# Milwaukee Water Works

# Infrastructure Condition Assessment for Capital Improvements Committee

July 2011

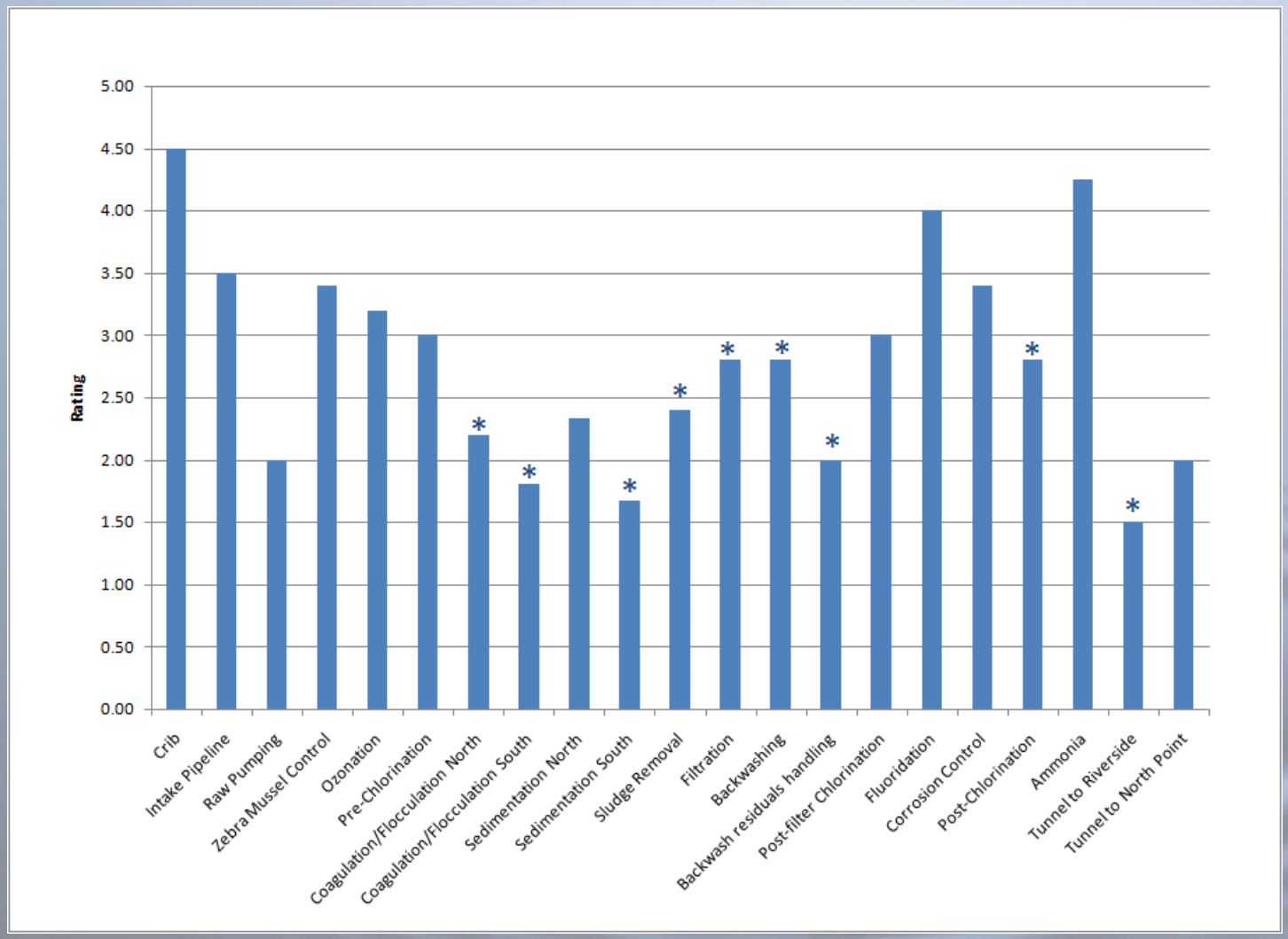
# Approach

- Water Treatment Plants
  - Processes, piping, buildings
- Pumping and Storage Facilities
  - Pumps, pipes and valves, buildings
- Distribution System
  - Pipes, valves, hydrants, other

# Water Treatment Plants

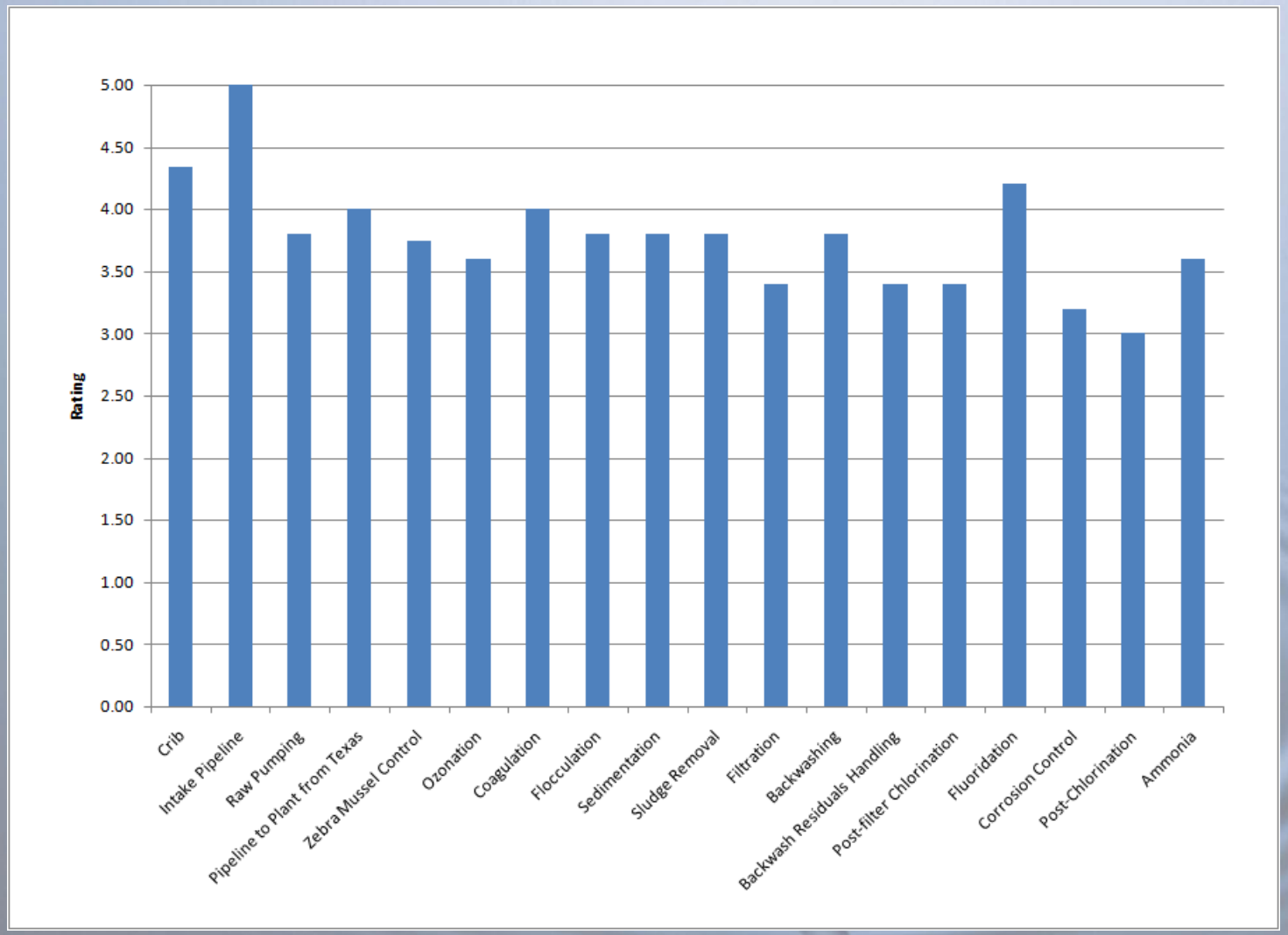
- 1 (poor) to 5 (excellent) rankings for each “feature”:
  - Building housing the feature
  - Physical structure of feature
  - Pipes and valves leading to feature
  - Electrical
  - SCADA
- Ratings for each component averaged for overall “feature” rating

# Linnwood Water Treatment Plant




1 = Poor, 5 = Excellent; * = some aspect of the feature has a “1” rating

# Howard Ave. Water Treatment Plant

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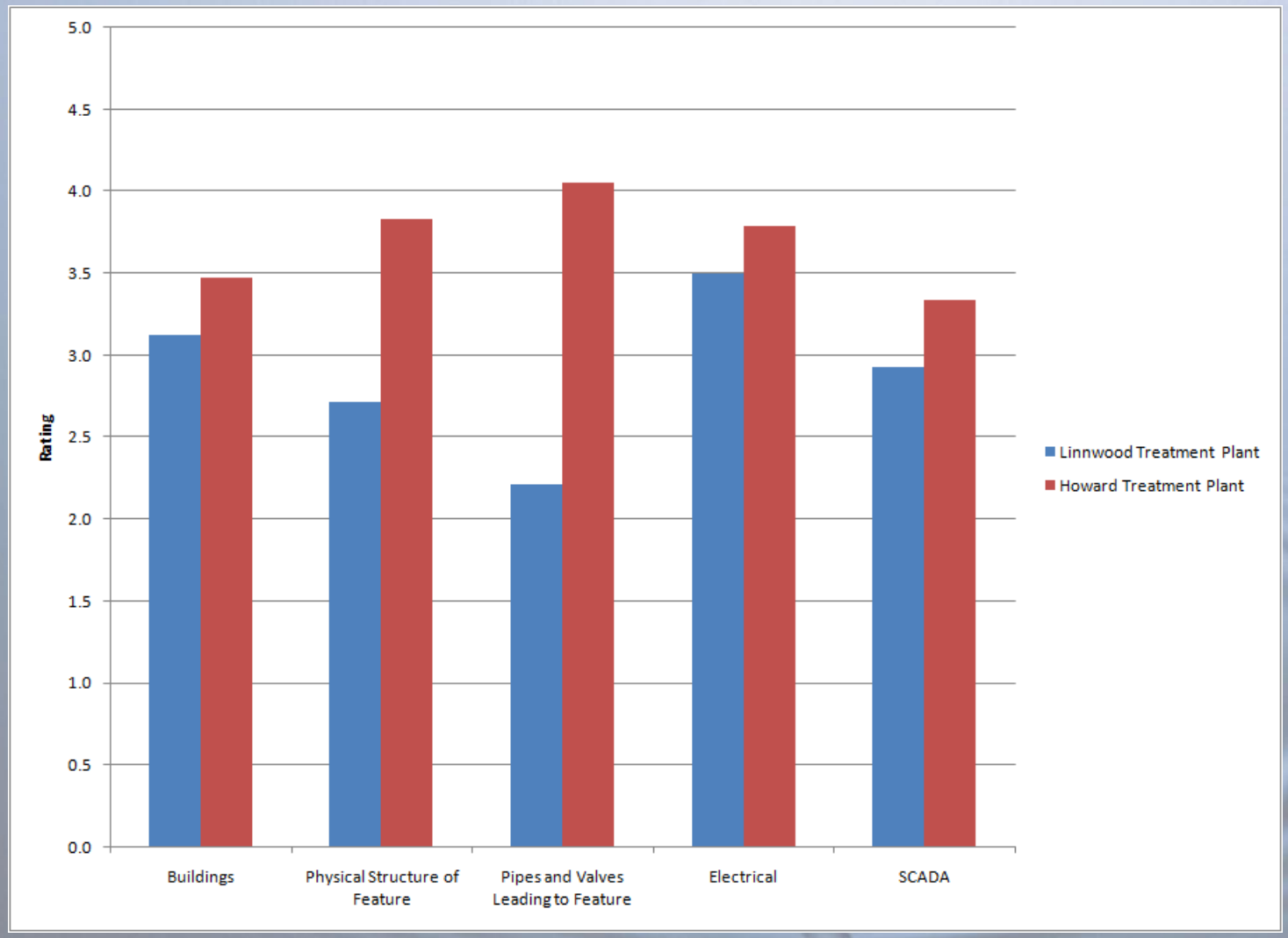
# Water Treatment Plants




1 = Poor, 5 = Excellent

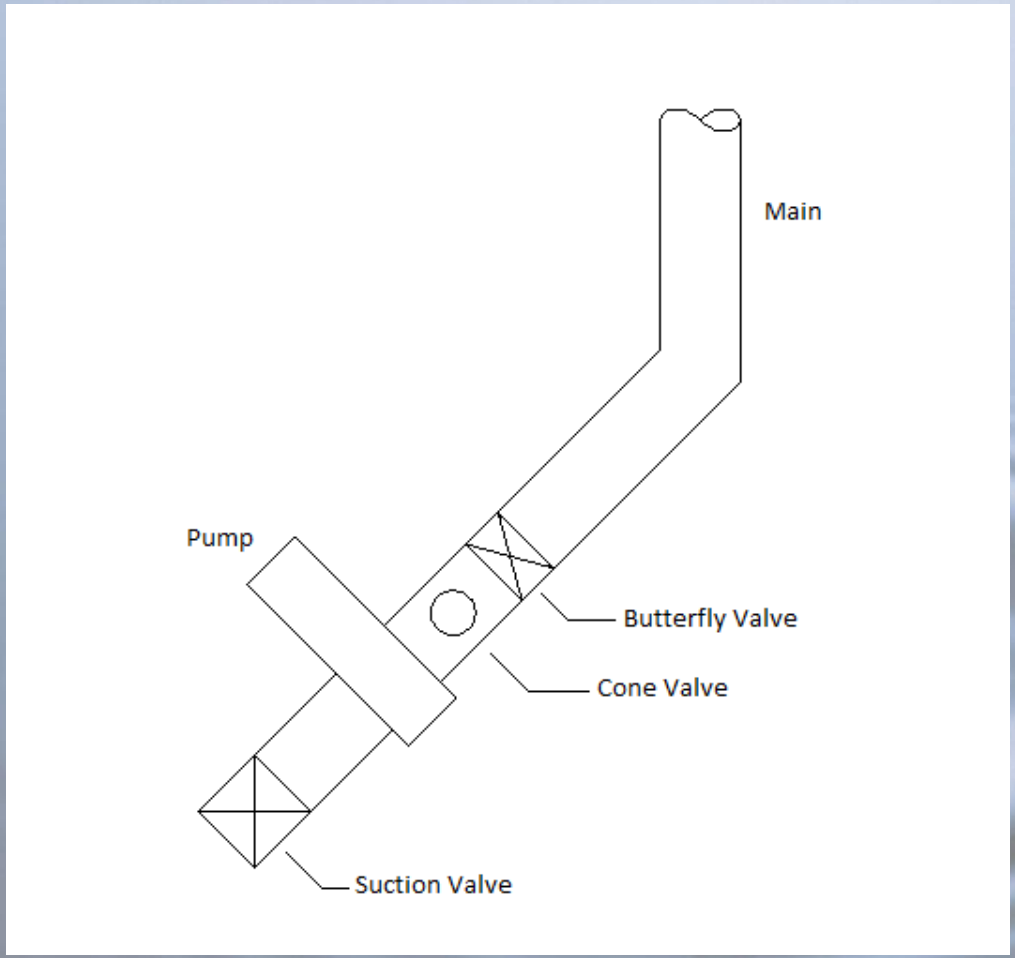
# Pumping Stations and Storage

- 1 (poor) to 5 (excellent) rankings for each “component”:
  - Station structure
  - Electrical
  - Each pump individually ranked
  - Pipes and valves
- Ratings for each component averaged for overall rating

# Riverside Pumping Station

- Major Pumping Station
- Built in 1924
- Feeds 70% of MWW service area
- Connected to Linnwood Treatment Plant by a gravity fed 9’ diameter tunnel
- Nine 30 MGD pumps boost pressures and push the water
- Three 54” and one 60” feeder main the water into and throughout the high service pressure district

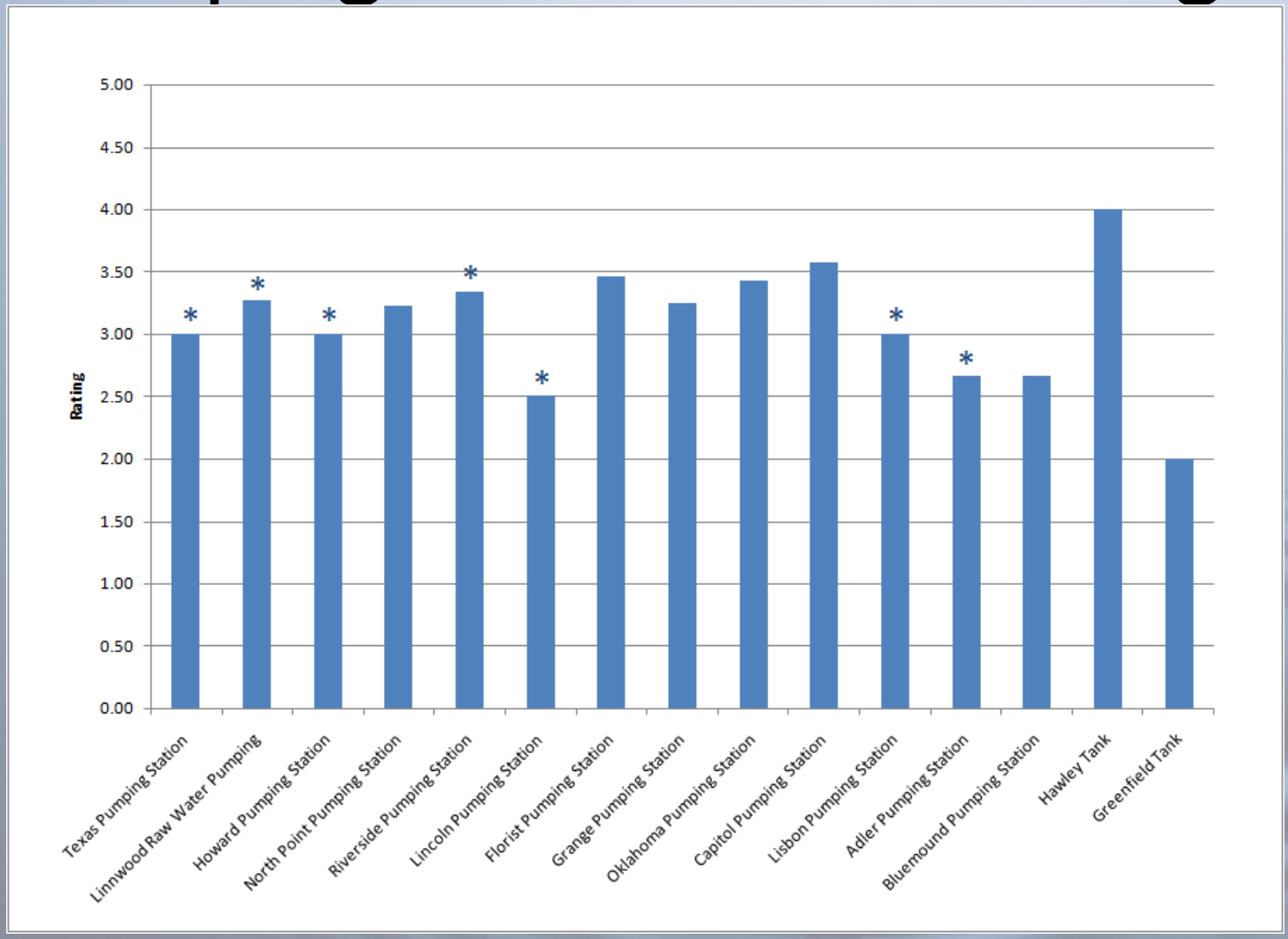
# Riverside Pumping Station



# Riverside Pumping Station

| | |
|---|---|
| Tunnel from Linnwood | Unknown |
| Structure | 3 |
| Electrical | 4 |
| Pump Number 1A | 1 |
| Pump Number 1B | 3 |
| Pump Number 2 | 3 |
| Pump Number 3A | 3 |
| Pump Number 3B | 3 |
| Pump Number 4 | 5 |
| Pump Number 5 | 3 |
| Pump Number 6A | 5 |
| Pump Number 6B | 5 |
| Pipes and Valves | 2 |
| **Average** | **3.3** |

# Pumping Stations and Storage

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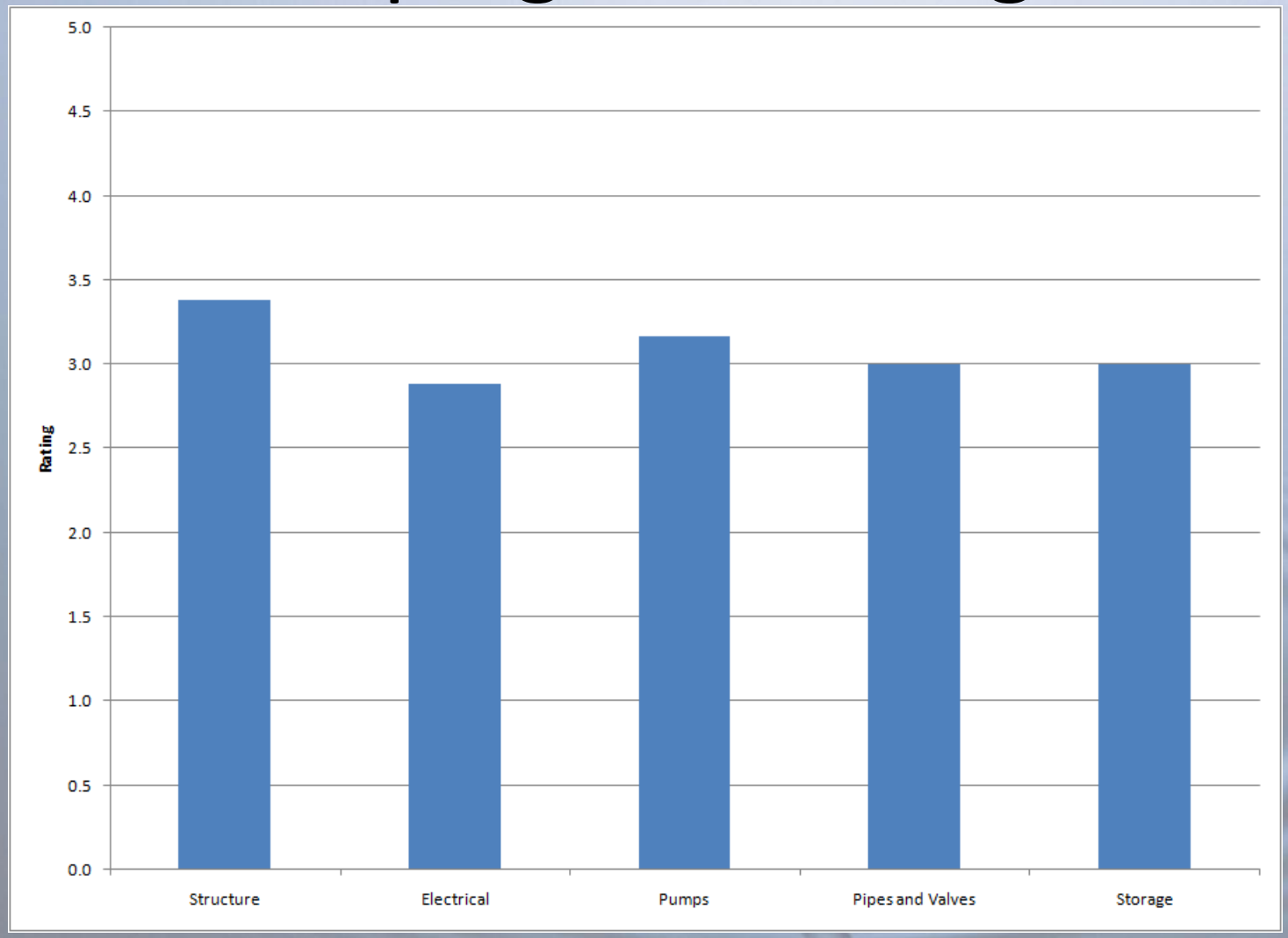
# Pumping and Storage




1 = Poor, 5 = Excellent

# Own, Operate and Maintain in *Four** Communities

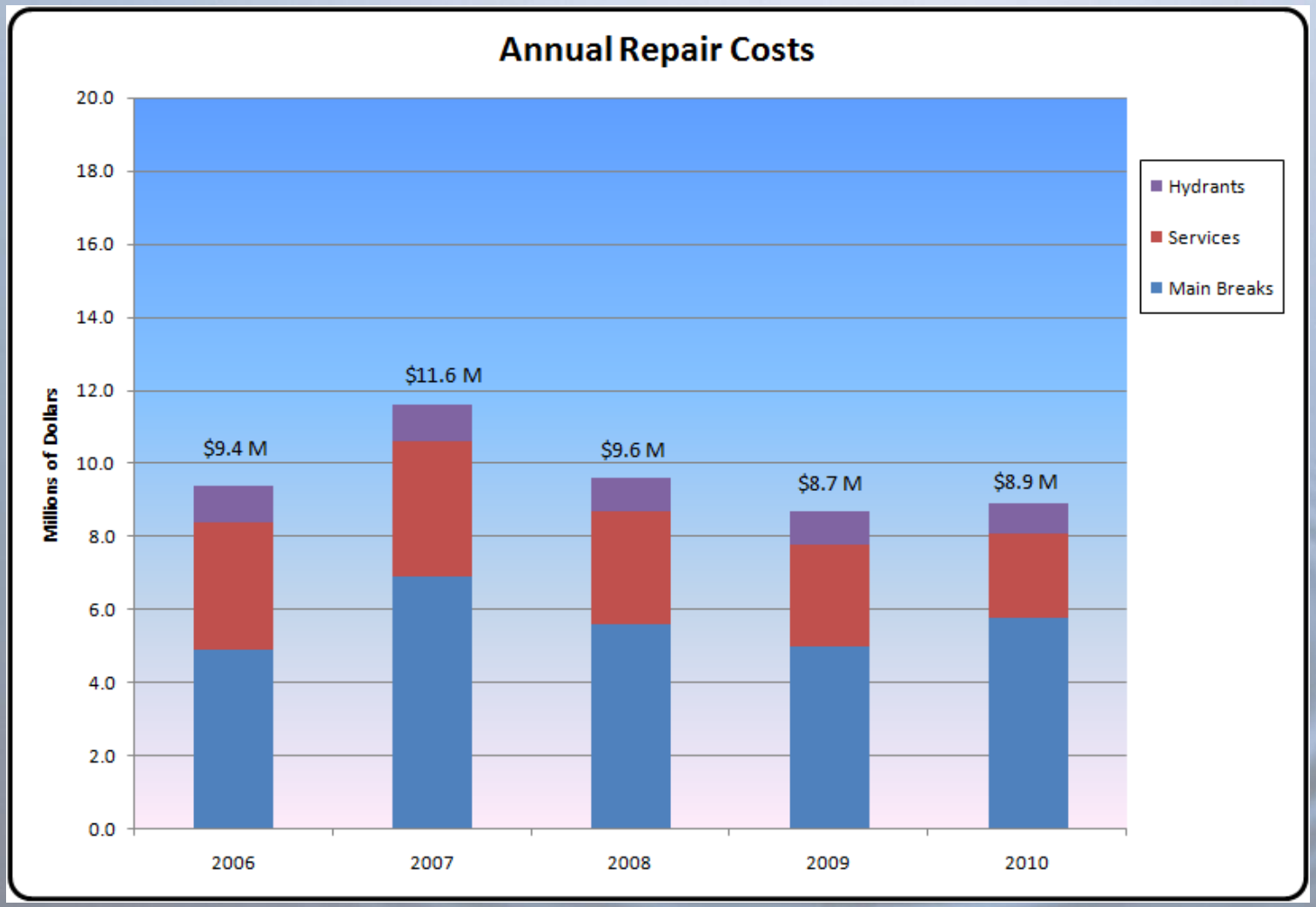
- 2,000 miles of water main
- 20,000 hydrants
- 50,000 valves
- 162,000 services

*Milwaukee, Greenfield, Hales Corners, St. Francis

# 2010 Distribution System Maintenance

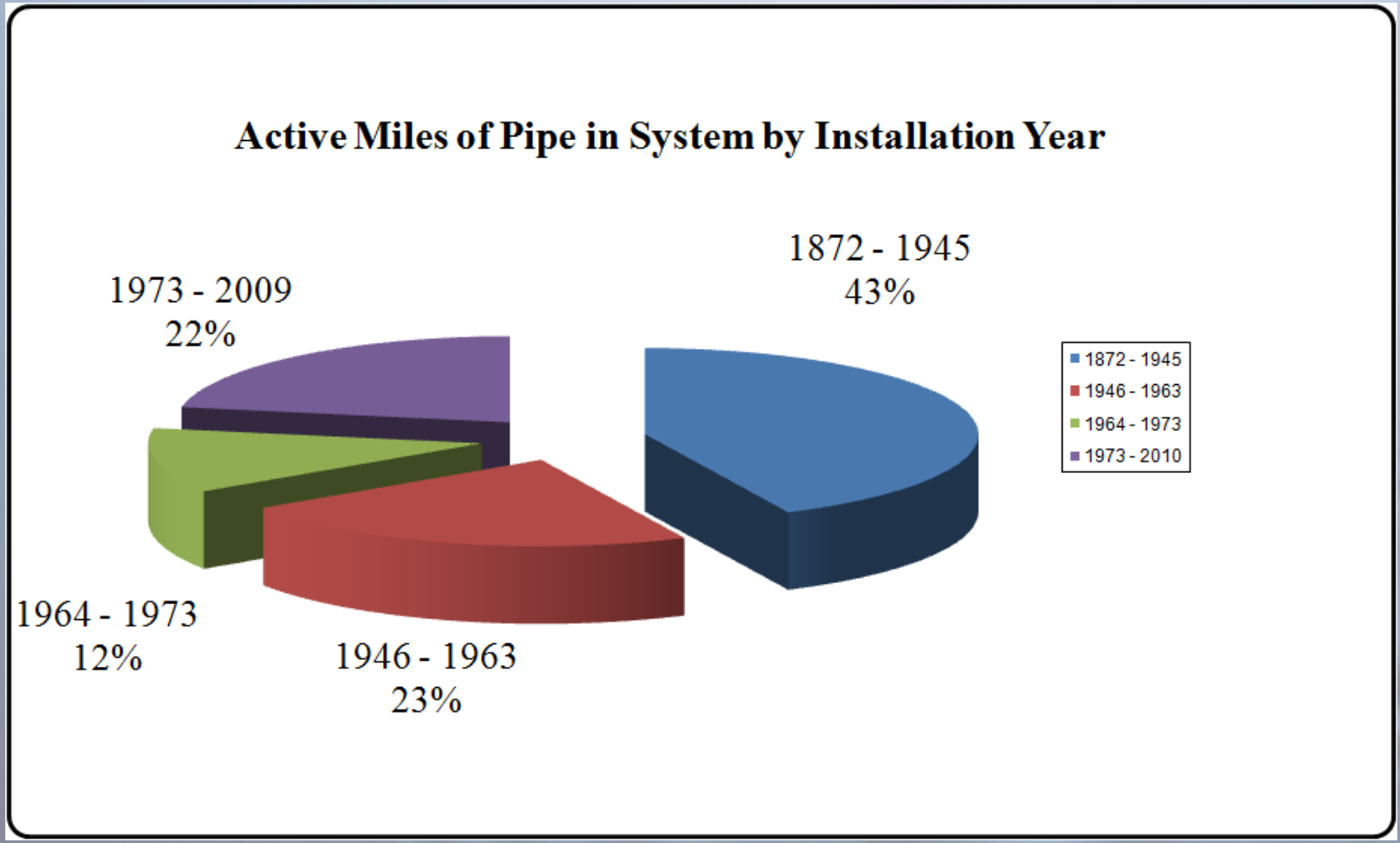
- Hydrants (12,808)
  - Inspect, Install, Repair, Replace
- Valve Maintenance (2,032)
  - Operation, Install, Repair, Replace
- Service and Branch Connections (1,205)
  - Install, Repair, Replace, Abandon
- Main Break Repairs (439)

# Maintenance Repair Costs



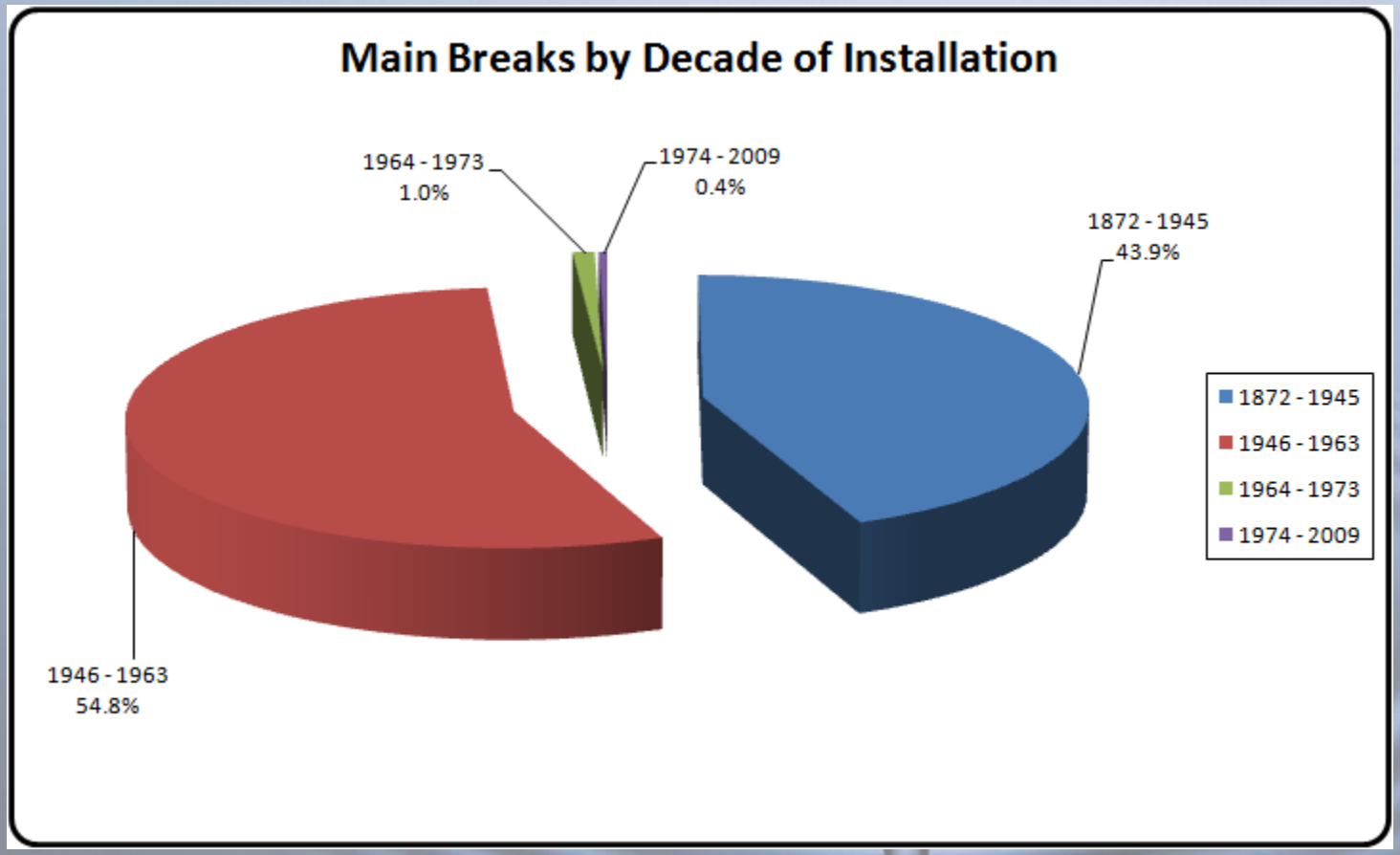

Data from Milwaukee Water Works Annual Report to the Public Service Commission

# Inventory of Assets
## Miles of Mains – By Year Constructed



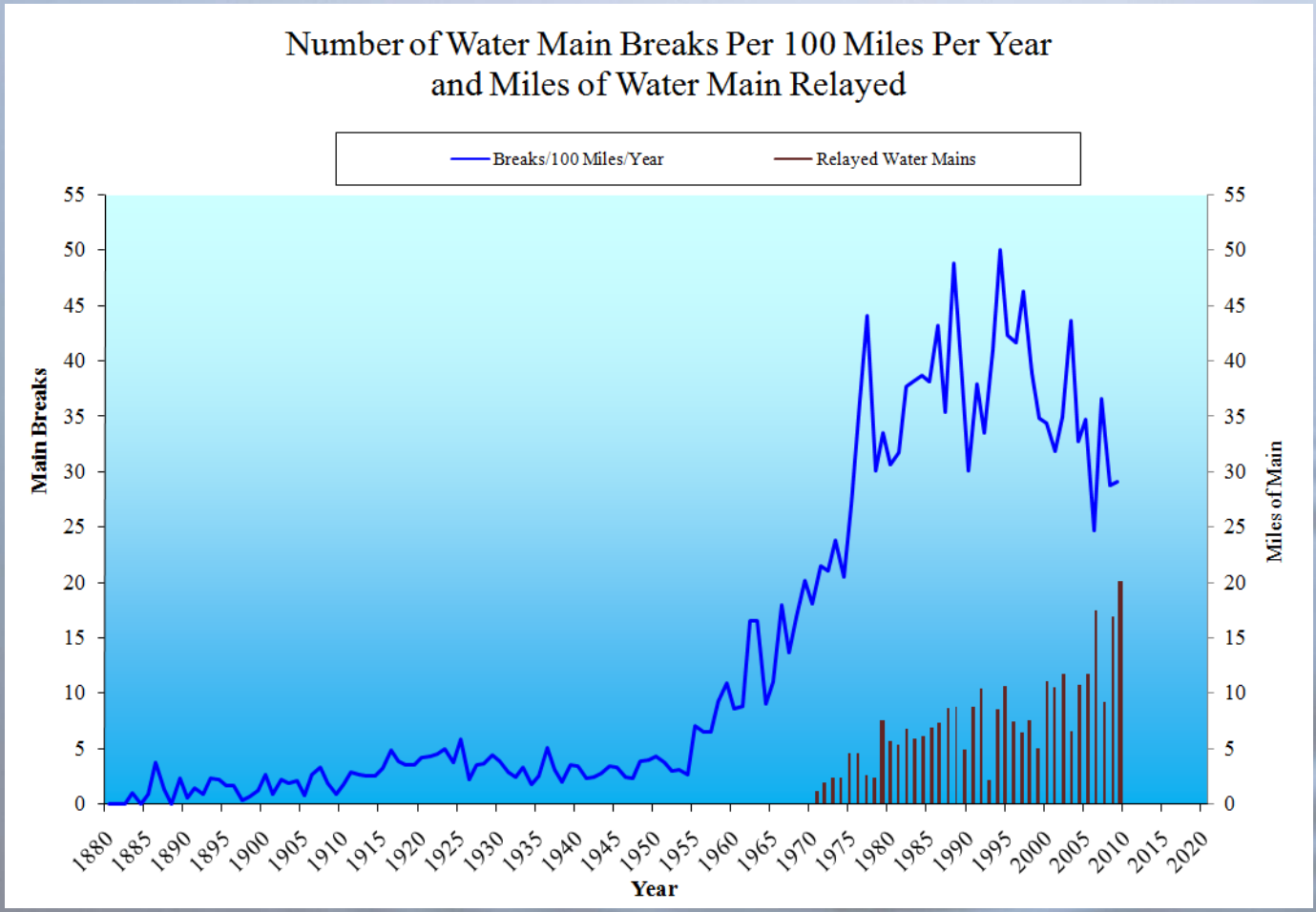

Data from Milwaukee Water Works Annual Reports

# Main Breaks



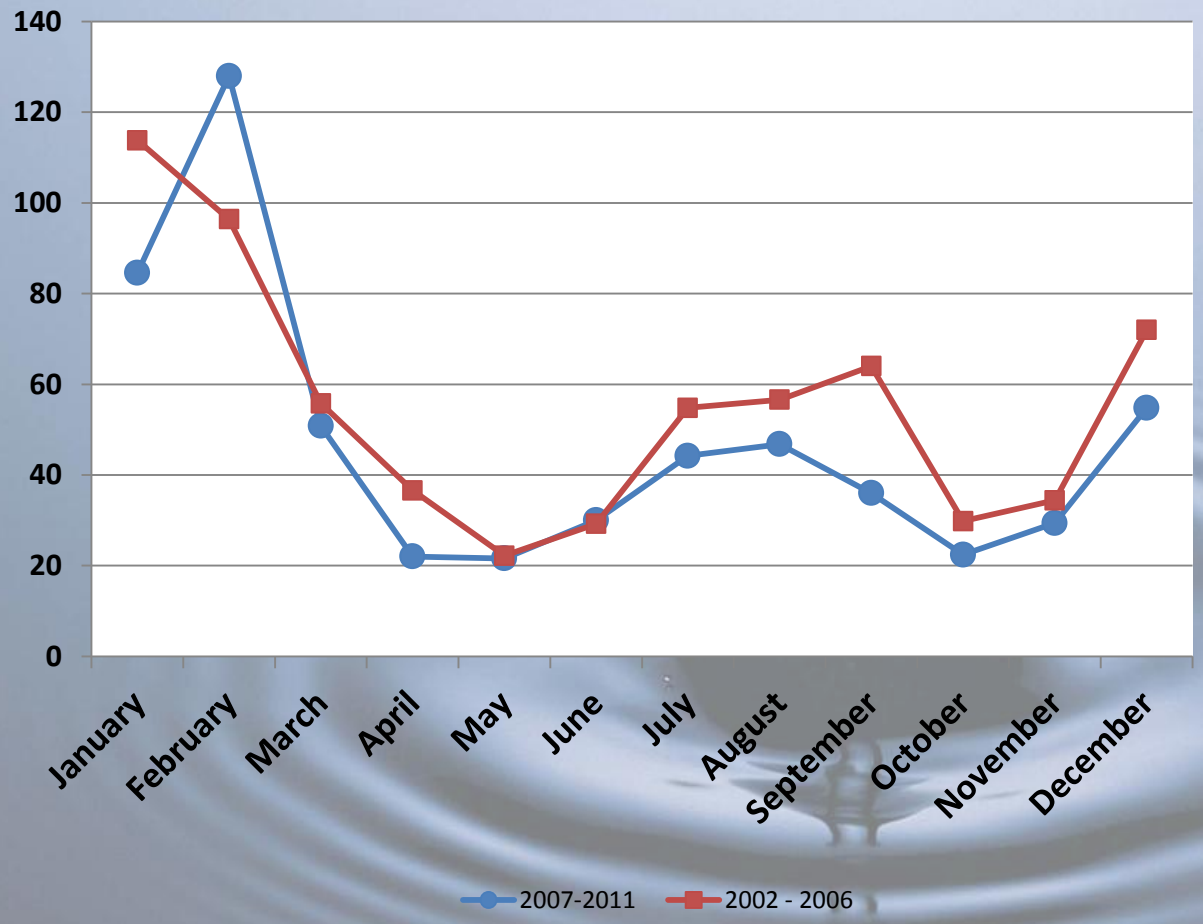

Data from Water Main Break Analysis

# Main Breaks and Miles of Water Mains Replaced




Data from Milwaukee Water Works Annual Reports and Main Break Analysis

# Water Main Breaks
# Five Year Averages



# Summary

- World-class system
- Large, varied and complex infrastructure of varying age and condition
- Work diligently to prioritize projects within constraints of
  - Manage risks, consequence of failure
  - Financial considerations
  - Significant lead time for projects
  - Significant scheduling considerations

# Summary, cont'd.

- MWW Strengths
  - Dedicated, knowledgeable, professional staff
  - Invest in research and development
  - Utilize best practices
- MWW Capital Improvements Plan
  - Prioritize projects within constraints
  - Fully utilize available financial resources
  - Reliable, resilient infrastructure