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MBA from Queen's University 2001
 B.Sc in Civil Engineering, University of Alberta 1977
 40 years of experience in transportation and municipal infrastructure projects

- World Bank, Washington D.C. (2016-2017), Senior Asset Management Specialist
- WSP , Edmonton (2014-2016), Manager of Asset Management
- City of Edmonton, 2008 – 2014, Senior Infrastructure Engineer
- Alberta Transportation, Edmonton (1981 – 2008), Senior Infrastructure Engineer
- City of Edmonton, Edmonton (1977 – 1981) , Construction Supervisor & Design Engineer

Publications

Ho, Peter. "Drainage Asset Management Strategy." The Annual Conference of the Canadian Network of Asset Managers, Edmonton, June 6-9, 2012

Ho, Peter. "Development of Decision Support System for Highway Capital Planning in Alberta, Canada." The 2005 Annual Conference of the Transportation Association of Canada, Calgary, Alberta

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The World Bank	Transportation Asset Management Plan for Saint Lucia
Township of Russell	Asset Management (AM) Plan
City of Leduc	2016 – 2017 Capital Utility Program
Village of Valemount	Gap analysis, AM Plan, AM Planning Program and Capital Investment Plan
Town of High Level	Integrated Infrastructure Management Plan
Town of Rocky Mountain House	Multi-year Capital Infrastructure Plan
City of Edmonton	AM System, Condition Rating System, AM Policy and Strategy, AM Roadmap, Risk Assessment, Lifecycle Management Plan, AM Plan, Financial Strategy, IT System and Tools
Alberta Transportation	Transportation Infrastructure Management System and Network Expansion Support System

Agenda

1. What is Asset Management?
2. Asset Management (AM) Opportunities
3. Challenges
4. Asset Management (AM) Process
 - Asset Management System
 - Policy
 - Asset Inventory and Condition Assessment
 - Asset Lifecycle Management
 - Gap Analysis
 - Assessment the current state of Assets
 - Asset Maturity Model
5. Asset Management Strategy and Plans
6. Asset Management Roadmap

"One Step at a time" Philosophy




What is Asset Management?

Definition of Asset Management from ISO 55000 – international Asset Management standard is
*“ the coordinated activities of an organization to realize **value** from assets”*

Asset – *“ something that has potential or actual value to an organization”*




MAP-21 Legislation

MAP 21 – Moving Ahead for Progress in the 21st Century

- is a funding and authorization bill to govern [United States](#) federal surface transportation spending
- was signed into law by President Obama on July 6, 2012
- each State is required to develop a risk-based asset management plan for the National Highway System




Risk-Based Asset Management

Asset Management:

- Is a systematic process of operating, maintaining and improving physical assets
- Focus on engineering and economic analysis
- Identify maintenance, preservation, repair, rehabilitation, and replacement actions
- Achieve a desired state of good repair with minimum lifecycle costs

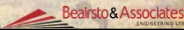


PSAB 3150 – Public Sector Accounting Board

Require all municipalities to report the value of all capital assets in their financial statements

Include:

- Assets condition
- Assets depreciation
- Historical costs



AM Opportunities

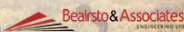
- ISO 55000 international AM standard approved in Jan 2014
- MAP-21 legislation
- PASB 3150 – financial reporting for Capital Assets
- In Aug 2013, Federal Gov. announced \$100M infrastructure fund for small & northern communities
- Last year, AAMDC stated municipal funding should be based on Assets rather than Population
- Bill 141 require the province to regularly table a 10 years infrastructure plan



Challenges

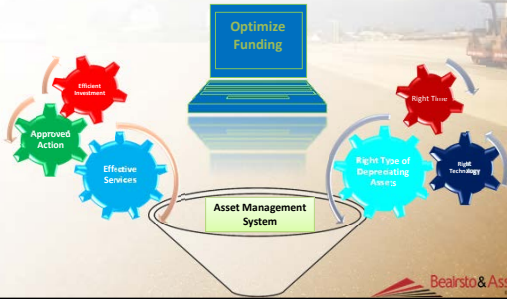
- Aging Infrastructure
- Financial Constraints
- Rapid Growth
- Customer Demands
- Workforce Shortages
- Regulatory Compliance
- Security & Emergency Response
- System Silos

Asset Management can help with most of these opportunities

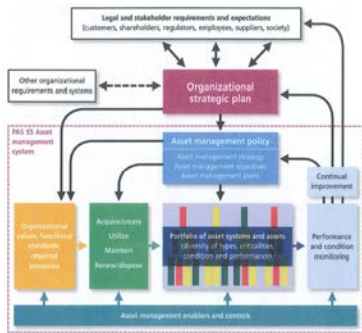


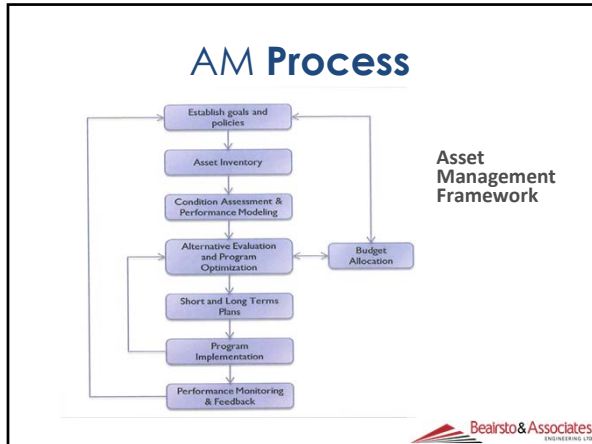
AM Process

Effective Asset Management System Should



Asset Management System Overview





AM Process

Effective Asset Management **Policy** Should:

- Articulate senior management's commitment to asset management
- Provide guidance to staff in carrying out business strategies, plans and activities
- Provide a clear direction and of asset management
- Provide a framework for the development of the Asset Management Strategy

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AM Process

Asset Inventory

- Asset Register Structure and Hierarchy
- Data Collection and Conversions
- Asset Identification Systems

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AM Process

Asset Condition Assessment

- Asset Condition Assessment Processes and Techniques
- Predict Asset Condition Deteriorate Rates
- Identify Critical Assets and Business Risks




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AM Process

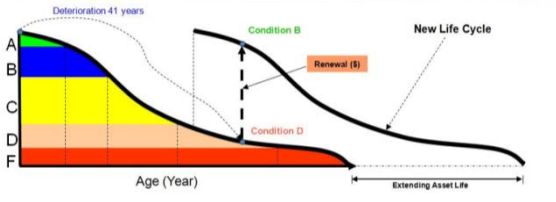
Asset Condition Assessment


Mark	State	Explanation of condition
A	Very good	New
B	Good	Physically sound and is performing its function as originally intended / or recently rehabilitated
C	Fair	Showing signs of deterioration and is performing at a lower level than originally intended
D	Poor	Maintenance is required Approaching the end of its expected life
F	Very poor	Physically unsound and/ or not performing as originally intended Replacement is required

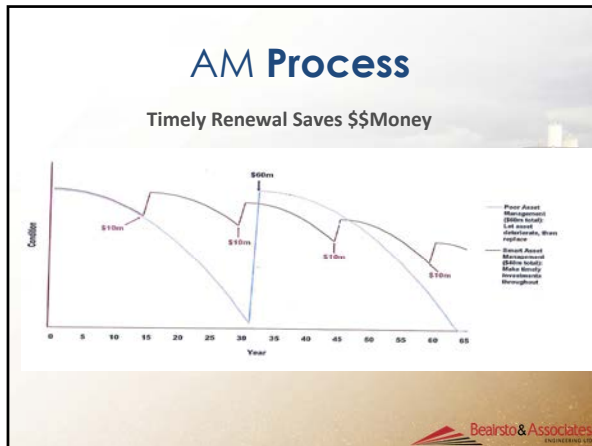
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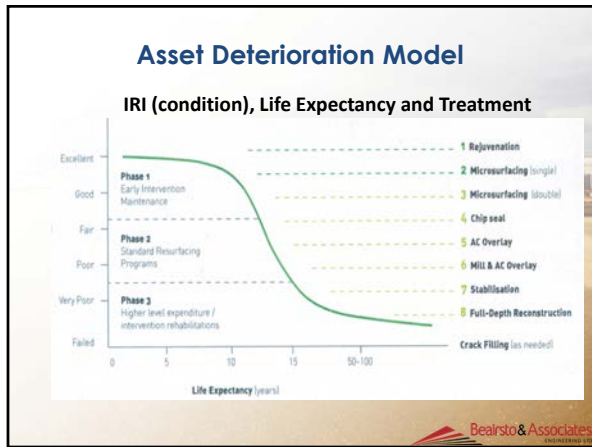
AM Process

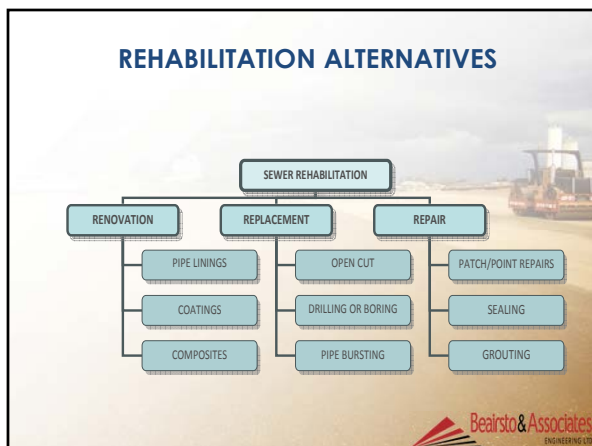
Asset Renewal Actions Impact



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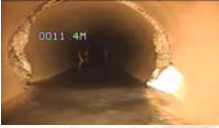





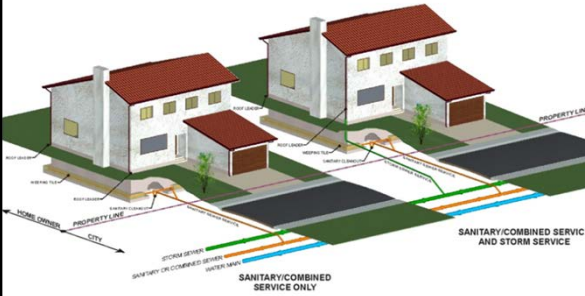



PIPE INSPECTION

- CCTV (Closed-Circuit Television) Inspection Data
- Pipeline Assessment and Certification Program (PACP) classification system
- PACP Coding

SEWER SERVICE PIPES

SEWERS


Condition:

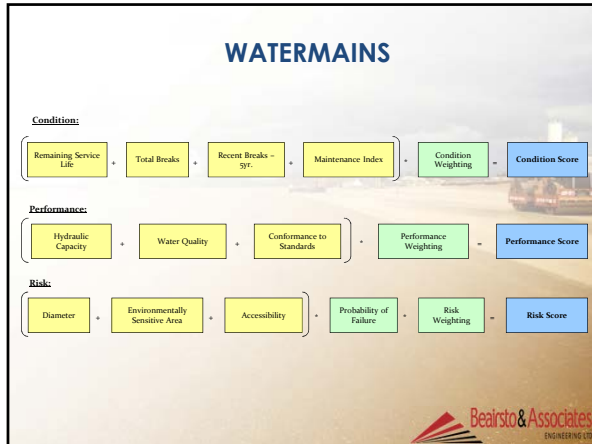
$$\left(\text{Remaining Service Life} + \text{W/R Grade} + \text{Inflow / Infiltration} + \text{Maintenance Index} \right) \cdot \text{Condition Weight} = \text{Condition Score}$$

Performance:

$$\left(\text{Hydraulic Capacity} + \text{Conformance to Standards} \right) \cdot \text{Performance Weight} = \text{Performance Score}$$

Risk:

$$\left(\text{Diameter} + \text{Environmentally Sensitive Area} + \text{Accessibility - Easements} + \text{Accessibility - Depth} \right) \cdot \text{Probability of Failure} \cdot \text{Risk Weight} = \text{Risk Score}$$


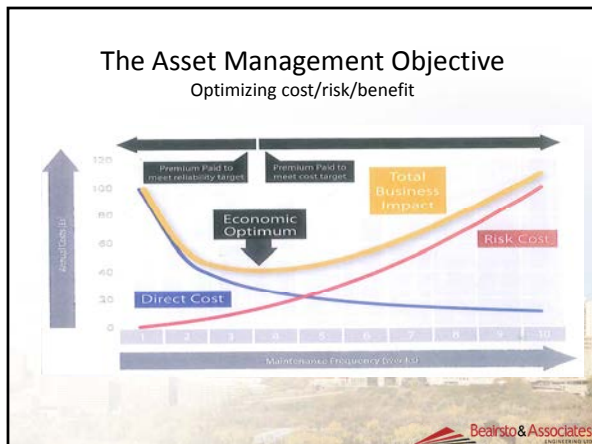


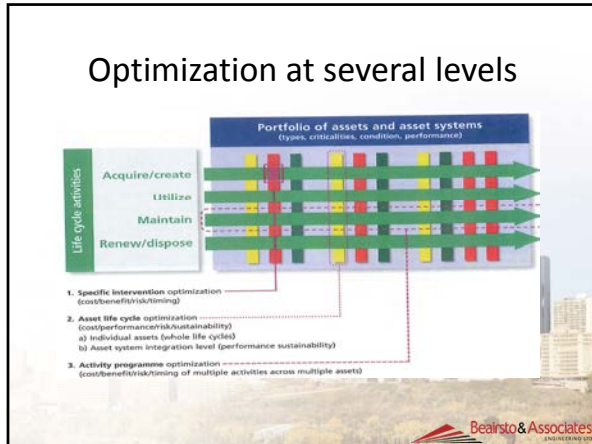
The Asset Lifecycle

What is **Asset lifecycle management**?

- Creation and acquisition of asset
- Operation and Maintenance of assets
- Renewal and disposal of assets
- **Whole lifecycle cost/performance/risk optimization** is needed

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Gap Analysis

Frequent ask Asset Management questions

1. What assets do you have and where are they?
2. What is the asset currently worth?
3. What is its condition and expected remaining service life?
4. What is the level of service expectation, and what needs to be done?
5. When do you need to do it?
6. How much will it cost and what is the acceptable level of risk(s)?
7. How do you ensure long-term affordability?

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Gap Analysis

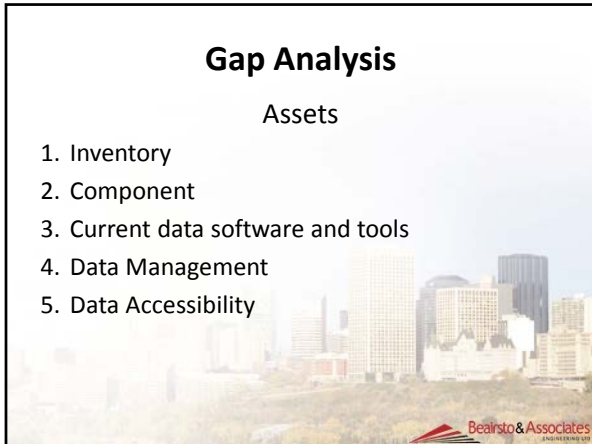
1. Assets
2. Financial Situation
3. Decision-making
4. Asset Lifecycle
5. Rules
6. Sustainability
7. Asset Management Functional Model

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Gap Analysis

Assets


1. Inventory
2. Component
3. Current data software and tools
4. Data Management
5. Data Accessibility



Gap Analysis

Financial Situation

1. Current and future Asset Investment
2. Current and Future Operations and Maintenance costs
3. Funding sources
4. Maintenance Liability
5. Optimized Capital Plan



Gap Analysis

Decision – Making

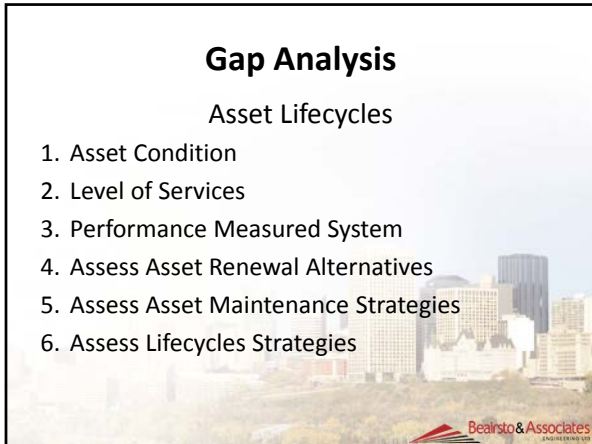
1. Decision Processes
2. Process and prioritization of Improvement Plan



Gap Analysis

Asset Lifecycles

1. Asset Condition
2. Level of Services
3. Performance Measured System
4. Assess Asset Renewal Alternatives
5. Assess Asset Maintenance Strategies
6. Assess Lifecycles Strategies



Gap Analysis

Rules

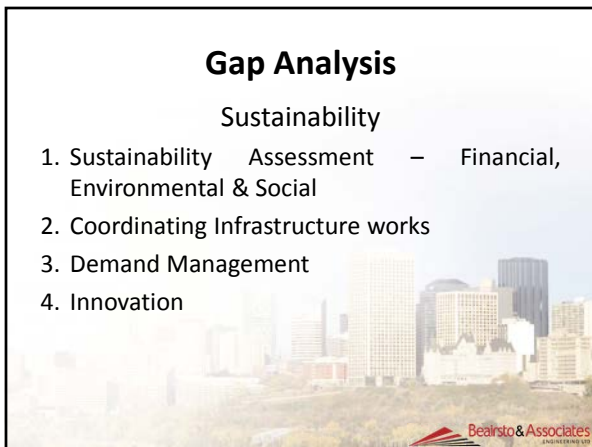
1. Strategic goals
2. Legal Obligations and Standards
3. Risk Evaluation
4. Review of Goals and Performance Targets



Gap Analysis

Sustainability

1. Sustainability Assessment – Financial, Environmental & Social
2. Coordinating Infrastructure works
3. Demand Management
4. Innovation



Gap Analysis

Asset Management Functional Model

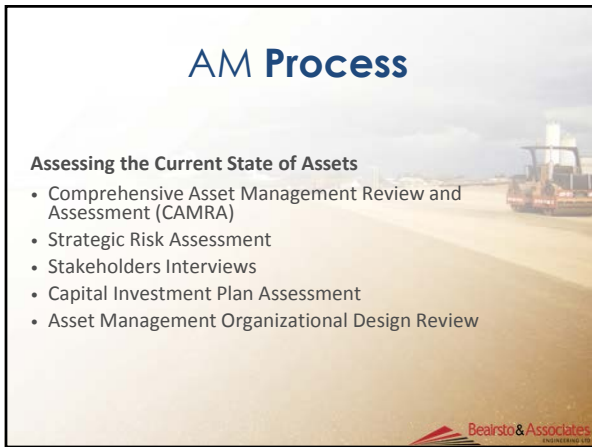
- Review current organizational structure



AM Process

Assessing the Current State of Assets

- Comprehensive Asset Management Review and Assessment (CAMRA)
- Strategic Risk Assessment
- Stakeholders Interviews
- Capital Investment Plan Assessment
- Asset Management Organizational Design Review



Comprehensive Asset Management Focuses on:
Strategy, Asset, People and Processes

AN INTEGRATED SET OF PROCESSES TO MINIMIZE THE LIFECYCLE COSTS OF OWNING, OPERATING, AND MAINTAINING ASSETS, AT AN ACCEPTABLE LEVEL OF RISK, WHILE CONTINUOUSLY DELIVERING ESTABLISHED LEVELS OF SERVICES



↓

Asset Management Ensures the Right Balance of: Strategy, Assets, Technology, People and Processes to Deliver Established Levels of Service



Asset Management (AM) Plans

- Document activities, resources, responsibilities and timescales for implementing the AM strategy
- The process of **How** and **When** the assets will be managed

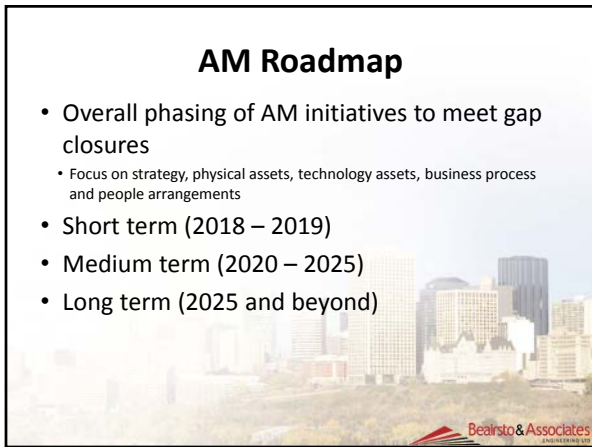
Should be based on:

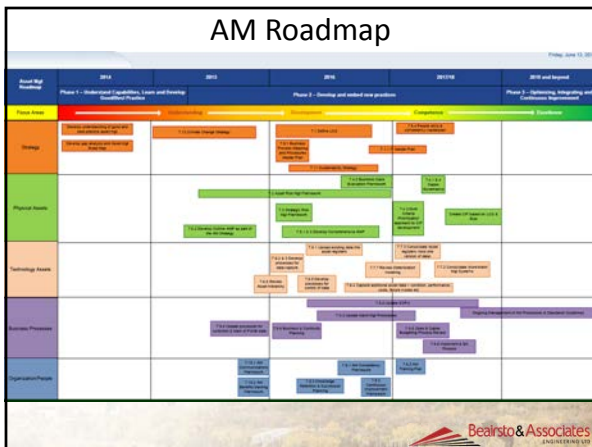
- Current inventories and condition
- Projected performance and remaining service life
- Risks and consequence of loss
- Level of service and demand forecasts
- Asset portfolios and life cycle activities
- Long term financial forecasts



AM Roadmap

- Overall phasing of AM initiatives to meet gap closures
- Focus on strategy, physical assets, technology assets, business process and people arrangements
- Short term (2018 – 2019)
- Medium term (2020 – 2025)
- Long term (2025 and beyond)





AM Services

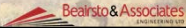
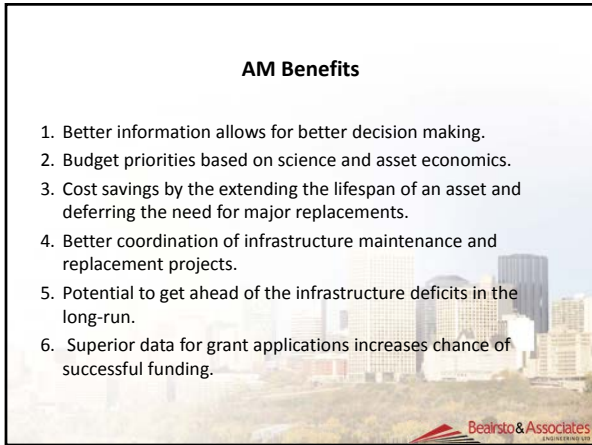
In Summary

- AM Policy and Strategy
- Data Management
- Asset Inventory and Condition Assessment
- Lifecycle Management
- Performance Measure
- Risk Analysis
- Gap Analysis
- Financial Strategy
- Business Process Improvement
- Maintenance Strategy
- AM Plans
- AM Roadmap



AM Benefits

1. Better information allows for better decision making.
2. Budget priorities based on science and asset economics.
3. Cost savings by the extending the lifespan of an asset and deferring the need for major replacements.
4. Better coordination of infrastructure maintenance and replacement projects.
5. Potential to get ahead of the infrastructure deficits in the long-run.
6. Superior data for grant applications increases chance of successful funding.



Thank-you

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