

ELEMENT 14: ENVIRONMENTAL PLANNING AND CONSERVATION

VISION



Native cactus brightens the desert with color.

Located in the environmentally rich Sonoran Desert and surrounded by mountains, the Tucson Basin is renowned for its natural resources and beauty. These natural amenities--clean air, pure groundwater, expansive vistas of desert and mountain landmarks, variety of wildlife and vegetation--give the region its identity and distinctive character. The regional vision for natural resources celebrates the natural and cultural commonalities and diversities found throughout the region. Increased public awareness and actions regarding conservation, preservation, and stewardship of the region's natural resources will foster the identity and economic well-being of the region.

The *Vision* begins with an interconnected network of open space, including parklands, washes, riparian habitats, and public preserves throughout the region. Critical natural areas, as well as designated peaks and ridges, will be protected in a variety of ways, including acquisition by public agencies.



Mountain ranges provide vegetative, wildlife, and geologic diversity.

Views of mountain peaks and panoramic vistas will be retained by encouraging cluster development and promoting infill in the urbanized areas. Designated scenic route corridors will form linear threads throughout the region, preserving panoramas and vistas through specific development standards for new development projects.

Brilliant blue skies and fresh, healthful air will have primary consideration in future land use planning and capital improvement programming. To protect and improve air quality, regional transportation plans will emphasize alternatives to automobile travel. The air will be protected rigorously against certain noxious, allergenic, and pollen-producing plants.



Many native species are unique to the Sonoran Desert.

As a prized and essential resource, the region's long-range water supply will be assured through water conservation programs, including restrictions on water-intensive uses, promotion of native landscaping, and the expanded use of effluent. The best use will be made of new water supplies, from such sources as the Central Arizona Project. To maximize the natural recharge function of desert washes, preservation and restoration of vegetation along water- courses, streets, and on construction sites will be encouraged. The quality of the groundwater supply will be protected by community education, as well as by programs about recycling and the safe disposal of hazardous wastes.

The community is proud of its unique and varied wildlife species, which will be protected by preserving their natural habitat,

Element 14: Environmental Planning and Conservation

particularly riparian areas. As development occurs, natural vegetation, geologic features, and other landmarks will be preserved and integrated with development to enhance the region and create a unique sense of place. As prime wildlife habitat, the natural resources in the area's public preserves will be protected by recognizing the delicate environmental balance and interdependent nature of the area's natural systems. Development projects will be encouraged to conserve soil and minimize soil erosion through careful project design.

The *Vision* includes innovative new energy technology, including solar resources, which will be actively promoted along with energy conservation techniques. The region's dark skies, an asset to world-acclaimed astronomical facilities and research, will be protected against light pollution, without undue hardship to the community's economy or safety.

Livable Tucson Goals

Abundant Urban Green Space and Recreation Areas

Includes recreation and green space within the city, including neighborhood and regional parks, common space, community gardens, bike and walking paths, linear and river parks, trees, and urban landscaping.

Protected Natural Desert Environment

Includes protection of the Sonoran Desert ecosystem and protection of washes, hillsides, open space, and wildlife.

Clean Air and Quality Water

Includes reduced pollution and provision of clean, potable water.

Efficient Use of Natural Resources

Includes conservation of resources and use of sustainable energy sources.

Introduction

The Environmental Planning and Conservation Element identifies policies and strategies that Tucson uses to address the issues of natural resources, air and water quality, and energy resources. This element also addresses the anticipated effects on these resources associated with implementation of the *General Plan*.

The City of Tucson has a long history of working to address issues of natural resource preservation, air and water quality, and energy conservation. Therefore, the City already has established policy direction regarding these issues. The Growing Smarter requirement that environmental planning and conservation be addressed in the *General Plan* provides the opportunity to bring the policies together in this document.

The Environmental Planning and Conservation Element includes subsections that were stand-alone elements of the former *Comprehensive Plan*, including the Vegetation and Wildlife and the Air, Water, and Energy Elements. New sections were added to

address water quality, watershed conservation, and soil erosion. Background information was added and policies were updated to bring the document up to date regarding the City's progress in implementing the policies. In some cases, additional policies were added to acknowledge the City's efforts to address issues relevant to this element.

Natural Areas

Background Preservation of natural resources, including native vegetation and wildlife, is of vital concern. Scientists are becoming increasingly aware that the health of all species is interdependent and that the preservation of entire ecosystems is of critical importance. Surveys have shown that residents enjoy living in close proximity to wildlife and derive recreational and educational benefits from bird watching, nature photography, and nature study. Contact with vegetation and wildlife can promote a sense of physical and psychological well-being.

The climate, in conjunction with the unique character of the Sonoran Desert, has attracted both residents and businesses to the Tucson area. Due to the rapid urbanization of the Tucson basin, unique habitats that are critical to wildlife have been dramatically reduced; only about 10 percent of the region's riparian areas remain. Local concerns include preserving this significant habitat, enhancing native vegetation in order to define the character and "sense of place" of Tucson, and promoting the environmental and economic health of the area.

Progress has been made on preserving native plants and wildlife habitat, but much remains to be done. Passage of the Arizona Heritage Fund Act has assisted in providing funds for habitat preservation and is evidence of both increased citizen interest and a sense of urgency. City efforts to support and enhance Tucson's wildlife and vegetation resources will help maintain corridors and pockets of wildlife habitat throughout the urban area.

Environmental Planning Analysis Several elements of the *General Plan* will have an impact on natural habitat. The Growth Areas and Population Element is anticipated to affect natural habitat because it acknowledges that growth is expected to occur within the Evolving Edge and the Future City Growth Areas, where much natural habitat remains. The Safety Element addresses the importance of preservation of washes in their natural states to provide for flood control. To address the many impacts of new growth, including natural habitat issues, the policies in this element encourage compact development, preservation of riparian and other valuable habitat areas, and sensitivity to key natural features. Implementation of these policies will help mitigate impacts of new development on natural habitat.

The Parks, Recreation, Open Space, and Trails (PROST) Element and the Community Character and Design Element contain policies to preserve natural undisturbed open space and to provide for other interconnected open spaces throughout the city. Although these

Element 14: Environmental Planning and Conservation

policies focus largely on providing open space for public use, their implementation will positively impact natural habitat by ensuring that open space issues are addressed.

The following policies build on the policies in the Growth Areas and Population Element; the Community Character and Design Element; the Safety Element; and the Parks, Recreation, Open Space, and Trails (PROST) Element. Implementation of these policies is intended to minimize the impacts of future development on sensitive habitat and to restore habitat that was disturbed by past development.

Environmentally Sensitive Areas

Background The City has a long history of working to identify and protect environmentally sensitive natural areas, such as watercourses and hillsides. These efforts have had positive results throughout the city. However, it is necessary to continue to identify additional sensitive areas and to devise methods to protect such areas when development occurs near them.

Policy 1: **Continue to identify and protect environmentally sensitive natural areas and encourage the preservation of vegetation and wildlife within these areas.**

Supporting Policies

1.1 Promote research to identify native vegetative and wildlife resources and to determine the habitat needs of these resources.

1.2 Consider the protection and enhancement of wildlife habitat in wash maintenance and flood control projects.

1.3 Continue to develop and refine guidelines to preserve wildlife and vegetation when development occurs within environmentally sensitive areas.

1.4 Develop a program to restore and enhance riparian areas.

1.5 Consider the environment as a major factor in cost/benefit analysis.

Policy 2: **Improve coordination and promote partnerships between City departments, other governmental agencies, neighborhoods, and community organizations that contribute to the management of environmentally sensitive areas.**

Supporting Policies

2.1 Identify and pursue funding sources for wildlife and habitat preservation and enhancement, including State Heritage Funds.

Element 14: Environmental Planning and Conservation

2.2 Coordinate with Pima County and other regional entities to develop habitat management plans and extend wildlife habitat preserves across jurisdictional boundaries.

2.3 Pursue legislation with state and local agencies to provide incentives for wildlife habitat preservation and conservation easements.

2.4 Coordinate with Pima County to develop river park design guidelines that provide habitat for wildlife, including preservation of existing vegetation, revegetation with appropriate riparian vegetation, roadway and river crossing facilities for people and animals, safe areas for wildlife nesting, and water collection areas.

2.5 Encourage coordination between agencies, such as the State Department of Game and Fish, City Parks and Recreation Department, and school districts, to develop wildlife and natural history educational programs for children and adults.

2.6 Support programs and activities undertaken by individuals and nonprofit groups to preserve vegetation and establish wildlife habitat.

Policy 3: Implement methods to conserve and enhance habitat when development occurs.

Supporting Policies

3.1 Promote alternatives to channelization which support wildlife needs, such as acquisition of floodprone properties, terracing, and revegetation of channels with native plant materials.

3.2 Encourage siting of all new development in ways that preserve vegetation.

3.3 Develop incentives to encourage preservation of habitat in new development.

3.4 Provide mitigation of disturbed wildlife movement corridors to maintain habitat linkages.

Urban Vegetation

Background

The urban landscape comprises many forms of vegetation, including trees, shrubs, groundcovers, and cacti of both native and introduced species. Urban vegetation is evidenced in public and private parks, along watercourses and streets, in parking lots and around homes, in natural areas, and on other public and private properties.

Vegetation within cities plays many important roles: it mitigates the harsh effect of urban hardscapes; it provides shade, beauty, and climate modification; and it assists in creating a livable city. In Tucson's warm desert climate, urban trees provide numerous physical benefits, including shade for sidewalks, bike lanes, and bus stops; wind protection; and improved air quality. Urban vegetation can screen buildings, camouflage blighted areas, filter air, protect soil, muffle noise, and create habitat for urban wildlife.

Element 14: Environmental Planning and Conservation

Because urban vegetation is dynamic, thriving in some places, declining in others, and continually changing its form, vigilant maintenance is required to conserve this important resource. Due to the long-term community benefits provided, efforts should be continued to enhance and expand Tucson's urban landscape.

Environmental Planning Analysis

Urban vegetation will be affected by several elements of the *General Plan*. The Parks, Recreation, Open Space, and Trails (PROST) Element contains policies that encourage the promotion and enhancement of urban vegetation. Because the focus of that element is to provide adequate open space areas and recreational opportunities throughout the city, it will have a positive impact on urban vegetation.

Numerous policies in the Community Character and Design Element relate to urban vegetation associated with watercourses, scenic views, streetscapes, and neighborhood character. The Growth Areas and Population Element addresses the many impacts of new growth through policies that encourage compact development, preserve riparian and other natural areas, and consider environmentally sensitive areas. The Safety Element addresses the role of preservation and revegetation of washes for flood control. Implementation of the policies in all of these elements will have a positive impact on urban vegetation in the City.

The following policies build on the policies in the Parks, Recreation, Open Space, and Trails (PROST) Element, the Growth Areas and Population Element, the Safety Element, and the Community Character and Design Element. Implementation of these policies will help to protect and enhance urban vegetation.

Policy 4: Promote the development and management of healthy and attractive urban vegetation.

Supporting Policies

- 4.1 Continue to incorporate water-conserving landscape elements in City of Tucson capital improvement and maintenance projects.
- 4.2 Improve, to the extent possible, public sector ability to maintain and sustain public urban landscape improvements.
- 4.3 Continue to require xeriscape principles in landscape regulations and development standards, including the Low Water Use Drought-Tolerant Plant List.

Actions

- 4.3.A *Continue to pursue mechanisms for the preservation, salvage, and establishment of native species in urban landscaping.*
- 4.3.B *Promote native vegetation as the preferred landscaping in order to restore wildlife habitat, conserve water, and enhance Tucson's regional identity.*
- 4.3.C *Continue to pursue funding opportunities for planning, implementation, and maintenance to enhance urban vegetation.*

Policy 5: Promote the long-term management and maintenance of Tucson's urban vegetation to maximize environmental and other benefits to the community.

Supporting Policy 5.1 Develop and support programs to maintain Tucson's urban vegetation.

Action 5.1.A *Coordinate with other City departments, citizen committees, utility companies, neighborhood groups, and nonprofit organizations to garner broad-based support and interest in maintenance activities.*

Supporting Policy 5.2 Develop landscape master plans for major streets and watercourses, reflecting cohesive design themes.

Actions 5.2.A *Implement landscape master plans for major streets and watercourses through funding opportunities in City Capital Improvements Projects.*

5.2.B *Pursue alternative funding sources to implement landscape master plans in areas where improvement projects are not scheduled.*

5.2.C *Develop processes and techniques to assure the involvement of private property owners in the planning and implementation of landscape master plans.*

5.2.D *Require landscape master plans to include maintenance costs for new landscape projects in public rights-of-way.*

Supporting Policies 5.3 Coordinate the implementation of planning and management reports, studies, and activities related to urban vegetation.

5.4 Adopt policies and guidelines for the landscaping of public rights-of-way in residential areas, and identify specific demonstration landscape projects.

Policy 6: Coordinate public and private efforts to promote the expansion of the urban landscape.

Supporting Policies 6.1 Encourage community awareness of the costs and benefits of urban landscapes and xeriscape principles through educational programs and activities.

6.2 Support and encourage activities of individuals and community groups to enhance the urban landscape.

Water Quality

Groundwater

Background Access to a dependable supply of clean water is vital to the health, safety, and welfare of major urban areas. As of January 2001, most of Tucson's water needs, including drinking water, are satisfied by groundwater. Although increased emphasis will be placed on water supplies, such as Central Arizona Project (CAP) water, groundwater will continue to be an important water source in the Tucson area. The City conducts extensive monitoring of the water delivered to its customers. Measures taken to protect the quality of the water supply are discussed in the Water Resources Element.

Beginning in the late 1970s, a heightened awareness of potential impacts of polluted water led to the implementation of programs to identify and clean up contaminated groundwater and soil. Two major sources of groundwater pollution are landfills and past discharges of industrial chemicals. Programs to protect groundwater quality include cleaning up areas that have been contaminated, or managing these areas to prevent further spread of contaminants, and implementing measures to reduce pollution from current activities to the maximum extent practicable.

Environmental Planning Analysis Two elements of the *General Plan*, the Growth Areas and Population and the Safety Elements, are anticipated to impact groundwater quality. The Growth Areas and Population Element identifies areas where growth is expected to occur. A larger population will generate a larger waste stream, most of which will be disposed of in a landfill. Also, an increased population will use larger quantities of industrial chemicals, which will ultimately be disposed of. Implementation of the policies in this section will address containment of pollutants associated with landfills and industrial chemicals used at City-owned facilities.

The Safety Element contains policies intended to minimize or eliminate hazards resulting from human activities, including the design and construction of waste disposal or storage sites and the use and storage of hazardous materials. Implementation of the Safety Element policies, together with the policies in this section, will help to mitigate these impacts of expanding urban development on groundwater quality.

Policy 7: Continue to implement programs to satisfy federal, state, and local regulations governing drinking water.

Policy 8: Continue to assess soil and groundwater quality in the vicinity of all City-owned sites of concern, including landfills.

- Supporting Policies***
- 8.1 Continue to monitor the quality of soils and groundwater at City-owned sites where contamination is known to exist. Develop cleanup strategies to protect nearby wells.
- 8.2 Continue to search for and identify locations where contamination may be present but not identified, through the City's Comprehensive Landfill Investigation program.
- 8.3 Conduct extensive monitoring of newly identified sites if results of the Comprehensive Landfill Investigation warrant it.

Policy 9: Continue to operate and monitor existing groundwater remediation systems to achieve maximum system performance and plan and implement new groundwater remediation systems at City-owned sites.

Policy 10: Continue to coordinate with City departments that use or generate hazardous materials to institute pollution prevention practices.

- Supporting Policies***
- 10.1 Continue to implement practices to reduce the waste material generated at City-owned facilities.
- 10.2 Continue to develop and implement chemical spill and hazardous materials management plans at City-owned facilities.

Policy 11: Continue to coordinate with federal, state, and local agencies regarding remediation of identified priority hazardous waste sites, such as the Tucson Airport Authority Superfund Site and regarding permitting activities, such as Aquifer Protection Permits for industrial facilities.

Reclaimed Water

Background As a growing community with a diminishing supply of groundwater, Tucson needs to take advantage of all available sources of water. Wastewater is the only supply that will continue to grow as the population increases. Some of this wastewater is currently being treated to a high quality for turf and landscape irrigation and limited industrial uses. This highly treated wastewater, called reclaimed water, will constitute an increasing percentage of the local water supply.

Reclaimed water is delivered to customers through a system of pipes, reservoirs, and booster pumps owned and operated by the City of Tucson. The City's reclaimed water system is regulated by the Arizona Department of Environmental Quality. Since reclaimed water is used primarily for irrigation and the volume of reclaimed water that can be applied to turf is regulated by the state, there is little return flow to the aquifer. The state and Tucson Water have

programs under way to monitor the effects of reclaimed water use on the quality of local groundwater.

Environmental Planning Analysis

Because the Growth Areas and Population Element provides for an increasing urban population, it is reasonable to expect that larger quantities of wastewater will be generated at regional wastewater treatment facilities. This in turn is expected to result in the availability of larger quantities of reclaimed water for turf and landscape irrigation. To more effectively use this renewable water supply, the reclaimed water pipe system will need to be expanded commensurately. The policies in this section will assist in assuring that the use of increasing amounts of reclaimed water will not adversely impact water quality.

Policy 12: Continue to monitor the effects of reclaimed water use on the quality of local groundwater.

Policy 13: Continue to implement the Floodplain and Erosion Hazard Area Regulations governing the placement of sewerage collection and/or disposal systems in floodplain areas.

Policy 14: Continue to coordinate with Pima County regarding reviews of permit applications to construct new, or substantially modify existing, septic systems within the city of Tucson.

Policy 15: Continue to support the Pima Association of Government's (PAG's) Section 208 Area-wide Water Quality Management Plan, which includes a policy that all wastewater be treated in regional, publicly-owned facilities (this is the local implementation of Section 208 of the federal Clean Water Act).

Surface Water

Background

To improve the quality of surface waters, amendments to the federal Clean Water Act require that permits be obtained, and updated annually, for discharges from storm drainage systems serving urbanized metropolitan areas. The purposes of the permit program, called National Pollutant Discharge Elimination System (NPDES), are to (a) identify and measure the pollutant loads being contributed to surface waters and (b) develop and implement programs to reduce the amount of pollutants to the maximum extent practicable. The City has been formally participating in the NPDES program since the early 1990s.

In most parts of the United States, storm drainage flows into lakes and rivers. In the arid Tucson area, the drainage system is typically dry, flowing in response to stormwater runoff. Stormwater pollutants may be deposited within the drainage system or in the upper soil layers. Some of these pollutants may ultimately wind up in the groundwater. As groundwater supplies much of Tucson's drinking water supply, it is important that surface waters be clean.

Element 14: Environmental Planning and Conservation

Environmental Planning Analysis

The Growth Areas and Population Element is expected to impact surface water quality, as an increased population will have greater impacts on the quality of stormwater runoff. Implementation of policies in this element, together with those in the Safety Element governing activities related to human activities, will reduce the impacts of urban growth on the quality of stormwater runoff.

Policy 16: Continue to monitor stormwater quality through the City's NPDES program.

Supporting Policies

16.1 Continue to maintain City-owned drainage facilities, such as open channels, pipes or culverts, and detention/retention basins. Maintenance includes vegetation management; removal and disposal of debris, including sediment; maintenance and repair of eroded areas; and repair of drainage structures.

16.2 Continue to inspect privately-owned drainage facilities in response to complaints received from the public and issue citations for improperly functioning facilities as warranted.

Policy 17: Control the amount of pollutants entrained in stormwater runoff from new construction and significant redevelopment.

Supporting Policies

17.1 Continue to review new projects for compliance with City regulations and policies, during the planning, design, and construction phases. Continue inspections to monitor compliance with approved plans.

17.2 Continue to monitor construction sites for compliance with site-specific Stormwater Pollution Prevention Plans (SWPPs).

17.3 Continue to require that new development include long-term measures to control pollutants after construction is complete.

Policy 18: Continue to implement measures to control stormwater pollution from landfills and industry.

Supporting Policies

18.1 Continue inspections and outreach to key industries and landfills to promote implementation of structural and nonstructural controls to reduce pollutants in stormwater runoff.

18.2 Respond to chemical spills that threaten to introduce pollutants to the drainage system and monitor cleanup measures.

Policy 19: Continue to develop the Tucson Stormwater Management Study (TSMS), a program to identify and meet the city's comprehensive stormwater management needs that addresses both the quantity and quality of stormwater runoff discharged to and from the city's stormwater drainage system.

Supporting Policy 19.1 Continue to identify watersheds with the greatest potential to contribute pollutants to stormwater runoff and target these watersheds for management practices to reduce the pollutants contributed.

Air Quality

Background The Tucson metropolitan area and eastern Pima County have long enjoyed the benefits of clean air, which is important to the health and economic development of and quality of life in the community. However, urbanization of the Tucson basin has resulted in the conversion of desert and riparian areas to an urban landscape, which has adversely impacted air quality. Vegetative cover, which assists in cleaning the air and filtering dust and other particulates, has diminished. An increased population has acquired more vehicles and expanded travel distances between work, services, and home. Vehicular emissions account for 70 percent of Tucson's air pollution.

Air pollution in the Tucson basin poses a threat to the health of community residents. In addition to man-made pollutants, naturally occurring pollutants, such as dust and various pollens and molds, further decrease the quality of air. Also, visual pollution associated with brown haze over the city affects several economic sectors of the community, including the film industry, tourism and convention business, and astronomical observatories and research.

Because air pollutants cross jurisdictional boundaries, improving air quality requires coordination between local governments in the Tucson basin. Improving air quality also depends upon the actions and lifestyles of the basin's residents. Three pollutants are of continuing concern: carbon monoxide (CO), particulate matter less than ten microns in diameter (PM₁₀), and ozone (O₃).

Environmental Planning Analysis Several elements of the *General Plan* will have an impact on air quality. The Circulation Element contains policies addressing transportation, transit, and bicycle routes. Implementation of those policies, which encourage efficiency in the community's circulation system, reduction of vehicle miles traveled, interconnectivity of roadways, and use of alternate modes of transportation, will have a positive impact on air quality.

The Growth Areas and Population Element is also anticipated to affect air quality. In order to address the many impacts of new growth, including air quality issues, that element contains policies specific to the City's Growth Areas to encourage infill, mixed use, and transit-oriented development in appropriate locations. Implementation of these policies will help mitigate the impact of growth on air quality.

Although Tucson is not expected to violate federal or state standards in the foreseeable future, improving air quality remains a desirable goal. The following policies build on the policies in the Circulation Element and the Growth Areas and Population Element that serve to improve air quality.

Element 14: Environmental Planning and Conservation

Policy 20: Protect and improve air quality by reducing sources of air pollution.

Supporting Policy 20.1 Continue to implement programs to reduce dust pollution, such as paving roadways, and administer and enforce ordinances relating to grading and construction regulations.

Actions

20.1.A Explore the use of additional strategies for dust pollution control, such as application of dust suppressants, reduction or cessation of dust-producing activities during high wind events, limitation of the area of bare earth, removal of dirt from paved street, and other strategies as appropriate.

20.1.B Expand regulations to promote preservation of existing vegetation and revegetation of disturbed areas and limit premature removal of vegetation to assist dust control.

20.1.C Educate the public regarding the impacts on vegetation and dust pollution by off-road recreational vehicles. Implement a public education plan targeting industries or activities that produce excessive dust.

Supporting Policy 20.2 Continue to support programs that reduce pollen pollutants.

Actions

20.2.A Continue to refine and administer ordinances, such as the Landscape and Screening Regulations, to reflect the need to reduce allergenic pollens.

20.2.B Continue to renovate existing and provide new City-owned landscapes that exemplify low-pollen vegetation.

Supporting Policies 20.3 Identify possible natural causes of air pollution, investigate techniques for mitigation, and implement mitigation techniques as appropriate.

20.4 Continue to support plans and programs that reduce vehicle miles traveled and vehicle emissions.

Actions

20.4.A Implement and expand programs, policies, and regulations that promote alternate modes of transportation, such as the Trip Reduction Ordinance, continuous sidewalks, flexible work hour programs, bike facilities, and improved public transit.

20.4.B Support research and evaluation of the use of alternate fuels or replacement fuels, such as hydrogen and electric power, to decrease dependence on fossil fuels.

20.4.C Support emissions reduction programs, including programs such as federal and state emissions control

Element 14: Environmental Planning and Conservation

programs; the state emissions inspection program, which requires that vehicles failing the emissions inspection must be repaired and reinspected; incentive programs for maintenance/repair of vehicles; and incentives for removing highly polluting vehicles from the road.

Policy 21: Continue to coordinate plans and improve communication between cities, agencies, and citizens regarding air quality issues.

Supporting Policies

21.1 Continue to support the planning efforts and travel demand management programs of PAG, the designated regional air quality planning agency; the monitoring and enforcement efforts of the Pima County Department of Environmental Quality (PDEQ), the designated air quality control agency; and the education and outreach programs of both agencies.

21.2 Encourage implementation of regional plans that serve to improve air quality, such as the 2001-2005 PAG Regional Transportation Improvement Program.

21.3 Work with jurisdictions throughout the region to bring nonattainment areas into compliance with federal, state, and local requirements.

21.4 Continue to support the assessment of programs needed to comply with the 1990 changes to the Clean Air Act, such as point source air pollution.

Action

21.4.A Encourage telecommuting, flextime, work at home, and four 10-hour workdays per week where appropriate, for both City employees and other citizens to reduce travel time, traffic congestion, and air pollution. Expand video conferencing capabilities and resources.

Supporting Policies

21.5 Continue to coordinate with other jurisdictions within Pima County to implement required air quality plans.

21.6 Include citizen participation and educational programs in air quality plans and projects.

Policy 22: Implement transportation system modifications that facilitate improved traffic flow throughout the region for vehicles and alternate modes of transportation.

- Supporting Policies*** 22.1 Implement information-based transportation system improvements, such as the Intelligent Transportation System and Freeway Management System, as appropriate. These programs use advanced technologies to gather, process, and distribute information to increase the efficiency of existing transportation infrastructure.
- 22.2 Implement, to the extent possible, transportation system improvements that do not involve additional infrastructure, such as restriping and traffic signal coordination.
- 22.3 Include promotion of transit ridership in the criteria used to evaluate requests for changes to land use plans and zoning ordinances.

Policy 23: Consider air quality impacts when designing new transportation improvements.

- Supporting Policies*** 23.1 Assure connectivity of major arterial routes, bicycle routes, and pedestrian routes.
- 23.2 Acquire right-of-way for the ultimate rather than the initial roadway cross section, where possible, to lower cost and avoid periodic moving of adjacent utilities and other associated infrastructure.
- 23.3 Maintain one-half-mile spacing between traffic signals, where possible, to facilitate centralized coordination of traffic flow.

Policy 24: Update applicable policies and plans to reflect new understanding of air quality issues as advances in the field are made.

Policy 25: Coordinate land uses to improve and protect air quality.

- Supporting Policies*** 25.1 Promote nonresidential uses in appropriate locations to reduce adverse air quality impacts to residential uses. Identify transitional uses that would have minimal impacts on residential areas, to serve as buffers between dwellings and more intense nonresidential areas.
- 25.2 Encourage the development of activity centers as "mixed-use areas" to integrate land uses and reduce vehicle miles traveled. Mixed-use areas should include amenities, such as day care facilities, bicycle and pedestrian access, employment, and affordable housing.
- 25.3 Promote the design and implementation of efficient transportation corridors and circulation systems in all developments. Developments should have the appropriate number and location of access points to reduce the likelihood of traffic conflicts due to multiple access points.

25.4 Provide incentives for "infill development" to minimize travel distances and to encourage the use of alternate modes of transportation. Encourage higher density development along existing or planned transit corridors. Encourage retail infill and the redevelopment of older commercial centers.

25.5 Establish and maintain minimum density and intensity standards for development within planned activity centers, particularly for planned transit corridors.

Policy 26: Encourage the use of vegetative cover to reduce soil erosion and particulates in the air.

Supporting Policy 26.1 Promote the use of vegetation, particularly along transportation corridors and in parking areas.

Policy 27: Develop standards for evaluating the impacts of regional traffic generators, including an analysis of other committed or planned development within a project's impact area.

Watershed Functions

Background In the past, watersheds were viewed only as surface drainage systems. Since the early 1980s, it has been increasingly recognized that watersheds, and the watercourses within them, provide several interrelated functions that are vital to the health of the associated ecosystem. Healthy watersheds are characterized by moderate to heavily vegetated washes, which provide habitat for wildlife. Measures taken by the City to protect and preserve vegetation and wildlife are discussed in the Natural Areas section. This section discusses City programs that conserve the surface drainage, groundwater recharge, and overbank floodwater storage functions provided by watersheds.

Prior to urbanization, a system of natural washes drained what was to be the Tucson area. As the city grew, washes were disturbed to accommodate development. In the 1970s, the importance of considering drainage patterns during the planning and design of man-made improvements was emphasized with the passage of federal regulations governing floodplain management. Local floodplain regulations are designed to protect the health, safety, and welfare of the citizenry while preserving and protecting the surface drainage system.

Natural washes are characterized by increased amounts of vegetation lining and adjacent to the flow path. This vegetation assists groundwater recharge by acting to slow the flow velocity, thereby allowing more time for water to infiltrate the subsurface. Vegetative root systems help open the soil structure, which also promotes infiltration.

Element 14: Environmental Planning and Conservation

Preservation of natural overbank floodwater storage areas decreases flood peak flow rates in downstream areas by slowing the progression of the peak discharge and spreading floodwaters over a larger area. This is a key nonstructural means of minimizing the downstream impacts of flooding and erosion. Preservation of overbank storage areas also promotes the growth of increased vegetation in these areas and assists groundwater recharge. The following policies and programs are implemented by the City to protect and preserve surface drainage systems, groundwater recharge, and overbank floodwater storage areas.

Environmental Planning Analysis

The following *General Plan* elements will have an impact on the watershed functions discussed in this section: Growth Areas and Population; Land Use; Community Character and Design; Safety; and Parks, Recreation, Open Space and Trails (PROST). Because the Growth Areas and Population Element identifies new areas where growth is likely to occur, it follows that natural drainage patterns in these areas will be affected. Implementation of the policies in this section will help to mitigate the impacts of urban growth on natural drainage patterns.

The Land Use; Community Character and Design; Safety; and Parks, Recreation, Open Space, and Trails (PROST) Elements contain policies that promote preserving and maintaining natural washes. The policies in these elements, together with the policies included herein, will help protect and preserve watershed functions as urbanization expands outward.

Policy 28: Continue to implement the Floodplain and Erosion Hazard Area Regulations, the purposes of which include maintaining drainage patterns and hydrologic and hydraulic processes and conserving groundwater recharge.

Supporting Policies

28.1 Continue to review development plans and subdivision plats for new development and require compliance with the Floodplain and Erosion Hazard Area Regulations.

28.2 Continue to review site plans and issue floodplain use permits for new development on individual parcels.

Policy 29: Continue to implement the provisions of the Standards Manual for Drainage Design and Floodplain Management.

Policy 30: Continue to implement the provisions of the Watercourse Amenities, Safety, and Habitat (WASH) regulations, the purposes of which include promoting opportunities for groundwater recharge along certain washes within the urbanized area and protecting vegetation that supports wildlife habitat.

Supporting Policy

30.1 Continue to evaluate washes within the City's jurisdiction for inclusion in the WASH regulations.

Policy 31: Continue to implement the provisions of the Environmental Resource Zone (ERZ), an overlay zone that requires new development to preserve critical riparian habitat, which assists in promoting groundwater recharge.

Supporting Policies 31.1 Continue to review development plans, resubdivisions, new subdivisions, and rezoning applications for ERZ compliance.

31.2 Continue to review annexation areas for the addition of new, or the extension of existing, ERZ corridors.

Policy 32: Continue to implement the Interim Watercourse Improvements Policy, which promotes maintaining the natural watercourse configuration.

Supporting Policy 32.1 Continue to review all plans for watercourse improvements, whether public or private, for compliance with the Interim Watercourse Improvements Policy.

Control of Soil Erosion

Background Controlling soil erosion provides several community benefits. A healthy layer of topsoil stores water for use by vegetation and provides a medium in which microorganisms and vegetation can thrive. These in turn are needed to support wildlife. Because it takes a long time for topsoil to form, especially in arid environments, it is important to preserve the existing soil layer.

When soil erodes, it may become airborne or may be carried downstream by flowing water. This can adversely impact air and water quality. In addition, eroded soil may be deposited in undesirable locations, creating hazardous situations. Finally, soil erosion can undermine public and private improvements. The City implements various measures to control soil erosion.

Environmental Planning Analysis Several elements of the *General Plan* will have an impact on soil erosion, including the Growth Areas and Population; Land Use; Community Character and Design; Safety; and Parks, Recreation, Open Space, and Trails (PROST) Elements. Because the Growth Areas and Population Element identifies new areas where growth is likely to occur, including the city fringe and beyond (a.k.a. the Evolving Edge and Future City), grading and construction will occur as the city develops outward. Implementation of the policies in this section will help control soil erosion associated with new development and infrastructure.

The Land Use; Community Character and Design; and Parks, Recreation, Open Space, and Trails (PROST) Elements contain policies that promote preserving and maintaining natural washes. The Land Use and PROST Elements include policies to preserve and protect riparian habitat, while the Community Character and Design element includes policies that promote restoration and revegetation of degraded

Element 14: Environmental Planning and Conservation

watercourses. The Safety Element promotes protection and preservation of natural drainage systems as the primary emphasis in the City's stormwater management efforts. The policies in this section, reinforced by policies in the referenced *General Plan* elements, will help control soil erosion as the city grows.

Policy 33: Continue to regulate grading for new construction by implementing the provisions of the Uniform Building Code, Chapter 33, Excavation and Grading.

- Supporting Policies***
- 33.1 Continue to review grading plans and issue grading permits prior to the beginning of any grading in excess of established minimums.
- 33.2 Continue to inspect construction sites for compliance with approved grading plans.

Policy 34: Continue to implement the provisions of the Hillside Development Zone.

- Supporting Policies***
- 34.1 Continue to review development plans and require that construction methods include measures to stabilize slopes and minimize soil erosion.
- 34.2 Continue to review hilly locations for designation as protected peaks or ridges.

Policy 35: Continue to implement the Floodplain and Erosion Hazard Area Regulations.

- Supporting Policies***
- 35.1 Continue to review development plans and subdivision plats for new development and require compliance with the Floodplain and Erosion Hazard Area Regulations.
- 35.2 Continue to review site plans and, where appropriate, issue floodplain use permits for new development on individual parcels.

Policy 36: Continue to implement the Landscaping Regulations in the Land Use Code.

- Supporting Policy***
- 36.1 Continue to review landscape plans for new development to ensure compliance with applicable *Land Use Code* and *Development Standards* requirements.

Policy 37: Continue to implement the provisions of Section 11-70.1 of the *Tucson Code*, which prohibits operating motor vehicles off the roadway within one-fourth mile of any structure, whether occupied or not, within the city.

Energy

Background Energy conservation is an issue of interest to cities across the nation. The City of Tucson, which is a large consumer of energy, is taking a lead role in the community by supporting programs to reduce energy consumption by government operations and City employees. City efforts also include working with nongovernmental agencies to reduce energy consumption and periodically updating building codes and other requirements to reflect energy-saving techniques.

Environmental Planning Analysis Energy use within the community will be affected by several elements of the *General Plan*. The Circulation Element contains policies that encourage reduction of vehicle miles traveled and the increased use of alternate modes of travel. This focus within the Circulation Element will have a positive impact on promoting energy efficiency.

The Housing Element encourages energy efficient design in structures to reduce the overall housing cost to the resident. Although the intent of these policies is to make housing more affordable, they will result in decreased energy use as they are implemented.

The Growth Areas and Population Element addresses the impacts of anticipated growth throughout the community. This element contains policies that, like those in the Circulation Element, are intended to increase the efficiency of the transportation systems throughout the community. The Growth Areas and Population Element also encourages infill, mixed use, and compact development. These development patterns can serve to increase energy efficiency by reducing the need for new infrastructure and amenities, such as street lighting. Although overall energy use will increase as the city grows, the policies in the Growth Areas and Population Element will serve to mitigate the increase.

The following policies build on the policies in the Circulation Element, the Housing Element, and the Growth Areas and Population Element. These policies promote reduced energy consumption in the community.

Policy 38: Continue efforts to reduce energy consumption and improve sustainability of government facilities and operations.

Supporting Policy 38.1 Continue to conduct energy audits of government operations.

Actions 38.1.A Continue to conduct audits of energy use by the City of Tucson and prepare appropriate reports.

Element 14: Environmental Planning and Conservation

38.1.B Continue to make program recommendations and propose specific actions to be taken to reduce overall consumption of energy by the City.

Supporting Policy 38.2 Continue to encourage energy conservation by City government employees by encouraging car pooling and other alternate modes of transportation programs.

Actions 38.2.A *Continue to provide information to employees and identify current carpool parking programs in conjunction with PAG.*

38.2.B *Continue to promote the implementation of staggered work hours and the establishment of employee commuting and home-work programs for City employees, to reduce the peaking of transportation demands and to reduce energy consumption.*

Supporting Policy 38.3 Consider energy efficiency in government purchasing and building construction.

Actions 38.3.A *City purchase procedures shall include consideration of life-cycle energy costs, as well as initial price, when feasible.*

38.3.B *Evaluate and select the designs and specifications for public facilities based on expected lifetime energy consumption/efficiency and initial construction costs.*

38.3.C *Consider the effects on energy consumption of orientation, window covering/screening, overhangs, and other protective devices, in all new and proposed City buildings and structures.*

Supporting Policy 38.4 Promote solar technology.

Action 38.4.A *Promote the use of solar technology when economically and technologically feasible, for example by including solar water heaters and solar heating in government buildings and public housing.*

Policy 39: Continue to support programs that reduce energy consumption and improve sustainability in housing.

Supporting Policy 39.1 Establish Green Building rating standards.

Action 39.1.A *The City should collaborate with local conservation groups, university researchers, builders, heating and refrigeration professionals, utility companies, and financial institutions to develop a proposed Green Building rating system for residential structures.*

Element 14: Environmental Planning and Conservation

Supporting Policy 39.2 Continue to update the building code regularly to promote energy conservation.

Policy 40: Continue to support partnerships with public and private agencies to increase energy efficiency and sustainability in nonresidential uses.