



Water Loss Control in Los Angeles



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Presentation Agenda

1. Water Loss Control Program Background
2. Improving Data Validity and Targeting Apparent Losses
3. Targeting Real Losses
4. Data Trends & Program Conclusions



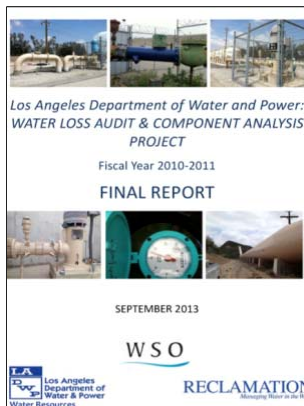
Program History



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Water Loss Control Program History



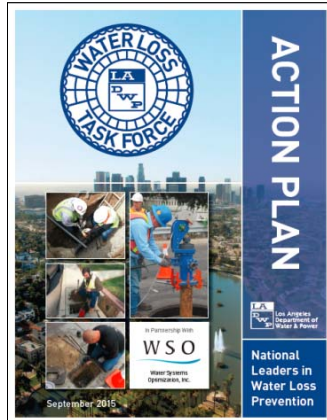
- 2010-2011 Water Loss Audit and Component Analysis
- State regulatory requirements



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Water Loss Task Force Action Plan



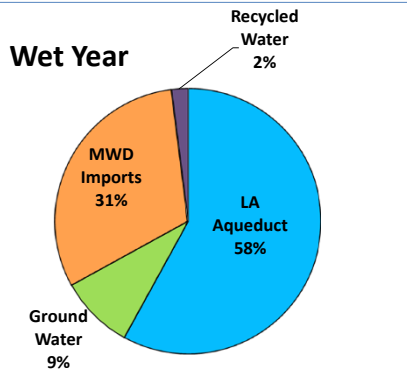
1. System Input Volume
2. Database Management
3. Meter Testing and Replacement
4. Leak Detection and Prevention
5. Unmetered and Unauthorized Consumption

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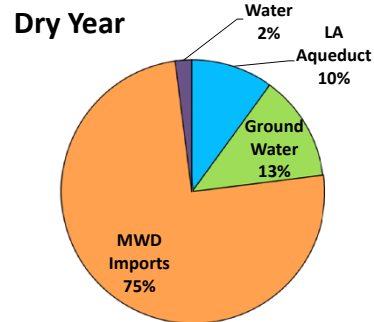
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Sources of Supply



Local Groundwater, Stormwater, Conservation & Recycling

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Data Validity and Apparent Losses

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Supply Meter Preventative Maintenance

67 LADWP supply metering devices, including:

- Flow Meters and Totalizers
- Pressure Transducers, Cells, and Floats

35 flow meters at MWD connections

Meter Types:

Venturi

Magnetic

Ultrasonic

Propeller



- Develop Preventative Maintenance Program for Annual Calibration & Maintenance



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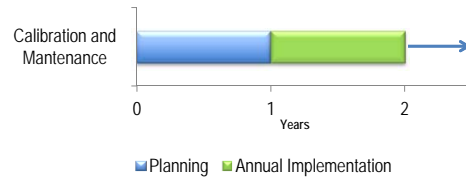
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Preventative Maintenance Program Cost

Maintenance and Calibration Program	Costs
One Time Costs	\$280,000
Ongoing Costs	\$233,000
Total Program Costs	\$513,000



Preventative Maintenance Program



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**Improves DVG:
5 → 6**

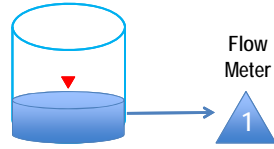
How does this benefit the city of Los Angeles?



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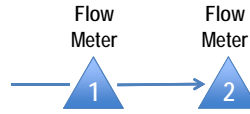
Supply Meter Accuracy Testing



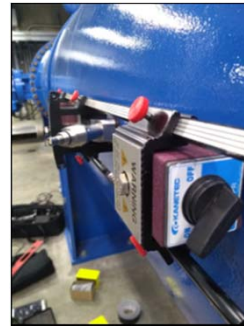
Tank Drop Test



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In-Place Comparative Test



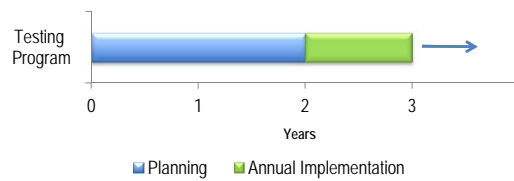
Meter Accuracy Testing Program Costs



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Testing Program	Costs
One Time Costs	\$ 218,000
Ongoing Costs	\$273,000
Total Program Costs	\$491,000

Source Meter Testing Program





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Improves DVG:
6 → 7




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Customer Meter Accuracy Improvements

- ◆ Bench testing 1,000+ small meters annually
- ◆ Goal to replace 30,000 small meters annually

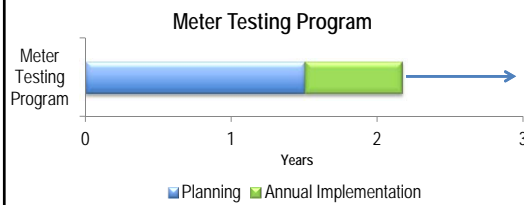


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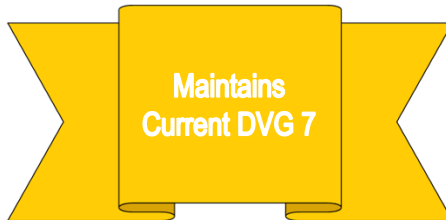
Customer Meter Testing Program Costs

Meter Testing Program	Costs
One Time Costs	\$146,000
Ongoing Costs	\$513,000
Total Program Costs	\$ 659,000



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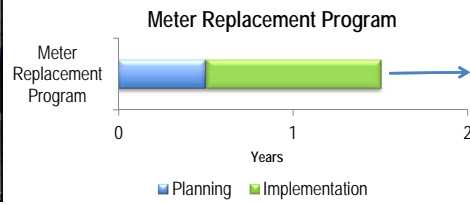
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Customer Meter Replacement Costs



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Small Meter Replacement Program	Costs
One Time Costs	\$34,000
Ongoing Costs	\$6,362,000
Total Program Costs	\$6,396,000



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Reduces Apparent Losses

Potential Revenue Savings: \$1 M



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How does this benefit the city of Los Angeles?



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Cost Summary

Implemented Actions	One Time Costs	Ongoing Costs	Benefits
Meter Calibration	\$280,000	\$233,000	Improves DVG
Supply Meter Accuracy Testing	\$218,000	\$273,000	Improves DVG
Customer Meter Testing	\$146,000	\$513,000	Maintains DVG
Customer Meter Replacement	\$34,000	\$6,396,000	Apparent Losses
Total Costs	\$678,000	\$7,415,000	



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Real Losses

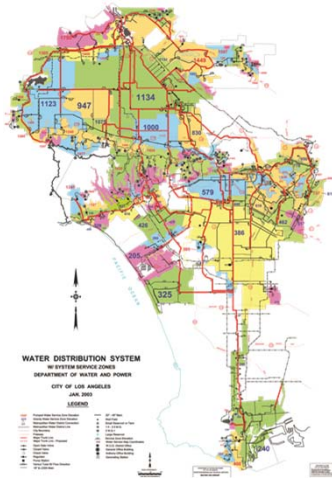
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LADWP's Water Distribution System



- ◆ 473 square miles
- ◆ 7,327 miles of mains
- ◆ 737,583 services
- ◆ 111 Pressure Zones
- ◆ 60,804 Hydrants
- ◆ 1,320 AF of water delivered per day
- ◆ 4 million people served

Real Loss Component Analysis Results

Majority is background leakage:

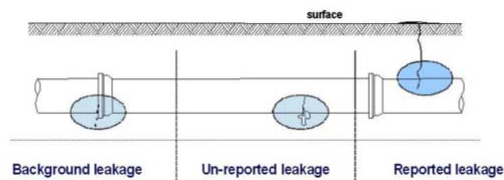
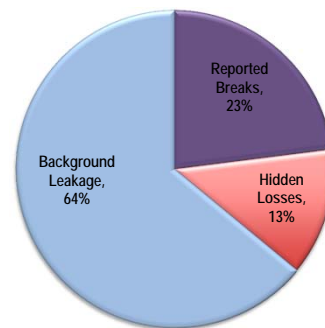
- ◆ Pressure management
- ◆ Infrastructure renewal and rehabilitation

Reported breaks:

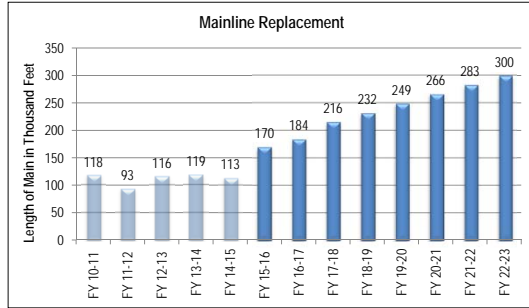
- ◆ Reduce response time

Some potential to reduce hidden losses:

- ◆ Active leak detection



Increased Mainline Replacement



Mainline Replacement Program	Costs
Annual Program Cost	\$260 Million



How does this benefit the city of Los Angeles?

Reduces Real Losses

Water Savings: ?



Pressure Monitoring & Hydraulic Modeling

- ◆ Pilot began in December 2016
- ◆ Evaluating various technologies
- ◆ Targeting 13 leakiest zones

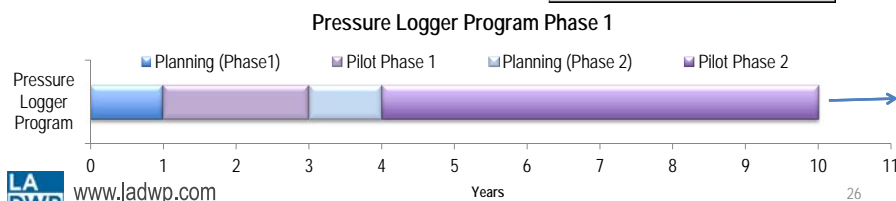


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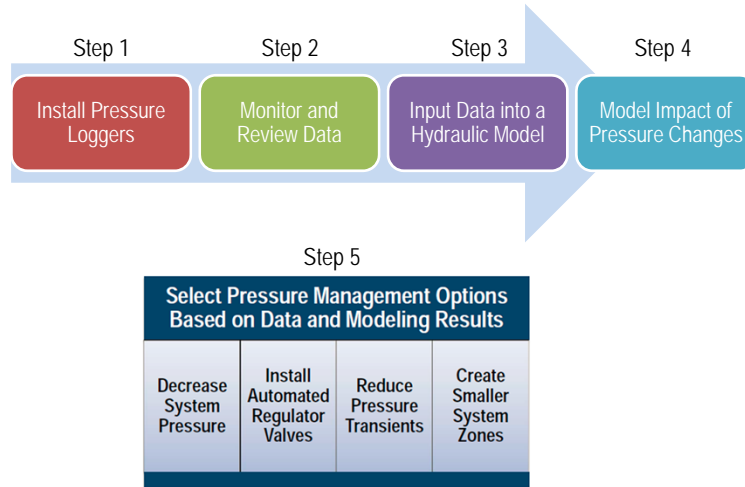
Pressure Monitoring & Modeling Costs

Pressure Monitoring Phase 1	Costs
One Time Costs	\$5,500,000
Ongoing Costs	\$2,100,000
Total Annual Costs	\$7,600,000



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Pressure Management: Phased Approach

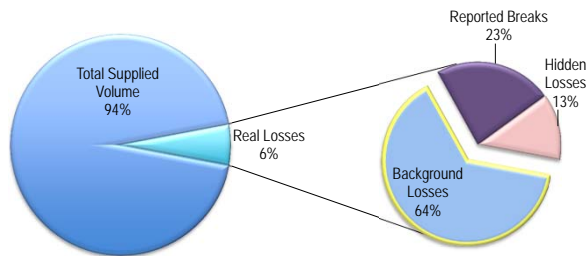


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Water Savings: ?

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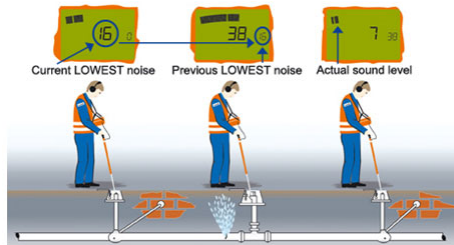
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Leak Detection Pilot Program

Pilot Project Objectives

- Verify Accuracy and Effectiveness
- Evaluate Ease of Use
- Evaluate Large Scale Deployment



Evaluate Multiple Technologies

- Fixed leak detection and monitoring
- Manual leak survey

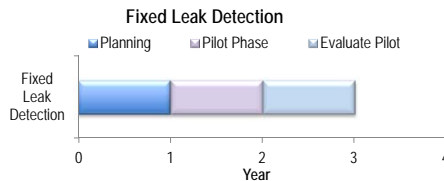


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Leak Detection Pilot Program Cost

Fixed leak detection	Costs
One Time Costs	\$304,000
Ongoing Costs	\$720,000
Total Annual Costs	\$1,024,000

Manual leak survey	Cost
One Time Costs	\$20,000
Ongoing costs	\$175,000
Total Annual Costs	\$195,000



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Leak Detection: An Emerging Technology

Pros

- Identifies leaks
- Easy to operate
- Good user interface

Cons

- Cannot determine the size of the leak
- Too many false positives
- Theft is prevalent
- Installation can be difficult

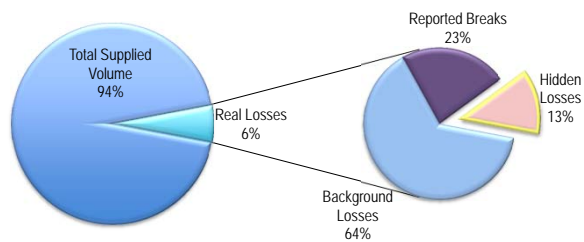


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Water Savings: ?

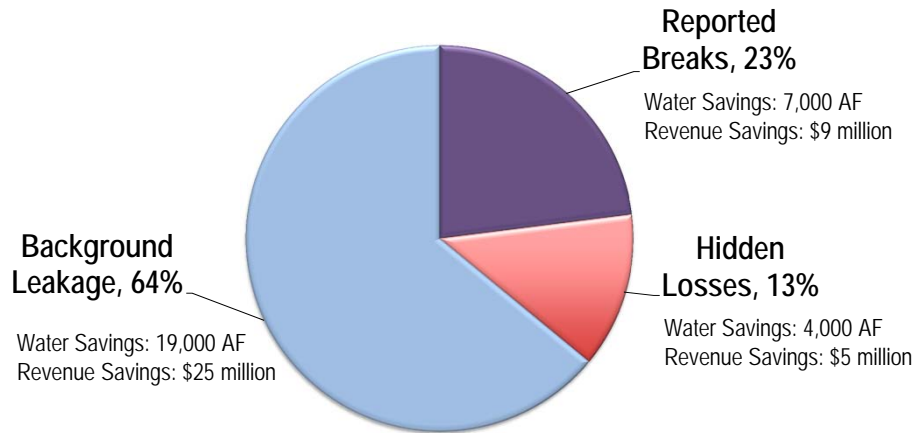
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Maximum Theoretical Savings



Cost Summary

Implemented Actions	One Time Costs	Ongoing Costs	Benefits
Mainline Replacement	-	\$260,000,000	Real Losses
Pressure Management	\$5,101,000	\$2,109,000	Real Losses/ Background Losses
Leak Detection Phase 1	\$304,000	\$720,000	Real Losses/Hidden Losses
Leak Detection Phase 2	\$20,000	\$175,000	Real Losses/Hidden Losses
Total Costs	\$5,425,000	\$263,000,000	

Data Trends & Program Conclusions

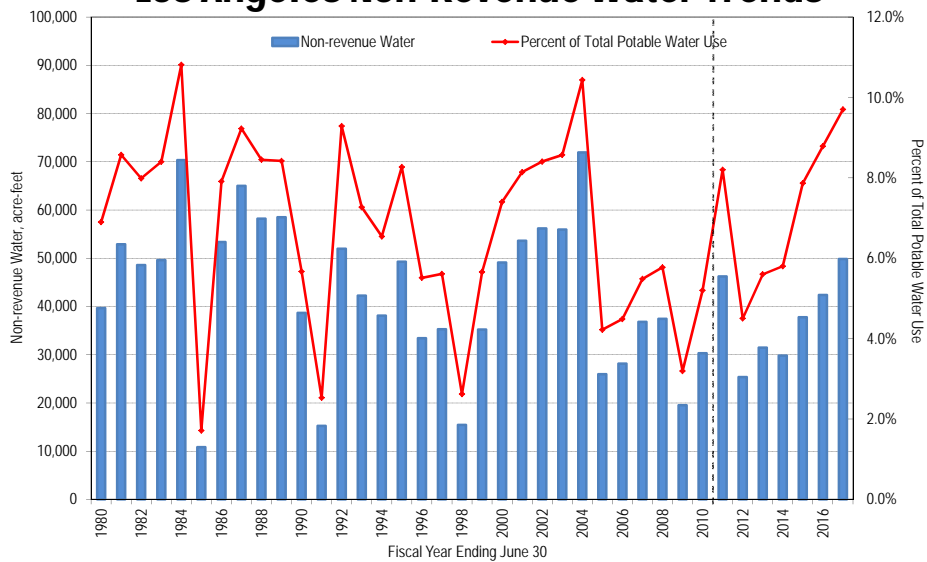
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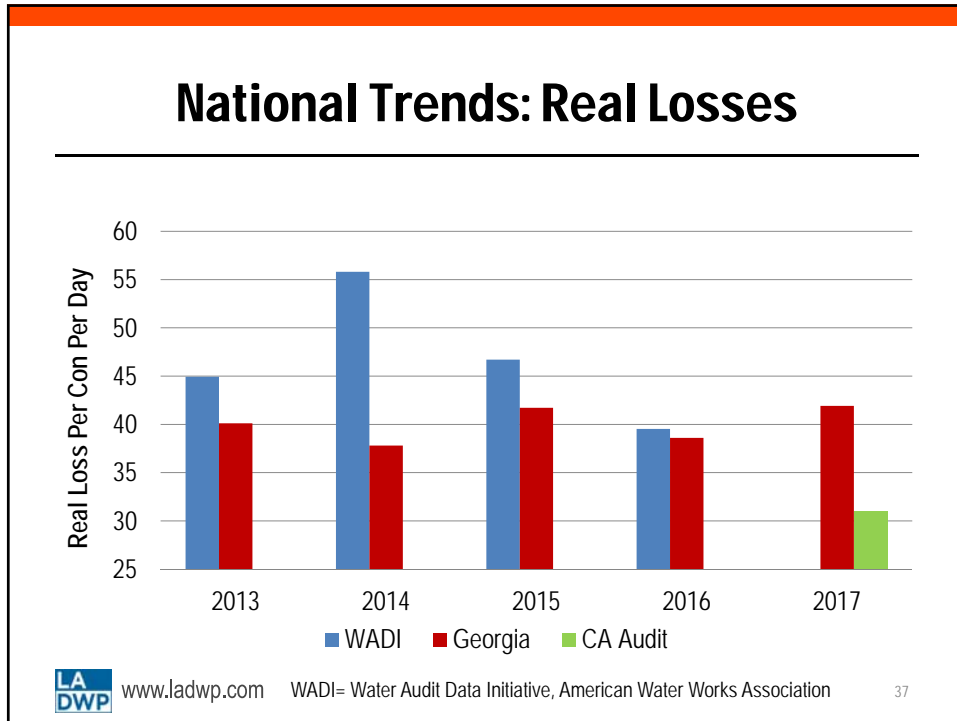
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Los Angeles Non-Revenue Water Trends



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The graphic features a blue and white circular logo for the "WATER LOSS TASK FORCE" with the LA DWP logo in the center. To the right is a vintage-style postcard that says "Greetings from LOS ANGELES CALIFORNIA" with the word "LOS ANGELES" in large, colorful letters. The background is a night-time photograph of the Los Angeles city skyline, including the Los Angeles City Hall.

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