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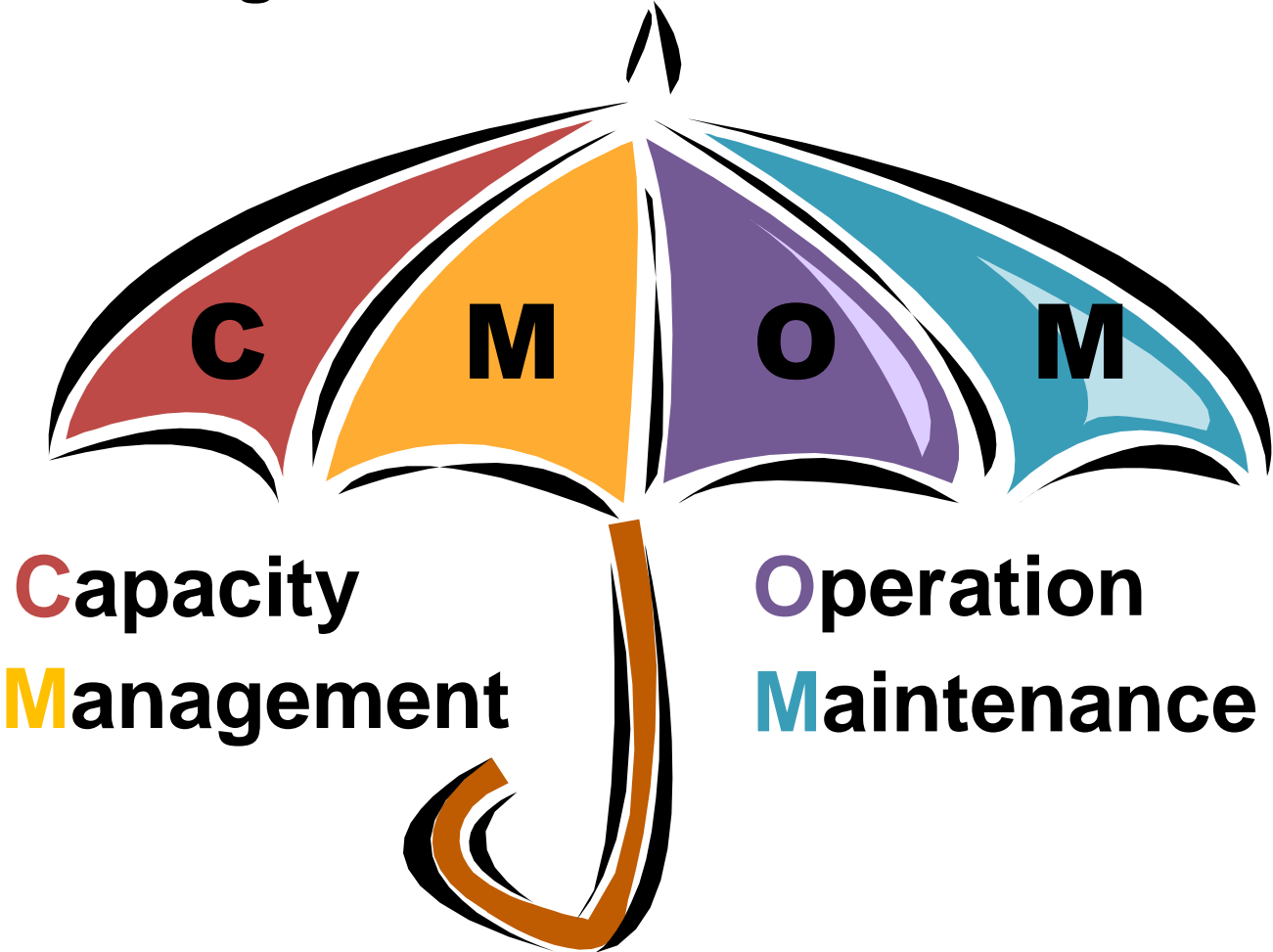
CMOM & Benchmarking – How Much O&M is Enough?

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

Presentation Outline

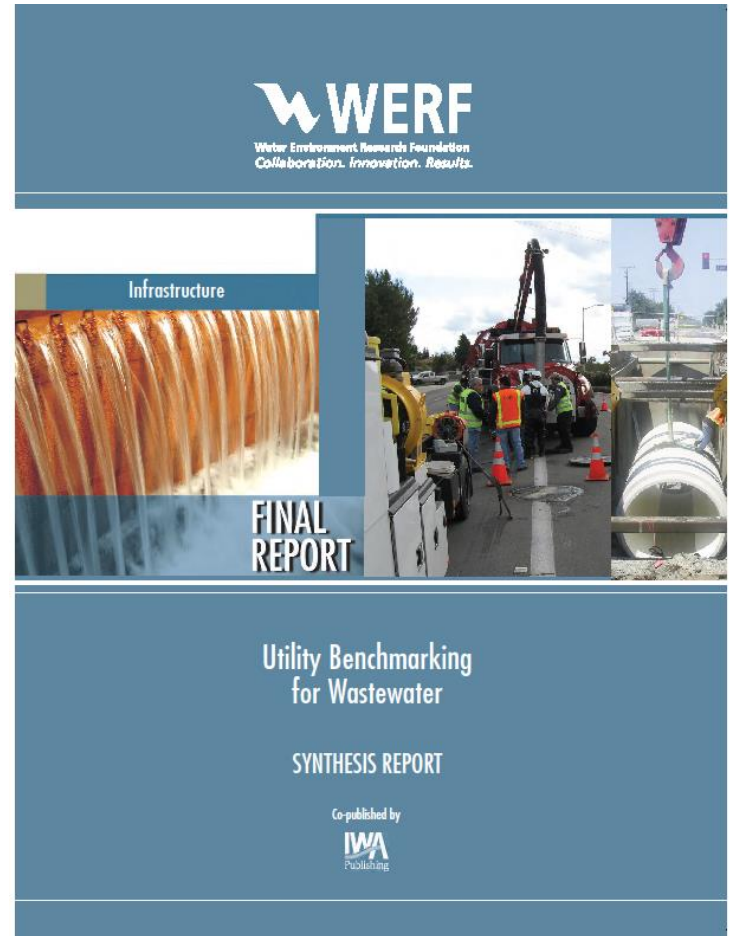
- CMOM & Benchmarking Overview
- CMOM Concepts
- Benchmarking Concepts
- The Link Between CMOM & Benchmarking – Why Does this Matter to Me? My Community? My Politicians?
- Available Resources
 - CMOM
 - Benchmarking
- Conclusions / Questions

CMOM – Encompasses Existing(?) Collection System Programs



“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

- **C**apacity
- **M**anagement
- **O**peration
- **M**aintenance

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

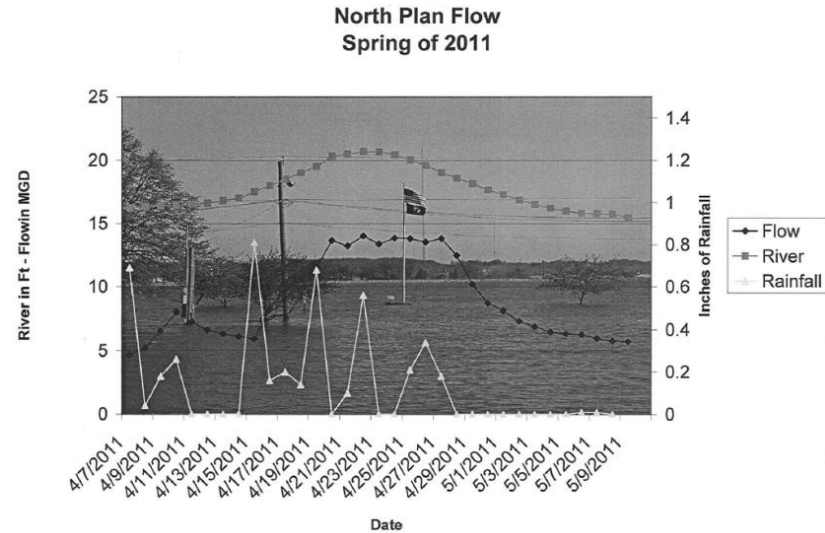


CMOM – Two Step Process

- 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



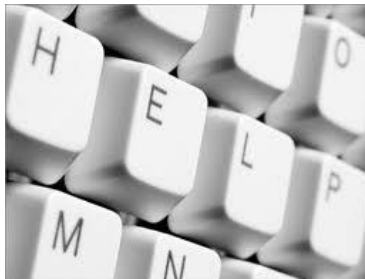
Management Program Evaluation: The Resources Required to Do the Job Right!



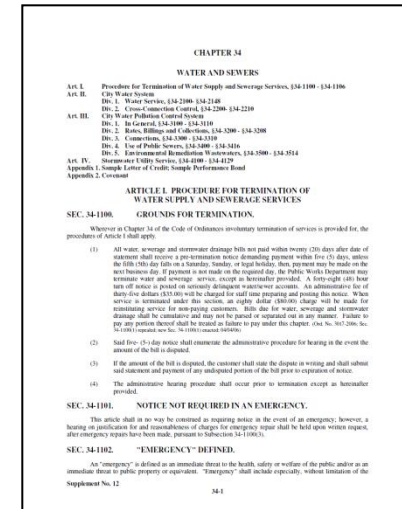
Staff



Safety Programs



Staff Training



Legal Authority/SUO

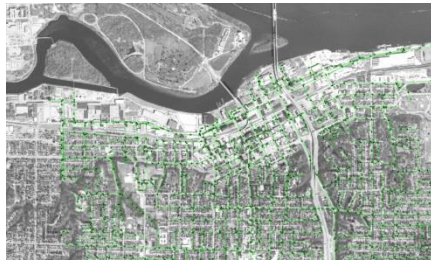


Money Matters!

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


I. General Information—Collection System Description

Question	Response			Documentation Available?		
				Yes	No	
Size of service area (acres)	± 5,725 acres/17% of the service area is served by combined sewers			X		
Population of service area	± 50,000 people/12,000 residential customers and 1,400 commercial customers			X		
Number of pump stations	12			X		
Feet (or miles) of sewer	190 miles of gravity sewer and six miles of force main			X		
Age of System (e.g., 30% over 30 years, 20% over 50 years, etc.)	Gravity Sewer			X		
	Age	Force Main	Pumping Station			
	0 to 25 yrs	10%	10%			100%
	26 to 30 yrs	40%	90%			0%
	31 to 75 yrs	30%	0%			0%
> 76 yrs	20%	0%	0%			
Pipe Diameters	Gravity Sewer		Force Main	X		
	Size (inches)					
	<8	45%	1%			
	9 to 18	45%	14%			
	19 to 36	5%	85%			
> 36	5%	0%				
Pipe Materials	Gravity Sewer		Force Main	X		
	Material					
	PCCP	0%	0%			
	HDPE	0%	0%			
	RCP	0%	0%			
	PVC	10%	N/A			
	VCP	85%	1%			
	DI	0%	99%			
Brick	5%	0%				
Comments:						
Ashland has adequate documentation and records for their collection system.						

To IEPA
August 1, 2011

Report

Capacity,
Management,
Operation and
Maintenance



City of
Ashland, KY

May 2008

Detailed
Evaluations &
Recommendations

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

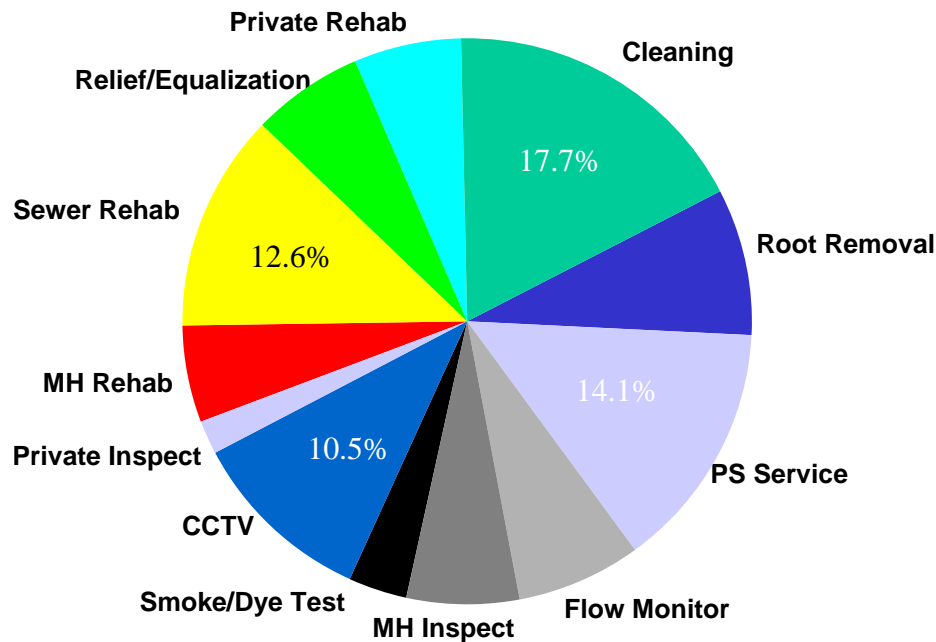
“Benchmarking” Process

- 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



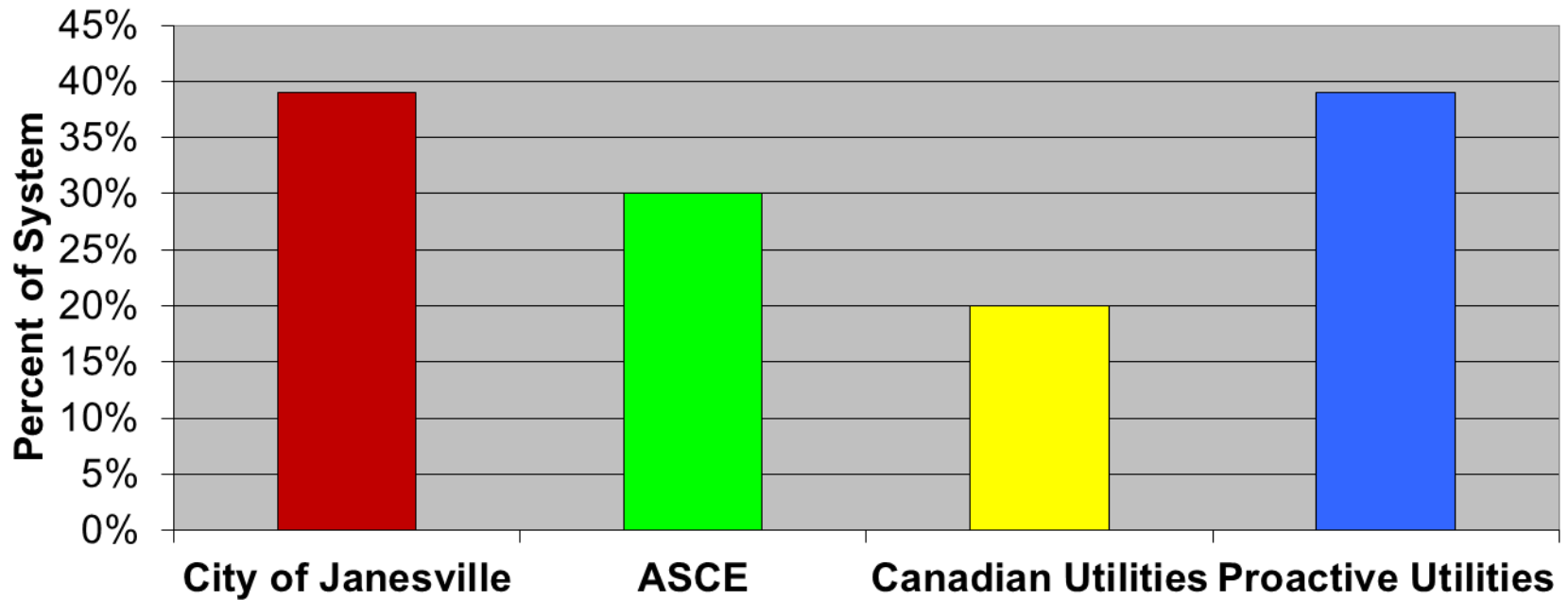
ASCE O&M Activities – Relative Importance

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

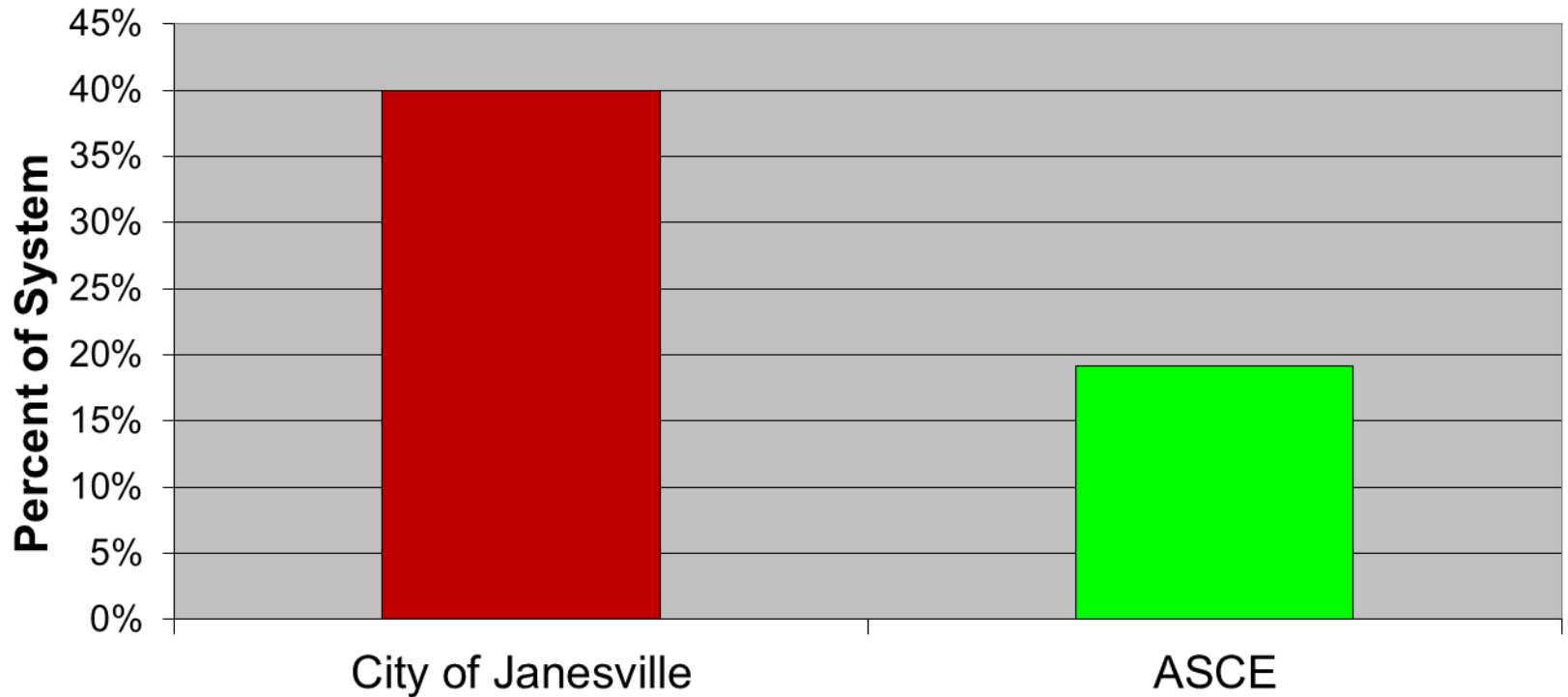
Frequency of O&M Activity - Comparisons

Annual Sewer Cleaning Comparison



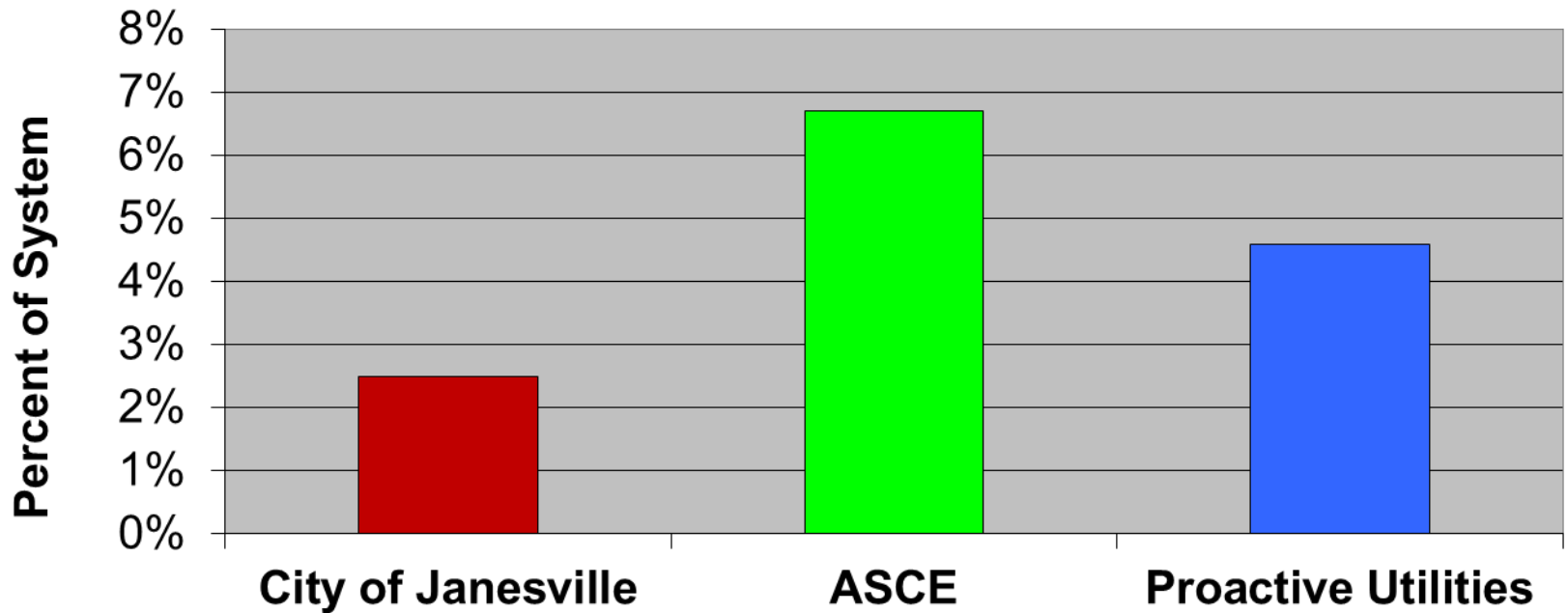
Frequency of O&M Activity - Comparisons

Manhole Inspection Comparison



Frequency of O&M Activity - Comparisons

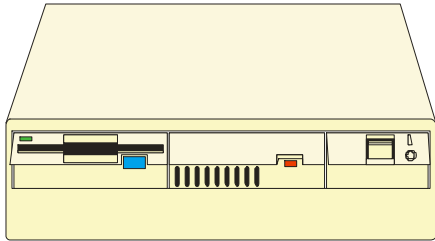
Annual CCTV Inspection Comparison



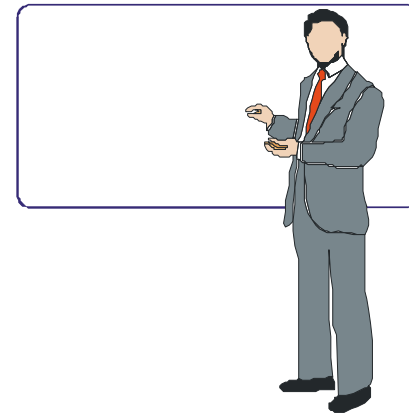
Frequency of O&M Activity

“Non-Comparable” Items

Record Keeping

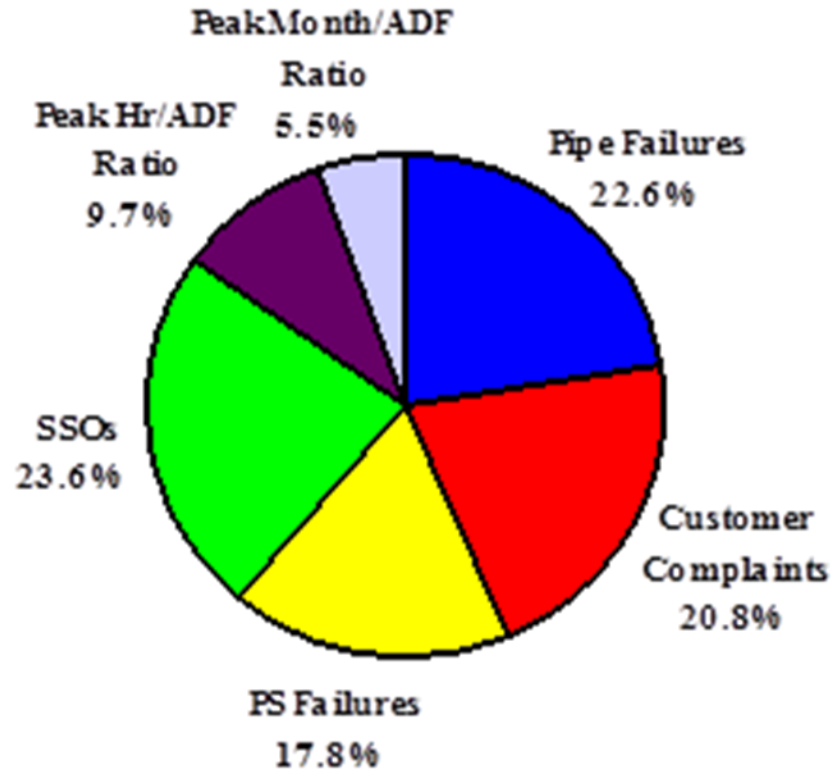


Public Education



- Well Run O&M Programs Recognize the Importance of these Activities – CMOM Requires Them!

Areas of Comparison – Effectiveness of O&M Activity



ASCE Performance Ratings

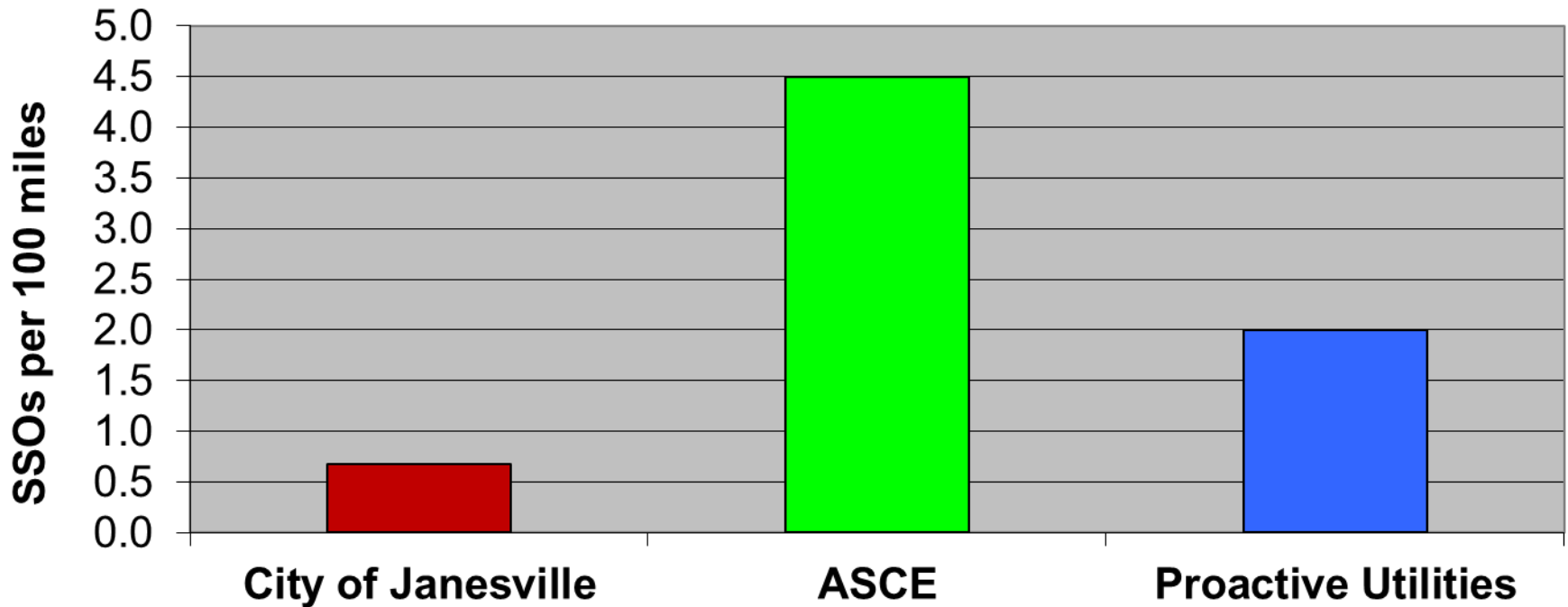
Areas of Comparison – Effectiveness of O&M Activity

- 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!

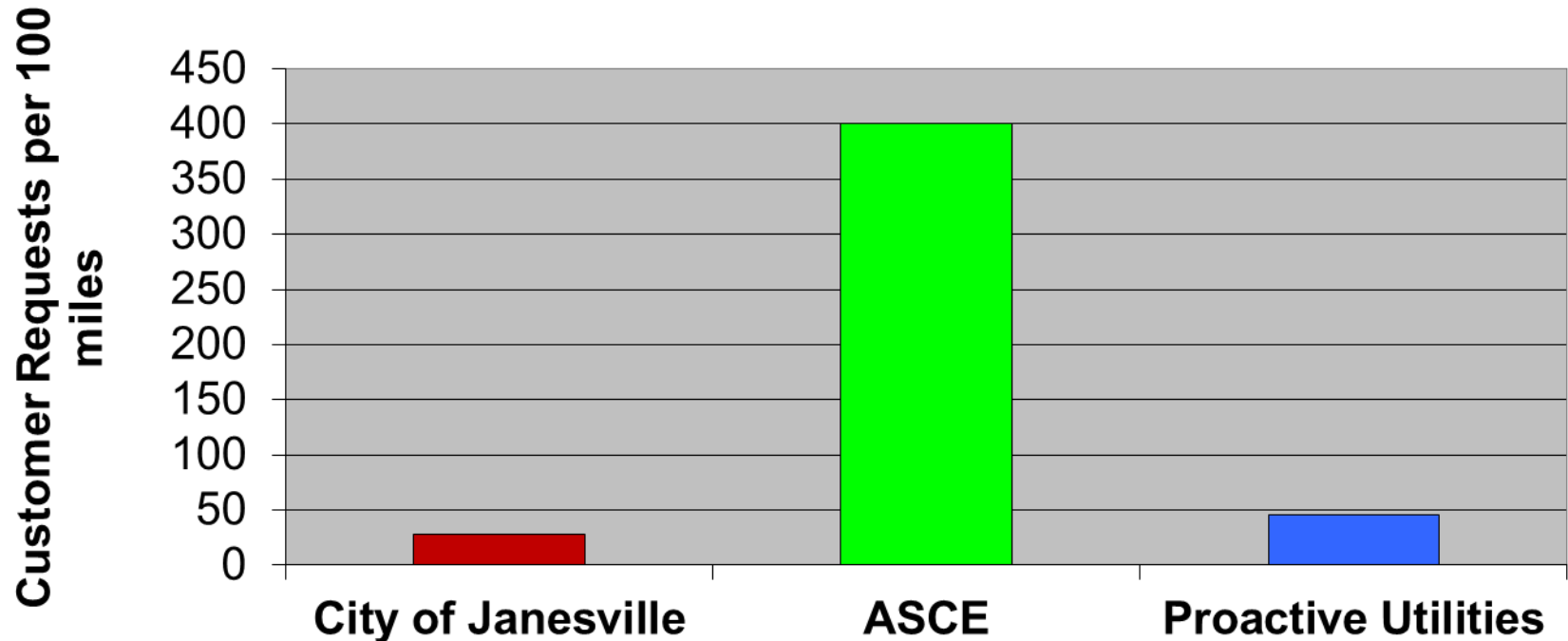
Effectiveness of O&M Activity – Comparisons

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



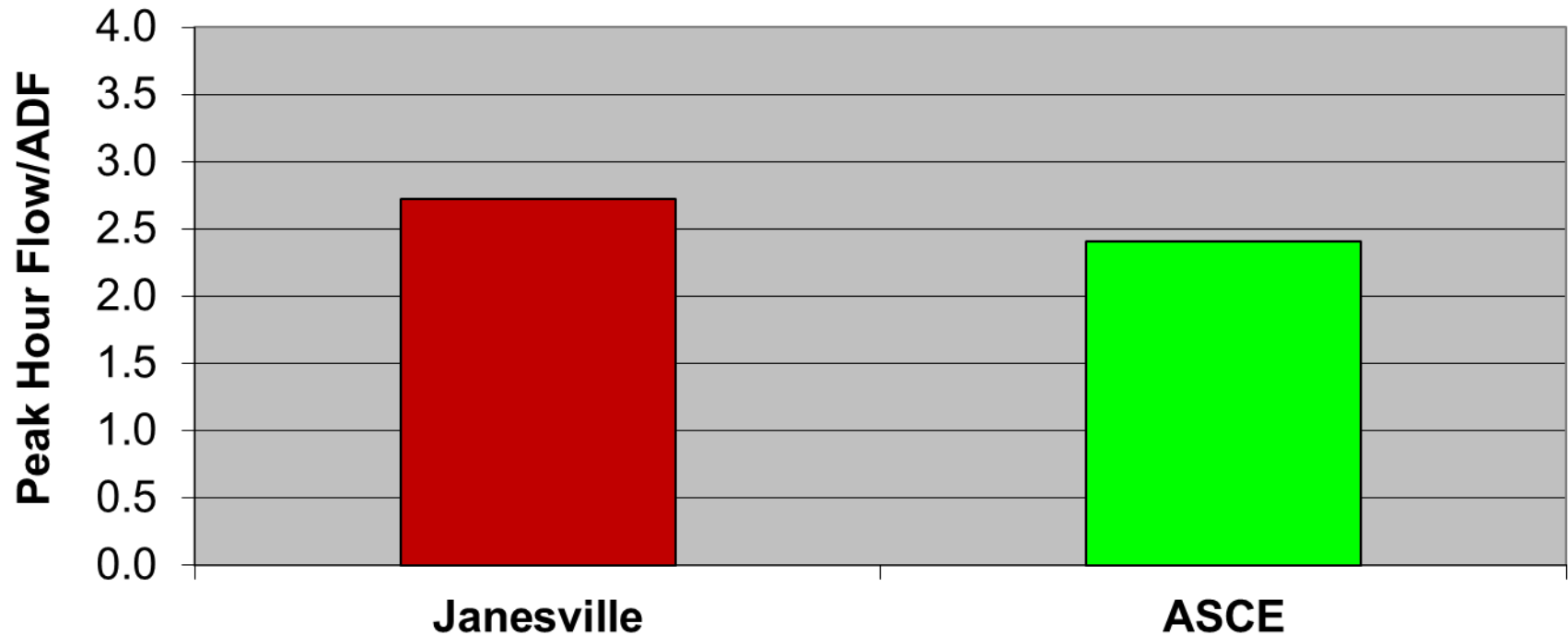
Effectiveness of O&M Activity –Comparisons

Customer Requests per 100 miles/yr Comparisons

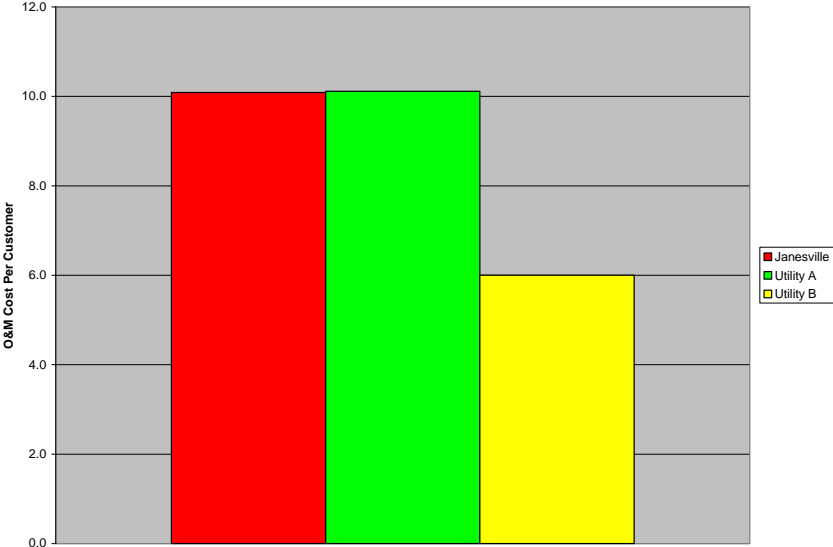


Effectiveness of O&M Activity – Comparisons

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



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

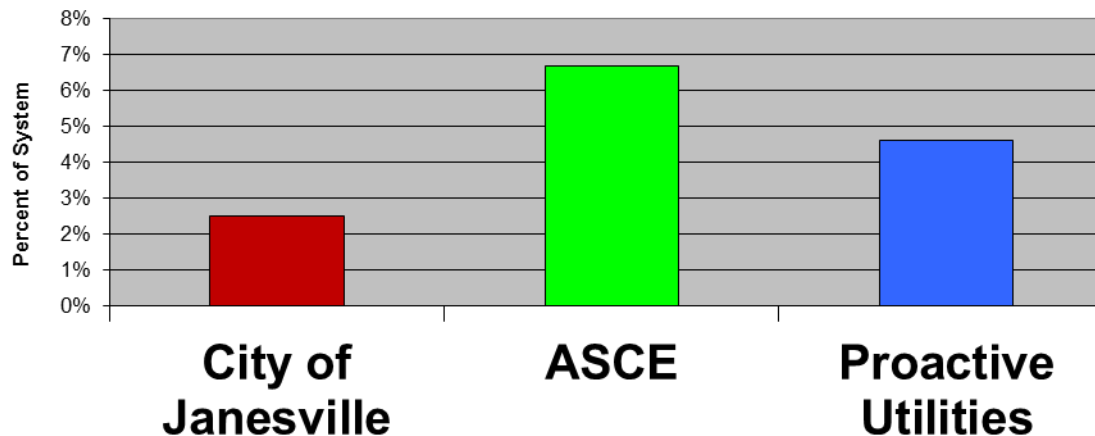
Track Performance

- 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



Available Resources - CMOM

- *Guide for Evaluating CMOM Programs at Sanitary Sewer Collection Systems* – USEPA
- Wisconsin CMOM – <http://dnr.wi.gov/topic/wastewater/cmom.html>
- 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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