City of Tucson

Urban Landscape Framework

Department of Urban Planning & Design

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Executive Summary

The City of Tucson Urban Landscape Framework (ULF) is vital to the quality of life within the City, the greater Tucson community and the region, and essential to developing and sustaining Tucson as a Great Sonoran Desert City.

The goals of the ULF are to advance the City's *General Plan*, to increase understanding of urban ecology, to examine and make choices about Tucson's natural and cultural landscape, and to chart a course of action that will foster civic health and environmental, social, and economic sustainability.

The ULF follows the environmental, urban form, and quality of life goals articulated in the City's *General Plan*, the Livable Tucson Visioning Program, and recommendations of the Landscape Advisory Committee and its predecessor the Landscape Task Force.

Sustainability is a common thread found throughout City policy, data collection and analysis efforts in the process of developing the ULF. Sustainable urban landscapes will benefit us in terms of individual health and the health of our community through:

- Improved air quality
- Increased water conservation through reduced water demand, storm water management and rainwater harvesting
- Increased green space (green infrastructure)
- Preservation of natural washes and other open spaces
- Prevention and mitigation of Urban Heat Island effects
- Renewed economic vitality

Tucson must develop and support an urban landscape that embraces sustainable design principles, uses a balance of incentives and regulations to achieve these objectives, and integrates City codes, policies, plans, and management strategies to promote the Great Sonoran Desert City vision.

Challenges facing the implementation of the ULF include strengthening interdepartmental communication and cooperation, improving departmental standards and practices, promoting interjurisdictional and regional coordination on urban landscape issues, and public acceptance.

Executive Summary

The following goals and recommendations are the most important in the development and implementation of the ULF.

ULF Goals:

1. DEFINE Tucson's urban and natural landscape environment and cultural connections
2. PROMOTE sustainable design principles
3. MAXIMIZE the green infrastructure for community vitality and walk-ability
4. EDUCATE City staff, elected officials, community leaders and citizens on the benefits of a sustainable urban landscape and implementing the ULF
5. INTEGRATE the ULF into City codes, policies, plans and management strategies
6. REGULATE and motivate by balancing regulations with incentives to achieve ULF goals
7. FUND City departments, programs and actions with adequate support for ULF goals

ULF Recommendations:

1. Mitigate Urban Heat Island effect
2. Update codes, guidelines and ordinances to resolve inconsistencies and to implement progressive, innovative practices
3. Enlist support of elected officials, senior City staff and community leaders
4. Promote the environmental, economic and aesthetic values of trees
5. Promote water conservation; enforce Water Harvesting Ordinance
6. Establish connectivity among drainage systems, streets, neighborhoods and activity centers
7. Advocate for transportation corridors that enhance the pedestrian, bicycle and transit experience and expand green infrastructure
8. Recognize projects and landscapes that utilize sustainable design principles
9. Standardize City maintenance contracts
10. Increase public outreach and education
11. Foster intradepartmental and interjurisdictional collaboration and cooperation

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Chapter 1: Introduction

What will nature permit me to do here without damage to herself or to me? What will nature ***help*** *me to do here?"*
Wendell Berry

Building cities and towns has not been about conservation and preservation. The history of Cities and towns has been about development. Tucson's population is increasing and resources are being consumed daily. Between 1999 -2007, the City boundaries grew by 33 square miles. The following table illustrates increases in City-owned properties by land-use categories (illustrated on Map 1 excluding drainage ways):

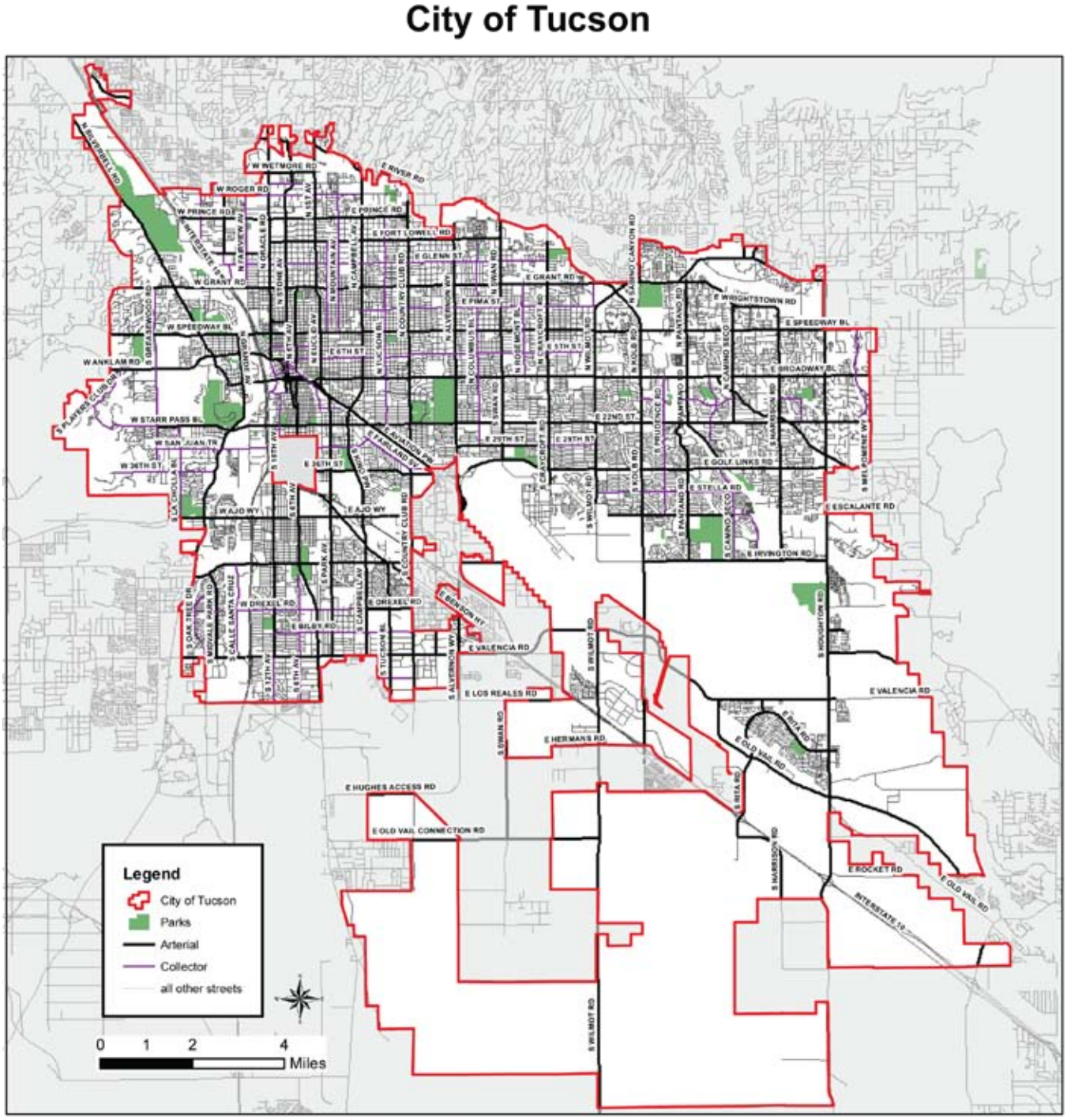
City totals:

	acreages		% of total lands w/in City	
Land Use - City owned	1999	2005	1999	2005
Street/medians/alleys	13,599	17,399	12%	12%
Open Space (Preserves/natural/parks/cemeteries)	3,500	4,350	3%	3%
Drainageways	3,200	4,350	3%	3%
TOTALS	113,626	144,993	17%	17%

Of the city-owned lands, streets comprise 67%, open space is 17% and drainageways is 16%.

How does this translate to urban form, smart growth and sustainable development? The City of Tucson has been and continues to work towards implementing smart growth and sustainable practices, honoring historic connections, utilizing current technologies and planning for seven generations into the future. (Great Law of the Iroquois: "In every deliberation we must consider the impact on the seventh generation . . . even if it requires having skin as thick as the bark of a pine.")

Many of the principles set forth in this Urban Landscape Framework are not new. In 1988, Mayor and Council approved the formation of the Landscape Task Force, recognizing the need for water conservation, or efficient use of water and appropriate vegetative materials providing high quality landscapes. *The 1997 City of Tucson Urban Landscape Manager* report by Landscape Advisory Committee to Mayor and Council is still current and applicable to today. The report, citing information from Dr. McPherson's article, "Emerging Desert Landscape in Tucson", *Geographical Review*, Oct. 1989, also identified historic connections:



Map 1. City of Tucson Streets and Parks

The editors of the Arizona Daily Star and other respected civic leaders mounted a citywide street-tree-planting campaign during the last part of the nineteenth century. Tree planting was considered a civic duty and was promoted on the basis of shading and beautifying streets. Furthermore, one editor encouraged public participation by extolling the healthful effects of trees on urban climate and air quality. He noted that tree planting "will result in greatly reducing the temperature of the summer months, as vegetation absorbs the heat, and more growing trees absorb many kinds of poisonous gases and thus they are not liable to be inhaled by the people." (*Arizona Daily Star,* January 31, 1888)

Over a century later, citizens are still concerned about human and ecosystem health. The City still has an eye to the future to develop smarter URBAN environments to accommodate the populations while striving to leave as small a footprint on the land as possible in the Sonoran Desert, leaving as much of the natural ecosystem intact as possible. This is a continual learning cycle, adapting and consciously developing new practices that define urbanism while attempting to integrate old and new landscape regenerative techniques into existing suburban land use patterns of the past.

As research, information and technologies improve, we are learning: Yesterday - natural resources were seen as 'renewable' and plentiful. Today - we are continually learning the limitations of resources, in part, being able to quantify consumption rates exceeding replenishment rates. The upside is that natural resources can be 'renewable' if its utilization is planned, designed and cycled through a combination of current technologies and natural systems.

As new city urban patterns take the form of mixed-use and clustered density developments, it will be important to integrate community patterns of green infrastructure, reflecting an evolving and dynamic urban ecosystem that interfaces between the built and surrounding natural environment.

Chapter 1: Introduction

The major concepts of the 1988 Mayor and Council appointed Landscape Task Force are still applicable today: "xeriscape design and water conservation, environmental considerations, maintenance, thematic elements (e.g. community image, neighborhood identity and historical context), landscape resources coordination and economic feasibility." (Landscape Task Force Final Report to Mayor and Council, June 25, 1990).

The dynamic green infrastructure effort will be defined through a combination of research, current technologies and participation by the community. The shifting balance is the coordination of all municipal departments (i.e., Transportation, Environmental Services, General Services, Parks and Recreation, Real Estate, Conservation and Sustainable Development, Water, Police, Fire, etc) working together with private developers, non-profit agencies and citizens-at-large. This commitment includes decisions of resource preservation, enhancement and allocations. Living as a community and creating a livable urban environment will require allocation of resources.

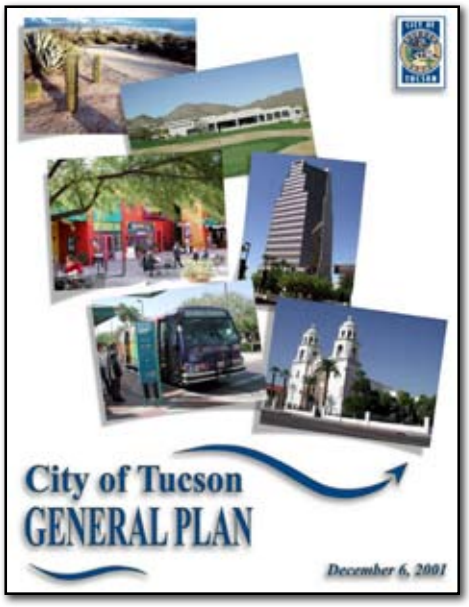
The Urban Landscape Framework outlines an approach to develop a stronger, healthier, green infrastructure. This includes an asset-based approach of quantifying and knowing what we have, and developing a system of 'level of services' to assist in decision-making process of defining acceptable urban landscape practices for this community.

GUIDING/FRAMEWORK DOCUMENTS

This document compiles the research, findings and recommendations developed through a process of working with consultants, staff, focus groups and the Landscape Advisory Group. It begins with the City's existing *General Plan* and *Code* structure. A summary of the research follows. The report concludes with recommendations in each strategic area of the Management Framework. A series of appendices follow the report offering greater detail regarding the research and findings.

Tucson General Plan

Tucson's *General Plan* (most current version dated December 6, 2001) grew from Arizona's Growing Smarter Act that "…requires cities and counties to address the issues associated with urban growth and development." Accordingly, the *Plan* provides comprehensive policy guidance for the future growth and development of Tucson. Its policies and recommendations also establish the foundation for more detailed land use, environmental, and transportation plans, and for specific City programs, capital improvements, and departmental budgets. Fourteen major topics, or plan elements, are organized under three *General Plan* themes: 1) Quality of Life, 2) Urban Form, and 3) Economy and Environment.



Plan elements are interrelated and mutually supportive. The seven elements that reference urban landscape issues are highlighted at the top of Figure 1. It is the stated goal of the ULF to move these elements of the *General Plan* forward through action items based on the recommendations in this report.

Chapter 1: Introduction

Livable Tucson Visioning Program

The year-long Livable Tucson Vision Program aligns the City with the federal Livability Agenda. The goals of the Agenda, proposed by the Clinton-Gore administration, include:

Preserve green spaces that promote clean air and clean water, sustain wildlife, and provide families with places to walk, play and relax.

Ease traffic congestion by improving road planning, strengthening existing transportation systems, and expanding use of alternative transportation.

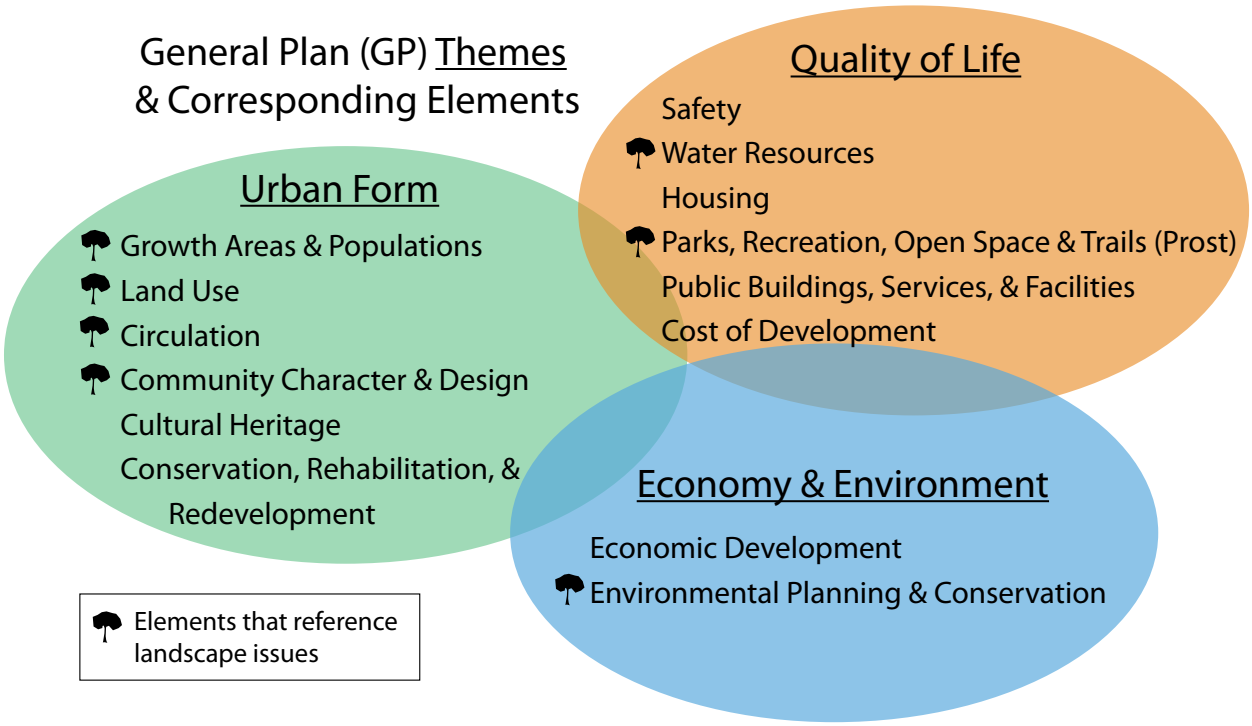
Restore a sense of community by fostering citizen and private sector involvement in local planning, including the placement of schools and other public facilities.

Promote collaboration among neighboring communities -- cities, suburbs or rural areas -- to develop regional growth strategies and address common issues like crime.

Enhance economic competitiveness by nurturing a high quality of life that attracts well-trained workers and cutting-edge industries.

Begun in the spring of 1997, the Vision Program included extensive public outreach and participation to explore the concepts of livability and community sustainability, and to help identify key indicators of environmental, social, and economic sustainability. A series of three workshops were held in each City Ward, followed by city-wide public forums. Participants identified 17 livability program goals and brainstormed key indicators or benchmarks of progress toward meeting these community goals. The goals and their relation to the *General Plan* and the ULF are illustrated in Figure 1.

FOUNDATION FOR LANDSCAPE MANAGEMENT FRAMEWORK



Livable Tucson Vision Program

- Better Alternative to Automobile Transportation
- Infill and Reinvestment, Not Urban Sprawl
- Respected Historic & Cultural Resources
- Safe Neighborhoods
- Caring, Healthy Families & Youth
- Abundant Urban Green Space & Recreation Areas
- Protected Natural Desert Environment
- Clean Air & Quality Water
- Efficient Use of Natural Resources
- *Engaged Community & Responsive Government*
- *Excellent Public Education*
- *Better Paying Jobs*
- *People-Oriented Neighborhoods*
- *Quality Job Training*
- *Reduced Poverty & Greater Equality of Opportunity*
- *Strong Local Businesses*
- *Successful Downtown*

Landscape Task Force Recommendations

- Develop city-wide landscape plan.
- Increase plantings throughout the City.
- Promote ecologically sound landscaping.
- Promote native & desert adapted landscape to enhance City's unique character and visual image.
- Road & median plantings are a major component of infrastructure development.
- Urban Landscape Planning & Management body to coordinate interagency landscape issues.
- Ordinance supporting Urban Landscape Master Plan for major & residential streets and washes.
- City should follow intent of recommendations.
- Establish public information program.

Text Legend

Relates to GP Urban Form Theme
Relates to GP Quality of Life Theme
Relates to GP Economy & Environment Theme
Not directly addressing ULF issues
Landscape Management Issues

Figure 1. Landscape Management Framework

Landscape Task Force and Landscape Advisory Committee

In the fall of 1988, Mayor and Council approved the formation of citizens committee to be known as the City of Tucson Landscape Task Force (LTF). Membership consisted of representatives from neighborhood and community groups, and landscape professionals. The work of the LTF culminated in a final report to Mayor and Council in June, 1990, and included 14 recommendations. Five of these have been implemented:

#1: Consolidate all landscape functions under one manager/body.
[Urban Landscape Manager position filled with responsibilities for on-going interdepartmental and interjurisdictional coordination.]

#2: Establish a permanent Landscape Advisory Committee (LAC).
[LAC established as permanent advisory body for landscape issues.]

#4: Establish uniform standards for drought-tolerant plant material.
[Adoption of Landscaping and Screening Regulations, *Land Use Code*, Article III, Div.7.Sec.3.7.0, also referred to as the Xeriscape Ordinance.]

#13: Require inventory and salvage and mitigation plans.
[Adoption of Native Plan Preservation Ordinance (NPPO), *Land Use Code*, Article III, Div.8. Sec.3.8.0.]

#14: Require wash/drainageway preservation and mitigation plans.
[Adoption of the Environmental Resource Zone (ERZ) Ordinance, *Land Use Code*, Article II, Div.8. Sec.2.8.6, and the Watercourse Amenities, Safety, and Habitat (WASH) Ordinance, City Code, Chapter 29.]

The other recommendations have been partially implemented, or are in the process of being addressed as part of the on-going development of the ULF. In addition to the urban landscape related elements of the *General Plan*, Figure 1 also shows that five of the other nine LTF recommendations relate to the *General Plan*'s Urban Form theme. More detailed descriptions of these are included in Appendix A.

In response to LTF recommendation 2, Mayor and Council created the Landscape Advisory Committee (LAC) on November 26, 1990. Membership consists of neighborhood representatives; landscape, ecology, horticulture, water and planning professionals; an educator; a member of the business community and others from related entities. The LAC functions in "… an advisory capacity to Mayor and Council on matters pertaining to policy, planning, design, management and promotion of public education of the City's landscape and vegetation resources." The City's Urban Planning and Design Department supports the LAC. The LAC is the arbiter of the City's landscape: providing recommendations for a landscape vision, goals and objectives, and input and support to staff toward their realization.

For nearly 20 years, the LTF and then the LAC have championed water conservation, reduced energy use and a cooler, greener, healthier, more beautiful Tucson. The LAC has advocated planting trees and relying on native and desert adapted plants and low water irrigation, as well as comprehensive planning, and landscape and buffering ordinances. Recommended plant lists have been developed and are now the standard for Tucson and Pima County.

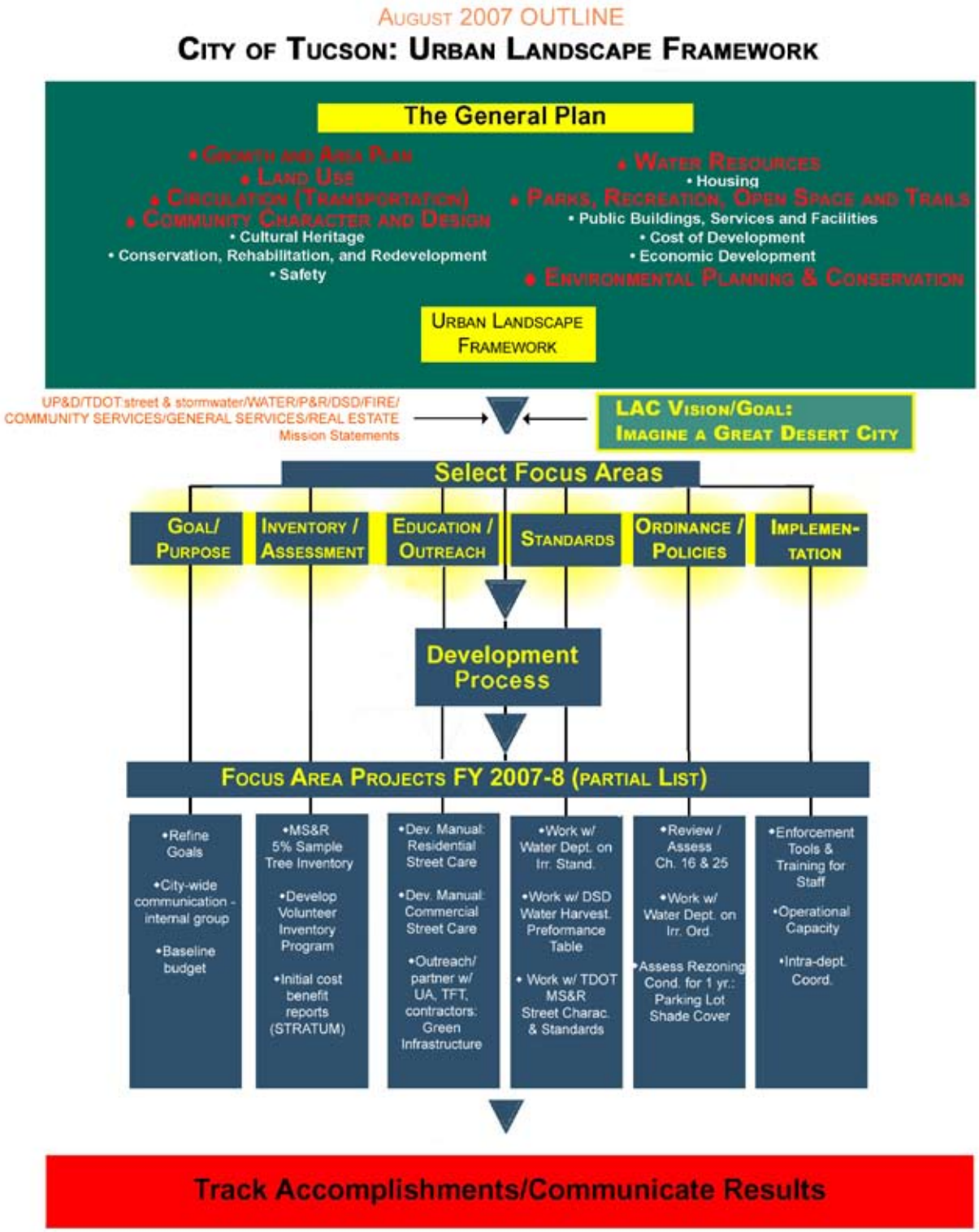
URBAN LANDSCAPE FRAMEWORK STRUCTURE & ORGANIZATION

The Urban Landscape Framework (ULF) structure, illustrated in Figure 2, grew out of the combination of the relevant *General Plan* elements, and the LAC recommendations. In 2006, the LAC asked Tucsonans to "imagine a 'Great Desert City'" and what this might mean for Tucson.

The ULF as outlined in Figure 2, illustrates the complexity of integrating *General Plan* elements with Departmental missions and external citizen voices into a vision of "Imagine A Great Desert City." The initial 5-year tasks are listed under Focus Area Projects. These projects were developed from the initial Landscape Task Force recommendations, surveys of benchmark cities, focus group meetings and recent input from the Landscape Advisory Committee.

City Relationships

This is the City of Tucson's first Urban Landscape Framework. The concept of comprehensive management is not new. The Landscape Task Force originally advocated for a City Urban Forest over 16 years ago. With increased information and research connecting urban form, landscapes, built environment and health (human, environmental, flora and fauna), they recognized an urban manager needed to address more than management and maintenance of trees. City elements of design and urban planning were seen as integral to a comprehensive approach to management.



Note: Heading in red indicates *General Plan* elements referencing landscape issues

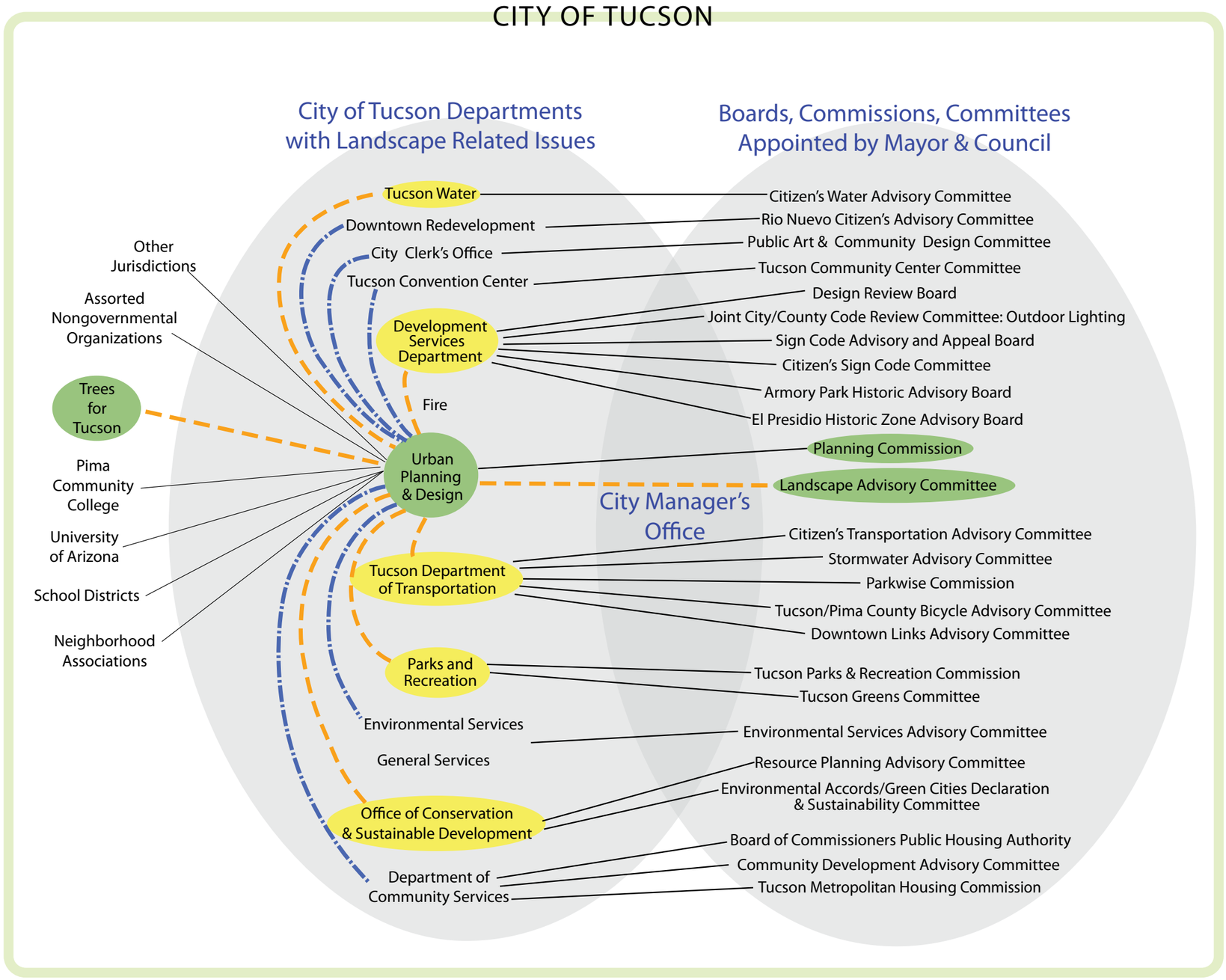
Figure 2. Structure of Landscape Management Framework.

Chapter 1: Introduction

The City is comprised of 20 Departments. Different Departments are charged with various policy and program development and/or enforcement of regulations. Landscape issues basically fall within eleven (11) departments. Six departments heavily responsible for landscape issues are Urban Planning & Design, Transportation, Parks & Recreation, Water, Development Services, and the Office of Conservation and Sustainable Development. Each Department has a different focus of the City's urban landscape. See Figure 3. The various departments are also responsible for overseeing sections of the Municipal Code, Development Standards and internal Department Policies. Also illustrated in this diagram is the direct and indirect relationship of Advisory Boards, Commissions, and Committees appointed by Mayor and Council affecting landscape issues. Figure 4 illustrates the general inter-relationship of regulatory and policy elements.

Successful implementation of this Plan and the various recommended programs within this Plan will be dependent on the communication linkages between the departments and advisory groups. Current knowledge base and skill levels of City staff within these departments are high and landscape maintenance issues have been conducted with professional expertise. Funding and human resource allocations have remained relatively constant as the City has expanded. These need to be regularly re-evaluated as City goals and directions shift.

	Landscape related expenditures (in millions)	Total City Expenditures (in millions)	% of Annual Budget	City of Tucson Population
1990	$13.3	$440	3%	415,444
1996	$18.8			442,910
2006	$22.1	$1,032.3	2.1%	507,362



Department Relationships on Issue of Urban Landscape

- Critical Connections
- Significant But Not Critical Connections
- Department Liaison to Advisory Group
- Departments with Major Urban Landscape Involvement
- Primary Coordination of Urban Landscape Management Plan

Figure 3. Department Relationships On Issue of Urban Landscape

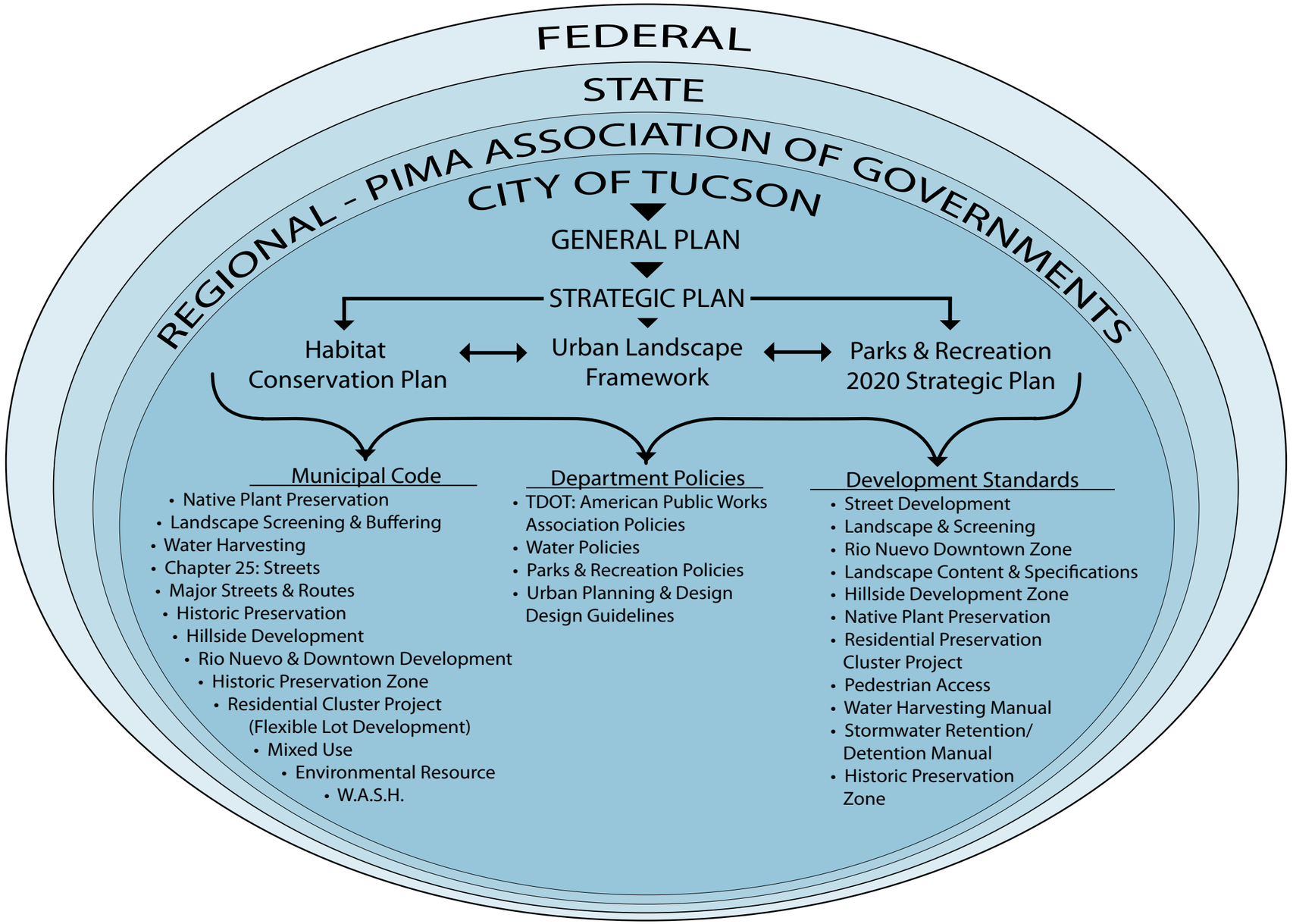


Figure 4: Relationship of Regulatory and Policy Elements

ADDITIONAL BACKGROUND, PHILOSOPHY AND SUPPORTING TRENDS

5 Trends Tucson?

The *5 Trends Tucson?* report, prepared by the City's Planning Department with assistance from the Office of the City Manager and published in 2004, recognizes that Tucson is at an important crossroads at the beginning of a new millennium. The report poses questions about choices and directions for Tucson's future and identifies 5 trends or alternative choices:

A Tale of Two Cities…or…One Community, One Future?

How can we truly work together as a region to address our community's toughest issues? Bottom Line: We can no longer afford a fragmented approach to governing our region. It places an unfair tax burden on city residents, the core of our city is deteriorating, and the long-term viability of our community is at risk with such a divide. We need cooperation, consolidation, annexation, and regional government.

Relevance to ULF: As noted in the cover letter from the City's Urban Landscape Manager, precious little of Tucson's natural landscape remains, and the resulting built landscape requires money and other resources to develop and sustain it.

Sidewalk to Nowhere…or…Investment In Community?

How do we redeem older neighborhoods and the core of the city while we grow better and smarter? Bottom Line: We need to build a better Tucson for everyone. We must invest in infrastructure improvements long delayed, and firmly commit to plan for and fund our future.

Relevance to ULF: In this report, this includes both green and gray infrastructure. As defined by the Conservation Fund, green infrastructure is "an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations." The concept of green infrastructure repositions open space protection from a community amenity to a community necessity.

Low Wage Town…or…Opportunity for All: Education and Economic

How can Tucson establish its niche in a new economic era and raise the standard of living for its residents? Bottom Line: Tucson will need to become increasingly competitive as a city in order to be successful in the global economy and improve the quality of life for residents. Attention to quality education must be a top community priority.

Relevance to ULF: Standard of living includes landscape benefits from well-designed and constructed streets (including pedestrian areas and shade trees), park, and other open spaces.

Going, Gone Tucson…or…Building from the Best of Tucson?

How can Tucson retain its uniqueness and enhance its great quality of place while growing into a 21st Century city? Bottom Line: Tucson must do more to enhance its quality of place so that the city outwardly reflects the beauty of the surrounding desert and the history, culture, and qualities that make Tucson uniquely the "Old Pueblo".

Relevance to ULF: From the Report, "Tucson's concern with community image is more than skin deep. It is a concern for underlying community quality and the well-being of residents. A quality built environment contributes to overall economic, environmental, and social well-being." The landscape is an intrinsic aspect of this community and its built environment.

Desert Island…or…Great City of the American Southwest?

How can Tucson begin thinking bigger about the city's future and act to make Tucson the best city it can be? Bottom Line: We cannot afford to live just for today or think too narrowly about solutions to the issues facing our community. We must look beyond the status quo and past our own borders to our neighbors, across the state and the nation, and to the world for opportunities and answers.

Relevance to ULF: one example from the Report, "Our Parks and Recreation programs have been cut back by $6 million in recent years. Our *Parks Strategic Plan* identifies the need for 1,800 new acres of land for parks, 37 new miles of multi-use paths, 125 more playgrounds…." Parks and associated open space are core elements of the landscape.

The Report recognizes that "We would all like to hold on to the things that make Tucson special, yet we can't go back in time and be the Tucson of our memory." We need to be forward looking and forward thinking as we grow into the 21st century and become the great Southwestern desert city.

Urban Ecology and Recent Trends

John Tillman Lyle, in his book *Design for Human Ecosystems*, 1999, characterizes human ecosystems as "places in which human beings and nature might be brought together again after a very long and dangerous period of estrangement." An underlying principle of ecosystems is that they are open systems and connected by flows of energy and materials. Another key principle in ecosystem planning or design is that every ecosystem is a part, or subsystem, of a larger system. Simply put, the urban landscape is a web of relationships.

Joel Kotkin, a writer on American cities and author of *The New Geography: How the Digital Revolution is Reshaping the American Landscape*, 2001, provides another perspective on urban life. He writes, "Cities are like individuals. They evolve in unique ways. Every city has a soul. You have to try to understand what that soul is first, and then you get a better sense of what the problems are. You start by looking at the city's history and thinking about ways to help nurture its intrinsic strengths."

Bill Mollison, an Australian ecologist, 1978, defined designing a system, "permanent agriculture/culture" (shortened to "permaculture") ". . . for creating sustainable human environments." It's applicability to urban environments connects community building as building ". . . upon the ethic of caring for the earth and interacting with the environment in mutually beneficial ways" (*The Permaculture Activist*, Autumn 1989). The "goals are energy and water conservation, sustainable local food production and regional self-reliance" (Seeds of Change interview with Bill Mollison, July 25, 2001).

Cool Communities

The Cool Communities program is a partnership of the U.S. Dept of Energy (DOE), other federal agencies, American Forests, and private industry, under DOE's Energy Partnerships for a Strong Economy. Lawrence B. Livermore National Laboratory (LBL) at Berkeley, CA conducted "Urban Heat Island Research" developing practical use of reflective surfaces and vegetation in cities as a means of improving energy use in buildings, reducing atmospheric concentrations of greenhouse gases, lowering air and water pollution contributing toward sustainable development. The City of Tucson is one of ten designated "Cool Communities."

Cool Communities Mission Statement: "Our mission is to promote healthy and livable communities by advocating Urban Heat Island mitigation using sustainable cost-effective strategies for development, construction and existing structure retro-fitting."

Further, "New strategies are emerging for improving the overall environment of urbanized areas by lowering ambient temperatures and reducing energy usage…. it is clear from the data that the built environment, and corresponding lack of vegetation, is several degrees warmer (2 to 10 degrees F) than nearby natural environments. Moreover, certain structures, especially asphalt parking lots and dark roofs, are much hotter and retain heat longer. Modeling suggests that by increasing the reflectivity (albedo) of these surfaces, planting more trees, and reducing the capacity of these structures to store heat, the high ambient temperature can be reduced, providing many direct and indirect benefits to the environment and our health."

Context Sensitive Design (Context Sensitive Solutions), New Urbanism, Leadership in Energy and Environmental Design (LEED)

As defined by the Federal Highway Administration, "Context sensitive solutions (CSS) is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist."

From the Institute of Transportation Engineers, "The ITE Proposed Recommended Practice, Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, advances the successful use of context sensitive solutions (CSS) in the planning and design of major urban thoroughfares for walkable communities. It provides guidance and demonstrates for practitioners how CSS concepts and principles may be applied in roadway improvement projects that are consistent with their physical settings. The report's chapters are focused on applying the principles of CSS in transportation planning and in the design of roadway improvement projects in places where community objectives support walkable communities-compact development, mixed land uses and support for pedestrians and bicyclists, whether it already exists or is a goal for the future.

This document was produced in cooperation with the Federal Highway Administration, the Environmental Protection Agency and in partnership with the Congress for the New Urbanism.

The Congress for the New Urbanism (CNU), "… is working with the U.S. Green Building Council (USGBC) and the Natural Resource Defense Council (NRDC) to lay the groundwork for a more coordinated and powerful environmental strategy: sustainability at the scale of neighborhoods and communities. The new joint venture known as LEED for Neighborhood Developments or LEED-ND is a system for rating and certifying green neighborhoods. LEED-ND builds on USGBC's Leadership in Energy and Environmental

Design (LEED) systems by expanding the project's scope beyond individual buildings to a more holistic concern about the context of those buildings."

"More than one-third of greenhouse gas emissions may be produced by buildings (primarily heating and cooling them), but another third is spent transporting people and goods to and from those buildings; a faster growing source of emissions. Workplaces, shops and residences – even energy-efficient ones -- in remote, auto-dependent locations generate vastly more transportation-related emissions than locations in urban places where transit-use, walking, bicycling are viable options. Simply put, no building can be considered truly green unless it's in a green urban neighborhood – and the principles of traditional city and town design as promoted by the CNU are essential guidelines for creating and supporting these neighborhoods. By focusing on traditional neighborhood design principles - such as density, proximity to transit, mixed use, mixed housing type, and pedestrian friendly neighborhoods - LEED-ND is recognizing the environmental benefits inherent in New Urbanism."

"LEED-ND aims to encourage development teams, planners, and local governments to construct sustainable, compact neighborhoods. By the time it launches in a year or two, the new program will rate neighborhoods according to four planned categories: location efficiency; environmental preservation; compact, complete and connected neighborhoods; and resource efficiency. Like other LEED systems, this one identifies certain core prerequisites – such as connected streets and blocks or the absence of a monitored community entrance gate – as well as a detailed list of additional characteristics, a substantial number of which projects must achieve to become LEED certified. Ultimately, LEED-ND will have a positive effect on development trends to revitalize existing urban areas by promoting walkable neighborhoods and urban reuse, consequently reducing the number of automobile trips and preserving natural, undeveloped lands."

Pedestrian Safety Action Plan and Complete Street

Both the Federal Highway Administration (FHWA) initiative to implement pedestrian safety (How to Develop a Pedestrian Safety Action Plan) and the National Complete Streets Coalition identify the streets as public spaces for everyone, young, old, walker, wheelchair user, bicyclist, bus rider or shopkeeper. The policies and goals target the safety of all users along the public right-of-way promoting design standards understanding pedestrian needs and characteristics. These initiatives do not currently incorporate the concepts of "green infrastructure" in connection with street/roadway planning and design but are critical elements in the fabric of the City's urban landscape.

American Forests

"Trees are indicators of a community's ecological health." While urban ecology is more complex than just tree cover, trees are good indicators of the health of an urban ecosystem because of the biological functions of the roots and leaves. When trees are large and healthy, the ecological systems that support them are also healthy. Healthy trees provide valuable environmental benefits which can be measured in terms of ecosystem services. The greater the tree cover and the less the impervious surface in a community, the more ecosystem services are produced. These services are measured as storm water runoff reduction, increasing air and water quality, carbon storage and energy reduction.

"American Forests advocates that every city set a tree canopy goal as an important step in ensuring that valuable green infrastructure is maintained at minimum thresholds, even as urban areas continue to grow."

American Forest has been analyzing tree canopy coverages of over a dozen cities across the United States. In the past, their focus was on street trees, but with urbanization and growth

of cities, they are beginning to see declines in overall regional urban forests. This factors into issues of regional sustainability and health of urban ecosystems. With current technologies and mapping systems, they are now capable of measuring region-wide canopy coverages and recommending guidelines for cities establishing thresholds to optimize environmental benefits. For southwest cities, the goal is an average of 30% canopy coverage (other regions are 40%). In general, this approximates to 15 trees per acre. This coverage acknowledges basic city form and divides coverage into the following categories: (a) core central business district = 15%; (b) urban neighborhoods & fringe businesses = 25%; (c) suburbs = 50%.

Tree City USA

The Arbor Day Foundation in conjunction with US Department of Agriculture (USDA) and the National Association of State Foresters designates national recognition and assistance to Cities that have met a minimum criteria for planting, caring and maintain urban forests. The City of Tucson has been a designated Tree City for over 15 years. The minimum requirements are (1) a Tree Board or Department, (2) Ordinance, (3) Community Forestry Program with minimum budget of $2 per capita (4) Arbor Day Observance and Proclamation. The benefits of a designated Tree City are (a) community education potentials, (b) community public image, (c) civic pride, (d) financial assistance opportunities, (e) visibility.

Smart Growth

"In communities across the nation, there is a growing concern that current development patterns -- dominated by what some call "sprawl" -- are no longer in the long-term interest of our cities, existing suburbs, small towns, rural communities, or wilderness areas. Though supportive of growth, communities are questioning the economic costs of abandoning infrastructure in the city, only to rebuild it further out."

"Spurring the smart growth movement are demographic shifts, a strong environmental ethic, increased fiscal concerns, and more nuanced views of growth. The result is both a new demand and a new opportunity for smart growth." Urban Heat Island (UHI) mitigation measures have focused on 3 major areas: (1) paving, (2) roofs and (3) trees. For the value and effect of trees, they have funded and collaborated with research coming out of Lawrence Berkley Laboratories, Oakview Laboratories, NASA, various universities and colleges across the nation and internationally.

"The features that distinguish smart growth in a community vary from place to place. In general, smart growth invests time, attention, and resources in restoring community and vitality to center cities and older suburbs. New smart growth is more town-centered, is transit and pedestrian oriented, and has a greater mix of housing, commercial and retail uses. It also preserves open space and many other environmental amenities."

Smart Growth focuses on seven issue areas:

Community Quality of Life ("…a framework to build community…"),

Design (…"communities that offer health, social, economic, and environmental benefits for all…"),

Economics ("…community-based small business investment and development…"),

Environment ("…current environmental challenges…are due in part to the way we have built…during the past half-century."),

Health ("…reduces health threats from air and water pollution and indoor air contaminants…"),

Housing ("…housing options for diverse lifestyles and socio-economic levels…") and

Transportation ("…promoting new transportation choices and transit-oriented development.").

EPA: Urban Heat Island and Heat Island Reduction Initiative

From the US Environmental Protection Agency, " For millions of Americans living in and around cities, heat islands are of growing concern. This phenomenon describes urban and suburban temperatures that are 2 to 10°F (1 to 6°C) hotter than nearby rural areas. Elevated temperatures can impact communities by increasing peak energy demand, air conditioning costs, air pollution levels, and heat-related illness and mortality.

"Fortunately, there are common-sense measures that communities can take to reduce the negative effects of heat islands."

"EPA's Heat Island Reduction Initiative (HIRI) focuses on translating research results into outreach materials, tools, and guidance to provide communities with information needed to develop heat island projects, programs, and policies.

An example program of particular relevance to the ULF: "Through HIRI, the EPA is supporting research on the impact that cool pavement materials have on urban heat islands and energy consumption. EPA worked with Arizona State University (ASU) to launch the National Center of Excellence on SMART Innovations for Urban Climate and Energy on April 24, 2006. The Center of Excellence will develop the next generation of sustainable materials and renewable technology (SMART) innovations that can help reduce urban temperatures and the resulting effect on energy consumption in U.S. cities. It will bring together leading researchers, government officials, and industry representatives to find solutions that have a sound scientific, economic, and practical basis."

FRAMEWORK

The following framework and action items will advance the City's *General Plan* toward achieving a healthier, sustainable Tucson environment and quality of life. This Urban Landscape Framework sets a path to develop maintenance and operation understandings and standards desired by this community. As new research and technologies develop through time, these practices must also adapt to changes based on rational findings, discoveries and available resources.

The sections are grouped according to the Goals listed in the Executive Summary.

1. DEFINE Tucson's urban and natural environment and cultural connections

A. Monitor progress and adjust goals as necessary to respond to the latest research and recommendations.

1) ACTION:

a. Partnering with ASU SMART Center for latest testing and research on porous concrete and pervious asphalt

b. Develop grant opportunities with UA Institute for the Study of Planet Earth to develop targets and goals for appropriate landscape techniques based on urban and human ecology

B. Expand green infrastructure by including all park space, from small neighborhood parks to large scale district parks; re-looking at street right-of-way as urban open space and utilizing as part of urban trails and connecting destinations as we design to accommodate landscape needs appropriately.

1) ACTION:

a. Integrate current research on urban ecology, conservation biology, anthropology, archeology and urban forestry in developing a working approach.

C. Promote water conservation through storm water harvesting, increased use of reclaimed water, and efficient irrigation systems.

1) Develop an irrigation ordinance in collaboration with Tucson Water.
   a. ACTION:
      (1) Work with UA Landscape Graduate School to enlist master's thesis to develop reasonable water budgets for typical commercial landscapes.
      (2) Work with irrigation consultant and committee of water experts to determine reasonable landscape water budgets.

D. Review and Revise Landscape Guidelines, Ordinances and Specifications to resolve inconsistencies, improve enforcement and to support ULF goal of a sustainable urban landscape.
   1) Encourage horticultural and ecologically appropriate plant selection.
      a. ACTION:
         (1) LAC to work with Arizona Native Plant Society, UA Extension Horticulturist and Audubon Society to review City plant list and selections for various uses such as Parks, Streets, drainage channels, washes, etc.

2. PROMOTE sustainable design principles

A. Mitigate Urban Heat Island (UHI) effect.
   1) Set goals for tree canopy coverage and/or number of species of appropriate trees to plant in the next five years.
      a. ACTION:
         (1) Compile research information from American Forest
         (2) Compile and track research currently being done by USDA Urban Forestry Division in Davis, CA
         (3) Compile and track research being done by ASU, National Science Foundation study, Central Arizona – Phoenix Long Term Ecological Research (CAP LTER)
         (4) Work with LAC subcommittee to explore appropriate targets

B. Establish connectivity and links among natural systems, restored washes, neighborhoods and activity centers.
   1) Work with Parks, Transportation Streets and Stormwater divisions to create and link corridors to achieve goals of non-vehicular, green infrastructure network.
      a. ACTION:
         (1) Work with Parks and Recreation on the Pima County Trails Update, focusing on the urban trails portion.

(2) Work with Urban Planning's Neighborhood Infill Coordinator to educate and assist neighborhoods to develop residential trails.

C. Advocate for multi-modal transportation corridors that enhance the pedestrian, bicycle and transit experience and expand green infrastructure.

1) Collaborate with Transportation in developing Street Design Guidelines to define desired street types and the design elements associated with adjacent land uses in order to improve pedestrian, bicycle and transit modes.

a. ACTION:

(1) Conduct charette with Transportations as part of Major Street and Routes update.

(2) Partner with UA Landscape Architecture Graduate Program to develop street pattern typology.

2) Support updating the City's Design Guidelines Manual to incorporate elements that enhance the pedestrian experience.

a. ACTION:

(1) Explore applications of UA Landscape Architecture graduate student's study of urban street patterns as part of the Design Guidelines Manual.

D. Plan species-appropriate trees located for best shade advantage.

1) ACTION:

a. Work with Trees for Tucson to update poster for trees appropriate to the region.

b. Incorporate research findings regarding urban trees for diversity and emission of biogenic volatile compounds.

E. Facilitate communication and information sharing and program development within City departments and among allied jurisdictions, professional organizations, educational institutions, design professionals, homeowners and neighborhood associations and throughout the community.

1) Continue to establish regional and state connections by joining organizations and continuing dialogues with other jurisdictions through regularly (quarterly, semi-annual) scheduled meetings.

a. ACTION:

(1) Maintain communications with Arizona State Land, Urban Forestry Division.

(2) Maintain communications with Arbor Day Foundation and renew annual Tree City designation.

F. Recognize projects and landscapes that utilize sustainable design principles, Context Sensitive Solutions and innovative methods in support of the City's vision of a great desert city.

1) Support and/or develop existing or new recognition (awards) programs for landscape successes, for water harvesting or for residential and commercial projects that best represent desert city.

a. ACTION:

(1) Continue to support and submit City projects to ADWR Xeriscape Awards Competition.

(2) Continue to seek and submit City projects for American Society for Landscape Architecture, American Planning Association, and American Institute for Architecture annual awards program for design and planning.

2) Adopt or Create an Enforceable Landscape Irrigation Efficiency Ordinance and Proposed Design Guidelines.

a. Establish site landscape water budgets.

(1). ACTION:

a) Work with Tucson Water Dept. and UA Landscape Architecture School to research and determine appropriate water budget for typical landscapes in the Tucson region.

3. MAXIMIZE the green infrastructure for community vitality and walk-ability

A. Set goals for residential, commercial/industrial, parks and open space and Rights-of-Way that increase canopy coverage to a minimum of 35%

1) ACTION:

a. Research applicability to utilize American Forest City Green software program to develop baseline and Tucson's calculations

B. Establish Landscape Design guidelines that will assist in mitigating UHI effects.
   1) ACTION:
      a. Partner with Trees for Tucson for developing neighborhood programs promoting neighborhood street tree plantings

C. Expand green infrastructure by including all park space, from small neighborhood parks to large scale district parks; re-looking at street right-of-way as urban open space and utilizing as part of urban trails and connecting destinations as we design to accommodate landscape needs appropriately.
   1) ACTION:
      a. Partner with Pima County Natural Resources, Parks and Recreation to integrate comprehensive regional green infrastructure system.

D. Enlist Support of elected officials, senior City staff and community leaders.
   1) Recognize urban landscapes are constructed green infrastructure elements and require resource support policies and BMP standards (how to manage more trees by developing efficient maintenance and practice standards).

4. EDUCATE City staff, elected officials, community leaders and citizens on the benefits of a sustainable urban landscape and implementing the ULF

A. Promote the Environmental, economic and aesthetic value of trees.
   1) Educate the City and community on the value of trees.
      a. ACTION:
         (1) Utilize the volunteer tree inventory program to educate community on value of trees.
         (2) Utilize Urban Heat Island Workshops to communicate research regarding value of trees to community.

B. Promote water conservation through storm water harvesting, increased use of reclaimed water, and efficient irrigation systems.
   1) Continue to promote the City's Water Harvesting Guidance Manual and enforce the water harvesting ordinance adopted in October 2005.
      a. ACTION:
         (1) Educate professionals regarding ordinance by being available to speak at organizational luncheons (i.e., American Society of Landscape Architects, American Planning Association, American Society of Civil Engineers, American Public Works Association).

C. Advocate for multi-modal transportation corridors that enhance the pedestrian, bicycle and transit experience and expand green infrastructure.
   1) Collaborate with Transportation in developing Street Design Guidelines to define desired street types and the design elements associated with adjacent land uses in order to improve pedestrian, bicycle and transit modes.
      a. ACTION:
         (1) Incorporate educational opportunities via Urban Heat Island workshops, presentations to Transportation Citizen's Advisory Committees.
   2) Integrate the Major Streets and Routes Plan (MS&R) as part of the foundation of a Green Infrastructure Plan.
      a. ACTION:
         (1) Incorporate RTA projects to include designs integrating walkability and activity areas along sidewalks and pathways adjacent to streets.
         (2) Educate City staff of right-of-way as regained public open space areas.

D. Communicate the value of trees to the community.
   1) Include research findings from American Forests, USDA Urban Forestry Program and others on Urban Landscape Website.
      a. ACTION:
         (1) Work with Urban Planning graphics division to develop website.
         (2) Coordinate with Office of Conservation and Sustainable Design, Transportation, Water, Parks & Recreation and Facilities regarding information on respective Dept.'s website.

E. Facilitate communication and information sharing and program development within City departments and among allied jurisdictions, professional organizations, educational institutions, design professionals, homeowners and neighborhood associations and throughout the community.
   1) Coordinate with other City departments to establish an informative, user-friendly webpage and expand educational links, literature and/or programs to teach and promote methods that support ULF goals.
      a. ACTION:
         (1) Begin with Urban Planning and Design website development for Urban Landscape Program.

(2) Connect and coordinate with webmasters in Transportation, Water, Parks and Recreation, Office of Conservation and Sustainable Design, and Facilities.
(3) Work with LAC subcommittee to develop goals in types of information to place on website.
(4) Hold quarterly meetings with eleven City departments/divisions that interface with landscape issues to communicate what departments have been doing and how we can assist/complement/promote each others work.
(5) If meetings are not held, maintain information update/exchange via intranet communications.

2) Utilize the media to promote and disseminate information.
   a. ACTION:
      (1) Work with LAC subcommittee to develop program of NPR radio sponsorships to deliver short messages regarding UHI and mitigation measures by residents and City.
      (2) Provide UHI information to local station meteorologists via National Environmental Education Foundation.
      (3) Work with Trees for Tucson and LAC member to keep local reporters abreast of City and volunteer efforts.
3) Provide information via periodic publication and/or routine meetings to elected officials, department heads, and community leaders so they will be better informed champions of ULF.
   a. ACTION:
      (1) Presentations to Mayor and Council, Mayor and Council Subcommittees, Dept. Directors, Advisory Boards, Commissions and Committees at start, intervals, and continuance of work in progress of ULF.
      (2) Develop annual report of progress for Mayor and Council and community.
4) Continue to train volunteers to assist with the tree inventory and expand role of volunteers as messengers and stewards of the urban landscape.
   a. ACTION:
      (1) Partner with Trees for Tucson to continue volunteer urban forester program.

F. Evaluate new technologies and practices pertinent to ULF.
   1) Schedule annual presentations and evaluations of new technologies and practices for City departments and community resources: contractors, manufacturers and educational and design professionals. Examples:

Irrigation components and methods, water harvesting, permeable pavement, structural soil, new plant species and varieties.

a. ACTION:
   (1) With assistance from LAC subcommittee, develop annual UHI workshop inviting City staff, elected officials, appointed members of Boards, Commissions, and Committees and partnering organizations and agencies.
   (2) Work with internal city staff landscape committee to inform each other of latest technologies and practices.
   (3) Invite and schedule presentations from University research facilities, such as ASU SMART Center, UA Institute for Planet Earth, UA School of Landscape Architecture, and UA Agriculture Extension.

G. Enlist Support of elected officials, senior City staff and community leaders.
   1) Develop communication and coordination strategy for across departmental activities.
      a. ACTION:
         (1) Develop internal staff committee comprised of managers working directly or in-directly with landscape issues.
         (2) Periodically inform Directors of the associated Departments of activities done through the Urban Landscape Manager and other department coordination.

5. INTEGRATE ULF into City codes, policies plans and management strategies

A. Update ULF strategies responding to changes in development, implementation an ongoing monitoring needs.

B. Establish Landscape Design guidelines that will assist in mitigating UHI effects.
   1) ACTION:
      a. Work with Transportation Department, Office of Conservation and Sustainable Development, Department of Neighborhood Resources and Ward office to integrate water harvesting principles into street tree planting designs.

C. Advocate for multi-modal transportation corridors that enhance the pedestrian, bicycle and transit experience and expand green infrastructure.
   1) Collaborate with Transportation in developing Street Design Guidelines to define desired street types and the design elements associated with adjacent land uses in order to improve pedestrian, bicycle and transit modes.

a. ACTION:
(1) Urban Landscape Manager to be a part of Transportation management teams dealing with street capital improvement projects.

D. Build in flexibility along roadways to design different street types and adjacent land uses.
1) ACTION:
a. Utilize Regional Transportation Authority (RTA) projects as opportunities to implement Context Sensitive Solutions to Urban Thoroughfares to Create Walkable Communities approach into roadway designs.

E. Coordinate with the transit authority to prioritize need of integrating landscape elements and provide transit shelters and seating.
1) ACTION:
a. Work with Transportation Transit division to integrate water harvesting design features into transit stops to provide landscape and shading.

F. Communicate the value of trees to the community
1) Develop city-wide tree inventory methodology.
a. ACTION:
(1) Utilize STRATUM as one method to conduct tree inventory to gather information to assist in street tree management.
(2) Consider alternative methods/program with requirements they are user-friendly and can incorporate method to update information.

G. Support and endorse training and programs for City staff, volunteers and contract labor force.
1) Develop and/or promote professional development programs for City irrigation and landscape maintenance staff for training and certification in industry Best Management Practices.
a. ACTION:
(1) Work with Water and Transportation Dept. to develop drip irrigation classes to help staff better understand current best management practices and research findings regarding maximizing irrigation efficiency.
(2) Collaborate with UA on applied research and technical training programs such as Smartscape and Water Auditor program.
2) Require irrigation and landscape maintenance staff certifications for all City maintenance including contract labor.
a. ACTION:
(1) For irrigation, work with Water Conservation Manager to develop certification program for drip irrigation.

(2) Continue working with Water Conservation Manager to provide spray irrigation classes, preparing attendees to take certification exam.

H. Review and Revise Landscape Guidelines, Ordinances and Specifications to resolve inconsistencies, improve enforcement and to support ULF goal of a sustainable urban landscape.

I. Update planting, irrigation and maintenance Best Management Practices (BMP) based on continued urban forestry/ecology, horticulture, and irrigation research information.
   1) ACTION:
      a. Utilize Arizona State Land Grant: Urban Forestry Community Challenge Grant to develop Best Management Landscape Maintenance Practice brochure to distribute to commercial property owners adjacent to Major Streets and Routes roadways.

J. Address underground, overhead and at-grade utility interfaces and conflicts with minimum tree/utility clearances.
   1) ACTION:
      a. Continue open dialogue with utility companies when conflicts arise.
      b. LAC to work with Tucson Downtown Partnership (TDP) and other agencies/ City Departments as downtown Congress Street improvement occur.

K. Standardize City maintenance contracts.
   1) Create a landscape maintenance contract boilerplate for use by all departments.
   2) Address worker training and certification requirements, update industry and BMP references, investigate the incorporation of plant replacement requirements, establish pruning cycles, clarify City oversight and approval requirements, and determine work schedule and maintenance report requirements.

L. Adopt or Create an Enforceable Landscape Irrigation Efficiency Ordinance and Proposed Design Guidelines.
   1) Require "smart" irrigation controllers on new projects and provide incentive to upgrade on existing projects.
      a. ACTION:
         (1) Transportation and Parks & Recreation has been moving toward Smart irrigation controllers on new installations.
         (2) Transportation has been systematically replacing older controllers with newer 'smart' controllers.

M. Develop tree protection ordinance and tree replacement program.
   1) Establish goals to provide, maintain and manage trees.

a. ACTION:
(1) Utilize STRATUM program to assist in developing goals and program.

2) Increase canopy in parking lots to 50%.
a. ACTION:
(1) Add as a rezoning condition for 1 year. After 1 year, amend landscape code to include language.

N. Enlist Support of elected officials, senior City staff and community leaders.
1) Achieve objectives through a balanced use of enforced regulations and incentives-policy.
2) Establish a City Water Manager position.
3) Increase length of maintenance periods in construction contracts.

6. REGULATE and motivate by balancing regulations with incentives to achieve ULF goals

A. Maintain and manage the urban forest.
1) Develop regular, periodic, proactive and systematic maintenance and management policies and protocols.
a. ACTION:
(1) Develop LAC subcommittee to explore advantages/disadvantages to develop ordinance/policy regarding great/heritage trees on private property.

B. Promote water conservation through storm water harvesting, increased use of reclaimed water, and efficient irrigation systems.
1) Continue to promote the City's Water Harvesting Guidance Manual and enforce the water harvesting ordinance adopted in October 2005.
a. ACTION:
(1) Work with Stormwater and Office of Conservation and Sustainable Development to develop onsite runoff chart to be part of grading/ hydrology plan submittal to Development Services Dept. indicating maximizing usage of onsite surface water run-off.
2) Develop an irrigation ordinance in collaboration with Tucson Water.
a. ACTION:
(1) Work with LAC and Development Services Dept. to explore requiring landscape architects/designers to add table of landscape water budget to landscape plans.

C. Adopt or create an enforceable landscape irrigation efficiency ordinance and proposed design guidelines.

1) Establish uniform plant water requirements, guidelines or recommendations.
   a. ACTION:
      (1) Work with UA Landscape Architecture School and UA Agriculture, Horticulture Dept. to develop and/or continue research on plant water requirements.
2) Enforce water harvesting ordinance through measurable standards and encourage innovation.
   a. ACTION:
      (1) Work with Transportation, Stormwater Division, Development Services and Office of Conservation and Sustainable Development to add water harvesting calculations table onto grading and/or landscape plans submitted for permitting.

D. Revise plan submittal requirements to specify water usage charts on landscape/ irrigation plans.
   1) ACTION:
      a. Begin discussion and education with professions why this is being requested and how this may be best accomplished.

E. Review and revise landscape ordinances – form a committee/task force to review and revise all landscape ordinances and guidelines with a goal of consistency throughout.
   1) Landscaping and Screening Regulations – LUC, Article III, Div. 7, Sec. 3.7.0. although it addresses natural resources (especially water conservation), the focus is on the built environment and landscaping and screening standards to improve or protect street and neighborhood character. In light of urban development, a need may arise to review and address the importance of land uses and landscape requirement within the urban context as population density increases.
      a. ACTION:
         (1) LAC subcommittee to meet with City staff from Urban Design and Planning and Development Services to review codes based on changes in urban form and suggest revisions accordingly.
   2) Native Plant Preservation (NPPO) – LUC, Article III, Div. 8, Sec 3.8.0. This ordinance is the key to native plant preservation in the undisturbed as well as built environment. The salvage of mature trees and cacti also provides a source of specimen trees and cacti for projects. Evaluate effectiveness, especially along city perimeter and next to washes to preserve existing native species.

3) Neighborhood Preservation – City Code, Chapter 16, It may be appropriate to add neighborhood landscape requirements to this chapter or consider where neighborhood character and preservation regulations could be included. For example, there may be neighborhood preservation policies in adopted neighborhood plans that need to be codified in this chapter.

4) Streets and Sidewalks – City Code, Chapter 25. There may be opportunities to amend this ordinance to include or at least reference landscape design standards and guidelines. A more substantive rewrite would add a purpose section and consider other street and landscape design issues.

F. Revise Water Waste and Tampering Ordinance 6096 to include enforceable penalties.
   1) Coordinate with Tucson Water's Water Waste Coordinator.

G. Establish or adopt irrigation certification requirements for contractors.
   1) Coordinate with Tucson Water to develop internal program for city staff.

H. Develop programs for the control of invasive plants and noxious weeds (especially Buffelgrass and green fountain grass) to protect native species.
   1) Address invasive, non-native species within the City of Tucson and their effects on the greater Sonoran regional landscape.
      a. ACTION:
         (1) Add language to rezoning conditions to include mapping and eradication as part of NPPO submittal.

7. FUND City departments, programs, and actions to adequately support Landscape goals

A. Promote the Environmental, economic and aesthetic value of trees.
   1) Utilize inventory and asset management tools to identify and manage the urban landscape as a valuable asset.
      a. ACTION:
         (1) Do a major streets and routes tree inventory utilizing volunteers to collect data (teaching opportunity).
         (2) Use STRATUM to develop major streets and routes tree management program.
         (3) Partner with Trees for Tucson to assist in enlisting neighborhoods to do residential street tree inventories.
         (4) Utilize STRATUM to develop residential street tree management program.

B. Promote water conservation through storm water harvesting, increased use of reclaimed water, and efficient irrigation systems.
   1) Continue working with Tucson Water to expand availability of reclaimed water infrastructure.
   2) Monitor irrigation systems for functionality and efficiency on a regularly scheduled basis.

C. Communicate the value of trees to the community

1) Train volunteers to assist with the tree inventory, utilizing activity as an opportunity to educate community on the value of trees.
   a. ACTION:
      (1) Conduct training the trainers workshop for volunteer tree inventory.
      (2) Partner with Trees for Tucson to enlist volunteers from residential neighborhood associations.
      (3) Enlist interested volunteers to assist with 5% sample inventory survey of Major Streets and Routes.

D. Facilitate communication and information sharing and program development within City departments and among allied jurisdictions, professional organizations, educational institutions, design professionals, homeowners and neighborhood associations and throughout the community.
   1) Nurture volunteer Adopt-A-ROW and Adopt-A-Park Programs to care for the landscape, report hazardous conditions, and identify needed repairs.
      a. ACTION:
         (1) Partner with Tucson Clean and Beautiful to assist, maintain, and expand as an on-going program.
   2) Provide neighborhoods with organizational capacity to promote volunteer tree planting activities and general neighborhood ownership.
      a. ACTION:
         (1) Partner with organizations such as Tucson Clean and Beautiful, and Watershed Management Group to provide hands-on education of planting, water harvesting, and maintaining trees on residential properties and neighborhood common areas.
   3) Support neighborhood goals for nodes and community gardens to expand green space and serve as activity centers along green belts.
      a. ACTION:
         (1) Partner with Community Food Bank to assist neighborhoods in the development and care of community gardens.

E. Implement Maintenance of Landscape in ROW by Private Property Owners.
   1) Develop program for phasing education and enforcement of adjacent property owner maintenance responsibility.
      a. ACTION:
         (1) Developing maintenance guidelines that can be distributed to adjacent commercial property owners.

F. Enlist Support of elected officials, senior City staff and community leaders.
   1) Provide information illustrating cost, revenue and manpower resource utilization.

REVIEW OF CITY CODES AND GUIDELINES

Analysis of City code and guidelines consisted of a review of more than 22 relevant ordinances, policy documents and plans. Documents were selected because of direct relation to landscape or streetscape design--for example, the Landscaping and Screening Regulations and Street Development Standards--or attention to larger, environmental issues and resource protection--for example, ordinances that protect riparian habitat or promote water harvesting. This broader, ecological perspective recognizes connections between the designed landscape (i.e. street and yard trees) and natural systems (i.e. riparian corridors and water resources). Looking at landscape issues in this way supports the City's urban landscape program approach, which emphasizes integrating green and gray infrastructure, regenerating the urban landscape, and making connections between wash corridors and roadway landscape resources.

The detailed report "Review of City of Tucson Landscape Ordinances, Policies and Plans" and accompanying checklist of items in Figure 5 "Matrix 1: City of Tucson Landscape Regulations and Policy Guidance" provide a summary of key issues and note relative importance to the Urban Landscape Framework process. In the matrix, each document was rated as either having a high, medium, or low level of importance based on the following criteria:

- directly relevant, with primary focus on landscape and vegetative resources; and/or
- important for street character and enhancement of landscape resources as part of roadway planning, improvements and maintenance; and/or
- important as policy basis for environmental, community, and landscape design regulations or programs.

More than half of the documents were rated at a "high" level of importance.

City of Tucson Urban Landscape Framework (ULF)
Matrix 1:
COT Landscape Regulations and Policy Guidance
July 2006

DOCUMENTS / DIRECTIVES	LANDSCAPE ISSUES	Importance to ULF			Vegetation & Other Natural Resources													Design																Maintenance and Management							
		High	Mod	Low	Site/Plant Inventory	Preservation/Mitigation	ADWR Plant List or Other Similar	Buffering & Screening	Plant Density & Coverage	Water Conservation	Effluent/Reclaimed Water Use	Water Harvesting/Use of Storm water Run-off	Water Features	Wash Conservation & Erosion Control	Topo, Slope, Peaks, Limit of Cut/Fill Slopes	Natural Undeveloped Open Space (NUOS)	Views, Scenic Routes	Air Quality, Dust Pollution	Incentives for Preservation	Cluster Design	Streetscape, Frontage	Parking Lots	Pedestrian & Alternative Modes Transportation	Neighborhood Character	Residential/Subdivision	Commercial/Non-Residential	Water Conservation, Irrigation	Water Features	Xeriscape	Mini-Oasis/Oasis	Limits on Turf	Plant Material Size	Design Review Procedures	Development/Design Review Board/Other Boar	Utility Needs, Constraints, Restrictions	Homeowners Association	Monitoring	Enforcement	Pruning for Sight Visibility/Safety	Utility Constraints	Pruning Cycle	Best Practices	Tree Inventory
REGULATORY:																																								
Landscaping and Screening Regulations-LUC, Art. III, Div. 7. Sec. 3.7.0		X					X	X	X	X	X	X	X		X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Native Plant Preservation (NPPO)-LUC, Art. III, Div. 8, Sec. 3.8.0		X			X	X				X				X		X		X	X											X	X	X			X	X				X
Hillside Development Zone (HDZ)-LUC, Art. II, Div. 8, Sec. 2.8.1				X		X								X	X	X	X			X														X		X				
Scenic Corridor Zone (SCZ)-LUC, Art. II, Div. 8, Sec. 2.8.2			X			X		X							X		X				X												X	X	X					
Major Streets & Routes Setback Zone LUC, Art. II, Div. 8, Sec. 2.8.3			X														X				X	X																		
Major Streets & Routes Plan (MS&R)		X					X										X				X		X	X																
Gateway Corridor Zone-LUC, Art. II, Div. 8, Sec. 2.8.4			X					X								X		X				X												X	X	X			X		
Environmental Resource Zone (ERZ)-LUC, Art. II, Div. 8, Sec. 2.8.6		X				X								X		X																			X					
Streets & Sidewalks-City Code, Chapter 25			X																		X															X					
Roadway Development Policies (April 1998)			X																		X																			
Neighborhood Preservation-City Code, Chapter 16				X																	X																			
Floodplain and Erosion Hazard Management-City Code, Chapter 26			X			X								X																					X	X	X			X		
Watercourse Amenities, Safety, and Habitat (WASH) Ordinance-City Code, Chapter 29			X		X	X								X																					X	X				X		

Figure 5: City of Tucson Code and Ordinance Matrix.

City of Tucson Urban Landscape Framework (ULF)
Matrix 1:
COT Landscape Regulations and Policy Guidance
July 2006

DOCUMENTS / DIRECTIVES	LANDSCAPE ISSUES	Importance to ULF			Vegetation & Other Natural Resources													Design																Maintenance and Management							
		High	Mod	Low	Site/Plant Inventory	Preservation/Mitigation	ADWR Plant List or Other Similar	Buffering & Screening	Plant Density & Coverage	Water Conservation	Effluent/Reclaimed Water Use	Water Harvesting/Use of Storm water Run-off	Water Features	Wash Conservation & Erosion Control	Topo, Slope, Peaks, Limit of Cut/Fill Slopes	Natural Undeveloped Open Space (NUOS)	Views, Scenic Routes	Air Quality, Dust Pollution	Incentives for Preservation	Cluster Design	Streetscape, Frontage	Parking Lots	Pedestrian & Alternative Modes Transportation	Neighborhood Character	Residential/Subdivision	Commercial/Non-Residential	Water Conservation, Irrigation	Water Features	Xeriscape	Mini-Oasis/Oasis	Limits on Turf	Plant Material Size	Design Review Procedures	Development/Design Review Board/Other Boar	Utility Needs, Constraints, Restrictions	Homeowners Association	Monitoring	Enforcement	Pruning for Sight Visibility/Safety	Utility Constraints	Pruning Cycle	Best Practices	Tree Inventory
NON-REGULATORY:																																									
Development Standard 2-06.0 (Landscaping & Screening)		X					X	X	X	X	X	X					X				X	X		X		X	X	X	X					X					
Development Standard 2-07.0 (Landscape Plan Content & Specifications)		X						X				X			X	X										X				X				X		X			
Development Standard 2-15.0 (Native Plant Preservation)		X			X	X													X																					
Development Standard 3-01.0 (Street Development)		X													X						X	X	X										X							
Development Standard 9-06.0 (Landscape Plant Materials)		X			X		X																			X		X												
Tucson Downtown Comprehensive Street Tree Plan (Sept. 1998)				X			X														X												X				X	X		
Design Guidelines Manual (Jan. 1999)		X				X	X	X			X	X		X	X	X			X	X	X	X		X	X	X	X		X										
Water Harvesting Guidance Manual (Oct 2005)		X								X	X	X									X	X		X	X	X	X		X	X				X					X	
General Plan		X				X				X	X	X			X		X	X		X			X			X		X												
Area & Neighborhood Plans(See Findings Report)																																									
Administrative Directive 1.07-6 (Code Compliance)		X																																	X	X					

Notes:
1. This matrix is a companion document to the "City of Tucson Landscape Ordinances, Policies and Plans" report.
2. Information was compiled from document review September - December 2005.

Figure 5: City of Tucson Code and Ordinance Matrix, continued.

Chapter 4: Summary of Findings

APPROACH

This summary is as of November 2007 from the consultant research, review, analysis and recommendation work with focus groups; benchmark communities; City policies, ordinances and standards; and related technical efforts: maintenance, irrigation and tree inventory and management software. The goal of this effort was "…to provide unified guidance for city departments, private landowners and other governmental entities. It is also intended to…make recommendations as to what the roles and responsibilities of the various individuals should be."

Data was gathered from a variety of sources and using a range of methods. Five focus groups were convened to gain essential and broad perspectives on the City's landscape and to identify landscape-related issues. Telephone interviews were conducted with planning department staff from neighboring and 10 "benchmark" communities using a survey questionnaire. Consultant team professionals conducted detailed reviews and interviewed local experts in the areas of landscape maintenance and irrigation, and possible tree management software programs were analyzed for applicability to Tucson's existing resource management systems.

Issues determined through data analysis were considered significant when they related to and supported the overall vision for the ULF. Subsequent analysis revealed those issues that predominate across the research areas.

Following the separate research and analysis of the benchmark communities and the focus groups, a second analysis was conducted identifying issues common to both. The benchmark communities were selected because of their successful landscape management programs. The Focus Groups consisted of City staff and community leaders involved with, and committed to, these issues. Five benchmark themes were similar to major Focus Groups issues. These are listed below:

Chapter 4: Summary of Findings

- ***Consistent, interdepartmental and enforceable ordinances and policies addressing tree conservation / protection and landscape development.***

- ***Programmatic, first-hand, and Internet-based public outreach and education across municipal and educational institution interfaces.***

- ***Proactive and systematic maintenance and management of the urban forest, including the irrigation system, in accordance with accepted, best management practices.***

- ***Recognition of the environmental, aesthetic and quality of life values provided by the urban forest.***

- ***Leadership and support of the landscape management plan by elected officials, senior City staff and the public at large.***

These support several elements of the City's *General Plan* and the Education / Outreach, Standards and Ordinance / Policies focus areas of the ULF structure.

Condensed versions of the research and analysis follow. The complete, detailed reports have been provided to the City's Urban Landscape Manager.

SUMMARIES OF SIGNIFICANT ISSUES

Focus Group Meetings

One meeting was held with each of the following Focus Groups: Citizen Advisory Committees, City of Tucson staff, Interjurisdictional/ Special Campuses, Professional Organizations, and Utilities.

Each group commented on a wide range of issues. Collectively, these fall into categories of Policy/ Ordinance/Standards, Environment, Design, Operations/ Management, Leadership and Outreach and Education. During analysis of the comments, issues were considered significant when they were raised at least five times and by more than one focus group. Many of these correspond directly to the *General Plan* (GP) and ULF (UL) Focus Areas, as indicated by GP and UL, respectively.

Policy/Ordinances/Standards

- *Landscape Standards and Ordinances (UL), including:*
  - Need for consistency and enforcement
  - Need for coordination with utilities
  - Native and mature plant conservation
- *Species Selection (GP), including:*
  - Preference for native species
  - Avoiding utility conflicts

Environment

- *Water Conservation (GP, UL), including:*
  - Harvesting and use of storm water runoff, and use of reclaimed supply
  - Reducing demand in landscape, especially on potable supply
- *Trees and Shade (GP, UL), including:*
  - Providing pedestrian comfort
  - Character and form
- *Open Space (GP), including:*
  - Definition, protection and management
  - Providing and ensuring variety

Chapter 4: Summary of Findings

Design

- *Landscape Character (GP), including:*
  - Landscape use of Right of Way
  - Shade trees along sidewalks
- *Neighborhood Character (GP), including:*
  - Uniqueness and diversity
  - Concern about use of non-native species

Operations/Management

- *Irrigation, Planting and Maintenance (GP, UL), including:*
  - Irrigation adjustment as plants mature
  - Consistent landscape management schedules

Leadership

- *City of Tucson Staff (UL), including:*
  - Senior management support of vision
  - Regular, scheduled implementation of improvements
- *Partners (UL)*
  - Public and private expertise and support
  - Shared responsibilities among jurisdictions

Outreach And Education (GP, UL), Including:

- *Public programs to raise awareness and knowledge*
- *Demonstration gardens*

Benchmark Community Research

Initial research to select benchmark cities consisted of website review and a telephone survey. The 10 benchmark cities were selected because they have:

- ***Well-established landscape/urban forestry programs; and/or***
- ***Exemplary landscape and/or environmental ordinances; and/or***
- ***Special program elements that might help inform Tucson's urban landscape planning process.***

In addition, size (similar to or larger than Tucson in population and area) and geographic location were considered. The benchmark cities are Austin and Fort Worth, Texas; Las Vegas, Nevada; Portland, Oregon; San Diego and Sacramento, California; Seattle, Washington; and Milwaukee, Wisconsin. Two neighboring communities, Scottsdale and Peoria, Arizona, were included as they have developed programs or landscape ordinances that recognize the unique qualities of the Sonoran Desert environment.

Although the intent was to assess "municipal" urban landscape/urban forestry programs, Sacramento's non-profit tree program was included due to its national recognition. Exploring public-private partnerships, and learning from such programs, was an additional selection factor.

The detailed "Landscape Management in Selected Neighboring and Benchmark Cities" report and the companion matrix provide a synopsis and comparison of landscape management and urban forestry programs in the 10 communities based upon the data. The brief summaries of each of the surveyed programs describe overall landscape assets, management strategies, community support, effectiveness of regulations, special benchmarks and applicability to the Tucson landscape planning process.

Chapter 4: Summary of Findings

The interviews, conducted in early 2006 by the ULF consultants using the survey questionnaire, emphasized seven topics:

- *Program Elements and Community Landscape Assets*
- *Tree/Landscaping/Street Character Ordinance and Standards*
- *Natural Resource Issues*
- *Management Issues*
- *Technical Issues*
- *Economic Issues*
- *Community Outreach/Role of Neighborhoods.*

The interviews and related literature search identified unique, yet replicable, characteristics of successful programs. An open-ended component of the interview offered an opportunity for program representatives to share management strategies that might be applicable in the planning process for the City of Tucson ULF. Based on research and interviews, the following themes and trends characterize the most successful programs:

Strong program identity, *generally centralized or consolidated in one department--often Parks-has led to more public visibility, more predictable staffing and a dedicated funding source; program elements supported by outreach, education and user-friendly and comprehensive web site*

Well-established interdepartmental protocols *for design review (or environmental review) and compliance with landscape and tree protection ordinances*

Strong partnerships *with non-profit organizations and with neighborhood groups for outreach and community volunteer efforts*

Strong ties with local educational institutions *(universities, colleges) to supplement city resources, share knowledge and support public education and outreach*

Advocacy, advice, or oversight from a ***Citizen Advisory Committee*** *(Urban Forestry Board, Tree Commission, Landscape Advisory Committee, Parks Board Committee)*

Recognition by program managers of the ***importance of maintenance and management of a healthy urban forest*** *(defined by number of trees, diversity in age and species) as the critical and most costly program element. Although tree planting may be the primary goal or function of non-profit partners through volunteer work force, maintenance of a sustainable urban landscape generally rests with the city*

Importance of ***proactive and systematic management*** *and maintenance. Many of the established programs maintain their street and park trees in-house with well-trained staff in accordance with accepted best management practices*

Recognition of the ***value of trees to the environmental and aesthetic quality*** *of city life. Several of the benchmark cities have high-profile programs that equate a healthy urban forest with environmental (air quality, watershed protection, heat island mitigation), urban design, and quality of life benefits*

Importance of the ***support of elected officials and the community*** *at large. The most successful programs, such as in Milwaukee, Fort Worth, Portland and Sacramento, have healthy budgets because trees are seen as community assets and reflect pride of place*

City of Tucson Landscape Maintenance Contract Review

Landscape Maintenance Contract Review of City documents from Parks and Recreation, Transportation and Facilities departments are summarized in the detailed report "Review of City of Tucson Landscape Maintenance Documents."

The review documents included past and current City landscape maintenance contracts, requests for proposals and department standards and practices. Consistency of language, stated maintenance requirements, reference to industry standards and practices, staff qualifications, and conformance to City regulations and guidelines were the main review focus areas.

The scope of services of the landscape maintenance documents varies greatly from the routine maintenance and care for plant material and inert groundcover including herbicide use to the repair of potholes, graffiti abatement, maintenance of drinking fountains, rodent eradication, and even sweeping of a heliport.

The diversity of the documents limits a true item for item comparison, but general observations and recommendations are noted and can be used to develop a boilerplate landscape maintenance contract for use by all City departments.

Several of the nine maintenance documents reviewed are detailed with well-written scope of work, qualifications, and experience requirements, specifications, and technical specifications sections that provide clear descriptions of tasks, limitations, inspections, and frequency of service. One document, single page, had clearly defined tasks but no discussion of contractor qualifications, experience, City oversight responsibilities, or legal obligations.

Significant Issues:

- ***Reference to outdated industry guidelines, standards, and Best Management Practices (BMP); specifically the National Association of Arborists (NAA) standards are outdated. Current references are the American National Standards Institute (ANSI) documents ANSI A300 Parts 1-6 and the associated Best Management Practices Series published by the International Society of Arboriculture (ISA).***
- ***Inconsistent weed control measures.***
- ***Disease, insect and animal pest control requirements and methods vary greatly and not included in all the landscape maintenance documents reviewed.***
- ***Inconsistent plant replacement requirements.***
- ***Department approval and oversight requirements not specified in all documents.***
- ***Frequency of maintenance tasks varies from two to three times per week to twice a year, varying with the department and type of service provided.***
- ***Irrigation system responsibilities vary, from excluding irrigation controller schedule adjustment and system repair without prior department approval to requiring the contractor to adjust controller schedules.***
- ***Inconsistent requirements for submittal of work schedules and maintenance reports.***

Irrigation Standards and Practices Evaluation

An evaluation of irrigation standards and practices evaluation consisted of the review of standard documents, department meetings and interviews with key personnel, and consultant team research into industry practices. The detailed Review of "City Irrigation Standards and Practices" report (Appendix E) summarizes the results and includes a discussion of successful irrigation system requirements. Issues needing management attention include:

Major Issues:

- ***Increasing demand on facilities.***
- ***Aging facilities/systems.***
- ***Maintenance capacity not keeping pace with facility growth.***
- ***Limited use of Central Control Systems.***
- ***Increasing cost of water and water service.***
- ***Lack of adequate observation during construction.***
- ***Inconsistent design guidelines, standards, specifications, plan review and enforcement.***

Recommendations for City Systems and Facilities:

- *Evaluate current maintenance budgets and staff resources.*
- *Consider increasing subcontracted maintenance as an option providing better efficiency.*
- *Consider increasing length of maintenance periods in construction contracts to provide better post development establishment.*
- *Establish or adopt irrigation certification requirements for contractors.*
- *Increase staff training and certification.*
- *Expand use of existing central control systems.*
- *Establish a City of Tucson Parks Water Manager position.*
- *Assess turf reduction opportunities.*
- *Enforce water harvesting ordinance and encourage innovation.*
- *Establish site water budgets.*
- *Continue to expand the use of reclaimed water as more becomes available.*
- *Regular evaluation of new technologies.*
- *Utilize community resources to evaluate practices.*

- *Annual evaluation of aging irrigation systems (infrastructure improvements) for upgrade and/or replacement.*
- *Include City of Tucson oversight/observations during construction as a line item construction budget expense.*
- *Adopt Model Landscape Irrigation Efficiency Ordinance and Design Guidelines.*

Community-wide Recommendations:

- *Many of the strategies and recommendations described above for City properties and Rights-of-Way may have applications for the community at large.*
- *Establish water budgets for planting areas as guidelines.*
- *Encourage use of smart controllers.*
- *Reevaluate water service development fees for landscape use.*
- *Continue to provide educational outreach with emphasis on conservation.*
- *Revise Water Waste and Tampering Ordinance 6096 to include enforceable penalties.*
- *Develop program to inform adjacent property owners of Chapter 25 requirements of maintenance of ROW.*
- *Establish site landscape water budgets as for City properties and ROW.*

Tree System Software Report

The full Tree System Software Report titled "City of Tucson Report on Tree Inventory System" documents the advantages for a city-wide tree inventory system, describes existing systems pros and cons, and includes recommendations for phased data collection. Two major points included in the report are:

> ***"Research in urban forestry is continuing to indicate the value of trees in urban environments.*** Data is pointing toward the mitigation impacts healthy trees can have in reducing air pollutants, energy consumption and storm water runoff. Cities across the nation are evaluating trees as an integral element of the urban infrastructure. Within this concept, trees are being inventoried with management practices following an asset-based approach."

"As the City continues to grow, efficiency of both financial and manpower resources is vital to sustaining urban health. Trees are one of the few assets a City has that appreciate with time. Inventory and assessment of existing stock will assist in addressing (1) resource needs to manage the asset, (2) baseline for evaluating cost-efficiency and management program, (3) added benefits of environmental value contributing to community quality of life, and (4) quantified data to assist developing alternative resources for capital improvement and management sustainability."

Major Streets and Routes Plan

The transportation network within the City is a major organizing element of urban form. But the landscape is the foundation from which the City's footprint is built upon. Building intentionally, roadway, green infrastructure, and public open space are compatible elements that can be bundled as a single multiple-use feature of the City. Proposed Major Streets and Routes design standards are included in Appendix H. These standards were developed by researching other cities' transportation plans and cross-sections, and from a design charette involving city staff and other design professionals. Street cross-sections and type descriptions integrated land usage zones and elements with the philosophy on which this Management Framework is based. These cross-sections and street types illustrate design flexibility in response to street character, Right-of-Way width and adjacent land use. Focus Group input and research identified the following significant issues:

- ***Mitigate Urban Heat Island (UHI) effect***
- ***Street Landscape Character***
  - ***Need for shade trees along street edges***
  - ***Recognize and allow for diversity***
- ***Capture water harvesting opportunities in Rights-of-Way***
- ***Develop multi-modal transportation corridors that enhance pedestrian, bicycle and transit experiences and serve to expand green infrastructure***
- ***Develop community and neighborhood sense of place***
- ***Promote energy savings resulting from shaded, cooler conditions***

Appendices

A. Nine, in-progress recommendations of the Landscape Task Force

B. Focus Group Summaries

C. Landscape Management in Selected Neighboring and Benchmark Cities, Questionnaire, and Matrix

D. City Maintenance Contracts Review

E. City Irrigation Standards and Practices

F. City Code Review and Matrix

G. Tree System Software Report

H. Major Streets and Routes Plan Sample Cross-sections

I. List of City Landscape Ordinances, Policy, and Plan websites

J. List of Benchmark Community contacts and websites, links to plans, guidelines, manuals, etc.

K. List of Software websites, Industry Organizations and BMP Websites (Urban Forestry, Community Development, Arborists)

L. Department Missions and Advisory Groups