CMOM & Benchmarking – How Much O&M is Enough?

Andrew L. Craven, P.E. – Strand Associates, Inc.
WWOA - 48th Annual Conference
Presentation Outline

• CMOM & Benchmarking Overview
• CMOM Concepts
• Benchmarking Concepts
• The Link Between CMOM & Benchmarking – Why Does this Matter to Me? My Community? My Politicians?
• Available Resources
  • CMOM
  • Benchmarking
• Conclusions / Questions
CMOM – Encompasses Existing(?!?) Collection System Programs

Capacity Management

Operation Maintenance
“Benchmarking” Process

- Comparison of common O&M activities with other utilities
- Frequency & Effectiveness compared
- Numerous studies exist that provide information to assist in conducting a benchmarking assessment – resource list provided at the end of presentation
CMOM – Encompasses Existing(?!?) Collection System Programs

- **Capacity**
- **Management**
- **Operation**
- **Maintenance**

Historically – CMOM programs have been driven by operational “issues” – often required by regulators
CMOM – Two Step Process

- Assessment Process – Typically utilizes a checklist
  - Where are we at now?
  - Where do we want to be in 2 years? 5 years?

- Implementation Process – How do we get there?
  - This is where Benchmarking comes into play
Capacity Program Evaluation: Making Sure We Get It to the WWTP!

- Flow Monitoring
- Collection System Assessments
- Capacity Assessments
- Rehabilitation Programs
Management Program Evaluation: The Resources Required to Do the Job Right!

Staff

Safety Programs

Legal Authority/SUO

Money Matters!
Operation and Maintenance Program Evaluation: The Day by Day Tasks

SIU Monitoring

Mapping

Safety

Budgeting

Sewer Cleaning

Parts & Equipment Inventory

Sewer Maintenance Statement
CMOM Documentation Satisfies Provides Staff with a Program Roadmap

A “Good” CMOM program is never done! It is a work in progress – always changing to meet new challenges.
“Benchmarking” Process

• Comparison of common O&M activities with other utilities
• Frequency & Effectiveness compared
• For the example presented - 3 studies were utilized for comparisons -
  • “Optimization of Collection System Maintenance Frequencies and System Performance” – ASCE
  • “Collection Systems: Methods for Evaluating and Improving Performance” – Office of Water Programs – CA State, Sacramento
  • “Benchmarking Canadian Wastewater Utilities” – WEFTEC 2000
• Wisconsin DNR establishing baseline values for Wisconsin municipalities
“Benchmarking” Process – WHY?

• You know you are responsible for taking care of the collection system
• When you do your job well – nobody knows!
• Benchmarking can be a tool that allows you to advocate for the resources you need to provide good services to your customers – the residents!
Areas of Comparison – **Frequency of O&M Activity**

ASCE O&M Activities – Relative Importance
Areas of Comparison – Frequency of O&M Activity – Example Project

- Sewer Cleaning
- Root Treatment/Removal
- Manhole Inspection
- Smoke & Dye Testing
- CCTV
- Manhole Rehabilitation
- Sewer Line Rehabilitation
- Record Keeping / Public Education
Frequency of O&M Activity - Comparisons

Annual Sewer Cleaning Comparison

- City of Janesville: 40% of System
- ASCE: 30% of System
- Canadian Utilities: 20% of System
- Proactive Utilities: 45% of System
Frequency of O&M Activity - Comparisons

Manhole Inspection Comparison

- City of Janesville: 45%
- ASCE: 15%
Frequency of O&M Activity - Comparisons

Annual CCTV Inspection Comparison

Percent of System

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<th>City of Janesville</th>
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<td>Percent of System</td>
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Frequency of O&M Activity
“Non-Comparable” Items

- Well Run O&M Programs Recognize the Importance of these Activities – CMOM Requires Them!
Areas of Comparison – **Effectiveness of O&M Activity**

- Peak Month/ADF Ratio: 5.5%
- Peak Hr/ADF Ratio: 9.7%
- Pipe Failures: 22.6%
- SSOs: 23.6%
- Customer Complaints: 20.8%
- PS Failures: 17.8%

ASCE Performance Ratings
Areas of Comparison – **Effectiveness** of O&M Activity

- Sanitary Sewer Overflows
- Pipe Failures/Stoppages
- Customer “Requests” (?/!)
- Pumping Station Failures
- Peak Hourly Flow / Average Dry Flow
- Peak Monthly Flow / Average Dry Flow

The amount of O&M you undertake matters ONLY IF your programs are effective – the goal is to work smart!
Effectiveness of O&M Activity – Comparisons

Sanitary Sewer Overflows (SSOs) per 100 miles/yr
Comparison

City of Janesville | ASCE | Proactive Utilities
--- | --- | ---
0.5 | 5.0 | 2.0
Effectiveness of O&M Activity – Comparisons

Customer Requests per 100 miles/yr
Comparisons

City of Janesville  | ASCE  | Proactive Utilities

Customer Requests per 100 miles

[Bar chart showing the number of customer requests per 100 miles for City of Janesville, ASCE, and Proactive Utilities]
Effectiveness of O&M Activity – Comparisons

Peak Hour Flow vs. Average Daily Flow (ADF) Comparison

- Janesville
- ASCE
Effectiveness of O&M Activity – Cost Comparisons

Annual O&M Cost Per Customer

Annual O&M Cost Per Mile of Sewer
“Do-It Yourself” Benchmarking!

Determine What Matters to Your Community!
- Cleaning
- Roots
- Manhole Assessments

Track Precipitation (Most Issues are Wet Weather)
- Total Annual Precipitation
- Event Specific Precipitation

Track Performance
- SSO / Basement Backups
- I/I Rates
- Pipe Failures
- Complaints
The Link Between CMOM & Benchmarking

- CMOM Helps Identify Program Areas That Need Improvement – Be Honest and Start Small!

- Benchmarking Provides Information –
  - How Much is Enough? Where Should I Be?
  - Advocacy Information! – Politicians & Citizens

Annual CCTV Inspection Comparison

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Available Resources - CMOM

- *Guide for Evaluating CMOM Programs at Sanitary Sewer Collection Systems* – USEPA
- Numerous publications by various state agencies, WEF
Available Resources - Benchmarking

- *Optimization of Collection System Maintenance Frequencies & System Performance* – ASCE
- *Collection Systems: Methods for Evaluating and Improving Performance* – Office of Water Programs, California State University
- *Benchmarking Canadian Wastewater Utilities – A Long Term Partnership*, WEFTEC 2000
- *Performance Indicators for Water & Wastewater Utilities* – AWWA (this resource has been updated several times)
- *Utility Benchmarking for Wastewater* - WERF
- Wisconsin DNR – Compliance Maintenance Annual Report – CMOM Section
Conclusions

- CMOM programs can provide valuable information to municipalities – develop a clear understanding of what you are doing & how you are doing it.
  - Document existing programs
  - Identify areas for improvement
- Benchmarking process will help develop an understanding of “how much is enough”
  - Advocate for collection system maintenance
  - Communicate with stakeholders
    - Council
    - Staff
    - Citizens
CMOM & Benchmarking – How Much O&M is Enough?

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