Managing Risk and Saving Money – Applying Asset Management to a Stormwater Program

Agenda

1. Emerging Business Conditions
2. Approach
3. Future Investment Needs
4. Innovations, Lessons-Learned, and How to Get Started
1. Emerging Business Conditions

- Aging infrastructure
- Increasingly stringent regulations
- Flood planning disconnected from water quality planning
- Climate change and adaptation
- Customer base not aware of all services provided
- Changing Boards and Councils
- Limited resources
- Key employees are retiring
- Renewed focus on accountability
2. Approach

What is Asset Management?

- Clearly communicates
  - What needs to be done & why it needs to be done
  - Long term funding needs to sustain the services
  - Consequences & risks

- Sound basis for prioritizing work

- Transparent, balanced
Why Asset Management?

- Ross Valley Sanitation District
  - Eliminated $4M in unnecessary capital projects
  - Supported 40% increase in rates with minimal opposition

- Central Contra Costa Sanitary District
  - Reduced SSOs by 70% by way of preventive maintenance scheduling

- South Placer Municipal Utility District
  - Reduced number of employees by 10% per mile of pipe

- City of South Lake Tahoe
  - Provided structured justification for CIP approval by City Council

- City of Folsom
  - Reduced SSOs by 80%
  - Central Valley RWQCB conclude collection system was in good operating condition

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Risk-Based Planning Represents New Focus

<table>
<thead>
<tr>
<th>OLD</th>
<th>NEW</th>
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<tbody>
<tr>
<td>Backward Looking</td>
<td>Forward Looking</td>
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</table>
| • Budget based on last year
  • Little knowledge of system risks | • Based on asset risk scores and cost |
| Reactive | Proactive |
| • Projects determined as problems arise during the year | • High risk assets slotted for renewal before failure occurs |
| Budget Constrained | Risk or Budget Constrained |
| • Do as many projects as you can afford each year | • Budget could be determined based on agreed risk targets for system |
| Ignores asset and system risks | Focused on risk management |
| • Money is spent but overall risk may not have been reduced much | • High risk assets addressed first
  • Budget may rise or fall to meet risk targets |
Mission and Goals

Program Integration “Holistic Approach”

Watershed Asset Management Plan
Asset Management Overview

1. What do we own / manage?
2. What is its required level of service?
3. Which assets are critical?
   a. Condition
   b. Business Risk Exposure
4. What are my optimized management strategies?
   a. What needs to be done?
   b. When?
   c. Costs?
5. What do I need to do to fund it?

Inventory Assets → Identify Failure Modes → Determine Residual Life → Determine Replacement Costs → Set Target Levels of Service

Assign Risk Rating (Criticality) → Determine Management Strategy → Determine Appropriate CIP → Fund Your Strategy → Build the AMP
Physical Assets (Future)

Programmatic Assets
Why Include Programmatic Assets?

- Provide a LOS citizens desire and regulators require
  - Flood Risk Management
  - Water Quality
- Account for significant stormwater program costs

Asset Register

Asset Management is scalable from the largest City to the smallest utility

- 8.0 miles of levees
- 69.2 miles of channels
- 308 clean water and green infrastructure projects
- 15 pump stations
- 6 watersheds
- 92,000 miles of street sweeping annually
- 46,023 drain structures
- 1,148 miles of pipes
- Existing stormwater system replacement value: $5.76 billion
What’s the Risk Associated with My Assets?

- Business Risk Exposure (BRE) Analysis:
  - Not all asset are equal!
  - The most powerful element in asset management!
  - Used for prioritization of activities with limited funding

Condition, Reliability,
Performance

↓

Probability
of Failure (PoF)

PoF

\times

Triple Bottom Line
Consequences
of Failure

Consequence
of Failure (CoF)

CoF

= BRE

Tool used to make best decisions for the municipality!

Four Major Failure Modes

<table>
<thead>
<tr>
<th>Mode</th>
<th>Definition</th>
<th>Tactical Aspects</th>
<th>Management Strategy</th>
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<tbody>
<tr>
<td>1. Capacity</td>
<td>Volume of demand exceeds design capacity</td>
<td>Growth, system expansion</td>
<td>Redesign</td>
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<tr>
<td>2. LOS</td>
<td>Functional requirements exceed design capability</td>
<td>Codes/permits: OSHA, water quality, life safety, ecosystem services, service, delays, etc.</td>
<td>Redesign</td>
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<td>3. Mortality</td>
<td>Consumption of asset reduces performance below an acceptable minimum level</td>
<td>Physical deterioration due to age, usage (including operator error), acts of nature</td>
<td>O&amp;M, Renewal</td>
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<td>4. Efficiency</td>
<td>Performs ok, but cost of operation exceeds that of feasible alternatives</td>
<td>“Pay-back” period</td>
<td>Replace</td>
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What is Failure

Levels of Services

Customer Expectations/
Legal Requirements
**Probability of Failure**

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<th>Mortality</th>
<th>Data Source</th>
<th>PoF = 1 (New)</th>
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<th>PoF = 5 (Failure)</th>
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- Asset provides defensible benefit to current operation.
- Asset provides break-even benefit to current operation.
- Asset provides potential benefit to current operation.
- Asset provides degraded benefit to current operation.
- Asset provides significant benefit to current operation.

**Triple Bottom Line for CoF**

- Balanced
- Transparent
- Recognizes all concerns
- Doesn’t borrow from future generations
Consequence of Failure

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Programmatic</th>
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<td>$50K</td>
<td>$250K</td>
<td>$5M</td>
<td>$8M</td>
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Emergency Fund

Business Risk Exposure

- **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: Reactive strategies (oppose to failure)

Consequences of Asset Failure (e.g., Dollars)

- Low
- Medium
- High
Risk-based Focus Reduces Costs and Liabilities

- 48” CMP Failure
- 11’ x 10’ Surface Opening
- 50’ x 20’ x 18’ Subsurface Cavern
- All Westbound Lanes and Eastbound Turn Pocket Closed
- Concerned parents of adjacent elementary school
- Trapped 10-year-old Golden Retriever
- $1,300,000 Catastrophic Failure Cost vs. $40,000 Proactive Replacement

3. Future Investment Needs
Where’s the Money Coming From?

- What’s this gonna cost me?
- How am I going to pay for this?

The Operations Manager
The Finance Manager

Long-Term Financial Stability Through Integration of Capital & Financial Planning

- Interactive model that evaluates and compares alternative funding strategies and cost-recovery side-by-side
- Holistic multi-year financial management plan
- Integrates with asset management plans
- Able to model deferred maintenance/risk adjusted costs
- Estimates cash flow
Long-Term Funding Need

- San Diego River
- San Diego Bay
- Mission Bay
- Los Pen

FY21 FY22 FY23 FY24 FY25 FY26 FY27 FY28 FY29 FY30 FY31 FY32 FY33 FY34 FY35 FY36 FY37 FY38 FY39 FY40

- Stormwater Conveyance System Investment
- Safe, Clean Water and Compliance

Non-TMDL Goals
TMDL Milestones

Investment Needs to Meet Goals

- Safe, Clean Water
- Flood-Safe Communities
- Public Partnership
- Environment
- Community Benefits
- Stormwater as a Resource

- Protecting safe clean water ($2.05)
- Safeguarding our community from flood ($1.28)
- Restoring the environment ($43M)
- Using stormwater as a resource ($6M)
- Encouraging public partnership ($7M)
- Preventing community benefits ($1.5B)
4. Innovations, Lessons-Learned, and How to Get Started

Watershed Asset Management Program Innovations

- Maintenance programs as “programmatic assets”
- Mapping of investments and goals allows line-of-sight visibility from vision and goals through KPIs
- Holistic inclusion of asset and programmatic
- Inclusion of existing assets and future assets
Lessons-learned

- Culture shift – challenging to change from old practices to risk-based driven work
- Takes time
- Creates organizational challenges
- Need to better establish and memorialize improved business processes

How to Get Started

- A basic inventory can give enough data to justify investment
- Asset management should not operate remotely
- Senior management understanding the concept is critical to success
- Staff should be involved and included in developing the program and compiling data
- Software does not need be complex
- You can manage the program
- JUST GET STARTED!
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