

CAMPUS
MASTER
PLAN

THE UNIVERSITY OF TEXAS AT AUSTIN
**LANDSCAPE
MASTER PLAN
& DESIGN
GUIDELINES**

SPRING 2014



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FORWARD

The planned beauty of The University of Texas at Austin campus has helped create enduring experiences for generations of students and their families, our faculty and our staff.

We can look back at the first conceptions of the campus for the aspirational ideas we still draw on today. We can also look back at the earliest photos of the university and walk across the campus to see how these ideas were made real in buildings and grounds.

Hard work, skill and dedication to a vision are essential in order to translate ideas first into plan and then to reality. Even as demand for increased efficiency spreads across the country, the best universities sustain a commitment to long term planning at a high level. University leaders, pursuing the Paul Cret vision a century ago, had no more or less a challenge or opportunity than we do today with the new Campus Master Plan and the associated Landscape Master Plan.

This Landscape Master Plan is exceptional for its integration of form and aesthetics with function and maintenance. The traditional look and feel of our campus landscape will be retained even as we evolve our expectations of how the landscape performs.

The emphasis on ecological performance is unprecedented. This plan balances a new and necessary water and climate consciousness with an awareness of the green infrastructure our grounds can be engineered to provide. The interest in applied sustainability introduced in the Campus Master Plan is continued in this Landscape Master Plan, most notably in selected horticulture, a focus on Waller Creek, and an emerging rethinking of storm water management.

To best ensure the practicality of the aesthetic and ecological priorities, our Landscape Services staff worked alongside the faculty and consultants drafting the Landscape Master Plan. The transition to a diverse, native, resilient landscape, as well as a new palette of furniture and space design, will require a high degree of care, knowledge and attention to detail.

UT Austin is rightfully proud of the history of our grounds and the many people engaged in shaping its creation, from planning to planting. This Landscape Master Plan marks a continuation of our pursuit of beauty at the University as well as an evolution of how we experience our landscape. By blending our traditions with new ideas, UT Austin serves as a model to all members of our campus community and truly distinguishes itself as among the best in the country.

Pat Clubb, *Vice President University Operations*

From Thomas Jefferson’s Lawn at the University of Virginia onward to today, landscape is what distinguishes the American university campus.

The word “campus” derives from the Latin “field.” Campus grounds present shared experiences, provide identity, and evoke memory. As students, faculty, staff, and visitors, we might identify with specific classrooms, labs, studios, performance spaces, and/or athletic fields. But landscapes provide platforms to connect our individual experiences. Walking across campus, we listen to the chimes of the carillon or a bird call. Other walkers hear the same sounds. We may watch a demonstration, watch a pair of squirrels chase each other up and down a Live Oak, watch other people, or simply enjoy the play of sunlight. Others see the same things and look at different phenomena, but what characterizes the campus landscape is that it is a shared community experience. Landscapes have the power to physically weave the fabric of the campus together but also to foster a unified sense of community.

The landscape is so ubiquitous that it may be taken for granted and fall victim to the tyranny of small, incremental decisions that diminish its influence. Through such actions, the precious qualities of the campus landscape can be reduced to something ordinary and powerless to lift our life experience. Campus landscapes require thoughtful and coordinated planning and design.

This landscape master plan provides such guidance for our campus. The plan acknowledges the best parts of our past while taking aim at an even brighter future. The landscape plan is embedded in the overall Campus Master Plan. As such, the plan has instrumental value as a guide for organizing the campus. Furthermore, this plan possesses educational value. It helps to call attention to the ways the campus landscape can and should be valued.

The campus landscape should reflect the aspirations of the University. The Texas Constitution specified that the legislature was to establish and support a “university of the first class,” which became The University of Texas at Austin. The Commission of 125 recommended that the University “establish an environment that promotes excellence.” The Commission also recommended the production of a master plan that would help maintain “a superior campus environment.” Our goal is to be the nation’s best public university. These aspirations can be advanced and realized through this plan.

The campus landscape plan presents a framework for sustaining valuable resources, especially water, while promoting a wider use of native plants. The conservation of water has both environmental and economic benefits as native plants contribute environmentally and aesthetically. Many other functional issues are addressed, including circulation, lighting, street furniture, and parking, which have safety and orientation consequences.

This landscape plan pays careful attention to the detailed elements that comprise the campus—the plants, walkways, bikeways, steps, benches, fountains, signs, and public art—while promoting significant transformations such as—making Speedway an attractive pedestrian spine; restoring Waller Creek to connect with the City of Austin’s new, ambitious greenway vision; and adapting more sustainable practices. The plan contributes to the Constitutional direction to be a university of the first class and the Commission of 125 recommendation to be an excellent learning environment. An outstanding campus landscape will help us attract and retain the brightest students and faculty. In doing so, The University of Texas at Austin will become the best public university in the nation.

Landscape Master Plan Committee Chair, Frederick R Steiner - *Dean, School of Architecture*



1.0 EXECUTIVE SUMMARY

1.1 PURPOSE

The Landscape Master Plan is intended to encourage unity in the design of the campus landscape over time, so that the individually designed parts of the landscape relate properly to one another, regardless of when they are built. This document’s audience includes University staff, administrators and consultants employed to design the campus landscape. The Landscape Master Plan aligns with the Operational Recommendations of the Commission of 125, which calls for the coordination of facilities planning to maintain a “superior campus environment” that assists in the recruitment and retention of a talented faculty, and improves the student experience.

The plan brings a balanced perspective to landscape design decision making, expanding the determinants of design beyond the traditional values of aesthetics and use to include ecology, water conservation, and long-term maintenance. Recent years of unusually severe drought have called into question the aesthetic of expansive green lawns and have brought focus to the need for water conservation. Some parts of the campus are expensive to water and may be unsustainable in the future. The Landscape Master Plan adopts a functional approach to campus ecology. Ecosystem services, such as climate regulation, water supply and regulation, erosion and sediment control, and habitat functions, are considered essential to the creation of a landscape that is attractive, resilient, and affordable to maintain. The Landscape Master Plan was prepared in collaboration with the Ecosystem Design Group of the Ladybird Johnson Wildflower Center at The University of Texas at Austin. The plan recommends that the University comply with the Sustainable Sites Initiative (SITES™) program, a national rating

system for sustainable landscape design. The SITES program is an interdisciplinary effort cosponsored by the United States Botanic Garden, the American Society of Landscape Architects and the Ladybird Johnson Wildflower Center.

The plan also defines an overall framework for landscape organization and treatment, design concepts for enhancements to areas of the existing landscape, and guidelines for landscape systems, including Ecology, Hydrology, Soils, Planting Design, Irrigation, Exterior Lighting, and Exterior Furnishings.

1.2 PROCESS

In the summer of 2013 Sasaki Associates Inc. and its sub-consultants, Applied Ecological Services (AES), Ecosystem Design Group (EDG) with the Lady Bird Johnson Wildflower Center, LAM Partners lighting design and the Austin planning and landscape architectural firm of RVi, were retained to work with the University Landscape Master Plan Committee and prepare a Landscape Master Plan for The University of Texas at Austin campus. The planning process began with a site evaluation and interviews with multiple campus constituents. The landscape was analyzed and issues were revealed through a series of meetings with the Landscape Master Plan Committee and constituent groups. Alternative directions for ways to improve the campus landscape were developed. Through several meetings, ideas were reviewed, critiqued and refined, yielding the recommendations contained in The University of Texas at Austin Landscape Master Plan.

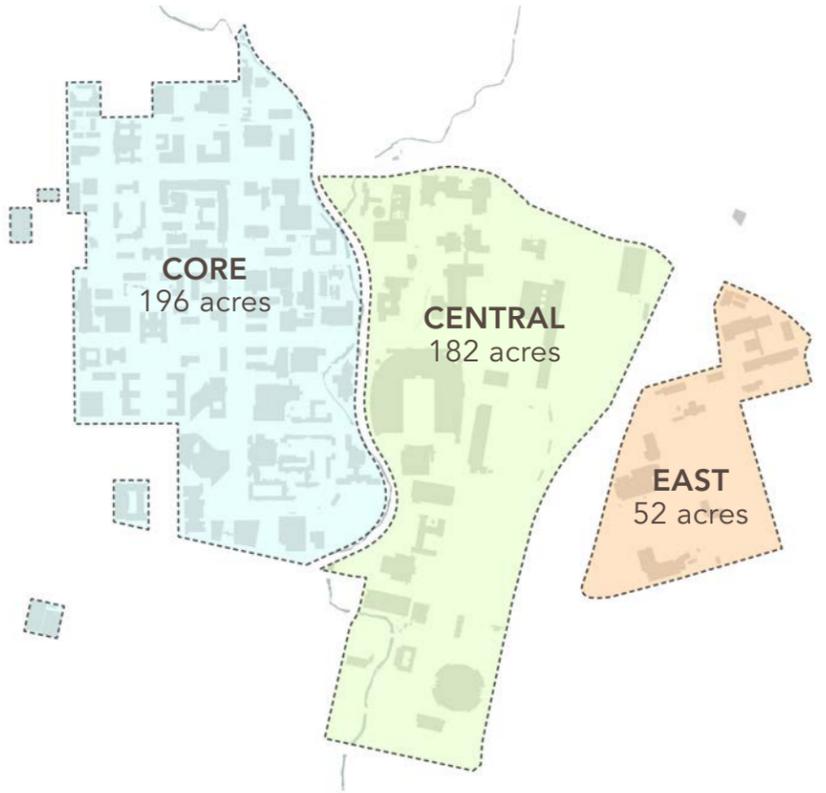
1.3 RELATIONSHIP TO THE CAMPUS MASTER PLAN

The Landscape Master Plan is a companion document to The University of Texas at Austin 2012 Campus Master Plan which was unanimously approved by the University of Texas Board of Regents in the spring of 2013. The Campus Master Plan provides a broad vision for future facilities growth, ideas for enhancing the campus environment and guidelines for architectural design. Of the eight key recommendations of the Campus Master Plan, four in particular have significant implications for the treatment of the campus landscape. They are:

- Expansion of campus facilities in new districts, that will require an integration of buildings and landscape
- Revitalization of the core campus and the call to protect historic buildings and landscape
- Redevelopment of the Central Campus to accommodate growth and enhance its pedestrian environment
- Transformation of Waller Creek and the San Jacinto corridor, making it less of a barrier within the campus

A principal goal of the Landscape Master Plan is to provide a more detail level of guidance for the development of the landscape in response to these master plan concepts. The Landscape Master Plan has also coordinated its recommendations with the 2008 University of Texas at Austin Public Art Master Plan.

Throughout the Landscape Master Plan report, the campus area designations (Core, Central, and East) established in the Campus Master Plan will be used.



LEGEND

- EXISTING UT BUILDINGS (represented by a white square with a grey outline)
- PROPOSED UT BUILDINGS (represented by an orange square)
- NON UT BUILDINGS (represented by a grey square)

2012 CAMPUS MASTER PLAN



1.4 BACKGROUND

The University of Texas at Austin is fortunate to occupy a campus whose original plan was designed with an awareness the spaces between the buildings are as important as the buildings themselves. In the early, formative years of the University plan, between 1909 and 1945, the vision of architect Cass Gilbert and the coordinated efforts of architect Paul Cret and the Kansas City landscape architecture firm of Hare & Hare accounted for a consistency of design and an integration of landscape and architecture that can still be experienced on much of the original Forty Acres today. Their goal was to create a larger, more embracing campus identity, not just individual buildings and landscapes. Through the thoughtful design of buildings and the conscious design of the spaces between buildings they achieved a palpable harmony that provides a sublime and enduring setting in which the daily life of the University unfolds. The proportions of outdoor spaces, and the organization of trees, paths, hedges and lawns were all purposefully designed. The grand malls and plazas were designed to express and celebrate the stature of the University, while the courtyards and smaller spaces between buildings created a humane environment with sensory appeal at the scale of the individual. Beyond the edge of the formal built campus, parklands offered complementary naturalistic scenery. The result of these early design efforts, as expressed in the South Lawn, malls, and courtyards of the Core Campus, is a wonderful integration of architecture, landscape and art that continues to be an outstanding and memorable place among American campuses today. The early 20th Century landscape is a defining feature of The University of Texas at Austin. It communicates powerful messages about the quality, self-image and values of the institution. It strongly influences recruitment, retention and the attachment of University alumni to this special place.

Over the years, the campus has been transformed from a group of institutional buildings in a pastoral setting to a distinctly urban place where nearly 65% of the land area of the campus is covered with pavements and buildings. The spectacular civic landscape conceived

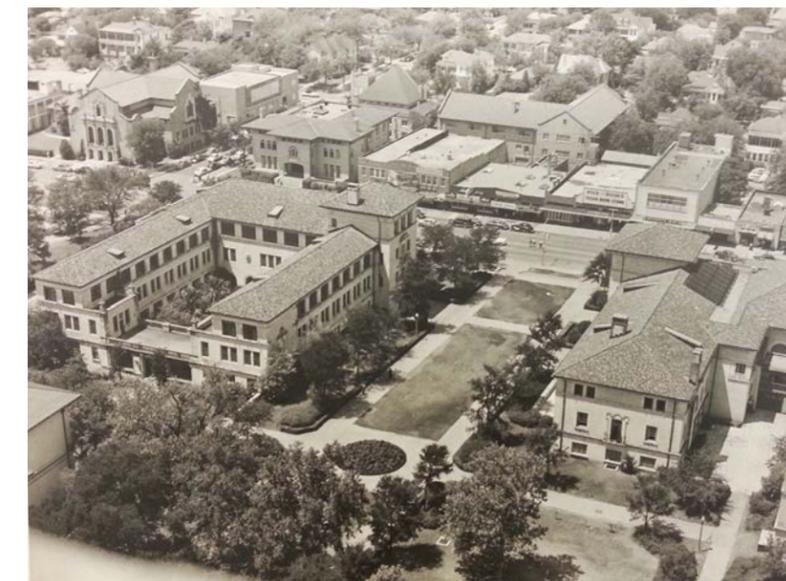
by Gilbert, Cret and Hare & Hare remains part of the Austin campus landscape - it is the part everyone remembers and the part most people refer to when the subject of landscape comes up. However, this landscape type accounts for less than 4% of the total landscape area of the campus, excluding buildings. The other 96% is a mosaic of streets, service areas, connective spaces, courtyards, parklands, and semi-natural areas (some well-designed and others not) that have largely been produced over the last 65 years of growth and urbanization. As the amount of landscape relative to the overall campus size has been continually reduced as the campus has grown, the need for landscape quality has become even more important to the health and well-being of the campus community. There is a need not only to protect the historic landscape, but also to raise the level of landscape design outside of the historic areas, address neglected areas such as Waller Creek, and provide landscape design guidance to future master plan growth areas, such as the Central Campus and the Medical District.

In addition, a challenging reality in the design and maintenance of the campus landscape is that the landscape is not a fixed artifact. It evolves dynamically with the natural growth of plants, damage from storms, and the impacts of disease and drought. The campus landscape is more accurately defined as a continuous process than a fixed thing. Natural and designed landscapes are defined by the interactions among the distinctive geologic and climatic attributes of a place with the living systems of plants and animals (especially people) that inhabit that place. Landscape is a living relationship of abiotic and biotic systems that interact dynamically, grow, and transform themselves over time. The pre-campus landscape of Austin, 130 years ago, was a reasonably stable natural system shaped by climate, the underlying geology, its biological communities and the presence of periodic fire. Significant changes in the landscape were measured in gradual increments extending over hundreds, if not thousands, of years. The landscape contributed to the presence of pure water, clean

air, and rich soils which supported a prosperous diversity of life. The impacts of human activity, though evident in the landscape, were once modest by comparison to impacts wrought by natural forces. Natural processes worked to create a landscape of distinctive beauty. The forces of nature are still at work within the campus landscape today; however, they are often overshadowed by the enormous influence of human use of the landscape. Today's challenge is to create a campus landscape designed to meet the needs of human use, while at the same time providing vital ecosystem services, and a more resilient and sustainable, and therefore more affordable landscape over the long term.



The campus plan of the early 20th century provided a clear integrated framework for buildings and landscape



The University is fortunate to occupy a campus whose original plan was designed with an awareness the spaces between buildings are as important as the buildings themselves. Bottom, West Mall circa late 1940s.

1.5 PRINCIPLES

The University seeks a landscape of consistent order and unified design, guided by the following general principles, which underlie the recommendations of the Landscape Master Plan:

Use - A well designed landscape will serve campus constituents' needs for well-structured places for circulation, access, socializing, recreation, and gathering.

Connection to Place - There is a deep emotional significance attached to the campus landscape by many constituent groups whose formative years and daily lives are intimately associated with the campus environment. This association with the campus can evolve into a true affection for place that can remain meaningful throughout a lifetime, and influence recruitment, retention and giving. A coherent landscape with a clear identity will enhance the connection to place.

The Experience of Nature - The campus landscape is significant in the real connection it offers to the natural world of plants, upon which all life depends. In our modern world of increasing virtual experience and detachment from nature, connections with the natural world become more meaningful and significant. The designed landscape is a cultural expression of our relationship to nature. A campus design that consistently recognizes the timeless value of the experience of nature will enrich the campus experience.

Ecosystem Benefits - A well planned campus landscape can enhance ecosystem services such as cleansing of air and water; regulating micro and macro climate; soil building and erosion control; habitat enhancement; and improvement of human health and well-being. These benefits extend beyond the campus boundary to the surrounding community.

Appropriateness - A campus landscape design inspired by the local character and flora of the surrounding Edward's Plateau and Blackland Prairie physiographic regions will embody authenticity and ecological pragmatism. The communities of plants which have evolved in this region for thousands of years will serve as a resilient palette for the campus landscape. Their use will also result in a regionally appropriate campus image.

Aesthetic Value - A beautiful campus is not necessary for education, but it is necessary for a full education. Attention to the quality of daily experience through the architecture and landscape of the campus is important for its own sake, but also as a reference that will guide the values of graduates and future leaders. The positive psychological benefits of beautiful surroundings are just as important as more measurable functional requirements of the landscape.

Efficient Management - A well-ordered, intelligent, and purposeful landscape can bring a commensurate level of efficiency and system to the maintenance of the landscape.



The campus landscape serves the community need for useful public spaces.



A well planned landscape can enhance ecosystem benefits such as regulating microclimate, shading of buildings and habitat enhancement.



Landscape design and campus art are significant to establishing the campus identity and life long connections to place.



The campus landscape offers an important connection to nature within a predominantly urban realm.

1.6 SUMMARY OF LANDSCAPE MASTER PLAN RECOMMENDATIONS

Establish a unified landscape framework for the campus as a whole

To improve and extend the overall structure and legibility of the campus landscape, it is proposed that the landscape be purposefully organized in a pattern of landscape types, including: Civic Landscapes; Street Landscapes; Quadrangles and Courtyards; Connective Landscapes; Parklands; Service and Parking Landscapes; and the Waller Creek Corridor. These types are based on use, a given area's location, and its configuration in the campus landscape plan. Guidelines are proposed for each landscape type, to encourage design consistency, foster visual coherence and allow for the systematic deployment of resources across the campus. This organization will facilitate practical design, maintenance and the concentration of resources in areas where they will have the greatest positive effect. The following are key guidelines related to development of the various campus landscape types:

- Protect the historic Civic Landscape
- Expand the Civic Landscape to include Speedway, from Dean Keeton Street south to the Blanton Museum, as a major public open space
- Revitalize the East Mall and replace the East Mall Fountain. Both have become run down over the years while concurrently becoming more significant as the center of campus shifts to the east
- In major public Civic open spaces, Streets, Parklands, Service, and Connective Landscapes, maintain an aesthetic of simplicity, restraint and proper institutional scale that supports the overall structure of the campus plan
- Develop a variety of diverse Courts, Quads and Plaza landscapes that encourage social interaction and support the public life of the University
- Reinforce the consistency of the tree canopy in campus street corridors

Improve ecosystem services

It is proposed the design for the campus landscape improve the functional ability of the landscape to provide ecosystem services. Ecosystem services are benefits humans receive from functioning ecosystems. The services most sought include local climate regulation; soil protection; water management, use and cleansing; and providing habitat to conserve biological diversity. The following are key guidelines related to improving campus ecosystem services:

- Future landscape projects will comply with the requirements of SITES™. SITES is a national rating system that encourages sustainable practices in landscape design, construction, operations, and maintenance. SITES is cosponsored by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center, and the United States Botanic Garden. Designers should refer to the SITES v2 Rating System and Guidelines found at <http://www.sustainablesites.org/>.
- Convert large lawn areas and traditional landscapes to a more resilient native landscape, particularly in locations where this change will not compromise human use of the landscape
- Employ native plant materials to maintain landscape resiliency, conserve regional biodiversity, and celebrate the landscape character of the Edward's Plateau and Blackland Prairie flora
- Restore Waller Creek to a more hydrologically and ecologically stable contributing campus landscape
- Improve upland stormwater management practices to reduce erosion, improve water quality, and reduce the rate of runoff

Design for maintenance

The design of campus landscapes should include strong consideration of the future requirements of maintenance, including the consumption of water. In the past, the general philosophy has often been to "maintain the design". In the future the guiding principle should be to "design for maintenance". Design for ecological resilience, human use, and aesthetic enjoyment should go hand in hand with an awareness of the implications for maintenance. The maintenance practices of the campus will also need to adapt to the requirements of native plantings.



The campus design should improve the functional ability of the landscape to provide ecosystem services including climate regulation, water management, soil protection, and providing habitat. Future projects should meet SITES certification requirements.

Adopt common guidelines for lighting, furnishings, campus planting, and irrigation

To foster consistency in the campus landscape, campus furnishings, lighting systems and planting should subscribe to a common set of guidelines. Among the guidelines for campus elements, the following key recommendations are made:

- In campus planting designs, celebrate the character of the Edward's Plateau and Blackland Prairie flora and select plantings that have low water requirements
- Adopt strategies to conserve water, such as conducting periodic distribution uniformity audits, installation of dedicated irrigation meters, use of bioswales, rainwater harvesting, and the use of reclaimed water
- Protect exceptional trees that contribute to the campus sense of place
- Adopt new exterior light fixtures that improve the quality of the nighttime environment, achieve design compatibility with modern architecture, and capitalize on the efficiencies of new LED technologies
- Adopt a consistent vocabulary of furnishings to be used throughout the major Civic, Street, Parkland, Service, and Connective landscapes of the campus

1.7 REPORT ORGANIZATION

The need for the Landscape Master Plan, its relationship to other campus plans, the planning process and relevant background information is explained in Section 1. Section 2 consists of a summary of Existing Conditions, and Sections 3, 4 and 5 include the Landscape Master Plan recommendations. Section 3 presents recommendations related to the overall structure of the campus landscape and guidelines related to the different landscape AREAS (Civic Landscapes, Streetscapes, Parklands, Connective Landscapes, Courtyards, Service Spaces, and Waller Creek) of the campus. Section 4 presents guidelines related to the various SYSTEMS of the campus landscape, and Section 5 presents recommended POLICIES to guide implementation of the campus landscape.

ACKNOWLEDGEMENTS

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2.0 EXISTING CONDITIONS

The process for preparing the Landscape Master Plan was initiated with an analysis of the campus landscape from several perspectives. Sasaki conducted a reconnaissance of the campus to observe and record its basic functionality, character-defining features, and the components of the designed landscape such as lighting and furnishings. Applied Ecological Services conducted an evaluation of the entire Waller Creek Corridor from 15th Street to the creek’s north crossing at Speedway. The Ecosystem Design Group evaluated and classified the campus landscape from the perspective of its ecology.

The evaluation of the existing campus landscape was recorded in a digital presentation made to the Landscape Master Plan Steering Committee on October 18, 2013, and in reports prepared by AES and EDG. The AES report is titled: Waller Creek Restoration, Enhancement and Existing Condition Considerations through UT Campus, and Medical Campus, with notes on the balance of the Waller Creek to Lady Bird Lake. The EDG report is titled: *Ecological Assessment, University of Texas at Austin*. These reports are available as separate appendices to the Landscape Master Plan.

This section briefly summarizes the principal characteristics of The University of Texas at Austin campus landscape that are more fully described in the Appendices reports.

OPPOSITE IMAGE: The elegant architecture of mature Live Oaks is a defining feature of the campus. The Battle Oaks, north of the Union Building.

2.1 EXISTING LANDSCAPE STRUCTURE

Three elements are responsible for the primary definition of the campus landscape: the shape of the terrain; the form of the built environment (buildings, paths, and streets); and the space defining characteristics of campus vegetation. The campus landscape is also strongly influenced by its surrounding urban context and its place in within the Central Texas Ecoregions.

CAMPUS LAND FORM

The structure of the campus landscape is shaped by its underlying topography. (See Topographic Plan of the University of Texas Campus) The defining features include the Waller Creek valley which bisects the campus along a north south line, and creates a major division between the historic core campus to the west and the late 20th Century central and east campuses to the east. The hills to the east and west of the creek frame a large inward looking bowl that acts to subtly connect the east and west parts of the university and define them as a single place centered around the creek valley. The promontories on both sides of the creek offer opportunities for panoramic landscape views to the south. The South Mall capitalizes on this circumstance with its framed view to the State Capitol dome. The elevation changes throughout the campus add an element of spatial drama that makes the landscape more interesting and engaging.



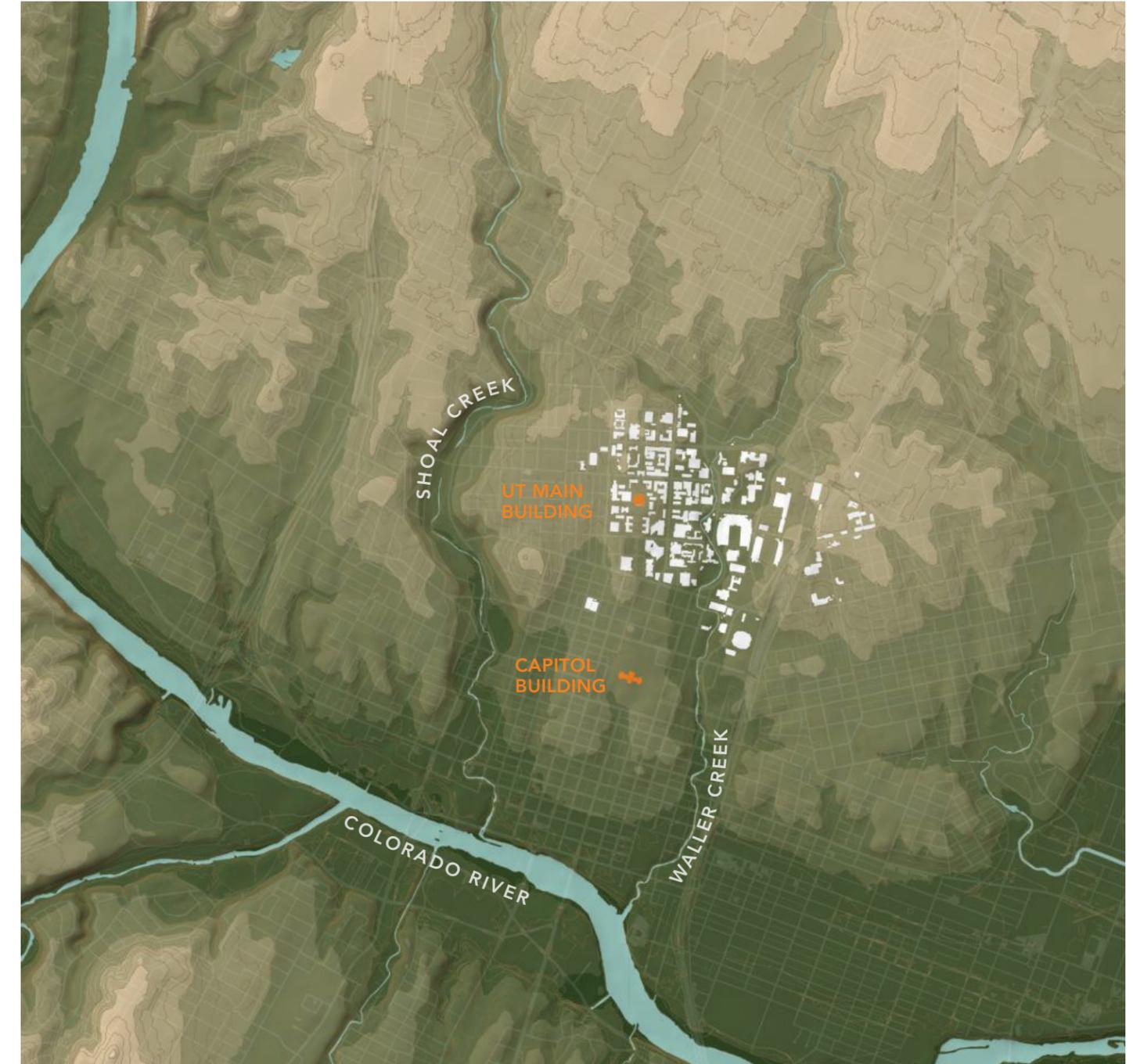
The grid of streets and buildings has a powerful organizing effect on the campus landscape. The Waller Creek valley divides the campus along a north-south line.



Elevation changes and varied topography add an element of drama and spatial interest to the campus landscape.

TOPOGRAPHIC PLAN OF THE UNIVERSITY OF TEXAS CAMPUS

2012 Campus Master Plan



CAMPUS BUILDINGS AND ROADS

The organization of the buildings and streets of the campus on a north-south-east-west grid has powerful organizing effect on the campus. The simple conformity of buildings to a common alignment allows for an easy understanding and navigation of the campus in spite of its topographic irregularities and differences in the scale and design of its architecture. The central tower at Main Building on the hilltop, the Stadium and the LBJ Presidential Library provide campus scale landmarks that further clarify one's understanding of the campus plan. The largest human-made intrusion in the landscape is Interstate Highway-35, and its frontage roads, which create a major divide between the Central and East Campus areas. This division renders these areas as fully separate districts of the campus.



The campus grid of streets and landmarks such as the Main Building Tower have a powerful organizing effect on the campus landscape.



Large avenues define the edges of campus. Here, the tree lined Guadalupe Street frames the west side of campus.

CAMPUS TREES

While the form of the campus topography, the order of streets and the space defining buildings of the campus form the structure of the campus landscape, its trees define its character. The elegant architecture of mature Live Oaks are a signature element of the campus. The dark silhouettes of expressive, reaching branches; the spectacular play of light and shadow in the intricate, delicate foliage patterns; and the sound of breezes and birds that inhabit the canopy of the campus forest are timeless and memorable. The trees are the essential feature of the campus landscape. Functionally, they provide shade; cleanse the air; intercept, conserve and store rainwater, secure the soil and moderate the campus climate. Visually, they provide naturalistic scenery to complement the dominant geometry of buildings. They add an element of wonder and living Nature to the campus experience, appealing to what E.O. Wilson has called *biophilia*, our propensity to subconsciously seek connections with the rest of life. When compared to the collective size of the campus buildings, paths, and streets, campus trees account for only a fraction of the visual "content" of the campus; however, the value of trees in defining the quality of the campus far exceeds their simple quantitative contribution.



Campus trees offer a connection to the natural world and bridge the scale between people and large buildings.



The play of light and shadow through foliage creates a marvelous, lively, and fleeting beauty

2.2 EXISTING LANDSCAPE ECOLOGY

ECOLOGICAL DEFINING FEATURES

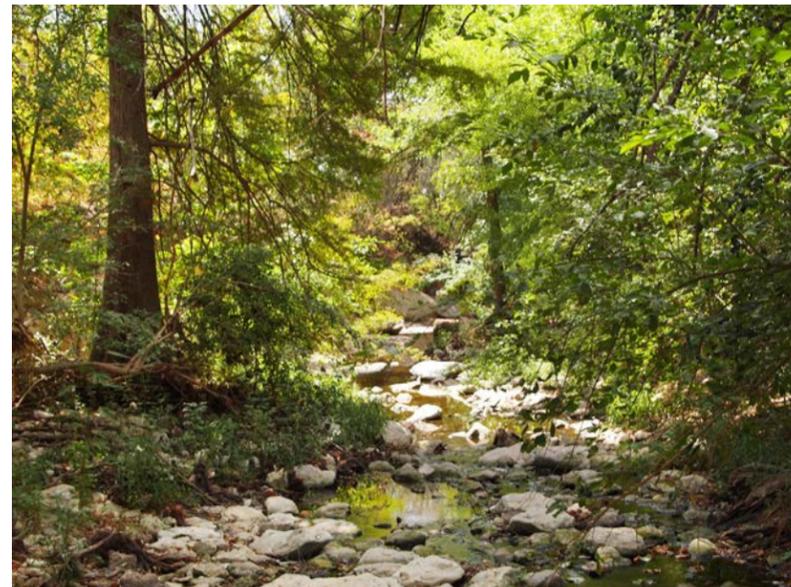
With the exception of the Waller Creek Corridor and a small area south of the San Jacinto parking garage, all of the campus landscape is managed on a regular basis.

Most of the managed campus is marked by a low diversity of plant species. The overstory of trees is composed mostly of native species, whereas shrubs, groundcovers and lawns are composed of a variety of introduced ornamental species. Soil conditions are disturbed throughout most areas with the soils often compacted, low in organic material, and subject to erosion. There are a few areas of campus where effort has been made to increase the function of the landscape. In these areas a positive balance between human use and plant material is achieved while increasing species diversity, managing stormwater, and enhancing soil resources. An example of a higher functioning landscape on campus is at the Belo Center for New Media courtyard.

ECOLOGICAL FUNCTION

The ecology of the existing campus can be understood by how well it consistently performs, over time, certain functions that are typically performed by healthy ecosystems. These functions include services such as mitigating hot microclimatic conditions; managing, cleaning and regulating water resources; protecting soil resources by limiting erosion and compaction; providing habitat conditions for diverse plant species including pollinators and other wildlife; cleansing the atmosphere; and providing cultural benefits for human health and well-being.

In general, the ecological functions performed by the existing campus landscape have been compromised over time by development which placed higher priority on other factors such as engineering of stormwater to protect buildings and infrastructure, and aesthetic motives to achieve a certain landscape effect that was not sensitive to the ecology of the region. There is an opportunity to improve the ecological functioning of the campus and obtain a higher level of benefit through designs that recognize the importance of a healthy ecology, and the importance of bringing urban environments closer in line with the natural systems on which human life depends.



The Waller Creek Corridor is one of the few unmanaged parts of the campus landscape.



Plant species diversity in the managed landscape is typically quite low.

BIOLOGICAL RICHNESS OF LOCATION

The campus occupies a location at the convergence of two ecological regions, the Blackland Prairie Ecoregion to the east and the Edwards Plateau to the west. These regions are separated by the Balcones Fault which runs parallel to Mopac Expressway (Texas State Highway Loop 1). This position makes the campus a suitable habitat for great number of diverse species of plants that mingle and overlap at the edges of each Eco-region. Consequently, there is a rich list of grasses, herbaceous forbes, and woody plants that are well adapted to the campus environment. Historically, and still today, much of the campus flora is composed of ornamental plants that are not native to Central Texas, some of which require extra care and water to survive. These species include many of the campus plants in the shrub and ground layer plantings, including campus lawns. This, however, was not always the case. Historic photographs taken in the 1930s show evidence of native Texas plant communities, such as wildflower meadow and savannah conditions found throughout the campus grounds.

CAMPUS CLIMATE

The crucial factors that determine the natural occurring flora of a landscape are both aspects of climate – water and temperature. In Austin, the most crucial limiting factor is water. Winter lows also have a constraining effect on what will grow well, but it is the limits on available water in the summer months that determine the ecology of the region. Limited water is what makes Central Texas a region of savannah and prairie rather than one of forests. The moderate winter, spring and fall temperatures of Austin also facilitate the active use of the landscape for much of the year, making the campus an attractive setting for outdoor living.



The Blackland Prairie and Edward's Plateau bioregions contain a rich array of species suitable for man made landscapes, as demonstrated here at the Lady Bird Johnson Wildflower Center.



The moderate spring, fall, and winter temperatures in Austin facilitate active use of the landscape for much of the year.

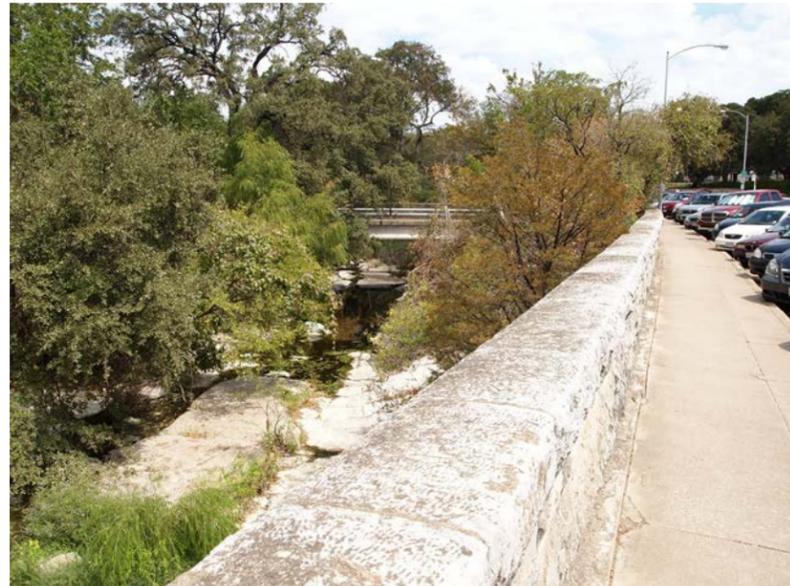
2.3 EXISTING CAMPUS HYDROLOGY AND SOILS

WALLER CREEK

The Waller Creek and its tributaries constitute the principal natural drainage system that conducts rainwater through the campus. A small portion of the campus drains to the Shoal Creek on the west side of campus. The Waller Creek catchment area extends far beyond the northern boundary of the campus and receives the waters of a watershed of about 2700 acres beyond the 400 acres of the campus. The creek is a degraded system, both hydrologically and ecologically. The creek bed, as well as its buffers has been encroached upon to the extent that its floodplain is nearly gone and its ability to slow, cleanse and return rainwater to the ground is significantly compromised. The creek has been largely reduced to an open conduit for runoff.

THE DESIGNED DRAINAGE SYSTEM

The system of streets, curbs, drain inlets, pipes, and culverts that comprise the campus drainage system has been designed to protect the buildings and roads of the campus by removing rainwater as quickly as possible during a storm event. Consequently, the benefits of rainwater infiltration to restore ground supplies and the ability of the landscape to slow, cleanse, and use runoff are often lost.



The Waller Creek and its flood plain has been encroached upon for much of its length through the campus, reducing its ability to slow, cleanse and return rainwater to the ground.

SOIL EROSION AND COMPACTION

According to the Natural Resources Conservation Service, the soils of the campus are mostly unclassified "Urban" soils. They are disturbed and are highly varied from place to place due to numerous previous construction projects. There are some areas east of Interstate Highway 35 where remnants of native soils remain. These are mostly Whitewright and Lewisville soils, which are silty clays overlaying chalk. Sampling of the urban soils across the campus revealed that most soils are sandy or clay loams with a wide range of soil permeability from poorly drained to well drained. The Whitewright and Lewisville soils are moderately permeable and reasonably well drained.

Due to a variety of conditions, soil erosion is prevalent in some upland areas of the campus and in the margins of the Waller Creek and its contributing drainageways, resulting in loss of soil the degradation of the waters of the Waller Creek. Soil compaction in lawns and planting areas is also a frequent occurrence, resulting in compromised growing areas for trees, shrubs and groundcovers.



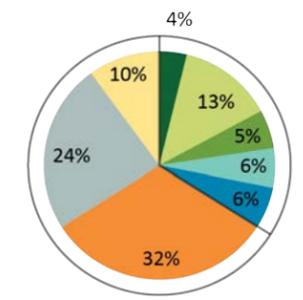
Soil erosion is prevalent in some upland areas, causing deterioration of downstream water quality.



EXISTING LANDSCAPE TYPES

LEGEND

■ CIVIC	12.9 AC.
■ PARKLAND	44.7 AC.
■ COURTS, QUADS & PLAZAS	18.4 AC.
■ CONNECTIVE LANDSCAPES	18.7 AC.
■ WALLER CREEK	19.7 AC.
■ STREET	107.6 AC.
■ TRANSIT ONLY STREET	0 AC.
■ SERVICE & PARKING	80.7 AC.
■ ATHLETICS & RECREATION	33.8 AC.



3.0 LANDSCAPE STRUCTURE AND AREA GUIDELINES

INTRODUCTION

The campus landscape can be understood as a composition of complimentary landscape types, each with its own functional requirements and aesthetic qualities. For each landscape type, the Landscape Master Plan describes defining characteristics, issues, and objectives; establishes general design guidelines; and offers a concept plan for one or more “enhancement areas,” which serve as examples of how the guidelines may be applied to the fabric of the campus.

The accompanying figures illustrate the existing organization of landscape types on the UT Austin campus in 2014 and the preferred future organization of types, taking into account the recommendations of the 2012 Campus Master Plan. The seven landscape types are listed at the right.

The landscape type guidelines emphasize improvements that are particular to each landscape type; however, the types do not operate independently from one another in experience. The intended effect of the guidelines is to yield a campus where moving from one landscape type to another is less disjointed and more intentionally continuous and harmonious. This is not to say that the distinctions between and treatment of civic landscapes and smaller connective and courtyard spaces will be erased, but rather that the quality of all will be improved to a common level.

In this section of the Landscape Master Plan report, guidelines for each of the landscape types are provided, and example “enhancement areas” are documented to show how the guidelines might be applied. The enhancement area concepts are not offered as final designs, but rather as one of several approaches that could improve the subject area.

LANDSCAPE TYPES

- 1 Civic Landscapes
- 2 Streets
- 3 Courts, Quads, & Plazas
- 4 Connective Space
- 5 Parklands
- 6 Service and Parking
- 7 Waller Creek

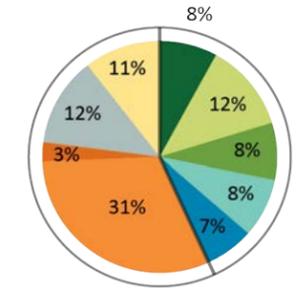
LANDSCAPE DESIGN GUIDELINES LEGEND

- ✓ Denotes positive example
- ✗ Denotes negative example



LEGEND

CIVIC	24.7 AC.	12.9 AC.
PARKLAND	38.2 AC.	44.7 AC.
COURTS, QUADS & PLAZAS	24.6 AC.	18.4 AC.
CONNECTIVE LANDSCAPES	25.6 AC.	18.7 AC.
WALLER CREEK	20.8 AC.	19.7 AC.
STREET	88.7 AC.	107.6 AC.
TRANSIT ONLY STREET	8.2 AC.	0 AC.
SERVICE & PARKING	38.6 AC.	80.7 AC.
ATHLETICS & RECREATION	32.6 AC.	33.8 AC.



PROPOSED LANDSCAPE TYPES



- LEGEND
1. SOUTH LAWN (CIVIC SPACE)
 2. 24TH STREET (STREETS)
 3. 6-PACK (COURTS, QUADS & PLAZAS)
 4. ARTS DISTRICT & LBJ (PARKLAND)
 5. MEDICAL DISTRICT (CREEK)
 6. PETROLEUM ENGINEERING (CONNECTIVE)
 7. HMA AREA (SERVICE & PARKING)
 8. RED RIVER STREET (STREETS)
 9. WALLER CREEK AT 24TH STREET (CREEK)
 10. SPEEDWAY & EAST MALL (CIVIC SPACE)

EXAMPLE ENHANCEMENT AREAS



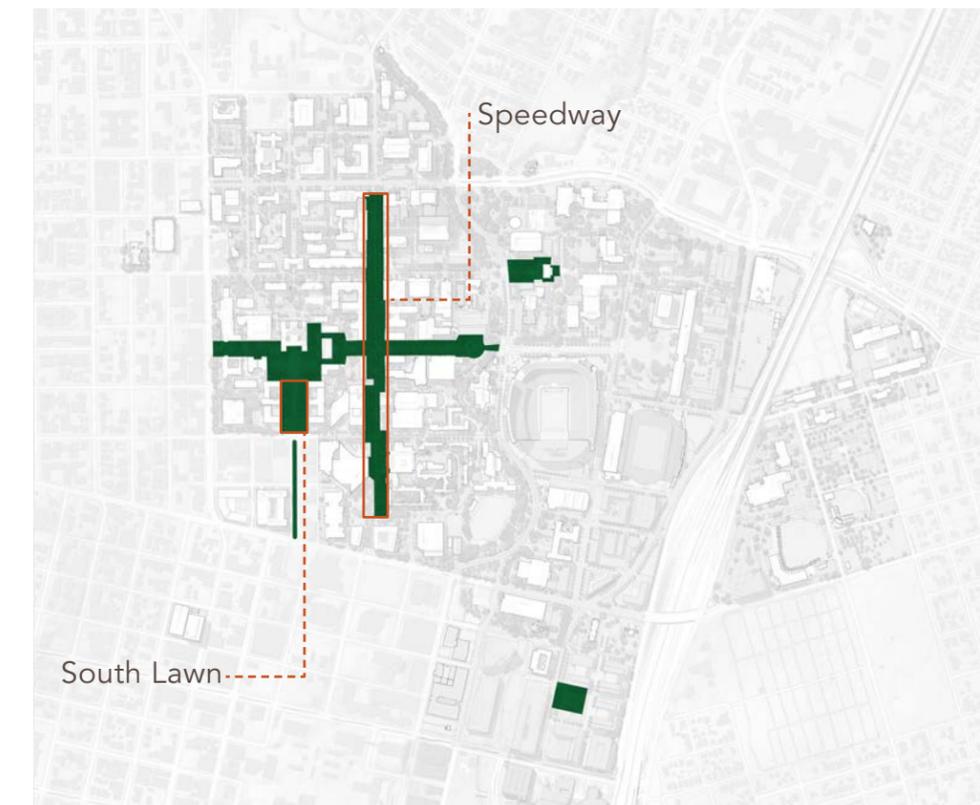
3.1 CIVIC LANDSCAPES

DEFINING CHARACTERISTICS

The civic landscapes are the most iconic landscapes on the UT Austin campus. An integrated, classical composition of landscape, architecture, and sculpture, the civic landscapes are central to the identity of The University of Texas at Austin.

This landscape type consists of a series of large landmark spaces, with a central plaza at the topographic high point. Formal symmetrical spaces are organized along axial views and the palette of vegetation and materials is limited. Live Oaks, Boxwood hedges, panels of lawn and groundcover, exposed aggregate pavements, and limestone masonry walls are organized into pleasing geometric compositions. Significant water fountains and art works are fully integrated into these landscapes, terminating views and dramatizing thresholds between spaces.

The Live Oak trees act as the primary character-defining element within the civic landscape. Though planted in rows or allees, their naturalistic forms play against the formal Beaux-Arts geometry of the buildings. Their shadows animate the orderly ground plane.



RECOMMENDED CIVIC LANDSCAPE
ENHANCEMENT AREAS

OPPOSITE IMAGE: The landscape of Battle Hall is part of the civic landscape that defines the identity of UT.



✔ Civic landscapes successfully integrate architecture, landscape, water features, and sculpture.

✔ Civic landscapes employ a limited palette of materials including Live Oaks, Boxwood hedges, lawns and groundcovers.



✔ Planting, walls, and walkways are organized in geometric compositions that reinforce the main malls and open spaces.

✔ Live Oaks are the primary character defining and space defining element in civic landscape.

ISSUES

The high use that civic landscapes receive poses significant challenges to plant longevity and the iconic appearance of these landscapes. Heavy foot traffic and large gatherings compact the soil around the Live Oak roots, limiting availability of nutrients, oxygen, and water, leading to tree decline over time. For additional information on the health of the Live Oaks in the South Lawn, refer to the *2013 Tree Inspection Report* by Bartlett Tree Experts.

Squirrels present an additional threat to the Live Oak canopy. These urban rodents often strip the bark from trees, thus girdling and eventually killing entire tree limbs.

The historic aesthetic of harmony and simplicity has been diluted in some areas of the civic landscape. The treatment of secondary plantings at some buildings has become overly ornamental and non-institutional in scale and quality.

The civic landscape, like the rest of the historic campus core, was designed in accordance with the best practices of its era. When examined through the lens of current design criteria, the visual effects of the civic landscape are still quite beautiful; however, the ecological functionality of these spaces is limited. Many planting choices have resulted in the use of water-intensive, non-native species with limited habitat value. Formal hedges require significant maintenance. These landscapes employ traditional engineering practices, which convey stormwater off surfaces and into the storm sewer system as quickly as possible. Opportunities to improve ecological functions of civic landscapes, without negatively impacting the aesthetic of the historic plan, should be sought.



Civic landscapes are organized in clear geometric compositions.

OBJECTIVES

The two principal objectives for civic landscapes are to protect the iconic historic landscape and to extend its design qualities to the Speedway and East Mall.

Within existing civic landscapes, the goal is to maintain the structure and appearance of the historic landscape, manage plant health, particularly that of the Live Oaks in the South Mall, and edit out incongruous elements that have crept into the limited palette of materials over time.

The framework proposed by the 2013 Campus Master Plan doubles the size of the civic landscapes on campus, from 12.9 to 24.7 acres. The majority of this new landscape will be added through two major projects: the transformation of Speedway from a Campus Street into a Civic Promenade, and the development of a new campus open space at the heart of the Medical District. The expansion of this landscape type extends the iconic aesthetic to newer areas of the campus, reinforcing the identity of the campus as a whole.

New civic landscapes should adhere to the aesthetic motives of the historic plan, emphasizing harmony and unity of the whole, while incorporating current ecological thinking regarding planting choices, stormwater management, and maintenance.

GENERAL GUIDELINES FOR CIVIC LANDSCAPES

Human Use

Civic landscapes serve as the center of community life on campus and experience exceptionally high levels of use, for circulation, passive recreation, large gatherings and events. To the extent possible, the design of these spaces should accommodate these uses, while protecting plantings. Measures should be taken to protect soils from compaction, minimize erosion, and enhance tree longevity.

Expanding the Civic Landscape

The Civic landscape should be expanded to provide more spaces that foster a sense of UT identity and community and to help reduce wear and tear on the South Mall. The Speedway should be converted into a pedestrian promenade, and the East Mall should be extended eastward to San Jacinto Boulevard. New civic landscapes should share the aesthetic character of historic Civic landscapes, while integrating lower maintenance, ecologically functional planting choices where possible, and current stormwater best management practices.

Design Simplicity

Civic landscapes should emphasize the harmony and unity of the overall composition through geometric order and symmetry. A limited palette of canopy trees, rows of single-species of shrubs or hedges, planes of groundcovers, concrete sidewalks, and high quality masonry walls should be arranged in simple, well proportioned, elegant compositions. Understated design should be employed to achieve a dignified effect.

Civic Scale

Civic landscapes function as an important element in the public realm of the campus. The scale and organization of the civic landscape should evoke an awareness of the stature of the University. Civic landscapes should “read” as large continuous spaces; they should not be segmented or filled with small-scale site features or overly ornamental planting.

Views

Key axial relationships and viewsheds should be protected, such as that between the Main Building Tower and the State Capitol building to the South, as well as the view from the East Mall to the Lyndon B. Johnson Fountain Lawn.

Public Art

Works of art are appropriate in civic landscapes. Art works must of the highest quality, be compatible with the overall landscape and building design of the space they inhabit, and be sensitively integrated into the plan. Art in Civic Spaces should possess qualities compatible with University values, as the symbolic meaning projected by the art work will be associated with the University in the public eye. For additional information on public art, see Section 5 in this report.

Planting

Plantings should consist of large canopy trees, shrubs, lawns and beds of groundcovers. All should be arranged to emphasize the order of the plan. Small-scale, decorative plantings with multiple species should be avoided. Existing plantings in the historic core should be managed for health to support the longevity of the historic landscape. In the civic landscape where the desired appearance of the landscape is to maintain the historic design of clipped hedges, neat beds, lawns and orderly colonnades of trees, it is less of a priority to use native plant materials. As it is, the Live Oaks, Boxwood hedges, occasional ornamental trees and beds of Asian Jasmine are not particularly demanding of water or extra maintenance. The need to clip hedges and groom ground cover beds is an accepted added level of maintenance in these landscapes. The lawns are the most intensive water and maintenance element in the civic landscape; however, their importance to the quality of student life argues for continued investment in them.

Microclimate

Civic landscapes, which are focused around human ecology, should be designed to provide a comfortable microclimate for gathering and for passive recreation. Canopy tree planting to provide shade is essential in these areas.

Stormwater

Opportunities to reduce water use and improve stormwater management in existing Civic landscapes should be explored; however, human use should be prioritized in these important public spaces.

CIVIC ENHANCEMENT AREA SOUTH LAWN

SOUTH MALL EXISTING ISSUES

The sculptural mature Live Oaks are the most memorable feature of the South Lawn; however, many of these trees are showing signs of decline. Extensive use of the lawn area has compacted the soil, limiting availability of nutrients, oxygen, and water in the trees' root zone. An assessment of the condition of the trees and its causes have been documented in the *2013 Tree Inspection Report* by Bartlett Tree Experts.

The South Lawn has served as a central setting for gatherings and events throughout the University's history. The photographs at right illustrate the greater access for circulation once permitted across the lawn. However, growth of the University population and greater use of the Lawn for events such as ESPN Game Day now corresponds with an increase in the trees' vulnerability, as they leave the prime of their growth cycle and settle into adulthood.

Since the tree's decline was identified, the University has performed several actions to protect and remediate the soil in the root zone, including removing compacted soil with air spades, replacing and amending the soil, replacing the lawn with mulch in the immediate root zone area around the trunks, beginning to limit large public events in this space, and moving away from wholesale lawn replacement after graduation each year. It will take several years to reveal whether these actions have reversed the trees' decline. With normal impacts, the trees could continue to thrive for decades. The protection of this precious resource is a University priority, but it must be balanced with consideration of the importance of allowing continued access to this community space so central to University identity. The following guidelines recommend additional measures that could be implemented, if tree health does not improve.

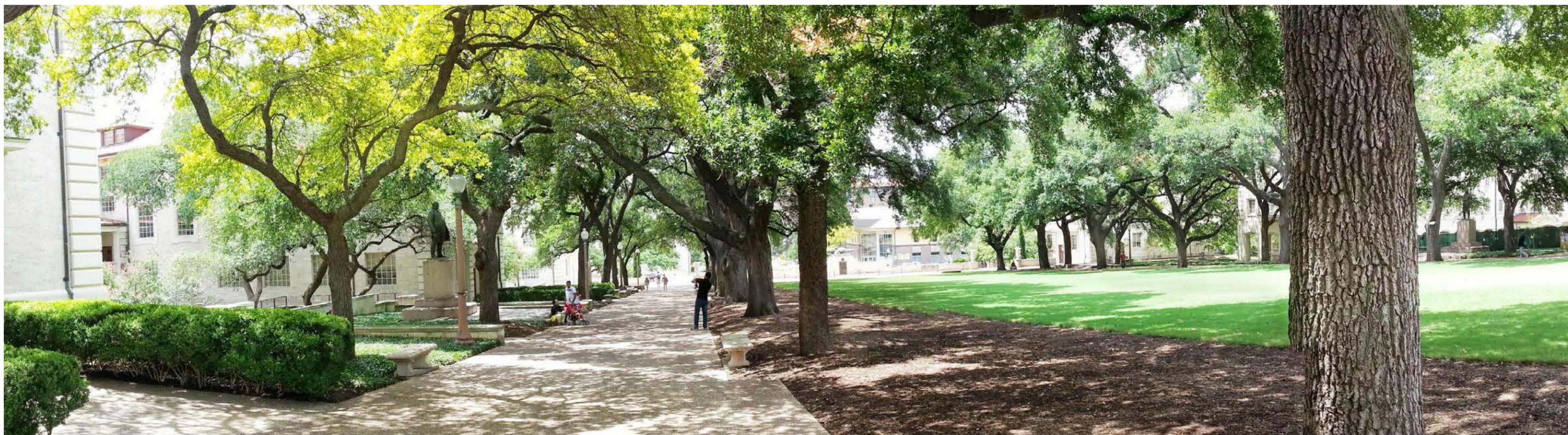


The South Lawn in the 1960's; young Live Oaks are less vulnerable to use impacts than mature trees.

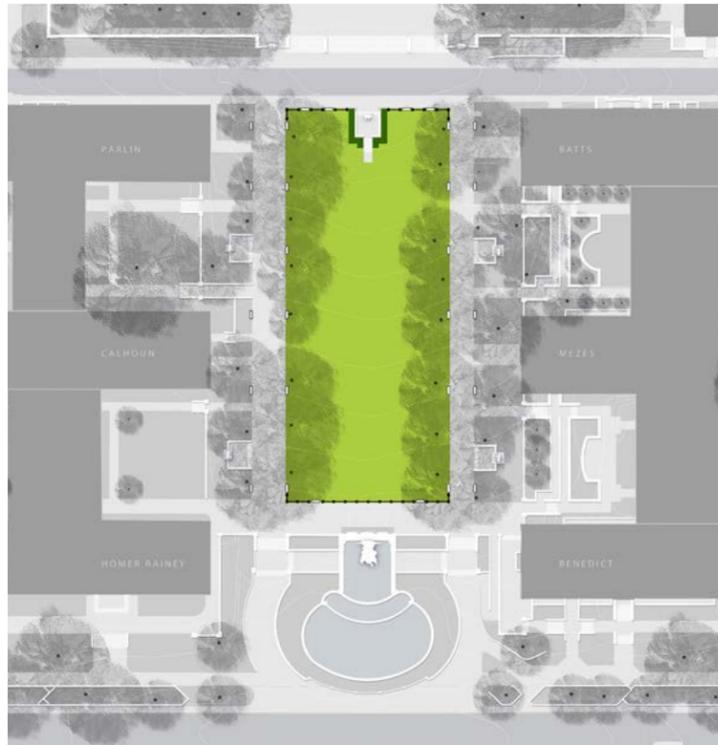


Diagonal circulation was once permitted across the South Lawn. This movement has been curtailed through the installation of post-and-chain at the north and south ends of the space.

The South Lawn in 2013. The Live Oaks are an iconic, character-defining element and should be protected.



SOUTH LAWN PREVIOUS CONFIGURATION



TREE IMPACTS

- Informal Student Use
- Annual lawn replacement after graduation
- Lawn used for large events such as ESPN Game Day and graduation

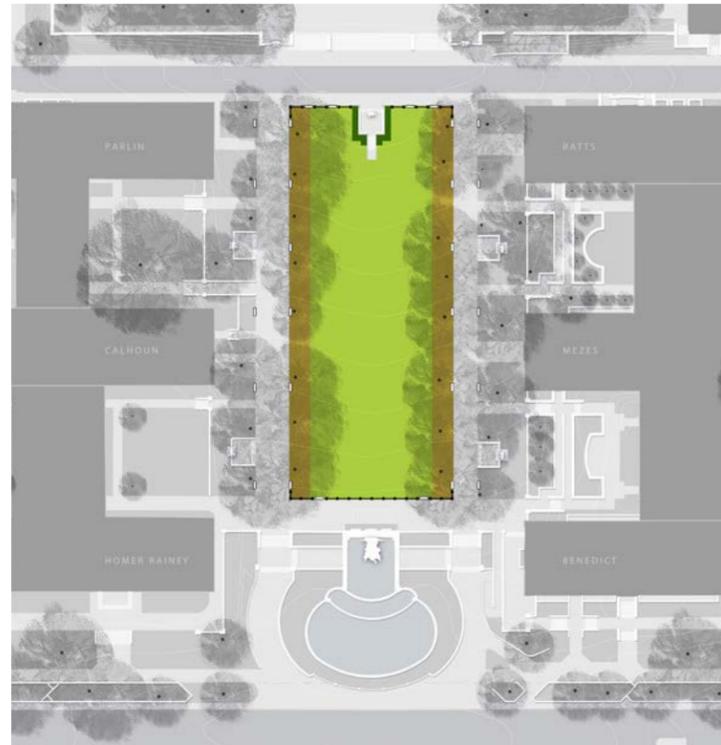
MITIGATION

- Post and chain installed at north and south ends of mall to prevent diagonal shortcuts

LEGEND

- LAWN
- HEDGE
- MULCH

SOUTH LAWN EXISTING CONDITION



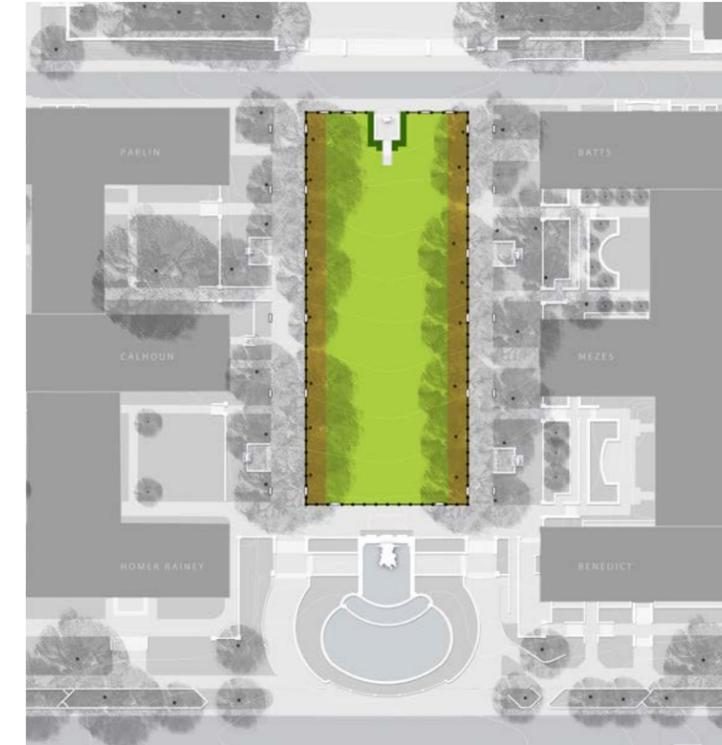
TREE IMPACTS

- Informal Student Use
- Lawn used for graduation

MITIGATION

- Soil replacement and amendment at tree root zone
- Conversion of root zone from lawn to mulch
- Root flare exposed
- Lawn restoration period versus lawn replacement after graduation
- Relocation of large events, except graduation

SOUTH LAWN PROPOSED CONCEPT PLAN



TREE IMPACTS

- Informal student use
- Annual graduation ceremony

MITIGATION

- Install removable post & chain on east and west sides of mall so that use of the Lawn may be intermittently restricted to allow root zone rest periods
- Relocate all large events, except graduation

SOUTH LAWN RECOMMENDATIONS

Design Integrity

The South Lawn is the most significant landscape on campus. The major features of the original design, including the tower plaza, the Lawn, the simple planting beds and walkways, the fountain and sculptural ensemble, as well as the view corridor between the Main Building tower and the State Capitol should be maintained and protected.

Planting

Existing plantings within the South Lawn should be maintained. Trees, understory plantings and hedges that show damage should be pruned, rejuvenated or replaced.

Protect the Trees

Consideration should be given to installing a removable post and chain system at the lawn's east and west edges to match that already installed at the Lawn's north and south ends. This will allow access to the Lawn to be restricted so that the lawn area can recover from events and be protected from use after rainstorms. Informal use should be regulated but continue to be allowed.

Limit Events

Consideration should be given to holding large events and student organization meetings in other locations on campus to limit compaction of the Live Oak tree root zone. Informal student use of the lawn and use of the lawn for graduation ceremonies should continue.



Existing

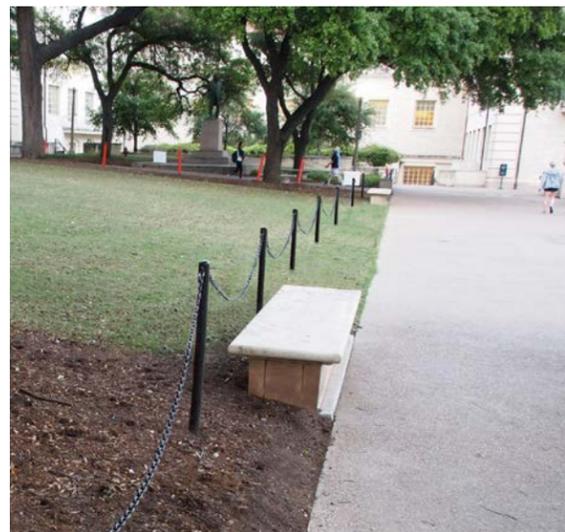


Proposed

The installation of a removable post and chain on all sides of the South Lawn will allow the lawn to be intermittently restricted for root zone recovery and for the protection of individual trees that may show signs of decline.



The removable chain and bollard system should have a pleasing design that fits with the civic landscape (top), rather than a merely utilitarian approach (bottom). The bollard at the top is used at the University of Virginia and several other campuses.



The permanent post and chain at the north and south ends of the South Lawn should be moved behind the benches (left photo) to provide a continuous enclosure and avoid cutting through at the bench (right photo).



Crowds occupy the South Lawn for the University of Texas at Austin Commencement on May 19, 2012

PHOTO CREDIT: Alberto Martinez/American-Statesman <http://galleries.statesman.com/gallery/ut-commencement-051912/#529590> (updated on 5/19/2012 at 11:15 p.m.)

CIVIC ENHANCEMENT AREA SPEEDWAY

Speedway is a Campus Street that runs north-south through the campus core. It is closed to through-traffic between MLK Boulevard and Dean Keeton Street, and some areas are completely closed to non-service vehicles. Speedway is one of the busiest pedestrian thoroughfares on campus. At class change times the roadway teems with pedestrians, bicycles, service carts, and delivery vehicles.

A 2006 Peter Walker Partners plan for the conversion of Speedway from a vehicular street to a pedestrian mall was well-received by the University community, and further supported by the recommendations of the 2012 Campus Master Plan, which called for the extension of the campus' Civic landscapes east from the historic core. However, adequate resources have not been available to implement the Walker Plan, which was estimated at \$130 million including utility improvements and the East Mall. The Landscape Master Plan Committee tasked the Landscape Master Plan team with translating the existing Speedway plans into a phase-able, lower cost series of projects in keeping with the spirit of the original recommendations. The following guidelines outline a concept for transforming this important corridor into a civic promenade, while continuing to allow service and emergency access; improving stormwater management; and retaining much of the existing infrastructure. The plan is broken down into three segments, but the project could be implemented in even smaller areas.



2006 Peter Walker Partners plan for Speedway

SPEEDWAY RECOMMENDATIONS

Design Goals

The Walker Plan outlines a series of goals that should be preserved in any Speedway conversion implementation. These include the creation of a central pedestrian promenade, limiting access to occasional use by service or emergency vehicles, increasing the amount of landscaped areas by removing redundant areas of paving, preserving the site's existing large canopy trees, and utilizing a system of hedge plantings to order the landscape, as well as to minimize corner-cutting through landscaped areas.

Landscape Design

The detail design of Speedway should include resurfacing of the promenade with unit pavers, preferably pervious. This will enhance the human scale of the street and improve the stormwater quality. The pavers should be sufficiently designed to support the loading of fire trucks and other large vehicles that will use the Speedway on a regular basis to service key buildings such as the Student Activity Center.

Planting should include additional canopy trees, informal native ground covers and understory plantings in the margins of the promenade. If a neat, reasonably uniform ground cover appearance is unattainable with native plant materials, the dominant ground cover for Speedway may be Asian Jasmine in shade and lawn in sunny areas. This would be consistent with groundcovers in other civic areas and the spirit of the Walker Plan. Informal groups of mature understory native trees such as Yaupon Holly exist along the Speedway

today and should be retained and augmented where possible as shown on the Walker schematic plan. The hedges in the Walker plan are essential to controlling pedestrian movement.

Infrastructure

The Walker Plan included a new grading and drainage system for Speedway; the plan proposed a new continuous 30' wide promenade sloped towards a central trench drain. This proposed profile would require extensive demolition and reconstruction of stormwater and utility infrastructure at significant cost. The current proposed concept plan preserves the existing utility and drainage infrastructure, while reducing pavement and replacing the roadway with a drivable, but pedestrian-character surface.

Phased Implementation

The infrastructure changes proposed in the Walker plan required that the half-mile long project be implemented all at once, in a single phase. Preserving the existing infrastructure will allow for a phased implementation strategy for surface improvements. Areas of higher visibility and highest pedestrian flows, such as the intersection of Speedway and the East Mall, can be implemented first, and other segments can be built out as funds become available.

Stormwater

The concept plan reduces paved area north of 24th Street and south of 21st Street, reducing stormwater runoff in these areas. Additional stormwater management strategies for Speedway may include the use of pervious pavement and water receiving landscape areas to hold and filter stormwater before it enters the storm sewer system.



Speedway is one of the busiest pedestrian thoroughfares on campus, but poorly designed for its use.



Informal native plantings in the margin of Speedway are proposed to augment existing plantings of the same type.

CENTRAL SPEEDWAY RECOMMENDATIONS

This area of Speedway, between East 24th Street and East 21st Street is a critical joint between the 40 acres and newer areas of the Core Campus. Currently, the Speedway roadbed interrupts the pedestrian character between the Main Building's grand terraces and the East Mall. The proposal for this section replaces the roadway with a promenade of the same 40 foot width designed to accommodate service and emergency vehicles, but pedestrian in character. Existing infrastructure remains in this section. The new wide paved surface in this central location can be programmed and used as an alternative to the South Mall lawn for small and large events, much as the Gregory Gymnasium plaza functions today.

Overall pavement is reduced through the removal of the secondary parallel walkways along the central promenade. Existing east-west walkways between the promenade and building entrances remain.

Native ground plane and understory plantings replace existing lawn areas and canopy trees are infilled along the promenade to shade and frame the corridor.

- LEGEND
- LAWN
 - NATIVE GROUND PLANE AND UNDERSTORY PLANTINGS
 - GROUNDCOVER
 - PROPOSED PROMENADE

EXISTING CENTRAL SPEEDWAY



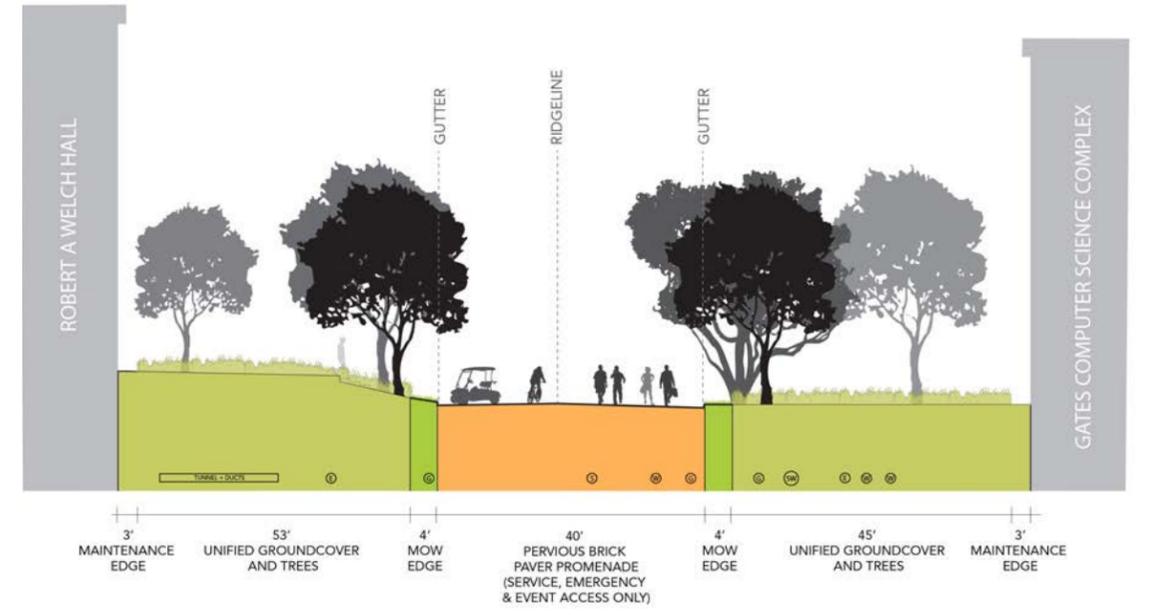
CONCEPT FOR CENTRAL SPEEDWAY



EXISTING CENTRAL SPEEDWAY SECTION A-A'



CONCEPT FOR CENTRAL SPEEDWAY SECTION A-A'



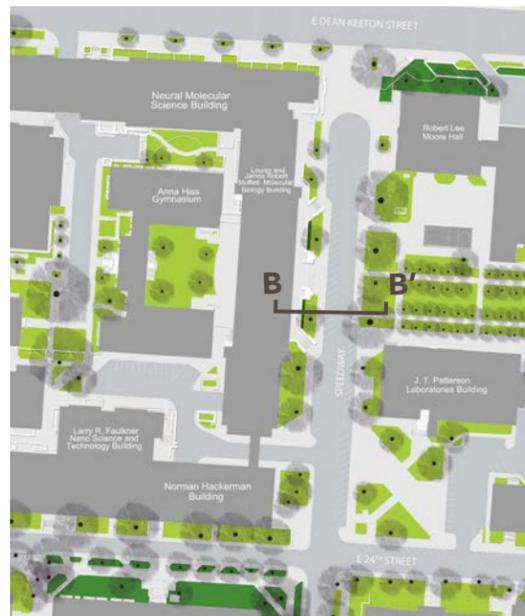
NORTH SPEEDWAY RECOMMENDATIONS

The North Speedway project removes the existing 63 foot wide sidewalk and roadway section and replaces it with a 30 foot wide pedestrian promenade extending from East 24th Street to Dean Keeton Street. In this segment, the promenade is located on the east side of the existing street corridor. At the busy intersection with East Dean Keeton Street, the promenade expands into a larger plaza.

Native ground plane and understory plantings replace the existing lawn and ground cover beds on both sides of the promenade. A double row of canopy trees frame the walkway, shading and framing the corridor.

The elevated sidewalk adjacent to the Louise and James Robert Molecular Biology Building will remain.

EXISTING NORTH SPEEDWAY



CONCEPT FOR NORTH SPEEDWAY

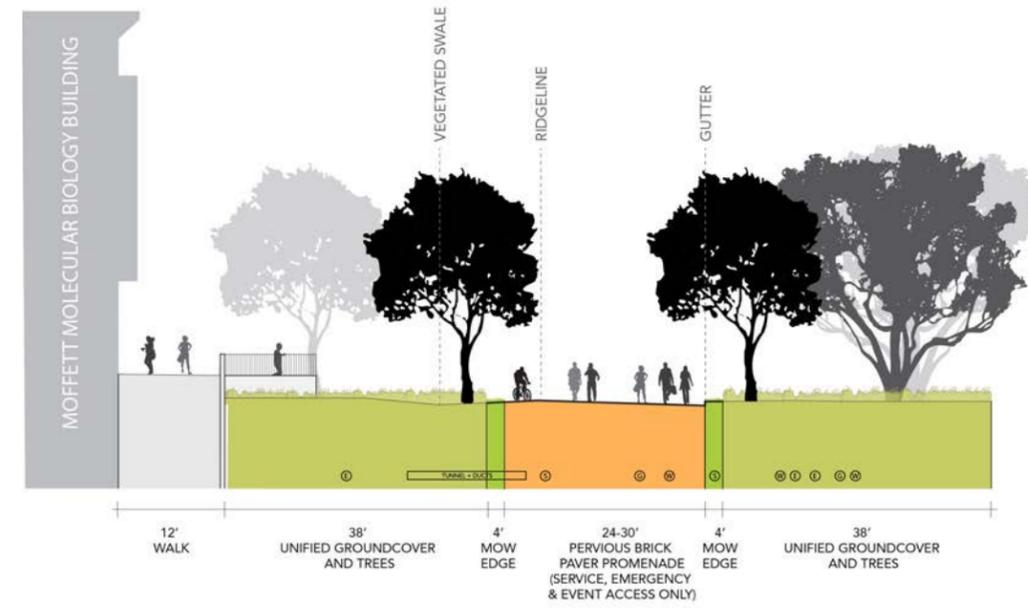


- LEGEND
- LAWN
 - NATIVE GROUND PLANE AND UNDERSTORY PLANTINGS
 - GROUND COVER
 - PROPOSED PROMENADE
 - PROPOSED TREES

EXISTING NORTH SPEEDWAY SECTION B-B'



CONCEPT FOR NORTH SPEEDWAY SECTION B-B'



SOUTH SPEEDWAY RECOMMENDATIONS

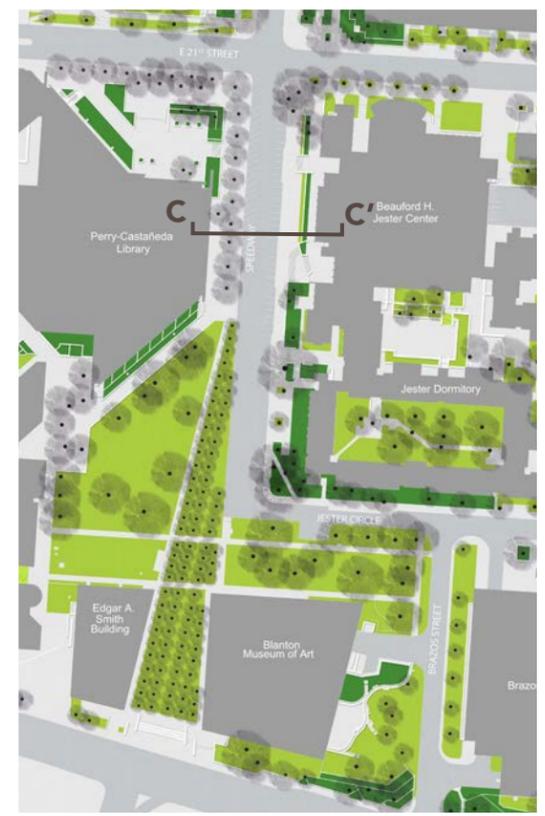
South Speedway extends between East 21st Street to Jester Circle. The intersection with MLK Boulevard has already been pedestrianized and a landscape designed by Peter Walker Partners frames the view south to the Texas Capitol.

In the south Speedway section, large inhospitable expanses of pavement along the Perry Castañeda Library and the Beauford H. Jester Center are reduced. The new 30 foot wide promenade pavement is located at the western side of the existing roadway, allowing for a 60 foot wide landscape area on the eastern side of the corridor. The promenade ties into the existing upper plaza of the Library and the large entry plaza at the entrance to the Jester Center.

The existing eastern roadway gutter remains in the center of a new water receiving landscape. This area is planted with native grasses and canopy shade trees. The fire lane and maintenance drive connection to Jester Circle remains.

- LEGEND**
- LAWN
 - NATIVE GROUND PLANE AND UNDERSTORY PLANTINGS
 - GROUNDCOVER
 - PROPOSED PROMENADE
 - PROPOSED TREES

EXISTING SOUTH SPEEDWAY

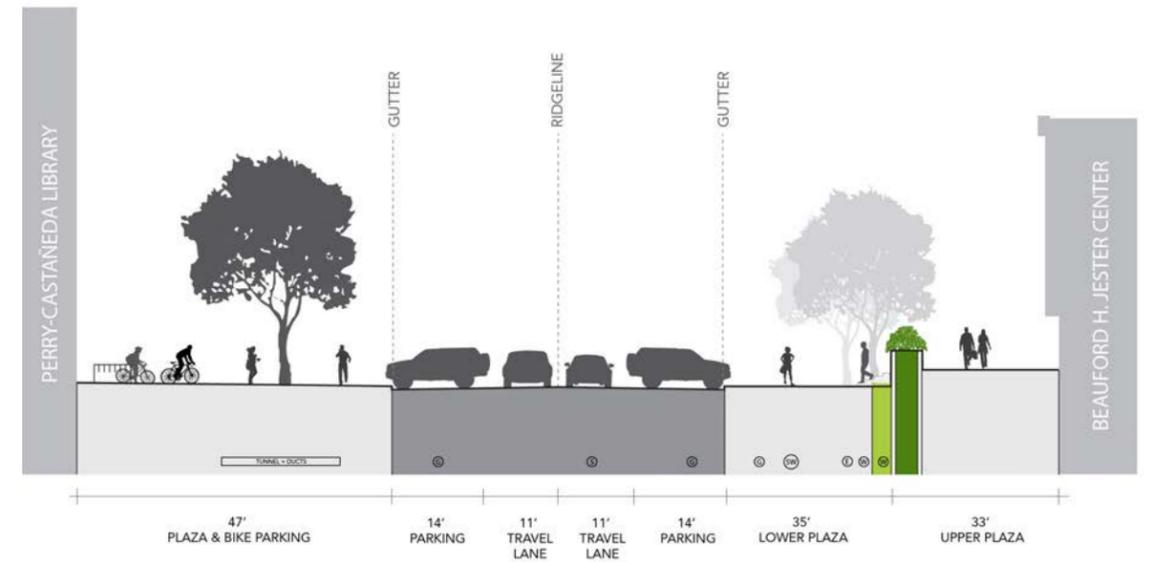


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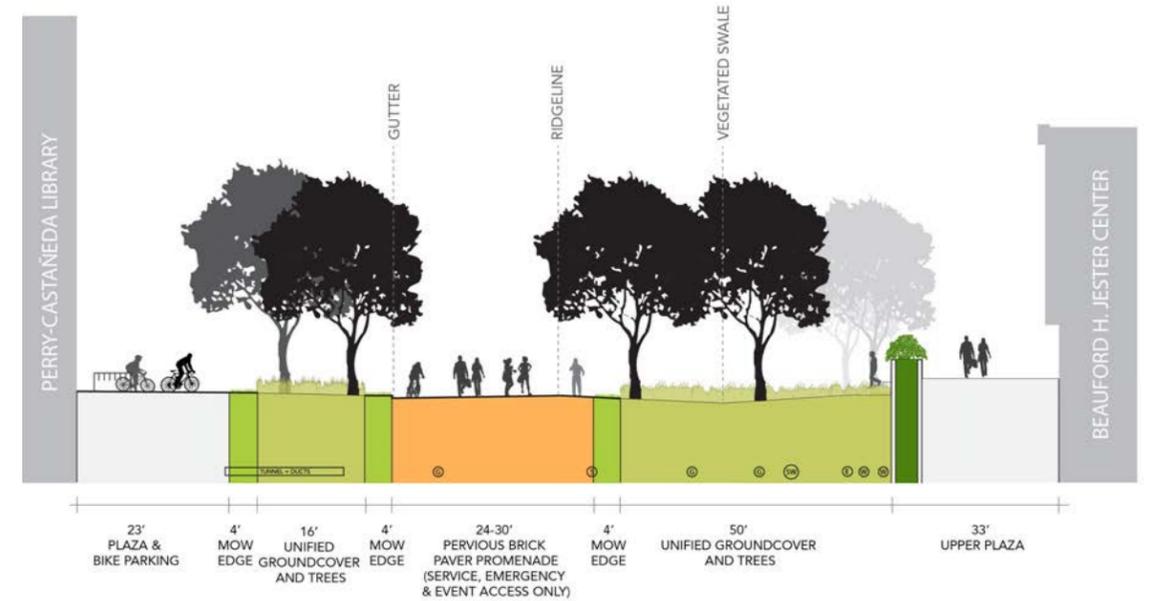
CONCEPT FOR SOUTH SPEEDWAY



EXISTING SOUTH SPEEDWAY SECTION C-C'



CONCEPT FOR SOUTH SPEEDWAY SECTION C-C'

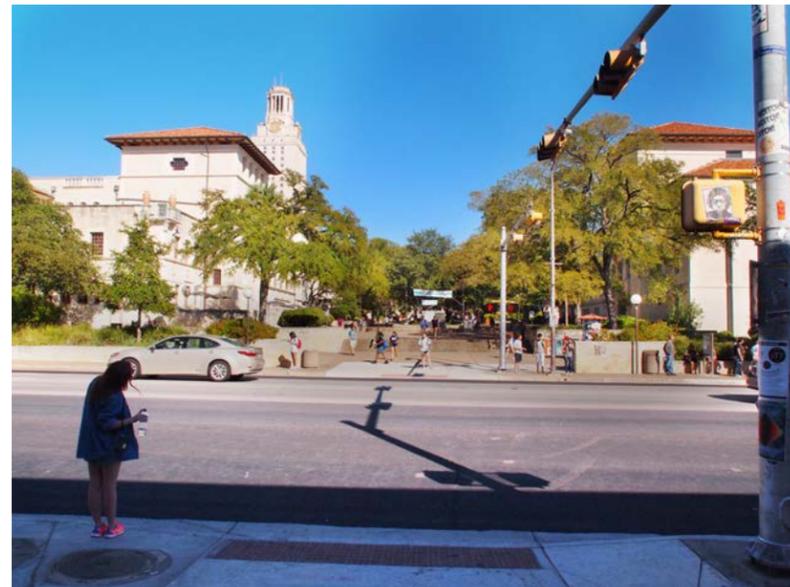


GUIDELINES FOR OTHER CIVIC AREAS

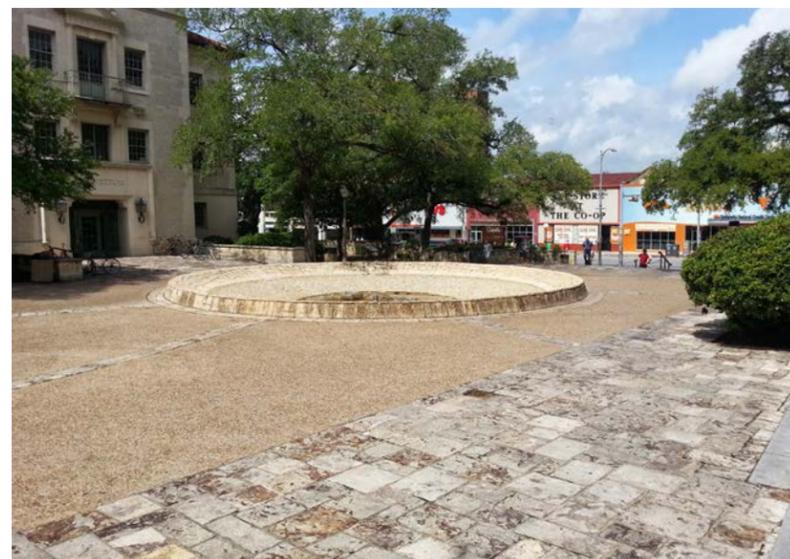
Three other important civic landscapes that should be studied and improved are the West Mall, the East Mall and the Texas Memorial Museum Mall.

THE WEST MALL

A February 15, 2000 West Mall study by Cesar Pelli and Susman Tisdale and Gayle found that a number of issues required attention to improve the mall. The principal finding was that the mall should be redesigned to improve its function as an important symbolic gateway to the campus and to enhance its function as a “free speech” and student activities space. The landscape recommendations of the study included replacement of the fountain with a more suitable water feature, development of a gateway at Guadalupe Street, and possible removal of the constricting center island and trees to open views to Main Building and provide more space for student activities. In the same year, the fountain design firm, Wet Design, prepared alternative concept plans for a no-barrier kinetic fountain element for the west end of the mall. In April, 2000 the Pelli office prepared multiple concepts for the fountain element, and for new gateway features at the intersection of the West Mall and Guadalupe Street. Today, the landscape needs identified in the Pelli study are still present. An added factor in today’s situation is the concern about water features in a period of severe drought and climate change uncertainty.



A stronger gateway statement should be developed at the West Mall and Guadalupe Street.



The February 2000 Pelli study calls for redesign of the West Mall fountain.



West Mall should be enhanced to facilitate student activities and free speech functions while maintaining the environmental and human comfort benefits of a healthy tree canopy.



The Pelli plan proposal to open the view down the center of the mall should be reconsidered. The existing ecosystem benefits of trees and shade are significant and should not be lost.

WEST MALL RECOMMENDATIONS

Design Goals

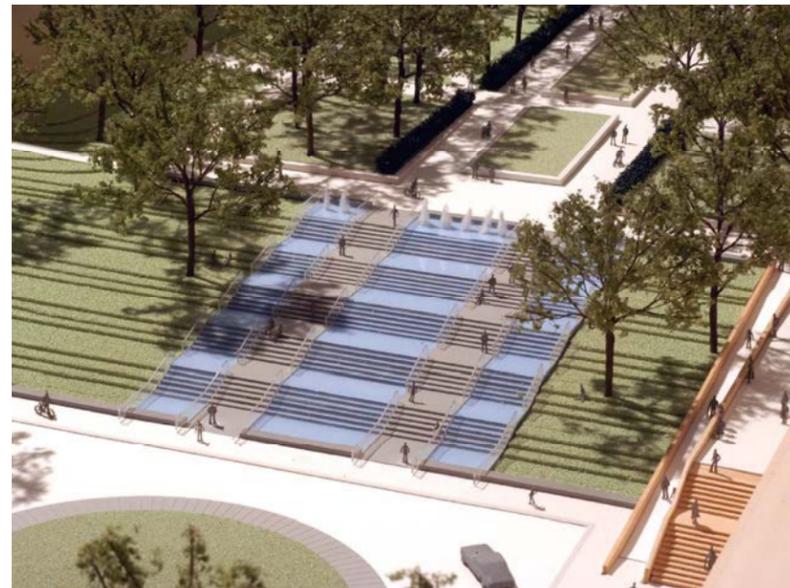
Many of the conclusions of the Pelli Study remain valid and should be the starting point for plans to renovate the West Mall. These include enhancement of the mall as a ceremonial entrance to the campus, enhancement of the mall to better facilitate student activities and free speech functions, and creation of a new fountain element that is uniquely integral with the West Mall and is an appropriate symbol of the University and water conscious design.

Planting

Although the Pelli study suggests that some of the trees in the center of the West Mall should be removed, strong consideration should be given to retaining the existing trees. The study recommended opening the view to the Main Building, however, tree removal will also open the view to enterprises on the west side of Guadalupe Street over which the University has no control. Loss of shade in the center of the mall will also reduce the attractiveness of this space for gatherings and day to day pedestrian use.

THE EAST MALL

In 2007 Peter Walker Partners landscape architects prepared a schematic plan for the East Mall. Their proposed plan unifies edge plantings, simplifies and reduces the amount of pavement, and installs a raised seat wall defining the central lawn panel, protecting it from pedestrian traffic. The plan also replaces the existing water feature on the west side of Waller Creek with an elegant new water feature and stairway that opens rather than blocks the mall, and supports the role of the mall as the key new link between the east and west sides of Waller Creek. The stairway echos earlier plans of Paul Cret, who proposed an amphitheater above Waller Creek at this location in 1933.



An elegant stairway-fountain-amphitheater is part of the Walker plan for East Mall.



The East Mall presents issues and opportunities similar to the South Lawn.



Ambiguous plantings and landscape treatments along the edges of the East Mall should be avoided.



The spaces between buildings and the East Mall should be treated with simple designs that provide places to sit.

EAST MALL RECOMMENDATIONS

Design Goals

It is recommended that the Walker schematic plan be carried forward for the East Mall. The Walker plan was only advanced to a schematic level and did not address the detail treatment of the space between the mall and the faces of buildings along its edges. It is recommended that the space between the mall and the buildings be developed as occupiable space similar to the sitting area in front of the Jackson Geological Sciences Building or the simple seat wall in front of the Liberal Arts Building. It is also critical that adequate walkway space be provided to accommodate pedestrian traffic in this heavily used corridor, which will only increase in its activity as the Central Campus area develops according to the Campus Master Plan. The fountain feature at the east end of the mall should be developed following the Walker concept of a grand stair that can also serve as a cascade or an amphitheater, depending if the water is on or not. This improvement is important because it will open the East Mall and make a unifying gesture to strengthen the connection between the Core Campus and the Central Campus; a key recommendation of the Campus Master Plan.



The PWP plan for East Mall



The elegant stairway in the PWP plan for the east mall echos the amphitheater concept of the 1936 Paul Cret campus plan

TEXAS MEMORIAL MUSEUM MALL

The large mall west of the Texas Memorial Building is similar in configuration to the South Mall, but its steeper slope, shadier western orientation, and peripheral location make it less popular for gathering and passive recreation. The central lawn panel is experiencing severe erosion in several areas. Given this space's largely visual function, the central lawn should be replaced with a shade-tolerant native ground cover to stabilize the soil, minimize water usage, and offer stormwater filtration benefits, while maintaining a simple, elegant appearance in keeping with its stature as a civic landscape.



There are opportunities to increase ecological function and improve stormwater management in some Civic Spaces, such as within the underutilized mall west of the Texas Memorial Museum.

TEXAS MEMORIAL MUSEUM RECOMMENDATIONS

Stormwater

The upper edge of the existing lawn should be stabilized with a gravel trench installed at the edge of the pavement. The trench will intercept stormwater from the adjacent uphill paved plaza, reducing its volume and velocity before it hits the planted lawn. This will reduce erosion of the central landscape panel.

Planting

Plant the central lawn with a shade tolerant, low-maintenance, low-water use groundcover. Options include the well tested Asian Jasmine (*Trachelospermum asiaticum*) or native groundcovers such as Inland Sea Oats (*Chasmanthium latifolium*). The edges of the space under the Live Oaks are already planted in Asian Jasmine. The existing Asian Jasmine planting edge could be straightened and widened, while the middle of the space could be native grasses.



3.2 STREETS

DEFINING CHARACTERISTICS

UT Austin is a campus whose form is determined to a large extent by the extension of the urban street grid through the campus. Campus streets, together with the campus' civic landscapes, form the principal circulation corridors that define the structure of the campus landscape. Comprising 32% of the total campus landscape, streets are the largest landscape type; these multi-modal spaces have a significant impact on campus character. In addition to providing access and circulation for vehicles, many campus streets double as major pedestrian thoroughfares. The figure Hierarchy of Street Types identifies the types of streets on campus.

ISSUES

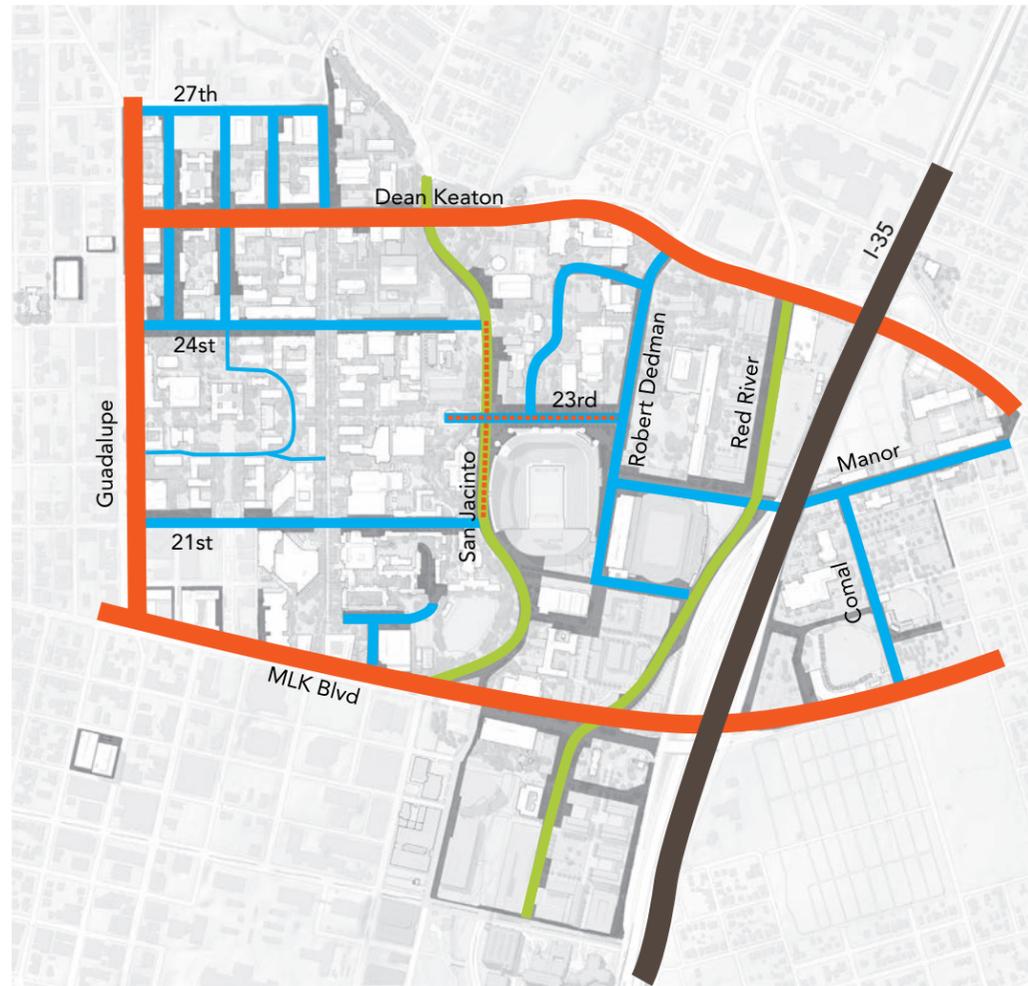
The majority of campus streetscapes are comprised of asphalt and concrete. Street tree planting is inconsistent in some areas, resulting in large areas of unshaded pavement, which negatively affects human comfort, contributes to heat island effect, and generates significant volumes of stormwater runoff, which contributes to downstream flooding, water quality, and erosion issues. Planting along streets often takes the form of multiple independent building "front yard" landscapes, leading to a visually fragmented effect along continuous spatial corridors. Many front yard landscapes employ plantings that are incompatible with the scale of institutional buildings and streets.

OBJECTIVES

The overarching landscape objective for campus streets is to provide continuous shaded landscapes that are safe and comfortable for pedestrians, bicycles and vehicles, and present an appealing, unified image of the campus. The street improvements for West 21st Street, and San Jacinto Boulevard identified in the Campus Master Plan shall be carried forward. These improvements include the removal of parking, and the addition of bicycle lanes, trees and bioswales. Streetscapes should share the visual simplicity of civic landscapes, so that these landscape types work together to define primary connective corridors through the campus. Where possible, streetscapes should incorporate integrated stormwater management best practices and employ low maintenance, high-resilience native plantings to increase ecological functionality in these areas.



STREET LANDSCAPE
ENHANCEMENT AREAS



HIERARCHY OF STREET TYPES

- LEGEND
- HIGHWAY
 - MAJOR STREET
 - THROUGH STREET
 - CAMPUS STREET
 - TRANSIT ONLY STREET

MAJOR STREETS

Major Streets are city-owned streets that define the boundaries of the campus; they include Dean Keaton Street, Guadalupe Street, and MLK Blvd. They are vehicle dominated, with multiple lanes and fast-moving traffic posing challenges to pedestrian comfort at crossings. These streets play an important role in shaping the University's "front door" image. There are opportunities to improve the sense of arrival and gateway, as well as develop safer pedestrian and bike crossing along the campus perimeter.

THROUGH STREETS

Through Streets are defined here as public streets that pass through the campus. They provide service and parking to the various large parcels that constitute Central and East Campus.

CAMPUS STREETS

Campus Streets are pedestrian-scale, mostly internal streets with University uses on both sides.

TRANSIT-ONLY STREETS

The 2012 *Campus Master Plan* proposed a new street type for East 23rd Street, which connects Robert Dedman Drive to the termination of the East Mall. This portion of the street would be redesigned to accommodate only transit, service, and emergency vehicles. Other vehicular traffic would be prohibited within this important intersection between the campus' pedestrian network, the major destination of the stadium, and the campus' regional transit system.



Major Street example: Martin Luther King Jr. Boulevard



Campus Street Example: 24th Street



Through Street example: Robert Dedman Drive



Transit-Only Street example: East 23rd will be transformed into a transit and pedestrian only streetscape.



- ✓ Street trees help to create a comfortable microclimate for pedestrians and limit the heat island effect created by large areas of pavement.



- ✓ A simple low water and low maintenance native landscape, here Turk's Cap (*Malvaviscus arboreus*), below Live Oaks adds shade and visual continuity to the streetscape.



- ✓ Continuous canopy trees at the campus edge along Guadalupe Street creates a positive campus image.



- ✓ The University Avenue streetscape is simple, powerful civic landscape that creates an extended gateway experience and connects the campus to the city.

GENERAL GUIDELINES FOR STREETS

Street Trees

The primary design objective for all campus street landscapes, be they major collectors or inner campus streets, should be to develop a healthy canopy of trees. More than any other single landscape undertaking, the planting and care of trees improves the visual quality, human comfort, and ecological services provided by the landscape. This is particularly important in streetscapes where the dominant presence of pavements requires relief; where the University presents its face to the public; and where members of the community spend a high percentage of their time moving from place to place on campus. Street trees, which are the most significant space-defining feature of each street, should be planted to the extent allowed by utilities, drives and other restrictions along the length of all street corridors. Street trees should be located along sidewalks and spaced to create a continuous shaded environment for pedestrians. Trees should be eventually pruned to a clear height of 15 feet or higher, allowing for vehicular passage, increasing the ambient light for understory plants, and minimizing branches blocking illumination from pedestrian post top lights. Tree species may be varied along streets to relieve monotony and protect against disease, however added variety should not be at the expense of the overall visual continuity of a given street as a whole.

Campus Edges

The edges of the campus along major streets should distinguish themselves through the presence of tree planting and natural greenery. The image that should be projected by the campus landscape as experienced from edge roadways, such as MLK Boulevard, or major through streets, such as Dean Keeton Street, is one of a green enclave within the city. This can be accomplished through regular street tree plantings in the "front yard" open spaces that surround the campus.

Design Simplicity and Continuity

Streetscapes, like civic landscapes, should strive for visual simplicity, consistency, and spatial continuity. Planting should be understated and organized in broad strokes in keeping with the scale and order of the overall space. Lighting, paving, curbs, planting, and signage should be consistent along the length of the street even if installed in separate projects over time.

Human Comfort

The design of streetscapes should emphasize the pedestrian experience. Campus streets should include appropriately sized sidewalks. Where possible, sidewalks should be separated from the street by a curb and tree lawn to protect pedestrians. The University should coordinate with the City of Austin to integrate lighting, traffic calming and safe pedestrian crosswalks along the campus' edges.

Stormwater

Where possible, integrate stormwater management practices into streetscapes to improve water quality and reduce the speed and volume of runoff. Best management practices include the use of permeable pavement, water-receiving landscapes, and pavement reduction where possible.

STREET ENHANCEMENT AREA

24TH STREET

24TH STREET ISSUES

24th Street, east of Guadalupe Street, is a campus street, owned and maintained by the University. It runs east-west along the northern boundary of the campus' historic core. The street includes setbacks of varying widths, sidewalks, a travel lane in each direction, some head-in parking and some parallel parking along both sides. The primary issue along 24th street is the lack of consistency of front yard treatment. These landscape spaces vary from high quality contemporary garden designs, residential style garden designs, xeriscapes in walled planters, Live Oak trees in Asian Jasmine beds, and panels of lawn. There is an opportunity to unify the landscape throughout the corridor to provide shade, improve stormwater management, and create a more unified visual effect.



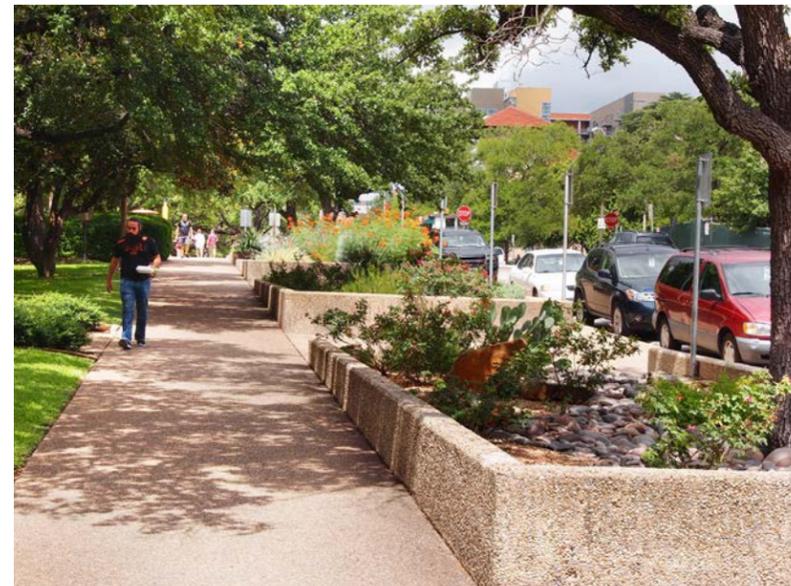
✓ This simple Iris (*Dietes bicolor*) planting creates a unified front yard landscape.



✗ This gardenesque front yard planting is not in scale with the building or street.



✗ The lack of street trees along the Hackerman Building creates a hot microclimate in this area and interrupts the spatial continuity of the streetscape.



✗ The xeriscapes along 24th Street are irrigated and do not serve a stormwater management function. This gardenesque expression is more appropriate in courtyard spaces.

24TH STREET RECOMMENDATIONS

Street Trees

Fill in the gaps in street tree planting along 24th Street with new tree planting to provide shade and spatial continuity.

Front Yard Landscapes

Simplify planting treatments in the area between the sidewalk and buildings. Plant a limited number of resilient species in large, continuous masses to reduce maintenance, increase visual harmony, and decrease water use.

Planting at Building Entrances

If planting variety is desired, develop framed perennial planting areas at building entrances. Planting beds should be framed by hedges or architectural elements to minimize disruption of the larger streetscape. These framed landscape areas can also be used as locations for trash receptacles, bicycle parking, and other functional elements.

Stormwater

Consider using low-water use native plants or Asian Jasmine instead of lawn. Where topography allows, create slightly depressed landscape areas to receive runoff from sidewalks. In new project areas, consider the use of pervious pavement and subsurface detention systems.

24TH STREET EXISTING PLAN

Lack of canopy continuity impacts visual, habitat and microclimate quality



A variety of disconnected ornamental front yard treatments fragment the landscape

- LEGEND
- LAWN
 - GROUNDCOVER/PERENNIAL PLANTING
 - ORNAMENTAL PLANTING
 - XERISCAPE

24TH STREET CONCEPT PLAN

Fill in Live Oak canopy



Increase continuity of verge plantings by adopting a single approach for the whole street

Simplify "front yard" landscapes with a uniform planting approach throughout the street

- LEGEND
- CONSISTENT FRONT LAWN PLANTING
 - GROUNDCOVER/PERENNIAL PLANTING
 - PROPOSED TREE



EXISTING 24TH STREET PLANTING



CONCEPT FOR 24TH STREET PLANTING

STREET ENHANCEMENT AREA RED RIVER STREET

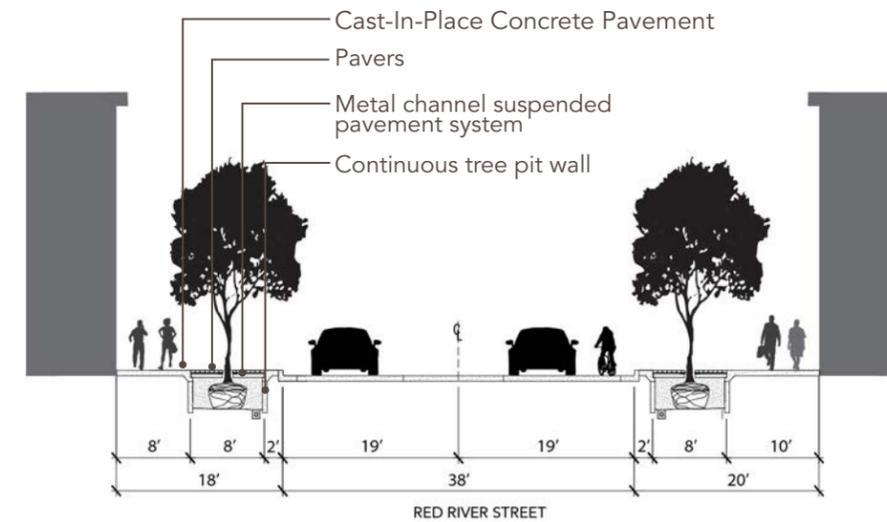
ISSUES

The University of Texas Medical District Master Plan defines Red River Street as a principal street serving the major buildings and open spaces of the Medical District. The street will provide an address for the existing School of Nursing, the new Seton Hospital, the Dell Medical School and future medical campus facilities that will be built after the removal of the Irwin Center. The street will be part of one of the most dense districts of the campus with limited landscape space between the street curb and building faces. The challenge for this and other future streets in Central Campus is to create attractive landscapes in relatively tight spaces defined by large buildings.

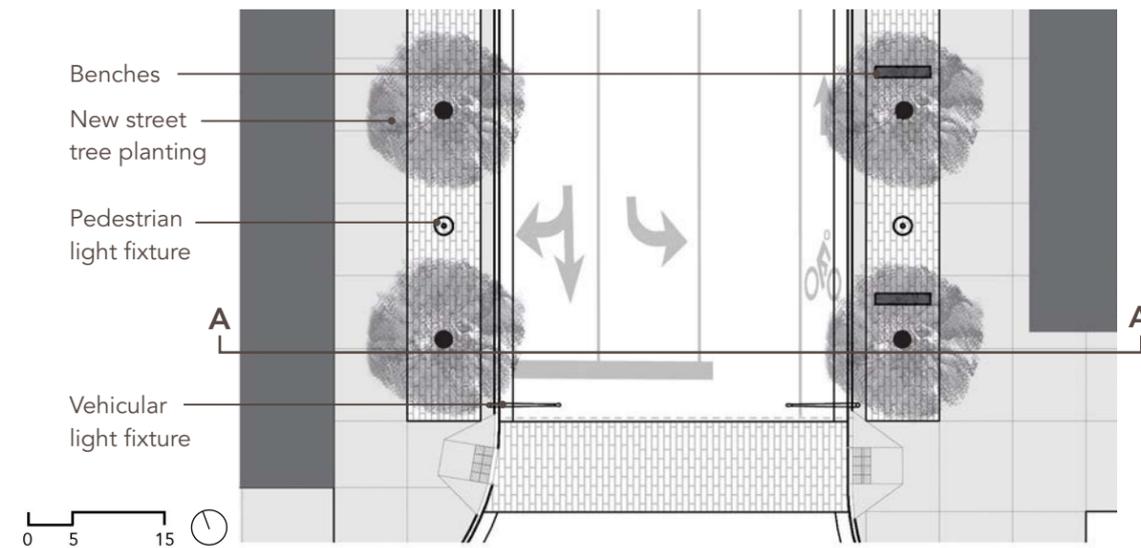


KEY PLAN

RED RIVER STREET PROPOSED SECTION A-A'



RED RIVER STREET PROPOSED PLAN



RED RIVER STREET RECOMMENDATIONS

Pedestrian Environment

Continuous rows of trees should line the edges of Red River Street to improve pedestrian comfort, reduce heat island effect and add abundant natural scenery as a complement to the built environment. Trees should be positioned between the automobile traffic and the walking lane of the sidewalk to separate pedestrians from bicycles and automobiles in the street. Benches, bicycle racks, and litter-recycle receptacle furnishings shall be provided to encourage occupancy and ownership of the public realm.

Deck System for Street Trees

The desire for a high quality street environment, the anticipated high pedestrian use of the street, and the limited space available for planting dictates the preferred method for planting to be a deck system which protects planting soil from compaction. This system will allow the trees to grow in larger continuous shared-soil trenches, allowing root systems to develop in a less restricted way than would be allowed by standard tree pits with tree grates, or by structural soil systems that have limited pore space for normal root development. The paving above the deck will be pervious brick pavers, allowing surface water to infiltrate to the soil level, augmenting the tree irrigation system. The adjustable collars around the trees will be designed to allow for tree trunk growth.

Pavement

The primary pavement material of the sidewalks of Red River and other future Central Campus streets will be cast in place concrete. Pervious paver bricks should be employed over planting trenches to protect soils, add pedestrian detail to the ground plane, and visual relief to the expanses of concrete.

Lighting

In addition to high-mounted street lights for illuminating the roadway, pedestrian post top lights should be employed to light pedestrian sidewalks and provide illumination below the ultimate tree canopy. The post top pedestrian light fixture should be the Kipp, manufactured by Louis Poulsen. This fixture emits a low glare semi-indirect light from an LED source, and has a modern, yet classical appearance that is compatible with the modern architecture that will define the Medical District and the Central Campus. See Section 4.5 Lighting

Infrastructure

The utilities of the street are coordinated with the planting system to minimize conflicts between the utility systems and the street trees. Utilities and drainage lines are concentrated in the roadway.



3.3 COURTS, QUADS & PLAZAS

DEFINING CHARACTERISTICS

Courts, Quads, and Plazas are self-contained, non-continuous outdoor spaces strongly defined by buildings or walls. These landscapes may be framed on only one side, such as Gregory Plaza, or on all four sides, like the spaces behind the Student Activity Center.

The design of these spaces is often influenced by the character of adjacent architecture.

Indoor-outdoor transitions and connections, including arcades and major building entrances, are frequently featured.

Courts, Quads, and Plazas are often natural gathering places and are configured to support social interaction, featuring tables and chairs, benches, and seat walls.

The scale of detailing in courts, quads, and plazas relates to human activity, and the self-contained spatial sense of place allows for distinct and individual design expressions.

Planting in these spaces is often rich in detail, and varied in form, color, and texture.



■ COURTS, QUADS & PLAZAS
 □ ENHANCEMENT AREA

ISSUES

Some newer courtyard spaces on campus, including those at the Student Activity Center, Geology Building, and the Texas Union, are tremendously successful and well used by students; however, many older courtyard spaces on campus are formal in character and were not designed to be actively used.

The lighting, planting, and seating in some courtyard spaces are not integrated with the character of the surrounding architecture.

The gardenesque plantings often found in courtyard spaces may require higher maintenance levels than other landscapes on campus. Additionally, formal garden plantings offer limited ecosystem benefits.

Most of the older courtyard spaces have been designed so that stormwater is conveyed off site into the storm sewer system as quickly as possible, limiting infiltration and groundwater recharge in these areas.

OBJECTIVES

The objective for quads, courts, and plazas is to create inviting outdoor spaces that foster social interaction while increasing ecological functions in these areas. There are great opportunities to revisit existing courtyard spaces throughout the campus and introduce ecologically functional practices and native plantings at a scale that can be maintained with the resources available.



✔ The courtyard spaces surrounding the SAC create shaded, human-scale, high quality environments for socializing and studying.



✔ The courtyard at the Visual Arts Center employs resilient native plantings and permeable paving to create a welcoming, ecologically functional environment.



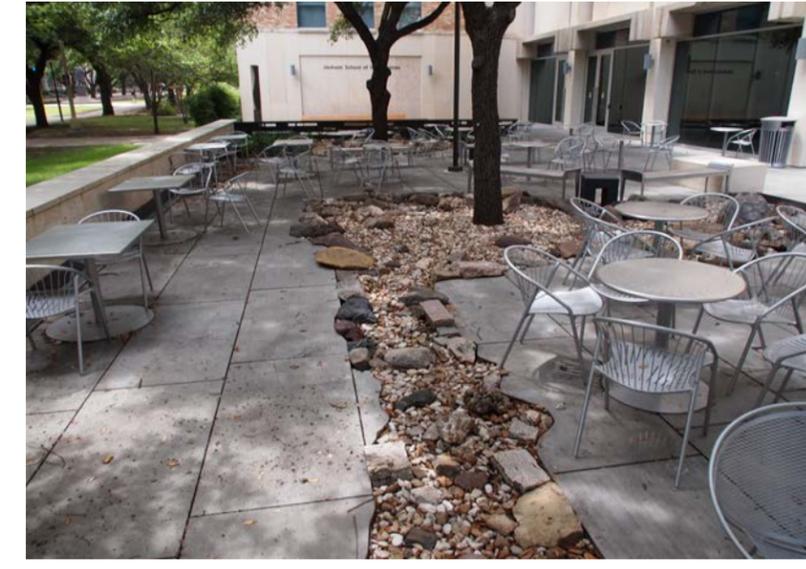
✔ The Texas Union courtyard employs a combination of architectural shade structures, plantings, materials, site furnishings, and a water feature to create a rich sensory environment.



✘ The six-pack courtyard spaces, while visually consistent with the Beaux Arts character of the surrounding historic architecture, do not provide usable, comfortable people spaces.



✘ Lack of shade at the Student Services Building courtyard limits the usefulness of this space.



✔ The design of the courtyard at the Geology Building includes permeable paving and a wet-dry stormwater infiltration feature.

GENERAL GUIDELINES FOR COURTS, QUADS, & PLAZAS

Social Interaction

Courts, quads, and plazas should be the public outdoor living spaces of the campus; places where people come to study, socialize, have lunch, or enjoy the outdoor environment. These spaces should differ from the “movement” spaces of the campus. Their design should invite people to linger. While many courts will include walkways, the guiding quality of the campus court is the idea of habitation, where all that favors movement is subordinated. Courts, quads, and plazas should integrate various forms of seating, including movable tables and chairs, seat walls, and benches, to foster social interaction and provide opportunities for rest and contemplation.

Identity

Collectively, this landscape type should provide a diverse range of designs that respond to unique settings and user groups. Because of their separateness from each other and from the campus’ framework spaces, courts, quads, and plazas do not need to be consistent with the design of the overall campus. They should be developed with distinctive characters, materials, and plantings related to their immediate architectural context and microclimate. Each court should have its own identity, art, and feature elements.

Context

Where courtyard spaces occur in close association with buildings, indoor-outdoor transparency should be encouraged to make visible the public activity of campus life, and encourage wellness by connecting people to natural scenery.

Planting

Plantings with unique colors and textures of foliage and seasonal flowers should be employed in courts, quads, and plazas for human enjoyment at close range. Plantings should be tailored to the particular microclimate of the project location to minimize irrigation and maintenance needs. Courtyards offer the opportunity to employ a wide range of native plants and the construction of plant assemblages based on regionally appropriate native communities. Unique types of plants such as aquatics are appropriate in small constructed ponds or wetlands in courtyards. These features require specific care; however, they can be designed to minimize maintenance. Their popularity and the added dimension of delight they add to the campus is unquestioned. For more detailed information on plants appropriate for courtyard spaces, see the planting systems section of this report.

Microclimate

Shade should be provided to create a comfortable environment for sitting or gathering in the Austin climate. Shade may be created with architectural elements, such as arcades, trellises or other sunshades, or through the planting of canopy trees. In conditions where courtyards are developed above occupied space, steps should be taken from the very earliest stages of design to properly budget for the challenges and added cost of creating a livable landscape over structure.

Stormwater

In both new and existing courtyard spaces, stormwater collection, detention and infiltration can be integrated as a design feature. Consideration should be given to storing the SITES Prerequisite Water Quality Storm Volume for each space’s immediate catchment area in a small wet-dry

infiltration feature. If employed across the campus, this strategy would significantly reduce stormwater runoff volume entering Waller Creek during storm events.

Landscape as Laboratory

Courtyard spaces may be considered as appropriate sites for experimental landscape installations. Projects must have educational merit and must be approved by the facilities group. For application procedure, see the policy section of this report. Educational landscape installations must include interpretive signage. For signage guidelines, see the elements section of this report.

Other

Consideration should also be given to avoid the creation of habitat for undesirable species, such as bats or grackles, above seating areas.



✓ The popularity of simple water features such as the turtle pond should encourage their use in courtyard spaces.



✗ Courtyards over structure present challenges that must be budgeted for from the earliest stages of design if the landscape is to be successful.



✓ Shaded arcades, trellises and other architectural elements enhance courtyard spaces.

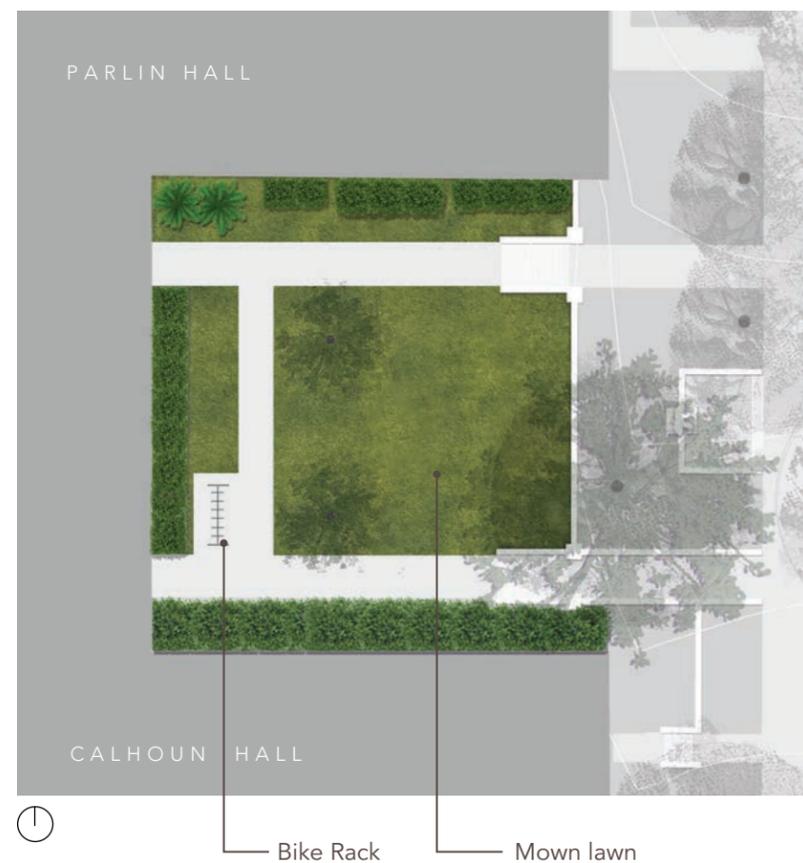
COURTS, QUADS & PLAZAS ENHANCEMENT AREA SIX-PACK COURTYARD

ISSUES

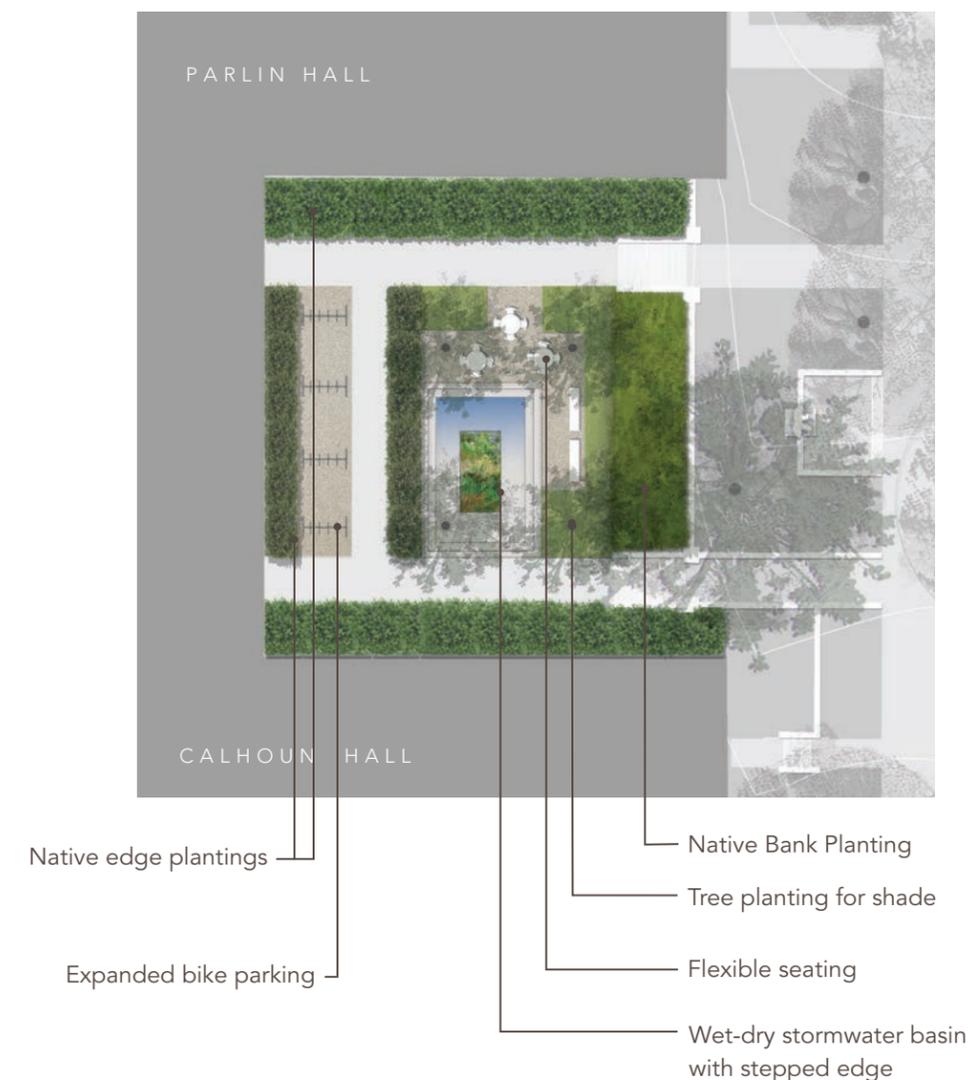
The four courtyard spaces surrounding the South Mall are integral to the overall civic architectural-landscape composition, yet are primarily used only for circulation. Visually and physically disconnected from the Mall by topography, ramps, and planting, the courtyards serve as a visual landscape seen from adjacent public spaces and building interiors.

The six buildings which form these courtyards are informally known as the "six-pack". The courtyards vary in configuration. Those with architectural arcades along the building face provide more shaded seating space, and thus are more popular with students. Plantings in the east courtyards are formal and include architectural sheared hedges and ornamental tree planting. The west courtyards include less formal planting, including some invasive species, such as Nandina, and planting bed edges that do not match the overall quality of the space.

EXISTING COURTYARD PLAN



PROPOSED COURTYARD PLAN



SIX-PACK COURTYARD RECOMMENDATIONS

Use
Maintain circulation routes and increase bicycle parking.

Microclimate and Comfort
Add space-defining plantings and shade trees to increase human comfort. Add benches and tables and chairs to make the space more occupiable. A tree canopy will be an important aspect of the landscape to provide concealment for people sitting in the space from the views from surrounding windows.

Visual-Sensory Experience
Increase the sensory richness of the courts by adding native perennial plantings that feature diverse colors, textures of foliage, flowers, and seasonal interest. Consider adding habitat to attract desirable pollinators to animate the spaces. One court could be planted to attract butterflies, one dragonflies, and another hummingbirds.

Stormwater
Integrate an intermittently wet and dry stormwater feature into the existing courtyard design. Design the feature to hold and infiltrate the SITES Prerequisite Water Quality Storm Volume for each courtyard's immediate catchment area. The proposed concept plan for the Calhoun-Parlin court is designed to store the volume of a two-year storm, reducing runoff from the site from .64 cubic feet per second to .04 cubic feet per second.



EXISTING VIEW OF COURTYARD



CONCEPT VIEW OF COURTYARD Native plantings, stormwater management improvements and flexible seating will improve the function of this courtyard.



3.4 CONNECTIVE SPACES

DEFINING CHARACTERISTICS

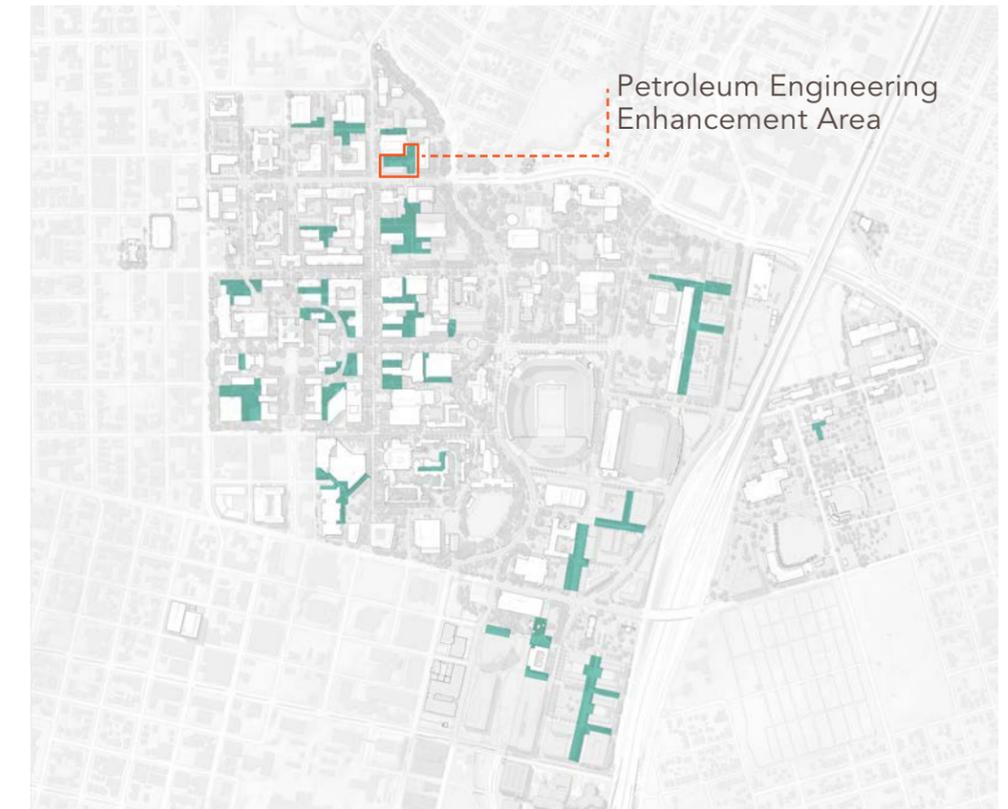
Connective landscapes, shown in blue on the map at right, are the multifunctional interstitial spaces that occur between and behind buildings and function as pedestrian corridors, bike parking areas, service spaces, and small planting areas. People primarily move through rather than stay in these areas. Connective spaces vary in character from large paved areas to soft landscapes.

ISSUES

Connective spaces exhibit a wide variety of designs across the campus, not always yielding a coherent sense of place. Sometimes the quality of materials used in these areas is not of appropriate quality to meet the University's ambition to maintain a superior campus environment. Walls, pavements, and other features are often installed to resolve functional issues, without overarching aesthetic considerations.

OBJECTIVES

The primary objective for connective spaces is to facilitate their functional roles while maintaining a consistent design vocabulary. Connective spaces should accommodate multiple overlapping uses, have a simple yet high-quality design aesthetic appropriate to a university setting, improve ecosystem services related to water, microclimate, soils, and habitat, and provide for ease of maintenance.



CONNECTIVE LANDSCAPE
ENHANCEMENT AREA



✘ This site wall is not institutional in character or construction quality.



✔ This area successfully integrates vehicular, pedestrian and bike circulation and bike storage, as well as providing shade within a limited planting area.



✔ This area successfully integrates vehicular, pedestrian and bike circulation and bike storage with a simple palette of materials.



✘ This landscape, which pitches toward the walkway and storm drain, could be improved if it were graded to better receive and infiltrate stormwater.

GENERAL GUIDELINES FOR CONNECTIVE SPACES

Design Simplicity

Emphasize simple, properly scaled landscape designs that avoid garden effects better suited to courtyards. Connective spaces should employ a limited number of pavement, wall, and planting materials.

Functionality

Maintain the service, circulation, emergency access and other functions of these areas. Pavement materials should be pedestrian in character.

Microclimate

Connective spaces should include canopy trees where possible to create a comfortable shaded pedestrian environment and to limit heat island effect.

Planting

Planting in connective spaces should consist of simple broad brush strokes of plant materials chosen for visual effect, high resiliency, habitat value, and low maintenance requirements.

Stormwater

Where space and use requirements allow, soft landscape within connective spaces should be designed to retain and infiltrate stormwater. In high use areas, pervious pavements should be considered.

CONNECTIVE SPACE ENHANCEMENT AREA PETROLEUM ENGINEERING

ISSUES

The area between the Chemical and Petroleum Engineering Building and the Engineering Teaching Center II is a major pedestrian thoroughfare. At class change students flow through this connective space and collect at the corner of East Dean Keeton Street to wait for a walk signal to cross back to the south. The high use of the space has had a significant impact on the landscape: existing sidewalks are not wide enough to accommodate pedestrian volumes and the soil beneath the Live Oaks has been significantly eroded and compacted until the planting areas no longer support groundcover or infiltrate water. At each storm event, additional soil erodes off the site, enters into the storm sewer, and is deposited into Waller Creek. At present there is inadequate bike parking and students lock their bicycles to railings throughout the site.



This landscape area provides attractive green space within the campus' dense Engineering district.



Significant pedestrian volumes require more paved queuing space at the corner of East Dean Keeton Street.



Small planting pockets at the Chemical and Petroleum Engineering Building offer opportunities for native plantings to improve habitat function.



The existing plaza tree planting system includes little soil volume, limiting pervious area as well as future tree growth and tree lifespan.

PETROLEUM ENGINEERING ENHANCEMENT AREA RECOMMENDATIONS

Paved Areas

Increase the paved area, including the size of the waiting area at the Dean Keeton crosswalk, to accommodate multidirectional pedestrian movement.

Stormwater

Consider the use of a stormwater storage system beneath pervious pavement to increase retention and infiltration.

Plantings

Redefine the boundaries of the planted areas, loosen and amend soil, and reestablish vegetative ground cover below existing Live Oaks. For more detailed information on soil remediation see 4.3 Planting Design.

Plant light wells and other small planting pockets with native plant communities to add visual and habitat value with minimal maintenance requirements. Native grasses, sedges, and seasonal herbaceous plants such as Columbine could be used in these areas.

Bicycle Parking

Improve and expand bicycle parking areas. Improve the quality of outdoor seating areas and provide additional shaded seating areas throughout the site.

PETROLEUM ENGINEERING EXISTING PLAN



PETROLEUM ENGINEERING CONCEPT PLAN



This plan offers one example of a new design concept to improve the Petroleum Engineering landscape.

- LEGEND
- LAWN
 - GROUND COVER
 - SITE ELEMENTS



EXISTING PETROLEUM ENGINEERING CONNECTIVE SPACE



CONCEPT PETROLEUM ENGINEERING CONNECTIVE SPACE

Pervious pavement and groundcover beds will stop erosion and make this a more usable landscape. Seat walls or custom benches will make the space more inviting for casual use.



3.5 PARKLAND

DEFINING CHARACTERISTICS

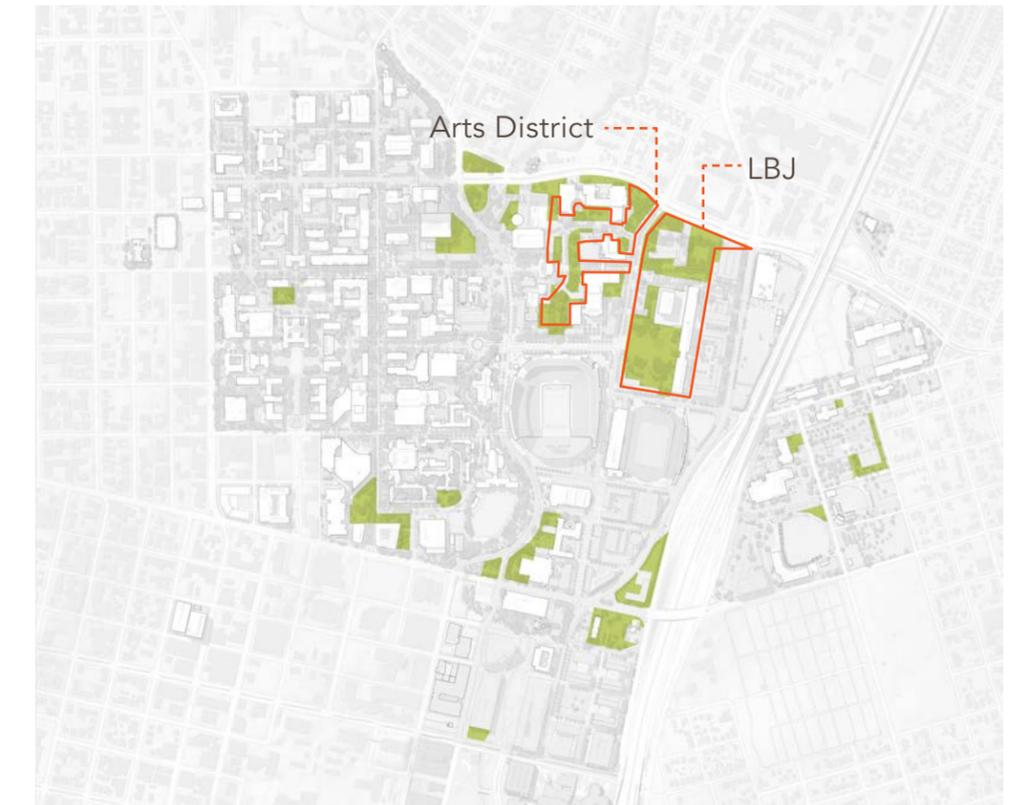
Parklands are picturesque, naturalistic landscapes reminiscent of the native Savannahs of Central Texas. The parklands occupy less densely developed areas of the campus, contrasting with and complementing the formal, ordered civic landscapes of the 40 acres. Typically one or more acres in size, Parklands are characterized by softly rolling expanses of green lawn scattered with clusters of large canopy trees. Views are largely open, producing an expanded sense of freedom in these spaces. A repetitive palette of lawns, sidewalks, lights and trees creates a simple and unified aesthetic, which makes them ideal landscapes for passive recreation and settings for significant architectural compositions, such as the LBJ Presidential Library.

ISSUES

Though attractive, the parklands are not functioning at a high ecological level. The large expanses of mown lawn require extensive maintenance and irrigation, and provide limited habitat. Much of this landscape type suffers from fragmentation, particularly in the Arts area. In many areas, the heavy shade of the Live Oak canopy combined with sloping topography has given rise to erosion and patches of bare compacted soil.

OBJECTIVES

The main objective for Parkland landscapes is to increase ecological services in these areas, keep resource use and retain their visual quality. Aesthetically, the goal is to increase visual unity and to enhance the perception of an open native landscape within the campus.



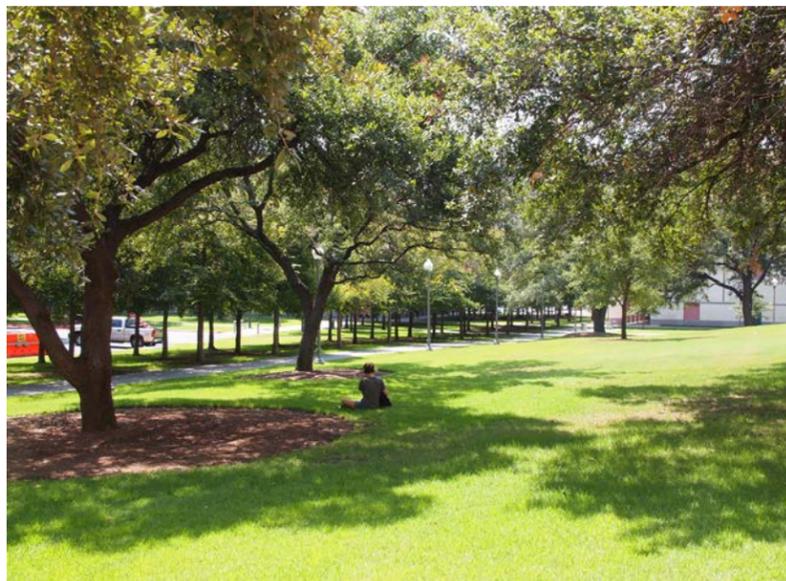
■ PARKLAND
 □ ENHANCEMENT AREAS



✓ The Parklands are characterized by large expanses of green lawn and picturesque groupings of canopy trees.



✗ Dense shade under the Live Oak canopy combined with poor drainage has led to erosion and bare patches of compacted soil in some areas.



✓ Areas of Parkland exist within the core campus, such as this landscape next to the Blanton Museum.



✓ Parklands offer a contrast to the denser urban areas of campus.

GENERAL GUIDELINES FOR PARKLANDS

Planting

Large areas of the parklands should be converted from Bermuda and St. Augustine grass to a more ecologically functional and resilient native Texas savannah grassland in order to minimize maintenance, water use, and stormwater runoff, provide habitat for a wider array of species, and develop a more robust soil profile.

Visual Continuity

The sense of expanse and visual continuity in the Parklands should be maintained and enhanced. Intricate plantings, extensive use of site furnishings, and variety in site materials should be avoided.

Human Use

The Parklands are a largely visual landscape, used primarily for circulation. Existing sidewalks and desire lines should be maintained. In areas where more active use is desired, Bermuda and St. Augustine lawns may remain to accommodate gathering.

Education & Mission

The University should share its sustainable goals and approach for the conversion of parkland into native savannah with the community through a series of educational initiatives, including the installation of interpretive signage within the landscape. The University should work with EDG to develop sign content. The signage shall conform with University standards for interpretive signage.

Savannah Maintenance

The optimal technique for the long term management of campus savannah landscapes is prescribed burning. Burning is the most effective means of removing dead biomass and encouraging new grass and wildflower growth. It simulates natural ecosystem functions, controls woody plant material, and offers opportunities for exceptional educational experiences. The City of Austin Fire Department is familiar with the use of prescribed burns inside the city and encourages periodic fire as a fuel management tool. It is recommended that the University work with the Ecosystem Design Group of the Ladybird Johnson Wildflower Center to train staff in safe, appropriate burn techniques. An alternative to burn management is the regular removal of excess biomass by mowing and mechanical or hand removal at the appropriate time of year. This will roughly approximate the effects of fire. Fire management or mowing is essential maintenance for native grassland systems. Failure to periodically remove dead biomass will mean the rapid deterioration of the system.

EDG has developed the following landscape guidelines based on the Zone 1 Fire Wise Design Guidelines:

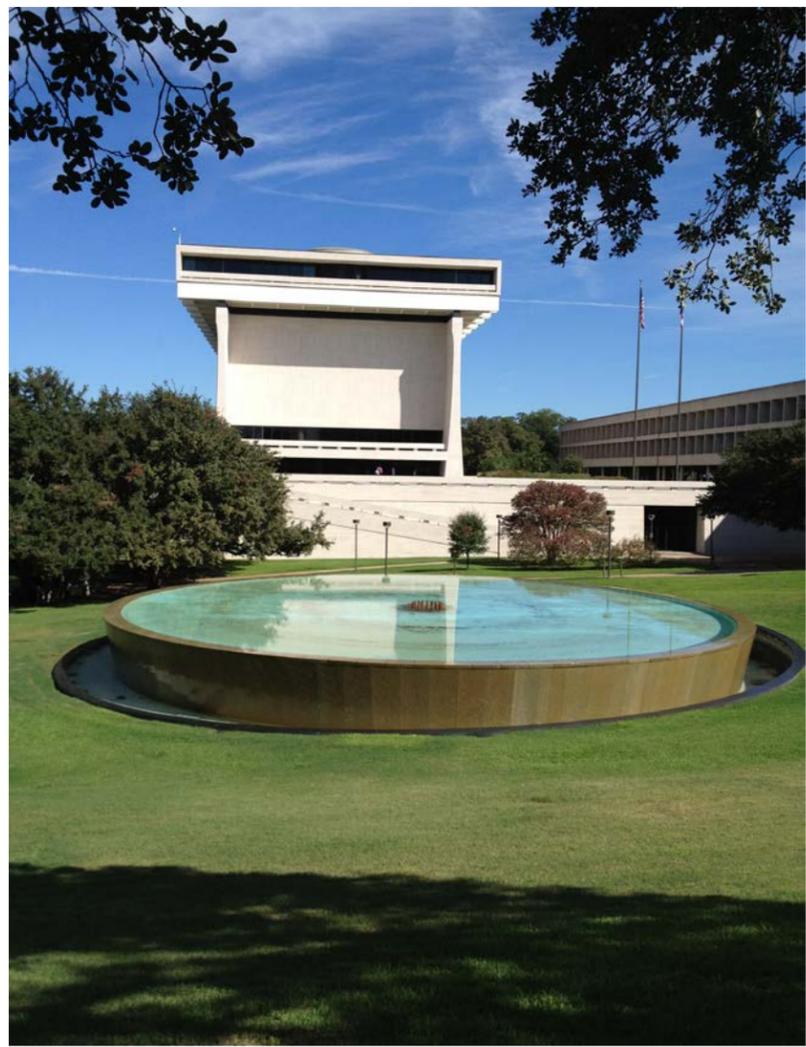
- Prune up existing trees six to ten feet from the ground
- Create a 'fire-free' area within five feet of any buildings, using non-flammable landscaping materials and/or high-moisture-content annuals and perennials
- Maintain a three foot mow buffer along all roads and pathways
- Consider fire-resistant material for furniture and fixtures

PARKLAND ENHANCEMENT AREA LBJ COMPLEX

LBJ LANDSCAPE ISSUES

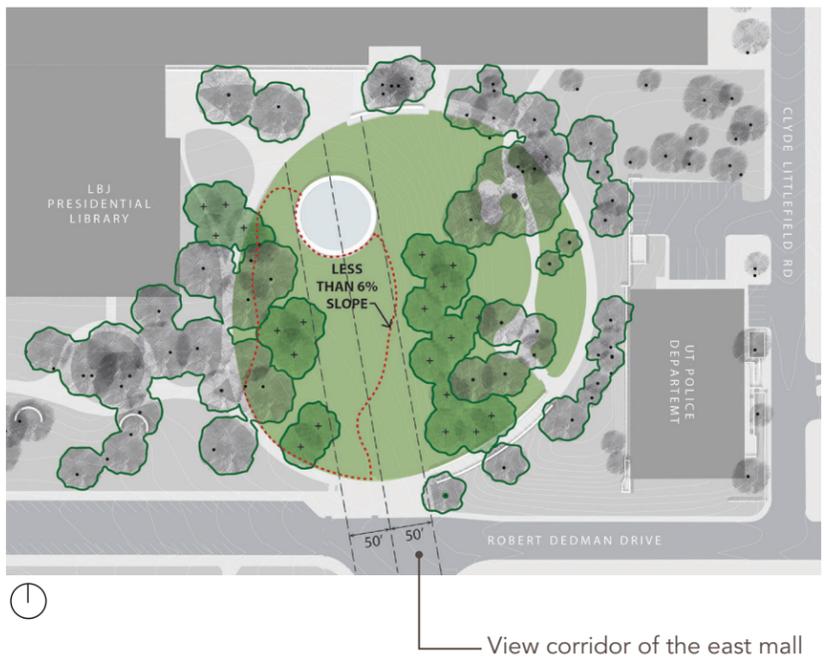
The largest contiguous area of Parkland is the landscape surrounding the Lyndon B. Johnson Presidential Library Complex. The large-scale park-like setting of sculpted topography and picturesque planting makes an elegant backdrop for the complex's monumental buildings and fountain. The elliptical central lawn area, with a circular fountain on axis with the termination of the East Mall, connects this campus district back to the civic landscapes of the core campus.

As the University begins to reduce use of the South Mall lawn for large events in order to extend the lifespan of the Mall's iconic Live Oak trees, it must find other venues to host these large gatherings. The LBJ fountain lawn area is an appropriately sized civic space that should be made better able to accommodate human use.



The Parkland makes an elegant setting for the Lyndon B. Johnson Presidential Library.

LBJ FOUNTAIN LAWN PLAN



- LEGEND
- EXTENT OF MOWN LAWN
 - PROPOSED NEW LIVE OAK TREES

LBJ COMPLEX PARKLAND RECOMMENDATIONS

Planting
The majority of lawn area surrounding the LBJ complex shall be converted to native savannah grassland with wildflowers.

The LBJ Fountain Lawn area defined by the circular walkway at the center of the complex shall be preserved as mown lawn area and enhanced to support community gatherings and events. The flatter area of this bowl-shaped landscape is best suited for large gatherings - area with slopes less than 6%, similar to the slope of the South Mall, is identified in red on the diagram at left. The area outlined in red is approximately the same size as the South Lawn.

Human comfort within the LBJ Fountain Lawn area should be enhanced through the planting of additional Live Oak trees for shade. The view corridor on axis with the East Mall should be preserved as an open viewshed. An 100-foot wide corridor will approximate the distance between the canopies of the oaks flanking the south lawn.

LBJ COMPLEX LANDSCAPE EXISTING PLAN



ⓘ Extensive mown lawns are maintenance and irrigation intensive, while providing limited ecosystem services

LBJ COMPLEX LANDSCAPE CONCEPT PLAN

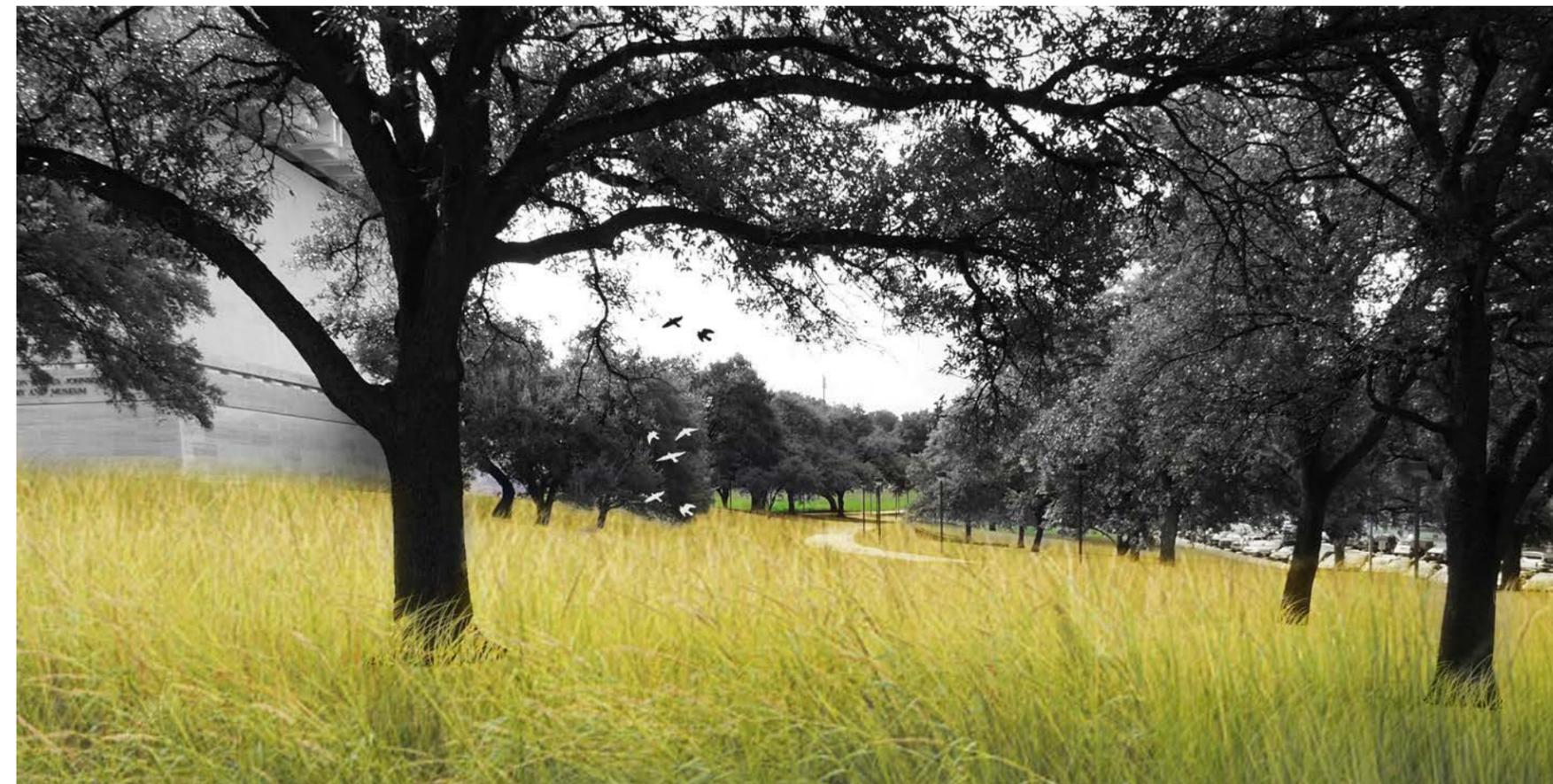


Replace lawn with native savannah plant community

Maintain Fountain Parking Islands as mown turf grass

Maintain Fountain Lawn as mown turf grass

- LEGEND
- LAWN
 - NATIVE GRASSLAND
 - GROUNDCOVER



EXISTING LBJ PARKLAND

CONCEPT FOR LBJ PARKLAND SAVANNAH

PARKLAND ENHANCEMENT AREA ARTS DISTRICT

ISSUES

The Arts District is characterized by wide, sloping areas between the large buildings of the Arts complex and Trinity Street. The area is also crossed by surface drainage ways that are part of a former tributary to Waller Creek. The large lawn areas are scattered with groupings of Live Oaks; however, these parklands are more fragmented by pathways, service roads and site walls than the LBJ area Parklands.

Severe soil erosion is common in the area west of the Performing Arts Center. Contributing factors include heavy shade, poor soils, loss of vegetative cover, compaction caused by intense pedestrian use, concentrated overland flows of water, and an inability to maintain eroded areas in a timely manner.

A tributary creek runs through the parkland parallel to Trinity Street. Design interventions have channelized the creek, which has resulted in eroded banks and generally degraded visual quality. The creek corridor is maintained as lawn, limiting water quality filtration and habitat value.



Consideration should be given to reducing paved areas where possible.



Native plantings are appropriate in little-used lawn areas of the Arts District.



The tributary stream channel that runs through the Arts District Parkland suffers from erosion and has limited ecological value.



The low point between the Music Building and the Performing Arts Center exhibits compaction, erosion, ponding and sedimentation.

ARTS DISTRICT PARKLAND RECOMMENDATIONS

The majority of lawn area within the Arts District shall be converted to native savannah grassland. The continuous savannah will help to visually unify landscape areas throughout the district. Overly mature evergreen shrubs and ornamental plantings should be removed and replaced with savannah grasses to create a simple, consistent visual effect.

The banks of the tributary stream along the west side of the Performing Arts Center should be restored and stabilized. Riparian planting shall be established along the stream corridor to improve habitat and water quality filtration.

A rain garden should be developed at the low point between the Music School and the Performing Arts Center to receive and detain stormwater runoff from paved areas in the district. The rain garden will provide some mitigation for both quality and quantity of stormwater leaving the site and being piped into Waller Creek.

Additionally, reducing paved area where possible within this local watershed will help to reduce runoff and erosion.

In order to enhance pedestrian connectivity and character within this district, consideration should be given to reducing the amount of parking along Trinity Street as recommended by the 2012 Campus Master Plan. In particular, the parking at the Trinity Street pedestrian crossing at the Texas Memorial Museum could be removed while maintaining the travel lanes.

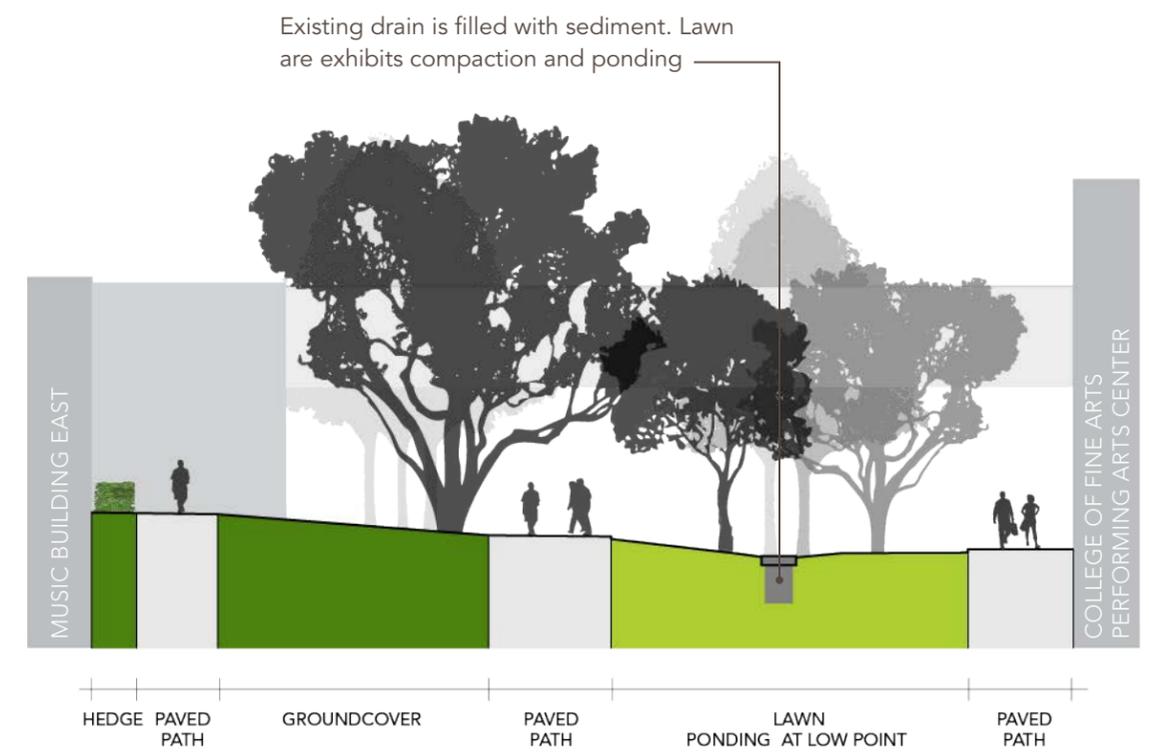
EXISTING ARTS DISTRICT PLAN



- Compaction and erosion
- Large expanse of paving
- Ponding and sedimentation at low point

LEGEND

- LAWN
- NATIVE GRASSLAND
- PERENNIAL PLANTING



EXISTING SECTION A-A'

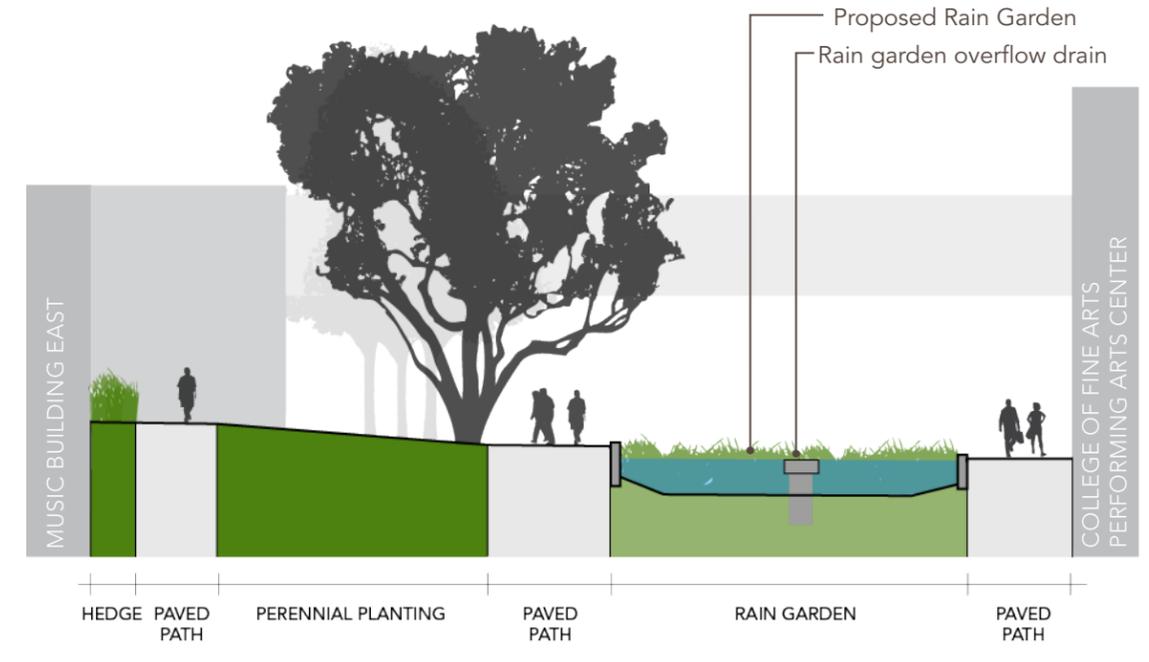


ARTS DISTRICT CONCEPT PLAN



- Remove parking at pedestrian crossing area
- Reduce paved area
- Develop rain garden with native plant palette at low point

Convert to savannah community (remove over-mature evergreen shrubs)



CONCEPT SECTION B-B'





VIEW OF EXISTING TRINITY STREET IN ARTS DISTRICT



CONCEPT FOR TRINITY STREET IN ARTS DISTRICT



3.6 SERVICE & PARKING AREAS

DEFINING CHARACTERISTICS

The majority of large surface parking lots and parking structures have been located at the edges of the UT campus, successfully reserving the campus core for pedestrians; however, some small parking lots and service areas are necessary throughout to keep the campus accessible to handicapped users, visitors, and service vehicles. Service and parking areas in the core are predominantly paved spaces that see overlapping vehicular and pedestrian activity. The majority of service and parking areas have limited space available for planting.

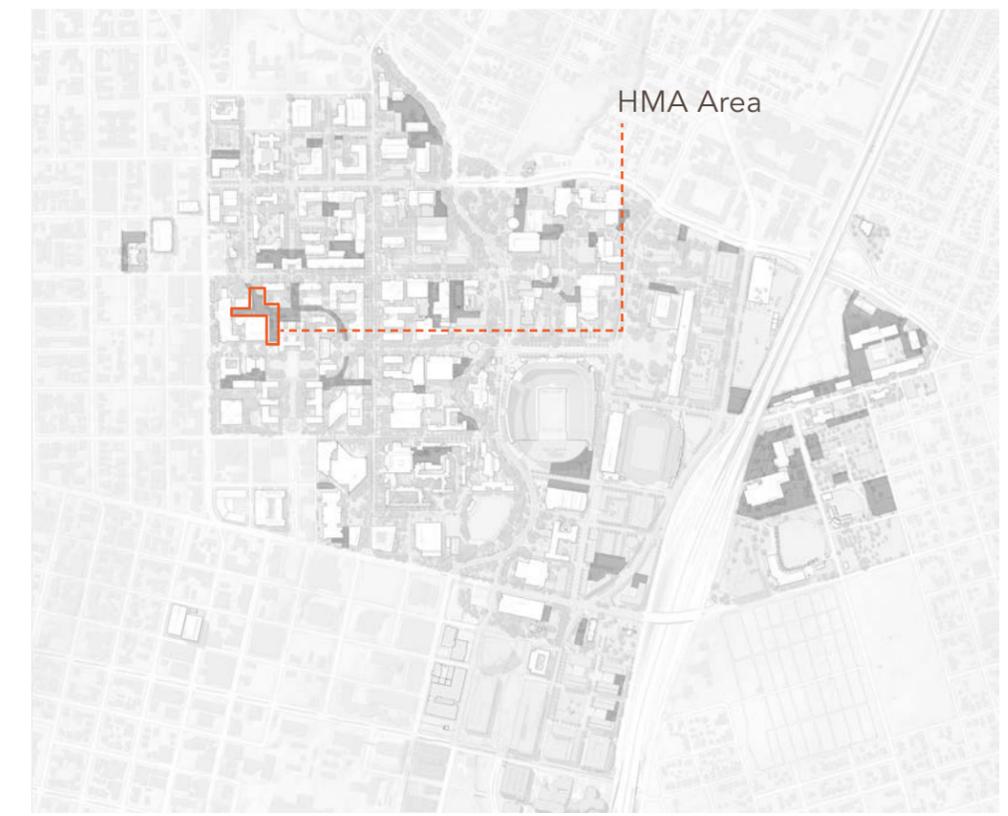
ISSUES

The large areas of pavement in service and parking areas increase the imperviousness of the campus. Stormwater conveying petroleum products from parked vehicles drains off of these pavements, enters the storm sewer, and flows untreated directly into Waller Creek.

Unshaded parking lots and service areas contribute to heat island effect. Some plantings in these areas are overly elaborate, out of scale with these large spaces, and fail to provide shade.

The large expanses of asphalt pavement in these areas can interrupt the pedestrian character of the core campus and create unwelcoming and unsafe environments for pedestrians.

OPPOSITE IMAGE: Pervious Pavement at the Liberal Arts Building.



■ SERVICE & PARKING
 □ ENHANCEMENT AREA

OBJECTIVES

The objective for campus areas where service and parking uses overlap with pedestrian use is to maintain their service and parking functionality, but also to ensure that these spaces feel like a continuation of the pedestrian fabric rather than vehicular spaces. Where budget allows, high quality materials, such as unit pavers, can be used make these areas feel more pedestrian friendly. For larger perimeter service and parking areas, maintaining simplicity and order will reduce their visual impact on the campus experience.

Shading pavement is a major objective in service and parking areas. Distributing small planting areas throughout parking lots and at the edge of service areas can have a significant cooling effect on the microclimate of these spaces.

The Campus Master Plan calls for the gradual removal and replacement of surface parking lots with parking garages. For those surface lots that remain, trees should be employed in islands and at edges to frame the perimeter of the lot. Islands should ideally be continuous linear elements and larger than two parking spaces in area.



✔ The planting islands provide welcome shade within large surface parking lots.



✘ The garden effect of this xeriscape is out of scale with the space and the plantings do not provide shade or other ecosystem services.



✔ It is important to maintain the pedestrian character in service areas where services and pedestrian functions overlap.



✔ Small landscape areas planted with Huisache (*Acacia farnesiana*) and other native plants at the edge of this parking area provide shade and visual relief.

GENERAL GUIDELINES FOR SERVICE AND PARKING AREAS

Functionality
Maintain overlapping pedestrian and service functions in these areas while promoting a pedestrian character landscape through plantings, pavement and detailing.

Design Simplicity
Emphasize simple, properly scaled landscape designs that avoid garden effects better suited to courtyards. Service and Parking Areas should employ a limited number of pavement, wall, and planting materials.

Planting
Employ perimeter areas and parking islands for plantings to improve microclimate and visual design. Include canopy tree plantings to provide shade. Promote biological diversity and provide habitat by employing native plantings with high resiliency and low maintenance requirements.

Stormwater
Employ stormwater Best Management Practices to improve water quality and reduce the rate and volume of runoff. Consider the use of planted filter strips within parking lots, pervious pavements, stormwater storage systems below pavements, and separator catch basins at connections to the storm sewer network.

SERVICE & PARKING ENHANCEMENT AREA HMA PARKING LOTS

ISSUES

The Service and Parking Areas between Hogg Memorial Auditorium (HMA) and the Peter T. Flawn Academic Center provide a large percentage of the accessible parking spaces that serve the 40 acres, as well as a valet drop-off point for events in this core area location. The paved parking area also acts as a major pedestrian thoroughfare for large volumes of students moving between areas north of 24th Street and the South Mall area.



The drop-off and parking area along the Academic Center feels like a break in the pedestrian fabric of the 40 acres.



The parking lot area detracts from the civic formality of the Auditorium Building.

HMA AREA EXISTING PLAN

Overlapping pedestrian and vehicle routes



- LEGEND
- LAWN
 - GROUNDCOVER AND HEDGES
 - GARDENESQUE PLANTING
 - PERMEABLE PAVERS
 - PROPOSED TREES

HMA AREA CONCEPT PLAN

Convert driveway to drivable walk



- Pervious Pavers
- Convert lawns to native ground cover plantings
- Add framing tree canopy
- Remove gardenesque plantings and replace with simplified native palette

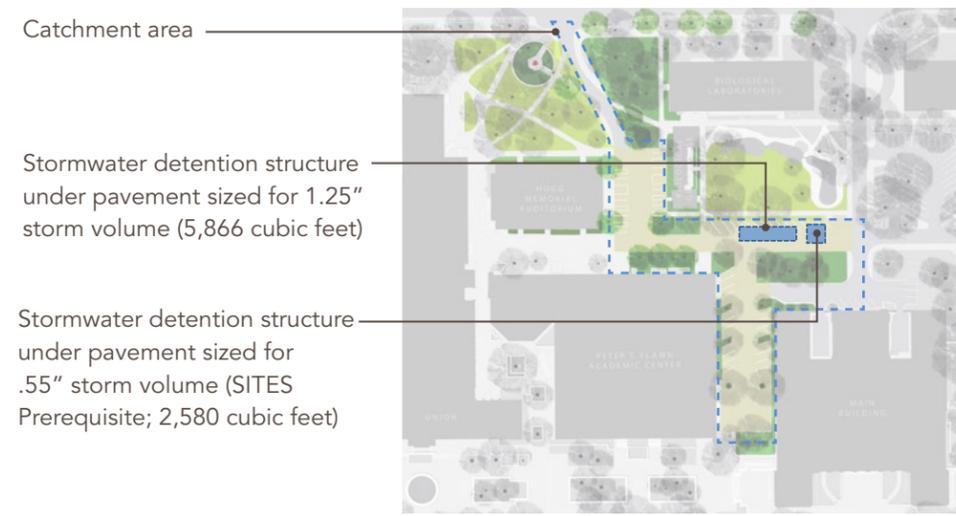
HMA AREA RECOMMENDATIONS

Design Goals
Transform this area so that it is simpler and more pedestrian in character, while maintaining its functionality as a vehicular space. Replace the asphalt pavement and concrete sidewalks with pervious unit pavers.

Stormwater
Install a separator catch basin and stormwater detention system below the pavement to limit and clean site stormwater runoff. The diagram at right shows the approximate sizes in plan of a subsurface detention system designed for either the 1.25" storm or the .55" storm for the area outlined with a blue dashed line. The .55" storm is the volume required to meet SITES criteria.

Planting
Utilize peripheral planting areas for native perennial and tree canopy planting to create a cooler microclimate, to increase habitat value and improve visual quality. Replace gardenesque plantings, hedges and lawn areas with a consistent planting of low maintenance native trees, shrubs and ground covers around the edges of the space.

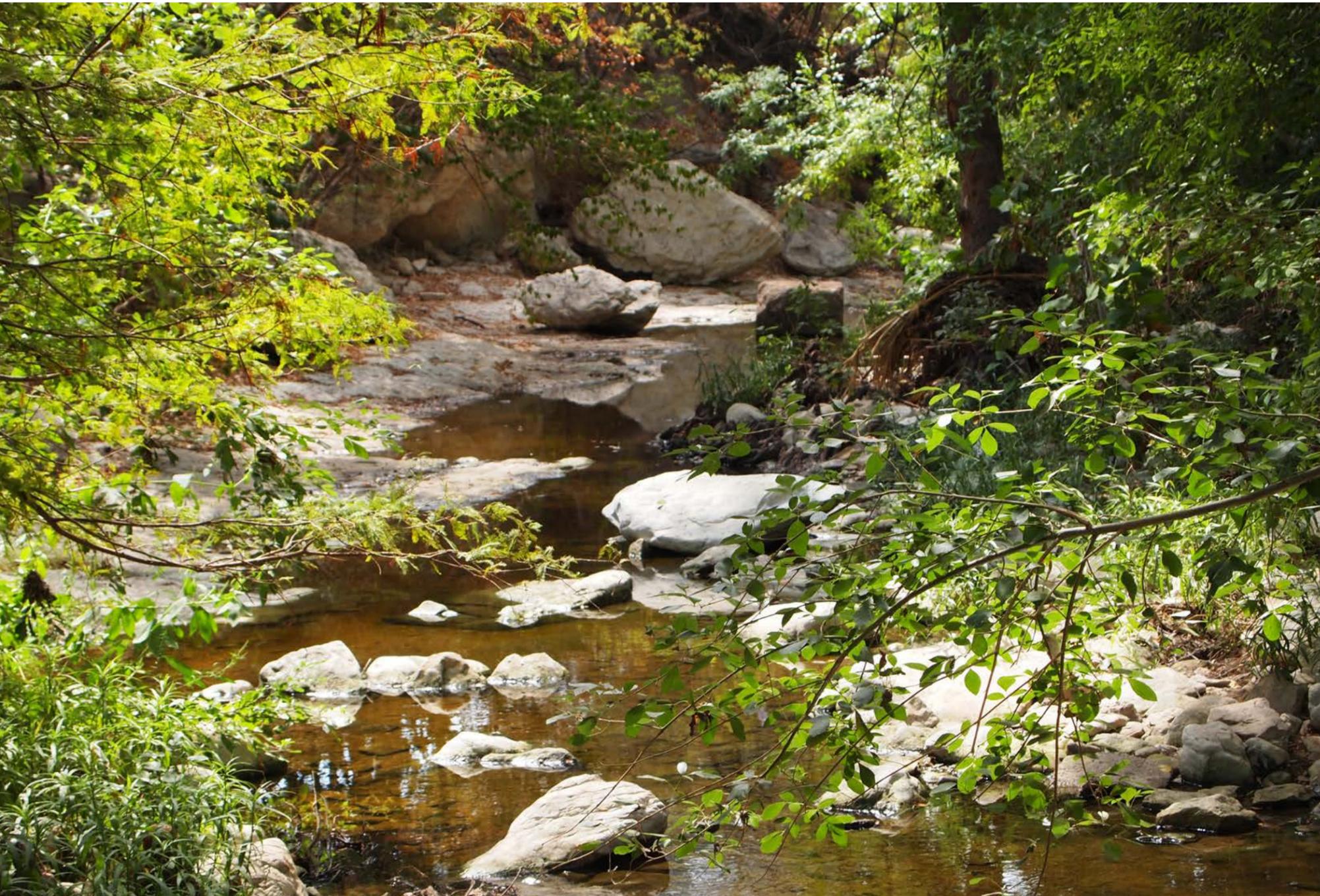
PROPOSED STORMWATER DETENTION STRATEGY



EXISTING HMA AREA



CONCEPT FOR HMA AREA



3.7 WALLER CREEK

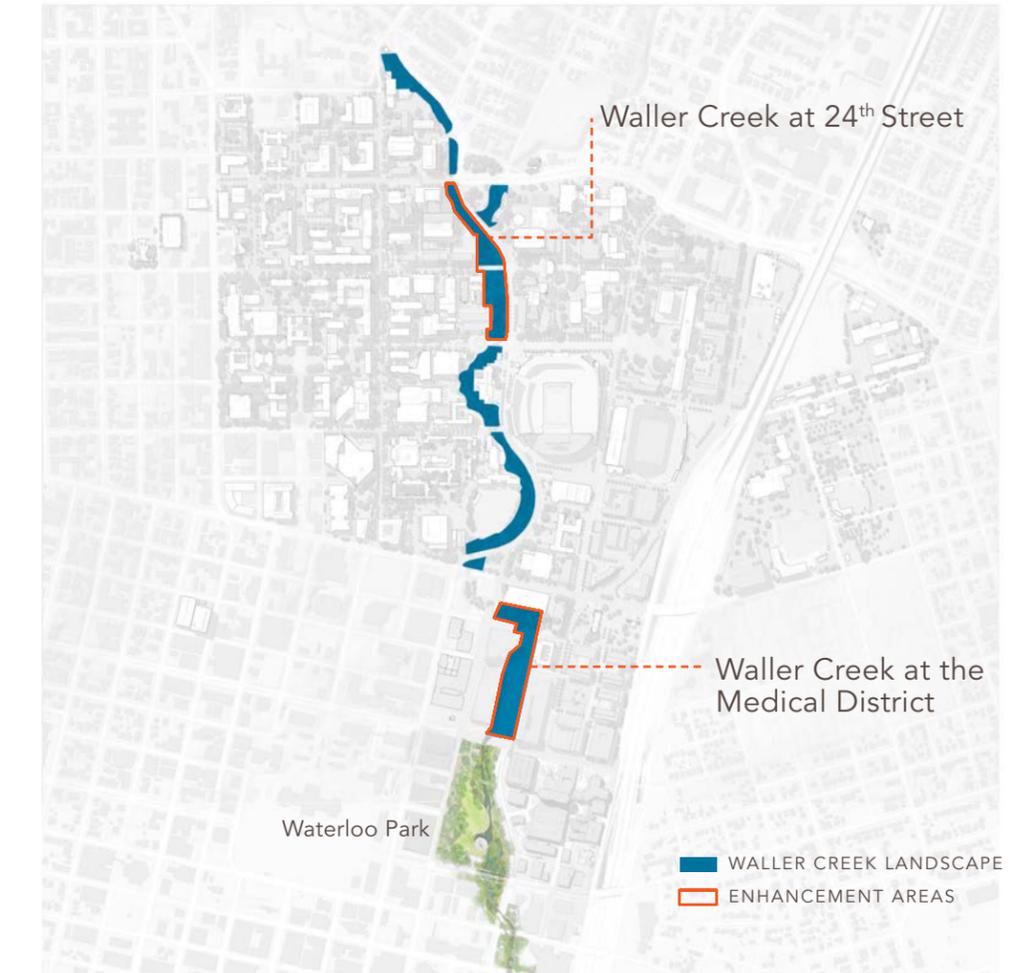
DEFINING CHARACTERISTICS

Waller Creek is a narrow stream corridor that flows through the center of the University campus, separating the Campus Core from Central Campus. The Creek section varies along its length, from 250 feet wide to less than 100 feet. The Creek is framed by roads, buildings and walkways. In many areas, the channel has been restricted or wholly relocated by urban development.

Waller Creek includes some areas of beautiful naturalistic scenery, but the campus has historically turned its back on this resource. There are limited areas on campus where the creek is accessible to the campus community. Because of its steep banks and the presence of dense invasive understory vegetation the Creek appears as a dense mass of foliage rather than as an occupiable space. The best views of the creek are available from the many bridge crossings within the campus.

ISSUES

Waller Creek is experiencing typical urban stream dynamics. The campus storm sewer system conveys pollutants from paved surfaces and sediment from erosion throughout the campus and deposits it directly into the Creek. Additionally, overland flows bring pollutants and sediment over the banks. Water quality in the Creek is monitored by the campus environmental health and safety group, and the Creek periodically exhibits degraded water quality, including suspended solids, E. Coli bacteria, and other pollutants, which has resulted in depleted in-stream biodiversity.



Increases in impervious cover in the Creek's watershed have led to high storm surges and erosion of the stream channel, bed, and banks. Urbanization has also led to the narrowing and fortifying of the stream channel, which has in turn led to exacerbated hydraulic volatility. These issues are threatening campus infrastructure; adjacent roadways, trails, sidewalks, and building foundations are being undermined, and pipes and walls are failing.

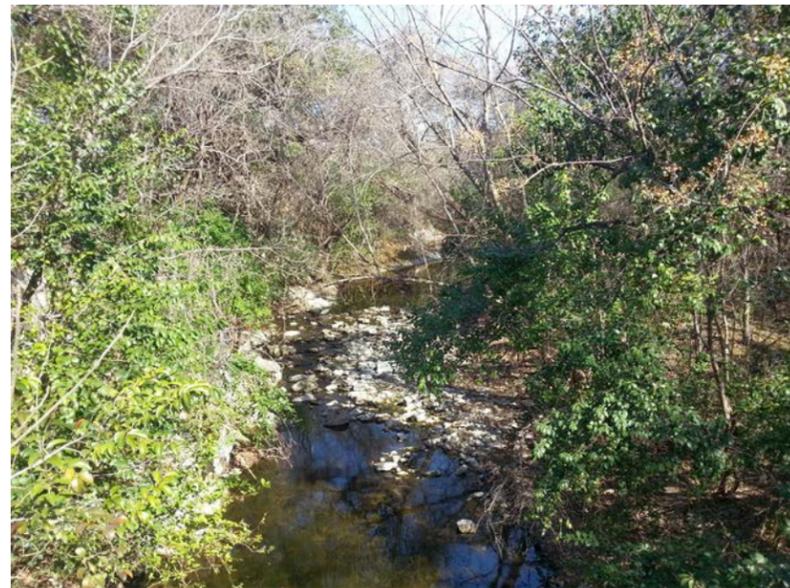
The most effective channel stabilization in these areas is provided by bedrock, cobbles, and vegetation. In some areas, large Bald Cypress trees, that appear to have established themselves before urbanization, provide effective bank stabilization through their root system.

In general, the banks are heavily vegetated with canopy trees, understory trees, shrubs and vines, but the ground level flora is missing because of shade suppression. Most vegetated areas along the creek have been degraded with invasive, non-native species. There are also remnant Oaks, Pecans, Sycamore and Elms present. Some large specimen trees are at risk through bank erosion of their root zone.

Immediately to the south of the campus the City of Austin is constructing a major diversion tunnel. The Waller Creek Conservancy has launched an effort to redesign the surface channel as a series of parks that will improve the quality of the creek environment between the campus and Lady Bird Lake. These improvements encourage a larger look at the campus creek corridor as part of a public amenity serving both the campus and community.

OBJECTIVES

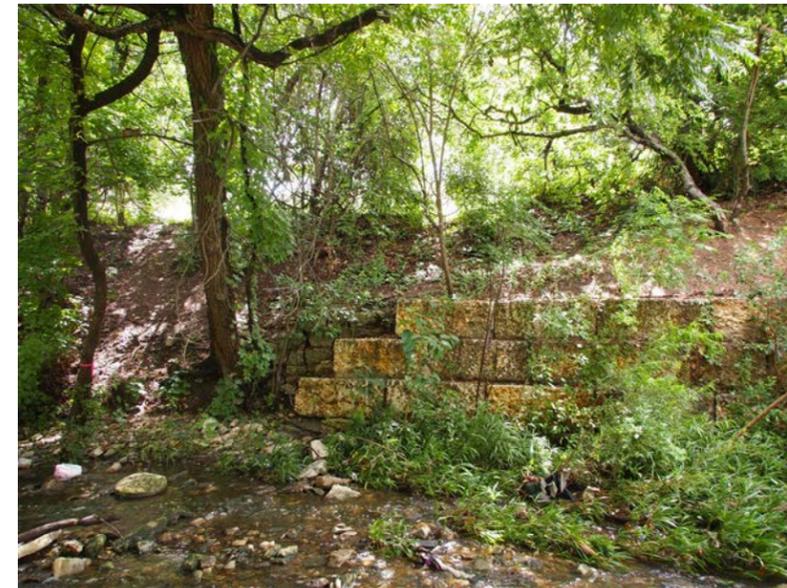
The recommendations in this section of the report provide a framework to address existing risks and problems, both within the upstream campus watershed and within the Creek itself, and restore a more ecologically functional, physically stable environment. The Creek has great potential to serve both as a model project for creek restoration applicable to many other urban water bodies, and as a campus landscape amenity for the University community. A restored creek corridor will also serve as a functional and ecological link to the downtown Austin and Lady Bird Lake.



Shade from invasive, non-native species of canopy and understory trees has suppressed ground layer vegetation in the creek corridor.



The amphitheater space next to San Jacinto Residence Hall is one of the few spaces on campus today that address the Creek landscape.



Unstable banks caused by urbanization and narrowing of the stream channel have been reinforced with a variety of limestone block walls.

GENERAL GUIDELINES FOR WALLER CREEK

Human Use

Transform the creek environment from a barrier to a linkage to foster the integration of the Core Campus and Central Campus. Develop the creek corridor as a link to the downtown and the Waller Creek Conservancy's improvement projects to the south.

Develop a continuous creek side trail to allow access to and enjoyment of the Creek landscape. Take advantage of developing opportunities for developing terraces and sitting areas similar to those at the Alumni Center.

Include educational signage about creek ecology and restoration along the trails.

Stream Channel Stability (Bed and Banks)

Use Natural Channel Design Practices to re-establish in-stream structure, floodplain, and channel elevation relationships, and stabilize the toe, bank and channel reaches. These practices include:

- Stabilize toe of slope with limestone block walls in areas where the creek banks exceed a slope of 6 horizontal to 1 vertical
- Stabilize all areas in the floodplain with slopes less than 6:1 with a prescribed mix of savannah grasses and associated riparian trees and shrubs

Remove existing structures that exacerbate bank, channel, and bed erosion and stability. Several of the existing dams which are integrated with what appear to be ornamental pools and waterfalls with several foot water drops should be evaluated. It appears as though the dams and associated pools elevate floodwater profiles by 5-6 feet, creating reverse hydraulic, supercritical flows of floodwaters below these structures. This contributes to significant structural erosion, tree mortality, bank erosion, etc. Other structures that should be removed are failed ends of storm sewer pipes and large concrete slabs that have entered the stream channel.

Remove rock-veneered banks that are failing or in danger of failing, and replant these locations with native bank-stabilizing vegetation.

Fortify all existing structural bank/bed/channel solutions with bioengineered plantings.

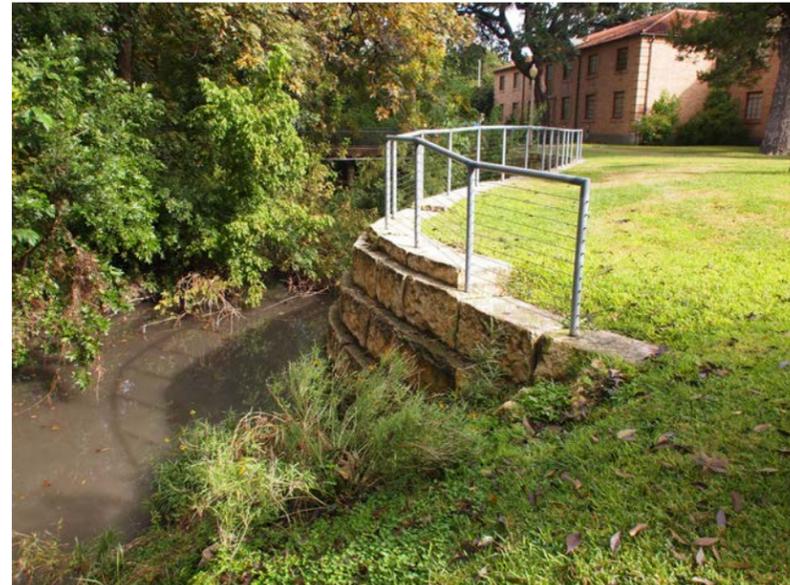
Create an upland savannah along the creek channel by retaining canopy and mature overstory trees; reduce dense sapling, shrub and invasive ground story vegetation; replant native savannah/forest and forest edge native grasses and wildflowers to stabilize soils in the stream environment.

Reduce mowing of lawns abutting the stream corridor and consider restoring these areas to native planting buffers which will perform alternative stormwater management functions.

Reduce the release of storm sewered water directly into the Creek by capturing, holding, and infiltrating rain water in dispersed rain gardens, roadside verge and median native plantings and infiltration galleries before it enters the stormwater system

For all new buildings, parking, and paved areas, design with zero stormwater discharge principles. Design for all but the most infrequent storm events. Integrate stormwater collection and reuse into building design from roof to exterior foundation. Use stormwater for internal humidification and cooling, fire protection, urban heat island reduction, and outdoor microsite cooling.

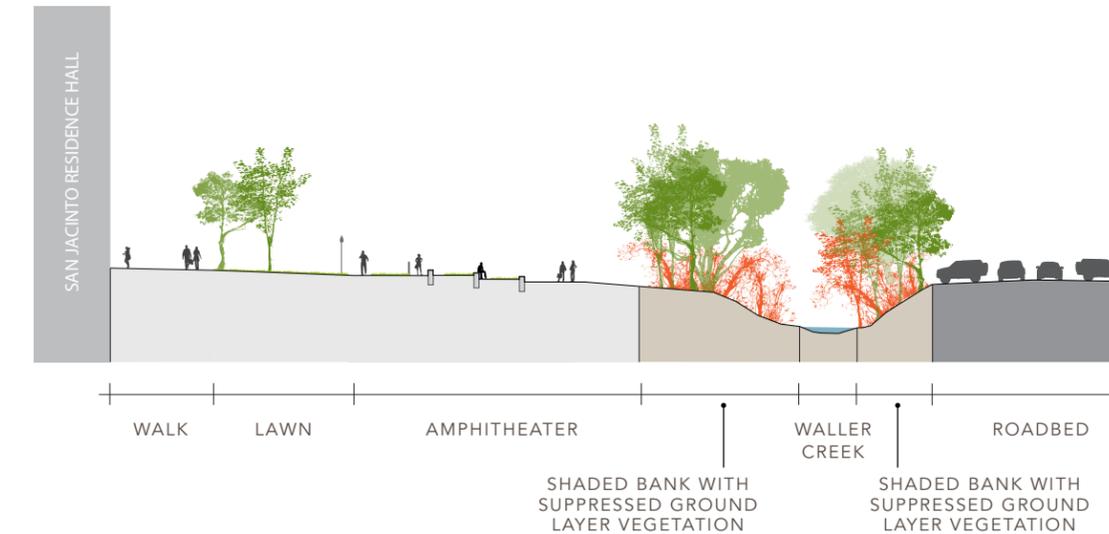
Use Best Management Practices to capture and manage overland runoff from campus lawns, roadways, and tennis courts that directly or indirectly flows into Waller Creek.



The creek channel shall be stabilized with limestone blocks in areas where the slope of banks exceed 6:1 in the floodplain.

EXISTING WALLER CREEK SECTION AT SAN JACINTO RES. HALL

Thick invasive vegetation in the stream corridor blocks view and access to Creek.



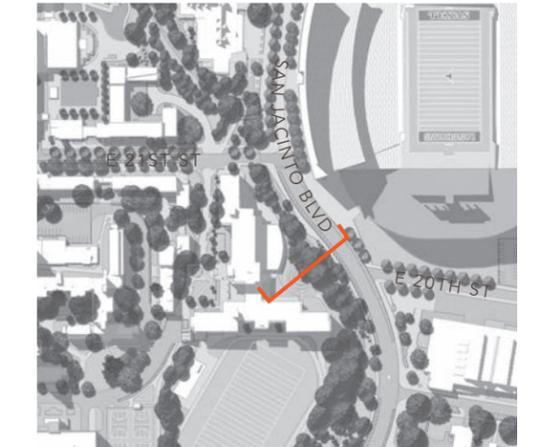
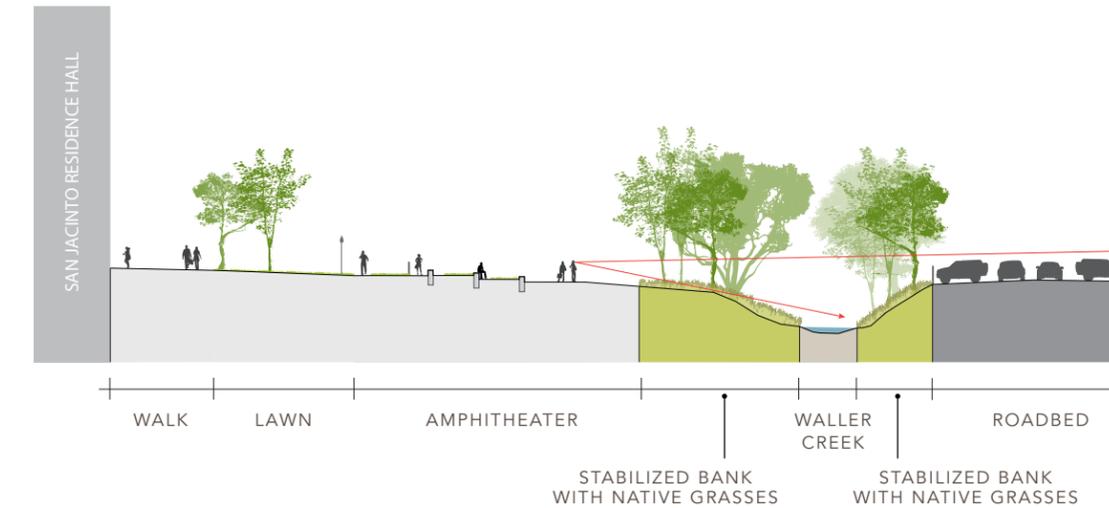
LEGEND

- NATIVE PLANT SPECIES
- INVASIVE PLANT SPECIES
- STABILIZED BANK WITH NATIVE GRASSES

0 15 45

PROPOSED WALLER CREEK SECTION AT SAN JACINTO RES. HALL

Thick vegetation in the stream corridor is thinned out to allow visual access through corridor



KEY PLAN

Install a dedicated “stream team”

to maintain the vegetation systems, stability, and aesthetics of the stream corridor throughout the campus.

Stream Channel Ecological Function (Plant and Animal Habitat)

Riparian vegetation should include three tiers: groundcover, understory, and upper canopy.

Design refugia (e.g., islands and “whelks”) to provide habitat for desirable native plant communities and desirable native wildlife. Refugia should be located where space allows and where tributary flows enter Waller Creek. Consider all creek side planting and the replacement of lawns with native plants as opportunities to restore refugia for native plants and wildlife in the Waller Creek corridor. Re-colonization of plants and wildlife can occur from refugia after storm events that damage vegetation along the Waller Creek corridor.

Identify game fish populations

(Largemouth Bass are doing well in the Creek) that could be improved by improving spawning areas in Waller Creek

Provide suitable rock/pebble size for spawning of desirable native fish.**Identify charismatic fauna and flora**

and/or other target species to “bring back” to Waller Creek and Lady Bird Lake through strategic habitat restoration and/or species reintroduction. Review Species of Greatest Conservation Need (SGCN) list for Texas and identify suite of species that might be appropriate for a restored/enhanced Waller Creek.

Create habitat appropriate for some of the target wildlife and plant species present and for species that could benefit from restoration of Waller Creek on the UT Campus.

Water Quality (Trash to Total Suspended Solids)

Implement stormwater management techniques that improve water quality

including rain gardens, bioretention ponds, vegetative filter strips, vegetative swales, rainwater harvesting, porous pavement, tree planters, and hybrid engineering/ecological solutions.

Enhance Connectivity of Individual Reaches to Create Consistent Creek Environment

Provide passage between reaches (e.g., fish runs/ladders) for fish and other aquatic wildlife

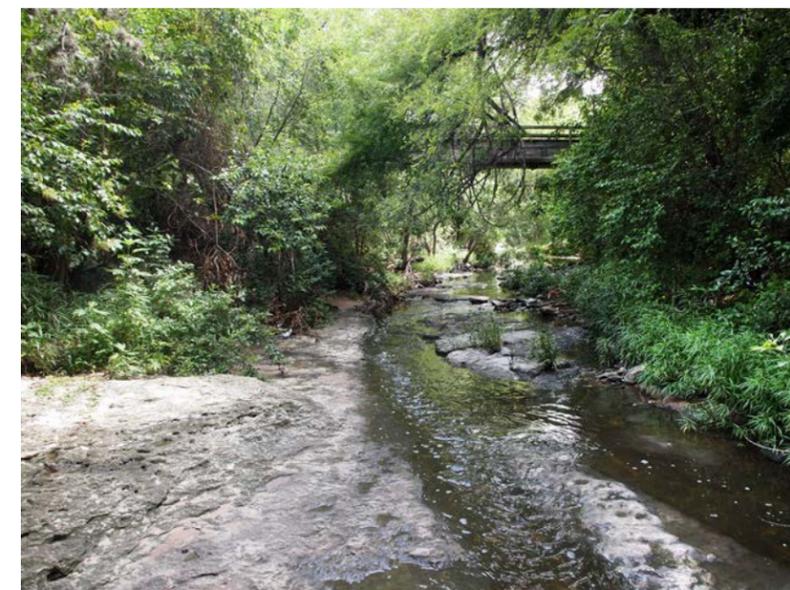
Plant contiguous riparian vegetation (including tree planter boxes and wall vines along developed and stone block wall sections of creek corridor).

Existing and Proposed Utilities in Creek

Consider using vegetation and other strategies to conceal the sanitary sewer pipes that cross the lower creek.



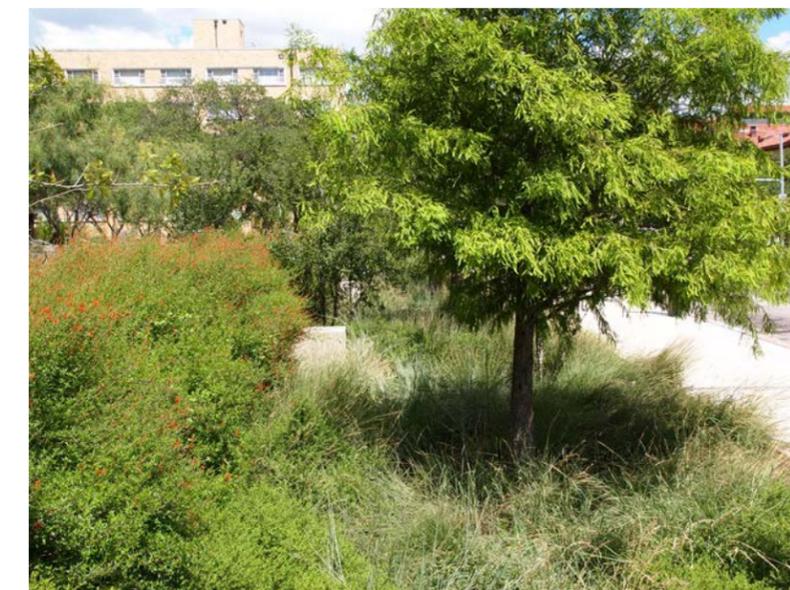
In stream structures should be removed to reduce the elevation of water profiles and avoid reverse hydraulic supercritical flows of floodwaters below the structures.



Where conditions allow, riparian plants such as Ruellia (right) shall be used to stabilize stream banks



Lawn areas along the creek should be considered for replacement with native planting buffers which improve stormwater management.



Upland stormwater treatment areas such as this bioswale at the Belo Center will help to improve water quality in the creek, and reduce peak flows.

WALLER CREEK ENHANCEMENT AREA MEDICAL DISTRICT

ISSUES

The Medical District project, currently under design, includes a significant length of Waller Creek within its project area. The proposed dense configuration of new large buildings requires that the creek channel be stabilized and its vegetation be restored to create an attractive native landscape. Stabilization will involve total reconstruction of the Creek's banks in some areas.



Mature native trees populate the creek corridor uplands in the Medical District.



Rock lined sections of the creek corridor in the Medical District are reasonably stable.



The Medical District creek channel will be restored to resemble this open savannah condition at the Barton Creek Preserve of the Nature Conservancy. Winter Photo.

MEDICAL DISTRICT WALLER CREEK ENHANCEMENT AREA RECOMMENDATIONS

Upland Planting

- Where grading and construction staging allows, retain walls and native trees in Creek upland areas including the trees at the corner of Trinity and 15th Streets.
- Transplant large native trees displaced by new medical district buildings within the creek corridor and upper floodplain
- Remove exotic understory vegetation, including Boxelder and Japanese Privet, to increase light levels at the ground level in order to establish native ground layer vegetation
- Restore vegetation typical of the historic local savannah and forest plant community – an open canopy of native trees, scattered saplings, understory woody plants, and a ground layer of warm season grasses and wildflowers
- Where grading and construction staging allows, maintain and protect existing mature native canopy trees along creek banks and in the floodplain, including large oak, elm, hackberry, pecan, and sycamore trees
- Establish storm surge-resistant vegetation in the active stream channel

Creek Bank and Bed Stabilization

- Protect rock-lined stretches of the creek bed
- Stabilize stream banks through stone stabilization of the toe of alluvial banks, new limestone block retaining walls, and laying back steep slopes to 6:1 or flatter where possible

Stormwater

- Reconstruct storm pipe inlets with velocity reducing devices to reduce channel erosion



Summer Photo of the savannah at the Barton Creek Preserve; a model for the medical District.

WALLER CREEK IN MEDICAL DISTRICT CONCEPT PLAN

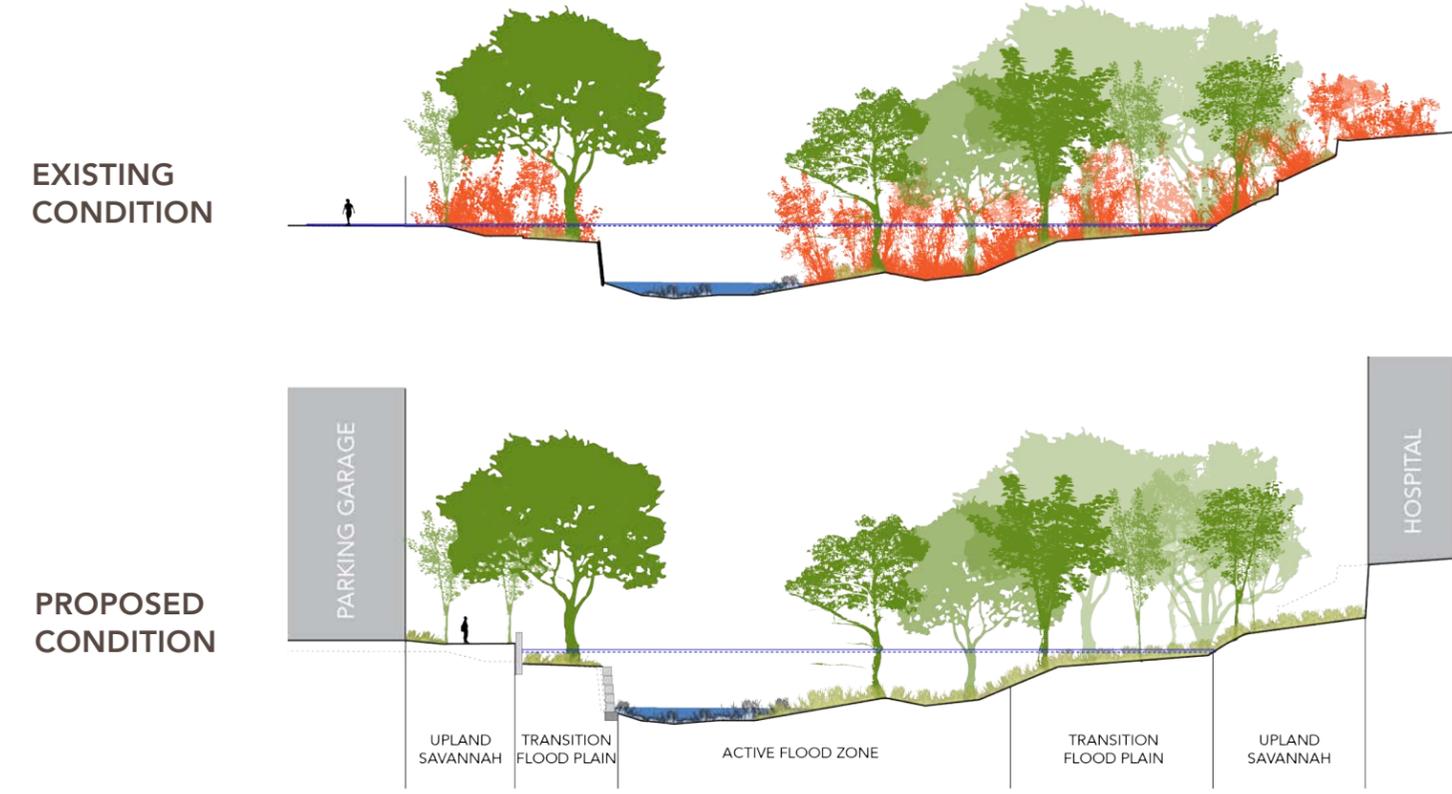


- LEGEND
- SAVANNAH GRASS
 - STABILIZATION WALL
 - TRANSPLANTED TREE
 - NEW PROPOSED TREE

Limb up existing native trees (Elm, Sycamore, Live Oaks); Remove invasive understory; Augment existing trees with new native trees and understory planting

Establish savannah grass understory in uplands and on sloping banks along the active stream channel

WALLER CREEK IN MEDICAL DISTRICT SECTION A-A'

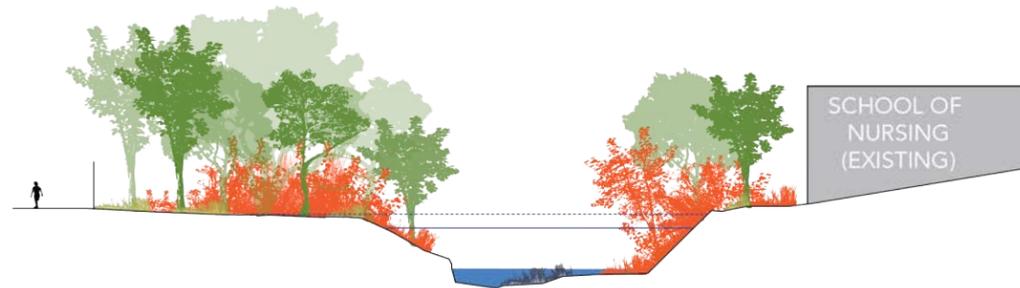


- LEGEND
- NATIVE PLANT SPECIES
 - INVASIVE PLANT SPECIES
 - SAVANNAH GRASS SPECIES
 - 500-YEAR FLOOD LINE
 - 100 YEAR FLOOD LINE

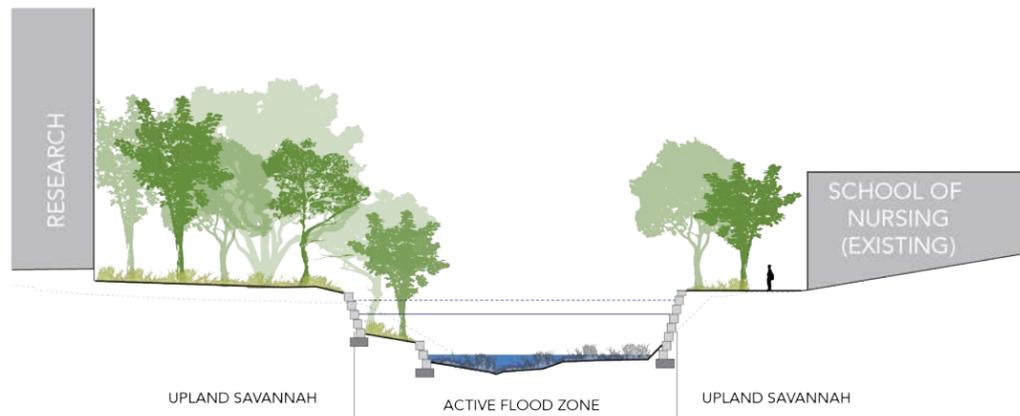


WALLER CREEK IN MEDICAL DISTRICT SECTION B-B'

EXISTING CONDITION



PROPOSED CONDITION



- LEGEND
- NATIVE PLANT SPECIES
 - INVASIVE PLANT SPECIES
 - SAVANNAH GRASS SPECIES
 - 500-YEAR FLOOD LINE
 - 100 YEAR FLOOD LINE



WALLER CREEK ENHANCEMENT AREA AT 24TH STREET

ISSUES

The area around Waller Creek at 24th Street is currently maintained in turf grass, which has limited stormwater management or habitat benefits. Replacing areas of the mown lawn with a native vegetation will improve stormwater management and habitat and reduce maintenance.



Lawn areas should be replaced with native vegetation that will slow stormwater and reduce erosion.

WALLER CREEK AT 24TH STREET ENHANCEMENT AREA RECOMMENDATIONS

Planting

Maintain limited open areas planted with habiturf to allow for passive recreation and pathways to access the Creek

Establish filter strips planted with native grasses parallel to the Creek to filter pollutants and sediment out of stormwater flowing towards the Creek

Establish bank stabilizing riparian vegetation on the steep stream banks



The area around Waller Creek and 24th Street is currently maintained as parkland. In-stream structures should be removed.

WALLER CREEK AT 24TH STREET EXISTING PLAN



Control structure
Existing lawns and parkland
tree and shrub plantings

LEGEND
LAWN
CONTROL STRUCTURE
RIPARIAN PLANTING
FILTER STRIP

WALLER CREEK AT 24TH STREET PROPOSED CONCEPT PLAN



Convert lawns to habiturf
or savannah grass
Remove control structure
Filter strip plantings
(reinforce slope where
needed)
Remove existing shrubs to
open up views to Creek
Riparian Buffer Planting



EXISTING WALLER CREEK LANDSCAPE AT 24TH STREET



PROPOSED CONCEPT FOR THE WALLER CREEK LANDSCAPE AT 24TH STREET



4.0 SYSTEMS GUIDELINES

This Section contains guidelines for campus systems that span all of the landscape areas identified in Section 2.0 of the Landscape Master Plan. The systems include Ecology, Hydrology, Soils, Planting, Irrigation, Lighting and Site Elements.

Habiturf planting at the East Mall is a good example of a more resilient alternative to Bermuda or St. Augustine turf. Honeybees populate this urban meadow when the Blue Gamma (*Bouteloua gracilis*) is in bloom.

This view depicts the fountain and stairway proposed in the Peter Walker Partners plan.

4.1 ECOLOGY

GUIDELINES FOR CREATING ECOLOGICALLY FUNCTIONAL AND RESILIENT GROUNDS

This section provides guidance on generating ecologically functional designs and selecting resilient vegetation and vegetation assemblages. It is based on an understanding of primary ecological processes, as well as on the Ecological Site Assessment performed for The University of Texas at Austin in September 2013 as a current depiction of the ecological function of the campus grounds.

By designing for ecological function the University provides important environmental and sociological services to the academic community. These services are often referred to as ecosystem services, which can be described as goods and services of direct and indirect benefit to humans that are produced by ecosystem processes involving the interactions of living and nonliving elements. The United Nations' 2004 Millennium Ecosystem Assessment (MEA) grouped these services into four broad categories: provisioning (e.g. providing food and water), regulating (e.g. climate control), supporting (e.g. pollination), and cultural (e.g. recreation). Restoring or generating ecological function at the University will provide many of these services for the immediate campus area, as well as for the larger region, as ecosystem services extend beyond human-designated boundaries.

In addition to provision of ecosystem services, the campus grounds can be designed as resilient systems that are able to respond to changing conditions of the area and the inputs needed to maintain these landscapes. In terms of ecology, resilience can be described as the amount of disturbance that can be absorbed before a system fails or changes structure. Accordingly, vegetation for University grounds should meet the demands of use and aesthetics but also be hardy and capable of adapting to changing conditions, whether climatic or patterns of maintenance.

By layering functional landscapes and resilient vegetation into the grounds, the University can provide services to the immediate and extended community and minimize resources and costs over time.



The campus landscape can be designed to emulate the services provided by native plant communities such as this savanna in Austin.



The designed landscape can help to restore ecological function at the University.

CAMPUS ECOLOGICAL FUNCTION

As part of the Ecological Site Assessment, four main ecosystem services were identified for The University of Texas at Austin grounds. While other ecosystem services are occasionally provided, these four are the chief benefits observed:

- Reducing hot urban micro-climates
- Managing and cleaning water resources
- Retaining and creating healthy soils
- Providing refuge for desirable plant and animal species to increase urban biodiversity

Each campus landscape type requires separate ecological goals; the ecological services are prioritized for each landscape type described in Section 2.0 of the Landscape Master Plan. It is important to note that these ecological function goals are not mutually exclusive and often overlap (e.g. sustainable management of soils improves plant health, which reduces irrigation requirements and prevents erosion). In addition, there are many other ecosystem services that are not mentioned here that can be applied to the University depending on the design intent and goals of the project. A full list of ecosystem services can be found in the outline of Ecosystem Services in this report. In conjunction with use and aesthetic objectives, designing spaces that consider multiple ecological services will be beneficial for the University community and for the long-term economic sustainability of the campus.

MITIGATING HOT MICO-CLIMATIC CONDITIONS

The University of Texas at Austin is an urban campus and is prone to the heat island effect created by dense urban settings of high thermal mass in the warm climate of the semi-arid southwest. Designing ecologically functional landscapes can regulate local temperature, precipitation run-off, evapotranspiration, and humidity by providing natural shade and windbreaks. When designing to mitigate hot micro-climates, it is imperative to understand the user needs, opportunities of outdoor seating and pedestrian access, and the sun exposure at a particular project site. There are many different ways to design spaces that mitigate hot conditions on the campus. While these practices may not be appropriate for all parts of the campus, the techniques can be applied to many different projects. These principles include:

- Provide shade for as much impervious surfaces as possible giving priority to high use spaces, such as benches, courtyards, and walkways
- Increase vegetative layers in planted areas to reduce reflected heat and light from impervious surfaces
- Provide seating and access to natural and engineered water features
- Increase the use of innovative vegetated structures such as green roofs and green walls

MANAGING, CLEANING, AND REGULATING WATER RESOURCES

The University of Texas at Austin can implement Low Impact Development (LID) to design the landscape to effectively slow, clean, and infiltrate rainwater. LID is a comprehensive approach to planning, design, and pollution prevention strategies that creates more ecologically functional spaces in terms of water resources. Designed landscapes to manage water resources can have many forms from vegetated swales and rain gardens to rainwater harvesting systems and porous pavements. These topics will be discussed in more detail in the *Section 5.2 Hydrology and Soils*. While these practices may not be appropriate for all parts of the campus, the principle behind them can be applied to many different projects. In general these principles include:

- Preserve ecologically functional vegetation at the project area
- Manage stormwater (quantity and quality) as close to the sources as possible
- Reduce the rate and volume of stormwater runoff from the project area
- Direct stormwater to vegetated features to improve quality of runoff
- Promote infiltration of stormwater
- Reuse stormwater as a resources for the landscape or within built structures

PROTECTING SOIL RESOURCES BY LIMITING EROSION AND COMPACTION

To limit sediment pollution of Waller Creek and to maintain soil within its given ecosystem, the University can protect its soil resources by limiting erosion and compaction. Soil health is fundamental to the success of trees and vegetated areas in both existing and future designs at the University. Soils are discussed in more detail in Section 4.2 Hydrology and Soils. There are a few important principles to protect soil resources:

- Preserve and protect healthy soils in the project area
- Design high use areas to limit compaction and stress on vegetated areas
- Discourage areas of open soil during and after construction
- Support a healthy trajectory for soils by amending with appropriate organic and inorganic material

PROVIDING HABITAT TO PROMOTE BIOLOGICAL DIVERSITY

The University of Texas at Austin is uniquely positioned within an urban environment to act as a refuge for desirable plant and animal diversity in the city. This ability can contribute to the conservation of biological and genetic diversity and contribute to important evolutionary processes. Promoting biological diversity and designing habitat spaces may not be suitable for all areas of the campus because of conflicting functional use or aesthetic motives. There are many different ways to design for habitat and promote biological diversity; however, there are a few key principles to follow. These principles include:

- Remove invasive or pest vegetation species
- Select native vegetation or native vegetation communities that provide food, shelter, and nesting space for desirable wildlife
- Create spaces that attract desirable wildlife not pest species
- Where possible provide human access to these areas
- Connect areas of beneficial habitat to create corridors where possible



Asclepias asperula, Antelope horns, is the primary food source for Monarch caterpillars (*Danaus plexippus*). This plant is in the milkweed family and easily grown in Austin.

ECOSYSTEM SERVICES

From The Case for Sustainable Landscapes, Sustainable Sites Initiative, 2009

Ecosystem services are goods and services of direct or indirect benefit to humans that are produced by ecosystem processes involving the interaction of living elements, such as vegetation soil organisms, and non-living elements, such as bedrock, water, and air.

Researchers have come up with several lists of these benefits, each with slightly different wording, some lists slightly longer than other. The members of the Sustainable Sites Initiative's committees and staff have reviewed and consolidated the research into the following list of ecosystem services that a sustainable site can strive to protect or regenerate through sustainable land development and management practices.

Local climate regulation

Regulating local temperature, precipitation, and humidity through shading, evapotranspiration, and windbreaks

Water supply and regulation

Storing and providing water within watersheds and aquifers

Erosion and sediment control

Retaining soil within an ecosystem, preventing damage from erosion and siltation

Habitat functions

Providing refuge and reproduction habitat to plants and animals, thereby contributing to conservation of biological and genetic diversity and evolutionary processes

Global climate regulation

Maintaining balance of atmospheric gases at historic levels, creating breathable air, and sequestering greenhouse gases

Air and water cleansing

Removing and reducing pollutants in air and water

Hazard mitigation

Reducing vulnerability to damage from flooding, storm surge, wildfire, and drought

Pollination

Providing pollinator species for reproduction of crops and other plants

Waste decomposition and treatment

Breaking down waste and cycling nutrients

Human health and well-being benefits

Enhancing physical, mental, and social well-being as a result of interaction with nature

Food and renewable non-food products

Producing food, fuel, energy, medicine, or other products for human use

Cultural benefits

Enhancing cultural, educational, aesthetic, and spiritual experiences as a result of interaction with nature

CREATING ECOLOGICAL RESILIENCY

In addition to designing with ecological function in mind, landscapes at The University of Texas at Austin should be designed as resilient systems. Two basic resiliency objectives should be followed in campus planting design: minimize irrigation needs and minimize maintenance requirements and inputs. As landscapes are designed with these resiliency objectives, they will be more adaptive to changing climatic conditions and can be slowly weaned off most, if not all maintenance inputs. A survey was administered to the Landscape Services supervising staff to help rank the irrigation and maintenance needs for 70 different plant species occurring on campus. This information was used to give each plant a Resiliency Level of High (low irrigation/maintenance), Medium (medium irrigation/maintenance), or Low (high irrigation/maintenance). This information can be found in the Campus Plant List that follows.

DESIGN FOR LOW WATER USE

Water resources in Central Texas are becoming more and more precious; therefore, limiting the use of potable water on outdoor landscapes is incredibly important. For the past few years, the City of Austin has been implementing water restrictions as part of its Drought Contingency Plan. Currently in Stage 2 restrictions, outdoor watering is permitted one day a week. If conditions worsen, outdoor watering may be restricted entirely. The University must design systems that can recognize these conditions.

There are a few important principles to follow when designing planting for low water use. These principles include:

- Select plant species that are native or adapted to the conditions in Central Texas
- Select plants specifically suitable to the site conditions
- Select plant species that are generalists and can handle varying water inputs
- Select plant species or assemblages that can go dormant during drought conditions
- Use plant material that has been propagated and grown locally

DESIGN FOR LOW MAINTENANCE

Designing and selecting plant species that require less maintenance inputs can reduce resources used to maintain the landscape. In addition, it can promote healthier space for the campus community by reducing pollution. There are a few important principles to follow when designing planting for low maintenance; in general these principles include:

- Select plant species that require minimum fertilizer and pesticide use
- Select plant species or assemblages that require little to no mowing/pruning/thinning
- Select plant species that have exhibit consistently appealing architecture, thus requiring minimal pruning
- Select plant species that covers bare ground to minimize mulching needs



Nassella tenuissima, Mexican Feathergrass is a low water use plant well chosen for this sunny situation at the LBJ Presidential Library where its tendency to spread by self seeding is checked.

LIST OF RECOMMENDED PLANTS AND ASSEMBLAGES

The campus plant list is intended as a resource to assist in making planting design decisions that will serve to strengthen the above stated ecosystem services provided by the campus landscape. The plants on this list have been reviewed with campus Landscape Services and are the preferred plants for use on campus. They are all hardy in Austin, are reasonable to maintain (although maintenance requirements vary) are relatively free from chronic disease and pest problems, and most will not become pests themselves. The list should not be considered as completely exhaustive. Additional species can be added. The list includes both native and introduced species, however, most of the plants are native to the Edward's Plateau and Blackland Prairie bioregions. It is recognized that there are some conditions on campus where the types of use or a desired aesthetic effect will limit the ability to use native plants, such as in heavily used campus lawns, or in the broad neatly clipped Asian Jasmine (*Trachelospermum asiaticum*) beds of the core campus that suit the desired formal appearance of that area.

The suitability of plants to a specific set of project conditions will require judgment to match plants to the conditions of use, exposure, moisture, and soils on a case by case basis. The plant list offers information on sun exposure, moisture needs, and general resiliency. Resiliency is based on the maintenance requirements and irrigation need of each specific plant species. For example, a species with low water requirement and low maintenance requirements is labeled as HIGH resiliency. In addition, the general size of the plant and the likely areas of the campus landscape (courts, streets, etc.) in which the plant may best find applications. To further aid in this, there are a number of "plant assemblages" offered as models for successful plant combinations that are applicable within the different landscape types of the campus. The assemblages are examples, not requirements for planting design.

LEGEND		LIGHT		WATER USE		LANDSCAPE TYPOLOGIES	
●	sun	■	low	CI	civic	P	parkland
●◐	sun - part shade	■◐	low - medium	ST	street	SE	service + parking
●◑	sun - part shade - shade	■◑	medium	CQP	courts/quads/plazas	WC	waller creek
◐◑	part shade - shade	■◒	high	CO	connective space		

HABIT	SCIENTIFIC NAME	COMMON NAME	HEIGHT	NATIVE	SOIL MOISTURE	LIGHT	WATER USE	RESILIENCE	LANDSCAPE TYPOLOGIES							
									CI	ST	CQP	CO	P	SE	WC	
FORB/HERB	<i>Aquilegia canadensis</i>	Wild red columbine	2 ft	N	DRY - MOIST	●◐	■◐	MEDIUM			✓					✓
	<i>Argemone albiflora</i>	White pricklypoppy	3-6 ft	N	DRY	●	■	HIGH								✓
	<i>Asclepias asperula</i>	Antelope horns	1-2 ft	N	DRY - MOIST	●	■■	HIGH			✓				✓	✓
	<i>Asclepias tuberosa</i>	Butterfly weed	1-2 ft	N	DRY - MOIST	●◐	■	HIGH			✓				✓	✓
	<i>Asclepias viridis</i>	Green milkweed	1-3 ft	N	MOIST	●	■	HIGH			✓				✓	✓
	<i>Callirhoe involucrata</i>	Winecup	0.5-1 ft	N	DRY - MOIST	●◐	■■	MEDIUM			✓				✓	✓
	<i>Calyptocarpus vialis</i>	Horseherb	0.5-1 ft	N	DRY - MOIST	●◐◑	■◐	HIGH			✓				✓	✓
	<i>Capsicum annuum</i>	Chile pequin	1-3 ft	N	MOIST	●◐◑	■	HIGH			✓					
	<i>Castilleja indivisa</i>	Indian paintbrush	0.5-1 ft	N	DRY	●	■	HIGH								✓
	<i>Chamaecrista fasciculata</i>	Partridge pea	1-3 ft	N	DRY - MOIST	●◐	■	HIGH								✓
	<i>Dalea greggii</i>	Greg's dalea	0.5-0.75 ft	N	DRY	●◐	■	HIGH				✓	✓			✓
	<i>Dichondra argentea</i>	Silver ponyfoot	0.5 ft	N	DRY	●◐	■■	MEDIUM				✓	✓			✓
	<i>Dietes bicolor</i>	Bicolor iris	1.5 - 2 ft		MOIST	●◐	■■	MEDIUM	✓			✓	✓			✓
	<i>Echinacea purpurea</i>	Purple coneflower	2-5 ft	N	DRY	●◐	■■	MEDIUM				✓			✓	✓
	<i>Equisetum hyemale</i>	Horsetail	3 ft	N	MOIST	●◐◑	■■	MEDIUM				✓				
	<i>Gaillardia pulchella</i>	Indian blanket	1-2 ft	N	DRY	●◐	■◐	HIGH				✓				✓
	<i>Helianthus maximiliani</i>	Maximilian sunflower	3-10 ft	N	DRY - MOIST	●	■	HIGH								✓
	<i>Liatriis mucronata</i>	Gayfeather	1-3 ft	N	DRY	●	■	HIGH				✓				✓
	<i>Liriope muscari</i>	Lilyturf	1-1.5 ft		MOIST	●◐	■■	MEDIUM	✓	✓		✓	✓			✓
	<i>Lupinus texensis</i>	Texas bluebonnet	0.5-1.5 ft	N	DRY	●	■	HIGH				✓				✓
	<i>Monarda citriodora</i>	Lemon beebalm	1-2 ft	N	DRY	●◐	■	HIGH								✓
	<i>Oenothera speciosa</i>	Pink evening primrose	1-2 ft	N	DRY - MOIST	●	■◐	HIGH				✓				✓
	<i>Phyla nodiflora</i>	Texas frogfruit	6-1 ft	N	DRY - MOIST	●◐	■◐	MEDIUM				✓	✓			✓
	<i>Rudbeckia hirta</i>	Blackeyed Susan	1-3ft	N	DRY - MOIST	●◐◑	■	HIGH				✓				✓
	<i>Salvia farinacea</i>	Mealy blue sage	2-3 ft	N	MOIST	●	■	HIGH				✓				✓
<i>Salvia roemeriana</i>	Cedar sage	1-2 ft	N	DRY	●◐◑	■	HIGH	✓	✓		✓	✓			✓	
<i>Scutellaria ovata</i>	Heartleaf skullcap	1-3 ft	N	MOIST	●◐◑	■■	MEDIUM				✓	✓			✓	
<i>Stemodia lanata</i>	Woolly stemodia	0.5-1 ft	N	DRY	●	■	HIGH				✓					
<i>Symphotrichum oblongifolium</i>	Fall aster	1.5 ft	N	DRY - MOIST	●◐	■	MEDIUM				✓				✓	
<i>Trachelospermum asiaticum</i>	Asian jasmine	0.25 - 0.5 ft		MOIST	●◐◑	■■	MEDIUM	✓				✓			✓	

HABIT	SCIENTIFIC NAME	COMMON NAME	HEIGHT	NATIVE	SOIL MOISTURE	LIGHT	WATER USE	RESILIENCE	LANDSCAPE TYPOLOGIES							
									CI	ST	CQP	CO	P	SE	WC	
FORB	<i>Tradescantia gigantea</i>	Giant spiderwort	1-3 ft	N	MOIST	☉☐	■ ■	MEDIUM			✓					✓
GRASS/GRASS-LIKE	<i>Andropogon gerardii</i>	Big bluestem	3-6 ft	N	DRY - MOIST	☉☐	■ ■	HIGH			✓		✓		✓	
	<i>Andropogon glomeratus</i>	Bushy bluestem	2-5 ft	N	DRY - MOIST	☉	■ ■	HIGH			✓		✓		✓	
	<i>Aristida purpurea</i>	Purple threeawn	1-2 ft	N	DRY	☉	■	HIGH					✓			
	<i>Bothriochloa barbinodis</i>	Cane bluestem	3-6 ft	N	DRY	☉	■ ■	MEDIUM					✓			
	<i>Bouteloua curtipendula</i>	Sideoats grama	2-3 ft	N	DRY - MOIST	☉☐	■ ■	HIGH					✓		✓	
	<i>Bouteloua dactyloides</i>	Buffalograss	0.5-1 ft	N	DRY	☉	■ ■	HIGH			✓	✓	✓	✓	✓	
	<i>Bouteloua gracilis</i>	Blue grama	1-1.25 ft	N	DRY	☉	■ ■	HIGH			✓	✓	✓	✓	✓	
	<i>Carex cherokeensis</i>	Cherokee sedge	1-1.5 ft	N	MOIST	☐☉	■ ■	MEDIUM	✓	✓	✓	✓		✓	✓	
	<i>Carex divulsa</i>	Berkeley sedge	1-1.5 ft		MOIST	☉☐	■ ■	MEDIUM	✓	✓	✓	✓			✓	
	<i>Carex retroflexa</i>	Reflexed sedge	0.5-1 ft	N	DRY - MOIST	☉☐	■ ■	MEDIUM	✓	✓	✓	✓		✓	✓	
	<i>Carex texensis</i>	Texas sedge	0.75-1 ft	N	DRY - MOIST	☉☐	■ ■	MEDIUM	✓	✓	✓	✓		✓	✓	
	<i>Chasmanthium latifolium</i>	Inland sea oats	2-4 ft	N	MOIST	☐☉	■ ■	MEDIUM			✓		✓		✓	
	<i>Cynodon dactylon</i>	Bermudagrass (sterile)	0.25-0.5 ft		DRY	☉☐	■	LOW	✓		✓					
	<i>Elymus canadensis</i>	Prairie wildrye	2-4 ft	N	MOIST	☉☐	■ ■	MEDIUM					✓			
	<i>Hilaria belangeri</i>	Curly mesquite	0.25-1 ft	N	DRY	☉	■	HIGH			✓	✓	✓	✓	✓	
	<i>Leptochloa dubia</i>	Green sprangletop	2-3 ft	N	DRY	☐☉	■ ■	HIGH					✓			
	<i>Muhlenbergia capillaris</i>	Gulf muhly	1.5-3 ft	N	MOIST	☉	■ ■ ■	MEDIUM	✓		✓	✓		✓		
	<i>Muhlenbergia dubia</i>	Pine muhly	1-3 ft	N	DRY	☉	■	HIGH	✓	✓	✓	✓	✓	✓	✓	
	<i>Muhlenbergia lindheimeri</i>	Big muhly	2-5 ft	N	DRY - MOIST	☉	■ ■	MEDIUM	✓		✓	✓		✓		
	<i>Nassella leucotricha</i>	Texas wintergrass	1-3 ft	N	DRY - MOIST	☉☐☉	■	HIGH	✓		✓	✓	✓	✓	✓	
	<i>Nolina texana</i>	Texas beargrass	1-3 ft	N	DRY	☐☉	■	HIGH	✓	✓	✓	✓		✓		
	<i>Panicum virgatum</i>	Switchgrass (upland)	3-6 ft	N	DRY - MOIST	☉☐	■ ■	HIGH					✓		✓	
	<i>Poa arachnifera</i>	Texas bluegrass	1-2 ft	N	MOIST	☉☐☉	■ ■	MEDIUM	✓	✓	✓	✓	✓	✓	✓	
	<i>Schizachyrium scoparium</i>	Little Bluestem	1.5-2 ft	N	DRY	☉☐	■	HIGH					✓		✓	
	<i>Sorghastrum nutans</i>	Indiangrass	3-8 ft	N	DRY - MOIST	☉☐☉	■ ■	HIGH					✓		✓	
	<i>Stenotaphrum secundatum</i>	St. Augustine	0.25 ft		M	☐☉	■ ■ ■	LOW	✓			✓	✓			

LEGEND

LIGHT
 ☉ sun
 ☉☐ sun - part shade
 ☉☐☉ sun - part shade - shade
 ☐☉ part shade - shade

WATER USE
 ■ low
 ■ ■ low - medium
 ■ ■ ■ medium
 ■ ■ ■ ■ high

LANDSCAPE TYPOLOGIES
 CI civic
 ST street
 CQP courts/quads/plazas
 CO connective space
 P parkland
 SE service + parking
 WC waller creek

HABIT	SCIENTIFIC NAME	COMMON NAME	HEIGHT	NATIVE	SOIL MOISTURE	LIGHT	WATER USE	RESILIENCE	LANDSCAPE TYPOLOGIES						
									CI	ST	CQP	CO	P	SE	WC
GRASS	<i>Tripsacum dactyloides</i>	Eastern gamagrass	3-6 ft	N	MOIST	☉☐	■ ■ ■	MEDIUM					✓		✓
	<i>Zoysia sp.</i>	Zoysia	0.25 ft		MOIST	☐	■ ■	LOW	✓	✓	✓		✓		
FERN	<i>Thelypteris kunthii</i>	Wood fern	2-3 ft	N	MOIST	☐☉	■ ■	MEDIUM	✓	✓	✓				✓
CACTUS/SUCCULENT	<i>Hesperaloe parviflora</i>	Red yucca	2-3 ft	N	DRY	☉	■	HIGH			✓	✓		✓	
	<i>Opuntia ellisiana</i>	Spineless prickly pear	3-6 ft	N	DRY	☉☐	■	HIGH			✓				
	<i>Yucca pallida</i>	Pale-leaf yucca	2 ft	N	DRY	☉☐	■	HIGH			✓				
	<i>Yucca rupicola</i>	Twistleaf yucca	2 ft	N	DRY	☉☐	■	HIGH	✓		✓				
	<i>Yucca treculeana</i>	Spanish dagger	6-12 ft	N	DRY	☉☐	■ ■	HIGH			✓				
VINE	<i>Campsis radicans</i>	Trumpet vine	35 ft	N	DRY - MOIST	☉	■	LOW			✓				
	<i>Ficus pumila</i>	Climbing fig	15 ft		MOIST	☉☐	■ ■	MEDIUM			✓	✓		✓	
	<i>Gelsemium sempevirens</i>	Carolina jessamine	10-20 ft	N	MOIST	☉☐	■ ■	MEDIUM			✓	✓		✓	
	<i>Jasminum mesnyi</i>	Japanese jasmine	5-10 ft		MOIST	☉☐	■ ■	MEDIUM			✓	✓		✓	
	<i>Parthenocissus quinquefolia</i>	Virginia creeper	40 ft	N	MOIST	☉☐☉	■	MEDIUM	✓		✓	✓		✓	
SHRUB	<i>Buxus sp.</i>	Boxwood	15-25 ft		MOIST	☉☐	■ ■	MEDIUM	✓			✓		✓	
	<i>Callicarpa americana</i>	American beautyberry	3-6 ft	N	MOIST	☉☐	■	HIGH			✓			✓	
	<i>Dalea candida</i>	White prairie clover	2-3 ft	N	DRY	☉	■ ■	HIGH					✓		
	<i>Dasyllirion wheeleri</i>	Common sotol	3-6 ft	N	DRY	☉	■	HIGH			✓				
	<i>Desmanthus illinoensis</i>	Illinois bundleflower	1-3 ft	N	MOIST	☉	■ ■	MEDIUM					✓		
	<i>Ilex decidua</i>	Possomhaw	15-30 feet	N	MOIST	☉☐	■ ■	MEDIUM			✓	✓		✓	
	<i>Justicia spicigera</i>	Mexican honeysuckle	3-4 ft		MOIST	☉☐	■ ■	MEDIUM			✓	✓		✓	
	<i>Lantana urticoides</i>	Texas lantana	0.25 - 0.35 ft	N	DRY	☉	■	HIGH			✓				
	<i>Leucophyllum frutescens</i>	Cenizo	2-8 ft	N	DRY	☉☐	■	HIGH			✓	✓		✓	
	<i>Malvaviscus arboreus var. drummondii</i>	Turk's cap	2-3 ft	N	DRY - MOIST	☐☉	■ ■	MEDIUM			✓	✓		✓	
	<i>Morella cerifera</i>	Wax myrtle	6-12 ft	N	MOIST	☉☐	■ ■ ■	MEDIUM	✓		✓	✓	✓	✓	
	<i>Nolina lindheimeriana</i>	Devil's shoestring	1-3 ft	N	DRY	☉☐	■	HIGH	✓	✓	✓	✓		✓	
	<i>Pavonia lasiopetala</i>	Rock rose	4 ft	N	DRY	☉☐	■	HIGH			✓	✓		✓	
	<i>Sabal minor</i>	Dwarf palmetto	5-10 ft	N	DRY - MOIST	☉☐☉	■ ■	HIGH	✓		✓	✓		✓	
	<i>Salvia greggii</i>	Autumn sage	2-3 ft	N	DRY	☉	■ ■	MEDIUM			✓				
	<i>Sphaeralcea incana</i>	Gray globemallow	3-6 ft	N	DRY - MOIST	☉☐	■ ■	MEDIUM			✓				
	<i>Symphoricarpos orbiculatus</i>	Coralberry	4-6 ft	N	MOIST	☐☉	■ ■	MEDIUM			✓				

HABIT	SCIENTIFIC NAME	COMMON NAME	HEIGHT	NATIVE	SOIL MOISTURE	LIGHT	WATER USE	RESILIENCE	LANDSCAPE TYPOLOGIES							
									CI	ST	CQP	CO	P	SE	WC	
TREE/SHRUB	<i>Acer grandidentatum</i>	Bigtooth maple	10-15 ft	N	MOIST	●	■ ■	MEDIUM	✓	✓	✓	✓	✓	✓	✓	✓
	<i>Aesculus pavia</i>	Red buckeye	10-40 ft	N	MOIST	●	■ ■	HIGH			✓		✓			✓
	<i>Bauhinia lunarioides</i>	Orchid tree	6-12 ft	N	DRY	●	■	MEDIUM			✓	✓			✓	
	<i>Cercis canadensis var. mexicana</i>	Mexican redbud	6-12 ft	N	DRY	● ●	■ □	HIGH			✓	✓	✓	✓	✓	✓
	<i>Diospyros texana</i>	Texas persimmon	10-15 ft	N	DRY	● ●	■	HIGH			✓	✓	✓	✓	✓	✓
	<i>Ilex vomitoria</i>	Yaupon holly	12-45 ft	N	DRY - MOIST	● ● ○	■	HIGH			✓	✓	✓	✓	✓	✓
	<i>Lagerstroemia indica</i>	Crepe myrtle	4-12 ft		MOIST	●	■ ■	MEDIUM	✓		✓	✓	✓	✓		
	<i>Senna corymbosa</i>	Flowering senna	6-8 ft		MOIST	●	■ ■	MEDIUM			✓	✓			✓	
	<i>Sophora secundiflora</i>	Texas mountain laurel	10-15 ft	N	DRY - MOIST	● ●	■ □	HIGH	✓		✓	✓			✓	✓
	<i>Ungnadia speciosa</i>	Mexican buckeye	8-12 ft	N	DRY	● ●	■	HIGH			✓	✓	✓	✓		
	TREE	<i>Acacia farnesiana</i>	Huisache	15-25 ft	N	DRY	●	■	MEDIUM			✓		✓		
<i>Aesculus glabra var. arguta</i>		Texas buckeye	10-25 ft	N	MOIST	●	■ ■	MEDIUM			✓					✓
<i>Carya illinoensis</i>		Pecan	70-100 ft	N	MOIST	●	■ ■ ■	MEDIUM					✓		✓	
<i>Celtis laevigata</i>		Hackberry	60-80 ft	N	DRY	●	■	MEDIUM					✓		✓	
<i>Chilopsis linearis</i>		Desert willow	15-40 ft	N	DRY - MOIST	●	■ ■	HIGH			✓	✓	✓	✓		
<i>Cornus drummondii</i>		Roughleaf dogwood	16 ft	N	DRY - MOIST	● ● ○	■	HIGH			✓	✓	✓	✓	✓	✓
<i>Cotinus obovatus</i>		American smoke tree	15-30 ft	N	DRY	● ●	■	HIGH			✓	✓	✓	✓		
<i>Fraxinus albicans</i>		Texas ash	30-45 ft	N	DRY	●	■	HIGH	✓	✓			✓		✓	
<i>Hesperocyparis arizonica</i>		Arizona cypress	50-60 ft	N	DRY	● ● ○	■	MEDIUM	✓	✓		✓	✓	✓		
<i>Juglans nigra</i>		Walnut	50-75 ft	N	MOIST	● ●	■ ■ ■	MEDIUM	✓				✓		✓	
<i>Leucaena retusa</i>		Goldenball leadtree	12-15 ft	N	DRY	●	■	HIGH			✓	✓	✓	✓		
<i>Parkinsonia aculeata</i>		Retama	12-39 ft	N	DRY - MOIST	●	■ □	HIGH			✓	✓	✓	✓	✓	✓
<i>Platanus mexicana</i>		Mexican sycamore	50 ft		MOIST	● ●	■ □	HIGH	✓	✓	✓	✓	✓	✓	✓	✓
<i>Prosopis glandulosa</i>		Mesquite	30 ft	N	DRY	●	■	MEDIUM			✓	✓	✓	✓		
<i>Prunus mexicana</i>		Mexican plum	15-35 ft	N	DRY - MOIST	● ●	■	HIGH			✓	✓	✓	✓	✓	✓
<i>Quercus buckleyi</i>		Texas red oak	50 ft	N	DRY	● ●	■	HIGH	✓	✓	✓	✓	✓	✓	✓	✓
<i>Quercus fusiformis</i>		Escarpment live oak	20-40 ft	N	DRY	● ●	■	HIGH	✓	✓	✓	✓	✓	✓	✓	✓

LEGEND		LIGHT	WATER USE	LANDSCAPE TYPOLOGIES			
●	sun	■	low	CI	civic	P	parkland
● ●	sun - part shade	■ □	low - medium	ST	street	SE	service + parking
● ● ○	sun - part shade - shade	■ ■	medium	CQP	courts/quads/plazas	WC	waller creek
● ○	part shade - shade	■ ■ ■	high	CO	connective space		

HABIT	SCIENTIFIC NAME	COMMON NAME	HEIGHT	NATIVE	SOIL MOISTURE	LIGHT	WATER USE	RESILIENCE	LANDSCAPE TYPOLOGIES							
									CI	ST	CQP	CO	P	SE	WC	
TREE	<i>Quercus laceyi</i>	Lacey oak	60 ft	N	DRY	●	■	HIGH	✓	✓	✓	✓	✓	✓	✓	
	<i>Quercus macrocarpa</i>	Bur oak	72-100 ft	N	DRY - MOIST	● ● ○	■ ■	MEDIUM	✓	✓	✓	✓	✓	✓	✓	✓
	<i>Quercus muehlenbergii</i>	Chinkapin oak	72-100 ft	N	DRY	● ●	■ ■	MEDIUM	✓	✓	✓	✓	✓	✓	✓	✓
	<i>Quercus nigra</i>	Water oak	50-100 ft	N	MOIST	●	■ ■ ■	MEDIUM								✓
	<i>Quercus polymorpha</i>	Mexican white oak	80 ft	N	MOIST	● ●	■ ■	HIGH	✓	✓	✓	✓	✓	✓	✓	✓
	<i>Quercus shumardii</i>	Shumard oak	50-90 ft	N	DRY - MOIST	● ●	■ ■	MEDIUM	✓	✓	✓	✓			✓	✓
	<i>Quercus sinuata var. breviloba</i>	White shin oak	36-72 ft	N	DRY	●	■	HIGH	✓	✓	✓	✓	✓	✓	✓	✓
	<i>Quercus stellata</i>	Post oak	40-50 ft	N	DRY	●	■ ■	HIGH	✓	✓	✓	✓	✓	✓	✓	✓
	<i>Quercus virginiana</i>	Southern live oak	40-80 ft	N	MOIST	● ●	■ ■	MEDIUM	✓		✓	✓	✓	✓	✓	✓
	<i>Rhus lanceolata</i>	Flame-leaf sumac	20 ft	N	DRY	● ●	■ □	MEDIUM			✓					
	<i>Sabal mexicana</i>	Texas palm	50 ft	N	DRY - MOIST	●	■ ■	MEDIUM							✓	
	<i>Styphnolobium affine</i>	Eve's necklace	15-30 ft	N	DRY	●	■	MEDIUM			✓	✓			✓	✓
	<i>Taxodium distichum</i>	Bald cypress	50-75 ft	N	MOIST	● ●	■ ■	MEDIUM			✓		✓		✓	✓
	<i>Taxodium mucronatum</i>	Montezuma cypress	36-72 ft	N	MOIST	●	■ ■ ■	MEDIUM			✓		✓		✓	✓
	<i>Ulmus americana</i>	American elm	60-80 ft	N	MOIST	● ●	■ ■ ■	MEDIUM	✓	✓	✓	✓	✓	✓	✓	✓
	<i>Ulmus crassifolia</i>	Cedar elm	50-70 ft	N	MOIST	●	■ ■	HIGH	✓	✓	✓	✓	✓	✓	✓	✓
	<i>Ulmus parvifolia</i>	Lacebark elm	40-50 ft		MOIST	● ○	■ ■	MEDIUM			✓	✓	✓	✓	✓	✓
<i>Viburnum rufidulum</i>	Rusty blackhaw	18 ft	N	DRY	●	■	HIGH			✓	✓	✓	✓	✓	✓	

PLANT ASSEMBLAGES

MID-GRASS PRAIRIE ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Asclepias asperula</i>	Antelope horns
<i>Argemone albiflora</i>	White pricklypoppy
<i>Aristida purpurea</i>	Purple threeawn
<i>Asclepias tuberosa</i>	Butterfly weed
<i>Asclepias viridis</i>	Green milkweed
<i>Bouteloua curtipendula</i>	Sideoats grama
<i>Bouteloua dactyloides</i>	Buffalograss
<i>Bouteloua gracilis</i>	Blue grama
<i>Callirhoe involucrata</i>	Winecup
<i>Castilleja indivisa</i>	Indian paintbrush
<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Dalea candida</i>	White prairie clover
<i>Echinacea purpurea</i>	Purple coneflower
<i>Elymus canadensis</i>	Prairie wildrye
<i>Gaillardia pulchella</i>	Indian blanket
<i>Hilaria belangeri</i>	Curly mesquite
<i>Leptochloa dubia</i>	Green sprangletop
<i>Lupinus texensis</i>	Texas bluebonnet
<i>Monarda citriodora</i>	Lemon beebalm
<i>Nassella leucotricha</i>	Texas wintergrass
<i>Oenothera speciosa</i>	Pink evening primrose
<i>Rudbeckia hirta</i>	Blackeyed Susan
<i>Salvia farinacea</i>	Mealy blue sage
<i>Schizachyrium scoparium</i>	Little Bluestem

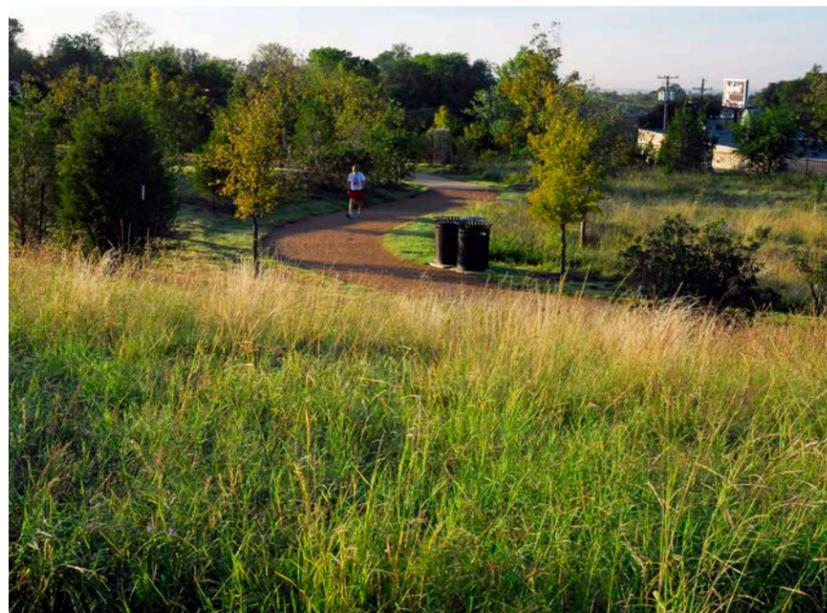
CONDITIONS: ● ○ ○ ■ □ □

SUITABLE LANDSCAPE TYPOLOGIES: **P WC**

RESILIENCE LEVEL: **HIGH**



Mid-grass Prairie Assemblage, photo taken at the Mueller Development, Austin, Texas.



Mid-grass Prairie Assemblage, photo taken at the Mueller Development, Austin, Texas.

MID-GRASS SAVANNAH ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Asclepias asperula</i>	Antelope horns
<i>Argemone albiflora</i>	White pricklypoppy
<i>Aristida purpurea</i>	Purple threeawn
<i>Asclepias tuberosa</i>	Butterfly weed
<i>Asclepias viridis</i>	Green milkweed
<i>Bouteloua curtipendula</i>	Sideoats grama
<i>Bouteloua dactyloides</i>	Buffalograss
<i>Bouteloua gracilis</i>	Blue grama
<i>Callirhoe involucrata</i>	Winecup
<i>Castilleja indivisa</i>	Indian paintbrush
<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Dalea candida</i>	White prairie clover
<i>Echinacea purpurea</i>	Purple coneflower
<i>Elymus canadensis</i>	Prairie wildrye
<i>Gaillardia pulchella</i>	Indian blanket
<i>Hilaria belangeri</i>	Curly mesquite
<i>Leptochloa dubia</i>	Green sprangletop
<i>Lupinus texensis</i>	Texas bluebonnet
<i>Monarda citriodora</i>	Lemon beebalm
<i>Nassella leucotricha</i>	Texas wintergrass
<i>Oenothera speciosa</i>	Pink evening primrose
<i>Rudbeckia hirta</i>	Blackeyed Susan
<i>Salvia farinacea</i>	Mealy blue sage
<i>Schizachyrium scoparium</i>	Little Bluestem
NA	Native overstory tree

CONDITIONS: ● ● ○ ■ □ □

SUITABLE LANDSCAPE TYPOLOGIES: **CQP P WC**

RESILIENCE LEVEL: **HIGH**

LEGEND	LIGHT	WATER USE	LANDSCAPE TYPOLOGIES
	<ul style="list-style-type: none"> ● sun ●◐ sun - part shade ●◑ sun - part shade - shade ◐◑ part shade - shade 	<ul style="list-style-type: none"> ■ low ■◐ low - medium ■◑ medium ■◒ high 	<ul style="list-style-type: none"> CI civic ST street CQP courts/quads/plazas CO connective space



Mid-grass Savannah Assemblage, photo taken at the Water Quality Protection Lands, Austin, Texas.



Mid-grass Savannah Assemblage, photo taken at the George W. Bush Presidential Library at Southern Methodist University, Dallas, Texas.

TALL-GRASS PRAIRIE ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Andropogon gerardii</i>	Big bluestem
<i>Andropogon glomeratus</i>	Bushy bluestem
<i>Argemone albiflora</i>	White pricklypoppy
<i>Asclepias tuberosa</i>	Butterfly weed
<i>Asclepias viridis</i>	Green milkweed
<i>Bouteloua curtipendula</i>	Sideoats grama
<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Dalea candida</i>	White prairie clover
<i>Desmanthus illinoensis</i>	Illinois bundleflower
<i>Echinacea purpurea</i>	Purple coneflower
<i>Elymus canadensis</i>	Prairie wildrye
<i>Helianthus maximiliani</i>	Maximilian sunflower
<i>Leptochloa dubia</i>	Green sprangletop
<i>Liatis mucronata</i>	Gayfeather
<i>Monarda citriodora</i>	Lemon beebalm
<i>Panicum virgatum</i>	Switchgrass (upland)
<i>Rudbeckia hirta</i>	Blackeyed Susan
<i>Schizachyrium scoparium</i>	Little Bluestem
<i>Sorghastrum nutans</i>	Indiangrass

CONDITIONS: ● ○ ○ ■ □ □

SUITABLE LANDSCAPE TYPOLOGIES: **CQP P WC**

RESILIENCE LEVEL: **HIGH**



Tall-grass Prairie Assemblage, photo taken at the George W. Bush Presidential Library at Southern Methodist University, Dallas, Texas.



Tall-grass Prairie Assemblage, photo taken at the George W. Bush Presidential Library at Southern Methodist University, Dallas, Texas.

NATIVE TURF ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Bouteloua dactyloides</i>	Buffalograss
<i>Bouteloua gracilis</i>	Blue grama
<i>Bouteloua rigidiseta</i>	Texas grama (optional)
<i>Hilaria belangeri</i>	Curly mesquite

CONDITIONS: ● ○ ○ ■ □ □

SUITABLE LANDSCAPE TYPOLOGIES: **CI CQP CO P SE WC**

RESILIENCE LEVEL: **HIGH**



Native Turf Assemblage, photo taken at the University of Texas, Austin, Texas.

NATIVE TURF / SPRING WILDFLOWER ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Bouteloua dactyloides</i>	Buffalograss
<i>Bouteloua gracilis</i>	Blue grama
<i>Callirhoe involucrata</i>	Winecup
<i>Castilleja indivisa</i>	Indian paintbrush
<i>Hilaria belangeri</i>	Curly mesquite
<i>Lupinus texensis</i>	Texas bluebonnet
<i>Oenothera speciosa</i>	Pink evening primrose

CONDITIONS: ● ○ ○ ■ □ □

SUITABLE LANDSCAPE TYPOLOGIES: **CQP CO P SE WC**

RESILIENCE LEVEL: **MEDIUM**



Native Turf / Wildflower Assemblage, photo taken at the Lady Bird Johnson Wildflower Center, Austin, Texas.

LEGEND	LIGHT	WATER USE	LANDSCAPE TYPOLOGIES
	<ul style="list-style-type: none"> ● sun ●○ sun - part shade ●○ sun - part shade - shade ○● part shade - shade 	<ul style="list-style-type: none"> ■ low ■□ low - medium ■□ medium ■□ high 	<ul style="list-style-type: none"> CI civic ST street CQP courts/quads/plazas CO connective space P parkland SE service + parking WC waller creek

NOLINA / PERSIMMON ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Diospyros texana</i>	Texas persimmon
<i>Nolina texana</i>	Texas beargrass
NA	Native overstory tree (optional)

CONDITIONS:

SUITABLE LANDSCAPE TYPOLOGIES: **CQP CO SE**

RESILIENCE LEVEL: **MEDIUM**



Nolina / Persimmon Assemblage, photo taken at the Lady Bird Johnson Wildflower Center, Austin, Texas.

NOLINA / TWISTLEAF YUCCA / YAUPON ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Ilex vomitoria</i>	Yaupon holly
<i>Nolina texana</i>	Texas beargrass
<i>Yucca rupicola</i>	Twistleaf yucca
NA	Native overstory tree (optional)

CONDITIONS:

SUITABLE LANDSCAPE TYPOLOGIES: **CQP CO SE**

RESILIENCE LEVEL: **MEDIUM**



Nolina / Twistleaf Yucca / Yaupon Assemblage, photo taken at the Lady Bird Johnson Wildflower Center, Austin, Texas.

LEGEND	LIGHT	WATER USE	LANDSCAPE TYPOLOGIES	
	<input type="radio"/> sun <input checked="" type="radio"/> sun - part shade <input type="radio"/> sun - part shade - shade <input type="radio"/> part shade - shade	<input checked="" type="checkbox"/> low <input type="checkbox"/> low - medium <input type="checkbox"/> medium <input type="checkbox"/> high	CI civic ST street CQP courts/quads/plazas CO connective space	P parkland SE service + parking WC waller creek

TX BLUEGRASS / PERSIMMON / OAK ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Diospyros texana</i>	Texas persimmon
<i>Poa arachnifera</i>	Texas bluegrass
NA	Native overstory tree (optional)

CONDITIONS:

SUITABLE LANDSCAPE TYPOLOGIES: **CQP CO SE WC**

RESILIENCE LEVEL: **MEDIUM**



Texas Bluegrass / Persimmon Assemblage, photo taken at the Lady Bird Johnson Wildflower Center, Austin, Texas.

DWARF PALMETTO / CEDAR ELM ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Sabal minor</i>	Dwarf palmetto
<i>Ulmus crassifolia</i>	Cedar elm
NA	Other native overstory tree

CONDITIONS:

SUITABLE LANDSCAPE TYPOLOGIES: **CQP CO SE WC**

RESILIENCE LEVEL: **HIGH**



Dwarf Palmetto / Cedar Elm Assemblage, photo taken at the Lady Bird Johnson Wildflower Center, Austin, Texas.

CORALBERRY / OAK ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Quercus shumardii</i>	Shumard oak
<i>Symphoricarpos orbiculatus</i>	Coralberry
NA	Other native overstory tree

CONDITIONS:

SUITABLE LANDSCAPE TYPOLOGIES: **CI CQP CO SE**

RESILIENCE LEVEL: **MEDIUM**



Coralberry / Oak Assemblage, photo taken at the Lady Bird Johnson Wildflower Center, Austin, Texas.

CORALBERRY / DESERT WILLOW ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Chilopsis linearis</i>	Desert willow
<i>Symphoricarpos orbiculatus</i>	Coralberry

CONDITIONS:

SUITABLE LANDSCAPE TYPOLOGIES: **CQP**

RESILIENCE LEVEL: **MEDIUM**



Coralberry / Desert Willow Assemblage, photo taken at the Mueller Development, Austin, Texas.

GLOBEMALLOW / GOLDEN BALL LEADTREE ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Leucaena retusa</i>	Goldenball leadtree
<i>Sphaeralcea incana</i>	Gray globemallow
NA	Other native overstory shrub

CONDITIONS:

SUITABLE LANDSCAPE TYPOLOGIES: **CQP**

RESILIENCE LEVEL: **HIGH**



Globemallow / Golden Ball Leadtree Assemblage, photo taken at the Lady Bird Johnson Wildflower Center, Austin, Texas.

SPANISH DAGGER / MESQUITE ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Prosopis glandulosa</i>	Mesquite
<i>Yucca treculeana</i>	Spanish dagger
NA	Other native overstory tree

CONDITIONS:

SUITABLE LANDSCAPE TYPOLOGIES: **CQP**

RESILIENCE LEVEL: **HIGH**



Spanish Dagger / Mesquite Assemblage, photo taken at the Belo Center for New Media at the University of Texas, Austin, Texas.

LEGEND	LIGHT	WATER USE	LANDSCAPE TYPOLOGIES
	<input checked="" type="radio"/> sun <input checked="" type="radio"/> sun - part shade <input checked="" type="radio"/> sun - part shade - shade <input checked="" type="radio"/> part shade - shade	<input checked="" type="checkbox"/> low <input checked="" type="checkbox"/> low - medium <input checked="" type="checkbox"/> medium <input checked="" type="checkbox"/> high	CI civic ST street CQP courts/quads/plazas CO connective space

SHORT EPHEMERAL STORWATER FEATURE ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Carex cherokeensis</i>	Cherokee sedge
<i>Carex retroflexa</i>	Reflexed sedge
<i>Chasmanthium latifolium</i>	Inland seaoats
NA	Native overstory tree or shrub

CONDITIONS: ● ◐ ○ ■ ■ □

SUITABLE LANDSCAPE TYPOLOGIES: **CI ST CQP CO SE WC**

RESILIENCE LEVEL: **MEDIUM**



Short Ephemeral Stormwater Feature, photo taken at the George W. Bush Presidential Library at Southern Methodist University, Dallas, Texas.

TALL EPHEMERAL STORWATER FEATURE ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Andropogon glomeratus</i>	Bushy bluestem
<i>Bothriochloa barbinodis</i>	Cane bluestem
<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Helianthus maximiliani</i>	Maximilian sunflower
<i>Rudbeckia hirta</i>	Blackeyed Susan

CONDITIONS: ● ◐ ○ ■ ■ □

SUITABLE LANDSCAPE TYPOLOGIES: **CQP CO P SE WC**

RESILIENCE LEVEL: **MEDIUM**



Tall Ephemeral Stormwater Feature, photo taken at the George W. Bush Presidential Library at Southern Methodist University, Dallas, Texas.

LEGEND	LIGHT		WATER USE		LANDSCAPE TYPOLOGIES	
	● sun	◐ sun - part shade	■ low	■ low - medium	CI civic	P parkland
	● ◐ sun - part shade - shade	■ medium	■ high	ST street	SE service + parking	
	◐ ◐ part shade - shade			CQP courts/quads/plazas	WC waller creek	
				CO connective space		

STERILE BERMUDA / BOXWOOD ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Buxus sp.</i>	Boxwood
<i>Cynodon dactylon</i>	Bermudagrass (sterile)
NA	Native overstory tree (optional)

CONDITIONS: ● ○ ○ ■ ■ □

SUITABLE LANDSCAPE TYPOLOGIES: **CI ST CO SE**

RESILIENCE LEVEL: **LOW**



Sterile Bermuda / Boxwood Assemblage, photo taken at the University of Texas, Austin, Texas.

ASIAN JASMINE / DWARF YAUPON ASSEMBLAGE

RECOMMENDED SPECIES:

SCIENTIFIC NAME	COMMON NAME
<i>Ilex vomitoria</i>	Yaupon holly
<i>Trachelospermum asiaticum</i>	Asian jasmine
NA	Native overstory tree (optional)

CONDITIONS: ● ◐ ○ ■ ■ □

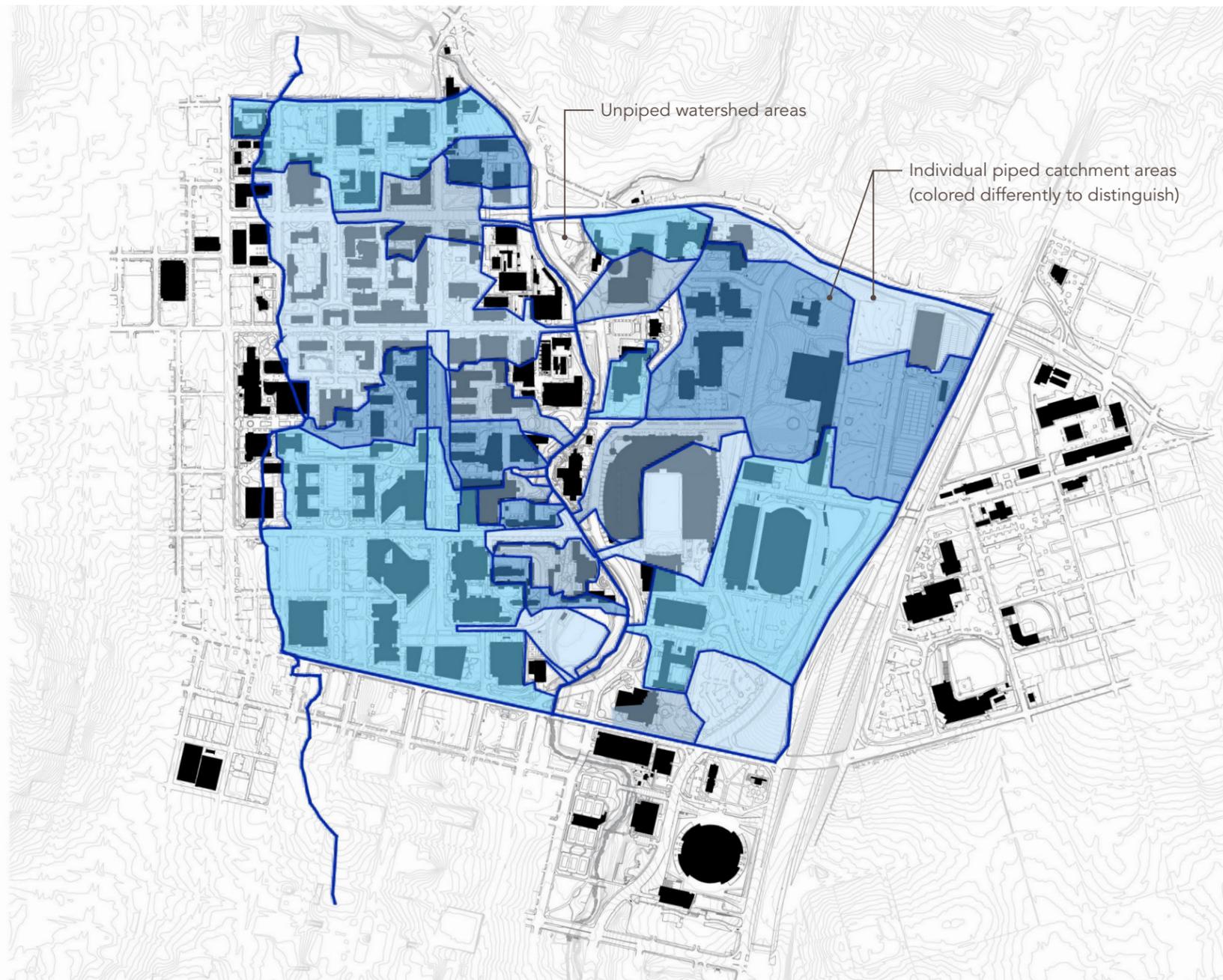
SUITABLE LANDSCAPE TYPOLOGIES: **CI ST CO SE**

RESILIENCE LEVEL: **LOW**



Asian Jasmine/Yaupon assemblage, photo taken at Speedway at the University of Texas, Austin, Texas.

LEGEND	LIGHT		WATER USE		LANDSCAPE TYPOLOGIES	
	● sun	◐ sun - part shade	■ low	■ low - medium	CI civic	P parkland
	● ◐ sun - part shade - shade	■ medium	■ high	ST street	SE service + parking	
	◐ ◐ part shade - shade			CQP courts/quads/plazas	WC waller creek	
				CO connective space		



CAMPUS WATERSHEDS MAP

4.2 HYDROLOGY AND SOILS

HYDROLOGY

The system of streets, curbs, drain inlets, pipes, and culverts that make up the campus drainage system has been designed to protect the buildings and roads of the campus by removing rainwater as quickly as possible during a storm event. Consequently, the benefits of rainwater infiltration to restore ground supplies and the ability of the landscape to slow, cleanse, and use runoff are often lost.

The campus watersheds map shows the individual piped catchment areas that drain to Waller Creek. The catchments are divided into regions where the outfall into Waller Creek is 24 inches or larger in diameter. Many of the watersheds empty into the creek at a point source that carries almost all of the runoff from the contributing area. It is recommended that the University prepare a campus master drainage plan that can help to determine which of the multiple watersheds can be most readily improved, and the methods for improvement. The use of Best Management Practices (BMP) is recommended as a means of improving the campus drainage system by slowing, cleaning and infiltrating rainwater. The principles that underlie the BMPs should guide the drainage aspects of all projects. The principles include:

1. Reduce the rate and volume of stormwater runoff. Landscapes should retain on site the runoff volume generated by the 60th percentile storm
2. Improve the quality of stormwater runoff. Landscapes should be used as a means of capturing, retaining and treating stormwater runoff
3. Improve groundwater recharge. Landscapes should be developed in a manner that minimizes new and reduces existing impervious surfaces
4. Increase reuse of rainwater. Campus projects should strive to capture rainwater, fin water and gray water for landscape irrigation use.

It is recommended that landscape projects adopt appropriate BMPs that achieve follow one or more of these principles. Examples of proposed BMPs for the campus landscape are outlined below. The principles that are met for each BMP are identified.

STORMWATER MANAGEMENT PRACTICES

1. Rainwater Harvesting Systems - Rainwater harvesting systems (RHS) have the ability to reduce rate and volume of stormwater runoff as well as reduce dependency on potable water systems. Typical uses of harvested rainwater include landscape irrigation, building gray water systems, and supply for mechanical systems such as cooling towers and chillers. It is critical that the University be engaged early in the design process to determine the level of maintenance required to keep a RHS operational.
2. Bioretention Gardens – Also known as Rain Gardens, Biofiltration Gardens can reduce stormwater runoff rate and volume, improve the quality of runoff and provide a source for groundwater recharge. Selection of proper planting and filter media and understanding the underlying soils are critical to the success of a biofiltration area. Where introduction of groundwater into the existing soils may cause environmental or structural concerns, such as expansive soils, bioretention cells can be designed to include an impermeable liner.
3. Green Roof – The stormwater benefits of green roofs range from reduction of runoff rate and volume to improving the quality of runoff in areas of higher pollutant loading. Given the urban nature of the campus, green roofs provide an efficient way to achieve the stormwater principles set forth in this section without taking up valuable area beyond the building footprint. Selection of plant material that can survive in the extreme conditions atop structures in Austin should be well coordinated with University officials.
4. Blue Roof - A blue roof is a system for capturing and holding rainwater at the building roof structure as a means of reducing runoff rate and volume. The system outlet can be designed to release water at a rate significantly lower than that of traditional roof drainage systems. Evaporation of the retained stormwater on the roof will reduce overall runoff volumes from the building.
5. Porous Paving – The use of porous paving will reduce stormwater runoff rate and volume, improve the quality of runoff and potentially recharge groundwater. Once the characteristics of the subgrade soils are determined and the design parameters for the stormwater management system are set, the thickness of the reservoir course can be calculated to provide various levels of mitigation for stormwater runoff. The use of underdrains should be determined based on the porosity of the underlying soils and any concerns related to infiltration of water adjacent to buildings or paved surfaces subject to heaving.
6. Planting Species Selection – Varying the planting species selection has the potential to impact runoff rate, volume, quality and groundwater recharge. Planting strategies such as native grass mixes that require less maintenance and are less compacted by pedestrian traffic will reduce runoff rates providing more time for soils to absorb stormwater before it leaves the site.
7. Subsurface Chambers – Subsurface stormwater chambers can provide an efficient means of capturing and retaining runoff to reduce runoff rate. When the system also acts as an infiltration chamber, these systems also have the ability to reduce runoff volume, improve water quality and recharge the groundwater. Given that these systems are located below grade, the space above them can provide valuable land for open space uses. Where located in environmentally sensitive areas or in areas where infiltration is not recommended, the system can be designed with an impermeable liner.
8. Disconnection from Impervious – Where possible, disconnecting impervious surfaces such as building roofs and parking lots from the closed drainage system by routing stormwater through landscape filtering areas can reduce runoff rate and volume, improve water quality and increase groundwater recharge. Topography, length and material of filter strips, and a means for limiting erosion at the interface of the filter strip with the impervious surface are all critical elements to consider when designing a disconnection area.

SOILS

Pedestrian and vehicular overuse and construction impacts from site development decrease the capacity of the soil to support desired vegetation and retain resources, such as water and important nutrients. To minimize the negative impact to these resources a well-developed and communicated soil management plan should be created. If applicable to the project, soil protection areas (areas where soil health is general good and therefore valuable) should be delineated to prevent any construction activities or storage of equipment in those sensitive areas. See the most recent version of the Sustainable Sites Initiative Rating System and Reference Guide (<http://www.sustainable-sites.org/>) for more detailed guidelines regarding soil protection. Although the soil condition, texture and type on campus vary, in general there are a few key guidelines to follow regarding the enhancement and preservation of this resource. These guidelines include:

1. Take pre-construction soil test(s) at the project site and/or at a reference site, if possible
2. Preserve and protect healthy soils in the project area
3. Restore impaired soils (from over use or construction activity) to a minimum of a 12-inch depth
4. Amend soils with mature and stable compost such that the top 12 inches contain at least 3 percent organic matter or organic matter levels and depths similar to the site’s reference soil (Adopted from SITES)
5. Ensure that compaction within 100 percent of the root zone does not exceed 260 PSI for sandy/loamy soils and 225 PSI for clay soils (field tested with a cone penetrometer), if compaction exceeds these amounts re-rip the soil to a minimum of 6 inches and apply compost as needed
6. Achieve infiltration rates (inches/hour) or saturated hydraulic conductivity (millimeters/second) comparable to the site’s reference soils and vegetation needs
7. Restore soil chemical and biological characteristics for plant growth, see below for more detail

SOIL CHARACTERISTICS

Existing soils characteristics across campus vary considerable with changes in subsoil, drainage, and topography. For all landscape projects, soil testing should be done to determine the specific site conditions that should be designed for.

From the perspective of plant establishment there are several critical variables that are usually important to quantify as they can have direct limiting effects on plant establishment and growth. These are soil texture, pH, cation exchange capacity (CEC), bulk density, organic matter (OM), nitrogen (as nitrate and / or ammonium), plant available phosphorus, and occasionally (rarely) potassium. In addition, where native plants are used extensively, such as a restored savanna, prairie or other native plant assemblage, soil biology can be important for establishment success. In these cases soil biology analysis should be carried out.

The following table gives approximate amounts and ranges for native prairie soils. Generally speaking, plants will do better under slightly elevated nutrient conditions, but if these are too high, weeds can become a problem and this can result in competitive exclusion of desired trees, forbs and grasses.

Table 1 Summarized soil data for native prairie soils:

	Native Prairie Range
pH	6.5-9
CEC (meq)	8-50
Organic matter (%)	3-15
Nitrate (ppm)	3-20
Ammonium (ppm)	3-20
Phosphorus available (ppm)	3-20
Potassium (ppm)	10-200
Bulk density (g/cm ³)	1.2-1.5
Proctor Density	75%-85%

Campus soils are mixed urban varying from sandy loam (a common building fill) to sandy clay loam. For the full soil report see the Ecological Site Assessment Report. In general, soil phosphorus is moderate to very high (common in horticultural soils) with varying amounts of nitrogen and organic matter. Individual soil tests will be needed to bring the soil within the target soil characteristics for specific campus landscape projects (Table 1).

SOIL ORGANIC CONTENT

Organic compost for amendment must be of biological origin, composted, weed-free, and un-sterilized. Standard soil/compost tests prior to application must be completed to ensure that it also falls within the following limits:

Table 2. Compost Specifications

Item	Range
Extractable nitrate (ppm)	20 -200
Available phosphorus (ppm)	5 - 200
pH	5-8
Salt concentration (dS.m-1)	<6
Moisture (% wt)	30-55



Severe erosion in the Arts District requires soil remediation.

RECOMMENDATIONS FOR PROBLEM EROSION AREAS IN CAMPUS UPLANDS, AND PLANTING UNDER LIVE OAKS

Throughout the campus there are problem erosion areas that are chronic or arise from changes in pedestrian use patterns, changes in vegetation cover, or changes in drainage patterns. The following guidelines provide direction on how to address these areas.

Correcting erosion problems requires a proper diagnosis of the causes. Problem area should be evaluated by competent professionals and all contributing factors identified including drainage patterns, soil composition, patterns of human use, vegetative cover and the schedule of maintenance for the area. Solutions should be identified by addressing fundamental causes first, such as redirecting or intercepting overland drainage flow, redirecting foot traffic, or soils remediation. Once these factors are controlled, re-vegetation and post repair maintenance can be successfully engaged.



Chasmanthium latifolium, Inland Seoats (midground – right) is a candidate for planting in the shade of Live Oaks.

Quite commonly erosion areas are located in areas under the canopies mature Live Oaks where it is difficult to grow grass. Planting directly under Live Oak trees can be difficult, but is a good practice as it helps to cut down on excess erosion, reduces compaction from foot traffic (which can be directly detrimental to tree health), and increases overall habitat value. Some of this difficulty arise from competition between the tree and understory plantings. Oaks use chemical defenses, referred to as allelopathic chemicals to reduce or prevent the growth of understory plants to improve the Oak's ability to compete for resources and nutrients. However, there are some plants that are less susceptible to this chemical output and there are methods to take to increase the survivability of understory plantings. These principles/methods include:

- Select understory plants that DO NOT require supplemental irrigation once established or only need minimal inputs
- Select understory plants that have similar water requirements as the overstory tree
- Use pneumatic tool or air-spades to prepare soil to reduce root damage before installing understory planting
- Insure that irrigation drains away from the trunk of the tree
- Do not plant within 6-10 feet of the tree trunk
- Prune dead and diseased branches
- Rake or blow off Live Oak leaf litter during the spring (leaf fall varies by specific tree species)

To the right is a list of plant species suitable for planting in part shade/shade conditions. The list is organized by plant habit shown in the far right column.

RESILIENCE	COMMON NAME	SCIENTIFIC NAME	HABIT
High	Twistleaf yucca	<i>Yucca rupicola</i>	cactus/succulent
Medium	Wood fern	<i>Thelypteris kunthii</i>	fern
High	Horseherb	<i>Calyptracarpus vialis</i>	forb/herb
Medium	Bicolor iris	<i>Dietes bicolor</i>	forb/herb
Medium	Asian jasmine	<i>Trachelospermum asiaticum</i>	forb/herb
Medium	Fall aster	<i>Symphotrichum oblongifolium</i>	forb/herb
Medium	Giant spiderwort	<i>Tradescantia gigantea</i>	forb/herb
Medium	Wild red columbine	<i>Aquilegia canadensis</i>	forb/herb
Medium	Heartleaf skullcap	<i>Scutellaria ovata</i>	forb/herb
High	Cedar sage	<i>Salvia roemeriana</i>	forb/herb
Medium	Inland seoats	<i>Chasmanthium latifolium</i>	grass/grass-like
High	Texas beargrass	<i>Nolina texana</i>	grass/grass-like
Medium	Texas bluegrass	<i>Poa arachnifera</i>	grass/grass-like
Medium	Reflexed sedge	<i>Carex retroflexa</i>	grass/grass-like
Medium	Texas sedge	<i>Carex texensis</i>	grass/grass-like
High	Pine muhly	<i>Muhlenbergia dubia</i>	grass/grass-like
Medium	Cherokee sedge	<i>Carex cherokeensis</i>	grass/grass-like
Medium	Berkeley sedge	<i>Carex divulsa</i>	grass/grass-like
Medium	Boxwood	<i>Buxus sp.</i>	shrub
Medium	Turkscap	<i>Malvaviscus arboreus var. drummondii</i>	shrub
High	Dwarf palmetto	<i>Sabal minor</i>	shrub
Medium	Coralberry	<i>Symphoricarpos orbiculatus</i>	shrub
High	Devil's shoestring	<i>Nolina lindheimeriana</i>	shrub
Medium	Mexican honeysuckle	<i>Justicia spicigera</i>	shrub
High	American beautyberry	<i>Callicarpa americana</i>	shrub
Medium	Wax myrtle	<i>Morella cerifera</i>	shrub
High	Roughleaf dogwood	<i>Cornus drummondii</i>	tree
High	American smoke tree	<i>Cotinus obovatus</i>	tree
Medium	Eve's necklace	<i>Styphnolobium affine</i>	tree
High	Texas persimmon	<i>Diospyros texana</i>	tree/shrub
High	Yaupon holly	<i>Ilex vomitoria</i>	tree/shrub
High	Mexican buckeye	<i>Ungnadia speciosa</i>	tree/shrub
Medium	Virginia creeper	<i>Parthenocissus quinquefolia</i>	vine



4.3 PLANTING DESIGN

Planting design decisions should be the result of balancing several factors including hardiness and resiliency noted in Section 4.1 Ecology; visual-sensory design considerations; the functional role of the plants; and practical factors such as budget and availability of plants in the nursery industry. This section addresses the visual-sensory and functional aspects of planting design.

SPACE DEFINITION

In addition to the important ecosystem services provided by campus planting, the visual role that plants play in the definition of outdoor space is a critical function performed by campus plantings. From a visual design perspective, the arrangement of plants on the campus grounds should be understood, first and foremost, as an exercise in space definition. Trees and shrubs should be employed to purposefully define the overall extent, scale, shape and character of the outdoor spaces of the campus. This approach to planting design contrasts with a popular understanding of planting as added decoration, or embellishment, without considering the overall scale, proportions and structure of landscape spaces. As a starting point, the design of campus plantings should strongly consider the space defining role of plants.

INSTITUTIONAL SCALE AND DESIGN SIMPLICITY

For both aesthetic and practical motives, the organization of planting for the major campus landscapes should be properly scaled to be in proportion to campus buildings and streets. Designs that are unnecessarily intricate, interrupting the simplicity and calm of the major campus streets and landscape spaces should be avoided for design reasons, but also because they increase maintenance. Garden scale planting designs are only appropriate in courtyard settings where they are more likely to fit the size of the space. In streetscapes, civic landscapes, parklands, and other large continuous campus landscapes,

simple plantings in unified masses should support the overall structure of the campus plan and be consistent with the order of campus architecture. Most campus buildings consist of few materials, with decoration integrated into the overall composition without significant material changes. Likewise, planting should be composed to be consistent with the scale and restrained use of materials shown in campus buildings. Simple, unified and understated plantings carry with them a dignified appearance appropriate to the size of the University.

VARIETY AND UNITY

In general, the diversity of plants is encouraged for ecological reasons, but should not result in the loss of visual unity in major landscape areas of the campus. It is particularly important not to sacrifice unity or coherence in civic and street landscapes for the sake of an exaggeratedly diverse plant palette. Some of the most significant and beautiful campus landscapes, including the South Lawn and the plaza in front of the Main Building, are appropriately composed with limited numbers of compatible plant species. The result is a pervasive unity of effect in which the eye moves freely, un-arrested by visually divergent calls for attention. In courtyards, plantings can be richer, more intricate and stylistically varied because these landscapes are visually contained, unlike streetscapes, parklands, connective and civic landscapes where continuity of effect is essential to the success of the campus landscape as a whole. In courtyards, designers can be less concerned with continuity of effect with adjacent landscape areas.

REGIONAL APPROPRIATENESS

Through the careful selection of predominantly native plants, designers should celebrate the character of the Edward’s Plateau and Blackland Prairie bioregions. The communities of plants which have evolved in this region for thousands of years will serve as a resilient palette for the campus landscape. Their use will also result in a regionally appropriate campus image. See plant list in Section 4.1.

EXCEPTIONAL TREES

Trees are the principal element responsible for the character of the campus landscape. Healthy, large existing trees and tree groupings of exceptional size and form should be protected. Designs should incorporate and celebrate exceptional trees. The reader is referred to the *2012 Campus Tree Care Plan* prepared by the Department of Facilities Services, Landscape Services Division, for details related to tree preservation, protection, planting, and maintenance information.

PLANT LAYOUT

The selection and layout of plants should take into consideration the ultimate space for normal plant growth, unless it is intended that the plants be clipped into a hedge.

PLANTING DESIGN GUIDELINES

Maintain Institutional Scale and Simplicity in all landscape types except courtyards

Celebrate the character of the Edward’s Plateau and Blackland Prairie flora

Maintain a diversity of plantings, but not at the expense visual coherence and unity of the larger campus landscape

Employ layered plantings for visual and ecological enrichment

Space plantings to allow plants to mature to their natural form where possible

Maintain practical spacing for maintenance and appearance

Celebrate and protect trees and tree groups with exceptional form and character

Employ layered plantings for visual and ecological enrichment



✓ Layered planting along west 21st Street adds visual interest and plant diversity at an appropriate scale with the adjacent street (right).

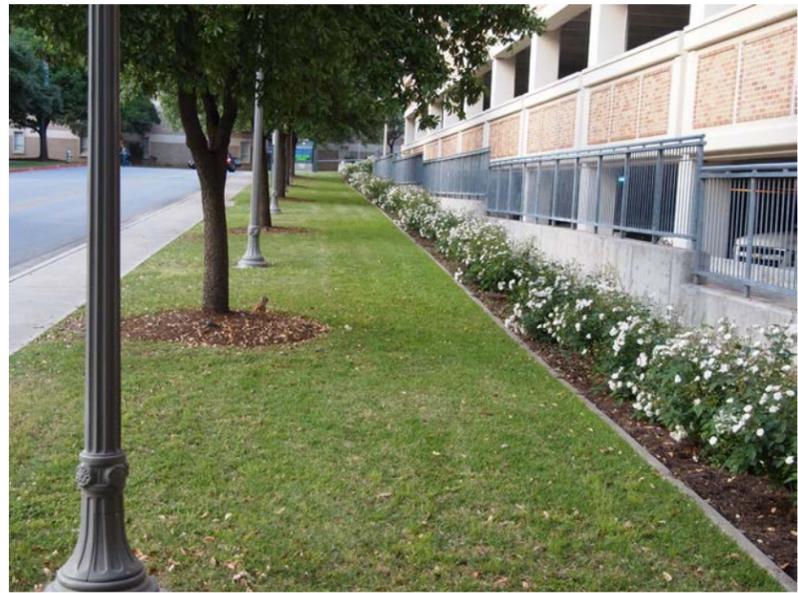


✓ Diversity and interest achieved through layering of plants at the Art Building.

PLANTING GUIDELINES LEGEND

- ✓ Denotes positive example
- ✗ Denotes negative example

Maintain Institutional Scale and Simplicity in all landscape types except courtyards



✔ A monoculture planting properly scaled to the building and street context at the Brazos Garage. Clean, geometric bed lines maintain appropriate simplicity and ease of maintenance.



✔ A simple unified palette of plants is appropriate in major campus landscape areas such as at South Lawn



✔ A simple monoculture is appropriately scaled at Clark Field



✘ This planting at the Athletic Center on Robert Dedman Drive uses low water use native plants, however, the garden quality design does not fit with the scale of surrounding streets, stadium and parking facilities.



✘ This garden scale planting is out of place, failing to relate to the scale of the 24th Street corridor, and failing to relate to its adjacent landscape.

Celebrate the character of the Edward's Plateau and Blackland Prairie flora



✔ A grove of Honey Mesquite (*Prosopis glandulosa*) at the Belo Courtyard.



✔ A low maintenance, regionally appropriate landscape of native grasses, Yucca, shrubs and trees along Guadalupe Street.



✘ This kind of simple design of lawn and hedges is more appropriate in large civic landscapes than in this courtyard at Calhoun hall.

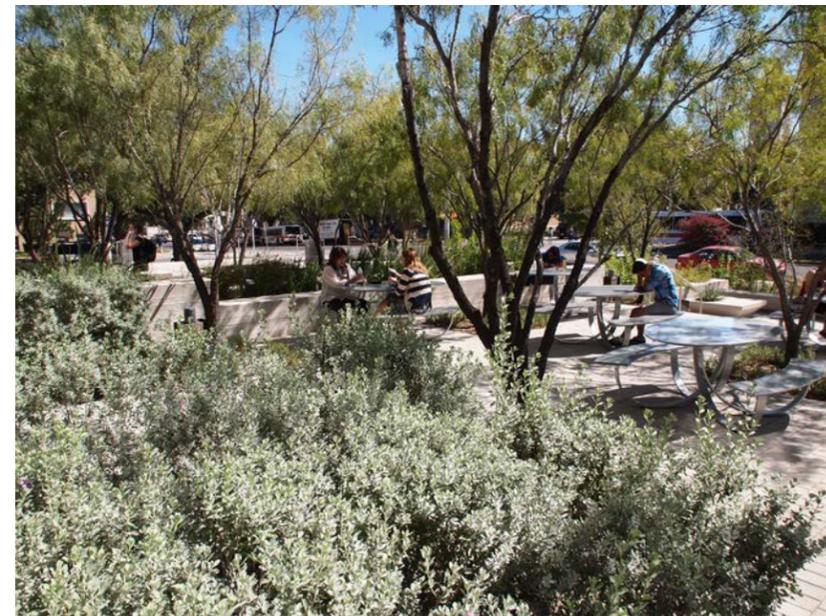


✘ An old hedge of Nandina (*Nandina domestica*), an invasive exotic.

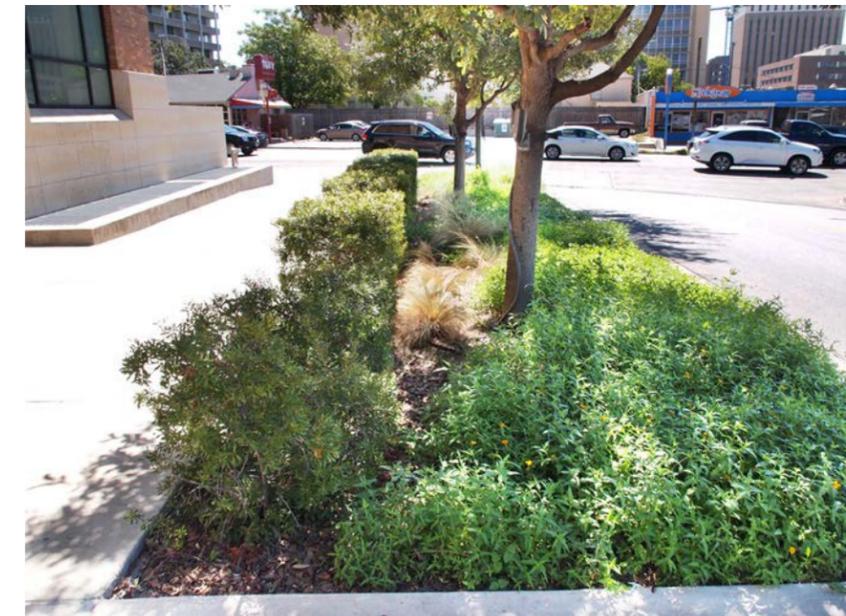
Maintain a diversity of plantings, but not at the expense visual coherence and unity of the larger campus landscape



✔ Courtyards are excellent locations for flowering plants where they can be enjoyed in a human scale setting.



✔ Diverse plantings are appropriate in courtyard areas.



✘ A verge at Whitis Street with excessive species diversity in a location that would better be served with a simple planting solution. Successful garden scale plantings are difficult to achieve in automobile scale locations.



✘ For success, imitation streambeds and rock formations require the containment of a courtyard. Here, juxtaposed with automobiles, garden scale gestures are out of place with their immediate surroundings.

Space plantings to allow plants to mature to their natural form where possible
Maintain practical spacing for maintenance and appearance



❌ Rosemary (*Rosmarinus officinalis*) planted too close to the sidewalk.



❌ Shrubs planted too close to the building. This attractive facade does not require shrubs.



❌ Yaupon Hollies planted too close to the building. These hollies could have been planted in the middle of the Jasmine bed for better effect.

Celebrate and protect trees and tree groups with exceptional form and character



✅ Live Oaks near the Fine Arts Building along a chosen path.



✅ The expressive architecture of tree branches is a defining feature of the campus.



CALSENSE CENTRAL IRRIGATION SYSTEM

Calsense Central Irrigation System interface showing the campus network.

● CALSENSE CONTROLLER

4.4 IRRIGATION

In 2013, the University implemented a major irrigation system update that is bringing the campus closer to the goal of saving 20 percent of water usage by 2020. The installation of the Calsense central irrigation system has resulted in a 57 percent reduction in water usage, a savings of more than \$719,000 (at 2013 rates), with that number to rise with the predicted increase in potable water costs. With the new system in place, water conservation is predicted to be over 100 million gallons of water annually - and labor costs will also be reduced.

The Calsense central irrigation system consists of over 104 irrigation controllers that are linked to a HUB by a low radio frequency. The HUB communicates to a virtual server that can be accessed by iPad, iPhone, laptop or any computer allowing changes and efficiencies to the system at any time without sending technicians into the field. The system uses live evapotranspiration data gauges and flow sensors to modify the runtimes and reduce overwatering. Three rain buckets will turn off the systems during a rain event and collect rain data that is transferred to the irrigation software which in turn modifies runtimes according to those rainfall amounts. The new central system also includes flow meters that monitor the irrigation usage for each individual zone. If problems arise at a valve, the system will stop that zone from irrigating. This feature alone saved over 4.6 million gallons of water over a three month period in 2013.

With the centralized system in place and data currently being gathered and analyzed, the University Landscape Services division is looking towards additional water savings techniques. Best practices that will continue to improve irrigation performance are described at right.



Cisterns at the Belo Center store roof water that is reused for landscape irrigation

RECOMMENDATIONS TO FURTHER REDUCE WATER USE

Choose less water intensive landscape plantings

Select Native And Well-Adapted Plants Which Are Naturally Drought Tolerant To Reduce The Amount Of Water Needed To Keep Plants Healthy And Attractive. Group Plants According To Water Needs To Avoid Mixing Those With Regular Watering With Those That Need Very Little. Plants Are Healthier When They Receive Only The Quantity Of Water That They Need.

Improve soil condition and reduce compaction

many areas of the campus suffer from soil compaction which results in wasteful irrigation water runoff. by adding compost and improving soil composition, more water will be retained and available for plants to use. Many of the compacted areas occur in the shaded areas below large existing trees where people tend to gather. Use air-spades to loosen the compacted soil around sensitive tree roots.

Analyze precipitation rate and distribution uniformity

Distribution uniformity (du) is a measure of how evenly water soaks into the ground during irrigation as landscapes mature and site conditions change. Although 100% distribution uniformity is theoretically possible, 70% to 80% is a practical goal. Periodical du audits should be performed to maintain maximum efficiency of the irrigation system but require significant staff time. Develop a program to utilize interns or a student program to aid in the audits.

Install dedicated irrigation water meters

Current meters in many areas of the campus combine irrigation water usage with building water usage, resulting in added water costs as storm sewer fees are calculated based on total usage according to the meter. For dedicated irrigation water meters, the storm sewer fees are not included. In some areas of the campus, adding the dedicated meters will be very costly but should be considered on renovation and new landscape projects.

Incorporate bioswales into the landscape

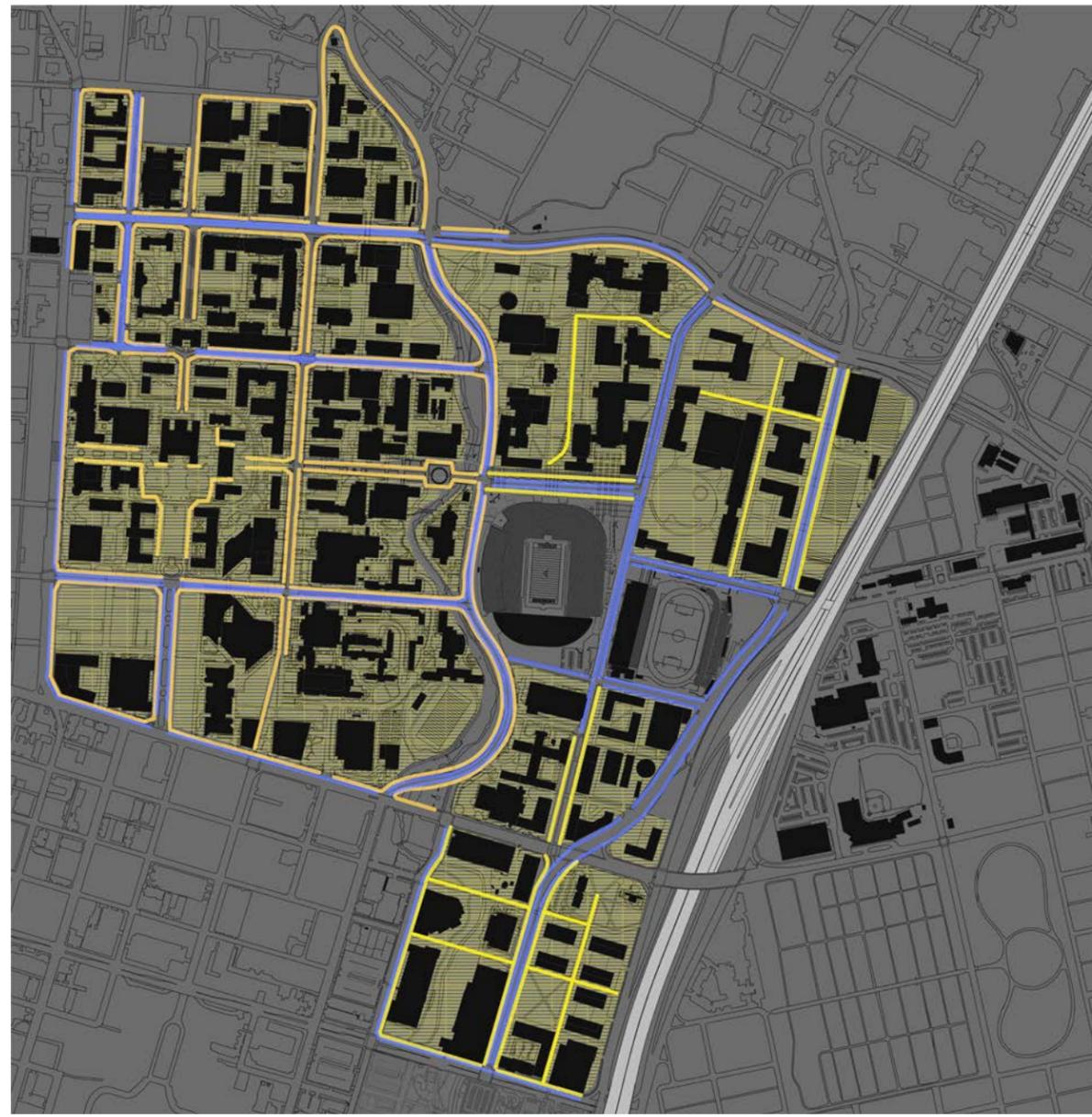
Bioswales are used to manage and treat storm water runoff. They are designed to filter pollutants and to temporarily store runoff water and increase infiltration. The resulting benefits include reduction in irrigation water needs, recharge of groundwater, and sustaining stream base flows.

Encourage rainwater harvesting and innovative storage methods

Rainwater harvesting provides an independent water supply by storing rainwater from building roofs and other impervious surfaces. Roof water is an excellent water source because it is generally of better quality than other sources, and the water itself comes at no cost. However, the water storage system may be costly depending on the amount of water to be stored. New innovative storage systems are evolving and come in a variety of forms that can be incorporated into building systems.

Develop strategies to use the city of Austin reclaimed water system

City of Austin reclaimed water is recycled from wastewater and treated for the majority of uses other than drinking water. Using reclaimed water for irrigation protects the drinking water supply, reuses water, and saves money. The reclaimed water program is relatively new and the processes for installing the system and annual testing of reclaimed water irrigation systems are still evolving. The current cross contamination testing of the location where the drinking water and the reclaimed system intersects make reclaimed water difficult for the University to use. Developing strategies with the City of Austin to make use of reclaimed water more feasible would be beneficial for both the City and the University.



CONCEPT DIAGRAM FOR CAMPUS EXTERIOR LIGHTING

- LEGEND
- FRAMEWORK PEDESTRIAN FIXTURE - ACORN
 - FRAMEWORK PEDESTRIAN FIXTURE - KIPP
 - COBRAHEAD ROADWAY FIXTURE
 - NON-FRAMEWORK SITE LIGHTING

4.5 SITE LIGHTING

BACKGROUND

The campus currently has a well-established, reasonably consistent campus-wide approach to exterior lighting. All streets are illuminated with a variety of “cobra-head” fixtures equipped with HID sodium or metal halide lamps. Exceptions include University Avenue, which is lit with post top LED fixtures. Pedestrian areas are illuminated with two standard fixtures, employing metal halide HID lamps. The most commonly used fixture of the two is an “Acorn” globe type fixture, of which there are several generations of slightly different types employed. The second type is a cut-off fixture manufactured by Kim Lighting. There are also some areas, such as along Guadalupe Street, that employ round globe fixtures.

Levels of illumination throughout the campus pedestrian environment are relatively high compared to standard IES recommendations. The University’s goal has been to maintain a minimum of 0.5 footcandles at pedestrian walkways. The quality of light varies. Many of the Acorn fixtures produce a high level of glare, as do the Kim fixtures when viewed at close range. The Kim fixture’s dropped, conical acrylic lens also produces uneven glare effects, especially in older fixtures in which the lens shows wear and abrasion. The Acorn fixture is not a cut-off fixture, and directs a significant amount of light skyward. The Acorn also has a marked historic character, particularly when mounted on the traditional aluminum or steel poles that are the current campus standard. The Acorn tends to feel aesthetically divergent or inappropriate when juxtaposed with modern architecture, such as at the Gates Dell Complex.

GUIDELINES FOR EXTERIOR LIGHTING

The following guidelines apply to exterior lighting and are intended to improve light quality and maintain consistency throughout the University campus:

Illumination Levels
 Minimum illumination for pathway lighting shall meet IES standards; however, experience at the University has determined that significantly higher levels (in the range of 0.5 footcandles minimum) are considered acceptable by the campus community.

Light Sources
 Light sources shall be LED, metal halide, or Linear Fluorescent if appropriate, with warm and accurate color, a CCT of 3000 – 3500 K, and a CRI of 80 or greater.

Cut Off and BUG Rating Requirements
 Full cut off lighting is not required, but lights should have a BUG Rating with a U Rating (Uplight) of 3 or less, and a G Rating (Glare) of 1 or less.

PEDESTRIAN LIGHT FIXTURES WEST OF SAN JACINTO BOULEVARD

Acorn Fixture

The pedestrian fixture that should be used for the primary framework spaces of the core campus is the Holophane Acorn fixture mounted on a 12'-7" metal pole. This fixture shall be used to define major malls and street sidewalks. It has a large glowing presence in the night environment and is therefore suitable for marking the primary malls and street spaces of the historic and core campus area. It is the fixture currently used for this purpose in the core area.

The preferred version of the Acorn is manufactured by Holophane – Model WAU15DHMDA8TDC4, Washington Series, Utility Grade, 150 Watt Metal halide, Medium Base Socket, Multivolt (120/208/240/277), factory wired at 277 volt only. Fixture painted to match Tiger Drylac RAL #7039, Symmetric Type V Optics. Trip painted to match Tiger Drylac RAL #7039

Lamp - Phillips "MasterColor" 150 Watt Metal Halide 3KI

Pole - North Yorkshire, Fluted Cast Aluminum Post, 12'-7" height, Custom painted to match Tiger Drylac RAL#7039

Kim Fixture

Will be phased out of use

Globe Fixture

Will be phased out of use

New Cut Off Fixture

A new cut off fixture with a "neutral" design appearance, and designed for LED technology is proposed for use in service areas, small connective landscape spaces, and will be available to designers for use with modern architectural settings in which the early 20th Century look of the Acorn fixture is not appropriate. The recommended fixture for this purpose is the Philips Gardco PureForm P21 LED (#P21-A2-1-3-55LA-WW-voltage*-finish*-SPR-TL) with a Philips Gardco 14' tall round straight aluminum pole with electrostatically applied powder coat paint. (*Voltage and finish per UT).

New Poulsen Kipp Fixture

In the areas west of San Jacinto, the Kipp will be a fixture available for use in courtyards and appropriate areas outside of the main malls and framework spaces to be lit with Acorn fixtures. The Kipp may be used in non-framework parts of the Core Campus landscape (see Concept

Diagram for Campus Exterior Lighting) where the Acorn fixture has not been employed or will be discontinued as the principal fixture, and where modern architecture is prevalent. One such area is the Engineering campus north and south of Dean Keeton Street. The goal is to use the Kipp in non-framework areas where it will not conflict with the Acorn fixtures.

The Post Kipp is manufactured by Lois Poulsen – Model KIP-PT, 104 Watt LED/ 3000K, 120-277 volt, Natural Paint Aluminum powder coated finish, with surge protector, T-RSA-4.5" transition to 12' – 7" Round Straight pole. A 60 Watt version of this fixture is available and may be preferred in some applications.



ACORN FIXTURE WITH 12'7" METAL POLE
MANUFACTURER: Holophane
CONTACT:

Holophane
<http://www.holophane.com/>
740.587.6006



KIPP POST TOP LED
MANUFACTURER: Louis Poulsen
CONTACT:

Louis Poulsen
<http://www.louispoulsen.com/>
1.940.427.2620

PEDESTRIAN LIGHT FIXTURES EAST OF SAN JACINTO BOULEVARD

Poulsen Kipp Fixture

In the Central Campus, East Campus and Medical District the Kipp Post fixture should be used for all major framework spaces and street sidewalk lighting, connective spaces, quadrangles and courts associated with all architecture. This will become the standard fixture for exterior pedestrian areas. The Post Kipp is manufactured by Lois Poulsen – Model KIP-PT, 104 Watt LED/ 3000K, 120-277 volt, Natural Paint Aluminum powder coated finish, with surge protector, T-RSA-4.5" transition to 12' – 7" Round Straight pole. A 60 Watt version of this fixture is available and may be preferred in some applications.

Acorn Fixture

Will be phased out of use

Kim Fixture

Will be phased out of use

Globe Fixture

Will be phased out of use

New Cut Off Fixture

A new cut off fixture with a "neutral" design appearance, and designed for LED technology is proposed. The recommended fixture for this purpose is the Philips Gardco PureForm P21 LED (#P21-A2-1-3-55LA-WW-voltage*-finish*-SPR-TL) with a Philips Gardco 14' round straight aluminum pole with electrostatically applied powder coat paint. (*Voltage and finish per UT) This fixture will be for use in service areas, and be available for use by designers in locations where cut-off area down lighting is required without the need for a visible source.

STREET AND PARKING LOT LIGHT FIXTURES

For the immediate future the University is committed to the use of HID and LED street lights in a "cobra head" configuration on a pole-mounted mast arm. As projects arise requiring replacement of related groups or blocks of lights, or new street or parking lot lights, it is recommended that the University adopt a fixture with housing and heat dissipation attributes specifically appropriate to LED technology. The recommended LED fixture for campus roads and parking lots is the Philips Gardco PureForm P32 LED (#P32-A2-1-2/3/4*-wattage*-WW-voltage*-finish*-SPR-TL) with a Philips Gardco 25' tall round straight aluminum pole with electrostatically applied powder coat paint. The distribution type and wattage will depend on the specific application; roadways will likely utilize Type 2 while parking lots could use Type 3 or 4 depending on the layout. *Voltage and finish per UT) The Gardco Pureform Series is recommended for its sleek, neutral appearance, quality construction and the ability to achieve many different optical configurations both in wattage and distribution. The requirements of each application may vary; however, the variety of fixture sizes and mounting heights offered with this fixture will allow its use in all situations. Use of this fixture in streets, parking lots and as a neutral cut off fixture for pedestrian areas will bring a consistent appearance and light quality to the campus.

OTHER FIXTURES

Bollard lights, recessed ground mounted, and tree-mounted fixtures should not be used as a general practice. Step lights and embedded wall lights are acceptable for use in circumstances where post top pedestrian lighting is not adequate to light the area in question. Step and wall lights should be cut off type fixtures. Products with non-corrosive and corrosion resistant materials shall be used.



4.6 SITE ELEMENTS

PURPOSE

The various site furnishings and elements found throughout the campus contribute to the usability and functionality of the landscape, have a significant impact on campus character, and come with maintenance implications. This section of the report establishes campus standards for exterior seating, trash and recycling receptacles, bulletin boards, interpretive signage, bollards, bike racks, and planting bed edges, as well as less prescriptive guidelines for pavements, stairs, ramps, handrails, guardrails and walls. The aim of the guidelines is to bring consistency and a clear identity to the campus -- not to constrain designer's creativity. Certain self-contained areas of the campus, such as courtyard spaces, have been identified as appropriate locations for greater visual variety and design expressions outside of the general guidelines.

Site Elements have been selected for aesthetic fit with UT campus character, durability, ease of maintenance, and to meet sustainable sites criteria where practical. In general, Site Elements shall have light colored or reflective finishes to minimize heat gain and to visually unify these products into a family.

GENERAL GUIDELINES FOR EXTERIOR SEATING

Exterior seating shall be organized to allow for respite, contemplation and the enjoyment of the outdoor campus environment.

Seating shall be movable for flexible use where possible, to facilitate and support small group gatherings for study, eating, and conversation.

Seating shall be provided to facilitate the practical need for convenient seating at pick-up, drop-off and waiting areas.

Standard benches for major civic, connective landscapes and street landscapes shall be consistent within a given area.

Standard seating for quads, courts and plazas shall include a variety of built-in and manufactured furnishings. Seating should be compatible with the surrounding architecture and coordinated with other furnishings and related site elements.

Furnishings within a given area shall be consistent.

BENCHES

The Austin Bench manufactured by Landscape Forms shall be used as the standard campus bench. In areas with high use and high UV exposure that would be detrimental to wood, the Austin Bench shall have aluminum slats. In areas with low UV exposure, the Austin Bench shall have Ipe hardwood slats. Austin Benches shall be 72" long, and shall be backed and without arms.

The 118 Bench by Dumor, model number 118-60, shall be used in areas of the campus where this bench is already deployed as the predominant bench,. The bench shall be 72" long and the finish shall be Argento powdercoated steel.

Stone and cast benches such as those on the South Lawn shall be kept as part of the historic landscape fabric.

Benches shall be surface mounted, set level and be harmoniously integrated with the geometries of surrounding buildings and landscape elements.



118 BENCH
MANUFACTURER: Dumor
FINISH: Argento Powdercoated Steel Finish
CONTACT:
DeMor
<http://www.dumor.com>
1.800.598.4018



AUSTIN BENCH
MANUFACTURER: Landscape Forms
FINISH: Aluminum Slats
CONTACT:
Landscape Forms
<http://www.landscapeforms.com>
1.800.430.6209



AUSTIN BENCH
MANUFACTURER: Landscape Forms
FINISH: Wood Slats
CONTACT:
Landscape Forms
<http://www.landscapeforms.com>
1.800.430.6209

TABLES AND CHAIRS

The campus standard for fixed tables and chairs shall be the Charlie Picnic Table manufactured by Landscape Forms. The 67" diameter table top shall have a silver powdercoated finish. All fixed Charlie Picnic Tables shall be surface mounted.

In courtyards and other protected areas on campus where moveable tables and chairs are appropriate, the Catena Table top with Catena Table Base & Catena Chairs shall be the standard table and chairs. The tables shall be free standing and all components shall have a silver powdercoated finish.

In areas where shade is not available from other sources, the Solstice



CHARLIE PICNIC TABLE WITH ALTAIR UMBRELLA
MANUFACTURER: Landscape Forms
FINISH: Silver Powdercoated
CONTACT:
Landscape Forms
<http://www.landscapeforms.com>
1.800.430.6209

Altair umbrella, manufactured by Landscape Forms, shall be used. In these applications, the tables shall have umbrella holes and anchors. The umbrellas shall have a silver powdercoated finish to match the standard tables and chairs.

However, in courtyard spaces directly associated with adjacent building programs, other high quality movable tables and chairs may be used to create a distinct identity for that place within the campus. Distinctive tables and chairs have been successfully employed at the Gates-Dell Complex and at the Student Activity Center to unify the indoor and outdoor environments and to give the spaces a unique and memorable character.



CATENA TABLE TOP WITH CATENA BASE AND CATENA CHAIRS
MANUFACTURER: Landscape Forms
FINISH: Silver Powdercoated
CONTACT:
Landscape Forms
<http://www.landscapeforms.com>
1.800.430.6209

BOLLARDS

The standard bollard shall be the B4-5A2 Steel Bollard, manufactured by FairWeather Site Furnishings. Where walkways and service drives require temporary admission of authorized vehicular traffic, bollards may be removable. Where admission of authorized vehicular traffic is not required, bollards may be permanently embedded. Bollards shall be 30" tall and 5" in diameter. Where crash-rated bollards are required, refer to FairWeather for appropriate size and embedment detail. Material shall be stainless steel or have a Silvadillo powdercoated finish.

In service areas outside of the pedestrian environment, simple painted pipe bollards can be employed. Color shall be compatible with the surrounding architecture.

It is recommended that illuminated bollards be avoided due to high maintenance requirements and glare production.



B4-5A2 STEEL BOLLARD
MANUFACTURER: FairWeather
FINISH: Silver Powdercoated
CONTACT:
FairWeather Site Furnishings
<http://www.fairweathersf.com>
1.800.323.1798



In service areas with low pedestrian use and visibility, simple pipe bollards with a powder coat paint finish of compatible color with the building are acceptable.



Where temporary vehicular access is required, bollards shall be removable or retractable

TRASH AND RECYCLING RECEPTACLES

Standard applications for both litter and recycling receptacles shall be the Chase Park models, manufactured by Landscape Forms. Both litter and recycling units shall have a 36 gallon capacity with a side-opening for easy removal of trash bags, and a closed top to prevent the trash bag from filling with water during storms. Both receptacles shall have a silver powdercoated finish; the recycling receptacle shall have a "blue bell" powdercoated top and two 8-inch wide by 6-inch tall recycling sign back plates to distinguish it from the litter receptacle. The single recycling receptacle works with the UT single stream recycling system. Receptacles for composting shall have a "grass" powdercoated top. Litter and recycling receptacles shall be surface mounted and located adjacent to one another in all installation locations. Litter and recycling receptacles shall be located adjacent to building entrances and within outdoor gathering spaces.



Trash Receptacle Recycling Receptacle Compost Receptacle

CHASE PARK RECEPTACLES
MANUFACTURER: Landscape Forms
BODY FINISH: Silver Powdercoated
TOP FINISH: Trash "silver"/ recycling "ocean"/ compost "grass"
CONTACT:
Landscape Forms
<http://www.landscapeforms.com>
1.800.430.6209

NEWSPAPER DISPENSER GUIDELINES

News dispensers should be aligned in neat simple rows. Putting dispensers in locations where they interfere with views and vistas along walkways or become visually obtrusive should be avoided. Dispensers are best organized at site or building walls along the edges of walkways.



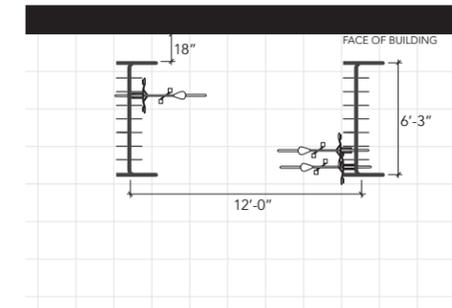
BIKE RACKS

The standard bike racks for open areas that require high capacity bike storage shall be the Expo® Series 7510, manufactured by Cora. This bike rack shall be 6' long in stainless steel or Peking Grey plastic color coated carbon steel. The rack shall be surface mounted, so it can be relocated if necessary, as use patterns change. Racks shall be positioned perpendicular to building facades where possible to allow access from both sides. Spacing between racks shall be 12' anchor to anchor, and 18" away from adjacent walls.

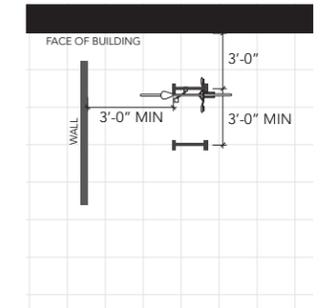
In confined spaces, where there is not room to install the Expo® Series 7510, the Hoop Rack, manufactured by Dero, shall be used. The Hoop Rack shall be surface mounted, so it can be relocated if necessary. The rack shall be stainless steel or have a Silver powdercoat finish.

All bike racks shall be mounted on pavement contiguous to walkways or plazas rather than floating in lawn areas. In order to promote bicycle use on campus, bike parking should be located as close as possible to bike routes, as well as adjacent to building entrances.

Bicycle lockers shall be located within parking garages or inside buildings.



1 1/2" = 1'-0"
Typical Expo® Series 7510 Rack Layout



1 1/2" = 1'-0"
Typical Hoop Rack Layout



HOOP RACK
MANUFACTURER: Dero
FINISH: Stainless Steel
CONTACT:
Dero
<http://www.dero.com>
1.888.337.6729

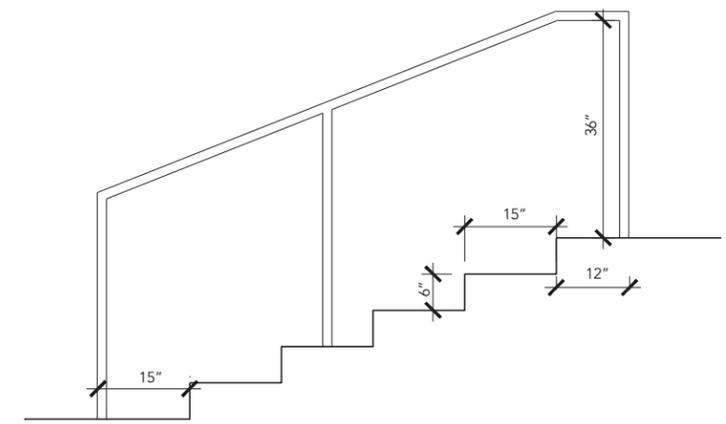


CORA EXPO® SERIES 7510
MANUFACTURER: Cora
FINISH: Stainless Steel
CONTACT:
Cora Bike Rack
<http://www.cora.com>
1.800.354.8624

STAIRS AND RAMPS

Stair materials shall be compatible with adjacent architectural and landscape materials. Stairs shall be constructed in proportions appropriate to their site context, with a preferred tread to riser relationship of 15" x 6". This is deliberately a flatter proportioned step than typical interior steps, and is more gracious for landscape applications.

Handicap access ramps shall conform to the American Disabilities Act (ADA) (<http://www.access-board.gov/guidelines-and-standards/buildings-and-sites>) standards.

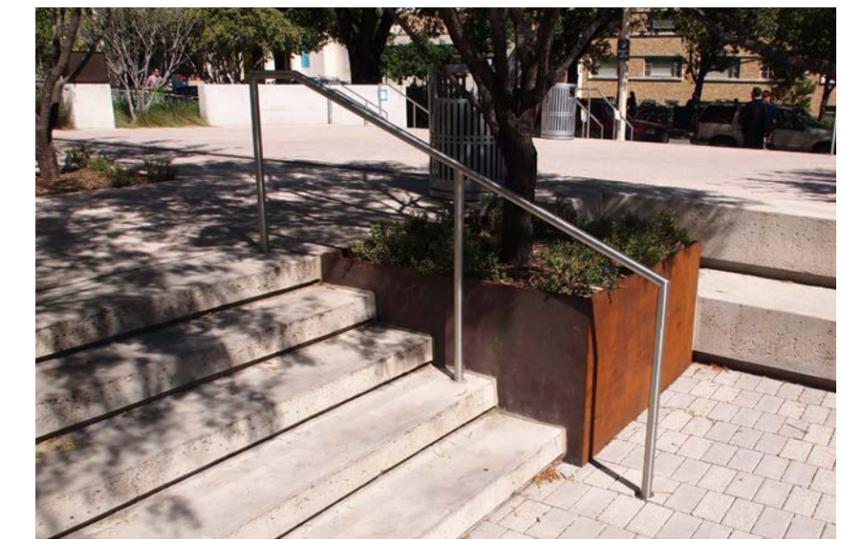


1" = 30"
Typical Handrail Design Silhouette

HANDRAILS AND GUARDRAILS

Handrails shall be metal with an easily maintained finish such as stainless steel or powdercoated paint finish. Color shall be light color and reflective to minimize solar heat gain. The standard for handrails shall be a rectangular, square or circular cross section and shall comply with ADA standards and meet other applicable design standards for handrails. Intermediate posts and rails where required shall meet structural requirements and applicable standards, but should be kept to a minimum to create a simple profile.

Guardrails shall be stainless or powdercoated paint finish, shall meet applicable codes and be designed to be compatible with the materials and design of associated or adjacent handrails. In most situations simple rails are preferred over ornamental guardrails, which interrupt the continuity of the campus environment with small-scale, singular design expressions.



✓ The simple profile of the stainless steel handrails at the Belo Courtyard fits in well in this contemporary setting, as well as in more traditional spaces.

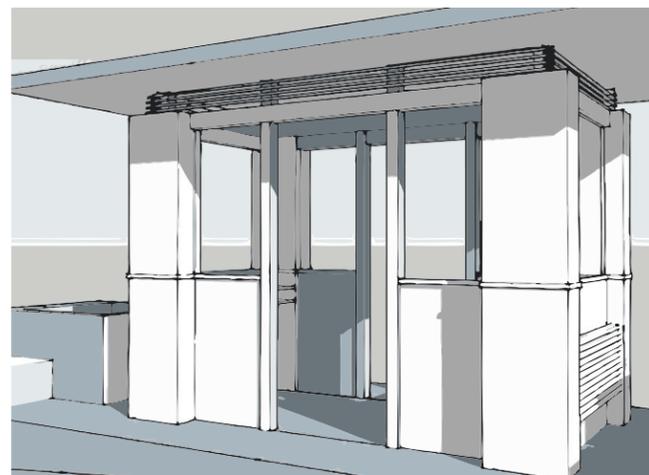
SMALL STRUCTURES AND CISTERNS

The designs for small structures such as food pavilions and guardhouses should be coordinated in a compatible design language. Today there is not standard language that can serve as a model; however, the accompanying photos illustrate previous designs for campus guard houses and examples of small structures that could serve as models. Once a project is launched to design and implement one of these structures, the design should be undertaken with the recognition that the project will be setting a standard for subsequent structures.

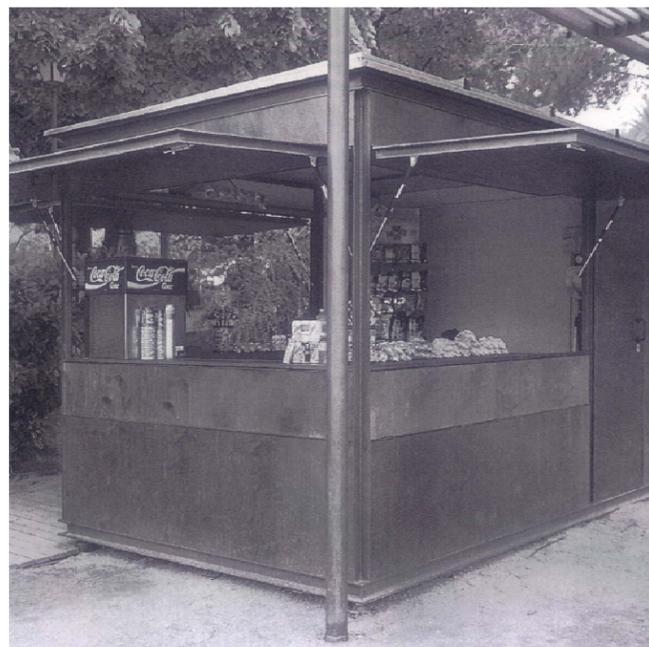
With the increased emphasis on water conservation and rainwater harvesting, there is a need to accommodate rainwater storage tanks and cisterns on the campus in ways that maintain the design quality of the landscape. These structures shall be designed to be consistent with landscape and architectural context in which they are to be placed. For example, cisterns located in non-pedestrian service areas such as those at the Belo Center may be more utilitarian in character (photo in Section 4.4), whereas cisterns to be located in or adjacent to civic spaces, streetscapes, courtyards, and other parkland and creek landscape areas shall adopt materials, design vocabulary, and character of their immediate surroundings.



The entrance pavilion at the Lady Bird Johnson Wildflower Center is a good example of what campus food pavilions or guard houses might be.



Proposed design for a guard house.

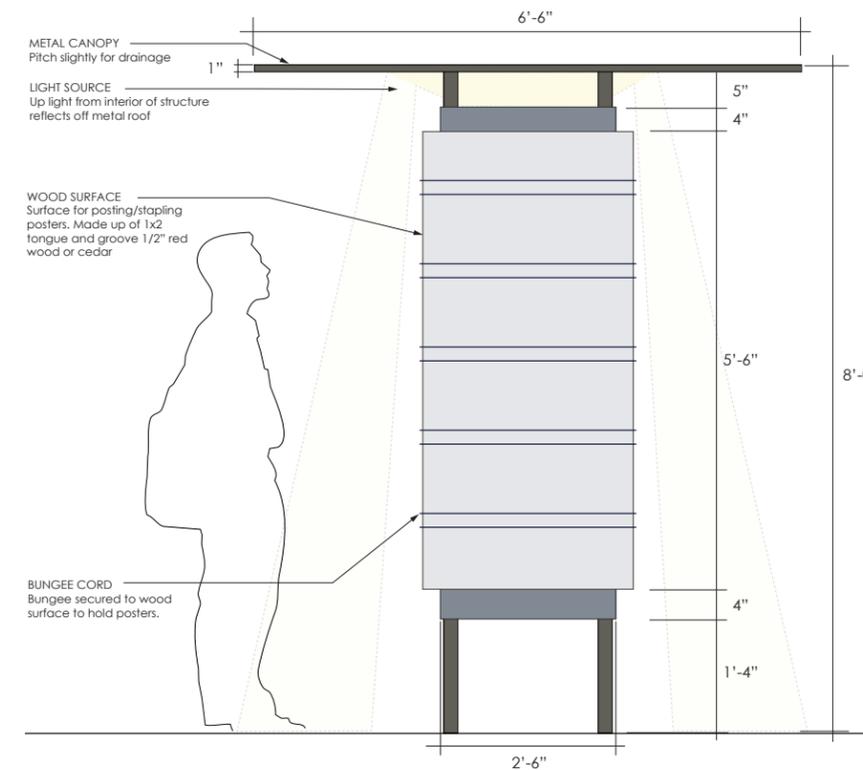


A simple appropriate design for a food kiosk.

BULLETIN BOARDS

Bulletin Boards shall be a custom fixture manufactured for the UT campus by Landscape Forms. Bulletin Boards shall be roofed to protect temporary signage from the elements, with LED down-lights within the roof. The surface shall be wood to allow stapling and tacking into, and equipped with bungee cords to secure signage onto the surface.

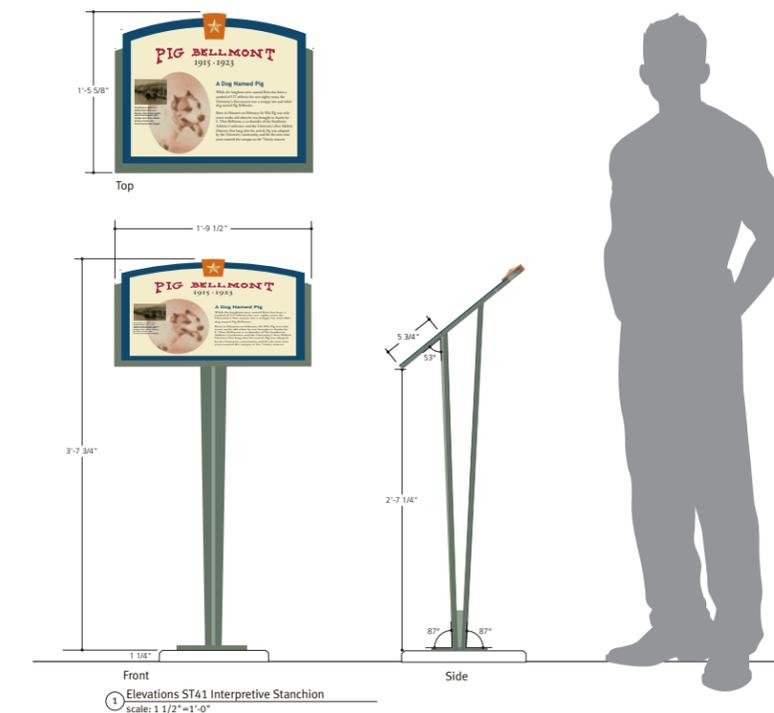
UT AUSTIN BULLETIN BOARD
 MANUFACTURER: Landscape Forms (custom made)
 CONTACT:
 Landscape Forms
<http://www.landscapeforms.com>
 1.800.430.6209



INTERPRETIVE SIGNAGE AND BANNERS

Interpretive signage should be located as appropriate throughout the campus to make information about landscape initiatives, campus ecology, and other relevant topics accessible to campus users. Interpretive signage shall conform to the 2008 UT Exterior Signage and Wayfinding Guidelines report. An example is shown below.

From time to time colleges, departments and other campus units wish to erect temporary banners on or near campus buildings to mark an occasion or event they are sponsoring. All such efforts, except those student banners governed by the Dean of Students, shall be reviewed by the Campus Master Plan Committee to insure that the banner is properly designed. Committee considerations will include safety, method of attachment, relationship to site lighting, and overall design effect of the banner in its campus surroundings.



PEDESTRIAN PAVEMENTS

In general, campus walkways shall be cast-in-place concrete with a broom finish and scoring perpendicular to the walk length. Any future repair or replacement should be made score joint to score joint to make the work less noticeable. Exposed aggregate concrete shall be employed only in areas of non-hazardous slopes, where matching existing exposed aggregate pavements is appropriate, such as within the 40 acres.

A wide range of materials other than concrete may be employed in plazas, courtyards, connective spaces, and other spaces associated with campus buildings to enhance human scale, material richness and landscape character. Materials may include brick, stone, and unit pavers. Unit pavers may also be used in service and parking areas when it is important to signal the intent that pedestrians are welcome in these areas.

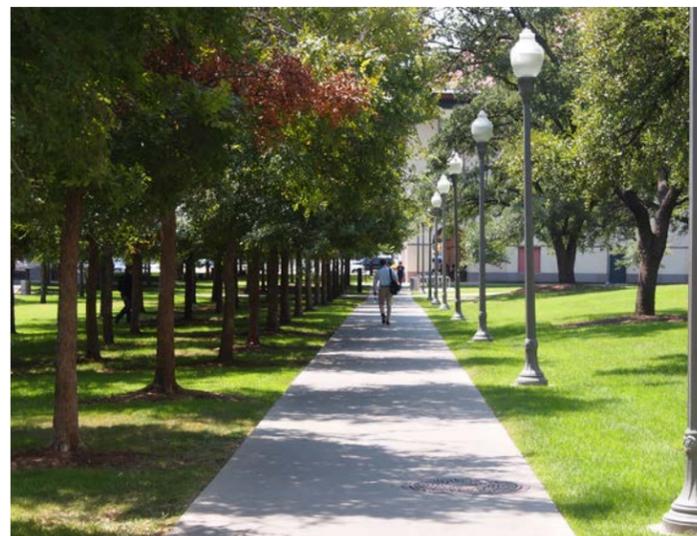
In the event that a campus unit wishes to mark pavements with donor names, proposals for donor designations on site pavements shall be reviewed by the Campus Master Plan Committee. As a general rule, marking pavements with donor names shall not be done. This practice incurs a long term maintenance cost and increased vulnerability of the pavement to damage.

Where project conditions are appropriate, pervious pavement is preferred. Factors to consider in the decision to use pervious pavement should include subsurface soil conditions, maintenance implications, traffic loading and cost effectiveness versus other stormwater management methods. Pervious pavements may include pervious concrete, pervious asphalt, concrete slabs with pervious joints and base, and pervious unit pavers.

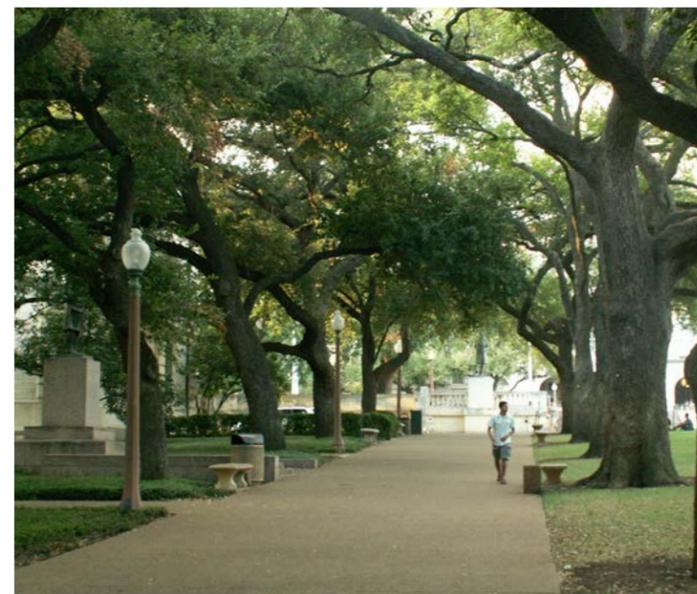
Setting method and base course depth for all pavements shall vary according to the pavement loading requirements and specific soil conditions at each site. At some time in their life, almost all campus walks will be required to support service or construction vehicle traffic. Therefore; it should be assumed that all walk pavements be designed to support service and construction vehicles unless the location strongly indicates otherwise.

Transitions from one pavement type to another should follow logical landscape divisions and other design considerations. Where landscape meets architecture, paving material selection shall be coordinated with exterior architectural materials and interior flooring materials to create one environment.

In order to minimize heat island effect, outdoor pavements shall be shaded or light-colored.



✓ Brushed cast-in-place concrete is the campus standard for walkways.



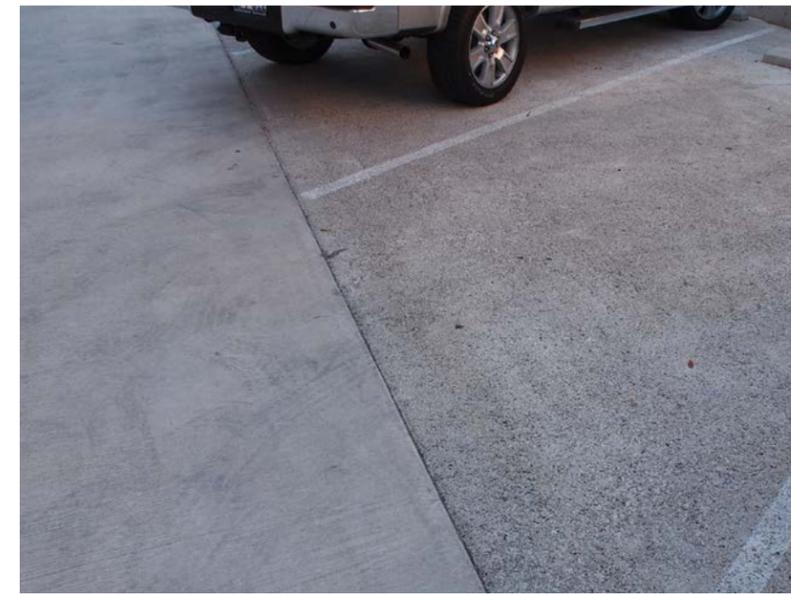
✗ Exposed aggregate concrete, which becomes a slip hazard as it wears down over time, shall only be used to repair areas already paved with this material.

VEHICULAR PAVEMENTS AND CURBING

Primary campus roadways shall be asphalt or concrete.

The preferred materials for small service and loading areas are pervious unit pavers or pervious concrete to minimize storm water runoff. In service areas that double as pedestrian walkways, unit pavers should be used to enhance pedestrian scale and character.

All street and parking lot curbs shall be cast-in-place concrete.



✓ Pervious concrete, which minimizes stormwater runoff and has a light color that minimizes heat gain, is a good choice for both vehicular and pedestrian pavements.

SITE WALLS

Site walls used for grade accommodation and visual screening purposes shall be permanent structures that adopt the scale, pattern, and quality of construction of their immediate landscape and architectural context.

Wall materials shall adopt regionally appropriate and available materials. In general, campus walls shall be constructed of durable high quality masonry materials; however, other materials may be appropriate in certain architectural settings. The use of incompatible, inferior site wall materials in close association with the architecturally finished walls of campus buildings should be avoided.

Seat walls are encouraged as a way to create informal meeting and gathering places at locations that naturally attract people, such as at building entrances. Seat walls should be generously sized to allow for comfortable informal use. A preferred minimum depth for seat walls shall be sixteen inches.



✔ Unique design expressions, such as this perforated metal wall at the Geology Building, are appropriate in courtyard spaces.



✔ High quality local limestone masonry walls are a character defining feature of the UT Austin campus landscape.



✘ Informal stacked limestone block walls are not institutional in character or construction quality.

PLANTING BED EDGING

Planting bed edges shall be defined by site walls where the walls serve a retaining function. In circumstances where one planting material meets another in a flush condition, metal edging shall be used to demarcate bed edges. Informal stone or concrete cobbles shall not be used. Bed edges shall be straight lines or simple curves sympathetic with adjacent architecture and site context. Elaborate ornamental planting bed shapes shall not be used.



✘ The use of incompatible, inferior site wall materials in close association with the architecturally finished walls of campus buildings should be avoided.



✔ Simple edging and bed shape define the transition from lawn to groundcover.



✘ Informal limestone block edging adds unnecessary visual clutter to planting beds.



5.0 POLICIES

This section of the Landscape Master Plan report identifies policy recommendations related to the campus landscape.

5.1 LANDSCAPE MASTER PLAN COMPLIANCE

The campus Landscape Master Plan establishes guidelines for the design of The University of Texas at Austin landscape. The guidelines are intended to bring high quality and consistency to the design of the campus environment. All new construction and renovation projects should conform to the Landscape Master Plan, or be able to show how they can improve upon the plan.

APPROVAL AUTHORITY

The Campus Master Plan Committee (CMPC) will review all campus projects impacting the exterior environment to assure that they conform to the guidelines in the Landscape Master Plan. The Committee recommends projects to the University President for approval. If the project is large or significant enough the University President will seek the approval of the University of Texas System Board of Regents.

The CMPC is appointed by the University President. The Committee membership includes the Vice President for University Operations, the Dean of the School of Architecture, the Senior Vice Provost for Resource Management, the Chair plus one member of the Faculty Building Advisory Committee, the Director of the Office of Campus Planning, and two architects and one landscape architect chosen from the faculty of the School of Architecture. It is recommended that the committee consider its membership be expanded to include student representation from the School of Architecture.

COMPLIANCE

Projects that Qualify for Review

All campus projects having an impact on the exterior environment must be reviewed by the CMPC. This includes all projects managed by the Office of Facilities Planning and Construction, projects managed by units within Campus Planning and Facilities Management, as well as the several auxiliary units on campus who have been granted the authority to propose and execute small projects on the main campus. In addition, review by the CMPC shall extend to all ad hoc projects proposed by individuals, departments or colleges which would change the exterior of existing buildings, add new structures or make changes to any University property between or around buildings.

Landscape Architect Selection

When a campus project is deemed to be significant in scope, size, location or its general impact on the campus environment, the project must not only be reviewed by the CMPC, but must also be designed by a team which includes a registered landscape architect. The group responsible for selecting qualified landscape architects for each project shall include at least one member of the CMPC. A primary consideration for the selection of landscape architects for campus projects should be the demonstrated ability to produce high quality landscape architectural designs while working within Landscape Master Plan guidelines.

The University may consider adopting methods for landscape projects that differ from the normal structure of design teams. In cases where landscape architects would normally be selected as subordinate player to a larger architect and engineer led consultant team, the University may choose to select the landscape architect separately to exercise more direct control over the quality of professionals retained. For some projects the University may also elect to exercise greater control over the landscape architectural design process by having the landscape architect directly contracted to the University, rather than as a sub-consultant working through a prime architect or engineer. Projects can also be framed to separate the sitework budget from the overall engineering or architecture budget, so that it is protected from disproportional cuts that can have a dramatic influence on overall campus quality.

PROCESS

Projects shall be presented to the Campus Master Plan Committee as early in the concept stage as possible. For larger projects, where a landscape architect is involved, the projects need to be presented at the end of Schematic Design and at the end of Design Development. Additional meetings may be requested by the Committee if substantial changes are made at the later phases of the project. The CMPC may seek advice from other campus entities involved in the campus environment such as the Landmarks Program for Public Art, and Landscape Services.

5.2 CAMPUS WIDE LANDSCAPE IMPROVEMENTS

The money spent on improving the campus environment is relatively small compared to the investments in buildings and utilities; however, the transformative effect good landscape architectural design has on the campus environment proportionally exceeds the dollars spent.

Important landscape architectural projects that are not part of a particular building or infrastructure project should be identified, budgeted and planned. Such projects may include large linear design elements, large district projects, or special projects. Large linear landscape architectural designs include projects such as the Speedway and East Mall transformation, the restoration of Waller Creek and the 21st Street and San Jacinto Boulevard streetscape renovations identified in the Master Plan. Large area exterior design projects include the Medical District and any area within the Central Campus zone where district scale environments need to be designed as a whole to insure continuity. Special projects include the East Mall Fountain, renovation of West Mall, and any number of courtyard renovations including the courtyards flanking the South Lawn noted in the Landscape Master Plan.

It is recommended that funding mechanisms for these important improvement projects be developed. Consideration should be given to imposing a “landscape infrastructure” assessment on all campus capital projects, similar to the widely used 1% for the arts programs. The proceeds of the assessment would be used to augment funds from gifts and other sources to create a well-designed campus environment which benefits everyone.

These assessments have been used at other large public universities; however, their success has been limited because the amounts of money set aside have typically been too small to effectively fund significant independent landscape projects. It is recommended that the landscape infrastructure fund be supported with resources appropriate to the scale of the design need. The ultimate return on investment for an efficient, resilient, well-designed landscape far exceeds the relatively small cost involved in its realization.



Mechanisms to fund important landscape projects such as the Speedway should be developed.



Large landscape projects such as the Waller Creek restoration should be identified for special funding.

5.3 MEASUREMENT OF PROGRESS IN SUSTAINABLE DESIGN

The University has the ability to track progress in the performance of landscape improvements and may require, in a landscape project RFP, that landscape projects monitor the following factors for the designated project area. There also may be opportunities to provide educational and student monitoring programs to evaluate the success of landscapes. To the best extent possible, the University should coordinate this effort with the most up-to-date versions of LEED and the Sustainable Sites Initiative Rating System and Reference Guide (<http://www.sustainablesites.org/>).

ITEMS TO BE QUANTIFIED DURING PRE-DESIGN AND DESIGN

- Percent of the total surface area of existing structures and pavement to remain and be used in situ on the project site
- Total surface area of existing pervious and impervious surfaces on the project site
- Total surface area of existing healthy soil to remain in situ on the project site
- Total surface area of vegetated areas to remain in situ on the project site
- Total surface area of existing invasive or pest plant species on the project site
- Number, height, and diameter at breast height of existing trees, including special status trees to remain in situ on the project site
- Number of unique or interesting site features including, view corridors, site landmarks, large shade trees, and water features to remain in situ on the site, photo document these features preconstruction
- Total surface area of stormwater receiving landscape areas at the project site
- Volume of stormwater quantity preconstruction; monitor the inflow and outflow of piped stormwater entering and exiting the project area, and correlate with daily rainfall data
- Stormwater quality preconstruction, e.g. total suspended solids analysis and other contaminant appropriate to measure at the project site
- Volume of existing irrigation water consumption to the extent it is measurable based on available metering
- Percent shade calculations demonstrating what percent of the impervious surfaces on the project site are shaded
- Calculations on estimated energy use for heating and/or cooling and the annual energy savings from vegetation and vegetated structures

- Percent of total site users that outdoor seating is provided for on the project site
- Percent of regularly occupied building with unobstructed views toward vegetated areas on the project site
- Number of dark sky compliant exterior light fixtures
- Percent reduction in electricity usage from baseline per fixture based on annual kilowatts per hour and hours of operation
- Percent of outdoor site electricity generated from renewable energy source
- Number of parking spaces for vehicles that have reduced emissions and/or high fuel-efficiency, and carpools/vanpools
- Number of short-term and long-term bicycle parking spaces
- Number of recyclable waste containers

ITEMS TO BE QUANTIFIED POST-CONSTRUCTION

- Total surface area of post construction pervious and impervious surfaces on the project site
- Total surface area (square feet) of removed invasive or pest plant species on the project site
- Number, height, and diameter at breast height (DBH) of proposed tree at a mature size
- Number of unique or interesting site features including, view corridors, site landmarks, large shade trees, and water features that were reinforced with the design, photo document these features post construction
- Total volume capacity of stormwater features, infiltration rates and evapotranspiration rates/vegetative cover located on the project site
- Total surface area of stormwater features, including conveyance

- Volume of stormwater quantity post construction; monitor the inflow and outflow of piped stormwater entering and exiting the project area, and correlate with daily rainfall data
- Stormwater quality post construction, e.g. total suspended solids analysis and other contaminant appropriate to measure at the project site
- Volume of irrigation water consumption to the extent it is measurable based on available metering after plant establishment
- Percent cover of native plants or native plant assemblages on the project site
- Percent of total material costs of reused (including plants) materials, recycled content materials, and regionally sourced materials used on the project site
- Percent of healthy soils and vegetated areas preserved on the project site post construction
- Tons or cubic yards of waste diverted from the landfill and recycled from the project site
- Percent reduction in emissions generated from landscape maintenance on the project site

4.5 ART IN THE LANDSCAPE

In 2008 the University adopted a Public Art Master Plan that informs the selection and placement of public art on the campus. The Public Art Master Plan defines seven principal "types" of art as defined by placement choices and provides a generalized map showing existing and proposed zones and sites for art in the landscape. This section of the Landscape Master Plan provides an updated map for art placement, based on the 2013 Campus Master Plan. It also provides a commentary and policy recommendations regarding the use of the campus grounds for memorials.

ART PLACEMENT

The figure on the opposite page shows an updated version of the Public Art Master Plan map showing existing and proposed locations for outdoor sculpture. This map is a concept level diagram for proposed art, and recognizes that each new art installation will require a detailed site selection process tailored to the specific budget, art characteristics, and site conditions of the project.

ART AND LANDSCAPE INTEGRATION

The Public Art Master Plan speaks to the importance of installation considerations and the importance of the landscape surrounding the piece to the overall experience of the piece. It is further emphasized here that sculpture, murals, pavement art and other outdoor art is often more successful when carefully integrated with its landscape and adjacent architecture. Sculpture installations shall give careful consideration to the appropriateness of the scale relationship of the piece to its immediate environment; orientation and frontality of the piece relative to its setting; landscape and building background materials, shape, color, texture; general illumination and shadow patterns, and detail design of bases and mounting methods.



This sculpture integrated into the landscape creates a landmark along Dean Keeton Street.



A temporary art installation animates the West Mall fountain.



UPDATED PUBLIC ART LOCATION PLAN

- LEGEND
- EXISTING OUTDOOR SCULPTURE
 - PROPOSED LARGE GESTURE - PRIORITY AREA
 - PROPOSED LARGE GESTURE
 - PROPOSED SMALL GESTURE
 - ▲ PROPOSED SERIAL GESTURE
 - PROPOSED SCULPTURE PARK
 - MAJOR VEHICULAR CAMPUS ENTRANCE
 - MAJOR PEDESTRIAN CAMPUS ENTRANCE

CAMPUS MEMORIALS

From time to time memorials are proposed for installation on the campus grounds. Given the basic physical limitations of the grounds to absorb memorial pieces indefinitely, the sensitivity of meanings associated with memorials, and their potential long term obstruction to the orderly development of the campus, the following observations and policy recommendation are made.

UNIVERSITY IDENTITY

Once established, memorials in the campus landscape initiate a lasting relationship between the University and the memorialized entity. In that relationship, the meanings and values associated with the individual, group or event being memorialized will, by inference, be understood as values shared by the University. The memorialized entity will, by the simple fact of being part of the grounds, become forever part of the identity of the University.



The statues in the South Mall are integrated into the overall architectural and landscape composition.



The Martin Luther King Jr statue occupies a prominent axial position on the East Mall.

MEMORIAL PLACEMENT

In addition to the above general condition of simply being within the campus grounds at all, there is the profound question of specific location within the landscape. If we look at the “face” of the campus, it matters if the memorial occupies a site on the forehead or behind an ear.

The landscape order of the campus for most of the campus west of Waller Creek is based on a geometric grid. The streets, order of buildings, major malls and open spaces are largely organized with a gridded geometry. To the east of the creek, the order of the grid is loosely maintained by the orientation of most buildings and some streets; however, the order of the landscape is decidedly not geometric. It is the order of a irregular naturalistic parkland.

By its very form, the campus landscape assigns higher importance to some areas than others. West of Waller Creek, the most significant and important places in the landscape are the malls and plazas that occupy the principal axes of the plan and which are intimately connected to the architecture. East of the Creek, the most significant and important places in the landscape are those which command high ground, those which have visible street locations or which are associated with the monumental buildings.

When memorials to people, groups, organizations or events are proposed for introduction into the campus landscape, the importance of such memorials will be granted increased or diminished stature and significance on the basis of their location. By association with a particular site, the significance of the memorial and all the values associated with it will be affected. A powerful site will assign power to the memorialized entity. A subordinate site will reduce the relative strength of the entity there memorialized.

POLICY

Given the importance of memorials, both in their literary meanings based on the historical story associated with them, and the symbolic meanings associated with the specific placement of the memorial within the campus grounds, the location and perpetuation of memorials in the campus landscape shall be controlled by the highest level of the University administrative leadership.



The Barbara Jordan statue is off axis and less well connected to the campus design than the King statue or the South Lawn pieces.

