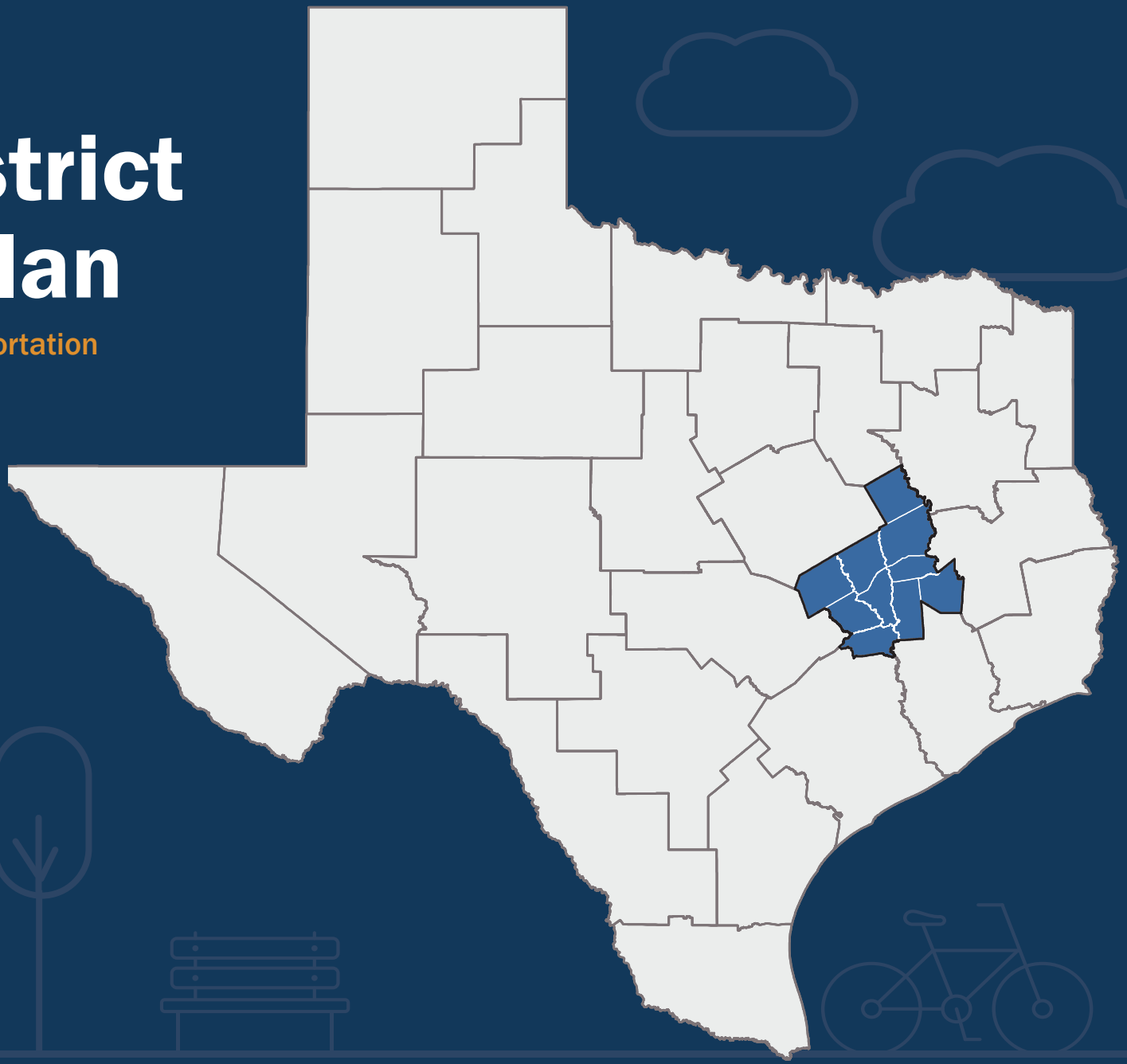
Bryan District Bicycle Plan

Texas Department of Transportation



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The following agency staff, local representatives, and community group members contributed their expertise to the Bryan District Bicycle Plan, guiding its development and recommendations.

TxDOT Project Staff

Amanda Owens, TxDOT Bryan District

Gregory Reininger, TxDOT Public Transportation Division

Bonnie Sherman, TxDOT Public Transportation Division

Technical Working Group

Bill Daugette, Walker County

Bobby Colwell, TxDOT Bryan District

Byron Prestridge, TAMU Transportation Services

Danny Kuykendall, Walker County

Delmy Reyes, TxDOT Bryan District

Don Koester, Washington County

Doug Marino, TxDOT Bryan District

Elizabeth Cunha, College Station Bicycle, Pedestrian and Greenways Advisory Board

Jace Lee, TxDOT Bryan District

James Kreamer, TxDOT Bryan District

James Robbins, TxDOT Bryan District

Jann Keong Kam, TxDOT Bryan District

Jeff Puckett, TAMU Transportation Services

Jennifer Mascheck, TxDOT Bryan District

Jimmy Henry, Walker County

John Mccall, TxDOT Bryan District

Joseph Grieve, TxDOT Bryan District

Juan Quiroz, TxDOT Bryan District

Mark Poage, TxDOT Bryan District

Matthew Hensarling, TxDOT Bryan District

Nate Schlagel, TxDOT Bryan District

Ronnie White, Walker County

Stephen Copley, TxDOT Bryan District

Community Needs Working Group

Charles Coats, Bryan College Station Habitat for Humanity

Elizabeth Cunha, College Station City Council and College Station Bicycle, Pedestrian, and Greenways Advisory Board

Haley Alejandro, Brazos Valley Council of Governments Economic Development

Rissina Hall, Bryan Housing Authority

Tyler Eutsler, Texas A&M Urban Planning Student

Consultant Team

AECOM

Poznecki-Camarillo

Toole Design Group

Table of Contents

List of Figures and Tables

List of Tables

Information contained in this document is for planning purposes and should not be used for final design of any project. All results, recommendations, concept drawings, cost opinions, and commentary contained herein are based on limited data and information and on existing conditions that are subject to change. Existing conditions have not been field-verified. Further analysis and engineering design are necessary prior to implementing any of the recommendations contained herein.

If you have issues interpreting the content in this plan, we encourage you to reference the companion StoryMap which can be accessed at: District Bicycle Plan Pilot.

In addition, you may also call 512-486-5977 to speak with a TxDOT representative who will be able to assist you with your question.

Glossary

The list below defines key terms as they are used throughout the Texas Department of Transportation (TxDOT) District Bicycle Plan.

- **At-Grade Highway**: Roadways on the State Highway System (SHS) that operate on the same vertical level as non-highway, local roadways with minimal physical separation that limits access.
- **Bicyclist:** This document uses the term bicyclists to include people riding traditional bicycles and a wide variety of other human-powered devices that use typical bicycle facilities. This includes electric-assisted bicycles, recumbent bicycles, bicycles or tricycles adapted for use by those with disabilities, and many others.
- **Bicycle Tourism Trail:** Routes that TxDOT has recommended for inclusion in a statewide bicycle tourism network. They traverse urban and rural areas and include three types of segments: cross-state spines, connecting spurs, and regional routes.
- **Bikeway Design User Guide:** A user-friendly guide for the Bicycle Facilities section of the Roadway Design Manual.
- **Bikeway Development Priorities**: Segments along the on-system network that have one or more need locations and are scored based on context factors into three categories: opportunistic, proactive, and high priority.
- **Bikeway Functions:** Designations that reflect potential types of users and journeys the route may support, such as whether a route connects children to local K-12 schools or long-distance riders to recreational destinations. The bikeway functions include all-ages bikeway, daily-travel bikeway, long-distance bikeway, and basic bikeway.
- **Community Needs Working Group:** A working group comprised of local and regional stakeholders from community-based organizations, affordable housing providers, educational institutions, and other agencies and organizations.
- **District:** One of the 25 TxDOT jurisdictions that oversee the construction and maintenance of state highways. Each district is composed of a grouping of adjacent counties.
- **Grade-Separated Highway, Limited-Access Highway:** Roadways on the SHS that operate with a degree of physical separation from local roadways. This separation may be vertical differences in height, separating the highway above or below local access.
- **Locally Identified Needs:** These segments and points indicate places where new or improved bikeways should be considered, drawing on local plans, TxDOT/partner input, and public input.
- **Need Location:** An on-system location where there is a bicycling gap or existing bikeways are deficient in some way. Needs are both segments and points. Some are data-driven and others are identified in local plans or by stakeholder input.
- **On-System Transportation Network:** Roads owned, operated, and maintained by TxDOT and connected infrastructure elements such as on- and off-ramps, bridges, and tunnels.
- **Right-of-Way:** The designated area, typically communicated as a width, on and surrounding a roadway over which an agency such as TxDOT has jurisdiction.
- **State Highway System:** Legislatively designated highway network that supports the movement of people and goods across Texas. The Texas state highways include a main network of Interstate Highways, U.S. Highways, state highways, business highways, loops, spurs, farm-to-market roads, park roads, ranch roads, and beltways. “On-system” refers to roadways that are part of the SHS.
- **Technical Working Group:** A working group comprised of local and regional experts who have a close understanding of the processes and technical conditions that inform bicycle planning in their areas.
- **Urbanized Area:** An incorporated city or an unincorporated census-designated place with a population of at least 2,500.

Executive Summary

The Bryan District Bicycle Plan presents a data- and community-driven set of priorities and guidance for TxDOT roadways that will meet the specific biking needs of the district. This plan provides:

- An analysis of existing bicycling needs that prevent people from being able to ride safely;
- A set of prioritized segments of TxDOT roadways;
- Designated bikeway functions for how bikeways are likely to be used; and
- Refinements to regional long-distance bicycling routes.

Bryan District Today

The district is comprised of 10 counties (Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, and Washington) and 56 cities, towns, and unincorporated places. The two major cities in the district are Bryan and College Station, home to Texas A&M University. Of the district's 490,000 residents, about 50% (242,000) live in Brazos County, which includes the cities of Bryan and College Station. Huntsville, home to Sam Houston State University, comprises 10% (47,000) of the population.

When compared to Texas as a whole, residents of the Bryan District are more likely to live below 200% of the federal poverty line, live in a cost-burdened household, be over the age of 65, and have asthma or heart disease.

Barriers to Bicycling

Connecting the cities and towns in the Bryan District is a 3,154-mile State Highway System (SHS) primarily comprised of rural, at-grade highways. Many of these state highways are major thoroughfares and main streets within cities, carrying vehicular traffic to and through developed areas. These roadways can act as major barriers to bicycling due to high motor vehicle volumes and speeds.

Of the state highways that allow bicycle use, 77% do not have designated bikeways. Currently, bicycle facilities in the district are very limited, and of there are restrict transportation and recreational opportunities for existing and potential bicyclists. On the 23% of roadways that have designated bikeways and do not restrict bicycling, the most common bikeway type is a bikeable shoulder located primarily along rural highways. Bikeable shoulders are not comfortable for many bicyclists due to the lack of separation from high-speed motor vehicles. About half of public survey respondents were comfortable riding on a roadway with a wide shoulder in the Bryan District. The district also has bicycle facilities that are generally accessible to more riders, including over 4 miles of bicycle lanes and 5 miles of shared-use paths located primarily within urban areas, but their limited coverage does not offer access for many riders or to many destinations.

Results from an online community survey and feedback from local stakeholders noted areas along the state highways and on connecting streets where conditions felt unsafe, or facilities were inadequate. Respondents commonly identified segments with high traffic speeds and volumes as contributing to stressful biking conditions. Safety concerns were the most prevalent comments, followed by locations with poor bicycling conditions. Roadways with high motor vehicle volumes, wide roadways, and narrow bicycle facilities that lack separation between modes contribute to high-stress conditions. These conditions may occur, for example, on the district's rural highways with narrow shoulders.

Figure 1. Bikeable shoulder on TX-40

Recommendations

A prioritized set of roadways segments identifies where bikeway improvements are most needed in the district, as determined by a set of goal factors related to safety, connectivity, community input, and other indicators. For the Bryan District, the high-priority segments are generally found on roadways that serve multiple trip types and are central within cities and towns. In the city of College Station, for instance, State Highway (SH) 60 (University Drive) connects SH 6 to Texas A&M University, passing by many businesses, student housing, and neighborhoods. Improvements on or along high-priority corridors may address critical needs related to bicycling safety and expand what residents are able to reach by bicycle.

The bikeway functions identified through the Bryan District Bicycle Plan provide guidance on how residents and visitors are likely to use bikeways in various SHS roadways. Roadways located within cities in proximity to local community destinations such as schools and community centers are identified as all-ages bikeways, as they are likely to be used by less-confident riders. There are a few routes located primarily within and adjacent to cities that are identified as daily travel bikeways. These meet the needs of riders who rely on bicycle trips to reach daily destinations like places of employment and local shops. Long-distance bikeways are those along the TxDOT Bicycle Tourism Trails Network (BTT), a series of recreational and tourism-focused bicycling routes that connect to regional destinations with regularly spaced stops in small towns and at other travel resources.

The Bryan District Bicycle Plan identifies eight refinements to the original 2018 Example Network of the BTT, expanding it with new routes and route adjustments. The most prominent addition is the north-south route through the Bryan District, generally following Interstate 45 between New Waverly and Fairfield where it connects to existing BTT routes. This route not only fills a major north-south gap, it also connects to many communities, parks, and other resources for long-distance riders. Other additional BTT routes provide access to Navasota, Somerville, and other destinations in the southwest section of the Bryan District.

Implementation and Next Steps

By pursuing a range of implementation strategies in cooperation with local and regional partners, the Bryan District can work to add bikeway improvements through a variety of roadway project types. Bikeway projects developed by TxDOT may be structured and delivered as a standalone project, as an improvement within a larger roadway project, or as lower-cost projects such as quick-build, maintenance, or pilot projects. In other project types, especially for key connections of local importance, bikeway improvements will ultimately be delivered through partnerships with local governments. These will include roadway improvements led by local county or city sponsors, as well as improvements required by private development that impacts TxDOT roadways and facilities.

As bikeways are implemented throughout the Bryan District, needs and conditions for the region's bicyclists will evolve. Continued engagement with local agencies and stakeholders will be key to maintaining progress on the Plan's goals of creating a safer and more comfortable transportation network for all users.

ONE
Introduction

Purpose and Priorities

The Bryan District Bicycle Plan charts a vision for how state highways can contribute to the bicycling networks of Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, and Washington counties. The State of Texas' on-system transportation network – roads owned, operated, and maintained by the TxDOT – connects communities, regions, and destinations within and outside of Texas. While many bikeways are planned and funded at the local level, incorporating bikeways on the Texas highway system strengthens regional bicycling connections. Bicycle connections on the Texas highway system give people a non-driving option to reach and traverse urban and rural destinations. Developing a framework for on-system bikeway investments is vital as the state works to provide safe, thoughtfully designed, well-maintained facilities for people biking both within TxDOT districts and across the state. This plan is one of four pilot district bicycle plans that TxDOT is preparing in support of Connecting Texas 2050, the state's long-range transportation plan. The four pilot plans cover the Bryan, Pharr, Bryan, and San Antonio districts, with the intention to complete similar bicycle plans for all 25 TxDOT districts. The district bicycle plans analyze needs on the highway system, prioritize routes, and identify potential solution types. This effort includes technical studies, stakeholder engagement, and virtual public meetings.

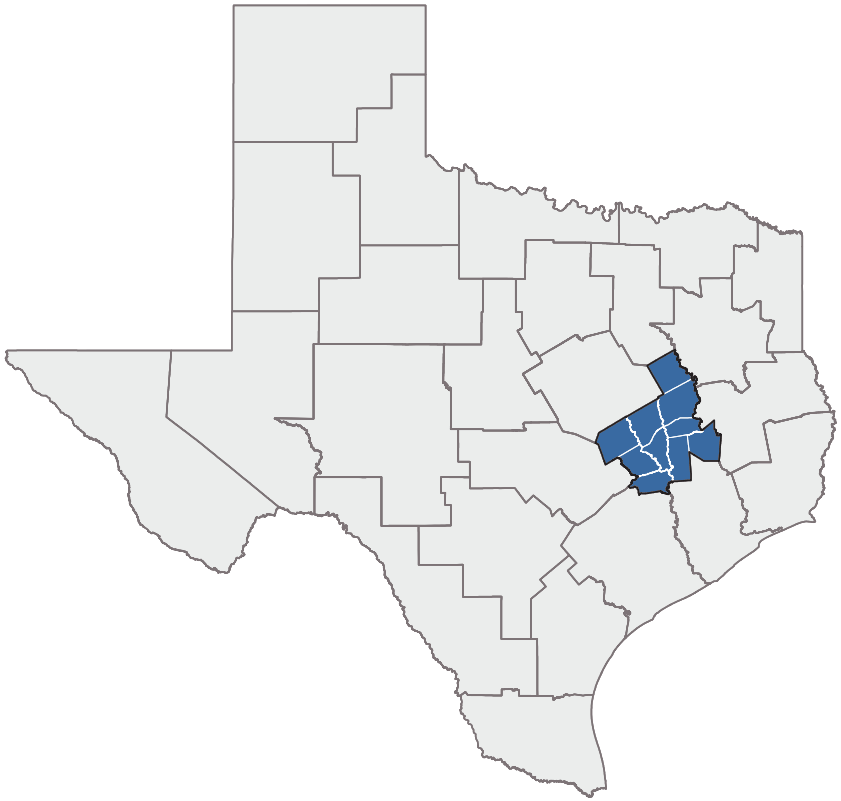


Figure 2. Bryan District Location Map

TxDOT's Role in Bicycle Planning

Connecting Texas 2050 is creating a vision for bicycle and pedestrian transportation across the state. TxDOT's role in active transportation includes developing bikeway design guidance, constructing appropriate bicycle accommodation along the SHS, providing local active transportation project support, and broadly supporting programs and initiatives that enhance safety for people who walk and bicycle. Major programs and activities performed by TxDOT that are related to bicycle and pedestrian planning include:

- Allocating state and federal funding for local projects and programs.
- Requiring engineers to consider bicycling and walking in construction and reconstruction projects.
- Providing engineering standards and design guidance for pedestrian and bicycle facilities.
- Promoting safe bicycle and pedestrian behavior and multimodal connections.
- Integrating bicycle and pedestrian needs into the TxDOT planning processes.

Together, these TxDOT bicycle and pedestrian activities span planning, engineering, and construction activities to expand regional transportation options across the state.

About 0.3% of Texas commuters ride a bicycle to work – well below the national average. TxDOT is committed to routinely providing bikeways when planning and designing transportation facilities, addressing the needs of the target design user.

What is a District Bicycle Plan?

The Bryan District Bicycle Plan documents and evaluates bicycling needs on and across the on-system highway network, identifying locations where better bikeways would enhance mobility, connectivity, safety, and tourism. It will guide the Bryan District in future project development and investment decisions by highlighting places where bicycling needs or potential benefits are the greatest. The plan uses information about the district's communities – such as demographics, land use, and destinations – to understand what kinds of travelers and bicycle trips different routes may support, informing design decisions. The ultimate purpose of this plan is to reduce barriers to bicycling in the region and support the growth of healthy, sustainable, connected, and accessible communities by increasing transportation options and supporting economic development.

The plan draws its policy framework from Connecting Texas 2050 and the Texas 2023-2027 Strategic Plan and aims to advance the following goals:

Promote Safety – Champion a culture of safety that reduces crashes and fatalities through a performance-based approach to address negative safety trends.

Deliver the Right Projects – Ensure efficient use of state resources by implementing effective planning processes to help deliver the right projects on time and on budget.

Focus on the Customer – Ensure the public and stakeholders can see and understand TxDOT's decisions and provide feedback that is heard.

Foster Stewardship – Integrate environmental considerations into all TxDOT activities so that future generations of Texans can benefit from the state's valuable natural, historic, and cultural resources.

Optimize System Performance – Develop and operate an integrated transportation system that provides reliable and accessible mobility enabling economic growth.

Preserve Our Assets – Deliver cost-efficient preventive maintenance for the transportation system that keeps Texas roads, bridges, and other infrastructure and technology in good repair.

Products and Outcomes

The Bryan District Bicycle Plan includes multiple resources that will guide bikeway project development. It is important to note that the plan can benefit local communities, as cities and counties can coordinate with TxDOT on projects along on-system highways that pass through their jurisdictions. The six essential outputs of the Bryan District Bicycle Plan are identified in Figure 3.

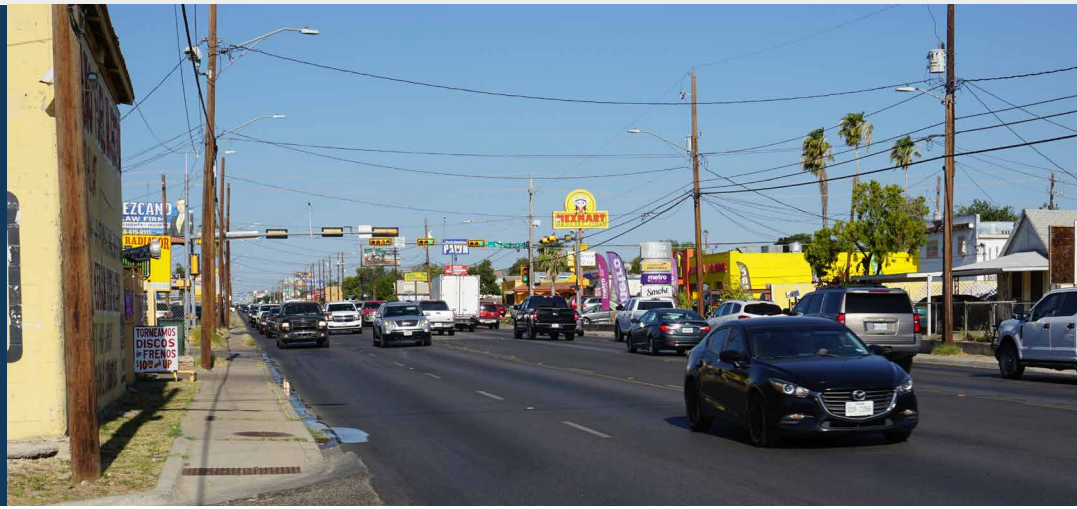
District staff will use the plan outputs to develop projects, select context-sensitive bikeway designs, and broadly make decisions of where, when, and what types of bikeways should be implemented at any given intersection or along any given corridor.

Plan Components

Component	What Question Does It Answer?	Definition
Existing Conditions	What does it feel like to bicycle on highways in the district today?	TxDOT and partner data provides a snapshot of on-system conditions at the time this plan was developed, such as existing bikeways, shoulder width, speed limits, crashes, and more.
Bikeway Needs Assessment	What makes bicycling at this location feel uncomfortable or stressful?	This analysis uses existing conditions data to identify road segments and crossings where gaps and deficiencies affect people traveling by bicycle. It also incorporates on-the-ground knowledge from TxDOT staff, agency partners, and local plans as locally identified needs.
Bikeway Development Priorities	How should a project advance to meet these bicycling needs?	This analysis provides TxDOT districts with guidance regarding how and when to develop bicycling improvements. Bikeway development categories are applied based on a series of prioritization criteria.
Bikeway Functions	Who will use this bikeway, and for what kinds of trips?	These segment-level designations indicate the likely type of bicyclist trip and potential users along an on-system highway, such as children or long-distance riders. The bikeway function is intended to inform decisions about where to provide a bikeway and what design is most suitable.
Refined Bicycle Tourism Trails (BTT) Routes	Where will the district plan for long-distance biking routes?	The plan includes refinements to the 2018 Bicycle Tourism Trails Example Network based on the results of the Bikeway Needs Assessment and other analyses conducted as part of the District Bicycle Plan development process.
Bikeway Design User Guide	How should bikeways be designed to suit the local context and needs?	This document complements the TxDOT Road Design Manual, which contains bikeway design guidance, by assisting roadway designers in the selection of appropriate bikeway facilities based on the surrounding context and bikeway function.

Figure 3. District Bicycle Plan Components

Plan Timeline and Methodology



The Bryan District Bicycle Plan kicked off in August 2022 and was developed in four distinct phases over a period of a year and a half: Existing Conditions, Needs Assessment, Prioritization, and Plan Development. All four pilot districts worked concurrently on this timeline with the goal of sharing best practices across districts. The district plans were also developed in coordination with the Statewide Long Range Transportation Plan and used common data sources and planning goals, though the district plans followed an independent schedule.

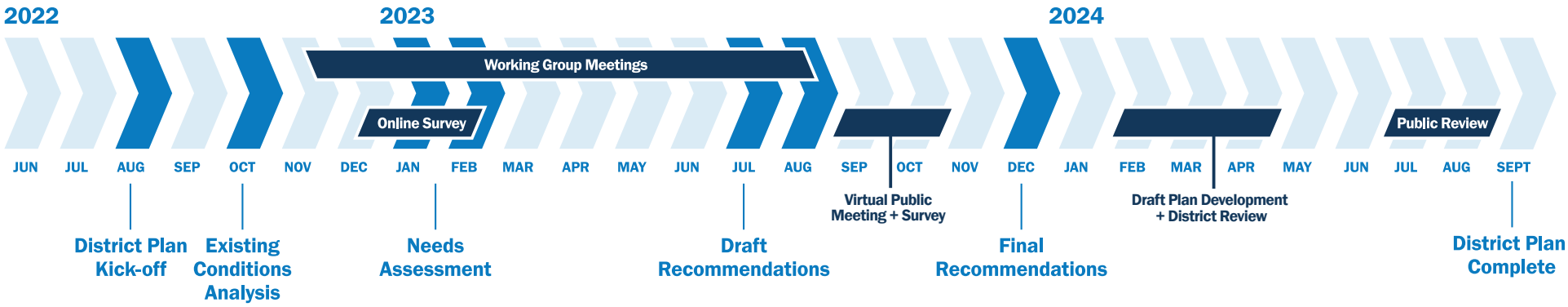


Figure 4. District Bicycle Plan Timeline

Benefits of Bicycling

Research indicates that strategic investments in active transportation infrastructure benefit local businesses, community public health outcomes, and environmental quality. In particular, investing in bikeways and increasing rates of bicycling can encourage physical activity, reduce risk of chronic disease and healthcare costs, and improve health outcomes.

Economic Benefits

Increases in bicycling rates for everyday and recreational purposes yield economic benefits for local communities through increases in local retail sales, bicycle repair services, and hospitality services associated with tourism[1]. Recreational riders may spend between $78 and $275 locally per day during riding trips, for an average of $136 as identified through a literature survey in the 2018[2] BTT. Non-recreational riding boosts sales as well— a study of 14 bicycle projects across 6 cities found that when new bicycle lanes were added to commercial corridors, retail and food service businesses either saw an increase in sales revenue and employment or no impact, with food service seeing the most consistent increase[3]. As new shared-use path infrastructure is added, many communities see modest increases in their property values; for example, a study of home prices in Bexar County found homes near trails valued at 2% more than homes farther from trails[4].

Public Health

Increases in bicycling brought by comfortable, accessible bicycling infrastructure yield a wide array of health benefits on a personal and community level. Regular active transportation lowers rates of obesity, high blood pressure, and insulin levels[5]. Regular bicycling exercise can be especially beneficial to older adults, yielding benefits to upper and lower body strength, endurance, and cholesterol[6]. For mental health concerns, research has shown that frequent bicycle trips (at least three per week) may aid in improving mental wellbeing[7]. A study of bicycle commuters also found reduced rates of overall stress[8]. These benefits can add up; for every dollar spent on a shared-use path, communities can save nearly three dollars in reduced healthcare costs from improved overall health and fitness[9].

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Enhanced Safety for All Users

Different bicycle lane treatment types yield a variety of safety improvements depending on street context. New bicycling facilities have been found to lead to up to a 65% reduction in crash frequencies[10]. Those safety benefits extend to street safety for other modes, not just biking. Research analyzing bicycling rates, safety, and infrastructure prevalence in 12 major U.S. cities found that separated bicycle lanes were associated with improved safety for road users of all modes, possibly owing to traffic calming effects and reduced speeds[11].

Reductions to crash frequencies through safety improvements also yield benefits through associated societal costs. By comparing the changes in crash frequency to the cost of a hypothetical project involving installation and maintenance of a bicycle lane, researchers found that the expected economic benefit yielded from the reduction in crash frequency was twice the cost to install and maintain the bicycle lane over a 3 year period[12].

Improved Air Quality

Changes in transportation choices made possible through new and expanded bicycling facilities can yield local and regional environmental benefits, specifically to emissions and air quality. Public health studies have found that the reduction of harmful particulate emissions and ozone associated with shifting vehicle trips to bicycle trips would reduce healthcare needs and costs[13] and save lives in the process. These outcomes would benefit residents both within cities and regionally.

Increased Transportation Options

The addition of bicycling infrastructure expands bicycling as an option for many people. This is especially true for the more than half of U.S. adults who consider themselves "interested but concerned" about bicycling and who require lower stress facilities to ride a bicycle. One study of several major cities surveyed residents who self-identified as "interested but concerned" bicyclists in areas with new protected bicycle lanes. Forty-three percent of these riders surveyed reported that because of a new facility near them, they found themselves riding more often overall[14]. Further, bicycle facilities can expand access to transit service, doubling the accessible distance to stations and complementing transit trips as a first/last mile mode option[15].

The option to travel by bicycle presents a more affordable transportation mode when compared to the costs of vehicle ownership, which on average total to $9,561 per year[16]. By contrast, the average annual cost of owning and riding a bicycle is $308[17].

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TWO

Community and Stakeholder Outreach

The people who live and work in the Bryan District have on-the-ground experience with, and knowledge about, conditions across the district's communities. They understand the challenges and opportunities that TxDOT will encounter as it works to improve conditions for bicyclists. The Bryan District Bicycle Plan was informed by a combination of stakeholder meetings that brought together representatives with that local knowledge and interactive mapping surveys for the general public. Two working groups were convened to provide invaluable input on overall plan progress, especially the components focused on analysis of local conditions and prioritization. The following section describes how each of the stakeholder groups and surveys came together to support the Bryan District Bicycle Plan process and outcomes.

Technical Working Group

The Technical Working Group (TWG) was comprised of local and regional experts who have a close understanding of the processes and technical conditions that inform bicycle planning in their areas. This includes staff of Bryan-College Station Metropolitan Planning Organization (MPO), TxDOT district staff, Texas A&M University representatives, county staff, and staff from local cities such as Navasota, College Station, Brenham, and Bryan. TWG members were asked about local conditions, their experiences planning and implementing projects, relevant datasets, and how to align bicycle plan priorities with local goals. A full list of TWG members is included in the Acknowledgements.

This group met three times during plan development. Key themes identified by the Bryan District TWG include:

- Quantitative as well as qualitative data and personal experiences can be used to determine desirable bicycle routes.
- Route planning should be coordinated with local jurisdictions.
- E-bicycles may change the distance and speeds at which people ride.
- There is demand and need for educational campaigns about rules of the road for bicyclists and non-bicyclists.
- Safety is the major issue related to bicycling and the top priority. The biggest threat to bicyclists is vehicles. Reducing vehicle speeds along on-system routes can facilitate bicyclist use, especially all ages and abilities.
- Providing resources about bicycle routes along off-system routes parallel to on-system highways can also help facilitate bicycling.
- Network function should generally focus on creating all-ages-and-abilities routes within developed areas.
- Project prioritization should reflect local input and be based upon identified needs, with safety being the top priority.
- BTT should focus on routes currently being used and create good long-distance connections and loops.

Community Needs Working Group

The Community Needs Working Group (CNWG) was comprised of local and regional stakeholders from community-based organizations, affordable housing providers, educational institutions, and other agencies and organizations. While most of the invitees do not focus their work on transportation, their direct work with local communities gives them insight into the daily needs of the people they serve. They also offered the project team local perspectives on access to opportunity, safety, environmental justice, public health, and related topics.

Through the CNWG, stakeholders shared early insights into the barriers, needs, and opportunities related to bicycling in their communities. The CNWG worked with the project team to determine what publicly available data could be used to locate communities who have limited transportation resources, experience increased burdens from existing roads and traffic, or experience elevated rates of health conditions that can be improved through access to physical activity. A full list of CNWG members is included in the Acknowledgements.

This group met once during plan development. Key themes identified by the Bryan District CNWG included:

Biking today in the Bryan District
There is a lot of cycling around the Texas A&M campus.
TxDOT highways bisect communities, creating barriers to bicycling.
Many people bicycle for recreation, but more would commute if connectivity was better.
Safety concerns deter people from bicycling more.
Physical barriers are needed between bicyclists and vehicular traffic to create a sense of safety for bicyclists.
Amenities like bicycle parking and shade are important to encourage more bicycling.
Local jurisdictions and advocates have thought a lot about the desired location of specific bicycle facilities.
Community needs related to bicycling
Bicycle racks on buses
More bicycling and micromobility routes to create connected networks
Curbside management (eliminate vehicles parking or queueing in bicycle lanes)
Primary barriers to bicycling:
The perception that bicycling is a means of travel for only those that lack resources to own a vehicle.
Lack of bicyclist education on how to properly use bicycle facilities and for motorists on the rules of the road
High-speed roadways and intersections

Public Input

Online Web Map Surveys

In 2022 and 2023, two interactive map surveys were employed to engage working group members and members of the general public, soliciting input at critical points in the plan's development timeline. In addition to direct outreach to bicycling advocacy groups, the study team encouraged participation through phone calls and emails. This section describes participation in the surveys and key findings from the public input.

Bicycling Conditions Map: The first map survey, shown in Figure 5, was open from December 2022 to February 2023 to collect input on where people bicycle today or wish to see improvements. This includes locations of bicycling destinations, desired routes, and key safety concerns. This map was part of a survey with questions related to general transportation behavior and desired bicycling facility types. Key findings are shown below.

Bicycling Recommendations Map: Figure 6 shows comments collected in the second interactive map survey, which gathered input on the draft priority network, BTT, and network functions from September to October 2023. Stakeholders reviewed recommendations for supporting bicycling on the SHS, providing comments on how those recommendations could be better shaped to address existing needs and opportunities in the Bryan District.

Survey Results Summary

- **Conditions Map Survey responses:** 440 responses, making 1,386 map comments
- **Recommendations Map Survey responses:** 238 responses, making 488 map comments

BRYAN DISTRICT: Bicycling Conditions Survey Comment Distribution

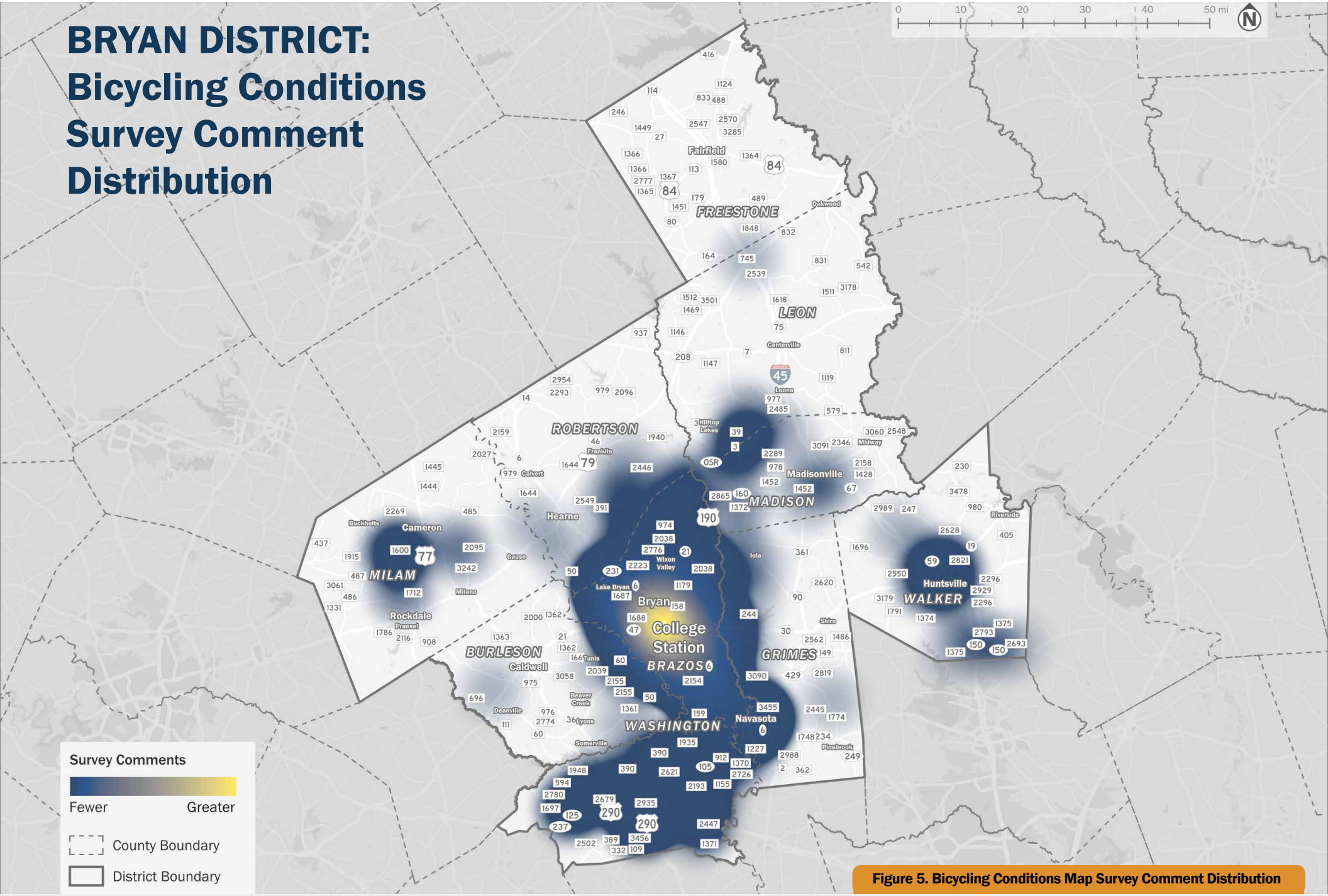


Figure 5. Bicycling Conditions Map Survey Comment Distribution

BRYAN DISTRICT: Bicycling Recommendations Survey Comments

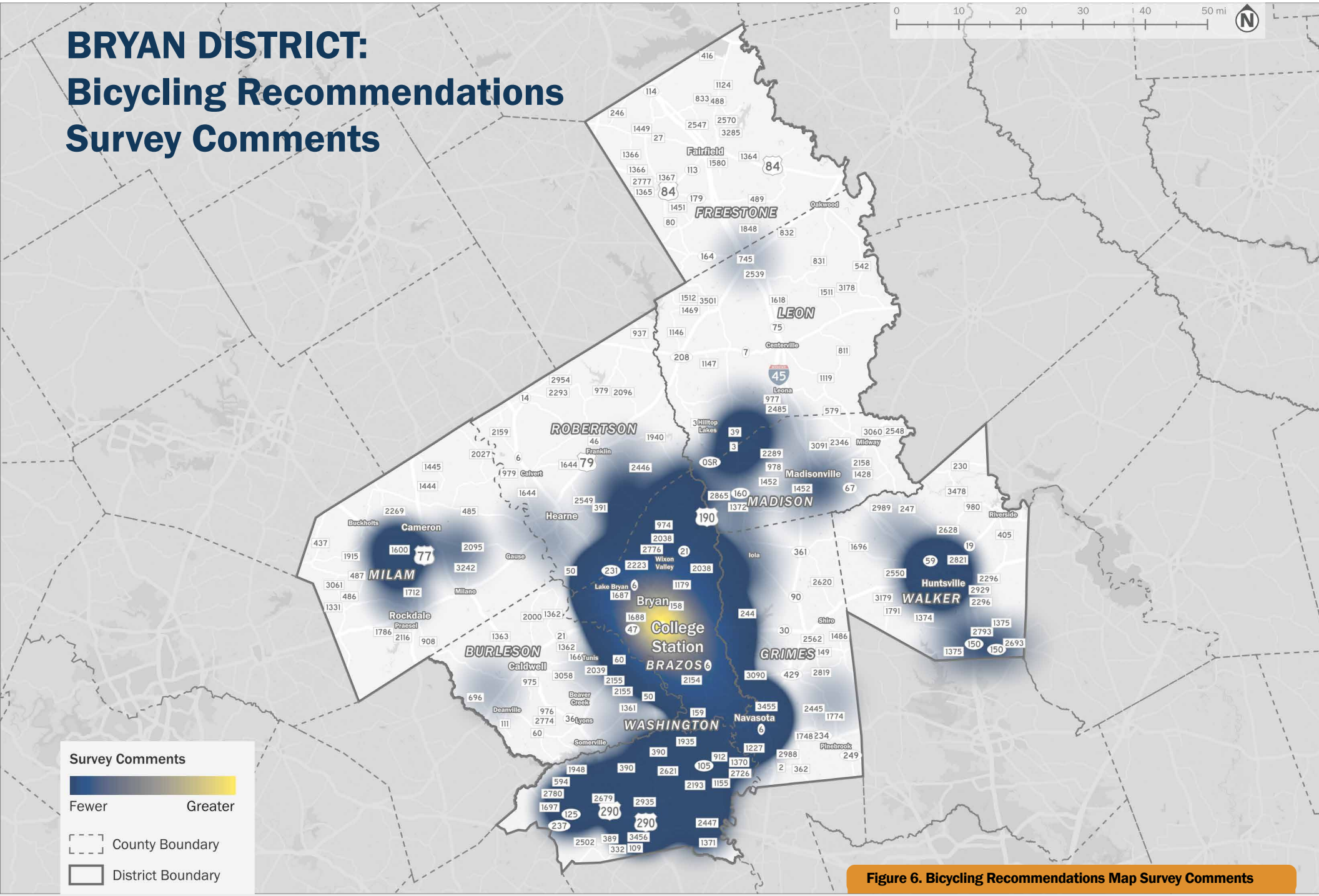


Figure 6. Bicycling Recommendations Map Survey Comments

Key Findings: Conditions Map Survey

- According to respondents in the Bryan District, biking for recreation is more prevalent than for transportation, although biking for transportation is still common. Just under half of respondents bicycle to get to places they need to go.
- The most prevalent transportation-related bicycle trip purposes are running errands (72% of respondents) and going to work (66% of respondents).
- Over half of the respondents ride a bicycle at least once a week.
- Bryan District bicyclists feel most comfortable biking on facilities separated from traffic.
- Safety is a top priority, followed by access to destinations and building a connected network.
- About 80% of bicyclists in the Bryan District are comfortable riding on bikeways or trails separated from traffic. Just under 70% of bicyclists are comfortable riding on low-volume streets with slow speeds. Just 13% of riders are comfortable on roads without bicycle lanes, wide shoulders, or bikeways separated from traffic (Figure 7).
- Of the 1,386 map comments, 751 (54%) were placed within 750 feet of a TxDOT facility. It is assumed that comments outside of the 750-foot buffer are comments on local facilities, so the following information reflects the 751 comments most relevant to TxDOT.

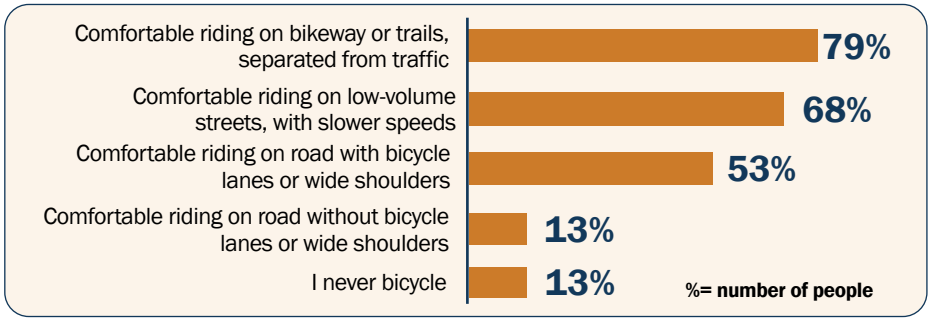


Figure 7. Bryan District Level of Comfort Results
Source: Bicycle Conditions Map, 2023 Online Survey

40% of comments identified a safety concern, including:

39% - No shoulder to ride on
29% - Difficult intersection to cross
16% - Too many cars or trucks
11% - Cars and trucks moving too fast
3% - Poor visibility
1% - Poor pavement condition

29% of comments identified a poor bicycling condition, including:

63% - Missing bicycle lane or bicycle lane markings
20% - Shoulders too narrow
13% - Shoulders not paved or in poor condition
3% - No bicycle signage
2% - No lighting or poor lighting

22% of comments identified a location where the respondent likes to bicycle, including:

46% - I bike this route for fun
28% - I would bike to this destination if there were better connections
14% - I frequent this destination
12% - I bike this route for work

9% of comments identified a bicycling gap or barrier, including:

42% - Missing link along or near bicycle route
37% - Barrier to a bicycle route
18% - Missing connection to community destination
2% - Missing connection to trail

Key Finding: Recommendations Map Survey

Prioritization

- Of the 118 comments on prioritization, 39% agreed with the proposed priority and 61% disagreed with the proposed priority.
- Routes or areas that are identified as having heavy bicycle use should be higher priority.
- Several routes are on a mainline highway that has frontage roads, so the highway should not be included.
- Several routes identified have a planned, programmed, or recently constructed bicycle facility.

Bikeway Functions

- Of the 328 comments on bikeway function, 54% agreed with the proposed function and 46% disagreed.
- There is a general desire for more routes for all ages and abilities.
- Routes near schools need more protection for bicyclists, including separation of bicyclists and vehicles.
- Motor vehicle drivers create unsafe conditions for bicyclists.
- Some routes should be extended.
- There were recommendations on specific facility types, such as shared-use paths, along some routes.

Bicycle Tourism Trail

- Of the 42 comments on BTT, 86% agreed with the proposed route and 14% disagreed with the proposed route.
- There was general agreement with route selection and some suggested revisions.
- Some routes are viewed as too dangerous for bicyclists due to vehicle speed and traffic.
- Routes may work for bicyclists, but improvements are needed.

Virtual Public Meeting

TxDOT uses virtual public meetings to publicize planning projects and ask for input. These meetings are delivered in the form of a pre-recorded presentation that is made available online for a set period of time. The TxDOT District Bicycle Plans virtual public meeting, which was made available in fall 2023, provided an overview of the plan purpose and products and invited attendees to respond to the second online mapping survey. The meeting had three goals:

1. Invite the public to learn about the planning process
2. Ask the public about their vision for the future of bicycling in Texas
3. Invite the public to provide input and comments on proposed recommendations

Input and comments collected during the Virtual Public Meeting are reflected in Figure 7 on the previous page via survey responses.

Figure 8. Virtual Public Meeting Announcement

THREE
Existing Conditions

District Profile

The Bryan District spans 10 counties – Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, and Washington. As of 2021, 489,313[18] people reside across 41 incorporated cities and 15 unincorporated places. The largest two cities in the district are Bryan and College Station, which are in Brazos County. Brazos County's population has increased by about 60% since 2000 and houses about 50% of the district's residents (a population of 241,931)[19]. Just under 10% (47,351) of the district's population lives in the City of Huntsville[20]. The rest of the district is largely rural in nature.

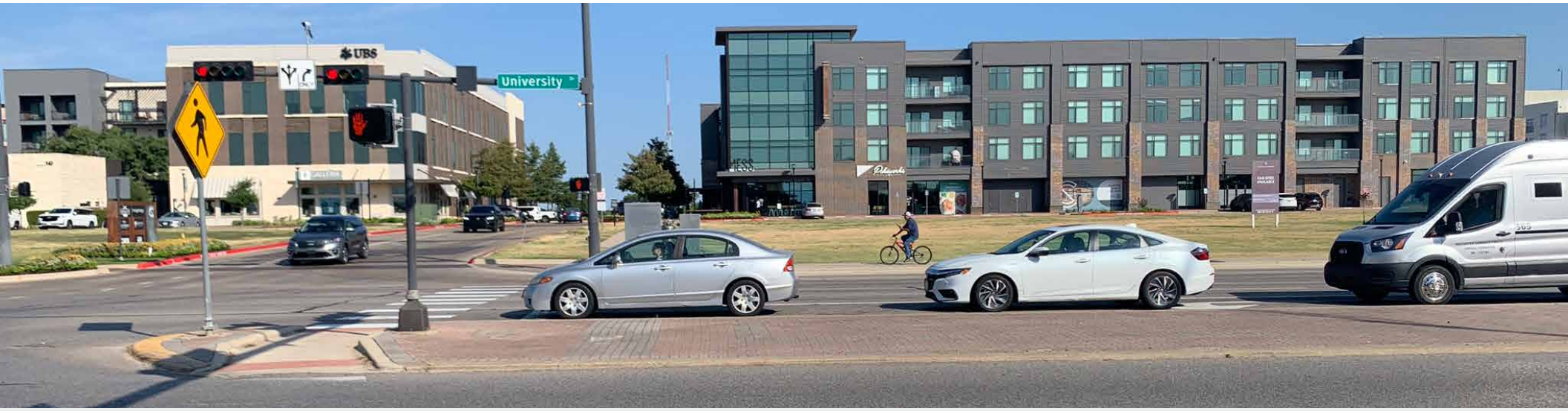
Connecting these cities and places are 3,154 miles of SHS roadways. Across those, nearly 5.6%, or 176.8 miles, are limited-access highways where bicycling is prohibited, as shown in Figure 9. The remaining 2,977 miles are generally rural at-grade highways that connect communities or are thoroughfares in cities and towns.

Residents and visitors in the Bryan District are likely to benefit from expanded transportation options, especially bicycling options that reduce the transportation cost burdens and improve health outcomes. As shown in Figure 10, the district's residents are more likely than the average Texan to live below 200% of the federal poverty line or live in a cost-burdened household, which could be influenced by the large student populations at Texas A&M and Sam Houston State University. Housing cost-burdened households as a percent of all households in U.S. Census block groups are shown in Figure 11. District residents are also more likely to be over the age of 65, have asthma, or have heart disease. Consistent with the state average, 5.2% of households in the district do not have access to a motor vehicle. Fatal and severe crashes per capita in the Bryan District are higher than the state average. Expanded bicycling options that make the district more safe, comfortable, accessible, and connected would allow residents greater access to less expensive transportation options and integrate exercise into their daily lives.

18 Bryan District – District Profile. Texas Department of Transportation, 2023. https://www.txdot.gov/content/dam/docs/district/bryan-district-profile.pdf

19 "Brazos County Profile." The County Information Program, Texas Association of Counties, 2022. https://txcip.org/tac/census/profile.php?FIPS=48041

20 "Census QuickFacts – Huntsville." U.S. Census Bureau, 2022. https://www.census.gov/quickfacts/fact/table/huntsvillecitytexas/PST045222



BRYAN DISTRICT:
State Highway System

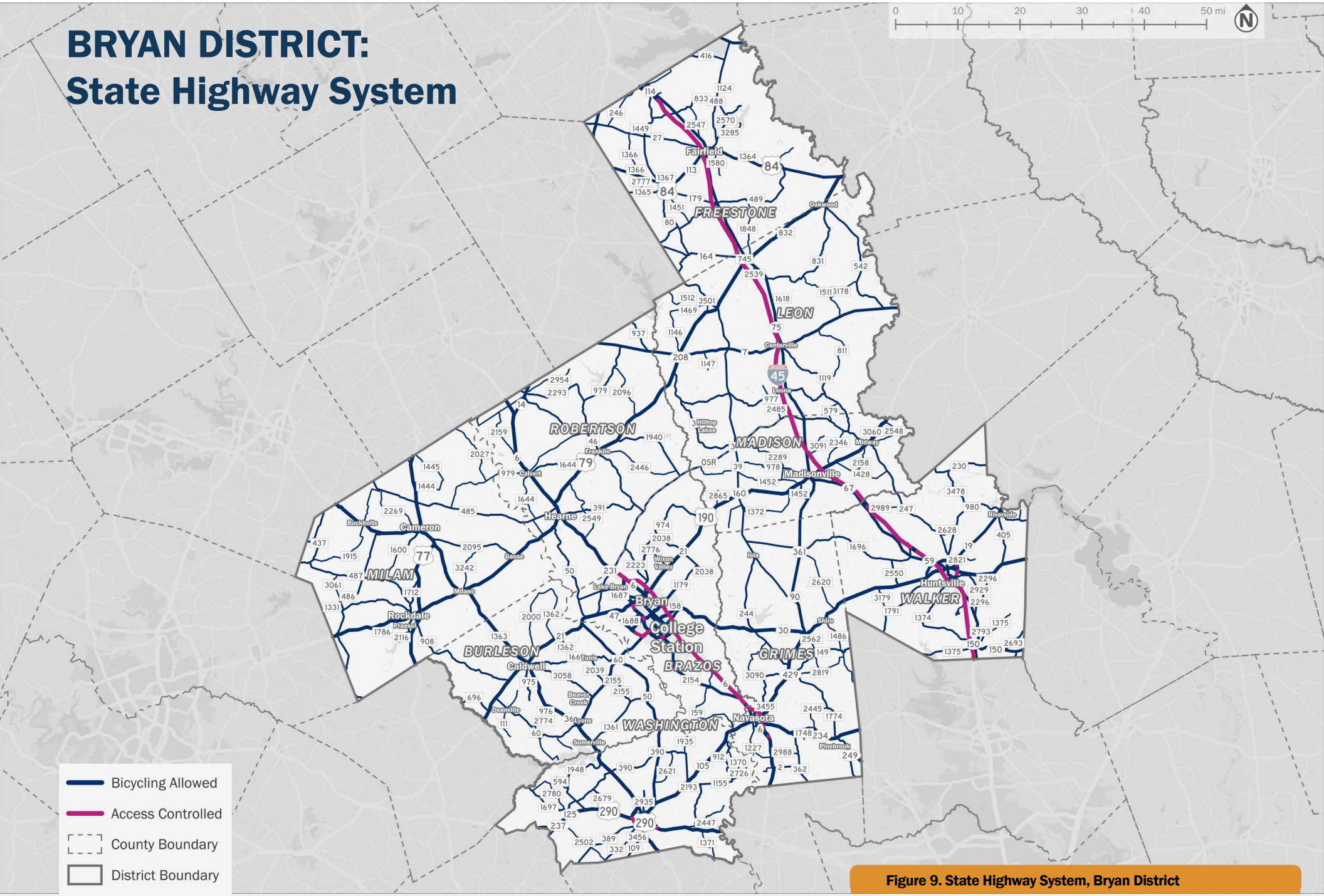


Figure 9. State Highway System, Bryan District

Community Profile

BRYAN DISTRICT

Population Under 18

20.5%
DISTRICT

26.0%
STATEWIDE

Population Over 65

13.5%
DISTRICT

12.3%
STATEWIDE

Population Non-White Latino

22.4%
DISTRICT

39.3%
STATEWIDE

Population Below 200% Federal Poverty Line

36.8%
DISTRICT

33.6%
STATEWIDE

Households with Disabled Residents

23.2%
DISTRICT

24.3%
STATEWIDE

Zero-Car Households

5.2%
DISTRICT

5.3%
STATEWIDE

Housing Cost-Burdened Households

31.4%
DISTRICT

29.5%
STATEWIDE

Population (18+) With Asthma

9.3%
DISTRICT

8.6%
STATEWIDE

Population (18+) With Heart Disease

5.5%
DISTRICT

5.4%
STATEWIDE

Fatal and Severe Crashes Per 1,000 Residents

16.8%
DISTRICT

12.8%
STATEWIDE

Figure 10. Community Needs in the Bryan District

BRYAN DISTRICT: Housing Cost-Burdened Households

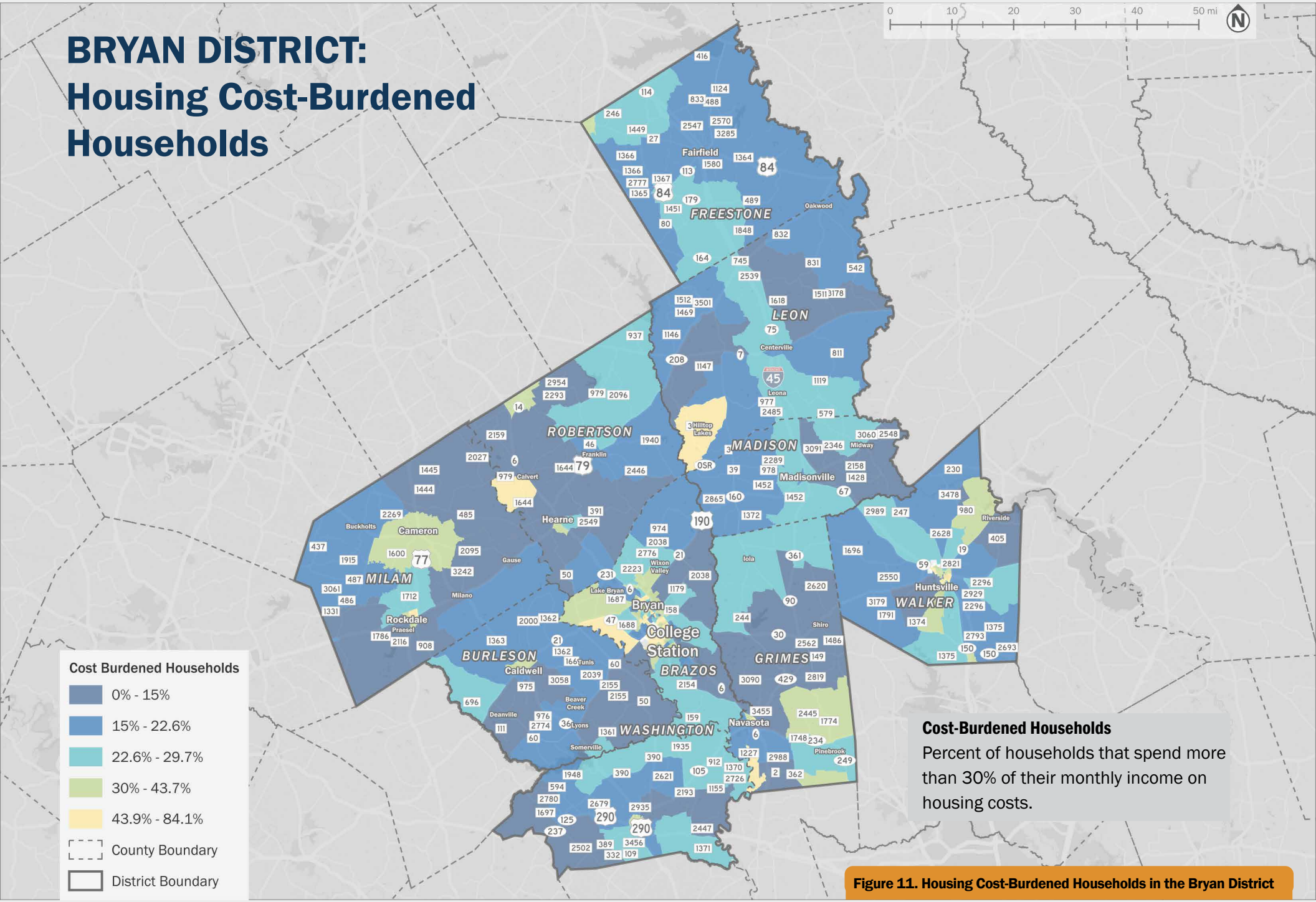
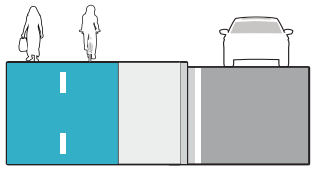
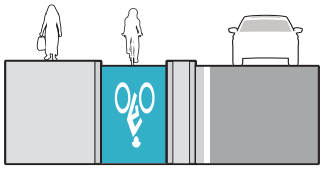
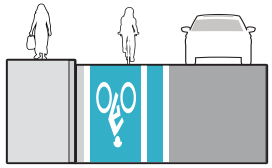
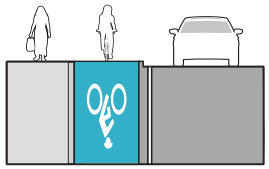


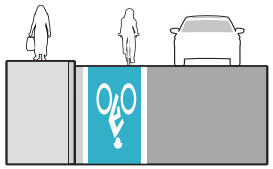
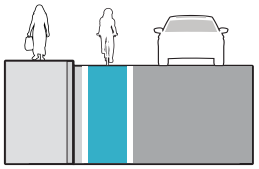
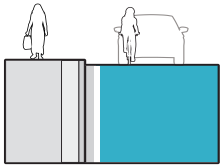
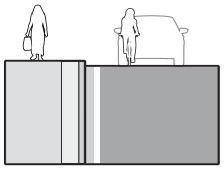
Figure 11. Housing Cost-Burdened Households in the Bryan District

State Highway System Bikeway Network

As shown in Figure 12, few designated bikeways exist on TxDOT roadways in the Bryan District. Within the district, 23% of TxDOT roads that do not prohibit bicycles have designated bikeways, leaving 77% of on-system roads that do not have designated bikeways. The most common bikeway type is bicycle-accessible shoulders, which are primarily located along rural roadways (Figure 13) where users may ride in the wider outer area adjacent to the travel lane. There are approximately 4.1 miles of bicycle lane and 5.1 miles of shared-use path. The bicycle lanes and shared-use paths along TxDOT roads are all within urban areas, - including Bryan, College Station, Brenham, and Caldwell.

Bikeway Facility Types

Facility Type	Miles	
Shared-Use Path	5.1	
Separated Bicycle Lane	0.0	
Buffered Bike Lane	0.0	
Raised Bicycle Lane	0.0	

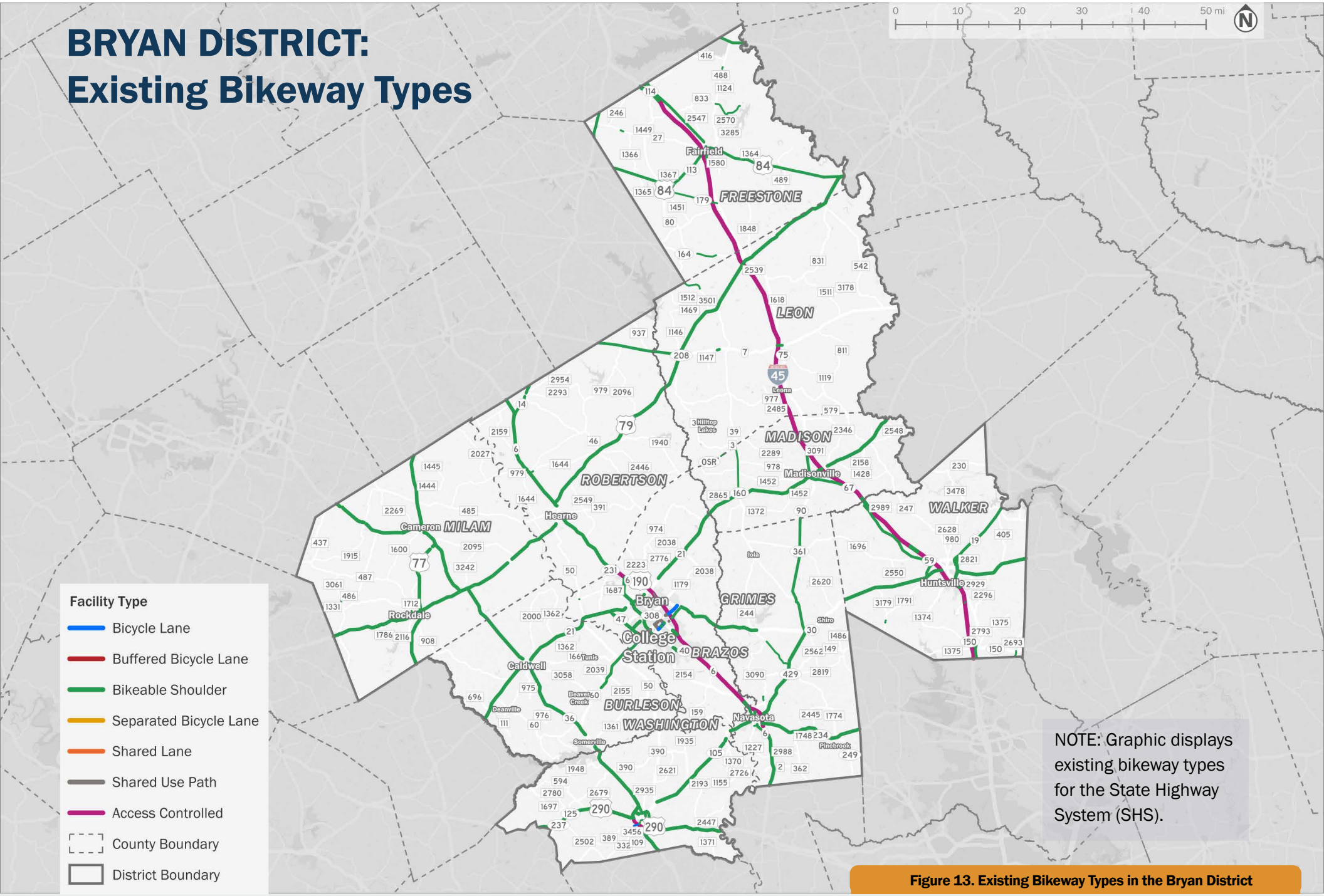
Facility Type	Miles	
Bicycle Lane	4.1	
Bicycle-Accessible Shoulder	666.1	
Shared Lane	0.0	
None	2,301.7	

NOTE: The bikeway types shown are general in nature and provided as examples. Actual field conditions may vary.

Figure 12. Bryan District Bikeway Types, by Mile

Total District Miles: 2,977

BRYAN DISTRICT:
Existing Bikeway Types



NOTE: Graphic displays existing bikeway types for the State Highway System (SHS).

Figure 13. Existing Bikeway Types in the Bryan District

Table 1. Existing On-System Bikeways by County (Centerline Miles)

Facility Type	Brazos	Burleson	Freestone	Grimes	Leon	Madison	Milam	Robertson	Walker	Washington
Shared-Use Path	5.1	0	0	0	0	0	0	0	0	0
Separated Bike Lane	0	0	0	0	0	0	0	0	0	0
Buffered Bike Lane	0	0	0	0	0	0	0	0	0	0
Bike Lane	3.1	0.3	0	0	0	0	0	0	0	0.7
Bike-Accessible Shoulder	62.3	53.0	87.8	80.8	49.5	48.8	97.4	59.2	62.2	65.2
Shared Lane	0	0	0	0	0	0	0	0	0	0
No Bikeway	237.7	180.5	255.5	207.2	311.7	197.0	236.6	218.4	250.7	206.4

Note: Centerline miles refers to the total length of the roadways. By contrast, lane miles refers to the number of centerline miles multiplied by the number of lanes.

Safety Conditions for People Bicycling

Bicyclist-involved crashes along TxDOT highways in the Bryan District have historically been concentrated on segments within or near developed areas such as the cities of Bryan, College Station, Huntsville, and Brenham, as well as some smaller cities like Rockdale and Cameron. Figure 14 shows the locations of bicycle-involved crashes from 2017 to 2021. During this period, 286 bicycle-involved crashes occurred within the District, resulting in five fatalities and 28 serious injuries (Table 2). Of the total district bicycle-involved crashes, approximately 56% occurred on the SHS, including 4 fatalities and 18 serious injuries.

Crash Severity	District Total	On-System	On-System, Percent of District Total
Fatal	5	4	80.0%
Suspected Serious Injury	28	18	64.3%
Suspected Minor Injury	174	92	52.9%
Possible Injury	50	27	54.0%
No Injury	29	18	62.1%
Total	286	159	55.6%

Table 2. Bicycle-Involved Crashes by Injury Type

As illustrated in Figure 14, crashes tend to be concentrated on TxDOT on-system roadways that function as main thoroughfares for cities, and often at-grade (not separated facilities). In the cities of Bryan and College Station, these include SH 6B (Texas Avenue), SH 60 (University Drive), and Farm Road (FM) 2347 (George Bush Drive), many of which are near Texas A&M University. These thoroughfares through cities tend to have multiple lanes, higher vehicle speeds, and higher vehicle volumes. These are key safety challenges, as these roadways connect residents and visitors to major educational, shopping, employment, and recreational destinations.

Local Plans and Policies

Local plans and policies can help TxDOT and local agency partners identify complementary opportunities to invest in bikeways that connect to form larger networks, regardless of road ownership. There are two plans within the Bryan District that shape bicycling-related projects and policies. The City of College Station and the Bryan-College Station MPO provide local or regional guidance on bicycle planning and infrastructure in a small portion of the Bryan District. The Bryan-College Station MPO has a draft Active Transportation Master Plan that includes a map of proposed on- and off-street bicycle facilities throughout the area. The City of College Station adopted the Bicycle, Pedestrian, and Greenways Master Plan in 2010, which recommends a network of on- and off-street bikeways throughout the city as part of its overall growth and development plan. The Huntsville Comprehensive Plan, adopted in 2006, recommends preparing a bicycle and pedestrian plan and making the city more bicycle friendly to achieve a variety of community goals.

BRYAN DISTRICT: Bicycle-Involved On-System Crashes (2017-2021)

Several of these concentrated crash areas are located on key segments that connect to international bridges, which are important connectors in the district for residents and visitors who travel across the border with a bicycle. As bikeways are implemented throughout the district, segments with higher concentrations of crashes will likely require greater degrees of protection and separation between modes.

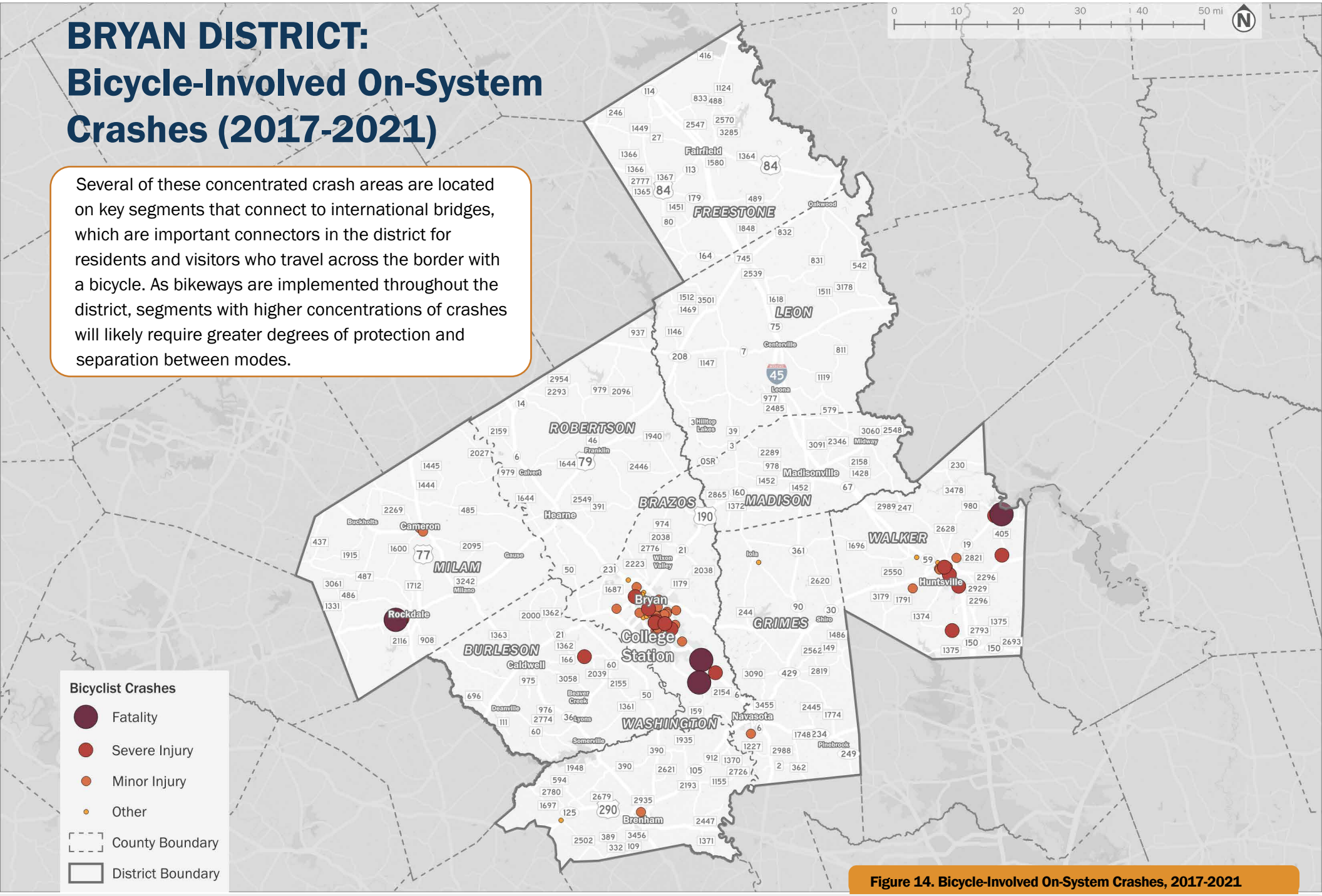
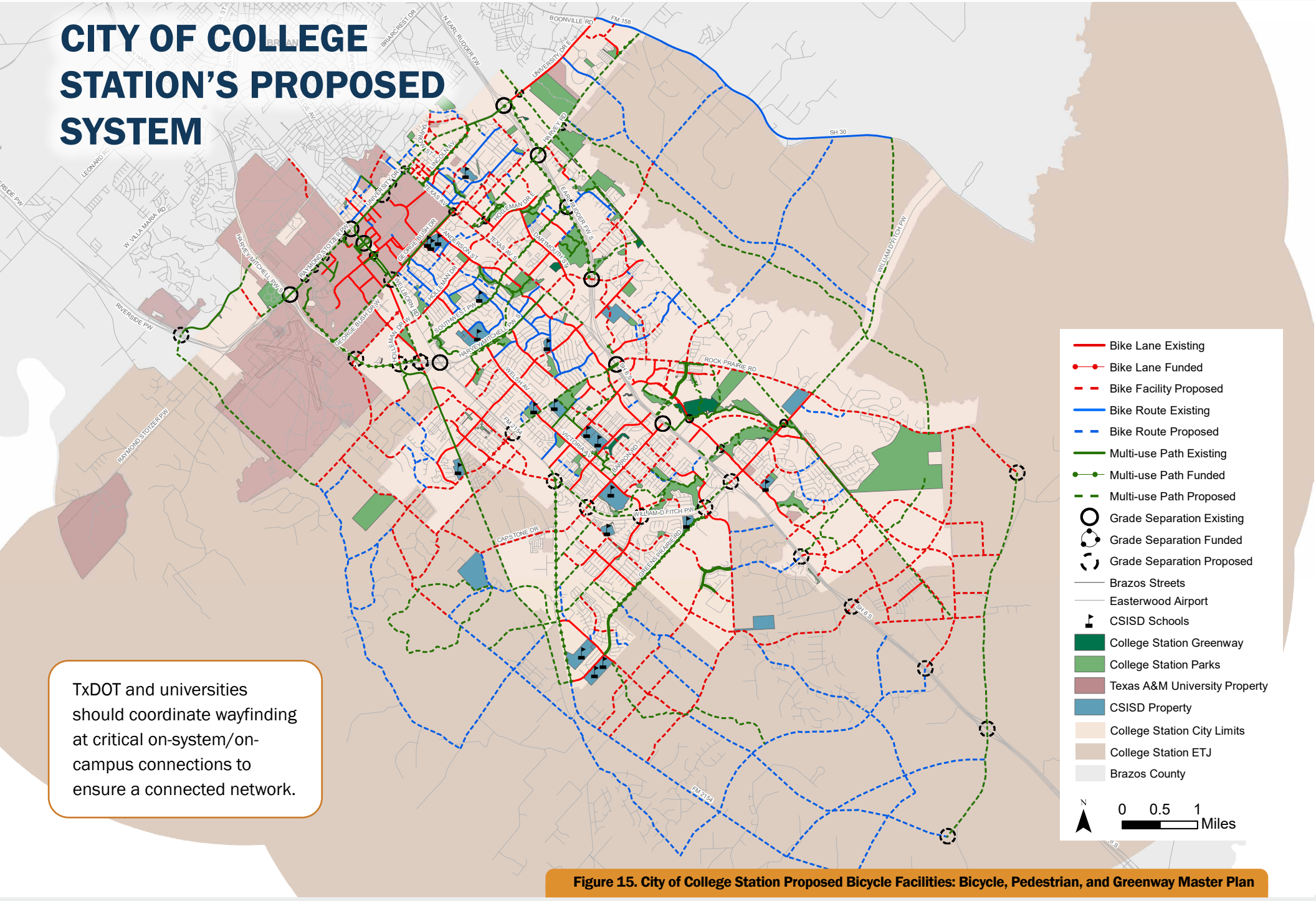


Figure 14. Bicycle-Involved On-System Crashes, 2017-2021

CITY OF COLLEGE STATION'S PROPOSED SYSTEM



TxDOT and universities should coordinate wayfinding at critical on-system/on-campus connections to ensure a connected network.

Figure 15. City of College Station Proposed Bicycle Facilities: Bicycle, Pedestrian, and Greenway Master Plan

FOUR
Needs Assessment

Defining Bicycling Needs

Geographic data from TxDOT and other public sources provide insight into places where on-system bikeways and roads may not meet the needs of people traveling by bicycle. These locations are classified into need types according to specific conditions that indicate the relevant bicycling-related needs. Some bikeway needs are mapped as segments of an existing route, while other types of needs are points representing intersections or other crossing locations. Where geospatial data on planned bikeway projects was available, such as for the Bryan/College Station MPO and the City of College Station, planned projects were included in the needs analyses to identify where connections to planned local bikeways are most needed along on-system corridors. Because interstates and other limited-access facilities in urban areas are generally not intended for use by bicyclists, most need types apply only to on-system roads that are designed as at-grade arterials.

Types of Bicycle Needs

- **High-Stress Bikeway:** This analysis identifies at-grade segments of the on-system network where bikeways exist, but conditions will be stressful for most riders. It uses roadway data such as bikeway design, number of lanes, traffic volumes, and posted speeds to calculate a bicycling Level of Traffic Stress (LTS) score of 1 to 4. A road segment that scores LTS 1 is considered comfortable for all users, while a road segment scored LTS 4 will likely be too stressful for all but the most experienced riders. A segment is considered a high-stress bikeway if the LTS score is 3 or 4.
- **No Bikeway:** This analysis identifies at-grade segments of the on-system network that do not have bikeway facilities or bikeable shoulders. A person riding along these roads would need to share a travel lane with vehicles or use sidewalks if available. While not all such locations are near places that generate or attract bicycle trips, they should be identified as routes that may not be bikeable for most users.
- **Gap Between Existing Bikeways:** This need type occurs where a gap exists between two bikeways segments along an at-grade route. A gap in a bicycle facility introduces stress into the riding experience, discouraging riders from taking a route that might otherwise serve them well.
- **Access to Schools:** This analysis identifies at-grade segments of the on-system network that may not meet the bicycling needs of students attending nearby schools. Young riders typically require protection and separation to make safe and comfortable bicycle trips, while adult riders are typically able to ride longer distances and navigate a wider range of bikeways. For roadway segments within 2 miles of K-12 schools, this need type identifies roadway segments without buffered or separated bikeways. This need type also locates road segments within 3 miles of a higher education school that do not have bikeways of any kind, including bikeable shoulders.
- **Bicycle Tourism Trail Need:** BTT are routes that TxDOT has recommended for inclusion in a statewide bicycle tourism network. They traverse urban and rural areas, which have different standards for how bicycle trips should be accommodated. In urbanized places, BTT needs are identified along routes with LTS scores of 3 or 4. In rural areas, BTT needs are identified where road shoulders are narrower than 8 feet (the standard the state has set for BTT routes with shoulder bikeways).

- **Lack of Crossing Opportunity:** Where intersections and grade-separated crossings are sparse, highways and other on-system roads become barriers for people who are trying to bicycle from one side of the highway to another. This need occurs on road segments where bicyclists must make long out-of-direction detours to find an opportunity to cross the highway.
- **High-Stress Crossing:** This need locates points on the on-system network where a crossing exists but people bicycling may find it uncomfortable. This version of the LTS analysis considers factors such as traffic volumes, type of traffic control, presence of a median island, number of lanes, and posted speeds. Crossings with an LTS of 3 or 4 are considered high stress.
- **Water Crossing Need:** Waterways can act as natural barriers for all travelers, making bridges and other crossings critical to providing connected networks. This need type identifies points where a state-owned road crossing a stream or river does not provide a bicycle facility (and is not adjacent to a bikeable bridge on a frontage road). Because bridges can be more challenging and expensive to improve than other parts of the road network, it is important to determine whether a bridge project should include bikeways before a project is fully designed.
- **Locally Identified Needs:** Locally identified needs reflect the local knowledge of TxDOT, its agency partners, and the communities they serve. These segments and points indicate places where new or improved bikeways should be considered, often drawing on qualitative data and public input. Locally identified needs include bikeway networks or projects from local plans, locations where TxDOT staff are aware of bicycling gaps, deficiencies, or community requests for improvements. TxDOT staff considered public survey input when determining locally identified needs.

TxDOT and the TWG reviewed the data-driven needs assessment and used local knowledge to add needs that had been missed or remove needs that are being resolved through another project.

Bicycle Needs in the Bryan District

Figure 16 demonstrates how multiple types of needs may be closely spaced or overlap, creating barriers to comfortable, safe bicycling in local communities.

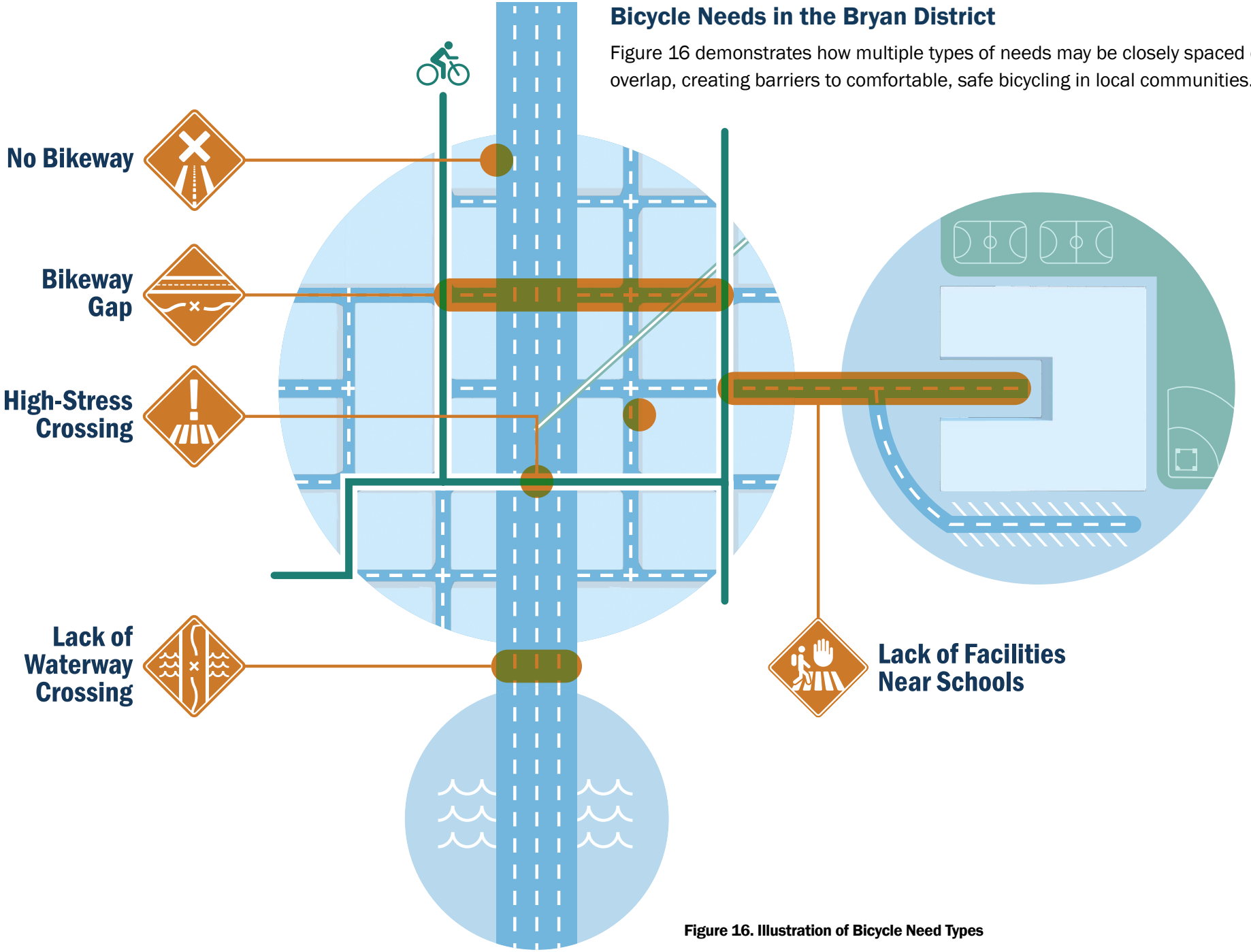


Figure 16. Illustration of Bicycle Need Types

The needs assessment maps shown in Figure 17 visualize these needs throughout the Bryan District, and Table 3 summarizes the need types. Overall, 88% of the SHS in the Bryan District exhibited at least one bicycling need. Consistent with the distribution of bikeways detailed above, "No Bikeway" was the most widespread need type, as the majority of TxDOT roadways in the district lack bikeable facilities. As a result, "Gaps Between Bikeways" (designated only where adjacent bikeways exist) was also a rare need type, occurring for only 0.6% of on-system roadways.

"Access to Schools" was a fairly common need type, as it captured most roadways in cities near school campuses. TxDOT roads throughout Bryan and College Station exhibit the need for improved access to schools due to roadways being in close proximity to schools without separated or buffered bicycle lanes for primary and secondary students, or any bikeway for higher-education students. This need for all-ages-and-abilities bikeways to schools is similar in most cities in the Bryan District.

Need Type	Miles	Percent of On-System Roadways
High-Stress Bikeway	301.9	9.6%
No Bikeway	2,312.2	73.3%
Gaps Between Bikeways	7.5	0.3%
Access to Schools	816.8	25.9%
Bicycle Tourism Trail	143.2	4.5%
Lack of Crossing Opportunity	131.4	4.2%
Locally Identified Need	68.1	2.2%
Total	3,791.6	120.2%

Table 3. Bryan District Need Type Distribution

Bryan District: Bicycle Needs

The bicycle needs in the Bryan District indicate how and where the current design and use of the SHS might discourage bicycle trips. For example, existing bikeways may feel uncomfortable for many users due to roadway conditions, while the key barrier in more rural areas is often the lack of bikeways. BTT segments may need improvements to meet long-distance riding needs.

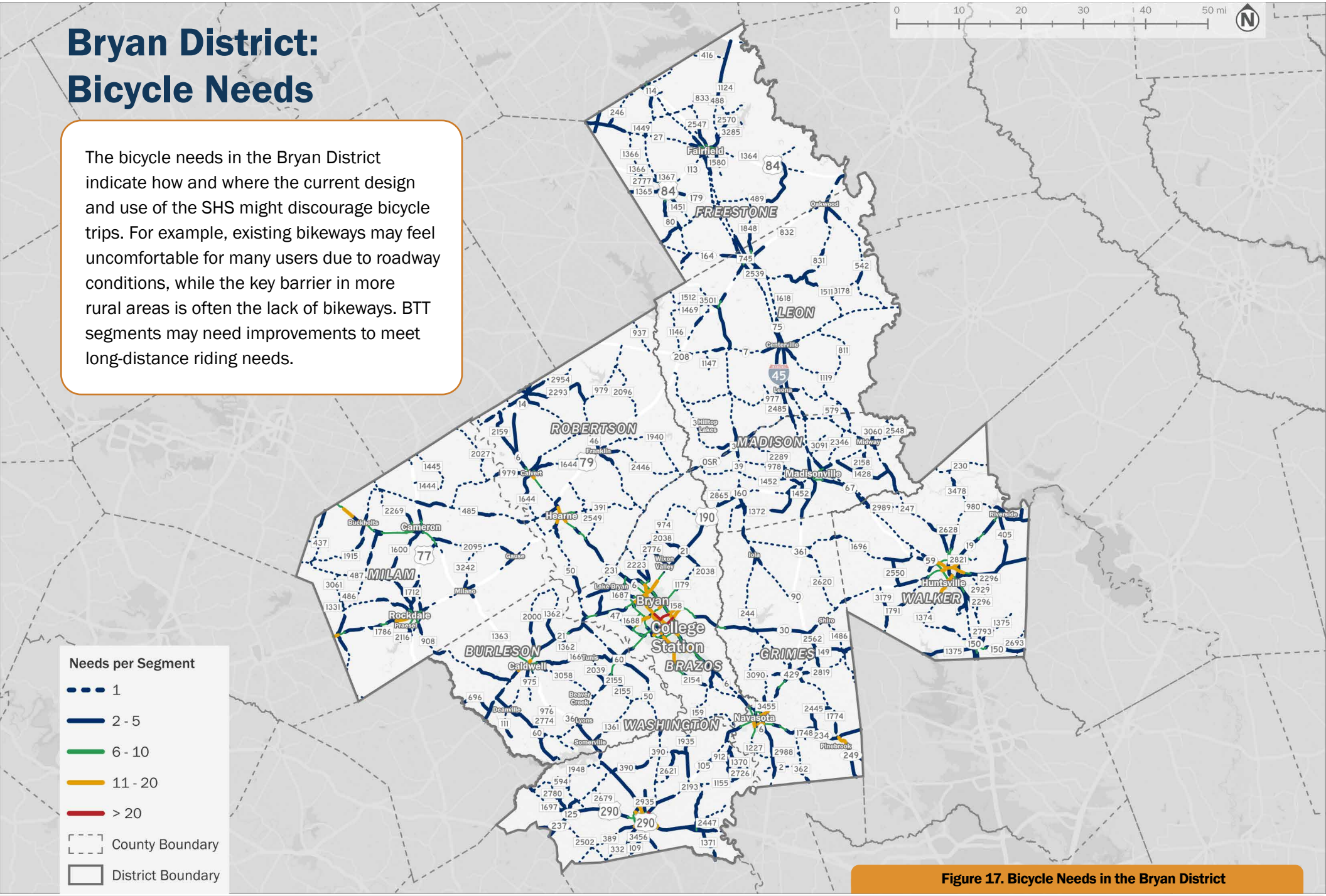


Figure 17. Bicycle Needs in the Bryan District

FIVE

Bikeway Development Priorities

As discussed in the previous chapter, there are many locations on the Bryan District's on-system network that may require improvements to provide connected and comfortable bikeways and crossings. To understand what design and operational changes will best meet the needs of nearby communities and the traveling public, TxDOT will need to advance specific locations into project development following the completion of this plan. Project development will allow TxDOT to evaluate options and select solutions based on detailed analysis and local public engagement, which are difficult to achieve in a district-wide planning effort.

To make the most of limited public funding, the project team developed a prioritization process to identify when and how the various bicycling need locations within the district should advance to project development. Prioritizing segments of the on-system network allows the Bryan District to apply for and target funding towards improvements that will have the most impact. By comparing the potential benefits that improved bikeways and crossings could offer at different locations, TxDOT was able to identify where improvements could do the most to increase safety, improve system performance, and meet TxDOT's other statewide goals from the 2022 Strategic Plan. This prioritization process will help TxDOT pursue competitive funding opportunities and support projects that provide safety, economic, health, and other benefits to district residents.

It is important to remember that this plan prioritizes locations where bicycling needs exist– it does not recommend solutions for those needs, which require more detailed study and local engagement than a districtwide plan can offer.

Goals for Biking in Bryan District

(Adapted from the TxDOT 2023-2027 Strategic Plan goals)

1. **Promote Safety** – Champion a culture of safety.
2. **Deliver the Right Projects** – Implement effective planning and forecasting processes that deliver the right projects on time and on budget.
3. **Focus on the Customer** – People are at the center of everything we do.
4. **Foster Stewardship** – Ensure efficient use of state resources.
5. **Optimize System Performance** – Develop and operate an integrated transportation system that provides reliable and accessible mobility, enabling economic growth.
6. **Preserve Our Assets** – Deliver preventive maintenance for TxDOT's system and capital assets to protect our investments.

Prioritization Methodology

Segmenting the System

The first step in the prioritization process was to divide the on-system network in the Bryan District into segments 0.25 mile to 2 miles in length, which is the right scale for future project development efforts. Segments generally start and end at clear landmarks that will be familiar to local communities, such as highway interchanges and at-grade intersections. Segments that contain at least one bicycling need proceeded into prioritization.

Using Prioritization Measures to Score Segments

As a second step, each segment on the network was scored based on a range of prioritization measures that align with the goals shown in Table 4. Some of these measures look at characteristics of the route itself that influence bicycling conditions, such as posted speeds or whether a bikeway exists there today. Some look at characteristics of the surrounding community, such as the segment's proximity to schools or whether people are making short trips there today that could be accomplished by bicycling. Some measures look at opportunities to efficiently use public funding by combining bikeway improvements with other upcoming projects, such as repaving, signal replacements, or bridge repair.

Assigning Weights Based on Local Values

To reflect local values and preferences, the scoring calculations incorporated input from TxDOT district staff, members of the TWG, and members of the public who participated in online surveys. First, the statewide project team selected a set of goals and measures that every District Bicycle Plan will use in prioritization. While most measures will be used by all districts, the list included a few optional measures that districts can choose if locally relevant. By using a consistent set of goals and measures in each District Bicycle Plan, TxDOT ensures that all districts consider the same information.

The Bryan District set customized scoring percentages for each goal and measure to reflect local values and input from stakeholders and the public, as well as the unique priorities of the district (Table 4). This customization allowed the analysis to elevate the benefits that are most important to the district's partners and communities.

Goal Area	Weight	Spatial Analysis Measures
Promote Safety	**25%**	• Crash locations where people walking or bicycling were injured or killed • Proximity to K-12 schools, recreation centers, and community centers serving youth and older adults • Higher posted speed limits
Deliver the Right Projects	**20%**	• Number of bikeway needs present on a segment • Number of programmed upcoming TxDOT projects • Improvements that could close gaps between existing bikeways
Focus on the Customer	**12%**	• Locations with higher numbers of public comments in winter 2022-2023 District Bicycle Plan survey
Optimize System Performance	**20%**	• Areas where people make more trips of 3 miles or less • Near local destinations such as supermarkets, libraries, healthcare, universities, and parks • Connects to existing and planned local bikeways • Connects to transit stops and stations
Preserve Our Assets	**10%**	• Bridge quality • Pavement quality
Foster Stewardship	**13%**	• Areas with greater densities of residents • Areas with greater densities of jobs • Near communities in need of affordable transportation options • Near communities exposed to high-crash and high-traffic corridors • Near communities with high rates of health issues like asthma and heart disease • Near historic destinations like museums and landmarks

Table 4. Weighting Factors for the Bryan District

Geographic Equity

TxDOT districts have land uses and highways that span communities of many sizes, from major cities to small communities and large rural areas. Several prioritization measures had the potential to elevate dense urban areas above other types of communities. To highlight the high-benefit locations across these communities, the project team created a geographic-equity methodology that corrected for potential bias in the analysis. Segments of the highway network were sorted into groups based on the population size of the surrounding area. After segments received initial prioritization scores, the analysis compared the range of scores achieved by segments that were located within similarly sized communities. By identifying the highest scoring locations within each community size grouping, this geographic equity adjustment elevated high-benefit locations for communities of all sizes.

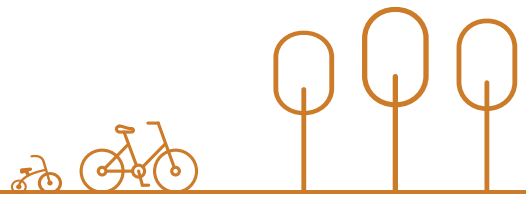
Population Size Categories Used to Apply Geographic Equity Analysis

- Rural (under 2.5K)
- 2.5-10K
- 10-25K
- 25-50K
- 50-100K
- 100-250K
- 250-500K
- 500K+

Refining Technical Analysis with Local Knowledge

The Bryan District reviewed the draft prioritization results and shared them with the TWGs, CNWGs, and public. After considering the feedback they received, they then refined the prioritization results through two types of adjustments:

- Data-driven adjustments: Changing goal and measure weights to reflect local values more accurately.
- Qualitative adjustments: Manually reassigning a specific location to a different priority category to reflect public input, partner support, or knowledge of opportunities and constraints not fully captured by the available data.



Bikeway Development Priority Categories

The map below shows the Bryan District's priority locations for improving bicycling conditions where needs exist. These priority categories will guide how and when TxDOT develops and funds bicycle projects on its highways.

Table 5. Bikeway Development Priority Categories

Opportunistic Improvement	Proactive Improvement	Constrained Corridor	High-Priority Improvement
Percent of Bryan District need segments assigned to this category: 85.5%	Percent of Bryan District need segments assigned to this category: 13.8%	Percent of Bryan District need segments assigned to this category: 0.3%	Number of Bryan District need segments assigned to this category: 0.4%
Description: Locations where bikeways should be improved when another project is planned in that location.	Description: Locations where the benefits of improving bikeways merit standalone development of a bikeway project, with funding opportunities in mind.	Description: Locations identified as high priority but are known to have significant barriers to improvements such as right-of-way (ROW) limitations, utilities, lack of local support, etc.	Description: Locations where bikeways should be improved as soon as is feasible due to intensity of bicycling needs and potential benefits.
Why this category? In every state, projects like reconstruction, rehabilitation, and maintenance create cost-effective opportunities to support bicycling. With limited public dollars available to meet the needs of all travelers, locations where bicycling needs are less urgent may wait for another project to provide an opportunity.	**Why this category?** Federal programs are expanding available funding for improving bikeways. Where prioritization shows that there are high benefits to meeting bicycling needs, TxDOT and its partners should develop a preferred design solution they can use to request funds or apply for grants.	**Why this category?** This category designates locations that score highly to indicate that it is a high-priority location. However, due to known challenges, improvements are not likely to be advanced in the near term.	**Why this category?** These are places where communities, agency partners, and TxDOT feel it is most important to advance bikeway improvements in the near term. A combination of technical analysis and public feedback determined that these locations represent the Bryan District's highest priorities.

Taken together, these four categories allow TxDOT to focus near-term efforts to improve bikeways where they will do the most good, while maintaining awareness of the opportunities provided by expanded federal funding and efficiencies offered by other nearby projects. For more information on funding sources and implementation, see Chapter 8.

Figure 18 through Figure 27 show the locations of prioritized segments within the Bryan District for each county. Due to the geographic-equity-based ranking, these segments are distributed throughout the district.

BRAZOS COUNTY: Priority Categories in the Bryan District

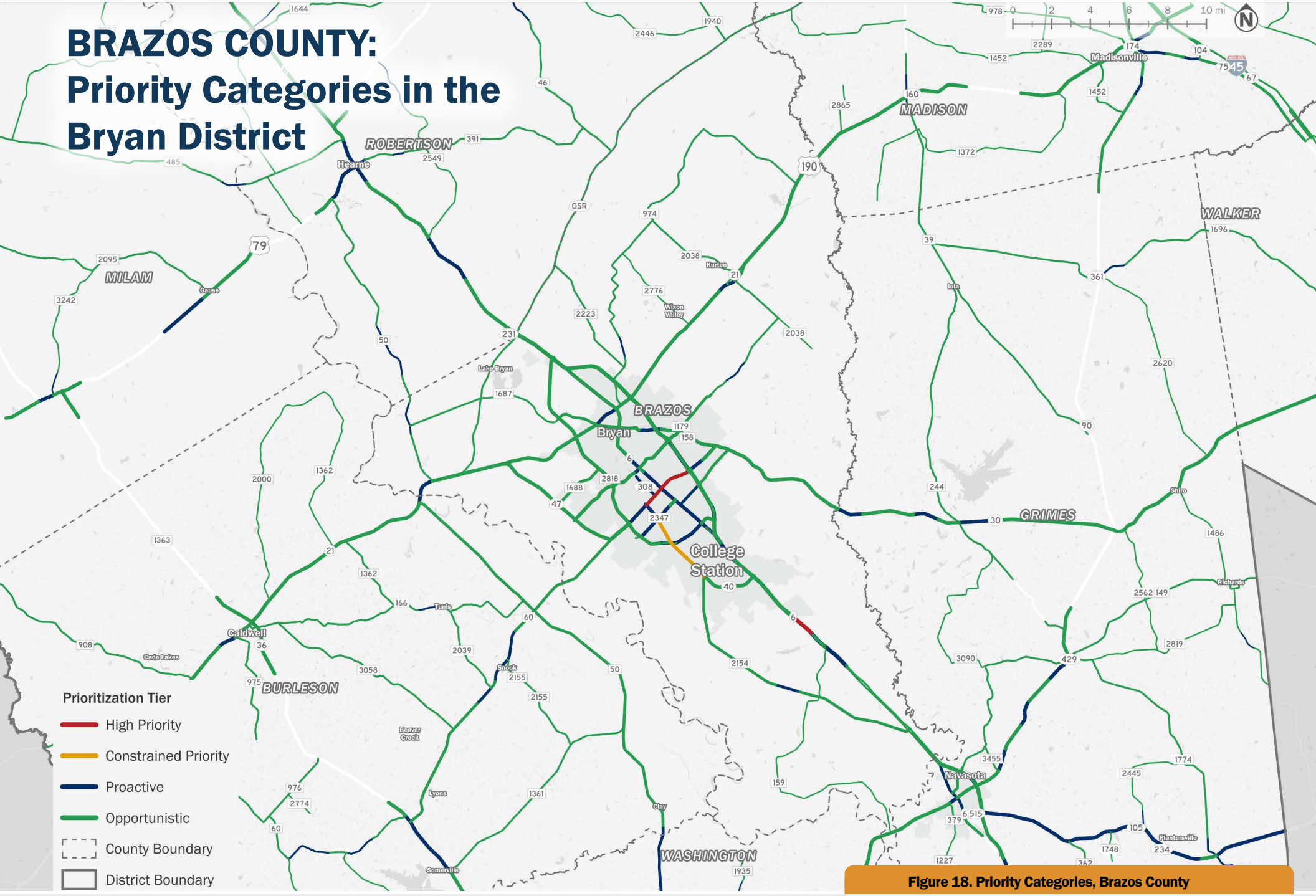


Figure 18. Priority Categories, Brazos County

BURLESON COUNTY: Priority Categories in the Bryan District

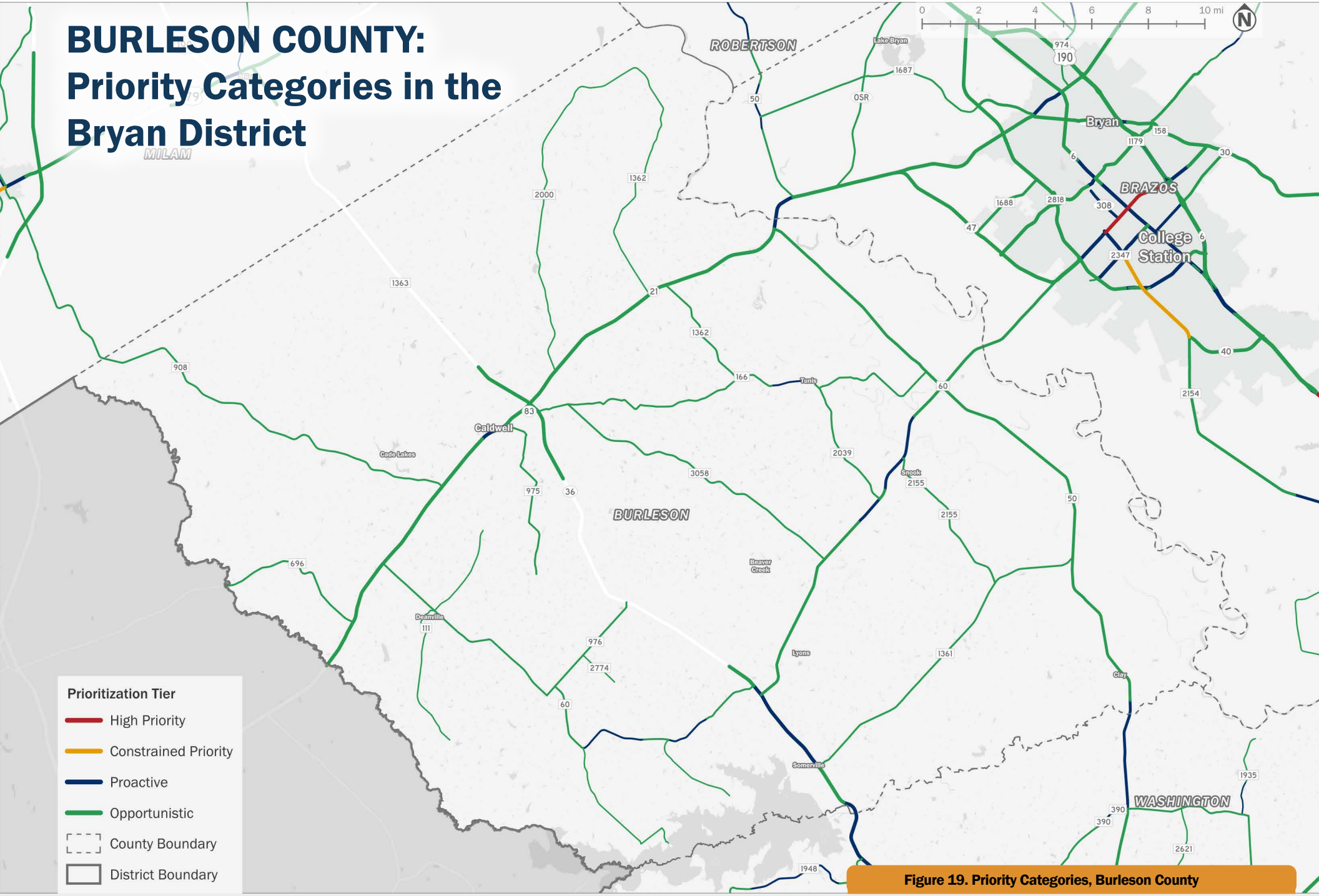


Figure 19. Priority Categories, Burleson County

FREESTONE COUNTY: Priority Categories in the Bryan District

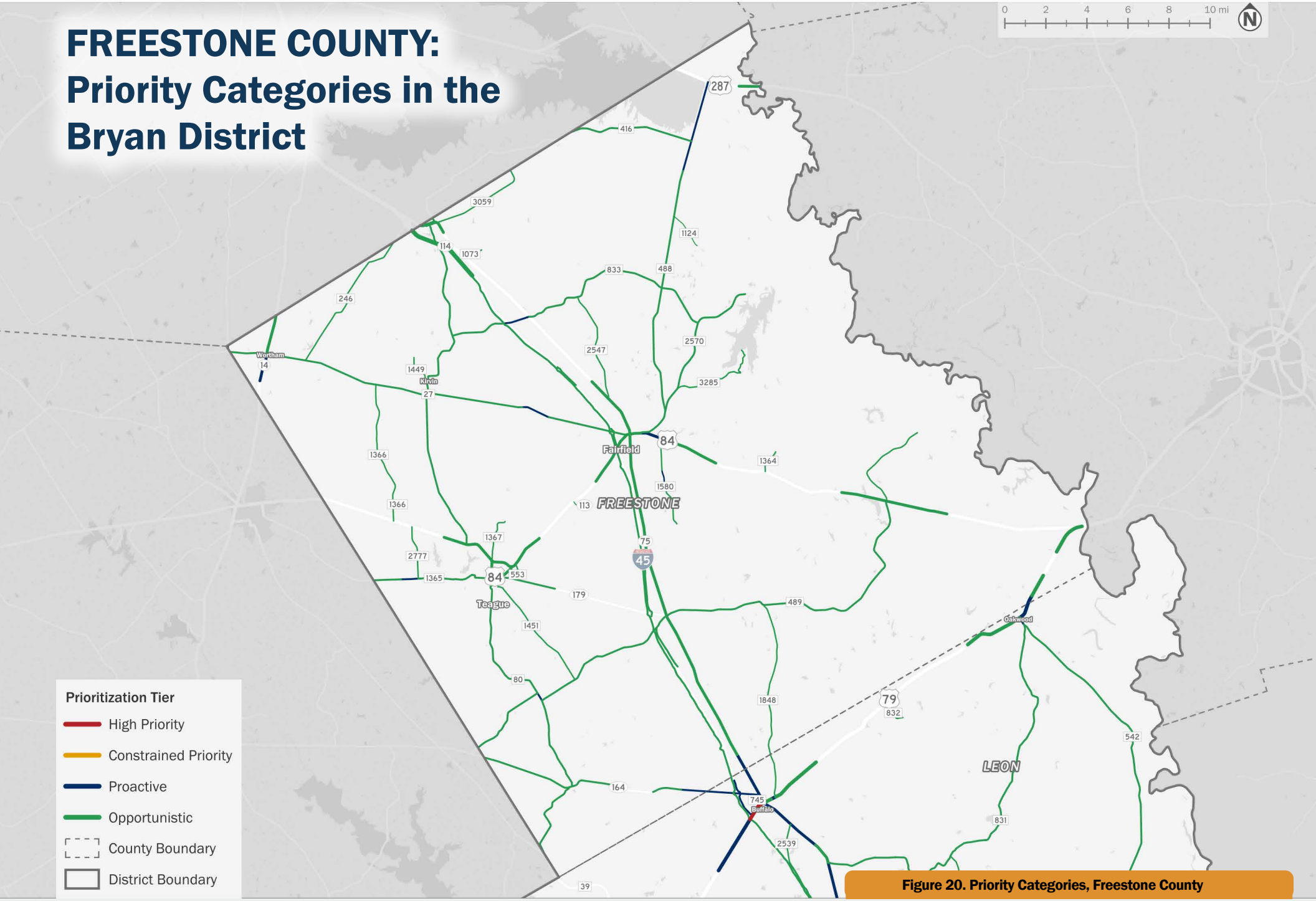


Figure 20. Priority Categories, Freestone County

GRIMES COUNTY: Priority Categories in the Bryan District

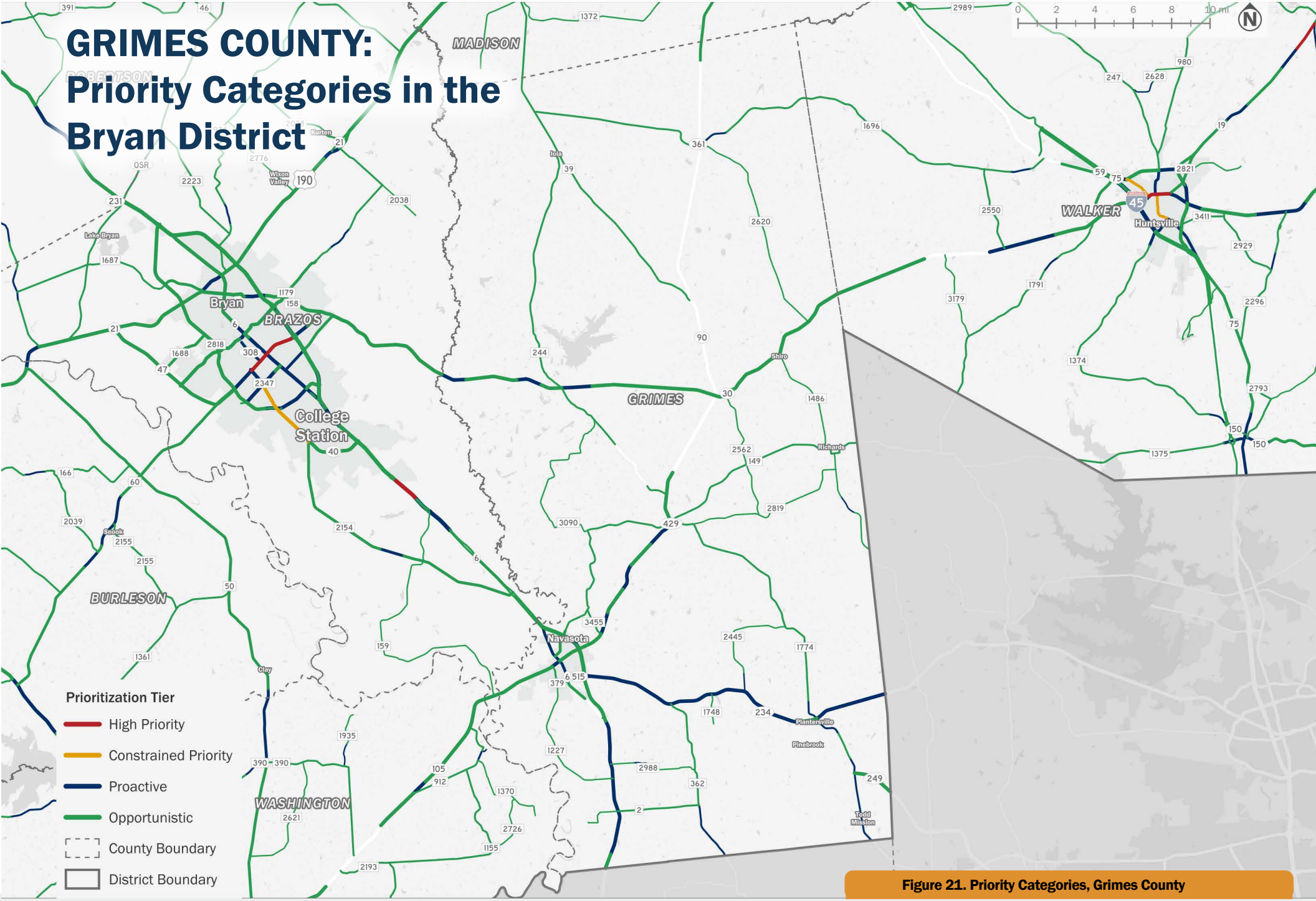


Figure 21. Priority Categories, Grimes County

LEON COUNTY: Priority Categories in the Bryan District

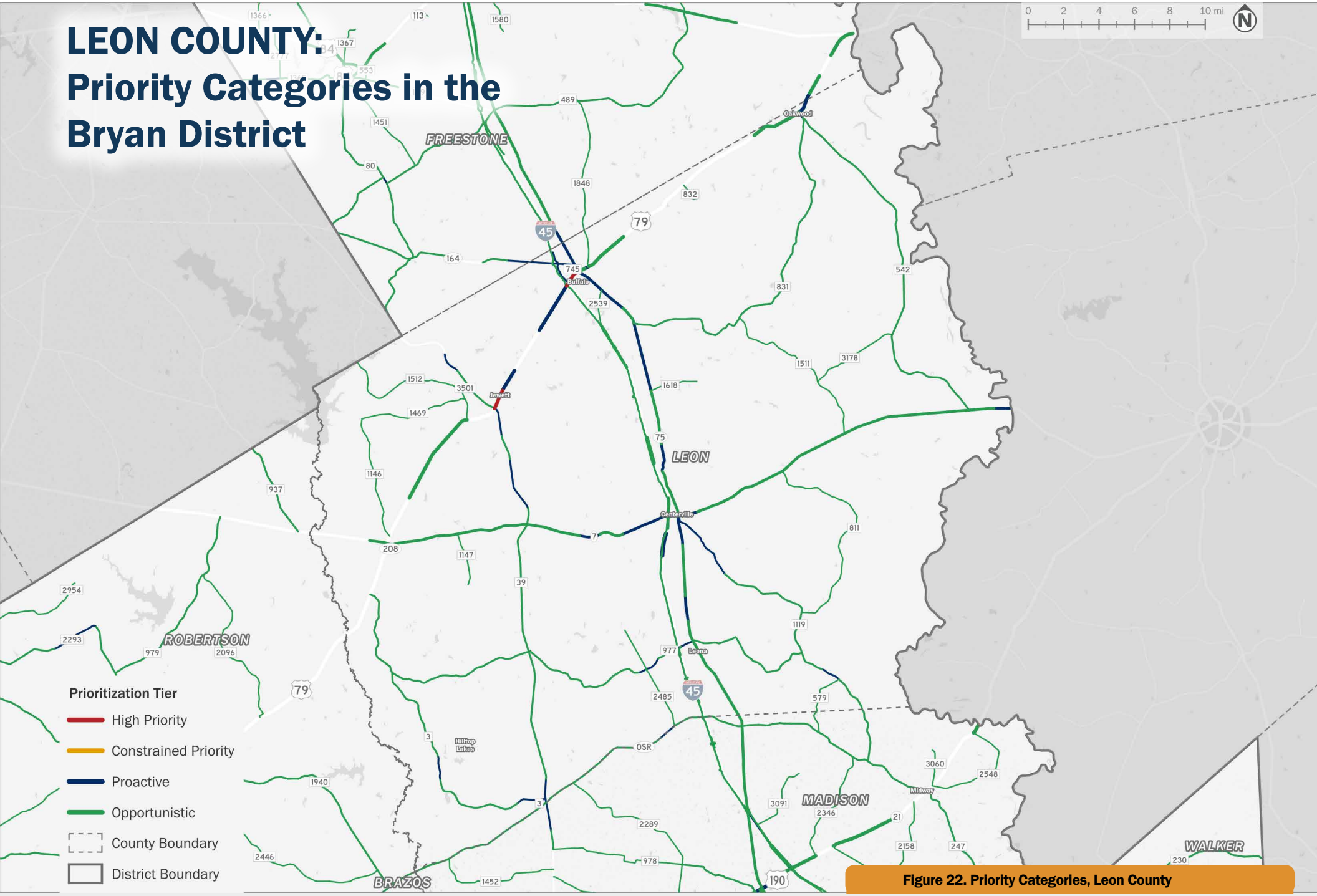


Figure 22. Priority Categories, Leon County

MADISON COUNTY: Priority Categories in the Bryan District

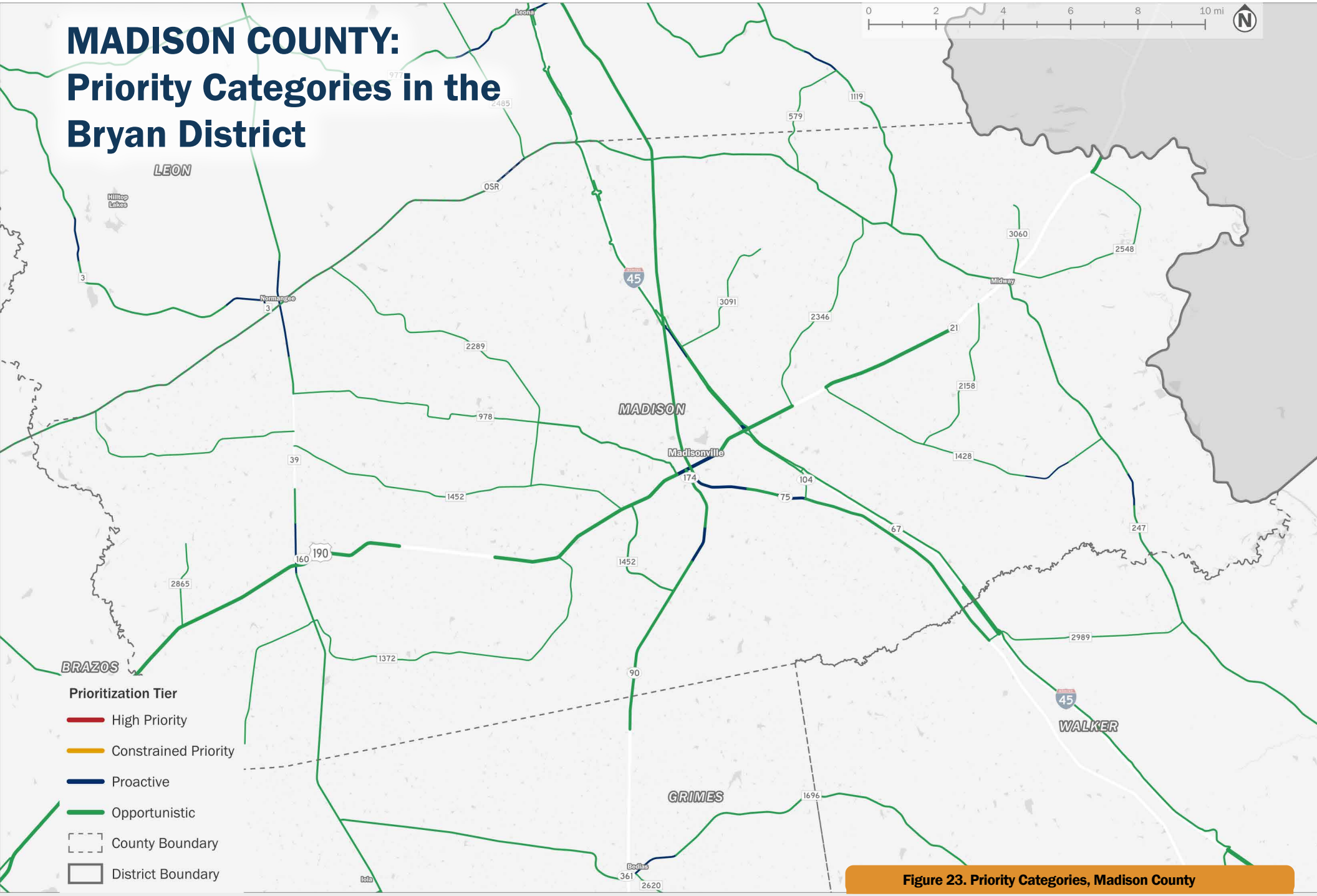


Figure 23. Priority Categories, Madison County

MILAM COUNTY: Priority Categories in the Bryan District

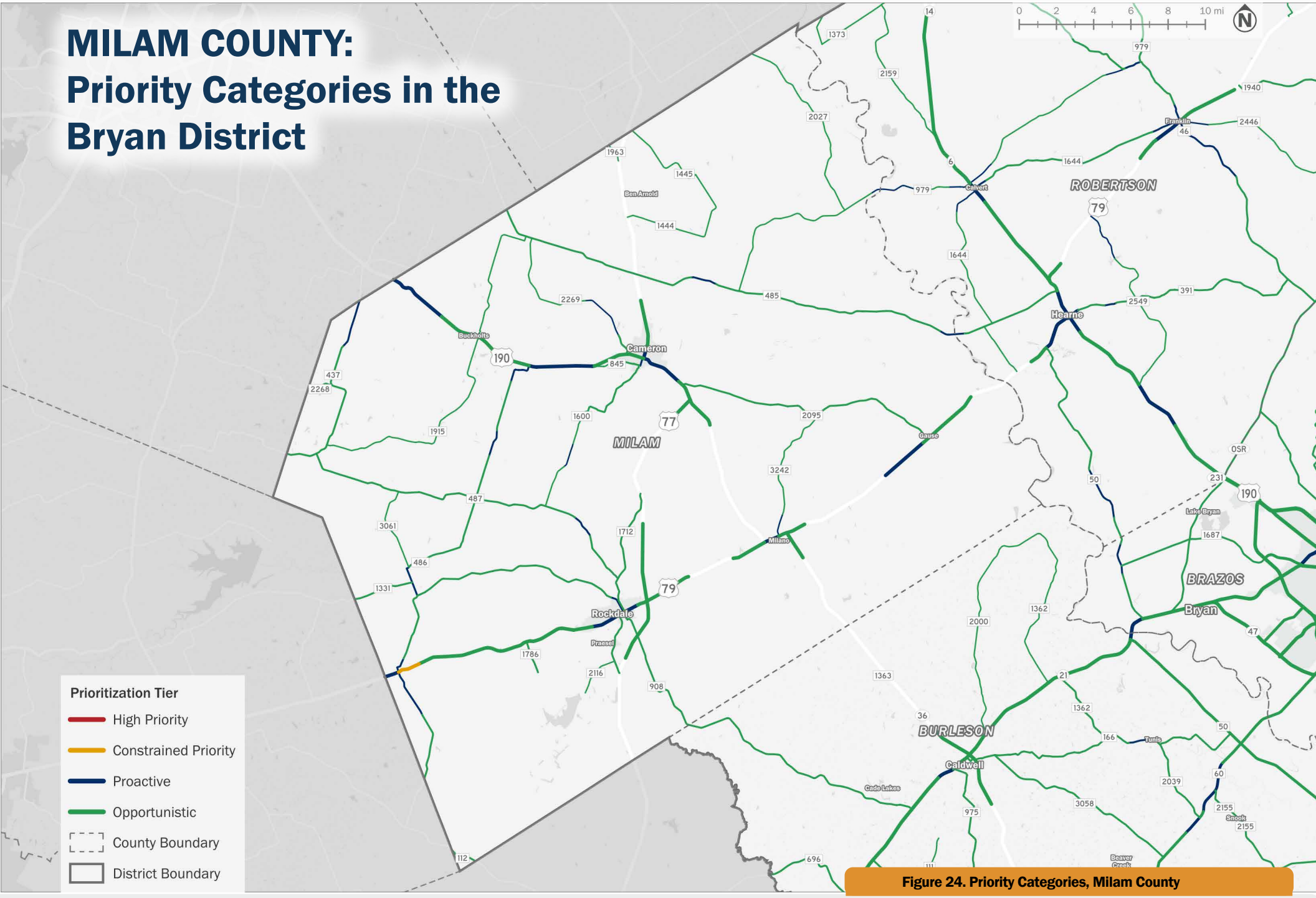


Figure 24. Priority Categories, Milam County

ROBERTSON COUNTY: Priority Categories in the Bryan District

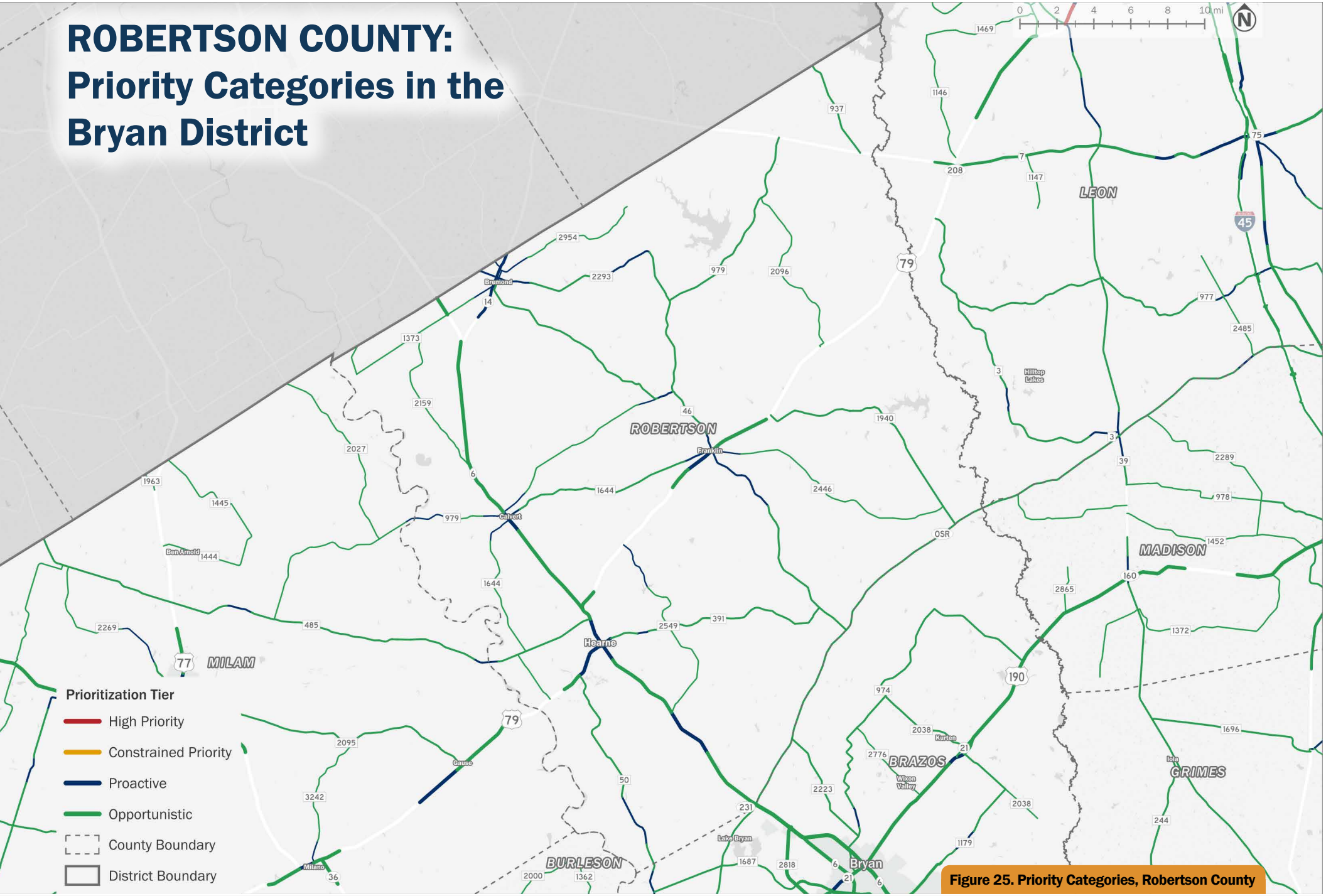


Figure 25. Priority Categories, Robertson County

WALKER COUNTY: Priority Categories in the Bryan District

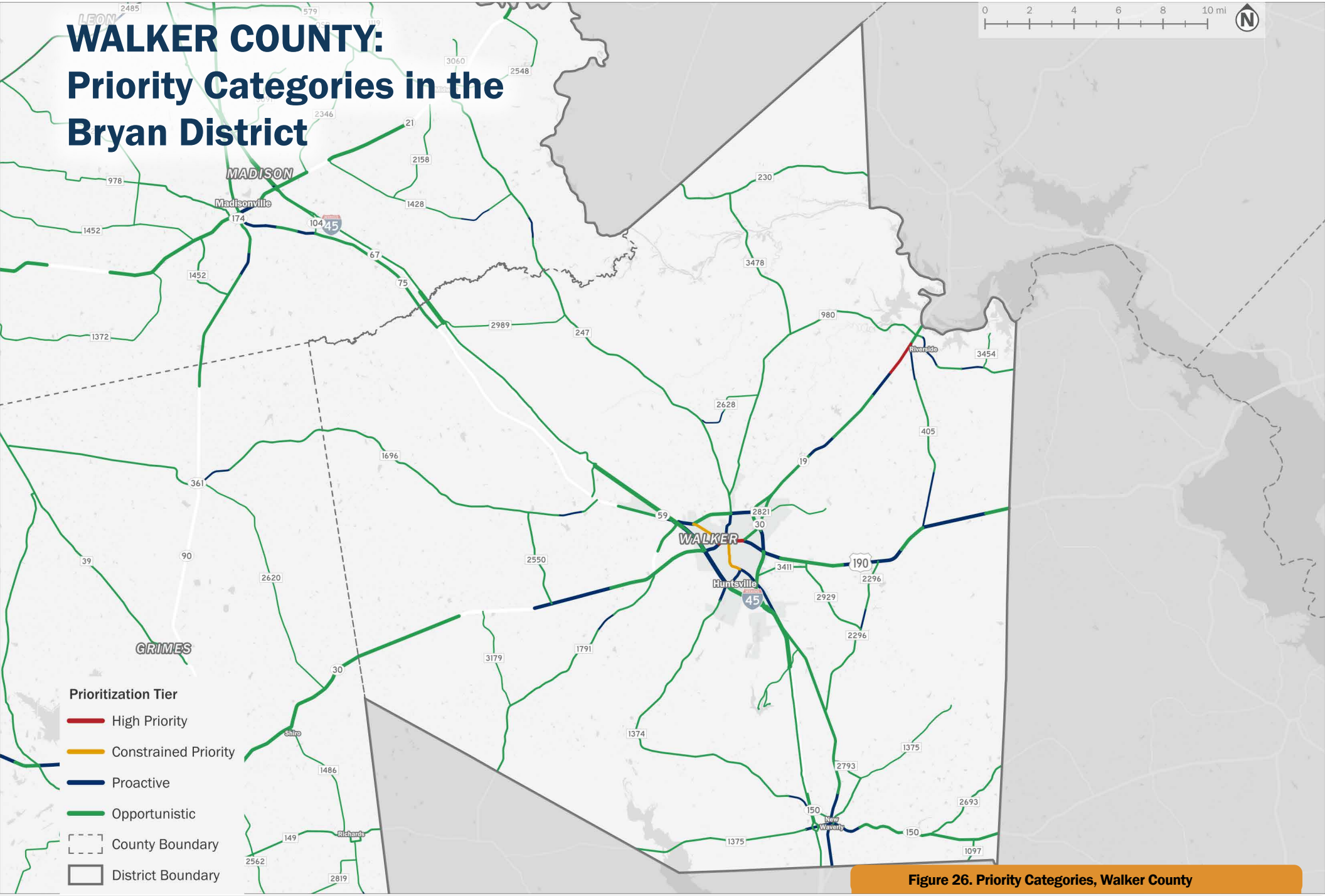


Figure 26. Priority Categories, Walker County

WASHINGTON COUNTY: Priority Categories in the Bryan District

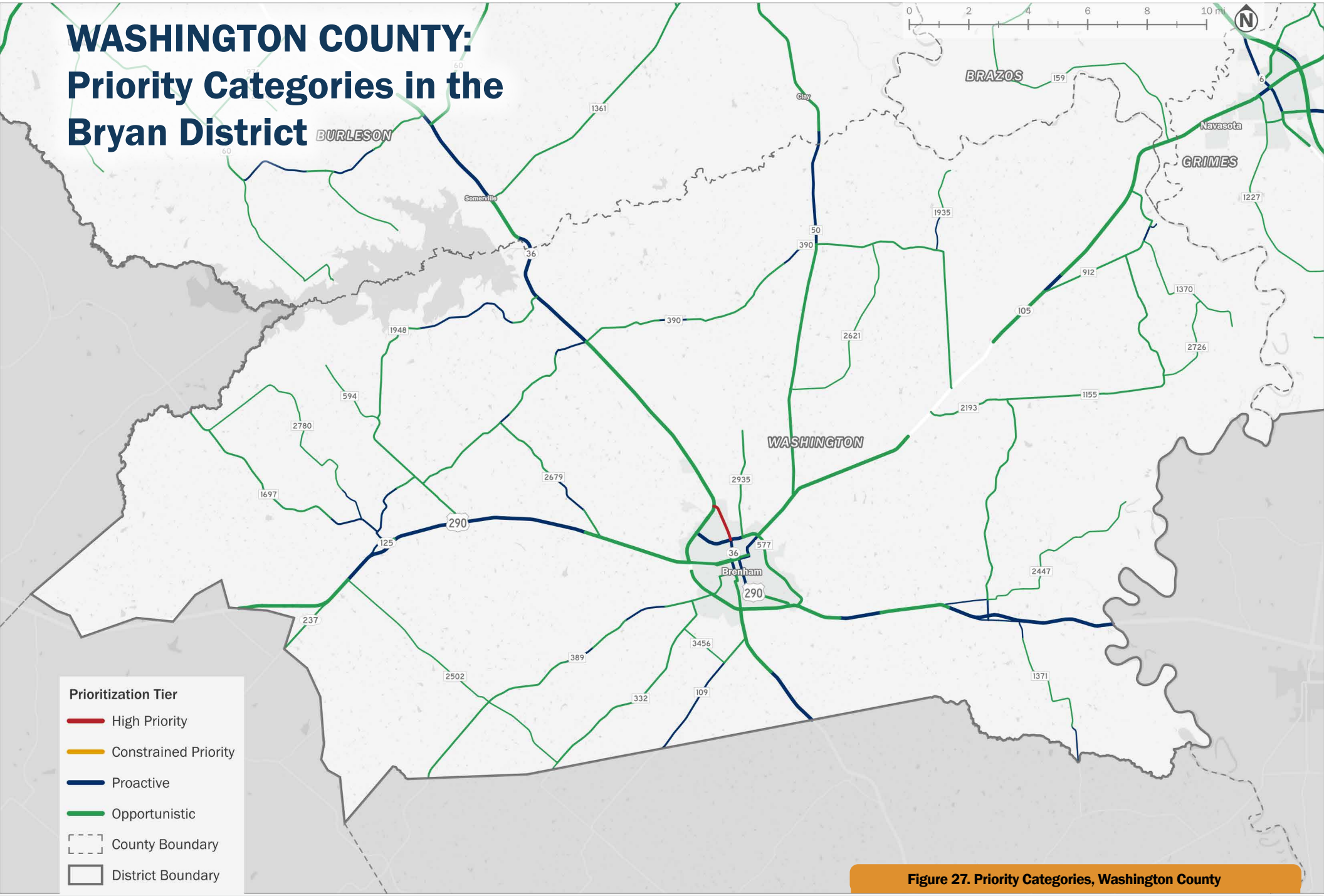


Figure 27. Priority Categories, Washington County

SIX
Bicycle Tourism Trails Network

Bicycle Tourism Trails Study

In 2018, TxDOT conducted the BTT Study to identify a statewide network of bicycling routes suitable for long-distance riders that would also provide local access within and between communities. Bicycle tourism is broadly defined as any travel-based activity involving a bicycle, such as bicycle backpacking, long touring rides, or even recreational day rides. The study sought to develop a network of regional tourism trail routes, use research to establish bicycle-related tourism economic benefits, and foster implementation of longer routes that require coordination and partnership between neighboring regions. Long-distance recreational routes that connect to other states were also proposed, to be considered as candidates for future U.S. Bicycle Routes. The study development process proposed and prioritized a network of bicycle tourism routes with guidance from a statewide advisory committee, data-driven considerations of roadway suitability, and local and regional refinement from stakeholder groups.

Figure 28. Texas Bicycle Tourism Trails Study (2018)

This statewide network, called the BTT Example Network, presents a possible vision for tourism trails across Texas. It identified three scales of bicycle tourism routes:

- Cross-state spines, which link major urban areas and interstate bicycling routes.
- Connecting spurs, which link major Texas and regional destinations.
- Regional routes, which provide more local connections between smaller cities.

Application of BTT Network Designations

The designation of BTT routes is important for both regional planning purposes and roadway design. Route designations can inform project priorities at the state and regional levels. BTT Example Network designations are also incorporated in the Bikeway Development Priorities identified through the Bryan District Bicycle Plan.

BTT Example Network designations are supported by design standards contained in the TxDOT Road Design Manual. In particular, the design manual establishes minimum widths for paved shoulders and bicycle lanes along BTT routes, with a minimum paved shoulder of 8 feet in rural areas and 10 feet in urban areas.

Refining Bryan District's Bicycle Tourism Routes

As part of the Bryan District Bicycle Plan development process, the project team took advantage of a more nuanced set of data on bicycling needs and conditions to review and refine the Example Network routes for the Bryan District. First, the project team used the needs analysis to identify portions of the BTT Example Network with significant barriers, such as high-stress locations or bridges with no bikeways. These were places where it was worth looking for alternative routes that avoided barriers or provided more comfortable connections. By mapping recreational destinations (such as parks, campgrounds, and open spaces) as well as places where travelers could get services (such as community centers and groceries), the team considered where the Example Network could be adjusted to improve access to these resources. New routes were selected and existing routes adjusted where the team found opportunities for better connections to destinations that avoided difficult barriers. Proposed BTT refinements were reviewed by the TWG, TxDOT district staff, and the public, then adjusted to best align to local priorities and projects.

Bryan District Proposed Refinement

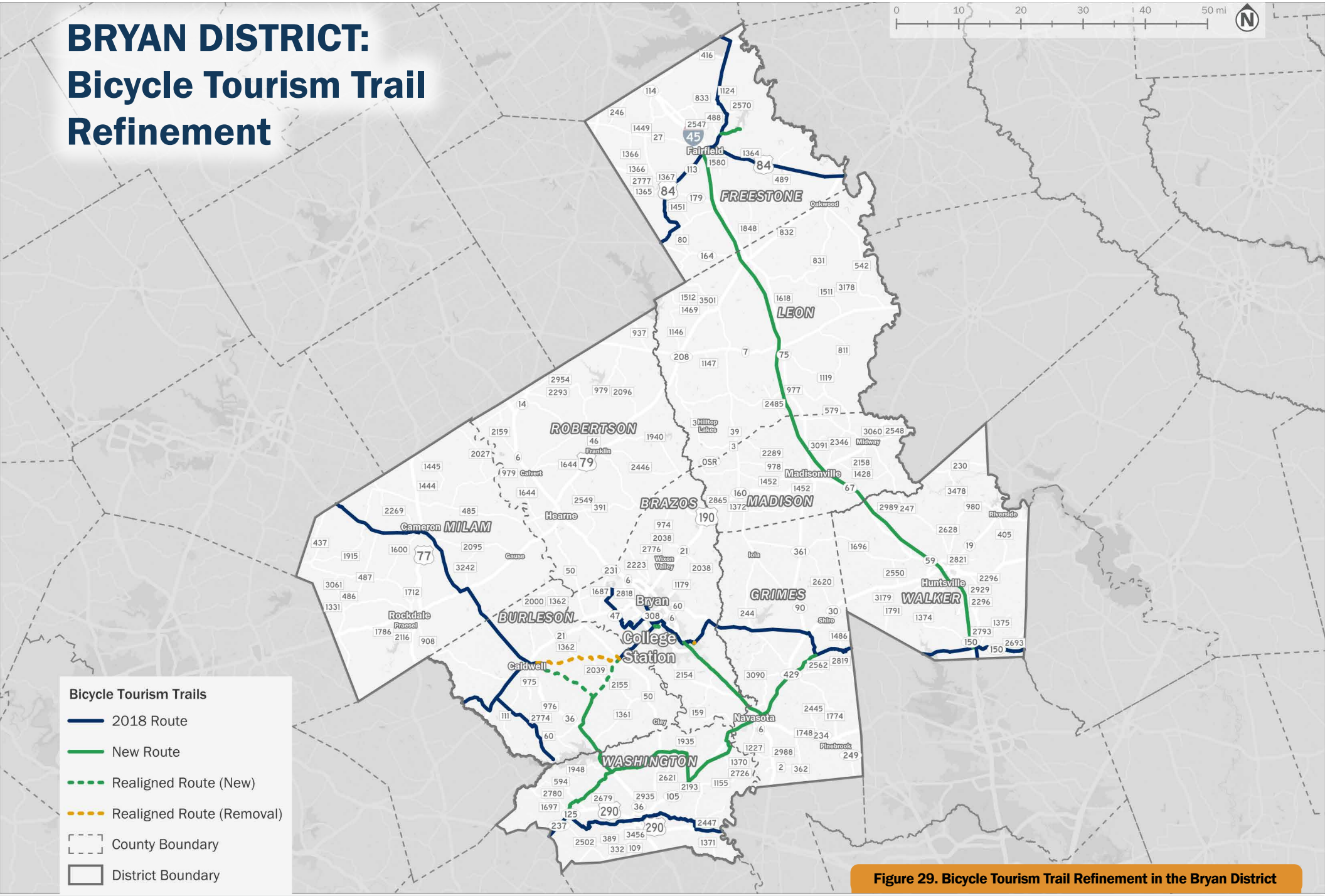
The 2018 BTT Example Network included good connectivity and routing through the Bryan District. However, there are additional opportunities to provide routing and facilities for long-distance bicycling in the district.

BTT Refinement Map

Figure 29 illustrates the eight refinements proposed to the BTT Example Network in the Bryan District.

- New regional route extending from an existing regional route to Fairfield Lake State Park.
- New regional route connecting two existing regional routes, filling a large north-south gap in the BTT network. This route connects Fairfield to New Waverly, passing through several cities including Huntsville, Madisonville, and Buffalo as well as several major parks and destinations.
- A minor realignment where a regional route transitions from a roadway to a shared-use path at William D. Fitch Parkway and Spring Creek, where the current connection is not feasible due to grade separation.
- New regional route connecting College Station to Navasota.
- New regional route connecting Burton to the existing BTT route on FM 2562.
- New regional route on SH 36 and FM 60 through Somerville.
- New regional route realignment east of Caldwell from FM 166 to FM 3058 and FM 60.

BRYAN DISTRICT: Bicycle Tourism Trail Refinement



Bicycle Tourism Trails

- 2018 Route
- New Route
- Realigned Route (New)
- Realigned Route (Removal)
- County Boundary
- District Boundary

Figure 29. Bicycle Tourism Trail Refinement in the Bryan District

Seven

Bikeway Functions and Design Selection

Bikeway functions are the last component of the planning resources produced in the Bryan District Bicycle Plan. Using geographic data, the project team assessed who might want to bicycle along different parts of the on-system network based on nearby destinations and travel activity. Different groups of users benefit from different design approaches – for example, a child may need a very protective bikeway to safely ride to elementary school, while someone on a multi-day bicycle camping tour may be satisfied with a wide and well-paved road shoulder.

Bikeway functions provide useful guidance when initiating a project and selecting an appropriate bikeway design. They're also useful for design decisions around separation, width, intersection improvements, and maintenance. The Bikeway Design User Guide, described on page 17, is a detailed decision-making tool that describes how designs should adapt to the needs of different users and the surrounding environment.

Bikeway Function Categories

Figure 31 shows how different state-owned routes serve different types of users based on nearby destinations and how people travel in the area today. Proposed functions were developed through spatial analysis, then refined by TxDOT staff using feedback from agency partners and the public. The bicycling function categories are:

- **All-Ages Bikeway**: Routes near community destinations serving children, older adults, or people with disabilities. These routes need more separation and protection so vulnerable users can bicycle safely and comfortably.
- **Daily-Travel Bikeway**: Routes in urbanized areas, which contain more closely spaced destinations. These routes should be designed to support frequent bicycling use so that people can make short trips to meet daily needs by bicycling.
- **Long-Distance Bikeway**: Routes that are popular for recreational riding and bicycle tourism or that connect destinations that could attract longer distance riders. These routes should be designed to serve experienced bicyclists as well as families on adventures.
- **Basic Bikeway**: Routes where only occasional bicycling is expected, based on nearby population and land uses, and where a basic design may be enough to meet occasional needs.

Throughout the Bryan District, all-ages bikeways are predominately located within the cities and smaller towns, focused on roadways that most directly serve local community destinations such as schools and community centers. A few all-ages bikeway routes in the Bryan District include SH 6B in College Station and Bryan, SH 60 in College Station, U.S. Highway (US) 290B in Brenham, SH 75 in Huntsville, US 190 in Madisonville, and US 84 in Fairfield.

Daily-travel bikeways are less common in the district and are primarily located in and around the cities of Bryan, College Station, Navasota, Brenham, and Huntsville, with a few segments in other cities. A few daily-travel bikeway routes in the Bryan District include N Freeway Service Road in Fairfield, FM 2821 in Huntsville, SH 515 in Navasota, SH 21 in Caldwell, and FM 2818 in Bryan.

Long-distance bikeways are predominately located along the BTT network in the Bryan District. These routes are likely to serve the long-distance recreational riders. A few long-distance bikeway routes in the Bryan District include SH 30 east of College Station, US 75 between Fairfield and New Waverly, and SH 21 southwest of Caldwell.

Many other on-system roads, primarily those outside of cities and towns, have been identified as basic bikeway routes. Along these routes, low population densities and rural land uses suggest that few riders are likely to ride on the two-lane highways, but design elements should provide for the safety of occasional riders.

Bikeway Functions

Figure 30. Bikeway Function Identification Methodology

BRYAN DISTRICT: Bikeway Functions

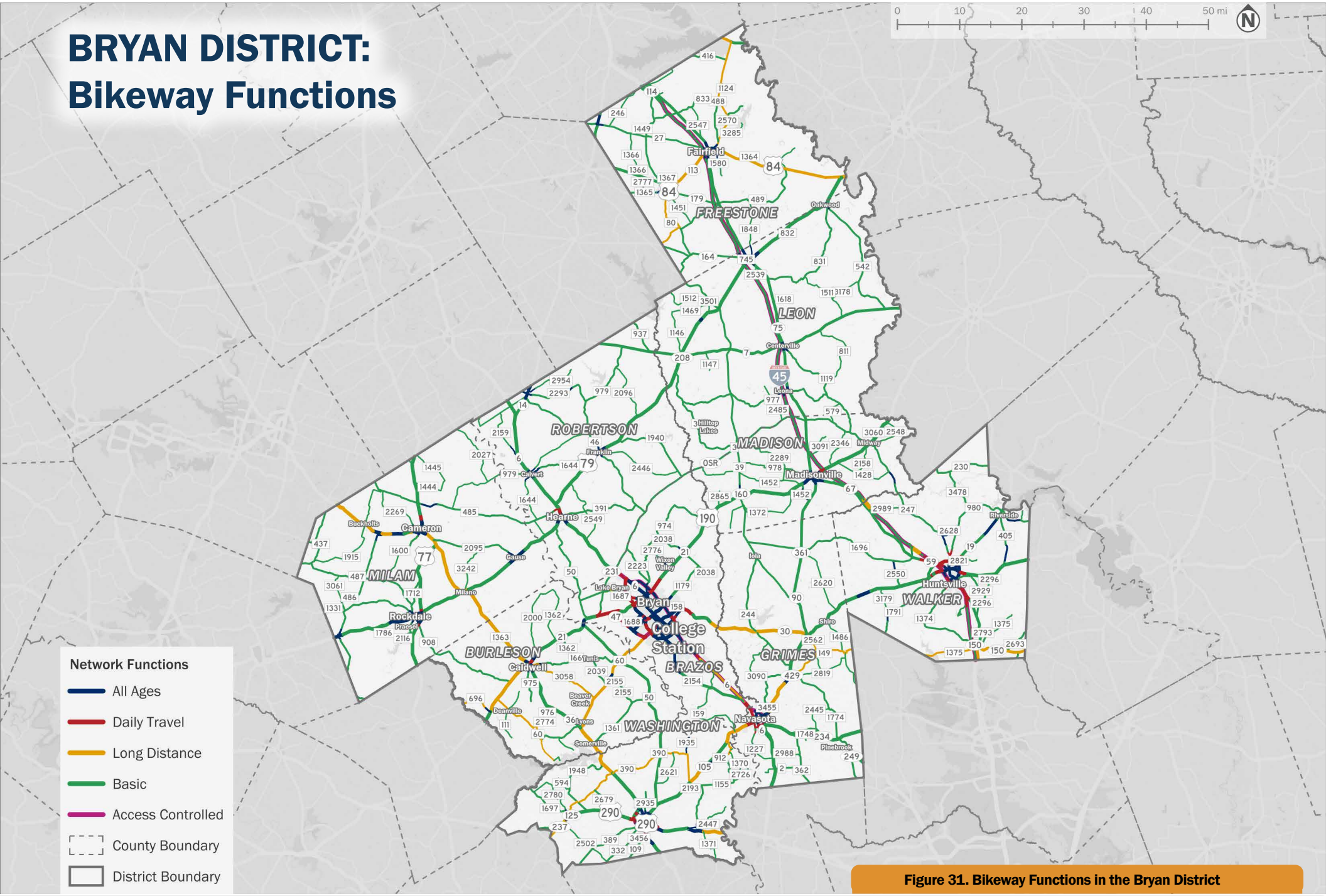


Figure 31. Bikeway Functions in the Bryan District

Bikeway Design User Guide

TxDOT has recently updated its Roadway Design Manual (RDM)[21] to match new national standards and best practices for developing bikeways. While the Bryan District Bicycle Plan was under development, the project team created a Bikeway Design User Guide to help TxDOT staff, agency partners, and the public consider what bikeway is the best fit for their location. It uses visuals and plain language to explain how to use community context and the RDM to design better bikeways and overcome design challenges.

Selecting and designing the appropriate bikeway requires answering many questions, such as:

- **What** is the need for a bikeway at this location?
- **Who** is the target user?
- **What** is the land use context?
- **What** is the roadway context?

The Bryan District Bicycle Plan and the data it produced provide a foundation for answering many of these questions.

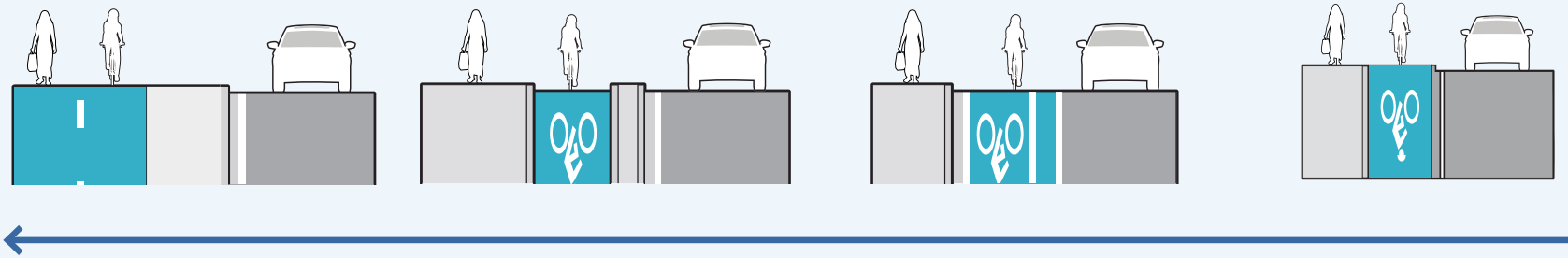
21 Texas Department of Transportation Roadway Design Manual: http://onlinemanuals.txdot.gov/txdotmanuals/rdw/rdw.pdf. Section: 6.4

Bikeway Types

There are several bikeway facility types to choose from. The land use and roadway context, bikeway function, and target design user should guide planners and designers to the ideal bikeway type.

Bikeway Types

Different bikeway types serve different target design users. Section 6.4.4 of the Roadway Design Manual describes each bikeway type, applicability, and design considerations.



Shared-use paths are shared by pedestrians, bicyclists, and micromobility users. They can be located between the roadway and the ROW line or on an independent alignment with their own ROW. When located along a roadway, they are separated from vehicular traffic by a curb and buffer space. Shared-use paths may be applicable in urban and rural areas.

Separated bicycle lanes are located between vehicles and pedestrians. They are buffered from adjacent vehicular traffic by a horizontal buffer space that includes a vertical element such as a raised median or flexible posts. If on-street parking is present, the people on bicycles are buffered from opening doors. People on bicycles are also separated from people walking by a horizontal buffer space and can include vertical elements. Separated bicycle lanes are applicable in urban areas.

Buffered bicycle lanes are separated from adjacent vehicle traffic or the parking lane by a striped buffer. The buffer is generally only space designated by pavement striping. Buffered bicycle lanes are more suitable in urban environments.

Raised bicycle lanes are at sidewalk level or between street level and sidewalk level to provide vertical separation from vehicular traffic. However, they do not provide horizontal separation. They are an option to consider on roadways where separation is needed and width is constrained. Raised bicycle lanes are suitable in urban environments.

Figure 32. Bikeway User Design Guide Excerpt

EIGHT
Implementation

By pursuing a range of different implementation activities in coordination with statewide TxDOT resources and local partners, the Bryan District can build momentum across the district and make bicycling a part of its everyday work.

Advancing Bikeway Projects

Bikeways require funding, coordination, and planning to be successfully implemented. Bikeway implementation is sometimes as simple as quick wins, like striping a bicycle lane where sufficient roadway width already exists. In other cases, bikeway implementation can be one component of a larger project that will be years in the making. With the analysis, priorities, and recommendations contained in this plan and TxDOT's RDM, TxDOT staff and partners have all the foundational tools to bring a bikeway project from a planning concept to implementation. There are many actions that can be taken at different stages in the bikeway implementation process to advance comfortable and safe communities for bicycling.

Bikeway improvements on the SHS may be developed and implemented through any of the following avenues.

Bikeway improvements developed and delivered by TxDOT.

- **Improving bikeways as a part of a larger project.** Across the country and in Texas, one of the major ways that bikeways get completed is when a roadway is restored, rehabilitated, or reconstructed. In fact, Title 43 §25.53 of the Texas Administrative Code requires TxDOT to take bicycle accommodation into consideration during the planning and implementation of all construction and rehabilitation projects[22]. Most TxDOT projects are scheduled and funded as part of the Unified Transportation Program (UTP), which includes 12 different funding programs that draw on a range of state and federal funding sources. The majority of these funding sources can be used to construct bikeways as one part of a larger project. Categories that are more likely to fund larger roadway projects incorporating bicycling elements include Category 2 – Metropolitan and Urban Area Corridor Projects, Category 4 – Statewide Connectivity Corridor Projects, and Category 12 – Strategic Priority. By consulting the Bryan District Bicycle Plan when developing UTP projects, TxDOT will be able to identify biking needs early in the project development process and consider how best to improve bicycling conditions.
- **Finding dedicated funding for a standalone project.** While relatively few on-system bikeway improvements have advanced as standalone projects, recent federal actions like the passage of the Bipartisan Infrastructure Law have greatly expanded opportunities to directly fund bikeway projects. These include new discretionary grant programs like the Reconnecting Communities and Neighborhoods Grant Program, where states and other eligible applicants compete for funding. They also include funding increases to longstanding programs like the Transportation Alternatives Set-Aside (TA) Program, which the State of Texas receives a set amount of funding to administer. TxDOT's Federal Grants website can help the district and its partners research and pursue federal funding opportunities. The UTP categories that most frequently fund standalone bikeway improvements are Category 5 – Congestion Mitigation and Air Quality, Category 7 – Metropolitan Mobility and Rehabilitation, or Category 9 – TA Set-Aside.
- **Quick-build, maintenance, and pilot projects.** These projects use low-cost materials or regularly scheduled maintenance activities to get bicycle infrastructure built on a short timeline. While local governments were first to advance projects this way, state governments across the U.S. also use this approach. These types of projects are especially helpful where improvements are urgently needed but the optimal project design may be very expensive or require many years to advance. Examples include restriping roads and bikeways, widening shoulders, or shifting the position of rumble strips to provide an uninterrupted surface for bicycling.

22 RDM sections 6.3 and 6.4 describes requirements and exceptions for providing bikeway accommodations. Note that section numbering may change in future updates.

Bikeway improvements developed in partnership with local governments.

- **Improvements sponsored by local governments.** Cities, counties, and MPOs can work with TxDOT to champion, fund, and even construct bikeway improvements on TxDOT roads that are important to the local community. Projects sponsored by local governments can sometimes use funding sources that may not be available for projects led by TxDOT, such as city bonds or federal funds administered by MPOs. The Bryan District can help local agency partners understand the process for getting designs and construction plans approved by the state. Detailed guidance can be found in TxDOT's Local Government Projects Policy Manual.
- **Improvements required as a part of private development.** When a developer seeks approval to construct a new building, campus, neighborhood, or other private development, their local government will assess whether the new development will impact public infrastructure like roads and utilities. The local government can require the developer to improve infrastructure so it can handle the increased use the new development will bring. This can include improving bikeways, walkways, intersections, and roads, including on-system elements. Local government staff should coordinate with the Bryan District when reviewing development proposals that may impact TxDOT facilities.

Advancing Bicycle Tourism Trails

The BTT network has been evaluated and updated for the Bryan District's current needs, leading to new opportunities for collaboration and coordination to implement the BTT. The 2018 study includes recommendations for implementing the network, which can help guide the efforts of the Bryan District and its partners. The implementation steps noted above also serve as potential pathways to advance the BTT, and the district may identify projects along the BTT that align to identified priority segments. As the Bryan District designs projects that affect BTT routes, the district and it s partners will need to refer to the TxDOT RDM for BTT-specific design requirements, such as bicycle-accessible shoulder widths. The RDM includes detailed design guidance on bicycle facilities suitable for rural and long-distance contexts, such as adequate bikeable shoulders, side paths, and the ROW necessary to implement them.

Programs that Support Bicycling

TxDOT, local governments, and nonprofit organizations can also support bicycling through technical assistance, education, and research programs. Developing documents like the Bikeway Design User Guide creates resources that can be used across the state. Programs like Safe Routes to Schools train young people to bicycle safely and engage school communities in mapping biking and walking needs around their campuses. Campaigns like #EndtheStreakTX encourage all road users to do their part in making sure everyone – including people bicycling, walking, taking transit, and driving – gets home safe. By collecting and sharing data related to crashes and bicycle counts, TxDOT and its partners support research into how best to support bicycling across the state.

Funding Opportunities

This plan makes the case that improving bikeways will benefit communities throughout the Bryan District. More than 90% of Bryan District highway miles have bicycling needs, and the high-priority locations alone represent substantial investment. To improve the system, TxDOT and its local partners will need to explore the full range of available funding sources.

Competitive Federal Grant Programs

- Active Transportation Infrastructure Investment Program
- Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation Program
- Rebuilding American Infrastructure with Sustainability and Equity
- Reconnecting Communities and Neighborhoods
- Safe Streets and Roads for All

State-Administered Funding

- Federal Lands Access Program
- UTP, which includes federal formula funding such as:
  - Carbon Reduction Program
  - Congestion Mitigation and Air Quality
  - Highway Safety Improvement Program
  - TA Program
- Enhanced Mobility of Seniors & Individuals with Disabilities (Section 5310)
- Transportation Alternatives Set-Aside Program

Regional Funding

- Bryan/College Station MPO Transportation Improvement Program, which includes regional apportionments of federal formula funds

What's Next?

The Bryan District recognizes that this plan is a first step that, while significant, only begins to address the need for bicycle improvements on the state transportation network. Planning for a multimodal system is an ongoing process. As more projects are implemented, needs will evolve and change. To understand these changing needs, the Bryan District will continue to engage local agency partners and stakeholders and is committed to working with them on making the state transportation network safer and more comfortable for all users, especially those on bicycles.