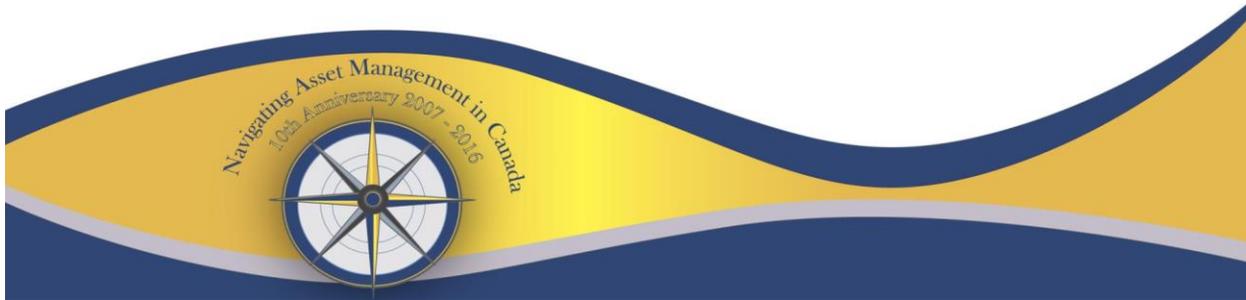
### **An Evidenced Based Approach to Potable Water Facility Capital and Maintenance Investment Forecasting**

*Amanda Beattie E.I.T., G.I.T., C.E.T., PMP, GM BluePlan*

*Richard Pinder - M.A.Sc, P.Eng, Region of Waterloo*

*Erin Hobbs - P.Eng, Region of Waterloo*

*The Region of Waterloo, in their continued commitment to operationalize their asset management plan and practices across the organization, embarked on the development of a business process and tool to assist in forecasting maintenance and capital needs for the Region's Groundwater Well portfolio of 128 facilities. Historically the capital and maintenance funding for these facilities was fixed and did not accurately reflect the actual rate of deterioration, condition, nor the accrued maintenance deficit and risk, security of supply, on a facility specific basis. The formalized business process and tool resulting from this project allowed for the aggregation and distillation of data pertaining to: existing condition assessments, capacity assessments, short and long term planned maintenance, scheduled capital rehabilitation and replacement investments and functional obsolescence / redundancy scores to derive a robust evidenced based investment plan. The optimized plan provided clear evidence of the need to increase current combined annual funding for this asset portfolio by 70% based on factual predictive outcomes. Learning outcomes for this session are understood to be: -Approaches to the development of a capital and maintenance funding strategy that reflects the reality of the current condition and performance of the facility complement. -How to optimize the maintenance and capital investment ratio for the provision of a facility centric level of service and risk. -Leveraging existing condition assessment, performance, capacity and MMWS data within common off the shelf software to develop a balanced and transparent investment plan*



## **Design and Construction Specifications for Brownfield Development on a Combined Sewer System**

*Bryan Bortolon (LEED AP+), GM BluePlan Engineering*

*TBD, Halifax Regional Water Commission*

*Halifax Water's wastewater system is a combination of separate, partially separate, and combined sewerage. The older combined sewerage is located in the downtown core of both Halifax and Dartmouth. These areas have significant development pressures and as such, it is important that the assessment and evaluation of existing available capacity, and future capacity needs, are completed appropriately for a combined sewer system. A combined sewer system policy was developed to define the level of service and establish design and construction specifications for brownfield development on a combined sewer system. The document contains guidelines for completing capacity assessments using desktop reviews, flow monitoring data, and hydraulic modelling. The policy discusses different strategies to support the mitigation of undersized infrastructure, including low impact development, sewer separation, and the acceptability of upsizing combined sewers.*

## **Structuring Your Asset Management Data**

*Doug Manarin, P.Eng., Opus International Consultants (Canada) Ltd*

*Over the last 10 years municipalities and utilities have been advancing their asset management systems. Organizations have made significant investments in systems to track maintenance activities, financial expenditures, asset information, and customer interactions. Being able to leverage this information can provide significant information into how assets are performing, insights into how residents are perceiving our infrastructure, and better information how we can make more informed decisions on maintenance and rehabilitation activities. How can we ensure that we are structuring our systems and activities to bring this information together to better inform our infrastructure decisions? Participants of this session will gain a further understanding on the importance of being able to link information between systems, assets, inputs and results to empower their decision making processes.*

**Thursday, May 12, 2016**

### **Workshop**

**10:30am – 12:30pm**

### **FCM LAMP Networking Session**

*Donna Chiarelli, FCM*

*This session will provide an overview of the LAMP (10 to 15 minutes) and then an opportunity for delegates to circulate around the room to chat with a range of LAMP participants. These participants will have posters that provide information about their municipality, where in the asset management maturity scale their program is today, and what they are hoping to achieve through LAMP. Delegates will have the opportunity to interact with LAMP participants, understand what other municipalities are doing in asset management, gain insight into what the challenges are/have been, and see a spectrum of varying sizes of municipal participants and variety in their program needs.*