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Organization Background

The City of Woodbury is a southeastern suburb of the Twin Cities that was established in 1967. The City of Woodbury is the most populated city in Washington County and is home to 66,807 residents as of 2014. City hall is home to the city's engineering department. The department is responsible for the maintenance and planning of present and future infrastructure.



“Through my internship, I became very educated in a field that I knew very little about going in. The experience made me more comfortable in communicating with all layers of management and coordinating meetings with people whom I had never met. Also, working at the city gave me insight on government workings which has allowed me to become more appreciative of public works projects.”
~BH

Project Background

Water use in the city continues to rise due to increasing population. Data shows per capita water use has a small upward trend over the last 22 years, but the total water pumped has continued to increase steadily due to the rising population. The spring and summer water demand is approximately double because of irrigation and this excess demand strains the city's water supply.

This project focused on conserving water that is used for irrigation at commercial properties. The work involved analyzing city records of commercial-irrigation use, determining the benefits of different irrigation technologies, and facilitating the installation of these technologies on commercial properties. Outreach was conducted with some of the largest commercial water users to facilitate irrigation conservation and make them aware of the benefits of the irrigation technologies.

Incentives To Change

Woodbury obtains water by pumping an underground layer of water-bearing rock known as an “aquifer.” Woodbury and other cities draw their water from the St. Peter-Prairie du Chien-Jordan aquifer which consists of a dolomite unit sandwiched by two sandstone units. Barr Engineering in Minneapolis completed a ground water model of the aquifer from which Woodbury and other cities, pump their water. Results of the latest model suggest that current practices may jeopardize the long term sustainability of the aquifer within the Woodbury area.

Woodbury's main objective is to pump the same amount of water in 2030 as was pumped in 2014. Woodbury pumped approximately 2.5 billion gallons in 2014 and is projected to pump approximately 3.5 billion gallons in 2030. Therefore, the city is aiming to conserve approximately 1 billion gallons annually by 2030 as compared to 2014 pumping data while adding approximately 20,000 new residents.





are set to water on certain days a week for an arbitrary amount of time. ET controllers utilize local weather data and landscape characteristics to determine if the property needs to be watered. The savings will vary based on weather, but a test site has seen a 49% reduction in water use since July 15th by switching from a clock-based to ET controller while maintaining and improving upon turf health and aesthetics.

Install Pressure Regulators at the Sprinkler Heads or the Master Valve

Irrigation systems are designed to operate at a specific pressure. Over-pressuring can lead to water loss and contribute to poor distribution uniformity of the water.

Pressure-regulated valves and heads are designed to prevent over-pressurized systems and the associated problems. A test site



with a pressure regulator is using 34% less water while maintaining and improving upon turf health and aesthetics.

Of the 25 candidate commercial sites that were contacted, six sites allowed assessments of their irrigation systems. All six sites can benefit from implementing ET controllers and pressure regulating heads/valves. If both upgrades are done, the savings generated from the two pieces of irrigation equipment are compounded and shown combined as such in the annual savings columns below. The cost of the ET controller varies with the number of zones in the irrigation system while the cost of the pressure regulator assumes that the property has a master valve for their irrigation system.

The city of Woodbury manages the water utilities for the majority of properties. The city's finance department categorizes the properties into three accounts: commercial, home owner association, and residential. If a commercial account has a dedicated irrigation meter, their account is categorized further into irrigation use and domestic use. Commercial account categories include: commercial properties, multi-residential housing properties, and schools. In 2014, 258 commercial irrigation accounts existed. Of the 258 accounts, the top 25 irrigating commercial properties were chosen as targets for this project. These 25 companies represent 10% of the commercial irrigation accounts but represent approximately 30% of the total irrigation use.

Solutions

Replace Clock-based Irrigation Controllers with Evapotranspiration (ET) Controllers

Clock-base controllers are the standard on most properties with an irrigation system. These controllers

Property	Upgrade*	Annual Reduction (gallons)	Annual Savings	Status
1	ET	360,000	\$1,020	Recommended
	PR	250,000		
2	ET	679,000	\$1,930	Recommended
	PR	471,000		
3	ET	529,000	\$1,500	Recommended
	PR	367,000		
4	ET	1,076,000	\$3,060	Recommended
	PR	747,000		
5	ET	1,056,000	\$3,000	Recommended
	PR	733,000		
6	ET	427,000	\$1,210	Recommended
	PR	296,000		

*ET upgrade = evapotranspiration controller; PR upgrade = pressure regulation of heads and/or valves. **Water savings if one or the other is done; if done together, the compounded water savings would be 66%, which is reflected in the Combined Annual Savings Column.