Developing Your Local Government Asset Management Plan

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Agenda

1) PSD Overview – What we do
2) Asset Management – an Overview
3) Miramichi Staff – Project Overview
4) Miramichi’s Asset Management Plan
5) Asset Management Roadmap Process
6) Benefits of Asset Management
What we do

1. Research
   - Public Sector Digest - monthly publication written for public sector practitioners
   - PSD Webinars
   - PSD Municipal Benchmarking – The National Infrastructure Database

2. Technology
   - Developed for local governments to tackle asset management, financial planning/budgeting, and performance measurement

3. Advisory
   - Asset Management Plans (AMPs)
   - Asset Management Roadmaps
   - Water & Wastewater Rate Studies
Asset Management – An Overview
Asset Management is Service Management

- The Asset is the conduit for the service
- Infrastructure provides services that bring our cities to life
  - Pipes provide a clean drinking water service
  - Roads provide a transportation service
  - Buses provide a public transit service
  - Facilities / Parks provide recreation programs and services
A NEW Framework (service centric):

- What are the organizational objectives?
- What assets are owned and what services do they provide?
- What is the assets value (to the organization and the community)?
- What is the asset’s impact to service delivery (performance and risk)?
- What are the life cycle needs and available options?
- What are the work/budget prioritisation processes?
- What are the financial strategies?
- What level of service is attainable?
Asset Management Discipline

It involves:

- Processes, procedures and practices to assist and define the management of infrastructure
- Achieving total lowest cost of ownership
- Established measures for performance, risk and cost
Asset Management Discipline

It includes:

- A sophisticated and coordinated effort
- A multi-disciplined team
- Ultimately public engagement and input
Miramichi – Project Overview

1) Why an Asset Management Plan
2) Challenges / Opportunities
3) Status / Findings
The City of Miramichi Asset Management Plan
Gas Tax Fund agreement (New Brunswick)

- All Municipalities will have to produce a Capital Asset Management Plan (CAMP) by March 31, 2018, which will include, at a minimum:
  - a complete inventory of the infrastructure assets
  - a report on the physical condition of the infrastructure
  - a list of priorities for lifecycle management based on the GTF recipient’s needs and planning.

- Capital Asset Mgmt. Plans can be funded with your Gas Tax Funds
- If any reports are missing, subsequent payments will be withheld until those reports have been duly received.
AMP - The Key Components

1. **INFRASTRUCTURE–STRATEGIC PLAN**
   - Strategic Plan Goals, Asset Performance & Community Expectations, Legislated Requirements

2. **STATE OF THE CURRENT INFRASTRUCTURE REPORTS**
   - Asset Inventory, Valuation, Current Condition/Performance, Sustainable Funding Analysis

3. **EXPECTED LEVELS OF SERVICE**
   - Key Performance Indicators, Performance Measures, Public Engagement

4. **ASSET MANAGEMENT STRATEGY**
   - Best Practices and Methodologies to produce a 10 year infrastructure plan.

5. **FINANCING STRATEGY**
   - Available Revenue Analysis, Develop Optional Scenarios, Define Optimal Budget & Financial Plan

6. **AMP PERFORMANCE REPORTING**
   - Project Implementation, Key Performance Measures Tracked, Progress Reported to Senior Management & Council

Are levels of service achievable?
State of the Infrastructure Report

A New Way of looking at the same Infrastructure
# What assets are Owned / What is the Value?

## Road Network Replacement Value

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Asset Component</th>
<th>Quantity/Units</th>
<th>2015 Replacement Method</th>
<th>2015 Overall Replacement Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Road Network</strong></td>
<td>Curb &amp; Gutter</td>
<td>78,175.76 m</td>
<td>$90/m</td>
<td>$7,035,819</td>
</tr>
<tr>
<td></td>
<td>Road Base</td>
<td>1,864,099.79 m2</td>
<td>$13/m2</td>
<td>$24,247,668</td>
</tr>
<tr>
<td></td>
<td>Road Surfaces</td>
<td>1,908,755.72 m2</td>
<td>$47/m2</td>
<td>$89,711,519</td>
</tr>
<tr>
<td></td>
<td>Shoreline</td>
<td>3</td>
<td>CPI Tables</td>
<td>$256,689</td>
</tr>
<tr>
<td></td>
<td>Sidewalks</td>
<td>76,287.01 m2</td>
<td>$50-$90/m2</td>
<td>$5,133,938</td>
</tr>
<tr>
<td></td>
<td>Streetlights</td>
<td>199</td>
<td>CPI Tables</td>
<td>$1,145,325</td>
</tr>
<tr>
<td></td>
<td>Traffic Controllers</td>
<td>11</td>
<td>CPI Tables</td>
<td>$197,827</td>
</tr>
<tr>
<td></td>
<td>Traffic Lights</td>
<td>11</td>
<td>CPI Tables</td>
<td>$802,092</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$128,530,877</strong></td>
</tr>
</tbody>
</table>
### Overall Asset Rating

#### Grading Scale: Condition vs. Performance

<table>
<thead>
<tr>
<th>Star Rating</th>
<th>Letter Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>★★★★★★</td>
<td>A</td>
<td>Excellent: No noticeable defects</td>
</tr>
<tr>
<td>★★★★★</td>
<td>B</td>
<td>Good: Minor deterioration</td>
</tr>
<tr>
<td>★★★★</td>
<td>C</td>
<td>Fair: Deterioration evident, function is affected</td>
</tr>
<tr>
<td>★★★</td>
<td>D</td>
<td>Poor: Serious deterioration. Function is inadequate</td>
</tr>
<tr>
<td>★★</td>
<td>F</td>
<td>Critical: No longer functional. General or complete failure</td>
</tr>
</tbody>
</table>

#### Grading Scale: Funding vs. Need

<table>
<thead>
<tr>
<th>Star Rating</th>
<th>Letter Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>★★★★★★</td>
<td>A</td>
<td>Excellent: 91 to 100% of need</td>
</tr>
<tr>
<td>★★★★★</td>
<td>B</td>
<td>Good: 76 to 90% of need</td>
</tr>
<tr>
<td>★★★★</td>
<td>C</td>
<td>Fair: 61 to 75% of need</td>
</tr>
<tr>
<td>★★★</td>
<td>D</td>
<td>Poor: 46 - 60% of need</td>
</tr>
<tr>
<td>★★</td>
<td>F</td>
<td>Critical: under 45% of need</td>
</tr>
</tbody>
</table>
Desired Levels of Service

- Set desired levels of service for each infrastructure program
- Use performance measures to track targets
- Establish current performance and expected performance
- A.M. plan should outline how to bridge any gaps.
Levels of Service are often based on:

- Community Expectations
- Strategic and Corporate Goals
- Legislative Requirements
- Expected Asset Performance
Asset Management Strategy

- A set of planned actions that will enable the assets to provide the desired level of service, while managing risk, at the lowest cost.

- Methodologies and practices used to produce a 10 year infrastructure plan
Life Cycle Management Review
**Risk / Criticality Assessment**

Risk = Probability of Failure \times Consequence of Failure

<table>
<thead>
<tr>
<th>Risk</th>
<th>Probability of Failure</th>
<th>Consequence of Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>1</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

- **High Risk**:
  - 4 Assets: $328.75 m, units, $760,297.82
  - 8 Assets: $86.37 m, units, $4,414,769.16
  - 14 Assets: 2,633 units, m, $16,111,284.80
  - 2 Assets: 2 units, $71,186,480.44
- **Medium Risk**:
  - 90 Assets: 320,340.34 m², units, $26,091,604.22
  - 11 Assets: 43,959.7 m², units, $6,053,130.56
  - 9 Assets: 42,914.8 m², units, $4,680,997.49
  - 3 Assets: 12,119 m², units, $1,472,719.24
- **Low Risk**:
  - 123 Assets: 648,803.45 m², units, $33,739,314.91
  - 17 Assets: 199,558.4 m², units, $11,725,286.41
  - 18 Assets: 2,014 units, m, $1,037,947.22
  - 2 Assets: 807.4 m², units, $396,470.25

**Probability of Failure**

- Low: 1
- Medium: 2
- High: 3
Why Does an AMP Need a Financial Strategy?

- The main risks to community financial sustainability:
  - The cost of infrastructure
  - Providing levels of service that don’t reflect fiscal capacity
Types of AMP Costs

- Growth
- Service enhancements
- Inflation requirements
- Renewal requirements
- Amortization of historical cost of investment
- Principal & interest payments
- Operating and maintenance costs

Funding at this level is fully sustainable and covers future investment needs.

Provides for proven renewal opportunities which delay the need and cost of full replacement.

Provides for replacement costs at existing service levels.

Meets accounting rules implemented in 2009 but does not adequately plan for the future.

Funding at this level covers cash costs only and is significantly under funded in terms of lifecycle costs.
The City of Miramichi
Asset Management Plan

Findings & Communications
Miramichi - Asset Replacement Value

2015 Replacement Value by Asset Class

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost:</td>
<td>$401,171,497</td>
</tr>
<tr>
<td>Vehicles</td>
<td>3%</td>
</tr>
<tr>
<td>Machinery &amp; Equipment</td>
<td>1%</td>
</tr>
<tr>
<td>Land Improvements</td>
<td>1%</td>
</tr>
<tr>
<td>Buildings</td>
<td>9%</td>
</tr>
<tr>
<td>Storm Sewer Network</td>
<td>7%</td>
</tr>
<tr>
<td>Sanitary Sewer Network</td>
<td>22%</td>
</tr>
<tr>
<td>Water Network</td>
<td>21%</td>
</tr>
<tr>
<td>Bridges &amp; Culverts</td>
<td>4%</td>
</tr>
<tr>
<td>Road Network</td>
<td>32%</td>
</tr>
<tr>
<td>Storm Sewer Network</td>
<td>7%</td>
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<tr>
<td>Sanitary Sewer Network</td>
<td>22%</td>
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<tr>
<td>Water Network</td>
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<td>Bridges &amp; Culverts</td>
<td>4%</td>
</tr>
<tr>
<td>Road Network</td>
<td>32%</td>
</tr>
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</table>
### Miramichi Infrastructure Report Card

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Condition vs. Performance</th>
<th>Funding vs. Need</th>
<th>Overall Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Network</td>
<td>D+</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Bridges &amp; Culverts</td>
<td>D</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Water Network</td>
<td>C</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Sanitary Sewer Network</td>
<td>C</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Storm Sewer Network</td>
<td>D</td>
<td>F</td>
<td>F</td>
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</thead>
<tbody>
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<td>D</td>
<td>F</td>
</tr>
<tr>
<td>Land Improvements</td>
<td>D+</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Machinery &amp; Equipment</td>
<td>D</td>
<td>A</td>
<td>C+</td>
</tr>
<tr>
<td>Vehicles</td>
<td>D+</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>
### Miramichi Financial Recommendations (Tax Levy)

#### TAX CHANGE REQUIRED FOR FULL FUNDING

<table>
<thead>
<tr>
<th>ASSET CATEGORY</th>
<th>TAX CHANGE REQUIRED FOR FULL FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROAD NETWORK</td>
<td>17.1%</td>
</tr>
<tr>
<td>BRIDGES &amp; CULVERTS</td>
<td>1.1%</td>
</tr>
<tr>
<td>STORM SEWER NETWORK</td>
<td>3.3%</td>
</tr>
<tr>
<td>BUILDINGS</td>
<td>1.8%</td>
</tr>
<tr>
<td>LAND IMPROVEMENTS</td>
<td>0.7%</td>
</tr>
<tr>
<td>MACHINERY &amp; EQUIPMENT</td>
<td>-0.2%</td>
</tr>
<tr>
<td>VEHICLES</td>
<td>2.1%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>25.9%</strong></td>
</tr>
</tbody>
</table>

#### REVENUE OPTIONS FOR FULL FUNDING

<table>
<thead>
<tr>
<th>ANNUAL TAX INCREASES REQUIRED</th>
<th>TAX REVENUES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 YEARS</td>
</tr>
<tr>
<td>ANNUAL TAX INCREASES REQUIRED</td>
<td>5.2%</td>
</tr>
</tbody>
</table>
Infrastructure Replacement Cost Per Household

Total: $60,268 per household

**Buildings**
- Total Replacement Cost: $38,015,197
- Cost Per Household: $4,674

**Machinery & Equipment**
- Total Replacement Cost: $2,049,975
- Cost Per Household: $252

**Storm Sewer Network**
- Total Replacement Cost: $27,953,281
- Cost Per Household: $3,437

**Sanitary Sewer Network**
- Total Replacement Cost: $86,793,097
- Cost Per Household: $13,836

**Water Network**
- Total Replacement Cost: $85,433,603
- Cost Per Household: $18,282

**Road Network**
- Total Replacement Cost: $128,530,877
- Cost Per Household: $15,804

**Vehicles**
- Total Replacement Cost: $10,530,558
- Cost Per Household: $1,295

**Bridges & Culverts**
- Total Replacement Cost: $16,756,285
- Cost Per Household: $2,060

**Land Improvements**
- Total Replacement Cost: $5,108,625
- Cost Per Household: $628

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PSD Findings After 120 Plus AMPs
Funding Analysis from over 120 AMPS

**Funding of Tax Based Categories**
- Taxes: 15%
- Gas Tax: 14%
- Other: 9%
- Unfunded: 62%

**Funding of Rate Based Categories**
- Rates: 62%
- Other: 8%
- Gas Tax: 9%
- Unfunded: 30%
Funding Analysis from over 120 AMPS

- Average Total Tax Increase Required for Full Funding:
  - Storm sewers: 2%
  - Bridges & culverts: 5%
  - Paved roads: 19%

- Average Total Rate Increase Required for Full Funding:
  - Sanitary: 22%
  - Water: 46%
Funding Analysis from over 120 AMPS

- Average Annual Tax Increase Required During Phase-In Period: 2.5%
- Average Annual Rate Increase Required During Phase-In Period:
  - Sanitary: 2.7%
  - Water: 5.0%
Asset Management Roadmap Process
PSD - Asset Management Road Map Process

- Provides continuous improvement of A.M. practices
- It breaks out the core components of A.M. for separate analysis
- Builds Staff Level Capacity
- Cross Departmental Collaboration
Road Map Components

- Organizational Cognizance
- Data and information templates
- Condition assessment development
- Legislative / regulatory requirements
- Risk and criticality model development
- Life cycle analysis methodologies
- Project & Program Prioritization
- Financial Strategy Analysis
- Level of Service Model Development
Current State of Maturity Analysis
(Critical Activities Path)

- Self Assessment Tests
- Departmental Interviews
- Collaborative Project
A.M. Policy Development

- The Problem / issue that needs to be addressed
  - The purpose of this policy is to ensure the development of the Cities’ asset management program, including roles and responsibilities, to facilitate logical and informed decision making for the management of the City’s infrastructure to support the delivery of sustainable community services.”

- The Players - the individuals and/or groups involved

- A course of action and/or principles

- Alignment to organizational objectives and goals
The Evolution of Asset Data

- Asset ID, location, description data
- Valuation data
- Condition data
- Performance (demand and capacity) data
- Risk data
- Maintenance data
- Life cycle activity data
- Optimised decision data
- Service based data
Asset Age vs Asset Condition

Assessed vs. Age-Based: **Average Asset Condition Rating (0-100)**

- **Paved Roads**
  - Assessed: 69
  - Age-Based: 40

- **Culverts (Structure)**
  - Assessed: 62
  - Age-Based: 32

- **Bridges (Structure)**
  - Assessed: 59
  - Age-Based: 36
Condition Assessment Program Development

Condition assessment by asset type will be reviewed:

- **Type of capture**
  - Field check or road patrol
  - Condition assessment
  - Detailed engineering study

- **Cycle of Capture**

- **Type of Index or reporting format.**
Risk and Criticality Model Development

**Probability of Failure**
- Age / Condition
- Soil Corrosion
- Stray currents

**Consequence of Failure**
- Cost to Repair
- Disruption to public
- Impact to environment

*Water Main Failure*
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CONDITION RANGE</th>
<th>WORK ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCELLENT CONDITION (MAINTENANCE ONLY PHASE)</td>
<td>100-76</td>
<td>MAINTENANCE ONLY</td>
</tr>
<tr>
<td>GOOD CONDITION (PREVENTATIVE MAINTENANCE PHASE)</td>
<td>75 - 51</td>
<td>CRACK SEALING, EMULSIONS</td>
</tr>
<tr>
<td>FAIR CONDITION (REHABILITATION PHASE)</td>
<td>50 -26</td>
<td>RESURFACE - MILL &amp; PAVE, RESURFACE - ASPHALT OVERLAY, SINGLE &amp; DOUBLE SURFACE TREATMENT (FOR RURAL ROADS)</td>
</tr>
<tr>
<td>POOR CONDITION (RECONSTRUCTION PHASE)</td>
<td>25 - 1</td>
<td>RECONSTRUCT - PULVERIZE AND PAVE, RECONSTRUCT - FULL SURFACE AND BASE RECONSTRUCTION</td>
</tr>
<tr>
<td>CRITICAL CONDITION (RECONSTRUCTION PHASE)</td>
<td>0</td>
<td>CRITICAL INCLUDES ASSETS BEYOND THEIR USEFUL LIVES WHICH MAKE UP THE BACKLOG. THEY REQUIRE THE SAME INTERVENTIONS AS THE “POOR” CATEGORY ABOVE.</td>
</tr>
</tbody>
</table>
How much money do we need?

- Age Based Analysis
- Condition Based Analysis
- Risk Based Analysis
- Life Cycle Based Analysis
- Optimised Analysis
Trends influencing LOS

- Climate change
- Aging infrastructure
- Uncertainty in growth forecasts
- Declines in water consumption
- Socio-Political expectations
- Declining senior gov’t grants
Financial Strategy Roadmap

1) Determine your AMP financial requirements based on replacement costs
2) Analyse your financial capacity
3) Determine how your numbers relate to your comparators
4) Develop scenarios for consideration
5) Make recommendations
Benefits Realized from Good Asset Management Practice

- Council awareness and involvement in the challenges of addressing the infrastructure deficit.

- Establishment of long term capital programs optimizing limited available funds.

- Better communication amongst internal stakeholders and a focus on continuous improvement.

- The establishment of alternate technologies = significant cost savings.
Benefits Realized from Good Asset Management Practice

- Better alignment between finance and engineering (PW)
- The robust AMP and process will be a catalyst of conversation, generating ideas, changing philosophies, and starting innovations for better management practices.
- A review of management practices & policies to better align with sustainable goals.
Questions

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