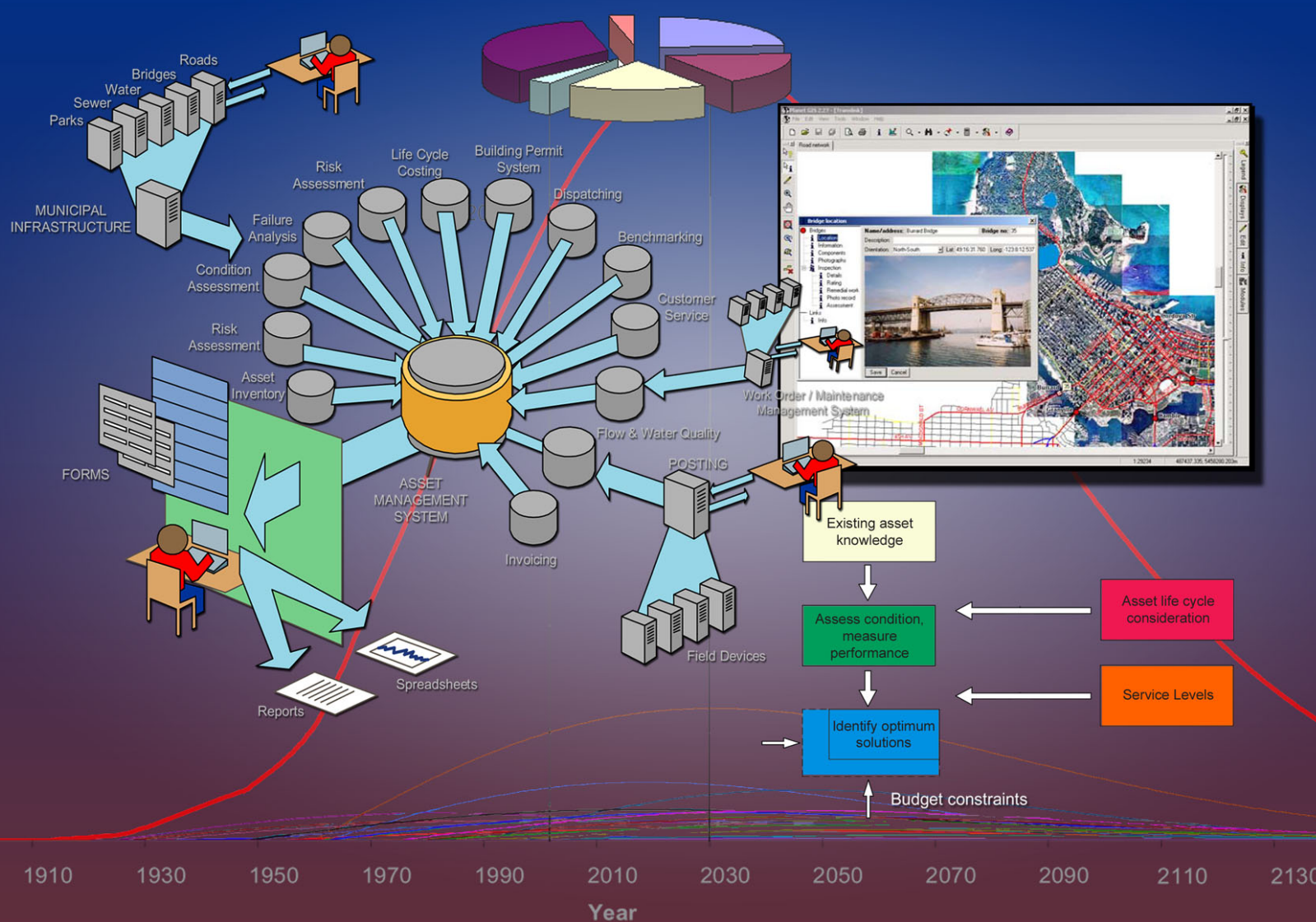


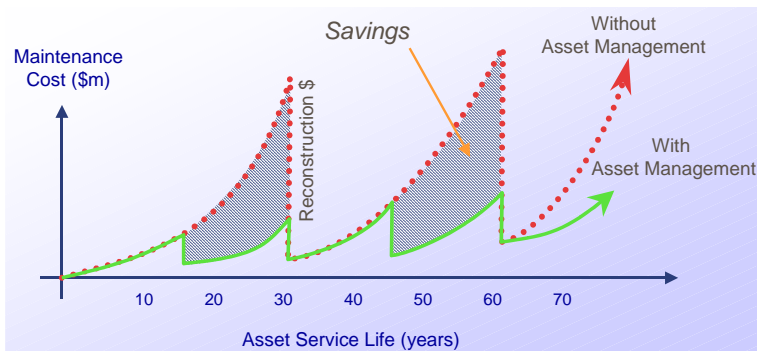
Asset Management

Optimizing the Life Cycle Cost of Your Assets

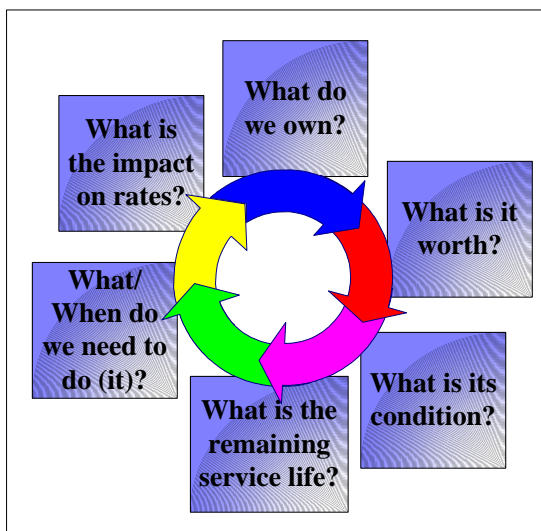


Asset Management – Optimizing the Life Cycle Cost of Your Assets

Asset Management is becoming a key strategic tool for utility managers to meet the challenge of maintaining or improving service levels while competing for ever diminishing funds. The huge investments in infrastructure over the past century, combined with the significant rehabilitation and replacement costs of existing infrastructure, make well-planned and efficient proactive management of these assets essential.



Asset Management is a structured program to optimize the life-cycle value of physical assets. It can apply to a wide range of infrastructure types, including municipal water, wastewater, roads, bridges and building assets through effective management and rehabilitation programs that will ensure ongoing integrity and sustainability.



Earth Tech's Strategic Approach to Asset Management

Earth Tech provides asset management solutions tailored to the needs of our clients. We use a "best practices" approach to realize the maximum value of assets while improving customer service levels by analyzing staff capabilities, current practices and existing processes. Our experience in assisting infrastructure managers and asset owners in tailoring asset management solutions to their needs is unsurpassed. For example, Earth Tech has advocated and used the NRC's "Six Whats" of asset management for a range of municipal asset management assignments in the past. Our high familiarity with this framework makes us uniquely qualified to address the asset management needs of municipal and

industrial clients alike.

Benefits

Assets are long-term investments. Short-term solutions are not realistic and may lead to increased costs over the life cycle of the asset. Earth Tech provides reliable, timely services that assist the asset owners in:



- ☑ Directing and enhancing the capital and maintenance planning process.
- ☑ Meeting the goal of service delivery at minimum sustainable cost.
- ☑ Providing the tools and direction to meet current and future infrastructure-related accounting regulations.
- ☑ Identifying and implementing continuous improvement opportunities.
- ☑ Assisting organizations to increase the revenue generating potential of their assets and services.
- ☑ Staying abreast of the most current trends and developments in the field of infrastructure asset management.
- ☑ Ultimately, optimizing the life cycle cost of the assets under your management.

Earth Tech's Asset Management Experience

Earth Tech's asset management planning and consulting experience for clients in Canada, the US and Asia embraces an extensive range of services. These include long-range capital planning, benchmarking & performance measurement, project multiple-account evaluation, master planning, information technology implementation services, water loss management & revenue improvement, and best practice definition.

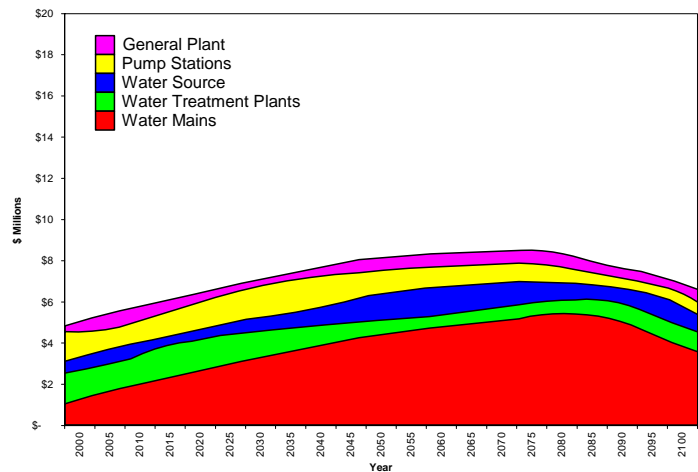
We believe that action speaks louder than words and that our project experience is the best indicator of our proven track record and the breadth and depth of Asset Management experience within Earth Tech. To that end we have included a brief review of some of our Asset Management projects. Please feel free to contact us if

you would like additional information or client references for any of the following projects:

The Greater Vancouver Water District (GVWD) Asset Management Planning Study

The GVWD retained Earth Tech to review existing asset management tools and processes, and identify gaps that were resulting in process bottlenecks and the inability to perform asset management-related functions. A detailed Asset Management Planning strategy was prepared, following a best-practices survey amongst a wide range of utilities. Accompanying this analysis was a range of theoretical replacement models of the GVWD's infrastructure assets to determine the approximate asset replacement requirements over the next 100 years. The output of this type of modeling is known as a "Nessie Curve". Given the current age, materials, and past reinvestment levels, it was possible to develop specific management and financial strategies which will assist the GVWD in meeting its objective of financial sustainability in perpetuity.

Water Utility Asset Replacement Projections

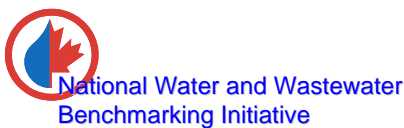


National Water and Wastewater Benchmarking Initiative

Earth Tech has successfully benchmarked Canadian water, wastewater and storm water utilities for over six years through the award-winning National Water and Wastewater Benchmarking Initiative. This project originally developed to meet a need of utility managers to know how well their utilities are performing and how they could improve operations. It has subsequently developed into potentially the largest and most successful public sector benchmarking project of its kind in the world, and includes over 30 of Canada's largest utilities. Beyond the mainstays of the collection and presentation of high quality data, the project is now evolving to provide web-based project output, with the following added features:

- ☑ Customized results for individual utility modules.
- ☑ Process benchmarking initiatives on strategic utility issues.
- ☑ Individual utility management reviews.
- ☑ Identification and implementation of continuous improvement initiatives.

Please refer to www.nationalbenchmarking.ca for more information on the Benchmarking project.



National Guide to Sustainable Municipal Infrastructure, Development of Best Practices for Managing Utility Data

The Earth Tech facilitated the development and documentation of Best Practices for Managing Utility Data with the participation of 12 municipal practitioners. This project was funded under the Infrastructure Canada Program of the Federation of Canadian Municipalities (FCM) and the National Research Council (NRC). The aim of the Guide was to assist municipalities with decisions regarding the long-term planning and prioritization of funding allocations for municipal infrastructure and in the selection of the best technical solutions to the infrastructure challenges that municipalities face.



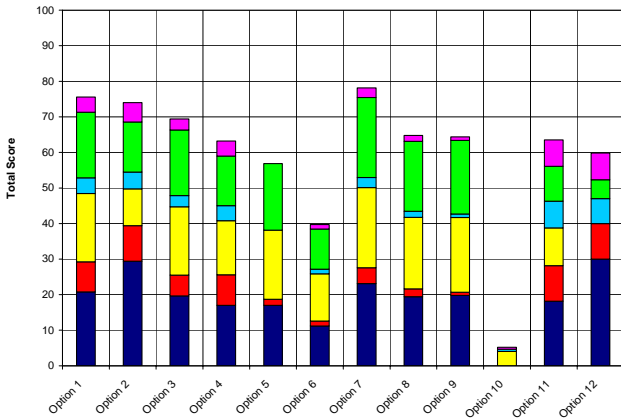
GVRD Wastewater Treatment Plant Asset Management System Study

Earth Tech was retained by the GVRD to develop strategies, standards and procedures to ensure the financial sustainability of the assets within the 5 GVRD wastewater treatment plants. Specifically, this assignment related to the development of asset management business processes and an asset management system implementation “blueprint” that can be utilized by the District in a schedule that meets their future infrastructure management and long range

budgeting needs. The methodology used to develop the asset management system is based on the NRC’s “Six Whats of Asset Management Planning”. This framework is based on answering key infrastructure related questions including: “What do you have?”, “What is it worth?”, “What is its condition?”, “What do you have to replace first?”, and “What is the cost?”. Based on this framework, Earth Tech developed procedures to evaluate all of the assets at the 5 WWTPs. The solution included leveraging off the existing CMMS system, developing standards and procedures for evaluating the asset condition and risk, and calculating remaining lifecycle and expected replacement cost of each asset in the inventory. Finally, a range of scenario-testing tools and reporting formats were designed so that the District could test various asset replacement and funding strategies and see the effect of each over the long term.

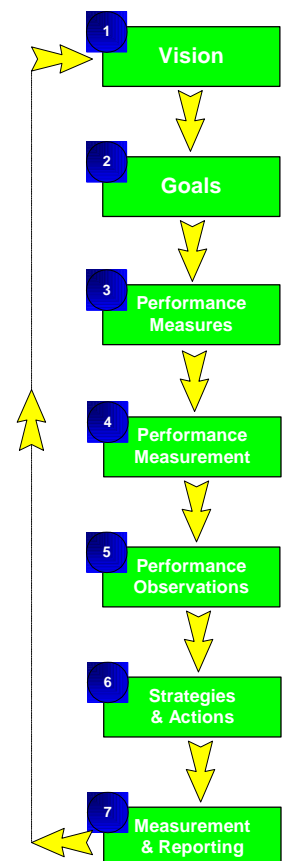
Multiple Account Evaluation of the GVRD's Future Water Sources

Earth Tech assisted the Greater Vancouver Regional District (GVRD) in identifying its most preferable future water source using an extensive Multiple-Account Evaluation (MAE) decision model developed for the project. After identifying 14 potential future water sources for the Region, Earth Tech developed the technical specifications and economic life cycles for each of the options, and compiled the terms of reference for social and environmental impact assessments of the options. Through consultation with stakeholders and the 21-member Regional Engineers Advisory Committee, Earth Tech designed the multiple-account decision framework and decision criteria to single out the technically and financially most feasible options. The results of the study is currently being incorporated into the GVRD's long-term Drinking Water Management Plan



Water Utility Benchmarking Report Card for CRD Water, Victoria

CRD Water in Victoria, British Columbia, is using an innovative new benchmarking report card developed by Earth Tech to review and improve the performance of its water utility operations. Earth Tech developed the Benchmarking report card for CRD Water for the utility's three functional areas of responsibility namely treatment, supply and distribution. Each of the functional areas were sub-divided into management, division and operational levels, thereby producing a total of nine report cards. Through statistical analysis, CRD Water's performance on each measure within the functional area and level was compared to similar utilities to identify areas where the utility performed exceptionally well, areas where the utility could potentially improve on its performance, or even areas where the tracking and recording of operational data could be improved. The Benchmarking report cards are proving to be a key management tool for CRD water in realizing a return from the data gathered during the Benchmarking project and in its pursuit of continuous improvement.



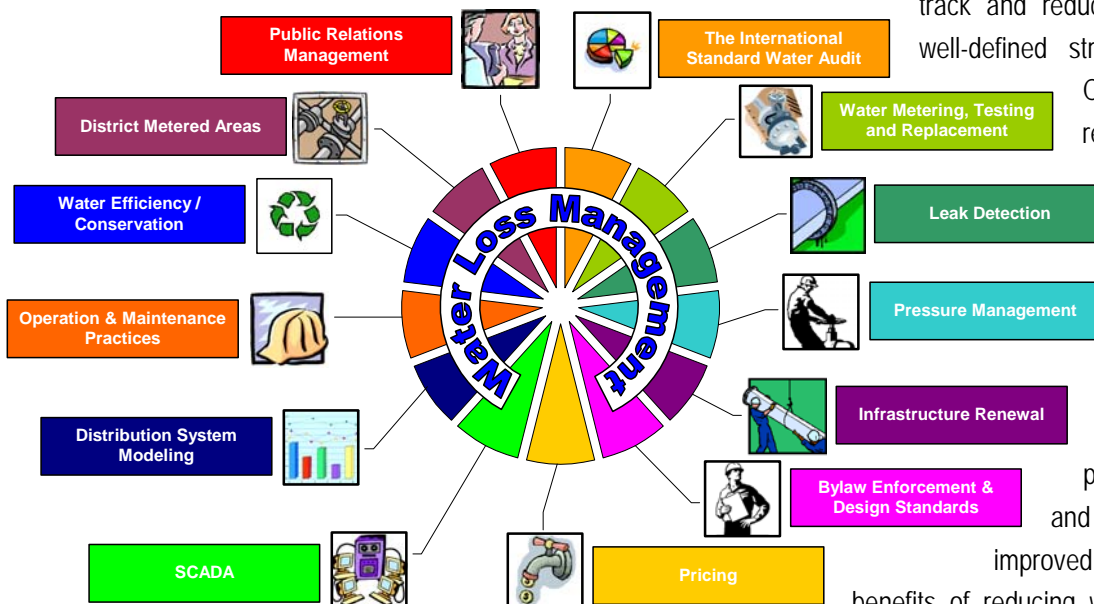
GVRD Business Process Redesign for Permit Application Review and Administration

Earth Tech conducted a business process redesign of the GVRD's Permitting and Enforcement (P&E) Team that administers three regulatory programs: Air Quality Control, Liquid Waste and Solid Waste Management. In each of these programs, permits are authorized to commercial and industrial entities within the District. Earth Tech was appointed to redesign all of the related business processes to improve the efficiency and effectiveness of permit application review and administration in a manner that is open and transparent to stakeholders. Process mapping in close association with a series of workshops involving a GVRD Working Group as subject matter experts was the primary methodology for delivering this project. Benefits of the project are that three individual permitting programs can be conducted in a manner that is more efficient, with improved effectiveness. Additionally, with detailed process documentation that can be viewed by anyone on the GVRD website, the transparency of these publicly-focused programs is improved.



City of Chilliwack Water Loss Reduction and Revenue Improvement Study

Earth Tech developed a water loss reduction strategy for the City of Chilliwack to help the City gain a full understanding of the nature and occurrence of water losses within its distribution system, and to define methods to



track and reduce these losses through a well-defined strategic plan. The City of

Chilliwack's strategies for reducing water losses include

the creation of District Metered Areas (DMA's)

to better track water consumption and

leakage, water main leak detection initiatives, pipe

renewal and replacement plans, a meter replacement

and testing program and improved revenue collection. The

benefits of reducing water losses to the City of Chilliwack are manifold, including savings in water production and distribution costs, equitable billing for services rendered, the deferment of water source expansion and an improved custodianship of the water source.

Earth Tech is an international provider of management, engineering, environmental, infrastructure development, construction and facility operation and maintenance services. We are a \$1 billion company that employs over 8,000 professional and support personnel in over 160 offices world-wide. Engineering News Record (ENR) consistently rate Earth Tech as one of the top engineering firms in North America. Our global reach coupled with local offices in Western Canadian centers such as Burnaby, Kelowna, Calgary, Lethbridge, Edmonton and Regina ensure that clients get the highest quality expertise and technically superior solutions for each project – globally and locally.

For more information on Earth Tech's Asset Management services, please contact

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