



# Phoenix: Living Like it Matters!

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# Phoenix: Living Like it Matters!

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### INTRODUCTION

Phoenix is an environmental leader in the state and is now gaining national attention as a sustainability champion with its many [award](#)-winning and innovative programs. Phoenix demonstrates its commitment to environmental stewardship through sustainability programs that have helped us to thrive in our unique and beautiful desert environment. As an early pioneer in water, energy and natural resource conservation programs, Phoenix has long used sustainability as a guiding principal, believing that sustainable living is critical to ensure that the actions we take today do not compromise the ability of future generations to meet their needs. Phoenix's sustainability motto, "Living Like it Matters!" reaffirms the sustainability creed that guides its current programs and future plans.

Phoenix is committed to reduce air pollution, greenhouse gases, conserve energy and water resources. Their support includes conducting sound water and land use planning, providing recreational opportunities, preserving open space and wildlife, and restoring blighted land and riparian habitat. This environmental ethic is shared by leaders and staff, who have developed the innovative programs that serve as success stories for other local governments. For example, as early as 1968, Phoenix pioneered rubberized asphalt overlay, using an estimated 7.9 million recycled tires since its 1989. And, Phoenix's Water Conservation Program, which began in 1986, has resulted in 20 percent per capita reduction in water usage during the last 20 years.

Phoenix residents have been an integral part of championing new initiatives and supporting sustainability efforts through bond issues and dedicated taxes including parks preservation and construction of the light rail system. Partnerships with agencies, nonprofits, colleges and universities, utilities and valley businesses have leveraged resources and enabled Phoenix to launch new programs, including the completed restoration of a portion of the Salt River. Active citizen boards and commissions have spearheaded new policies and programs, and ensured that the city's programs continue to be cutting edge and enhance existing quality of life.

The city has more than 80 environmental sustainability programs, which are summarized below in the 2008 Sustainability Summary. The Sustainability Summary includes links to selected programs and refers readers to the appropriate department in the event that additional information is needed. The

Sustainability Summary demonstrates the city's environmental commitment and reaffirms that Phoenix is "Living like it matters"!

## **SUSTAINABILITY PROGRAM SUMMARY**

### **I) *Environmental Leadership***

Phoenix's environmental leadership successes have resulted from implementing policies, programs and practices that have a far-reaching affect on the environment. For example, 2007 marked the 20<sup>th</sup> Anniversary of the establishment of the Phoenix Environmental Quality Commission (EQC), an appointed citizen's group comprised of fifteen members. The EQC's commitment to a sustainable environment was even more evident as the group forged strongly ahead on the issue of renewable energy. Ongoing environmental leadership was demonstrated through citywide environmental performance indicators for department management and Environmental Management System (EMS) project accomplishments.

- A) Phoenix Environmental Quality Commission (EQC)** – The 15-member [EQC](#), which was established in 1987, is a citizens' commission appointed by the mayor and city council. The EQC meets monthly to discuss environmental issues and concerns. The commission has been instrumental in recommending green building practices for inclusion in the General Plan, strengthening the smoking ordinance, addressing water quality, promoting water conservation and fluoridation, and many other important projects and policies to support a sustainable and healthy environment.
- B) City Council Subcommittees** – The city council boasts a long standing subcommittee specifically designed to review and use environmental and natural resource issues. While the subcommittee has evolved over time, the mayor recently added a sustainability component to the subcommittee charge.
- C) Environmental Performance Indicators** – Since 1999, the city manager has required department directors to include an environmental goal in their annual Environmental Performance Plan to enhance environmental compliance and environmental programs. Departments are evaluated based upon their achievements in specific environmental programs. As of 2006, there are five indicators including Compressed Natural Gas Usage, Hazardous Materials Management, Pollution Prevention, Asbestos Management, and Air Quality Programs.

## **D) Environmental Management System (EMS) Project**

- In 2005, the Phoenix Public Transit Department was one of ten transit agencies in the United States to participate in an EMS training and assistance project sponsored by the Federal Transit Administration. After one year of implementation, the Center for Organizational and Technological Advancement at Virginia Tech evaluated all of the EMS programs. The city of Phoenix Public Transit Department EMS was the only program to receive a score of 100 percent.

EMS accomplishments at the Transit South Operating facility included:

- Implementation of a paper and cardboard recycling program, resulting in 10,000 lbs being recycled in its first year.
  - Waste stream identification resulting in less costly and more efficient and environmentally friendly disposal methods.
  - Trained 445 staff on environmental impacts from transit operations.
  - Significant energy use reductions and cost savings of \$34,000 (compared to prior three years).
  - Purchase of five aqueous-based parts washers to replace solvent-based equipment; saving \$15,000 per year and reducing the solvent use by more than 3,000 gallons per year.
- In July 2007, the Parks and Recreation Department (PRD) South Division began an EMS. Using input from staff at all levels of the division, objectives were set in the following areas:
    - Reduced vehicle idling
    - Dust control
    - Reduced electricity use
    - Partnerships for community environmental projects
    - Lower emissions on hand-held equipment
    - Increased environmentally preferable purchasing
    - Reduced aerosol emissions from can depressurizing equipment

The goals will be achieved through a combination of awareness training and equipment upgrades. EMS progress is being measured against specific targets. An annual review process will be used to refine and expand the goals.

## II) ***Climate Action***

As the issue of climate change moved into the forefront of global concerns, Phoenix has demonstrated its leadership by focusing resources on this important issue. Phoenix is committed to reducing greenhouse gas emissions to help ensure a sustainable future. Many of the programs included in this Sustainability Summary address reduction of greenhouse gas emissions through resource conservation, recycling, pollution prevention, green buildings, land use and planning, and innovative technologies. The city is developing a Climate Action Plan to further reduce emissions from city operations.

- A) Climate Action Plan** – In January 2008, the city began a comprehensive effort to develop a Climate Action Plan to reduce greenhouse gas (GHG) emissions from city operations. The first step is to conduct a GHG emissions inventory to determine the current emissions and future growth. The emissions inventory that GHG emissions from city operations were approximately 617,000 tons of carbon dioxide emissions in 2005 including 61% energy use, 25% vehicles, and 14% landfill & wastewater treatment gases. In December 2008, the City Council approved a resolution adopting a goal to reduce GHG emissions from city operations to 5% below the 2005 levels by 2015.

The city continues to finalize the emissions inventory report and is developing a Climate Action Plan that will help the city meet that goal. Many of the existing city programs outlined in this Sustainability Summary will be the initial basis for the plan. The project is expected to be completed in July, 2009.

- B) U.S. Mayor's Climate Protection Agreement** – In June 2007, Mayor Phil Gordon joined other mayors in signing the [U.S. Mayor's Climate Protection Agreement](#). Under the Agreement, Mayor Gordon committed to conduct a GHG inventory, reduce Phoenix GHG emissions, and serve as a model environmental steward for other local governments.
- C) Cities for Climate Protection** – In June 2007, the city of Phoenix joined [ICLEI Local Governments for Sustainability](#) Cities for Climate Protection Campaign. The campaign helps cities identify measures to reduce greenhouse gas emissions. Over 800 local governments worldwide have joined the campaign. As part of this campaign, cities calculate their GHG emissions, establish targets, implement programs to lower emissions, and report their performance. The campaign provides technical assistance, conferences and other networking opportunities for local governments to share successes and challenges.
- D) Center for Clean Air Policy: Urban Leaders Adaptation Initiative** – In December 2007, Phoenix joined the [Center for Clean Air Policy](#) (CCAP):

Urban Leaders Adaptation Initiative. The initiative is designed to serve as a resource for local governments as they deal with adaptation strategies for climate change. CCAP is interested in highlighting specific Phoenix programs including the Downtown Urban Form Project, Urban Heat Island Task Force, and Water Resources Management.

- E) Arizona Governor’s Climate Change Advisory Group** – The city of Phoenix served as the municipal government representative on the 2006 Arizona Governor’s Climate Change Advisory Group (advisory group) which developed 49 recommendations on greenhouse gas emission reductions for the State. The city also assisted on several subcommittees, which conducted extensive reviews of transportation and land use issues.

In September 2006, the Arizona Governor released the final report of the advisory group and an Executive Order that established a statewide goal to reduce Arizona’s future greenhouse gas emissions to the 2000 emissions level by the year 2020, and to 50 percent below the 2000 level by 2040. The [AZ Climate Change Action Plan](#) includes a number of recommendations to improve energy efficiency, increase the use of renewable energy, reduce vehicle emissions, and conduct more effective land use and transportation planning.

- F) Aviation Industry Commitment to Action on Climate Change** – At the 2008 Aviation & Environment Summit, the city of Phoenix Aviation Department joined organizations including airlines, airports, aircraft and engine manufactures and air traffic control organizations in signing a declaration on climate change action. The declaration demonstrates that the aviation industry is committed to meeting the climate change challenge in a responsible manner through sustainable growth.

- G) Earth Hour** – In March 2008, the city of Phoenix participated with cities around the world to raise awareness on climate change by voluntarily turning off nonessential lights for one hour. Phoenix was one of four U.S. cities selected by the World Wildlife Fund, the project sponsor, to be featured during [Earth Hour 2008](#). Phoenix encouraged employees, residents and businesses to participate. The local utilities, APS and SRP were active participants in the event and estimated that the valley community saved enough energy to power 12,515 valley homes for one hour.

- H) National Conversation on Climate Action** – In October 2008, Phoenix partnered with the Arizona Science Center to participate in the [National Conversation on Climate Action \(NCCA\)](#) sponsored by the Yale School of Forestry and Environmental Studies, ICLEI – Local Governments for Sustainability, and the Association of Science Technology Centers. The NCCA was designed to build local awareness of climate change. The event

included a community brown bag hosted by the city of Phoenix featuring Dr. Gregg Garfin, program manager for Climate Assessment for the Southwest at the University of Arizona. In addition, the Arizona Science Center coordinated the “Time to DECIDE Game” about climate change issues facilitated by Dr. Garfin.

### III) **Land Use**

Phoenix has a long history of promoting sustainable development through the use of zoning codes and land use policies. The effects of these policies and environmental principles are evident in the transit oriented development, infill and downtown development programs, and the Urban Form and Heat Island Studies. The award-winning Brownfields Program is another example of an innovative approach to land redevelopment which has restored land and increased private investments, training and jobs.

**A) General Plan** – In 1999-2000, the city of Phoenix conducted an extensive Community Involvement program to amend the [General Plan](#) to expand its focus on environmental and natural resource issues. Extensive plan revisions included the addition of the following five new elements: growth area, open space, environmental planning, cost of development, and water resources. Among other activities, residents in more than 2,000 households, representing a vast cross-section of the population, were contacted directly via telephone to participate in a survey regarding the issues most important to Phoenix. This comprehensive document was approved by the voters in 2002 and serves as a blueprint for sustainability and responsible growth. It includes a wide range of goals and policies to promote infill, pedestrian/bicycle friendly communities, and transit-oriented development. It also addresses heat island effects, development of brownfield properties, promotion of green building techniques, recycling, protection of water resources, and protection of native vegetation and wildlife habitat. The Planning Department maintains the General Plan and provides periodic updates on the implementation status.

**B) Infill Area: Redevelopment** – The city’s General Plan includes an infill area to promote development in the central city, conserve energy, reduce commute times, and maximize city services. The Neighborhood Services Department (NSD) is responsible for implementing redevelopment plans for designated redevelopment areas within the infill area. The redevelopment programs include pro-active code enforcement and compliance, neighborhood capacity building, infrastructure repair and replacement, graffiti and crime reduction efforts, new home construction and rehabilitation and neighborhood economic development. The 2004 Housing Condition Study documented the success of these programs, noting an increase in the improvement of housing conditions in these areas of over 35 percent in the past ten years. NSD's neighborhood revitalization efforts are linked with

other sustainable initiatives including water conservation, energy efficient affordable housing, dust control, weatherization and historic preservation.

- C) Infill Program: Impact Fees** – The city’s infill program provides incentives to developers to build developments in the inner city, and charges infrastructure impact fees to pay for construction of new infrastructure in developing areas. From 1995-2006, the program assisted more than 4,298 housing units. The city Public Transit Department also practices infill redevelopment by using odd-shaped parcels, usually remnants from freeway development, for passenger facilities. Use of these infill parcels also addresses problems with under-maintained, vacant, and under-utilized properties.
- D) Transit Service Planning** – Public Transit works with private developers to add transit infrastructure to new development in the city. Staff reviews approximately 700 Planning Department and Development Services Department site plans, annexation, zoning and other requests per year.
- E) Zoning: Edge Treatment Guidelines** – The city has instituted an overlay zoning district to protect the interface between new development and the natural Sonoran Preserve. The Sonoran Preserve is an area of 30,000 acres being purchased by the city with dedicated sales tax revenues to conserve large portions of the Sonoran Desert ecosystem. The edge treatment guidelines will ensure that development impacts are minimized and public access to the preserve is maintained. The Sonoran Preserve Edge Treatment Guidelines received the 2007 Valley Forward Crescordia Environmental Award for Livable Communities.
- F) Zoning: Commercial Hazardous Waste Facilities** – The city has amended the Zoning Code to address hazardous and blighted land uses and promote beneficial future development. Zoning Code changes prohibit new or expanded commercial hazardous waste facilities, thermal treatment, and offsite storage of contaminated soil. Because of the zoning changes, the number of commercial hazardous waste facilities in Phoenix has been reduced from five in the late 1990s to only two by 2006.
- G) Zoning: Transit Oriented Development Overlay District** – This zoning overlay district encourages development close to light rail stations, which will enhance transit ridership and decrease automobile dependency by providing a complimentary mixture and density of activity. The overlay district applies to all new land uses or development and prohibits or limits some uses that discourage transit ridership. It also adds requirements to promote a comfortable pedestrian environment. The overlay district ordinance is being updated to provide more development flexibility to encourage more intense development in conjunction with start-up of the light rail system in December 2008.

**H) Zoning: Other Overlays** – The city has established other overlays including the Rio Salado zoning overlay district which prohibits new or expanded junkyards and requires special permits for solid waste facilities. A Special Redevelopment Area (RDA) created for the Matthew Henson HOPE VI Project also includes a zoning overlay which discourages undesirable uses and promotes positive redevelopment. Commercial overlay districts for obsolete commercial strip retail areas along major streets will stimulate rehabilitation and redevelopment.

- I) Heat Island Study** – As a desert city experiencing heat island affects, the city has initiated several related efforts to address the impacts as described below:
- **Urban Heat Island Task Force** – In 2005, the city council established an inter-departmental Urban Heat Island Task Force led by the Planning Department to research the issue and recommend new policies and programs. In addition, several city departments are working in collaboration with Arizona State University's (ASU) Global Institute of Sustainability to study the impacts of the Urban Heat Island and possible mitigation options. For example, the city's Aviation Department is collaborating with ASU to study cooler options for materials used in the pavements, benches, roofing and landscaping. Study results will be used as guidance for regional planning efforts and airport development. In addition, city buildings have incorporated Energy Star roofing materials to reduce heat.
  - **Shade** – The Planning Department is conducting the [Downtown Urban Form Project](#), to develop zoning regulations that will better utilize downtown buildings and land resources. The new zoning regulations will include sustainability standards to address the urban heat island by requiring the use of appropriate materials and incorporation of shade throughout downtown. Planning has also completed a downtown study to look at opportunities for increasing shade via "connected oasis" paths for the thermal comfort of pedestrians in the city center. In addition, the Parks and Recreation Department has installed shade structures at numerous parks, pools, sports complexes and community centers.
- J) Brownfields** – The city collaborates with numerous nonprofit agencies and local businesses on neighborhood and citywide sustainability programs. The [Brownfields Program](#) has won several national awards and is widely recognized for its innovative approach. By the end of fiscal year 2006-07, Brownfields redevelopment projects had resulted in:
- Restoration of 297 acres of previously contaminated land.
  - Creation of more than 3,000 jobs.
  - Private investment of more than \$293 million.
  - Blighted property transformed to commercial, office, retail and residential uses.

Brownfield redevelopment examples include:

- Metro North Corporate Park – a 150-acre former computer chip manufacturing facility that was cleaned up and redeveloped into a mixed-use complex with office, retail, and residential uses.
- Ace Asphalt Inc. – a 10-acre former auto salvage yard and landfill site redeveloped into Ace’s corporate headquarters with approximately 200 employees.
- Copper Leaf Project – a 103-acre vacant site with tons of surface and subsurface debris, soil contamination, and illegally dumped hazardous materials. The site was redeveloped through a public private partnership with Trend Homes of Arizona into a 750-home, mixed-income master planned community.

**K) Environmental Technician Training Program** – In December 2007, the Phoenix Brownfields program conducted a four-month Environmental Technician Job Training Program for residents in the West Phoenix Revitalization Area. The program was funded with a \$200,000 U.S. Environmental Protection Agency (EPA) grant and in-kind contributions. Eighteen individuals completed the program and received three key environmental certifications that enable graduates to seek entry level positions with environmental firms, private water companies or municipalities. Job placement assistance was provided to the graduates including a Job Fair with 20 participating companies.

**L) Property Acquisitions** – Since 1990, the city’s policy has been to perform Phase I and II environmental reviews for all property and right-of-way acquisitions. This reduces the municipality’s liability during necessary property transactions, and allows for remediation of contaminated sites in the course of planned development projects. The policy transitioned into a city regulation ([A.R. 3.95](#)) in 2006.

#### **IV) Parks & Open Space**

Parks and open spaces are the backbone of a healthy and sustainable environment, offering public recreational benefits as well as a respite from fast paced urban living. Benefits include preservation of native plant and wildlife habitat and conservation of critical ecosystems. The Phoenix Mountain Preserves also offer a variety of recreational opportunities as well as important archaeological features. Phoenix has a rich history of citizen involvement in creating and maintaining its park system and strives to support a balance between protection and recreational use of the land.

- A) Phoenix Parks & Conservation Foundation** – In 1979, the [Phoenix Parks and Conservation Foundation \(parks foundation\)](#) was established to help the city of Phoenix create and maintain a well-equipped and safe park system. The nonprofit parks foundation is a partner with the city of Phoenix and serves in a valuable land trust role, by seeking and accepting contributions from the public. They also facilitate private sector and community participation in special projects and in the restoration, development, and preservation of Phoenix parks and preserves.
- B) Phoenix Parks and Preserve** – The Parks and Preserve Programs have a rich history, which exemplifies citizen involvement and action. In 1924, residents began early efforts to save the mountain preserves. These efforts coalesced into the Phoenix Mountains Preservation Council in 1970. Aided by community leaders, a number of successful city bond issues resulted in the acquisition of various parcels of mountain land by the city. The Phoenix Parks Preserve Initiative, approved by the voters in 1999, increased the total open space for parks and preserves to 30,000 acres, with 107 miles of developed and maintained trails. By 2006, eight regional parks were developed, over 160 park improvements were made to community and neighborhood parks, and over 3,000 acres of Arizona State Trust Land was acquired for the Sonoran Preserve.

In 2000, the Parks and Recreation Department established a Natural Resources Division to provide stewardship and development of natural park areas and to maintain a balance between protection and recreational use of the land. Highlights of the city's [Parks and Preserves](#) are summarized below.

- **South Mountain Park/Preserve** – The 16,000 acre South Mountain Park/Preserve was purchased by the city in 1929 and is the largest municipal park in the country, attracting over 2 million visitors each year. It includes 58 miles of trails for horseback riding, hiking, and mountain biking for all ability levels. A series of trails from the Environmental Education Center, including a wheelchair accessible trail, provides easy access to explore the desert. The South Mountain Environmental Education Center and ranger-led outdoor programs allow visitors to gain new insights into the richness and diversity of the Sonoran Desert ecosystem.
- **North Mountain Park and Visitor Center** – At 2,104 feet, North Mountain Park is a landmark Phoenix peak and offers an array of trails. The North Mountain Visitor Center now serves as a gateway to the vast and rugged North Mountain Park. The Center hosted more than 20,000 visitors in 2005 and offers educational classes and displays to understand the Sonoran Desert. The North Mountain Visitor Center also

boasts a 3,150 watt Photovoltaic system which offsets power from the utility grid.

- **Camelback Mountain** – In 1965, Barry Goldwater spearheaded community efforts to save the Camelback Summit from development. This 2,704-foot mountain is now one of the most popular hiking trails in the Phoenix area.
- **Papago Park** – In cooperation with the Arizona Game and Fish Department, the city has restored over 1,000 feet of shoreline in two ponds in Papago Park to improve the fish habitat. Several areas have benefited from re-vegetation projects. Over 100 native plants and trees have been added to the park and invasive plants have been targeted for removal.
- **Reach 11** – Reach 11 Recreation Area is 1,500-acres of xeroriparian habitat owned by the Bureau of Reclamation (BOR) and managed by the city of Phoenix, Parks and Recreation Department through a land use agreement established in 1986. The primary function of Reach 11 is as a flood detention basin to protect flood waters from damaging the CAP canal. Its secondary function is for recreation, with 18 miles of multi-use trails frequented by hikers, bikers and horseback riders. The park also features a 90-acre equestrian center with four lighted arenas, a 1-1/2 mile Barrier Free Accessible trail and a 100-acre sports complex with 10 lighted soccer fields.

### C) Forestry

- The [Phoenix Urban Forestry Program](#), in the Parks and Recreation Department (Parks), provides educational information and instruction programs to increase awareness of proper planting and tree care practices. These activities include puppet show presentations for elementary schools, adult information booths available for special events, cost matching programs for individuals and communities to plant on right-of-ways and school grounds, and a Living Tree Memorial planting program in public parks. During fiscal year 2006-07, the program provided 237 presentations serving over 12,000 students. A total of eight community cost-match projects planting 124 trees and 16 Living Tree Memorials were completed. Another 148 trees were planted through community programs in celebration of Arbor Day. In addition, PRD planted over 2,900 trees in public parks and in street landscape areas.
- Parks Forestry field crews maintain trees in [streetscapes and parks](#) and are responsible for the care of approximately 33,000 palms and over 200,000 hardwood trees located throughout the city. Forestry provides

training for city personnel concerning tree biology and maintenance, and is helping to develop a plan for the sustainable management of shade and tree planting. Forestry is partnering with local electric utilities to champion the concept of “Right Tree, Right Place” to alleviate problems with trees and power lines, and piloted a green waste reduction program at Paradise Valley Park.

- The Neighborhood Services Department (NSD) Neighborhood Coordination Division also facilitates the planting of trees in the community through the Fight Back Program in conjunction with Urban Forestry. The focus is on low water use trees and beautifying neighborhoods.
- The city of Phoenix was honored by the National Arbor Day Foundation as a Tree City USA for the twenty-first straight year. The city also received a 10-year Sterling Growth Award from the National Arbor Day Foundation for having demonstrated continual improvement and growth of its Urban Forestry Program over the past eleven years.

## V) ***Pollution Prevention & Recycling***

The city has a long standing commitment to diverting materials from the waste stream and using cleaner and more green materials. The city’s Pollution Prevention (P2) and Recycling programs began in the 1990s. Both programs are designed to reduce waste, conserve natural resources, and lessen Phoenix’s impact on the environment. In 2007, mayor and council expanded the recycling program to address plastic bags, and passed a resolution reaffirming the city’s commitment to purchasing more environmentally preferable or “green” products.

**A) Pollution Prevention (P2) Program** – The Office of Environmental [Programs Pollution Prevention \(P2\) Program](#) was created in 1994 to reduce or eliminate wastes generated from city operations and enhance environmental compliance. Key program elements and accomplishments are listed below.

- **Outreach** – An extensive outreach program including P2 Week, a bimonthly newsletter, monthly poster program, and incentive awards provides city employees with information on chemical management and best practices.
- **P2 University** – This training program offers seven pollution prevention topics including Environmentally Preferably Purchasing. From 2002 to 2007, approximately 3,500 employees have been trained. In addition, online training plans identify appropriate P2 training courses for city job classifications with a role in hazardous materials management.

- **Facility Assessments** – P2 staff visit city-owned facilities to ensure environmental compliance, identify P2 opportunities, share information on best practices, and determine any capital needs. Since 1999, the P2 Program has coordinated nearly \$1,000,000 in improvements, such as weatherproofed hazardous materials storage areas.
- **Waste Minimization** – Product substitution and process changes, such as recycling of batteries, has resulted in less hazardous waste being generated and fewer facilities that are subject to regulation. Phoenix has achieved a 60 percent reduction in the number of its hazardous waste-regulated city facilities since 2001.
- **Environmental Data Management System** – The city developed an innovative chemical tracking database that includes safety information on over 10,000 chemical products purchased by city departments. P2 staff review all new products and rate each one based on their relative risk. A Reviewed Products List features the safest products to help expand their use. As a result, the percentage of environmentally preferred products has grown from 12 percent in 2001 to 29 percent in 2007.
- **Toxic Reduction** - Product substitutions, such as the examples listed below, have helped the city achieve its goal of reducing hazardous materials:
  - The use of ionized water engine coolant on the transit bus fleet has eliminated the use and disposal of engine coolant chemicals.
  - Water-based parts cleaners are used in several city departments, eliminating volatile organic compounds and hazardous waste generation.
  - High copper-content bullets have been substituted for lead bullets in Police indoor ranges to reduce lead waste, provide a recycling opportunity, and reduce the cost of waste disposal.
  - Use of Integrated Pest Management (IPM) reduces pesticides by integrating occupant training, building improvements, and applying chemicals only when necessary. In 2005, the city began transitioning its contracts from traditional pest services to IPM.

**B) Environmentally Preferable Purchasing (EPP) Program** – The [EPP Program](#) identifies products and services that minimize environmental impacts. Resolution 20519, Environmentally Preferable Purchasing, approved by city council on July 12, 2007, was the latest resolution to reaffirm the city’s commitment to EPP. Key elements of the program

include department EPP Liaisons and product evaluation teams to further enhance the purchase of EPP. Examples of EPP are listed below:

- **Hope VI Project** – The HOPE VI Project uses recycled wood products from rapidly renewable local forests and 100 percent recycled carpet pads.
- **Phoenix Convention Center** – The Phoenix Convention Center has incorporated certified wood products that encourage responsible forest management practices, and adhesives, sealants, carpeting and paint with low emissions of Volatile Organic Compounds (VOCs). Additionally, by using construction materials from within a 500-mile radius, crews reduced fuel usage and support growth in the local economy.
- **Contracts** – Upcoming city contracts are reviewed to include EPP requirements such as Energy Star products, recycled content, general hazardous material characteristics, safer janitorial products, and pesticides.
- **Energy Efficient Computers** – The Information Technology and Finance Departments helped purchase desktop computers, laptops and monitors which meet Electronic Products Environmental Assessment Tool (EPEAT) Silver certification environmental standards. In 2007, the city was awarded an EPA Green Electronics Champion Award for these computer purchases, which from July 2006 to December 2007, reduced energy use by 3,744,969 kWh (enough electricity to power 330 households annually); reduced greenhouse gases equivalent to removing 233 cars from the road per year; reduced 12.7 tons of hazardous waste; avoided 769 pounds of toxic materials; and saved \$324,491.

**C) Phoenix Recycles, Film Plastic Bag, Household Hazardous Waste and Greenwaste Programs** – For over two decades, Phoenix has been committed to diverting materials from the waste stream through the Public Works Department programs featured below:

- **Phoenix Recycles** – The city's primary solid waste diversion program, was created as a pilot program in 1989. Today, approximately 90 percent of eligible residents participate in this voluntary program, diverting over 127,000 tons of newspaper, mixed paper, aluminum, scrap metal, glass, plastics and cardboard into blue 90-gallon containers every year. The materials are sorted at the city's Materials Recovery Facilities before they are sold in their respective commodity markets. Phoenix Recycles has been recognized as one of the first commingled (where residents do not have to separate items by commodity) residential recycling programs in the nation. Phoenix

Recycles also includes recycling promotion/education components, including presentations at schools, community events, mass media announcements, PHX11 announcements, and the Valleywide Recycling Partnership (made up of local municipalities).

- **Film Plastic Bag Recycling** - Phoenix residents annually consume an estimated 300 million film-plastic shopping bags, which are a major litter source and cannot be processed through Phoenix's residential recycling program. In 2007, the city of Phoenix partnered with the Arizona Food Marketing Alliance, the Arizona Retailers Association, and the carry-out restaurant industry on a voluntary in-store plastic bag recycling program and the "[Bag Central Station - Where Plastic Bags Belong](#)" campaign. The partnership uses education and marketing to promote the program and overall recycling message throughout the community, schools and neighborhood associations. The city also provides plastic bag recycling options for Phoenix residents through drop off sites at the city's two transfer station/recycling centers and monthly household hazardous waste collection events. The city has also designed and distributed reusable cloth bags for residents to encourage alternatives to plastic bags.
  - **[Household Hazardous Waste \(HHW\) Program](#)** – Phoenix City Council established its HHW Program In 1988. The program allows residents to bring batteries, oil, paints, antifreeze, tires, appliances, electronics, and computers to a city organized collection event. As of fiscal year 2005-06, ten HHW collection events are held annually at various locations in the city. In fiscal year 2006-07, over 99,669 gallons of household hazardous waste, 1,929 batteries, 613 white goods, 637 fire extinguishers, 5,160 electronics and 3,631 tires were collected.
  - **Mulching/Greenwaste Program** – Public Works continues to support a contract mulching program to divert organic material from entering the waste stream. Green waste is collected from residents and small commercial customers, converted to mulch, then composted at a contractor's site. Since 2003, over 100,000 tons of yard waste material has been mulched. Old and/or damaged residential refuse containers are also recycled into backyard composting kits and yard carts for sale at the 27<sup>th</sup> Avenue and North Gateway Transfer Stations.
- D) Recycling: Parks and Recreation Department** – In 2008, the city purchased 75 water bottle recycling containers made from recycled milk jugs with funding from an Arizona Department of Environmental Quality Waste Reduction Assistance recycling grant. The containers are being installed at trail heads in the Mountain Preserves for hikers to recycle plastic water bottles. The collected water bottles are processed into flakes for use

in products such as clothing, pillows and carpets. During the first six weeks, with fewer than half of the containers installed, hikers filled containers with approximately 20,000 water bottles. The same grant also funded purchase of other recycling containers and a truck to provide recycling collection at special events.

- E) Recycling: Convention Center** – The Convention Center works with clients to maximize recycling opportunities, including the collection of paper, plastic, cardboard and glass materials in receptacles throughout the facility. Daily operations use biodegradable, recycled and environmentally friendly materials. The expansion project included an innovative Construction Waste Management program to reduce waste items and support the facility’s aggressive recycling efforts. Sand and stone material excavated from the construction site of the North Building was sent to a concrete processing firm, and will be used to make new concrete and asphalt paving materials. The North building construction process used over 18,000 tons of recycled steel and 6,000 tons of recycled rebar.
- F) Recycling: Aviation Department** – The Aviation Department works with Public Works and private vendors to recycle office, airline and passenger waste. They also offer an “Annual Airport Cleanup Day” for Sky Harbor tenants to recycle non-hazardous metal, plastic, wood and other non-hazardous materials free of charge at airport collection points. For general aviation airport users, the department collects used oil and other fluids, promoting correct handling and recycling of these substances.
- G) Tire Recycling: Rubberized Asphalt** – In 1964, the city of Phoenix pioneered the use of rubberized asphalt overlay and incorporated the product into the city's chip seal resurfacing program. In 1989, the resurfacing program shifted to rubberized asphalt overlay. Since that time, the program has completed 1,700 miles of road overlay, used 2.3 million tons of rubberized asphalt, and an estimated 7.9 million recycled tires.
- H) Lead Hazard Control Program** – This program helps homeowners, landlords, and tenants in targeted areas control hazards from lead in paint, soil and dust. The program assists low-to-moderate income families with children under age six. Educational information on prevention of childhood lead poisoning and safe maintenance of lead-based paint is also provided to residents. Since 1996, the Lead Hazard Control Program has made over 900 homes lead-safe for the children who live there. All Neighborhood Services Department housing rehabilitation projects (about 700 in fiscal year 2005-06) comply with the federal Lead-Safe Housing Rule.
- I) Neighborhood Clean-Up** – [Neighborhood Services Department \(NSD\)](#) staff organize and facilitate neighborhood clean-ups and assist residents in identifying hazardous materials and reporting of illegal dumping.

## VI) ***Air Quality & Transportation***

The city is a leader in the ongoing regional effort to improve the quality of life for residents. The city has invested more than \$19 million in projects to reduce dust, the primary source of air pollution in the valley, through paving roads, shoulders and alleys. The city continues to invest in alternative fuel vehicles and clean fuels such as biodiesel. Transportation programs to provide public transit options and reduce congestion are also important tools to address air quality.

**A) Air Quality Planning** – Protecting and improving air quality is a critical issue for long-term sustainability in a large urban area. The city plays an active role in the regional effort to address [air quality](#). Since the early 1980s, the Maricopa County area has dramatically reduced air pollution levels in spite of continued growth in population and vehicle traffic.

Dust pollution from construction, vehicle traffic, rock and gravel operations and other activities has been the most challenging air quality issue in recent years. In December 2002, the regional planning agency completed a new air quality plan which includes an extensive range of new dust control programs that are expected to eliminate violations of the particulate (dust) standard by 2010.

Stringent air quality programs by the state, county and municipal governments have eliminated violations of the carbon monoxide standard since the mid-1990s. In addition, there have also been no violations of the current ozone standard for several years. (In 2008, the U.S. Environmental Protection Agency adopted a more stringent ozone standard.) The city will be an active participant in the regional effort to meet that new standard.

**B) Dust Control Program** – The city has implemented one of the most aggressive municipal dust control programs in the valley. Between 1999 and 2006, the city has invested nearly \$19 million in dust control programs. Examples are provided below.

- Paved 70 miles of roads.
- Completed 264 miles of an on-going asphalt treatment program for alleys.
- Transitioned to a full fleet of more efficient street sweepers which are designed to reduce dust.
- Designed an innovative vacuum system to reduce dust from crack seal operations.

- Trained nearly 3,600 city staff and 175 private contractors (2000-2007).
  - Stabilized 12 acres on the banks of the Salt River.
  - Conducted inspections of more than 300 city properties and applied dust control treatments as necessary.
  - Maintained an aggressive enforcement of unpaved parking lots and vacant lots, issuing nearly 7,000 violations in 2007.
- C) Fire Place Ordinance** – The city ordinance allows only clean-burning natural gas or other clean burning fireplaces in new or remodeled homes to reduce air pollution.
- D) Bikeway System** – In 1987, the city adopted a [bikeway program](#) to encourage alternative modes of transportation, promote physical activity, and reduce emissions and traffic congestion. Over 520 miles of bike lanes, bike routes, and multiuse trails connect neighborhoods with employment centers, parks, schools, shopping, downtown, and other destinations. The standard design for all new arterial and collector streets includes bike lanes.

In 2002, Phoenix instituted the country's most sophisticated bicycle school safety program and was honored with the Edmund Richert Award for the single best contribution to safety. Phoenix holds an annual "Bike To Work with the Mayor" program to encourage employees to bike to work. The city has also constructed four grade separated crossings of arterial streets to facilitate the use of the Arizona Canal as a recreational and commuter bike route. Crossings have been completed at 43<sup>rd</sup> Avenue, Peoria Avenue, 19<sup>th</sup> Avenue and 29<sup>th</sup> Avenue, and are under construction at 51<sup>st</sup> Avenue and Cactus Road.

**E) Light Rail**

The [METRO](#) Light Rail is the newest element of the Valleywide transit system, designed to address the high capacity transit needs of the Valley and complement the growing bus system. Each 90-foot long electrically-powered light rail car has the capacity to comfortably transport 180 people. Passes are sold at electronic fare vending machines and provide full accessibility to people with disabilities. In its first two months of regular service, the Light Rail system has beat ridership expectations and by every measure is carrying more riders than projected. The weekday goal was 26,000 boardings; Metro reported 30,600. More boardings – 31,300 – occurred on Saturdays, eclipsing the goal of 20,800.

The Regional Transportation Plan (RTP), adopted by the Maricopa Association of Governments (MAG) and financed partially under the one-

half cent sales tax extension, identifies 37-miles of major light rail/high capacity transit corridors to be implemented by 2025. The 20-mile starter segment opened in December 2008 and planning is complete for another 4.6-mile extension to serve the North Mountain Village Core.

**F) Clean Fuel Vehicles** – The city has invested more than \$33 million in alternative fuel programs since 1994, resulting in the Arizona Clean Cities Program recognizing Phoenix as a “Clean Air Champion”. As of December 2007, the city’s fleet consists of 1,300 light-duty compressed natural gas (CNG) vehicles, 343 liquefied natural gas (LNG) buses and trucks and 20 clean diesel buses with particulate traps and electronic engine controls to reduce emissions. The city operates 10 CNG and 3 LNG fueling sites, and over 1.1 million gallons of CNG and over 8.3 million gallons of LNG were used in 2006/2007. In addition, pilot programs are underway to evaluate synthetic and rerefined motor oil, hybrid vehicles, and LNG Solid Waste vehicles. Since November 2007, the Public Works and Aviation fleets have used only B20 Biodiesel to fuel their diesel vehicles.

**G) Clean Buses**

- The Public Transit Department has over 355 Liquefied Natural Gas (LNG) buses, representing 71 percent of the bus fleet. The Clean Bus Program earned a Clean Cities Partner award from the U.S. Department of Energy and the “Crescordia” award from the Valley Forward Association (Environmental Excellence Awards – 1999). These buses use an estimated 9 million gallons of LNG annually.
- The Aviation Department’s inter-terminal and rental car center bus fleets are 100 percent compressed natural gas (CNG), with three CNG filling stations, which are open to the public. The Aviation Department was honored by the Clean Cities Program and the Valley Forward Association for this program in 2003.

**H) Bus Rapid Transit (RAPID) & Expanded Local Bus Service** – The RAPID bus service, initiated in 2003, is an extremely successful and popular commuting option for Valley residents. The RAPID buses are scheduled for frequent trips during morning and afternoon peak hours, use existing freeway HOV lanes, and operate as point-to-point service. The RAPID buses consist of a light weight composition body for greater fuel efficiency and less impact on roads and freeways. The fixed-route local bus service extended hours of service, and added buses and new bus routes to serve new areas. This program received the “Crescordia” award from the Valley Forward Association (Environmental Excellence Awards – 2004).

In 2007, the Phoenix Public Transit Department launched extensive transit improvements, investing nearly \$70 million dollars on more bus service, new

routes, new buses and more staff. Improvements resulted in an increase in ridership in the city – 45 million passengers boarding compared to 32 million in 2000. Other changes included:

- Three million more miles of new service added for an annual total of 21 million miles;
  - \$52 million in new transit vehicles, including 96 new 40-foot buses and 30 new 60-foot buses that use clean burning fuel;
  - 536 new shade shelters;
  - Increased bus frequency on 11 local routes, including more frequent stops during peak afternoon hours and Sunday service.
- I) Bikes on Buses** – The entire fixed route transit bus fleet has been 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 provides bicycle lockers at all Phoenix’s park-and-ride locations.
- J) Neighborhood Circulator Bus Service** – In 2001, Phoenix initiated a neighborhood transit service using fuel-efficient mini-buses in targeted neighborhoods and communities. The service connects to the regional transit system and encourages youth transit ridership. The neighborhood circulator was successfully piloted in Ahwatukee/Desert Foothills. In 2007, new neighborhood circulator routes were launched in the Maryvale/Desert Sky and Sunnyslope communities and two more are scheduled for 2008 in Desert Ridge and in northwest Phoenix.
- K) Transit Vehicle Management System** – Phoenix has implemented 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 also used to create more efficient schedules. Real time bus arrival information is displayed on electronic message boards in the downtown area and Park and Ride lots.
- L) Automated Bus Trip Planning** – [The Valley Metro website](#) provides automated trip planning for Phoenix residents. The user friendly system assists passengers in planning trips from origin to destination to encourage transit usage.
- M) Electronic Fare Collection Systems** – In 2007, a new fare collection system was implemented with the installation of new fareboxes on all transit buses, 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 now offered for

purchase. Additionally, a more convenient Smart Card pass, that may eliminate a need for paper-based passes, is being tested.

- N) Bus Pass Programs** – Bus Card Plus, the Phoenix Union High School Pass Program, and the Arizona State University Pass help to encourage transit use by improving convenience, helping employers comply with travel reduction goals, and supporting transit fare subsidy programs.
- O) Ride Share: Car and Van Pooling** – Phoenix participates in a regional [rideshare](#) matching program to reduce traffic congestion, greenhouse gases, air pollution, and consumption of fuel. The city provides carpool parking subsidies, free bus passes, and emergency cab vouchers for all city employees. Phoenix also participates in the Valley Metro Vanpool Program that provides up to 15 commuters per van a ride to their place of employment. Also, several city departments have vehicles that are shared by department staff or other city employees.
- P) Phoenix Dial-A-Ride & Reserve-A-Ride** – Phoenix Dial-A-Ride transports ADA-certified passengers and persons with disabilities and seniors for a variety of trips using 123 paratransit vans. Also, the city’s Human Services Department’s Reserve-A-Ride Program has 38 mini buses which provides transportation to adults with permanent mobility disabilities.
- Q) Transportation/Congestion Management** – Programs to reduce traffic congestion also help reduce air pollution by reducing travel times and vehicle idling. The city traffic light synchronization program reduces stop-and-go traffic and computerized traffic monitoring allows the Street Department to remotely control traffic signals to respond to accidents and other problems. By the end of 2007, more than two-thirds of the nearly 1000 traffic signals in Phoenix will be connected to the Traffic Management Center, allowing an unprecedented degree of responsiveness to changing traffic conditions. Computerized message boards provide information to help improve traffic flow for events.
- R) Airport Traffic Congestion Reduction** – Phoenix Sky Harbor International Airport has implemented the following programs to reduce vehicle idling and related emissions:
  - **Automated Vehicle Identification (AVI)** – The AVI system uses Radio Frequency Identification technology to track and identify taxis and other commercial vehicles as well as airport-owned shuttle buses. This system improves customer service by providing information on vehicles that are currently in the system, reducing wait times and congestion through fleet adjustments.

- **Rental Car Center** – In January of 2006, the opening of Sky Harbor’s off-site consolidated rental car facility reduced the number of vehicles traveling through the airport. Transportation from the airport terminals to the rental car facility is provided by city-owned Compressed Natural Gas (CNG) clean fuel burning buses, replacing over 100 privately owned rental car company vehicles burning conventional fuels.
  - **Cell Phone Lots** – In the free Cell Phone Lot, “pick up” drivers can wait in their vehicles for deplaning passengers. Flight and luggage status information is displayed on large screens allowing drivers to track the progress of their party, eliminating vehicles from circling the terminals. The Cell Phone Lots (formerly the Stage and Go program) won an innovative Use of Technology Award from Public Technologies, Inc.
  - **ExpressPay/Pay On Foot at East Economy Lot** – Two airport public parking garages have a walk-up payment center in the garage lobby. The prepaid ticket will allow airport exit at one of the two dedicated ExpressPay lanes, reducing vehicle idling time.
- S) Parks and Recreation Department Computerized Registration** – The Parks and Recreation Department has implemented a class registration software system, "Active," which allows residents to register for department classes and activities from their homes or from any other computer eliminating trips to recreation centers. The system also allows customers to use credit cards to pay registration fees. The "Active" system is also being used for sports league scheduling and team sign-ups.
- T) Library Electronic Information Delivery System** – For many years, the Library has provided customers with the ability to conduct business and receive information using a personal computer. Card holders can access the Library’s Web site and catalog from home, place a hold on materials; ask staff questions, and retrieve information from over 100 electronic databases the Library provides through special subscriptions 24 hours per day.

## **VII) *Green Buildings & Energy***

The city has received numerous awards and recognition for its long-standing commitment to energy conservation, energy efficiency and environmental preservation. Phoenix’s unique and long standing Energy Conservation Savings Reinvestment Fund has allowed the Phoenix Energy Office to be on the cutting edge of energy conservation. Through education and community outreach, the city actively participated in national campaigns and grassroots efforts, such as ‘ENERGY STAR Change a Light, Change the World’, to promote and raise awareness of the benefits of energy efficient lighting choices. Following a city policy that encourages construction of 2006 bond-funded city buildings using

Leadership in Energy and Environmental Design (LEED) standards, the city has seen a steady increase in the number of city-owned green buildings as well as the number of LEED accredited professionals among city staff. Partnerships with local utilities prove to be beneficial as the number of joint and independent solar photovoltaic (PV) projects continue to be developed, including a 100 kilowatt solar system at the new Convention Center.

**A) Green Buildings** – In June 2005, the city council adopted a policy that, at a minimum, all new city buildings built with the 2006 Bond Funds be constructed to the basic LEED standard. Bond funds approved by voters in 2006 include a 2 percent cost to cover any basic LEED-related design and construction costs. For the past ten years, the city has co-sponsored an annual Green Building Expo with the Cities of Scottsdale and Tempe. By June 2008, eleven city staff had tested to become LEED accredited professionals. The nine city buildings listed below are either LEED Registered or LEED Certified:

- [Fire Station #50](#) - LEED “Certified” in 2004.
  - [Desert Broom Library](#) – LEED "Certified" in 2006.
  - [Cesar Chavez Library](#) – operational and certification in process.
  - Glenrosa Service Center Bldg. – operational and certification in process.
  - [Burton Barr Central Library](#) – certification in process for EB (existing Building).
  - [Phoenix Convention Center/West Bldg](#) – LEED “Silver” in May 2008.
  - ASU Cronkite School of Journalism/KAET 8 – construction complete June 2008, certification in process.
  - Rio Salado Audubon Center – in design, construction begins summer 2008.
  - ASU College of Nursing and Healthcare Innovation – in design.
- **Design Standards for City Buildings** – The city Building Standards were revised in 2006 to include additional energy related standards for city projects. The revisions supplement the LEED standards for green buildings which, by design, use less water and energy, generate less waste products, provide a more comfortable environment for their occupants, and contribute to a more sustainable environment. Due to Phoenix’s climatic conditions, the city has established minimum standards more stringent than the LEED minimum standards, requiring:
- Landscape and exterior designs that reduce urban heat islands.
  - Diversion of a minimum of 50 percent of construction waste from landfill disposal.
  - A LEED accredited professional on the design team.
  - When compared to the Energy Policy Act of 1992, buildings should use:

- 50 percent less water in landscaping
- 20 percent less water in interiors
- 30 percent less overall energy

**B) Phoenix Energy Conservation Program** – The city has received numerous energy efficiency awards and is working with Arizona State University and the utility companies on sustainability issues and solar photovoltaic pilot projects. The city of Phoenix’s Energy Conservation Program has saved over \$75 million since the late 1970s. Program highlights include:

- **Energy Efficiency Retrofits for Air Conditioning and Lighting** – The Energy Conservation Savings Reinvestment Fund (Pay-as-you-go), which was first approved by city council in 1983, has provided the funding for Energy Management staff to work with city departments on a wide variety of retrofit projects. Most of these projects involve High Volume Air Conditioning (HVAC) and lighting, which comprise the most energy consumption and expense in city facilities. Projects include replacement of HVAC units with high efficiency units, variable speed drives on air and water distribution systems, energy management systems and controls, and light system retrofits from standard T-12 lamps and magnetic ballasts to T-8 lamps and electronic ballasts.
- **Energy Conservation Outreach** – The Public Works Department promotes energy conservation through presentations at various events including annual Engineering and Facility Management shows, Energy Association meetings, technical groups, city council subcommittees, and the Environmental Quality Commission. Energy conservation information is provided to city staff in appropriate venues.
- **Energy Star Program** – [Energy Star](#) rated equipment is in the top ten percent of the most efficient equipment available. The Energy Management Task Force initiated an Energy Star purchasing pilot program for city departments. The pilot program evolved into a permanent program where city buyers work with departments to make Energy Star rating a requirement for city procurement. Affected equipment includes computers, monitors, printers, copiers, and other general appliances required in city operations.

**C) Energy Conservation: Other Departments**

- **Street Transportation Department** – Streets is implementing an energy conservation program to convert incandescent traffic signal bulbs to light emitting diode (LED) devices. These devices reduce energy use by 90 percent. While a new U.S. Department of Energy rule requires this conversion for all colors (red, yellow and green) on new signaled

intersections, Phoenix started their program well before the federal program, and began replacing traffic signal bulbs in 2000. As of the end of 2007, more than 9,000 LED devices have been installed, and traffic signal indications at about 80 percent of all signalized intersections will operate completely or partially with LED light sources.

- **Aviation Department** – The Aviation Department will use the U.S. Green Building Council's LEED standards in a pilot study for several future construction projects at Phoenix Sky Harbor International Airport to reduce operating costs and energy use, lower utility bills, and minimize environmental impacts. The Aviation Department currently uses computerized energy management systems that assist in the optimal running of temperature control systems. Environmentally preferable construction techniques, high performance building materials, high efficiency cooling towers, fan wells, and variable frequency drives are also utilized.
- **Fire Department** – The Phoenix Fire Department is committed to building green fire stations and thus far, has built nine green facilities. Fire stations are designed to last at least 50 years, and for the buildings to return the additional green building investment costs via energy savings within the half lifecycles (25 years) of the buildings. Energy audits of the existing green fire stations have found an energy savings of between 30 percent and 50 percent. Green materials include recyclable metals in the roofing, recycled rubber tires for athletic floor coverings, insulation materials that include post-consumer recyclable styrene, formaldehyde free insulation bats, and recycled acoustic tiles. Planned green fire stations will incorporate an improved roof structure that will give an insulation value of R-54, equaling the insulated concrete form exterior walls.
- **Parks and Recreation Department Pools** – Three high-efficiency motor/pump combinations purchased for city pools have a variable speed drive system to maximize energy savings. The purchase of solar pool covers for six heated pools will result in an estimated 20 to 30 percent savings in pool heating costs as well as reduced chemical and water use.
- **Parks and Recreation and Golf Courses** – All golf courses and parks with large pump stations have small pumps which are activated when small amounts of water are needed, saving the energy required to operate a larger pump. Installation of Variable Frequency Drives on irrigation pump stations and booster pumps alters the frequency and spins the motor more slowly, thus reducing energy demand. In addition, an automated remote control lighting system is used at various parks to provide automated and remote control of lighting systems.



- **Water Treatment Plant Optimization** – Through an energy optimization program, the city’s Water and Wastewater Treatment Plants and associated facilities run as energy efficiently as possible, reducing peak energy demands and overall energy usage. Energy efficiency is incorporated into all new construction and upgrades at Water Services Department facilities.
- D) Building Codes** – In 2007, city council adopted the 2006 International Energy Conservation Code, which established minimum energy conservation standards for development. This Code regulates general development in the city of Phoenix, and represents a major step in providing guidance on minimum energy standards to owners and developers. Energy reductions, from 10 to 40 percent, may be achieved in buildings built to this new code.
- E) Renewable Energy Goal** – In 2008, City Council approved a goal that by 2025, 15% of the energy used by the city should come from renewable energy sources. To the greatest extent feasible, the city will achieve goal through city-owned and city-sponsored projects, primarily through public and private partnerships. The goal includes periodic reviews by the city council and includes milestones to track progress. The citizen-based Environmental Quality Commission and Public Works Department collaborated to develop the recommendation for an aggressive and challenging renewable energy goal to help guide the city in future energy decisions.
- F) Solar Energy** – Solar, or photovoltaic (PV) power is created by transforming solar energy collected by modules into electricity. Examples of the [city’s PV projects](#) include the facilities listed below.
- **40<sup>th</sup> Street - Pecos Park & Ride Facility (100 kW)** – Through a partnership between the city of Phoenix and the Salt River Project, this facility provides solar generated electricity to the Ahwatukee community and parking spaces for transit passengers. The PV modules are located on top of two parking shade canopies and the security building. PV equipment enclosure transforms solar energy for use in the public grid, generating enough energy to 13 to 15 Valley homes on an annual basis and collecting solar energy data for future alternative energy projects. This program received the “Crescordia” award from the Valley Forward Association (Environmental Excellence Awards – 2003).
  - **North Mountain Visitors Center (3.15 kW)** – This center, operated by the Parks and Recreation Department, was built with minimum impact to the site on previously disturbed land. Shading devices (24 feet deep) block sunlight from windows to increase energy savings. Exterior walls are Integra insulated concrete block, which is a type of concrete block

system that involves laying a block wall and filling the core with foam. All of the trees on site were salvaged and replanted throughout the area. A 3,150-Watt PV system, which includes eighteen 175 watt solar panels, is being installed to provide power to the facility during the day, offsetting power from the utility grid, and demonstrating solar and renewable technologies in a natural educational setting. An information screen is installed inside the building for educational purposes and to monitor the systems performance.

- **Camp Colley (8.45 kW)** – Camp Colley, which is located 50 miles north of Payson, in the mountains of Central Arizona, is a city-owned and operated outdoor wilderness camp. Electricity at Camp Colley is primarily supplied through a PV system which converts solar rays into energy. Camp Colley also utilizes a subsurface wastewater treatment system that filters out solids into septic tanks, then treats effluent water by passing it through wetland plants, which utilizes the waste and allows recharge of cleaner water into an adjacent meadow. These sustainable systems are part of the educational component of the camp. Camp Colley also teaches participants about the environment by conducting conservation projects including the removal of non-native and invasive plants and animals.
- **Pecos Community Center (30 kW)** - This project, a partnership between the Salt River Project (SRP) and the city of Phoenix, has a 30 kW solar photovoltaic system installed on the roof of the gymnasium equivalent to powering four area homes on an annual basis. It is designed to feed power to the facility and offset utility purchased power on site. A data acquisition system will make system information available via the Internet and a monitor in the lobby of the facility will display power generation information and other environmental facts.
- **Phoenix Convention Center (100 kW)** – The West Building of the Phoenix Convention Center (PCC) will incorporate 100 kW of solar power on its roof. This system, which is equivalent to powering 13-15 homes on an annual basis, will provide power directly into the facility and is designed to offset power typically purchased from the utility.
- **North Gateway Transfer Station (7 kW)** – This city developed a 7 kW photovoltaic system on the roof of the transfer station, which will offset power requirements during the day and 32 photovoltaic powered lights in the employee and visitor parking lot of the facility, avoiding approximately 4 kW of conventional lighting load. In total, these two systems are equivalent to powering eight area homes. The roof mounted photovoltaic system will provide power directly to the facility and is designed to offset onsite power requirements.

- G) Landfill Gas-to-Energy (LFGTE)** – Gas generated from landfills is a viable renewable energy source. Benefits include the reduction of greenhouse gas emissions and the ability to defray methane gas control expenses. Potential sites for LFGTE projects described below include the 27<sup>th</sup> Avenue Landfill, Skunk Creek Landfill and the State Route 85 Landfill.
- **27<sup>th</sup> Avenue Landfill** – At the 27th Avenue landfill, staff continues to work on a gas-to-energy project with Cambrian Energy, which owns the rights to the landfill gas per a previous agreement with the city. Tentative plans are for construction of a LFGTE plant at 27<sup>th</sup> Avenue to begin in 2008. Initial conceptual discussions have begun concerning the inclusion of bio gas produced at the 23<sup>rd</sup> Avenue Waste Water Treatment Plant in this renewable energy project.
  - **Skunk Creek Landfill** – At the recently closed Skunk Creek landfill, Public Works staff is close to finalizing a contract with AMERESCO to develop a LFGTE project. As of December 2007, the project is anticipated to be permitted and construction complete by mid-2009. Approximately 3 megawatts of power will be produced, which is equivalent to powering 2,100 homes.
  - **State Route 85 Landfill** – Installation of the 1<sup>st</sup> phase of a landfill gas collection system was completed in 2007. The landfill gas being collected is of sufficient quantity and quality to support a future energy project. Although specifics are not known at this time, Public Works anticipates preparing a request for proposal (RFP) to solicit a developer to utilize the landfill gas as a renewable fuel source.
- H) City/Downtown District Cooling System** – Built in 1993, the innovative district cooling and thermal storage system supports over 1.2 million square feet in the downtown area. A Thermal Energy Storage Tank underneath the Adams Parking Garage provides chilled water (40°F) during on-peak hours through underground pipes to the buildings to meet all air conditioning loads. Water is returned to the tank from the buildings at 60°F. During the off-peak periods, the Central Plant Chillers in the City Hall basement operate to meet all air conditioning loads and “recharge” the Thermal Energy Storage Tank with 40°F chilled water to use during the next on-peak period. It is estimated that annual energy savings from district cooling exceeds \$200,000 per year. The eight buildings supported by the district cooling system include: Phoenix City Hall, Orpheum Theater, Personnel Building, Calvin Goode Municipal Building, Walker Building, Municipal Courthouse, Historic City Hall, and the 305 Garage.

- I) **Northwind District Cooling System** – Five city-owned facilities are connected to the privately owned Northwind district cooling system, which uses an industrial grade, ice-based chiller system that manufactures 3 million pounds of ice each night when utility loads and rates are lowest. During peak periods, the ice is melted and 34°F water is distributed through an extensive network of underground pipes to provide state-of-the-art cooling to buildings throughout downtown Phoenix. The ice storage system reduces energy costs by producing air conditioning in advance. By making ice at night when electricity is less expensive, Northwind Phoenix can store low-cost cooling for use during the hottest part of the day when costs and use are highest. The buildings in this system include: TGen/CC Headquarters, ASU Downtown University Center, Phoenix Convention Center, Herberger Theater, and Symphony Hall.
- J) **Energy Efficient Housing** – The following programs demonstrate the city's commitment to energy efficient housing:
- **Affordable Housing** – The Housing Department Development Section encourages energy efficient improvements in its affordable housing proposals. As part of evaluation scoring criteria, additional points are given for energy efficiency improvements, such as HVAC with a seasonal energy efficiency ratio (SEER) rating greater than 10; “Energy Star” rated appliances, and landscape designs utilizing xeriscape principles to conserve water usage.
  - **Housing Modernization** – For more than ten years, the Housing Department has been involved in improving the energy efficiency and sustainability of its rental apartments that provide housing to lower income residents. Housing has invested over \$25 million in modernization projects that have always incorporated improvements with regard to efficiency, accessibility, affordability, livability and sustainability. Some projects and improvements include:
    - Installation of low-flow water valves and fixtures in all apartments.
    - Coating flat roofs with energy saving reflective ceramic polymer material.
    - Replacement of interior incandescent lighting with lower energy use fluorescent lights.
    - Replacement of exterior incandescent lights with lower energy use high pressure sodium light fixtures.
    - Purchasing only Energy Star appliances.
    - Installation of xeriscape landscaping and irrigation systems.
    - Use of passive building cooling techniques including shade trees.
    - Use of gas appliances with electronic ignitions (instead of pilot lights).
    - Replacement of evaporative coolers with high SEER-rated HVAC systems.

- Installation of master chiller systems.
  - Use of environmentally safe cleaning solutions.
  - Remodeling bathrooms to include low water use fixtures, solid tub surrounds, additional grab bars and improved ventilation to reduce mold growth and improve accessibility.
  - Using Green Seal paint products with low volatile organic compounds.
  - Using aqueous based solvents and products that contain recycled materials.
  - Installing artificial turf in landscaping designs.
  - Eliminating or encapsulating environmentally sensitive building material such as lead and asbestos.
  - Developing a 69 unit mixed finance apartment building for seniors with a Silver LEED certification.
- **Neighborhood Services Department (NSD) Weatherization Program** – NSD provides one-time grants of up to \$8,000 to qualifying homeowners to help reduce energy use. The program is funded by a range of sources including Southwest Gas, Arizona Public Service, Salt River Project (SRP), U.S. Department of Energy - Low Income Energy Program, and the Human Services Department Utility Repair Replacement and Deposit Program (URRD). Examples of energy projects include replacement or repair of heating and cooling units, insulation addition, duct sealing, weather-stripping and caulking. Based on grant funding, the city plans to assist approximately 100 homes per year. Energy use measurements are obtained before and after the improvements to ensure the effectiveness of the program.
  - **Energy Efficient Home Construction** – The Neighborhood Services Department (NSD) utilizes house plans for new construction that provide energy savings to the low-income homeowners through energy demand reduction. The investment in energy reduction measures costs approximately \$3,500 per house, with a projected monthly decrease in energy costs of \$35. This amounts to a return on investment at 8.3 years, compared with the industry standard of 20 years or less. The homes incorporate improved building design and utilize passive energy practices, resulting in energy-efficient homes that exceed the Energy Star standards. NSD was honored by the National Association of Home Builders, the National Renewable Energy Laboratory and the U.S. Department of Energy with their 2004 Silver Award for Energy Value Housing as a leader in energy efficient home building and environmentally conscious building practices.
  - **HOPE VI Project** – The Matthew Henson HOPE VI Project provides affordable and energy efficient housing for public housing residents. The HOPE VI Project demolished 356 old and obsolete public housing units

(while preserving 16 historical units) and is constructing 611 state-of-the-art, energy efficient housing units. Green building concepts have been incorporated including:

- Energy Star appliances in all housing units, providing energy cost savings to public housing residents.
- Upgraded paint systems that resist fading and heat absorption are applied to all new units. Low-E glass is also being used in all multi-family units, which reduces heat transfer from the sun while still allowing non-harmful light in. High quality caulking is used on all windows, door frames and structural framing.
- Desert landscaping and low water use plants have been installed throughout the project and buildings have been positioned to maximize shade in the summer months and sun in the winter months. Rain water is guided to water catchment basins to be recycled back into the underground water shelf.
- Two waterless urinals were installed in management and youth buildings, saving over 40,000 gallons of water per year. Efficient hot water delivery systems, self-closing faucets, and low flow fixtures also conserve water.
- M-Energy Efficient Home Construction – The HOPE VI Project was one of ten selected in September 2006 to be featured in the ASU/Stardust Foundation, Arizona Excellence in Affordable Housing Exhibition because of its unique “Green Building” concept and environmentally friendly design.

**K) Rental Rehabilitation Program** – The Neighborhood Services Department provides financial assistance to property owners of multi-family housing units. The program’s objective is to stabilize and physically improve the affordable housing stock to promote a healthy, safe living environment for the residents and the neighborhood. Improvements may include new electrical and plumbing systems, heating and cooling units, and appliances that meet or exceed Energy Star ratings.

## **VIII) Water**

Phoenix has long recognized that water is a most precious resource in its arid, desert environment. Phoenix has taken great care to plan, acquire and manage its water resources, including innovative water conservation, recharge and reclamation programs. Phoenix has had a water conservation program since the 1980’s, and has steadily reduced its reliance on groundwater from 35 percent in 1984 to 3 percent today. Through innovative ordinances and programs, Phoenix’s per capita water usage has decreased approximately 20 percent during the last 20 years. Phoenix continues its legacy of careful water planning and conservation outreach, and various city departments assist in this effort by implementing innovative water-saving approaches.

- A) Water Utility Sustainability** – Unlike older urban areas of the United States, Phoenix has relatively modern, sophisticated infrastructure to meet the Water and Wastewater needs of our customers. Sustainable practices include:
- Separate storm sewer and sanitary sewer systems, eliminating the problem of combined storm overflows and associated water quality problems;
  - 100 percent metered connections to the system, encouraging efficient use;
  - A seasonal water rate structure that encourages efficiency through a higher charge during the hottest summer months.
- B) Water Resource Sustainability** – The city of Phoenix is a national leader in utilization of long-term sustainable water sources in an arid environment. Following the enactment of the 1980 Arizona Groundwater Management Act, Phoenix shifted its portfolio to rely mainly on renewable, surface water supplies, saving the groundwater as a backup for extended droughts.
- **Aquifer Management** – In cooperation with other local agencies, the city engages in groundwater recharge and groundwater savings activities. Groundwater usage has been reduced from approximately 35 percent of the Phoenix water supply in 1984 to only 3 percent today in a normal supply (non-drought) year.
  - **Long-term Planning** – Phoenix regularly updates its long-term Water Resources Plan to ensure continued water supplies for current and future customers. The [2005 Water Resources Plan Update](#) reflects growth over the next 50 years under a variety of conditions (current density, high density, etc). Modeling conducted to determine the stability of the water resource portfolio demonstrated that Phoenix is positioned well to meet future needs and to comply with the State’s 100 year Assured Water Supply requirement. The 2005 Update identifies several functional plans and projects necessary to meet our future water needs.
  - **Research and Innovation** – The city of Phoenix actively participates in groundwater research and regional coordination efforts examining in the Phoenix Metropolitan area. In addition, the city is embarking on a groundwater management study to identify the volume of groundwater and the number of wells needed to: 1) meet demands under moderate drought conditions; 2) provide necessary operating system flexibility to meet peak demands, and 3) maintain a reasonable volume of water to customers during system emergencies. The study will address recharge

needs within the service area, and recommend ways to best manage available reclaimed water supplies.

- **Drought Planning/Climate Change** – Phoenix has been involved in studies aimed at determining the length and severity of past droughts in the area using tree rings. From these studies, the city has increased its drought planning horizon. In addition, long term plans have accounted for future climate change by assuming a long-term reduction in precipitation in the watershed.

**C) Conservation Outreach** – Phoenix is committed to ensuring a sustainable water supply through comprehensive water management programs. The [city's Water Conservation program](#) was established in 1986 and includes extensive public education activities, plumbing retrofit initiatives and water use efficiency requirements for new development. Implementation of conservation initiatives has resulted in a per-capita reduction of approximately 20 percent over the last 20 years, well below the standard established for Phoenix by the Arizona Department of Water Resources. The city continues to build on its success with a new “Enhanced Conservation Program” initiative which seeks further efficiencies. In addition to working with the community, the Water Services Department (WSD) works with city departments to reduce water use.

**D) Water Conservation: Parks and Recreation Department (PRD)**

- PRD is piloting a new water conditioning system which will ionize the water with a low voltage electrical charge. The energized water is intended to more efficiently penetrate the soil, be more easily absorbed by plant tissue, and allow fertilizers to be utilized more efficiently. Initial results at the Maryvale Baseball Stadium and Coyote Basin Park indicate a 30 percent savings in water use during the trial period.
- Synthetic turf has been installed by PRD on two soccer fields, reducing water use by more than 2 million gallons of water per year. Energy is saved due to reduced electrical use on pump systems, and use of fertilizers and pesticides is reduced. The fields also use recycled rubber as infill for the turf.
- Reclaimed water is used for irrigation at Desert Willow Park, Cashman Park and Reach 11 Sports Complex.
- PRD uses central irrigation control with a weather- based evapotranspiration system at all golf courses and 9 major parks. Central irrigation control systems allow for centralized monitoring and adjustments of sprinkler operations. Water is saved by using weather

equipment to measure the amount of evaporation, allowing application of only the required amount of water. Energy savings are also achieved.

- PRD is experimenting with different turf grass to conserve water, reduce maintenance, and determine which varieties perform better with reclaimed water. Grass varieties are matched for site specific needs ranging from retention basin parks to sports fields.

#### **E) Water Conservation: Other Departments**

- The Sky Harbor International Airport uses xeriscaping concepts, which are aesthetically pleasing and functional while minimizing the maintenance requirements. The Sky Harbor International Airport received Valley Forward's Environmental Excellence Award for both Water Conservation and its xeriscaping program.
- At Ed Pastor Transit Center, rainwater caught by the shade canopy is used to irrigate vegetation in the retention area. (The Ed Pastor Center also received a Valley Forward Environmental Excellence Award for historic preservation activities.)
- The Neighborhood Services Department (NSD) coordinates the Curb appeal projects, which are sponsored by the Maryvale Revitalization Corporation, the city of Phoenix, private sector, and volunteers. The Curb Appeal Projects add green space and revitalize homes by providing desert landscaping.

**F) Water Quality** – Phoenix's tap water meets or exceeds all federal and state requirements for health and safety. The city of Phoenix must adhere to even more stringent requirements than bottled water producers. Over 4 million tests and measurements are performed each year in the treatment and distribution systems to ensure water quality. Phoenix has state-of-the-art equipment and laboratories which test for more than 100 different substances, and submits hundreds of reports each year to the appropriate regulatory agencies.

**G) Reclaimed Water Management** – Over 90 percent of the water "reclaimed" from Phoenix's wastewater treatment facilities is reused. The city's Cave Creek Reclamation Plant generates reclaimed water to serve golf courses and parks in North Phoenix, thus freeing up potable supplies. Reclaimed water from the larger 91<sup>st</sup> Avenue and 23<sup>rd</sup> Avenue wastewater treatment plants is utilized for crop irrigation, industrial cooling at the APS Nuclear Plant and for habitat restoration uses along the Salt River. Phoenix has also entered into an innovative "three way exchange" program with the Salt River Project and the Roosevelt Irrigation District which allows the city to deliver reclaimed water to farms and receive surface water in return at city

water treatment plants. The city continues to evaluate further means to effectively utilize this important resource, including underground storage and recovery.

- H) **Bio Solids Reuse** – The Water Services Department participates in the National Biosolids Partnership (NBP), for environmentally sound and effective biosolids reuse. Biosolids, which result from treatment of municipal sewage, are processed to reduce or eliminate pathogens, minimize odors, and provide a beneficial agricultural product instead of landfilling.

## IX) ***Riparian Area Restoration & Preservation Projects***

Riparian areas are among the most biologically rich habitats, and once represented a much large portion of the Phoenix area. Aided by community leaders, the city recognized the importance of these areas and worked with various partners to restore these areas. Two key award winning projects, the Rio Salado Habitat Restoration Project and the Tres Rios Project, have been completed after much hard work, and serve as a credit to the many involved residents and agencies. These areas are now lush riparian corridors open to the public with numerous environmental educational opportunities. The city is also working with other agencies to preserve habitat and ensure the environmental health of the valley's watershed.

- A) **Rio Salado** – The 595-acre [Rio Salado Habitat Restoration Project](#) has yielded both environmental and economic benefits. Once a deteriorated dumping site along the Salt River, it has now been restored to a native wetland with riverbank habitats, a lush riparian corridor of stream, wetlands, trees, and desert grasslands for visitors to enjoy. The project includes a flood control feature, five miles of trails, and a wildlife habitat. This urban wildlife and habitat resource spans five miles along the Salt River from 24<sup>th</sup> Street to 19<sup>th</sup> Avenue. The inspiration and vision for the park started over 40 years ago and has included thousands of residents and numerous government agencies. Rio Salado represents a careful balance between water conservation and the use of water to sustain wildlife habitat. Future plans are for an additional eight miles downstream, the Rio Salado (West).

Nearly 60 percent of the water applied to the project returns to the aquifer through incidental recharge and its quality is naturally improved by filtering through the wetlands. Irrigation water is only released to the habitat as needed through canals and pipes designed to be protected from periodic flood waters. Non-potable water pumped from the groundwater aquifer is used for the project and then recharged through an innovative reclaimed water exchange program with the Roosevelt Irrigation District (RID). Future elements include an Audubon Arizona Nature Center to promote environmental education.

- B) Tres Rios** – The city of Phoenix is the lead with its Sub-Regional Operating Group (SROG) partners on the [Tres Rios Project](#), which includes restoration of 1,500 acres for native riparian habitat, water quality improvement, flood damage reduction, recreational expansion, and environmental education. Starting with a small demonstration project, Tres Rios is expanding to use reclaimed water to enhance the sustainability of an important riparian area. Additionally, the city is pursuing a Safe Harbor Agreement with the U.S. Fish and Wildlife Service to provide a net conservation benefit for endangered species while still performing maintenance work. The project partners include the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, and Flood Control District of Maricopa County.
- C) City of Phoenix Section 404 Program** – The Office of Environmental Programs helps departments with Section 404 of the federal Clean Water Act, which helps protect rivers, streams, and washes by establishing guidelines for projects to have the least possible impact on these important environments and providing for restoration as appropriate. In Arizona, the 404 program focuses on fragile desert washes that are key wildlife habitat and movement corridors. The city of Phoenix 404 program helps departments review projects and address the impacts of construction or maintenance on desert washes. The program was established in 1998, and by 2006, more than 5,000 employees and consultants have been trained. The program also helps to ensure that other natural and cultural resources are addressed.
- D) Water Protection: Stormwater** – The Phoenix Stormwater Protection Ordinance helps protect the waterways and riparian areas through regulation of stormwater discharges. The Street Transportation and Engineering and Architectural Services Departments work together to identify and eliminate sources on pollutants entering storm drains. The program includes public information and education activities and a hotline for the public to report dumping or other activities that may pollute stormwater. Other departments, such as Aviation, Public Works and Water Services, have separate “industrial source” storm water permits from the U.S. Environmental Protection Agency, as required, and have instituted their own compliance programs.
- E) Roosevelt Habitat Conservation Plan (HCP)** – The city, with Salt River Project, the U.S. Bureau of Reclamation, and other Valley cities are addressing habitat protection and endangered species issues through the HCP for Roosevelt Lake. The participating entities funded the purchase and management of land along some remaining free-flowing rivers in Arizona to help ensure habitat preservation.
- F) Verde Habitat Conservation Plan (HCP)** – The city and Salt River Project are completing a HCP for Horseshoe and Bartlett Reservoirs to provide

habitat protection for endangered species. Selected land is being purchased and managed along Arizona's rivers for this effort. Additionally, habitat improvements and other programs to benefit native fish species are being implemented.

- G) River Sustainability** – The city is participating in collaborative processes to enhance the health and sustainability of the State's watersheds. The city has been actively involved in the discussions and the need for the State to address how pumping wells affect stream flow.
  
- H) Burrowing Owls** – Since October of 2002, the Parks and Recreation Department (Parks) has partnered with Wild at Heart and Partners in Flight to relocate displaced burrowing owls to the Reach 11 Recreation Area. These small ground dwelling owls have been forced from their habitat by various types of construction around the valley. Parks has been providing a habitat friendly location at the 1,500-acre multi-use park at Reach 11 to create new homes for these owls. Wild at Heart and Partners in Flight provide the supplies, expertise, and collect the owls. To date, 16 relocation sites have been established and over 40 birds introduced to the new sites at Reach 11. Success has been limited but several of the sites have produced young owls over the last few breeding seasons. In October 2007, Parks met with the Arizona Game and Fish Department and the Bureau of Reclamation to discuss a proposed five year study and possible relocation of the unsuccessful nesting sites.

## **X) *Historic Preservation***

Historic preservation refers to maintaining and preserving buildings and artifacts that are at least 50 years old under the National Historic Preservation Act. Preservation allows an ongoing connection with Arizona's historic heritage and provides a legacy of cultural, social, environmental, educational and economic benefits that will enrich future generations. The city's award-winning program continues to provide incentive programs and workshops to promote preservation and rehabilitation of historic resources.

- A) City of Phoenix Historic Preservation Office** – This [city office](#) preserves, protects and enhances historic neighborhoods, buildings and sites. The city works closely with the citizen's Phoenix Historic Preservation Commission, appointed by the mayor and city council, to identify and designate properties and districts eligible for listing on the Phoenix Historic Property Register. Over 8,000 properties are registered to date, with most of these properties located in the urban core. The city works closely with historic property owners on rehabilitation projects, provides technical advice, and performs design review for new additions and alterations to historic properties. Recent accomplishments include surveys to identify historic properties associated with the city's African American and Hispanic heritage. Several

city incentive programs, which provide matching grants are available to preserve and rehabilitate historic resources including:

- Exterior rehabilitation assistance to owners of historic homes listed on the Phoenix Historic Property Register. This Valley Forward award-winning program has helped more than 300 individual property owners rehabilitate existing historic homes, and has facilitated the revitalization of several, large inner-city historic neighborhoods.
- Demonstration Project Program to help acquire and rehabilitate historic properties used for multi-family, commercial or institutional purposes. This ongoing program has helped find new viable uses for vacant historic buildings downtown, including the Title and Trust Building (Orpheum Lofts) and Phoenix Union High School (University of Arizona Medical School).
- Low Income Historic Housing Rehabilitation Program, which provides matching grants to income-qualifying homeowners to help them rehabilitate their homes. The city has committed additional 2006 bond funds to this program, which ensures that this program continues and is expanded. The program specifically funds critical structural stabilization, repair, and rehabilitation of historic exterior features such as roofs, exterior walls and porches. Funding requests can range from \$2,000 to \$25,000 with the city providing up to 70 percent of the project costs. Workshops are offered to assist property owners with the grant process.
- New Warehouse and Threatened Building Initiative (funded with 2006 bond funds) to provide owners of empty, fire-damaged and warehouse buildings with funding to adaptively reuse existing historic buildings.