

This presentation premiered at WaterSmart Innovations

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COOLING TOWER SYSTEM UPGRADES

- Save 15,000,000
Gallons of Water per year



City of Phoenix

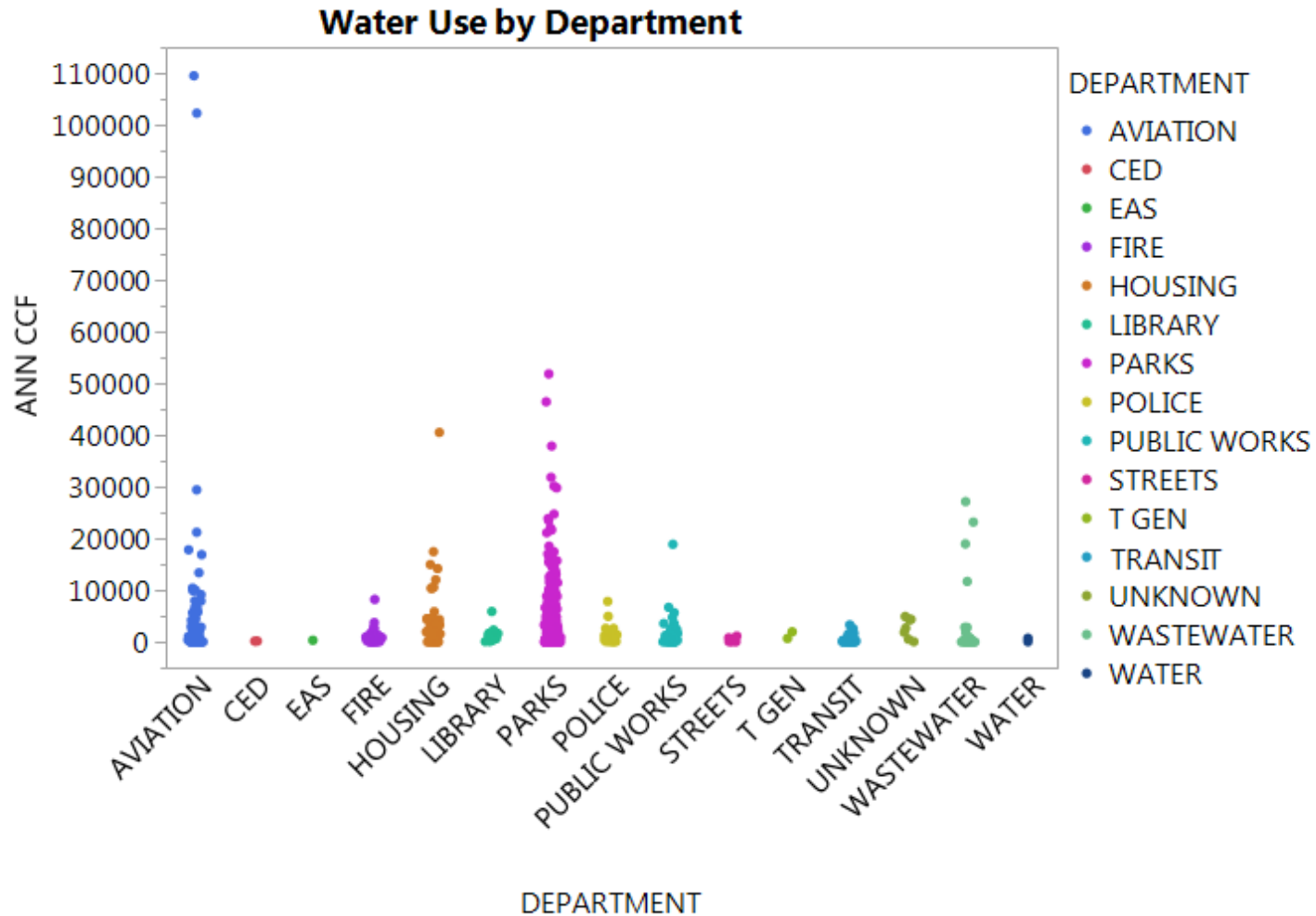
WATER SERVICES DEPARTMENT
Quality Reliability Value

OVERVIEW

- Terminal 4 Cooling Towers
- System Condition Pre-renovation
- Project Proposal
- Costs and Performance
- Operational Review
- Additional Renovations
- Future Applications



- Sky Harbor Airport
- 9,600 tons of cooling (all of Terminal 4)



SYSTEM CONDITIONS PRE-RENOVATION

- Heavy Scale and Corrosion
 - Chemical and physical removal
- 2.5 Cycles of Concentration at peak efficiency
- Conflict: Chemical Company vs Chiller Company
- Storage of Strong Acids (Health and Safety Concerns)

PROPOSED SYSTEM UPGRADES

- Add water softener
 - Swap the calcium (removal) with sodium (ion exchange)
- Add mixed oxidant generator (MIOX)
 - Use salt to generate bleach (predominant) and peroxide (minor)
 - Replaces Biocide







COSTS & RETURN ON INVESTMENT (SIMPLE PAYBACK)

- Initial estimate = \$295,000 (Capital and Labor)
- Actual = \$407,000
- Estimated savings = \$140,000 per year
 - (Water = \$100K, Chemicals = \$40K)
- ROI = 2.9 years

HOW ARE WE DOING?

- 6 months in operation
- Chemistry Monitoring
- Relocation of MIOX Brine Tank
- Achieving 6.5 COC on regular basis
- Water savings may be underestimated
- Future Capital savings not included in ROI
- Reduced O & M costs not included in ROI

SO1	Cond	10813	0
SO2	KU Cond	1670	0
PI1	4940	144.00	ppb
PI2	HACH CL	0.22	ppm
DIC	Bleed	2497	gal

No Alarms

OTHER IMPROVEMENTS





OTHER UPGRADES
SS PIPE INSTALLATION

NO MORE RUST CRABS



CIRCULATION JETS IN BASINS (LAKOS SYSTEM)



CIRCULATION JETS IN BASINS (LAKOS SYSTEM)



FUTURE APPLICATIONS

- Rental Car Center
- Air Cargo Facility
- Terminal 3 (under renovation)

QUESTIONS

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