Optimizing Sprinkler Performance in the City of Woodbury

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City Background

- Woodbury is the largest city in Washington County
- Population expected to grow an additional 34% by the year 2040
  - “Flat Water Use by 2030” goal
- Minnesota GreenStep City since 2013
- City Council adopted water as a strategic initiative
- Residential and commercial irrigation water use for new sod and maintenance of lawns is high
Incentives to Change

• Quantity and quality concerns with groundwater
  • Drawdown
  • PFC contamination
  • Population growth
  • Costs

• Alternative water source and water treatment facility

• 42% of water used for irrigation
Approach

• Programs have improved water efficiency on over 40 businesses and homeowners associations

• The residential smart irrigation controller program
  • More than 1,500 homes involved
  • Reduces 30,000 gallons annually per household

• Study on six residential homes by implementing pressure regulated sprinklers

• Project replication with other cities in Washington County with Washington County

WaterSense label indicates a certified product that uses at least 20% less water than regular models
Project Overview

• Higher than optimal pressures for an irrigation system
• Pressure regulated sprinklers decrease water waste
• Excess pressure in an irrigation system leads to:
  • Smaller water droplets
  • Increased evaporation
  • Poor distribution uniformity
  • Increased irrigation system maintenance
Pilot Study Overview

1. Selected six random homes from residential smart controller program

2. Completed first irrigation audit
   - System inspection and flagging
   - Performance testing
   - Uniformity calculations

3. Contacted contractors to accomplish the installations

4. Completed second irrigation audit

5. Shared results

6. Recycled 175 sprinklers through Tech Dump
Findings and Recommendations

- Two primary kinds of sprinklers
- Install pressure regulating spray sprinklers
  - Reduction of 0.5 gallons used per minute per spray sprinkler
- Install pressure regulating rotor sprinklers
  - Reduction of 1 gallon used per minute per rotor sprinkler
- Additional water savings can be realized from reducing irrigation run-times
## Results

<table>
<thead>
<tr>
<th>Home</th>
<th>Total Water Savings Per Day (gal/day)</th>
<th>Total Water Savings Per Year (gal/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home 1</td>
<td>280</td>
<td>18,700</td>
</tr>
<tr>
<td>Home 2</td>
<td>900</td>
<td>59,900</td>
</tr>
<tr>
<td>Home 3</td>
<td>740</td>
<td>49,100</td>
</tr>
<tr>
<td>Home 4</td>
<td>240</td>
<td>15,600</td>
</tr>
<tr>
<td>Home 5</td>
<td>400</td>
<td>26,600</td>
</tr>
<tr>
<td>Home 6</td>
<td>360</td>
<td>24,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Average Savings Per Home (gal/yr)</th>
<th>Total Savings for Pilot Study (gal/yr)</th>
<th>Program with 100 participants (gal/yr)</th>
<th>Program with 500 participants (gal/yr)</th>
<th>Program with 1,000 participants (gal/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32,000</td>
<td>193,900</td>
<td>3,200,000</td>
<td>16,000,000</td>
<td>32,000,000</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Water reduction option</th>
<th>Per Unit Cost</th>
<th>Per Unit Cost with Contractor Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Regulating Spray Sprinklers</td>
<td>$9.95</td>
<td>$19.75</td>
</tr>
<tr>
<td>Pressure Regulating Rotor Sprinklers</td>
<td>$19.95</td>
<td>$33.75</td>
</tr>
<tr>
<td>Total Cost per Household</td>
<td></td>
<td>$800</td>
</tr>
</tbody>
</table>
A Future Program

1. Find eligible homes to take part in the program
2. Upload educational and outreach materials on Woodbury Water Efficiency webpage
3. Send out information to interested residents
4. Fill out screener questions and eligibility requirements
5. Pass on information from screener questions to contractor(s)
6. Installation of sprinklers by contractors
Educational Resources

- Guides for residents about pressure regulation
- Calculator for water savings
- Document detailing irrigation issues residents should look for
Personal Benefits

• Learned about:
  • City government
  • Water savings potential through irrigation
  • Project management
  • Time management

Thank you!