

City of Glendale, Arizona

**City of Glendale
Sustainability Initiatives:**

Programs, Plans, Projects, and Best Practices

City of Glendale Sustainability Initiatives: Programs, Plans, Projects and Best Practices

Community Development Group

Build Safety Department

Low Flow Ordinance

- On Dec. 14, 1993, the Glendale was one of the first Valley Cities to adopt and enforce a low flow ordinance (Ordinance 1793) for the maximum allowable water use for all plumbing fixtures installed in buildings. The Ordinance is more restrictive than the State Law that went into effect on Jan 1, 1994. City Ordinance requires a maximum of 2.75 gallons per minute (GPM) for faucets including lavatories, kitchen sinks, and bar sinks, and for shower heads. State law allows 3 GPM for the same faucets and shower heads. Toilets and urinals are allowed a maximum of 1.5 gallons per flush in the City of Glendale Ordinance and 1.6 gallons per flush by State and Federal Law. In all public restrooms, all faucets are required to be self closing or self metering, per the COG Ordinance.

Adoption of Codes

- A new code series is published by the International Code Council every three years. The Building Department adopts these new codes regularly to ensure that the latest standards, technology and information are being used in the construction or renovation of buildings in the City of Glendale. Staff is reviewing the 2009 International Energy Conservation Code and will propose the adoption of this code in 2010. The International Code Council is working with the National Home Builders Association and ANSI to create consistency in the requirements being suggested for sustainability. Alternatives to the adopted code methods and materials are submitted on a regular basis to the building department. This option, provided for in the administrative portion of the codes, allows for any energy efficiency item to be considered, even if it is not specifically mentioned in one of the codes. In the past, only items in direct conflict with other portions of the code would be rejected and the presenter given the opportunity to re-apply.

Solar Program/Permits

- The building department currently has a program where solar water heater permits are issued at the counter. Photovoltaic systems, depending on the size of the unit, are issued within three days of submittal. In residential applications, for both types of systems, we have revised the process for determining fees, based on the valuation of the unit to a fixed cost per system, thus reducing the fees for these systems substantially.

Support of ADEQ's requirements for gray water and rain water harvesting

- Arizona Department of Environmental Quality has delegated authority to the Health Department of Maricopa County to perform the technical review of gray water use systems as well as rain water harvesting systems. Our adopted codes allow these systems, as approved by Maricopa County Health Department.

First LEED Certified Platinum home in Glendale:

- Plan review and inspection services were part of the project created for Habitat for Humanity under the Affordable Home Program for LEEDS.

“First Truly Green Subdivision in the Phoenix Area”:

- The Cabrillo Point Subdivision by Pulte that touts itself as the “First Truly Green Subdivision in the Phoenix Area” is in Glendale and obtained an “Environments for Living” Certification. Plan reviews and inspections have been provided on the homes in this subdivision.

Engineering Department

Design of Capital Improvement Program

- We encourage the use of LEED concepts in the design of all of our capital projects. To date the new city courthouse is the only project pursuing a LEED’s certification, however (as seen below) many other projects have utilized LEED concepts in their design without the expense of certification.

Mapping/GIS

- Through the use of the EMS viewer, our inspectors, blue stake locators, and other city departments are able to view as-built and property rights information on their computers, thereby eliminating trips to city hall and the mapping department to get copies of this information.

Pavement Management Program

- The design of our annual pavement overlay program includes the use of asphalt rubber which helps get rid of old tires from landfills and reduces noise levels on the city streets.

City of Glendale Park and Ride (Glendale Ave and Loop 101)

- The new Park and Ride lot was designed and built using pervious concrete. Pervious concrete is a new technology that helps reduce the Urban Heat Island effect, along with the added benefit of allowing rainwater to percolate through the concrete instead of running off into a retention basin. Pervious concrete is unique in it prevents standing water on the pavement surface, and it assists in the elimination of water pollution through natural biological processes. As water infiltrates the soil, larger pollutants are filtered out and microorganisms break down pollutants until it is inert, and it recharges ground water aquifers.

Property Acquisitions

- Since the early 1990s, the city’s policy has been to perform Phase I and II environmental reviews for all property and right-of-way acquisitions. This policy is more precisely defined in City Manager Directive No. 6. This provides the municipality with a clearer picture of its potential liability and reduces unexpected costs related to property transactions. It further assists the municipality in more accurately planning for any necessary remediation of contaminated sites in the course of planned development projects.

Planning Department

General Plan

- The General Plan is the official policy statement of the City Council to guide both the private and public physical development of the community. It is the policy foundation for guiding growth, development and redevelopment of the community. Glendale 2025 was adopted in 2002. The General Plan time frame is twenty years into the future. The General Plan is comprehensive in subject matter and general through goals, objectives, polices and implementation action plan that sets forth specific programs and projects to carry out the General Plan. The General Plan includes elements that are critical to sustainable development, e.g.,
 - land use,
 - circulation,
 - housing,
 - redevelopment,
 - urban design,
 - public services and facilities,
 - fiscal,
 - public buildings,
 - economic development,
 - quality of life,
 - recreation,
 - safety,
 - neighborhood,
 - conservation of resources
 - bicycling,
 - Growing Smarter and Growing Smarter plus elements include growth areas, cost of development, open space, environmental planning, and water resources.
- The General Plan is mandated by state law to be updated every year. Planning staff is working on updating the General Plan. New plan elements will include Energy (mandated), Sustainability (optional) and Neighborhood Preservation and Revitalization (mandated).

Zoning Ordinance

- The Zoning Ordinance implements the General Plan and is site specific relative to establishing land uses and development standards for all properties in Glendale. The Zoning Ordinance was adopted in 1993. It requires private open space for all dwelling units whether single family or multi-family in nature. This generally equates to covered patios for all new dwelling units in Glendale.

Residential Design & Development Manual

- The Residential Design & Development Manual was adopted in 2004. It guides quality development standards for new single family and multi-family projects. New dwelling units are encouraged to include front porches and are required to provide covered patios. Having outdoor space on each dwelling unit helps residents enjoy the Sonoran Desert climate.

Community Services Group

Parks and Recreation Department

Park Redevelopment

- As part of the older park redevelopment program, staff has included as part of its design requirements the option to utilize alternative energy, such solar energy to light park pedestrian pathways and ramadas. An example of this includes the Hidden Meadows Park solar light installation. The system was installed as an alternative to standard electrical lighting. The cost of establishing grid lighting with an electrical meter and on-going monthly electric expenses was estimated at over \$100,000. Substantial savings have been realized with the use of the solar powered lights. The material and installation costs totaled to \$12,000 and there are no monthly energy expenses. Butler and Bicentennial neighborhood parks are currently under renovation and will include solar power security lighting.

Green Lighting

- Green generation lighting technology is beginning to be utilized in replacement or new sports field lighting which reduces the use of energy and fossil fuel emissions. It also provides more efficiency and reduces life cycle operating costs by at least 50%. Currently, the green technology sports field lighting is being utilized at Copper Canyon and Kellis High Schools as a result of the city installing and cooperatively using the sports fields through an intergovernmental agreement with the school districts.

Water Conservation

- Staff worked closely with the Environmental Resources Department to develop a monitoring system that assists in analyzing and improving water conservation for all parks and public grounds. In addition, a new internal city staff committee is being formed that will consist of representatives from parks and recreation and other departments that utilize water and sewer services. The purpose of the committee will be to educate and provide awareness to the users regarding their usage levels and cost impacts, as well as identify opportunities to improve water conservation.

Public Works Group

Environmental Resources Department

Water Resources

- The city has a designation of assured water supply from the Arizona Department of Water Resources. The designation demonstrates that the city has a 100-year water supply for existing and proposed developments within its water service area.
- The city has reduced its reliance on groundwater from 100% in 1980 to approximately 10% in 2008. The city has stored several thousand acre-feet of water in the aquifer that can be used in the future, when needed.

Drought Plan/Ordinance

- The city adopted a drought plan/ordinance in 2004 to address major droughts that occur periodically. The ordinance includes language to control water wasting in the city.

Water Conservation

- The City established a water conservation program in 1985. The city updated the program in 2005. The comprehensive program includes landscape rebates for low water use landscaping, adult and youth water conservation education and outreach, technical assistance to city departments, and participation in a regional water conservation program.
- The water conservation program is also expanding its role in public education and outreach by including sustainability and energy information, including the Glendale Green website.
- The water conservation program assists city departments with water budgeting assistance which has resulted in water and budget savings for the organization.

Air Quality

- As part of regional efforts to improve and maintain air quality, the city has adopted and is implementing a number of air quality plans for carbon monoxide, ozone and particulate matter. The most recent city commitment was the adoption of a city fugitive dust ordinance.

Regional Sustainable Cities Network

- Glendale participates as a partner in the Sustainable Cities Network lead by the ASU Global Institute of Sustainability. The network shares information regarding the growing interest and activities in sustainability.

Field Operations Department

Landfill:

- The development of a public private partnership between APS, Glendale, and Bryan A. Stirrat and Associates engineering firm to convert methane gas produced at the city landfill into electricity that will produce electricity equivalent to the use of 750 homes per year.
- The landfill improved the annual trash compaction rate and soil use ratio to achieve the best airspace efficiency measurement in the last 5 years. The landfill achieved a gross capacity utilization of 67% after averaging 56.2% over the previous years. As a result, less space in the landfill was needed to bury over 311,267 tons of refuse during the year, translating into a longer life for the landfill.

Solid Waste:

- Glendale has continued to operate a comprehensive curbside recycling program for all residents to participate in, and is disseminating educational information through printed materials, public meetings, media exposure and inspection enforcement to reduce the recycled contamination collection rate by 5%.
- The Sanitation division held its first Electronic Waste Recycling event back in February of 2009 and collected approximately 14 tons of E-Waste and serviced over 350 Glendale residents. The city also offers two Household Hazardous Waste (HHW) events annually. Over the years, staff has revamped the HHW program from a large event conducted on city property to having a contractor go to resident's homes on an appointment basis and pick the material up from them directly. This makes getting rid of residential hazardous materials as convenient as possible for residents. Last year, the city serviced over 1,000 residents during a 30-day period for the same cost that we typically serviced 500 residents on a single day.

MRF/Glendale Recycles:

- The city's recycling program was created as a pilot in 1997. In February 2000, the city built a 45,000 square foot Materials Recycling Facility to collect newspaper, magazines, paper (computer, office, junk mail, file folders & colored paper), aluminum and steel/tin cans, telephone books, cardboard and chipboard, and #1 or #2 plastic containers. The city owned and operated Facility expected to collect 50 tons per day at the beginning of the curbside program but actual collections proved to be 90 tons/day. Glendale curbside recycling collected 9,000 tons the first year, and in FY2007-08 collected a little under 17,000 tons from residents and processed a total of 22, 000 tons with external contract agreements.
- Some residents in multi-family homes do not have the option to recycle. A public drop-off has been made available at the Glendale Landfill for the collection of recyclables.
- Glendale's recycling program includes recycling promotion/education components, including presentations at schools, community events, educational shows run on Cable 11, and participation in Valley-wide Recycling Partnership (made up of local municipalities).

Streets and Right of Way:

- Solar controllers are being used to reduce the need for electrical services in areas where the right of way is being improved.
- The City has continued to insist on low water use plants indigenous to the southwest so that landscaping improvements do not increase the demand for water unnecessarily.
- Both Streets and Right of Way are transitioning to a paperless work order system for increased productivity and to reduce the city's waste stream.

Equipment Management:

- Reduced the total size of the city fleet by over 80 vehicles by creating a motor pool at City Hall and Field Operations. The department has also been working with all city departments to evaluate opportunities to downsize vehicles (larger to smaller engines for example) in order to improve fuel efficiency and to reduce dependence on gasoline.
- The city has invested \$5,500,000 in the purchase of 282 alternative fuel vehicles to included hybrids, bi-fuel, Flex Fuel, and Electric vehicles in an effort to reduce the city's dependence on fossil fuels and continue to evaluate alternate fuel vehicles that are available with our applications for city operations.
- The city has converted 1 of 3 unleaded fueling sites to E85 to increase the use of alternative fuels within the city. Additionally, the city moving towards the use of bio-diesel for exclusive use in our heavy truck fleet.
- The equipment management shop recycles all used oil products and filters generated by our 1,400 vehicle fleet.

Facilities Management:

- Facilities Management staff is retrofitting buildings with older electrical ballasts and bulbs with newer, more efficient bulbs. The newer ballasts and bulbs use less electricity, generate less heat, and contain less hazardous materials.
- Reinvestment in existing city buildings will exceed \$1 million dollars in the next 12-24 months addressing issues such as air quality in older buildings, replacement of roofing systems, and enhancing access for the disabled. Cross departmental team of employees evaluating construction of green buildings and looking at lifecycle costs of such buildings.

Transportation Department

LED Traffic Signal Conversion:

- Currently Traffic Operations has converted 80% of the city's incandescent traffic signals to LED. The LED signals are tremendously more energy efficient and have a working life of over 5-years versus an incandescent light that will last less than 1-year and uses more electricity. Transportation has received funding from the Energy Efficiency and Conservation Block Grant to complete the conversion to LED.

Solar Flasher Units:

- There eight solar flasher units, this equipment is usually placed near school zones and flashes during school times when students are traveling to and from school. There is also a flasher unit located at 47th Avenue and Peoria near Fire Station 154, and alerts the traveling public a fire engine is entering the roadway. This fire station does not have a traffic signal located near the fire truck exit/entrance and this device enhances driver awareness as the firefighters exit onto the roadway. Using the solar units eliminates the needs to connect to electricity.

Solar Powered Speed Radar Signs:

- There are ten solar powered speed radar signs in the city. This equipment is a neighborhood traffic mitigation device often used where speed cushions are not a viable option. They provide notification and public awareness in areas where traffic mitigation is needed.

Solar Powered Dynamic Message Signs:

- During special events requiring an increased level of traffic control these units are deployed to provide information to the traveling public. They are used at all of the Cardinal football games, Fiesta Bowl as well as, large events at the stadium or arena.

Solar Powered Bus Shelters:

- Glendale's solar bus shelters provide lighting at bus shelters without the need to connect to the city's electrical grid. All new bus shelters installed in the city come equipped with solar lighting packages and older shelters have been retrofitted to accommodate solar lighting.

Dark Sky - Outdoor Lighting Standards:

- The Transportation Department complies with city code Section 26.5 to promote dark skies through ensuring street lights are fully shielded (full cutoff) so that no direct light escapes above the horizontal plane of the light fixture. In addition, staff review plans for new development projects to ensure outdoor lighting complies with city code. Restricting artificial lighting activities as provided in code promotes visibility of nighttime skies and supports the astronomical community throughout the state. This goal works in conjunction with good lighting practices whereby lighting systems are designed to provide for nighttime safety, utility, security, and productivity while conserving energy and costs.

Transportation/Congestion Management:

- Programs to reduce traffic congestion also help reduce air pollution by reducing travel times and vehicle idling. The City of Glendale traffic signal synchronization program reduces stops and delays to traffic and the computerized traffic signal monitoring program allows the Transportation Department to remotely control traffic signals to respond to recurring and non-recurring congestion. Of the 190 traffic signals in Glendale, 117 are connected to the Traffic Management Center. The Traffic Management Center also monitors traffic and posts electronic messages during special events at the stadium and arena.

Travel Green:

- Glendale currently is participating in a valley-wide initiative to help improve the quality of our air. Travel Green encourages and educates our citizens, employees, and employers in Glendale to explore options in transportation. Programs include carpool matching, 100% bus and light rail subsidy, a bike loaner program, and a guaranteed ride home program. Travel Green initiatives can reduce traffic congestion, pollution, fuel consumption and improve personal benefits by helping people staying fit and saving money.

Glendale's Employee Bike, Bus and Carpool Program:

- City employees who agree to ride a bike at least once a week (9 months out of the year) can request a loaner bike through our employee bike program. Bicycles that have been released through the Police Department are taken to a bike shop for a safety check and then matched with an employee. Once the employee leaves the city or no longer participates in the program, the bike is returned and reissued to another interested employee.
- To encourage carpooling, the city provides carpool matching for its employees and covered parking for those who choose to carpool.
- Employees and qualifying volunteers are eligible for a free bus card. Employees and volunteers complete an application and the program is funded by the GO Transportation Program.
- As an incentive to use an alternative mode of transportation through the Travel Green Program, employees are eligible to enter a monthly drawing for a gift card if they carpool, ride the bus, bike, and walk or use some other alternative mode of transportation during the month.

Bus and Gus Individual Training (BAGIT):

- BAGIT encourages alternate modes of travel and teaches Glendale residents and employees how to travel on Valley Metro or on a Gus Bus.

Automated Bus Trip Planning:

- Riders can go to The Valley Metro website and access the automated trip planner to help them plan their trip using the fixed route buses. The user friendly system assists passengers in planning trips from origin to destination to encourage transit usage.

Transit Vehicle Management System:

- All of the fixed route buses that service Glendale has a GPS based communication system that allows for better management and control of the transit fleet. Effective vehicle management results in more efficient operations as service can be redirected to provide better transit service. The system operating information is used to create more efficient schedules.

Bus Rapid Transit (RAPID) & Expanded Local Bus Service – Express Bus Routes:

- The City of Glendale has six express bus routes, two of which connect citizens to the new light rail system. Express busses provide fast and frequent trips for choice riders, or those that have transportation options such as personal vehicles. By removing vehicles from the street, the City is able to curb both pollution and traffic congestion, but still ensures both quality and convenient transportation. Citizens across the city can access these routes from a number of places, whether it is up North at Arrowhead Mall, downtown at the Myrtle Park and Ride Lot, or out west at Glendale's new 99th and Loop 101 Park and Ride.

Neighborhood Circulator Bus Service:

- In 1998, Glendale initiated a Neighborhood Circulator Service called the Glendale Urban Shuttle (GUS). The service runs seven days a week with two routes running during the week (opposite directions). This circulator serves downtown Glendale and the Northern Crossing Shopping Center. Ridership on GUS has continued to increase each year. In 2003, a third Circulator route was added, serving such locations as the Glendale Adult Center, Glendale Community College, the Main Library, YWCA, and other popular locations. All GUS buses are equipped with bicycle racks and wheelchair lifts for the disabled.

Electronic Fare Collection Systems:

- In 2007, a new fare collection system was implemented with the installation of new fare-boxes on all transit fixed route buses operating in Glendale and throughout the region, allowing passengers to buy All-Day passes on the bus. A variety of bus passes of varying day-lengths (1, 3, 7 and 31 days) are offered for purchase. Additionally, a more convenient Smart Card pass, that may eliminate a need for paper-based passes, is being tested.

Bikes on Buses:

- The entire fixed route transit bus fleet that serves Glendale is equipped with bike racks. This increases accessibility, allows passengers alternative transportation for commuting, eliminates the need for personal vehicles for midday trips, and allows greater access to areas outside walking distance from the transit system. The city also has a bicycle locker at the Park-and-Ride located at 99th and Glendale Avenues.

Bus Pass Program:

- The Bus Card Plus program helps to encourage transit use by improving convenience, helping employers comply with travel reduction goals, and supporting transit fare subsidy programs.

Glendale Dial-A-Ride:

- Glendale Dial-A-Ride transports ADA-certified passengers, persons with disabilities, seniors and the general public for a variety of trips. All of the vehicles are equipped with lifts to accommodate mobility devices. The service runs 365 days a year and transfers can be arranged for customers who need to travel to neighboring cities (certain restrictions may apply for certain cities).

Transit Website:

- Glendale Transit offers several options to driving such as Valley Metro fixed route service, GUS circulator service and Dial-A-Ride. More information on these services is available at www.glendaleaz.com/transit

Utilities Department

The City of Glendale has a modern and sophisticated infrastructure to meet the Water and Wastewater needs of our utility customers. Glendale's water meets or exceeds all federal and state requirements for health and safety, and the city must adhere to even more stringent requirements than bottled water producers. Over 2 million tests and measurements are performed each year in the treatment and distribution systems to ensure water quality. The city has state-of-the-art equipment and laboratories which test for more than 200 different substances, and submits hundreds of reports each year to the appropriate regulatory agencies.

Sustainable practices include:

- The city has shifted its water portfolio to rely mainly on renewable, surface water supplies, saving the groundwater as a backup for extended droughts.
- A tiered water rate structure that encourages conservation by increasing water rates as usage increases, and 100 percent metered connections to the system, encouraging efficient use and accurate accounting practices.
- Separate sanitary sewer and stormwater systems, eliminating the problem of combined storm overflows and associated water quality problems.

Operation Optimization Study:

- In 2009, Utilities commissioned an engineering study to evaluate and optimize operation of its production facilities and distribution system. This effort reduced overall electrical consumption and costs by establishing best operating modes taking into account source water availability, water demand, water quality, power consumption, and seasonality issues.

Nitrate Removal Demonstration Facility:

- A one million gallon per day Demonstration Facility constructed at the Cholla Water Treatment Plant enabled the testing of various nitrate removal technologies currently available. The results of this effort allowed Utilities and Engineering personnel to select the best overall treatment techniques to incorporate into the design of the groundwater treatment facilities to be located at the Oasis Water Treatment Plant. The addition of groundwater supplies will ensure that high quality water is available to meet current and future demands.

Salt-based Chlorine Generators:

- The Utilities Department has replaced chlorine gas cylinders at certain of its locations with a newer technology that uses common salt to produce a chlorine solution, sodium hypochlorite, used for water treatment and disinfection. This innovative technology eliminates the use, transportation, and handling of a hazardous, pressurized gaseous chemical in favor of a safer, more environmentally friendly chemical produced on-site, as and when needed.

Oasis Water Treatment Plant:

- The City's new Oasis Water Treatment Plant realizes significant electrical savings through use of solar drying beds for sludge treatment. Solar energy, instead of mechanical devices reliant on electrical or other energy sources, is used to dry residuals removed from source water in the production of potable water. The use of solar energy greatly reduces the cost to produce water while significantly reducing the overall electrical demand of the facility.
- Operations personnel at the Oasis facility also employ simple but effective energy saving practices in their day-to-day jobs, such as implementing a "lights out" practice in which lights are turned off in rooms vacant for more than 15 minutes and using bicycles as a mode of transportation around the multi-acre site.

Water Recharge/Reuse:

- The Utilities Department is responsible for treating the sewage generated within the city. Two wastewater reclamation facilities treat the sewage and produce a high quality effluent (treated water) that is then recharged to the aquifer or beneficially reused at lakes, golf courses, and other amenities. Reusing effluent helps to conserve a valuable resource in our desert environment, while recharging excess effluent ensures that water resources will be available on a long-term basis for the citizens of Glendale.

Arrowhead Ranch Water Reclamation Facility:

- Significant energy conserving enhancements are planned for the Arrowhead Ranch Water Reclamation Facility. The blowers will be replaced by newer, more energy efficient equipment, and personnel are in the process of upgrading the ultraviolet light disinfection equipment with newer equipment to realize a marked increase in electrical efficiency. Funding for this latter project is from a non-competitive grant from the federal government.
- This same grant will also be the source of funding for improvements to Well 43. This well will be equipped with a variable frequency drive to allow production to better track demands and achieve higher levels of electrical energy efficiency.

West Area Water Reclamation Facility:

- The West Area Water Reclamation Facility is a wastewater treatment plant that was conceived, designed, and constructed with the environment foremost in mind. Aside from the immediate and obvious benefits to the environment realized by treating wastewater and producing a reusable supply of water, the plant was constructed to a large extent with recycled materials and utilizes solar energy for lighting and other electrical purposes, such as to heat water in the administration and maintenance buildings. Desert landscaping was used to conserve water and to demonstrate low-to-no water use native plants.

Water Meter Testing Study:

- Utilities staff recently embarked on a water meter testing program to determine the optimum time to replace its residential water meters. The findings of this study help to ensure that water usage is metered and billed properly and will further promote conservation of this valuable resource. Used meters are also recycled due to the value of the brass components.

Meter Reader Bicycle Program:

- The Utilities Department's Field Customer Service division is responsible for reading approximately 60,900 water meters a month. Approximately 10 years ago the division decided to retrofit mountain bikes with brackets for handheld computers so they could be utilized for meter reading. As of this writing, there are several Water Services Representatives who utilize bicycles to read their assigned routes. This significantly reduces fuel and emissions, and has ancillary benefits of allowing those employees to maneuver safely through congested areas while reducing the wear and tear on vehicles.

Automatic Meter Reading (AMR):

- The Utilities Department uses the latest technology in its retrofit of water meters. More than 700 water meters have been retrofitted with radio-read devices, primarily in entertainment and commercial districts where heavy traffic and safety issues are of concern. AMR offers multiple benefits including fuel savings, reduction in emissions, reduced time spent reading water meters, enhanced employee safety by eliminating hazards associated with heavy traffic areas and confined space entry, and creation of a "paperless" environment.

Paperless Blue Stake System:

- The Department is responsible for marking all City-owned underground water & sewer facilities prior to commencing onsite or nearby construction activities. The Utilities Department's four Utility Locators perform approximately 17,000 to 20,000 underground locates a year utilizing a paperless notification system in conjunction with the Arizona Blue Stake Center. Utilizing the paperless system saves paper and reduces waste generation.

Water & Sewer Line Replacement:

- The Department continues to seek alternate methods of construction to repair or replace both water and sewer lines. Many of these alternate installation methods utilize trenchless technologies to repair existing pipelines without digging up and the patching the streets. Pipelines are repaired in place using special linings or even by bursting the existing pipe and then pulling a new pipeline in the same alignment of the old pipe. These environmentally sound projects minimize construction effort, reduce the need for new pavement, and are significantly less disruptive to traffic flow and pedestrian traffic.

Wastewater Collections & Irrigation:

The Wastewater Collections and Irrigation Division have taken a proactive approach to ensure environmental stewardship in their daily work practices. Some innovative initiatives include:

- Parking the three large hydro-cleaning vacuor trucks each day at the Field Operations Center rather than driving them back to our base location at West Area Reclamation Facility to reduce fuel consumption, maintenance costs, and drive time.
- Employees are reducing emissions by limiting engine idle times on all gas and diesel engines in the division, and by refueling vehicles in cooler morning hours instead of during the higher temperatures at end of shift.
- Propane is utilized on three pickup trucks as an alternative fuel. Further, crew members are using laptops for daily reports and communications thus reducing paper usage.
- Many employees conserve fuel and energy by carpooling, riding bikes, or using public transit to commute to work each day.