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Association

Dedicated to the World's Most Important Resource®

AWWA WEBINAR   American Water Works Association

The Development and Application of Level of Service

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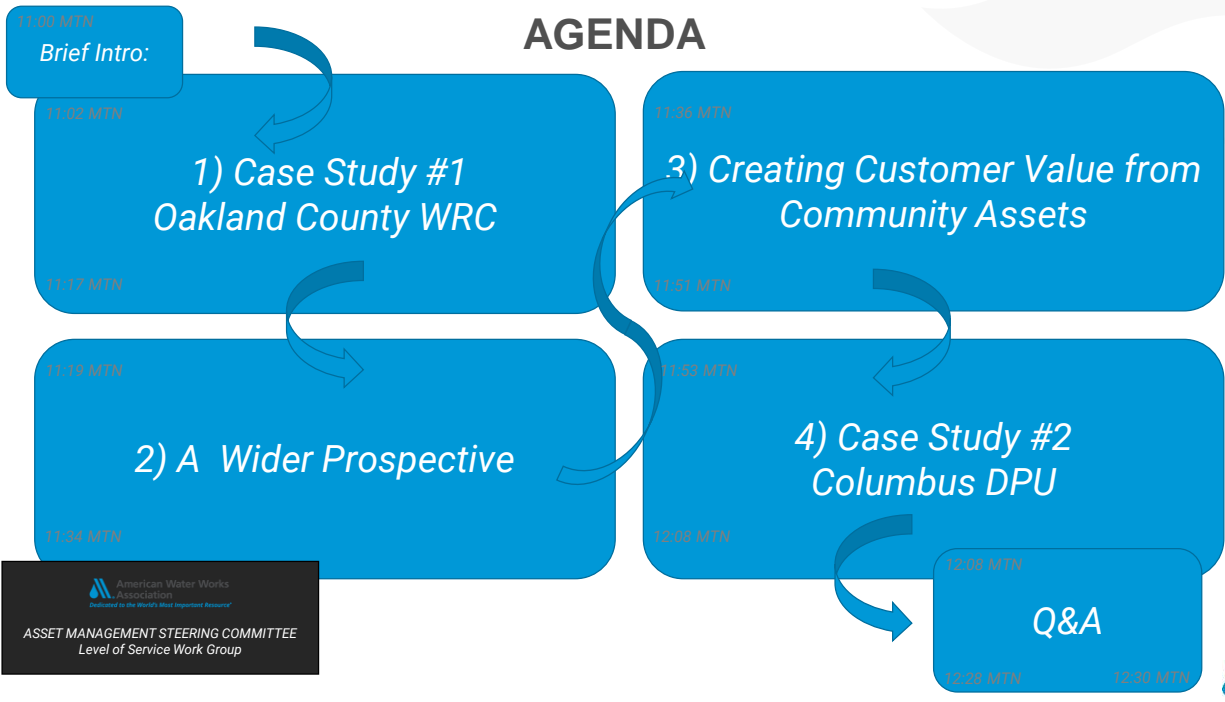
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AGENDA



American Water Works Association
Dedicated to the World's Most Important Resource™
 ASSET MANAGEMENT STEERING COMMITTEE
 Level of Service Work Group

THE PRESENTATION TEAM



Barry Buchanan
NZ/US
Buchanan and Associates



Carrie Cox
US
Oakland County WRC



Richard Kirby
NZ
Tasman District Council



Haydn Reynolds
AUS
Haydn Reynolds & Associates



Kevin Campanella
US
Burgess & Niple



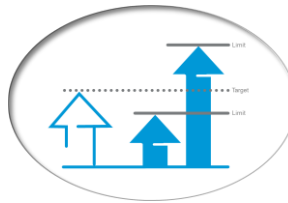
MODERATOR
CHAIR AMC LoS WORKING GROUP

Barry Buchanan, P.E.

- **Principal Consultant, Buchanan and Associates**
- 40 year supporting the Wet Utilities; 3 Waters; Water Industry
- Designed, Built, and Operated Systems Serving 5 to 2.3M People
- Worked for Consultants, Private and Public Water Purveyors
- Worked in Australasia, Asia, Europe, North/Central/South America
- Specialize in Infrastructure Planning and Life Cycle Management
- Founder/Member of:
 - US National Asset Management Steering (US-NAMS) Group
 - Asset Management Users Group (AMUG)
 - AWWA Asset Management Committee (AMC)



WEBINAR LEARNING OBJECTIVES



As a result of this presentation you will learn:

- What Levels of Service (LoS) are, and are not
- Why LoS are crucial to the foundation AM
- When LoS should be identified
- How to identify appropriate LoS
- Who should be involved to formulate LoS

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ASSET MANAGEMENT STEERING COMMITTEE
Level of Service Work Group

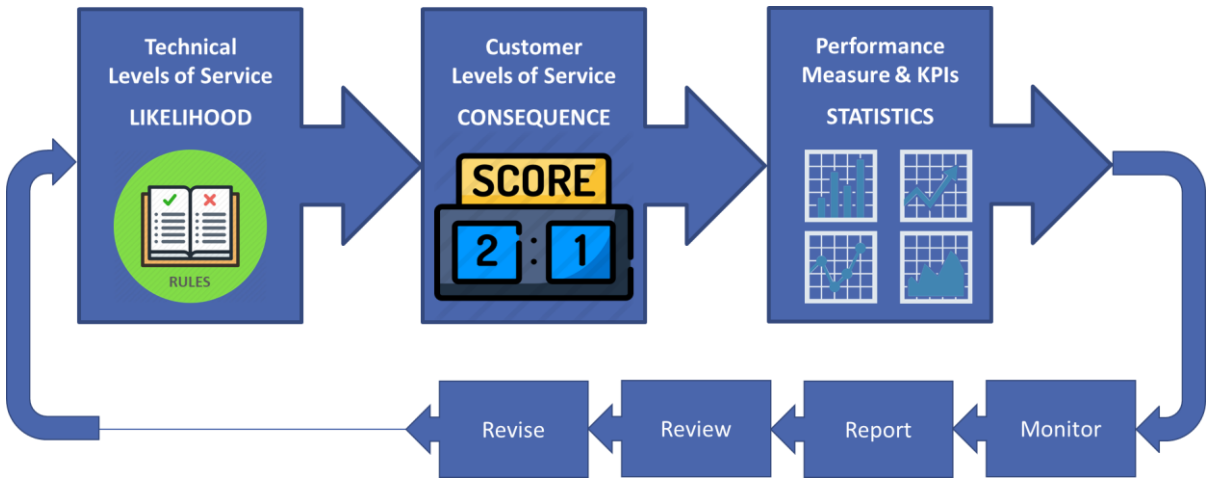


LEVELS OF SERVICE

A BRIEF INTRODUCTION

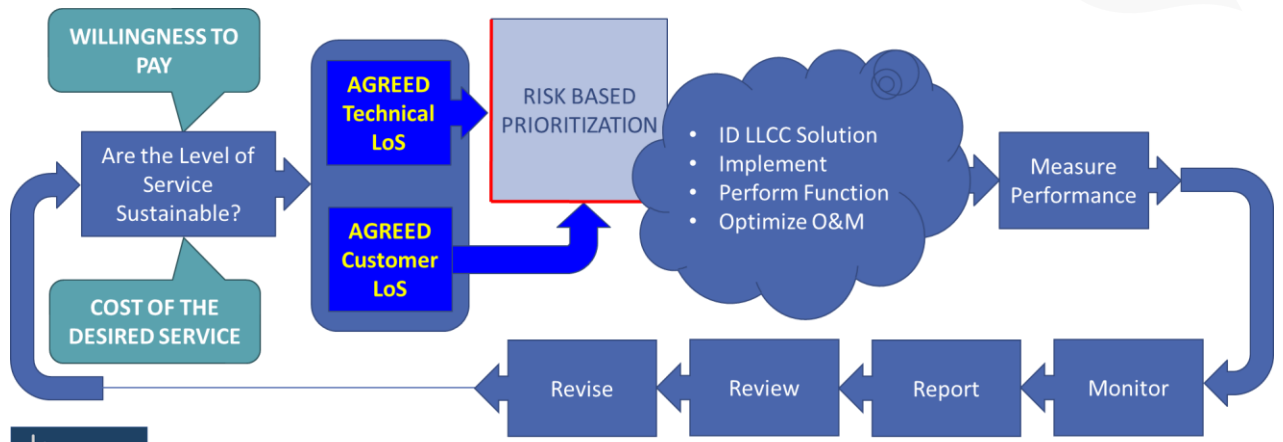


CONTINUALLY ADJUST LEVELS OF SERVICE



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APPLIED LEVELS OF SERVICE



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MANAGING EXPECTATIONS AND NOT JUST DOLLARS

Carrie Ricker Cox, P.E.

- *Chief Engineer, Oakland County WRC, Michigan*
- *20 Plus Years of Experience in:*
 - *Civil, Environmental, and Water Resources*
- *Responsible for CapEx, Asset Management, and Planning.*
- *Affiliations:*
 - *Chair of the AWWA Engineering and Construction Division*
 - *Member of the AM committee*
 - *Vice-chair of the MI-AWWA membership council*
 - *Member of the Michigan Water Infrastructure Council*

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CASE STUDY #1 MANAGING EXPECTATION

CARRIE RICKER COX

*Oakland County Water Resource Commission's
Journey to Sustainable Operations with
Deferable Levels of Service*



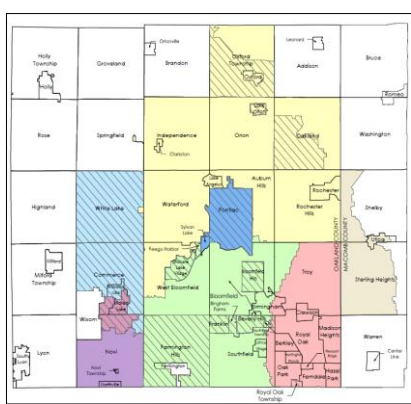
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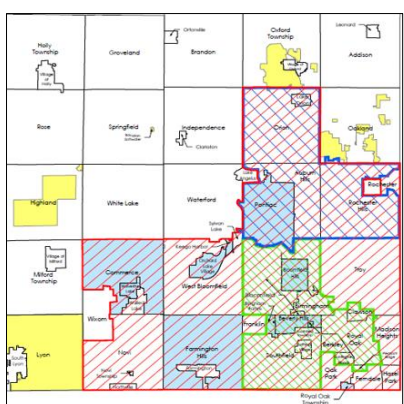
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WRC DIVERSITY

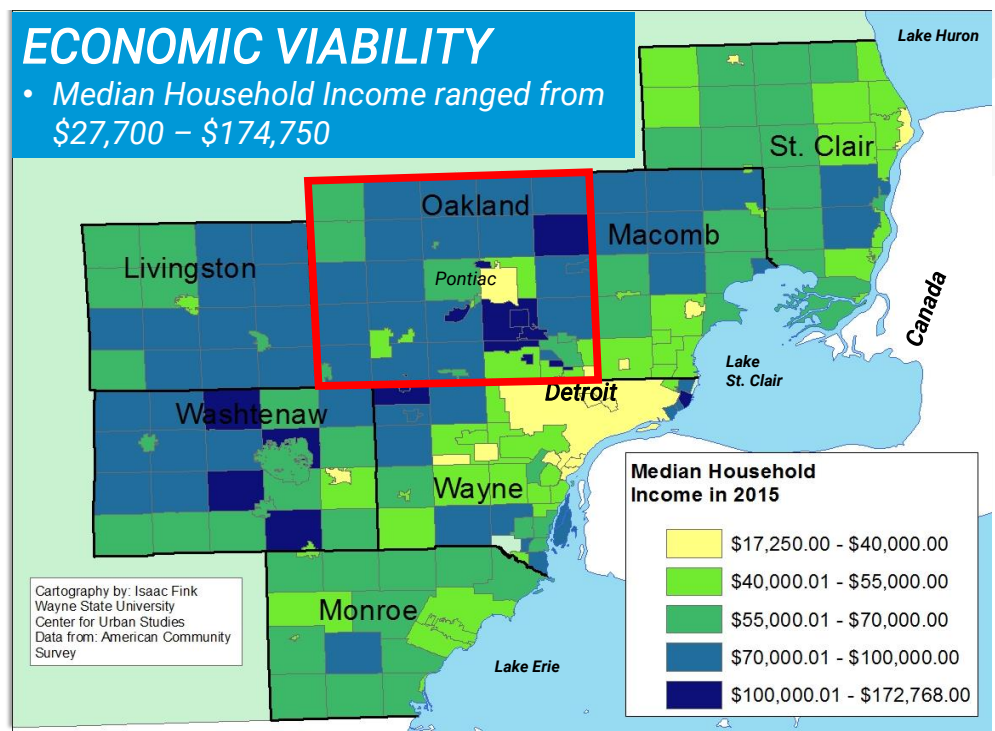
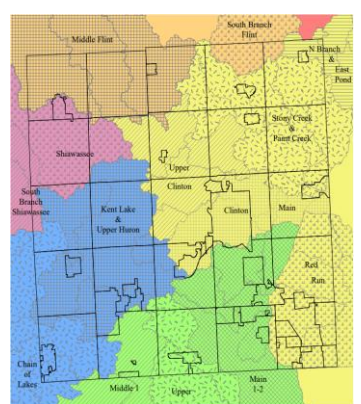
Wastewater



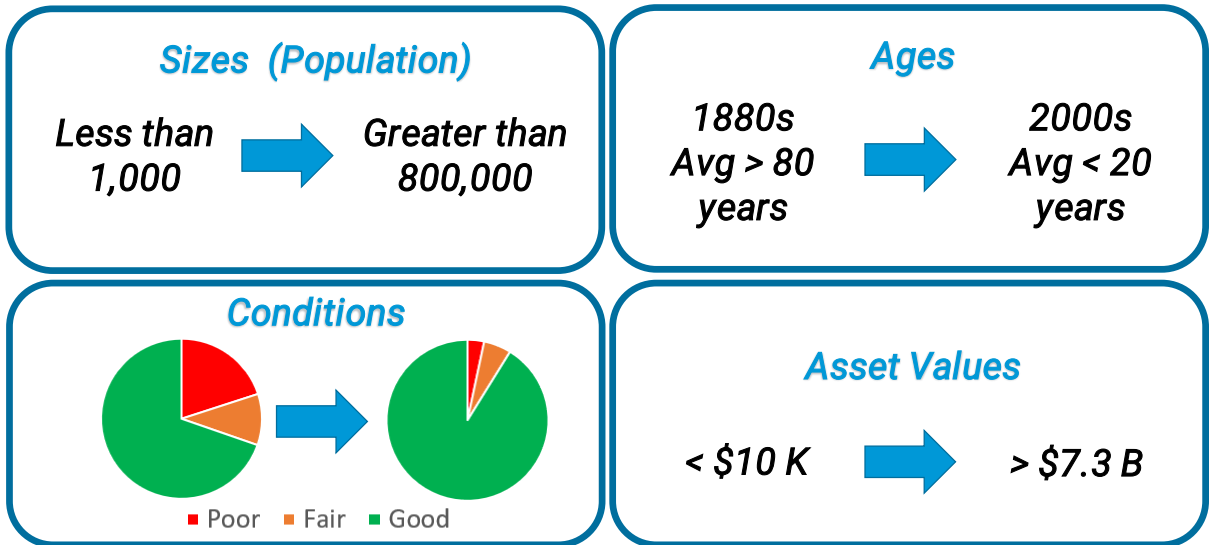
Potable Water



Stormwater



WIDE RANGE OF SYSTEM ...



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FUNDING

EACH SYSTEM HAS THEIR OWN FUND

- 489 separate legal entities with proprietary funds
- Within each fund there are three reserve buckets
- Asset Management System focuses on two
 - Major Maintenance
 - Capital



Inspections and
Rehabilitation

Replacement or
Rebuild



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WHY DID WE START THIS LEVEL OF SERVICE JOURNEY

- WRC received a large state grant
- Measurables were prescribed, however,
- The measurables were hard to translate into:
 - Tangible rate, or
 - Decisions making tools for CIP approval



Engineers, the Management Team, the Board, and Council needed understandable measurement criteria

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THE JOURNEY

TEAM CONVERSATION

- Kevin
- Richard
- Haydn

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DEVELOPING LEVELS OF SERVICE AND PERFORMANCE MEASURES

CREATING CUSTOMER VALUE FROM COMMUNITY ASSETS

Richard Kirby, P.E.

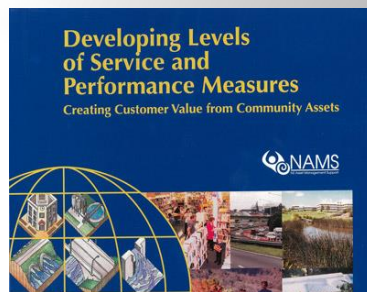
- *Engineering Services Manager, Tasman District Council, N.Z.*
- *A Chartered P.E. and Fellow of Engineers New Zealand*
 - *Executive Management within Local Government*
 - *A Private Practice Consultant*
 - *20 years Plus in Asset Management*
- *Chaired the NAMS Group in New Zealand from 1999 to 2005*
- *Lead the Developed of several AM Guidelines.*
 - *IIMM,*
 - *Developing LoS and Performance Measures Guidelines*

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DEVELOPING LEVELS OF SERVICE AND PERFORMANCE MEASURES

RICHARD KIRBY



- *Developing the New Zealand Guidelines*
- *Overview of the Guidelines*
- *Creating Customer Value from Community Services*

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PURPOSE

- Outline development of NAMS Levels of Service Guidelines
- Provide overview of the infrastructure assets covered



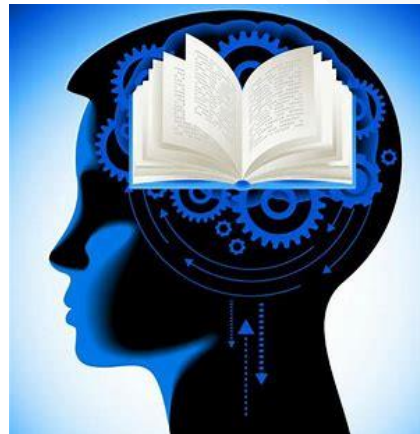
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LEARNING OBJECTIVES

- A knowledge of how New Zealand developed its Guidelines
- Delivering infrastructure services needs to be customer centric



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GUIDELINE DEVELOPMENT

Why the Guidelines

- Statutory Requirement to develop 10 year Long-term Plans
- Consult with communities over service level provision
- Asset/Activity Management Plans critical in supporting LTPs



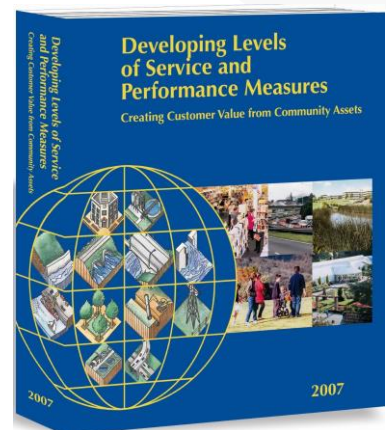
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GUIDELINE DEVELOPMENT

- Who and when Developed the Guidelines
- National Asset Management Steering group
 - IPWEA NZ (Institute Public Works Engineering Australasia NZ)
 - Office of the Auditor General
 - Local Government New Zealand
 - Society of Local Government Managers
 - Water New Zealand
 - New Zealand Recreation Association
- When
 - First version in 2002
 - Revised 2007



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GUIDELINE DEVELOPMENT

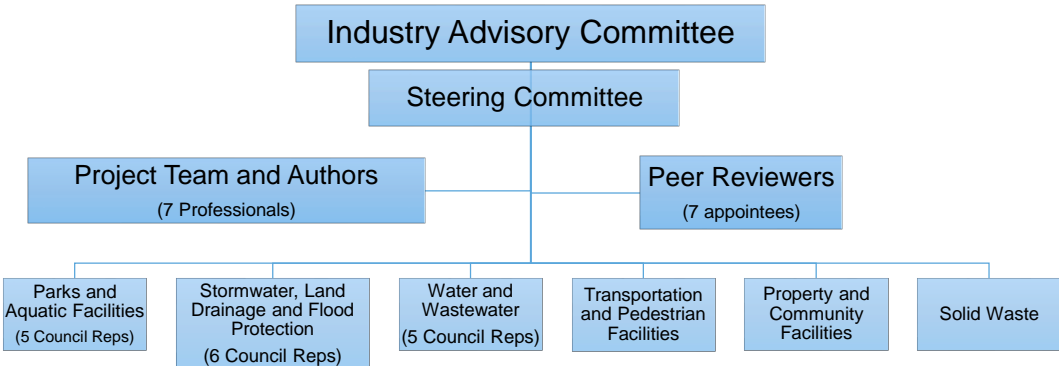
Infrastructure Services covered:

- Storm water and Land Drainage
- Water and Wastewater
- Transportation and Pedestrian Facilities
- Property and Community Facilities
- Solid Waste
- Parks and Aquatic Facilities



GUIDELINE DEVELOPMENT

Governance & Management Structure



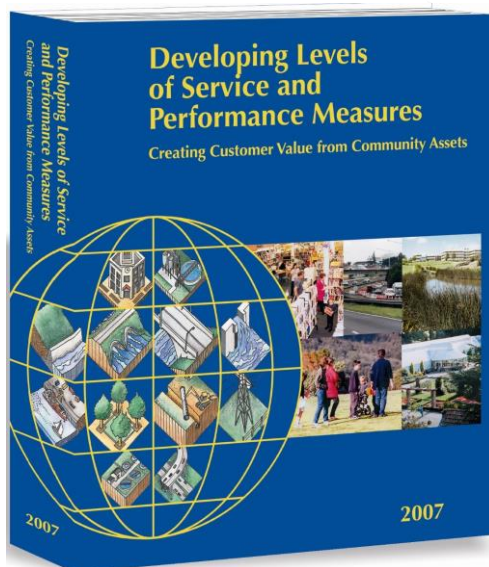
Working Parties – 36 Industry Representatives



OVERVIEW OF GUIDELINES

Levels of Service - Definition

“The defined characteristics for a particular activity or service area against which performance may be measured.”

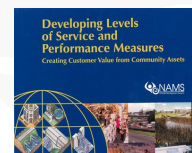


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OVERVIEW OF GUIDELINES



PART A: The Level of Service Review Process

- A1 Introduction
- A2 Getting started
- A3 Understanding your customers
- A4 Document current levels of service and performance measures
- A5 Debate options and decide the right service level
- A6 Consulting with customers
- A7 Deliver the agreed outcome

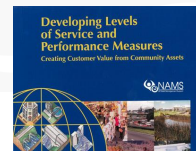
Part A takes the reader through a step-by-step process of developing levels of service with input from customers. It also provides guidance on how to ensure the promised services are delivered.

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OVERVIEW OF GUIDELINES



PART B: Developing Levels of Service Toolbox

B1 Parks and Aquatic Facilities

B2 Stormwater, Land Drainage and Flood Protection

B3 Water and Wastewater

B4 Transportation and Pedestrian Facilities

B5 Property and Community Facilities

B6 Solid Waste

B7 Other Government Services

A toolbox of examples for each activity area including:

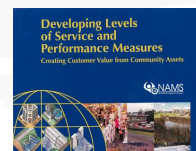
- activity descriptions
- customer groups
- what customers typically value
- technical and legal constraints in setting levels of service (New Zealand local government context)
- levels of service and performance measures
- level of service options and costs.

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OVERVIEW OF GUIDELINES



PART C: Consultation Toolbox

C1 Focus group discussion topics

C2 Willingness to pay surveys

C3 Customer satisfaction surveys

C4 Customer charters

A toolbox of examples such as scripts for the facilitator of focus group discussions, customer satisfaction surveys, willingness to pay surveys, customer charters and service level agreements.

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CREATING CUSTOMER VALUE

- Adopting a customer centric mind-set
- Service Level Review – Customers always there
- Performance Management – core business and drives improvement
- Performance Targets – achievement and measuring success
- Customer input is essential, but recognise who the final decision makers and the service providers are



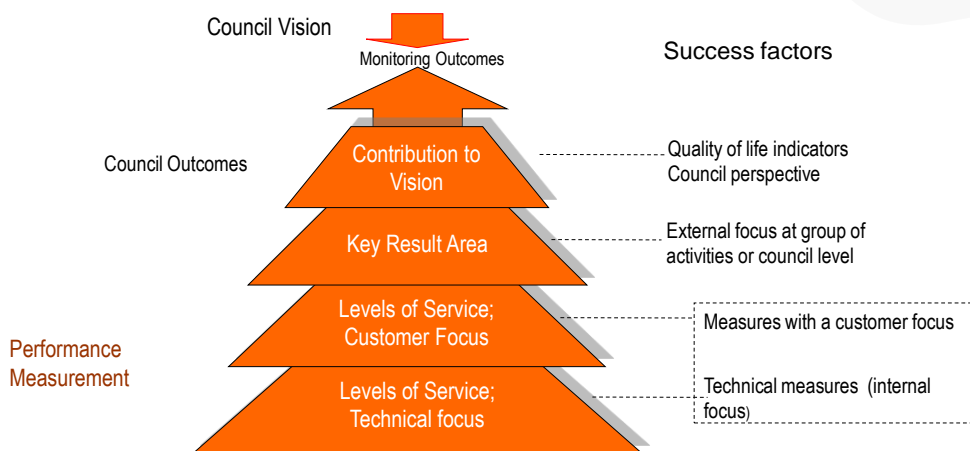
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LINKING COUNCIL VISION AND LEVELS OF SERVICE

Levels of Service
Hierarchy



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CUSTOMER VS. TECHNICAL FOCUS

- **Customer Measure** = 'what the customer gets'
 - How the customer receives the service
 - e.g. "number of complaints of insufficient water pressure to undertake normal household tasks"
- **Technical Measure** = 'what we do'
 - Things about our service that we measure
 - e.g. " average pressure in kPa at the property boundary in residential streets"

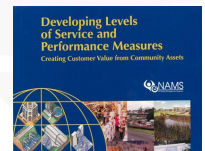
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CUSTOMER VALUES

- Accessibility
- Affordability
- Community Involvement
- Health and Safety
- **Quality**
- **Reliability/Responsiveness**
- Sustainability



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LEVELS OF SERVICE AND PERFORMANCE MEASURES

Customer value	Level of Service	Customer Performance Measure	Technical Performance Measure
Quality	<i>Pleasant tasting and looking drinking water is provided.</i>	(x) % of customers are satisfied with the quality of their drinking water. Fewer than (x) complaints per annum regarding water supply quality.	Drinking Water Standards (as above)
	<i>Water pressure is appropriate to its intended use.</i>	Water pressure at all customer properties is sufficient to fill a (x) litre bucket in (y) seconds (urban supply). Water pressure at all customer properties is sufficient to fill a (x) cu.m tank in (y) days (rural supply). (x) % of customers are satisfied with the pressure of their drinking water. Fewer than (x) complaints per annum regarding water supply pressure.	Minimum available flow at point of supply during normal operations (excluding routine shutdowns and loss of power). <ul style="list-style-type: none"> On demand supply (ordinary) - (x) litres /min Restricted flow supply - (x) m3 / day Rural water supplies: >(x) m3 / day Minimum pressure at point of supply during normal operations <ul style="list-style-type: none"> On demand supply - >(x) kpa Restricted flow supply - >(x) kpa
Reliability/ Responsiveness	<i>A reliable water supply is provided.</i>	(x) % customers satisfied with the reliability of their water supply services. A 24x7 service is available for reporting problems. All affected customers receive at least 24 hours notice of any planned shutdown. Fewer than (x) water supply disruptions per 1000 properties	Operative risk management in place and planned mitigation measures completed. Normal duration of one service disruption - (x) hours (95% success). Percentage of time service is available to any property: <ul style="list-style-type: none"> On demand supply ->(x) % (y hours loss/ year) Restricted supply - >(x) % Less than (x) water mains breaks per 100km of water network.

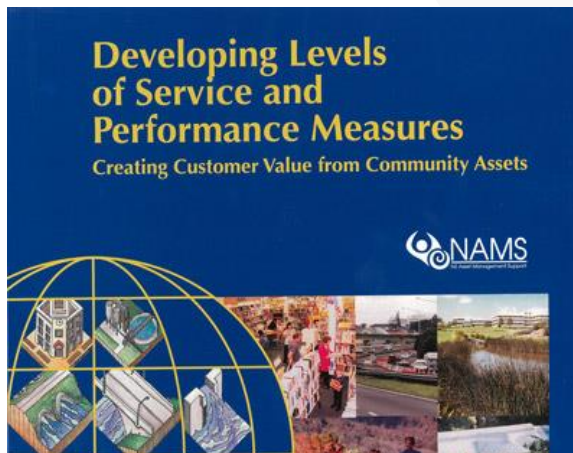
Figure B3.7: Levels of service and performance measures for water supply (cont.)

continued overpage



SUMMARY

- Developing the New Zealand Guidelines
- Overview of the Guidelines
- Creating Customer Value from Community Assets





LoS: A WIDER PERSPECTIVE

Haydn Reynolds, P.E.

- **Principal, Haydn Reynolds & Associates**
- *40 years plus of Water Utilities Experience*
- *AM Focus Since the 1980s.*
 - *Asset Management Planning*
 - *Comparative Performance Assessments*
- *Consulted Internationally for Past 20 Years, working in Australia, North America, England & Scandinavia*

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WIDER PERSPECTIVE



- *LoS in South Australia's Water Regulations*
- *LoS as an Element of Asset Management*
- *LoS & Performance Metrics*

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**LoS
DOWN UNDER**

The Place of LoS in
Australia



The South Australian Water Corporation Example

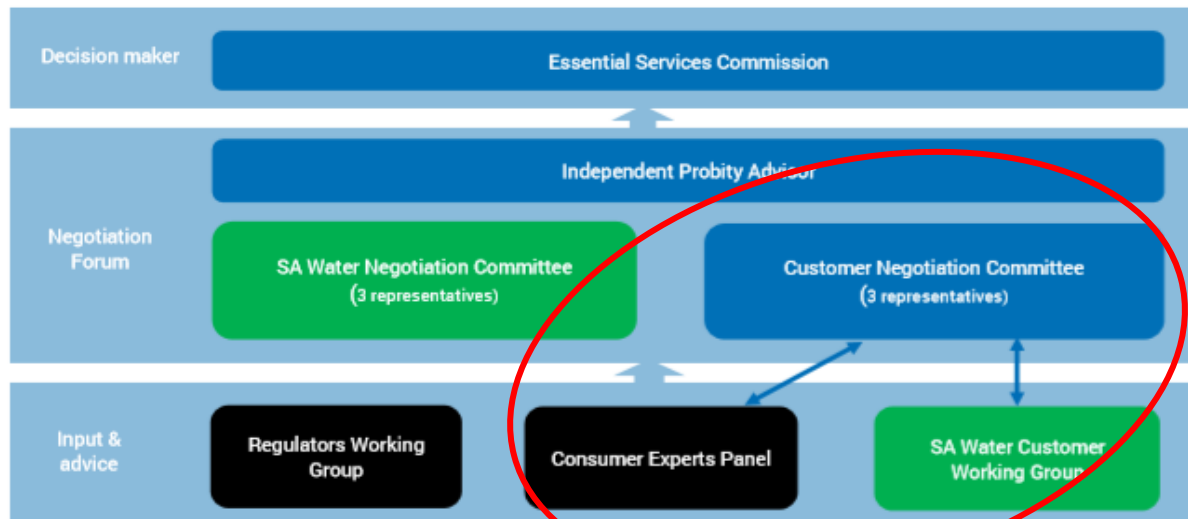


THE LAND OF OZ CONTEXT

- Major water utilities operate under a ‘Corporatized’ model.
- They are owned by Governments.
- Have Boards
- Are subject to Health, Environmental, Technical and Economic Regulation.
- The Economic Regulators set the revenues for the Utility on a 4 years cycle (a Determination), based on a balance between customer preferences and Utility aspirations.
- Utilities can seek to vary a Determination during the 4 years for exceptional circumstances, such as:
 - Significant reductions in expected consumption;
 - Higher than expected reliance of Desalination;
 - Technical innovation opportunities (Carbon Neutrality).



4-YEAR DETERMINATION GOVERNANCE – STRONG CUSTOMER/LOS INVOLVEMENT



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MONITORING & CONTINUOUS IMPROVEMENT



- The Regulator monitors trends in service performance annually and holds the Utility to account for service delivery outcomes.
- 18 LoS are the main focus; general format = *%age of actions completed within a specified time*. (E.g. connections installed, phone calls answered, outages resolved).
- 66 other metrics tracked:
 - Sub-sets based on severity, risk, location.
 - System indicators, such as Breaks/Mile/Year.
- The Utility engages (surveys & workshops) with customers to Identify preferred services, LoS, willingness to pay ('choice' surveys) and check alignment of the Corporation's vision.

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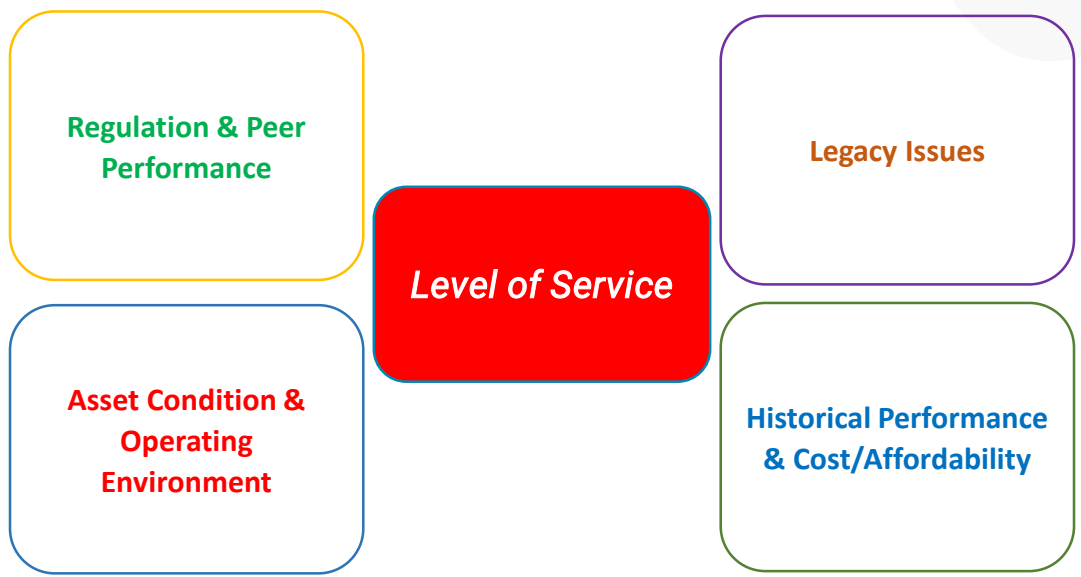
LoS IN ASSET MANAGEMENT



- LoS are central to Asset Management
- Agreed LoS are the 'contracts' with the Customers; achieving them is the reason for everything that is done and they form the basis for all Stakeholder relationships.
- Consequently, LoS are the 'line-of-sight' targets for asset management
 - strategies,
 - tactics, and
 - activities.
- However, longer-term derivation of LoS should be in the context of factors that impact on LoS.



KEY FACTOR GROUPS IMPACTING LoS



BEWARE...

... OF PREVIOUS & COMPARATIVE PERFORMANCE

- Significant quantities of water Industry assets are coming into their twilight years - Past LoS may be tough to maintain.
- When comparing with others, ensure comparison of Apples with Apples.
- Watch out for ‘Cherry Picking’!!



COMPARE WITH CARE!

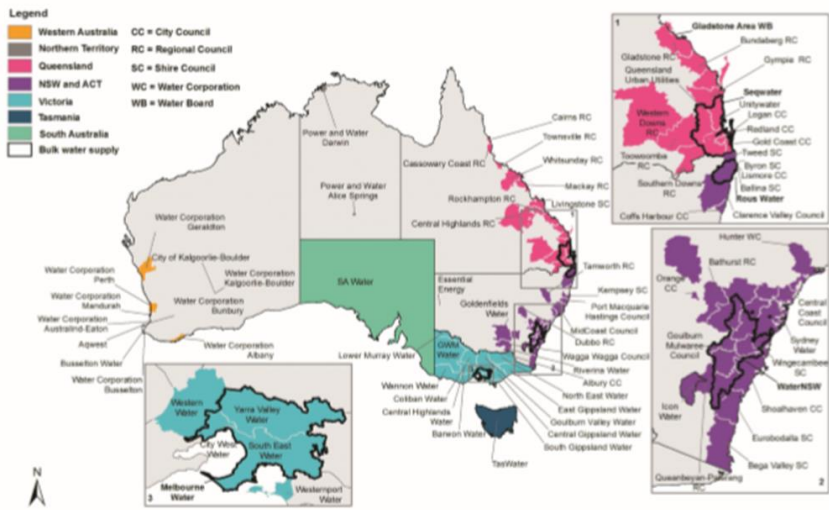


- Only look to compare like-for-like applications
- Normalization is required around:
 - The assets generating the faults; make, type, operating environment, EUL, ...
 - Rate of change of system size, customer density, ability/willingness to pay.
- Some metrics OK for time-based comparison for the Utility, but more problematic for inter-utility comparison: E.g.
 - Number *breaks* / Km (Mile) / Year,
 - Number *complaints* / 1,000 properties (etc.)

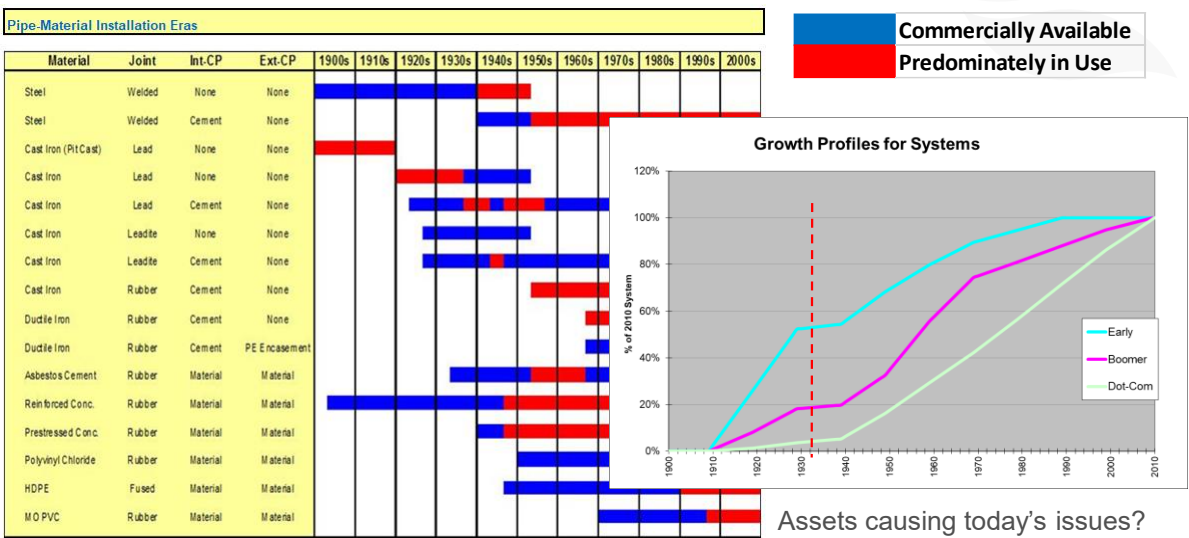


PICK ON SOMEONE YOUR OWN SIZE!

The administrative boundaries of all utilities reporting data for the 2017 Urban NPR are shown in Figure 1.1. Further details about the utilities are available from their respective websites.

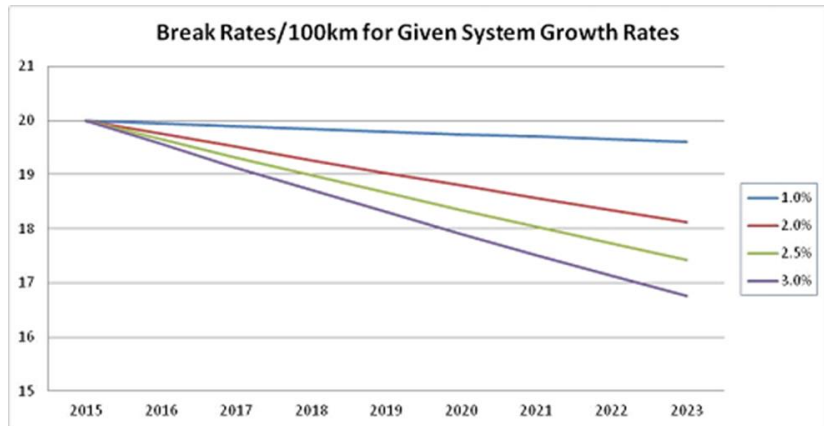


'EARLY' VS. 'BOOMER' VS. 'DOT-COM' SYSTEMS



RECOGNISE 'LOCAL' ADVANTAGE/DISADVANTAGE

- Utility-X is growing at around 1% per annum.
- Utility-Z growth is between 2% and 2.5%.
- Utility-Z has an on-going advantage from growth alone.



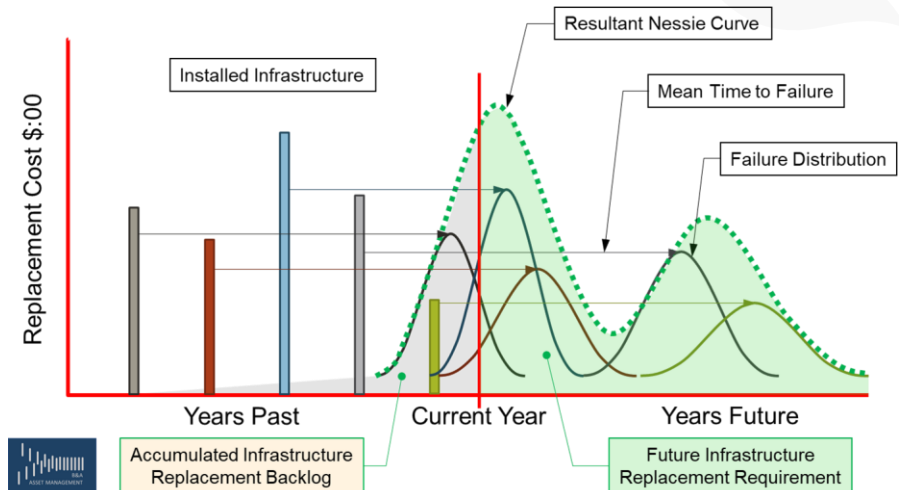
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THINKING THROUGH LOS #1

- Project this Investment Using EUL.
- Consider the LoS Impacts During the Planning Period.



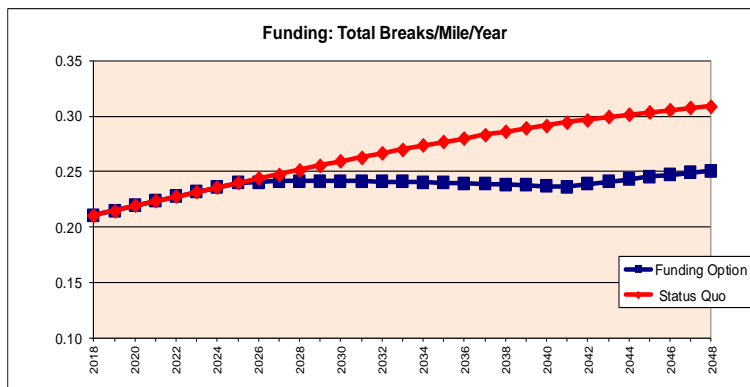
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THINKING THROUGH AN LoS #2

- If mains are replaced for an LoS of 2 breaks in 3 years, directly affected customers will experience no change but overall breaks increase.
- To cap Breaks/Mile/Year at 0.25/Mile/Year, mains must be replaced earlier & earlier for an extra \$280 Million for the period.
- If community wants this outcome (e.g. traffic flow impacts) and can pay for it – great, but needs to be informed of costs and/or other options foregone.



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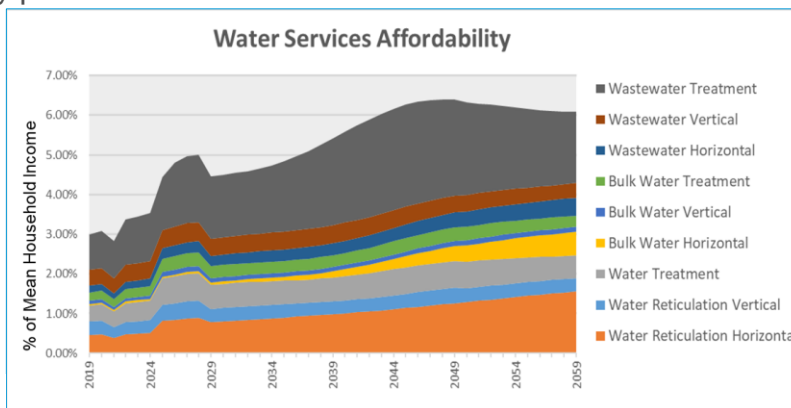


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AFFORDABILITY: NOW AND IN THE FUTURE



- The legacy of ‘service in perpetuity’, plus upgrades and growth.
- Reductions in household incomes.
- Competing community priorities.
- Being ‘the best’ isn’t necessarily providing the highest LoS or lowest costs; it is about the efficient provision of the preferred outcomes for an informed community.



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TAKE-AWAY

MAIN POINTS

- Levels of Service will continue to have a growing impact on Asset Management and Regulation.
- LoS are key to Stakeholder relationships.
- The identification of appropriate LoS for the times, is an on-going process of investigation, education and negotiation.
- Always check out the future impact of today's LoS.
- Only compare LoS with true Peers.

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BURGESS & NIPLÉ

Engineers ■ Planners



US CASE STUDY #2 LEVELS OF SERVICE AT COLUMBUS DPU

Kevin Campanella, P.E.

- *Utility Planning and AM Lead, Burgess & Niple*
- *Was 7 years as Assistant Director at Columbus Public Utilities*
 - *Program Manager for their comprehensive AM program*
 - *Secured \$70 million in cost avoidance*
 - *Improved service levels*
- *Incoming Chair of the US AWWA AM Committee.*

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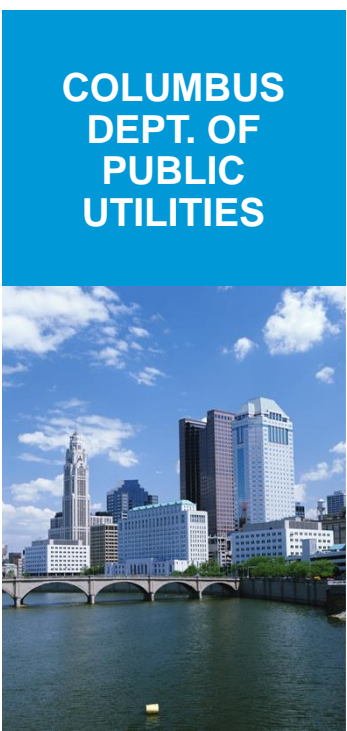
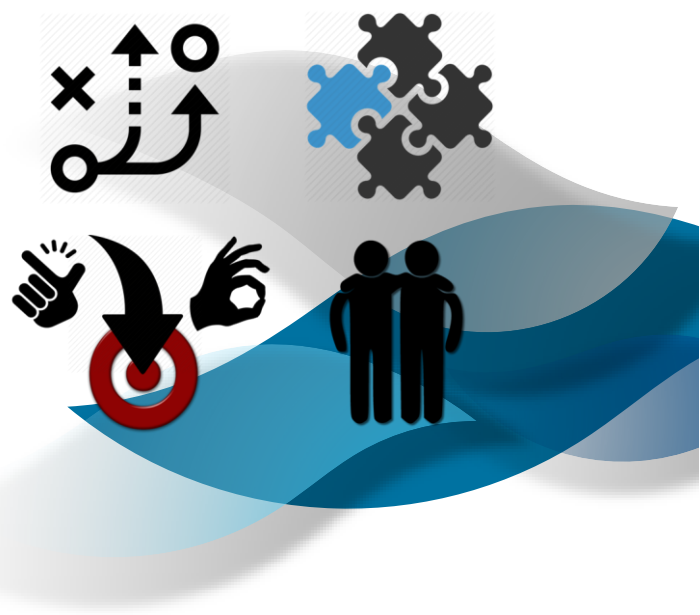
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CASE STUDY #2 COLUMBUS DPU

KEVIN CAMPANELLA

- **TEAMING TO:**
 - Establish Levels of Service
 - Agree Upon Levels of Service
 - Monitor and Measure



3 Divisions: Sewerage and Drainage, Power, Water

1,100,000 Population served (sewer / water)

13,000 Electric customer accounts

2008 Department-wide AM Program formalized

DPU'S LOS INITIATIVE



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Phase 1 (2009)

- Develop comprehensive set of initial LOS across DPU including all business lines
- Develop LOS definition sheets and define detailed metric and data requirements
- Gather data, validate with key stakeholders and gain commitment for implementation

LOS Team 1

Phase 2 and 3 (2010+)

- Continued refinement of the framework and ongoing data collection
- Establishment of specific goals / targets for each LOS
- Internal communication
- Formal reporting to customers and stakeholders
- Link to utility-wide performance management initiative for cascading measures

LOS Team 2

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GETTING STARTED

LOS Team Formation and Chartering Process

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DPU's Levels of Service (LOS) TASK TEAM CHARTER
October 6, 2009

Mission / Objective:
• Drive performance management into the DPU culture.

Team Leader: Kevin Campanella (SM&T)
Facilitator: David Blair (Finance)
Staffer: John Rogers (Finance)

Team Members:

Division	Team Members	Division	Team Members
AM&C	Kevin Campanella	DPU	Talena Arab
DO&D	Jeff Brubaker	DO&D	James Gross
CS&C	David Estep	DO&P	Jeff Hubbard
FISCAL	Melinda Cunningham	REG/COOP	Bob Zahner
DO&P	Gary Katz	DO&D	Tom Russell
DO&P	Jeff Hubbert	DO&P	George Meyers

Steering Team Sponsor(s): Kevin Campanella, James Gross, Jeff Hubbard

Item	Description	Start Date	Scheduled Finish	Actual Finish
6.2.1	Perform Level of Service and Performance Assessment	7/1/09	8/31/09	
6.2.2	Determine Recommendations for Future Enhancements and Develop Process for Customer and Stakeholder Feedback and Acceptance	12/1/09	1/31/10	
6.2.3	Establish Formidable Levels of Service Measurements for each of DPU's core services. Determine if measures will be universal or if there will be different measures and/or targets for different customer classes (e.g. critical, large users, etc.)	9/1/09	10/31/09	
6.2.4	Align Levels of Service with the current DPU Strategic Plan	9/1/09	10/31/09	
6.2.5	Develop Specific, Measurable, Achievable, Relevant and Time-bound (SMART) Service Level targets for review and approval by senior staff responsible for targets & performance.	9/1/09	10/31/09	
6.2.6	Make recommendations for linking Key Performance Indicators (KPIs) to service level measures.	11/1/09	1/31/10	
6.2.7	Recommend a framework for LOS data collection, analysis, and strategic adjustment, including periodic review and adjustment of targets.	11/1/09	1/31/10	
6.2.8	Identify ownership and responsibility for each Service Level target.	11/1/09	1/31/10	
6.2.9	Develop an approach for reporting and monitoring of service levels to ensure that they can be effectively communicated within DPU.	11/1/09	1/31/10	
6.2.10	Define an approach on how to engage customers regarding Levels of Service.	11/1/09	1/31/10	
6.2.11	Communicate and evaluate the SMART Service Levels and targets to assure they are meeting customer's expectations.	11/1/09	1/31/10	

Expected Benefits:

- More customer service-focused organization.
- All DPU employees have a better understanding of performance measures, day-to-day staff work and the linkage with overall strategy and goals.
- Improved customer relations.
- Continuity between Division performance measures, Levels of Service, and the DPU Strategic Plan to assure we are meeting customer expectations.
- Elimination of any unnecessary performance measures and tracking.
- Improved ability to implement the actions that will support the goals of the strategic plan.
- Refine and build upon existing measures.
- More consistency and objectivity in decision-making process for setting capital improvement priorities.

Charter Date: October 6, 2009

Endorsements:

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LOS CATEGORIES

Metrics for Every Major Business Line

Water Distribution	
Water and Wastewater Treatment, Supply, and Quality	
Wastewater Collection	
Electric Distribution	Streetlighting
Billing and Meter Reading	Customer Service
Human Resources	Financial
Sustainability / Environmental Stewardship	

CANDIDATE LOS MEASURES CAME FROM SEVERAL SOURCES

<i>AWWA QualServe IWA Other Standards</i>	<i>Emerging Global Best Practice Including Sustainability / TBL / GRI</i>	<i>Other Best Practice Utilities in US, UK, AUS</i>
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Considered:

- Alignment with industry standards
- Relevance to business model and customers
- Alignment with current and future strategic plan
- Ability to measure
- Keep it simple

CANDIDATE METRICS WITHIN LOS CATEGORIES

	Category / Measure	Description / Comments	Currently Tracked?
29	Total Sewer Blockages (Total Blockages Per 1,000 miles of sewer line. Identified by type such as grease, roots, other, unknown)	Good measure of overall reliability of collection system, specifically O&M practices including inspection and sewer cleaning. Blockages limit flow and typically lead to events including overflows and backups. Trends are especially important. <i>AWWA QualServe Measure (collection system integrity – failures per 100 miles).</i>	
30	Total Sewer Collapses (Total Collapses Per 1,000 miles of sewer line)	Good measure of overall reliability of collection system, specifically capital programs to address sewers in poor condition and susceptible to collapse. Collapses typically lead to events including overflows and backups. Trends are especially important. Could be combined with blockages above to create one consolidated measure. <i>AWWA QualServe Measure (collection system integrity – failures per 100 miles).</i>	
31	Sewer Overflows - SSOs / CSOs (SSOs / CSOs per 1,000 miles of sewer line)	Good measure of overall reliability and capacity and environmental impact. Can track dry and wet weather overflows separately and include in one stacked bar chart. <i>AWWA QualServe Measure (sewer overflow rate per 100 miles).</i>	Y
32	Sewer Overflow Volume Released - SSOs / CSOs (SSOs / CSOs total volume released)	Good measure of overall reliability and capacity and environmental impact. Alternative measure to total incidents, but can be more difficult to track. Can track dry and wet weather overflows separately and include in one stacked bar chart.	
33	Total Property Flooding Incidents (Basement, Yard, and Other Property Backups)	Good customer focused measure of overall capacity and reliability of the collection system. Can be caused by many factors, and can often impact specific portions of the system more than others. Can track repeat incidents for individual customers over x years to assess whether specific customers are worse served than others. Can segment between city responsibility and non-city responsibility. Can track by cause (blockage, surcharge, etc.)	Y (WIB)

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LOS METRICS SELECTION

- *Develop consensus on the highest priority service levels to support the asset management program.*
- *Rank service levels in terms of importance for EACH area*
- *Place one vote of each priority for each of the categories*

*“High Priority” measures
(Red – 5 points)*



*“Medium priority” measures
(Yellow - 3 points)*



*“Low priority” measures
(Green -1 point)*



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SELECTED 2 TO 4 METRICS PER LOS CATEGORY



EXAMPLE LOS METRICS

- Customer Service
- Water Distribution

**Customer Service
Billing and Meter Reading**

- **LOS 1 Average Speed of Answer / Wait Time** (Average Minutes of Hold / Wait Time From Connection Until a Call is Answered by Call Center Representative)
- **LOS 2 Percent First Call Resolution Rate** (Total Calls That Are Resolved On First Contact / Total Calls Received)
- **LOS 3 Customer Complaints** (Customer Service Related Complaints and Technical Quality Complaints Per 1,000 Accounts)
- **LOS 4 Billing Accuracy** (Error Driven Billing Adjustments Per 10,000 Bills)

Water Distribution

- **LOS 5 Total Water Quality Complaints** (Rusty Water, Taste / Odor, On-Site Visit, Cloudy Water, Other)
- **LOS 6 Inadequate Water Pressure Events** (Percent of Connected Customers Not Meeting Requirements)
- **LOS 7 Water Distribution System Integrity** (Total Water Main Breaks and Leaks Per 100 Miles per year)



EACH LOS HAS A DETAILED DEFINITION SHEET

- Owner / Sponsor
- Purpose
- Description
- Mathematical Expression / Measurement
- Definition
- Data Requirements
- Reporting Period / Format
- Historic DPU 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 systemwide 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, finances, 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 show a consistent metric as systems expand and replace other utilities. This metric reports the frequency of occurrence but does not measure the impact of events (i.e. duration or customer affected). A table and worksheet for frequency is available, assuming that reasonable levels of service based on cost / benefit analysis have been evaluated, considering system characteristics such as urban / rural, service area, geographic, pressure, pipes, relative age of infrastructure and size of system and customers. 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:
Frequency Rate = $\frac{\text{Total number of breaks} + \text{Total number of leaks}}{\text{Total miles of distribution mains}} \times 100$

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:

Historic DPU Performance

Available data on historic performance is indicated in the table below. This data has been validated to ensure a reasonable level of confidence and accuracy.

2005	2006	2007	2008	2009
18.0	15.0	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 22.4 and national top quartile performance is 14.5. Large system median is 26.8 and national median is 20.8.

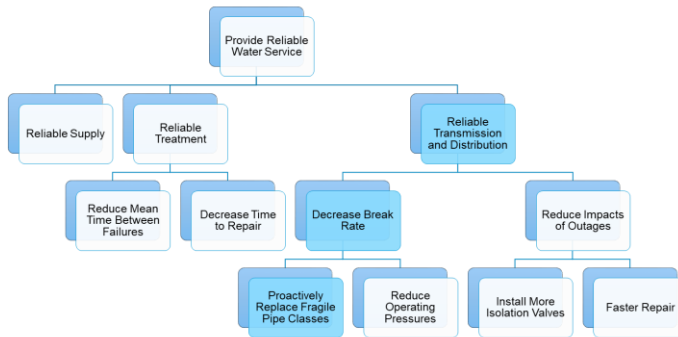
Performance Measure Target:
Current DPU Target is at or below 30-annual average

(This water industry) can to the metric... which is... and, which... of...
... and...
... as a...
... average

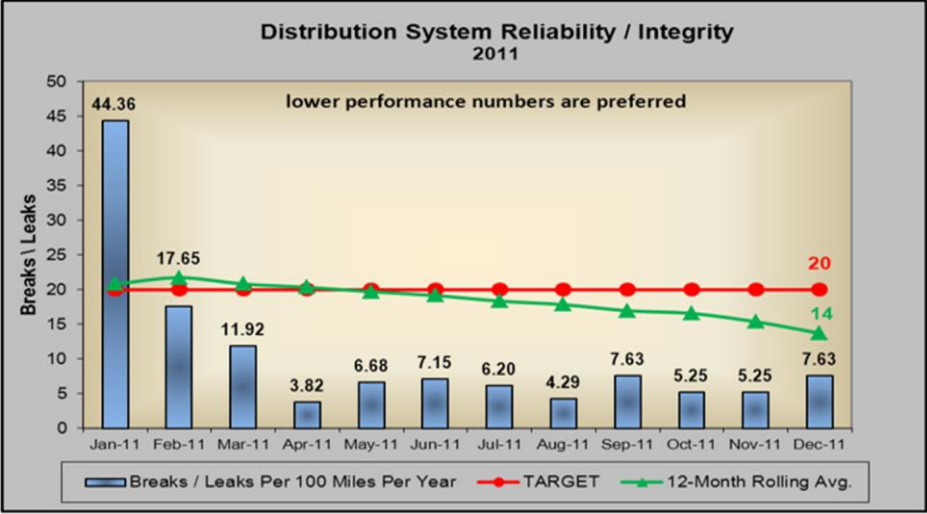


STRATEGIC PLAN ALIGNMENT AND LOS/KPI CONNECTION

Strategic Plan Elements		LOS Category and Measures
C.1.1	Improve safety (Lost work hours)	Water Treatment <ul style="list-style-type: none"> • LOS 9 Drinking Water Outage Rate
A.2.10	Improve reliability of service	Rate
Sample Performance Measures		
Treatment Maintenance <ul style="list-style-type: none"> • Ratio of PM/CM work orders • Work order completion ratio • Average backlog (days) for PM repair work orders • Work orders completed within +/- 20% of standard labor hour estimate 		



TARGET SETTING



CITY OF COLUMBUS
2020 BUDGET
★
US

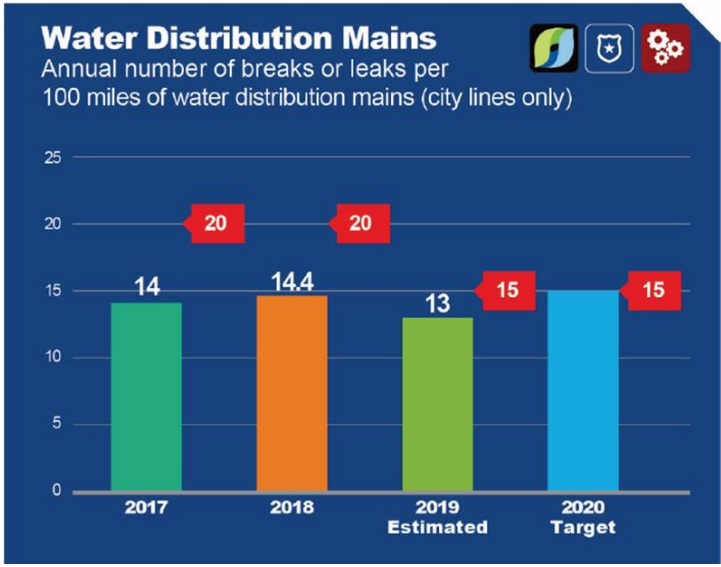
THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

REPORTING





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BENEFITS AND CHALLENGES

Benefits

- Alignment between strategic plan, asset management, and customers
- Better understanding of customer and stakeholder needs
- Improved accountability and awareness for staff
- Enhanced decision making framework
- Alignment of capital and O&M investments with customer and service impacts

Risks / Challenges

- Risk of front line staff viewing it as "big brother" monitoring and punishment
- Management fear or concern for exposing "weaknesses" and setting numeric targets
- Reluctance to assign resources for data collection and validation – "just another thing to do"
- Not yet sure how external stakeholders will react, and what the impact will be

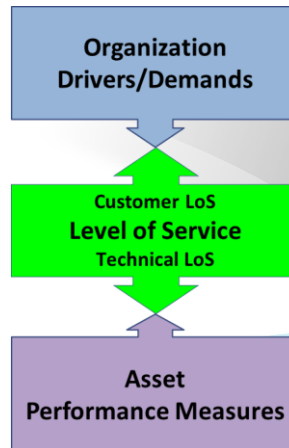
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LEVEL OF SERVICE ... PANEL Q&A

CARRIER COX
HAYDN REYNOLDS
RICHARD KIRBY
KEVIN CAMPANELLA



American Water Works
Association
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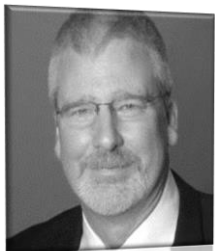
ASSET MANAGEMENT STEERING COMMITTEE
Level of Service Work Group

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June 5 - FREE Webinar: Workforce and COVID-19: Utility Solutions

June 9 - FREE Webinar from GE Digital: It's More Than Grayscale: Busting Myths About High Performance Human-Machine Interface (HMI)

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- Until next time, keep the water safe and secure.

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PRESENTER BIOGRAPHY INFORMATION

Specializing in study and design work associated with utility planning, hydraulic modeling and system control, she holds numerous leadership positions in state and national organizations. Carrie is vice chair of the American Water Works Association's (AWWA) Engineering and Construction Division, and co-chair of the Michigan Water Environment Association's Industrial Recruitment Committee. She also is vice chair of the Michigan AWWA Membership Council. Carrie joined Oakland County in 2013, currently, she is a Chief Engineer overseeing capital asset management and planning, mapping services including geographic information systems (GIS) and sewer system metering for all sewer systems owned and/or operated by Oakland County.

Involved in the water industry since 1975, with an asset management focus since the early 1980s. Worked in a Water & Wastewater Utility until 2000 at up to Executive level. Past nearly 20 years spent working Internationally as a consultant on asset management planning, with an emphasis on buried assets, at both the Utility and National level.

Richard Kirby is a chartered P.E. and Fellow of Engineers New Zealand. His career includes: executive management within local government, a private practice consultant, and 20 years plus in asset management. He has chaired the NAMS Group in New Zealand from 1999 to 2005 and has lead the development of several AM guidelines: IIMM, developing LoS and Performance Measures Guidelines.

Kevin provides Asset Management and Utility Planning support to help utilities across the US lower their costs, improve service to customers, and manage risks. In 2002, he practiced in New Zealand with internationally recognized authorities in the asset management field. He was the Assistant Director and Comprehensive Asset Management Program Director at Columbus Public Utilities for 7 years before joining Burgess & Niple in 2015 as their Utility Planning Leader.

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