

ZILKER
METROPOLITAN
PARK
VISION PLAN

Date: May 5, 2021

Title: Site Analysis and Needs Assessment Report

DRAFT



INTRODUCTION

Zilker Metropolitan Park (Zilker Park) was designated as a public park in 1934. With lands donated in 1917 by Andrew Jackson Zilker, the history of the park's land goes back farther – 9,000 years or more. Today, with approximately 350 acres of area to explore, Zilker Park is a complex blend of precious environmental resources, events that have become tradition, economic income for the City and a symbol of Austin life. No comprehensive plan has ever been done on the park until this initiative. With the vast number of stakeholders, users, and complicated regulations that exist within the Park, a plan is long overdue. It will provide direction for Zilker Park's improvements for the next several decades.

Many plans and studies have been done on various elements or aspects of Zilker Park in the past decade. In addition to providing regional, demographic, economic, environmental and transportation-related context, this report summarizes the more recent plans and recommendations.

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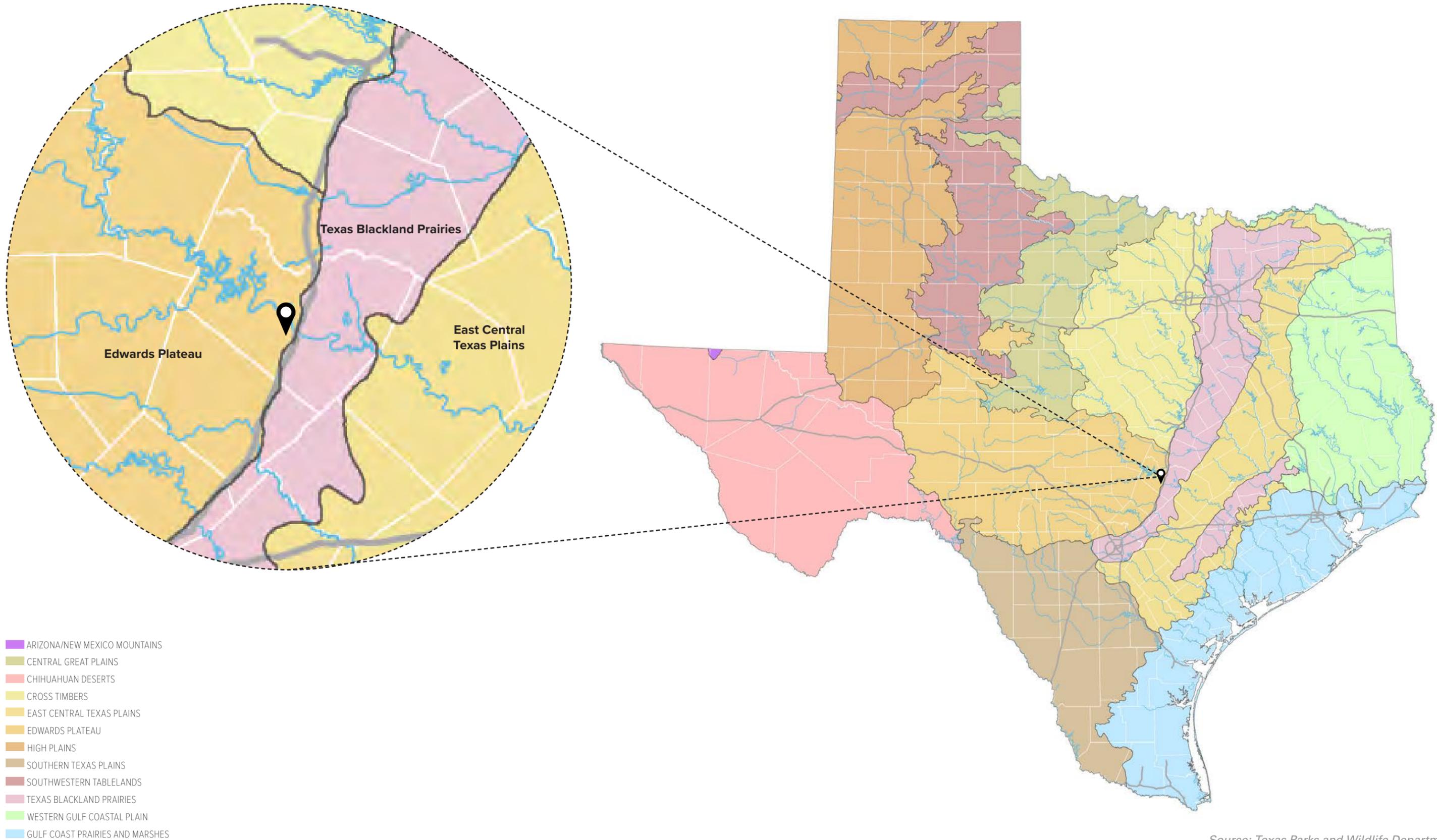
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REGIONAL CONTEXT

ECOLOGICAL CONTEXT_ ECOREGION



Source: Texas Parks and Wildlife Department

AUSTIN PARKS SYSTEM



METROPOLITAN PARK

Focus on natural resource values and recreational diversity. Often include water-based recreation and environmental education.

Size: 201+ Acres

Service Area: Citywide

Access: Major Arterials (All Transport Modes)

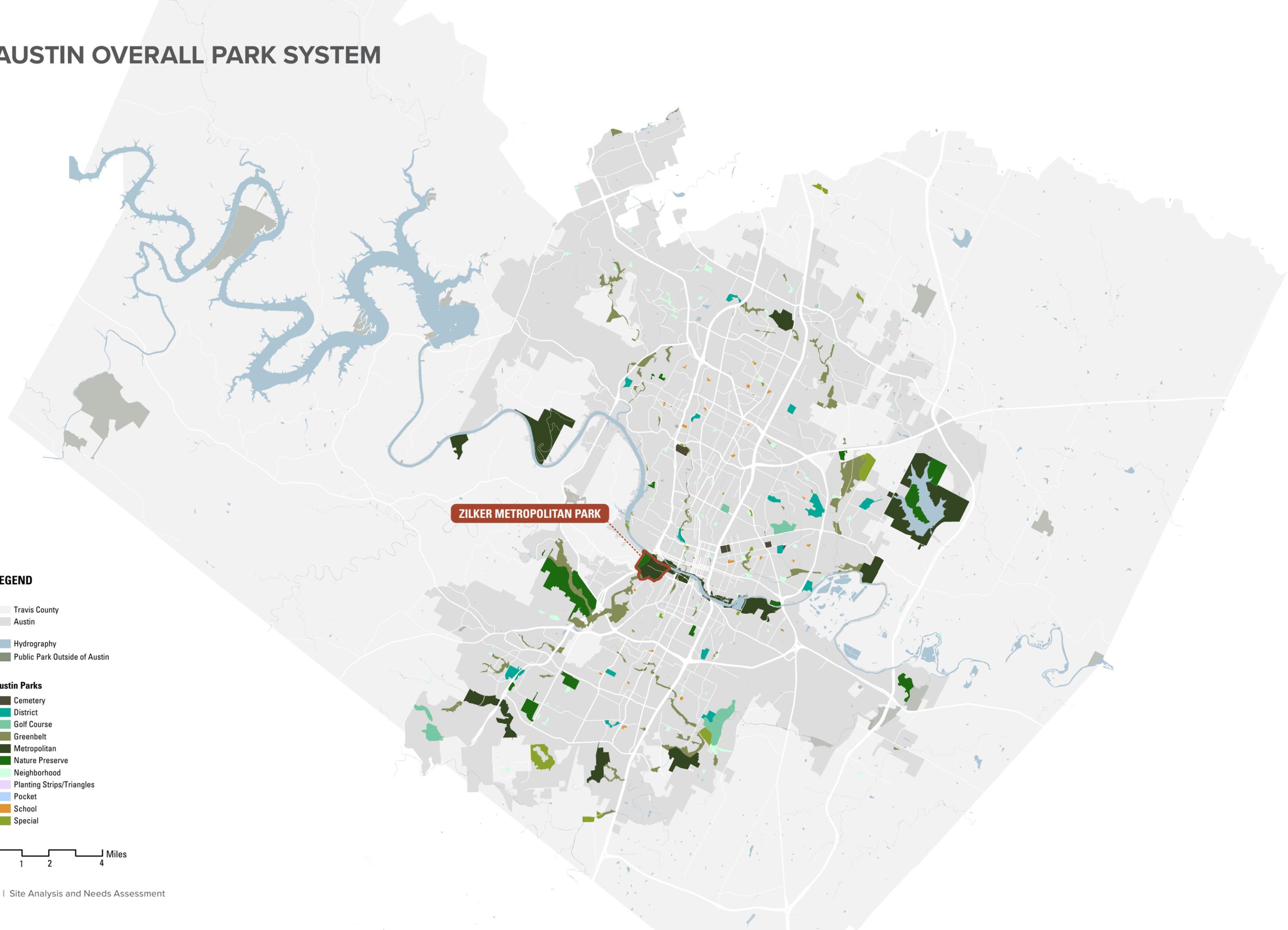
Feature: More Large, Specialized Features and Facilities

Zilker Metropolitan Park

Size: 307.85 Acres

Address: 2100 Barton Springs Road., Austin, Texas 78746

AUSTIN OVERALL PARK SYSTEM

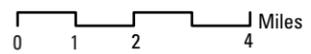


LEGEND

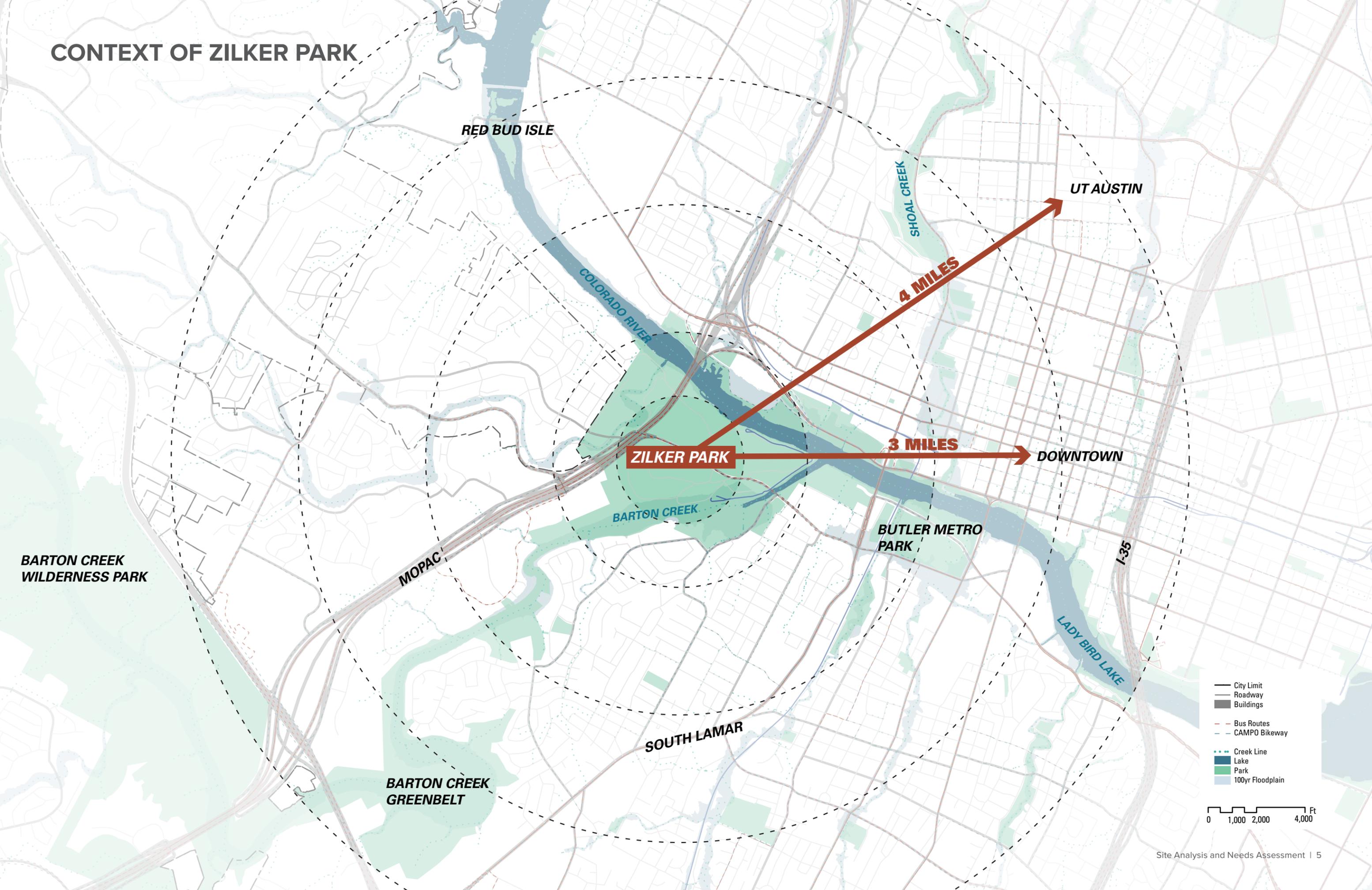
- Travis County
- Austin
- Hydrography
- Public Park Outside of Austin

Austin Parks

- Cemetery
- District
- Golf Course
- Greenbelt
- Metropolitan
- Nature Preserve
- Neighborhood
- Planting Strips/Triangles
- Pocket
- School
- Special



CONTEXT OF ZILKER PARK



RED BUD ISLE

UT AUSTIN

4 MILES

ZILKER PARK

3 MILES

DOWNTOWN

BARTON CREEK WILDERNESS PARK

MOPAC

BARTON CREEK

BUTLER METRO PARK

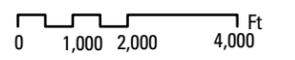
I-35

LADY BIRD LAKE

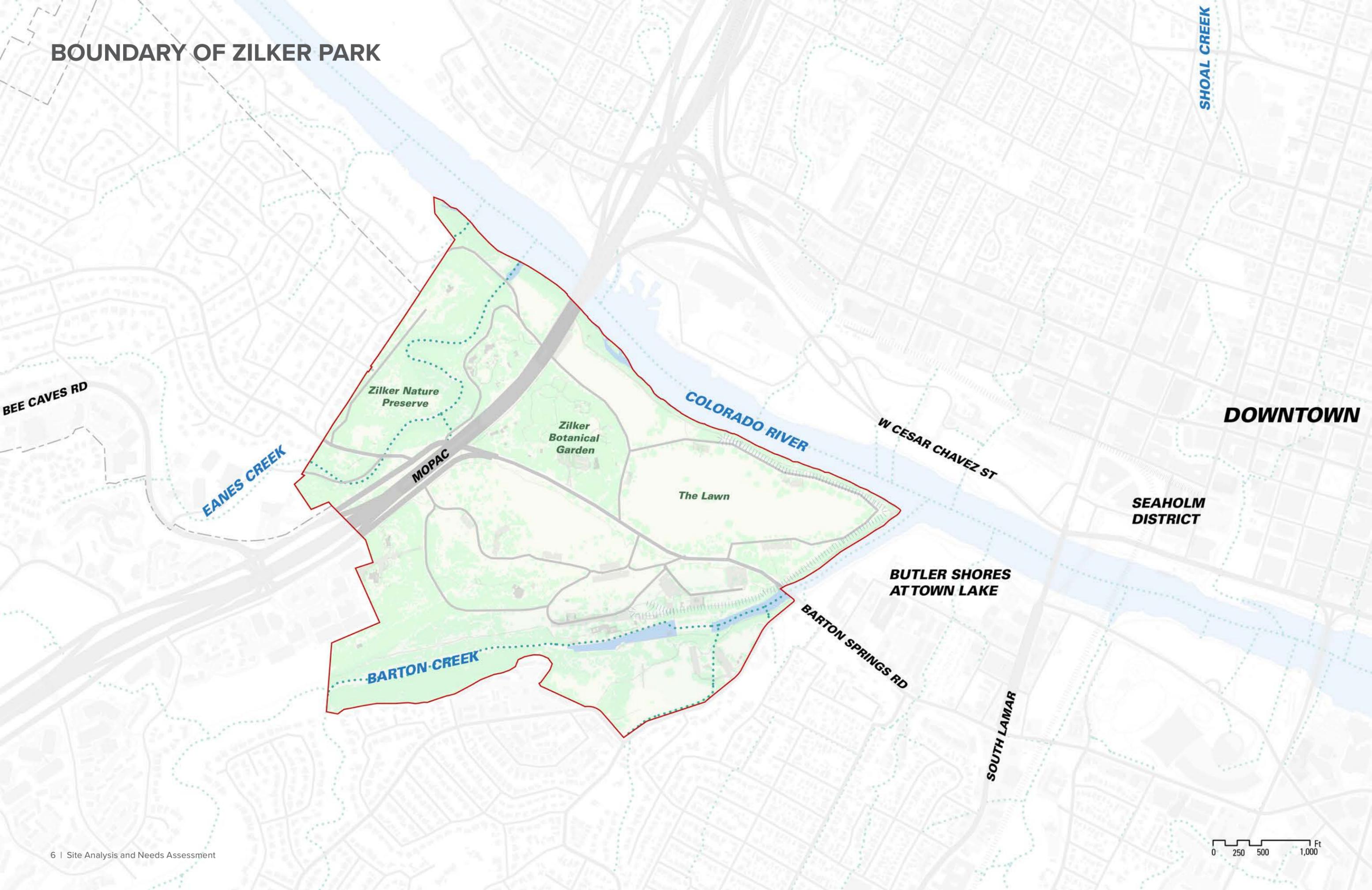
SOUTH LAMAR

BARTON CREEK GREENBELT

- City Limit
- Roadway
- Buildings
- Bus Routes
- CAMPO Bikeway
- Creek Line
- Lake
- Park
- 100yr Floodplain



BOUNDARY OF ZILKER PARK



BEE CAVES RD

EANES CREEK

Zilker Nature Preserve

Zilker Botanical Garden

The Lawn

BARTON CREEK

MOPAC

COLORADO RIVER

W CESAR CHAVEZ ST

SHOAL CREEK

DOWNTOWN

SEAHOLM DISTRICT

BUTLER SHORES AT TOWN LAKE

BARTON SPRINGS RD

SOUTH LAMAR

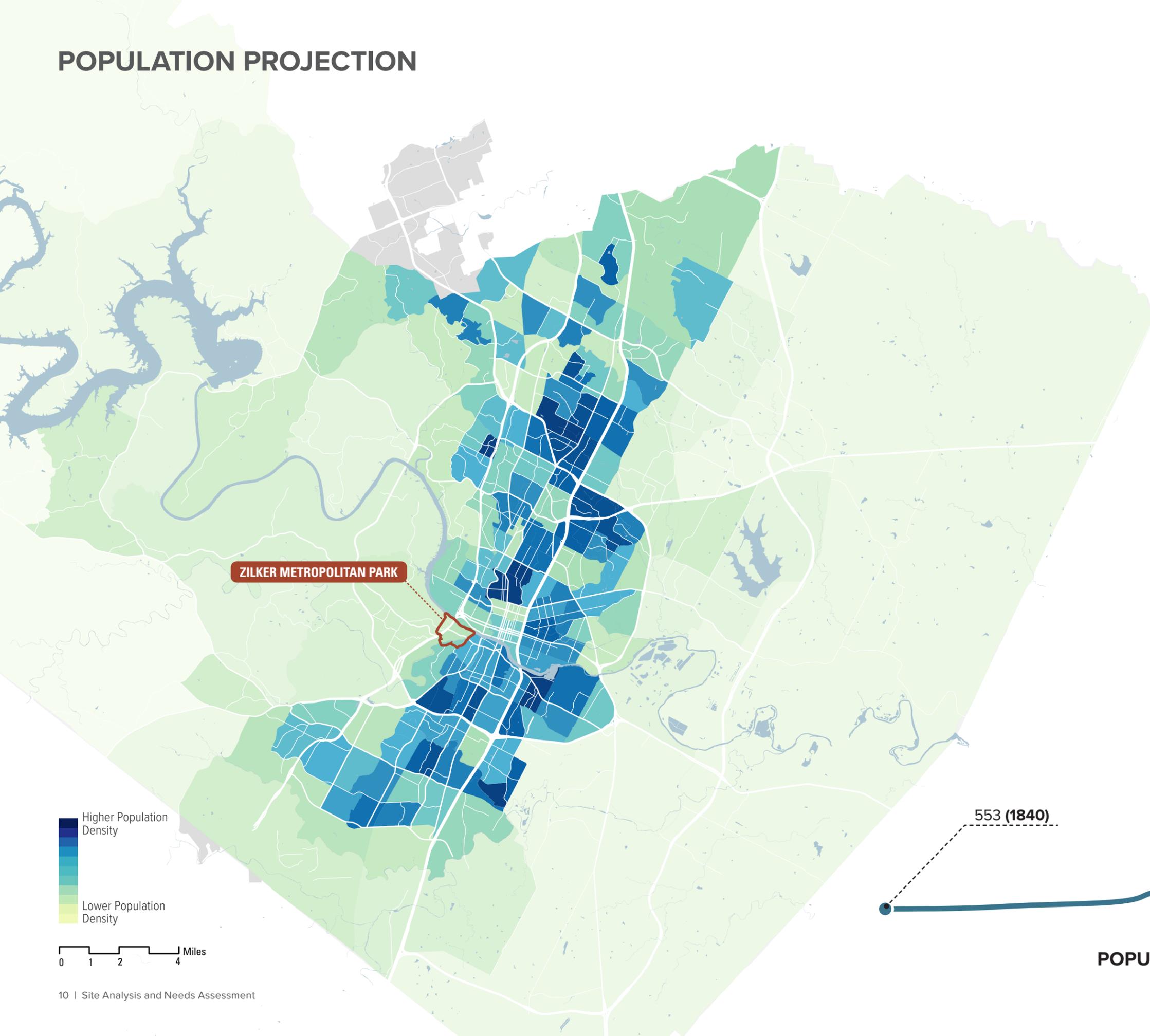




The image shows a city skyline across a body of water, with a bridge in the foreground. The scene is overlaid with a semi-transparent image of trees, creating a layered effect. The word "DEMOGRAPHICS" is written in a bold, blue, sans-serif font on the right side of the image.

DEMOGRAPHICS

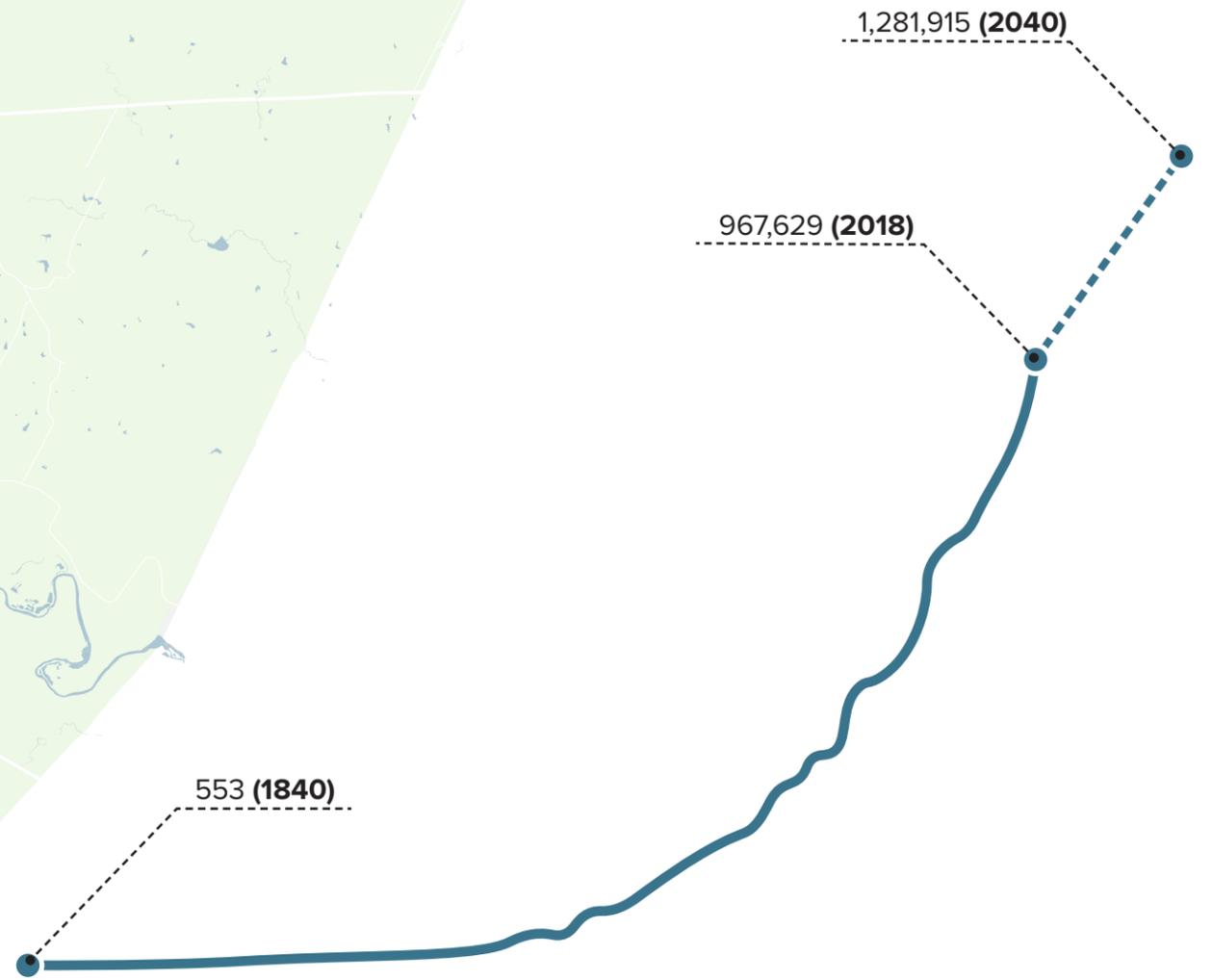
POPULATION PROJECTION



ZILKER METROPOLITAN PARK

Higher Population Density
Lower Population Density

0 1 2 4 Miles



POPULATION INCREASE FROM 1840 TO 2040

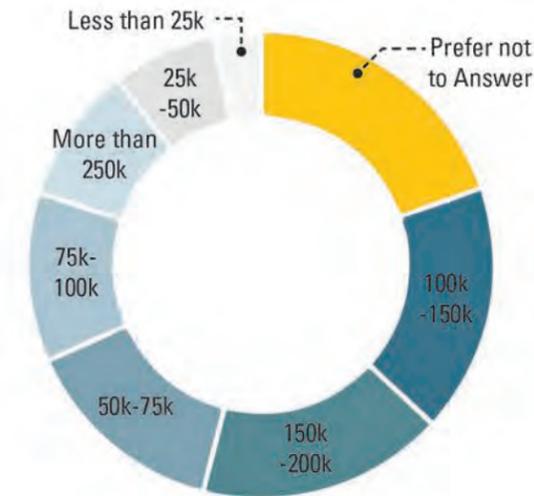
THE VISITORS OF ZILKER PARK

This information is from the Pre-Kickoff Preview Survey that started in November 2020. At the time of this report, 81,011 responses (2,952 participant) have been received.

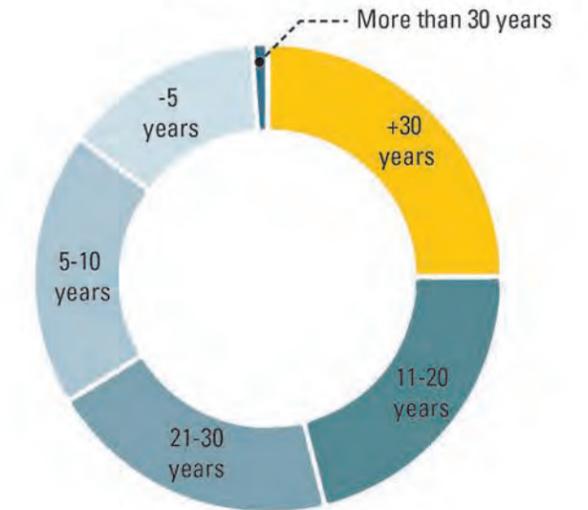
What is your zip code?



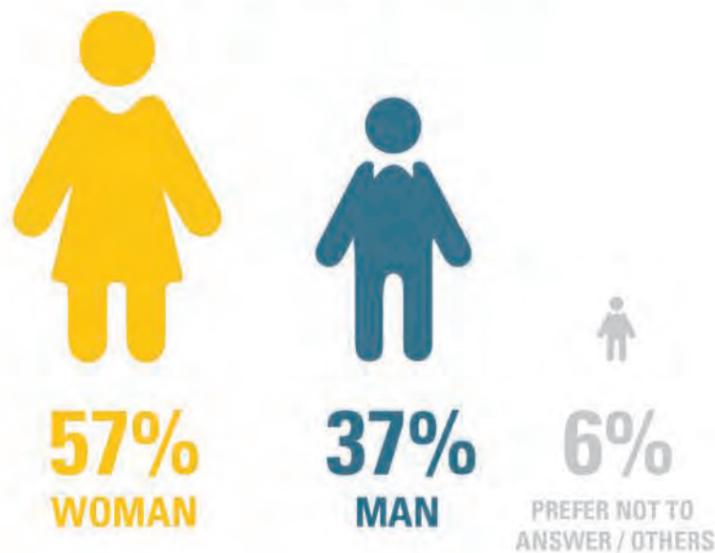
What is your household income?



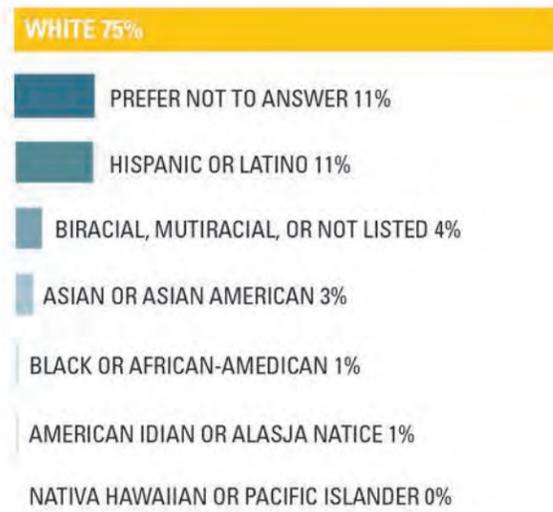
How long have you lived Austin?



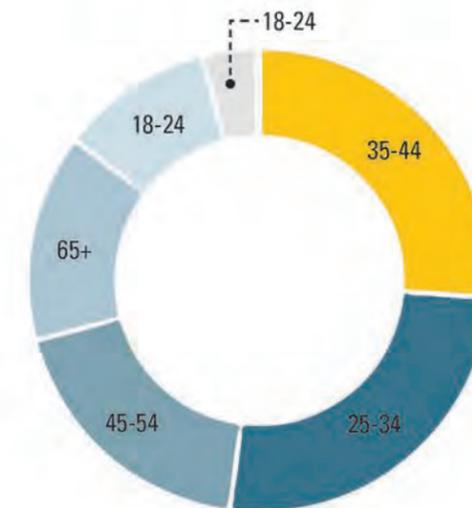
What is your gender?



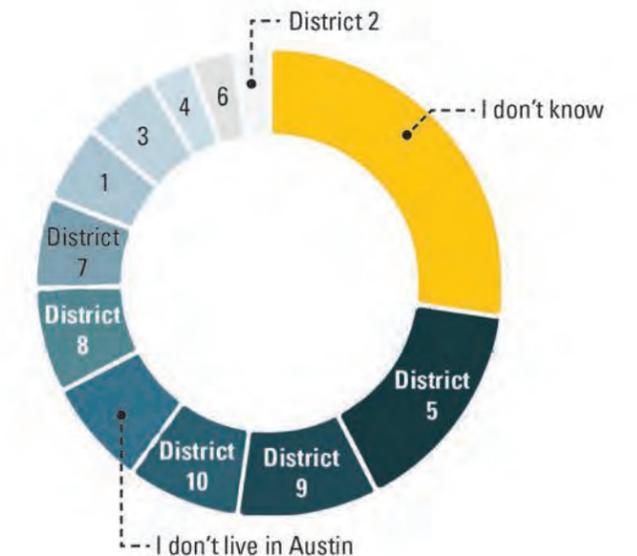
What is your race/ethnicity?



What is your age range?



Which City Council District do you live in?



Source: Zilker Vision Plan - Pre-Kickoff Preview Survey



A person is kayaking on a river. The kayaker is wearing a dark shirt and light-colored pants, and is holding a yellow paddle. The river is surrounded by lush greenery, including a large tree branch with many green leaves hanging over the water in the foreground. The water is calm and reflects the surrounding environment. The word "ENVIRONMENT" is written in bold blue capital letters across the middle of the image.

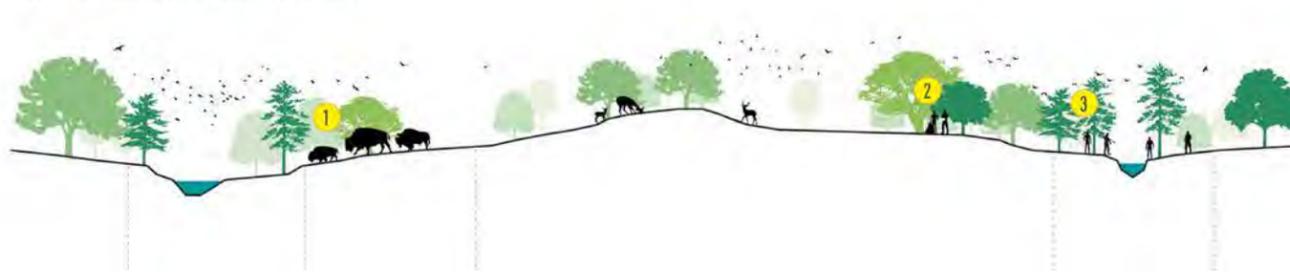
ENVIRONMENT

HISTORIC LAND USE CONTEXT

For the purposes of this report, Zilker Park’s landscape history can be roughly divided into three periods—Forest, Savanna, & Springs; Industrial & Agriculture; and Recreational. The Forest, Savanna, & Springs period (7000 BCE–17th century) shows the landscape before widespread colonial settlements and represents thousands of years of Indigenous habitation. It highlights some of the tribes who frequented the springs—including the Tonkawa, Lipan Apache, and Comanche. This landscape was characterized by a naturally dense forested landscape, a low and wide undammed Colorado River, plentiful wildlife, and naturally flowing spring water in Barton Creek. The Industrial & Agriculture period covers the 18th–19th centuries and ends approximately 300 years after colonists first arrived. This time period in Zilker Park was characterized by highly extractive activities, such as mining, farming, and milling along Barton Creek’s banks. These intensive land use changes removed tree canopy, decreased wildlife, and increased erosion. The final Recreational period (20th–21st century) shows land use up to today, which shows Zilker Park as a city-owned public space. The modern landscape in Zilker Park is characterized by a higher and more consistent water level on the north side of the park, created by the damming of the Colorado River and formation of Lady Bird Lake. Additionally, heavy public use, soil compaction, trampling, and contamination is also present throughout the park. These sections highlight not only Zilker Park’s accelerating landscape changes, but also how land uses have changed and why. Themes that have emerged from these three historic periods include:

- A transition in land uses from a natural landscape to industrial and finally to recreational;
- A landscape where the proportion of wild lands decreases steadily over time;
- A decrease in wildlife abundance and diversity over time, especially a decrease in megafauna; and
- A transition from tribes camping along Barton Creek, to a few independent mill owners and homesteaders, to a modern landscape visited by hundreds of people daily.

FOREST, SAVANNA, AND SPRINGS



7000 B.C.E. - 17th Century

Wildlife is abundant, bison and deer roam the landscape and are a major food source for indigenous peoples hunting in the area. Indigenous peoples’ encampments are near Barton Creek. Numerous tribes frequented the area—of these, the Tonkawa, Comanche, and Lipan Apache were among those documented in written records. People fish along Barton Creek.



Figure 2.2 Historic 1940 Aerial



Zilker bathhouse exterior, 1948 (from The Austin History Center via UNT Texas History Portal)



Bathers at Barton Springs Pool, 1940-1969 (from The Austin History Center via UNT Texas History Portal)



Zilker Zephyr with Capitol in background, 1960-1980 (from The Austin History Center via UNT Texas History Portal)

ECOREGIONS & EDWARDS AQUIFER

Zilker Park lies in the transition zone between the Edwards Plateau and Blackland Prairie ecoregions, blending aspects of the two. Hydrologically, Zilker Park sits atop the Edwards Aquifer and within the Colorado River corridor. The park includes sections of both Barton Creek and Eanes Creek and is home to the iconic Barton Springs. These factors combine to create a beloved, ecologically significant landscape in great need of planning and stewardship. This chapter describes the site's hydrology, topography, geology, soils, plant communities, and wildlife. This information is the foundation of the Natural Resource Inventory report's management guidelines.

The Edwards Aquifer lies under the eastern and southern borders of the Hill Country and gives rise to the iconic springs of Central Texas. The Barton Springs segment of the Edwards Aquifer covers 250,000 acres and includes the Barton and Eanes Creek watersheds. The recharge zone is the critical area where water enters the aquifer through cracks and pores in the limestone. The recharge zone covers over 56,000 acres including 321 acres in Zilker Park. Water from the recharge zone flows out in the prolific Barton Springs system that feeds Barton Springs Pool and creates habitat for the endangered Austin Blind Salamander and Barton Springs Salamander. Because the limestone—through which water enters the aquifer—does not filter out contaminants, this critical, fast-moving water system is impacted by resource management decisions throughout the contributing and recharge zones. Activities in the park can also impact the recharge zone and areas immediately adjacent to the springs.

Ecological Context

- Barton Springs
- Springs
- Major Roads
- Ecoregion Boundary
- Lakes and Waterways
- Conserved Land
- Edwards Aquifer (EA)
- Contributing Zone (Barton Springs Segment)
- Recharge Zone (Barton Springs Segment)
- Transition Zone (Barton Springs Segment)
- Austin City Limits

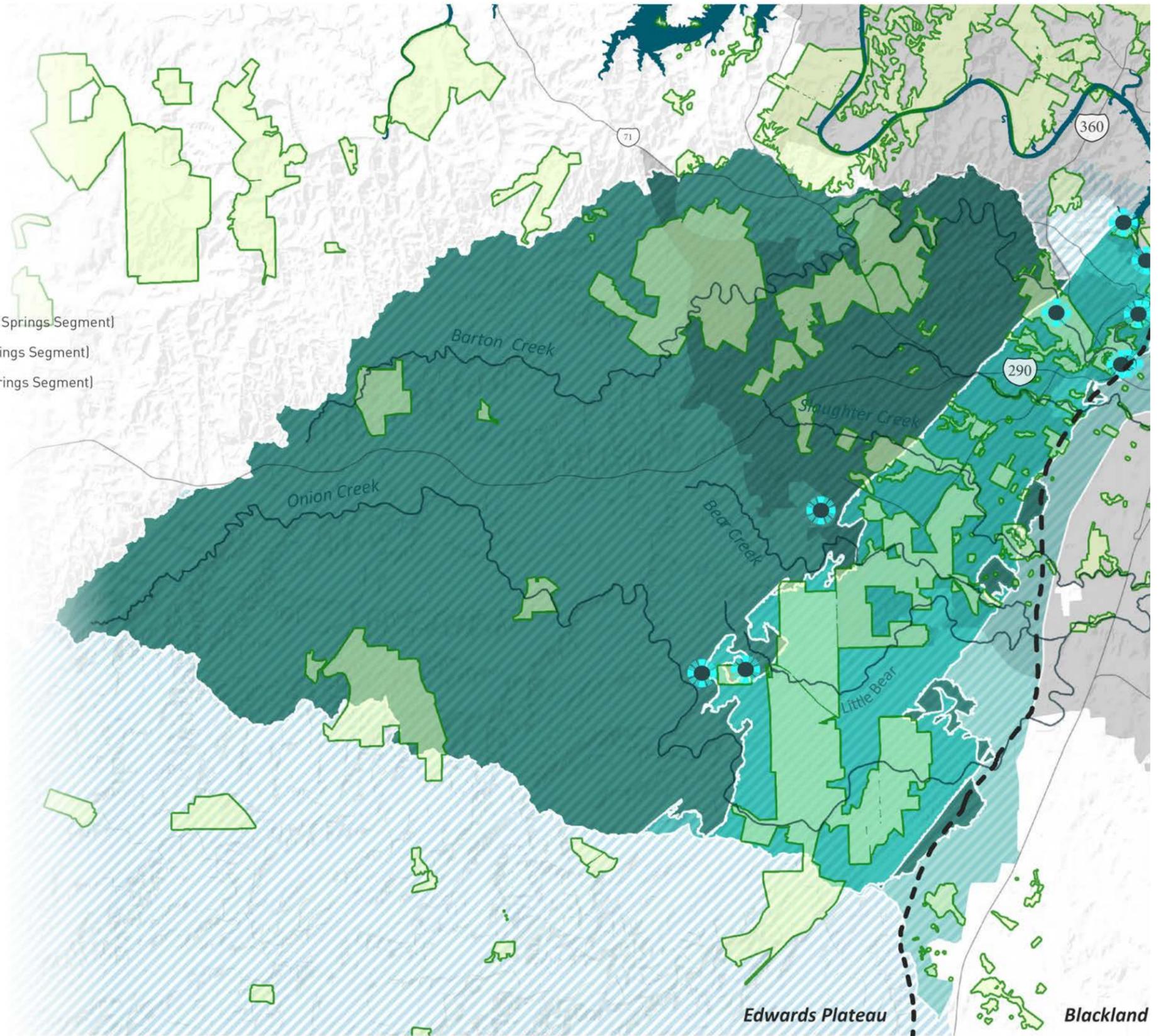


Figure 3.1. Ecological context of Zilker Park

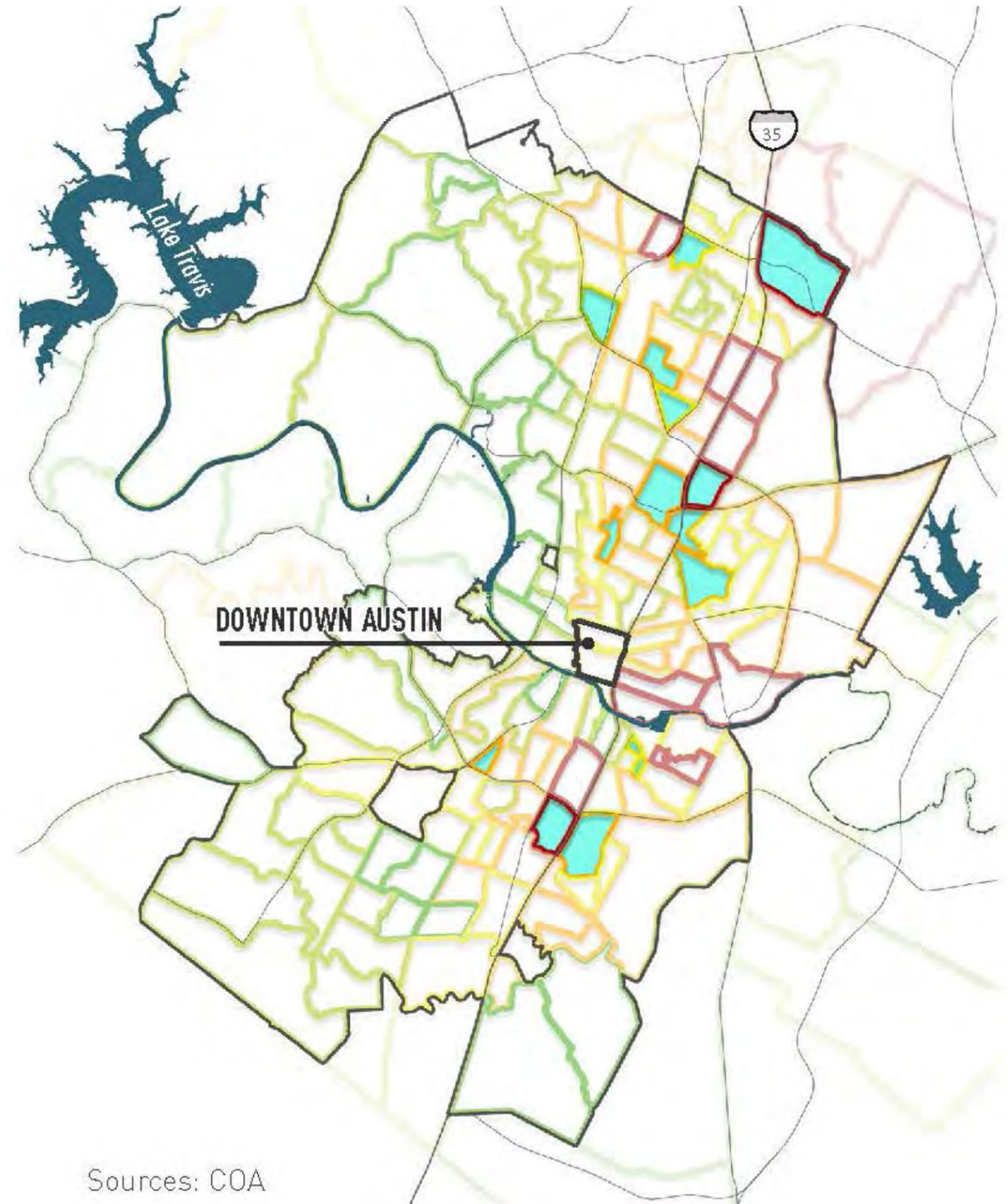
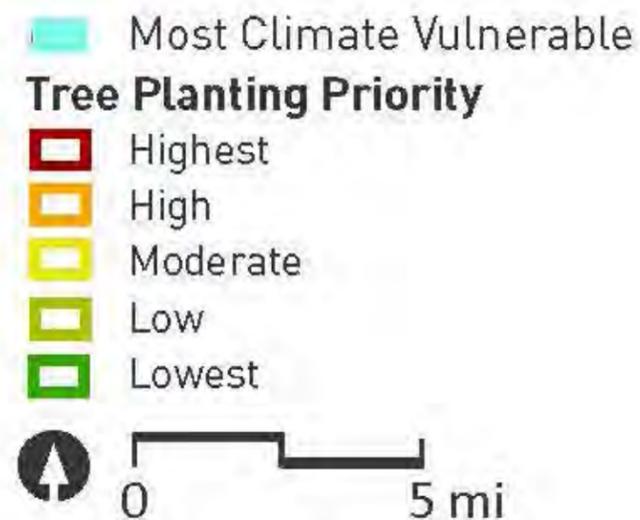
GREEN INFRASTRUCTURE

In 2012, the City of Austin adopted the Imagine Austin Comprehensive Plan, which included Priority Program #4: Use green infrastructure to protect environmentally sensitive areas and integrate nature into the city. It also established a definition of green infrastructure as a strategically planned and managed network of natural lands, parks, working landscapes, open spaces, and green stormwater controls that conserve and enhance ecosystem services and provide associated benefits to human populations.

As climate change intensifies and results in higher temperatures and more extreme weather events, the many forms of green infrastructure will become increasingly important. A map of climate vulnerability and tree planting priority in Austin from the City of Austin Green Infrastructure Assessment (Figure 3.13) shows areas that are climate vulnerable as a result of urban heat island temperature increases, lack of urban forest, and lack of shade over impervious cover. In addition, these areas coincide with higher levels of social vulnerability and worse health outcomes.

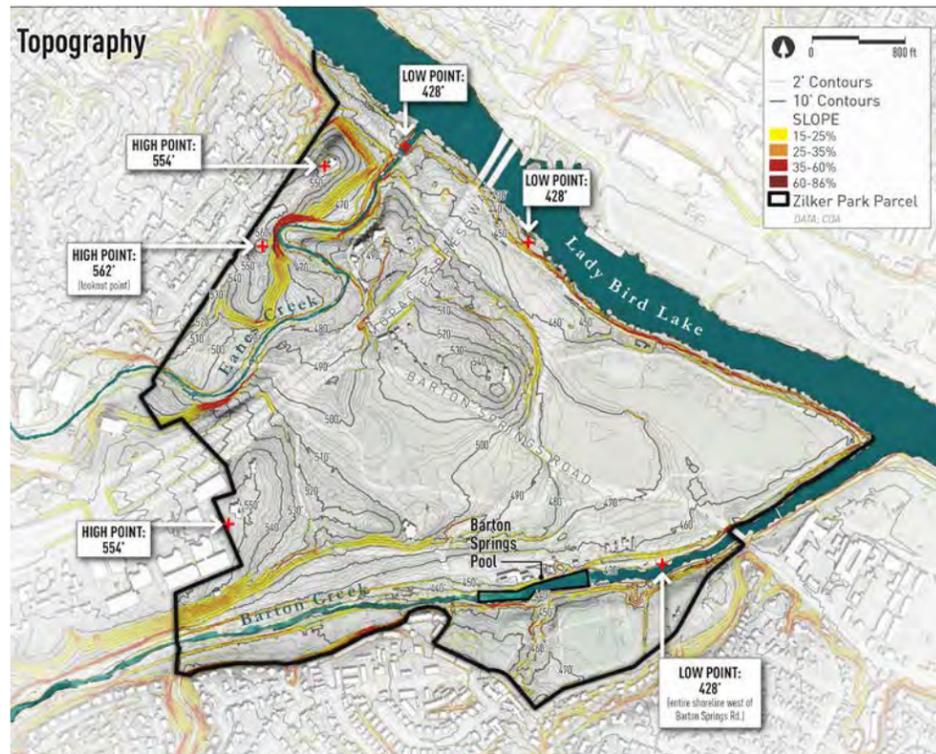
While the general area around Zilker Park exhibits a low to moderate tree planting priority, this park serves as a city-wide refuge to enjoy the outdoors in a location that has relief from higher temperatures as a result of the urban forest, shading, and water related cooling. In addition, the changes suggested in the Zilker Park Natural Resource Inventory and Natural Area Management Guidelines recommend the improvement of canopy in the park and addition of green stormwater infrastructure. The result is a park that is adapting to and mitigating climate change. These same concepts must be integrated into the Zilker Park Vision Plan to create a sustainable park that addresses climate change.

Climate Vulnerability and Tree Planting Priority



SITE CHARACTERISTICS: GEOLOGY AND SOILS

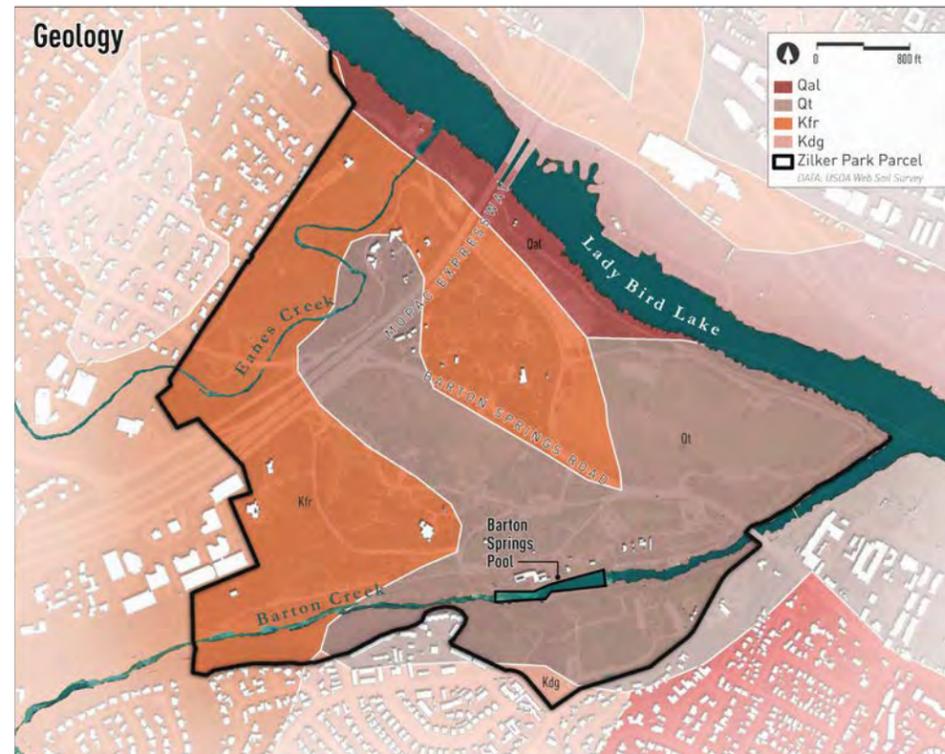
Topography



The topography of Zilker Park varies from low-lying lands near waterways to steep cliffs carved by creeks. The lowest elevations in the park are along the Lady Bird Lake shoreline which, due to damming, stay near 428 feet elevation. The highest points in the study area are over 550 feet, with the highest point at 562 feet elevation. These areas are located upslope of a major bend on the west side of Eanes Creek—with Lookout Point lying near the high point of 562 feet and the Zilker Park Clubhouse lying near 554 feet. On the other side of MoPac Expressway, the McBeth Recreation Center lies close to the 554 feet elevation point. Changes in topography (slope) are most substantial west of MoPac Expressway, along the lakeshore, and along Barton Creek. In contrast, the Great Lawn, Disc Golf Course, and Polo Fields are comparatively flat.

The topography of the site affects its current condition in numerous ways. Generally, within parks, steep slopes contain the most intact woodlands yet are more prone to erosion. Flat areas accessible to lawnmowers tend to be regularly mowed. While the elevation gain throughout the site is relatively small, high points do allow for a greater variety of views of Lady Bird Lake, the urban forest canopy, and the Austin skyline.

Geology

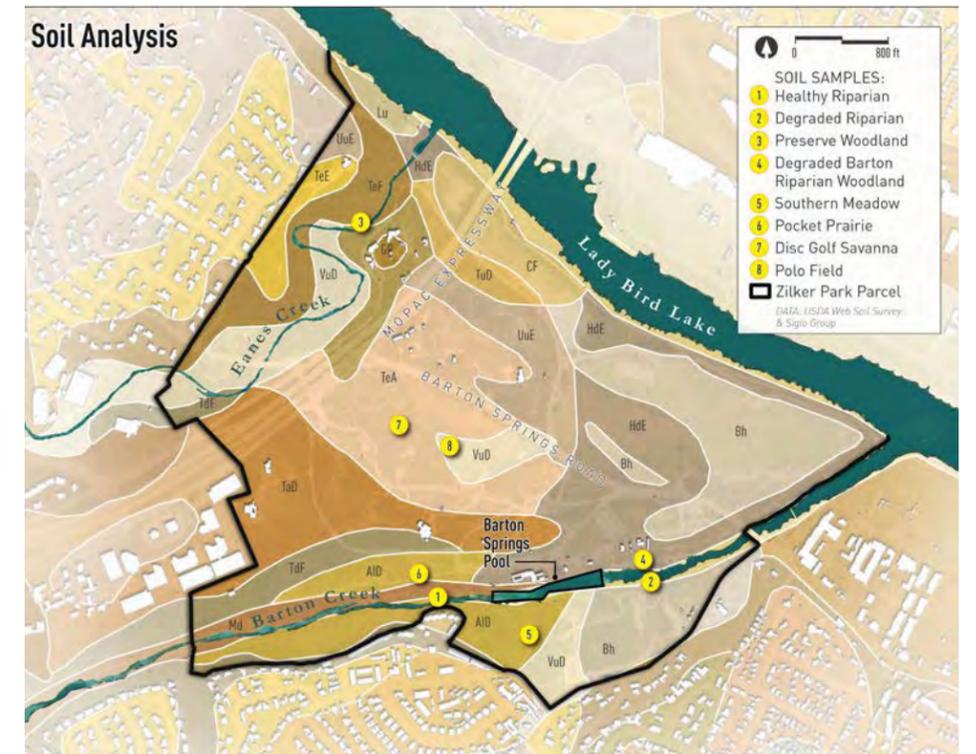


The geology of Zilker Park is a combination of Hill Country limestone and influences from the Blackland Prairie, and is shaped by water that cuts through rock and sediment to expose four types of bedrock:

- Quaternary Alluvium (Qal)
- Fluvial Terrace Deposits (Qt)
- Fredericksburg Group (Kfr)
- Del Rio Clay and Georgetown Limestone (Kdg)

The alluvium deposits of the Qal and Qt layers (6% and 48% of the park, respectively) underlie areas along Lady Bird Lake, much of Barton Creek, and the low-lying portions of the park. They are highly variable with some areas dominated by sand and others by loamy clay or gravel. The Fredericksburg Group comprises the upland forested areas of Zilker Park, accounting for approximately 45% of the site. It is made of Edwards Limestone, Bee Cave Marl, and Comanche Limestone. It is also known for its karst features (caves and sinkholes), although none have been found on the property. Del Rio Clay and Georgetown Limestone cover less than 1% of the site and are comprised of clay and beds of limestone with marl. This

Soils

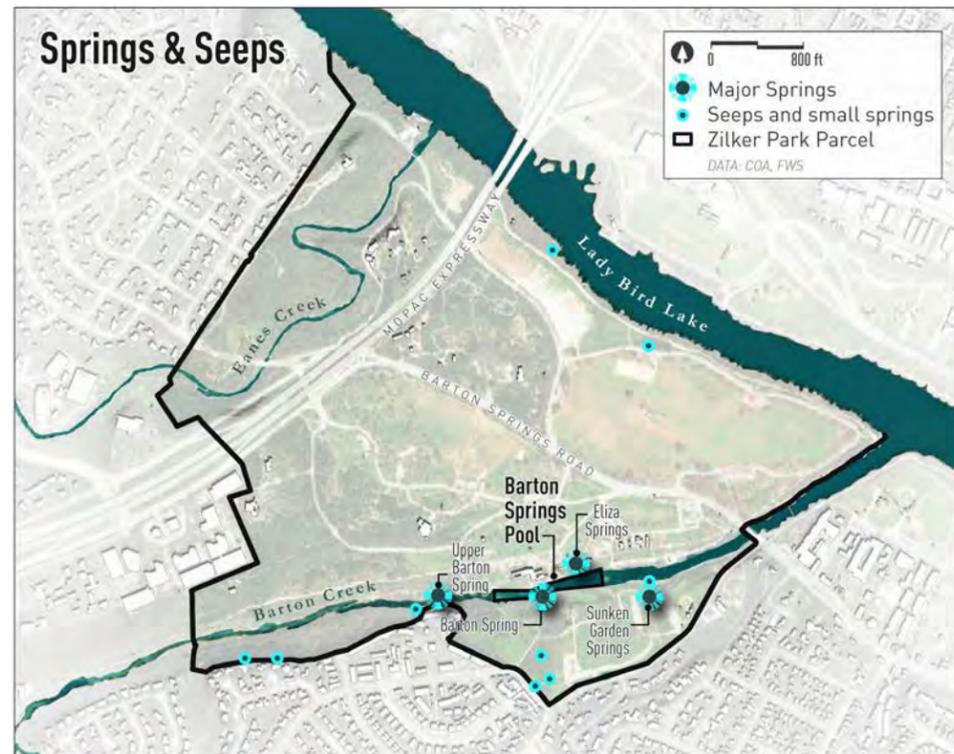


bedrock type is characteristic of the Edwards Aquifer confined (or artesian) zone and contributes to the pressure in artesian springs.

Zilker Park includes 13 soil types. These soils have been heavily impacted by agriculture and urbanization over the past 150 years as well as ecological changes in climate and topography. Their composition, nutrient levels, organic material, and health give direction on what may grow in areas, and what needs to occur to restore native plant communities.

SITE CHARACTERISTICS: WATERWAYS AND SPRINGS

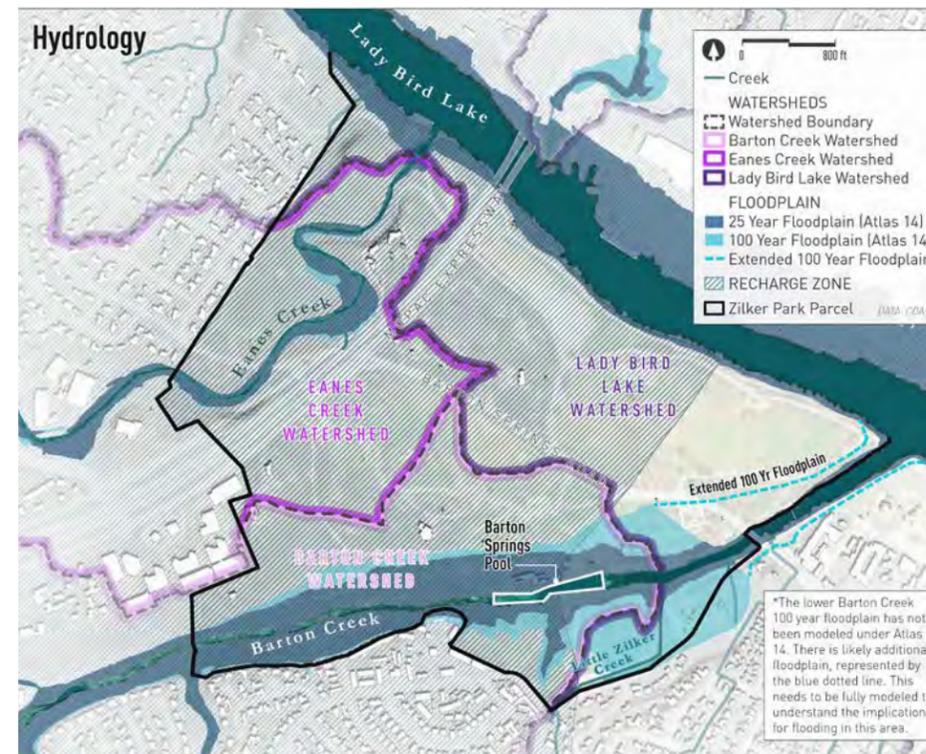
Springs and Seeps



Zilker Park contains four major springs—Barton, Eliza, Sunken Gardens (Old Mill), and Upper Barton. Each of these major springs is home to endangered salamanders (discussed in detail in the Wildlife Section of this chapter). There are an additional nine seeps and small springs located throughout the park. The major 4-spring complex has an average combined discharge of 53 cubic feet per second. Discharge varies substantially from year to year and season to season, ranging from as little as 10 cubic feet per second to as much as 166 cubic feet per second. During the severe 2009 drought, discharge was only 13 cubic feet/second.

Eliza and Old Mill Springs lie at a higher elevation than Barton Creek and are protected from all but the most severe floods, while Upper Barton Springs is in the creek bed. Barton Springs is protected in the pool by a bypass channel, but this channel is overrun during major flood events, allowing floodwaters to enter the pool and reduce water quality.

Barton Springs Pool and Creek



Barton Springs Pool had nearly one million visitors in 2018, with rapid growth in attendance expected to continue. The pool is fed by the main Barton Spring, which discharges from fissures in the rocky bottom of the pool, just west of the diving board. Localized water quality concerns for the pool include contamination entering from off-site, Barton Creek floodwaters causing pool contamination, gasoline-powered pool cleaners causing contamination and stagnant water during drought conditions causing algal blooms.

The last mile of the 50-mile-long Barton Creek flows through Zilker Park before it drains into Lady Bird Lake. The creek's watershed includes 118 acres of the study area (Figure 3.3). The creek above the pool (upper creek) has highly variable flows that have an impact on plant and animal habitat. The upper creek typically fills up after high rainfall periods in spring and is dry in the more drought-prone summer and winter months. Below the pool, the creek is fed by the springs, flows from the upper creek, and inundation from Lady Bird Lake, creating year-round flow. Water quality concerns for the creek include stormwater runoff and the resulting contaminants from park infrastructure, informal trails, trash (bottles, cans, wrappers, etc.) And animal waste entering from the shoreline, and offsite infrastructure.

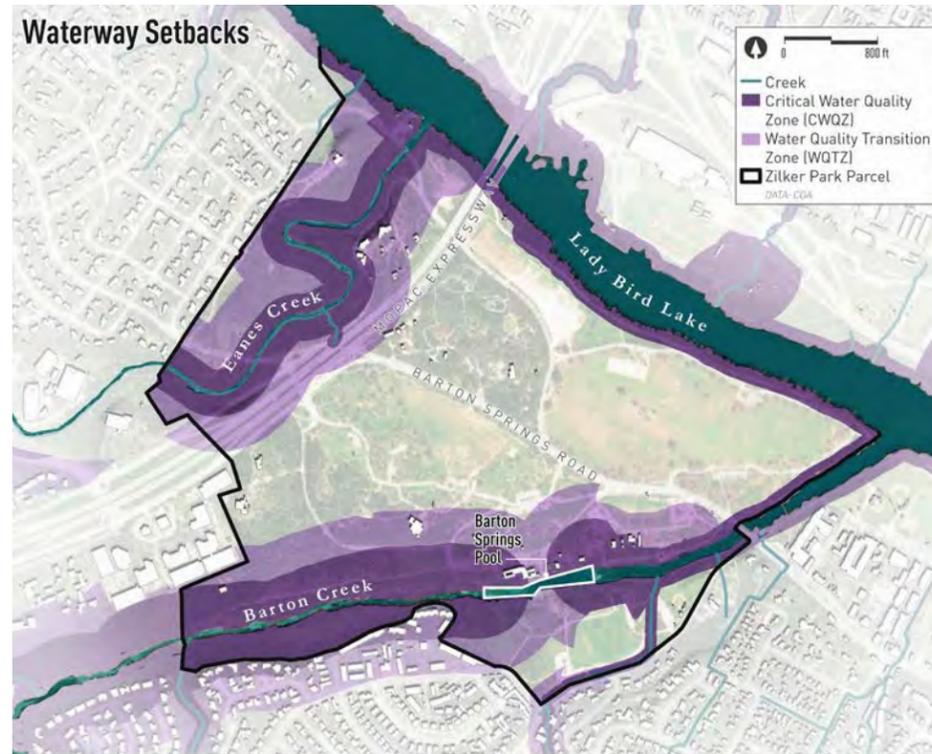
Lady Bird Lake

Zilker Park includes 6,000 linear feet of Lady Bird Lake shoreline. The shoreline's steep banks descend rapidly in some places from the upland Butler Trail to the wetland fringe below. This area has some of the largest trees in Austin. The Colorado River, of which Lady Bird Lake is a 400-acre impoundment, flows from New Mexico to the Gulf Coast and connects Zilker Park to a migratory flyway. There are 169 acres of the study area that drains into Lady Bird Lake (Figure 3.3). Water quality concerns here include substantial stormwater runoff around MoPac Expressway, bank erosion along all of the Butler Trail, and trampling and compaction along the water's edge.

Eanes Creek

Eanes Creek is a 6-mile-long creek that runs through the Zilker Nature Preserve for 4,500 linear feet before it empties into Lady Bird Lake. There are 115 acres of the study area that drain into it (Figure 3.3). The portion of Eanes Creek in Zilker Park is dry much of the year, giving it the nickname Dry Creek. Although the Zilker Nature Preserve and Austin Nature & Science Center are some of the least disturbed areas of Zilker Park, Eanes Creek is impacted by issues outside the park. Extensive new development just outside the park has created high flows that have channelized the creek, while runoff from MoPac Expressway degrades the quality and quantity of flow into the creek. Water quality concerns here include flows draining from the Disc Golf Course and bank erosion near Stratford Drive.

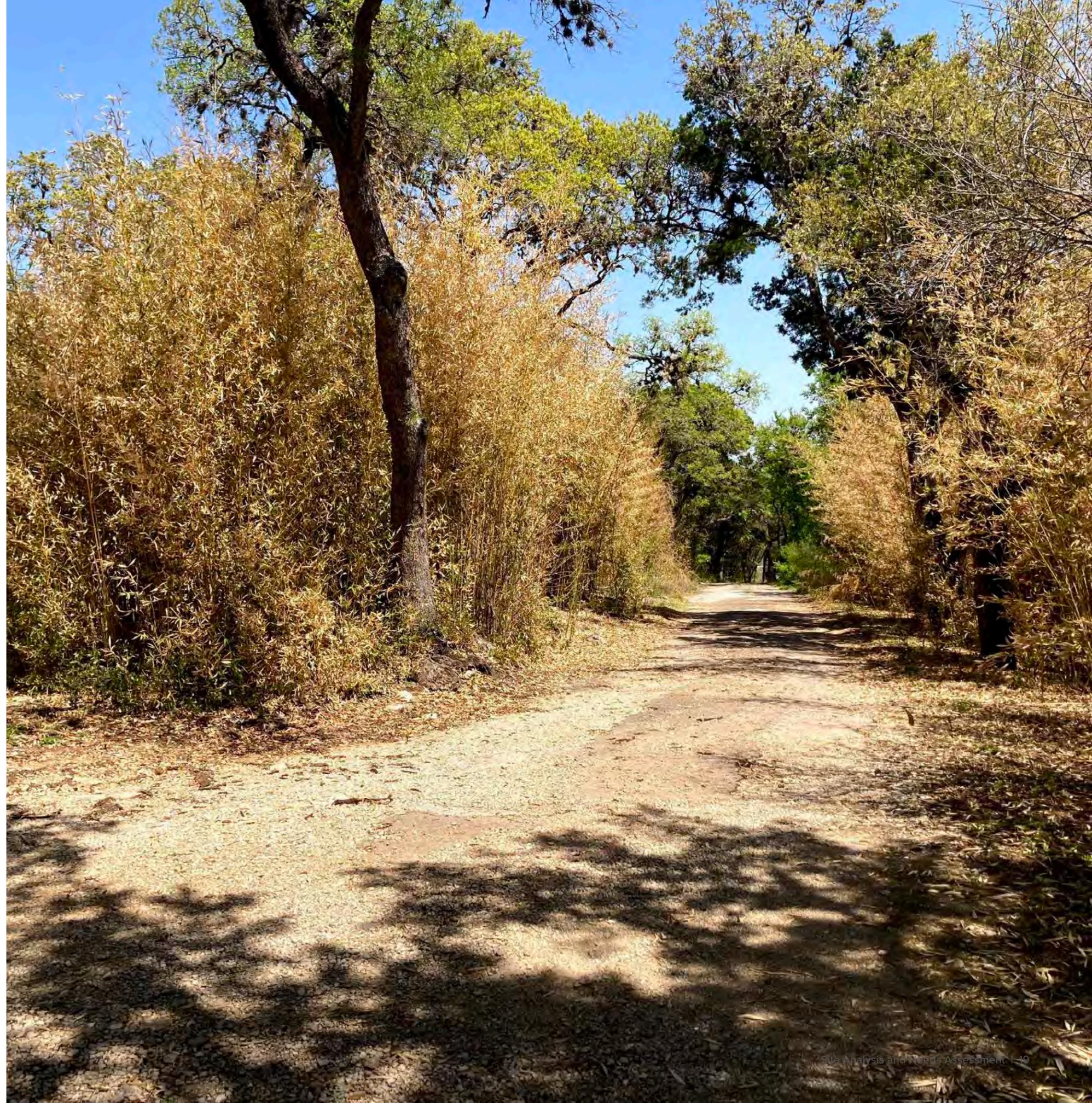
Floodplains and Water Quality Buffers



A floodplain is an area along a waterway that is prone to flooding. According to the Interim Atlas 14 floodplain from the City of Austin, 75.5 acres (18%) of Zilker Park are included in the 25-year floodplain. An additional 31.1 acres (8%) are included in the 100-year floodplain (Figure 3.3). Since the lower Barton Creek 100-year floodplain has not been modeled under Atlas 14, likely additional floodplain is marked with a dotted line. The floodplain is highly regulated by City of Austin building code and any potential floodplain modifications should comply with these regulations.

Floodplains play an important role in regulating water quality, because they filter water through their soils. The extra moisture creates denser plant growth, providing important wildlife habitat. Floodplains can be harmed by trampling and high runoff during storms that erode soil and wash away plants. At Zilker Park, both problems are visible, especially along Barton Creek where visitors compact creekbank soils in search of water access.

Critical Water Quality Zones and Water Quality Transition Zones restrict land use near waterways to protect healthy riparian corridors. Critical Water Quality Zones extend for 200, 400, and 100 feet from Eanes Creek, Barton Creek, and Lady Bird Lake, respectively. Water Quality Transition Zones extend an additional 300 feet from both Eanes Creek and Barton Creek (Figure 3.4).



ENDANGERED SPECIES AND CRITICAL ENVIRONMENTAL FEATURES

ENDANGERED SPECIES

The Austin Blind Salamander (*Eurycea waterlooensis*) and the Barton Springs Salamander (*Eurycea sosorum*) are federally endangered species living in Zilker Park's major springs. Averaged over a 10-year period, Eliza Spring had the highest population of the Barton Springs Salamander (4.32/m²), followed by Barton Springs (0.25/m²), Upper Barton Springs (0.24/m²), and Sunken Gardens (Old Mill) Springs (0.093/m²).

HABITAT RANGE & THREATS

The two salamanders live in overlapping habitats. Austin Blind Salamanders are a subterranean species, found on the surface only occasionally. Barton Springs Salamanders are usually found aboveground and are therefore easier to study. Both salamanders are found around outlets of the Barton Springs complex but their habitat also extends into the subsurface of the Edwards Aquifer. The two species have been found in all springs on the site except for Upper Barton Spring, where only the Barton Springs Salamander has been found.

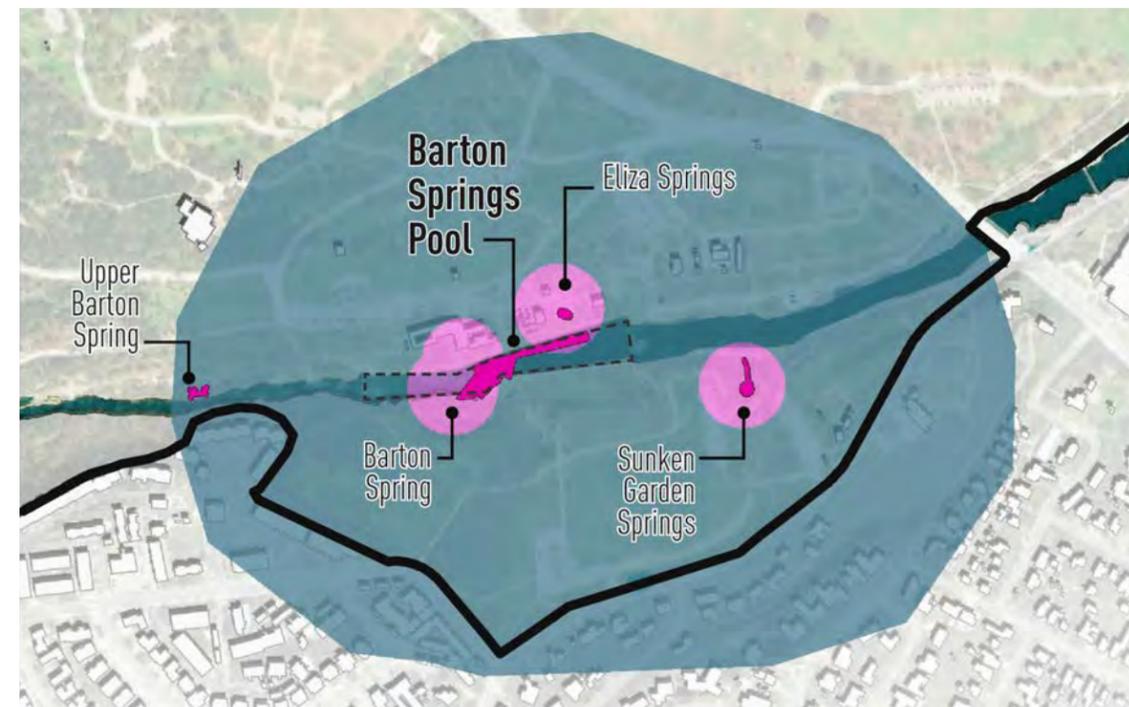
Threats to the salamanders include increased withdrawal of groundwater and decreasing water quality because of urbanization, pollution, construction, climate change, increased well use, drought, or other changes in water chemistry; habitat modification; disease or predation; overuse of the springs; and the potential inadequacy of existing regulatory mechanisms.

A critical habitat boundary—areas of habitat believed to be essential to the species' conservation—has been established for the Austin Blind Salamander. It includes both surface and subsurface components. While no critical habitat boundary has been designated for the Barton Springs Salamander, the critical habitat boundary for the Austin Blind Salamander can be used as a rough reference. The critical habitat boundary includes approximately 120 acres that stretches from Barton Springs Road to Barton Creek upstream from the pool. Surface habitats from the City of Austin's Barton Springs Pool Habitat Conservation Plan (HCP)

are marked in dark pink. These are areas that the City manages. Only City biologists listed under current federal Endangered Species Act 10(a)(1)(A) and state scientific permits are authorized to manage vegetation in salamander habitat areas. These protected salamander habitat areas in Barton Springs Pool have been redrawn to include more habitat that is, or can be, maintained as suitable habitat and exclude unsuitable habitat areas of Beach. Existing conservation measures are described in the Barton Springs Pool HCP permit.

CRITICAL ENVIRONMENTAL FEATURES

A Critical Environmental Feature (CEF) is a feature that is of critical importance to the protection of environmental resources, and includes bluffs, canyon rimrock, caves, point recharge features, sinkholes, springs, and wetlands. Features designated as CEFs in Title 25, section 8 of the City of Austin Code of Ordinances were documented using data from the City of Austin CEF database, the National Wetlands Inventory, and surveys conducted in conjunction with this project. The Code of Ordinances requires a buffer of 150 feet around CEFs. Inside that buffer, natural vegetation must be retained as much as is practical; construction, wastewater disposal, and irrigation are prohibited. Hiking trails are allowed within the buffer if they are at least 50 feet from the CEF. CEFs found within the study area include springs, seeps, and canyon rim rock. As efforts move from vision planning to site plans, CEFs may require additional buffers including wetland areas along Lady Bird Lake.



PLANT COMMUNITIES

Zilker Park's habitats were grouped in 16 plant communities (Figure 3.8). The plant communities are influenced by the soil and geology described above, as well as the history of human influence. These plant communities include over 380 plant species (Table 3.1).



PLANT COMMUNITIES

SPRING (0.3 ACRES, 0.1% OF PARK)

The spring plant community includes the waters and land immediately surrounding Upper Barton, Eliza, and Sunken Gardens (Old Mill) Springs. This plant community has 25 native plant species and four invasives. There are also three obligate wetland plant species present, along with three facultative wetland plants. The spring's waters are home to aquatic species like eelgrass, Bacopa, and macro algae, while numerous natives are present above water. No invasive species were documented in the springs' waters. However, Bermudagrass, hedge parsley, Johnsongrass and perennial ryegrass were found in the adjacent terrestrial areas.

OAK/JUNIPER/ELM WOODLAND (114.6 ACRES, 28.4% OF PARK)

Oak-juniper woodlands are characteristic of the Texas Hill Country. At Zilker Park, this plant community is found throughout most of the Zilker Nature Preserve, as well as in the Austin Nature & Science Center, informal areas of the Zilker Botanical Garden, surrounding the Violet Crown Trail and upper Barton Creek and in the southwestern portions of the park. This plant community has 173 native plant species and 34 invasives and exotics. There are also seven facultative wetland plants. Non-native, invasive species include Ligustrum, Nandina, and Japanese honeysuckle. Chinese pistache is found in the Disc Golf Course and a Chinese parasol tree was noted in the Zilker Nature Preserve, near the entrance across from the boat dock. King Ranch bluestem and Johnsongrass are less common but found in open areas.

BARTON RIPARIAN WOODLAND (9 ACRES, 2.2% OF PARK)

Extending from Barton Springs Pool upstream along the creek, this woodland includes the floodplain and upper bank of Barton Creek. Its plants are inundated during floods and, in lower areas, they may stay underwater for months. The woodland has diverse canopy, understory, and herbaceous layers. This plant community has 78 native plant species and 15 invasive and exotic species. There are also 10 facultative

wetland plants, but most plants on the slopes are in dry soils. Non-native, invasive species are found throughout the area, with Chinese tallow and Arundo being especially common. Woody plants like Nandina and Ligustrum are found occasionally. Herbaceous invasives include Johnsongrass and King Ranch bluestem.

EPHEMERAL CREEKBED (3.2 ACRES, 0.8% OF PARK)

The Ephemeral Creekbed upstream of Barton Spring Pool includes pools, channels, and low water areas where the water flows through vegetation. Diversity is generally low in this plant community, with only 35 native species and seven invasives recorded during plant surveys. Additionally, two obligate and six facultative wetland plant species were found. Non-native, invasive species include Arundo—found in dense stands—along with Ligustrum, Chinese tallow and Johnsongrass.

EANES CREEK RIPARIAN WOODLAND (12.3 ACRES, 3.1% OF PARK)

This woodland lies on both sides of Eanes Creek. Variability in moisture within this mostly dry creek affects the diversity and abundance of plants. This plant community has 121 native plant species and 19 invasives. There are no obligate wetland plant species present, but the area is home to 10 facultative wetland species. This community has 65% more species than the Barton Creek Riparian Woodland, likely a result of less human impact and the work of Louis René Barrera. Non-native, invasive plants are found throughout this area, spread by the floods. Common invasives include Ligustrum, Nandina, Chinaberry and Japanese honeysuckle.

DEGRADED BARTON RIPARIAN WOODLAND (5.6 ACRES, 1.4% OF PARK)

This woodland lies on the sloped hillsides around Barton Creek, downstream of the pool. This plant community has 64 native plant species and 20 invasive and exotic species. It also has one obligate wetland plant species, along with two facultative wetland species.

Non-native, invasive woody species include Ligustrum, Chinese tallow and Nandina.

DEGRADED BARTON CREEK SHORELINE (2.6 ACRES, 0.6% OF PARK)

The community is a thin strip of vegetation between the trail and the creek downstream of Barton Springs Pool. While this could be one of the most robust plant communities in the study area, overuse and upslope stormwater outfalls have degraded the vegetation. This plant community has 50 native plant species and 15 invasive and exotic species. It also has three obligate wetland plant species present, along with six facultative wetland plants. Non-native, invasive species including Ligustrum, Chinese tallow, Johnsongrass, and Nandina, along with substantial stands of Arundo.

AQUATIC – BARTON SPRINGS POOL AND PERMANENT WATER (5 ACRES, 1.3% OF PARK)

The permanent waters of Zilker Park include Barton Springs and extend from the Pool spillway through Barton Creek and into Lady Bird Lake. It does not include bank species. Only two plant species—Cabomba (*Cabomba caroliniana*) and Arrowroot (*Sagittaria platyphylla*)—were found within the pool itself. Both are obligate wetland species. Because this artificial pool is often cleaned and used heavily, it has very little native aquatic vegetation. In similar spring-fed limestone pools along perennial creeks, aquatic plants such as eelgrass, pondweed, hornwort, and floating primrose would likely be present. The spillway waters contain a mixture of Cabomba, Arrowroot, and macro algae also. Much of the rest of the permanent water lacks aquatic vegetation, with only Cabomba being present.

LAKESHORE RIPARIAN WOODLAND (15.7 ACRES, 3.9% OF PARK)

This woodland extends from the water's edge of Lady Bird Lake to the top of the floodplain slope and ranges in width from 40 feet with very steep slopes to 250 feet with a more moderate slope. This community is one of the most used

recreational areas in Austin because of its location along the Butler Trail and next to the Great Lawn. It also includes 4 of the 10 largest trees in Austin, because it is one of the few areas along Lady Bird Lake that appears not to have been cleared in the last 100 years. This plant community has 89 native plant species and 25 invasive and exotic species. It also has two obligate wetland plant species present, along with six facultative wetland species. Non-native, invasive species are common throughout this area. Woody species include Ligustrum, Nandina, Chinaberry, and Chinese tallow. A single Chinese parasol tree was found near the boat dock. Vines include sweet autumn clematis, Japanese honeysuckle, catclaw vine (around MoPac Expressway). In open areas, herbaceous species include Johnsongrass, Bermudagrass, hedge parsley and bastard cabbage.

WETLAND (1.9 ACRES, 0.5% OF PARK)

The wetland lies at the junction of the Butler Landfill, Butler Trail, and Lou Neff Road. This area was created to collect water from surrounding areas before it runs into the Lake. It includes a small spring/seep (Figure 3.2). This plant community has 38 native plant species and 10 invasive and exotic species. It has no obligate wetland species and one facultative wetland species. Non-native, invasive species include rescue grass, prickly lettuce, Bermudagrass, Ligustrum, Chinaberry, white mulberry, Johnsongrass, hedge parsley and Brazilian vervain.

OPEN MEADOW (7 ACRES, 1.7% OF PARK)

Open meadows are found at the Violet Crown Trailhead and near the southern entrances. This plant community has 46 native plant species and 12 invasive and exotic species. It also has one facultative wetland species. Non-native, invasive grasses include the perennials Johnsongrass, King Ranch bluestem, and Bermudagrass, as well as annuals such as Japanese brome and rescue grass. The stands of invasive grasses are maintained by low and frequent mowing. This mowing regime reduces the opportunity for native grasses and forbs to flower and seed. The mowing has also created good growing

conditions for Japanese brome, a cool-season annual that creates a thick thatch layer that smothers out natives.

FORMAL AREAS (225.7 ACRES, 56% OF PARK)

Formal areas of Zilker Park include the Disc Golf Course, Zilker Botanical Garden, Austin Nature & Science Center, Maintained Parkland and Infrastructure, and rights-of-way. These consist of large open areas and a variety of buildings, playground, and other park infrastructure used for recreation and upkeep. These plant communities collectively are home to 203 native plant species and 65 invasive and exotic species. They also have three obligate wetland species and 11 facultative wetland species. These areas lack diversity and are dominated by non-native, invasive grasses such as Bermudagrass, King Ranch bluestem, hedge parsley, prickly lettuce and rescue grass.

WILD LIFE

BIRDS

Breeding bird surveys were completed in Zilker Park from mid-May to mid-June 2020, coinciding with the peak of nesting season and the tail end of spring migration. These surveys provide a repeatable baseline of resident and migrant birds for the study area. Nearly 600 individuals, representing 58 bird species, were identified in the park. Of these species, 48 likely nest in or directly adjacent to Zilker Park. According to eBird and iNaturalist, 166 additional bird species have also been observed at the site.^{84,85}

The highest bird diversity was observed along Barton Creek in the Degraded Barton Riparian Woodland, Degraded Barton Creek Shoreline, Oak/Juniper/Elm Woodland adjacent to the Barton Creek corridor and Open Meadow in the trail areas south of the pool. These areas include many different habitats, from relatively dense forest to open meadow, increasing the variety of birds that can live there.

Several neo-tropical migratory songbirds, such as Swainson’s Thrush, Bay-breasted Warbler and Canada Warbler, use Zilker Park as a stop-over point en route to breeding grounds in the North. These species were primarily observed in the wooded corridors in the Degraded Barton Riparian Woodland, Degraded Barton Creek Shoreline and Lakeshore Riparian Woodland.

Barton Creek is used by several species of wading bird including Great Blue Heron, Great Egret, Green Heron and Yellow-crowned Night-heron, which were noted hunting for prey along the banks and shallow waters upstream of the pool. These observations illustrate the value of clean surface waters to support healthy fish, amphibian and insect communities.

Thirty-three of the reported species are listed as Species of Greatest Conservation Need (SGCN) in the Texas Conservation Action Plan. These include American Golden-Plover, American Kestrel, Bell’s Vireo, Bewick’s Wren, Carolina Chickadee, Chuck-will’s-widow, Common Yellowthroat, Dickcissel, Eastern Meadowlark, Field Sparrow, Franklin’s Gull, Golden-cheeked Warbler, Grasshopper Sparrow, Green Heron, Harris’s Sparrow, Lark Sparrow, LeConte’s Sparrow, Little Blue Heron, Loggerhead Shrike,

Louisiana Waterthrush, Mississippi Kite, Northern Pintail, Orchard Oriole, Painted Bunting, Peregrine Falcon, Prothonotary Warbler, Red-shouldered Hawk, Scissor-tailed Flycatcher, Snowy Egret, Summer Tanager, Swainson’s Hawk and Wild Turkey. Additionally, the Oaks and Prairies Joint Venture considers Bewick’s Wren a species of conservation concern.

OTHER WILDLIFE

Zilker Park is home to a total of 262 wildlife species, including six amphibians, two fish, one mollusk, 224 birds, nine mammals, and 20 reptiles (Table 3.4). Four of these are SGCN—the common snapping turtle, red-eared slider, Texas map turtle, and western diamondback rattlesnake. This list was compiled from on-the-ground surveys, eBird lists, and over 1,800 iNaturalist “research grade” observations. According to iNaturalist, the 10 most commonly observed native wildlife are the Yellow-Crowned Night Heron, Texas spiny lizard, white-tailed deer, Great-tailed Grackle, Gulf Coast toad, plain-bellied water snake, Western rat snake, Great Egret, coyote, and diamondback water snake.

These natural area management guidelines will increase the amount and quality of wildlife habitat in Zilker Park by:

- Protecting salamander habitat by reducing stormwater runoff and increasing water quality within the park;
- Recommending over 150 native plant species that support a greater diversity of wildlife visiting and breeding in the park;
- Adding 54 acres of meadow and savannas that provide adequate food and nesting habitat for grassland birds;
- Adding 70 acres of proposed tree canopy that increases habitat connectivity; and
- Repairing the sensitive riparian shoreline that serves as nesting habitat for waterfowl, supports amphibious species, and allows for fish spawning areas.

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Bird Habitat Enhancement & Expansion

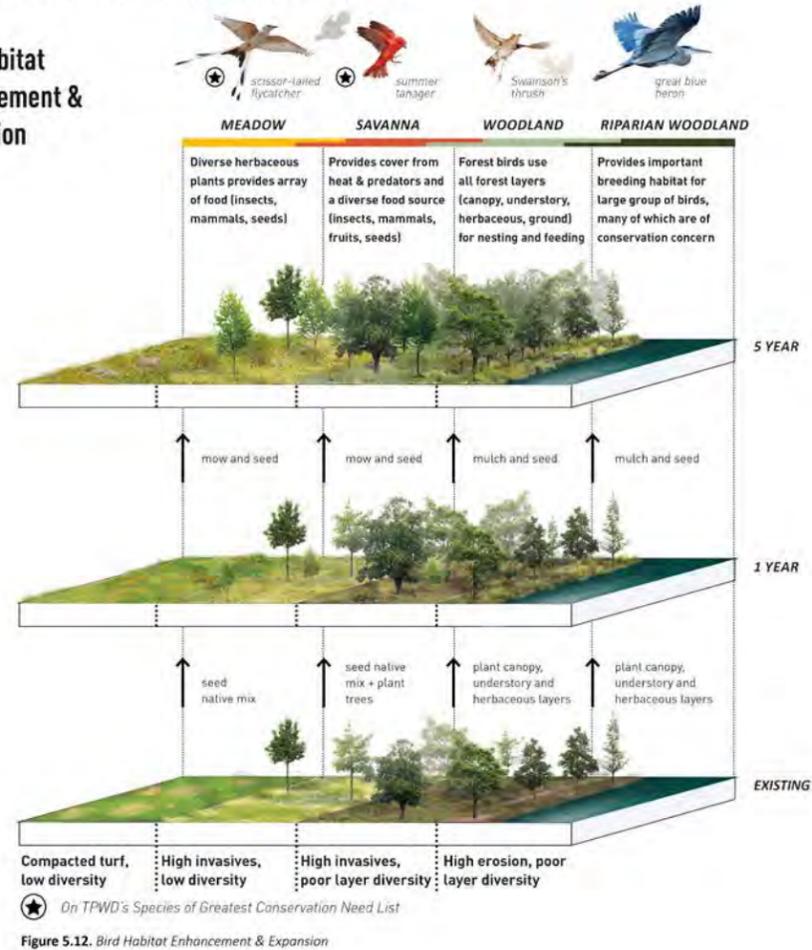


Figure 5.12. Bird Habitat Enhancement & Expansion

2021



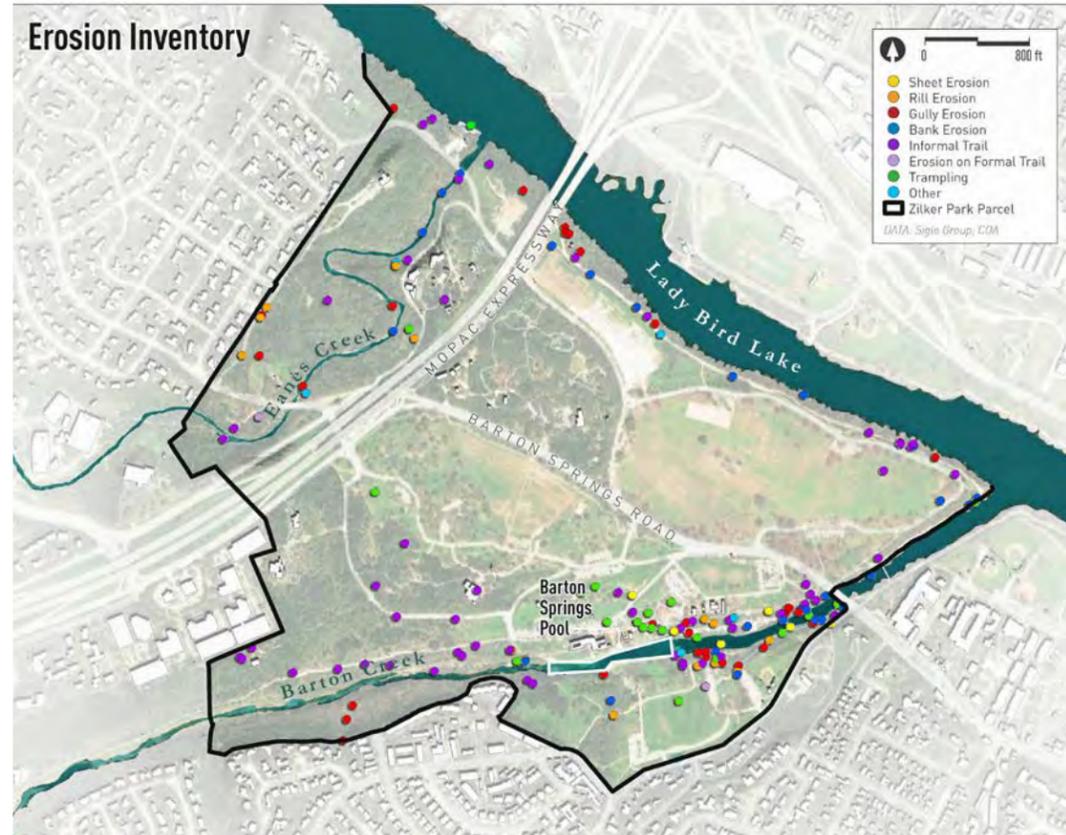
ENVIRONMENTAL DEGRADATION

INVASIVE SPECIES

Over 70 non-native species were recorded during the plant survey, with 38 species considered invasive due to their aggressive growth and spread. Of these, 20 species were included in at least one of these three lists (Table 3.5)—Texas Invasives, the City of Austin’s Top 24 Invasive Species list, or list from Natural Resource Inventory by Siglo. The high priority species from this list include Arundo, bamboo, bastard cabbage, Bermudagrass, catclaw vine, Chinaberry, Chinese parasol tree, Chinese pistache, Chinese tallow, Nandina, hedge parsley, Japanese honeysuckle, Johnsongrass, King Ranch bluestem, Ligustrum, Malta star thistle, paper mulberry, sweet autumn clematis and tree of heaven.

SOIL DISTURBANCE

The primary causes of soil disturbance in Zilker Park are stormwater flow, poorly functioning or absent infrastructure, mowing and use of other heavy machinery, off-trail recreation, formal recreation without suitable supporting infrastructure and erosion of trail material. Soil disturbance is problematic in all areas but is particularly concerning along environmentally sensitive waterways. Field data were taken on soil erosion issues at 140 points throughout the study area.



Invasive Plants

Common Name	Botanical Name	TX Invasive	COA	Siglo
Arundo	<i>Arundo donax</i>	☐	☐	☐
Bamboo	<i>Phyllostachys aurea</i>	☐	☐	☐
Bastard cabbage	<i>Rapistrum rugosum</i>	☐	☐	☐
Bermudagrass	<i>Cynodon dactylon</i>	☐	☐	☐
Catclaw vine	<i>Maclediana singulari-cati</i>	☐	☐	☐
Chinaberry	<i>Melia azadirach</i>	☐	☐	☐
Chinese parasol tree	<i>Firmiana simplex</i>	☐	☐	☐
Chinese pistache	<i>Pistacia chinensis</i>	☐	☐	☐
Chinese tallow	<i>Triadia sebifera</i>	☐	☐	☐
Nandina	<i>Nandina domestica</i>	☐	☐	☐
Hedge parsley	<i>Lonita arvensis</i>	☐	☐	☐
Japanese honeysuckle	<i>Lonicera japonica</i>	☐	☐	☐
Johnsongrass	<i>Sorghum halepense</i>	☐	☐	☐
King Ranch bluestem	<i>Bothriochloa rufaemum</i>	☐	☐	☐
Ligustrum	<i>Ligustrum lucidum</i> and <i>L. sinense</i>	☐	☐	☐
Malta star thistle	<i>Conyza medifera</i>	☐	☐	☐
Paper mulberry	<i>Broussonetia papyrifera</i>	☐	☐	☐
Sweet autumn clematis	<i>Clematis terniflora</i>	☐	☐	☐
Tree of heaven	<i>Ailanthus altissima</i>	☐	☐	☐

Table 3.5 Invasives at Zilker Park. These have been identified through crosschecking lists from Texas Invasives, the City of Austin Invasive Species Management Plan, and Siglo Group’s expertise.



POTENTIAL FOR ECOLOGICAL UPLIFT

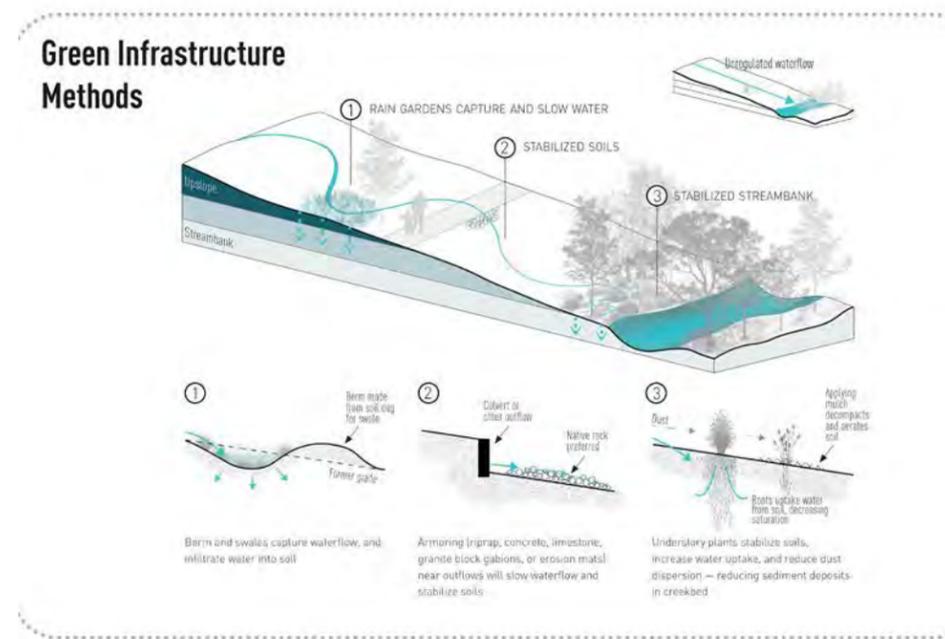
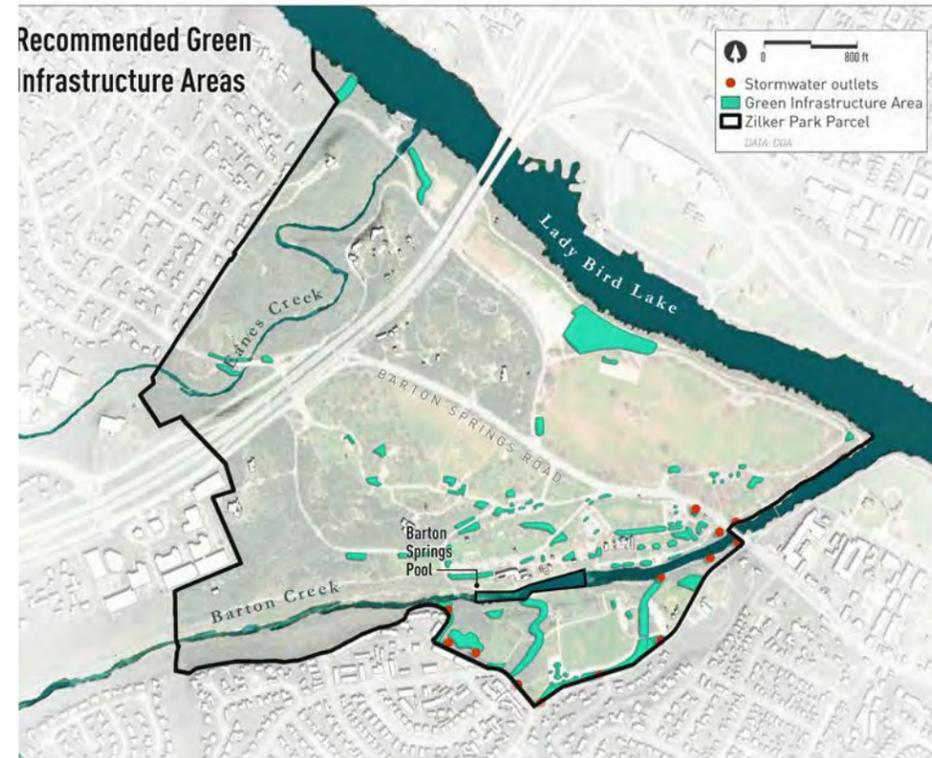


Figure 5.3. Green Infrastructure Methods



The restoration potential in Zilker Park is immense. From its waters and forests to its meadows and maintained areas, there is a diversity of landscape topologies in need of stewardship and enhancement. The restoration principles outlined in the Natural Area Management Guidelines chapter, if followed, would work toward the following goals:

GREEN STORMWATER INFRASTRUCTURE

Green stormwater infrastructure can address the root cause of erosion: fast-moving water often coming off roads, parking lots and buildings. Rain gardens, swales, berms and grading changes can slow water flowing across a landscape (Figure 5.3). When water moves more slowly, it has longer to soak into the soil, reducing erosion, preventing sediment and pollutants from entering streams and springs and increasing groundwater supplies. Green infrastructure offers other benefits, including increased creek flow and wildlife habitat. At Zilker Park, green infrastructure has already been used to decrease stormwater flows into Barton Springs Pool and in the Disc Golf Course. Just over 14 acres have been identified as potential locations for improving and/or installing green stormwater infrastructure (Figure 5.4). These areas have standing water after heavy rain, periodically carry large volumes of stormwater, are open with no active recreation, have significant water-related erosion and/or are near impervious surfaces that create runoff. In addition, a well-planned and designed green stormwater installation can heighten the aesthetics and quality of the user experience in these areas.

CANOPY ENHANCEMENT

Canopy enhancement adds shade trees in the formal park areas where that expansion does not interfere with park use and improves the user experience. It is recommended where additional tree cover will provide shade, improve water quality and reduce the impacts of impervious cover on localized heating. There are 66 acres of recommended canopy enhancement along the edges of roads, parking lots, and walkways (Figure 5.7). Canopy enhancement should use live planting whenever feasible with irrigation during establishment. Where possible, trees should be planted at the same time as green stormwater infrastructure is installed because the additional water in the soil will create healthier trees. By adding more shade trees, Zilker Park will increase in comfort, contribute to climate change mitigation and adaptation and create a more natural park aesthetic.

- Protect and maintain endangered species habitat and water quality: Protect the habitat of the endangered Barton Springs and Austin Blind Salamanders and maintain the water quality of all waterbodies adjacent to and within the study area.
- Repair environmental degradation: Address threats to the site's ecological health including invasive species, erosion issues and historic land use.
- Restore and enhance plant communities: Manage and expand native meadows, savannas and woodlands to create diverse, resilient plant communities.
- Repair and improve wildlife habitat: Enhance habitat quality for wildlife by managing the site for ecological health, creating connectivity between habitat patches and providing refuge in an urban environment.
- Enhance the user experience: Provide aesthetically pleasing, compelling and comfortable natural surroundings.
- Facilitate stewardship: Catalyze opportunities to appreciate, observe and care for the natural environment as an ongoing part of people's lives.

POTENTIAL FOR ECOLOGICAL UPLIFT

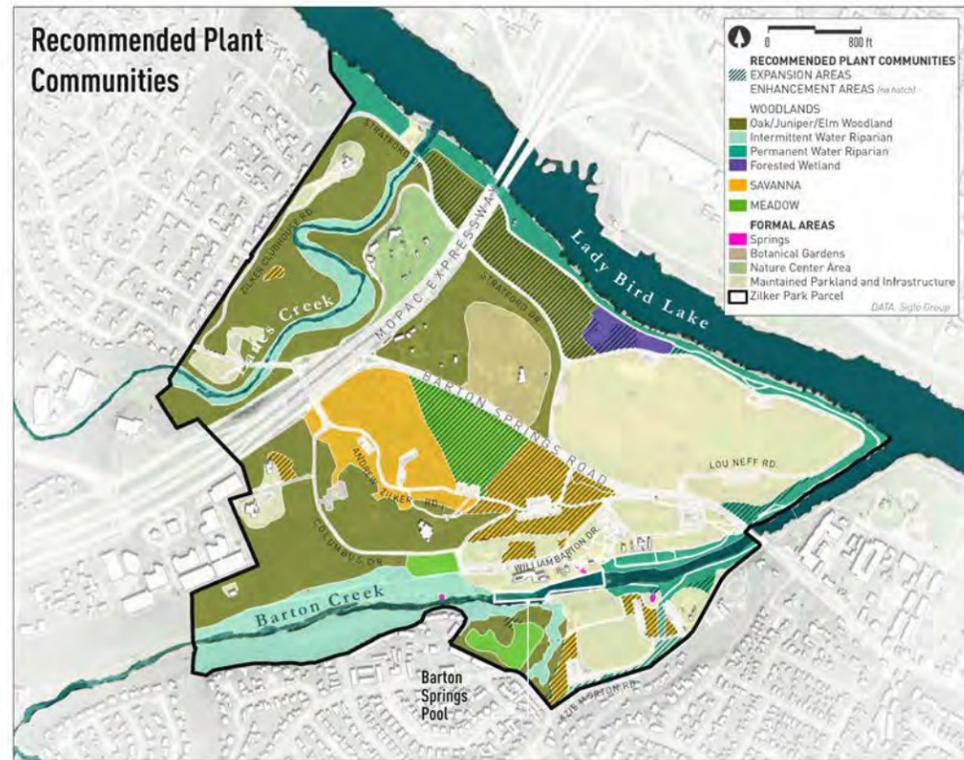


Figure 5.5. Recommended Plant Communities

RESTORING PLANT COMMUNITIES

The site has been grouped into 10 proposed plant communities with six driven by ecological considerations, three by land use, and one by water (Figure 5.5). These communities were derived from the 12 existing plant communities described in the Ecology chapter and from an evaluation of topography, existing and likely use, soils, infrastructure constraints, proximity to water, likely response to different management and the likelihood of restoration success. The recommendations here focus on the six terrestrial plant communities: Oak/Juniper/Elm Woodland, Riparian Woodland-Permanent Water, Riparian Woodland-Intermittent Water, Forested Wetland, Savanna and Meadow. In addition, planting recommendations are given for the open water areas. To a lesser extent, ecological management practices, such as canopy enhancement, are recommended for the formal parkland area and the rights-of-way, recognizing that land use needs and formal park uses will drive management in these areas.

Woodlands are plant communities where trees are the dominant plant form. At Zilker Park, there are four proposed woodland plant communities that require enhancement and/or expansion (Figure 5.8).

Meadows are open expanses of grasses and wildflowers that represent the swaths of prairies that would be found on rich soils outside the floodplains in the Blackland Prairie. These areas are generally without trees. They were maintained for eons by a combination of large herbivores and fire. While the ideal management practices for this area would aim for a mid to tall grass prairie, because of the dominance

of invasive grasses (Bermuda grass, King Ranch Bluestem, Johnsongrass, etc.), The intent of meadow management is to build on current wildflower meadow management practices used by PARD and increase native plant diversity over time.

Savannas are grasslands with groupings of trees found throughout the Edwards Plateau and in flatter areas outside of the floodplain. They represent a mix of woodland and meadow.

The waters and wetlands of Zilker Park offer opportunities to increase aquatic and wetland plant diversity that increases the quality of wildlife habitat and reduces the likelihood of invasive plant establishment. The Forested Wetland, Riparian Woodland, and Springs & Permanent Waters columns in the recommended plant list (Table 5.2) include over 25 species appropriate for wetter parts of the study area.

DEFINING THE USER EXPERIENCE AND STEWARDSHIP

To enhance the user experience, trail improvements and formalization of areas is recommended as shown in Figure 6.2. Figure 6.2 visualizes the Lower Barton Creek transformation. The upper image shows degradation from lack of stormwater management upslope, trampling and flooding that has resulted in compacted soils, erosion, an incomplete canopy, struggling vegetation and a degraded user experience. The bottom image shows the ecological health and enhanced user experience that results by addressing upslope stormwater with green stormwater infrastructure, formalizing trails and water access, installing physical barriers to

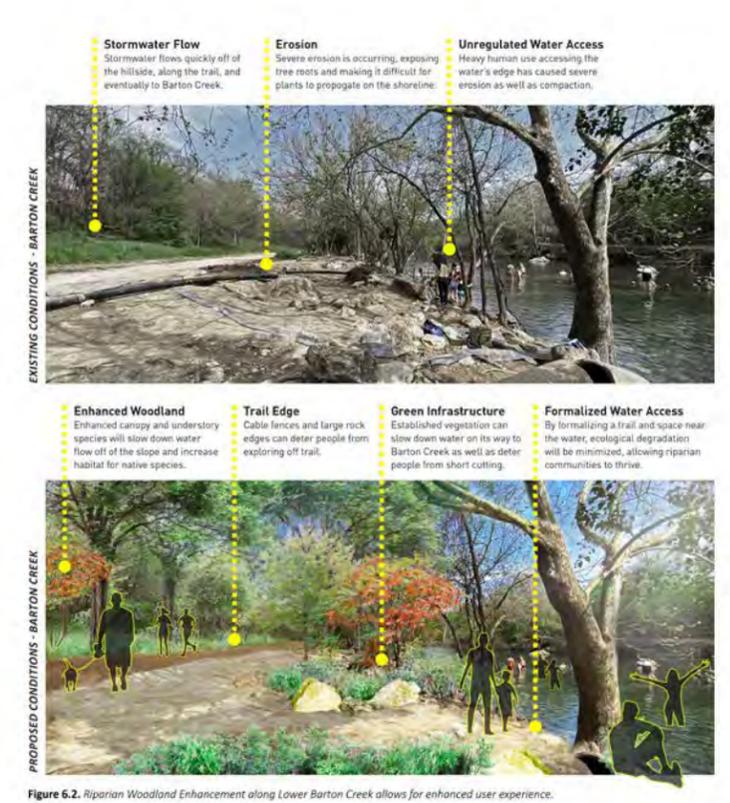
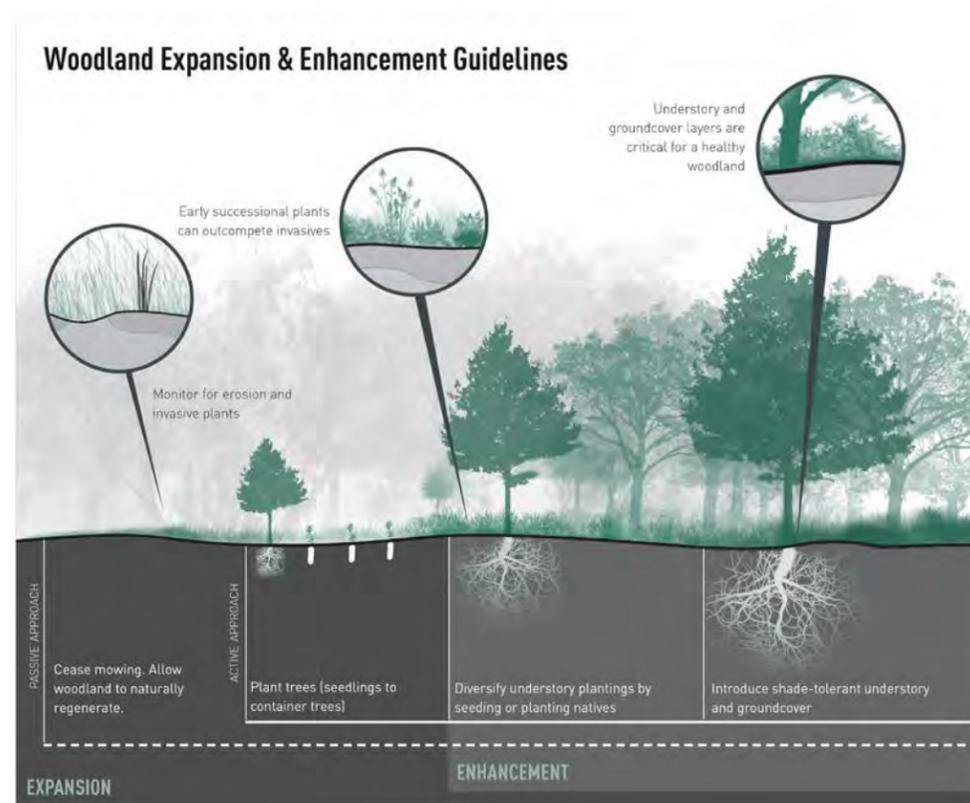


Figure 6.2. Riparian Woodland Enhancement along Lower Barton Creek allows for enhanced user experience.

plantings, decompacting soils and planting robust native canopy, understory and groundcover vegetation.

FORMALIZING TRAILS AND IMPROVING INFRASTRUCTURE

Some of the informal trails can be formalized and added to the regular trail system. This process directs the flow of users to formal areas, decreases informal use and allows for decommissioning and restoring other informal trails. Many formal areas, like the historic picnic tables in the Nature Preserve, have not been maintained regularly. Creating formalized access paths to these picnic areas offers the opportunity for design that fits into the surrounding area and historic features of the park. It also moves people away from informal use of the natural areas. The Zilker Vision Plan process should consider which informal trails to formalize. For more information on Trail Design and Maintenance and Access to the Water, see the corresponding section in the Natural Area Management Guidelines chapter of the Zilker Park Natural Resource Inventory & Management Guidelines report.

POTENTIAL FOR ECOLOGICAL UPLIFT

CITIZEN SCIENCE

Citizen science is a vital way to track biodiversity information, with numerous individuals in the Austin area actively recording biodiversity data through eBird, iNaturalist, Odonates of Texas, Fishes of Texas and other online services. Individuals input data, which goes through a validation process that allows final users to understand the quality of the data. To continue to track biodiversity data within Zilker Park, a “project” titled “Zilker Natural Areas” has been created on the iNaturalist website. New and existing observations will automatically be added to the project for long-term biodiversity tracking. There are also existing eBird hot spots within Zilker Park and along the Ladybird Lake shoreline that park visitors and staff can contribute to. Travis Audubon is engaging its volunteers to serve as monthly spotters to encourage recording observations and to promote interest and participation by the general public. Wildlife observations can, if desired, also be linked on the City of Austin Zilker Park landing page from iNaturalist and eBird.

PROFESSIONAL SERVICES AND VOLUNTEER SERVICES

Previous partnerships between the City of Austin and Texas Conservation Corps’ (TxCC) provides a great example of how this work can be delegated and shared with private and non-profit partners. TxCC and similar organizations have the ability to implement a wide variety of management activities including invasive plant removal, trail building, soil remediation, planting and seeding. They can also work with professionals on other tasks including installing and repairing culverts, some components of tree care, constructing swales and rain gardens, decompacting soils, removing concrete and installing gabions. In addition, appropriate private and non-profit organizations can support Barton Springs Conservancy with volunteer days by training and overseeing volunteers.

With limited funds and the ongoing need for land management, many parks and preserves have turned to volunteers. For instance, on the east side of the study area south of Barton Creek,

the Friends of South Zilker Park adopted a quarter mile long stretch of the creek alongside Azie Morton Road and the abandoned channel draining into the south side of Barton Springs Pool through Keep Austin Beautiful’s Adopt-a-Creek program. Over the course of a year, more than 50 volunteers removed 150 invasive plants, established native seedlings, and removed 200 pounds of litter.

Using volunteers has lower costs, generates public interest, and fosters community buy-in, but sometimes lacks accountability and can take longer. Volunteers also cannot take on all tasks done by professionals. The tasks laid out in this report can be accomplished by professional and volunteers working together to create a more robust, ecologically healthy landscape at Zilker Park.

NON-PROFIT AND COMMUNITY PARTNERSHIPS

A number of projects have already been completed in Zilker Park through the Community Activated Park Projects (CAPP) program. This program was initiated in 2018 to streamline, approve, and track community-led improvement projects. Since its inception the program has been used 17 times in Zilker Park (Table 7.1). In 2019, Barton Springs Conservancy submitted a CAPP to restore and establish plant life in Barton Springs Pool. Much of the work suggested in this report will require approval from the Parks and Recreation Department that will likely be acquired through the CAPP process.

This type of community-led work on public lands is a huge asset for Zilker Park. These community partners enhance public open spaces using their own time and resources, while allowing for a level of open space development and maintenance that is not feasible when relying on Parks and Recreation Department resources alone.

Partner Organizations & Neighborhood Groups

Year	Partner Organization or Neighborhood Group Name	Facility	Recent Activities
2019	Austin Nature & Science Center	Austin Nature & Science Center	The installation of shading structures over the Dino Pit at the Austin Nature & Science Center.
2019	Austin Nature & Science Center	Austin Nature & Science Center	Construct a tree-house pavilion as well as an amphitheater area for meetings, instructions, and teaching.
2018	Austin Ridge Riders	Barton Creek Greenbelt	Maintain the existing trails.
2018	Austin Parks Foundation	Barton Creek Greenbelt	Continuation of ongoing maintenance work on the Barton Creek Greenbelt.
2018	BHNA Greenbelt Guardians	Barton Creek Greenbelt/Violet Crown Trail	Trail surface and erosion repair work, removal of invasive species, tree plantings, installation of trail edge safety rails and water-crossing bridges, as needed.
2019	Hill Country Conservancy	Barton Creek Greenbelt/Violet Crown Trail (proposed) Trailhead	Construction of a new trailhead per design approved by PARD Director in 2017.
2018	Friends of Barton Springs Pool	Barton Springs Pool	Tree planting
2019	Friends of Barton Springs Pool	Barton Springs Pool	Tree planting
2018	Girl Scouts of Central Texas	Girl Scouts Hut (Zilker Cabin)	Roof replacement
2018	Girl Scouts of Central Texas	Girl Scouts Hut (Zilker Cabin)	Bamboo removal
2018	Parents of Children with Disabilities	Zilker	Add more accessible sensory play opportunities.
2019	Zilker Theatre Productions	Zilker Hillside Theater	Enclose east wing of the theater.
2018	Zilker Theatre Productions	Zilker Hillside Theater	Maintenance and Repairs at the theater as funds and resources are available.
2019	Zilker Theatre Productions	Zilker Hillside Theater	Build the interior of the enclosed east wing.
2019	Barton Springs Conservancy	Zilker Metropolitan Park	Restore and establish plant life in Barton Springs Pool.
2018	Capital Area Master Naturalists	Zilker Nature Preserve	Removal of outdated and damaged signage, and the installation of fourteen new signs.
2019	Austin Parks Foundation	Zilker Playscape	Maintenance work on the Zilker Playground.

Table 7.1. Partner Organizations and Neighborhood Groups

ENVIRONMENTAL CONTAMINATION FROM HISTORIC LAND USE

Zilker Park has three main areas of environmental concern—the Butler Landfill, the Pistol and Skeet Range, and the Bone Yard (Figure 2.6). In anticipation of future renovations on site, a Phase I Environmental Site Assessment was completed for Zilker Park in 2019 by TRC Environmental Corporation.

BUTLER LANDFILL

The 25-acre Butler Landfill has a maximum depth of 30 feet. This location originally served as a clay quarry for the Butler Brick Factory through the early 1900s, but after termination of quarry operations, the location was operated as a municipal landfill by the City of Austin from 1948 to 1967.¹

Several investigations and groundwater monitoring events have been conducted. While the earlier events did not find constituents of concern (COCs), later monitoring events did detect them. These later investigations found that waste materials were exposed in several areas throughout the landfill and that the lower portion of material within the landfill is saturated by the waters of Lady Bird Lake. A range of contaminants exceeded recommended maximum levels including arsenic, barium, cadmium, chromium, magnesium, lead, iron, and manganese. Due to this, the 2019 Environmental Assessment classified Butler Landfill as a recognized environmental condition (REC).¹

As an aside, Wetlands borders the capped Butler Landfill on the eastern and northern sides. The Watershed Protection Department (WPD) advises that ponded areas should not exist over closed landfills. Based on the 1998 Task 5 Report, the boundary of the fill extends eastward towards the Zilker Zephyr tracks and under the eastern ponded area. As of 2019, when the Zilker Park Working Group completed their report on the park, Watershed Protection Department and Parks & Recreation Department were planning to assess this area and consult with the Texas Commission on Environmental Quality to determine if additional action is necessary relative to this pond.²

PISTOL AND SKEET RANGE

The 2.5-acre Pistol and Skeet Range was originally developed in the 1930s. Based on aerial photographs and interviews with PARD staff, the western portion was used for skeet shooting (Skeet Range), while the east side was used for pistol and rifle shooting (Pistol Range).¹ The range was likely heavily used on a daily basis by the Austin Police Department and citizens between the mid-30s and 70s. The Pistol Range property was used by the Austin Nature & Science Center for archery, equipment storage, and supply storage in portable buildings after the mid-1980s. Historic and recent soil investigations have identified elevated concentrations of arsenic, antimony, and lead at concentrations. The Pistol and Skeet Range, including the wooded area to the north, is therefore a recognized environmental condition (REC).¹

BONE YARD

This area lies atop the northwest corner of the Butler Landfill and is currently used for storage of equipment and landscaping materials such as soil, brush, and gravel. Due to the presence of asphalt, electric powered carts and small vehicles with lead-acid batteries, surplus lawn-maintenance equipment, and chemical containers without cover and/or impervious pavement, this area has a possibility of leaking hazardous substances and/or petroleum products to the environment.¹ This area is a REC, due to the material threat of a future release to the environment.

Major take-aways that will impact future development include:¹

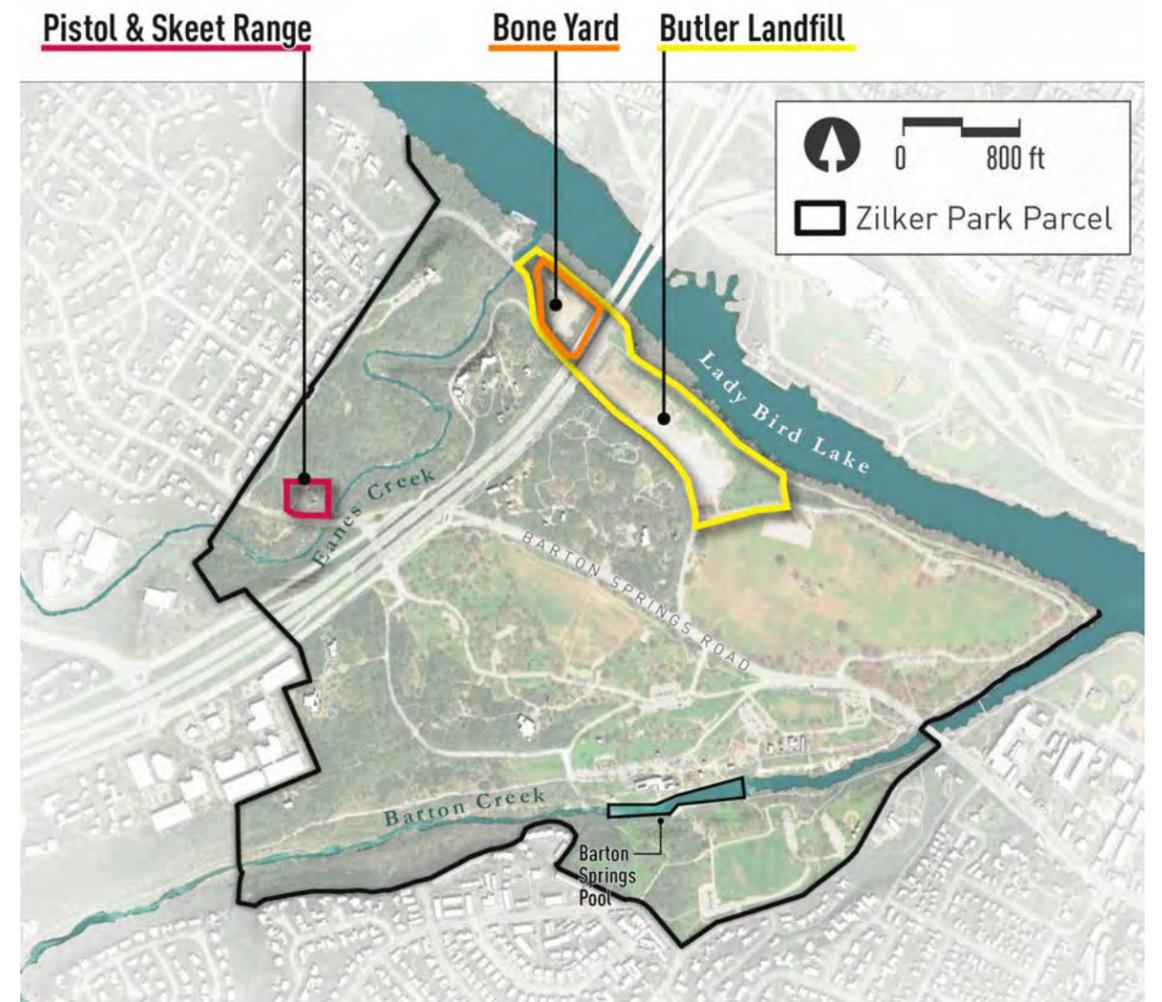
- The Butler Landfill is considered a recognized environmental condition due to the high levels of arsenic, barium, cadmium, chromium, magnesium, lead, iron, and manganese, along with the potential for comingling of groundwater within the landfill with Lady Bird Lake.
- The Pistol and Skeet Range, including the wooded area to the north, is considered a recognized environmental condition due to

historic and recent soil investigations that have identified elevated concentrations of arsenic, antimony, and lead.

- The Bone Yard is a recognized environmental condition because it has several hazardous materials that could threaten the surrounding environment.

1. TRC Environmental Corporation. 2019. Phase I Environmental Site Assessment Report: Zilker Metropolitan Park 339575.0000.0000.

2. Zilker Park Working Group. 2019. Zilker Park Working Group Final Report & Appendices. Austin City Council. <https://www.austintexas.gov/department/zilker-park-working-group-0>







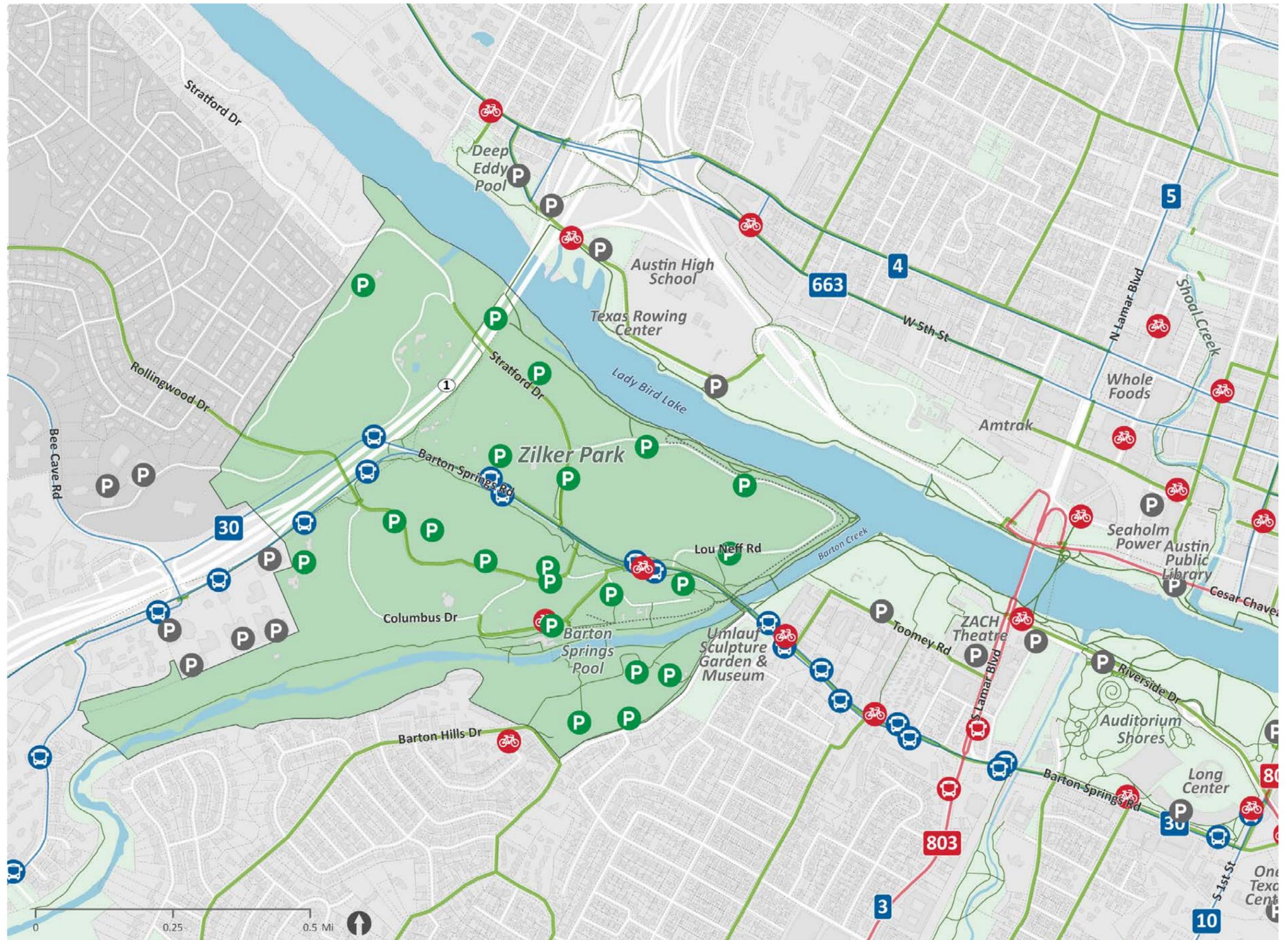
The background image is a faded, low-angle shot of a dirt path in a park. On the left, a group of people is walking away from the camera. In the foreground, a large, dark tree trunk curves from the top left towards the bottom right. The overall scene is bright and airy, with a soft, hazy atmosphere.

TRANSPORTATION

EXISTING MOBILITY FRAMEWORK

Although visitors today can access Zilker Park through a variety of transportation options, not all modes of travel to the park are equally convenient or safe. Because of this, most park visitors arrive via private automobile. The busiest park amenities are located west of Barton Creek, and with Barton Springs Road providing the only vehicular connection across the creek and connecting to MoPac Expressway, it is the primary multimodal gateway into the park for most visitors.

Figure x.x shows the primary transportation options within and near Zilker Park.



GETTING TO THE PARK: TRANSIT

Zilker Park is currently served by one Capital Metro Route – Route 30 (Barton Creek Square), which connects the Westgate Transit Center at US 290/SH 71 and Manchaca Road and Barton Creek Square Mall in Southwest Austin to Downtown Austin, stopping as far north as 12th and Guadalupe. Within the park, Route 30 operates on the MoPac Expressway frontage roads and Barton Springs Road. The route serves seven stops within the park.

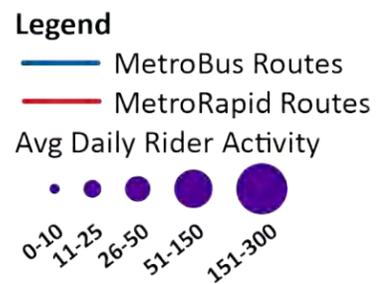
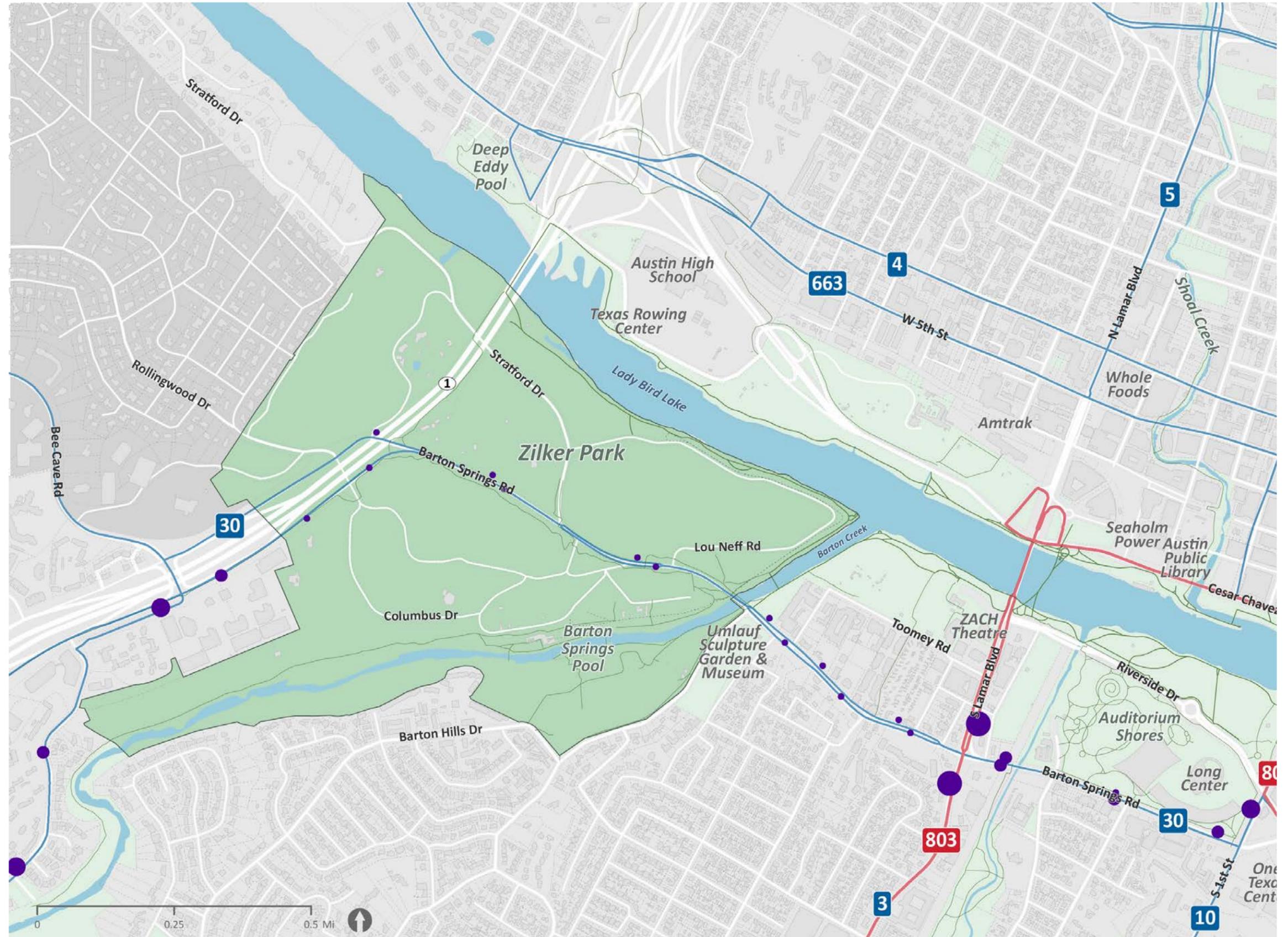
Coming from Downtown, Route 30 stops at the following locations:

- At signalized pedestrian crossing of Barton Springs Road near Lou Neff Road
- At the entrance of the Zilker Botanic Garden
- At the Nature Center Access Road

Coming from Southwest Austin, Route 30 stops at the following locations:

- Along the MoPac Expressway frontage road near the McBeth Recreation Center
- Along the MoPac Expressway frontage road near the Disc Golf Course
- Across from the entrance of the Zilker Botanic Garden
- At signalized pedestrian crossing of Barton Springs Road near Lou Neff Road

The following map shows the alignment of Route 30 and ridership at stops near and within the park.



GETTING TO THE PARK: TRANSIT

The busiest bus stop within the park is the stop pair located at Barton Springs Road near Lou Neff Road, which serves several of the park's primary amenities including the Great Lawn and Barton Springs. In February 2020, eight people used this stop on a typical weekday, while 25 people used the stop on a typical Saturday day. However, it should be considered that 2020 was not a typical year, with the City taking official COVID-19 precautions starting in March 2020.

Route 30 typically operates approximately every 30 minutes, both during the weekdays and on weekends. Capital Metro temporarily increased the frequency of Route 30 to every 15 minutes during weekends in the summer months in 2019 as part of a pilot project.

Origin/Destination survey data collected by Capital Metro provides a snapshot of how transit users are accessing the park. Since Route 30 does not travel north or east of Downtown, nearly half of riders that use a stop within the park transfer to another route. Most transit riders walked to the bus and few riders took a bike with them on the bus, meaning that transit users are primarily on foot once they arrive at the park.

Transit Access Zilker Park as Origin



89%

Walk to transit stop



3.9 blocks

Average walk distance
to transit stop



50%

Ride on
multiple routes

Transit Access Zilker Park as Destination



88%

Walk from transit stop



3.7 blocks

Average walk distance
from transit stop



42%

Ride on
multiple routes

GETTING TO THE PARK: ACTIVE MODES

Zilker Park is served by several of the city's highest profile trails – including the Butler Trail along Lady Bird Lake and the Barton Creek Greenbelt & Violet Crown Trail. Despite this trail access, getting to Zilker Park can be challenging by active modes (biking, walking, scootering).

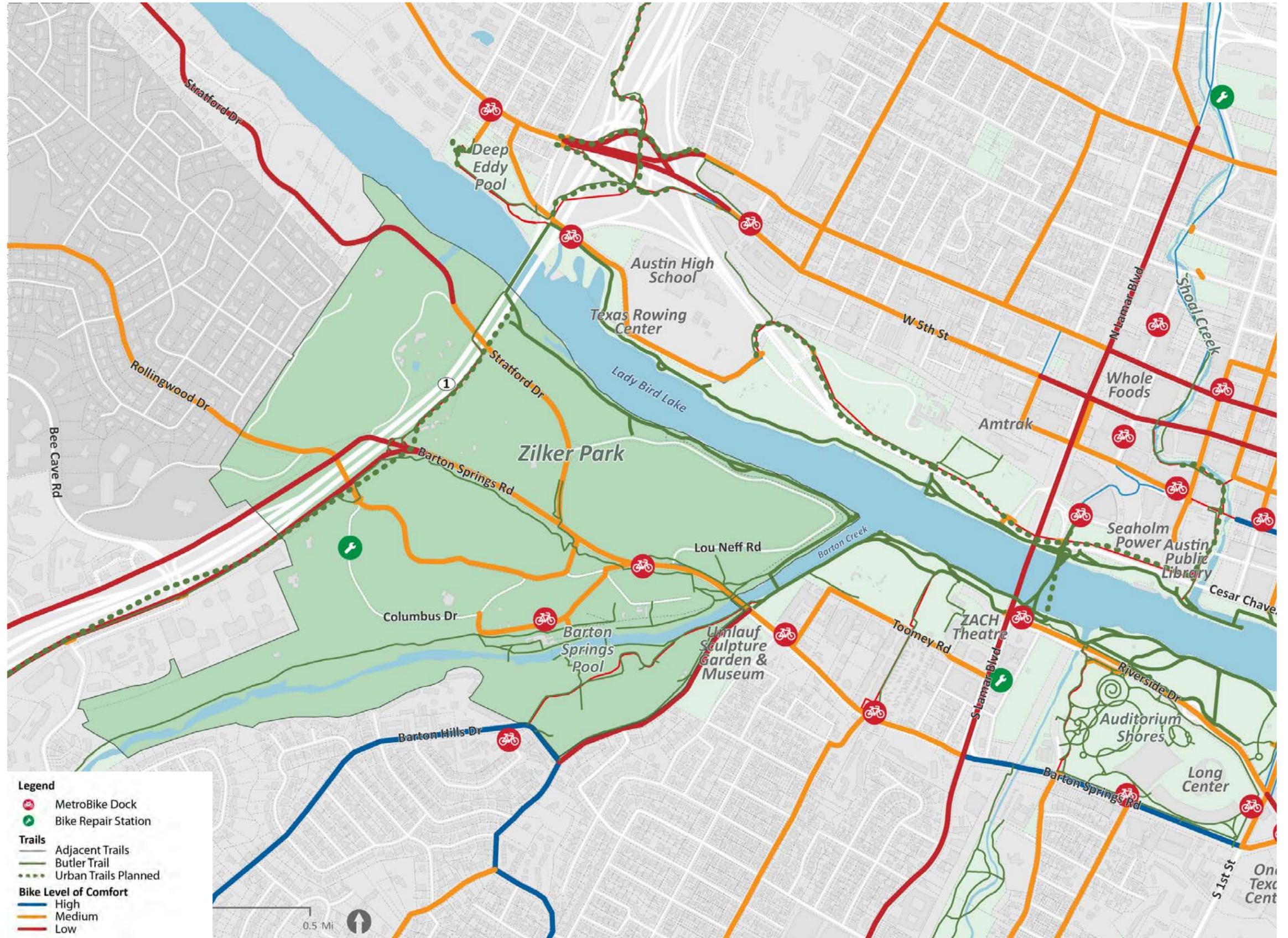
BICYCLES

The most prominent on-street bicycle access to Zilker Park exists on Barton Springs Road, which features a buffered bicycle lane in both directions through the park (west of the Barton Creek bridge). The bicycle lanes become less comfortable east of the intersection with Azie Morton Road and are not buffered from vehicular traffic. Due to the width of the bridge across Barton Creek, there is no dedicated bicycle facility on the crossing itself. There is a bicycle/pedestrian-only bridge crossing the creek several yards to the north as part of the Butler Trail.

On the west side of the park, the bicycle lanes on Barton Springs Road connect to a paved, shared-use path along the east side of the northbound frontage road of MoPac Expressway that continues north of Barton Springs Road as a paved trail connection to the Butler Trail.

Several existing park streets are commonly used by cyclists despite a lack of dedicated bicycle facilities given their generally low speeds, including Stratford Drive and Andrew Zilker Road. The park also features two MetroBike docks within the park boundary – one at the Capital Metro bus stop near Lou Neff Road, and the other at the entrance to Barton Springs – with several additional docks located near the park.

The Butler Trail Safety & Mobility Study collected trail usage data for one location within the park just east of the MoPac Expressway trailhead. On a typical weekend in 2020, approximately 15 bicycles used the trail heading westbound while 10 used it heading eastbound. On a typical weekday, these numbers increase to 21 and 36, respectively. It is unclear how many of these cyclists may be using the trail to access Zilker Park itself.



GETTING TO THE PARK: ACTIVE MODES

MICRO-MOBILITY

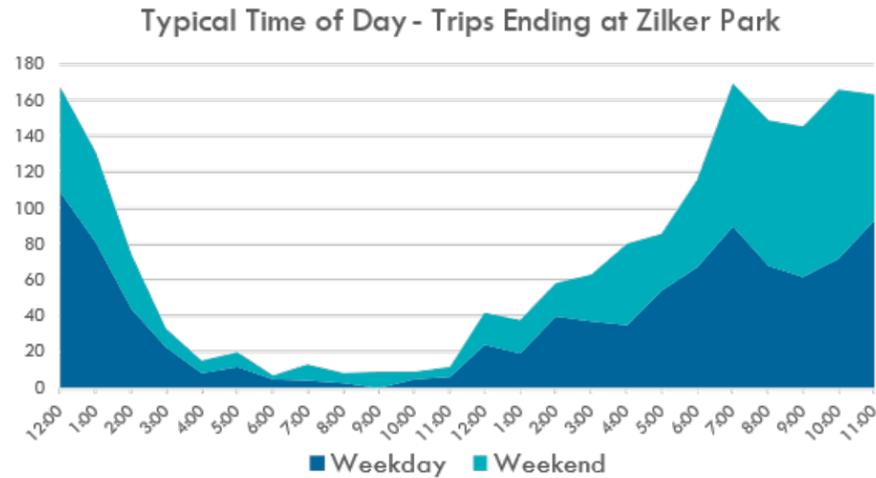
Dockless scooters and bicycles – known as micromobility – are a popular way to access Zilker Park. Usage data shows that by and large, the peak of access to Zilker Park falls in the late afternoon to early evening, with the highest usage around 7:00PM. Access is about twice as high on weekends than at the same time on weekdays, and access dips significantly in the early morning hours. Weekly usage follows the trend of most parks, with the bulk of access occurring on the weekends and the dip occurring mid-week.

In April 2019 alone, 3,322 scooter trips ended in the census tract that contains Zilker Park. However, due to the COVID-19 pandemic and the resulting decrease in demand and supply for micromobility, that number fell to just 85 scooter trips in April 2020. Overall, the number of average monthly trips originating in the Zilker Park census tract fell by 50 percent after the beginning of the COVID-19 pandemic. For trips that ended in the Zilker tract, there was a 54% decrease compared to pre-pandemic numbers.

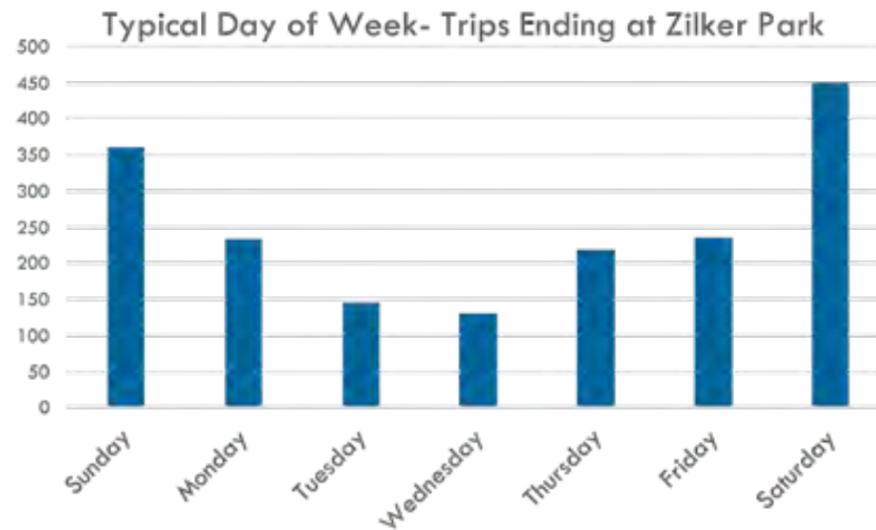
While the number of trips changed drastically as a result of the COVID-19 pandemic, the locations from which users accessed the Zilker Park census tract remained roughly the same. Riders using micromobility devices made connections between Zilker Park and four census tracts more than any other:

- The Zilker Park tract (inter-tract trips)
- The Downtown tract
- The South Congress tract
- The South Lamar tract (immediately east of Zilker Park)

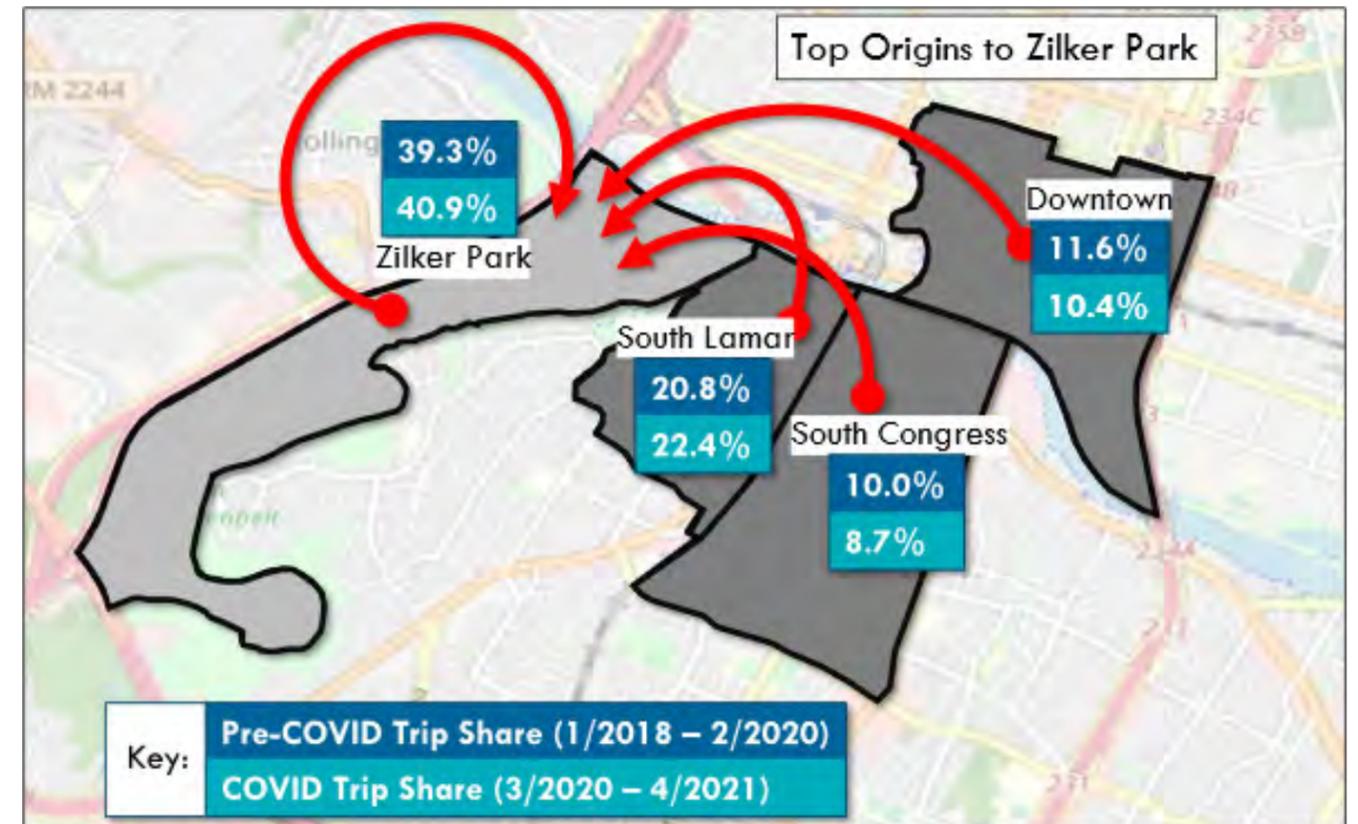
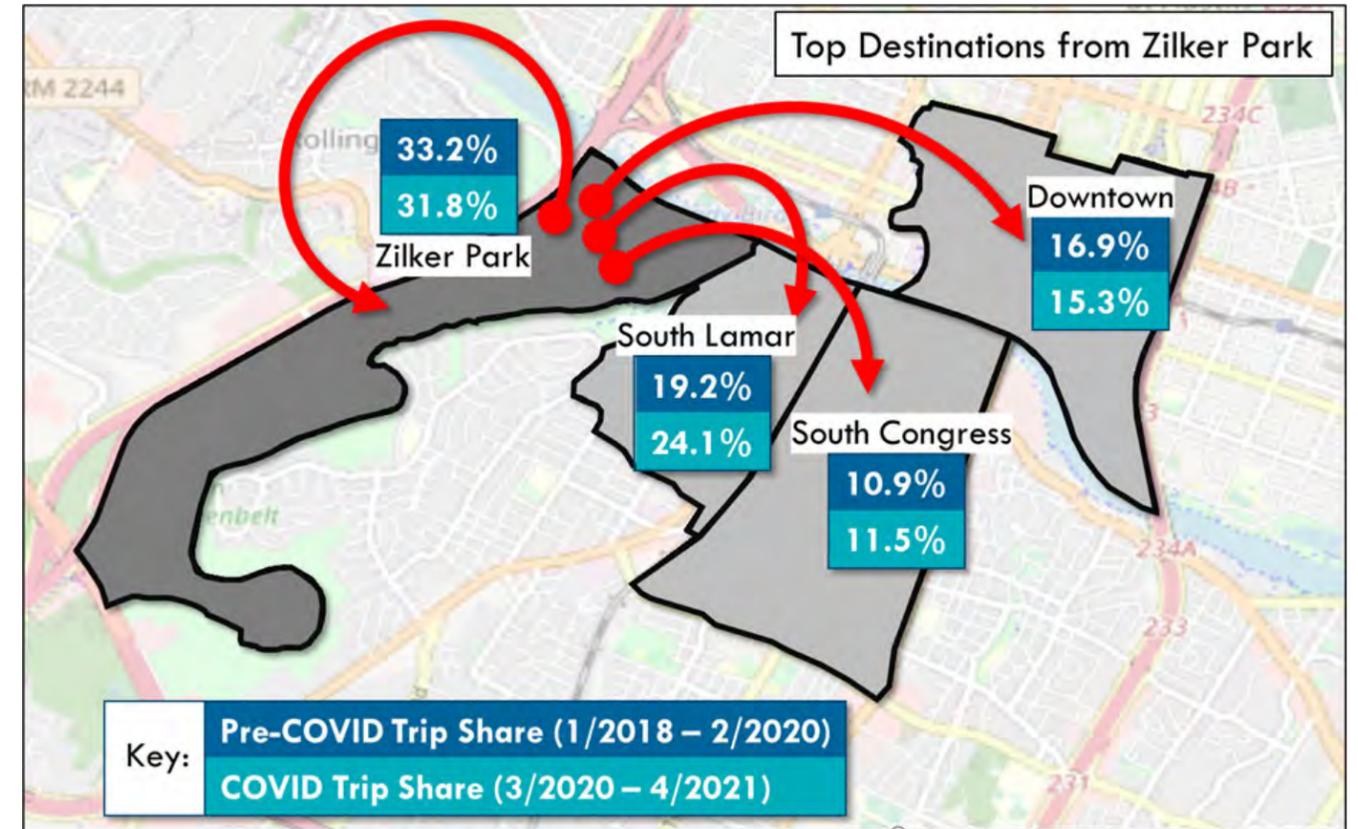
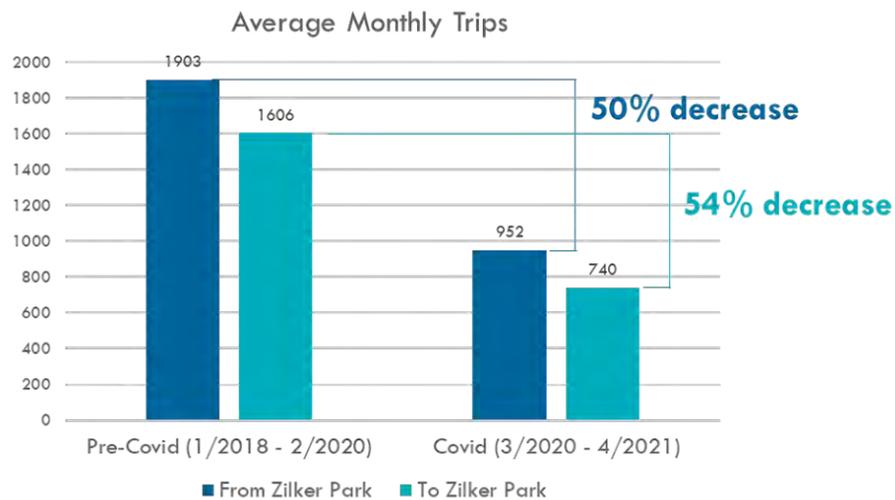
In all cases except one, trips to and from these tracts remained within two percentage points between the pre-COVID numbers and those after the beginning of the pandemic. In sum, micromobility travel patterns to and from Zilker Park remained roughly the same.



*Note: trends on this chart pulled from representative sample dataset



*Note: trends on this chart pulled from representative sample dataset



GETTING TO THE PARK: ACTIVE MODES

PEDESTRIANS

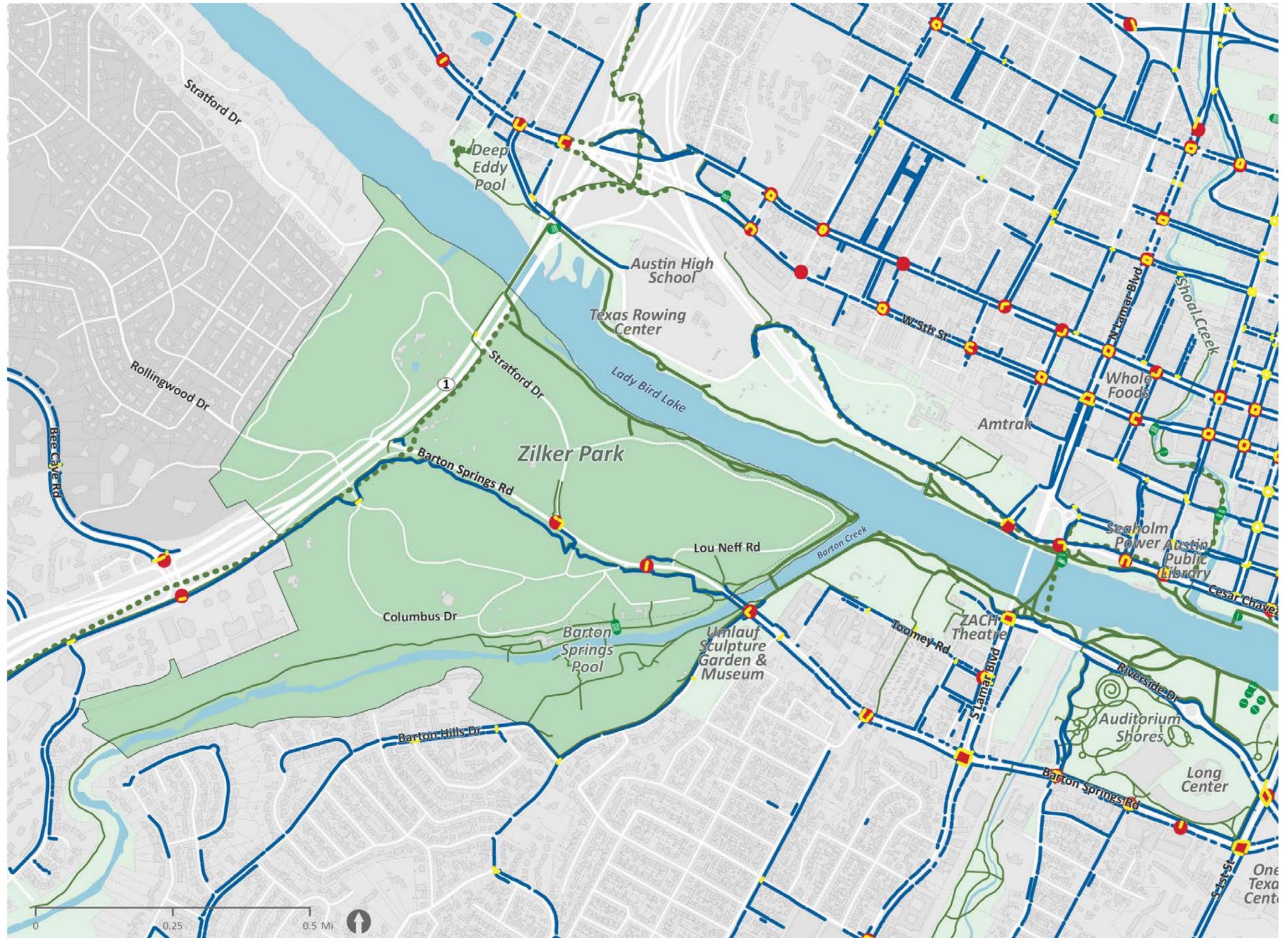
Other than the Butler Trail and Barton Creek Greenbelt Trail, dedicated pedestrian facilities within Zilker Park are very limited. There is a paved, off-street sidewalk called the “Zilker Metro Park Loop” located to the east of the MoPac Expressway frontage road and south of Barton Springs Road. There is also a short segment of paved sidewalk between the Capital Metro bus stop and the Butler Trail on the north side of Barton Springs Road.

Other than sidewalks connecting parking areas to the entrances of Barton Springs, there are few other dedicated pedestrian facilities within the park, with the most notable gaps occurring along intra-park roads such as Stratford Drive, Lou Neff Road, and Andrew Zilker Road. There is also no dedicated pedestrian access to Zilker Botanical Garden, including both bus stops in either direction near the Garden entrance.

There are two designated pedestrian crossings of Barton Springs Road: a crosswalk at the Stratford Drive signal, and a signalized crosswalk (using a Pedestrian Hybrid Beacon or PHB) between William Barton Drive and Lou Neff Road, connecting to the existing Capital Metro bus stops. There is a grade-separated pedestrian crossing under Barton Springs Road along the Barton Creek section of the Butler Trail on both sides of the creek.

The Butler Trail Safety & Mobility Study collected trail usage data for one location within the park just east of the MoPac Expressway trailhead. On a typical weekend in 2020, approximately 345 pedestrians used the trail heading westbound while 515 used it heading eastbound. On a typical weekday, these numbers decrease to 167 and 280, respectively. It is unclear how many of these pedestrians may be using the trail to access Zilker Park itself.

- Legend**
- Sidewalk
 - Crosswalk
 - Stairs
 - Pedestrian Traffic Signal
- Trails**
- Adjacent Trails
 - Butler Trail
 - - - Urban Trails Planned



GETTING TO THE PARK: ACTIVE MODES

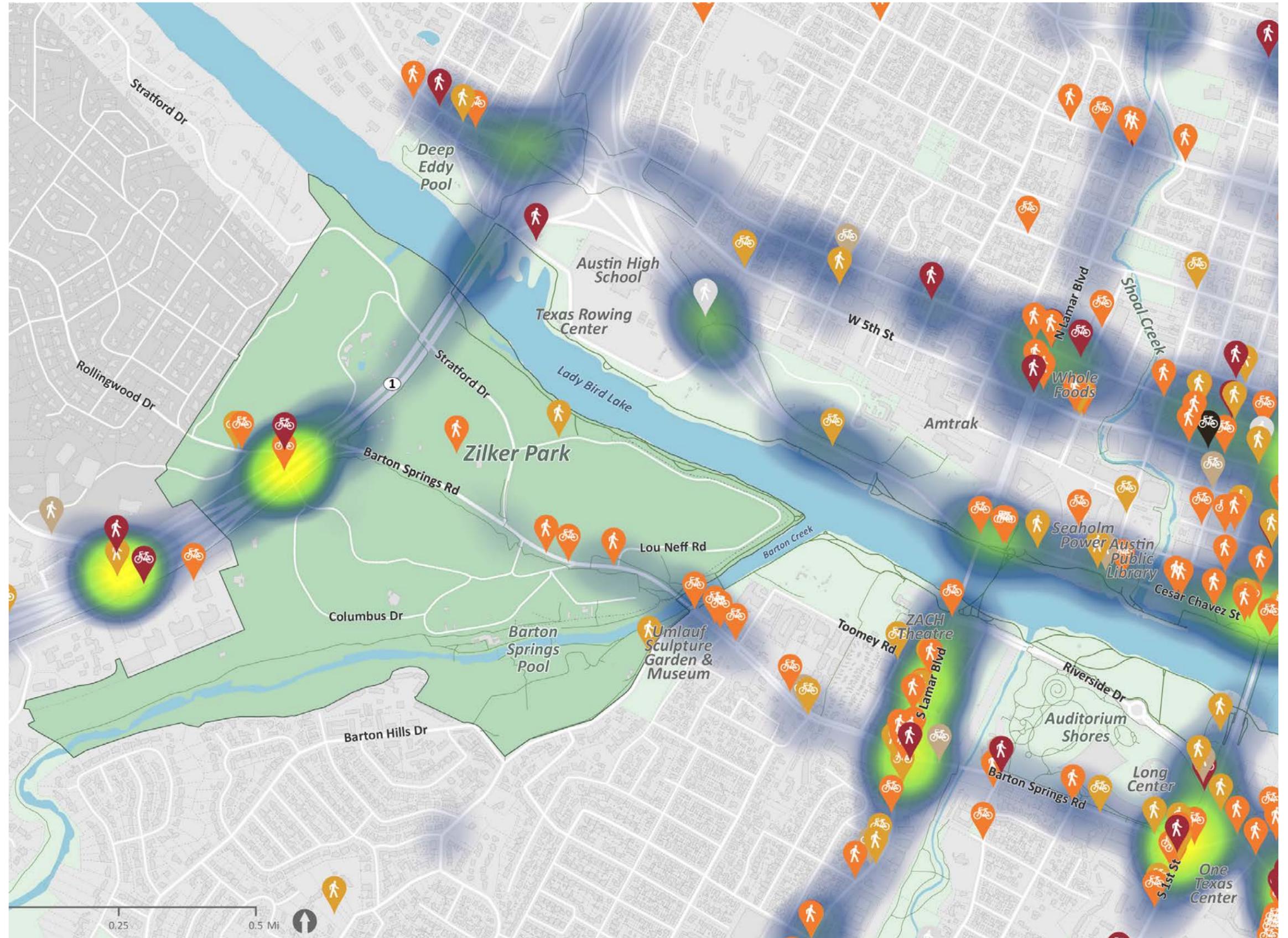
SAFETY

The highest incidences of crashes in the Zilker Park area were found at major intersections near the park, including:

- MoPac Expressway / Bee Cave Road
- MoPac Expressway / Barton Springs Road
- Barton Springs Road / South Lamar Boulevard

Among crashes involving a cyclist or pedestrian, many of the incidents occurred primarily along South Lamar Boulevard, South Congress Avenue, and in the Downtown core. While there were crashes that occurred on Barton Springs Road and within the park itself, there were no recorded fatalities between 2016 and 2020 near or in the park.

One incapacitating injury involving a cyclist was recorded between 2016 and 2020, which occurred near the MoPac Expressway frontage road. The non-incapacitating crashes within the immediate Zilker Park area occurred primarily along Barton Springs Boulevard, where there is an unprotected bicycle lane in the westbound direction.



GETTING TO THE PARK: PARKING

Parking opportunities within Zilker Park are dispersed throughout the park, primarily in off-street parking lots that accommodate between 50 and 100 vehicles per lot. Between formal parking lots, on-street parking on Lou Neff Road, and informal lots such as the former landfill gravel lot between Mopac and Lou Neff Road, there are almost 2,450 parking spaces within the boundary of Zilker Park. Of those spaces, approximately 875 of the spaces are located in formal lots (lots with marked spaces) and on-street parking stalls that serve general park attendees and are not limited to specific park facilities. These spaces require payment on approximately 57 days of the year on weekends and holidays from March through September. Of these spaces, approximately 230 are on-street spaces along Lou Neff Road.

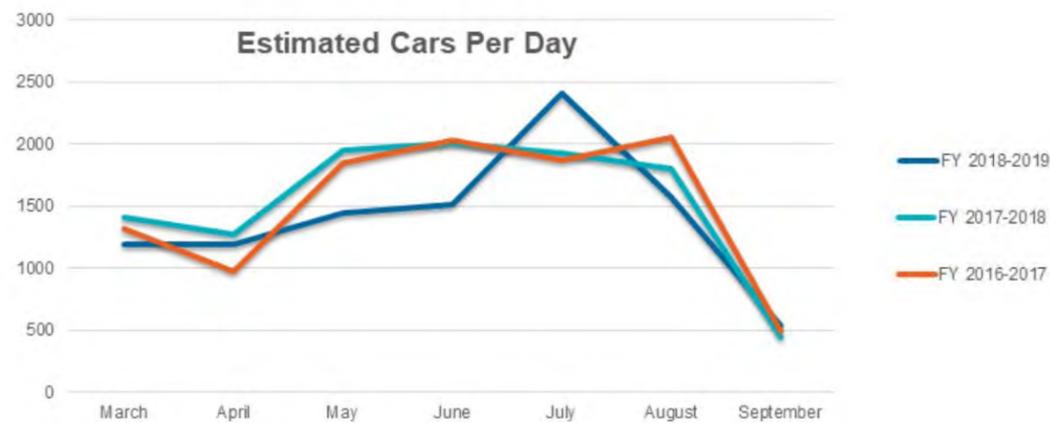
The remaining parking spaces are divided as follows:

- Approximately 1,150 spaces on the landfill lots north of Stratford Drive and under the MoPac Expressway bridge, which serves as overflow parking during busy weekends. These spaces do not require payment
- 75 spaces that are limited to visitors to the Botanical Gardens

- 30 spaces that are limited to visitors to the Zilker Clubhouse
- 70 spaces in a free lot closest to McBeth Recreation Center
- Almost 250 spaces in four lots south of Barton Creek, near the ball fields along Azie Morton Road. Approximately 100 of these spaces are in informal gravel lots

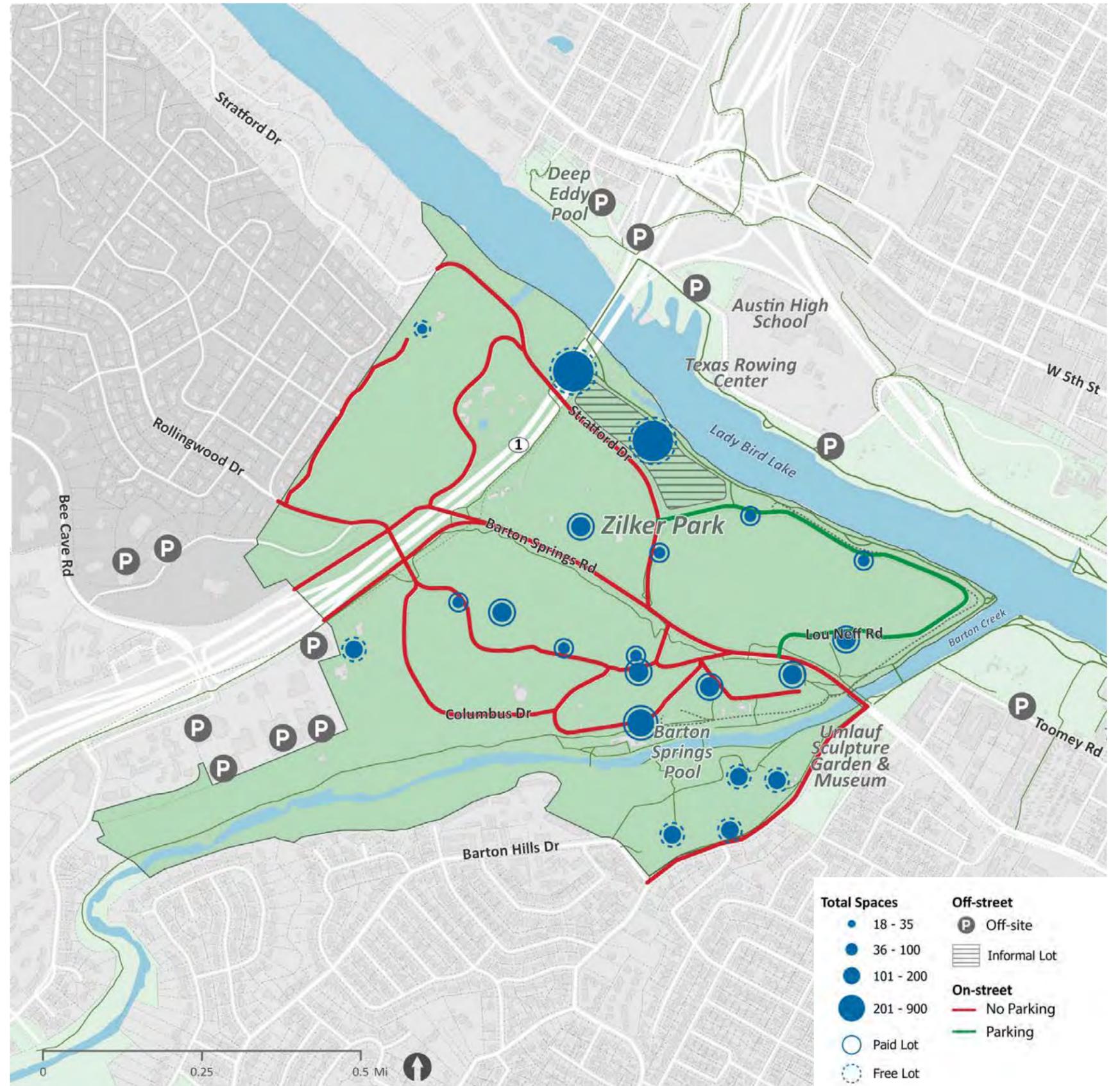
There are approximately 60 ADA spaces dispersed throughout the park, although some lots also feature ramps but do not have dedicated ADA spaces. The lot near the Polo Field off Andrew Zilker Road also features two electric vehicle charging stations.

According to revenue data from paid parking locations, parking demand within the park peaked in FY 2017/2018, with almost 93,000 cars paying for parking during times when parking requires payment. In FY 2018/2019, that total decreased slightly to approximately 92,000 cars. This averages out to approximately 1,900 cars per day on weekends and holidays. The highest use month for paid parking has varied between July and August, depending on the year.



There are several parking lots and garages located just outside the boundary of Zilker Park that could potentially serve as off-site parking, with notable concentrations west of the park near the intersection of Mopac and Bee Cave Road, north of Lady Bird Lake at Austin High School, and east of the park at lots that serve

other parks and public facilities (such as the Long/Palmer Center garage) on the south shore of Lady Bird Lake. Further study is needed to determine the appropriateness of these sites for serving Zilker parking demand and how to provide access to the sites from park destinations.



TRAVEL WITHIN THE PARK: STREETS & TRAFFIC

Vehicular circulation within the park is dominated by the presence of Barton Springs Road, which travels east/west through most of the park. Most of the park's parking lots and major destinations that are accessible by vehicle are accessed through park roadways that are reached via Barton Springs Road – with the exception of Andrew Zilker Road, which is accessed via the MoPac Expressway service road at the intersection of Rollingwood Drive on the west side of the park, and Stratford Drive, which provides a vehicular connection under MoPac Expressway to neighborhoods west of the park boundary (and eventually Redbud Trail near the Ullrich Water Treatment Plant).

Several of the park's intra-park roadways are one-way streets, including Lou Neff Road, Andrew Zilker Road, William Barton Drive, and Nature Center Drive. Several of these roadways have a narrow width between their curbs, so directing vehicle traffic in one direction can maximize the use of limited street space for on-street parking. However, the reliance on one-way streets to provide park circulation can be confusing for wayfinding for visitors, while also limiting the flexibility of the roadway network to accommodate peak vehicular demand. This can result in long delays on streets such as Lou Neff Road, particular on busy weekends when the signal at Stratford Drive produces queues that can stretch all the way along the loop back to Barton Springs Road.

Barton Springs Road is a high-speed major arterial through most of the park. As the only major vehicle connection between MoPac Expressway and Downtown between Lady Bird Lake and Loop 360, the road serves a critical function for accommodating heavy vehicle traffic, especially during the peak commuting periods. In 2015, between 20,000 and 25,000 vehicles traveled on Barton Springs Road on a typical day through the park.

Barton Springs Road features three traffic signals within the park – one at Stratford Drive, the pedestrian signal between William Barton Drive and Lou Neff Road, and one at the park's eastern boundary at Azie Morton Road. While both intersections at Stratford Drive and Azie Morton Road provide pedestrian crossing



phases, these signal locations are the only safe locations for cyclists and pedestrians to cross Barton Springs Road within the park. As Barton Springs Road essentially transitions to a freeway ramp west of Stratford Drive, vehicle speeds tend to increase – further reducing safety for non-motorized travelers in this part of the park.



EVENT MOBILITY

Mobility within the park is disrupted most during four large events that occur at Zilker Park throughout a typical year:

- ABC Kite Festival (One weekend, typically in March)
- KGSR's Blues on the Green concert series (4-5 Wednesday evenings during Summer)
- Austin City Limits Music Festival (ACL) Two weeks plus an additional set-up/take-down time; Late September/Early October)
- Trail of Lights (beginning Thanksgiving through the New Year)

During all four of these events, Barton Springs Road and Stratford Drive are closed to general vehicle traffic, although closures are limited to event-hours for all events other than ACL. In-park parking – particularly at lots north of Barton Springs Road and east of Stratford Drive – are typically closed during these events as well. Both ACL and the Trail of Lights have implemented robust shuttle services, with both events providing frequent trips between Republic Square and a drop-off site north of Barton Springs, and Trail of Lights also offering shuttles to remote parking at AISD's Toney Burger Center in Sunset Valley.

Micromobility device and Transportation Network Company (TNC) pick-up/drop-off is provided off-site for large events such as ACL. In 2019, TNC pick-up/drop-off locations included Austin High School, Wallingwood Drive (west of the Barton Oaks office development), and Lee Barton Drive near the Butler Pitch & Putt. Micromobility drop-off sites included Azie Morton Road and the Butler Shores parking lot on the north side of Toomey Road.



