Developing a Portwide Asset Management Program

American Association of Port Authorities
Marine Terminal Management Training Program

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President, Kayuga Solution
Asset Management Program

- Core Values
- Mission
- Goals
- Objectives
- Strategic Levels of Service
- AM Processes and Practices

Strategic

Tactical
Asset Management Program

- AM processes and practices
- Asset data
- Information systems
- Organizational leadership & support
- Staff understanding and acceptance

Creating Balance!
Goal of Asset Management

Proactive
- Budgets based on future needs
- Replace high risk assets before failure
- Prioritize work based on risk
- Focus on high benefit to cost ratio

Reactive
- Budgets based on last year
- Reactive projects
- Projects based on budget
- Money invested with little risk reduction

Customer Expectations + Cost of Service = Risk
Asset Management Program Objectives

To find out:

• Catch Up ($) → Restoration
• Keep Up ($) → Preservation
• Moving Forward ($)

How?

• Document the assets owned and managed
• Understand the current state of assets
• Establish appropriate levels of service
• Prioritize the need by risk
• Understand what budget and resources are required to catch up, keep up, and move forward
• Calculate cost of service
• Communicate the infrastructure problem
Port is a small city!

1. Roadway assets
   • Pavement, sidewalks, curbs and gutter, lights, signage, etc.

2. Building assets
   • Warehouses, office buildings, comfort stations

3. Underwater assets
   • Wharfs, moorings, sheet piles, floating dock, etc.

4. Park assets
   • Playgrounds, benches, picnic tables, gazebos, etc.

5. Water and wastewater assets
   • Pipes, pumps, motors, MCCs, gensets, valves, hydrants, manholes, etc.

6. Drainage assets
   • Pipes, channels, structures, BMPs

7. Fleet

8. Urban Forestry

9. And more...
Asset Management Program Methodology

- Inventory and assess condition
- Project preservation and restoration costs and schedules
- Assess criticality and estimated asset replacement costs
- Determine the desired service levels
- Understand the finance and resources required to sustain the delivery of services
- Optimize and prioritize the critical needs based on risk

Tell the infrastructure story...
Asset Management Plan Development Process

- **Create Asset Database**
  - Asset Inventory
  - Condition Assessment
  - Asset Valuation
  - Asset Hierarchy

- **Assess Asset Criticality**
  - Criticality Ranking
  - Asset Risk

- **Perform Life Cycle Cost Assessment**
  - Catch Up
  - Keep Up
  - Moving Forward

- **Develop Risk Based Plan**
  - Risk
  - Budget
  - Resources
  - Align with Strategic Direction
ASSET INVENTORY & CONDITION ASSESSMENT
Asset Inventory / Data Collection Activities
Roadway Condition Assessment
Underwater Condition Assessment
Building Maintenance and Repair Challenges
Maintenance Needs
Condition Assessment
ADA Compliance Assessment

Compliance criteria:
- No lip
- Truncated dome
- Slope ≤ 8.3

Tight stall width
Non-compliant faucets
Needs grab rails
Assets are Recorded and Organized
Condition Assessment Results
Installation & Consumption Profiles

Installation Profile

Consumption Profile
RISK ASSESSMENT
Risk

**Probability of Failure**
(Timing to Failure)
- Mortality
- Capacity
- Level of Service
- Financial Efficiency

**Consequence of Failure**
(Impact of a failure)
- Economic
- Environment
- Social

Risk = PoF + CoF
# Risk Profile

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Total number of asset: 7008

Consequence of Failure
State of Pavement
Risk-Based Strategy

- **High Risk Zone**
  - Strategy: Plan for asset renewal and/or risk mitigation

- **Medium Risk Zone**
  - Strategy: Mix of reactive and proactive strategies - dependent on owner preferences and site specific issues

- **Low Risk Zone**
  - Strategy: Proactive condition and/or performance monitoring

- **Probability of Asset Failure (e.g., 0 to 1)**
- **Consequences of Asset Failure (e.g., Dollars)**

- **High Risk Zone**
  - **Low Probability, Low Consequences**
  - **Medium Probability, Low Consequences**
  - **High Probability, Low Consequences**

- **Medium Risk Zone**
  - **Low Probability, Medium Consequences**
  - **Medium Probability, Medium Consequences**
  - **High Probability, Medium Consequences**

- **Low Risk Zone**
  - **Low Probability, High Consequences**
  - **Medium Probability, High Consequences**
  - **High Probability, High Consequences**
LIFE CYCLE COST ASSESSMENT
Calculating the Timing to Failure

![Graph showing the timing to failure over years with condition ratings decreasing as time progresses.](image-url)
Asset Management Tool

- IRIS (Infrastructure Reinvestment Intelligence System)
Asset Valuation (Parks)

Total Valuation: $72,045,065
Understanding the Need (Year By Year... Asset By Asset...)

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<tr>
<th>Year of Activity</th>
<th>Asset ID</th>
<th>Asset Name</th>
<th>Activity Name</th>
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Prioritize by Risk
Results are Mapped
Understanding the Impact of Funding

10 YEAR PROJECTED RENEWAL NEED

Projected Budget

Current Budget
Work Backlog Analysis

10 YEAR PROJECTED RENEWAL NEED

Unfunded Portion

Current Budget

Years: 2016 to 2026
What If We Don’t Do Anything?

10 YEAR BACKLOGS AT CURRENT BUDGET

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What If We Increase the Funds by 5%?

10 YEAR WORK BACKLOGS AT 5% INCREASE

Increased Budget $-

Asset Management Data Flow

GIS

CMMS

Finance

Work

Budget

Continuous Improvement
Using Asset Management Results to Understand and Communicate

- Catch Up
- Keep Up
- Moving Forward

Managing Risk & Planning for the Future
Thank you!