Water Conservation in Residential Turf Irrigation
City of Woodbury

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City Overview

- Officially incorporated in 1967
- 9th largest City
- Approximately 25,517 housing units
- Draws water from the Prairie Du Chien-Jordan Aquifer
Incentives for Change

• Flat Water-use by 2030
  • Preserve the aquifer
  • Reduced need to drill more wells
  • Fostering a city-wide culture of water conservation
Reasons for MnTAP Assistance

• Improve residential water conservation through irrigation retrofits
• Developing a pilot program to distribute “smart” irrigation controllers to residential homeowners
• Evaluate the effectiveness of “smart” irrigation controllers
• Make recommendations for larger-scale distribution
“Smart” Irrigation Controller

• Saves water in 2 ways
  • Using lawn characteristics to optimize run-times/watering frequency
  • Skipping waterings with evapotranspiration and local weather data
• Controlled remotely through smartphone app
• EPA WaterSense® Certified
• Smart Water Application Technologies© Tested
Approach

• City purchased 100 “smart” irrigation controllers
  • Provided at no cost to residents
• Developed an application/project agreement to obtain controller
• Worked with City staff to advertise the program
• Organized and facilitated distribution
• Verified installation of all 100 controllers
• Provided continuous technical support
  • Used to gauge complexity of installation/potential maintenance concerns
• Surveyed participants
• Conducted irrigation audits to estimate water savings
Program Application

• Describes the City’s water conservation goals
• Gives background on the program
• Project agreement/criteria that needed to be met
• Information on existing irrigation system
Outreach

- Email and social media as communication tools
- Targeted to several groups
  - Eco-Interest Mailing List
  - Next Door Neighborhoods
- Posted on City website
Distribution

• Controllers numbered 1-100
• Each number assigned to a participant
• Participant picked up controller at office, given further instructions
• Most picked up within 1 week of acceptance
Verification

• Participants given 15 days to install controller

• Required to take a photo of their controller with box
  • Controller number and serial number visible

• Photo emailed to the City for archiving and tracking installation
Surveying

- All 100 participants emailed a post-installation survey
- Satisfaction with controller/program
- Comments/suggestions
- Scheduling tool for audits
- 60 responses (60% participation)
Irrigation Audits

• 5 Audits conducted
  • Limited by weather (no rain, wind less than 5mph)

• Catch cup test
  • Distribution uniformity
  • Precipitation rate (used to calculate usage)
  • Zone by zone (usually between 6 and 8)
## Audit Results

<table>
<thead>
<tr>
<th>Controller ID</th>
<th>Average Distribution Uniformity (DU)*</th>
<th>Estimated Annual Water Usage (gallons)**</th>
<th>Estimated Annual Water Savings (gallons)**</th>
<th>Percent Water Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>49%</td>
<td>53,231</td>
<td>30,230</td>
<td>56.79%</td>
</tr>
<tr>
<td>19</td>
<td>57.5%</td>
<td>76,265</td>
<td>48,970</td>
<td>64.21%</td>
</tr>
<tr>
<td>50</td>
<td>59%</td>
<td>59,154</td>
<td>20,840</td>
<td>35.23%</td>
</tr>
<tr>
<td>29</td>
<td>58%</td>
<td>95,725</td>
<td>44,780</td>
<td>46.78%</td>
</tr>
<tr>
<td>17</td>
<td>61%</td>
<td>88,421</td>
<td>40,550</td>
<td>45.86%</td>
</tr>
<tr>
<td>Average</td>
<td><strong>56.9%</strong></td>
<td><strong>74,559</strong></td>
<td><strong>37,074</strong></td>
<td><strong>49.77%</strong></td>
</tr>
</tbody>
</table>

*Between 50% and 60% DU is considered to be average performance

**Based on a 5 month predicted irrigation season (May through September)
Recommendation

• Purchase and distribute as many “smart” irrigation controllers as desired to maximize impact
  • Spread out purchases to maintain simplicity
  • Limit technical support
  • Continue surveying/evaluation to continuously improve program
  • Approximate savings using a five year rolling average in pumping reduction
# Benefits Table

<table>
<thead>
<tr>
<th>Initial Capital Investment (per unit)*</th>
<th>Annual Water Savings per unit (gal)**</th>
<th>Number of units purchased</th>
<th>Total cost</th>
<th>Total Water Savings (gal)***</th>
</tr>
</thead>
<tbody>
<tr>
<td>$150</td>
<td>~37,000</td>
<td>100</td>
<td>$15,000</td>
<td>~3,000,000</td>
</tr>
</tbody>
</table>

*After bulk discount of $50 per unit  
**Based off of irrigation audit results  
***Conservative estimate
Personal Benefits

• Deepened understanding of City Infrastructure
• Communication on all levels from residents to city officials
• Time management and project management skills
Questions?

This project was sponsored in part by Metropolitan Council Environmental Services.