

# Determining The Time For An Irrigation System Upgrade



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Like anything else, irrigation systems wear out over time. Sprinklers stop turning, arcs stop being adjustable, valves fail to open or close and controllers stop functioning. Additionally, new technologies and better equipment are on the market that improve efficiencies and save water and money for customers. For any of these reasons, an irrigation system will at some point need upgrading, but how do you determine when?

## **Why upgrade?**

There are many ways in which an irrigation system can signal that it needs to be upgraded. For example, the water use may have escalated or the landscape appearance may have deteriorated. Another sign is that the number of service calls has increased or the cost to maintain the system has become excessive.



Newer spray heads and rotors are designed to apply water more evenly when properly spaced. PHOTO: RAIN BIRD

A system may also need to be upgraded due to changes in regulations. In Orlando, ordinances have been passed that do not allow water to be thrown over or across a sidewalk. If an existing system within the city of Orlando does that, it has to be upgraded to eliminate overthrowing the walk. In California, you can be fined for irrigation water running off of your property. In order to prevent that from continuing, the system most likely will need to be upgraded with a new sprinkler configuration, nozzles and/or controller.

Lastly, time may have just passed and the system is just plain old.

## Upgrading options

There are many options available to upgrading a system. Upgrading means just that: upgrading. It does not mean the whole irrigation system has to be abandoned and replaced. An upgrade could consist of just something as simple as changing the sprinklers. The existing sprinklers could have stopped turning, don't pop up high enough or distribute water poorly and it's time to be more water efficient.

An upgrade could also include replacing the valves because they are no longer opening or are stuck open or maybe additional features such as flow control or pressure regulation are needed. Additionally, the diaphragms could be worn, cracked or dried out or the solenoids past there life cycle. Wiring could be bad due to construction damage or years of being under water, especially if waterproof connections were not used when the system was originally installed. An upgrade could consist of just replacing the controller. This could be desirable to provide more flexibility in scheduling, to change to a smart controller to be more sustainable, by reducing overall irrigation water use or because the controller just quit working.



PHOTO: TORO

## Irrigation system lifespan

The length of time the complete irrigation system lasts can be a short time to a very long time. Normally, the system doesn't wear out; just the various components do. There are two things that wear on the irrigation system: location and number of cycles. The two are usually, but not always, directly related. An irrigation system in Phoenix is going to operate more often than an irrigation system in Minneapolis. Whereas the Phoenix system is operable and running on some type of schedule year round, the system in Minneapolis is off from November through mid-April. The system in Phoenix is operating at least twice as much as the system in Minneapolis, and because evapotranspiration (ET) rates are higher in Phoenix than in Minneapolis it is also operating longer each cycle. Therefore, a system in Phoenix would not be expected to last as long as a system installed in Minneapolis. It all comes down to cycles. The more often the system goes on and off, the more wear there will be. If you have a system that you use cycle and soak on – water a little, let it soak in and then water some more – that system will turn on and off more and the components will also wear faster.

Upgrades may also be required due to the maturing landscape. As the landscape grows it may interfere with the irrigation system sprinklers' water distribution or require more water as trees and other landscape materials grow. This is especially true with point source systems, which need to be adjusted for the amount of water applied as the landscape grows and matures. The maturing landscape can require sprinklers to be moved or alter the type of irrigation necessary.



## **Technological advances = better irrigation**

As time passes, equipment ages but technology continues to advance. Advances in technologies are good for irrigation. Technology provides ways to better manage an irrigation system, enhances the system's operation and makes the system operate more efficiently. As such, technology improvements alone may be a reason to upgrade the system. This has been especially true with the introduction of smart controllers and soil moisture sensors.

Smart controllers circumvent the "set it and forget it" mentality of irrigation system operators, whether it be the landscaper, homeowner or property manager, and as such can save substantial amounts of water when properly installed, programmed and tweaked.

Smart controllers are either climate-based or soil moisture sensor-based. A smart controller is programmed with site characteristics that a conventional controller does not have, such as plant type, precipitation rate, root zone depth and soil type. These parameters are used to set up a base schedule and then the climate data, normally ET or the soil moisture sensor readings are used to adjust the base schedule to apply the amount of water needed based on the existing weather or soil moisture conditions.

The controller doesn't just come on the same day at the same time and apply the same amount of water. Upgrading the sprinklers, if they are more than five years old, will alone improve the uniformity of the water being applied. In the last decade, manufacturers of irrigation sprinklers have greatly improved the sprinklers ability to apply water uniformly, as well as the reliability of the sprinklers. When possible, upgrading just the sprinkler nozzles will then improve water distribution. Upgrading both the sprinklers and the nozzles will improve both the uniformity and the reliability.



Upgrading old sprinklers and nozzles can improve uniformity and reliability. PHOTO: IRRIGATION CONSULTING

Newer sprinklers are designed and manufactured to apply water more evenly when properly nozzled and spaced. However, just replacing the sprinklers on their existing spacing with more up-to-date models will provide some benefits in uniformity.

Upgrading a system to a smart controller or changing the sprinklers does not guarantee results. If the core irrigation system is poorly installed or has other issues, such as poor pressure, a smart controller or sprinkler change is not going to miraculously make the system better.

## **Minor upgrades or major overhaul?**

So, how do you tell the difference between when a system just needs minor upgrades versus knowing when the system needs a complete overhaul/replacement? The simplest way is to log the service calls and make

sure you document what the service call was for: pipe break, bad splice, broken sprinkler, bad solenoid, etc. That way you can look at trends.

If the trending is showing frequent component failures are occurring, the easier it will be to make the decision as to whether to continue to repair the system versus replace the system. For example, how many pipe breaks have there been and were they on the mainline before the valve or on the lateral after the valve? Are the breaks always in the same place or are they spread out throughout the system?

Pipe breaks are a sign of major issues with the system, such as high pressure or excessive velocities. High pressures may not break the system like high velocities, but they will prematurely wear the components and make the system less efficient. If pipe failures cannot be determined and continue to occur, that means piping replacement or a major overhaul.



#### PHOTO: IRRIGATION CONSULTING

An irrigation system is a mechanical system buried in the harsh environment of the ground. Just like your car, it will not last forever, needs maintenance to keep running and does not like to sit idle. Systems that have not operated for several years will most likely need replacement sooner when compared to an operating system. Sprinklers like to pop up and down and valves to open and close. When that does not occur over several years, the system will be in very poor condition.

### **Making irrigation systems last**

The life of an irrigation system is dependent on not only when it was installed but also how it was installed. Old systems (more than 20-plus years old) wear out as the equipment used does not have the lifespan of today's precisely manufactured equipment. Repair parts for older equipment are also no longer made.

Installation is the key, however. Poor installation will cause a system to not last as long as it should or not operate properly from the very beginning. For example, poor solvent weld cementing or clamping, not using waterproof connections, under sizing wire or pipe and oversizing zones will cause the system to operate poorly and not last its normal life cycle.

Initial installation will also be a large factor in how long the system will last. A well-installed system will, needless to say, last longer than a poorly installed system.

When you think about it, irrigation systems gained popularity in the early 1980s, so most systems are really not that old. But just like baby boomers, as these systems age they will require more maintenance and upgrades whether it is just replacing components or the whole system. Upgrades are a business opportunity that will not go away. Remember, when upgrading a system it is important to use proper installation techniques and follow best management practices such as those published by the [Irrigation Association](#). That way the

system will not be in need of another upgrade for some time.

***Editor's note:*** *This article was originally published in July 2015 and has been updated.*