



The Office of Conservation *and* Sustainable Development

- Green Building
- Energy and Climate Change
- Transportation Alternatives
- Waste Reduction and Recycling
- Water Resources
- Urban Nature
- Environmental Health



Sustainability Report 2008 - 2009

2008-2009 Sustainability Report

CITY COUNCIL



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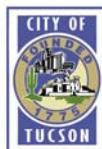
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Highlights From the Director



Office of Conservation and Sustainable Development
(left to right) Jamie Brown, Ann Audrey, Leslie Liberti,
Nicole Urban-Lopez, David Schaller, Lupita Valencia.

As this 3rd Annual Sustainability Report demonstrates, the City of Tucson has had a very exciting and productive 2008 and early 2009 with respect to promoting sustainability both in City operations and in the broader community. The Office of Conservation and Sustainable Development (OCSD) staff has also been working hard to bring resources and tools to residents, businesses, and organizations to help them become more sustainable in their activities, work, and home lives. The following is a sampling of major OCSD projects over the past year.

The official OCSD sustainability website went live in Summer 2008. This site is intended to be a comprehensive and evolving source of information on City programs and activities that promote sustainability, highlights of community partners and local sustainability projects to inspire similar action by others, and tools and resources for greening businesses. The website covers a broad range of topics including: Green Building and Smart Growth, Water Resources, Transportation Alternatives, Waste Reduction and Recycling, Energy and Climate Change, Nature and Food, Social Health and Well-being, Green Jobs and Green Business, and

Environmental Health. Check out the website at www.tucsonaz.gov/ocsd. We are always looking for additional resources, projects, events, and organizations to highlight, so contact us at 791-4675 if you have something you would like to share with the community.

A related initiative is the Green Pueblo Map, developed through collaboration between the City, Pima County, and the non-profit

Inner Connection. The Green Pueblo Map is a celebration of all the assets that make our region sustainable. Everyone is invited to “make your mark” on the map by nominating the sites that showcase the best of the region’s culturally, socially, and environmentally sustainable features. The Green Pueblo Map will be a resource for residents, students, visitors, businesses, and others seeking to learn about the multitude of sustainability assets the greater Tucson area has to offer, and how to make greener, more sustainable lifestyle choices. The map will be continually updated online and a printed version of the map will be available in the future. Become part of the Green Pueblo Community at www.GreenPuebloMap.org.

In 2009, OCSD staff worked with Pima County and the University of Arizona to organize the first-ever Community Conversation on Climate Action for the Tucson region. Tucson was selected to be one of 10 Spotlight Conversations across the nation by ICLEI–Local Governments for Sustainability in an effort to highlight local action on climate change. This event, held on Earth Day, April 22 at the University of Arizona, drew more than 100 community members to talk about how climate change affects

important community aspects such as water supply, affordable housing, mobility, health and food security, and green jobs. The information gathered at this event will be used to inform climate change policies in the General Plan when it is revised in 2010. Powerpoint presentations and information on the event can be found at www.tucsonaz.gov/ocsd/climateaction

OCSD staff also worked with the University of Arizona and the Center for Disease Control to organize a conference on the Health Effects of Climate Change. This event, held in November 2008, covered topics such as climate crisis responses with hope and resiliency, emergency preparedness in the community, and prevention of climate-related health effects through mitigation and adaptation in communities. Designed to stimulate a dialogue between health professionals and public officials, the conference focused on public leaders’ responsibility to become better informed about and move toward planning a response to the impending new community health challenges of climate change.

In March 2009, OCSD staff, in partnership with the Himmel Park Branch Library, hosted the world’s first Sustainability Living Library. This event is part of the global Living Library Network which was developed in Copenhagen, Denmark in 2000 to encourage cultural understanding and tolerance. While hundreds of Living Library events have been held in dozens of countries around the world, OCSD’s event was the first time this format has been used to provide information specifically related to sustainability. Library patrons were invited to “check out” one of 12 experts on hand about a range of topics including Backyard Gardening and Composting, Rainwater Harvesting, Home Water Efficiency, Local Food Choices,

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Healthy Eating Choices, Tips for Using Gray Water at Home, Solar Energy 101, Home Energy Efficiency, Bicycle Basics, Native Landscaping, Mend–Don't Toss, and Your Carbon Footprint. OCSD will be working with other local libraries to host additional Sustainability Living Library events.

In March 2009, the Mayor and Council initiated a Green Jobs program and asked OCSD staff to coordinate a City response to utilizing Federal stimulus money for local green job creation. OCSD has been working with City Departments and numerous community groups and businesses to develop an Energy Efficiency and Conservation Strategy for utilizing the \$5.1 million in Energy Efficiency and Conservation Block Grant funds that have been awarded to the City. Activities that can be supported by this grant include working with local non-profits to undertake home weatherization, supporting energy audits and energy efficiency retrofits in both City and privately-owned buildings, and a range of other programs that can reduce energy use within the community while at the same time promoting job retention and creation. OCSD is planning to implement several new initiatives in the coming year. Two exciting examples are a

Green Business Certification program and a Neighborhood Sustainability program. OCSD staff has been working with Tucson Water, the Environmental Services Department, the University of Arizona, and other entities to develop the Green Business Certification program. These various entities are teaming up to provide evaluations for businesses in the areas of water and energy consumption, waste production, and pollution prevention. After the evaluations, staff will work with business enrolled in the program to voluntarily improve their performance in each of these areas. To assist individual homeowners, OCSD and Prescott College are working to develop a Neighborhood Sustainability program where students in Prescott College's Sustainability degree program will be matched with neighborhoods to provide technical support in evaluating how they can improve the sustainability their neighborhood and implement sustainability strategies at home. The ultimate goal is to identify one or more discrete "green" project ideas that would enhance the neighborhood, and to work with Prescott College students and other partners to assist the neighborhoods with implementation of these specific projects.

OCSD is partnering with the Mayor's Office, the University of Arizona, the Biosphere 2, and other entities to organize and host the first-ever conference on sustainable cities aimed at elected officials and senior administrators from 75 cities in the Four Corners states. The goal of the Four Corners Summit on Sustainable Cities, to be held next spring, is to bring policymakers and leading scientists together to share the latest understanding of the challenges of climate change, to learn of emerging trends in technology and best practices, and to develop common ground for achieving sustainable communities across the region.

Finally, I would like to extend my sincere gratitude to the wonderful OCSD team that has made all of these great projects a reality. Thanks Ann, David, Jamie, Lupita, and Nicole!



Leslie F. Liberti, Director
Office of Conservation and
Sustainable Development





US Mayors' Climate Protection Agreement

The Kyoto Protocol is an international agreement to address climate disruption by setting a goal of reducing global warming pollution levels to 7 percent below 1990 levels by 2012. The Kyoto Protocol went into effect on February 15, 2005 in the 141 countries that had ratified the agreement. In response to the United States government's failure to sign on to the Kyoto Protocol, mayors from around the nation signed the U.S. Mayors Climate Protection Agreement urging the federal and state governments to enact policies and programs to meet or beat the Kyoto reduction target, and urging the U.S. Congress to pass bipartisan greenhouse gas reduction legislation that includes clear timetables and emissions limits, and a flexible market-based system of tradable allowances among emitting industries.

On September 6, 2006 the Tucson Mayor and Council adopted the Mayors' Climate Protection Agreement, becoming one of more than 900 cities that have signed on to date. To date, nine other Arizona cities have joined Tucson in signing the Mayors' Climate Protection Agreement.

The signatory cities agree to take action in their own operations and communities towards meeting or exceeding Kyoto Protocol targets for reducing global warming pollution, including efforts to:

- Inventory global warming emissions, set reduction targets and create an action plan.
- Reduce sprawl, preserve open space, and create compact, walkable urban communities.
- Promote transportation options to single-occupant car use.
- Increase the use of clean, alternative energy.
- Improve municipal energy efficiency.
- Purchase only Energy Star equipment and appliances for City use.
- Practice and promote sustainable building practices, such as through the LEED program.
- Reduce fossil fuel consumption by the municipal fleet.
- Increase pump efficiency in water systems.
- Increase recycling rates.
- Maintain urban green space and promote tree planting to increase shading and to absorb CO₂.
- Educate others about reducing global warming pollution.

The City, in conjunction with Pima County and the Pima Association of Governments, completed an updated Greenhouse Gas (GHG) Emissions inventory for both City of Tucson internal operations and the community at large in October 2008. The inventory was the first conducted anywhere in the region since 1998 and provides the baseline data from which the City and other regional governments can build their respective Climate Action Plans.

City of Tucson SustainLane Ranking

In 2008, SustainLane released its sustainability rankings of the 50 largest U.S. cities using a number of sustainability factors. Overall rankings were determined by averaging 16 areas of urban sustainability: City Commuting, Metro Public Transit, Metro Congestion, Air Quality, Tap Water Quality, Water Supply, Solid Waste Diversion, Planning/Land Use, City Innovation, Housing Affordability, Natural Disaster Risk, Energy/Climate Change Policy, Local Food and Agriculture, Green Economy, Knowledge Base, and LEED (Green Buildings).

According to SustainLane, "The 2008 US City Rankings of the 50 most-populous cities is the nation's most complete report card on urban sustainability. The rankings explain how people's quality of life and city economic and management preparedness are likely to fare in the face of an uncertain future."

How Did Tucson Score?

- Tucson's overall score was 55.86 (Cities ranged from a high of 90.13 to a low of 64.85 out of 100)
- Tucson ranked 22nd overall
- Tucson ranked 2nd among six desert cities highlighted because of our unique issues with water supply.

The complete 2008 SustainLane rankings with methodology and 50 individual City scores can be viewed at <http://www.sustainlane.com/us-city-rankings/>.



Framework for Advancing Sustainability

In 2008, Tucson's Mayor and Council formally established a Framework for Advancing Sustainability, a document that identifies for the first time the vision and guidance necessary for developing a comprehensive sustainability program for the City of Tucson. The City of Tucson is committed to sustainability – to finding ways to transition from the economic, environmental, and social stress of a fossil fuel-dependent society to a more stable, secure, and healthy community where we celebrate and live in balance with our desert environment. The City commits to improving the health of the environment and community in a time of uncertainty and challenge brought about by global climate change. The Framework is available on the OCSD web site at <http://www.tucsonaz.gov/ocsd>.

The Framework creates three major focus areas where sustainability initiatives will occur:

- 1) Practices – improving internal operations of the City to achieve a sustainable organization and model sustainable practices
- 2) Policies – incorporating sustainability principles and goals into plans, regulations, funding decisions, and policies that affect the broader community, and
- 3) Partnerships – working with other entities and the community at large to address those issues that require community-wide action, such as the response to climate change.

Under each focus area, the Framework details:

- Broad goals concerning the values the City wishes to promote
- Specific policy guidance from Mayor and Council
- Targets indicating desired long-term performance within the focus area
- Initiatives to address each element of Mayor and Council policy guidance, and
- Potential quantitative success indicators for each initiative

Climate Change Citizens Advisory Committee

An important component of the Framework is the creation of a Climate Change Committee. The Committee serves several important functions. First, it brings with it broad, high-level skill sets, expertise and vision necessary to address the multiple dimensions of climate change in a strategic manner on behalf of the City. The Committee also represents key stakeholder groups that will contribute to the broad climate change and sustainability work that needs to be undertaken over the long term.

Among the Committee's principal functions is to develop a Climate Change Mitigation and Adaptation Plan (MAP) that includes recommendations to achieve the City's greenhouse gas reduction commitments along with strategies and action steps needed to prepare for both the direct and indirect effects of climate change on the City's infrastructure and operations, as well as its ecological, economic, and social capital.

Thirteen areas of expertise and stakeholder groups are represented on the Climate Change Committee: climate change science, sustainable land use/transportation, architecture and sustainable design, community grass roots efforts, urban green space/urban heat island mitigation, low-income representation, local economy, workforce advocacy/training, social services, small/local business, neighborhood advocacy/support, human health, and food security.



Green Building

Green Building designs make our community more sustainable by reducing resource consumption and resulting greenhouse gas emissions, and by creating healthier places to live and work. Green building designs include energy efficiency, an area in which the City has been a leader for decades. In 1998, the City developed and adopted the Sustainable Energy Standard (SES) for all new City buildings. In 2006, Mayor and Council adopted a Leadership in Energy and Environmental Design (LEED) Silver or higher rating for all new City buildings and any renovations greater than 5,000 sq. ft. By applying the LEED standard, the City has expanded green building requirements for City buildings to include water conservation, waste reduction, and consideration of sustainable site design, indoor air quality, and use of recycled and sustainable materials.

Leadership in Energy and Environmental Design (LEED)

Since adoption of the LEED Silver standard, the City has completed one Gold and one Platinum building, and has ten Registered LEED projects. The following projects are under design, construction, or have been completed at the LEED Silver level or higher during the past year.

- **Fire Station #22** was designed as the City's first LEED Silver certified building and is now in service. When, however, all the efficiency, conservation, sustainable and quality elements were added together, Fire #22 was actually awarded at the **LEED Gold** level.

- **The Reid Park Zoo Conservation Learning Center** was officially awarded **LEED Platinum** in December 2008. Features include solar panels, highly efficient heating and cooling systems, recycled and sustainable construction materials, and rain water harvesting. The building is 10,000 square feet and demonstrates the best in sustainable construction techniques to zoo guests.

- Construction on the **Fire Central Building** continues with its chilled water connection to the District Heating and Cooling Plant, solar water heating, energy efficient lighting, and high efficiency air conditioning. This project is pursuing LEED **Silver**, but may achieve a Gold rating.

- **The Sun Tran Bus Storage and Maintenance Facility** is over 50% complete. In October 2009, \$16 million in Federal Stimulus construction funds should provide for expanding the Facility's capacity from 150 to 250 buses. The project includes: 34 kW of solar power generation capacity; reuse of all water from bus washing operations; extension of reclaimed water to the site for irrigation; use of water efficient native landscaping and related conservation measures; waterless urinals and sensor faucets; Cool Communities guidelines to reduce Urban Heat Island effects from the expanse of rooftops and paving required at the site; building furnishings, carpet and paint with low emissions of volatile organic compounds; natural day lighting to reduce electrical lighting; provision of on-site stormwater harvesting basins; use of 50% certified Forest Stewardship Council wood; and use of other building materials that have a 20% post industrial content. With all of these elements, the project is pursuing a



- Design has begun on the new entrance facilities project for the **Los Reales Landfill**. The new facility will be built on an 80-acre parcel located north of the existing landfill. A drop-off center for residents will include expanded options for recycling, household hazardous waste disposal and waste diversion. The new entrance facilities are currently being designed to achieve LEED Silver Certification. In particular, the administration building is being designed to showcase recycled content beyond the requirements of LEED to the greatest extent feasible. Some of the highlights of the LEED points being sought are as follows: crushed glass from the Los Reales stockpile will be used for paving sub-base, concrete flatwork accents, and concrete countertops. Finished materials throughout will either be sourced with recycled content or from rapidly renewable materials. Solar hot water panels will augment water heating and low flow fixtures will reduce the amount of potable water used. Rainwater will be collected in cisterns and used for

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irrigation to further offset water demands. Clerestories have been designed to achieve day-lighting. A learning center and demonstration garden will allow the facility to educate schools and citizen groups about the need for recycling and how ES is addressing the need every day. Water run-off from the Recycle and the Self Haul Pavilions will be captured and used for dust control on the landfill face.

- The design for a 55,000 square foot **Tucson Police Department Crime Lab** is underway. The new facility will provide a laboratory and offices for 84 employees and should be completed by early 2011. The facility will be designed and subsequently constructed to meet the City's requirement of LEED Silver at a minimum. As such, it will feature day lighting, energy efficient air conditioning, water use reduction, water harvesting, and the use of solar energy is being considered.

- Design for the **El Pueblo Activity Center and the Clements Senior Center** expansions are under way. These projects will meet LEED Silver standards at a minimum.



Other Green Building Projects

- The restrooms at **La Madera Park** include a number of green building elements, such as solar panels for lighting, gray water collection system for use in a new community garden, use of glass block for day lighting, motion sensor light actuation, dual flush, ultra low-flow toilets and waterless urinals, reclaimed water is used for toilet flushing, and the building is shaded by newly planted native trees.

- The **Julian Wash Linear Park** now includes active and passive water harvesting, depressed landscape areas, a ramada with a rain collection system for use in the wildlife viewing area and installation of 200 burrowing owl habitats. This project is currently in the permitting process.

- A **Mountain Master Plan** and Site Improvements include passive water harvesting, solar panels on ramadas, and composting toilets.

- **Affordable Housing:** There are 45 affordable housing units currently under design or construction that will meet Pima County's Green Building standards, some of which will be owned by the City. An additional 56 units are being built to meet LEED standards and all single family homes built with HOME funds from the City must meet the TEP Energy Guarantee Program.

2008 Policy Highlights

In addition to being a leader by adopting LEED standards for internal operations, Mayor and Council adopted a number of new requirements to encourage the use of green building elements throughout the community.

- The Residential Gray Water Ordinance amended the International Residential Code to require the installation of gray water "stub-outs" in all new residential construction beginning on June 1, 2010.
- The Commercial Rainwater Harvesting Ordinance requires all new commercial development to prepare a landscape water budget and supply 50% of the landscape water needs with harvested rainwater beginning on June 1, 2010.
- The Residential Solar Readiness Ordinance requires all newly constructed residences to be solar ready for the installation of a system that utilizes solar energy to provide electrical power and hot water heating beginning on March 1, 2009.



Energy and Climate Change

The City is working to promote energy conservation, improve energy efficiency and increase the use of renewable energy in City buildings and operations to meet the goals of the Mayors' Climate Protection Agreement. In October 2008, the City completed the first Regional Greenhouse Gas Emissions Inventory since 1998. The inventory includes a sub-set of data that captures greenhouse gas emissions resulting from City government operations. This information is guiding City planning efforts to reduce energy-related greenhouse gas emissions. The City government facility electricity use decreased by 29% between 2000-2007. The City government-generated greenhouse gas emissions decreased from 240,201 in 2000 to 225,632 CO₂e in 2007, a 6% decrease overall.

Improvements in Energy Efficiency

- The City participates in the **Energy Star Challenge**, sponsored by the US Environmental Protection Agency. In 2008, all of the City's facility energy data was made available online and, where possible, historical energy data continues to be entered into the Energy Star Portfolio Manager to track City facilities against a national benchmark for comparable buildings.
- The General Services Department initiated an internal **Energy Conservation Committee (ECC)** in August 2008 to coordinate building-related energy cost reductions across all departments. The ECC has



met monthly to share ideas for both cost and energy reductions. Several examples of where departments have initiated changes include: Energy Reduction Challenge for all the Fire

What is CO₂e?

CO₂e stands for Carbon Dioxide Equivalent. This is a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential. For example, 1 ton methane has 23 times the greenhouse gas effect of carbon dioxide. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O₃), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).

Department stations, Energy Performance Contract energy analysis at the Tucson Convention Center, and Information Technology guidelines for turning off unused computers and peripheral equipment.

- In December 2008 the City Manager's Office established a standard for City of Tucson building heating and cooling temperature ranges and other building energy conservation measures aimed at saving approximately \$150,000/year.
- **Energy audits** were completed for the Quincie Douglas Neighborhood Center, Ward III Office, Ward VI Office, and for the Golf Links Police Station & Library.



- **Energy-efficient retrofits** included an HVAC upgrade at La Entrada (Tucson Water) to reduce electricity usage by 20%, and a control upgrade at the compressed natural gas (CNG) fueling station to reduce compressor energy use by approximately 20%.

Solar America City

Tucson was awarded a Solar America City in 2007 and was selected to host the first Solar America Cities National Conference in April 2008. Representatives of the U.S. Department of Energy, which is funding part of our **Tucson Solar Initiative**, and all of the 25 Solar America Cities, met in Tucson to discuss new developments in reducing barriers to expanding solar deployment. Working with the Pima Association of Governments (PAG), The University of Arizona's Research Institute for Solar Energy (AzRISE), and the Clean Energy Corporation (CEC), we released a **Greater Tucson Solar Development Plan** in early 2009, available at: www.pagnet.org

AWARD

In September 2008, our Tucson Solar Initiative was honored to receive the **Governor's Excellence Award for Leadership in Energy Efficiency** at the Arizona Rural and Regional Development Conference.

Solar Energy Projects

The City to date has invested more than \$1.78 million in solar energy projects – approximately \$1.12 million



in City funds, \$380,000 in utility rebates and in-kind support, and \$280,000 in private financing. Currently, the City has installed eight photovoltaic (PV) systems with a combined 220 kW peak capacity rating, five solar water heating systems, a solar outdoor lighting system, over 250 solar-powered bus stop shelters, solar-powered data acquisition systems for remote well sites, solar-powered traffic hazard signals and numerous day-lighting systems.

- **The Reid Park Conservation Learning Center** was officially awarded **LEED Platinum** in December 2008. Features include a 15 kW photovoltaic system, a solar hot water system, highly efficient heating and cooling systems, and extensive day lighting that will provide over 20% of the building's energy needs.

- In early 2009, the City placed \$7.6 million of **Clean Renewable Energy Bonds (CREBs)** to finance construction of seven new City solar photovoltaic (PV) projects which will be completed in late 2009. The projects will be located at the Public

Safety Training Academy, El Rio and El Pueblo Neighborhood Centers, the City's Information Technology Building downtown, the Parks Store warehouse in Reid Park, and at two Tucson Water sites - the Hayden Udall CAP plant, and the Roger Road Reclaimed Reservoir. Together these projects will add approximately **1 megawatt (MW)** of solar electric capacity to the City. These projects will demonstrate new-to-Tucson solar equipment and help the City reduce its greenhouse gas emissions.

- Tucson Water and the General Services Department's Energy Office worked together to develop an additional **1 MW** solar project at the **Central Avra Valley Storage and Recovery Project (CAVSARP)**. This project is expected to come online in late 2009. Through a power purchase agreement (PPA), a third party will own and operate the solar system, and the City will buy set-price power under a 20-year contract. Possible expansion to 5 MW in 2010 is also



being considered. Federal tax incentives, Arizona's Renewable Energy Standard and Tariff and partnerships with Arizona Electric Power Cooperative and Trico Electric Cooperative have been key for the project's success.

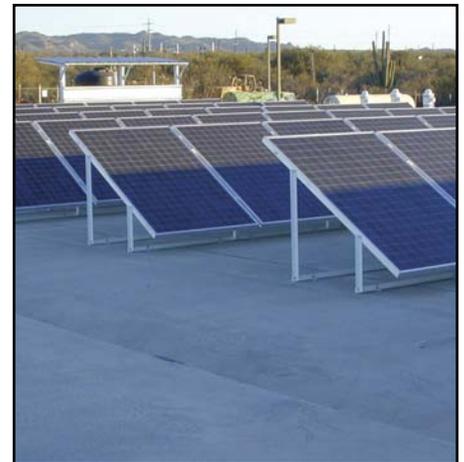
- Tucson Water and the Energy Office have also partnered to add a total of **340 kWdc** in photovoltaic solar electric capacity at two sites - **Hayden Udall Water Treatment Facility (HUWTP)** and **Roger Road Reclaimed Water Treatment Plant**

AWARD

Tucson was selected as one of 10 communities nationally to host a **"Spotlight Conversation on Climate Action"** by ICLEI-Local Governments for Sustainability. The community event was hosted in partnership by the City of Tucson, Pima County, and The University of Arizona and engaged over 100 community members in the City's climate change planning process.

(RRWTP). Both sites will remain grid-connected, and the system will supply a portion of the energy required at the sites. CREBs financing, renewable energy incentives for distributed systems from the utility (TEP), and utility-grid energy cost avoidance will pay for the installations and provide an additional savings over their life cycle.

- **Future plans:** The City hopes to locate financing for solar electric and solar water heating projects at additional City sites, including buildings, closed landfills, and other locations in 2010 to continue to expand our solar portfolio.





Methane Gas to Energy

Methane gas produced at the **Los Reales Landfill** is being piped to Tucson Electric Power (TEP) Company's Irvington Road Plant where it is being burned to generate 6,000 kWh of electricity per year, enough energy to power 5,500 homes on a continuous basis. During 2008, the use of landfill gas has allowed TEP to avoid burning approximately 11,000 tons of coal. TEP was able to reduce sulfur dioxide emissions by more than 120 tons and avoid the production of more than 15,000 tons of carbon dioxide. Since the project began in 1995, over 190,000 tons of greenhouse gases have been reduced. As the landfill expands, the gas-to-energy system will also be expanded.

Los Reales is expected to remain an active landfill for 60 years but the landfill gas produced will continue to be available to generate electricity for an additional 40 years after that.

- The Environmental Services Department (ES) is currently seeking proposals from qualified offerors to finance, design, build, commission, own, operate and maintain a 540 kWh landfill gas-to-energy electricity generator on City-owned land within the footprint of the closed **Vincent Mullins Landfill and the Udall Park Recreation Center**. It is the City's intent to use the electricity produced to power the recreation center with any excess being sold back to Tucson Electric Power (TEP).

Additionally, it is the City's intent to use the heat produced by the gas-to-energy generator to heat the Udall Park Recreation Center swimming pool facility, thereby eliminating the use of natural gas onsite.

In addition to the landfill gas to energy generator, the City is seeking proposals offering an optional photovoltaic (PV) system on the site. Should the City elect to exercise the photovoltaic option, the successful offeror would finance, design, build, commission, own, operate and maintain the system. The PV system will be installed on the customer (City) side of the master meter through which TEP powers the Udall Park Recreation Center.

- ES is also seeking a contractor to finance, design, build, commission, own, operate and maintain a 540 kWh landfill gas-to-energy electricity generator system at the **Harrison Landfill**. The site for the gas-to-energy system will be City-owned land within the footprint of the closed Harrison Landfill. The electricity will be generated and sold back to the TEP grid. An interconnect study with TEP has been completed and approved for the project. The system will comply with TEP requirements for distributed generation.

2008 Policy Highlight

The **Residential Solar Readiness Ordinance** requires all newly constructed residences to be solar ready for the installation of systems that utilize solar energy to provide electrical power and hot water heating beginning on March 1, 2009.



Transportation Alternatives

The City has invested in planning for and the implementation of transportation improvements that promote a livable community. These improvements are more environmentally sensitive in design and offer greater alternative transportation options. The City has also committed to reducing fossil fuel consumption by increasing the use of alternative fuels in the City fleet and buses and by educating the community about the need for and availability of alternative transportation options.

Transportation Improvements and Planning

The City's Department of Transportation continues to look for opportunities to include water harvesting, drought-tolerant native plants, the preservation of green spaces, street trees, rubberized asphalt, and pervious materials for pathways, sidewalks and bike lanes throughout the design and construction of its projects. The **Neighbor-hood Traffic Management** program improves the quality of neighborhoods by using street trees and landscaping as part of the traffic control system.

The Mountain Avenue – Roger Road to Ft. Lowell Road Improvement project is a continuation of the Mountain Avenue Demonstration Project. This \$12 million project, which began construction in October 2008, will construct curbs, sidewalks, bike lanes, drainage facilities, street lights, and landscaping. A traffic calming element was added to this project after consultation with the area residents, who stated they would like to keep a rural feel to the roadway.



Construction of the **4th Avenue Underpass** at the Union Pacific Railroad is scheduled for summer 2009. When completed, this underpass will serve vehicular and alternate modes traffic, including tracks for the upcoming Modern Streetcar. The 4th Avenue project will feature a 20-foot wide sidewalk on the south side, a 10-foot sidewalk on the north side, and will provide a vibrant pedestrian linkage between the 4th Avenue retail area and Downtown.



Several RTA-funded corridor projects are underway which utilize a **"context sensitive solutions" (CSS)** approach to roadway planning. CSS seeks to balance safety, mobility, community, and environmental goals; involves stakeholders early and continuously; addresses all modes of travel; and applies design flexibility into roadway design. Through this process, land use planning is integrated with roadway planning. For example, the Grant Road project will include a land use planning element that will be adopted as part of the City's General Plan and will provide form based guidance for future development.



The **Oracle Area Revitalization Plan** focuses on encouraging reinvestment and redevelopment in an older, high crime area of the city. Visioning workshops with neighbors, business, institutions, and developers have revealed an interest in "new urbanism" principles such as green building development, mixed uses, better pedestrian and transit access to downtown and the community college campus, and use of water harvesting methods in conjunction with landscaping.

Regional Transportation Authority Plan (RTA)

Over the next 20 years, the **Regional Transportation Authority (RTA)** Plan dedicates nearly \$533 million for transit enhancements, including expanded hours of service, new service areas, greater weekday frequencies, more express service, and a fleet expansion to 280 buses. The plan also includes \$45 million for **Wildlife Linkages** that will help alleviate the potential for new roads and reduce the impact of existing roads to act as barriers to wildlife. In addition to fixed route improvements, the RTA funds expansion of Sun Van, the City's paratransit system, neighborhood circulators, and a modern streetcar to enhance mobility between the downtown and university areas.

Sun Tran and Sun Van

100% of Sun Tran's fleet of 226 buses utilizes cleaner-burning fuels. Currently, 141 buses are using biodiesel and the remaining 89 buses

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utilize compressed natural gas (CNG), both of which emit fewer particulates than traditional diesel-fueled vehicles. The use of these alternate fuels is expected to displace approximately 250,000 gallons of petroleum product in 2009. 100% of Sun Van's 119-vehicle active fleet also runs on biodiesel.

All Sun Tran buses now have bicycle racks on them that hold two bikes.

Sun Tran implemented the first RTA-funded fixed-route improvements in fall 2006, when additional buses deployed on key routes helped to relieve a portion of the overcrowding. In 2007 and 2008, Sun Tran implemented later weeknight evening service on 21 routes and expanded weekend service hours along 23 routes. Also in 2008, Sun Tran purchased 36 new BRT-style express buses and 11 new low-floor buses that run on biodiesel fuel.



In early 2009, Sun Tran launched three new weekday express bus routes funded by the RTA. Route 107X serves Oro Valley to Downtown, Route 203X serves Oro Valley to Raytheon, and Route 110X provides service between Rita Ranch and Downtown. A new temporary park-and-ride facility was built in Rita Ranch to serve as the terminus for the 110X. It accommodates 82 parking spaces. The Town of Oro Valley also constructed a new park-and-ride to serve riders on routes 107X and 203X. It is located near Rancho Vistoso Blvd. and Innovation Park Drive and accommodates 103 vehicles.

Other Transportation Alternatives

The **Tucson Modern Streetcar Project** is moving forward in its pursuit of federal funding through the FTA New Starts/Small Starts program. A draft Environmental Assessment was completed in late 2007 and a finding of no significant impact was issued in February 2009. While pursuing federal funding, the project team has also started the procurement process for modern streetcars. Revenue service is estimated to begin in late 2011. Tucson's modern streetcar will bring with it a great potential for transit-oriented development, creating community areas that could include retail, commercial, cultural, non-profit, office and living spaces that are compact and rely heavily on transit systems for mobility.

The **City Cycle Bike-Sharing** program offers City of Tucson employees an easy and healthy option for traveling to appointments around the downtown area. The federal Department of Transportation program includes: 20 easy-to-use basket-equipped bikes; helmets, locks and other safety equipment, easy check-out at 8 locations and a quick online bike safety refresher course. Over 700 City Cycle trips have been recorded, replacing at least 366 vehicle trips. According to the EPA, this program has prevented more than 1,026 lbs of CO2 from entering the atmosphere.

The Tucson Police Department has 36 operational bikes in service. An additional 14 bikes are kept as spares or used for training. City Parks and Recreation staff uses 2 bikes for transportation around Randolph Park and to/from adjacent ball fields while Zoo Administration staff use another 6 bikes to move around the Zoo complex.

Infrastructure for Bicycles

Tucson's first **Bike Box** was added at the intersection of 6th St. and

Highland Ave., moving the vehicle stopping point 12 ft. behind the crosswalk and allowing bicyclists to get safely across the intersection without competing for space with vehicles when the road narrows on the southside of the intersection.

The Tucson region now offers 630 miles of striped bike paths, 72 miles of shared use paths, and over 100 miles of residential bike routes.



AWARD

Gold Level Bicycle Friendly Community

In 2006 the entire Tucson/Eastern Pima County region received a **Gold Level rating as a Bicycle Friendly Community by the League of American Bicyclists**. The region's Gold rating was upheld in 2008, and remains the only region in the nation to receive this rating. The award was based on our ability to meet and excel in the following five criteria:

- 1) Encouragement of bicycle riding and use.
- 2) Engineering to provide facilities for biking such as bike lanes and parking.
- 3) Education to enhance safety of cyclists.
- 4) Enforcement of violation in bike laws, which jeopardizes safety.
- 5) Evaluation and Planning of areas where improvements can be made.

Alternative Fuels in the City Fleet

In 2008 over 256,000 gallons of petroleum product were displaced by the use of alternative fuels. The City of Tucson's Fleet Services Division is committed to continuing its efforts towards reducing green house gas emissions and the reliance on foreign oil by expanding the use of domestically produced alternative fuels. It is projected that the amount of alternative fuel usage will continue to grow



as the number of vehicles using it increase and dispensers are changed over from conventional to alternative fuels. There are three types of alternate fuels that the City presently uses:

• (E85) Ethanol

The City's Fleet Services division manages 220 Flex Fuel vehicles (up from last year's total of 85). Last year over 16,800 gallons of E85 were dispensed at City fuel sites. Fleet Services added two new E85 fueling locations with the Eastside Service Center in June 2008, and the Midtown Fuel Island (Reid Park) in February 2009, for a total of three E85 fueling stations. A fourth location is slated to open at the Northwest Fuel Site in August 2009. With additional fueling locations and flex fuel vehicles being put into service, E85 usage is projected to have a substantial increase in calendar year 2009.

• (B20) Biodiesel

Currently there are over 460 Fleet Services-maintained vehicles using biodiesel. In 2008, these vehicles

consumed approximately 1.1 million gallons of B20. 93% of all diesel fuel now used is B20. There have been no reported performance or maintenance problems associated with the use of this cleaner burning diesel fuel. To help promote biodiesel, Fleet Services continues to provide access to this fuel to the University of Arizona for use in its Cat Tran shuttle-buses.

• (CNG) Compressed Natural Gas

Currently 79 Fleet Services-maintained vehicles use CNG. In 2008, the City's CNG plant produced approximately 1,517,000 equivalent gallons of fuel, out-of-which approximately 16,600 gallons were consumed by CNG vehicles. Due to its lower cost and the City's pre-existing CNG fueling infrastructure, vehicles of this fuel type are constantly being evaluated for purchase when made available by vehicle manufactures.

BikeFest and Clean Air Days

Local agencies and businesses concerned about air quality, wellness, changing behaviors, and reducing traffic congestion organized 40 events in April to promote the use of alternative modes of transportation during this year's Clean Air Days & Bike Fest. These events encourage everyone to drive less and carpool, walk, bicycle, or take the bus to improve our quality of life and health. This annual event included Bike 2 Work week where the City coordinated with Ward offices, local businesses and



non-profits, the Town of Oro Valley, Town of Sahuarita, and the University of Arizona to host eleven Bike 2 Work Stations throughout the Tucson Metro Area. These public events featured safety information, give-a-ways, demonstrations, tune-ups, and a free continental breakfast.

To encourage bike commuting, this year the City hosted a Bike Commuter Challenge where bike commuters logged their trips on the PAG RideShare website. This year, 320 commuters together in one month traveled 28,435 miles on bikes and made 5,620 bike trips. By shifting their mode they offset:

- 608 pounds of CO₂
- 88 pounds of nitrous oxide (N₂O)
- 64 pounds of volatile organic compounds (VOCs)
- A total of 25,309 pounds of greenhouse gases





Waste Reduction & Recycling

Transporting and managing waste requires the use of energy and valuable water resources. Reducing the waste we put into this system will reduce the load on our landfill system, the last resource to get rid of unwanted materials, giving it a longer useful life expectancy, and will conserve energy and water resources. Waste reduction requires a multi-pronged approach involving a reduction in the amount of waste that is generated, promotion of recyclable materials, education and outreach efforts to increase recycling rates, and the use of recycled materials in City operations. Besides the savings in natural resources and the reduction in the carbon footprint, our local economy benefits from many activities related to keeping objects and materials out of the landfill.

Tucson Recycles and Waste Diversion

The citywide implementation of Tucson Recycles began in July 2002 and was fully implemented by February 2003. In 2008, the Environmental Services Department (ES) - in partnership with other City agencies and the public at large - made substantial progress in increasing the availability of recycling opportunities in City facilities and public events while simultaneously moving toward a more efficient operation.



- Between 2003 and 2008 more than a **250,000** tons of materials have been diverted from the landfill through recycling.
- Since its inception, the blue barrel residential collection program has had an increase in participating households from 55% to the current 85%.
- Waste diversion has increased from less than 9% to 21%.

- The City also collects recyclables from commercial accounts and now has 15 Neighborhood Recycling Centers (drop-off sites around town for use by small business and apartment dwellers).
- Last year Tucson Recycles collected just over 45,000 tons of material and the sale of the recyclables earned the City over \$2.2 million.
- The 45,000 tons of recycled material led to greenhouse gas (GHG) reduction of about 109,000 metric tons of carbon dioxide equivalent (CO₂e). This is equivalent to the GHG reduction achieved when removing 24,000 passenger cars from the road for one year.
- In 2008, Tucson Recycles expanded to the Tucson Convention Center, almost all of the Parks and Recreation facilities, the Sunnyside and Canyon View Little Leagues, and the Food City Soccer Tournament held at Jacobs Park and Ochoa Park.

- The annual Christmas tree recycling program, Tree Cycle, collected over 20,000 trees.
- Over 1,351 tons of scrap metal were collected at the landfill for recycling.
- 7,631 tons of clean yard debris were collected at the landfill, mulched, and used for erosion control on the landfill slopes.
- More than 47 tons of computers were dropped off at the landfill for reuse or recycling.



- The City delivered over 236 tons of used tires to the Pima County Tire Recycling Program
- Approximately 5 tons of electronics waste was collected at a special electronics recycling collection day held in partnership with Tucson Clean & Beautiful as part of the Make a Difference Day events.
- Tucson Clean & Beautiful assists with a project to donate used trash barrels that no longer conform to present service standards and must be replaced, to the municipalities of Nogales and Agua Prieta, Sonora and Naco. These communities arrange to periodically pick up and transport the used, damaged containers for several more years of use as shared trash containers in their communities. This enables the City of Tucson to avoid the environmental and financial impact of disposing of these items at a landfill. Since 2005, over 4,500 used containers have been donated to these communities for their reuse.

Household Hazardous Waste

- Over 35,000 people participated in the HHW program in 2008.
- Over 741 tons of household hazardous waste was collected through the HHW program. About 98% of this material was reused or recycled.

Continued

Do More Blue

Discover all you can Blue at DoMoreBlue.com or call 791-5000.

City of Tucson Environmental Services **tucsonrecycles**

- The Drop & Swap program returned close to 25,000 items to the community for reuse, including over 23,000 gallons of latex paint.
- Over 56,000 pounds of waste were collected from small businesses through the SBWAP for proper disposal.
- 177 program volunteers contributed close to 1,600 service hours at various collection and outreach events.

Education and Outreach

- ES partnered with the Environmental Education Exchange to provide 378 presentations to 8,913 students in 83 different Schools.

- The Tucson Clean & Beautiful “E Pluribus Recycles!” interactive play reached approximately 6,500 students in the Tucson metro area this past year as part of the overall TucsonRecycles education program. Teachers may contact Tucson Clean and Beautiful to schedule a presentation
- In partnership with Tucson Clean and Beautiful, reuse and recycling information was provided to 6,525 persons through the bilingual 791-5000 Recycling Info Line and the Reduce-Reuse-Recycle Directory Booklet was updated online receiving over 12,000 visits last year.

- ES delivered “Recycle the Right Way” bilingual door hangers along with the Brush & Bulky collection notices, in areas identified as having either a high rate of contamination of recyclables with garbage or a high resident turnover rate.
- In partnership with Recycle America, ES conducted 14 tours of the Materials Recovery Facility, allowing 258 persons of all ages to see the actual sorting, baling and shipping of the recyclables.
- Began the **Do More Blue** campaign in November 2008. The willingness of many local media personalities and businesses to participate in this recycling outreach project indicates that there is awareness about the benefits of recycling and a commitment to its success.



2008 Policy Highlight

The Plastic Bag Recycling Ordinance, adopted by Mayor and Council March 24, 2009, requires most grocery stores that provide plastic carry-out bags to their customers to offer onsite collection of plastic carry-out bags, to recycle carry-out bags collected, and to provide reusable carry-out bags for purchase as an alternative to plastic carry-out bags, among other requirements.



Water Resources

Water is our community's most valuable resource, not only for the vitality of the city, but as an important element of the integrity of our greater desert ecosystem. Ensuring our future water supply means that we must engage in conservation efforts today. The City's commitment to smart water management involves comprehensive planning to meet the long-term water supply needs of the community, coupled with a strong water conservation program. The City is working hard to achieve these goals, and to reach our shared vision of an assured, clean water supply balanced by a strong commitment to water conservation for the overall health of our ecosystem.



Water Resources Planning

• Regional Water and Wastewater Infrastructure, Supply and Planning Study

The City of Tucson Mayor and Council and the Pima County Board of Supervisors initiated a multi-year study of water and wastewater infrastructure, supply and planning issues in 2008. The ultimate goal of this effort is to assure a sustainable community water source given continuing pressure on water supply caused by population growth. The initial focus of the study is to identify and agree on basic facts related to the condition and capacity of water, wastewater and reclaimed water infrastructure, and the ability of the infrastructure to accommodate existing and future population within the city and county service areas. Visit www.tucsonpimawaterstudy.com for more information.

• Long-Range Water Resources Plan

Tucson Water provided its 2008 Update of Water Plan 2000-2050 to



Mayor and Council in early 2008. A subsequent update will be provided when updated spatial population projections are developed for the Long Range Planning Area. This update will also account for recent reductions in per capita potable water use when making water demand projections and potential opportunities to acquire additional supplies to increase supply reliability in future years.

- Expanding use of Colorado River water allows the community to reduce the over drafting of its finite groundwater resources. In late 2008, the **Southern Avra Valley Storage and Recovery Project** was completed and is now operational. With this addition, the total recharge capacity of Clearwater facilities has been expanded to approximately 175,000 acre-feet per year. This provides the City with sufficient recharge capability to fully utilize its entire annual Central Arizona Project (CAP) allocation of 144,172 acre-feet as well as store (bank) additional water underground in the aquifer which can be recovered in times of future need.

Drought Preparedness

Drought planning is a way of formally preparing for climate change, so it is not really possible to plan for drought without taking climate change into consideration. Climate change planning includes the consid-

eration of the rate, amplitude, and socioeconomic impacts of such change. The implications of climate change have been considered in recent planning, and will become formalized in updates to the Drought Plan in the future.

The City of Tucson Water Department's **Drought Preparedness and Response Plan (Plan)**, adopted by Mayor and Council in December, 2006, is now available in CD form and may also be downloaded from the Tucson Water website. The Plan includes an annual assessment of drought impacts on the City's water supplies and water system and a recommendation as to which, if any, drought response stages the City should implement.

Water Conservation Program

Tucson Water continues to support wise use of water throughout all sectors of the community. Water use continues to drop, with residential water use dropping to 99 gallons per capita per day. In 2008, Mayor and Council authorized a Conservation Fee to be assessed of all water users, establishing the initial charge at .03¢ per ccf. Revenues collected through the Conservation Fee will be used to fund all aspects of the Conservation Program. Approximately \$1.5 million dollars are projected to be generated in FY09 from the new fee.

Continued

Community input on the Community Conservation Task Force (CCTF) recommendations for conservation programs was completed in 2008.

With funding support established through a new Conservation Fee, Tucson Water initiated the first of 19 programs scheduled to be phased in over a five-year period. There is a 7.5% long-term reduction in water use expected from the implementation of these measures. The new programs introduced in 2008 include:

- **High Efficiency Toilet (HET)**

Rebate programs for residential, commercial, and multi-housing customers. In the first six months, 108 rebate applications were submitted.

- **Commercial Customer Rebate** program for assisting with irrigation system upgrades.

- Tucson Water entered into a partnership with Southwest Gas, and ADWR to distribute **water efficient pre-rinse spray valves** to commercial and institutional kitchens in the Tucson Water service area. In the first six months, 20 valves were installed in kitchens.

- **WaterSmart Business Program**

The Business Incentives Advisory Group was established in 2007 to help develop a program to assist the business community with increasing their efficiency of water use. In 2008, the first of several in a series of workshops were conducted to provide a hands-on approach to learning about managing water in their businesses. Over 140 individuals attended workshops on landscape water budgeting, cooling tower training, and facility water audits. The Advisory Group also worked towards finalizing a rating system that would indicate a facility's conservation potential, facility audit guides that identify best practices for various types of water uses, manuals for use in training, and public recognition programs.

Reclaimed Water System

In 2008, Tucson Water connected 30 new reclaimed water customers, including residential users, nine golf

holes at Dove Mountain, local ball fields and four elementary schools. Continued growth in the number of sites that are served with reclaimed water is expected with schools being



the most likely prospective customers in the next several years. The Capital Improvement Programs for FY 2009 and FY 2010 include a project to increase the booster capacity of the reclaimed water system which will allow more reclaimed water to be delivered to customers. Reclaimed water has great benefits: it's the only water supply that grows with the population, it saves valuable drinking water, and it's renewable. The Parks and Recreation Department has developed plans and coordinated with Tucson Water, the Development Services Department and Arizona Department of Environmental Quality to use **reclaimed water in new park restrooms**. The first restroom to use reclaimed water will be under construction in FY 09 at **La Madera Park**. Future restrooms will take advantage of the recent coordination in permitting and will use reclaimed water in the toilets where reclaimed water is available. The approval to use reclaimed water in park restrooms is a milestone in park development.

Improved Pump Efficiency

We carefully evaluate hydraulic conditions at the required flows, and

then select pumps to meet these conditions at the best possible pumping efficiencies available. This is done for new wells and boosters, and also for existing wells that have lost efficiency. Of 25 existing wells which had pumps replaced in 2007 and 2008, all but one improved performance, with a range of 5% to 100% and an average of 28.8% in increased pump efficiency.

Water Loss Control Program

Since the programs inception in 2006 we have reduced our water loss from 12.5% to 11.3% to date. The program is continuing to evaluate supply-side conservation measures that include all aspects of apparent and real water losses from the source to the customer's meter to accurately determine the amount of revenue water and non-revenue water, with the goal of identifying critical areas that need improvement and the resource required to address them efficiently. This includes tracking lost water from system leaks and breaks, inaccurate metering, use of water for fire protection, theft, hydrant use, system flushing activities to address water quality issues, and water that is pumped from the ground but does not generate revenue. The main goal is to reduce our water loss percentage to less than 10%.

The City sponsored **water audit program** managed by General Services has been in place since 2007. This program examines all City water use to identify water-saving and water efficiency measures for all City facilities, landscapes and equipment. To date several pilot audits have been conducted to test the procedure of gathering audit data and information. The next step is to create a comprehensive data base to begin capturing the audit details for all City facilities, landscapes and equipment.

Continued

Conservation Effluent Pool

The Conservation Effluent Pool (CEP) was established by the City and County during the spring of 2000, to provide a water supply for Endangered Species Act compliance and riparian habitat restoration. At present, the CEP entitlement is 10,000 acre-feet; the City of Tucson contributes about 75% of the effluent to the pool, with lesser contributions from Pima County, Metro Water, and the Town of Oro Valley. During the spring of 2009, the City and County are expected to ratify an implementation agreement for the CEP, which would result in the designation of City and County co-administrators over CEP projects and allocations. The City's Office of Conservation and Sustainable Development is currently discussing proposals to use CEP effluent to establish riparian restoration projects along the Santa Cruz River within the City of Tucson and just north of the City.

Water Harvesting at City Facilities

The following parks and facilities have implemented or will implement rainwater harvesting in the coming year:

- Highland Vista Park
- Columbus Park
- Davidson Elementary School (Carol's Grove)
- A Mountain Master Plan and Site Improvements
- Grijalva Park Improvements
- Habitat for Humanity Park
- Herrera Quiroz Covered Basketball Court
- Parque de Diego y Orlando Mendoza
- Alvernon Valencia Park
- Verdugo Park Improvements
- Julian Wash Linear Park
- Reid Park Zoo Conservation Learning Center
- Ward I
- Ward II
- Ward III
- Ward VI



AWARD

EPA Environmental Achievement Award

Ward II and City staff received the **2008 Environmental Achievement Award** from the EPA for adopting the country's first Commercial Rainwater Harvesting regulations approved in October 2008.

2008 Policy Highlights

Mayor and Council adopted new requirements to encourage the use of rainwater harvesting throughout the community, including the country's first commercial rainwater harvesting ordinance.

- The **Residential Gray Water Ordinance** amended the International Residential Code to require the installation of gray water "stub-outs" in all new residential construction beginning on June 1, 2010.
- The **Commercial Rainwater Harvesting Ordinance** requires all new commercial development to prepare a landscape water budget and supply 50% of the landscape water needs with harvested rainwater beginning on June 1, 2010.



Urban Nature

Promoting and maintaining “urban nature” involves efforts ranging from providing accessible parks and recreation facilities, to preservation of important natural habitats. Protecting urban green space also requires efforts to maintain the quality of natural areas and restoring areas that have become degraded over time. The City provides assistance to community groups, developers, businesses, and other organizations in developing water harvesting projects, incorporating sustainable site design principles, and riparian habitat protection and enhancement efforts.

Creating Urban Greenspace

In concert with the Tucson Parks and Recreation Department’s 10-year Strategic Services Plan, the City has engaged the following projects and programs targeting the strategic directions of: Protecting Natural Resources, Developing Signature Facilities, and Maximizing Resources.

- The **El Paso and Southwestern Greenway** will create recreational linkages from South Tucson through downtown Tucson and will include infrastructure and landscape improvements and the installation of public furnishings and art as funding permits.

- **Davidson Elementary School (Carol’s Grove):** This project is a multi-use school/ park partnership to include the design and construction of playground improvements. Additionally, Davidson students will use this project as a learning lab. It incorporates water harvesting techniques with the use of contouring to capture and retain rainwater to be used by plants on site as well as the planting of native tree species.

- **Highland Vista:** This 2008 project includes landscape improvements around a newly constructed perimeter path in the park. In addition, the neighborhood has identified a riparian restoration element for this project, the use of water harvesting techniques, and the use of native plant species.

AWARD

2008 Xeriscape Awards

The City of Tucson Parks and Rec Department received the 2008 Judges Award for Best Neighborhood/Community Landscape Project for the San Antonio Park.

The City of Tucson Department of Transportation received the **2008 Grand Prize in the Professional category** for the median water harvesting on Alvernon Rd. and 29th St.



- The **Arroyo Chico Basin Drainage** improvement project began in 2007 with the construction of the Cherry Field Basins. The overall project area encompasses approximately 6 miles of the Arroyo Chico wash from Alvernon Way to its confluence with the Santa Cruz River near St.Mary’s Road. When complete, the \$68 million project will include a 42-acre urban open space greenbelt park with habitat restoration.



- **Trees for Tucson**, a program of Tucson Clean and Beautiful, provides thousands of low-cost trees to city of Tucson residents each year through a grant from Tucson Electric Power Company. The primary objective is to reduce energy use as the trees grow and shade homes. Additional benefits include carbon sequestration, wildlife habitat, erosion control, aesthetic enhancement, particulate pollution control, and property value improvement. Trees for Tucson also provides trees to neighborhoods and organizations for planting in the public right of way and common areas to beautify neighborhoods and provide shading to encourage walking and bicycling. In 2008, 4,300 trees were distributed in the community.

Trails Program

Paths, river parks and greenways are being developed using impact fees, RTA funding and bonds. The Parks and Rec department’s long range plan of an interconnected system of paths provides alternative transportation, recreation and landscaped connections between parks, schools and other community destinations. Native plants and water harvesting are also incorporated into the system. Inter-agency cooperation as well as support from the elected officials and residents advance the trails program. Segments of the following paths are either in planning, design or construction:

- Julian Wash Linear Park
- Atterbury Wash Linear Park
- Arroyo Chico Urban Greenway

Continued

- Alamo Wash Urban Greenway
- Arcadia Wash Urban Greenway
- Eastern Pima County Trails Master Plan Update
- Valencia Corridor Long Range Plan

Maintaining Urban Greenspace

• **The Urban Landscape Framework** is both a short and long-term road map providing citywide direction on issues and practices involving public



properties as well as creating an “Image for a Great Desert City.” Short-term actions have included increasing awareness of Urban Heat Island issues through an annual workshop; working to create downtown pockets of biologically diverse native plant landscaped areas; assisting with development of water harvesting practices at bus shelters and other practices promoting principles of smart growth. Actions related to long-term issues include formulating a Living Infrastructure Plan; strengthening communications between City Departments, City-appointed Boards, Commissions and Committees, and external organizations/agencies involved in landscape issues.

• **The Camino Del Cerro Roadside Beautification and Demonstration project** involves re-vegetation to provide a visual screening from the sewage ponds. During re-vegetation, the City will evaluate several aspects of plant establishment done without the installation of an irrigation system. The four elements of this

study include: 1) evaluation of a wide range of drought tolerant plants; 2) the use of water harvesting; 3) the use of water trucks for supplemental watering; and 4) the installation of DriWater. The project will be closely monitored and evaluated for a period of two years.

• **The Adopt-a-Park & Public Areas** litter cleanup volunteer program promotes cleanliness of natural urban areas including parks and washes. Presently, over 135 sites are adopted and additional park, street, and wash sites are added regularly. Volunteers have contributed over 185,000 service hours since the program was initiated in 1984, presently averaging well over 7,000 hours annually.

Riparian Habitat Preservation and Restoration

On November 7, 2006, the Tucson Mayor and Council adopted an Interim Watercourse Preservation Policy and Development Standard to address concerns over inconsistent and inadequate protection of riparian habitat. The policy and development standard reaffirm the City’s commitment to watercourse protection and provide greater clarity and consistency to the implementation of the three City riparian habitat preservation ordinances – the Watercourse Amenities, Safety, and Habitat (WASH), Environmental Resource Zone (ERZ), and Floodplain regulations. In 2008 the City continued to work towards improved wash protection regulations through the consolidation of the three existing riparian habitat ordinances into a comprehensive **Environmentally Sensitive Lands Ordinance**.

City staff works collaboratively with developers and homebuilders to discuss possible design solutions to help reconcile development with riparian habitat protection. Results can enhance habitat conditions and improve quality of life for Tucsonans,

while allowing for growth in the City. The City also provides support to neighborhood groups to help address issues related to open space and washes in their neighborhoods.

The City of Tucson is a partner in two federally sponsored river restoration projects along the Santa Cruz River. The two projects, **El Rio Medio and Tres Rios del Norte**, aim to restore riparian habitat along an almost 23-mile stretch of the river. El Rio Medio, which includes that portion of the river between Congress and Prince Roads, is particularly important for the City in that it will address habitat restoration, flood control, and recreation needs through downtown Tucson.

Habitat Conservation Plans

Through the Endangered Species Act, the U.S. Fish & Wildlife Service empowers jurisdictions to create conservation programs unique to their region that protect plants and animals threatened by human activity. The City’s Preliminary Draft Habitat Conservation Plans (HCPs) will address activities in two geographic areas. The **Avra Valley Habitat Conservation Plan** effort examines

Continued

AWARD

2008 American Society of Landscape Architects Awards
The Arizona chapter of the ASLA awarded the City of Tucson Department of Urban Planning and Design the **Honor Award for the Urban Landscape Framework**. The Honor Award is the highest award granted by ASLA.

The City of Tucson Mayor and Council was also awarded a **Friend of Landscape Architecture**.

water supply and renewable energy projects that may be developed on City-owned lands in Avra Valley. Future urban development in the largely undeveloped Southlands area, which lies south of Interstate-10, will be informed by the **Greater Southlands Habitat Conservation Plan**. The creation of these two HCPs involves extensive coordination with federal, state, regional, and county government agencies. The process has been supported by a technical advisory committee, which provides scientific guidance and recommendations

while the City's Resource Planning Advisory Committee (RPAC) provides direction on implementation

AWARD

The Tucson Audubon Society, in partnership with the City of Tucson, was awarded a 4-year grant from the Arizona Water Protection Fund (AWPF) to be used to restore the wildlife and riparian habitat value of the Atterbury Wash within Lincoln Regional Park. The grant provides resources to mitigate erosion in the wash and engage residents in implementing and maintaining the restoration work. Project partners include Tucson Parks and Recreation, the Office of Conservation and Sustainable Development, Tucson Audubon, and the Groves Lincoln Neighborhood Association, along with volunteer labor from the Association.

and funding options. Ultimately, implementation of approved HCPs will allow development to proceed in the HCP planning areas without jeopardizing sensitive plant and animal species.

Current Planning Processes

• In 2005, the first of a series of **Urban Heat Island** workshops was held to educate city staff about the issues of

HOT TOPIC...

Buffelgrass is an invasive, non-native plant species that is rapidly expanding into the Sonoran desert. The spread of buffelgrass is of concern because the plant tends to "crowd-out" existing plant species and once established, serves as a source of fuel for fires. Fire in the Sonoran desert is not natural and will destroy native species, such as cactus, and, once destroyed by fire, the native species have a difficult time reestablishing. These fires also encourage the growth of buffelgrass. Eventually, areas that become infested with buffelgrass will become transformed, with buffelgrass becoming the dominant plant.

Urban Heat Islands and how staff can individually, and as a City government, implement mitigation measures. The 2008 workshop focused on landscape and human health in relation to urban heat island mitigation.

• The City will continue development of a **Green Infrastructure Plan**, a project initiated in 2007. Just as communities approach planning of their streets, sewers, electrical and telecommunication systems along with other "gray" infrastructure in a comprehensive and deliberate manner, the concept of 'green' infrastructure planning uses the same principles. City staff, working together with surrounding jurisdictions, will develop a green infrastructure map, plan and policies to improve availability of green space in under-served areas, provide better access and recreation opportunities, create linkages where discontinuity between urban habitat exists and help direct conservation, restoration, and urban heat island mitigation efforts.

• **The City's Living Infrastructure Plan** is a combination of a Green Infrastructure Plan, Healthy Cities Plan and elements of a Smart Growth Plan. It will be based on current research in evolutionary biology, Urban Heat Island mitigation measures, economics of water policies, public health, and site designs using green building principles. The intent of the Living Infrastructure Plan is to link the built environment, both landscape and structures, to the natural surrounding desert environment in order to identify priorities for the City

to be both a leader and practitioner of smarter development patterns. The Plan is intended eventually to fold into the City's General Plan Update.

Outreach and Education

City staff conducts rainwater harvesting design consultations on request for commercial sites, subdivisions, and public spaces. Water harvesting presentations are available to help the community understand water harvesting concepts and techniques they can implement at public, commercial and private sites.

City staff provides technical support to develop sustainable concept designs for public, commercial and neighborhood sites. These workshops consider various factors which, depending on site goals, may include solar orientation, solar technology, water harvesting design, use of native vegetation, natural building materials, LEED building guidelines, and many others. Sustainable design is intended to improve site efficiency, productivity and comfort, while reducing energy and water use.

2008 Policy Highlight

On April 15, 2008, Mayor and Council approved an Inter-governmental Agreement with Tucson Unified School District to open 12 elementary schools for use as public parks when school is not in session, effectively increasing accessible urban green space for recreation.



Environmental Health

Environmental health addresses the biological, chemical and physical conditions that can affect our health. Living in a healthy environment means that we do not have to worry about toxins in our air and water, in our homes, or in the products we use. The City actively works to prepare for and mitigate environmental issues to keep our community healthy.

Environmental Remediation

- Groundwater remediation projects at Los Reales, Harrison, Silverbell and Broadway Landfills are ongoing. Also ongoing is a comprehensive groundwater monitoring program conducted by Environmental Services (ES) aimed at protecting groundwater throughout the City. ES expanded the groundwater treatment system at the Los Reales Landfill in 2008, and has completed the feasibility study for a groundwater pump & treatment system at Silverbell.



- ES completed the remediation of gasoline-contaminated soil at a former warehouse located within Tucson’s Historic Warehouse Arts District and received a letter of No Further Action (NFA) from the Arizona Department of Environmental Quality on June 30, 2008.

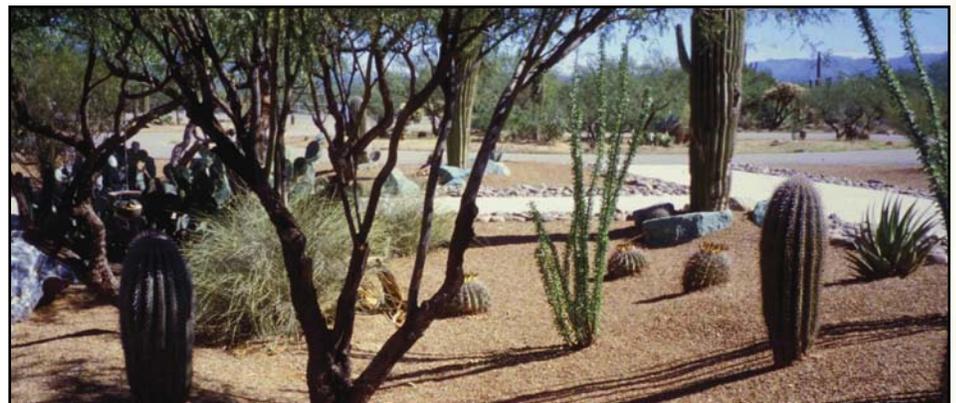
- In 2007, the Central Energy Plant at the Tucson Convention Center replaced sodium nitrite (an anti-corrosive chemical used in the piping of the heating and cooling system) with

a more environmentally friendly phosphate-based anti-corrosive. Leaking pipelines that were part of the heating and cooling systems were replaced in 2008. ADEQ issued a No Further Action (NFA) determination for soil adjacent to the leaking pipelines in 2009 and completed the project.

City Brownfields Program

The Environmental Services Brownfields Program promotes infill by assessing and cleaning up Brownfields sites. Brownfields redevelopment spurs economic benefits and revitalizes once blighted areas while maintaining pristine desert and open spaces.

- In the last year, ES completed its third year of an Environmental Protection Agency (EPA) funded Brownfields Job Training Grant. The department trained 40 individuals as environmental technicians with an average job placement rate of 70% and an average hourly salary of \$14.15. Our trainees work in the field



of environmental remediation and redevelopment.

- ES has completed an Analysis of Brownfields Cleanup Alternatives for the cleanup of a former Tungsten Ore Mill site near Silverbell and Speedway. This project is partially funded by a \$200,000 EPA Cleanup Grant. The Brownfields Program is beginning the design phase of this cleanup project and is pursuing additional funding so that once clean, this site can be redeveloped as a natural resource park.

- Environmental assessments of a 5.5 acre parcel known as the former Adkins property, which is adjacent to Fort Lowell Park, were completed in 2008. This parcel was acquired to preserve historic resources and incorporate them into the City’s Fort Lowell Park. The site is impacted with polynuclear aromatic hydrocarbons and metals above residential soil remediation levels. In the fall of 2008, ES applied for a \$200,000 EPA Brownfields Cleanup Grant to cleanup the site.

City of Tucson
Office of
Conservation and Sustainable Development

2009
sustainabilityreport



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