



GREAT SPRINGS PROJECT *Trails Plan*

*from the Alamo
to the Capitol*

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Great Springs Project

Great Springs Project (GSP) is a 501(c)(3) non-profit organization formed to help create a network of spring-to-spring trails and a corridor of protected lands over the Edwards Aquifer recharge zone, between San Antonio and Austin. This plan lays the foundation for GSP and its partners to achieve this goal by the Texas Bicentennial in 2036.

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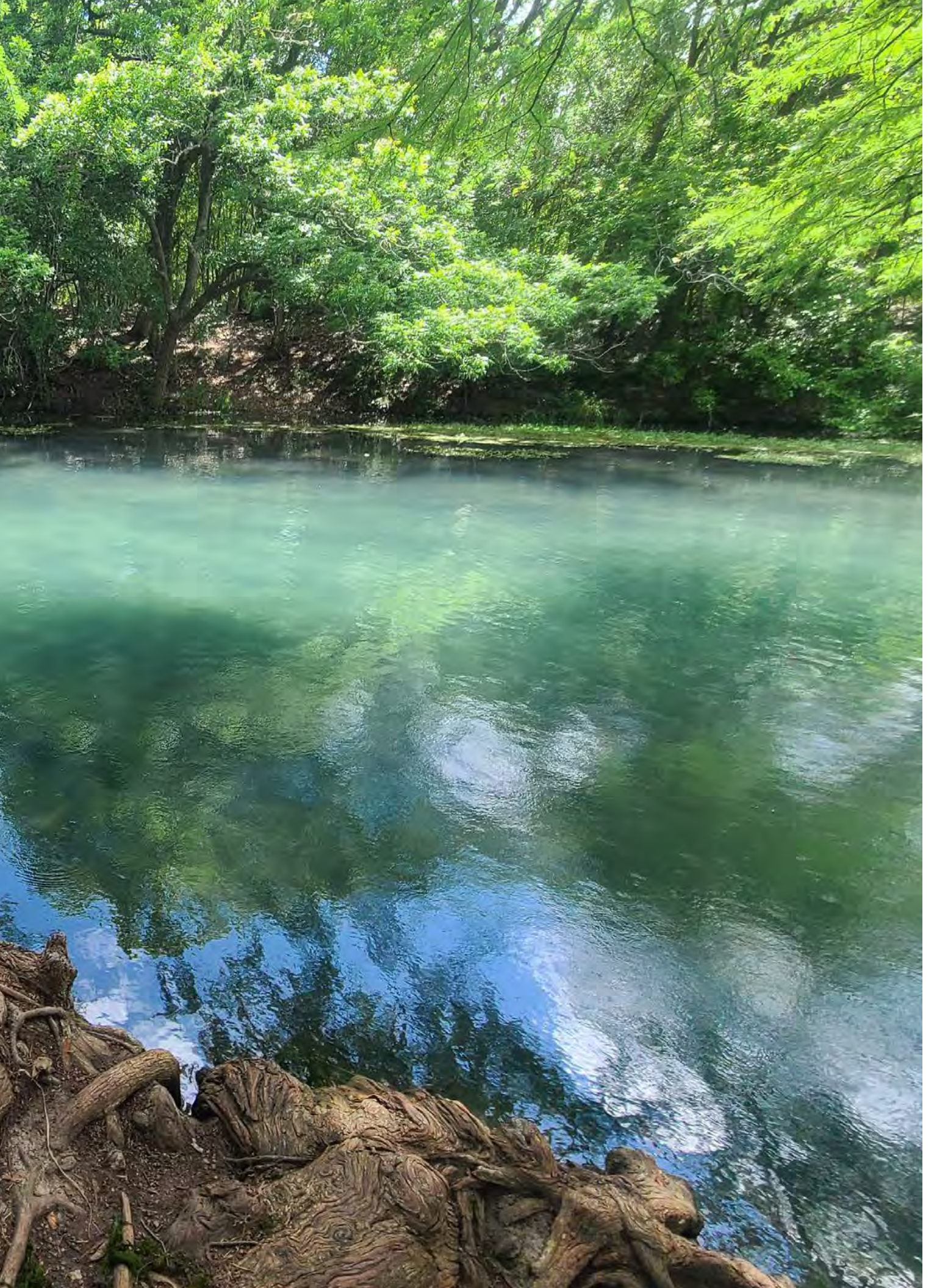
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Community Task Force

Thank you to the members of GSP's Community Task Force. GSP's mission to protect and connect Texas' beautiful natural surroundings is underpinned by the fundamental requirement of community and inclusion in public access to this beauty. Important components of GSP's work are the recommendations and guidance of the Community Task Force early in the trail visioning and planning process to advance an equitable approach and outcomes for the trail, including equitable access to the many benefits of the Great Springs Trail.

Melissa Ayala, Waterloo Greenway

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The background of the entire page is a photograph of a large, mature tree with a thick trunk and dense foliage. The image is overlaid with a semi-transparent teal color. In the top left corner, there is a solid dark teal rectangular block.

Chapter 1

The Vision

Great Springs Project is working to create a greenway of contiguous protected lands between San Antonio and Austin over the Edwards Aquifer recharge zone. This green corridor will be connected by a 100-mile network of spring-to-spring trails, linking four of Texas' Great Springs: Barton Springs, San Marcos Springs, Comal Springs, and San Antonio Springs. Through collaboration with our many partners, Great Springs Project unifies and supports existing local efforts and catalyzes new efforts to address the most critical water, land, wildlife, and public health and equity challenges facing the Central Texas region.



A Regional Vision in the Heart of Texas

We still have an opportunity to conserve land over the Edwards Aquifer and the life-sustaining waters that run through it. As one of the fastest growing regions in the US, those opportunities will become fewer and farther between as residential and commercial development fills the open spaces between Austin and San Antonio. Establishing this green protected corridor will also allow for a trail network connecting people to nature, offering a vital community resource for community health, active transportation, outdoor recreation, flood protection, and economic development.

HOW WILL WE REALIZE THIS VISION?

Any project of this magnitude requires many sources of investment. Similar long-distance regional trail networks in other parts of the country have had success in leveraging local, state, and federal funding with private investment. These types of projects also generate high annual economic returns on investment, creating continued value for local communities. A similar approach is envisioned for Great Springs Project.

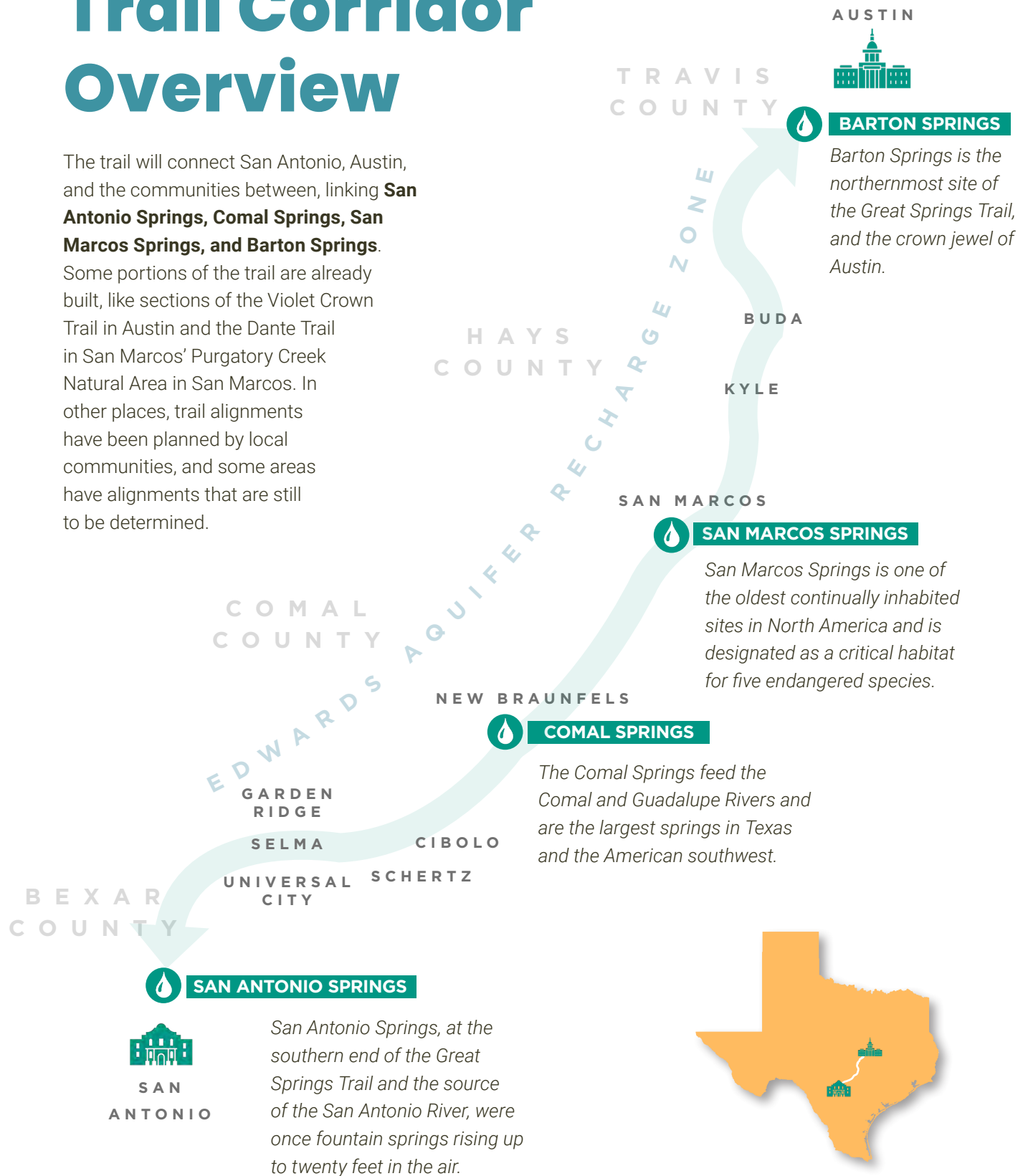
WHEN WILL WE REALIZE THIS VISION?

The mission is for the approximately 100-mile trail network from the Alamo to the Texas State Capitol to be built and contiguously connected by the Texas Bicentennial in 2036. Sections of the trail will likely be built in phases, with the order of phases depending on key factors such as funding, landowner negotiation, establishing right-of-way, permitting, design, and construction. This plan represents a major step forward on the path to implementation.

Trail Corridor Overview

The trail will connect San Antonio, Austin, and the communities between, linking **San Antonio Springs, Comal Springs, San Marcos Springs, and Barton Springs**.

Some portions of the trail are already built, like sections of the Violet Crown Trail in Austin and the Dante Trail in San Marcos' Purgatory Creek Natural Area in San Marcos. In other places, trail alignments have been planned by local communities, and some areas have alignments that are still to be determined.





An Ancient Story in Modern Context

Great Springs Project is echoing an ancient story in a modern context. These springs, filtering up through purifying limestone and emerging from the Edwards Aquifer as cold, clear water, have been a source of life for wildlife and humans alike for millennia and are the reason the communities around them were established and have thrived.



Image of the White Shaman Panel featuring what some believe to be a map of the four great springs. Photo credit: Virginia Parker

THE WHITE SHAMAN PANEL

The 4,000-year-old White Shaman Panel, named for a major figure drawn in white on rock art, is located above the Pecos River near Comstock, Texas, and features a map some believe to be of the four great springs. Coahuiltecan elders believe that this panel has elements of the creation story of the Coahuiltecan people, and documents the pilgrimage of people who visited the ancient and sacred peyote gardens in South Texas and Northern Mexico. Present-day Coahuiltecan ceremonies trace the route of four water sites that were visited during ancient pilgrimages, including **TZA WAN PUPAKO** (Barton Springs in Austin), **AJEHUAC YANA** (Spring Lake in San Marcos), **SAXŌP WAN PUPAKO** (Comal Springs in New Braunfels), and **YANA WANA** (the Blue Hole headwaters of the San Antonio River).

Source: Indigenous Cultures Institute:
indigenoucultures.org/sacred-sites

Guiding Principles of the Great Springs Trail Plan

Trail development should occur within an overall framework of principles. The following principles reflect best practices for trail development and can help guide future decisions.



THE TRAIL NETWORK SHOULD BE SAFE.

Cycling and walking routes should be physically safe and perceived as safe by users. *Safe* means minimal conflicts with vehicular traffic, and use of clear pavement markings and directional signage. *Safe* also means education about trail safety and etiquette, as well as crime prevention through environmental design.



THE TRAIL NETWORK SHOULD BE EQUITABLE.

The trail network is for everyone and should create a common ground for all, offering diverse and scalable experiences. The planning and design of trails should include equitable community engagement, with opportunities for everyone affected by the trail network to be meaningfully engaged in the process.



THE TRAIL NETWORK SHOULD BE ACCESSIBLE TO PEOPLE OF ALL AGES AND ABILITIES.

Cyclists, pedestrians, and persons with disabilities have a range of skill levels and mobility needs. The trail network should be designed with a goal of providing a mix of trail types, so that people of all ages and abilities are able to enjoy various parts of the system. For example, while some trail segments may be limited to hiking due to topography or other environmental features, other parts of the system should be designed to accommodate all users.



THE TRAIL NETWORK SHOULD BE ECONOMICALLY VIABLE.

Trail investments should create significant economic benefits, elevating community pride and prosperity. Trail improvements should also provide alternatives to more expensive modes of transportation and offer opportunities for savings in personal costs of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce, and connect with adjacent private improvements.



TRAILS SHOULD CONNECT TO PLACES PEOPLE WANT TO GO.

The trail network should provide continuous direct routes and convenient connections between destinations such as parks, springs, natural areas, schools, downtown areas, neighborhoods, and cultural resources. A complete network of trails should connect seamlessly to existing and proposed sidewalks and bicycle lanes to complete recreational and commuting routes.



NAVIGATING THE TRAIL NETWORK SHOULD BE EASY.

As trails throughout the region are constructed and connected, the regional routes among them should use a comprehensive and consistent wayfinding system. Wayfinding tools should include directional signage, kiosks with detailed maps, handheld paper maps, and online components such as a website or app. The overall design and branding should be consistent across all these tools. This will require close coordination with locally established trail networks.



THE TRAIL NETWORK SHOULD HELP PROTECT THE SPRINGS WHILE ENHANCING COMMUNITY LIVABILITY.

The trail network should be compatible with the nature, history, and character of the environment. Context and scale should be given thoughtful consideration, including locating the trail where it can best protect water quality over the Edwards Aquifer Recharge Zone. Good design should integrate with and support the development of complementary uses and

should encourage preservation and construction of art, landscaping, and other items that add value to communities. These components might include places to rest along the trail, scenic viewpoints, public art, and educational/interpretive signage about the springs and other natural features. These, along with historical elements and cultural references, should promote a sense of place.



THE TRAIL NETWORK SHOULD EXHIBIT A HIGH STANDARD OF DESIGN.

Trail designers and builders should reference national guidelines for trail facility design, as well as locally established best practices. With the overall goal of consistency, design guidelines used should also be flexible enough to allow for the professional judgment of the design and engineering staff of local communities. In all cases, sound engineering judgment should be used, specific to the trail segments being designed and constructed.



TRAILS SHOULD BE BUILT FOR LONGEVITY WITH A SUSTAINED COMMITMENT TO MAINTENANCE.

Trail funding opportunities are often limited to construction rather than maintenance purposes. Trail design and construction decisions should be made with this in mind, favoring more durable materials and lower-maintenance options when possible.



**THE TRAIL DEVELOPMENT
PROCESS SHOULD
DEMONSTRATE RESPECT
FOR LANDOWNERS.**

Respect for land and landowners is a core value of GSP. GSP encourages partner communities along the corridor to engage with willing landowners who participate in this process on a

voluntary basis and does not endorse the use of eminent domain, except for rare cases in which it is preferred by the landowner. While GSP can facilitate connections between landowners and other stakeholders, most actual land-related transactions occur between landowners, land trusts, and local community trail operators and managers.

Trail Partnership Case Study: *GSP and The Nature Conservancy*

GSP and The Nature Conservancy are exploring ways to partner for trail development. In 2021, GSP and land managers from The Nature Conservancy met on private conservation lands north of San Antonio to evaluate opportunities and constraints for potential trail routes.

The site includes sensitive wildlife habitat, like that of the golden-cheeked warbler. Other sites with public access have addressed similar concerns through temporary trail closures during mating season.

Other factors that will influence trail alignment and design include

topography, existing ATV paths, potential for trailhead locations, and privacy from existing buildings on-site.

Ultimately, the trail alignment decisions are being driven by the people who know the land best: the owners and managers of the land. GSP recognizes the value in these types of partnerships, especially when the knowledge and understanding of the land can be brought to the forefront of trail development decision-making.





Bicentennial Trail Bill (Texas House Bill 4230)

In 2025, the Texas Legislature passed House Bill 4230, which was signed into law by Governor Abbott.

Bill Summary

HB 4230 directs the General Land Office (GLO) to coordinate the establishment of a network of hike-and-bike trails connecting the Alamo to the Texas Capitol and other specified locations. HB 4230 adds Subchapter J, Chapter 31, Texas Natural Resources Code, and directs the General Land Office to enter memoranda of understanding with entities, including the Texas Department of Transportation (TxDOT), as necessary, to establish and maintain the network of hike-and-bike trails.



“The Bicentennial Trail is established as a network of hike and bike trails to connect the Alamo to the State Capitol and to include hike and bike trail connections to Barton Springs, San Marcos Springs, Comal Springs, and San Antonio Springs for the purposes of promoting outdoor recreation, environmental stewardship, and the historical and cultural heritage of this state.”



Chapter 2

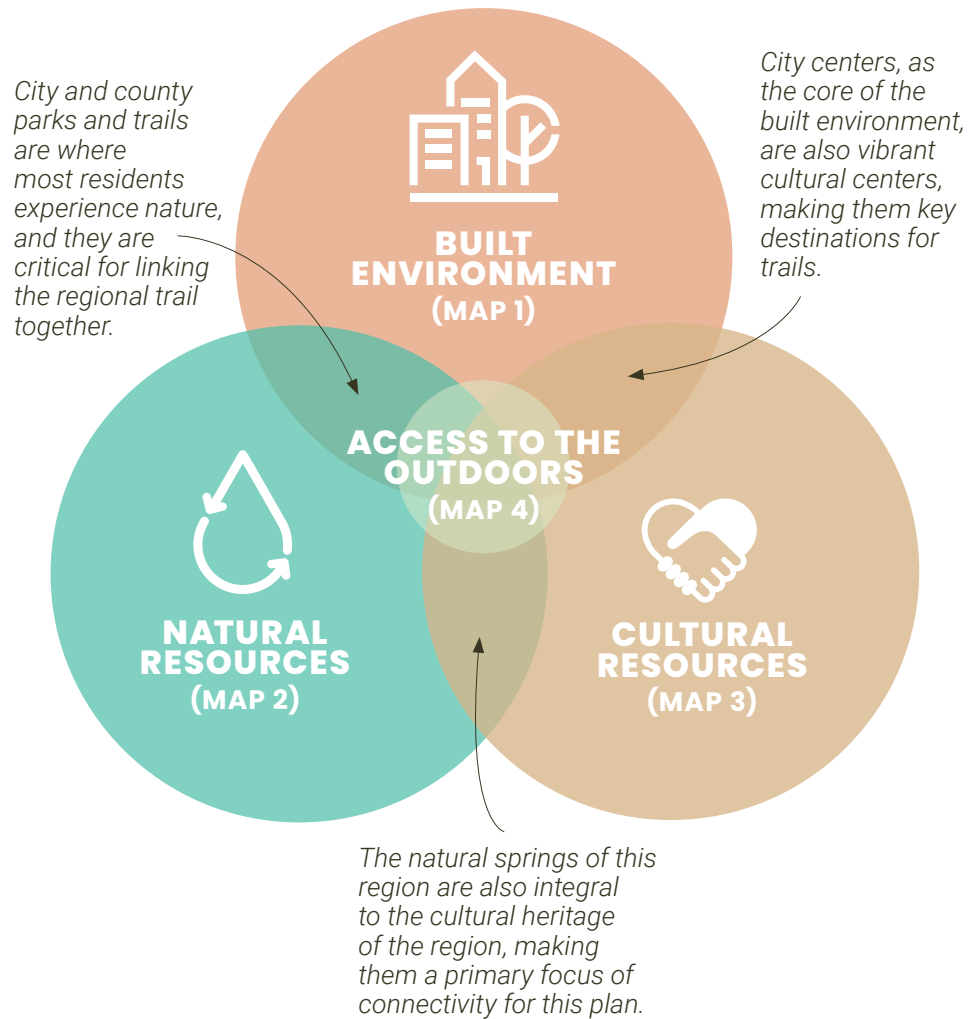
The Challenge

Texas is growing fast. The San Antonio-Austin corridor is growing even faster. Rapid growth presents both challenges and opportunities for realizing the vision of Great Springs Project. This chapter outlines these challenges and opportunities in terms of our built environment, natural resources, cultural resources, and access to the outdoors.



CHAPTER FRAMEWORK

This chapter is organized by the key topic areas shown in the following graphic. This framework allows for an examination of a variety of existing conditions as they relate to the potential for trail development. As noted below, each of the topic areas are overlapping, with access to outdoors being central to the discussion.





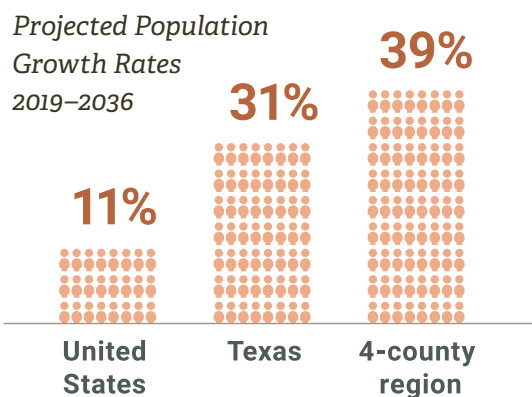
Blazing a Trail in a Fast-Growing Region

A key challenge for this project is how to create a contiguous network of trails and open space as Central Texas transforms into a mega-region.

Between now and 2036, the population of Texas will grow at three times the rate of the rest of the US; the four-county region is expected to grow nearly four times as fast.^{1, 2}

This growth presents many challenges for Central Texas:

- Strain on natural resources, such as water supply
- Strain on built infrastructure, such as transportation and utilities
- Loss of open spaces for wildlife, aquifer recharge, flood protection, and recreation



1 U.S. Census Bureau, Population Division; <https://www.census.gov/data/tables/time-series/demo/popest/intercensal-2000-2010-counties.html>

2 Texas Demographic Center <https://demographics.texas.gov/data/tpepp/projections/>

This plan will help local communities and regional organizations face these challenges by identifying a recommended network of connected trails and protected lands as the region grows.

Opportunity in Growth

The key conservation and trail-building opportunity that comes along with a growing population is the greater potential for the large-scale funding that will be needed to protect land for parks, trails, and open space. Recent examples include the Hays County 2020 Parks and Open Spaces Bond, the City of Austin's 2020 Active Transportation and Safety Bond, and the Travis County 2023 Parks Bond.

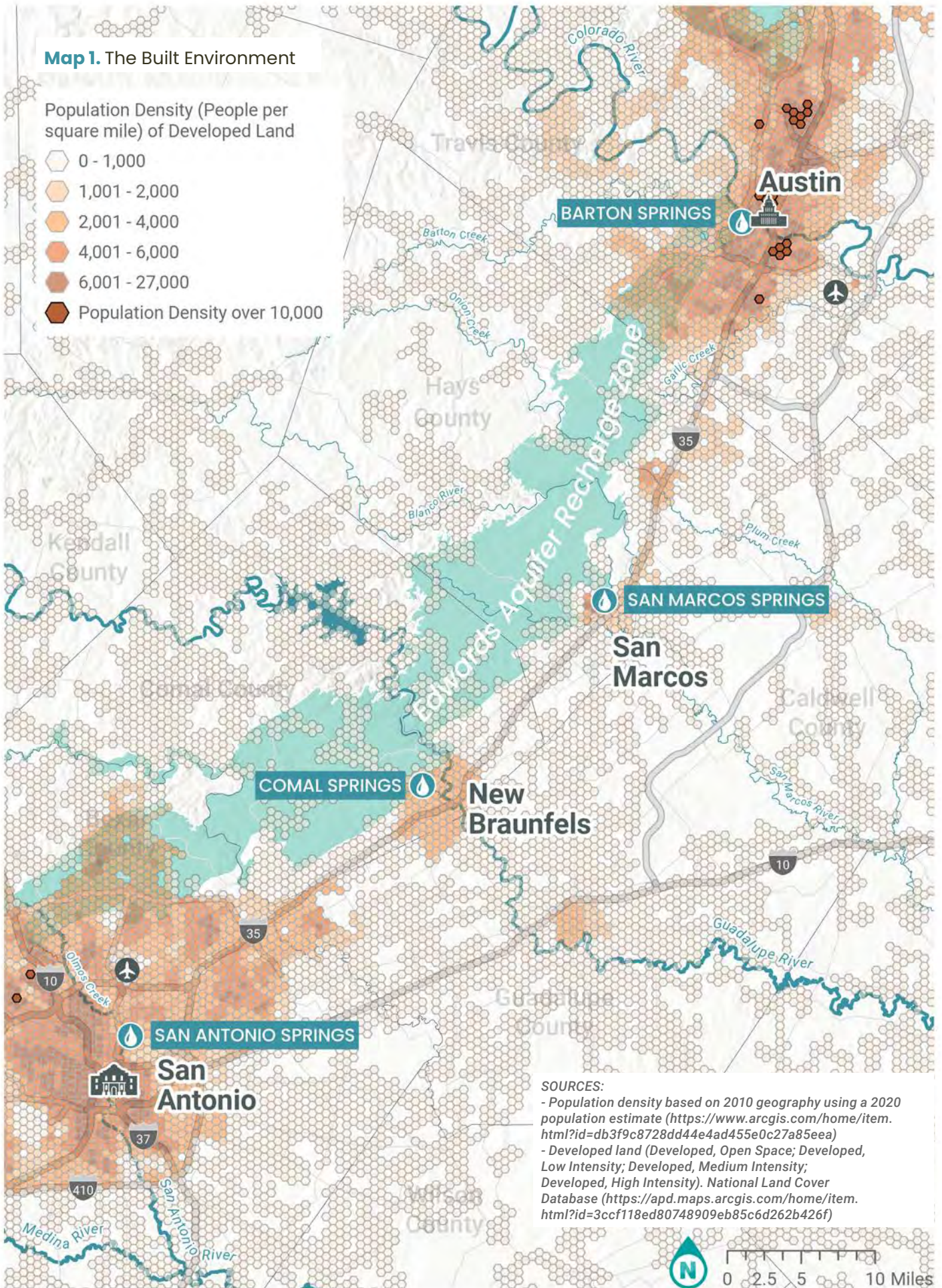
Similarly, increased coordination with development projects could yield substantial results for trails and open spaces, such as the following:

- ★ Parkland and trail dedication with new residential and commercial development
- ★ Coordination of trail development with TxDOT and other transportation partners
- ★ Incentivizing conservation subdivision development, where developers preserve open space within their development plans

THE BUILT ENVIRONMENT MAP

The map on the next page illustrates population density and developed areas throughout the region. Growth and development north of San Antonio and south of Austin can be seen in transparent orange, over the Edwards Aquifer Recharge Zone.

Map 1. The Built Environment





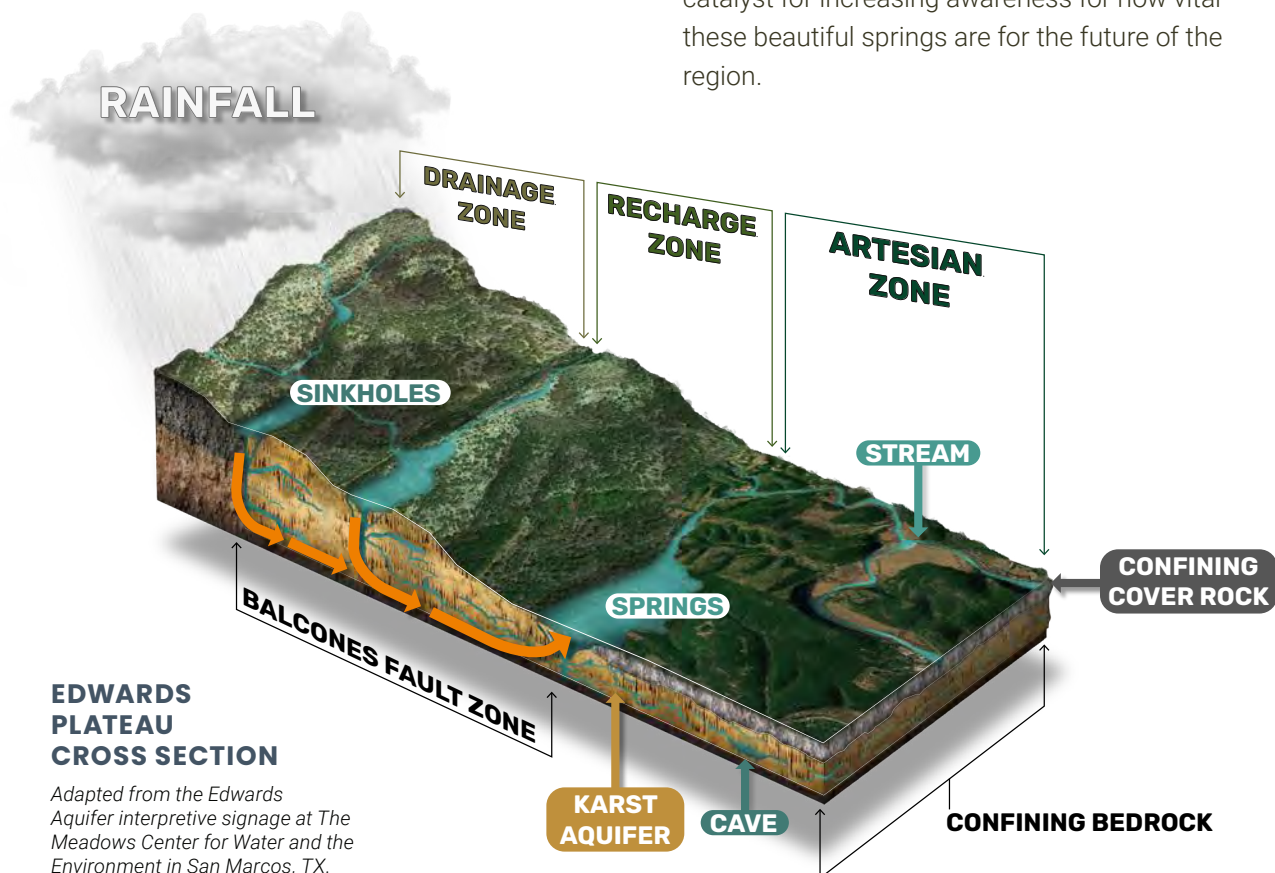
Protecting the Edwards Aquifer Recharge Zone

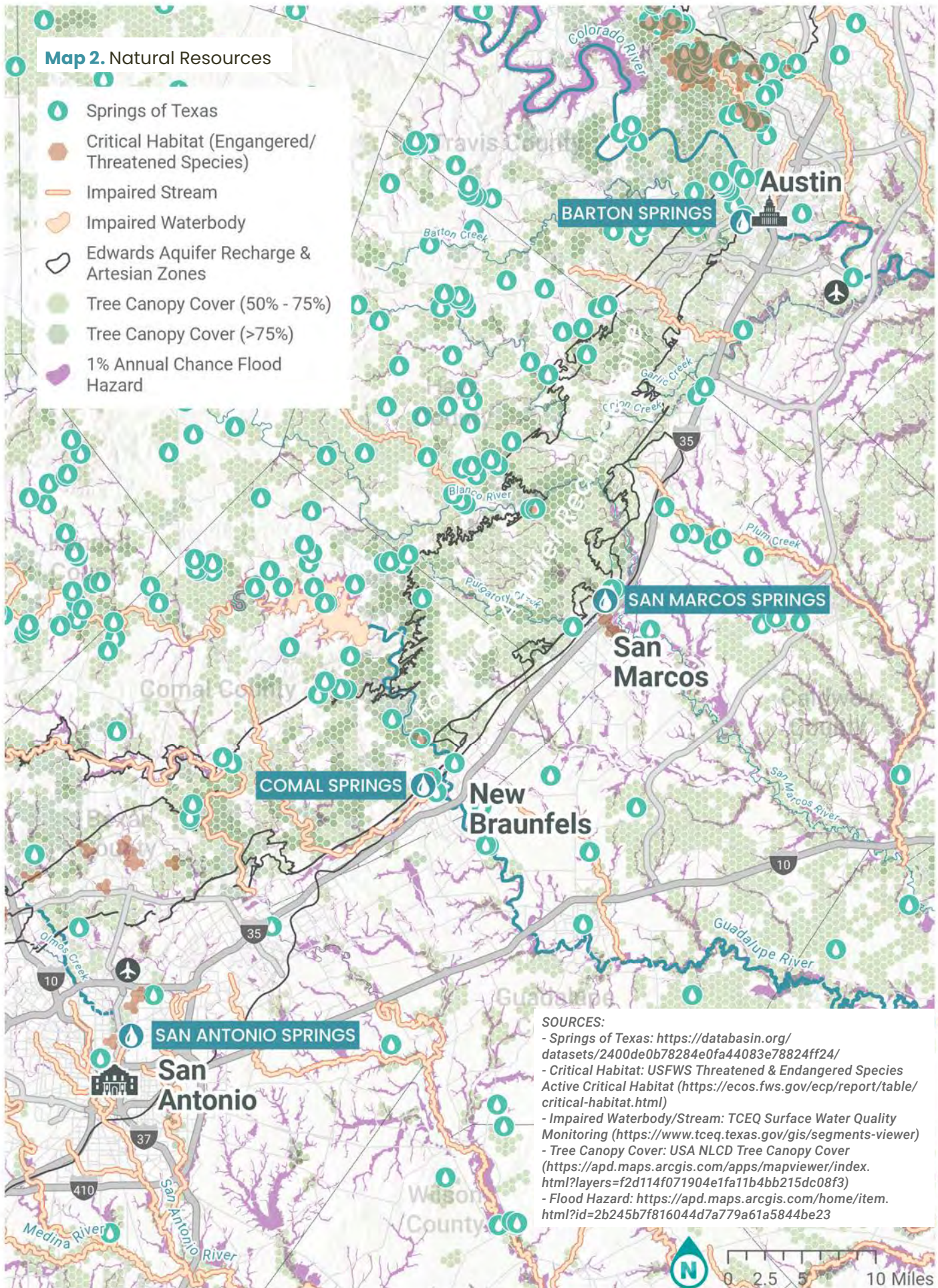
*GSP's goal is to help protect an additional 50,000 acres of land in the Recharge Zone of the Edwards Aquifer, one of the most productive aquifers in the United States.*³

3 Edwards Aquifer Authority. 2021. About the Edwards Aquifer. <https://www.edwardsaquifer.org/science-maps/about-the-edwards-aquifer/>

A Legacy of Conservation

This corridor is characterized by the presence of sinkholes, sinking streams, caves, large springs, and highly productive water wells. Local and regional organizations throughout the Hill Country have been working for decades to protect the region's land and water supplies. GSP's conservation goal will be achieved through facilitating conservation partnerships and building relationships with landowners, ranchers, developers, and local governments. The trail network will tie it all together and serve as a catalyst for increasing awareness for how vital these beautiful springs are for the future of the region.







Connecting to a Shared History and Heritage

The GSP trail network presents a unique opportunity to connect people to the rich and diverse history of the region, whether at the springs or in the communities and countryside along the way.

Finding Meaning on the Trail

The sacred nature of these springs is not a concept that lives only in the past. Native Americans indigenous to this area honor this aspect of their heritage through present-day ceremonial pilgrimages to the springs.

Similarly, many people of all backgrounds find meaning in visiting the state's multitude of historic sites that lie between the Alamo and the Capitol—two destinations that will be connected by this trail network in time for the Texas Bicentennial in 2036.

GSP will facilitate connection to this shared history through designing the trail network in collaboration with partner projects and organizations such as the El Camino Real de los Tejas National Historic Trail (see sidebar), the Indigenous Cultures Institute, and the Texas Historical Commission.

The map on the next page illustrates the El Camino Real de los Tejas route, along with the region's many other heritage and cultural sites.

"Remember above all else that the land and waters are sacred, that we are all related, and that the time has come to renew our ancestral covenant with Mother Earth."

– Dr. Mario Garza, Miakan-Garza tribe of the Coahuiltecan people

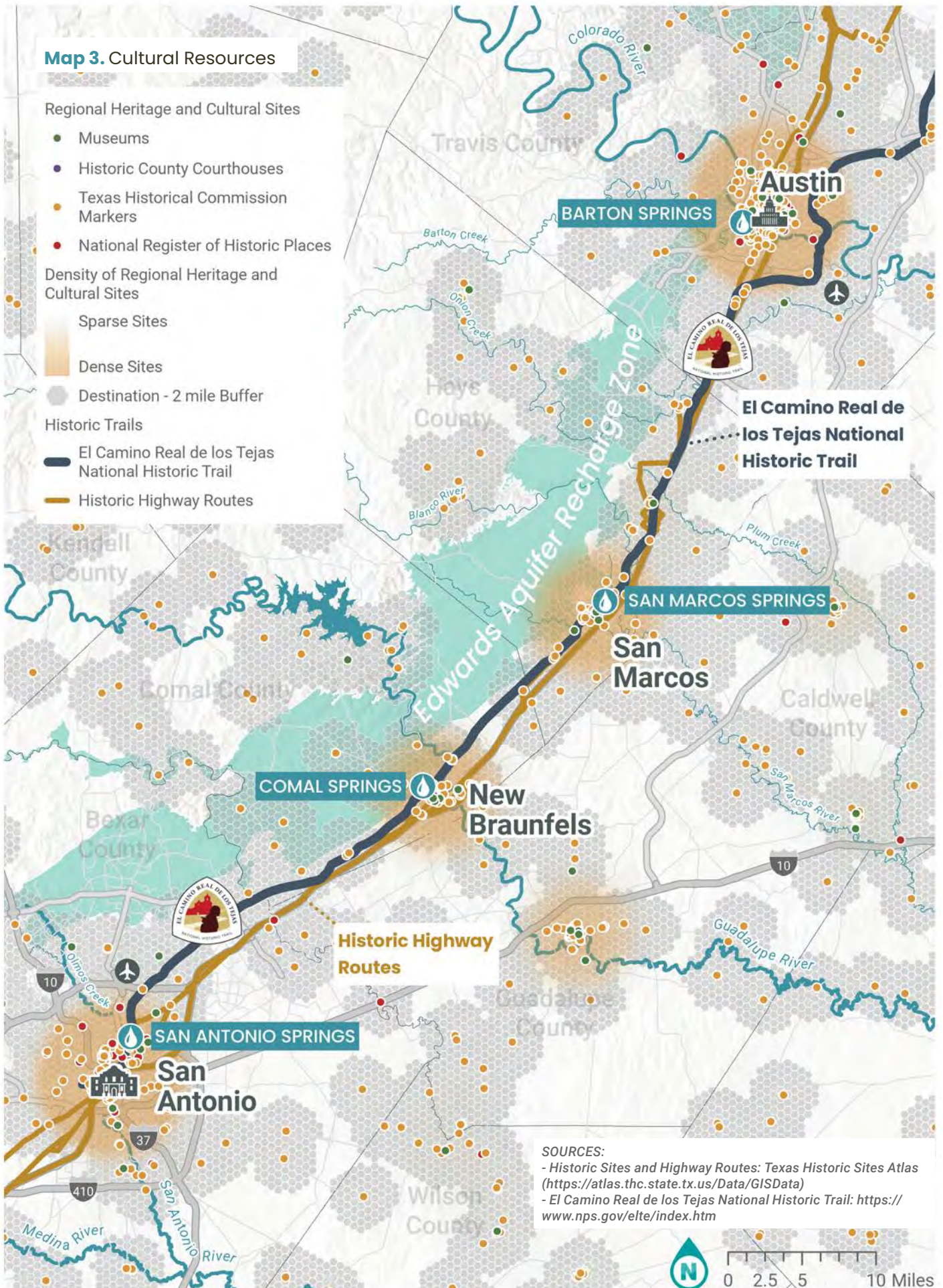
El Camino Real de los Tejas National Historic Trail

"El Camino Real de los Tejas served as a political, economic, and cultural link between Mexico City and Los Adaes (and all points in between). Settlers, missionaries, soldiers, servants, and indigenous allies followed various roads and trails along the 2,500 miles of this route to populate the settlements, missions, and presidios of eastern Texas and northwestern Louisiana. Linking a variety of cultural and linguistic groups, the royal road served as an agent for cultural diffusion, biological exchange, and communication and as a conduit for exploration, trade, migration, settlement, and livestock drives. Spanish, Mexican, French, American, Black, and American Indian travelers along El Camino Real de los Tejas created a mix of traditions, laws, and cultures that is reflected in the people, landscapes, place names, languages, music, and arts of Texas and Louisiana today."

– National Park Service



Map 3. Cultural Resources





Providing Access to the Outdoors for All

Today, less than 4 percent of land in Texas is accessible to the public. The shortage of access to open space is magnified in rapidly developing Central Texas.

The Great Springs Trail will go a long way towards bridging the gap in access to the outdoors for many people and communities that lie between the outdoor recreation hubs of Austin and San Antonio.

The good news is that progress is already being made. Many long-standing plans for trails and open space are now coming to fruition. For example, the Violet Crown Trail in Austin is nearly complete from Barton Springs to the Travis County/Hays County line, with future plans to expand into Hays County.

On the other end of the corridor, San Antonio has been building out the decades-long vision of the Howard W. Peak Greenway System. New Braunfels is making progress on Alligator Creek trails and the Dry Comal Creek Master Plan, while trails in San Marcos' Purgatory Creek Natural Area are open for use and widely popular. Even some smaller communities, such as Kyle, Buda, and Schertz, not only have big plans for trails, but have significant portions of trails open and in development.

"Our mission to protect and connect Texas' beautiful natural surroundings is underpinned by the requirement of equity and inclusion in access to this beauty."

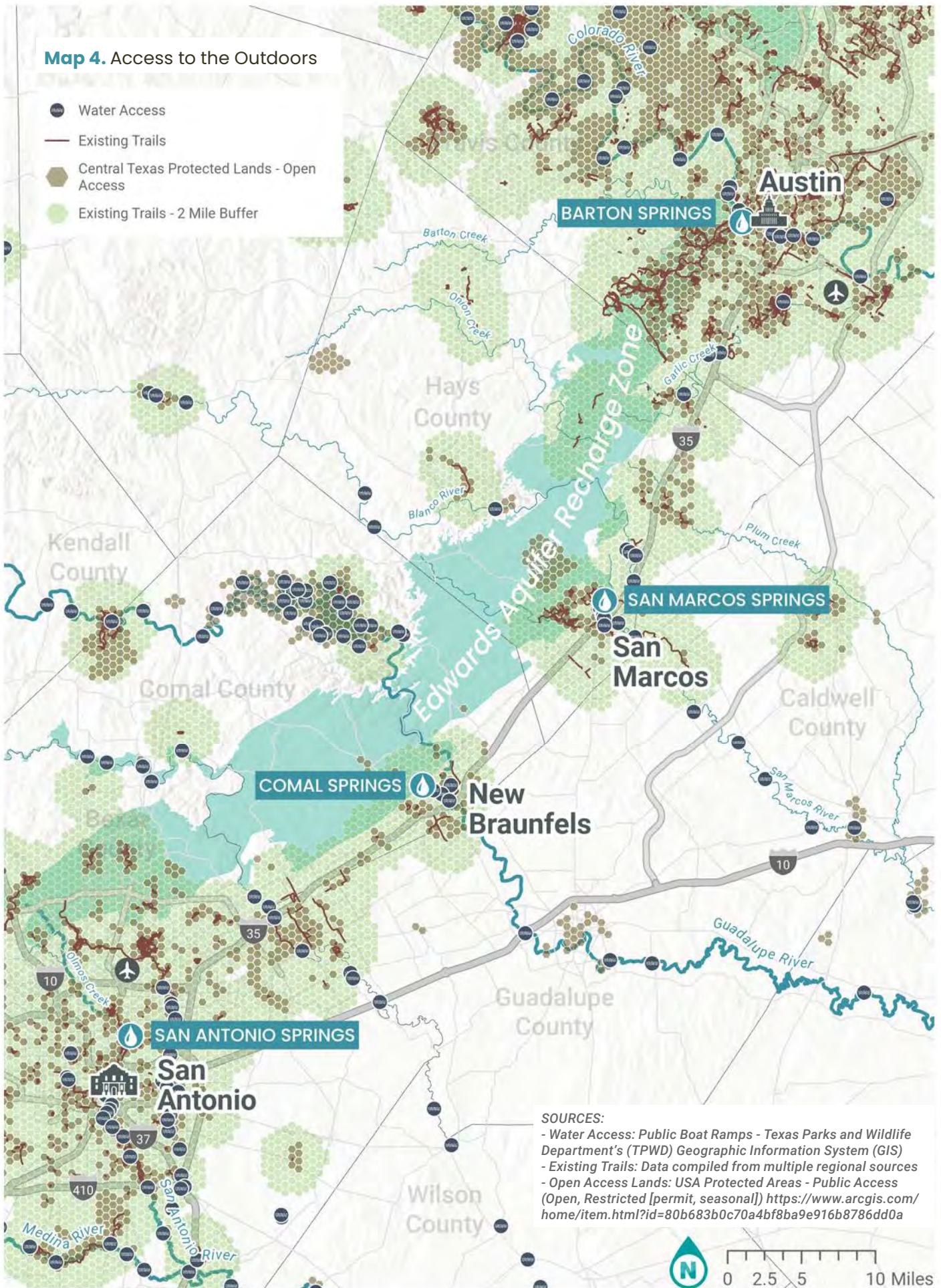
– From Great Springs Project's Equity Commitment

The map on the next page illustrates two-mile buffers (in light green) around existing trails. The spaces between these buffers (and the actual trails) are substantial. This is especially evident between San Marcos and New Braunfels, with approximately a 10-mile gap. Bridging the gaps between these local efforts is at the core of this Great Springs Trails Plan and is the focus of the next chapter.



Graphic adapted from the Robert Wood Johnson Foundation's Visualizing Health Equity: One Size Does Not Fit All Infographic.

Map 4. Access to the Outdoors





Leveraging & Supporting Local Trail Efforts for Regional Connectivity

The next chapter focuses on opportunities, constraints, and recommendations for building upon the many local trail planning efforts and related initiatives inventoried in Tables 1 through 6. These resources informed the work of this plan and should be referenced in both trail implementation as well as in grant writing and other applications for future funding.

Table 1. Statewide and Regional Plans & Resources

OFFICIAL PLAN & RESOURCES TITLE	SOURCE (AGENCY/AUTHOR)	YEAR
Texas Trail Study: Evaluating the need to enhance trail opportunities for Texans	Texas Parks & Wildlife, Texas Department of Transportation, and Texas Historical Commission	2022
TIP Project Brochure	TxDOT / AAMPO	2021
Upper Cibolo Creek Conservation Area Map: TNC/BCI Preserve Additions - Bexar County & Comal County, Texas	The Nature Conservancy of Texas GIS Department	2021
AAMPO Subregional Planning Study: A Brief Overview	TxDOT / AAMPO	2021
2020 Evaluation Report	Texas Farm and Ranch Lands Conservation Program	2020
Aquifers of Texas	Texas Water Development Board	2012
CTRMA Shared Use Paths	CTRMA: Central Texas Regional Mobility Authority	2021
Economic Benefits Presentation	Land and Greenspace Committee of Greater Austin-San Antonio Corridor Council	2001



El Camino Real de los Tejas National Historic Trail	National Park Service	ongoing
Existing and Proposed Trails in GSP Region	Great Springs Project	2019
GIS Data Sets from GSP	Great Springs Project	Multiple
Growth Scenario	Texas Hill Country Alliance	2008
GSP 2020 Trail Jam	Great Springs Project	2020
Mobility Hub Report	Urban Land Institute	2020
Habitat Conservation Plan for the Guadalupe River	Guadalupe-Blanco River Authority (GBRA)	Ongoing
Texas Hill Country Maps: Groundwater Management Areas, Land Values 1997 & 2007, Aquifers, Edwards Aquifer, Floodplain, Golden Cheeked Warbler Habitat, Max Flood Peaks, Projected Population Increases, Regional Water Planning Areas, Scenic Quality & Visibility, Slopes, Springs, Hill Country Topo, Protected Land of the Barton Springs Edwards Aquifer, Trinity Aquifers, Watersheds, Municipal Water Use, Regional Growth Model	Texas Hill Country Alliance	2005–2014
The Central Texas Greenprint for Growth	Trust for Public Land, Capital Area Council of Governments, Envision Central Texas	2009

Violet Crown Trail Master Plan	Hill Country Conservancy/Alta (legacy Greenways, Inc.)	2010
Protected Land of the Barton Springs Edwards Aquifer	Save Our Springs Alliance	2021
Capital-Alamo Connections Study	CAMPO, AAMPO, TxDOT	2019
Alamo Area Sentinel Landscape Boundary (four maps)	AACOG	n/a
Map of Existing Trails, Map of Existing & Proposed Trails	Great Springs Project	n/a
Violet Crown Trail 30-Mile Route Map	Hill Country Conservancy	Updated 2019

Table 2. Bexar County

OFFICIAL PLAN & RESOURCES TITLE	SOURCE (AGENCY/AUTHOR)	YEAR
Bicycle Network Plan Update	City of San Antonio	2024
BUL Sentinel Landscape Potential Boundary COA Maps	Alamo Area Council of Governments	2020
Comprehensive Active Transportation Plan	ActivateSA	2021 (ongoing)
EcoCounter Trail Counts for San Antonio	City of San Antonio	Ongoing
Greenway Trail Survey 2020	San Antonio Parks and Recreation	2020
Howard W. Peak Greenway Trail System Map	San Antonio Parks and Recreation	2020
Howard W. Peak Greenway Trail System Map	San Antonio Parks and Recreation	2021 (ongoing)
Proposed Bexar County River and Creek Capital Improvement Program	San Antonio River Authority (SARA)	2020
Trail Design Strategy (TDS) (Executive Summary & Full Doc)	San Antonio Parks and Recreation (Asakura Robinson)	2018
Potential Uptown Trailways to Bracken Cave	ActivateSA	2020

Local and Regional Water Supply Projects	San Antonio Water System	n/a
Update Presentation	ActivateSA	2021 (ongoing)
2022 Active Transportation Corridors: Bond Project Proposals	ActivateSA	2021 (ongoing)
The Flyway: Final Presentation	David Bemporad, ActivateSA	2020
Selma Trails and Branding Master Pan	City of Selma	2018

Table 3. Comal County

OFFICIAL PLAN & RESOURCES TITLE	SOURCE (AGENCY/AUTHOR)	YEAR
Trails & Branding Master Plan	City of Selma	2018
TIP Recommended Projects	Comal County	2021
Alamo Area MPO Regional Bicycle & Pedestrian Planning Study	AAMPO	2016
Dry Comal Creek Greenway Master Plan	City of New Braunfels	2019
City of New Braunfels Hike and Bike Trail Plan	City of New Braunfels	2021
Thoroughfare Plan	City of Schertz	2017
TPWD Recreational Trails Grant Application	City of New Braunfels	2021
Trail Development Page	City of Schertz	2017
Schertz Trails Update (Parks & Recreation Advisory Board Meeting presentation)	City of Schertz	2021
West Alligator Creek Trail Documents	City of New Braunfels	2021
Presentation: Parks & Recreation Advisory Board Meeting	City of Schertz	2021
Master Land Use Plan	City of Garden Ridge	2018
Selma Trails and Branding Master Pan	City of Selma	2018
Vision Zero Plan	City of New Braunfels	2024 (ongoing)

Table 4. Hays County

OFFICIAL PLAN & RESOURCES TITLE	SOURCE (AGENCY/AUTHOR)	YEAR
Trails Master Plan	City of Buda	2023
Emerald Crown Trail Master Plan	Regional Trail Work Group (with National Park Service)	2019
City of Buda Parks Master Plan	City of Buda	2021
Buda Moves! Transportation Mobility Master Plan	City of Buda	2020
City of Kyle "VYBE" Trails Plan	City of Kyle	2021
Post Rd/Old Stagecoach Rd Bike Trail	Hays County	2006
Emerald Crown Trail one-pager	Regional Trail Work Group (with National Park Service)	2019
Vision 2025 Economic Development Strategy, Goal 4: Enhance Community Appeal	Greater San Marcos Partnership	2020
Vision 2025 Draft Economic Development Strategy	Greater San Marcos Partnership	2020
Hays County Conservation Development Guidelines: A Sustainable Future (Scoring Matrix)	Hays County	2020
Water Quality Protection Land Program, Goals and Evaluation Method	Hays County Natural Resources	2021
Potential Incentives	Hays County Natural Resources	2021
Hays County Development Regulations, Ch. 765: Conservation Development	Hays County	2017
Conservation Subdivision Development: Executive Summary (presentation)	Hays County	2019
Conservation Subdivision Development: Developer Incentives Flyer	Hays County	2019
Hays County ESA Habitat Conservation Compliance Form	Hays County	2019
Conservation Subdivision Development in Hays County: Final	Hays County	2019
Update on Hays County Conservation Development Guidelines	Hays County	2021
Maps from Sherwood Bishop	San Marcos Greenbelt Alliance	
San Marcos Loop and Check Gaps	Great Springs Project	2021
San Marcos Loop Trail Draft map	Great Springs Project	2020
San Marcos Preferred Scenario Map; Ordinance 2018-03	City of San Marcos	2018

Table 5. Travis County

OFFICIAL PLAN & RESOURCES TITLE	SOURCE (AGENCY/AUTHOR)	YEAR
ATX Walk Bike Roll	City of Austin	2023
Austin Urban Trails Master Plan	City of Austin	2014
EcoCounter Trail Counts for Austin	City of Austin	Ongoing
Longhorn Dam Multimodal Improvements	HDR	Ongoing
The Trail: Economic Impact Analysis 2016	The Trail Foundation via Angelou Economics	2016
TxDOT Bikeway Maps	TxDOT	Ongoing
Violet Crown Trail: What's Open & What's Not Open	Hill Country Conservancy	2020
Onion Creek Greenway Plan	City of Austin / Travis County	2010

"I'm feeling optimistic. I am always hearing about new trail projects, and I am completely amazed at all the trail work being done across the region by different agencies and organizations. We should share our strategies and approaches with each other to benefit from our experiences."

– Sherwood Bishop, former president of the San Marcos Greenbelt Alliance, on his outlook for the future of the Great Springs Trail

Table 6. Other

OFFICIAL PLAN & RESOURCES TITLE	SOURCE (AGENCY/AUTHOR)	YEAR
The Economic Value of Ecosystem Services	Dartmouth Natural Resources Trust	n/a
The Economic Impact of Shared Use Paths	ITRE, NCDOT, Alta	2017
Conserving and Restoring America the Beautiful: A Preliminary Report to the National Climate Task Force	US Department of Interior	2021

The background of the page is a photograph of an outdoor event, possibly a community meeting or a fair. Several people are visible, some standing and some sitting at tables. The image is heavily overlaid with a teal color, which also serves as the background for the text. In the top left corner, there is a small dark blue rectangle.

Chapter 3

The Plan

“As the Central Texas region grows together, Great Springs Project is absolutely the best hope for a permanent, unifying, and essential greenspace that demonstrates our respect for our land, our natural resources, our history, our outdoor spirit, and our commitment to the common good.”

– The Honorable Henry Cisneros, former Mayor of San Antonio and former United States Secretary of Housing and Urban Development

The GSP Trail Corridor

*This plan is a living document to be updated frequently throughout the life of this project, from now through 2036.**

The proposed trail alignments on the maps that follow are flexible and subject to change. Some of the proposed routes are based on long-standing and fully adopted community plans. Others roughly follow existing roadways, waterways, or patchworks of undeveloped land where the goal is to connect trails while protecting land and water resources. In most cases, the actual trail location will evolve in the coming years, as project partners (GSP, landowners, land trusts, local governments, developers, and many others) come to agreement on specific alignments.

*Contact info@greatspringsproject.org for the most up-to-date proposed trail alignments.

Developing the Proposed Routes

These key steps were used to develop the maps that follow:

1. Determine Primary Trail Destinations

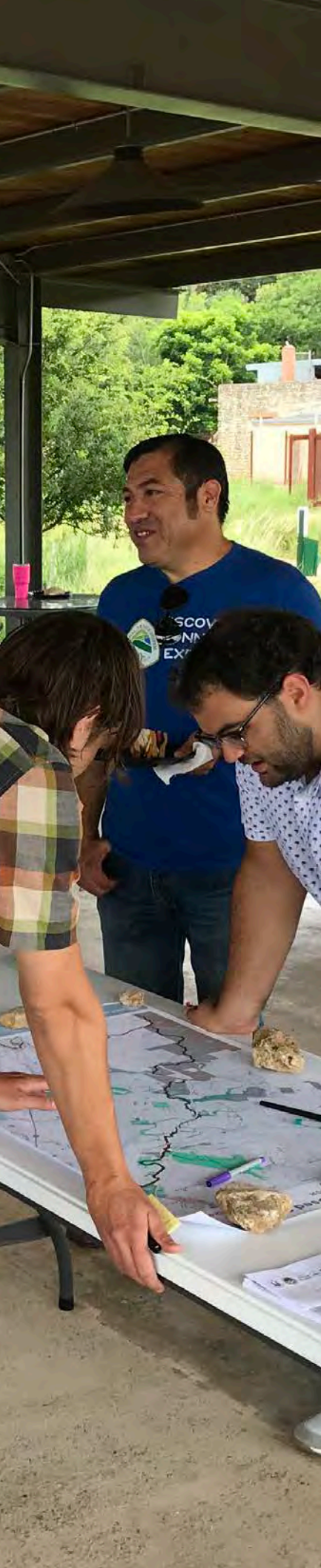
- San Antonio Springs, Comal Springs, San Marcos Springs, and Barton Springs
- Communities from San Antonio to Austin
- Historic, cultural, and ecological sites of importance

2. Propose Routes That Align with Existing Resources

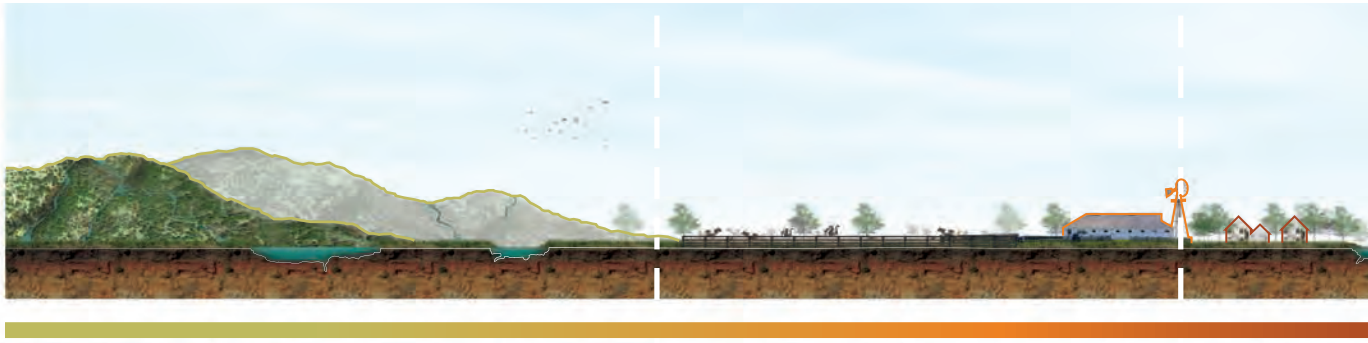
- Primary destinations, existing trails, trails in development, parks, open spaces, and the Edwards Aquifer Recharge and Artesian Zones
- Current trail plans, transportation projects, and opportunities for land conservation

3. Refine Routes & Maintain Flexibility in Implementation

- Meetings with stakeholders along the corridor
- Trails Plan Steering Committee Meetings
- Input on Draft and Final Trails Plan
- Continued refinement of routes as implementation progresses



The Great Springs Trail will take people across a variety of Texas Hill Country ecosystems and communities.



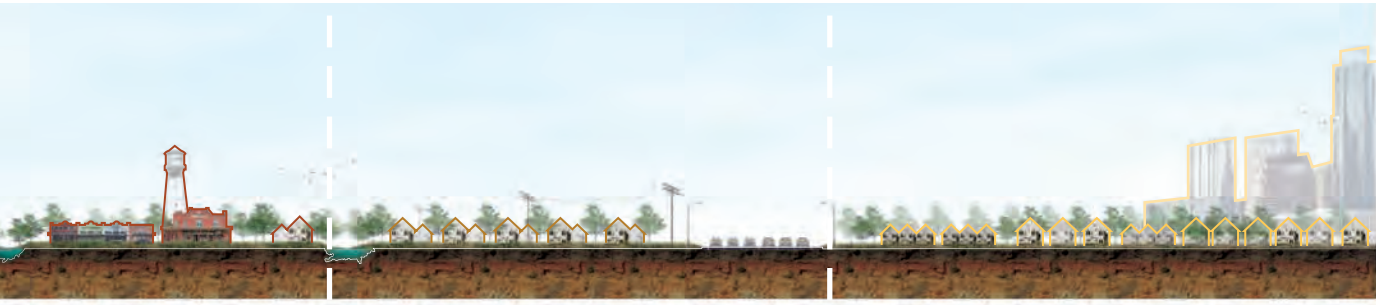
HILL COUNTRY RURAL

RANCHLAND RURAL

SMALL TOWN

The trail may look different in these varying contexts.

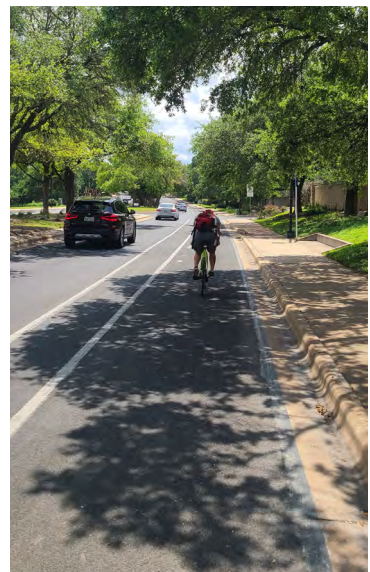
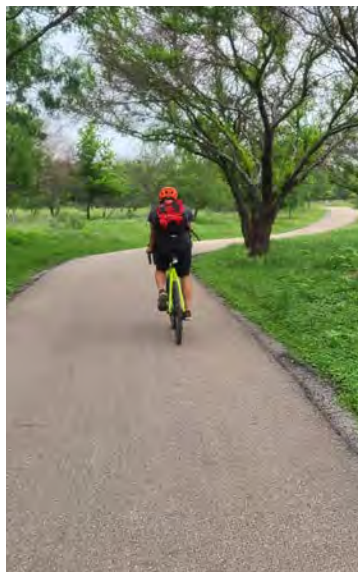




ALL TOWN

SUBURBAN

URBAN



Where on the Trail Corridor is this?



-  **Complete** (and open to the public)
-  **Funded** (for construction)
-  **In Planning** (with a study underway)
-  **Adopted** (by a governmental body)
-  **Identified** (a specific trail route)
-  **In Routing** (a conceptual alignment)

Trail
Type**

 The Great Springs

El Camino Real de Los Tejas
National Historic Trail

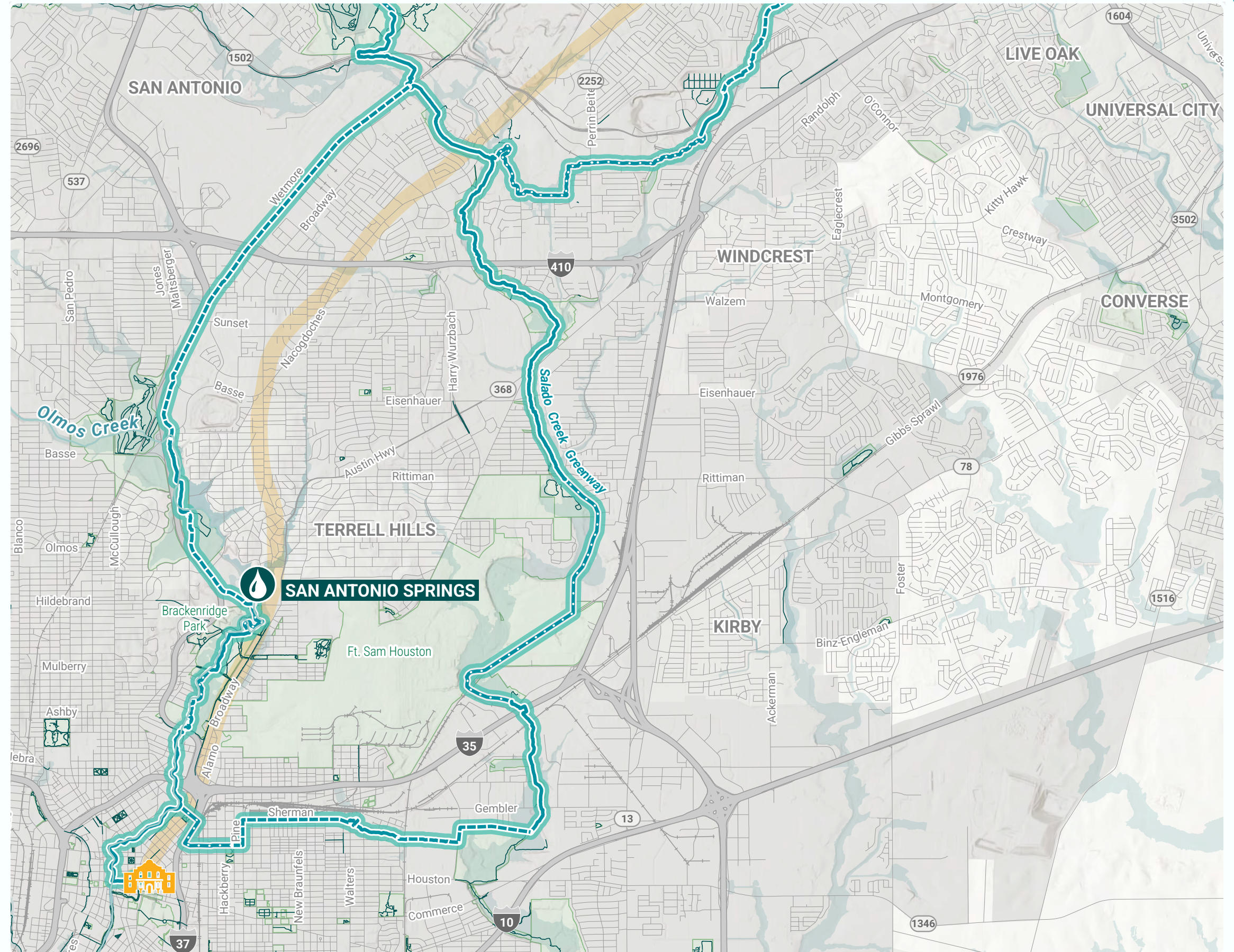
- Highways

Railroad

2 Rivers/Streams

1% Annual Chance Flood Hazard

/// Edwards Aquifer Recharge Zone



Sources: Great Springs Project, Alta Planning and Design, RS&H, TxDOT, City of San Antonio, City of New Braunfels, City of San Marcos, City of Kyle, City of Buda, City of Austin, National Parks Service, Esri, NASA, NGA, USGS, FEMA

Comments below were submitted via the public survey and were filtered to match the trail segment area.



What the Community Says

So excited! I hope it happens sooner than later!

Prefer a trail with surroundings that feel natural and secluded. That is, no or limited noise from major roads. Please keep in mind that a fully paved trail has better potential to accommodate a variety of mobility and ability levels. There are very few places where people with disabilities can easily get out in nature.

So important to not only preserve open spaces but give access to them and allow us as citizens to put our taxpayer money to work where our values are.

I'm so supportive! What a great idea.

This is a critical piece to protecting all of the Edwards Aquifer, the Balcones Canyonlands, and the greater Hill Country. Through public use and access, the public gains awareness of the natural resources that need protection and demand/fund that protection at higher levels.

As this area continues to grow, it will be important to have the Edwards Aquifer recharge zone protected to ensure aquifers remain as full as possible.

I think this is a great idea. We are desperate need of a way to get our kids and ourselves out of our homes and outdoors where kids can appreciate nature, soak up the sun and get some movement. This is huge. This has the potential to affect, classroom learning, obesity issues in youth, teen drug use, depression and countless other issues in today's society.

Comanche Lookout Park, San Antonio



Northeast San Antonio Trails

Where on the Trail Corridor is this?



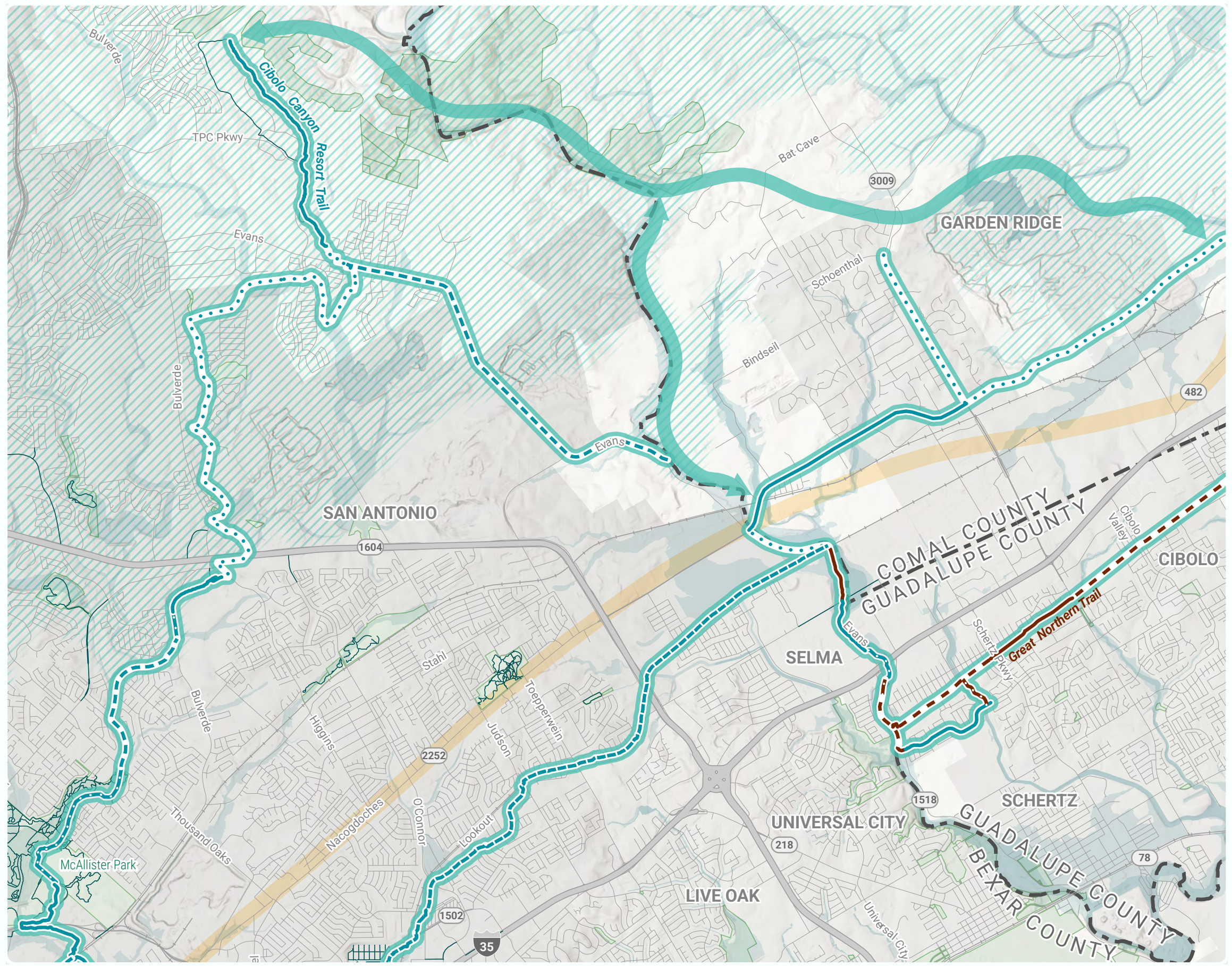
- Trail Routes**

 - Complete (and open to the public)
 - Funded (for construction)
 - In Planning (with a study underway)
 - Adopted (by a governmental body)
 - Identified (a specific trail route)
 - In Routing (a conceptual alignment)

Trail Status*
- Hard Surface (Concrete, Asphalt)
 - Soft Surface (Wood, Dirt, Gravel)

Trail Type**

- BASE MAP**
- The Great Springs
 - El Camino Real de Los Tejas National Historic Trail
 - Existing Trails
 - Highways
 - Roadways
 - Railroad
 - Public and Private Open Spaces
 - 1% Annual Chance Flood Hazard
 - Regulatory Floodway
 - Edwards Aquifer Recharge Zone
 - Counties



Sources: Great Springs Project, Alta Planning and Design, RS&H, TxDOT, City of San Antonio, City of New Braunfels, City of San Marcos, City of Kyle, City of Buda, City of Austin, National Parks Service, Esri, NASA, NGA, USGS, FEMA

*The status of trails depicted in this map is part of a working document to be consistently amended and updated. **The surface of trails depicted here follows guidance from the Rails to Trails Conservancy. Please contact GSP@info@greatspringsproject.org for the latest trail planning and design information.



Comments below were submitted via the public survey and were filtered to match the trail segment area.



What the Community Says

More trails but please be sensitive to protecting our Dark Sky community as well, no upward or constant lighting please

I think it's a great idea. My family would particularly enjoy a longer distance trail in Comal County for biking/hiking

Sounds awesome. Pls hurry!

Fantastic idea that makes me proud to be a TEXAN!

I'm excited about the prospect of a more unified trail system. I would also encourage project leads to examine issues of accessibility and equity that surround trail use. Texas, especially central Texas, is increasingly diverse and I think it's important that people of all races, ethnicities, genders, and disability statuses feel welcome and comfortable at the Great Springs Trail (and other trails).

I really appreciate that this is being done!

I think it's a great addition to the area and I'm very excited for this project.

This would be a great addition to our area and will make Comal County an even more desirable place to live

I am really excited about the possibility.

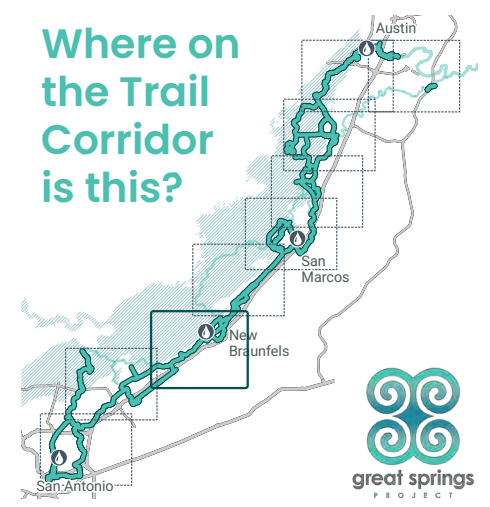
What a great idea. I do see this being not only enjoyed, but necessary. Thank you for the opportunity to provide input.

Comal River, New Braunfels



New Braunfels Trails

Where on the Trail Corridor is this?

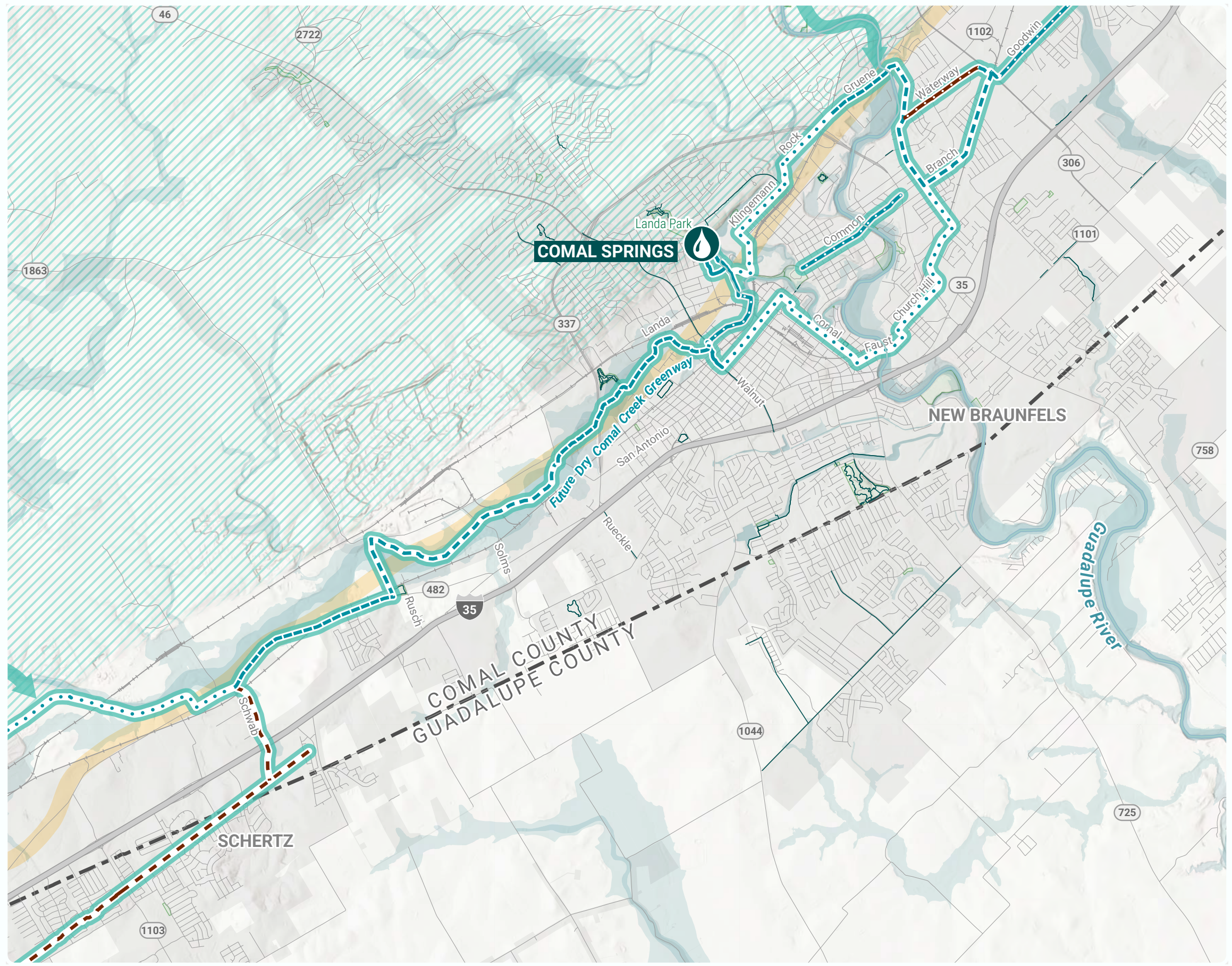


- Trail Routes**

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 - Identified (a specific trail route)
 - In Routing (a conceptual alignment)
- Trail Status***

 - Hard Surface (Concrete, Asphalt)
 - Soft Surface (Wood, Dirt, Gravel)

- BASE MAP**
- The Great Springs
 - El Camino Real de Los Tejas National Historic Trail
 - Existing Trails
 - Highways
 - Roadways
 - Railroad
 - Major Rivers
 - Rivers/Streams
 - Public and Private Open Spaces
 - 1% Annual Chance Flood Hazard
 - Regulatory Floodway
 - Edwards Aquifer Recharge Zone
 - Counties

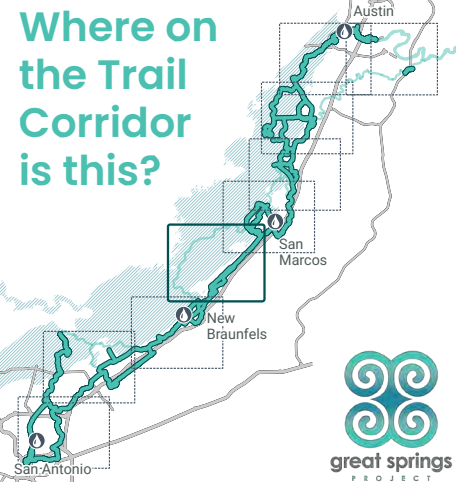


Sources: Great Springs Project, Alta Planning and Design, RS&H, TxDOT, City of San Antonio, City of New Braunfels, City of San Marcos, City of Kyle, City of Buda, City of Austin, National Parks Service, Esri, NASA, NGA, USGS, FEMA

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North New Braunfels Trails

Where on the Trail Corridor is this?

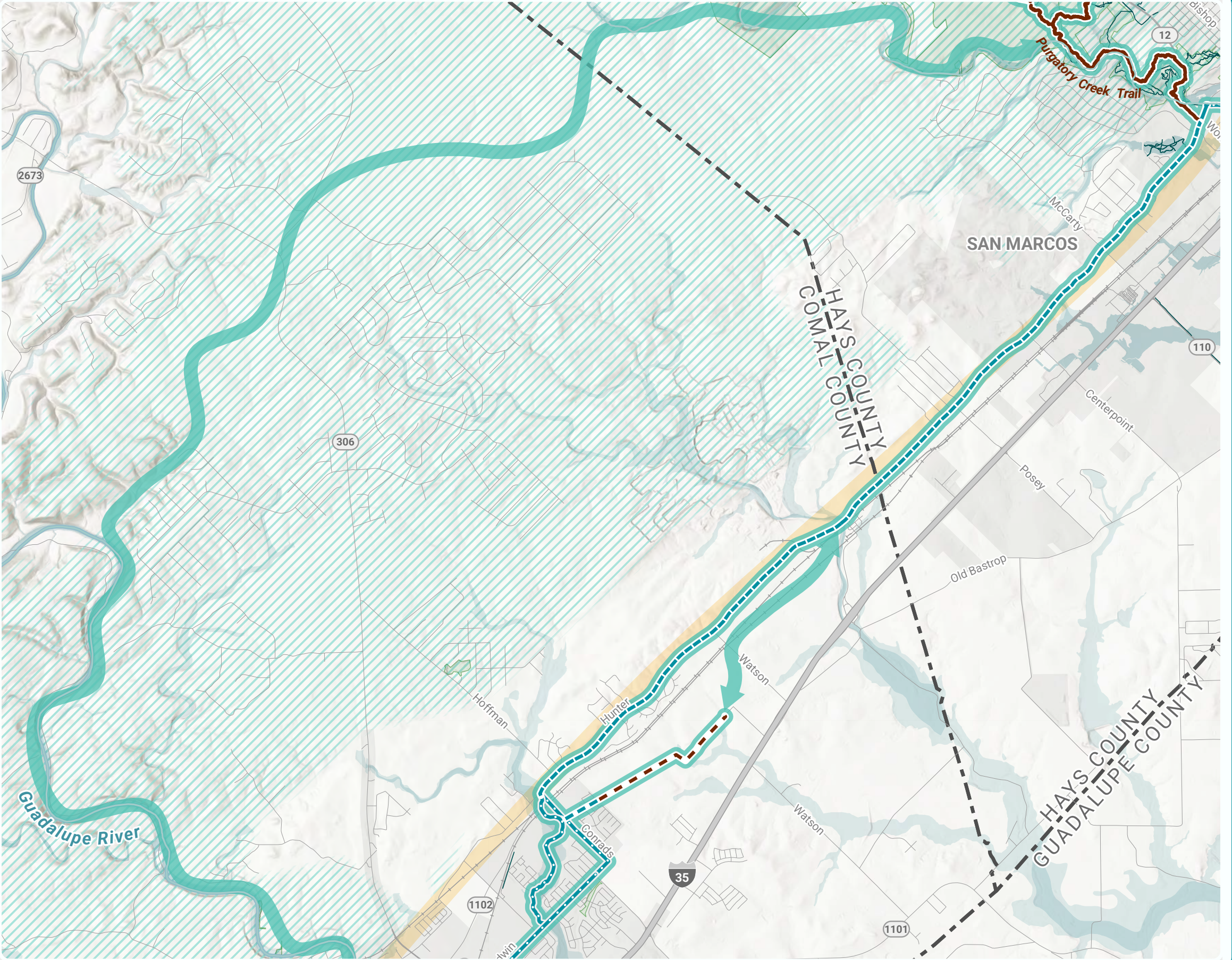


- Trail Routes**

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 - Identified (a specific trail route)
 - In Routing (a conceptual alignment)
- Trail Status***

 - Hard Surface (Concrete, Asphalt)
 - Soft Surface (Wood, Dirt, Gravel)

- BASE MAP**
- The Great Springs
 - El Camino Real de Los Tejas National Historic Trail
 - Existing Trails
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Comments below were submitted via the public survey and were filtered to match the trail segment area.



What the Community Says

I hope this will be on local Governments fast track. We have too few public trails for recreation compared to places we have visited in the U. S.

It's a really important amenity in need for the area.

It sounds like a great initiative and I like the big thinking of it.

Such a fantastic concept. Been needed for a long time but after Covid, access to quality spaces like this has never been more important for health and wellness for everyone.

It is soooo needed! We are very excited!

I am excited for this project and increased connectivity!

I think it is a wonderful idea and very forward thinking. Central Texas is growing so quickly so it is important for dedicated parklands to be developed as well.

Can't wait. I am in my 60's. Time to catch up to other parts of the country.

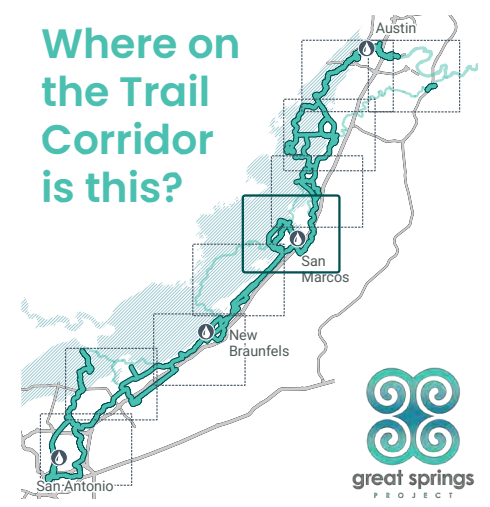
very important project for the region. potential high impact and high profile Quality of life Asset.

This is a terrific endeavor, potential benefit, for ALL Texans, and visitors.



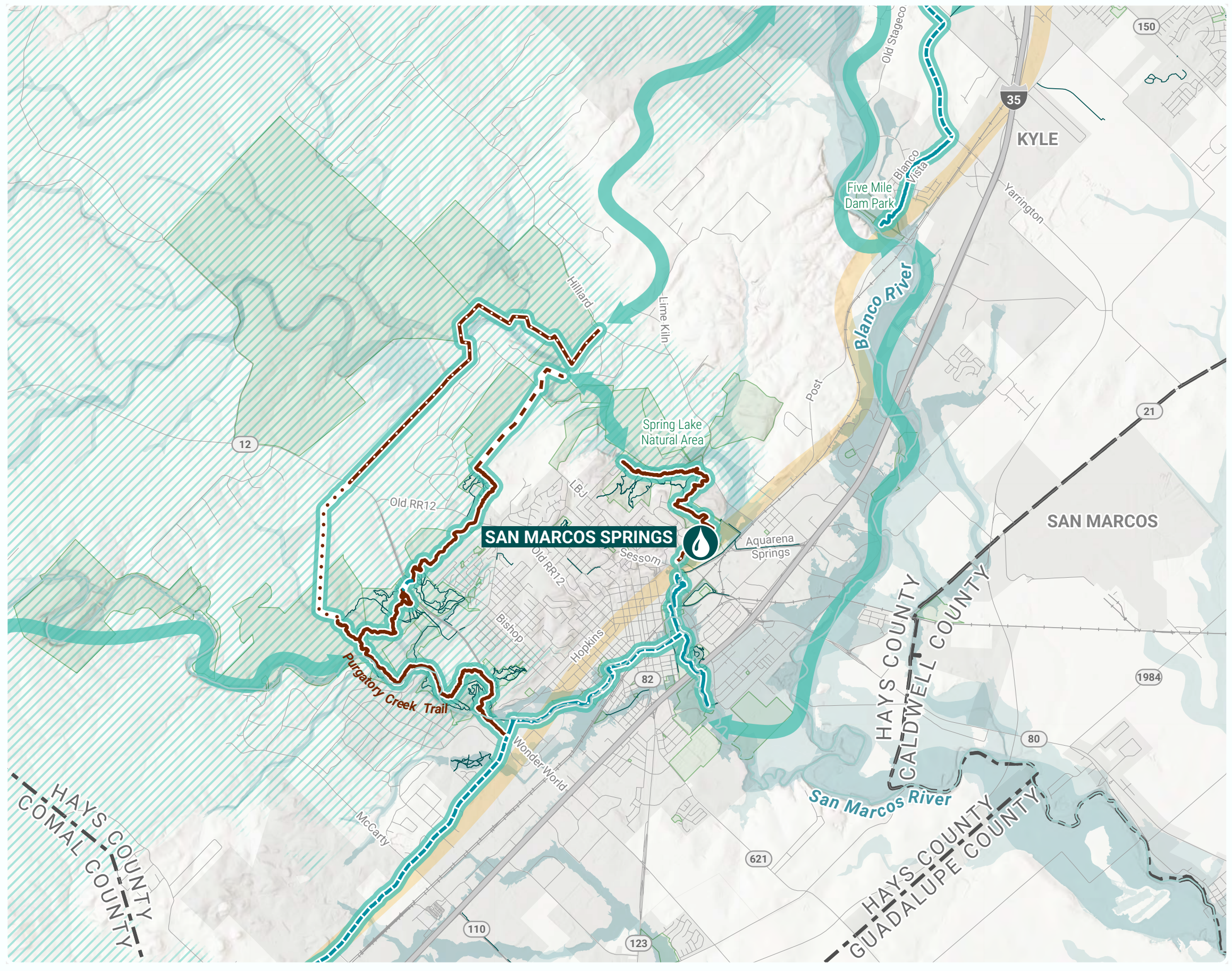
San Marcos Trails

Where on the Trail Corridor is this?



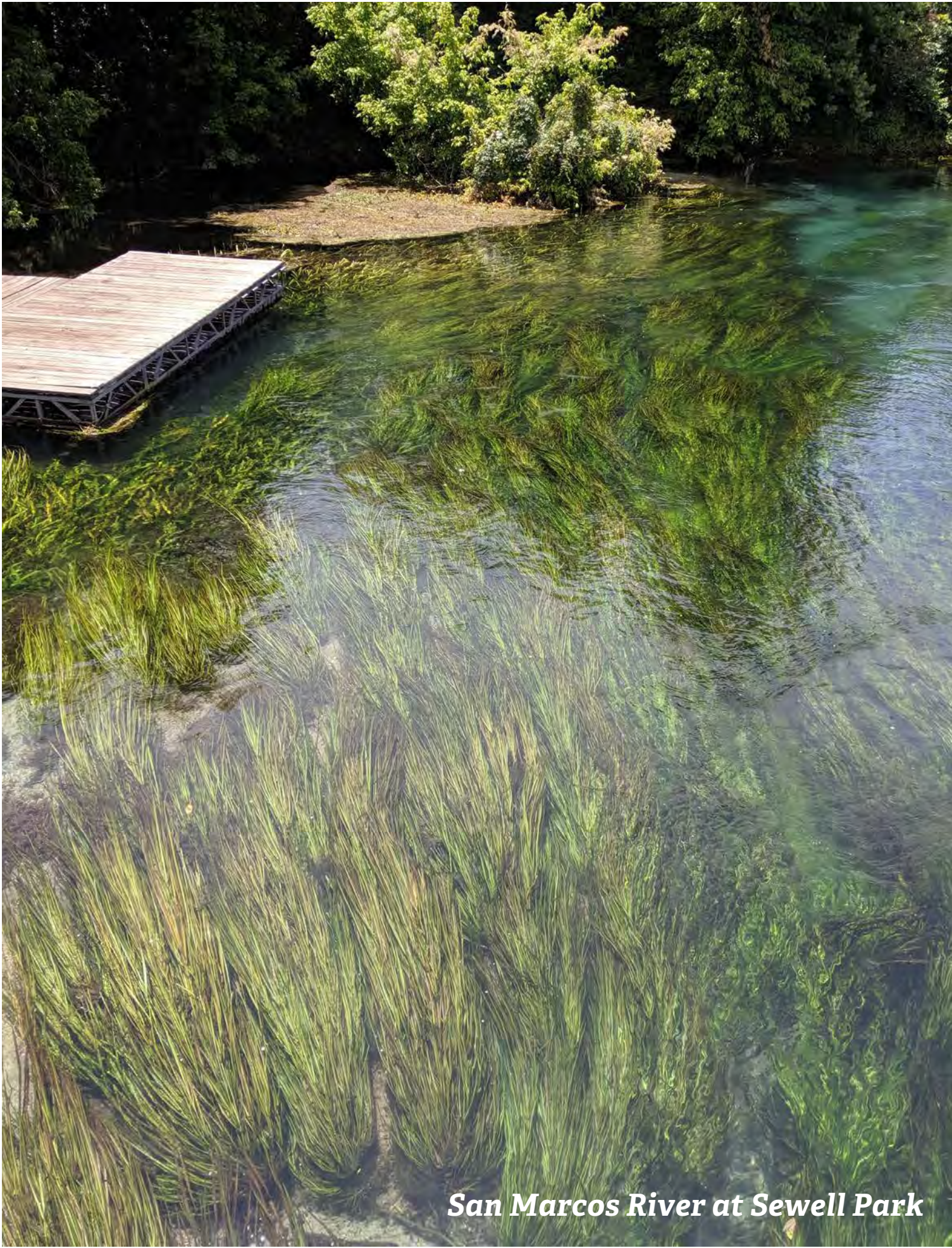
- Trail Routes**
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 - Identified (a specific trail route)
 - In Routing (a conceptual alignment)
- Trail Status***
- Trail Type****
 - Hard Surface (Concrete, Asphalt)
 - Soft Surface (Wood, Dirt, Gravel)

- BASE MAP**
- The Great Springs
 - El Camino Real de Los Tejas National Historic Trail
 - Existing Trails
 - Highways
 - Roadways
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 - Rivers/Streams
 - Public and Private Open Spaces
 - 1% Annual Chance Flood Hazard
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San Marcos River at Sewell Park



Downtown Kyle

Left Photo: Unsplash, Arthur Thompson
Above Photo: Austin.com

Comments below were submitted via the public survey and were filtered to match the trail segment area.



What the Community Says

I'm excited for this project!!! I love visiting San Marcos for there's beautiful spring river and I can wait till they're connected with San Antonio and Austin. It'll be so much easier for us cyclists to get to!

I think it's a wonderful idea and would be awesome for conservation

It would be nice, if purpose built mountain bike trails could be included, in addition to the main trail.

Make connectors to towns along the way to promote additional economic growth potential.

Just keep up the work on providing natural areas for future generations. People need to connect with nature more than ever.

I feel this is such an important project to help preserve and conserve the natural area in such a densely populated area.

Please allow for the development of unimproved/natural surface trails for mountain biking, hiking, trail running. This could be parallel and in addition to paved or crushed granite trails.

Very important for the I-35 corridor.

I'm a land owner who gave some of his land to a right of way, I'm all for it!

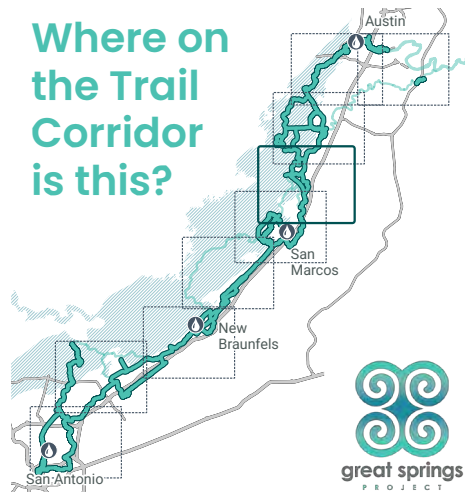
I hope Indigenous Peoples & a land acknowledgment are recognized on signs & consulted/supported throughout the entire process & beyond.

Plum Creek Hike & Bike Path



Kyle Trails

Where on the Trail Corridor is this?



Trail Routes

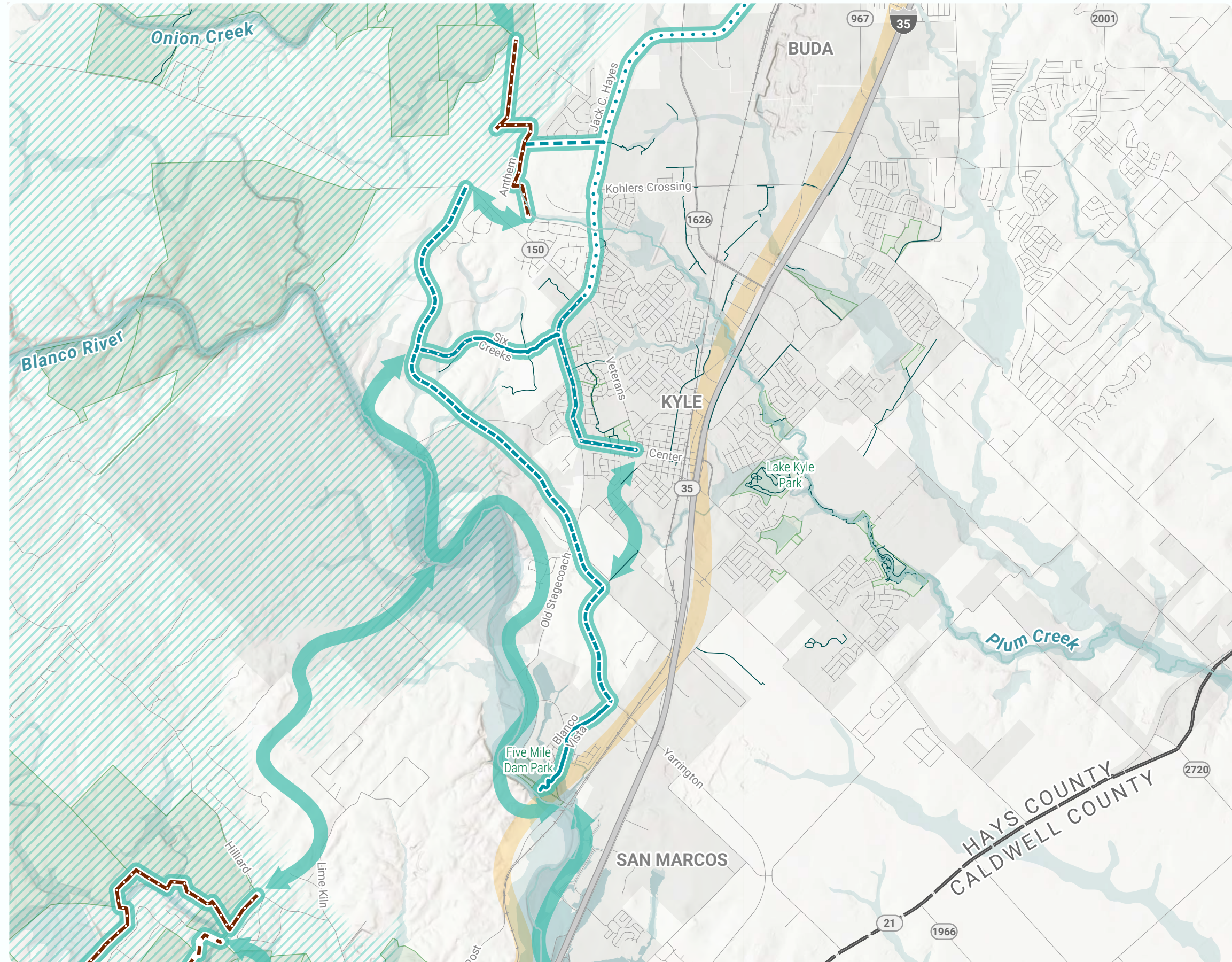
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- Hard Surface (Concrete, Asphalt)
- Soft Surface (Wood, Dirt, Gravel)

Trail Status*

Trail Type**

BASE MAP

- The Great Springs
- El Camino Real de Los Tejas National Historic Trail
- Existing Trails
- Highways
- Roadways
- Railroad
- Rivers/Streams
- Public and Private Open Spaces
- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Edwards Aquifer Recharge Zone
- Counties



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Buda Mill & Grain

Comments below were submitted via the public survey and were filtered to match the trail segment area.

What the Community Says

This is a project that would be a huge win for Central Texas when complete.

This would greatly increase my family's amount of time on the trails. We spend a lot of time driving to go hiking.

I just found out about this project. let's make this real. Such a great vision for our region!

Educate folks of the importance to preserve and conserve our springs and not pollute them.

I think this is much needed to preserve wildlife and nature, especially before development increases and we lose this opportunity

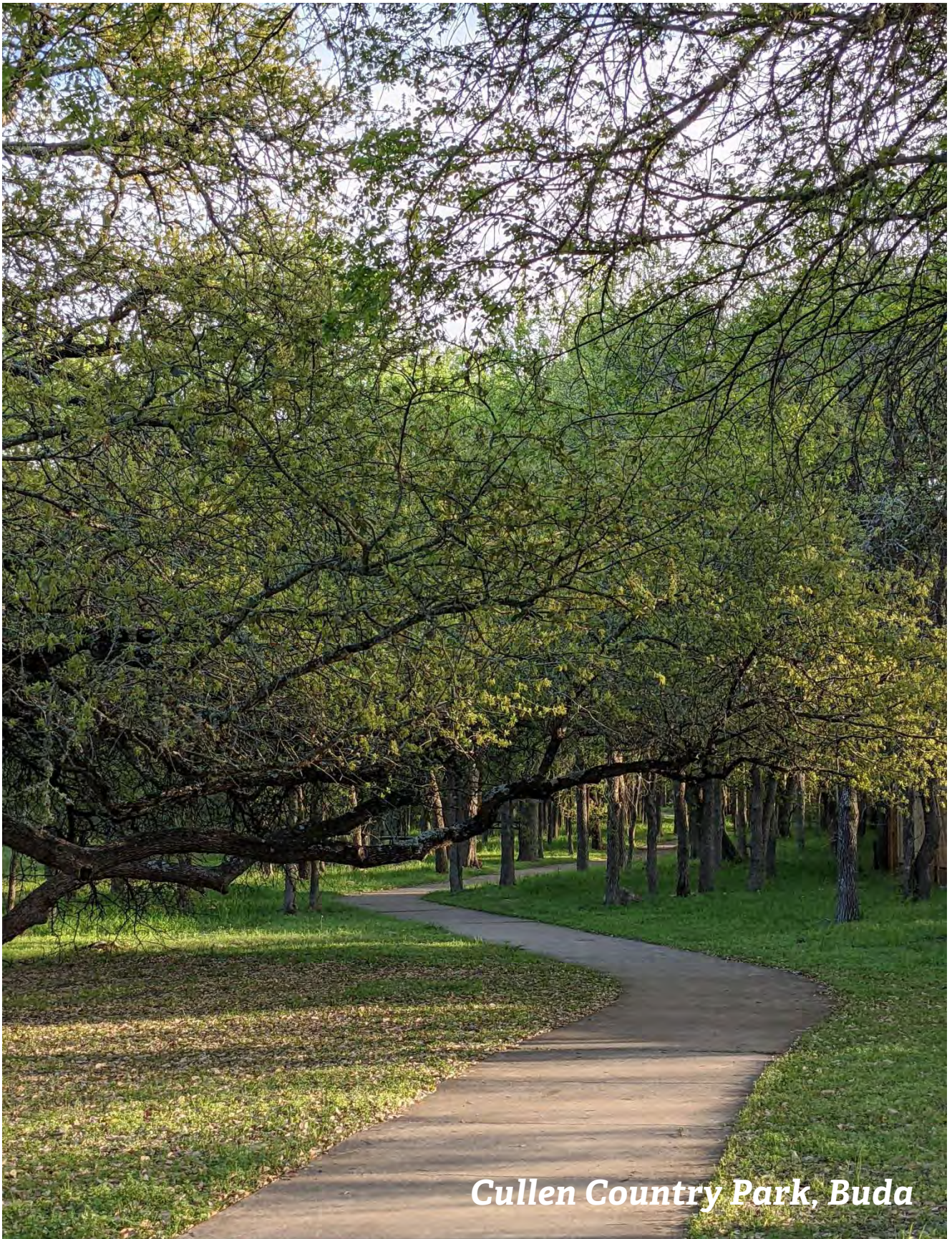
Visionary projects like this are inspiring to all who encounter them. Achieving these types of projects shapes the identity and legacy of our region.

How much natural space is being preserved around the trail? It would be awesome to have a wide Greenway with large 'anchor' parks to visit and travel between.

Love this idea and will support it. Thank-you for proposing this!

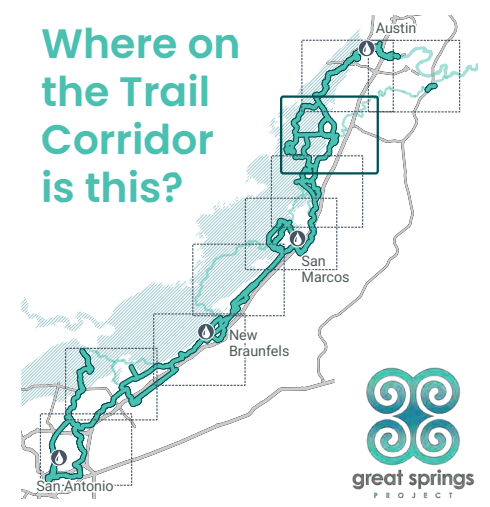
Great project that should be supported!

I would love for this to become a reality! I would use it as much as possible and I could see it becoming a great National long trail as well



Buda Trails

Where on the Trail Corridor is this?

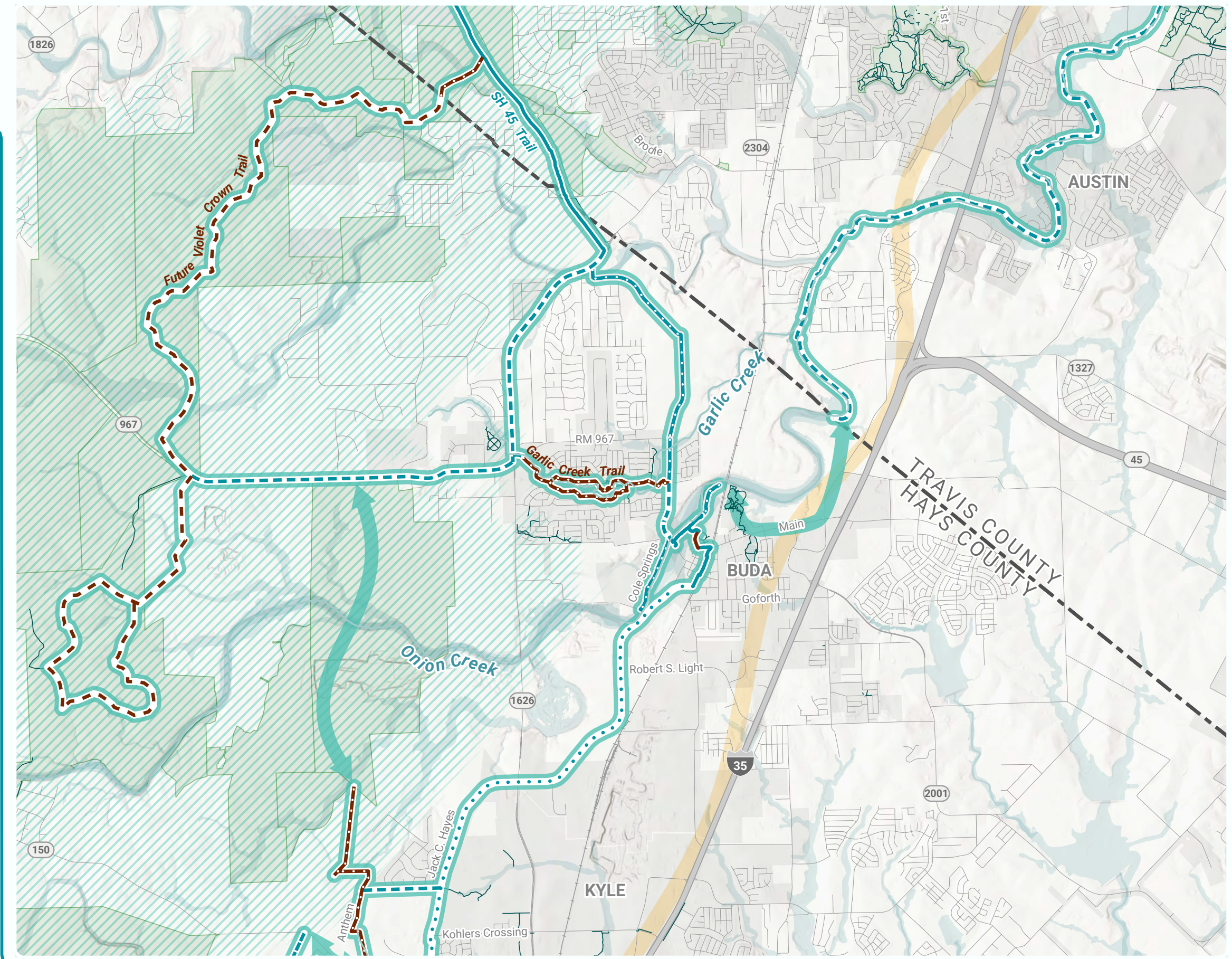


- Trail Routes**

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 - In Routing (a conceptual alignment)
- Trail Status***
- Trail Type****

 - Hard Surface (Concrete, Asphalt)
 - Soft Surface (Wood, Dirt, Gravel)

- BASE MAP**
- The Great Springs
 - El Camino Real de Los Tejas National Historic Trail
 - Existing Trails
 - Highways
 - Roadways
 - Railroad
 - Rivers/Streams
 - Public and Private Open Spaces
 - 1% Annual Chance Flood Hazard
 - Regulatory Floodway
 - Edwards Aquifer Recharge Zone
 - Counties



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Left Photo: Unsplash, Alex George
Top Photo: Unsplash, Max Miner
Bottom Photo: Unsplash, Clark Van Der Beken

Comments below were submitted via the public survey and were filtered to match the trail segment area.



What the Community Says

We are incredibly excited about this project - please keep the community posted on progress and how / if we can assist

Trails go hand in hand with healthy lifestyles, and outdoor opportunities are key to improve life quality. These also underpin economic growth by making the region more attractive as a place to work and raise families.

Thank you for undertaking this! The preservation of open space is so important, and growing as our population grows.

This project is critical for community well being

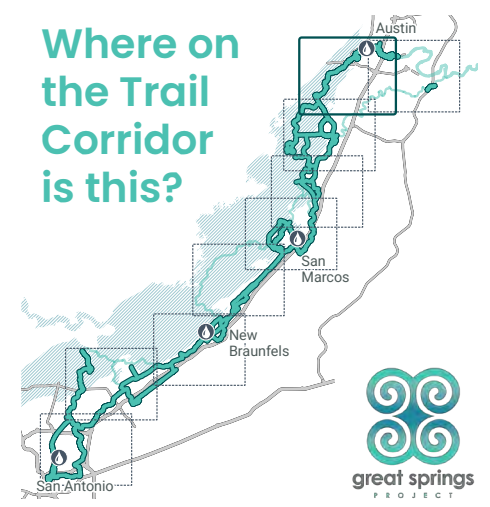
The Great Springs Trail should not only acknowledge the Indigenous territory in which it will be in but commit to the land and the different ways in which this trail can educate more people about Indigenous peoples in Texas and the different ways they can become involved, and respectfully support those groups. This commitment and involvement is a long-term responsibility and can be manifested in different ways. And this acknowledgment is not only with the peoples in those territories but all living creatures. There are two points that I would like to share based on my experiences on trails: One is the displacement of the floral and fauna that may happen in those areas. I think that it is important to carefully inform those who go to the trails of the animals and plants they will encounter without instigating fear. Oftentimes people are afraid of snakes or spiders and may decide not to go to trails or simply kill spiders or snakes upon encounter. Creating signs with advice on what to do in these cases may be a good idea. Trash is another concern that should be addressed with more bins provided throughout the trails not just in the start/endpoints.

Slaughter Creek Trail, Austin



Austin Trails

Where on the Trail Corridor is this?

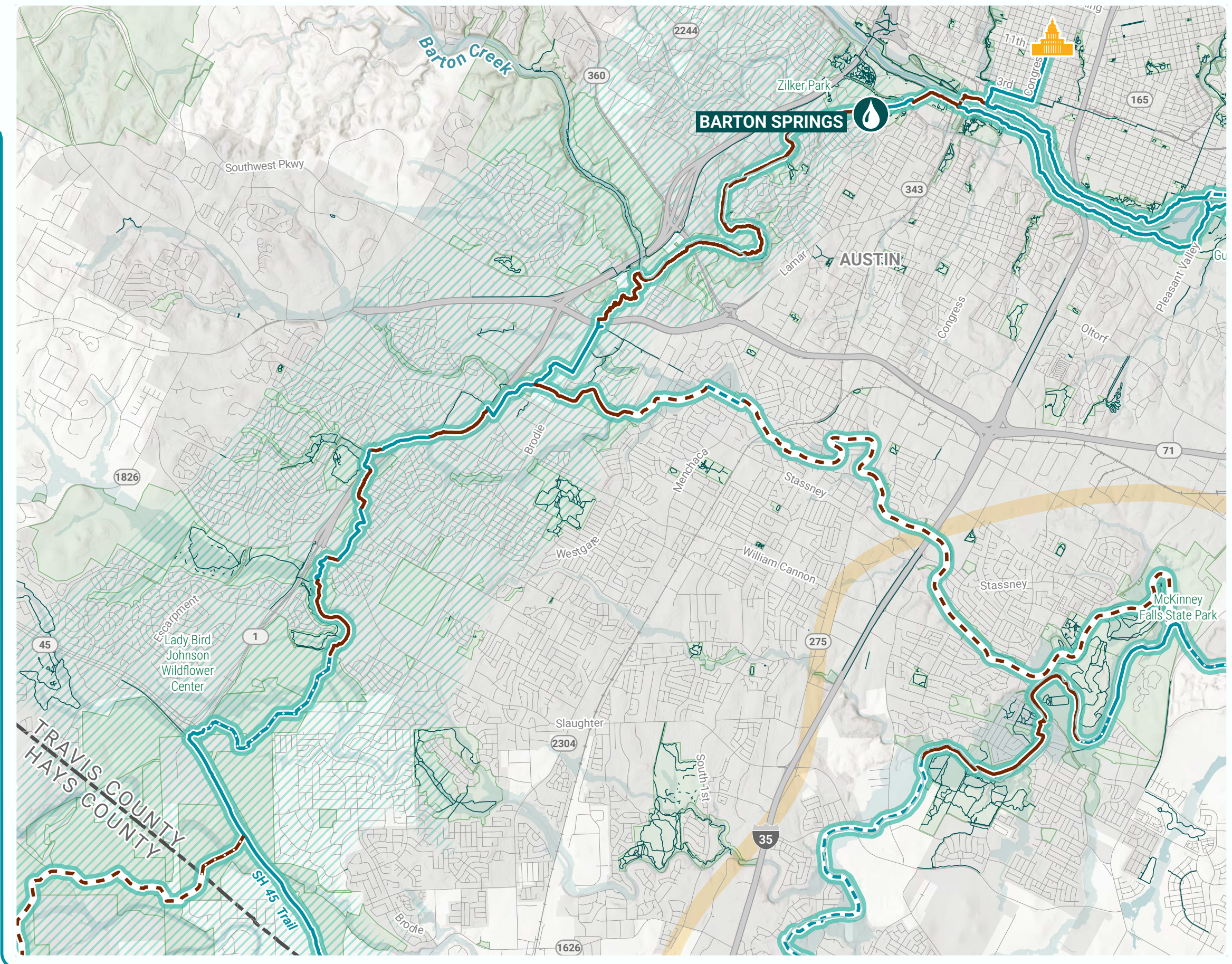


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 - In Routing (a conceptual alignment)
- Trail Status***
- Hard Surface (Concrete, Asphalt)
 - Soft Surface (Wood, Dirt, Gravel)

Trail Type**

- BASE MAP**
- The Great Springs
 - Texas State Capitol
 - El Camino Real de Los Tejas National Historic Trail
 - Existing Trails
 - Highways
 - Roadways
 - Railroad
 - Major Rivers
 - Rivers/Streams
 - Public and Private Open Spaces
 - 1% Annual Chance Flood Hazard
 - Regulatory Floodway
 - Edwards Aquifer Recharge Zone
 - Counties

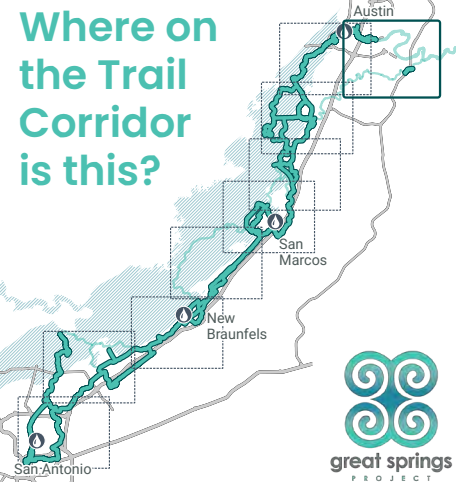


Sources: Great Springs Project, Alta Planning and Design, RS&H, TxDOT, City of San Antonio, City of New Braunfels, City of San Marcos, City of Kyle, City of Buda, City of Austin, National Parks Service, Esri, NASA, NGA, USGS, FEMA

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East Austin Trails

Where on the Trail Corridor is this?

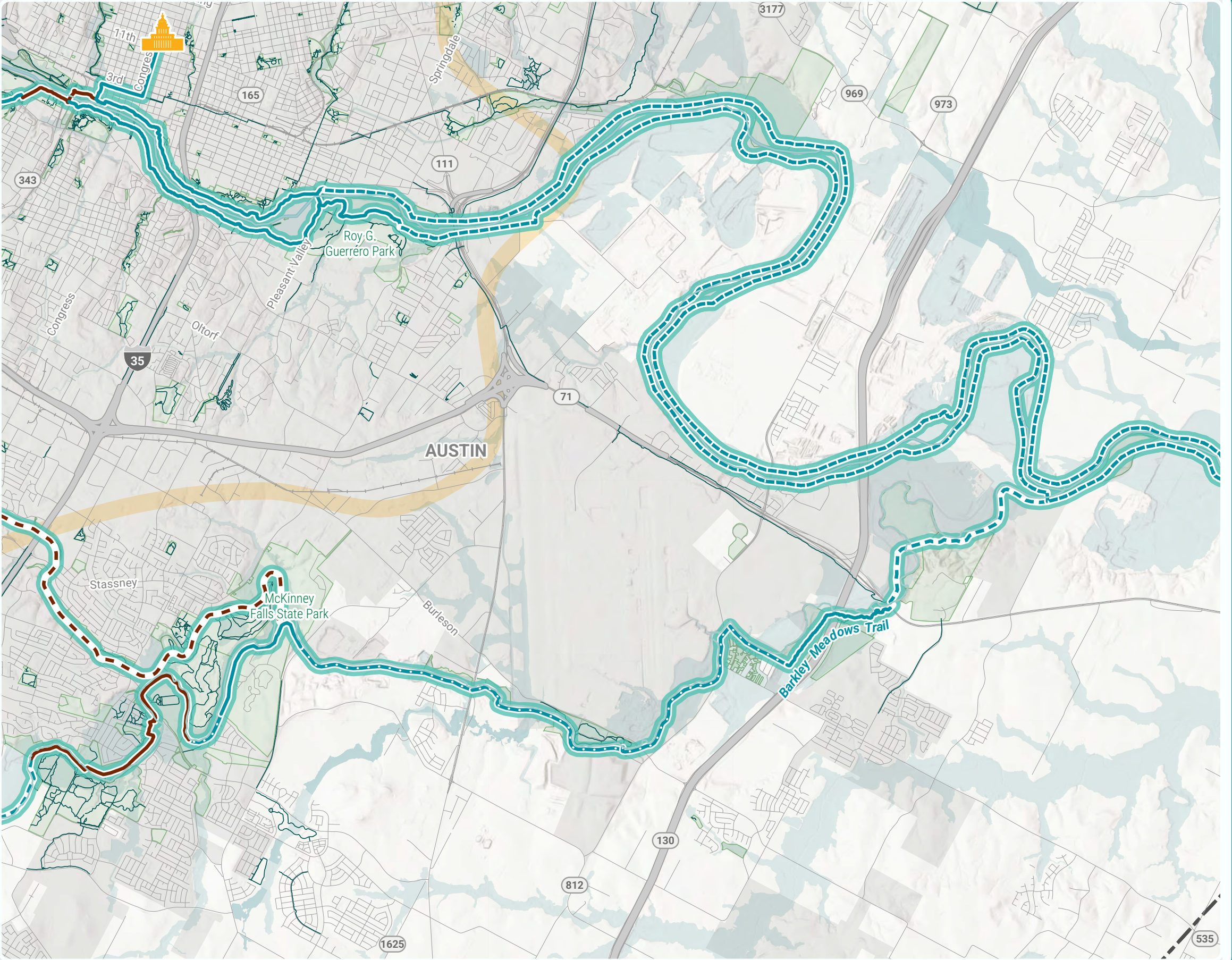


- Trail Routes**

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 - In Planning (with a study underway)
 - Adopted (by a governmental body)
 - Identified (a specific trail route)
 - In Routing (a conceptual alignment)
- Trail Status***

 - Hard Surface (Concrete, Asphalt)
 - Soft Surface (Wood, Dirt, Gravel)

- BASE MAP**
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 - Texas State Capitol
 - El Camino Real de Los Tejas National Historic Trail
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Comments below were submitted via the public survey and were filtered to match the trail segment area.



What the Community Says

We This is a fantastic project that we needed 20 years ago. Please don't be deterred from proceeding with as much enthusiasm and vigor as possible.

Build it!

We love the idea of more trails in Central Texas

I hope this can become a reality very soon.

I can't wait for it to be done!

I am looking forward to being able to hike from Austin to San Antonio

Let's make it happen and let's make it connect to Houston!

Please create it! Take cyclist transportation as seriously as car roads... are taken.

I think it's important to protect the natural areas.

Get it done!

Chapter 4

The Path Forward

“Our promise is to build a 100-mile network of trails from the historic Alamo in San Antonio to the Texas Capitol in Austin by the Texas Bicentennial in 2036. This is a Texas-sized civic project requiring hard work, commitment, and large-scale funding, and it is a legacy and gift to our state that will live on for generations. What we need now is a coalition of doers and generous donors to realize this Lone Star Dream.”

– GSP Chief Executive Officer, Garry Merritt



Implementation Strategies, Actions, and Resources

This chapter provides a step-by-step program of action for Great Springs Project to begin the process of constructing new miles of shared use trail and conserved natural resources along the entire route of the planned corridor.

It is not necessary for project development to begin at the terminal endpoints of the project corridor. It is possible for implementation to begin anywhere along the corridor where right-of-way exists in sufficient length to support resource conservation and trail development.

To successfully implement phases or components of Great Springs Project, it will take the collective action of project supporters including the nonprofit organization leading this effort, in partnership with private sector and philanthropic organizations, as well as municipal, county, regional, state, and federal governments.

Implementation includes the physical development of new trail segments, operations, management, and programming, all underpinned by the concept of equity. The recommendations and guidance of the Equity Task Force were established early in the trail visioning and planning process to advance an equitable approach and outcomes for the trail, including equitable access to the many benefits of the Great Springs Trail.

Community Task Force Recommendations

CENTERING SACRED HISTORIES AND FUTURES

We are on Indigenous land. As depicted in the White Shaman Mural on the Pecos River near Comstock, Texas, there is a deep spiritual connection between all four major springs, with San Marcos springs being the site of creation of the Coahuiltecan* people. This is why the springs are not only cultural, but more-than-human. Equity Task Force members, the Indigenous Cultures Institute, and scholarly research have pointed out that Indigenous knowledge systems differ fundamentally from conventional Western approaches to planning and ecological management. In collaboration with Indigenous communities, the trail system must incorporate indigenous knowledge to honor the springs' sacredness.

PLANNING + DESIGN

Planning and design play a large role in how people engage with their community, trails, and park spaces and have the power to create spaces that are welcoming and accessible for everyone regardless of race, age, gender, ability, or income level. Centering the experiences and needs of the diverse communities along the corridor allows for the design of spaces that community members can feel was co-created with them in mind.

ACCESSIBILITY

People with disabilities are essential members of the community, but their needs are often overlooked or not considered enough in the planning process. Accessibility, as it relates to people with disabilities, is particularly important for trail planning, design, and long-term maintenance.

TRANSPARENCY + ACCOUNTABILITY

Ensuring the equitable development of a regional trail system involves community members having a voice and that there are mechanisms for accountability. Asking community members to

participate and be vulnerable requires time and trust; the people involved in this process should feel like their time and contributions are creating something meaningful.

COMMUNITY VISION + STEWARDSHIP

Communities that are engaged and steer the vision of the regional trail project will be empowered to stay involved into the future. Stewardship and long-term involvement of the community will result in a more successful project that has greater impact overall in the lives of the community it serves.

STORYTELLING + ACTIVATION

The GSP regional trail network intersects and traverses a rich cultural landscape of diverse communities, histories, and stories. Honoring those stories, including underrepresented stories, though the project will develop a deeper connection to people and place. In addition, intentional programming and activation can invite different user groups out to experience the trail.

ECONOMIC JUSTICE

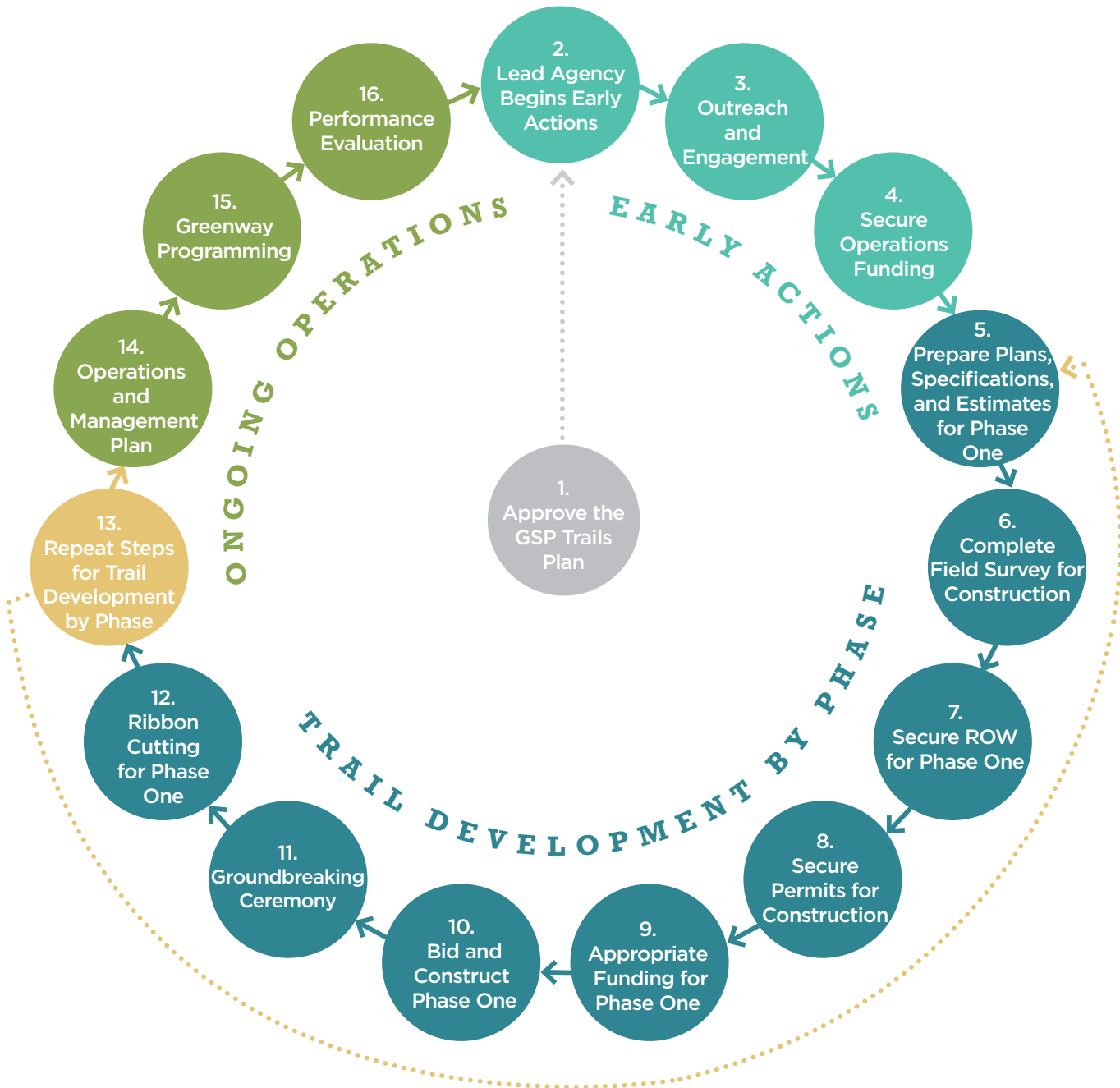
Economic justice seeks to address a legacy of segregation and displacement that has undermined historically marginalized communities' economic opportunity and ability to generate wealth. A step many organizations are taking to reverse this legacy is to equitably distribute economic opportunities by co-creating higher-paying jobs and prioritizing opportunities for small, minority-owned businesses and cooperatives.

**Coahuiltecan were one of the indigenous groups that occupied the Rio Grande delta area of South Texas. The Coahuiltecan are actually multiple tribal groups placed into a larger group which was labeled the Coahuiltecan after the Mexican state of Coahuila. (The University of Texas Rio Grande Valley)*



Action Steps Overview

The following pages describe a series of sixteen action steps that should be accomplished in the sequence defined for the completion of specific phases of implementation for the Great Springs Trail.



Step One: Approve the GSP Trails Plan

The most important first step in the process is to have the entire Great Springs Project Trails Plan adopted by all participating local governments. This is an important first step as some of the funding that could be used to build trail sections requires proof of local government support and an adopted plan. Additionally, local government adoption signifies that the municipalities and counties that are included along the project corridor have used their legislative authority to endorse and approve of project development, operations, and management.

Step Two: Lead Agency Begins Early Actions

Leading implementation of this regional trail effort is a core part of GSP's mission. GSP, as lead agency, will coordinate with partners on various steps of the trail development process, segment by segment. This will mainly be achieved by: 1) Providing support and assisting local and regional partners with their own trail efforts, from planning through public engagement and implementation; and 2) Pursuing trail funding opportunities, including ways to leverage funds across federal, state, local, private, and non-profit sources.

Step Three: Continue Public Outreach, Engagement, and Communications

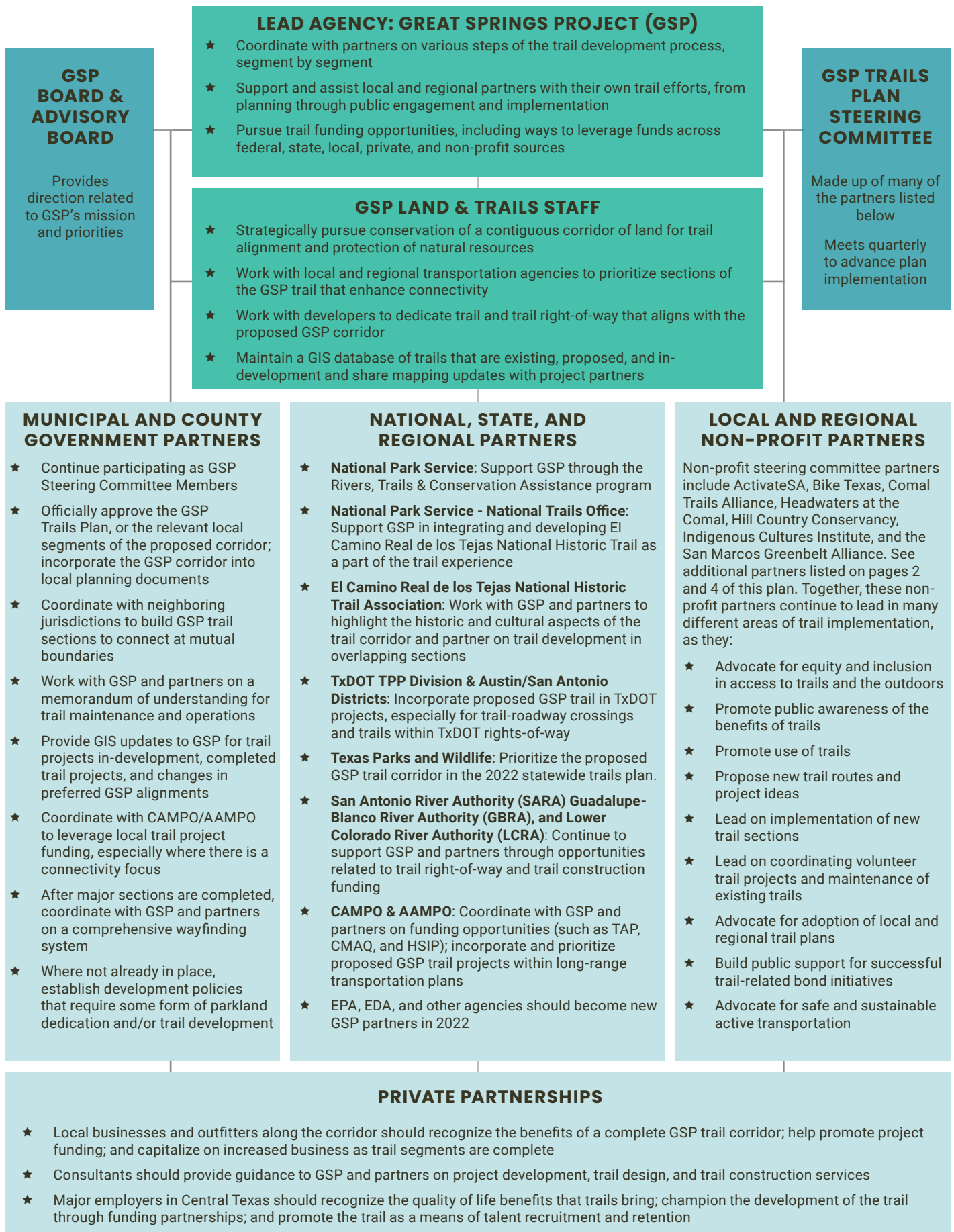
So much has already been accomplished through the production of this trails plan for Great Springs Project. The public support that has been gained must be nurtured and expanded as the project enters the implementation phase. The following steps can help build on the success to date:

- ★ Many groups already support Great Springs Project. Continue to encourage other non-government partners to “sign-on” and support the plan and project implementation.
- ★ Generate positive stories about the beneficial impacts that Great Springs Project will have on the region. Work with local media outlets and make use of social media, such as TikTok, Facebook, Instagram, Snapchat, and LinkedIn, to share the project timeline and other content.
- ★ Establish a “Friends of Great Springs Project” as an outgrowth of the trails plan.
- ★ Organize events and rides to showcase built and yet-to-be-built phases of the project. Invite area residents to participate.
- ★ Continue public engagement by staging information booths at community events and on higher volume existing trail sections once per month.

Step Four: Secure Operations Funding

The lead agency or organization will need to secure operational funding in order to deliver its work program. The goal of this funding is to support the staffing, advocacy, and leadership required to implement all phases of Great Springs Project. Operational funding can come from public and private sources. One option would be to ask every county to contribute an annual pro-rata share to fund lead agency operations. Another option would be to find a private benefactor willing to either match public section contributions or to fund full operations for a set period of time.

ORGANIZATIONAL FRAMEWORK FOR TRAILS PLAN IMPLEMENTATION



Step Five: Prepare PS&E for Phase One

Step five in the process is to prepare Plans, Specifications, and Estimates (PS&E) for the construction of phase one of the Great Springs Trail. The scope and length of phase one is defined within other sections of this plan. The lead agency can contract directly with a design development consultant to complete the phase one PS&E. These plans should meet the requirements of construction funding for each project phase. For example, if a phase is constructed with federal transportation funding, PS&E will need to address USDOT FHWA and TxDOT design development requirements. PS&E documents will need to be reviewed and approved by local, state, and federal authorities. A separate work flow process for completing PS&E for each phase of the project should be prepared.

Step Six: Complete Field Survey for Phase One

In conjunction with Step Five, employ a qualified and registered land surveyor to work with the design development consultant to complete an accurate boundary, centerline and topographic survey of the phase one project corridor. The surveyor(s) will also be responsible for preparing plat maps for all rights-of-way and recording those rights-of-way at the applicable county courthouse.

Step Seven: Secure Phase One Right-of-Way

Once preliminary PS&E drawings have been completed, it will be necessary to acquire all rights-of-ways necessary for project construction. This includes temporary and permanent rights-of-ways, easements, and rights of entry/access. The use of federal funding may require that all rights-of-way be acquired in compliance with the Uniform Relocation Act. There are a number of strategies that can be employed in the acquisition of rights-of-way and payment or fair compensation for such rights may be part of the process. Therefore, sufficient funding should be available to secure certain rights-of-way.

Step Eight: Secure Permits for Construction

When the PS&E documents are complete, they should be used to secure or acquire entitlements and permits for project construction. These permits will include environmental, access, all construction activities (earth moving, erosion control, use of fill material, impacts to wildlife, etc.), and, in some instances, accessibility. A checklist of applicable permits should be prepared during the PS&E phase of the project.

Step Nine: Appropriate Funding for Phase One Development

It is rare to fund regional greenway projects similar to the Great Springs Trail from a single source of funds. A funding quilt composed of public, private, and philanthropic funds will be required to finance all elements of project development. Great Springs Project works with all the stakeholders in the GSP trail corridor to identify, structure, and manage a combination of funding sources for project development.

Step Ten: Bid, Award, and Begin Construction of Phase One

When all funding has been secured, the next step will be to bid and award a construction contract for each phase of the Great Springs Trail. Typically, bid packages for each phase will be prepared by the design development consultant. Depending on how the project is funded, a sponsoring agency will administer the bid, and be in charge of awarding a construction contract. The process of bidding and awarding a construction contract takes time, no less than 3 to 4 months and as much 6 to 8 months depending on the approval process of the agency that awards the contract.

Once a bid is awarded, the selected construction contractor will be given a specific number of working or calendar days to build the trail. It is normal for construction activities to take between 6 months and one year to complete construction. Sometimes construction may take longer based on the complexity of a given project.

Step Eleven: Groundbreaking Ceremony

It is always good to celebrate the accomplishments and success of long distance, regional greenway projects. For each phase, the lead agency and sponsoring agency should work together to host a groundbreaking ceremony. Make sure to invite and involve everyone who has worked in partnership to make a particular phase successful. Groundbreaking ceremonies will vary in size and celebration. Be certain to invite local media outlets to attend, arrange for interviews with key stakeholders, and document the celebration.

Step Twelve: Ribbon Cutting Ceremony

Once construction is completed, it will be time for a second celebration and official public opening of the trail segment. As with the groundbreaking ceremony, it will be important to include all parties that made trail construction a success. It is a good time to recognize those that will operate and maintain each segment of the Great Springs Trail. A celebratory ride or walk should be included in the festivities.

Step Thirteen: Repeat Action Steps Five Through Twelve

For all remaining phases of the Great Springs Trail, repeat steps five through twelve. Each phase of the project will be unique. A different set of challenges, opportunities and constraints will shape the character of each phase. It is not simply a matter of repeating the steps, but more an opportunity to use the steps outlined to guide the process of future phase of development.

Step Fourteen: Operations and Management Plan

For all segments of the Great Springs Trail, operations, maintenance, and management is a critical element of project development. Similar to a city street system, park system, or utility networks, trails should be managed as highly valued public assets. Trails are public resources and components of local green infrastructure. There can be an unwarranted belief that trails either take care of themselves or should be managed in a less attentive manner. This is, of course, not true. Trails require daily, weekly, and monthly attention as well as a systematic approach to maintenance in order to keep them functioning in the manner in which they were designed and constructed.

The following guiding principles will help assure the operation of a first-class system:

1

Good maintenance begins with sound planning and design.

2

Foremost protect life, property, and the environment.

3

Promote and maintain a quality outdoor recreation and transportation experience.

4

Maintain quality control and standards and conduct regular inspections.

5

Develop a management plan that is reviewed and updated annually with tasks, operational policies, standards, and routine and remedial maintenance goals.

6

Conduct regular inspections and keep complete records.

7

Maintain an effective, responsive public feedback system and promote public participation.

8

Be a good neighbor to adjacent properties.

9

Operate a cost-effective program with sustainable funding sources.

10

Establish, adopt, and implement a uniform plan and level of quality amongst all of respective agencies and jurisdictions along the entire Great Springs Project corridor.



O&M Agreements

Trail segments or phases will not be managed by one agency or organization. Most likely, each trail segment will be managed by a separate entity. Therefore, it will be necessary to execute management agreements for each segment or phase of the greenway. An example Operations and Maintenance (O&M) Interagency Agreement is included in the Appendix of this report.

O&M Strategies and Actions

The purpose of an O&M Plan is to promote a well-maintained, well-groomed, safe, secure and pleasant-to-use greenway. O&M plans describe tasks of work to be performed, along with policies and programs that will be undertaken by responsible partners to operate, manage, and maintain the Great Springs Trail. The term operations and maintenance refers to day-to-day tasks as well as the long-term remedial tasks and programs performed to assure resources and facilities of the greenway are kept in a usable condition. This begins with sound design, durable construction, and a comprehensive management plan. In addition, community groups, residents, business owners, developers, and other stakeholders will continue to be engaged in the long-term stewardship of the resources preserved and enhanced by the greenway.

ROUTINE MAINTENANCE refers to the normal regime of trail sweeping, trash and debris removal, sign replacement, weed control, tree and shrub trimming, ice or snow removal, and other regularly scheduled activities. Routine maintenance also includes minor repairs and replacement such as fixing cracks and potholes or repairing broken furniture and furnishings.

REMEDIAL MAINTENANCE refers to correcting significant defects as well as repairing, replacing, or restoring major components that have been destroyed, damaged, or significantly deteriorated during the life of the project. Some items (“minor repairs”) may occur on a five-to-ten-year cycle such as repainting, seal coating asphalt pavement, or replacing signage. Major reconstruction items will occur over a longer period or after an event such as a flood. Examples of major reconstruction remedial maintenance include: stabilization of a severely eroded hillside, repaving a significant stretch of the trail surface, repaving a street used for biking, or replacing a footbridge. Remedial maintenance should be part of a long-term capital improvement plan.

SEASONAL MAINTENANCE is in addition to the routine and remedial categories and includes seasonal tasks that should be performed on an as needed basis. Designated maintenance crews should remove leaf debris, sediment from flood events, snow, and ice, etc. from all trail facilities as soon as possible. (Leaf debris is hazardous when wet and special attention should be given to facilities with heavier usage).

Life Cycle of Built Facilities

Constructed greenway facilities will have a limited life cycle, or useful life. The life cycle varies based on environmental impact, use, and care of the resource. The following chart offers a typical life cycle for major greenway elements:

Table 7. Life Cycle of Built Facilities		
GREENWAY COMPONENT	LIFE CYCLE	REPLACE COSTS
Asphalt Trails	10-15 years	\$1.5 million/mile
Concrete Trails	25-35 years	\$2 million/mile
Gravel Trails	5-7 years	\$500 K/mile
Wood Bark Trails	2-3 years	\$750 K/mile
Wood Boardwalk Trails	7-10 years	\$2 million/mile
Steel Bicycle and Pedestrian Bridge	15-20 years	\$75 K/foot
Asphalt Parking Lot	10-12 years	\$10 K/space
Crosswalks	3-5 years	\$7.5 K/crosswalk
Greenway Signage	7-10 years	\$5 K/sign
Park Benches	7-10 years	\$4.5 K/bench
Trash Receptacles	7-10 years	\$2 K/trash can
Wood Bollards	5-7 years	\$750/bollard
Metal Bollards	15-20 years	\$2.5 K/bollard

Source: Greenways Incorporated (2022)



Adopt-a-Trail

An Adopt-a-Trail program is one method for maintaining the environmental and aesthetic quality of the Great Springs Trail by generating a strong sense of ownership among citizens. Through the Adopt-a-Trail program, residents, businesses, trail users, and various community groups can have an active role in maintaining the lands and facilities of the trail. Volunteers work with local agency staff to participate in various projects, which may include:

- ★ Litter pickup
- ★ Leaf raking
- ★ Graffiti removal
- ★ Spreading of mulch, gravel
- ★ Sweeping of paved trails
- ★ Removal of exotic invasive plants
- ★ Planting flowers
- ★ Reporting of safety hazards, illegal dumping, injured or dead animals, storm damage, and other issues

An example Adopt-a-Trail form is included in the Appendix of this report.

Trail Ambassador Programs

Trail Ambassadors differ from those who participate in Adopt-a-Trail services. Ambassadors are an additional set of eyes and ears on the trail. They promote goodwill, help trail users with minor needs (such as directions) and promote safety and authorized use of the trail. Ambassadors often work in pairs and are usually given clothing to signify their status. Ambassadors are typically volunteers who provide services to an entire trail corridor. Some communities may deputize Ambassadors and provide them with telecommunications equipment. Ambassadors are skilled in first aid,

they are very knowledgeable about the trail and location of services and facilities, and they are also knowledgeable about natural and cultural resources. As with Adopt-a-Trail programs, Trail Ambassadors will undergo orientation and training. They are asked to work specific dates and times. Some local governments will ask that they sign waiver of liability forms. Often times, Ambassadors make use of a bike to complete their service. An example Trail Ambassador program is included in the Appendix of this report.

Crime Prevention Through Environmental Design (CPTED)

Many Trail Managers across the United States employ Crime Prevention Through Environmental Design (CPTED) techniques in the design, development, and management of trails. According to the National Crime Prevention Institute, “CPTED is the proper design and effective use of the built environment which may lead to a reduction in the fear and incidence of crime, and an improvement of the quality of life.”

Crime Prevention Through Environmental Design (CPTED) theories contend that law enforcement officers, architects, city planners, landscape designers, and resident volunteers can create a climate of safety in a community right from the start. CPTED’s goal is to prevent crime by designing a physical environment that positively influences human behavior. For trails, people who use the trail regularly will need to perceive it as safe and would-be criminals should view the trail as a highly risky place to commit crime. CPTED strategies rely upon the ability to influence offender decisions that precede criminal acts.

CPTED is based on the following principles: natural surveillance, natural access control, and territorial reinforcement.

NATURAL SURVEILLANCE

Natural surveillance increases the threat of apprehension by taking steps to increase the perception that people can be seen while using a trail. Natural surveillance occurs by designing the placement of physical features, activities, and people in such a way as to maximize visibility and foster positive social interaction among legitimate users of public space. Potential offenders feel increased scrutiny and limitations on their escape routes. Natural surveillance design features include:

- ★ Use adjacent roadways and the passing vehicular traffic as a surveillance asset.
- ★ Create landscape designs that provide surveillance, especially in proximity to designated points of entry and opportunistic points of entry.
- ★ Use the shortest, least sight-limiting fence appropriate for the situation.
- ★ When creating lighting design, avoid poorly placed lights that create blind-spots for potential observers and miss critical areas. Ensure potential problem areas are well-lit: pathways, stairs, entrances/exits, parking areas, children's play areas, recreation areas, storage areas, dumpster and recycling areas, etc.
- ★ Avoid too-bright security lighting that creates blinding glare and/or deep shadows, hindering the view for potential observers. Eyes adapt to night lighting and have trouble adjusting to severe lighting disparities. Using lower intensity lights often requires more fixtures.
- ★ Place lighting along pathways and other pedestrian-use areas at proper heights for lighting the faces of the people in the space (and to identify the faces of potential attackers).
- ★ Natural surveillance measures can be complemented by mechanical and organizational measures. For example, closed-circuit television (CCTV) cameras can and should be utilized.

NATURAL ACCESS CONTROL

Natural access control limits the opportunity for crime by taking steps to clearly differentiate between public space and private space. Natural access control occurs by selectively placing entrances and exits, fencing, lighting, and landscape to limit access or control flow.

- ★ Use a single, clearly identifiable, point of entry.
- ★ Use low, thorny bushes to keep people out of sensitive areas.
- ★ Use waist-level, picket-type fencing to control access and encourage surveillance.
- ★ Natural access control is used to complement mechanical and operational access control measures, such as target hardening.

NATURAL TERRITORIAL REINFORCEMENT

Natural territorial reinforcement promotes social control through increased definition of space and improved proprietary concern. An environment designed to clearly delineate private space does two things. First, it creates a sense of ownership. Owners have a vested interest and are more likely to challenge intruders or report them to the police. Second, the sense of owned space creates an environment where "strangers" or "intruders" stand out and are more easily identified. Natural territorial reinforcement occurs by using buildings, fences, pavement, signs, lighting and landscape to express ownership and define public, semi-public and private space. Additionally, these objectives can be achieved by assignment of space to designated users in previously unassigned locations.

- ★ Maintain premises and landscaping such that it communicates an alert and active presence occupying the space.
- ★ Provide trees in residential areas. Research results indicate that, contrary to traditional views within the law enforcement community, outdoor

residential spaces with more trees are seen as significantly more attractive, safer, and more likely to be used than similar spaces without trees.

- ★ Restrict private activities to defined private areas.
- ★ Display security system signage at access points.
- ★ Avoid cyclone fencing and razor-wire fence topping as it communicates the absence of a physical presence and a reduced risk of being detected.
- ★ Placing amenities such as seating or refreshments in common areas in a commercial or institutional setting helps to attract larger numbers of desired users.
- ★ Scheduling activities in common areas increases proper use, attracts more people, and increases the perception that these areas are controlled.
- ★ Natural territorial reinforcement measures make the typical user feel safe and make the potential offender aware of a substantial risk of apprehension or scrutiny.

Trail Watch Program

A Trail Watch program for the Great Springs Trail will help to promote safety and appropriate trail use by providing information and assistance to all trail users. Trail Watch Volunteers observe and document safety issues requiring attention, serve as a positive presence on the trail and would assist the local governments and law enforcement agencies with keeping the Great Springs Trail safe and well maintained.

Funding for O&M

Several types of funding sources can be identified and it is likely that a combination will offer the best solution. Following are potential funding sources:

- ★ Budget Allocation Commitments

- ★ Partnerships
- ★ Dedicated Tax
- ★ Creating an Endowment
- ★ Earned Income and User Fees
- ★ Outside Funding Sources
- ★ In-Kind Services

BUDGET ALLOCATIONS

These funds come directly from annual budget allocations by the respective municipality. Typically, this is the most reliable revenue source for project management, operations, and maintenance. This is the most common and likely source of O&M funding. Note that on most projects around the nation, private donors or other potential partners will want to see a strong long-term public commitment to management as a condition of awarding grants for capital trail improvements and management programs.

PARTNERSHIPS

Some the elements of the program serve multiple public and private benefits including access for floodway and stream bank upkeep, promotion of local businesses, utility access, school facilities, road maintenance, and enhancement of adjacent private properties. This may provide a number of opportunities for task sharing and cost sharing among the various beneficiaries. These options should be vigorously and creatively explored. In addition, area businesses may have a vested interest in sponsoring and participating in trail maintenance along segments of the corridor.

DEDICATED TAX

A number of communities have specific dedicated tax programs in place such as open space sales tax or special districts with property tax based funding. To implement such a program, it will be important to have a specific visionary plan in place and build

broad-based public support and partnerships with park, recreation, and open space advocacy groups. Pursuing this process should begin with an examination of the potential property, sales, lodging, and other potential tax bases.

For example, Johnson County Park and Recreation District in Shawnee Mission, KS raises approximately \$1 million annually through a mill levy with 50% going to construction and maintenance of trail and open space facilities. Jefferson County, CO passed a ½ cent Open Space Tax in the late 1970's. This tax generates over \$14 Million annual for acquisition and maintenance of open spaces, trails, and local park facilities. Voters in the St. Louis area approved a bi-state regional park district effort. They created the multi-county Metropolitan Park and Recreation District on the Missouri side and the Metro East District on the Illinois side. With a 1/10-cent sales tax allocation the two districts raise approximately \$10 million annually (\$9 million on Missouri side and \$1.5 million on the Illinois side). A portion of the funds will go toward building and maintaining an extensive regional trail and greenway system.

CREATING AN ENDOWMENT

An endowment is a set-aside account held strictly to generate revenue from investment earnings. The endowment could be held by a non-profit. Funding of the endowment could come from a percent of capital grants and from an endowment campaign. The endowment could also be funded by bequests and deferred giving such as donations of present or future interests in stock or real estate. To have an effective impact the endowment should have several million dollars in its "corpus" (asset holdings). This endowment could be built up gradually in tandem with project development. Some private organizations, such as the Yakima River Greenway Foundation in Washington State, earn funds through bingo and special events.

EARNED INCOME AND USER FEES

This is a revenue stream created by the use of the amenities such as a user permit for trails and open space facilities. This might be an annual pass that can be purchased online or at grocery stores, community centers, etc. Cannon Falls, MN raises funds through a "Wheel Pass " program where users 18 and older must purchase a user permit providing funds for trails maintenance. Another community near Saratoga, NY, a \$35/year membership fee subsidizes trail maintenance. In a option would be leasing trail rights-of-way for fiber-optic and other utility corridors. The Niagara River Trail (Canadian side) and the W&OD Trail Corridor in Virginia (Northern Virginia Regional Park Authority) receive several hundred thousand dollars annually in lease revenue for telecommunications cable license fees.

In most cases, however, earned income revenue streams are not likely to fund more than a fraction of the total management costs, though the fraction could be substantial. Note that these programs have an administrative cost. Furthermore, it is also important to avoid compromising or commercializing the quality of the trail.

OUTSIDE FUNDING SOURCES

Outside contributions include outside public and private sector grants that can be applied toward management including routine and remedial maintenance. Presently the Federal ARRA "Stimulus" program has funded trail replacement projects in a number of locations, though availability of such programs in the future are hard to predict. Private contributors might help fund seasonal youth "trail ranger" programs or purchase equipment such as a sweeper. Creation of a trail advocacy/ land conservancy non-profit might offer a way to raise money through "membership" donations. Note that, with the exception of remedial projects, generally, private donors are not interested in funding operations and maintenance. Many forms of outside funding may be unpredictable year after year and therefore is "uncontrollable income".



IN-KIND SERVICES

Management services might be supported and enhanced by available non-cash resources such as volunteers, youth, student labor, user groups (such as cyclist associations), correctional services, and seniors. In-kind support may also include donations of materials and equipment. Groups may be encouraged to “adopt” a park or a trail and hold annual fundraisers. The corridor might also be eligible for youth programs such as AmeriCorps.

Note, however, that volunteer and in-kind participation will likely meet only a fraction of the operations and maintenance needs and funding of these programs may be sporadic. The management program will still need a base

of trained professionals and proper equipment. These programs require staff time to coordinate.

Volunteers offer a cost effective method for maintaining certain aspects of Great Springs Project. For example, local Eagle Scouts can work with local government staff to build or repair bridges and help with other small construction projects. The Federal Volunteer Protection Act of 1997 protects the volunteer worker. This act protects volunteers of nonprofit organizations or governmental entities. The Act states that such volunteers are not liable for harm caused by their acts of commission or omission provided the acts are in good faith.

Step Fifteen: Greenway Programming

The Great Springs Trail is an ideal landscape for programming and hosting of events. Some of these events can generate additional revenue for local governments to help offset the costs associated with operation, maintenance, and management of the system.

The trail can also serve as an outdoor classroom where young and old alike can learn about the wonders of nature and visit important cultural landscapes that are part of our community. Local governments can work with schools, colleges and universities, organizations, and groups on a case-by-case basis, to make greenway areas available for ecological and environmental study. Typically, a local government will review and approve curricula and programs that include access and use of greenways to ensure that these programs are compatible with other non-programmed uses.

Step Sixteen: Performance Evaluation

Once the trail is opened for public use, the lead agency should work with local governments to evaluate its use and performance. For example, if transportation funds were used, how effective is the trail segment at providing alternatives to the use of cars for a specific trip? If environmental education was a primary emphasis of a particular segment, how effective has the segment been in serving the educational needs of school groups? Evaluations can be completed starting within one year of the official public opening of a given segment.

Trail Construction Costs and Land Value Considerations

Estimating Trail network Construction Costs

Estimating a single total cost for the GSP trail network is not recommended at this stage in the process. There are many variables and details related to feasibility, design, and construction that will need to be determined for individual sections of trail before reasonably reliable figures could be generated. Shared use trails in the United States have been observed to be developed from less than \$500,000/mile to \$4,000,000/mile or more, depending on their characteristics, settings, and many other factors. Even a seemingly simple natural surface hiking trail can vary greatly in cost, running anywhere from a short season of volunteer labor to \$120,000/mile or more.

This plan identifies proposed trail locations for general trail types (hiking trails, shared use paths, and on-road connectors). Within these categories, there are still many potential variations. For example, aside from basic variations such as desired widths and materials, a shared use path within a cleared, level, and accessible corridor is entirely different from a path that requires extensive clearing, grubbing, grading work, drainage work, landscaping, fencing, relocation of utilities, and major structures for crossing highways and waterways.

Similarly, a hiking trail can follow an existing access road and cost very little to make it usable; or it could require building a new trail over steep topography, with multiple switchbacks and bridges; not to mention variations such as the quality and quantity of amenities and the size and scope of new trailheads.

Other factors include the costs of right-of-way acquisition and negotiation, design, mobilization costs, the scale of the project, the means of installation (contractor vs local forces), and the proper escalation of costs to consider for long-term project forecasting. These are the types of factors to be determined as GSP and its partners take the next steps in implementation, focusing segment by segment.



Trail segment under construction at Bulverde Rd and Classen Rd in San Antonio, TX

Land Value Considerations

The valuation of land is typically performed by qualified appraisers using prescribed methodologies to arrive at the highest and best use of a given property in whole or in part, as well as in fee (full ownership of all property rights) or less-than-fee (purchase of one or more property rights) to determine the likely market value of the property. The appraiser must consider, and the appraisal must describe, a wide range of factors that inform the valuation of a property. These factors can be as broad as the local or regional economy or as specific as the value of improvements on the land.

Valuation may consider, but is not limited to: property location, size, nearby infrastructure and amenities, topography, legal access, past or current uses, zoning, floodplains, and, in general, the suitability of a property to serve its highest and best use. As no two properties are exactly the same, the utility or development value of one property may be different than that of a neighboring property, leading to different values.

Understanding a property's value may become more challenging with regard to less-than-fee acquisitions (i.e., conservation or trail easements). Conservation and trail easements may have a significant impact on the overall value of a property, depending upon what rights are retained by the property owner, and what rights the property owner conveys to the easement holder. Conversely, these types of easements may benefit a private landowner with

regard to tax and estate planning in the instance of a full or in-part donation of easement value, or can make the property more desirable for a future owner. To truly arrive at a property value that incorporates easements, the appraiser must perform a "before and after" appraisal to parse the values of the retained purposes and land, as well as that of the easement value.

It is important to note that appraisals are a "snapshot in time". As an example, a property may be deemed to have development as its highest and best use, but absent the required approvals, permits, zoning, etc., it may only be valued for what it provides at the time of the appraisal, not for what it may become over time. This is an important consideration in areas experiencing rapid growth and inflating values, much like this area.

Given the nature of the landscape and explosive growth within the boundaries of Great Springs Project's focus area, it would not be possible to determine an average or median cost per acre or length of trail, or other such equivalency. Each project performed by Great Springs Project, whether for land conservation or trail connectivity, will need to be evaluated independently to determine its financial and conservation/connectivity value relative to the mission of Great Springs Project, the desire or intent of the landowner, and the long-term benefits to the community.

Conclusion

The epic proportions of this undertaking will take time, patience, and consistent hard work on behalf of GSP and its many partners to complete.

Even though the target completion date of 2036 may seem like a long way off to some, it may in fact take every bit of that time to complete. At the same time, the pressures that come with working in such a fast-growing region necessitate moving on some aspects of implementation immediately, such as land conservation efforts and securing trail right-of-way. Equally urgent is the need to begin securing multiple sources of funding, leveraging both public and private sources for trail right-of-way, land acquisition, design, construction, and maintenance.

The Appendices that follow serve as supplementary resources to assist GSP and its partners in these efforts. They include trail design guidance, a summary of public engagement to-date, a conservation toolbox, and the full GSP Benefits Report, to help make the case for both trail development and conservation throughout the corridor.

“Nature created Great Springs; Texans are blazing the trail.”

- Tim McClure, former member, Great Springs Project (GSP) Board of Directors

A Living Document

Overall, this plan is meant to serve GSP and its partners as a living document, not only to be referenced during implementation, but also periodically updated to reflect the ever-changing opportunities, constraints, and progress on the ground. To this end, GSP will continue to facilitate quarterly Trails Plan Steering Committee meetings to help coordinate plan implementation in step with local and regional partners. Likewise, GSP will continue to expand public engagement opportunities, offering ongoing ways to engage with the process of trail system implementation (see the end of the Public Engagement Appendix for more on this topic).

Contact info@greatspringsproject.org for the most up-to-date information and proposed trail alignments.

Get Involved!

Whether you are a local resident, business owner, landowner, government official, trails advocate, or just simply someone with an idea or helping hand, there are ways to get involved to make this trail a reality.

When available, GSP encourages participation in related public surveys, webinars, and events, and by helping spread the word about engagement opportunities via social media and word of mouth. There will also be times when voicing support for the project with elected officials will be welcomed and encouraged, such as with local adoption of the trails plan, local bond measures related to trails and conservation, and support for local sections of trail generally.

GSP's website and social media feed serve as the most up-to-date resources for how and when to get involved. Please contact GSP directly if you would like to:

- Volunteer to support efforts related to public engagement, trail building, or trail maintenance
- Learn about how your organization or business can get involved or become a project partner
- Learn about opportunities for landowners to get involved
- Share ideas or suggestions for collaboration

Contact info@greatspringsproject.org





Appendix A

The Design

Trail designers and builders should reference national guidelines for trail facility design, as well as locally established best practices. With the overall goal of consistency, design guidelines used should also be flexible enough to allow for the professional judgment of the design and engineering staff of local communities. In all cases, sound engineering judgment should be used, specific to the trail segment(s) being designed and constructed.

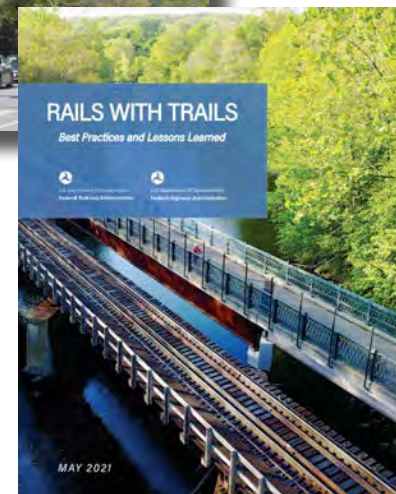
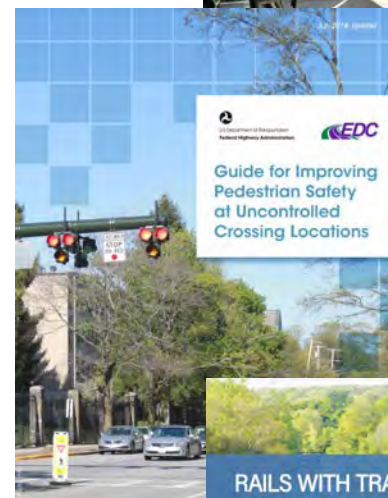
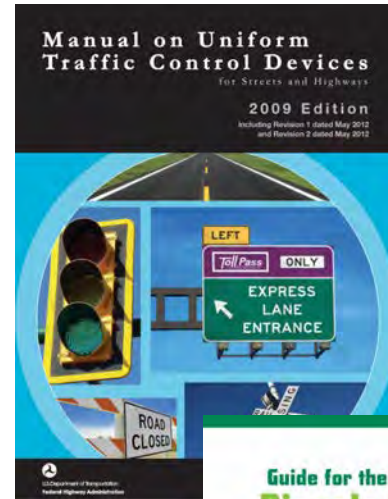
- From the Guiding Principles of the Great Springs Trail Plan

Guidance Basis

The trail design guidelines referenced in this plan are based on national standards and industry best practices.

National Guidance

- ★ The Federal Highway Administration (FHWA) **Manual on Uniform Traffic Control Devices (MUTCD)** defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel. The MUTCD is the primary source for guidance on lane striping requirements, signal warrants, recommended signage, and pavement markings.
- ★ The American Association of State Highway and Transportation Officials (AASHTO) **Guide for the Development of Bicycle Facilities** (2012) provides specific guidance on dimensions, use, and layout of each type of bicycle facility.
- ★ The FHWA **Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations** (2018) provides guidance to support the installation of countermeasures at uncontrolled pedestrian crossing locations, and local policy development associated with these countermeasures.
- ★ The FHWA **Rails with Trails: Best Practices and Lessons Learned** (2021) provides guidance on effective practices for each phase of a rail-with-trail project, including development, design, construction, operation, and maintenance.



Trail User Types

In most cases, GSP trails should be designed for users of all ages and abilities. A wide range of people and modes can be found on existing trails today. Each experience level and mode requires unique design considerations for making trails safe and enjoyable for everyone who uses them. The table at right outlines various user types and factors that may influence trail design.

People with Disabilities

The term “people with disabilities” includes individuals with physical or cognitive impairment as well as those with hearing or visual limitations. According to the Centers for Disease Control and Prevention (CDC), in 2016, one out of every four Americans had a disability that limits their mobility.

Additionally, nearly everyone will experience a disability at some point in their life, whether through injury, aging, or other circumstances. Trails that are physically separated from motor vehicle traffic provide a safe and comfortable place for people with disabilities to get from place to place.



An example of an ADA/accessible trail within the Purgatory Creek Natural Area in San Marcos.

Anticipating Changes in Transportation Technology and Services

Technology is quickly changing the way people travel. Mobile devices are making it easier to check transit status in real-time, call a ride sharing service, or access a bike or scooter share system. They will also create opportunities to integrate modes, making it easier to use more than one mode to complete a trip. Additionally, shared autonomous vehicles (SAVs) may soon be a regular travel option for individuals and transit services. New technologies could be used to expand travel options and reduce vehicle trips in the surrounding communities by utilizing the GSP trail network.

Trailheads as Mobility Hubs

As travel behavior changes, so too can our conception of trailheads. Incorporating new technologies and amenities can allow more people to enjoy the GSP trail network. Features to consider may include:

- Transit access
- Electric vehicle charging stations
- New mobility access (scooter and/or bike share)
- WiFi and charging docks
- Hydration station and bike fixit stands
- Lighting and emergency phones

Table 8. Trail User Needs

USER TYPE		SPEED OF TRAVEL	CONSIDERATIONS
	WALKERS	1 to 3 mph	<p>Need wider areas for traveling in groups or walking dogs</p> <p>Comfortable on sidewalks and paths that are grade separated from vehicles and fast active users</p>
	WHEELCHAIR USERS	1 to 3 mph (non-motorized) 3-5 mph (motorized)	Comfortable on sidewalks and paths that are grade separated from vehicles and fast cyclists
	EQUESTRIANS	3 to 8 mph (trot)	Prefer a soft surface tread separated from people riding bicycles
	RUNNERS	5 to 9 mph	<p>Prefer off-street paths with consistent lighting</p> <p>Fast runners may prefer to share space with cyclists during periods of high pedestrian traffic</p>
	CASUAL AND NEW CYCLISTS	6 to 12 mph	<p>Prefer riding on off-street facilities</p> <p>Compared to experienced cyclists, casual cyclists are more likely to utilize rest areas</p>
	E-BIKE USERS	16 to 20 mph	<p>Most prefer fewer crossings, separated paths, and room to pass slower cyclists</p> <p>Opportunities for shared mobility docking stations with charging stations</p>
	E-SCOOTER USERS	Up to 20 mph	<p>Stand-up and seated versions, e-skateboards, hoverboards, balance board</p> <p>Access to on-street corrals, racks in the furnishing zones, shared mobility parking zones</p>
	EXPERIENCED CYCLISTS	12 to 25 mph	<p>Very experienced cyclists may choose to use roadways over paths</p> <p>Most prefer fewer crossings, separated paths, and room to pass slower cyclists</p>

Sources: Boise Pathways Plan, 2021

Shared Use Path (SUP) Materials

Trail Surface

A trail segment's design, material, and level of accessibility will vary depending on its unique context. Many sections of the trail network are likely to be either a concrete or asphalt surface with natural surface or crushed aggregate shoulders. However, key segments will require a permeable surface for constrained portions of the trail that are along river and creek channels or near sensitive habitat.

ASPHALT VS. CONCRETE

Asphalt requires lower upfront costs, but has a shorter life expectancy and, depending on the location, requires more maintenance than concrete. When concrete is used, saw-cut joints (not tooled joints) should be used. Saw-cut joints provide a smoother and safer experience for people on wheels. This is particularly noticeable with smaller wheels, such as those on roller blades or skateboards.

PAVEMENT MARKINGS

Pavement markings can be used to delineate space, provide wayfinding information, and establish an identity or brand for the SUP. Dashed centerlines are not necessary on lower-volume SUPs, but may help organize two-directional flow where there is more demand. Wayfinding and branding markings may be incorporated with decals, thermoplastic, paint, stamped or sandblasted pavement, or embedded metal.

Eco-Friendly Trail Design & Materials

To achieve GSP's goals of sustainability and water preservation, trail design should incorporate emerging technology in tandem with context-specific irrigation and planting. Below are a few potential materials and approaches that should be considered as trail segments move into design and construction.

AGGREGATE BINDING

Natural surface trails can use a binding application that allows for water permeability while maintaining the strength and accessibility of an asphalt trail.

- ★ <http://www.stabilizersolutions.com/products/stabilizer-landscape/>

- ★ <https://www.organic-lock.com/>

NATIVE PLANTING AND CONTOUR FILTERS

Grading and landscaping should utilize native plantings and techniques that encourage filtration and provide benefits such as drought mitigation, flood mitigation, groundwater enhancement, and habitat regeneration.

CARBON SEQUESTERING CONCRETE

When concrete is needed, carbon sequestering processes can be applied to improve the overall sustainability of the project, without compromising characteristics of the material.

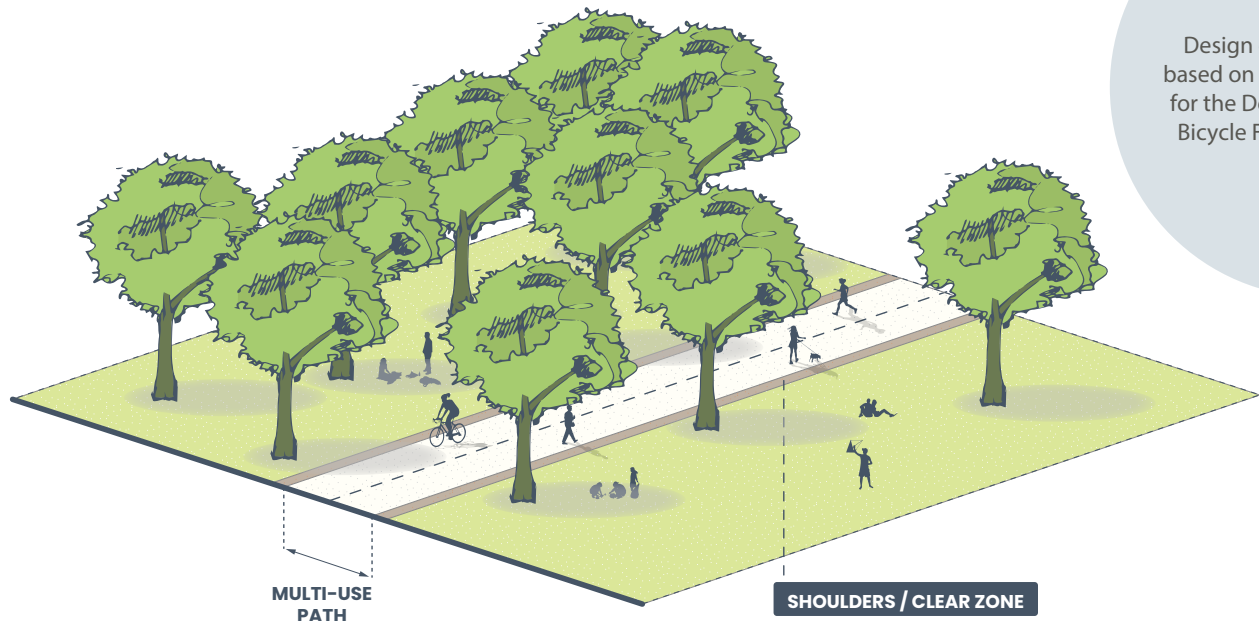
- ★ <https://www.carboncure.com/>

Material Trade-Offs

IMAGE	MATERIAL	PROS	CONS
	ASPHALT	<ul style="list-style-type: none"> ★ Relatively inexpensive ★ Low maintenance ★ Smoother surface ★ 20+ year life expectancy 	<ul style="list-style-type: none"> ★ Tendency to buckle after time and from tree roots, creating bumps and ruts that pool water. Particularly likely if near irrigation systems
	CONCRETE	<ul style="list-style-type: none"> ★ Durable ★ Long lasting ★ Resilient to flooding ★ 25-35+ year life expectancy 	<ul style="list-style-type: none"> ★ Expensive ★ Cracks are difficult to repair
	PERVIOUS CONCRETE	<ul style="list-style-type: none"> ★ Provides smooth surface for people cycling while being highly permeable 	<ul style="list-style-type: none"> ★ Not as strong as conventional concrete ★ Relatively expensive ★ Requires maintenance to maintain permeability ★ 10- to 15-year life expectancy
	NATURAL SURFACE OR CRUSHED AGGREGATE	<ul style="list-style-type: none"> ★ Preferred by some user types ★ Color blends well with surrounding landscape 	<ul style="list-style-type: none"> ★ Limits most users on wheels ★ Requires regular maintenance ★ 5- to 10-year life expectancy

Shared Use Path

Design guidelines are based on AASHTO, Guide for the Development of Bicycle Facilities (2012)



A shared use path (SUP), labeled in the graphic above as a multi-use path, provides a travel area separate from motorized traffic for cyclists, pedestrians, skaters, wheelchair users, joggers, and other users. SUPs are desirable for cyclists of all skill levels preferring separation from traffic. These off-road travelways generally provide routes and connections not provided by existing roadways. Most SUPs are designed for two-way travel of multiple user types. Designs vary depending on factors such as the grade of

the land, size and amount of vegetation present, and proximity to waterways, structures, and other elements.

Typical Application

SUPs are typically located in independent rights-of-way, separate from roadways.

Refer to guidance on sidepaths for information on shared use paths adjacent to roadways.

REAL WORLD EXAMPLES

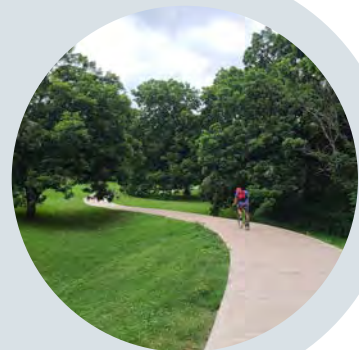
Left: Alligator Creek Trail
Middle: Salado Creek Greenway
Right: Stokes Park Trail



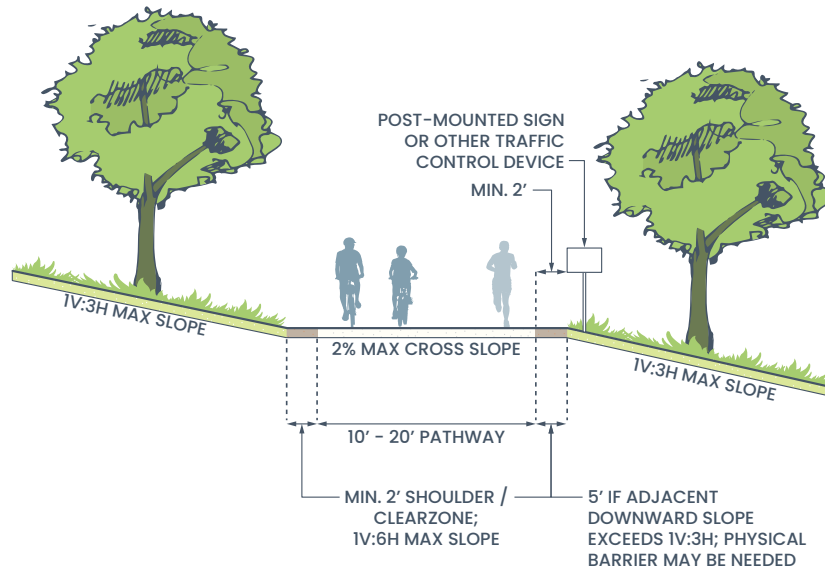
New Braunfels, TX



San Antonio, TX



San Marcos, TX



Design Guidelines

WIDTH:

A demand analysis, combined with the use of FHWA's SUPLOS Calculator, should be conducted to determine appropriate widths. 10-12' is a typical default SUP width, and 8' width is acceptable only in constrained conditions and for short distances (AASHTO Bike Guide Section 5.2.1).

SHOULDER / CLEAR ZONE:

Minimum 2' graded area (maximum 1V:6H slope) should be provided for clearance from landscaping or other vertical elements such as fences, light poles, sign posts, etc.; recommend aggregate or turf grass to prevent weeds from spilling onto trail.

VERTICAL CLEARANCE:

8' minimum, 10' typical.

SLOPE:

Trail slopes should be designed at 5% (greater slope is permitted, but should be limited, see AASHTO); SUP cross slope should not exceed 2%.

PHYSICAL BARRIER:

If the land beyond the shoulder/clear zone has a slope exceeding 3:1, a physical barrier may need to be added.

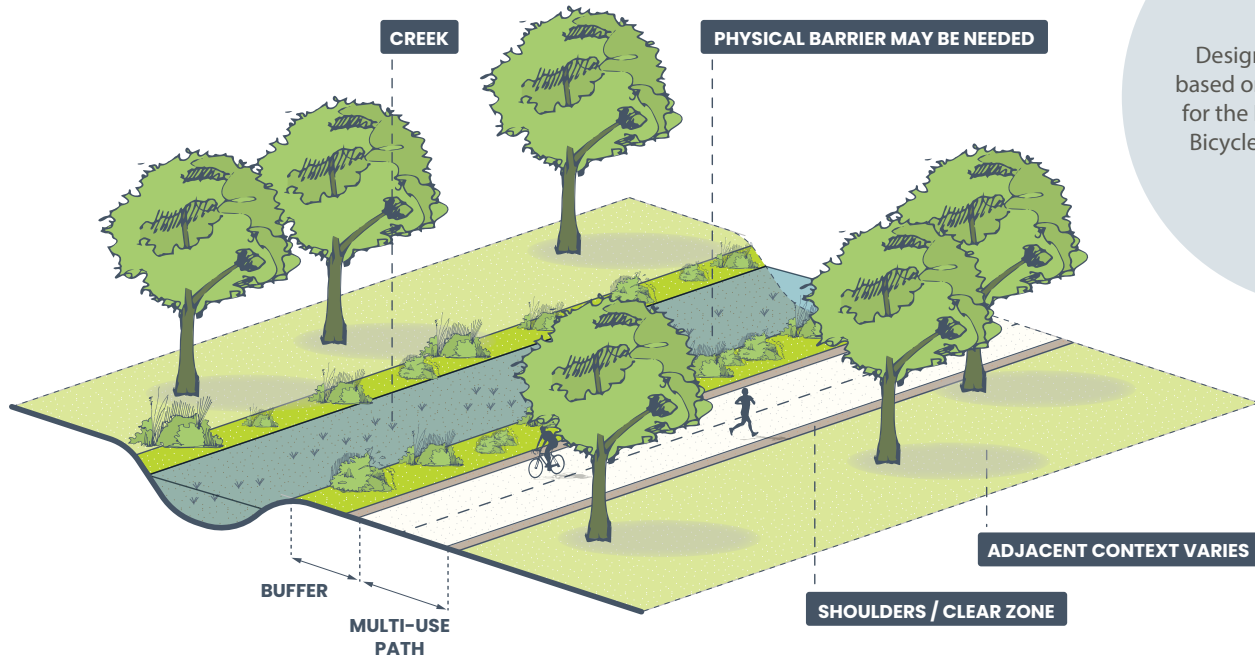
OTHER DESIGN CRITERIA:

With the great variety of users on open space trails, amenities such as benches, trash and recycling receptacles, bike racks, and appropriate lighting should be included along trails.

Trail design should comply with all AASHTO requirements for shared use paths related to design speed, sight distances, stopping distances, and grades.

Shared Use Path

Riparian Corridor in Urban and Suburban Areas



Design guidelines are based on AASHTO, Guide for the Development of Bicycle Facilities (2012)

SUPs running along a riparian corridor offer scenic views, access to natural areas, and connections to additional recreational opportunities.

Typical Application

SUPs along riparian corridors should provide plenty of separation between the path and waterway. Where width allows, riparian landscaping should be included. If the slope from the path to waterway exceeds 3:1, a fence or other physical barrier should be installed.

REAL WORLD EXAMPLES

Left: The San Antonio River Walk
Middle: Prince Solms Park Trail
Right: Alligator Creek Trail



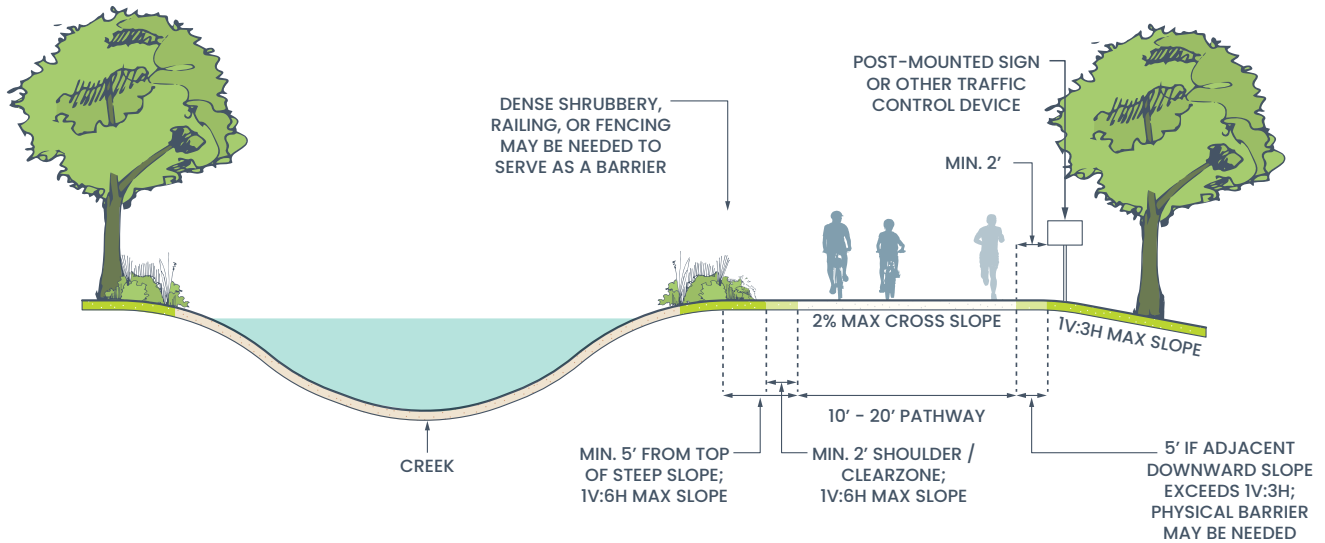
San Antonio, TX



New Braunfels, TX



New Braunfels, TX



Design Guidelines

WIDTH:

A demand analysis, combined with the use of FHWA's SUPLOS Calculator, should be conducted to determine appropriate widths. 10-12' is a typical default SUP width, and 8' width is acceptable only in constrained conditions and for short distances (AASHTO Bike Guide Section 5.2.1).

SHOULDER / CLEAR ZONE:

Minimum 2' graded area (maximum 1V:6H slope) should be provided for clearance from landscaping or other vertical elements such as fences, light poles, sign posts, etc.; recommend aggregate or turf grass to prevent weeds from spilling onto trail.

VERTICAL CLEARANCE:

8' minimum, 10' typical.

SLOPE:

SUP slopes should be designed at 5% (greater slope is permitted, but should be limited, see AASHTO); SUP cross slope should not exceed 2%.

ENVIRONMENTAL CONSIDERATIONS:

SUPs within environmentally sensitive areas should be designed to minimize impacts during construction and once in use. Alignment should avoid significant waterways, mature tree stands, sensitive habitat areas and ecosystems, or endangered or significant flora and fauna areas, staying 30' outside of these conditions when possible.

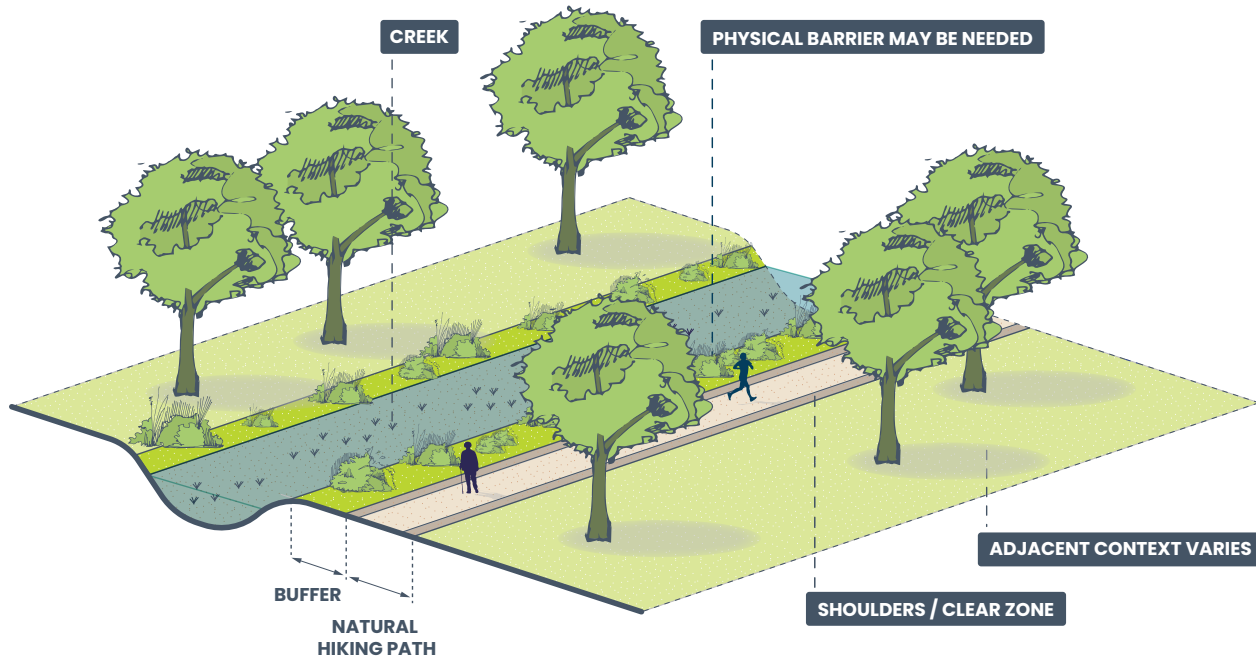
Where SUP construction must run through sensitive areas, sustainable construction materials and methods must be used to make up for the negative impacts. The design of the trail should not detract from the natural landscape, but rather should enhance and blend in to the area.

OTHER DESIGN CRITERIA:

SUP design should comply with all AASHTO requirements for shared use paths related to design speed, sight distances, stopping distances, and grades.

Natural Surface Trail

Riparian Corridor in Environmentally Sensitive Areas



Sometimes referred to as footpaths or hiking trails, the natural surface trail is used along corridors that are environmentally-sensitive but can support bare earth, wood chip, or boardwalk trails. Soft surface trails may be used as spur trails, or as parallel hiking trails to the primary Great Springs Trail route.

Typical Application

Natural surface trails are a low-impact solution and found in areas with limited development or where a more primitive experience is desired. These are not intended to be ADA compliant or accommodate all non-motorized uses.

REAL WORLD EXAMPLES

Left: Violet Crown Trail

Middle: Smooth crusher fines can be a good surface material for natural surface trails for all user types

Right: Trail surface material can be further stabilized with a variety of products

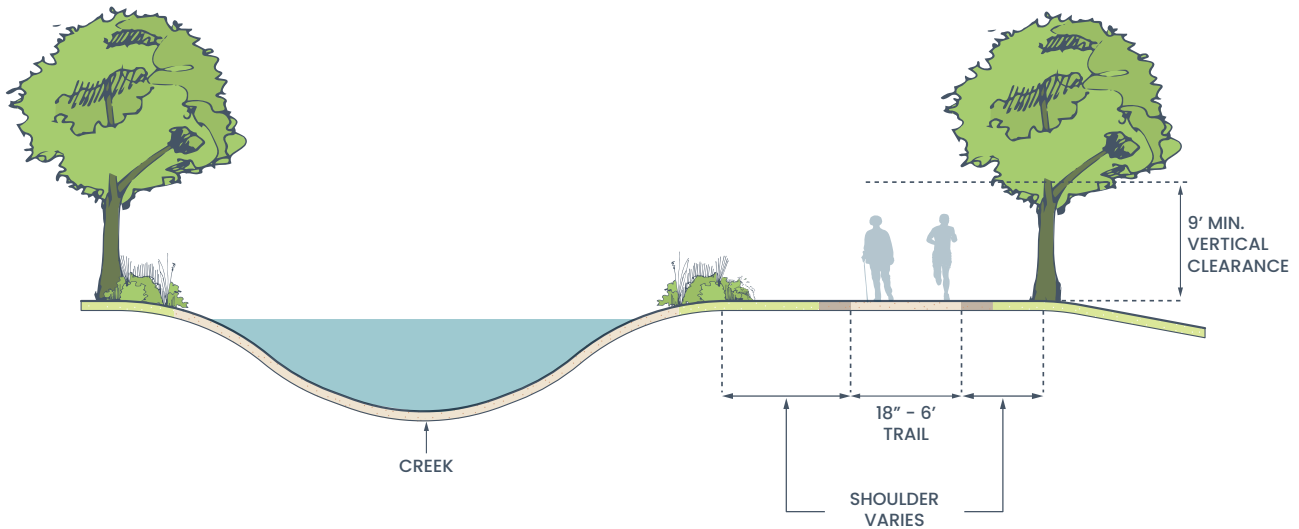


Austin, TX



Source: National Trails Training Partnership





Design Guidelines

WIDTH:

Trails can vary in width from 18 inches to 6 feet or greater.

VERTICAL CLEARANCE:

Maintained at nine-feet above grade.

ENVIRONMENTAL CONSIDERATIONS:

Trail surface can be made of dirt, rock, soil, forest litter, or other native materials. Some trails use crushed stone (crusher run) that contains about 4% fines by weight, and compacts with use.

Provide positive drainage for trail tread without extensive removal of existing vegetation; maximum slope is 5 percent (typical).

OTHER DESIGN CRITERIA:

Base preparation varies from machine-worked surfaces to those worn only by usage.

Trail erosion control measures include edging along the low side of the trail, steps and terraces

to contain surface material, and water bars to direct surface water off the trail; use bedrock surface where possible to reduce erosion. Refer to the US Forest Service 2007 Trail Construction and Maintenance Notebook for detailed guidance on erosion control methods.

Consider implications for accessibility when weighing options for width and surface treatments. Refer to guidance on Accessible Shared Use Paths for more information on design for accessibility and shared use.

OTHER RESOURCES:

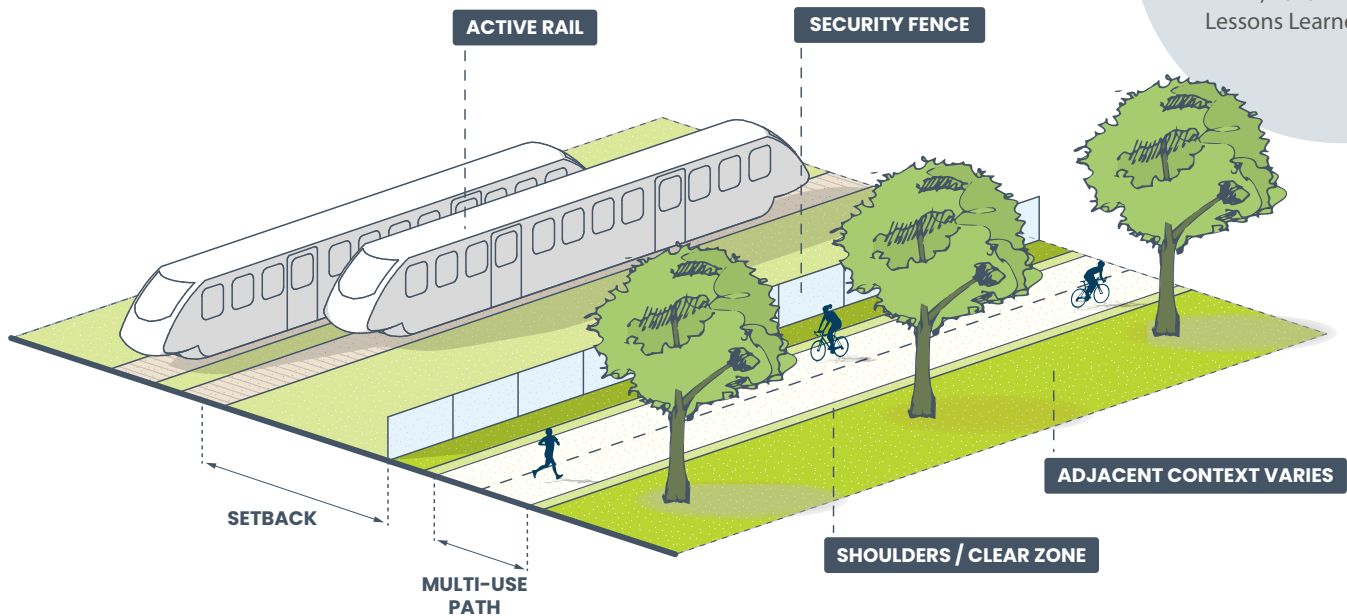
The International Mountain Biking Association's (IMBA) online resources offer free, easy-to-access information for the benefit of mountain bikers in the U.S. and around the globe. Search the collection of PDFs, videos, books, and graphics to further your local mountain bike access and advocacy efforts.

Source: <https://www.imba.com/explore-imba/resource-hub>

Shared Use Path

Active Rail Corridor

Design guidelines are based on AASHTO, Guide for the Development of Bicycle Facilities (2012) and FHWA, Rails-with-Trails: Lessons Learned (2002)



A shared use path that runs along an active railroad is referred to as a rail-with-trail. Rail-with-trail designs vary widely, depending on factors such as requirements for setbacks from trains, the frequency and speed of rail service, and the presence of at-grade crossings.

Typical Application

Many rail-with-trail facilities have segments of trail that are within thirty feet of active railroad tracks. In some cases, space needs to be preserved for future planned freight, transit, or commuter rail service. In other cases, limited right-of-way width, inadequate setbacks, concerns about safety, trespassing, and numerous crossings may affect a project's feasibility.

REAL WORLD EXAMPLES

Left: Denton Branch Rail-Trail
Middle: Northstar (commuter rail) Rail-with-Trail
Right: Lance Armstrong Bikeway



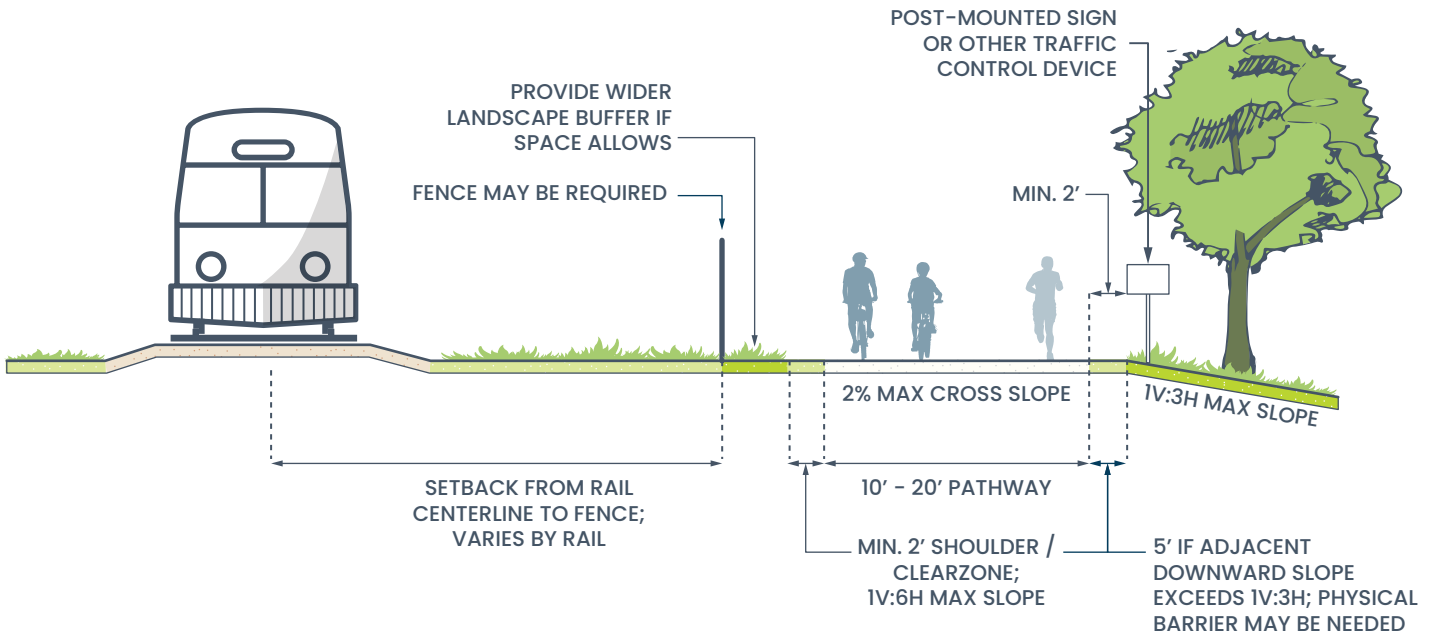
Denton, TX



Minneapolis, MN



Austin, TX



Design Guidelines

WIDTH:

A demand analysis, combined with the use of FHWA's SUPLOS Calculator, should be conducted to determine appropriate widths. 10-12' is a typical default SUP width, and 8' width is acceptable only in constrained conditions and for short distances (AASHTO Bike Guide Section 5.2.1).

SHOULDER / CLEAR ZONE:

Minimum 2' graded area (maximum 1V:6H slope) should be provided for clearance from landscaping or other vertical elements such as fences, light poles, sign posts, etc.; recommend aggregate or turf grass to prevent weeds from spilling onto trail.

VERTICAL CLEARANCE:

8' minimum, 10' typical.

SLOPE:

SUP slopes should be designed at 5% (greater slope is permitted, but should be limited, see

AASHTO); SUP cross slope should not exceed 2%.

RAIL SETBACK:

The FHWA Rails-with-Trails document provides no consensus on an appropriate setback distance between the paved edge of a trail and the centerline of the closest active rail track. Setbacks from active rail lines will vary depending on the speed, and frequency of trains, topography, sight distances, available right-of-way, and rail operator standards (FHWA 2002).

SECURITY FENCE:

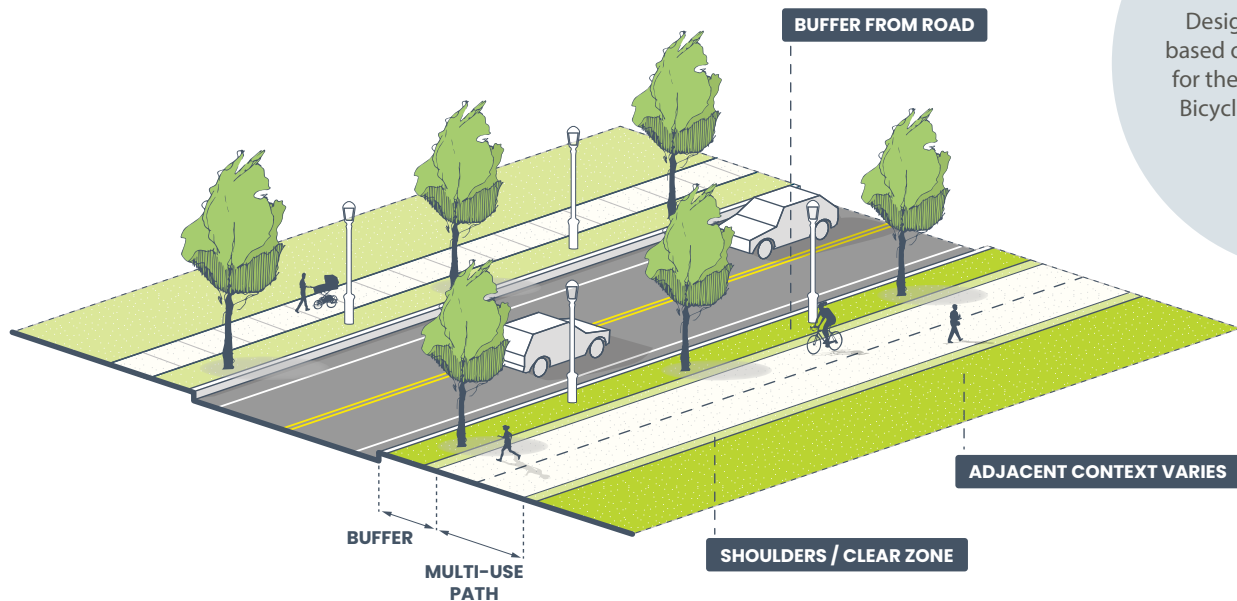
If required, fencing should be a minimum of 5' in height with higher fencing considered next to sensitive areas such as switching yards.

OTHER DESIGN CRITERIA:

SUP design should comply with all AASHTO requirements for shared use paths related to design speed, sight distances, stopping distances, and grades.

Shared Use Path

Roadway Corridor



Design guidelines are based on AASHTO, Guide for the Development of Bicycle Facilities (2012)

Shared use paths which are located alongside roadway corridors, also known as sidepaths, serve as both recreational and utilitarian routes. While this placement poses unique SUP challenges, such as driveway crossings and close proximity to moving vehicles, these trails create direct and important routes through the community.

Typical Application

When SUPs run alongside a roadway corridor, standard shared use path characteristics should be maintained in order to reinforce the continuity of the SUP and create a distinction between sidewalks and other nearby facilities. Buffer space of at least 5' between the roadway and SUP can include smaller vegetation, light and utility poles, and other physical barriers. A buffer must be at least 8' wide to accommodate trees.

REAL WORLD EXAMPLES

Left: 45SW Trail

Middle: CM Allen Pkwy Trail

Right: Olmos Basin Greenway Trail



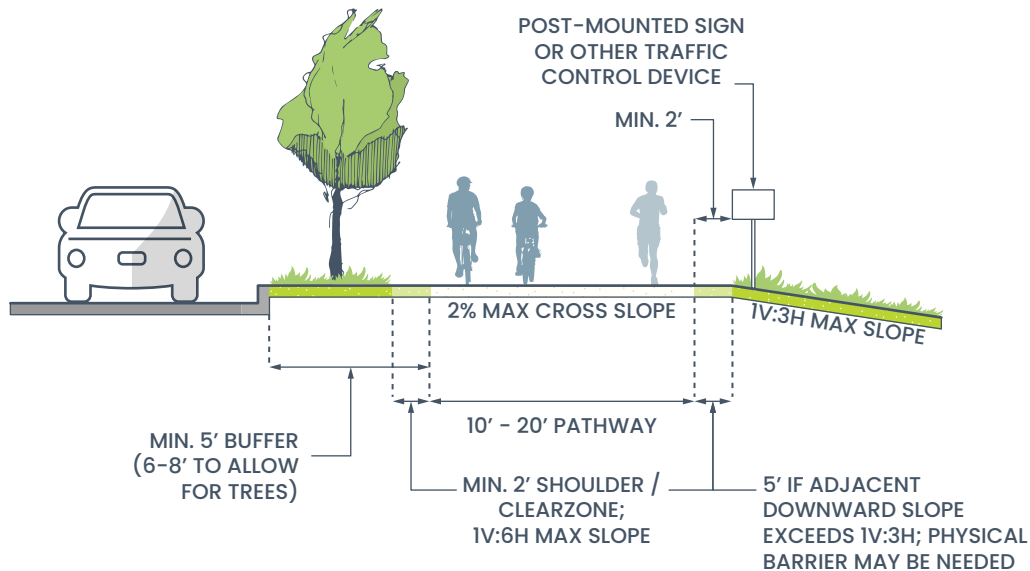
Austin, TX



San Marcos, TX



San Antonio, TX



Design Guidelines

WIDTH:

A demand analysis, combined with the use of FHWA's SUPLOS Calculator, should be conducted to determine appropriate widths. 10-12' is a typical default SUP width, and 8' width is acceptable only in constrained conditions and for short distances (AASHTO Bike Guide Section 5.2.1).

BUFFER:

A wide separation should be provided between the trail and adjacent roadway. The buffer is measured from the face of curb (if present) or the edge of the paved roadway, and should not be less than 8'. Paved shoulders do not count towards the overall buffer width. Greater separation is desirable along high-speed roadways. In either case, if proper separation is not achievable, a physical barrier or railing should be provided.

SHOULDER / CLEAR ZONE:

Minimum 2' graded area (maximum 1V:6H slope) should be provided for clearance from

landscaping or other vertical elements such as streetscape amenities, light poles, sign posts, etc.; recommend aggregate or turf grass to prevent weeds from spilling onto trail.

VERTICAL CLEARANCE:

8' minimum, 10' typical.

SLOPE:

SUP slopes should be designed at 5% (greater slope is permitted, but should be limited, see AASHTO); SUP cross slope should not exceed 2%.

OTHER DESIGN CRITERIA:

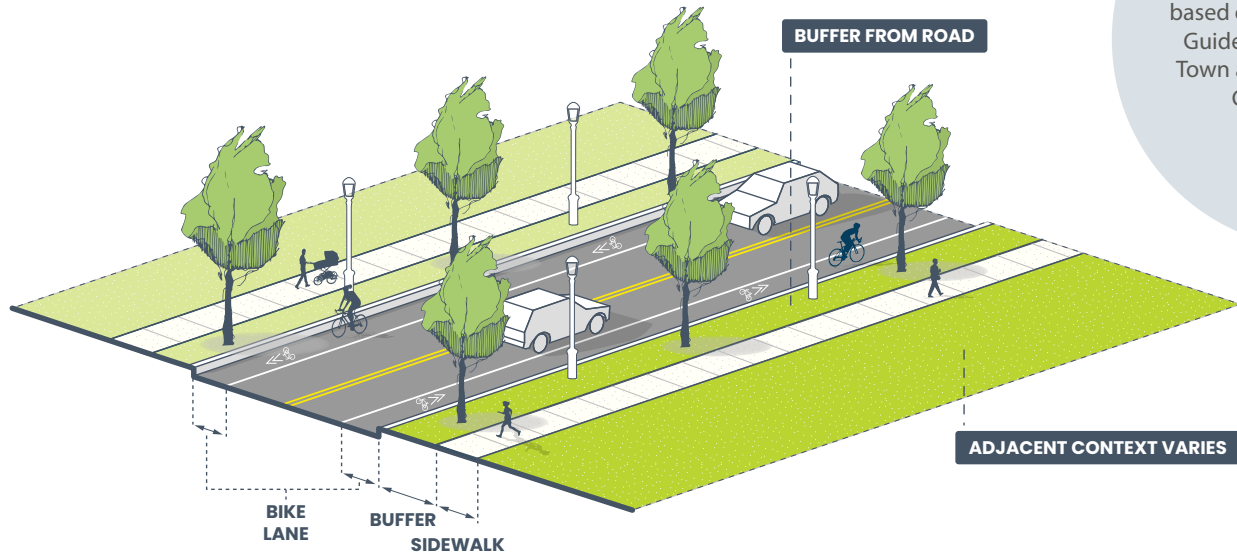
Trail design should comply with all AASHTO requirements for shared use paths related to design speed, sight distances, stopping distances, and grades. See AASHTO p. 5-8 for roadway corridor conflict considerations.

SIGNAGE:

Wayfinding or other informational signage, if located within buffer between roadway and trail, should be mounted at 7' from trail to bottom of sign and 2' from the side of the SUP (see MUTCD).

Sidewalks

Design guidelines are based on NACTO Design Guides and the Small Town and Rural Design Guide (2016)



Sidewalks

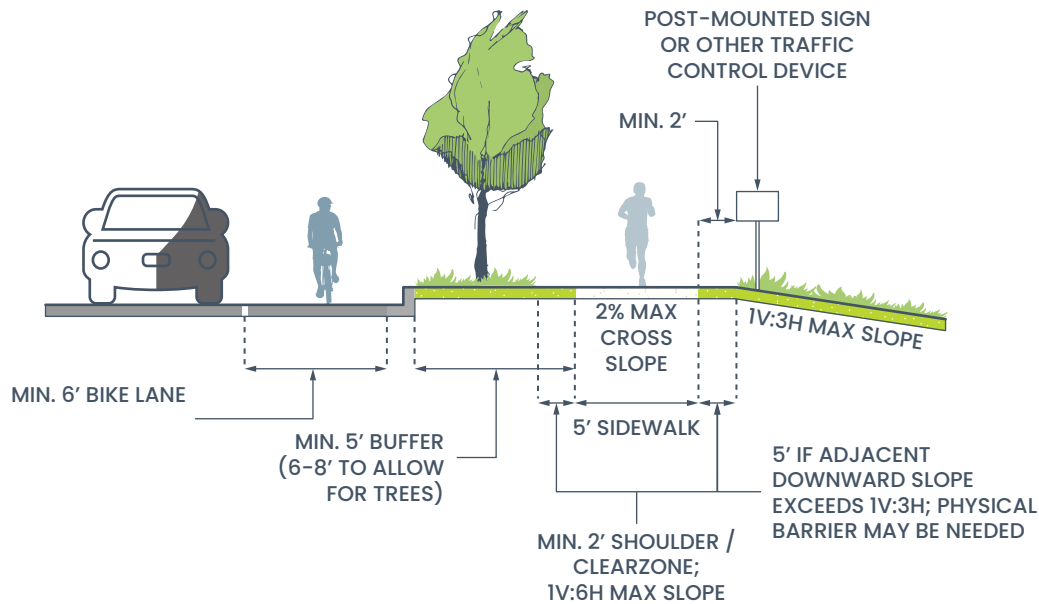
Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel separated from vehicle traffic. Providing adequate and accessible facilities can lead to increased numbers of people walking, improved safety, and the creation of social space.

Typical Applications

Sidewalks should be provided on both sides of urban commercial streets, and should be required in areas of moderate residential density. (1-4 dwelling units per acre).

When retrofitting gaps in the sidewalk network, locations near transit stops, schools, parks, public buildings, and other areas with high concentrations of pedestrians should be the highest priority.

In rural areas, no curb and gutter is necessary to establish a sidewalk. Instead, the sidewalk should feature a wide furnishing zone, which may be configured as an open ditch for stormwater catchment and infiltration. Ditches can be retrofitted into bioswales or rain-gardens for filtration and water purification.



Design Guidelines

WIDTH:

It is important to provide adequate width along a sidewalk corridor. A pedestrian through zone width of 6' enables two pedestrians (including wheelchair users) to walk side-by-side, or to pass each other comfortably.

In areas of high demand, sidewalks should contain adequate width to accommodate the high volumes and different walking speeds of pedestrians.

BUFFER:

Appropriate placement of street trees in the furnishing zone (minimum width 4') helps buffer pedestrians from the travel lane and increases facility comfort.

OTHER DESIGN CRITERIA:

At a minimum, the Americans with Disabilities Act requires a 3' clear width in the pedestrian zone plus 5' passing areas every 200'.

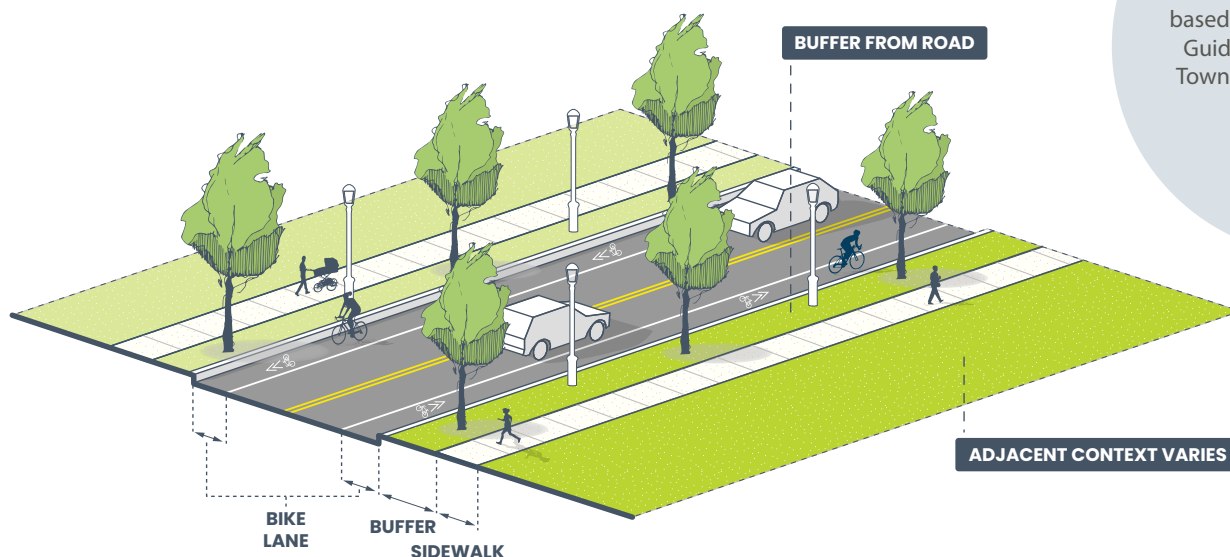
The clear width may be reduced to a minimum of 32 inches for short, constrained segments of up to 24 inches long, provided that constrained segments are separated by regular clear width segments that are a minimum of 48 inches long and 36 inches wide.

Providing a 6' clear width across the full corridor for all new sidewalks (and 12' or greater in downtown and pedestrian-priority areas) meets requirements for passing and maneuverability.

Existing deficient-width sidewalks are to be retrofitted to meet citywide standards.

Bike Lanes

Design guidelines are based on NACTO Design Guides and the Small Town and Rural Design Guide (2016)



Bike Lanes

On-street bike lanes designate an exclusive space for cyclists through the use of pavement markings and signs. Bike lanes are located adjacent to motor vehicle travel lanes and travel in the same direction as motor vehicle traffic.

Where additional width is available, or where additional distance from motor vehicles is desired, a marked buffer may be included between the bike lane and travel or parking lane.

Typical Applications

On streets with multiple travel lanes in any one direction, consider buffered or separated bike lanes for increased separation.

REAL WORLD EXAMPLES

Left: Bike lane along Escarpment Blvd in Austin, TX
Middle: S Alamo St in San Antonio, TX
Right: Hunter Rd in San Marcos, TX



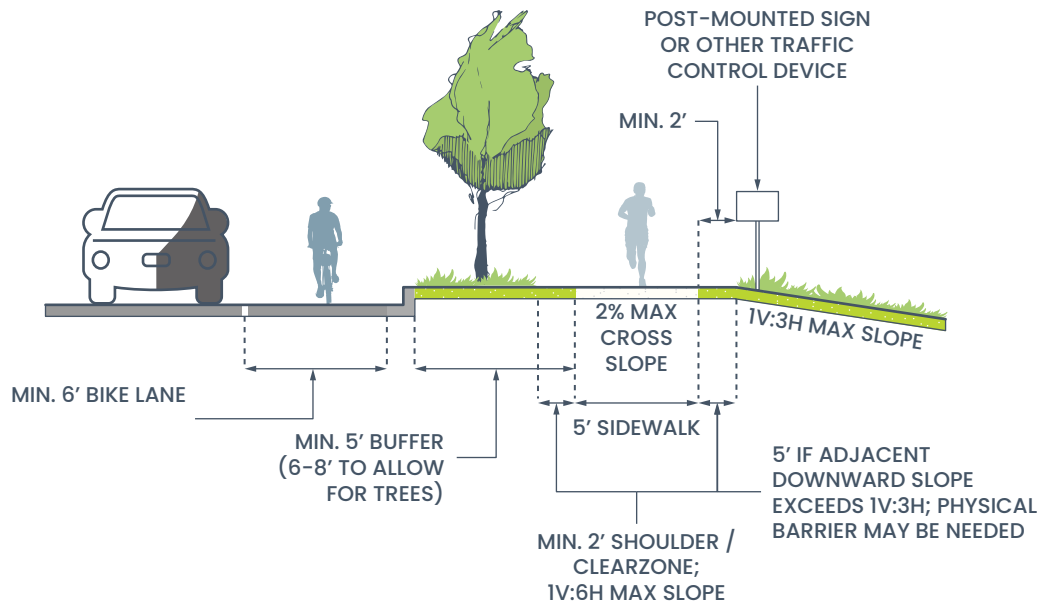
Austin, TX



San Antonio, TX



San Marcos, TX



Design Guidelines

WIDTH:

Standard bike lane width along the GSP corridor is 7' (2.1 m) preferred. In constrained conditions, minimum width is 6' (1.8 m) adjacent to on-street parking, 5' (1.5 m) adjacent to curb faces, and 4' (1.2 m) adjacent to road edge (AASHTO Bike Guide 2012).

BUFFER:

If used, bike lane buffers should be at least 2' (0.6 m) wide. If buffer area is 4' (1.2 m) or wider, white chevron or diagonal markings should be used (MUTCD 2009, 3D.02). At driveways, mark the inside buffer line with dotted lines.

OTHER DESIGN CRITERIA:

Where on-street parking is permitted, NCHRP Report 766 recommends installing a buffer space between the parking lane and bicycle lane rather than between the bicycle lane and vehicle travel lane.

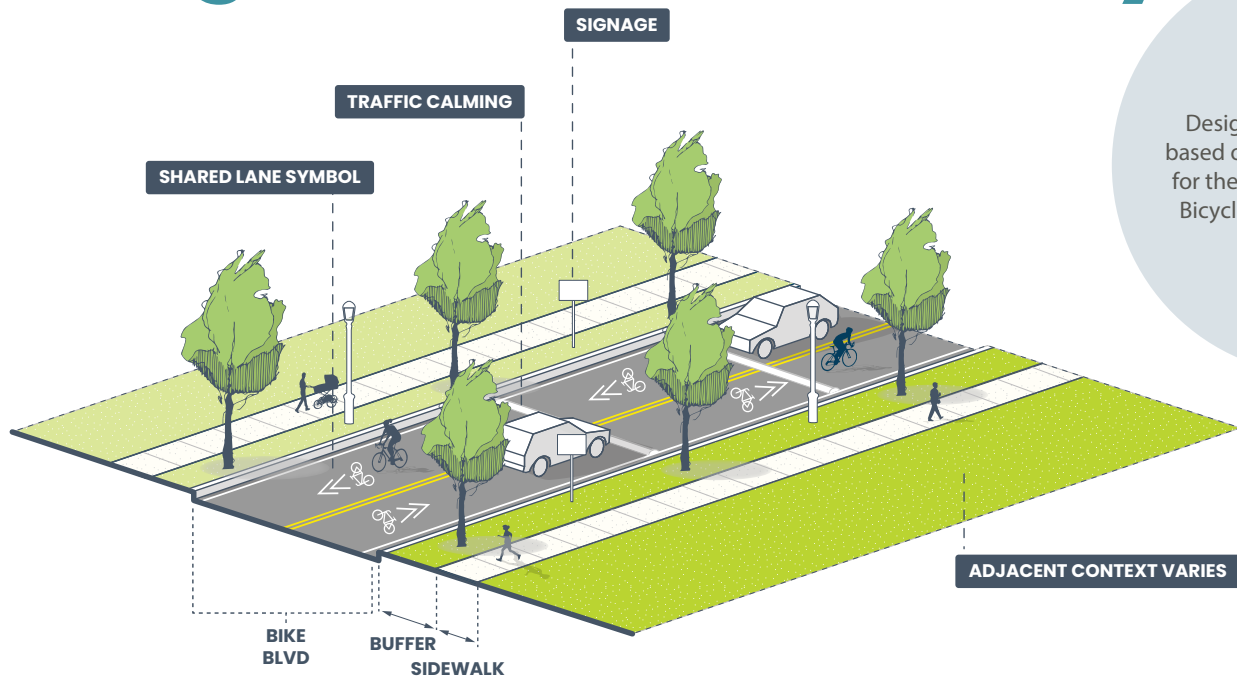
There are many strategies available to implement bicycle lanes into roadway resurfacing projects, including road widening, lane narrowing, travel lane reconfiguration and parking lane reconfiguration (FHWA Resurfacing Guide, 2016).

On high speed streets (≥ 45 mph) or multi-lane streets, a physically separated bike lane or sidepath is preferred over a bike lane or buffered bike lane for safety.

SIGNAGE:

Bike lane signs R3-17 (BIKE LANE) are required for use in conjunction with bike lanes; and additional supplemental signs, such as R3-17aP (AHEAD) and R3-17bP (END) may be used to indicate bike lane provision.

Neighborhood Bikeway



Design guidelines are based on AASHTO, Guide for the Development of Bicycle Facilities (2012)

A bike boulevard is a low-speed, low-volume roadway that is designed to enhance comfort and convenience for people cycling. It provides better conditions for cycling while improving the neighborhood character and maintaining

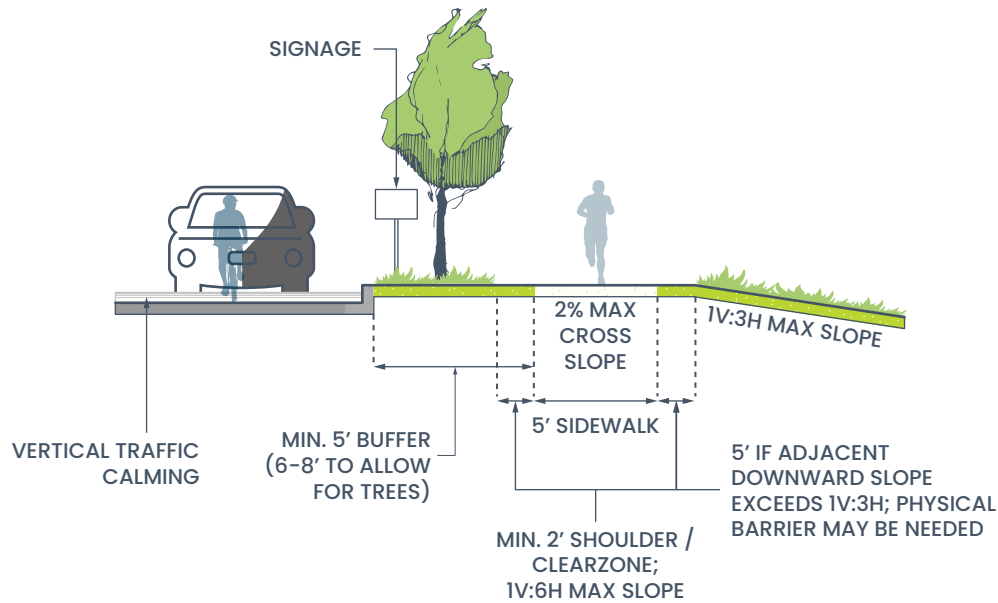
emergency vehicle access. Bike boulevards are intended to serve as a low-stress bikeway network, providing direct and convenient routes. Key elements of bike boulevards are unique signage and pavement markings, traffic calming

and diversion features to maintain low vehicle volumes, and convenient major street crossings.



Concept for a neighborhood bikeway from the City of Austin.

<https://www.austintexas.gov/page/neighborhood-bikeways-0>



Design Guidelines

GENERAL DESIGN CRITERIA:

Signs and pavement markings are the minimum treatments necessary to designate a street as a bike boulevard.

Implement volume control treatments based on the context of the bike boulevard, using engineering judgment.

Intersection crossings should be designed to enhance comfort and minimize delay for cyclists of diverse skills and abilities

TYPICAL USE:

Parallel with, and in close proximity to major thoroughfares (1/4 mile or less) on low-volume, low-speed streets.

Follow a desire line for bicycle travel that is ideally long and relatively continuous (2-5 miles).

Avoid alignments with excessive zigzag or circuitous routing. The bikeway should have less than 10% out of direction travel compared to shortest path of primary corridor.

Local streets with traffic volumes of fewer than 2,500 vehicles per day and posted speed limits of 25 miles per hour. Utilize traffic calming to maintain or establish low volumes and discourage vehicle cut through / speeding.

FURTHER CONSIDERATIONS:

Bike boulevards are established on streets that improve connectivity to key destinations and provide a direct, low-stress route for cyclists, with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority over other modes.

Bike boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for cyclists, these intersections can become major barriers along the bike boulevard.

Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

Safe Crossings

For most people, interaction with vehicle traffic is one of the primary deterrents to using active transportation, which is why off-street trails attract such a wide range of people (see CAMPO's 2045 Regional Active Transportation Plan, page 1-7). However, unless careful consideration is given to how trails cross streets, highways, and other barriers, the concern over safety will still be prevalent in people's decision to use trails.

Selecting a Crossing Treatment

Selecting the most appropriate trail crossing treatment depends on the characteristics of the barrier that the trail crosses. Treatments range from simple marked crosswalks to full traffic signals or grade-separated crossings. An engineering study should be conducted for each crossing to determine the most appropriate treatment, and should consider:

- ★ Number of lanes
- ★ Presence of, or opportunity for, a median
- ★ Distance from adjacent signalized intersections
- ★ Trail user volumes and delays
- ★ Vehicle speeds and volumes
- ★ Geometry of the location
- ★ Possibility to consolidate multiple crossing points
- ★ Availability of street lighting

Contextual Guidance

The matrix below provides guidance for crossing treatments when a pathway crosses a street or highway at unsignalized locations and should be used during the design process when considering appropriate crossing treatments. More information can be found in FHWA's *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* (2018).

		Local Streets 15-25 mph			Collector Streets 25-30 mph			Arterial Streets 25-45 mph						
CROSSING TREATMENT		2 lane	3 lane		2 lane with median refuge	3 lane		2 lane with median refuge	3 lane	4 lane	4 lane with median refuge	5 lane	6 lane	6 lane with median refuge
1	Crosswalk Only (high visibility)	✓	✓		EJ	EJ	X	EJ	EJ	X	X	X	X	X
	Crosswalk with warning signage and yield lines	EJ	✓		✓	✓	✓	EJ	EJ	EJ	X	X	X	X
	Raised Crosswalk	✓	✓		✓	✓	EJ	EJ	X	X	X	X	X	X
2	Active Warning Beacon (RRFB)	X	EJ		✓	✓	✓	✓	✓	✓	✓	X	X	X
3	Hybrid Beacon*	X	X		EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓	✓
4	Full Traffic Signal	X	X		EJ	EJ	EJ	EJ	EJ	EJ	✓	✓	✓	✓
5	Grade separation	X	X		EJ	EJ	EJ	X	EJ	EJ	✓	✓	✓	✓

LEGEND	
Most Desirable	✓
Engineering Judgement	EJ
Not Recommended	X

*Hybrid beacons should not be used in conjunction with railroad crossing signals due to the similarity in lens and flash pattern. Use full traffic signal instead.



CROSSWALK

Where streets are 2-3 lanes wide and vehicle speeds are low (15-25 mph), a crosswalk should be considered. Crosswalks consist of high visibility paint at a minimum, and may include pedestrian crossing signs with supplemental yield triangle pavement markings. Raised crosswalks should also be considered as a traffic calming measure and to prioritize pathway users.



ACTIVE WARNING BEACON

An active warning beacon is an appropriate treatment when 2-3 lane roads have more moderate vehicle speeds (25-40 mph). This treatment consists of high visibility crosswalks and pedestrian warning signage with Rectangular Rapid Flashing Beacons (RRFBs) mounted to the sign post. RRFBs are typically push activated, but can also include passive detectors that recognize pathway users and immediately activate the RRFB. When possible, pedestrian refuge islands should be included.



HYBRID BEACON

Hybrid beacons should be installed at crossings of streets that are more arterial in nature, either due to high vehicle speeds or number of lanes. Hybrid beacons are centered over each travel lane, typically push activated, and are accompanied by signage to indicate to drivers where to stop and how to interpret the light patterns. Hybrid beacons should not be used in conjunction with railroad crossing signals due to the similarity of flashing signals (use full traffic signal instead). It is important that the beacon is immediately activated after the button is pushed, unless there are nearby signals to coordinate timing.



FULL TRAFFIC SIGNAL

The use of a full traffic signal at a mid-block location would require a signal warrant as outlined in the Manual on Uniform Traffic Control Devices (MUTCD) and should be considered where pathways cross arterial roads in conjunction with a railroad crossing or where high volumes of pathway traffic is anticipated.



GRADE SEPARATION

Grade separated crossings include bridges and undercrossings and should be used when physical barriers such as canals or creeks need to be crossed, or when an at-grade street or railroad crossing is deemed unsuitable through an engineering analysis. Bridges and undercrossings should be at least 14' wide (16' preferred). Greater widths are preferred for undercrossings that are longer than 60'. Undercrossings should have a minimum vertical clearance of 10', and lighting should be considered, especially in culverts or tunnels or when high use is anticipated.

Wayfinding Signage

Description

Developing a consistent regional wayfinding experience through adherence to best practices will improve the user experience along the Great Springs Trail and facilitate more regional trips by foot or bike. Bicycle wayfinding signage provides information on direction and distance to key regional destinations and other routes. This plan provides guidelines for the region to develop their own wayfinding, including sign design and placement.

A coordinated, well-designed signage system improves the coherency of a trail network. It also provides a greater sense of security and comfort for users by confirming that riders are on the correct route and are aware of how far they will have to travel to reach their destination. On-street bicycle wayfinding signs also provide visual cues to motorists that people on bikes may be present and should drive with caution.

Signage should provide a sense of identity and utility for the trail network. The signage program should adhere to a consistent, selective, and strategic manner so as not to clutter or dominate the visual character of the trails. The signs should also be easily reproducible, since the implementation and construction could take place over many years.

Goals

The following goals were developed to guide the design of the Great Springs Trail wayfinding system, to ensure that the proposed design suits the needs of the corridor, and its users.

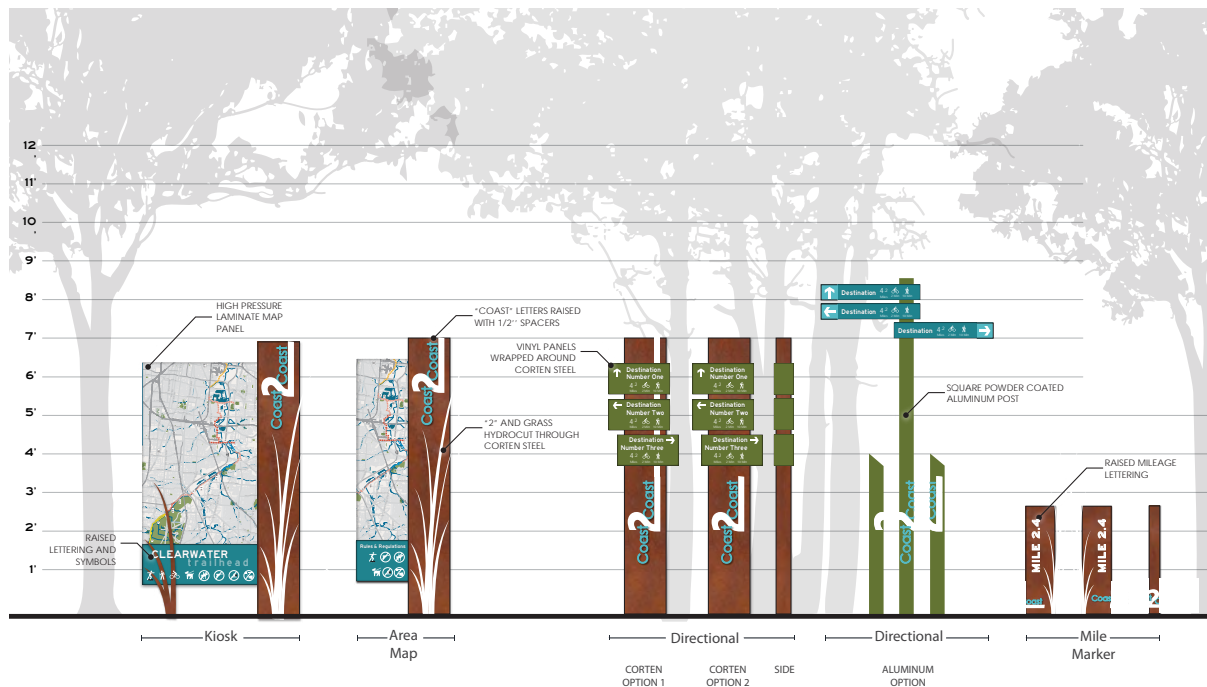
- ★ Enhance awareness for users that they are along a larger trail network.
- ★ Improve wayfinding throughout the sub-areas.
- ★ Improve connections to trail networks from adjacent neighborhoods/communities, improve connections from the trail network to nearby amenities, cultural destinations or recreational destinations.
- ★ Mark the national historic trail (NHT) in places where the Great Springs Trail closely follows the NHT corridor. The National Trails office can provide information on the NHT standard pedestrian sign types that are used to mark the NHTs. This signage was designed to pair with other local trail signage.
- ★ Enhance education opportunities about local history, amenities, culture, and ecology.

Destination/Directional Sign Guidance

The ability to navigate through a community is informed by landmarks, natural features, and other visual cues. Wayfinding signs indicate the direction of travel and the location of destinations and access points along the way. These signs increase users' comfort and accessibility to the trail network. Signs should typically be placed at key locations leading to and along routes, including the intersection of multiple routes.

Directional signs serve many purposes, including:

- ★ Helping to familiarize users with the trail network.
- ★ Helping users and emergency responders identify locations, in case of emergency on the trails.
- ★ Helping users identify the best routes to destinations.
- ★ Helping overcome a "barrier to entry" for people who do not use the trail network.
- ★ Helps users find access points to the trail network.



Example of a trail network wayfinding signage package.



Appendix B

Public Engagement

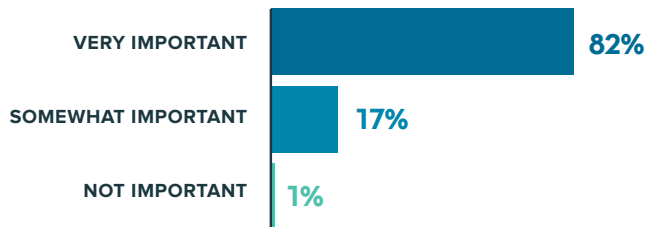


Public Survey Results

639 Submissions



HOW IMPORTANT TO YOU IS THE GOAL OF CREATING THE GREAT SPRINGS TRAIL?

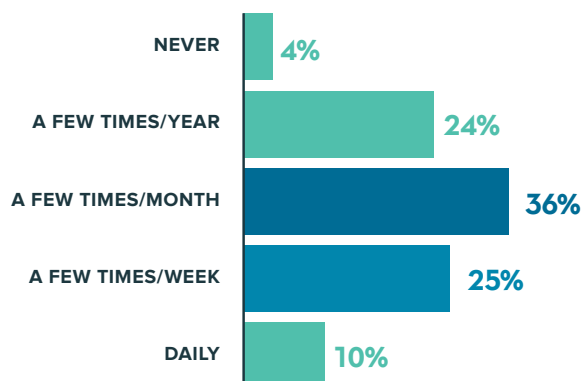


99%

RESPONDED THAT THE GOAL OF CREATING THE GREAT SPRINGS TRAIL IS VERY OR SOMEWHAT IMPORTANT



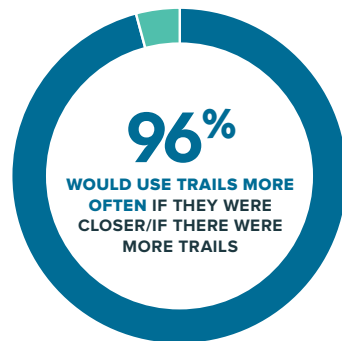
HOW OFTEN DO YOU USE TRAILS NOW?



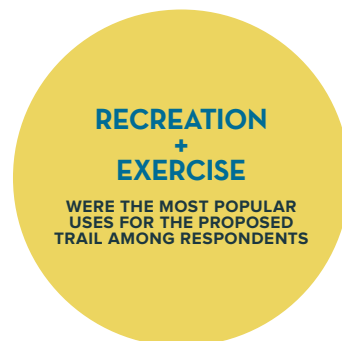
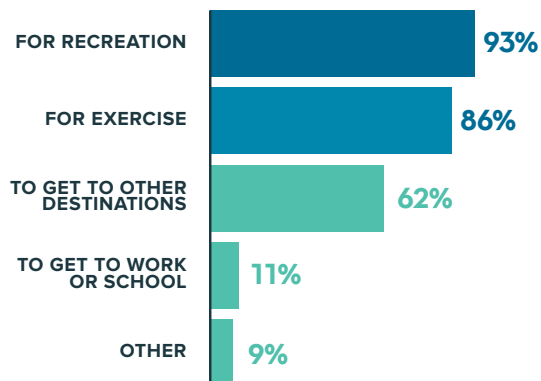
72%

OF RESPONDENTS USE TRAILS A FEW TIMES A MONTH OR MORE

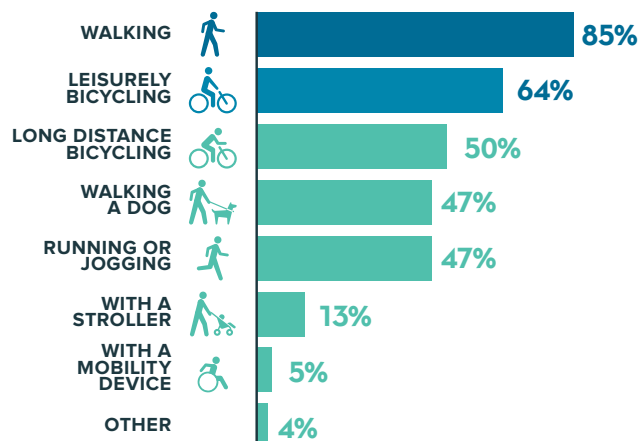
? **WOULD YOU USE TRAILS MORE OFTEN IF YOU WERE CLOSER TO THEM, OR IF THERE WERE MORE OF THEM?**



? **HOW WOULD YOU OR A FAMILY MEMBER IN YOUR HOUSEHOLD USE THE PROPOSED GREAT SPRINGS TRAIL?**

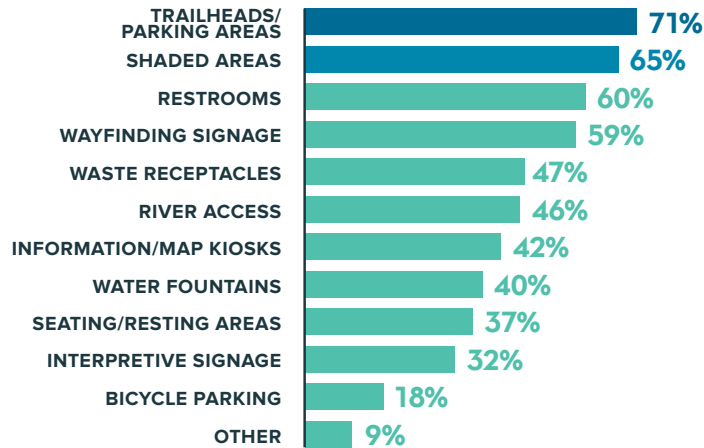


? **HOW WOULD YOU OR A FAMILY MEMBER IN YOUR HOUSEHOLD TRAVEL ALONG THE TRAIL?**





WHAT TRAIL FEATURES ARE MOST IMPORTANT TO YOU?



60

SELECTED
OTHER

CLEAN! Trash cans are eyesores, but better than a trail with litter

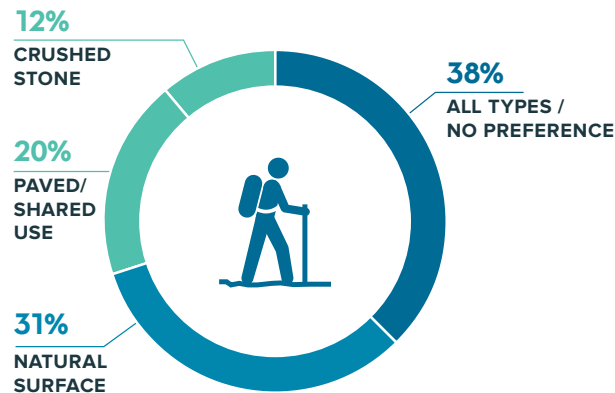
Not overdeveloped—leave some nature

Sufficient width for bicycle and pedestrian use

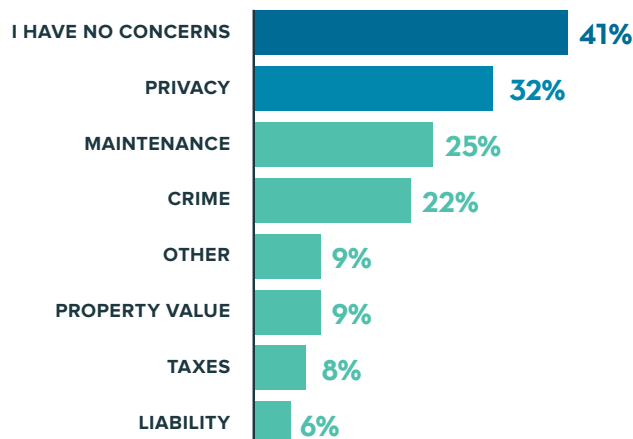
Primitive camping sites



IN GENERAL, WHAT TRAIL TYPE DO YOU MOST PREFER?



WHAT WOULD BE YOUR MAIN CONCERN ABOUT TRAILS IF YOU WERE A NEARBY LANDOWNER OR LIVED NEARBY A TRAIL?



41%

OF RESPONDENTS HAVE NO CONCERNS ABOUT LIVING NEAR TRAILS

? ARE THERE OTHER COMMENTS YOU WOULD LIKE TO SHARE ABOUT THE GREAT SPRINGS TRAIL?

224
RESPONSES

I'm a land owner who gave some of his land to a right of way, I'm all for it!

It sounds like a great initiative and I like the big thinking of it.

I am so happy and excited about this project. Looking forward to enjoying the new trail.

This will be the most exciting trail to come from Texas, and will benefit many people.

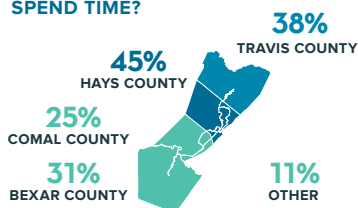
Important piece of planning for future. wish we had started this 50 years ago!

I hope this can become a reality very soon.

We are incredibly excited about this project—please keep the community posted on progress and how / if we can assist

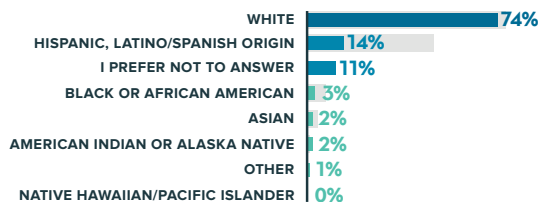
Hoping camping overnight would be allowed in certain areas for thru hiking

? WHERE DO YOU LIVE, WORK, OR SPEND TIME?

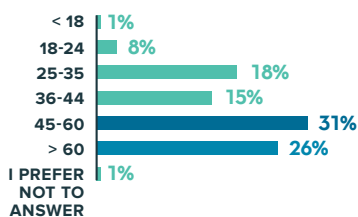


? WHAT IS YOUR RACE/ETHNICITY?

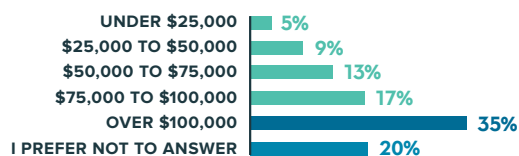
The gray bar represents an approximation of population share in Bexar, Comal, Hays, and Travis Counties.



? WHAT IS YOUR AGE?



? WHAT IS YOUR ANNUAL HOUSEHOLD INCOME?



The public survey remains open into 2022 as GSP continues to evaluate and adjust engagement methods to reach a broader range of people. See last page of this Public Engagement Appendix for next steps of GSP engagement.

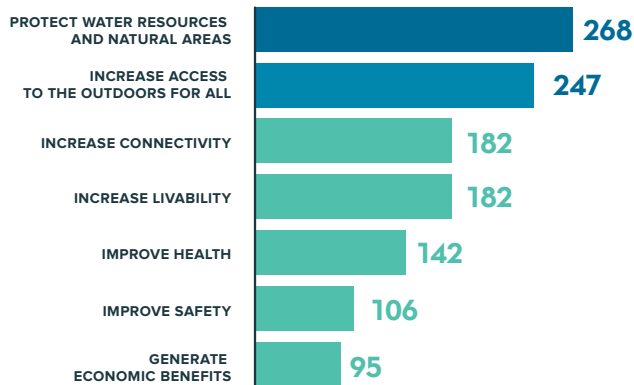


Public Webinar Results

56 Participants



PLEASE RANK THESE GOALS FOR THE GREAT SPRINGS TRAIL PLAN:

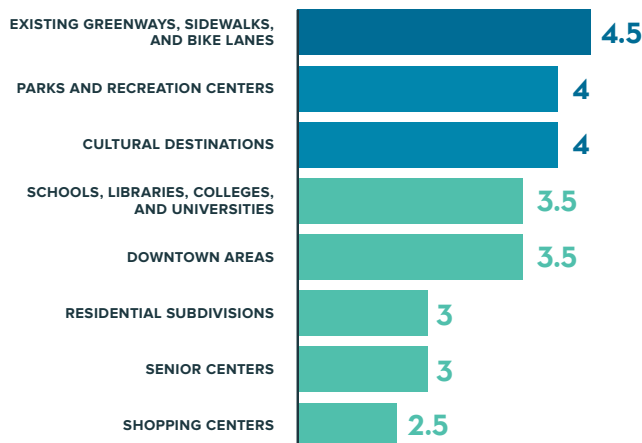


**PRESERVATION
+
ACCESS**

WERE THE MOST POPULAR GOALS FOR THE GREAT SPRINGS TRAIL PLAN



IN ADDITION TO THE ACTUAL SPRINGS, WHAT IS MOST IMPORTANT FOR THE GREAT SPRINGS TRAIL NETWORK TO CONNECT TO...



**EXISTING ACTIVE
TRANSPORTATION
FACILITIES**

WERE THE MOST POPULAR CONNECTIONS FOR THE PROPOSED TRAIL AMONG RESPONDENTS



WHAT DOES SUCCESS LOOK LIKE FOR THE GREAT SPRINGS TRAIL, FROM YOUR PERSPECTIVE?

***A connected trail
that includes all
communities***

*Protecting lands and
waters for future
generations*

*A unified trail network with
consistent signage and
shared maintenance and
operation, with opportunities
for storytelling and activation*

*Accessible via walk, bike,
wheelchair (even if there
are different parallel routes
for some sections)*

***Increased access
to nature and
protecting the
springs***

*Asset to regional quality of
life, while protecting the
aquifer.*

44

RESPONSES

***Deeping and making
more healthy the
connection between
those that have
settled here and
Indigenous Peoples,
lands and waters***

*Get more people outdoor
and reconnect people with
nature*



Pop-Up Engagement

November 11, 2021

San Antonio at Salado Creek Trailhead/Loop 1604
Planners met with about **70** trail users



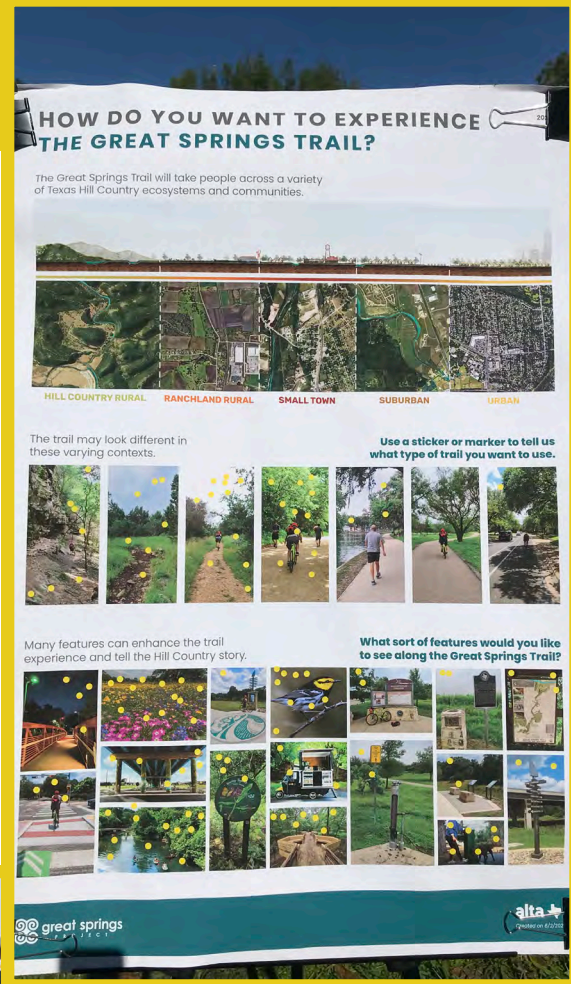
November 12, 2021

Violet Crown Trail trailhead at Barton Springs
Planners met with about 45 trail users





Dot Voting Results from Austin Pop-Up



Dot Voting Results from San Antonio Pop-Up



Public Input Open-Ended Responses

Table 9. Q1 – How important to you is the goal of creating the Great Springs Trail?

LET US KNOW WHY YOU FEEL THIS WAY (OPTIONAL)

These comments are listed as received and have not been edited or modified.

THE ENVIRONMENTis our future

The intentions are good, but the plan is vague, unclear. The trail has been blocked by current development and more is coming. There's no land for it. I don't see people walking that far.

We are short on Rails to Trails in Texas! This is similar -- a nonmotorized path for recreation and greenspace.

I've thru-hiked other trails in the US, and clearly understand the societal benefits of an outdoor hiking trail.

The 4 sacred springs are important to the Indigenous peoples of Central Texas and they have been the original caretakers for millennia. They should be appreciated but also protected.

I feel that it is important to create trails that can motivate our community to be outdoors a bit more. It is not extremely important but in some areas there aren't many recreational areas available.

Definitely need more and longer hiking trails here in New Braunfels.

Bikes are key: health, environment, happiness, conservation.

the four springs of this area are important to me and my ceremonial community, it is also a source of joy and recreation.

Protecting green space along one of the nation's most rapidly developing corridors, alternative connectivity and mobility between Austin and San Antonio, promoting and educating environmental awareness and appreciation.

These lands are sacred indigenous lands which have been stolen by non-indigenous White settlers. Indigenous people care for 80% of the world's biodiversity and yet have been forced off, murdered, incarcerated, and relocated to barren lands. These "public lands" and private lands are largely "owned" by White settlers. To this day, indigenous peoples are fighting for land back because White settlers have forcibly extracted fossil fuels from mother earth literally endangering the existence of humanity and causing climate chaos. White settlers feel entitled to and see mother earth as a resource in which they can extract from nonstop, and trash when they are done. They see themselves as superior and separate from earth. What indigenous people fight for is for balance and harmony between living beings of this planet and the planet and universe itself. So instead of these "trails" give the land back to the rightful owners- indigenous peoples that see themselves as part of the land and not separate or superior to it.

Non-carbon producing transportation will become more important going forward. Even the switch to electric vehicles is only a temporary solution. The automotive and highway building industries have long had the upper hand as far as money and influence in the halls of policy making. It is time for that political focus to shift and GSP can be instrumental in that process.

I think it's a great project that will benefit the whole community

People have a need to get outside and move but it's getting hard to find a safe public space that this can be done. We need to set aside land now before it's all paved over.

"...when you walk in another man's shoes..." A trail such as this will allow people not only to appreciate the old trails our ancestors had to traverse to get from one city to the next, it will also serve to allow people to truly appreciate nature as they walk along an intentional path. I cannot wait. Imagine the pilgrimages people could partake in? Although I am not religious, I assume the journeys I could take will definitely have a spiritual effect on me. Nature has always done that to me. It always will.

Important legacy for our great state especially given the iconic beauty of this unique region in the heart of Texas. It is also important to increase access to greenspace amidst diminishing opportunities as we've learned through this global pandemic. Perfect way to celebrate Texas' 200th birthday in 2036!

Given the explosive growth of this region, conservation of these precious springs is a critical objective.

I don't want to attract more people.

I think it's inspiring and will bring awareness of our special and vulnerable aquifer systems, opportunity for recreation, and even economic perks. I just don't want the project to detract from land conservation efforts that are close but not part of the trail system.

First and foremost it's because it is vital to the surrounding areas to have the recharge zone protected, it plays such an important role in our daily lives, we are reliant on it and it would be silly not to protect it. In addition it would be such a beautiful addition for recreational purposes, i would definitely take advantage of the trails and ride my bike exploring new areas of central texas.

Tourism, economic impact, conservation...not necessarily in that order

Great for providing a place for people get outdoors and BE in nature, protecting land and natural vegetation, drawing attention to the springs and, hopefully, inspiring more interest in aquifer protection, and providing a great 'natural attraction for visitors.

It would be an incredible outdoor offering for the Austin area and make us feel more connected to a great town like San Antonio

i live in Fischer where there is no trails or green belts. we have to go to Wimberley or Hancock

Texas - especially central Texas, is in desperate need of more trails!

We need to protect green space while it's still undeveloped.

My family, adult children and grandchildren, all live to walk and hike. It is so important to have hiking trails close by and I know this will help preserve the aquifer.

I would use this trail and use it often! For me, a destination is motivating with my cycling!

the preservation of mother nature is a necessity

I think conservation of the Edwards aquifer is so important. Creating this trail will provide Texans a way to enjoy nature and remember how important it is that we protect our great state and it's resources.

I think nature is one of the most beautiful things on this plant and we should protect it no matter what. By creating trails it allows us to show kids and even adults how pretty nature can be and why it's important to keep it around.

BECAUSE THIS WOULD BE AMAZING

Preserving wilderness

It's absolutely amazing that we're doing things like this, I've always wanted something like it.this makes the earth so dam pretty

Preserve wildlife and more walking space

I feel like conserving the land and protecting the aquifer is important.

There is not a lot of safe trails for people

For conservation and the preservation of the indigenous lands

I feel as though it would be amazing to have a trail like this and potentially get more people outside in nature. A trail like this is sure to attract bikers, runners, hiker, and potentially even tourists because of its size and location. Over all I think it would be an amazing way to experience nature.

It gives people the opportunity to bike/hike. It help people train for much larger marathons

Conservation and appreciation of nature is very important.

Me and my family are big hikers/bikers and I feel like this trail would be really cool for not only is, but people like us. It poses a really cool challenge!

I am an outdoor athlete, so trails are very important to me.

Green space and having the ability to take my family to these types of areas is harder a JD harder to come by. Growing up on a ranch in South Texas it was nearly unlimited for me but I see the need for it my children. It detaches you from the everyday hustle, Netflix, IPads etc. it reduces anxiety and makes for better, calmer, more peaceful kids.

There is not a better way to help connect people with nature than by leading them through nature. The Great Springs Trail will connect communities and provide benefits that will range from spiritual, environmental, social, and more for generations and generations.

Promotes healthy living

We are losing green space at a phenomenal pace!

We need to protect undeveloped land and the clarity and biodiversity of our spring and ground water supply.

These waterways are the heart of Texas - ecologically, culturally, and spiritually. Protecting these springs and bringing awareness to their influence and our impacts creates an opportunity for greater community engagement, enjoyment and responsibility.

I'm an avid hiker and love the outdoors.

Open and green spaces improve water quality, air quality, health and quality of life for residents. So that alone is reason enough. However, it is the transportation aspect that particularly appeals to me. As a cyclist I am finding that as more homes go up in and around San Marcos, the increased traffic has made a number of cycling routes untenable due to safety. What I want most is cycling routes which are completely segregated from car traffic. Doesn't matter whether the surface is paved or unpaved.

Sounds awesome execute this

Outside recreation is vital to health. Our son is disabled and uses a adapted bike, and he is not safe riding on the streets. He and others need this trail for outside exercise opportunities.

So desperately needed. There is not enough green space in comal county specifically new braunfels is pathetic. This trail will help bring to the forefront the need for this.

I feel very strongly about the value of exercise. The infrastructure of the GST would motivate citizens to get out and enjoy, and benefit from the exercise! The tourism value would generate thousands of jobs also!

Safer places to ride, hike, more green spaces. Get away from cars!

Thing our communities in ways that aren't freeways and preserving natural space is critical as the population grows.

Conservation

I am a cyclist who enjoys introducing the sport to more females and want them to feel safe when riding.

Cyclist definitely need a safe place to cycle. The growing number of deaths on the road. The refusal by the government to sign a 3 feet bill into law. Texas drivers are very aggressive when they see and approach us when we are on the road.

Our family loves trails of all kinds

Public access to these natural resources for leisure & recreation is too limited by private land ownership. The symbolism it presents that the well-being of human individuals and human society as a whole are dependent on a healthy natural environment is so important now and going into the future.

This would be amazing!!

I love walking, biking, being outdoors. Having a safe place to do that is very important!

We need more ways to connect with Nature here - especially with the way this area is growing

Having such a trail reflects importance of natural resources and lends opportunity for greater respect and learning about the aquifer to future generations. They can build on this beginning (grow the project in time).

We need more connected green spaces! There are plenty of parks and natural features, but no great way to get to them other than by car.

Sprawl is getting out of control and I'd love to see some preventative measures in place to keep some green space.

We live in a beautiful place and there are not enough options to get outside and travel outside of a vehicle!

First I have heard of this, but I believe trails enhance a community.

We are going so quickly that we need to start ensuring that we our land from being over developed

As a cyclist this would make Central Texas one of the premier destinations to ride your bike.

Love of traveling by bicycle and my love of Texas. Not to mention the mental and physical wellbeing that comes with turning the cranks.

Showing love to the Earth

I see the population in the are is growing rapidly and constructions of houses, businesses and roads. While all the development is clearing the wildlife, we should work on preserving the nature, land and wildlife and think about how to coexist with the nature.

The Great Springs Trail has never been more important than today and into our future as it will play a significant role in mitigating several exponential concerns: (1) population growth along the I-35 corridor and its corresponding demand on a clean, abundant water supply; (2) the increased pressure to build housing from Austin to San Antonio; and (3) the advent of COVID and the need for exercise and pleasure derived from being out-of-doors.

Preservation of natural resources and open space are critical.

We owe it to the next generations to protect our planet.

Texas because of its integration into the United States has very little public lands, especially near the major metropolitan areas. This trail would provide some sorely missed recreation.

I will use it, but I also think it will be great for tourism

Sounds great but don't know much about it

It will encourage people to get outside and exercise. It's a great stress reliever and brings people together.

trails are important for transportation and recreation, connecting people

Improves quality of life by getting folks outside!

Preservation of recharge land, conservation of native and endangered species, outdoor recreation opportunity

We need to preserve more of the rapidly depleting wild spaces for human enjoyment and conservation for all the wild civilization depends on. Making these areas connected and usable infrastructure is a huge bonus.

Would not use often but would enjoy occasionally. Mostly interested in protecting space from development and making wildlife available to enjoy.

The trail will provide a great recreational amenity for many different communities while also protecting watersheds, forests, and wildlife habitat.

As people are able to see and experience the springs they realize the importance of the aquifers.

It would be nice, but would take a lot of work and may not even be possible.

With increasing development, it will become impossible to do this in the future - now is the time. And at my age, now is the time if I ever want to enjoy hiking the Great Springs Trail!

It would be great to physically link the trails, but also to collectively grow a voice to protect open green spaces throughout the region.

We need more non-motorized vehicle transportation options. The trails will improve access to, and therefore quality of life for, Hays Cty/Central TX residents.

I think it would be great to hike this and visit these fantastic resources.

I am from San Antonio, attend Texas State University in San Marcos, and hope to work in Austin someday and as an environment management and nature and heritage tourism student I am really invested in expanding green spaces in the region and protected places.

Now more than ever, for many reasons including population growth and urbanization, it is so important to protect our green lands and spaces

We need recreation options that don't involve using motor vehicles.

I love to hike and the idea of connecting trails appeals to me.

People outside in nature, both working on the natural areas and just enjoying the areas, is a good thing.

It's important to have areas where people can safely enjoy the outdoors.

This is a very cool idea that will preserve green space and benefit generations.

I am a life long hiker and currently lead Saturday morning hikes for the San Marcos Take a Hike Group. I am also a member of the SMGA trail crew.

This trail will be valued and loved in the future.

These types of areas contribute to a better quality of life and appreciation for nature.

Recreation is tge way to go. What a great trail concept.

Comprehensive plan for larger area.

We need to save green space any way we can.

because preservation of land over the recharge and contributing zone is a critical goal not just locally but globally (climate change)

More miles of trails is always great. It will get more people outside and less people on the roads.

Any way we can conserve greens pace not only for the aquifer, & humans bird for migrating birds.

It is important to have areas that are protected from urban development but doing in the form of trails and park land encourages outdoor activities. So it is a win, win for two different priorities.

Conserve land for green space and recreation is important.

Alternative transportation corridor is important option as population explodes in central Texas. Preservation of sensitive natural areas important for flood mitigation.

no comment

We have a unique opportunity to create a park system and greenspace over a 80 mile area. Soon, this will be impossible because the area will be too built up. Trails around San Marcos and Austin are very heavily used. We need more space for our increasing population and to preserve our hill country environment.

The outdoors are a great way to connect people, and are great for mental health.

This frail increases options for being outdoors participating in healthy activities

I've always thought having a lot of parks would be a saving grace for aquifer and springs and supportive ecosystems. It's the new times, tourism and recreation and nature for children are the way to build unity. NE Ohio's Metroparks trails now includes shorelines and rivers, reviving a stalled growth and shoddy environmental protection. Great idea,

The loss of habitat is devastating. Trails are good for people and birds.

so more and more people can come to love this earth. we protect what we love.

Keep land out of the hands of Bill Gates and his business is good for America.

I live in Kyle and I'm a cyclist and mountain biker who would use the trail a lot. I want these amenities available for my daughter when she is old enough.

With the growing population, more land is being used to build and less preserved. But we can all agree that it's better to live in a walkable town with parks and trees-even in a city. So why is the first thing we do when growing to cut down trees and pave the grass? This trail will not only provide needed green space but also encourage trekking and the outdoor lifestyle popular in Europe and right to roam countries.

Important for public to access green spaces and more important for protection of water resources

Texas is becoming overpopulated in regions where the public, shared land space is limited. This project will help everyone see more and understand how precious it is.

More access to nature is critical

These kinds of projects are interesting and beneficial. The term 'very important' should be reserved for a different class of project.

My wife and I have been wishing for a "great trail" through\around Wimberley for years.

I love walking on trails...especially if we could have so many choices.

This would be a feature that would serve millions of people in our region and create an attraction for visitors.

Gets people out in nature which is the first step towards a desire to protect it.

The central Texas natural ecosystem must be celebrated and preserved for generations that will come after us.

The existing trails and natural areas accessible to the public in central Texas are not keeping up with the population growth. Those we have are overcrowded to the point that many are accessible only by reservation. We simply need more and we need to protect the land that is not yet developed.

Preservation of green spaces

I would utilize a long interconnected trail for trail running. I have many friends that feel the same way. Also, by lengthening the available trails, it may reduce congestion, giving more options to locals, so that trails aren't as crowded

I'm a hydrogeologist and conservationist. The Great Springs project directly aligns with my values and aspirations for the Texas' future.

Hiking and biking are important to me. It's the best way to experience communities, parks, forests, hills and natural settings. There's time to really see and get to know and develop an appreciation of the land - and people - of the Hill Country.

I am a hiker and would love to have conservation trails that are easily accessible

It is vital to save what we can for the future....before it's all "Developed"

It's important to have areas where we can experience nature in its original form. If we don't work to save these areas, these areas will be gobbled up by development.

It's a great community way to support extra curricular activity and be health conscious.

Nature is valuable!

There aren't enough longer trails to get out in nature and away from cars in this area.

The more people are exposed to this fragile area the more they'll appreciate and want to protect it. People need to know more about the water that magically comes out of their faucets. It's like meat eaters thinking beef is made at H-E-B.

I'm all for protecting nature, and in so doing, making it for all to enjoy!

I'm a cyclist and love trail systems - without cars.

I appreciate the conservation of our green spaces as well as a place for the public to enjoy nature and be active.

Preservation.

We love the area and hiking, biking, and enjoying the outdoors.

Too often long hikes, bike rides, etc. cannot be continued safely due to road & building development. Once it's paved, it's hard to reclaim

Hiking is a very healthy activity for all ages.

I love how green Austin is, and would love to see the same care extended to the outdoor spaces here in San Antonio

Protect our great natural state resources

We can never have too many green spaces.

I'm old and would like to see it now.

I think it's important to keep parts of Texas wildlife pristine and to give people areas to get out and be able to enjoy it. Especially kids.

Many reasons, but a big one is we need connection between these communities that doesn't rely on the automobile. Also big is to teach about the beautiful and sensitive environment on and near the Edwards Aquifer.

It's extremely important to preserve the land that allows recharge to keep our unique & beautiful springs flowing to enjoy.

Our region is growing and the strain on our existing trails and outdoor recreation areas is very noticeable. These resources should grow, at the very least, in line with population growth. Also, to have car alternatives to move around this region, either by foot or by bike, is key both to attract talent, tourists and general quality of life.

Seems like a great way to preserve both green space and free recreational opportunities

Good for people, especially families. Good for the environment, too

We have beautiful land in the hill country, but lack the public access to enjoy it.

Texas needs more features like this!

I love this idea! We spent 3 years in Washington where it was so easy to spend time hiking because there were trails everywhere. We would definitely use the proposed trail system as a family.

I would indicate very important if along with the trail system a conservation easement was created that would further protect the resources from development.

I feel access to quality spaces can be improved. With so much development pressure, this trail makes sense and will be an asset to so many citizens. The economic benefit for tourism also has great potential.

For those of us who love to be out in nature, most definitely a trail like this and to get families and children outside to grown within them a love and appreciation for the natural world.

Texas has very little public spaces unlike other states

Anytime you can get out and exercise plus enjoy nature is a plus!

I walked across the country and walking from Austin to San Antonio was very challenging especially as I had to walk down I-35 frontage road

Important to put value on our springs and for future generations

I think it would be very cool!

It's important to balance out all the construction destruction.

Projects that increase accessibility to natural spaces and allow for SAFE alternatives to vehicle travel are a huge win in my opinion.

Explosive growth in our region will endanger our precious natural spaces.

I love springs and conservation but I personally will not likely use the trail so it's not a must have. The land conservation alone is valuable to me

I'll support anything that will disallow DEVELOPERS from trashing up the area. Texas Hill Country is precious ecological territory that is not being protected.

It would be great to have another protected place away from cars to ride my bike!

Post pandemic now more than ever having outside green space accessible to all is hugely important to the overall health of our communities. Population in this corridor continues to explode - for continued economic prosperity we need to plan for and build important green space into our communities.

Fantastic for so many folks, and business along the way to be developed. Austin is buzzing with excitement, as well as San Antonio. I'm so excited for the development of this trail system.

It makes things whole. Protecting wildlife is our only shot at peace. What a world this be- to just be there. We need a different way to travel

I think opening these trails will provide a great tool for educating people about the Springs in Texas. It will give people the chance to walk along them and see the land that surrounds the Springs themselves. The Springs tell a rich story from the past as well as the present. They must be protected and people must learn about them in order to continue their legacy and purpose. The springs play a vital role in the lives of not only people, but the aquatic and vegetative species that call it home.

I think it's a project that is good for everybody in terms of society. Provide public access to water, good for the environment and it is a democratic project.

I love the springs of Central Texas and I think Texas as a whole is desperately in need of more publicly accessible land!

Too much greenspace lost to development. Too much recharge zone being covered by impervious materials.

If we don't preserve the beauty and resource of the land today, it will not be the same with continued urban development.

The wildlife need this. Humans need this... It's therapeutic, healthy and brings everyone together.

Concerned about safety on a trail that big

I would use it and it would make natural environments more accessible to more people.

Conserving the vital recharge zone of the Edwards Aquifer is critical to the future of our water supply, especially with the projected growth rate of the Austin-San Antonio I-35 Corridor most likely putting stress on natural resources and areas in the near future.

Having a safe bike path between Austin and San Antonio would open up so many opportunities for cyclist to train without using public roadways.

Environment protection is important to me.

This project would create a safe and fun way for cyclists to enjoy a scenic trip to and from Austin- provided it is kept free of transients who would cause problems.

Outdoor actives are important to all people, multiple use trails that include learning opportunities for wildlife, land and resource conservations, recreations etc. are excellent for all ages. Building a trail system from Austin to San Antonio brings communities together creating lots of interaction possibilities including cultural understanding and sharing of local traditions etc.

It is important to save the landscape of Texas and for people to experience the great outdoors

Important to preserve as much green space along the Edward's Aquifer recharge zone.

It will help us to be safe

If love to be able to safely ride from SA and Austin.

More trails, more healthy and active people.

To sustain the natural habitat

I enjoy ride my bike I. The greenway with this expansion will be more adventures and more places to explore.

Get to ride my bicycle away from cars and traffic. It will be safer

Industry and population over-growth is rapidly decreasing our open-spaces which affects not only our water resources but the air we breath, our quality of life and the landscape/environment we leave for future generations.

Having alternative transportation from San Antonio to Austin will be a great step forward for the region.

The Great Springs Trail will help add to the sense of place we experience here in the Hill Country. Completing the trail will help preserve natural areas over the recharge zone, create opportunities for recreation and active transportation, and add an amenity to add value to the lives of Hill Country residents and visitors alike.

I'm a lifelong Austinite, and I am devastated to see the unchecked growth destroy the beauty and health of our environment, especially over the recharge zones. GSP project will be one more step towards protecting our most precious resource.

It's a great way to showcase the natural beauty of the springs and allow people to better their physical and mental health. It will also be an economic draw for all areas it touches.

We need more trails and green space in this area, and all over. You can see how popular the current trails in SA and Austin are by how many people are using them.

Important to have trail for healthy activities connecting Austin to San Antonio. This resource will have multiple benefits of health, protect habitats and community

The hill country is a beautiful place in high demand to call home. We must balance welcoming newcomers with protecting and conserving the land and water that draw people here!

I believe it is a great project and look forward to hopefully seeing it completed in my lifetime. As a resident of San Antonio I would love to see more of our Greenway completed but realize these are separate programs.

Conservation of the rivers for future generations.

When folks learn about and love a resource, they will take care of it.

This beautiful region needs more ways to experience and connect its natural treasures. This trail is the perfect way to do that.

Connection of local trail systems via regional links will potentially lead to a nationwide network of multi-use paths.

Texas has very few long hiking trails in the state that are not in state or national parks. The lone star trail is one of the few that is a through hiking destination.

It would be an amazing attraction for a unique region of the country.

The pure beauty of having a public trail in Texas - especially near my home. There ain't a thing NOT to like about the project and the end results.

As an avid outdoorsman, I would thoroughly enjoy the use of this trail system.

The GSP will provide such incredible recreation and environmental protection to an area that continues to explode with growth. If we miss this chance now, we'll miss it forever!

We need to both preserve important ecosystems & waterways, as well as create new and unique ways to entice people to reconnect with nature.

More options for running and biking. Exploring the beautiful nature along the trail

There is too much eminent domain and infringement on land owners' property already.

With the exploding population growth we are having here its super important to conserve and protect some spaces, not to mention a local 100 mile trail to thru hike is super cool!!!

Preserving the amazing springs and nature trails.

It will create a big attraction for people not from the area, and it will help people with their health, and it will save a lot of nature. Instead of it getting knocked down for houses.

A great way to connect the cities

I love the outdoors and it's so important we preserve and protect as much land as possible.

Connecting the cities and creating active transportation that makes sense. This also creates recreational opportunity thus doesn't require you get in your to visit the San Marco River for the weekend. Free and open recreational for abilities.

I have an electric unicycle. It's capable of the drive to Austin, where I can visit family. However, the current routes make it infeasible to forgo the car. This project would give me choice - the realistic option of using my portable EV to see my family.

Water management will be integral to the states continued economic success.

If the Netherlands can do it, why can't we?

I want a place to bike safely from Austin down to San Antonio. This would provide a scenic, safe way to ride in central Texas while exploring communities along the way.

I live in Austin and I love visiting San Antonio. currently, the only safe way to do this is by car. A route that connects more locations along that line would get people outside and away from traffic.

We need to secure more green spaces in Central Texas, both for the present and the future. And trails are a great way to enjoy nature while still preserving it.

i would love to bike between the springs for recreation. it's a great way to connect the two cities. it will encourage more people to hike and bike. it will increase revenue opportunities in small towns between austin and san antonio.

Definitely important for the protection of water

Loop 410 was the edge of San Antonio when I was very born, and leagues of miles beyond that now

Would a safe environment for cyclist and promote physical activity.

mental health and connection to nature

Want to ensure nature is preserved near the 35 corridor

Green Spaces are necessary, especially in an area quick to become overrun with buildings

It's important for the recharge zone, wildlife, drinking water and helping combat climate change.

I'm a cyclist and ride the Butler bike and bike trail regularly. However, I live in Buda so a bicycle trail system closer to me would allow more flexibility without me having to drive 15 miles to and from the Butler trail.

Protect the Texas hill country.

I love distance road biking but don't feel safe riding alone on busy streets. I would love the opportunity to be able to ride my bike ride one way or round trip from SA to Austin over weekends. Also, spring trails are so much more beautiful to ride on than streets.

Bring attention to important natural resources. Provide a legacy of recreation for all generations.

1. It may result in less car use. Good for environment 2. More exercise. Good for everyone's health. 3. Preserve the aquifer.

As a cyclist it's important to have safe agency to travel within the state. This project would greatly increase access and promote lesser seen areas and communities.

Biking and outdoor exercise is becoming less accessible as the area grow in population and development expands outward. We're losing the ability to bike in safe designated areas without cars.

Most important to me is preserving land over and adjacent to the Edwards Aquifer recharge zone, especially near the Hays/ Travis county line where the 45 toll road was allowed to be built and is now threatened with high density development proposals. There is incredible plant and wildlife diversity in this area that should be protected and the time is now.

We need more protected places to commute without a vehicle.

I've been to Colorado, I think we need to get people outdoors. Healthy mind and body!

Texas needs more trails. It's very difficult to find long distance walking trails in Texas. I was just in Colorado and was blown away by the quantity of trails in that state.

This is an awesome legacy project for our future generations to use Before the development ruins everything.

I was born in Austin and have lived in Central Texas my whole life. I've always had a passion for hiking but have felt limited in my options for long trail systems in the state. This would be an amazing luxury to have a multi-day trail at my footsteps that connects some of the best cities in Texas!

Essential to natural resources protection, sustainability, human health & well being, climate change resiliency, and DEIJ.

I recreate on trails daily & would love to have expanded options in my area that are linked together. I also feel that our society needs to reconnect with the outdoors & this trail will be a boon for our local consciousness raising.

This is a historic window to create new trails lasting hundreds of years. If not done now, it probably won't be completed, ever.

Wonderful long-term amenity for residents and visitors. It is essential to preserve Creek areas and green spaces before developed!

I want to be able to bicycle between Austin and San Antonio.

This will be an invaluable resource for generations and will help make the Texas rivers more publicly accessible and available. There also isn't a safe direct route from Austin to San Antonio aside from I-35 and this will provide a destination for people to be able to traverse the distance safely and enjoyably.

It is useful to provide pedestrian/bike friendly connections between these springs for recreation and wildlife. This is a long-term project.

Securing greenspace and allowing the earth/resources to be free from development is key to our survival.

I love hiking and cycling.

It represents a tangible connection between the citizens of central Texas and the our environment in ways that make it accessible, and enjoyable for more people, and greatly enhances the quality of life for residents while expanding the range of activities available to visitors and tourists.

Conserving as much of our Hill Country land, springs, and waterways as possible should be a top priority for the region.

Critical to ensure outdoor spaces can be conserved and subsequently enjoyed by future generations. Also, 100 mile trail in our backyard, super cool!

The ability for people to connect to the natural world is crucial for public health and for instilling in people the desire to care for the planet, which is essential to our survival in a flourishing biosphere.

Connectivity it's vital for any organization

It will help motivate all kinds of people to come out and exercise by walking/ biking and getting outdoors.

Conserving as much green space and natural habitats as possible is critical. The population growth in this area is concerning, so we need to maintain green space to support the species and water in the area that depend on green space. Also, humans need to have green space to explore and discover nature in their region.

The great springs trail will seize lands from family agriculturalists for the benefit of entitled urbanites. Mother Earth is best kept in the hands of farms, where wildlife will run free, not in the claws of urbanites crisscrossing the holy land with trails and litter.

We have a serious lack of trails in the area.

It's so amazing to have safe, alternative transportation options and routes between metropolitan areas. This will be great for area residents, recreational athletes, commuters, and tourists. Long bike paths/rail trails can be a big draw for area visitors — I know I seek them out when I travel.

It's important to have protection over our acquirer and we need to conserve greenspace for every living thing.

Inter connectivity is critical to transportation, health & wellness

"Alternative transportation" corridor for travel connectivity between Austin and San Antonio.

It will help preserve land for public enjoyment in a time when Central Texas is rapidly changing.

This is probably our only chance to acquire necessary land and preserve these critical areas over the Edwards Aquifer before all razed, built over and privately owned by developers.

"I think it is a wonderful way to get people outdoors and moving. It is a great educational tool to explain the significance to our area of the Edwards Aquifer and the magnificent springs to the people who drink from it every day. It would hopefully preserve and protect more land over the recharge zone of the Edwards Aquifer.

it will preserve 50,000 acres from being developed and leave it in a natural state.

Being able to bike around my city is a literal dream for me, and having a longer hiking trail available in this area would be great! I always have to make a super long drive from NB for anything more than a mile or two.

I have always wanted to be able to ride to San Antonio, Austin, New Braunfels, and San Marcos from my house. It would also help to spur trail connectivity throughout this growing region and protect land from over-development.

Trail systems enrich everyone's lives - protects beautiful spaces and gives people an even greater reason to get outside easier. Love this so much!!

Table 10. Q4 – How would you or a family member in your household use the proposed Great Springs Trail?

OTHER (PLEASE SPECIFY)

These comments are listed as received and have not been edited or modified.

Nobody walks except in Austin.

For short (3-4 day) bicycling "vacation" (without a vehicle!)

Thru-hike

To pray as a Native American person

ceremonial pilgrimages

#landback

To get downtown and commute around downtown

Education tool for kids.

To get away. To replenish my soul.

Explore new places

We live to be able to walk for activities of daily living.

To practice long-distance cycling.

It's pretty and helps the environment

to be closer to nature and not be in a vehicle

To appreciate nature.

To travel between cities

For forest bathing

If it was available, I would use it as much as possible.

Geocaching

To see Texas by bicycle!

to enjoy being in nature, seeing plants, trees, wildlife

I'd hike the whole length as a backpacking experience most likely.

We don't live near a trailhead so it would have to be an excursion for us

For work or school projects.

Nature enjoyment.

Cycling friendly trails to get to parks, restaurants

Get to other towns

I frankly hadn't even thought of it as a viable way to get places. I usually think of our trails as a way to get away from "places" and into nature, but "trails as transit" would be amazing.

Connection with nature

For calming my mind.

To observe plants and animals not normally seen

Both exercise and recreation

Horses

Would love to "park and hike" to work or elsewhere.

horse back riding

Get away from motorized modes of transport. Good ol' one ft in front of the other. Empowering.

For therapy, meditation, learning about the environment (education), learning the seasonal plants.

To take a fun weekend cycling trip to Austin and back.

Learning experience such as local history, understanding resources that may be indanger.

Thru hiking the entire thing!

Don't know where it is so can't say how I would use it

and commuting if it the chips lined up

Transportation highways

To do Austin to San Antonio bike rides

For appreciation of Nature. For groundwater preservation. My entire neighborhood is on groundwater wells and there are proposals for high density development very close by, on top of the recharge zone

Fieldtrip

Would LOVE to see some landowners allow camping on the GSP-trail to allow for backpacking.

enjoy outdoors

To explore new areas of hill country

going from Austin to San Antonio on bike

meditative walks

Enjoy the entire trail end to end!

For education, spirituality, and mental health!

For reflection

We would actively not use it

bird watching

Ceremonial

having a fun outing with a friend like for a bike ride

Very specifically to get to the library.

Table 11. Q5 – How would you or a family member in your household travel along the trail?

OTHER (PLEASE SPECIFY)
These comments are listed as received and have not been edited or modified.
religious
If we walk down the trail, how do we get back home? Where do we sleep?
#landback
Connect the trail to (safe, monitored) campgrounds along the way, and you'll have me for life!
rollerblading, hiking, horseback riding!
I am 81 and might have to use a wheelchair. Yikes!
Tandem cycling bikes for two.
If paved - roller blades
Opportunity to raise money for further projects with runs & walks (Ex. 5K or 10K or trail run over a couple of days). Also would offer students from the counties to collaborate on projects.
Hiking
Leave it rough.
Maybe a wheelchair in the future
Organized group runs and hikes
Through-hike
Horse back riding
horse
Skateboarding
Mountain Biking on trails built for Mountain Bikes
My family would not travel along the trail
Electric unicycle
all the above at times
Hiking long distance.
Trail running
Na

Table 12. Q6 – What trail features are most important to you?

OTHER (PLEASE SPECIFY)

These comments are listed as received and have not been edited or modified.

Nobody walks You'd have to turn around and walk back home

Designated camping sites

#landback

Gaaack! Only five? This space here; for "All of the above!"

Bike repair stations.

River access is highly important

Permeable sidewalks. To allow for water filtration

A soft surface, not concrete for sure!

Extra waste receptacles, always surprised how nasty people are.

Signage for forest bathing and mindfulness activities to connect with nature

showers

I would not suggest river access... Just my opinion.

Camping options

espresso stations/breakfast tacos stands...let's do this! :)

Dogs on leashes (not running free)

Passing by interesting geological and ecological features and views

water availability--fountains as such not necessarily

Trails that retain the natural beauty of the area--not 'landscaped' walkways

1. Condition of the trail surfaces. 2. The natural areas that the trails go through

No, or fenced and regulated, off-leash areas.

Safe connectivity via protect bike lanes on the roadways

MTB trails off the main path

Safety

Only works if trash is 100% controlled.

Ways to safely collect actual spring water

CLEAN! Trash cans are eyesores, but better than a trail with litter

Continuity, not overdeveloped, leave some nature

I think all options are important, but some impact the natural areas, such as parking areas or building restrooms, which may not be safe on a trail. So, what is best environmentally?

horse trails

Mountain bike trails would be cool

all important-I like these best

Law Enforcement presence to keep the transients away.

educational and history of the area or features such as geology etc.

For education about how to use the trails, dog rules, walking only a certain amount of people abreast. Watch your kids!

When a cyclist says on your left it is for yours and their safety, not to be rude.

Connectivity with adjacent trails

sufficient width for bicycle and pedestrian use

Historical information concerning Indigenous Peoples and how important Springs are to them. For example, the San Marcos Springs, known as The Sacred Springs to the local Coahuiltecans consider the San Marcos Springs, the Sacred Spring as part as their origin story.

These are all great features! Can't think of one i would leave out

Camping areas

Trails for walking and running as well as trails for mountain biking

None. Trail features would be disruptive to existing property owners.

Primitive camping sites

Nearby campground/camping areas

Campsites

drinking water along the way is essential for the Texas climate

all seem relevant

emergency lines

Interconnection between trails

Nature should be the star of the trail. Education about the flora and fauna native to this area and the roles each plays in a balanced ecosystem. Education about water protection. Education about invasive plants that threaten ecosystem balance and waterways.

biking trails (or trails wide enough to handle walker and bikers)

making sensitive sites part of the trail but restricting access to certain times of year with security would be helpful. Too many EA recharge sites being degraded due to no protections & human access. Landowners should get paid for this (Both restricted access & public use). Landowners would also get security for their sensitive features.

unimproved singletrack

Must be dog friendly

All of these would be critical components of a successful trail

Land preserved near trail that can also be explored, or possibly have alternate trails

Adequate primitive camping sites

An emergency phone booth

These are all fancy ways of saying "environmental destruction"

Grade separation. No interaction with vehicles.

Teaching about the land, water, and original peoples.

Table 13. Q8 – What would be your main concern about trails if you were a nearby landowner or lived nearby a trail?

OTHER (PLEASE SPECIFY)

These comments are listed as received and have not been edited or modified.

This idea is not cost effective

Rogue users who wander onto private land and degrade it

Encroachment on private property

White settlers taking more land

Users wandering onto my property, littering

noise of construction/disruption in previously private area

how to prevent the rise of property value to negative non landowning residents

People here are very trashy and don't feel the need to pick up after themselves

Sadly litter is a possibility.

Flooding effects

I have a trail behind my property and this trail has enhanced my life and my property value.

Trail abuse.

Rising number of homeless encampments in green spaces.

Governing body - those who make decisions concerns me because the ideologies and philosophies between the listed counties are profound. Ex: Laws for camping and homeless encampments are different county to county. I would not want the trail in my area to be subjected to the governance of those I don't elect.

Waste disposal / litter on the trail

I think you have to convince landowners that this won't be just a homeless highway.

Afraid of homeless folks taking over, trashing and ruining public trails/parks/wild spaces.

Noise and trash from trail users

Trail access. I currently live by a trail in San Marcos and it's not clear if people who don't live in the neighborhood can park here or not to access it.

trespassers straying off trail

I would want the trails to be as far from homes, etc. as possible

Parking at trailhead, where there is not a designated parking area.

trash

increase in homeless camping

Noise from people using the trail

I'd worry about whether there would be too many cars trying to find parking in the neighborhood

Trash and parking/traffic

Trespassing

Parking

Trash. Homeless.

Increase in traffic. I have seen what the public does to Barton-Skyway on weekends. These people don't respect the park and they leave a mess behind.

Trash

Movement of more invasive plants into the area
Not sure
People camping on the trails near or on our property that has a trail easement on it and trails on the parameter.
Intrusion of Nature by residential and commercial DEVELOPERS.
I don't live near a trail
Transients (homeless people) occupying the trail and areas nearby.
I learned from this question! Good job!
Parking
trash on my property
Responsible use of trails (e.g. that users appropriately dispose of waste, etc.)
Elimination of dark skies
perhaps more snake activity near my property?
That the land was allowed to remain native and wild, and the wildlife and native plants are protected
Increased public presence in places that are already overrun with visitation/use; degradation of sites due to overuse/pollution
unfinished construction
It was not connected to us in the hill country
Degradation of natural areas with too much development and users who disrespect sensitive areas, go off trail, leave trash, etc
I don't appreciate all the coercion that is happening in these answer selections.
Y'all tearing up the good earth to make paths for lazy entitled city people
trash
Trash
degredation of natural areas with increased number of disrespectful users; trash; adequate toliet facilities along trail
Pollution and disturbing wildlife
homeless people or criminally minded people having access to my property

Table 14. Q9 – Are there other comments you would like to share about the Great Springs Trail?

RESPONSES

These comments are listed as received and have not been edited or modified.

contact info needed

The idea will cost too much and the number of people using the trail will not justify the expenditure of funds

Wonderful concept! Please make this happen ASAP; Tx needs outdoor spaces that aren't for motor vehicles! Europe has many bicycle trails going between towns and there are young and OLD users (with walkers, even)

Consider having it added to Far Out (formerly Guthooks Guide) for mapping and information along the route. Many Longer trails are part of this.

Let's do it sooner than planned.

I hope Indigenous Peoples & a land acknowledgement are recognized on signs & consulted/supported throughout the entire process & beyond.

So important to not only preserve open spaces but give access to them and allow us as citizens to put our taxpayer money to work where our values are.

The Great Springs Trail should not only acknowledge the Indigenous territory in which it will be in but commit to the land and the different ways in which this trail can educate more people about Indigenous peoples in Texas and the different ways they can become involved, and respectfully support those groups. This commitment and involvement is a long-term responsibility and can be manifested in different ways. And this acknowledgment is not only with the peoples in those territories but all living creatures. There are two points that I would like to share based on my experiences on trails: One is the displacement of the floral and fauna that may happen in those areas. I think that it is important to carefully inform those who go to the trails of the animals and plants they will encounter without instigating fear. Oftentimes people are afraid of snakes or spiders and may decide not to go to trails or simply kill spiders or snakes upon encounter. Creating signs with advice on what to do in these cases may be a good idea. Trash is another concern that should be addressed with more bins provided throughout the trails not just in the start/endpoints.

None

Can't wait. I am in my 60's. Time to catch up to other parts of the country.

very important project for the region. potential high impact and high profile Quality of life Asset.

please limit commercial projects

Imagine a rail service that would accommodate a bicycle from SA wishing to ride from breakfast in San Marcos to lunch in New Braunfels then taking the train back to SA.

#LANDBACK

Given that you acknowledge in your survey that trails lead to increases in property values and therefore property taxes and given what we already know about how investment, especially public investment, can lead to displacement, I would like to see GSP emphasize the need for a community impact study wherever it's advocating for trail development, so that vulnerable homeowners, renters and small business owners can be identified and pro-active measures taken to help them weather the change if they want to stay, or take advantage of the improved value if they want to sell.

If the property value goes up so will my property tax. There needs to be a tax clause in the law to prevent this.

Soon to be: Magical! Ingenious! A marvel! C'mon: Walk the Talk, Texas!!

I hope it all happens someday, and I would like to help make it so.

no

no

This is a terrific endeavor, potential benefit, for ALL Texans, and visitors.



I do think it's a wonderful idea

n/a

We need our own Appalachian Trail, North East Texas Trail, etc

Good luck!

None

Thank you for your work on this amazing project!

I hope this happens in my lifetime, I'm 70.

I'm excited

No

I hope this will be on local Governments fast track. We have too few public trails for recreation compared to places we have visited in the U. S.

One of the coolest things to come about. Thank you!

Seems really cool!

i'm excited for it!

Sounds awesome

No

Na

Can't wait to see this happen

I'm hoping the project gets completed soon so I can explore some more!

Seems like a great idea!

This would be just amazing please have it happen

No

i think you should add bags for those to throw away their dogs waste and lots of trash cans

I love this project! I'm so excited it's happening!

Water and shade are essential with this heat

Super excited!

Such a great project. Please do it

I hope it works haha

I can't wait for it to be completed :)

None

N/a

Awesome project

No

Sounds like a great idea

I hope it gets approved!!

No.

This is a great idea if build like a "sponge city" trail.

As long as it's accessible for everyone

I think it's a wonderful idea and would be awesome for conservation

No!

I hope it gets made!

I am so happy and excited about this project. Looking forward to enjoying the new trail.

So glad this is happening. Texas needs more public green space & training on how to keep it clean for others. Texas is a dirty state by comparison.

I am excited for this project to happen. Keep up the good work and don't stop fighting.

if you build it 'they will come'

No

More trails but please be sensitive to protecting our Dark Sky community as well, no upward or constant lighting please
Good luck!

I think this idea is amazing!!!

Hope y'all are coordinating with the Emerald Crown Trail folks.

Build it

This would be a great addition to our area and will make Comal County an even more desirable place to live

We hope to see it soon !

Wonderful project

As a certified forest therapy guide I would love to help get this trail to be a designated nature therapy trail and get this on an international map so that comal county and surrounding areas can be known for our green efforts. [address removed].
I would love to be part of a team to help bring nature connection to the trail

"Please

Please

Please

And before I'm too old to enjoy!"

Make it happen and try to triple the protected areas

Please keep chasing!

No

Would like to see the surrounding communities educated about the trails.

I would love to see it in my cycling lifetime

I think it's a great idea. My family would particularly enjoy a longer distance trail in Comal County for biking/hiking

Do it.

I'm recovering from foot surgery but hope to see what I can do to help with the project next year

Please make it happen!

What a great idea. I do see this being not only enjoyed, but necessary. Thank you for the opportunity to provide input.

So excited about this!

No

Parking! Please make it a priority!

Awesome plan!

Nope

Paved paths please!! It's hard for road cyclers to enjoy trees and shade.

Make connectors to towns along the way to promote additional economic growth potential.

Great idea! Hope it works out!

great idea

DO IT NOW

No

Terrific plans!

I just found out about this project. let's make this real. Such a great vision for our region!

Do it!

It would be nice to have an online map with potential places to stay along the way if one wanted to hike the entire trail.

Please see The Parklands project in Louisville Ky. Very well done and a foundation established to maintain. The Jones family of Humana the visionaries behind the project. A gift to the community.

I understand there are different desires for the concept. Bikers want to bike. Hikers want to hike. Some will want the whole thing paved. Others will want natural trails. Perhaps the only solution is a combination of all. Personally believe leaving it rugged will keep those with an inclination to litter and damage the area from coming. The more easily accessed it is, the more likely it will be a homeless highway.

This is Roch with @texas_hillcountry. Would love to talk more with you about this project!

A website that gives updates on the project would be nice

Exciting project

I'm a land owner who gave some of his land to a right of way, I'm all for it!

Information is very difficult to find on specific areas. It would be nice to have access to updates.

I think this is a wonderful project!

no

Good on ya

no

The sooner the better. Build it and they will come. Why is it taking so long

It sounds like a great initiative and I like the big thinking of it.

It's a great idea and I hope it can actually come to fruition

It a good idea. Traverse City, Michigan has such a trail called the T.A.R.T.. (Traverse Area Recreational Trail) with about 200 miles of paved trails for biking, hiking, skiing

Just keep up the work on providing natural areas for future generations. People need to connect with nature more than ever.

Build it sooner rather than later.

I'm very excited about this project.

Is there a state or county by county overall plan in place ?

Hope it doesn't take away from development of new trails by the San Marcos Greenbelt Alliance.

I was a charter member of the SMGBA. I'm glad to see that it has lasted and progressed to this important juncture.

Very important for the I-35 corridor.

Not at this time.

Would love to help with the effort in the SMTX area!

Hoping for numerous access points to encourage use.

none

It would be nice, if purpose built mountain bike trails could be included, in addition to the main trail.

Trails should be for walking or biking not both. Bicycles do not belong on walking trails.

Thank you for making this happen

Love the idea!

This would be a very big benefit for the city socially and economically

I commend the people who are spearheading this project, are you recruiting volunteers?

I think it is a wonderful idea and very forward thinking. Central Texas is growing so quickly so it is important for dedicated parklands to be developed as well.

Very exciting!!

Important piece of planning for future. wish we had started this 50 years ago!

Make sure there will be maintained and monitored for unacceptable behaviors from users

This is all very exciting, and it's a tribute to the many brilliant years of work and service of the SMGA that SMTX is so ready to contribute to and benefit from this larger project.

Encourage leadership to be open to collaborating with a broad spectrum of groups sharing the same vision. This may include releasing a measure of control to work collaboratively. Seek out, if possible, professional contractors to build portions of the trails and infrastructure instead of total reliance and control of volunteers.

I think property owners probably will need a lot of assurance and that there is unlikely ever to be 100% agreement. A few bad actors may prevent the success fo the trail system.

Hoping camping overnight would be allowed in certain areas for thru hiking

This would be a great partnership with The Texas Trailhead to help promote! An ambassador for the trail system would be an easy way to get people excited about getting out on the trails.

We are incredibly excited about this project - please keep the community posted on progress and how / if we can assist

Sounds great!

It's a really important amenity in need for the area.

Can't wait for it! Let's go!!!

"Conserving our lands for future generation.

Having safe secure places for our citizens to relax and enjoy the great state of Texas. "

Please allow for the development of unimproved/natural surface trails for mountain biking,hiking, trail running. This could be parallel and in addition to paved or crushed granite trails.

No

No, thanks

You should work closely with local groups and assist with their work rather than try to start new

Please scale this project to other area in Texas. For example the already designated Texas Independence Trail is only a marked roadway. Let's provide for hiking and biking in this area (not road bikes)

This project is critical for community well being

Protecting trail users from crimes committed against within urban areas. Presence of police and or emergency call boxes.

Great idea! That could be a huge project that will draw many folks.

Hurry!

How soon will it be finished

None

I'm so supportive! What a great idea.

Glad to see this project moving forward,

Great project that should be supported!

I support any effort to add trails

I support it!

I would be SOOOOOOO happy to see this project take place. I've literally considered leaving Austin to move somewhere with more trails. Though we have trails, we need more, especially long trails. I will use this and love this for years to come!

Think it's a great project! How can I help?

GO FOR IT

Not at this time

I think it's the best idea ever!!!

Let's do it soon!

Thank you! When will it be done? ☺

If there is not ample natural surface singletrack, it will be of no interest to me or my family.

Do it. But only if you can keep it clean and keep out the homeless.

Great work!!

No

Just do it

This area is in dire need of trails, parks, etc.

No

As This area continues to grow, it will be important to have the Edwards aquifer recharge zone protected to ensure aquifers remain as full as possible.

Make it happen. I'm waiting.

Having a spur along Dry Comal Creek connect to White Ranch in Comal County would be ideal.

No

I think people need more biking trails to get them off the roads. They tend to use the smaller roads with no shoulders that is really dangerous.

DO IT NOW!!

Trails go hand in hand with healthy lifestyles, and outdoor opportunities are key to improve life quality. These also underpin economic growth by making the region more attractive as a place to work and raise families.

I enjoy the idea but I am concerned with people being caught in between trailheads in undeveloped areas and getting in trouble. Cell service can be nonexistent.

Huge project! Worth it, though, I think. Good luck.

Build it!

Thank you or working on this project.

Such a fantastic concept. Been needed for a long time but after Covid, access to quality spaces like this has never been more important for health and wellness for everyone.

I love the idea of linking towns, of being able to journey this way safe from traffic, out in nature. Where you can be outdoors and walk and walk . . . miles and miles of Texas trails . . . yes!

I would love for this to become a reality! I would use it as much as possible and I could see it becoming a great National long trail as well

I live in the city of Woodcreek, and our community is always out walking in our neighborhoods. If we had more trails near us, I know that we would welcome them as an alternative to walking in our streets.

Very excited about this project and similar such as SA greenways and ongoing extensions to that project

No

This is a great idea!

I think it's a great idea!

Texas ecological Treasures are under stress due to greedy politicians and developers. The precious rivers are inundated with unregulated aggregate producers. There is too little oversight by TX government.

Love it

No

such a fantastic idea to promote Texas, and tourism

Please, can we do this?

I think there should be emergency phones along the trail. Some people may not have cell phones, or batteries may run out while on the trail.

No

I think this is a great opportunity to educate people more about the Springs. The San Marcos River is trashed yearly by recreational tubing, mostly by people visiting from out of town. If we can reach people living up and down the I-35 corridor and present something like this, maybe tourists will have more respect for our ecosystem. Familiarity and a sense of community creates respect.

I love your mission!

I'm excited about it. I would love to take Girl Scouts on the trail.

Get it done!

I'm excited for this project!!! I love visiting San Marcos for there's beautiful spring river and I can wait till they're connected with San Antonio and Austin. It'll be so much easier for us cyclists to get to!

I wish you folks the best of luck and hope you are successful.

As a bicycle rider it would be nice if little wider to make sure have wide enough area to safely pass walkers. Also keep in mind blind curves to minimize as much as possible because I have seen a lot of near misses when people do not follow trail etiquette (which many people do not know).

It is a great way to divert cycling from unsafe roads and connect communities.

Please plan it in such a way where transients will be kept away. I would like to see this be a safe trail for families as well as women who may be running or cycling alone. I'm a CCP holder who looks out for the safety and well being of others as well as myself and want this to be an enjoyable trail.

This would greatly increase my family's amount of time on the trails. We spend a lot of time driving to go hiking.

Comal county has done a very poor job of developing trails and conservation areas for public use. Commissioners need to be pushed hard to catchup

Please provide more information to the public about actual connectivity. It's not feasible to have one nature/natural connection without having to leave nature and connect via hard surfaces.

No

None

None

I would love to know of opportunities to purchase land along the trail!

No

I enjoy my workout and recreation time

No

I live in the middle of Comal County between Bulverde and New Braunfels. I am very concerned about a quarry that is under consideration in this area over the EARZ. The west and east forks of the Dry Comal Creek meet up on the property in question and move on to Comal Springs. This is beautiful 1500 acre ranchland that could be part of a park system in Comal County. Even though the springs aren't running through the property, the pollution, blasting and quarry operation could potentially affect Comal Springs.

I am really excited about the possibility.

It would be nice & helpful to have solar powered lights along the trail.
This is a project that would be a huge win for Central Texas when complete.
I applaud your efforts!
Wonderful idea.
Looking forward to the possible construction and completion.
Love the idea!
I hope this can become a reality very soon.
Sounds awesome. Pls hurry!
Educate folks of the importance to preserve and conserve our springs and not pollute them.
keep up the good work
More parks along the route of the trail would be a great addition. Preserving and connecting natural areas would be a great feature
Not really yet
No thank you
No
Love this idea and will support it. Thank-you for proposing this!
N/A
there were no questions about swimming or canoeing
Thanks for pursuing this unique project!
I think it's a great project! I love watching the progress. Keep up the good work!
None
I'm excited about the prospect of a more unified trail system. I would also encourage project leads to examine issues of accessibility and equity that surround trail use. Texas, especially central Texas, is increasingly diverse and I think it's important that people of all races, ethnicities, genders, and disability statuses feel welcome and comfortable at the Great Springs Trail (and other trails).
Don't underestimate the damage increased population and usage of the trail system will do to local land owners and small communities who have no desire to be overrun by tourists.
Love what you guys are doing. We have a home on Lake McQueeney, hopefully this project will spur on feeder trail projects , say from Seguin, connecting to the Great Springs trail near New Braunfels. Cheers
Hopefully it starts soon.
Happy about it
I think it's important to protect the natural areas.
Thank you for making these great connections happen. For some people cycling is their only form of transportation and for others it's purely recreational. Some people require that the trails be paved to meet their accessibility needs. It would be a disservice to forget to include all trail users.
I would like to see several charging/WiFi stations along the route
Texans need our safe, beautiful trails as an affordable option for exercise and peaceful time in nature.
If the Netherlands can do it, why can't we?
Very excited about this!
Go go go!
Na
Looking forward to this great project

na

Would love for most paths to not be concrete! It's hard on the joints for walking and running.

Keep at it!

I think it's a great addition to the area and I'm very excited for this project.

No

Never heard of the trail before today, Wednesday, 6 October 2021. Maybe better information dissemination in San Antonio may be useful, especially news reports that speak to the trail and its interface with local linear parks. The SA Riverwalk should be an extension of the Trail through Breckenridge park

adopt-a-mile / section

N/A

I think this is much needed to preserve wildlife and nature, especially before development increases and we lose this opportunity

How can I support?

We NEED a long trail in this area. One free to the public. I lived near one in mid-Michigan when I was growing up and it was amazing. We spent a lot of time on it walking and biking and it's something I've missed greatly. It would give people here something to do other than eat and shop. A free trail could encourage people to get outside and exercise. This is an amazing idea and I absolutely love it.

Exciting opportunity to expand and connect various trail systems!

Please build it!

I think this is a wonderful idea to increase recreation, fitness and commuting ability in the Austin area as long as the construction, cost and crime are not a problem

If using concrete on trails, use pervious concrete.

Let's get this trail built asap :)

N/A

Fantastic idea that makes me proud to be a TEXAN!

Looking forward to this great project coming to fruition.

This will be the most exciting trail to come from Texas, and will benefit many people.

Please create it! Take cyclist transportation as seriously as car roads and I gastric tire are taken.

How can i get involved?

We love the idea of more trails in Central Texas

I think this is a great idea. We are desperate need of a way to get our kids and ourselves out of our homes and outdoors where kids can appreciate nature, soak up the sun and get some movement. This is huge. This has the potential to affect, classroom learning, obesity issues in youth, teen drug use, depression and countless other issues in today's society.

No

This is long overdue. Good luck.

Keep up your good work!

I can't wait for it to be done!

This is a critical piece to protecting all of the Edwards Aquifer, the Balcones Canyonlands, and the greater Hill Country. Through public use and access, the public gains awareness of the natural resources that need protection and demand/ fund that protection at higher levels.

Great project. I worry your timelines are way too long. Any thing big and bold needs to be pursued with a plan to go much faster. Target completion in 7 years, max, otherwise the risk of non completion goes up dramatically.

So glad this planning and investment is being done sooner rather than later

This is a fantastic project that we needed 20 years ago. Please don't be deterred from proceeding with as much enthusiasm and vigor as possible.

Looking forward to using it!

occasional access to waterways, with secure bike parking would be great!

Thanks for your work.

I really appreciate that this is being done!

Build it!

Prefer a trail with surroundings that feel natural and secluded. That is, no or limited noise from major roads. Please keep in mind that a fully paved trail has better potential to accommodate a variety of mobility and ability levels. There are very few places where people with disabilities can easily get out in nature.

Visionary projects like this are inspiring to all who encounter them. Achieving these types of projects shapes the identity and legacy of our region.

Let's make it happen and let's make it connect to Houston!

We should continue to grow/expand this program after completion of the Great Springs Trail.

Thank you for undertaking this! The preservation of open space is so important, and growing as our population grows.

Thank you.

I feel this is such an important project to help preserve and conserve the natural area in such a densely populated area.

No

How do we finish it faster???

Complements the ambiance of this area

Yeah this is a disgusting idea that further disenfranchises and threatens America's hinterlands and family farms. How are urbanites walking thru the woods good for the earth?

No

Looking forward to seeing the project come to fruition!

No.

I can't wait

Please consider connections on the east side of IH 35. This area is often forgotten but worth connections and preservation.

Thank you

I am excited for this project and increased connectivity!

It is soooo needed! We are very excited!

Where possible, please go with natural or gravel paving instead of pavement. It's so much nicer, easier on joints, forgiving if you fall, and makes you feel more part of nature.

Getting out in nature, especially in this time of COVID, is so important to mental health and well-being

This is exciting project and I'm very impressed how much you've been able to accomplish! (I'm a trail builder for San Marcos Greenbelt Alliance)

How much natural space is being preserved around the trail? It would be awesome to have a wide Greenway with large 'anchor' parks to visit and travel between.

Concept sounds wonderful. Love that it would be used daily by locals near towns, but then would have rural areas for long distance riders or kayakers (although by time this is finished, none of these areas will probably still be rural). Hope there will be many connections into trail from other smaller trails developed by various entities, so there is a whole web of options to explore that lead to interesting towns (food/lodging), cultural and historic attractions, and natural areas. Hopefully after this stretch is finished in 2036, it can continue expanding north (to Red River and existing trails up there) and south (to some of the coastal natural preserves), thereby actually connecting to remote and honest to goodness rural areas.

My answers are colored a bit by my left lower leg no longer working well. I am probably not going to be doing long distance hiking on the trails, but I think it is important for the rest of the community to use them. I have worked on the trails adjacent to Landa Park in the past.

I am looking forward to being able to hike from Austin to San Antonio,

Excellent presentation, thank you!

It would be great if some parts of the trail could be made from permeable surfaces such as porous pave. <https://www.porouspaveinc.com/>. it is smooth and would allow water to infiltrate into the ground. All concrete trails is not a good idea. It is being used at San Antonio Schools for trails and there are local contractors who have experience. Contact me [removed] if you need more info. Decomposed granite is not permeable.

Really looking forward to this being a thing and hope you all succeed

Please connect to nearby neighborhoods, schools, and shopping areas.

Love this!! Do it and do it fast!! So excited!!



Next Steps for GSP Engagement in 2025 and Beyond

SPANISH LANGUAGE SURVEY AND WEB PAGE

A Spanish language version of a GSP public survey was launched in 2022. These materials are accessible online and at in-person events. Whenever possible, a translator or Spanish-speaking staff member is present at in-person events.

MONTHLY TABLING AT LOCAL EVENTS (FOCUSED ON REACHING UNDERREPRESENTED COMMUNITIES)

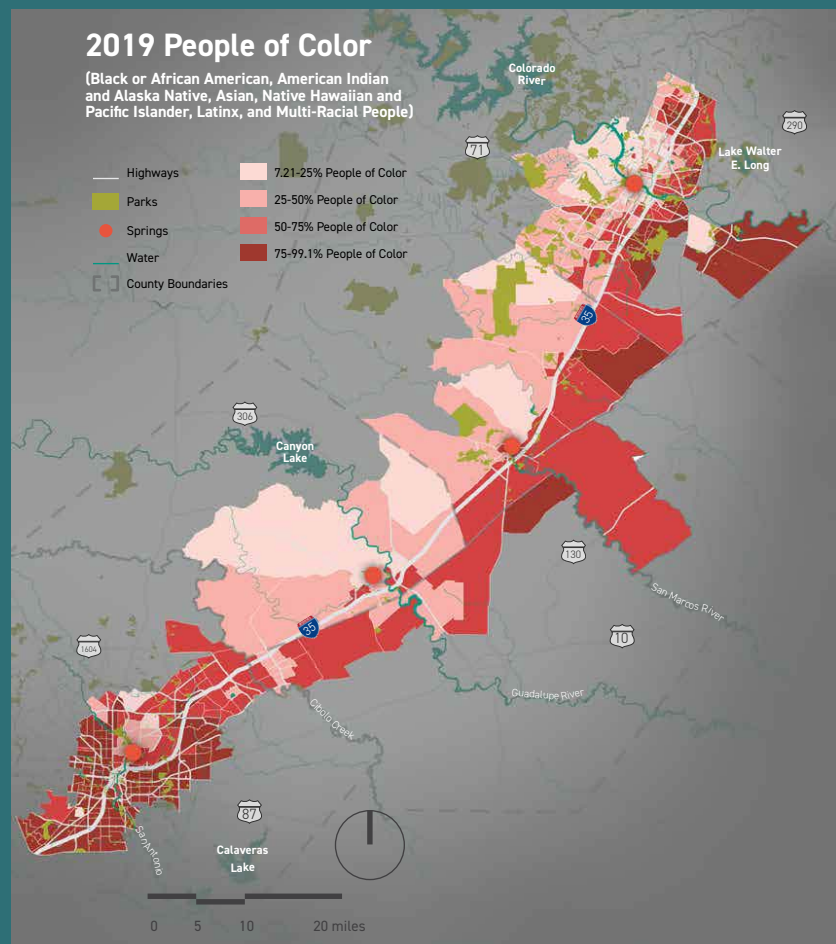
GSP staff has developed a toolkit of tabling materials that can be deployed at community events throughout the region. Events target areas with diverse populations throughout the region. GSP identified local leaders, community ambassadors, and other stakeholders who can point GSP in the direction of key events. Local community organizers are compensated when appropriate for allowing GSP to table at their event. GSP will publish a public calendar of upcoming events where staff will be present to discuss the GSP mission and Trails Plan.

ENGAGEMENT AMBASSADOR PROGRAM

GSP has created a program that trains and deploys individuals to staff public engagement events, conduct intercept surveying, and/or provide other insight or materials to engagement activities. Ambassadors reflect the diversity of the region.

BE DATA DRIVEN

GSP utilizes previous demographic analyses, such as the Equity Framework (image below), to guide future engagement efforts. GSP has developed a system for tracking public input, identifying gaps, and being transparent about activities and outcomes.





Appendix C

Conservation Toolbox

Conservation Toolbox

The following conservation tools offer various benefits and drawbacks for GSP to consider as conservation and trail goals are pursued in the coming years.

Table 15. Conservation Toolbox

STRATEGY DESCRIPTION	BENEFIT	DRAWBACK
CONSERVATION PRACTICES		
The term “conservation practices” refers to a variety of methods to conserve natural resources by a range of stakeholder types. Examples of conservation practices include stormwater management, low impact development, soil and nutrient management, riparian restoration, etc. Examples of stakeholders involved in these practices include developers, municipalities, households, farmers, landowners, forest managers, and businesses.	The main benefit of a conservation practice over purchasing land or conservation easements is that practices can be implemented by land owners and managers without selling the land or putting it under easement.	One challenge in relying only on conservation practices to protect natural resources and open spaces is that most practices are voluntary in nature, or may rely on incentives for participation by landowners, farmers, developers, and others. Education and encouragement may go a long way in increasing use of conservation practices, but there is a limit to which people are willing and able to invest time and resources into such practices.
CONSERVATION EASEMENT		
This is a legal agreement between a landowner and a qualified conservation organization or government agency to voluntarily restrict the use and development of the property. Easement grantee (i.e. local government) would hold a partial interest or some specified right in a parcel of land. A conservation, historic preservation, open space, or scenic easement is designed to protect a specific sensitive natural, historic, or cultural resource. An easement may be in effect for a specified period of time (see below), but is usually perpetual.	A conservation easement can be effective in preserving open space if it meets mutual goals of landowner and agency. Easement provisions are tailored to needs of landowner and site preservation goals. Landowner retains ownership, use and management of the land. Potential property, income, and estate tax benefits for donation or bargain sale of an easement if it is permanent. Easements run with the land, despite changes in ownership. Reduces costs for site protection when easements are acquired at less than fair market value for the protected area.	Baseline survey required to identify the extent of natural, historic, or cultural resources within the easement. Less protection than outright acquisition. Easement purchases may be costly, even though they are less than fee acquisition. Terms must be carefully and clearly outlined. Management intensive: easements must be monitored and enforced; grantee agency must work closely with landowners. Easement grantee must possess technical expertise and financial wherewithal to monitor and enforce easement. Easement restrictions may limit property resale opportunities. Tax benefits may not be sufficient motivation for landowner to donate or sell easement.

STRATEGY DESCRIPTION	BENEFIT	DRAWBACK
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TEMPORARY CONSERVATION EASEMENT

An easement may be in effect for a specified period of time. For example, California's Williamson Act gives tax incentives to landowners who place agricultural easements on property for a minimum of 10 years under a "rolling contract" with local government.	Most of the above benefits apply, with exception of income and estate tax benefits. There is an added benefit of flexibility in terms of the length of the agreement. This flexibility may benefit the landowner if their vision for the property changes in the future. It also may benefit the larger community, if the land is later determined to have a higher or more desirable use than conservation.	Temporary conservation easements do not qualify for income and estate tax benefits. Also, see the above drawbacks of conservation easements in general. The temporary nature of the agreement also does less to guarantee that the land will stay in conservation, which is a major drawback if conservation is the goal.
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DONATION

Owner grants full title and ownership to conservation agency.	Resources are acquired at very low costs to the agency. Agency may receive endowment for long-term land stewardship. Donor may qualify for income tax deductions, estate tax relief, and property tax breaks.	Landowner loses potential income from sale of land. Receiving agency must accept responsibility and long-term costs of land management. Stewardship endowments may make donations cost prohibitive for landowners.
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FEE SIMPLE ACQUISITION

Usually the sale of land at full market value. Ownership and responsibilities are transferred completely to the buyer. While cash payment yields the greatest return, taxes and other expenses may reduce net return.	The most straight forward acquisition method. Provides agency with full control over future of property.	Most expensive. Buyer assumes full responsibility for care and management of property. Loss of revenue when land is removed from tax rolls. Capital gains issues for seller.
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RIGHT TO FARM

A county right to farm and ranch ordinance protects agricultural enterprises from nuisance suits and complaints related to their agricultural activities. It gives constructive notice to potential residential landowners that agricultural activities and practices in the area will continue and may cause odors, land use practices, and transportation impacts that may affect residential living.	This program is good for protecting farm land in rapidly growing communities. Encourages farmers to continue their operations and offers legal protection for these land uses.	Depends on farmers to continue their operations, so it is not a method for long-term protection of this greenspace resource.
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STRATEGY DESCRIPTION	BENEFIT	DRAWBACK
LAND BANKING		
Land is purchased and reserved for later use or development. Land could be leased for immediate use (i.e. agriculture or athletic field) or held for eventual resale with restrictions. Local government functions as a land trust. Many programs are funded through real estate transfer taxes.	Local government proactively identifies and purchases resource land. This lowers future preservation costs by working as a defense against future increases in land prices, speculation, and inappropriate development.	Land banking is often expensive as it requires large up-front expenditures. Public agency must have staff to handle land trust functions of acquisition, management, lease, or resale. Real estate transfer tax for land acquisition would require local enabling legislation.
BARGAIN SALE		
Land, or a conservation easement, is purchased at less than fair market value. The difference between the bargain sale price and the easement or land's fair market value becomes a charitable donation.	Reduced acquisition costs. Seller may qualify for tax benefits for charitable donation. May offset capital gains on the sale.	Difficult and time-consuming to negotiate. May still be costly to acquire land.
RIGHT OF FIRST REFUSAL		
Agreement giving the conservation agency the option to match an offer and acquire the property if the landowner is approached by another buyer. This can be done so when the landowner decides to sell. The agency or organization has the first right to either purchase or refuse the purchase.	Agency can gain extra time to acquire funds for purchase.	Resource may be lost if offer can't be matched by the conservation agency. Some landowners are unwilling to enter into this kind of binding agreement.
ACQUISITION AND SALEBACK OR LEASEBACK		
Agency or private organization acquires land, places a conservation easement, protective restrictions or covenants on the land, then resells or leases land.	Proceeds from sale or lease can offset acquisition costs. Land may be more attractive to buyer due to lower sale price resulting from restrictions. Management responsibilities are assumed by new owner or tenant.	It is often a complicated procedure. Owner retains responsibility for the land but may have less control over the property. Leases may not be suitable on some protected lands.

STRATEGY DESCRIPTION	BENEFIT	DRAWBACK
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CLUSTER DEVELOPMENT/ CONSERVATION SUBDIVISIONS

Cluster development allows land developers to develop in a compact form at higher densities, thereby preserving greenspace within the same tract that would not be developed. This approach can be combined with conservation easements to protect the undeveloped greenspace.	Allows for flexibility in design to protect natural resource areas located on the parcel. Construction and infrastructure costs for land developers are reduced. Example: Montgomery Farm in Allen, TX: www.montgomeryfarm.com	Participation is voluntary. If not implemented correctly, protected lands are often scattered and non-contiguous. Clustering may not be a preferred option for developers. Long-term management of common greenspace may become problematic for homeowner associations.
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VOLUNTARY AGRICULTURAL DISTRICT

Special districts established to promote continuation of agricultural and forestry activities. Agricultural districts are formed where farmers and ranchers agree to keep their land in agricultural uses.	Maintains land in agricultural and forestry use. Provides some protection from nuisance lawsuits against agricultural operations. Protects farmers and ranchers from nuisance complaints, provides tax relief, and limits infrastructure expansion.	Participation is voluntary and there is a minimum acreage criteria. Does not provide long-term protection. Most effective when several contiguous farms participate in areas with development pressure.
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PURCHASE OF DEVELOPMENT RIGHTS (PDR)

The owner's rights to develop a parcel of land are sold to the local government or to a land trust, usually through a conservation easement. Most PDR programs are voluntary and offer a viable financial option to interested landowners.	A proven technique for local communities with strong support to acquire lands for preservation. Owners who sell development rights receive an income and continue to use their land while retaining all other rights. Property taxes should be reduced. See the Texas Farm and Ranch Lands Conservation Program (TFRLCP) for more information: https://tpwd.texas.gov/landwater/land/private/farm-and-ranch/	Purchasing development rights can be expensive and rarely protects enough land to relieve development pressure on resource land. Funding may not meet demand for easement purchases. Voluntary program means some resource areas may be lost.
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PURCHASE OF RIGHTS AND OTHER EASEMENTS

In addition to purchasing development rights, other rights, such as the right to timber or extract minerals, could also be purchased. Other 'customized' easements could be developed as needed depending upon the resource in question.	For protection of scenic view-shed or forested buffer. Less expensive than fee-simple acquisition or PDR. Provides desired income to owner while keeping resources intact.	Mineral rights management issues must be resolved. Limited applicability for protecting open space.
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STRATEGY DESCRIPTION	BENEFIT	DRAWBACK
LEASE		
An agreement between an agency and landowner to rent the land in order to protect and manage a sensitive resource.	Low cost approach to site protection. Landowner receives income and retains control of property. An alternative for preservation-minded landowners not ready to commit to sale of easement. Restrictions can be included in the lease to direct the activities of the conservation agency on the land.	Short-term protection strategy. Leases are not permanent.
INSTALLMENT SALE		
A percentage of purchase price is deferred and paid over successive years.	Possible capital gains tax advantages for seller.	Complicates budgeting and financing of acquisitions.
ROLLING OPTION		
A series of options to buy a property, in portions or sections, extending the purchase over a period of years.	When insufficient funds are available, this option is used to purchase land at fair market value over a period of time using smaller annual appropriations.	May not work for the landowner due to elongated time period of payment.
DONATION VIA BEQUEST		
Land is donated to a conservation agency at the owner's death through a will.	Reduces estate taxes and may benefit heirs with reduced inheritance taxes. Allows owner to retain full use and control over land while alive; ensures its protection after death.	No income tax deduction for donation of land through a will. Requires careful estate planning by the landowner.
DONATION WITH RESERVED LIFE ESTATE		
Owner retains rights to use all or part of the donated land for his or her remaining lifetime and the lifetimes of designated family members.	Allows owner to continue living on and using the property during his or her lifetime while ensuring the land's protection. Allows designation of family members to remain on land.	Tax benefits may be earned prior to death; some types of open space may not qualify. May delay transfer of title to the conservation agency for a long period of time.

STRATEGY DESCRIPTION	BENEFIT	DRAWBACK
INTERGOVERNMENTAL PARTNERSHIP		
Federal, state, and local agencies form joint partnerships to own and manage land.	Sharing the responsibilities and costs of acquisition and management can protect larger or more expensive properties. Can foster county-wide cooperation to preserve greenspace.	Partners must agree on management strategies in order to reduce potential for conflict. Agency budgets and acquisition criteria may restrict acquisitions. Slower response time; acquisition opportunities may be lost due to agency procedures. May remove land from tax base.
AGENCY TRANSFER		
Government transfers excess land to another agency that can assume resource protection and management responsibilities.	Resource protection and management with little additional expenditures.	Excess property may not be suitable for resource protection. Obtaining fair market value for the property may be agency's priority.
LAND EXCHANGE		
Land may be exchanged for another parcel that is more desirable for resource protection.	Lower acquisition costs. Scattered properties can be exchanged for a single, larger parcel. When equal value properties are exchanged, there is no tax on the transfer.	Complicated process; not widely known and rarely used. Subject to IRS regulations. Property owners must be willing to participate and properties must be of equal value.
NONPROFIT ACQUISITION AND CONVEYANCE TO PUBLIC AGENCY		
Nonprofit organization (such as land trust) buys a parcel of land and resells it to a local government or other public agency.	Nonprofits can often move more quickly to purchase and hold land until the public agency is able to purchase the land. Could reduce acquisition costs for public agency.	Local government must be willing to purchase land and assume management responsibilities.
JOINT VENTURE PARTNERSHIP		
Strategy used by public agencies and private organizations to accomplish projects serving mutual goals. For example, some government grant programs could be matched with both private contributions and public funds.	Partners share benefits, responsibilities, and costs of acquisition and management. Creates a coalition of support for protecting diverse resources. Brings diverse sources of knowledge and expertise to solve resource protection issues.	More complicated property management and decision-making. Conflicts in acquisition criteria and funding priorities must be resolved.

STRATEGY DESCRIPTION	BENEFIT	DRAWBACK
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MANAGEMENT AGREEMENT

Agreement between landowner and conservation agency to manage property to achieve resource conservation goals.

Owner may be eligible for direct payments, cost-share assistance, or other technical assistance from the agency. Management plan is developed based on owner's preservation goals.

Mutual agreement is more easily terminated than a lease. Agreements are not permanent.

MUTUAL COVENANTS

Agreement between adjoining landowners to control future land uses through mutually agreed upon restrictions.

Permanent (unless parties agree to change); covenants can be enforced by any of the landowners or future landowners of the involved properties. Significant incentive to comply with restrictions since all parties are aware of use controls. Can reduce property taxes.

Loss in market value from mutual covenants does not qualify as a charitable deduction for income tax purposes.

DEVELOPMENT IMPACT FEE

Impact fees are also known as exactions. In its simplest form, the developer is charged an easy-to-calculate fee. A formula may be created to decide the cost that development will impose on the community. The formula can account for the area of land affected, the number of units built, the expected market value of those units, the distance from the fire and police stations, costs of building roads, and the expected population growth resulting from the construction. The exaction can come in forms other than money. The developer can be required to provide streets, sewers, street lights, parks, or other infrastructure and amenities. The town or county can develop a comprehensive system or formula or exactions can be formulated on a case-by-case basis from more general criteria.

A "pay-as-you-grow" program that really has been proven to help cities keep pace with rapid land development. A particularly useful tool for Central Texas, due to its fast pace of growth and rate of change. Development impact fees are authorized in Texas under Chapter 395 of the Texas Local Government Code.

Can be difficult to implement, as it must meet Supreme Court rulings on "essential nexus," fair and equitable implementation. Politically challenging because impact fees are generally not favored by the development community.

STRATEGY DESCRIPTION	BENEFIT	DRAWBACK
PARKLAND DEDICATION ORDINANCE		
Parkland dedication is a local government requirement imposed on subdivision developers or builders mandating that they dedicate land for a park and/or pay a fee to be used by the government entity to acquire and develop park facilities.	<p>These dedications are a means of providing park facilities in newly developed areas of a jurisdiction without burdening existing city residents. They may be conceptualized as a type of user fee because the intent is that the landowner, developer, or new homeowners, who are responsible for creating the demand for the new park facilities, should pay for the cost of new parks.</p> <p>See the City of Austin's Parkland Dedication website for more information, including their fee structure methodology, rules, and formulas: https://www.austintexas.gov/departments/parkland-dedication</p>	Difficult to introduce new development regulations in some communities and it does not address the need for conservation outside of new development areas.



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Appendix D

Benefits Report



The
**ECONOMIC
BENEFITS**
of the
**GREAT
SPRINGS
TRAIL**

from the Alamo to the Capitol



THE HEART *of* TEXAS



Great Springs Project envisions a national park-scale corridor of protected lands between the densely urban areas of Austin and San Antonio over the Edwards Aquifer recharge and contributing zones.



Great Springs Project (GSP) envisions a national park-scale corridor of protected lands between the densely urban areas of Austin and San Antonio over the Edwards Aquifer recharge and contributing zones. This green corridor will be connected by a network of trails, linking four of Texas’ Great Springs: Barton Springs, San Marcos Springs, Comal Springs, and San Antonio Springs. To realize this vision, GSP is unifying existing local efforts to address the most critical water, land, wildlife, and public health challenges facing the Central Texas region.

GSP’s mission to protect and connect Texas’ beautiful natural surroundings is underpinned by the requirement of equity and inclusion in access to this beauty. An important aspect of this work is an Equity Framework, developed by GSP’s Equity Task Force early in the trail visioning and planning process, to advance an equitable approach and outcomes for the trail, including equal access to the many benefits of the trail.

The GSP Economic Benefits Report identifies the key benefits of such efforts, organized by the topic areas outlined below.

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\$	ECONOMIC BENEFITS	8
💧	LAND & WATER BENEFITS	10
☁️	FLOOD PROTECTION BENEFITS	16
⚠️	TRANSPORTATION BENEFITS	18
❤️	HEALTH BENEFITS	20
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To learn more about the Equity Framework and GSP’s work overall, please visit GreatSpringsProject.org.

The proposed location of the GSP trail will be determined in coordination with local communities, and is the focus of the GSP Trails Plan, concluding in late 2021.

This report uses a best estimate of the location based on connecting the four main springs, existing trails, and local trail plans, extending about 100 miles from Austin to San Antonio. When including potential spur trails, that number grows to over 170 miles, which are taken into account in this report.



*In total, it is estimated that communities
from Austin to San Antonio will
experience the following benefits per year
with the completed Great Springs Trail.*

\$55,920,000
TOTAL ANNUAL BENEFITS

ECONOMIC \$ \$23,370,000

LAND & WATER 💧 \$19,240,000

TRANSPORTATION 🚶 \$11,440,000

HEALTH ❤️ \$1,870,000

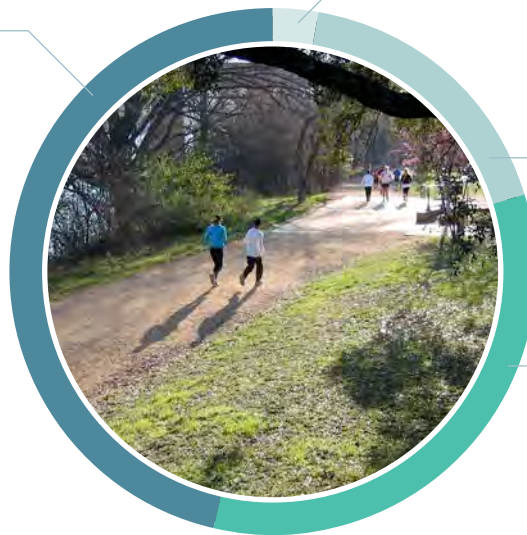


ESTIMATED ANNUAL BENEFITS

\$23,370,000

ECONOMIC BENEFITS

Factors such as flood damage and loss of open space are outlined later in this report in terms of their costs and challenges to the region, rather than in terms of annual benefits.



\$1,870,000

HEALTH BENEFITS

\$11,440,000

TRANSPORTATION BENEFITS

\$19,240,000

LAND & WATER BENEFITS

Introduction

Estimated daily use:



5,500

WALKERS & RUNNERS



4,800

BICYCLISTS

This report contains an economic and health impact analysis of the proposed Great Springs Trail in Travis, Hays, Comal, and Bexar counties of Texas. The analysis estimated the number of bicycle and pedestrian trips that might take place on the proposed trail system; approximated the corresponding reduction in vehicle trips and vehicle miles traveled (VMT); assessed the potential benefits that might accrue if the entire proposed trail system was constructed; and assessed the potential ecosystem services benefits associated with land conservation adjacent to the trail corridor.

For the purpose of this report, the proposed trail system would connect Barton Springs, San Marcos Springs, Comal Springs, and San Antonio Springs (totaling 177 miles with parallel routing alternatives in Hays and Comal

counties). In total, it was estimated that the completed trail system and association land conservation could generate **\$55,920,000 in benefits**.

DEMAND

To understand the potential demand for the proposed trail system, count data from Austin and San Antonio was supplemented with data from similar trails in Alabama, Arkansas, North Carolina, South Carolina, Tennessee, Virginia, and other parts of Texas. If the proposed trail system experienced the same number of bicyclists per mile as the average of the comparable trails (by land use), there would be an estimated 4,800 bicyclists per day. If the proposed trail system experienced the same number of pedestrians per mile as the average of the comparable trails, there would be an estimated 5,500 pedestrians per day.



Photo: Jennifer M. Ramos



Methods

This impact analysis utilizes a standard methodology for calculating economic, environmental, transportation, and health benefits. All projections are based on trail usage estimates and survey results from similar trail systems in Texas and throughout the southeastern United States. These estimates are then extrapolated through the use of various multipliers derived from national studies and quantified in terms of monetary value where appropriate.

LIMITS OF THE ANALYSIS

The primary purpose of the analysis is to enable a more informed policy discussion on the benefits of investing in the proposed Great Springs Project. Even with extensive primary and secondary research incorporated into the impact analysis model, it is impossible to accurately predict the exact impacts of various factors. Accordingly, all estimated benefit values are rounded and should be considered order of magnitude estimates, rather than exact amounts.

Additionally, carbon estimates are not intended to be interpreted as an emissions audit that can be used in emission trading programs; they are based on the region's overall land cover, and carbon values will vary depending on the land cover of the actual locations to be conserved.





ECONOMIC BENEFITS



The average expenditures of groups of trail users on comparable trails:

\$64

for FOOD/MEALS

\$60

at RETAIL ESTABLISHMENTS

\$31

for ENTERTAINMENT

\$52

for BICYCLE RENTAL

\$93

for LODGING

Once the majority of the trail system is complete and regionally connected, people using it are likely to spend money on food, retail, entertainment, and sometimes lodging.

The average percent of trail users that were not from the surrounding area was 33 percent among comparable trails. If the proposed trail experienced the same percent of non-local users as the comparables, then an estimated 1.1 million non-local users would use the proposed trail each year.

The average expenditures of groups of trail users on comparable trails are listed at left. If the estimated 1.1 million non-local trail users purchased goods at the same rate as comparable trails and there is an average of four people per group, then the proposed trail system would contribute to an estimated \$8,910,000 in annual food/meal spending, \$2,260,000 in annual

retail spending, \$720,000 in annual entertainment spending, \$150,000 in annual bicycle rental spending, and \$11,330,000 in annual lodging spending (assumes only 42 percent of the non-local trail users stay overnight in a hotel), for a total of \$23,370,000 in estimated annual trail-related spending from non-local trail users (excludes transportation spending).

This section only includes direct economic benefits of the trail system. There are also indirect economic benefits, as trail-related spending from non-local users is expected to circulate through the economy, providing a multiplier effect. Additional related economic benefits could include those related to trail construction and maintenance jobs, and jobs related to recreation, food service, retail, entertainment, and lodging.



The completed Great Springs Trail will result in direct annual economic benefits from non-local trail users, particularly benefiting those in the tourism and service industries.



FOOD/MEALS

\$8,910,000



RETAIL

\$2,260,000



ENTERTAINMENT

\$720,000



**BICYCLE
RENTAL**

\$150,000



LODGING

\$11,330,000

(assumes 42% of non-local trail users stay overnight in a hotel)

\$23,370,000

**TOTAL
ECONOMIC BENEFITS**



LAND & WATER BENEFITS



Conservation Goal:

50,000

ACRES BY 2036,
PROVIDING BENEFITS
FOR LAND, WATER, &
FLOOD PROTECTION

Water may be Texas' most vital resource and land conservation over the aquifer is critical to its protection. GSP aims to conserve 50,000 acres of land by the Texas Bicentennial in 2036, protecting the life sustaining waters in the Edwards Aquifer Recharge Zone. This will not only help protect the springs along the trail, but will also provide ecosystem benefits to people throughout the region for:

- Water Quality
- Water Supply
- Flood Mitigation
- Stormwater Management
- Pollination and Wildlife Habitat
- Agritourism and Agricultural Commodities
- Preservation of Farms, Ranches, and Forestlands
- Carbon Sequestration

The potential ecosystem services benefits can be measured by first assessing the various types of land in the Recharge Zone, all of which provide different ranges of benefits. According to USGS Land Cover

Classifications data, the study area is predominantly evergreen forest and pasture/hay, followed by deciduous forest, grasses, and urban lands. Assuming the conserved land would have a similar composition to the study area as a whole, we applied land values per acre and land cover type, based on land cover values from studies developed in Texas¹ and the southeastern US.² Our final estimate of annual ecosystem service benefits based on this approach is \$18.1 million.

Additional benefits from GSP's land and water conservation goals may include other ecosystem services, such as photosynthesis, genetic diversity, heat mitigation, soil formation, medicinal plants, biofuels, nutrient cycling, aesthetic values, and spiritual enrichment.

¹ Texas A&M Natural Resource Institute, Texas Land Trust Council, and the Texas Water Resources Institute (2020). *Texas Farm and Ranch Lands Conservation Program: 2020 Evaluation Report*.

² Paul, A. (2011). *The Economic Benefits of Natural Goods and Services: A Report for the Piedmont Environmental Council*.



GSP's conservation efforts will protect water quality, water supply, wildlife habitat, and preservation of working lands, while protecting people and property from flood damage.

**WATER QUALITY
& WATER SUPPLY**



**WILDLIFE HABITAT
& POLLINATION**



**FARMS, RANCHES,
& MANAGED
FORESTLANDS**



**\$18.1
MILLION**

**IN ESTIMATED
LAND AND WATER
CONSERVATION
BENEFITS**

\$1.1 MILLION

**IN ESTIMATED ANNUAL CARBON
SEQUESTRATION BENEFITS**
(SEE PAGES 14-15)





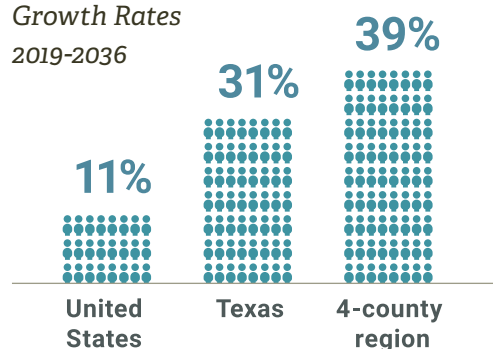
Protecting the Edwards Aquifer Recharge Zone

The GSP study area lies between Austin and San Antonio, along the Edwards Aquifer Recharge Zone. This is one of the most productive aquifers in the United States, characterized by the presence of sinkholes, sinking streams, caves, large springs and highly productive water wells.¹

The GSP goal to protect the aquifer in this region faces many challenges, particularly the fast pace of population growth and development. For example, between now and 2036, the population of **Texas will grow at three times the rate of the U.S. and the four-county region is expected to grow nearly four times as fast** (below).^{2,3}

⁴ Furthermore, past development patterns suggest that finding balance between conservation and development will continue to be a challenge, adding urgency to the GSP mission (right).

Projected Population Growth Rates 2019-2036



¹ Edwards Aquifer Authority. 2021. *About the Edwards Aquifer*. <https://www.edwardsaquifer.org/science-maps/about-the-edwards-aquifer/>

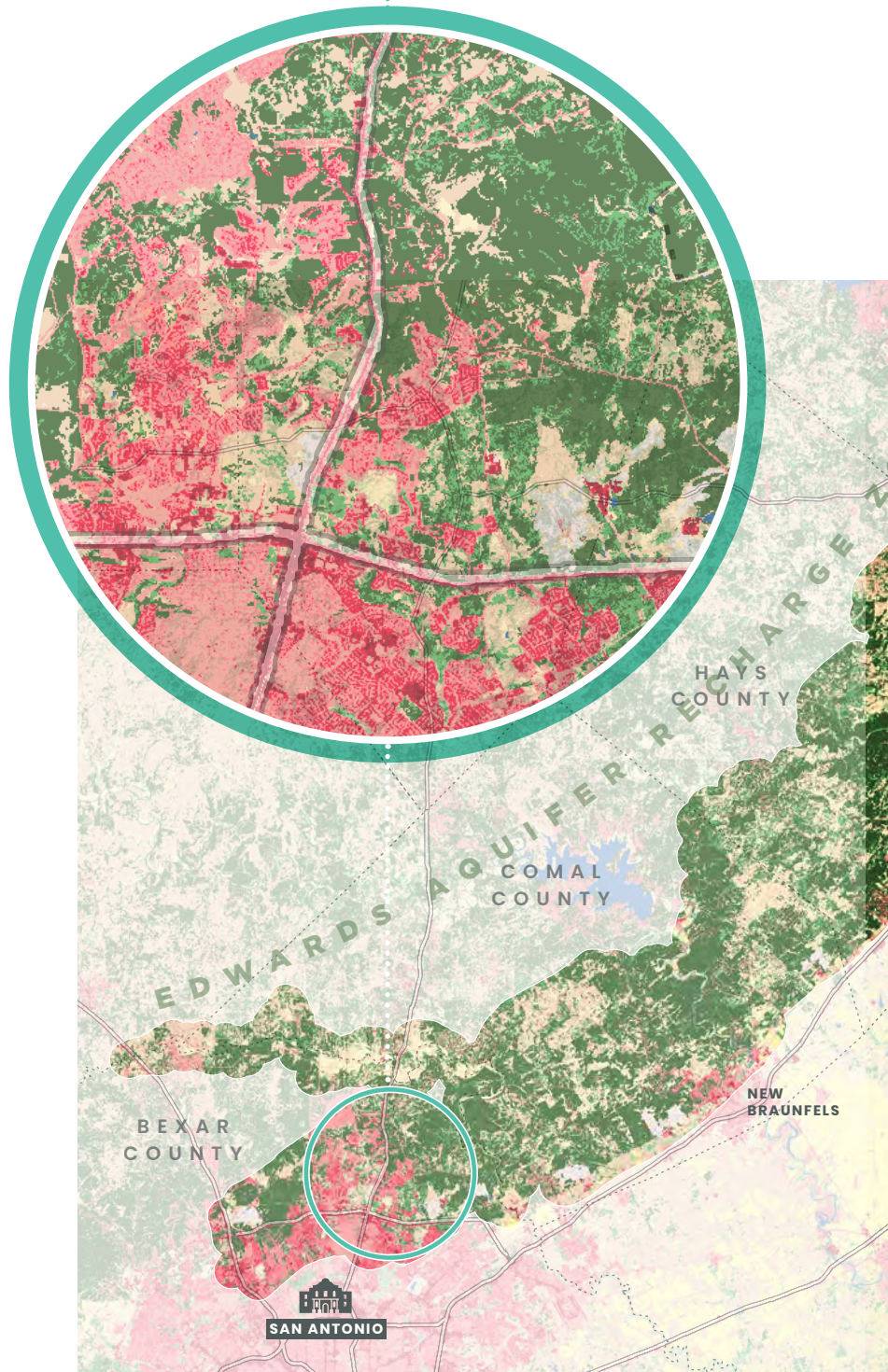
² U.S. Census Bureau, Population Division; <https://www.census.gov/data/tables/time-series/demo/popest/intercensal-2000-2010-counties.html>

³ Texas Demographic Center <https://demographics.texas.gov/data/tpepp/projections/>

⁴ US Census, *Projected Population Size and Births, Deaths, and Migration; Projections for the United States: 2017-2060*

⁵ The U.S. Geological Survey, *Date range selected based on the earliest comprehensive landcover data available (2001), and the most recent (2016).*

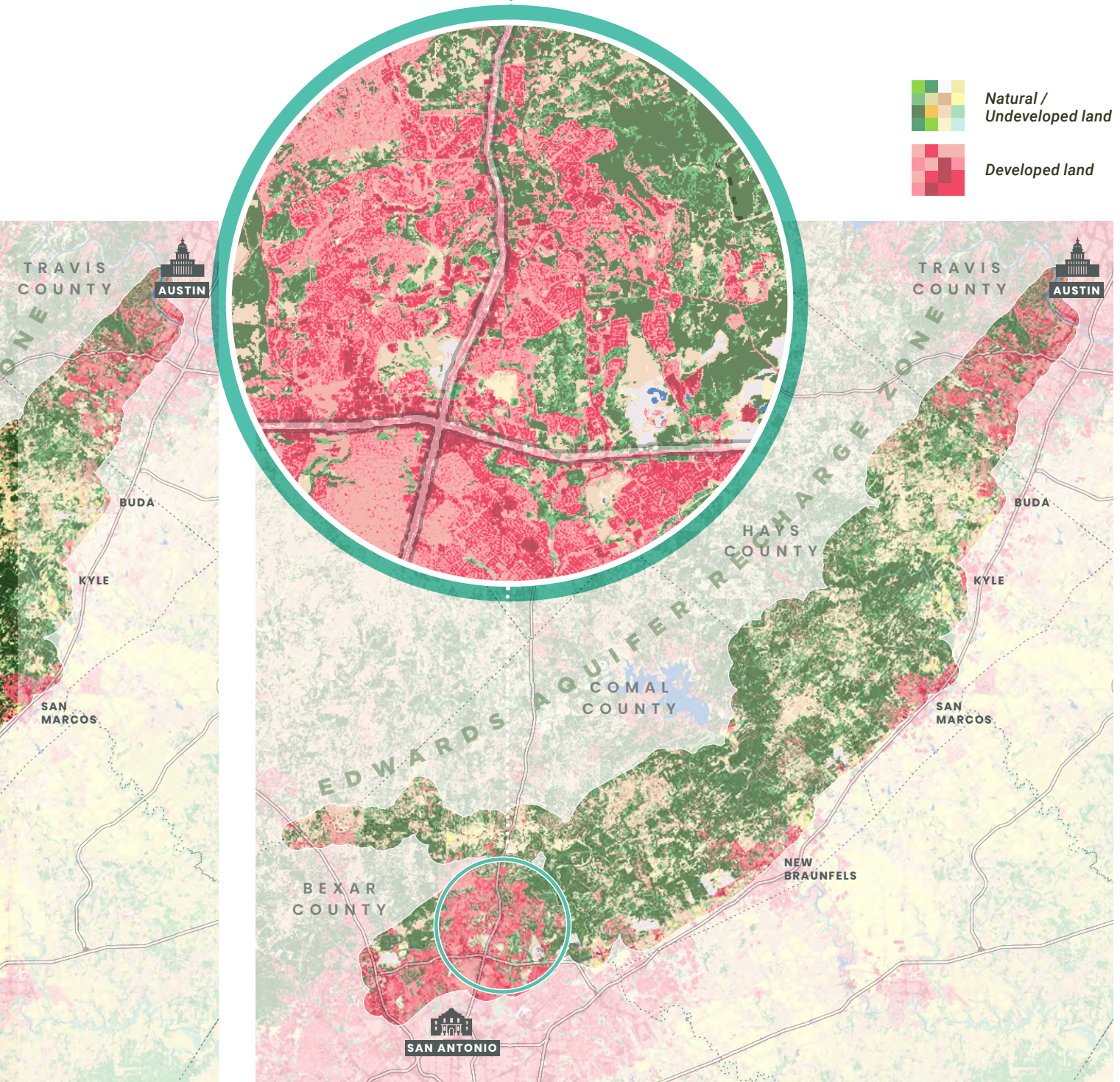
From 2001 to 2016, one of the biggest changes from natural to developed land in the region was north of Loop 1604 in San Antonio, shown here.⁵



2001 Developed Land over the Edwards Aquifer Recharge Zone between Austin and San Antonio, with a 1-mile buffer.



During this 15-year period, the GSP study area lost **23,500 acres** of natural land. For context, that's about **18,000 football fields** of development added between Austin and San Antonio.



2016 Developed Land over the Edwards Aquifer Recharge Zone between Austin and San Antonio, with a 1-mile buffer.



Carbon Sequestration Benefits



Estimated carbon sequestration associated with 50,000 acres of land conservation in the GSP study area:

823,000

METRIC TONS
OF STORED CARBON

20,000

METRIC TONS OF
CARBON SEQUESTERED
ANNUALLY (FLUX)

Carbon is naturally stored in the Earth's atmosphere, oceans, soils, and vegetation (sometimes referred to as different "stores" of carbon). The imbalance of increased carbon in the atmosphere contributes to climate change, with related social costs that are experienced globally, either directly through changing weather patterns, or indirectly through changes in water, air, food, ecosystems, livelihoods, and infrastructure.

Carbon moving from one store (like the atmosphere) into another store (like trees, via photosynthesis) is referred to as carbon flux. Measuring carbon sequestration as a benefit of land conservation takes into account both the annual flux of carbon into the landscape, as well as the overall benefit provided by storing carbon in the natural landscape over long periods of time. Because natural areas absorb and store more carbon than developed areas (shopping centers, highways, and homes), the growth of our cities results in a net release of carbon into the atmosphere.

The carbon sequestration benefits within the GSP study area were estimated by first examining what the region offers in terms of forests, grasslands, and other natural areas, all of which absorb and store carbon at different rates. Assuming the land cover composition of the 50,000 acres to be conserved is roughly proportional to the study area as a whole, we applied per-acre estimates of carbon storage and fluxes by land type, derived from U.S. Geological Survey Professional

Paper 1787.¹ The key finding is that approximately 823,000 metric tons of CO₂ would be released if 50,000 acres within the study area were developed. Additionally, if we account for carbon flux changes if the land was developed, we find that there would be a reduction in CO₂ sequestration in the range of 20,000 metrics tons per year.

The social cost of these metric tons of CO₂ was quantified using the EPA's social cost of carbon² for 2020, which finds that each metric ton of carbon costs \$55, resulting in carbon storage benefits of **\$45 million**, and flux benefits of **\$1.1 million annually**.

Reduced Travel Emissions Benefits

The more commonly known release of carbon into the atmosphere is from automobiles. We estimate a reduction of 5,400 metric tons of CO₂ emissions, plus 23 metric tons of other emissions, based on the increased number of walking and bicycling trips associated with the trail (as outlined in other sections of this report). This translates to a total vehicle emission cost savings of **\$420,000**.

¹ Zhu, Zhiliang, ed., Bouchard, Michelle, Butman, David, Hawbaker, Todd, Li, Zhengpeng, Liu, Jinxun, Liu, Shuguang, McDonald, Cory, Reker, Ryan, Saylor, Kristi, Sleeter, Benjamin, Sohl, Terry, Stackpoole, Sarah, Wein, Anne, and Zhu, Zhiliang, 2011, *Baseline and projected future carbon storage and greenhouse-gas fluxes in the Great Plains region of the United States*: U.S. Geological Survey Professional Paper 1787, 28 p. (Also available at <http://pubs.usgs.gov/pp/1787/>)

² EPA. *Social Cost of Carbon Fact Sheet*. 2016. (Also available at https://www.epa.gov/sites/production/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf)



\$45 MILLION

**ESTIMATED ONE-TIME CARBON
STORAGE BENEFIT RELATIVE TO
DEVELOPED LAND**

\$1.1 MILLION

**ESTIMATED ANNUAL CARBON
SEQUESTRATION BENEFITS
RELATIVE TO DEVELOPED LAND**
(CALCULATED IN LAND AND
WATER BENEFITS, PAGE 11)

5,400

**METRIC TONS OF CO2 VEHICLE
EMISSIONS REDUCED ³**



\$420,000

**TOTAL VEHICLE EMISSION
COSTS REDUCED ⁴**

(CALCULATED IN
TRANSPORTATION
BENEFITS, PAGE 19)

³ Average Annual Emissions and Fuel
Consumption for Gasoline-Fueled Passenger
Cars and Light Trucks (EPA)

⁴ GHG Equivalencies Calculator (EPA)





FLOOD PROTECTION BENEFITS



1 in 10

TEXANS IS EXPOSED TO MODERATE OR HIGH RISK RIVERINE FLOODING EACH YEAR²

CONSERVATION AS NATURAL FLOOD INFRASTRUCTURE

Protecting people and property from catastrophic flooding is especially critical in this region of Texas. For example, the 2015 flood alone required the City of San Marcos to seek **\$50 million** in federal funding for flood mitigation.¹ In fact, roughly **one in every 10 Texans is exposed to moderate or high risk of riverine flooding each year**, and anticipated statewide flood mitigation costs over the next 10 years are estimated to be **more than \$31.5 billion.**²

Using land conservation as a form of natural infrastructure can effectively reduce such impacts.³ The primary benefits of this approach are rainfall interception, increased soil infiltration, water uptake, water storage and the delay of peak flows, all of which reduce the quantity of water requiring management. Surface attenuation is a key benefit of open spaces and it has been shown that trees and pastureland can decrease peak flows by up to 60%.

¹ Hays County Parks & Open Space Advisory Commission. 2021. *Flood Mitigation, Stormwater Management, Water Quality, & Aquifer Recharge Benefits From Open Space Conservation*.

² Texas Water Development Board. 2019. *State Flood Assessment*. 86th Legislative Session.

³ Glick, P., E. Powell, S. Schlesinger, J. Ritter, B.A. Stein, and A. Fuller. 2020. *The Protective Value of Nature: A Review of the Effectiveness of Natural Infrastructure for Hazard Risk Reduction*.





Given the high costs of flood damage in Texas, every tool possible should be employed to protect people and property. Strategic land conservation as a form of natural infrastructure should be a key tool in reducing catastrophic damage, saving Texans millions of dollars.



\$50 MILLION

REQUESTED FEDERAL FLOOD MITIGATION FUNDING
FOR THE 2015 FLOOD IN SAN MARCOS, TX

— Hays County Parks & Open Space Advisory Commission.

\$31.5 BILLION

ANTICIPATED STATEWIDE FLOOD MITIGATION
COSTS OVER THE NEXT 10 YEARS

— 2019. State Flood Assessment



TRANSPORTATION BENEFITS



1,900,000

ANNUAL ESTIMATED
PEDESTRIAN TRIPS



1,620,000

ANNUAL ESTIMATED
BIKE TRIPS

3,520,000

TOTAL ANNUAL
WALKING & BIKING
TRIPS

The most readily-identifiable benefits of the proposed trail derive from its potential ability to connect residents and visitors to major activity centers and recreation opportunities across the four-county area of the Great Springs Project.

Ultimately, the proposed GSP trail system would serve as a major investment in bicycling and walking for the region and could provide long-term transportation benefits to residents and visitors. While no money may change hands, real savings can be estimated from the cost savings associated with congestion, vehicle crashes, road maintenance, and household vehicle operations.

TRANSPORTATION CALCULATIONS

The daily estimates noted in the demand section of this report (4,800 bicycle trips and 5,500 pedestrian trips) were extrapolated to annual volumes and broken into different trip types (i.e. commute, recreation,

school, college, and utilitarian). The breakdown of trip types is based on the travel patterns of people living near the proposed trail (2019 American Community Survey) and trip-type data from the National Household Travel Survey (NHTS). The result is an estimated 1,620,000 annual bike trips and 1,900,000 annual pedestrian trips, for a total of 3,520,000 trips per year.

Some of the estimated 3.5 million annual bicycle and pedestrian trips will replace motor vehicle trips. The number of motor vehicle miles reduced due to bicycle and pedestrian trip replacement was estimated through a comparison of the data noted above, along with trip distance data from the NHTS. The analysis estimates that the 3.5 million walking and biking trips on the trail system would reduce annual vehicle miles traveled by 12.9 million miles.

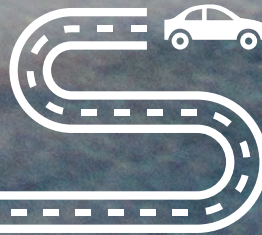


The completed Great Springs Trail will result in more bicycle and pedestrian trips for commute and utilitarian purposes, which are likely to replace motor vehicle and transit trips.

ANNUAL ESTIMATED
TRANSPORTATION OFFSETS:

12,900,000

MOTOR
VEHICLE
MILES



TOTAL VEHICLE
EMISSION
COSTS
REDUCED ⁵

\$420,000



REDUCED TRAFFIC
CONGESTION
COSTS ¹

\$890,000



REDUCED
VEHICLE CRASH
COSTS ²

\$2,880,000



REDUCED ROAD
MAINTENANCE
COSTS ³

\$1,900,000



HOUSEHOLD VEHICLE
OPERATION
COST SAVINGS ⁴

\$5,350,000

\$11,440,000

TOTAL TRANSPORTATION
BENEFITS

¹ Average Annual Miles per Driver by Age Group. Last modified: September 26, 2014. FHWA; Using Figure ES.3 "Cost of Crashes and Congestion per Vehicle Mile Traveled" ratios.

² Average Annual Miles per Driver by Age Group. Last modified: September 26, 2014. FHWA; Using Figure ES.3 "Cost of Crashes and Congestion per Vehicle Mile Traveled" ratios.

³ Kitamura, R., Zhao, H., and Gubby, A. R. Development of a Pavement Maintenance Cost Allocation Model. Institute of Transportation Studies, University of California, Davis.

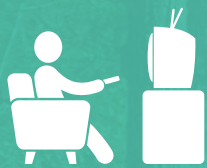
⁴ American Automobile Association, Your Driving Costs. 2017.

⁵ GHG Equivalencies Calculator (EPA)



HEALTH BENEFITS

Why It Matters



27%

OF ADULTS *and*

17%

OF CHILDREN

REPORT LITTLE OR
NO LEISURE-TIME
PHYSICAL ACTIVITY
IN TEXAS ¹

The implementation of a well-designed, regional trail from Austin to San Antonio will encourage a shift from energy-intensive modes of transportation such as cars and trucks to active modes of transportation such as bicycling and walking. More people bicycling and walking can help encourage an increase in physical activity levels, which may help reduce healthcare costs for residents in the region.





The completed Great Springs Trail will result in more people walking and bicycling, reducing healthcare costs for the region.



1,200

ESTIMATED NEWLY ACTIVE PEOPLE



\$1,603

HEALTHCARE COST SAVINGS PER PERSON THAT BECOMES PHYSICALLY ACTIVE ²

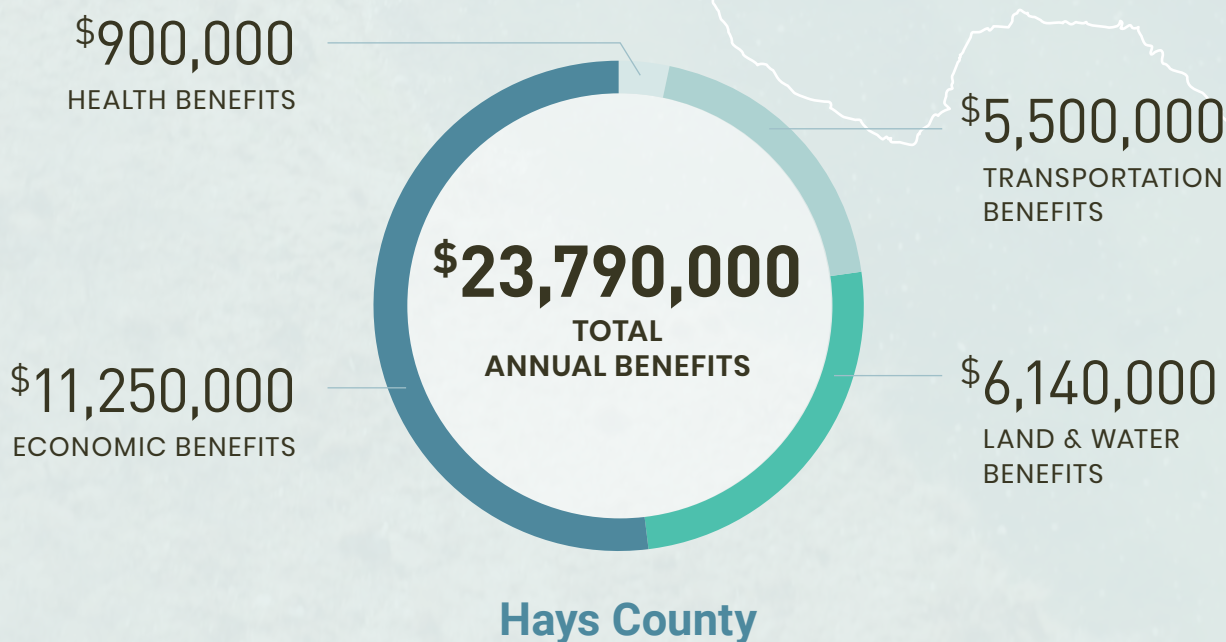
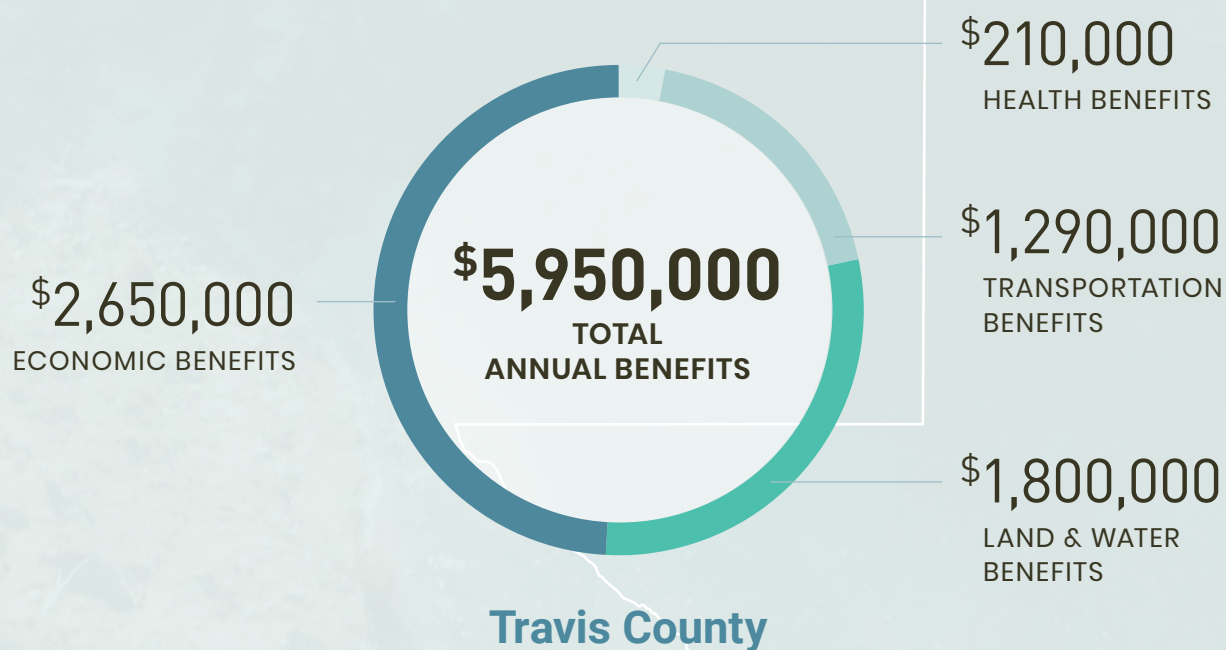
\$1,870,000

TOTAL HEALTHCARE COST SAVINGS

1 State Indicators Report on Physical Activity (CDC)

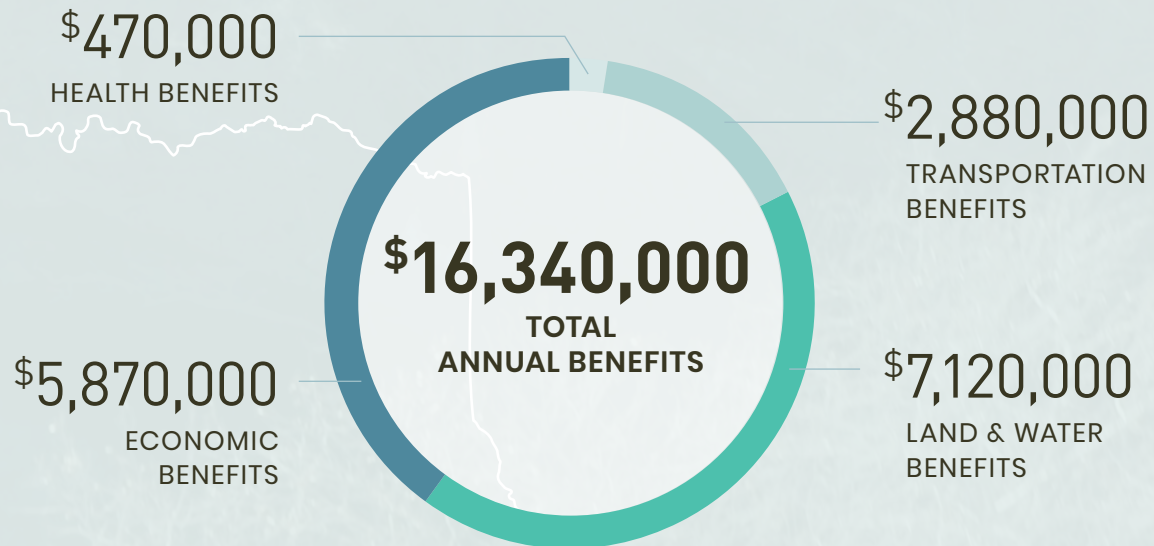
2 Inadequate Physical Activity and Health Care Expenditures in the United States (CDC)

BENEFITS BY COUNTY

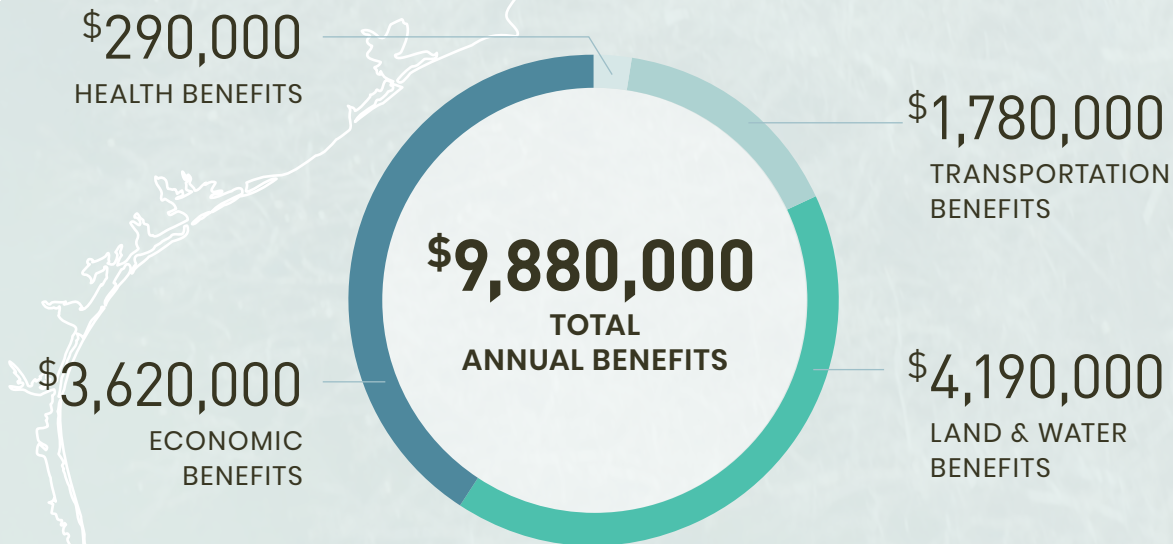




This section displays the estimated annual economic benefits of the Great Springs Project by county. Benefits based on land cover (ecosystem and carbon sequestration benefits) used the proportion of land within the study area for each county to apportion benefits. The remaining benefits were allocated to each county based on the proportion of estimated users within each county. Factors such as flood damage and loss of open space are outlined in other sections of this report in terms of their costs and challenges to the region, rather than in terms of annual benefits.



Comal County



Bexar County