Conservation of Commercial Irrigation in the City of Woodbury

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Site Supervisor: Jim Westerman
City Overview

• 1844: First settlers
• 1858: Organized township
• 1859: Name change
• 1967: Village incorporation

Today
  • 66,807 Residents
  • 25,137 Housing Units
  • 420 Commercial Properties
  • 35.56 Square Miles
  • 2.7 Billion Gallons Annually
Woodbury’s Water Use (Gallons)

Inside Property: 1.6 Billion

- Irrigation: 955 Million
- Home Owner’s Associations: 250 Million
- Commercial: 155 Million
- Residential: 550 Million

Other: 0.1 Billion
Motivations to Change

• Aquifer sustainability
  • Aquifer test
  • Ground water management

• Groundwater
  • Precious resource
  • One alternative

North & East Metro Groundwater Management Area Plan
Reasons for MnTAP Assistance

• Focused on water conservation of commercial properties
• Outdated irrigation equipment
• Pilot irrigation technologies
• Generate conservation data
• Identify interested commercial properties
Approach

• Researched irrigation technologies
• Monitored two test sites
• Analyzed commercial utility reports
• Outreached to properties
• Presented recommendations
Determining Opportunities for Improvement

- Supervisor recommendations
- Inspection of irrigation systems
- Collaboration with irrigation experts
- Financial benefits
Irrigation Schedule

• Opportunity: Irrigation controllers
  • Arbitrary schedule
  • Watering because it’s Tuesday
  • Often unmanaged
  • Every zone every cycle
  • What’s rain?
Irrigation Schedule

• Solution
  • Evapotranspiration (ET) controller upgrade

• Benefits
  • Based on ET
    • Weather data
    • Landscape data
    • Plant data
    • Compute soil moisture
    • Zones that need it
Controller Test Site

- Clock-schedule
- ET watering basis
  - Data gaps
- Savings
  - Percent
  - Gallons
  - Time
  - Payback
Water Pressure

• Opportunity: Master valve/sprinkler heads
  • City water pressure
  • Optimal water pressure
  • Difference in pressure
    • Mist
    • Distribution
    • Harmful to plants

http://www.allianceforwaterefficiency.org/Irrigation_System_Maintenance_Introduction.aspx
Pressure Regulator Test Site

- **Irrigation audit**
  - Distribution of catch-cans
  - Run system

- **System efficiency**

\[
EF = \left( \frac{\bar{V}_{LQ}}{\bar{V}_{Tot}} \right) \times 100
\]

\[
\bar{V}_{LQ} = \text{Average volume of the lower quartile}
\]

\[
\bar{V}_{Tot} = \text{Average total volume}
\]

- **Irrigation experts provided consultation for process**
Water Pressure

• Solution
  • Master valve regulation
  • 30 psi regulator
  • Solenoid restriction

• Savings
  • Pressure dependent
  • Test site: ~ 35%
  • 1 million gallons example
## Outreach

<table>
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<tr>
<th>Property</th>
<th>Upgrade</th>
<th>Pay Back Period (Months)</th>
<th>Annual Savings (gallons)</th>
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City-Wide Projections (Gallons)

- Domestic: 1.6 Billion
- Irrigation: 955 Million
- Other: 90 Million

- Domestic: 1.6 Billion
- Irrigation: 325 Million
- Other: 90 Million
Additional/Future Ideas

• Standardize irrigation use
  • Mapping irrigable property
  • Compare and contrast

• Outreach to residents
  • Personal investment
  • Outreach simplicity
  • Management levels
Personal Benefits

- Communication skills
- Coordinating
- Developed relationships
- Education
- Governmental processes
- Independence
Thank you

• MnTAP
  • Mick Jost
  • Miriam Yee
  • Linda Maleitzke
• MnTAP Organization
• City of Woodbury
  • Jim Westerman
• Engineering Department
Questions?