



WaterSense Labeled Irrigation Products

Oklahoma Makes Median Irrigation OK

City Strips Inefficient Sprinkler Systems of Water Waste

Project Summary

The Oklahoma City Utilities Department partnered with a local nonprofit and a landscaping company to retrofit three highly visible median irrigation systems. By using a WaterSense® labeled irrigation controller and sprinkler bodies that meet WaterSense criteria, the project reduced water use, improved irrigation distribution uniformity, and decreased runoff in a unique landscape area.

Background

Medians calm traffic and beautify urban streets and highways. In areas with variable rainfall, medians may use turfgrass or other landscaping that requires regular irrigation. Proper irrigation system design and maintenance are important, because medians are much narrower than typical landscapes, and sprinklers are more exposed to potential damage from cars and pedestrians.

In Oklahoma City, Oklahoma, the local utilities department often received calls about median sprinkler systems that were overwatering, wasting water, and causing runoff in the street. This didn't reflect well on the city or the organizations that sponsor maintenance along the roadway. The Oklahoma City Utilities Department partnered with a local nonprofit organization and Keep America Beautiful affiliate, OKC Beautiful, to sponsor a pilot project to determine ways to improve irrigation, starting with three median strips. They also partnered with a local landscaper, Urban Lawn and Landscape, to provide installation services.

Evaluating the Problem

To get to the root of the water waste, the three median strips were tested to determine the water pressure going to their sprinkler systems. Optimum pressure for most sprinkler systems is about 30 psi, but the medians' sprinklers were operating at 60 psi. High incoming water pressure can prevent sprinklers from working as intended, causing misting, overspray, puddles, and runoff (see photo at right). However, the U.S. Environmental Protection Agency's WaterSense program developed criteria for sprinkler bodies with integral pressure regulation to earn the WaterSense label, which means they are independently certified for water efficiency and performance. WaterSense labeled spray sprinkler bodies reduce the effects of high incoming water pressure to prevent misting and overspray.

Case Study Highlights

- **Property:** Three separate roadway medians across the city
- **Location:** Oklahoma City, Oklahoma
- **Landscape size:** Each median was 7,600 to 34,000 square feet, for a total of 53,742 square feet of land
- **Water savings:** The retrofit project reduced water use in those median strips by 67 percent (1.2 million gallons of water saved between 2016 and 2019)
- **Cost savings:** More than \$5,000 annually



What's more, sprinkler heads on medians can be easily damaged; replacing old or broken sprinkler bodies with water-efficient models can save water and money. The medians that Oklahoma City Utilities selected also had major water waste associated with leaks, broken sprinklers, sprinklers pointed in the wrong direction, and overspray from sprinklers directed beyond the median landscape, causing flooding in the street.

Because irrigation needs vary from year to year, Oklahoma City Utilities developed a water budget for each of the three median strips, a target against which water savings could be measured. Water budgets are based on the irrigated area, plant type, and local weather. Before efficient sprinklers were installed, the medians were regularly using between 60 and 70 percent more water than was allotted in the budget.



Water pressure can be tested at the valve or the sprinkler head.

Partners Made Pilot Possible

A key component of the successful pilot was the partnerships Oklahoma City Utilities established from the outset. The mission of OKC Beautiful is to enhance the appearance of Oklahoma City through education, programs, and community engagement. By leveraging their LandScapes Beautification Program, the city created a demonstration of potential water savings for existing and new irrigation systems.

Urban Lawn and Landscape, which maintains many of the medians for OKC Beautiful, provided labor and the technical expertise to install water-efficient sprinklers on the three pilot medians, which demonstrated the local impact and potential water savings associated with these products. To assist with installation during the pilot, Oklahoma City Utilities provided staff to direct traffic away from the median strips and keep workers safe.

WaterSense partners Hunter Industries, Rain Bird Corporation, and the Toro Company provided products to demonstrate their water-efficient equipment on each of the three medians. Although the project was completed prior to release of the final WaterSense specification for spray sprinkler bodies, according to Malarie Gotcher of the Oklahoma City Utilities Department, the installed models meet WaterSense criteria.

Strip by Strip Savings

Medians 1 and 2 are similar in design: Median 1 is approximately 7,600 square feet and six irrigation zones of tall fescue grass, trees, and shrubs; Median 2 has nine irrigation zones covering more than 11,000 square feet. After replacing the old sprinklers with sprinkler bodies with integral pressure regulation, along with new nozzles, Gotcher said, pressure tests found all the sprinklers consistently operating at the intended pressure of 30 psi. This meant less misting and water lost to the wind or streams of water flowing to the street. Gotcher also reported that the number of calls about water waste at those medians decreased.

Median 3 is more unique; it covers an area of 34,525 square feet and is split between a median and a turning lane. Along the length of the entrance lane, the median narrows to allow vehicles to merge, and this irregular shape caused incorrectly positioned sprinklers operating at high pressure to miss their target and spray into the road. A certified landscape irrigation auditor conducted a pre- and post-project audit and determined that sprinkler heads and positions weren't optimal for the space. The system operating pressure was also too high, and there were several leaks. The irrigation zones were reconfigured for better efficiency, and some rotating sprays were replaced with multi-stream, multi-trajectory nozzles (MSMT).

Did You Know?

Replacing all spray sprinkler bodies across the country that operate above optimal pressure with WaterSense labeled models could save more than 31 billion gallons of water nationally each year!

The Median 3 installation also replaced a traditional clock timer with a WaterSense labeled weather-based irrigation controller. WaterSense labeled controllers use local weather and landscape conditions to make sure the system waters only when needed.

Results

Overall, the project has decreased water use on all three median strips by 67 percent compared to pre-installation rates; an average 1.2 million fewer gallons of water than what was used in 2015. On Median 3 alone, water use was reduced from 1.4 million gallons in 2016 to 657,000 gallons in 2018. Medians 1 and 2 are now operating much closer to their water budget, with current savings estimated at 21 gallons per square foot.

Lessons Learned

By starting with a limited number of medians, the Oklahoma City Utilities Department was able to identify and address important issues that will be applied to future median irrigation systems. Following are some of the lessons learned from the project that other municipalities may want to consider for median strip improvement:

- **Medians are unique.** Due to their location, medians present unique challenges in terms of conducting work and maintaining the system. Sprinkler heads located near turning lanes are more likely to be damaged by vehicles.
- **Get a grip on the strip.** Gotcher said the pressure testing on Medians 1 and 2 was helpful, but the audit conducted on Median 3 was the most useful piece of the puzzle. In the future, they plan to include a pre- and post-irrigation audit for other projects.
- **Put good boots on the ground.** The Oklahoma City Utilities Department's project worked in part because they identified partners who were stakeholders in keeping the city beautiful and competent contractors to handle the installation.
- **Don't get caught in traffic.** Upgrades were scheduled to avoid rush hour. With little room for contractors to maneuver, the department had to close road lanes and direct traffic away from the workers for their safety. Gotcher also noted that they needed to be flexible when scheduling upgrades, because "the weather can turn on you."
- **Keep a happy median.** While initial improvement and water savings are great, Gotcher noted, long-term maintenance is critical to the success of a project such as this, especially when medians are so visible to the public.

Acknowledgements

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Learn More

For more information about how the Oklahoma City Utilities Department reduced water use on medians, watch the WaterSense and Alliance for Water Efficiency webinar, "Efficient Irrigation Practices for Medians and Park Strips," on-demand at <https://youtu.be/xpQWCFppxjY>.

To read other case studies on outdoor water use, visit <https://www.epa.gov/watersense/case-studies>. For more information about *WaterSense at Work*, a best management practices guide for commercial and institutional facilities, visit <https://www.epa.gov/watersense/commercial>.