



Let's Go All In

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Conference & Exhibit

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# SERVICE LEVELS AND PERFORMANCE MANAGEMENT

## STEP 1 IN THE ASSET MANAGEMENT CYCLE

Kevin Campanella

Utility Planning Leader

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**BURGESS & NIPLE**

Engineers ■ Architects ■ Planners

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# AGENDA

- Play by the Rules (LOS Regulation)
- Definitions (LOS, KPI)
- Performance Management
- Choosing Measures, Establishing Targets
- Addressing Risks and Challenges
- Good News











# PLAY BY THE (ASSET MANAGEMENT) RULES







# **AWWA RESEARCH ON GOVERNMENT AND POLICY**

# CASE STUDY RESEARCH

- New Hampshire DES
- New Jersey DEP
- Michigan DEQ
- Ohio EPA
- Ontario, CAN
- New South Wales, AUS

# EXCERPTS FROM THE OHIO EPA DRAFT RULES

(B) The owner or operator of the public water system shall include at least the following information in the asset management program:

(10) Level of Service.

(a) Primary objectives and goals.

(i) Quantity.

(ii) Quality.

(iii) Reliability.

(b) Measure of success.

**3745-87-05      Long-term implementation.**

(A) The water system shall annually review and update the asset management program.

(B) All public water systems shall establish and measure at least three levels of service goals. Levels of service shall be kept onsite and available for review at the discretion of the director. Levels of service shall be reviewed annually, unless otherwise directed by the director.

(1) Levels of service for community public water systems may include the following:

(a) Cost per million gallons (MG).

(b) Actual operating expenses.

(c) Actual operating revenue.

(d) Million gallons per connection.

(e) Million gallons per person.

(f) Distribution length (miles of pipe).

(g) Testing and maintenance tasks per year.

(h) Testing and maintenance tasks per million gallons.

(i) Gallons per person or connection.

(j) Compliance or violations per year.

(k) Compliance or violations per million gallons.

(l) Customer complaints per million gallons.

(m) Staff per million gallons.

(n) Staff per mile of pipe.

(o) Rate as a percentage of median household income.

(p) Energy audit and efficiency.

(q) Reserve funds.



(C) Metrics shall be kept onsite and available for review at the discretion of the director. Metrics shall be reviewed and documented annually by the public water system, unless otherwise directed by the director. The following metrics will be required for the specified system type:

(1) Community public water systems.

(a) Operating budget (operating ratio).

(b) Cost per customer, connection or person.

(c) Breaks per mile of distribution or breaks per MG or breaks per customer or connection.

(d) Non-revenue water (water loss).

(e) Summary of events where system pressure drops below minimum pressure specified in paragraph (E) of rule 3745-83-01 of the Administrative Code.

(f) Repair, rehabilitation or replacement tasks per year (emergency versus planned).

(i) Rate structure.

(g) Customer complaints per year, customer or connection.

(j) Reliability.

(h) Summary of completed projects from CIP.

(k) Plant utilization.

# THE FINAL OHIO EPA RULE:

(B) Metrics shall be kept onsite and available for review at the discretion of the director. Metrics shall be reviewed and documented annually by the public water system, unless otherwise required by the director. The following operational metrics will be required for the specified system type:

(1) Community public water systems.

(a) Operating ratio.

(b) Operating cost to produce water per service connection.

(c) Breaks per ten miles of distribution pipe.

(d) Non-revenue water (percentage loss).

(e) Maintenance tasks per year (planned vs. unplanned) on vertical assets.

(f) One additional customer service metric to be tracked shall be determined by the water system.

# NEW SOUTH WALES

Performance area	Indicator number	Obligation or indicator
	A3	Total number of unplanned interruptions – water supply
	A4	Average duration of unplanned water interruptions – water supply
	A5	Percent of priority 6 breaks/leaks in drinking water mains that the water utility responded to within 3 hours
	A6	Percent of priority 5 breaks/leaks in drinking water mains that the water utility responded to within 6 hours
	A7	Percent of priority 5 breaks/leaks in drinking water mains that the water utility responded to within 24 hours
	A8	Percent of priority 4 breaks/leaks in drinking water mains that the water utility responded to within 5 days
	A9	Percent of Water Orders rescheduled, which are rescheduled in consultation with an affected Customer within one working day of an expected water shortage, or other delivery delay
	A10	Number of properties that experience a water pressure failure
	A11	Number of properties (other than public properties) that experience an uncontrolled wastewater overflow in dry weather
	A12	Number of properties (other than public properties) that experience three or more uncontrolled wastewater overflows in dry weather

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# WHY ARE LEVELS OF SERVICE STEP 1?





If you don't know where you are  
going, you might wind up someplace  
else.

— Yogi Berra —

AZ QUOTES

# THE TWO MOST IMPORTANT QUOTES IN BUSINESS (DRUCKER)

- "If you can't measure it, you can't improve it."
- "Management is doing things right; leadership is doing the right things."

**WHAT IS MY BEST  
LONG-TERM FUNDING  
STRATEGY?**

**WHAT ARE MY BEST O&M  
AND CIP INVESTMENT  
STRATEGIES?**

- What alternative management options exist?
- Which are the most feasible for my organization?

**ASSET  
MANAGEMENT  
ENABLERS:**

- LEADERSHIP
- ORGANIZATIONAL ALIGNMENT
- KNOWLEDGE MANAGEMENT
- TECHNOLOGY
- TRAINING

**WHAT IS THE CURRENT STATE  
OF MY ASSETS?**

- What assets do I own?
- Where are they?
- What condition are they in?
- What are their remaining useful lives?
- What is their remaining economic value?

**WHAT IS MY REQUIRED  
LEVEL OF SERVICE?**

- What is the demand for my services by my stakeholders?
- What do regulators require?
- What is my actual performance?

**WHAT ARE MY BUSINESS RISKS?**

- How do assets fail? How can they fail?
- What is their likelihood of failure?
- What are their consequences of failure?
- What assets are critical to sustained performance?

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# DEFINITIONS





# LOS V. KPI

- A “Level Of Service” (LOS) is a measure of the quality of service provided to [customers](#).
- A “Key Performance Indicator” (KPI) evaluates the success of a particular activity in which an [agency](#) engages. Often success is simply the repeated, periodic achievement of some levels of operational goal, and sometimes success is defined in terms of making progress toward strategic goals.





Amtron

12:15

OFFICIAL TIME

	1	2	3	4	5	6	7	8	9	10	R	H	E
RED SOX	2	4	0	2	0	0	0	1	1		10	13	0
YANKEES	0	0	1	0	0	0	2	0	0		3	5	1

DUNKIN'  
DONUTS

DUNKIN'  
DONUTS

Poland Spring

Poland Spring











# LEVEL OF SERVICE



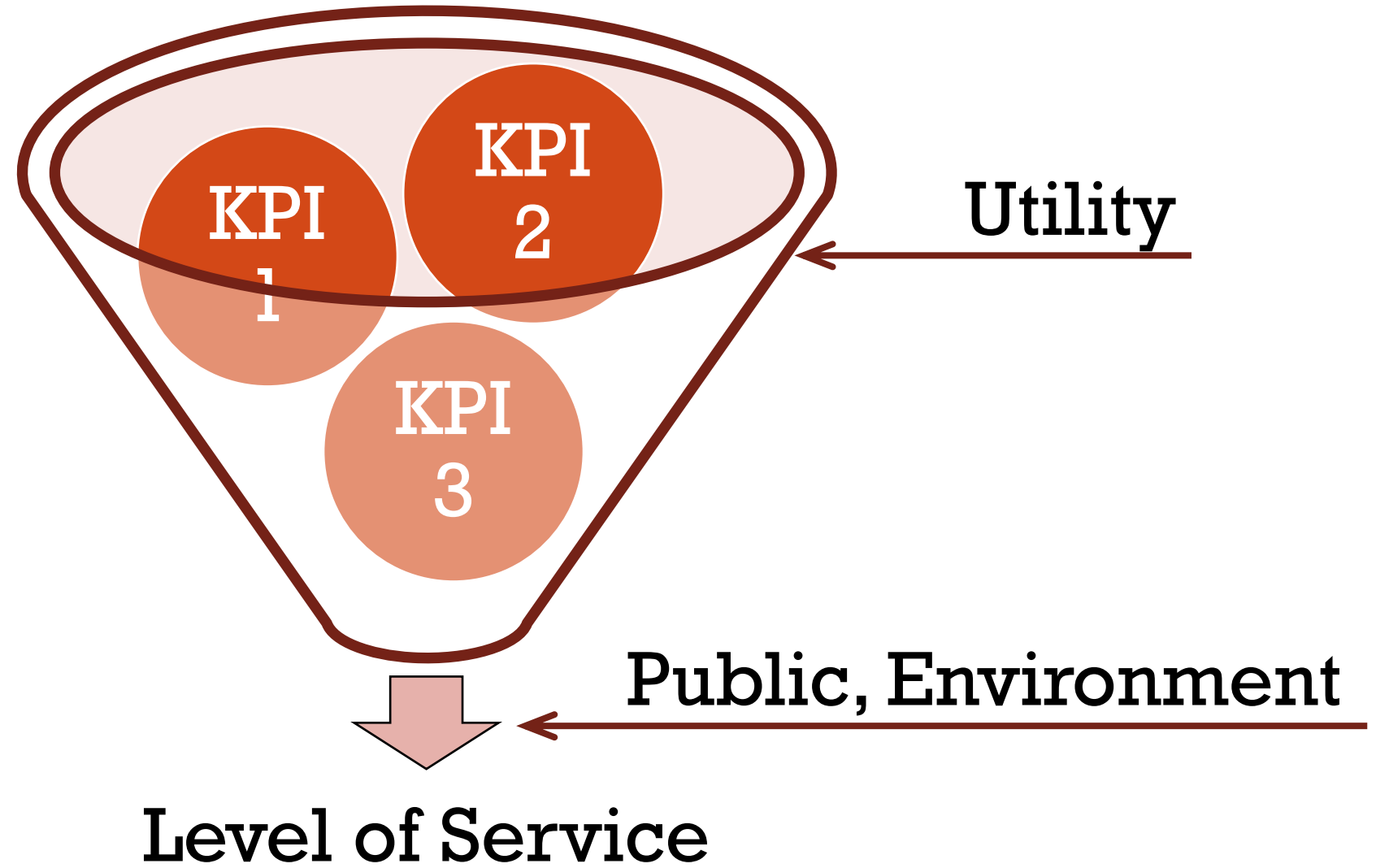
# KEY PERFORMANCE INDICATORS (KPI'S)



## HALFTIME STATS

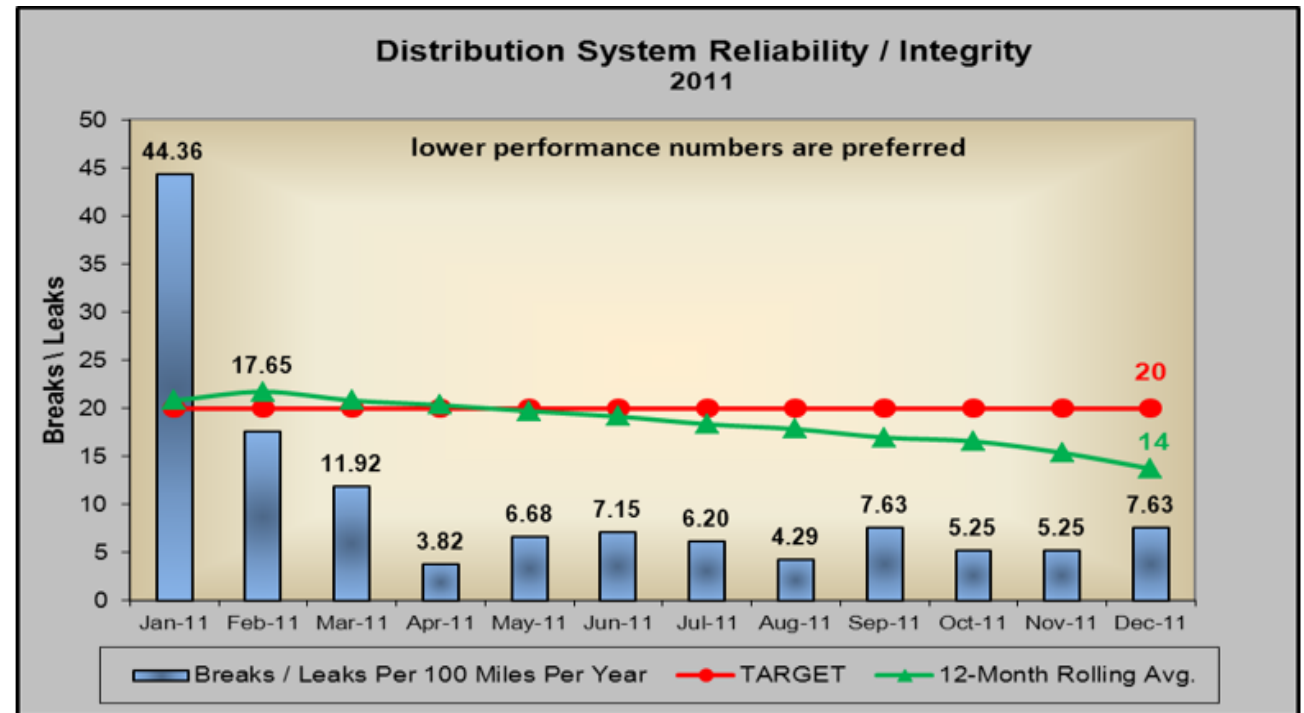


<b>6</b>	<b>FIRST DOWNS</b>	<b>16</b>
<b>2</b>	<b>RUSHING YARDS</b>	<b>103</b>
<b>54</b>	<b>PASSING YARDS</b>	<b>143</b>
<b>56</b>	<b>TOTAL YARDS</b>	<b>246</b>
<b>3/15</b>	<b>PENALTIES</b>	<b>5/70</b>
<b>8:28</b>	<b>TIME OF POSSESSION</b>	<b>21:32</b>



# DEFINITIONS

- Level of Service Metric
- Level of Service (Performance)
- Level of Service Target

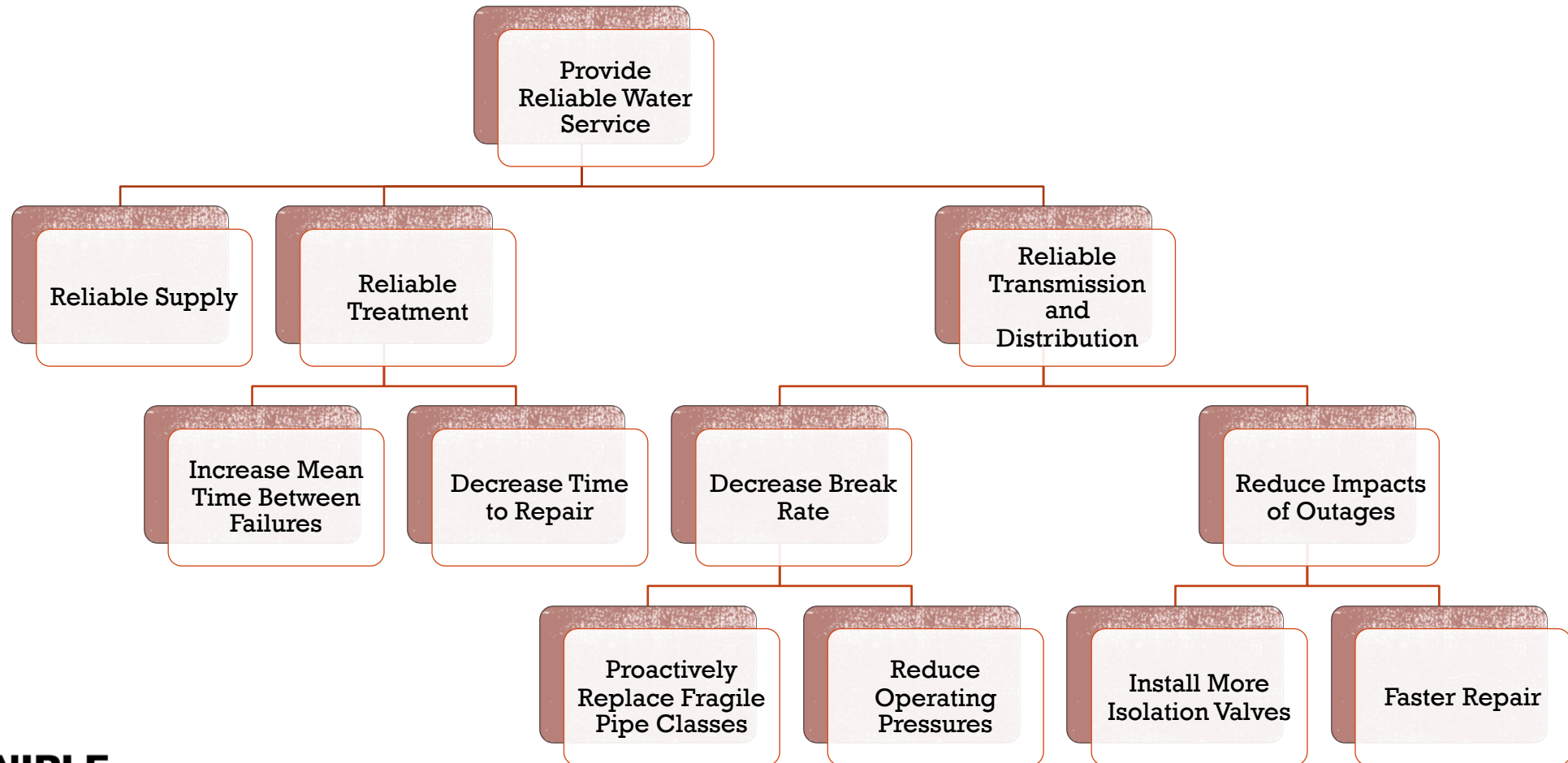


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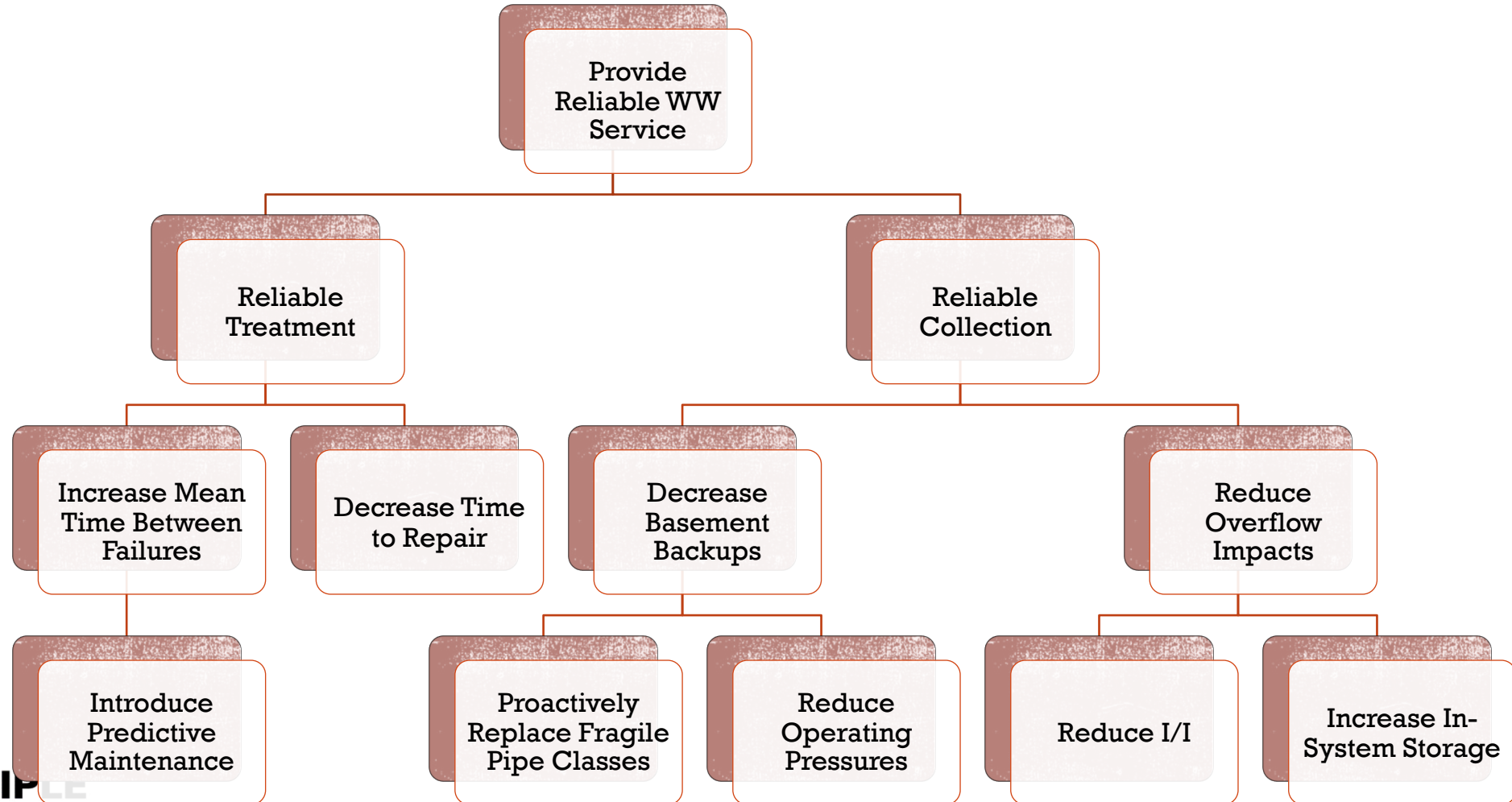
# PERFORMANCE MANAGEMENT



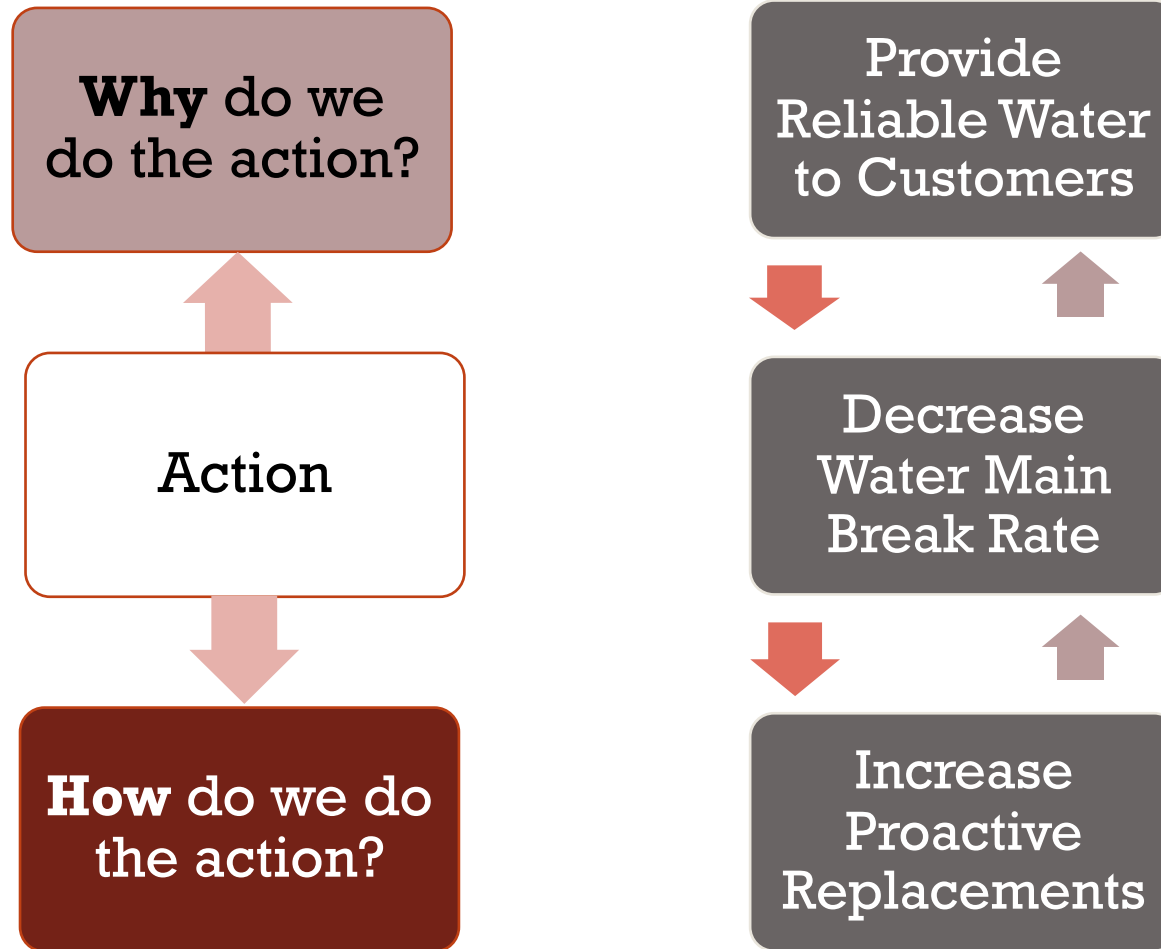
# PERFORMANCE MANAGEMENT FRAMEWORK – WATER UTILITY



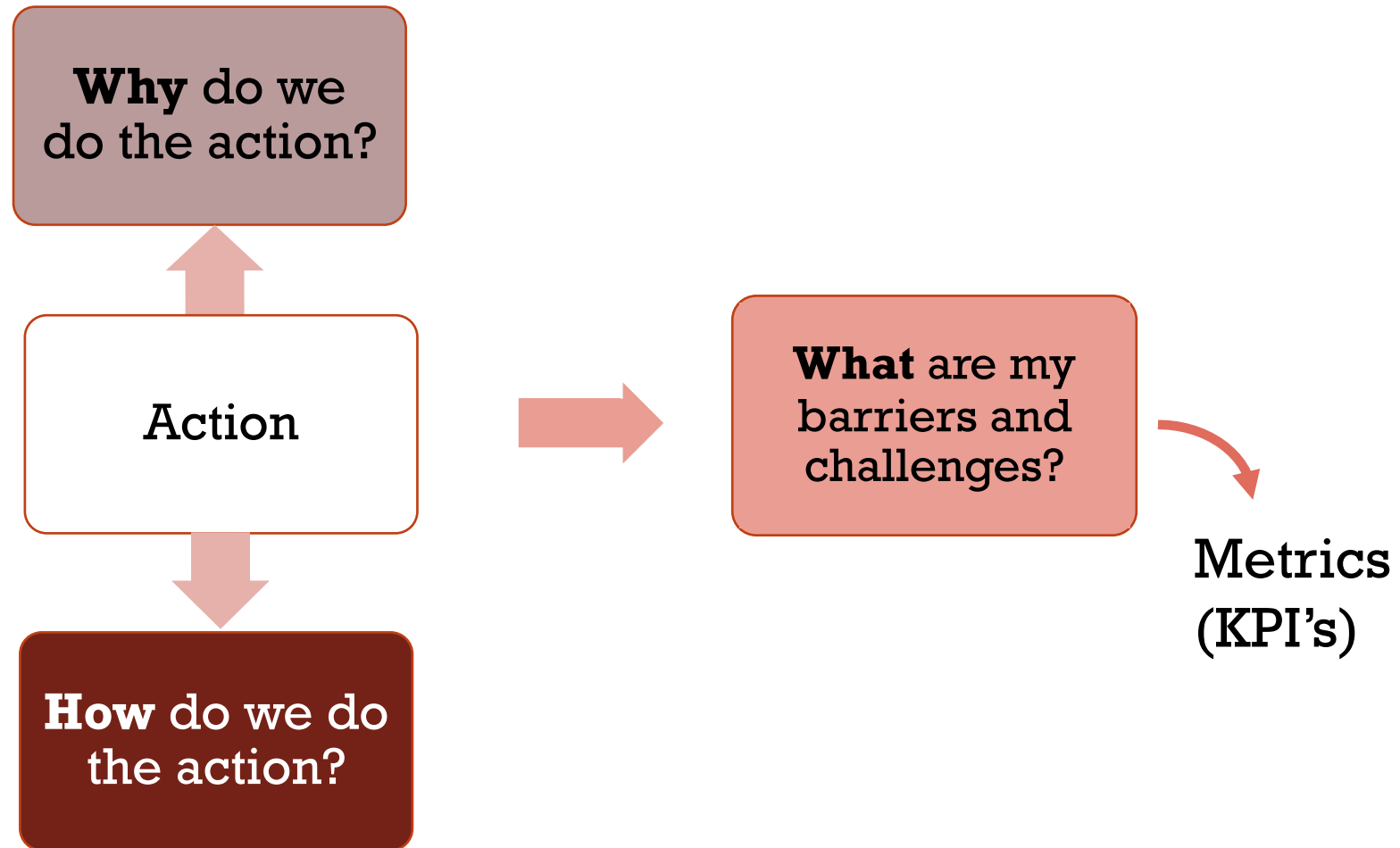
# PERFORMANCE MANAGEMENT FRAMEWORK – WASTEWATER UTILITY



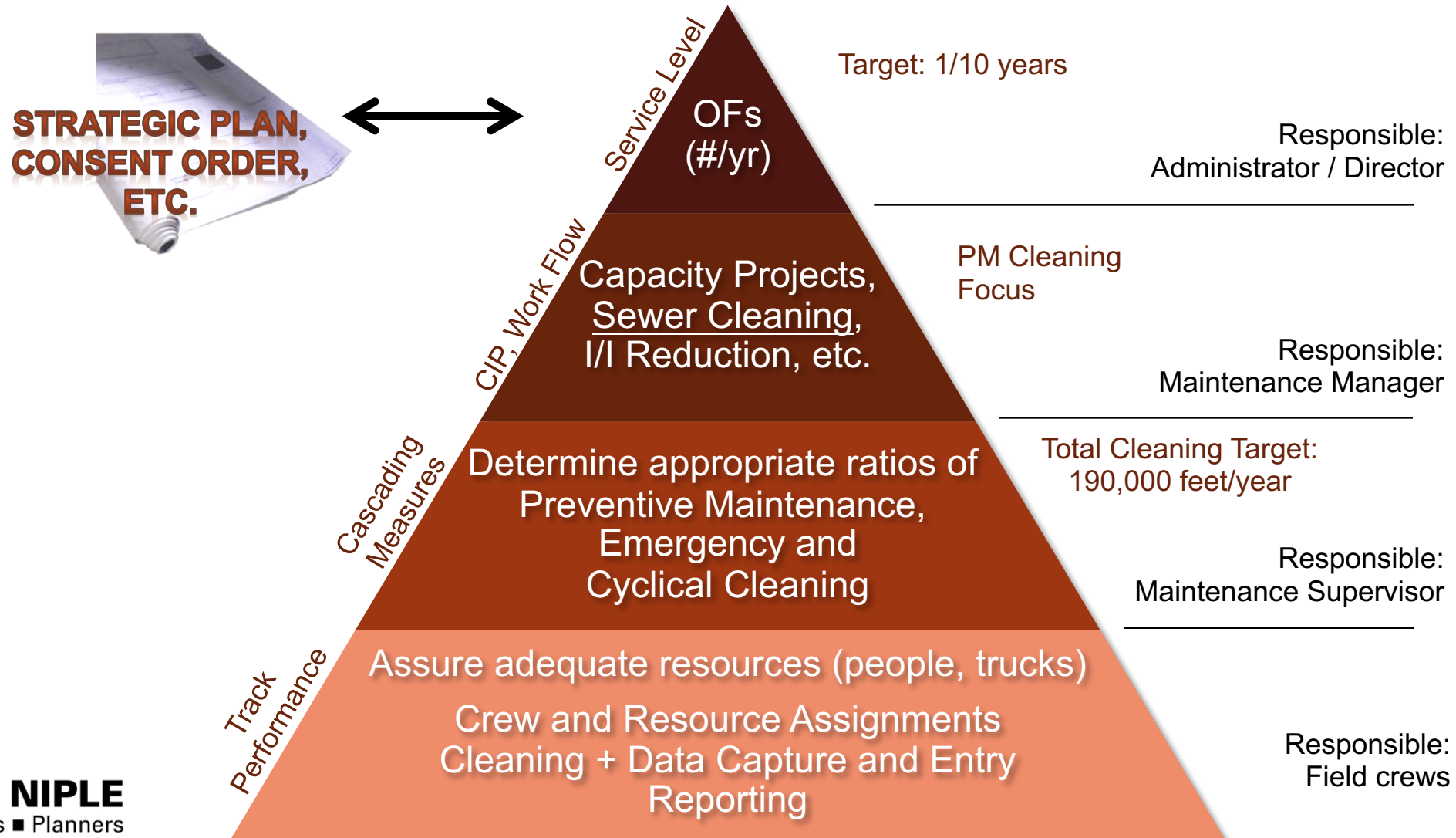
# SIMPLEX MODEL / BUSINESS MAPS



# SIMPLEX MODEL — METRICS DEVELOPMENT



# PERFORMANCE MANAGEMENT FRAMEWORK





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# CHOOSING MEASURES / ESTABLISHING TARGETS



# SERVICE STARTS AND ENDS WITH CUSTOMERS

- Drinking Water Utility
  - Finished Water Quality (# of permit violations)
  - Availability (number and duration of outages)
  - Pressure (number of pressure complaints)
  - Complaints (taste, color, odor, etc.)



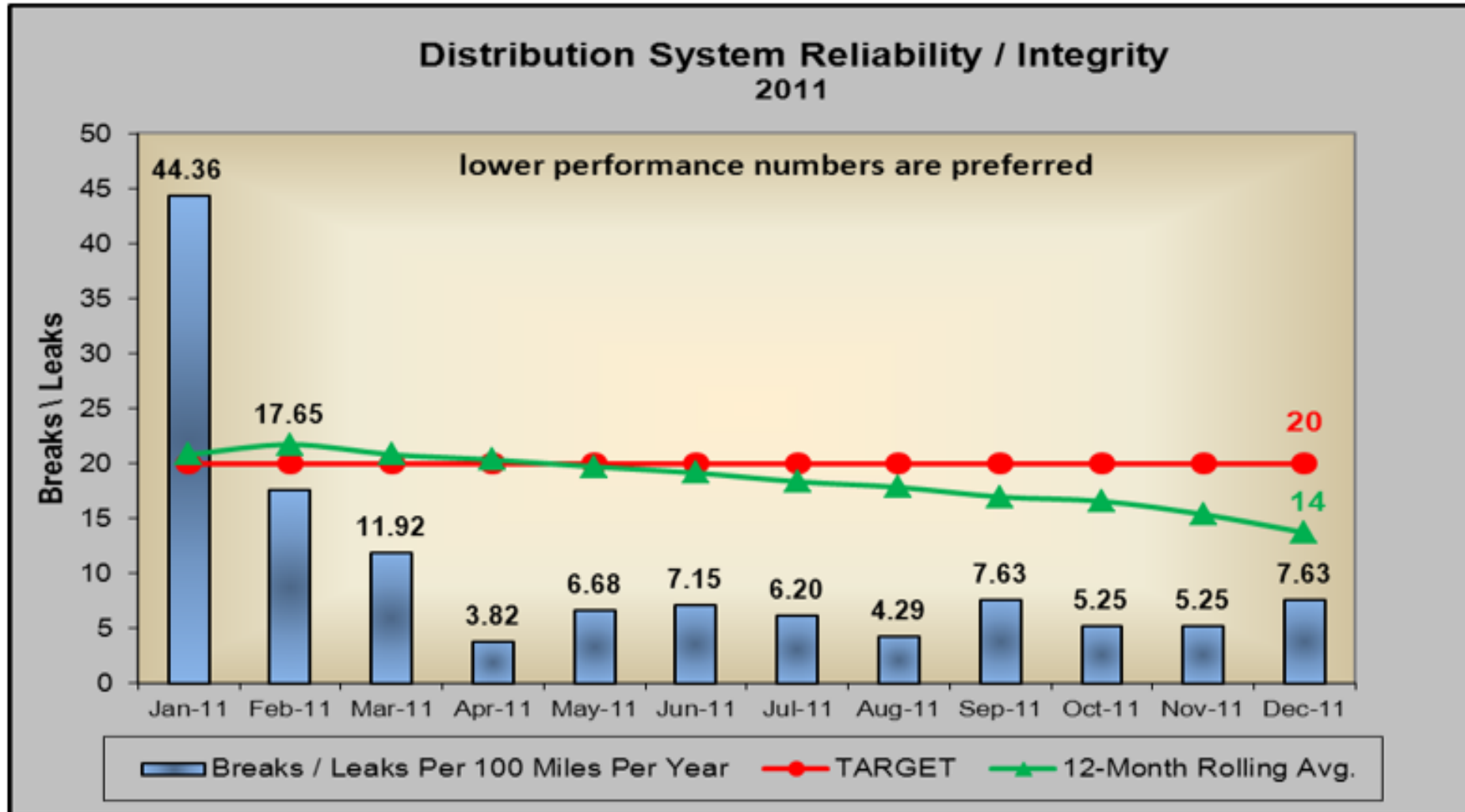
# SERVICE STARTS AND ENDS WITH CUSTOMERS

- Wastewater Utility
  - Overflows (Volume, Frequency, Duration)
  - Treatment Plant Bypasses
  - Basement Backups
  - Odor Complaints
  - Permit Violations (Effluent, Air Emissions, Solids)





# LOS – WATER DISTRIBUTION





# GOOD NEWS!

- You shouldn't track everything!
  - If you are meeting specific service level targets, do not create an additional report (e.g. pressure).
  - Focus on areas where performance versus service level targets is not as desired
  - Focus on areas where current performance will not meet future demands (help determine when to act)

# SMART MEASURES AND TARGETS

- Specific
- Measurable
- Achievable
- Relevant
- Time-bound





# RISKS AND CHALLENGES




# FROM DATA TO DECISIONS



# METRICS SHOULD HAVE DETAILED DEFINITIONS

- Owner / Sponsor
- Purpose
- Description
- Mathematical Expression / Measurement
- Definition
- Data Requirements
- Reporting Period / Format
- Historical Performance
- Available Benchmark Data
- Target



**LOS Measure 21: Distribution System Reliability**  
**Total Water Main Breaks and Leaks per 100 Miles per Year**

**Owner:**  
**Steering Team Sponsor:**

**Purpose:**  
 This measure is an important indicator of distribution system reliability as impacted by age, condition, and other factors. It is used to trend DPU's overall reliability performance on a system-wide level against targets and can be used to gauge the effectiveness of rehabilitation, renewal, and replacement programs over time. It can be a lagging indicator as targeted capital investment efforts can take several years to demonstrate improvement trends.


**Description:**  
 It is expressed as the total number of main breaks and leaks per 100 miles of distribution mains. For a water utility, distribution system reliability has important implications for customer service, operations and maintenance, asset management, financial, and public health and safety. This indicator quantifies the total number of water distribution system breaks and leaks requiring repair per 100 miles of piping to allow a consistent metric as systems expand and against other utilities. This metric reports the frequency of occurrence but does not measure the impact of events (i.e. duration) or customers affected. A stable and relatively low frequency is desirable, assuming that reasonable levels of service based on cost / benefit analysis have been evaluated considering system characteristics such as: urban / rural service area, predominant material types, relative age of infrastructure and size of system and cost/benefit. This measure can show seasonal variations in performance such as a higher number of events during winter and summers during extreme temperatures. Although monthly variations can be acceptable, this measure should be monitored for discernable trends over time. Rolling 1, 2, or 3 year averages can be useful indicators to monitor long term trends.

**Mathematical Expression and Measurement Tips:**  

$$\text{Frequency Rate} = \frac{(\text{total number of breaks} + \text{total number of leaks}) * 100}{\text{Total miles of distribution mains}}$$

Leaks and breaks are distinctly different events in terms of customer impact, water loss, and repair costs/procedures, but both are important to measuring overall reliability. If an event requires repair it should fit into one category or the other. This measure specifically excludes service leaks and breaks which could be captured separately if desired.

**Definitions:**



... appurtenances conveying water (residential, commercial, and industrial) connection from the main to the meter. This is not considered in this metric.

... valve, or appurtenance, which is stable or progressive.

... nt, or other appurtenance, which causes customer service interruption or

**Source:**

Owner	
Report	
Specify	
Specify	

... basis for internal purposes and external purposes. As data is collected, this data will be represented as a legend. A rolling 3 year average trends.

... the table below. This data has been validated to ensure a reasonable level of confidence and accuracy.

2005	2006	2007	2008	2009
18.0	19.0	22.0		

**Available Benchmark Data:**  
 This service level is an AWWA Quality measure. Based on the most recent report, large system top quartile performance is 32.4 and national top quartile performance is 14.9. Large system median is 66.9 and national median is 32.9.  
**Performance Measure Target:**  
 Current DPU Target is at or below 2011 annual average





# RISKS / CHALLENGES

- “Big brother” monitoring for punishment (internally and externally)
  - Management fear or concern for exposing “weaknesses”
  - Fear of numeric target setting and accountability to targets
  - “Pencil whipping”
- Unintended consequences (rob Peter to pay Paul)
- Resource needs for data collection and validation
- Addressing external stakeholder reaction
- Reviewer fatigue



# GOOD NEWS



# BENEFITS OF ESTABLISHING SERVICE LEVELS

- Common goals across the organization
- Consistency in the utility's activities
- Focus on the things that matter
- Utility can communicate LOS goals to customers (incl. OEPA), and customers will know what to expect



# THANK YOU!

## QUESTIONS AND COMMENTS

Kevin Campanella, Burgess & Niple

Utility Planning Leader

614.459.2050; [Kevin.Campanella@burgessniple.com](mailto:Kevin.Campanella@burgessniple.com)

