Assessing the Water Savings Impact of Irrigation and Landscape Management Strategies

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Representing Seattle Public Utilities & the Saving Water Partnership

www.savingwater.org
Special thank you...

- JSH Properties
- Signature LLC
- City of Renton
- Hunter Irrigation
Presentation

- Background
- Objectives
- Study Process
  - AMR
  - Field Observation
- Findings and Results
Discovery Tools

- Automatic Meter Reading
- Field Observation
Background

- 13 Years with SPU on Irrigation Efficiency Program
- Managed the Water Efficient Irrigation Program
  - Rebates
  - Technical Information
    - On-line irrigation run-time calculator
  - Market Transformation
- Worked directly
  - Landscape and Irrigation Professionals
  - Property Managers and Owners
  - Residential, Commercial, Multifamily
  - Industry groups
- Landscape Team – Utility Related Resource Conservation
  - Water
  - Solid Waste
  - Drainage
  - Water Quality
Background

- Industry change
- More customer interest in sustainability
- Identified site
- Developed approach
- Implemented and documented
- Publish findings
Objectives

- **Save Water - Efficiency**

- Analyze the impact of water saving strategies:
  - Technology
  - Management

- Understand how to manage efficiently while maintaining high quality landscape:
  - Fine-tuning the scheduling
  - Checking for problems
Questions:

- Unknown
- Requirements
- Time
- Cost
- Issues
- Who
- Skills
- Opportunity
Study Process

- **Assessment**
  - Utility bills
  - Walk-about
  - Record irrigation runtimes and frequency
  - Audit irrigation zones

- **Implement**
  - Change irrigation schedules

- **Assess/Analyze**
  - Watch and record

- **Adjustments**
  - Change irrigation schedules

- **Analyze/Results**
Test Site Selection

- Landmark East & West in Renton, WA
  - Good case study candidate
    - Two similar landscapes
    - Separately metered
    - Sustainability specialist
    - Real-time meter data
    - Landscape contractor
Landmark East & Landmark West
Landmark East & Landmark West
Assessment

- Historical water consumption
- Irrigation runtimes
- Management
- Observe
- Identify issues
- Review consumption
Historical Water Consumption

- 1 CCF or 748 gallons
- City of Renton Irrigation Water - $3.92 per CCF
- Generally around $8,000 per year
- Consumption patterns
1 Unit = 1CCF or 748 gallons

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Utility Billing Information

- Multiple Years by Month
AMR – Years, Months, Days & Hours
AMR – Months & Days
AMR – Week & Days
AMR - Hourly
AMR – Cost of the Stuck Valve
Irrigation Runtimes

- Document existing schedules
- Assess use of conservation features
- Compare to standard

Hunter controller with Solar Sync (rain and weather sensor)
Management

- Determine who is in charge of landscape and irrigation system
- Walk the site with irrigation manager
  - Wet areas
  - Broken heads
Observe

- Operate each zone for 5 minutes
  - Leaks and breaks
  - Other hardware issues
- Document:
  - Plant material
  - Microclimate
  - Head type
  - Mulch
Identify Problem Areas

- Audit a few zones
- Compare programmed, and audited to standard schedules
- Estimate savings potential
Discovery

- Rain sensors working
- Weather sensors turned on but not adjusting schedules
Discovery

- **Solar Sync**
  - Controller requires Programs to be set to specific type of sensor - Solar Sync
Step 2 – New Irrigation Schedules:

Programmed the Clocks

- Aug 8 – New schedules on East Landmark – Used standard and audited schedules, turned on weather sensors and set for Seattle area climate (Solar Sync)
- West – Changed one zone that was audited and turned on weather sensors
  - Fixed module Aug. 20
Step 2 – New Irrigation Schedules:

- Red – New schedules and Turned on Weather Sensor
- Blue – Turned on Weather Sensor
Step 3 – Monitoring:

- Visit the site weekly and review billing data or read the meter to monitor consumption and visual quality of plant material.
- Adjust irrigation schedules.
AMR Insights

- Stuck valve
Turf – Looks okay but not perfect
September 25, 2015
1.5 inches of rain
Step 4 – Results:

- Identify major issues affecting irrigation
- Program controllers for 2015
- Estimate savings
Bottom-line: Rain Sensors

- Rain sensors work
Bottom-line: Rain Sensors

- Rain sensors saving money
Bottom-line: Weather Sensors

- Weather sensors work – Weekly comparison
Bottom-line: Weather Sensors

- Weather sensors save money – Weekly comparison

![Graph showing weekly cost comparison over a month for the West region.](chart-image)
Bottom Line: Evapotranspiration
Bottom-line: Irrigation Scheduling

- Guessing
- Standard Schedules
- Audit Schedules
- Fine-tuned
Bottom-line: Irrigation Scheduling

- Guessing – 20 minutes, 5 days per week: 100 minutes
- Standard Schedules – 5 minutes, 2 starts, 4 days: 40 minutes
- Audit Schedules – 4 minutes, 3 starts, 7 days: 84
- Fine-tuned: 3 minutes, 5 starts, 4 days: 60 minutes
Discovery

- There’s an opportunity for a service
  - Estimate costs and benefits

- Verify sensors work

- Standard schedules good place to start
  - May need adjustment.

- Auditing provides much more insight
  - Auditing still requires some guesswork

- The environment makes a big difference
  - Fine mulch may create barrier
## Final Bottom Line

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Final Bottom Line

- Good question!
- Depends on weather
- Based on pre and post schedules
  - about 30% reduction in number of minutes

Potentially $3,000 per year