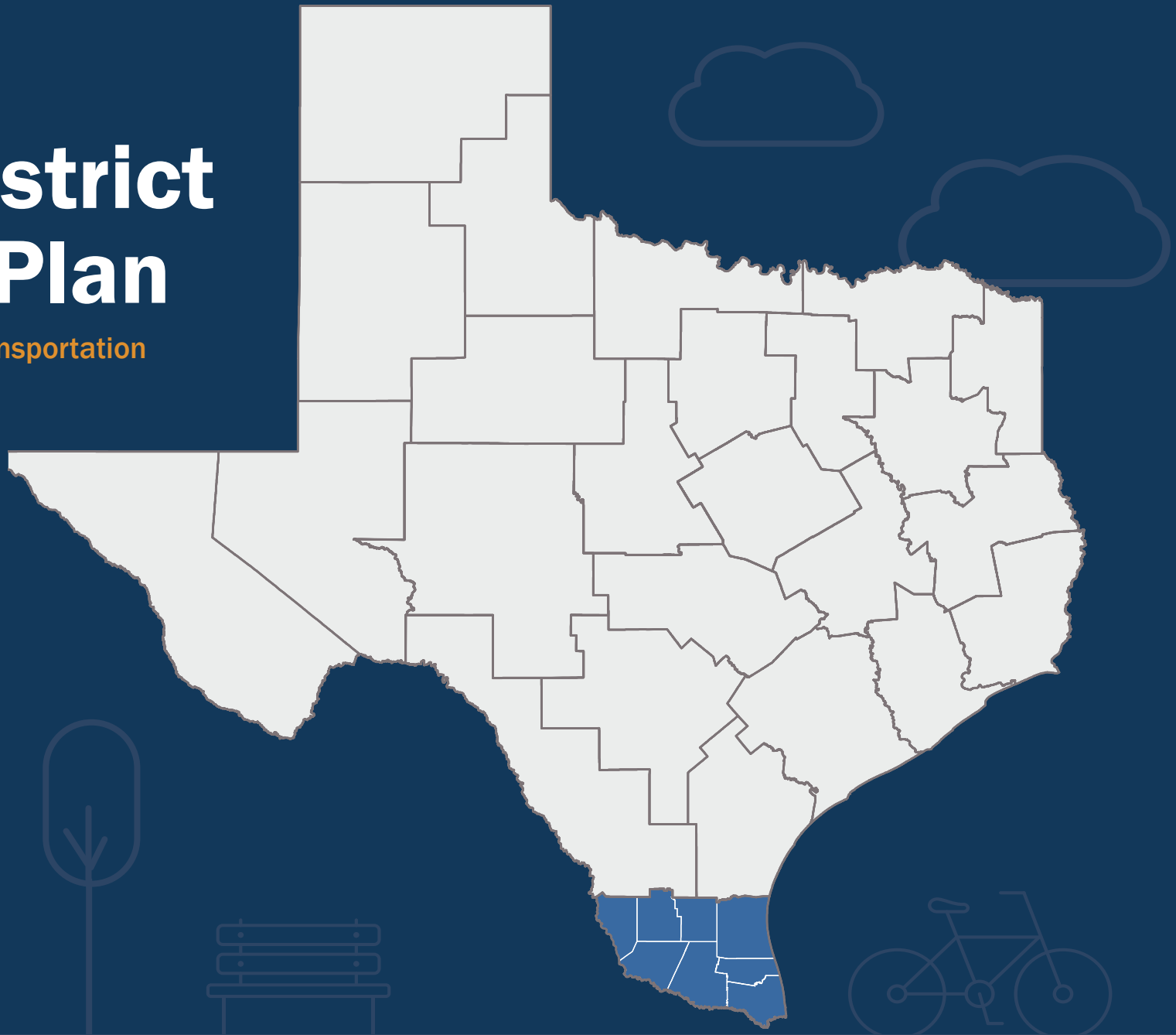
Pharr District Bicycle Plan

Texas Department of Transportation



Final
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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 Pharr 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 Texas Department of Transportation (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

Texas Department of Transportation

Plan Components

The Pharr District Bicycle Plan presents a data- and community-driven set of priorities and guidance for bikeway improvements along Texas Department of Transportation (TxDOT) on-system highways that will address the bicycling needs of residents and visitors across the district and help create additional transportation options. This plan provides:

- An analysis of existing bicycling needs that prevent people from being able to ride safely;
- Prioritized segments for development of bikeway improvement projects;
- Designated bikeway functions that reflect the likely users along a corridor; and
- Refinements to regional long-distance Bicycle Tourism Trail (BTT) routes.

Pharr District Overview

The Pharr District includes eight counties (Brooks, Cameron, Hidalgo, Jim Hogg, Kenedy, Starr, Willacy, and Zapata) and is comprised of a series of urbanized communities throughout the Rio Grande Valley and along the U.S.-Mexico border, as well as rural and more sparsely populated areas outside the border region. The geography of the district shapes both the population dynamics and transportation needs. The Rio Grande Valley is fast growing and internationally oriented. The overall population of the district increased from around 1 million in 2000 to 1.4 million in 2020, of which more than three-quarters speak Spanish at home. The region is also known for transnational communities with family members located on both sides of the border and a high degree of international travel for tourism and commercial purposes. The 11 border crossings across the district are major conduits for commerce and provide critical connections for residents and workers who cross them every day, many by bicycle. Yet the combination of international overland shipping plus the significant agricultural activity across the Rio Grande Valley leads to high levels of freight truck travel, which creates major barriers for people bicycling along or across TxDOT on-system highways.

Nevertheless, interest in bicycling is strong. Among community survey respondents, about two-thirds ride their bicycles at least once a week. The same survey reported bicycling rates increased since the onset of the COVID-19 pandemic. Though most respondents bicycle for recreational purposes and drive to their destinations, participants have high levels of access to bicycles and expressed an interesting in bicycling more if quality infrastructure were provided. Local communities and regional agencies are meeting this demand through concerted planning efforts and implementation of on-street bikeways and hike-and-bike trails. Additionally, many TxDOT on-system highways feature paved, bikeable shoulders.

Barriers

The plan development process revealed a range of barriers and challenges to more widespread bicycling activity in the region, including traffic conditions, vehicle speed, and unfriendly roadway characteristics that often form significant barriers to high-activity destinations. High levels of truck freight traffic in the border region also negatively affect user safety and comfort, while frontage roads are lined with key destinations and retail opportunities but lack shoulders or trails for bicyclists. Other challenges include the fact that wide shoulders and bicycle lanes in urbanized areas without clear buffers or barriers can be mistaken for turn lanes or used as vehicle passing lanes.

Figure 1. Bikeable shoulders along U.S. Highway (US) 281 Near the Santa Ana National Wildlife Refuge (Left) and Farm to Market Road FM 88 (Right)

Recommendations

The Pharr District Bicycle Plan provides a series of recommendations and tools that can be used to promote greater opportunities for people to bicycle and to create safe and comfortable facilities that are appropriate for their surroundings and roadway contexts. Strategies that are applicable district-wide include providing high-quality bicycle infrastructure near retail and schools to reduce the number of short car trips and creating an all-ages-and-abilities network to improve transportation access and mobility, especially for people living in low-income communities and those who are unable to afford a car. The plan also includes:

- **Bikeway development priorities**: Roadway segments where bikeway improvements are most needed in the district, as determined through a set of criteria related to safety, connectivity, community input, and other indicators. Priority routes for the Pharr District include US 77 Business Loop through Harlingen, State Highway (SH) 48 from Brownsville towards South Padre Island, and various segments along US 281, including central Brownsville and around the Santa Ana National Wildlife Refuge near Pharr.
- **Updates to the BTT Example Network**: The Pharr District Bicycle Plan reviews and expands on the 2018 BTT Example Network with new regional connections. Recommendations build on the Caracara Trails network and utilize lower-stress and well-connected routes such as US 281 (Military Highway) and SH 107.
- **Identification of bikeway network functions**, ranging from all-ages-and-abilities facilities that promote the highest level of user comfort to long-distance bikeways that support the needs of recreational bicyclists and bicycle tourism travel. See Chapter 7 for additional details.
- **Facility Selection User Guide** that complements the TxDOT Road Design Manual and assists designers in selecting the appropriate bikeway facility, given the surrounding context.

Implementation and Next Steps

By pursuing a range of implementation strategies in cooperation with local and regional partners, the Pharr District can implement a variety of bikeway improvements throughout the on-system highway network. 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. Bikeway improvements may also be implemented through partnerships with local governments, especially along on-system highways that provide key connections through incorporated communities. As bikeways are implemented throughout the Pharr 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.

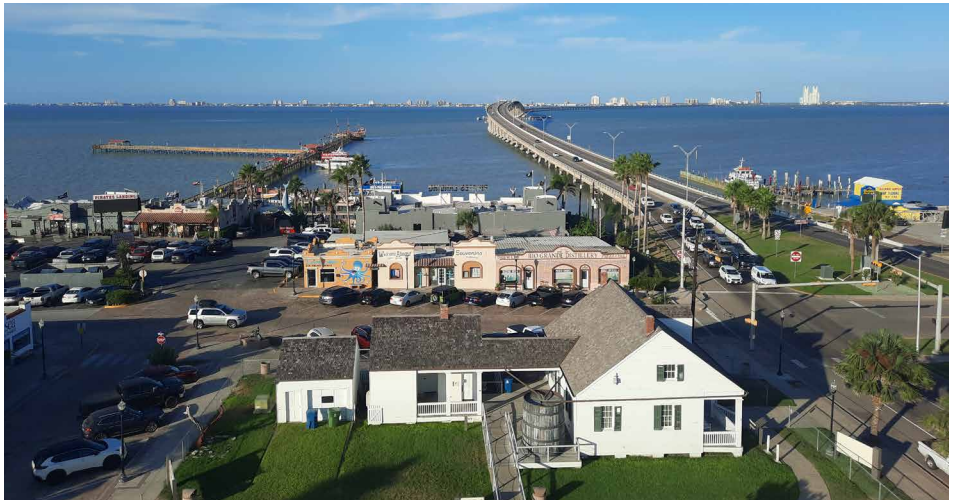


Figure 2. View of Queen Isabella Causeway to South Padre Island

ONE
Introduction

Purpose and Priorities

The Pharr District Bicycle Plan charts a vision for how state highways can contribute to the bicycling networks of communities across the Rio Grande Valley, including Brooks, Cameron, Hidalgo, Jim Hogg, Kenedy, Starr, Willacy, and Zapata counties. The State of Texas' on-system transportation network – roads owned, operated, and maintained by the Texas Department of Transportation (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 bicycling 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, Laredo, 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.

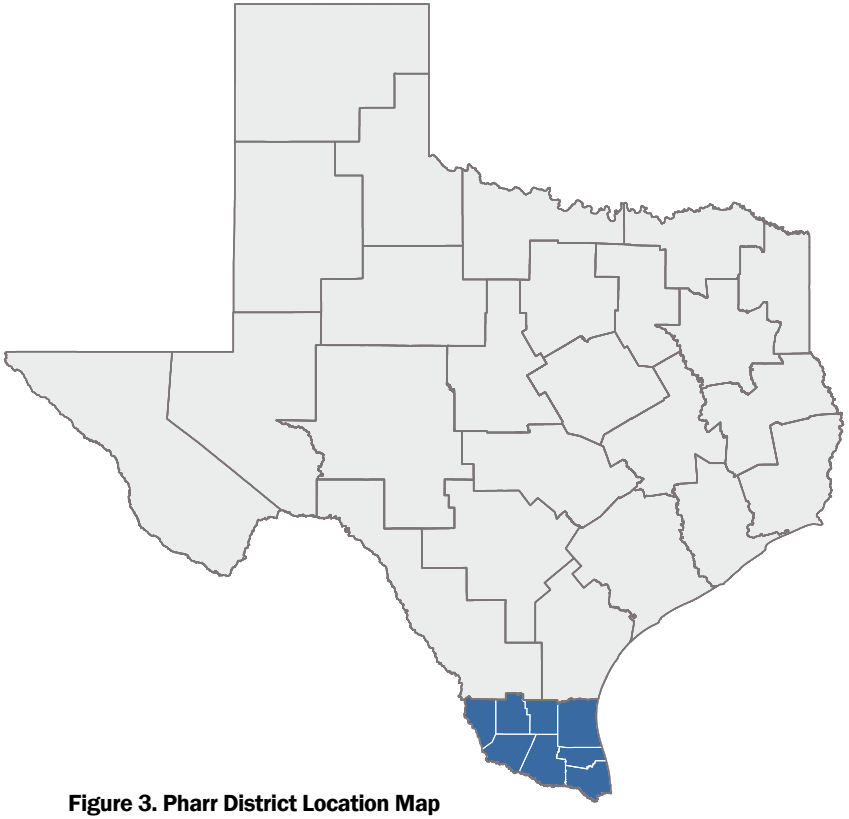


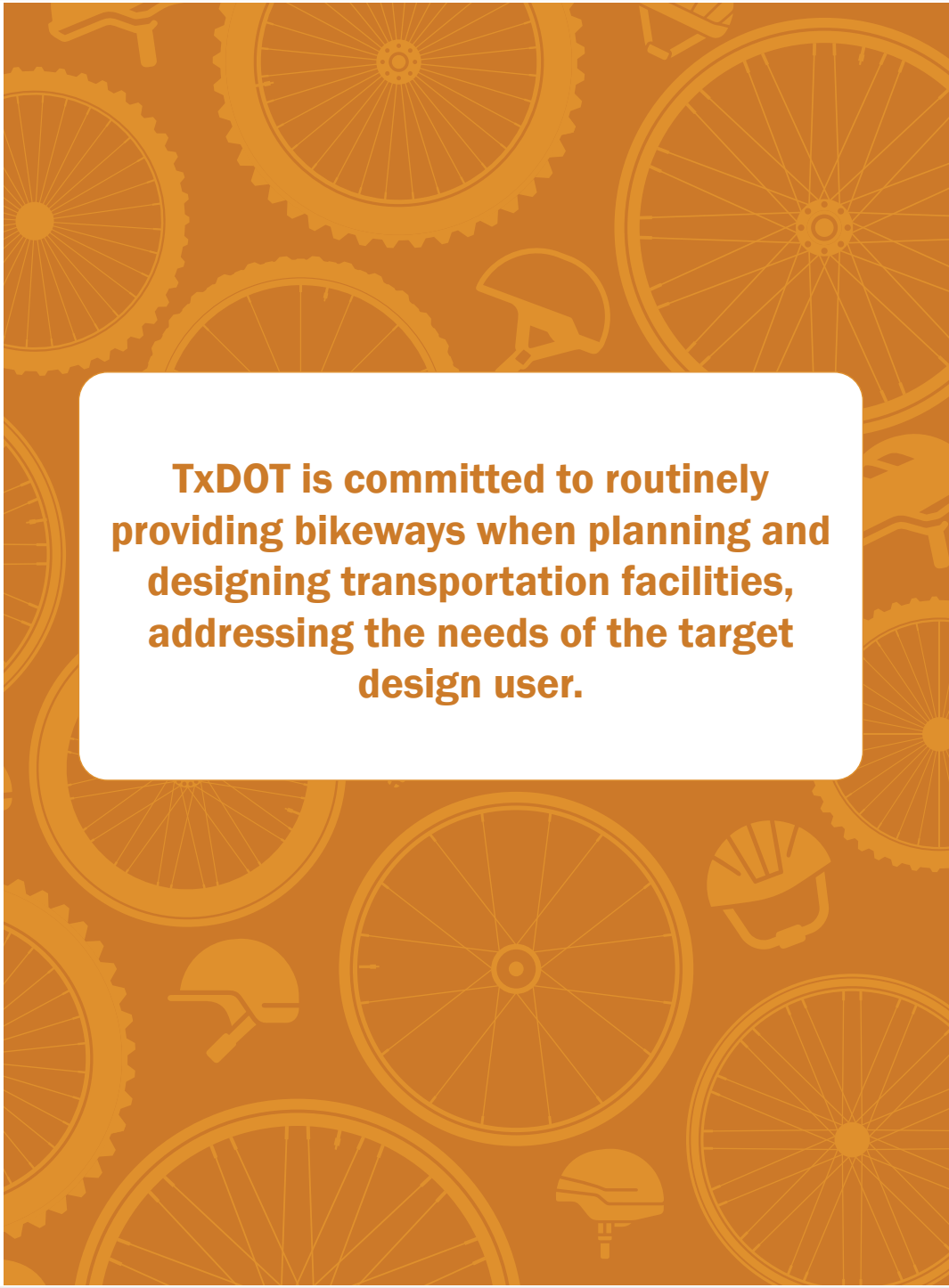
Figure 3. Pharr District Location Map

TxDOT's Role in Bicycle and Pedestrian Planning

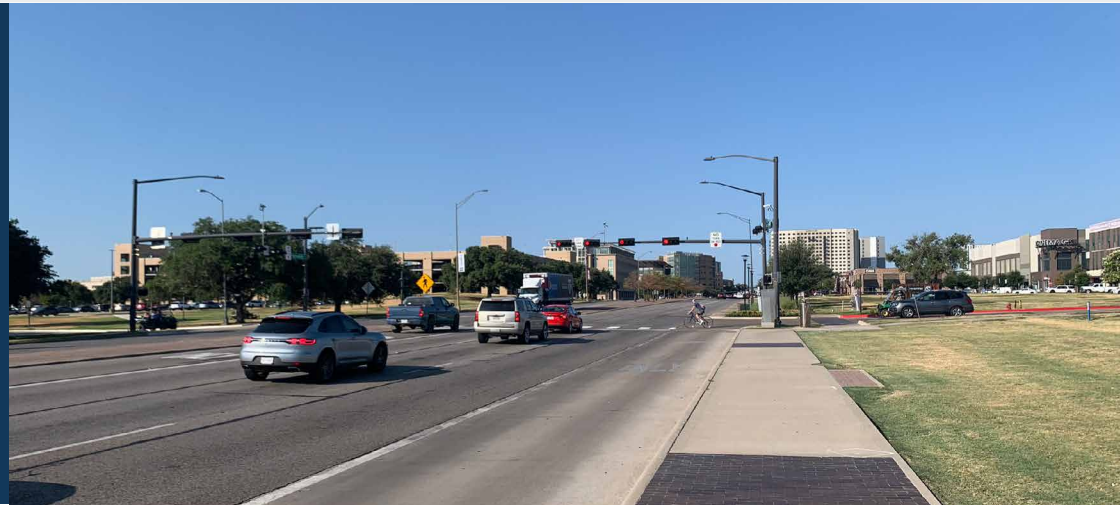
Connecting Texas 2050 is creating a vision for bicycle and pedestrian transportation across the state. TxDOT's role in active transportation includes developing bikeway design guidance, constructing appropriate bicycle accommodation along the State Highway System (SHS), providing local active transportation 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.



What is a District Bicycle Plan?



The Pharr 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 Pharr 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 to 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 Pharr District Bicycle Plan includes multiple resources that can guide the bikeway project development process. In particular, district staff will use the plan outputs to develop projects, select context-sensitive bikeway designs, and broadly to make decisions of where, when, and what types of bikeways should be implemented at any given intersection or along a corridor.

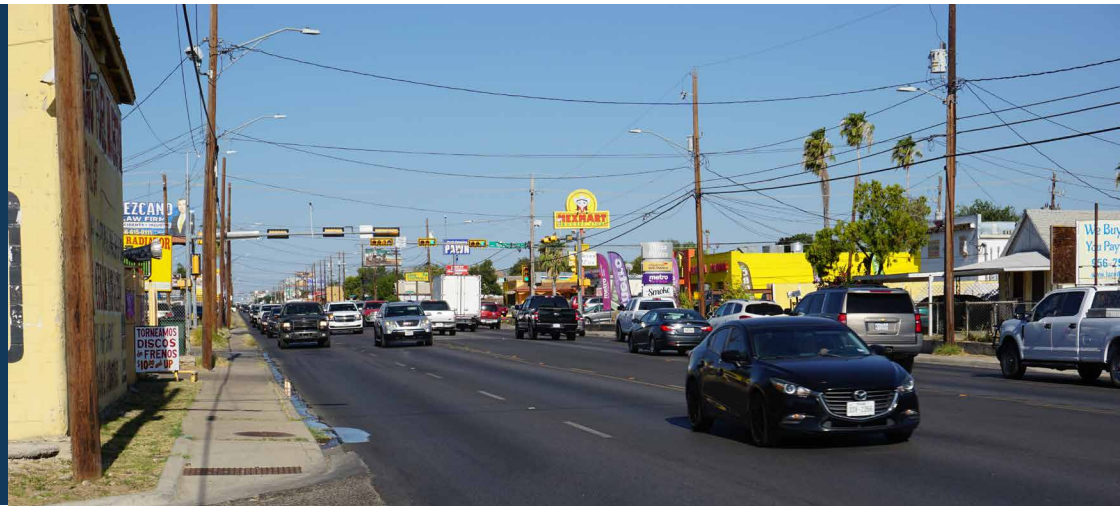
It is important to note that the plan can benefit local communities as cities and counties can coordinate with TxDOT on projects along on-system highways that pass through their jurisdictions. The six essential products and outcomes of the Pharr District Bicycle Plan are identified in Figure 4.

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 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 BTT 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 4. Pharr District Bicycle Plan Components

Timeline and Methodology



The Pharr 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. The plan was developed in coordination with the Statewide Long-Range Transportation Plan and used common data sources and planning goals, though the Pharr District Bicycle Plan followed an independent schedule.

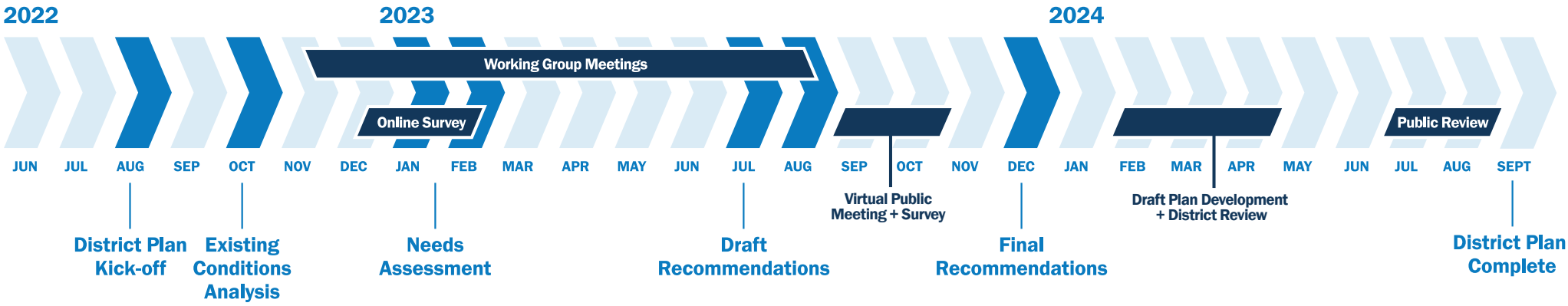


Figure 5. District Bicycle Plan Timeline

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 BTT Study.[2] 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 upper and lower body strength, endurance, and cholesterol in older adults.[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]

1 "An Economic Impact Study of Bicycling in Arizona: Out-of-State Bicycle Tourists and Exports." Arizona Department of Transportation. June 2013, https://apps.azdot.gov/files/ADOTLibrary/Multimodal_Planning_Division/Bicycle-Pedestrian/Economic_Impact_Study_of_Bicycling-Final_Report-1306.pdf.

2 Bicycling Tourism Trail Study Technical Memorandum 1: Benefits of Bikeways and Trails." Texas Department of Transportation 2018, https://ftp.dot.state.tx.us/pub/txdot-info/ptn/tech-memo-1-bikeway-trail-benefits.pdf

3 Liu, Jenny and Jennifer Dill. "Understanding Economic and Business Impacts of Street Improvements for Bicycle and Pedestrian Mobility – A Multi-City Multi-Approach Exploration." National Institute for Transportation and Communities, June 2019, https://nitc.trec.pdx.edu/research/project/1031/.

4 Asabere, P.K. and F.E. Huffman. "The Relative Impacts of Trails and Greenbelts on Home Prices." The Journal of Real Estate Finance and Economics (2009): Vol.38, No. 4, pp 408-419.

5 Gordon-Larsen, Penny, et al. "Active commuting and cardiovascular disease risk: the CARDIA study." Archives of Internal Medicine vol. 169, 13 (2009): 1216-23. https://pubmed.ncbi.nlm.nih.gov/19597071/.

6 Verney, Julien, et al. "Combined lower body endurance and upper body resistance training improves performance and health parameters in healthy active elderly." European Journal of Applied Physiology 97.3 (2006): 288-297.

7 Liang Ma, Runing Ye, Hongyu Wang. "Exploring the causal effects of bicycling for transportation on mental health", Transportation Research Part D: Transport and Environment, Volume 93, 2021, https://doi.org/10.1016/j.trd.2021.102773.

8 Avila-Palencia I, de Nazelle A, Cole-Hunter T, et al. The relationship between bicycle commuting and perceived stress: a cross-sectional study.BMJ Open (2017):7:e013542. doi: 10.1136/bmjopen-2016-013542.

9 Guijing Wang, Caroline A. Macera, Barbara Scudder-Soucie, Tom Schmid, Michael Pratt, David Buchner, and Gregory Heath, (2004): Cost Analysis of the Built Environment: The Case of Bike and Pedestrian Trials in Lincoln. Neb American Journal of Public Health (2004): 94, 549_553, https://doi.org/10.2105/AJPH.94.4.549.

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 bicycling. 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 save lives and reduce healthcare needs and costs[13]. 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 $9,561 per year[16]. By contrast, the average annual cost of owning and riding a bicycle is $308[17].

10 Dadashova, Bahar, Karen Dixon, Joan Hudson, et al.
11 Wesley E. Marshall, Nicholas N. Ferenchak. "Why cities with high bicycling rates are safer for all road users," Journal of Transport & Health, Volume 13, 2019, 100539, ISSN 2214-1405, https://doi.org/10.1016/j.jth.2019.03.00.
12 Dadashova, Bahar, Karen Dixon, Joan Hudson, et al. "Addressing Bicyclist Safety Through the Development of Crash Modification Factors for Bikeways." Texas A&M Transportation Institute. September 2022, https://trid.trb.org/view/2023867.
13 Grabow, Maggie L et al. "Air quality and exercise-related health benefits from reduced car travel in the midwestern United States." Environmental Health Perspectives vol. 120, 1, 2012, https://pubmed.ncbi.nlm.nih.gov/22049372/.

14 Monsere, Christopher, et al. Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the U.S. NITC-RR-583. Portland, OR: Transportation Research and Education Center (TREC). 2014, http://dx.doi.org/10.15760/trec.115.
15 Krizek, Kevin J., Eric Stonebraker, and Seth Tribbey. "Bicycling Access and Egress to Transit: Informing the Possibilities." Mineta Transportation Institute. April 2011, https://transweb.sjsu.edu/sites/default/files/2825_bicycling_access.pdf.
16 "Your Driving Costs Fact Sheet – December 2020." American Automotive Association. 2020, https://newsroom.aaa.com/asset/your-driving-costs-fact-sheet-december-2020/.
17 Grabow, Maggie L et al. "Air quality and exercise-related health benefits from reduced car travel in the midwestern United States." Environmental Health Perspectives vol. 120, 1. 2012, https://pubmed.ncbi.nlm.nih.gov/22049372/.

TWO
Community and Stakeholder Outreach

The people who live and work in the Pharr 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 Pharr District Bicycle Plan was informed by a combination of stakeholder meetings, which 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 local conditions and general priorities, including the BTT network alignment. The following section describes how each of the stakeholder groups and surveys came together to support the Pharr District Bicycle Plan process and outcomes.

Technical Working Group

The Pharr District 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 and street design in their jurisdictions. This includes staff of Rio Grande Valley Metropolitan Planning Organization (RGVMPO), the TxDOT Pharr District, and the cities of Brownsville, McAllen, and Pharr, among others. Over the course of three meetings, TWG members were asked about local conditions, their experiences planning and implementing projects, relevant datasets, and how to align Pharr District Bicycle Plan priorities with local goals. A full list of TWG members is included in the Acknowledgements.

TWG Meeting Topics

Meeting 1:	Meeting 2:	Meeting 3:
Project overview	Public input survey	Key plan products and implementation
Existing conditions analysis	Needs analysis	Implementation scenarios
Role of TWG	Prioritization	Design Guide
Overview of outreach efforts		Virtual public meeting

Key themes identified by the Pharr District TWG include:

- Planning across local, regional, and state bikeways is challenging and bikeways are not always well connected or designed in a consistent manner. It is vital to improve coordination and connections across jurisdictions.
- BTT routes should be evaluated and refined in coordination with local groups that are pursuing U.S. Bicycle Route System (USBRS) designations.
- The Pharr District should proactively plan and design bikeways in the earlier stages of project development rather than as a secondary consideration.
- Regular maintenance of shoulders and bicycle lanes enhances bicycling in the district and keeps bikeways in good condition.
- Pharr District riders have concerns about TxDOT's use of chip seal, a type of pavement that slows riders down and creates safety concerns on roadways with bicycle lanes and shoulders.
- Plan recommendations should consider and serve the needs of people who cross the border, especially those who bring or ride a bikecycle.
- Safety is a key issue throughout the district and often burdens the lowest-income neighborhoods and border communities.
- The RGVMPO maintains a Bicycle and Pedestrian Advisory Committee (BPAC) and is active is the planning and funding of bikeway projects across the region.
- Local jurisdictions are expanding their bikeway and trail networks, including a growing number of hike-and-bike trails.

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 Pharr District CNWG are listed below.

Several factors limit bicycle travel in Pharr District, including:

Connections to schools and colleges are inadequate to meet current and future demand for bicycling trips.

A lack of network signage and maps mean residents do not know where it is safe to travel by bicycle.

Safety is a major concern, including lack of facilities and the high share of heavy vehicles such as freight trucks on TxDOT highways.

Cultural barriers to bicycling include the perception that only the very poor ride bicycles and that owning a vehicle is a status symbol.

Current users are the very poor and the very confident.

Many bicyclists on TxDOT facilities are recreational users and confident riders, including members of bicycle clubs.

Vehicle ownership rates are high, even though incomes are low. Many bicyclists are those without access to vehicles.

Bicycling benefits are linked to improving safety and public health.

Various local jurisdictions and organizations are making the connection between bicycles and health and wellness.

Rio Grande Valley Metropolitan Planning Organization Bicycle and Pedestrian Advisory Committee

General Project Updates

The project team provided multiple updates to the BPAC of the RGVMPO, which oversees the counties of Hidalgo, Cameron, and Starr. Presentations took place at the monthly BPAC meetings in April and August 2023.

Bicycle Tourism Trails Workshop

The presentation in August 2023 was followed by a workshop to review draft recommendations for the BTT Network update and to consider additional routes and alignments. See Chapter 6 for detailed discussion on the BTT Network and proposed updates.

The BTT Network is of particular interest across the Pharr District, as there are opportunities to build upon the growing network of hike-and-bike trails as well as regional bicycle planning and planning efforts through the RGVMPO and the Cameron County Caracara Trails program.

Themes from the workshop with BPAC members include:

- BPAC members discussed whether it is better to provide direct access through communities where bicycling conditions are more stressful or to provide lower-stress routes with less direct access to destinations.
- There is a shared desire to connect BTT routes to local and regional trails and to provide access to regional destinations.
- Many connections and destinations are not currently served in the proposed BTT Network, including the University of Texas, Rio Grande Valley, the Nuevo Progreso border crossing, and the communities of Mission and Edinburg.

Public Input

Online Surveys and Input Maps

In late 2022 and summer/fall 2023, the project team used two interactive map surveys to solicit input from local and regional stakeholders and members of the general public at critical points in the plan's development timeline. In addition to direct outreach to bicycling advocacy groups, the Project Team encouraged participation through phone calls and emails. The first survey focused on bicycling conditions, and the second collected feedback on the draft plan recommendations.

Bicycling Conditions Survey

Background

The first map survey, shown in Figure 6, was open from December 2022 to February 2023 to collect input on where people bicycle today or wish to see improvements. Survey participants provided a total of 908 comments that addressed current bicycling destinations, desired routes, and key safety concerns. In addition to an interactive input map component, the survey contained questions related to general transportation behavior and desired bicycling facility types. Comments were concentrated in the southern and southeastern portions of the Pharr District, which is consistent with general population distribution patterns. A total of 340 individuals participated in the survey, though not all participants responded to every question. The survey could be completed in both English and Spanish.

PHARR DISTRICT: Bicycling Conditions Survey Comment Distribution

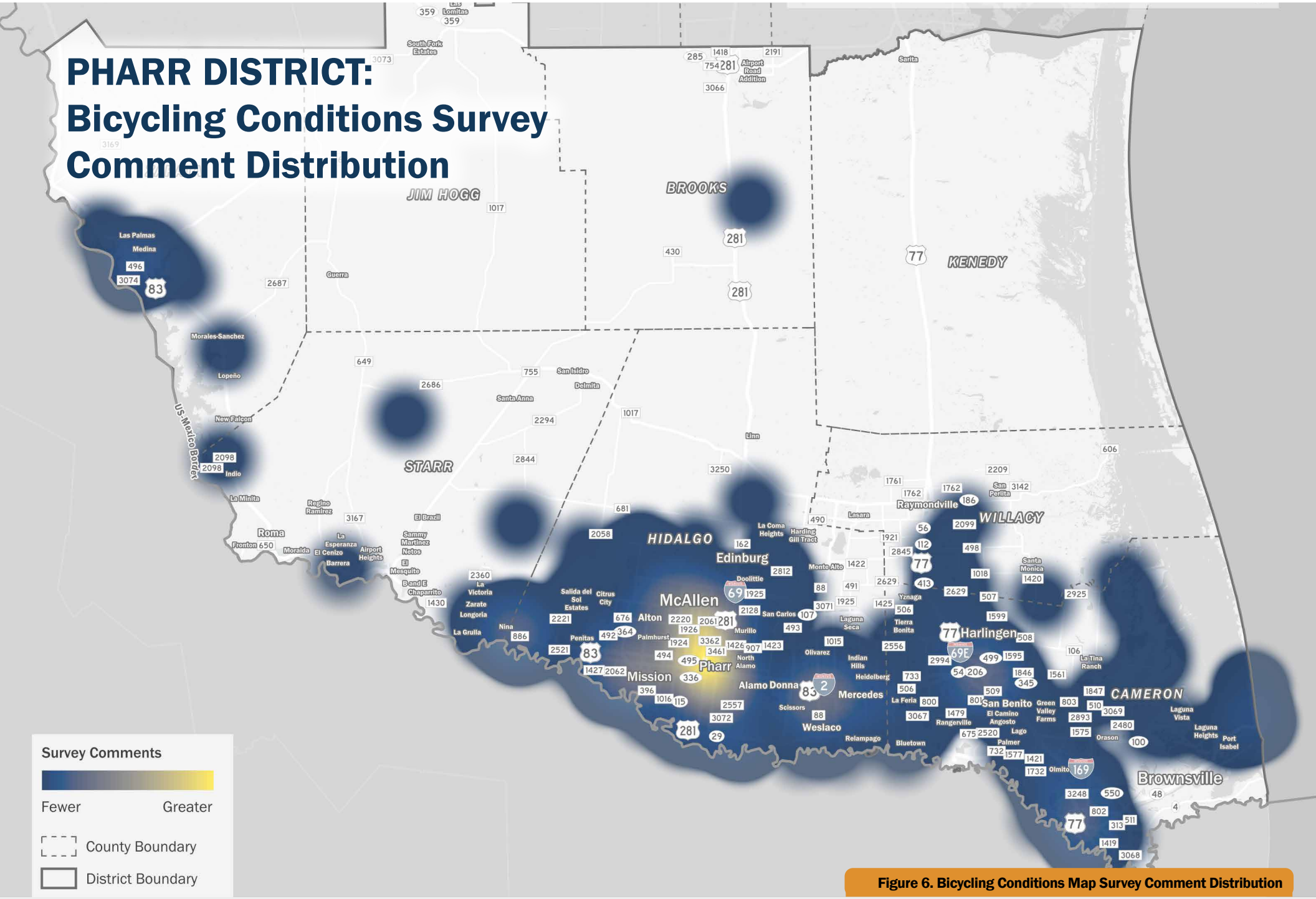


Figure 6. Bicycling Conditions Map Survey Comment Distribution

PHARR DISTRICT: Distribution of Plan Recommendation Survey Map Comments

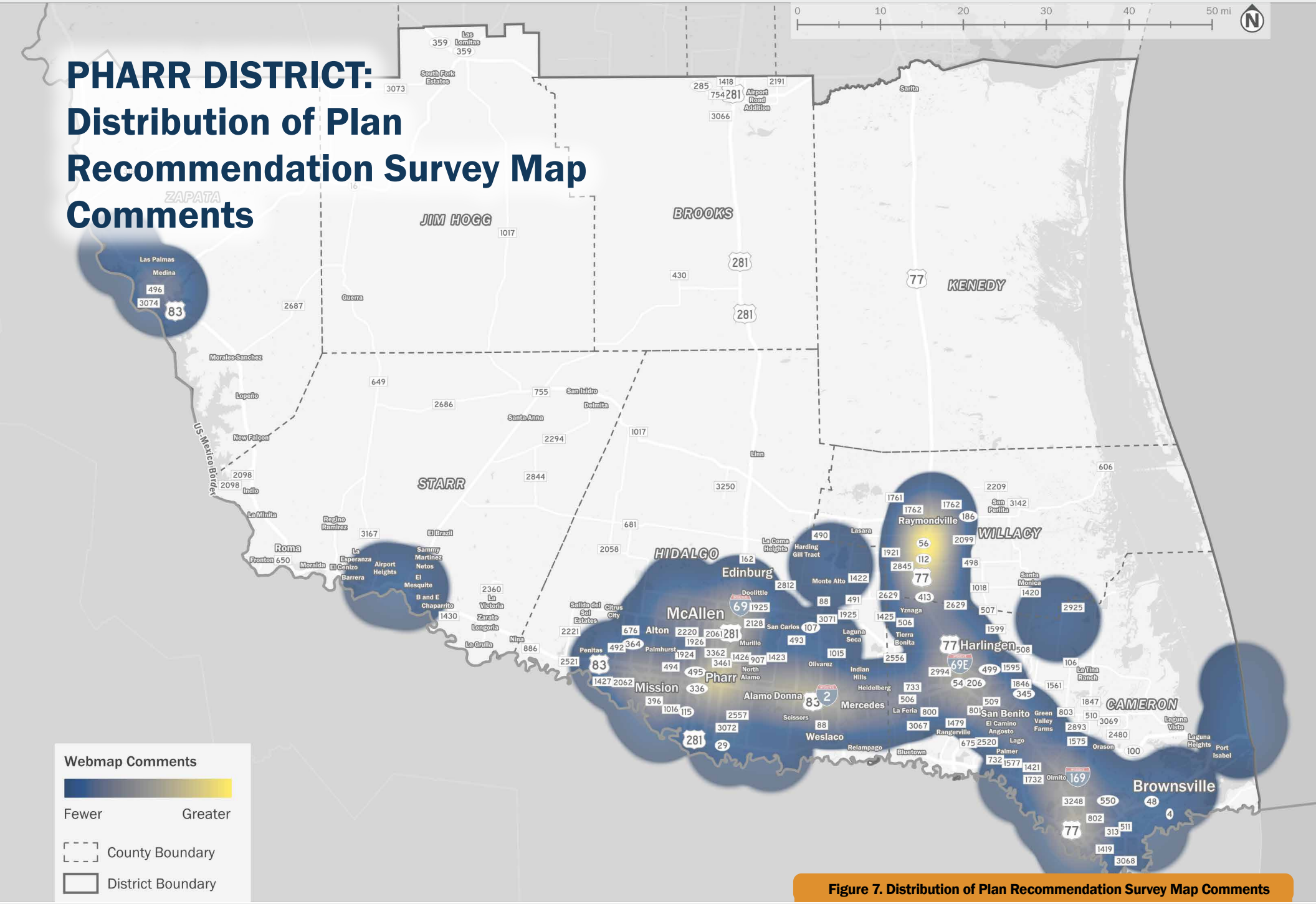


Figure 7. Distribution of Plan Recommendation Survey Map Comments

Key Findings

Recreation is the primary reason for bicycling in Pharr County: 88% of respondents bicycle for recreation; 31% bicycle for utilitarian purposes.

Though most respondents drive to their destinations, participants have high levels of access to bicycles.

About 2/3 of respondents ride their bicycles at least once a week. Reported bicycling rates among participants increased since the onset of the COVID-19 pandemic.

Participants are most comfortable riding on trails or bikeways that are separated from motor vehicle traffic. About 85% of respondents indicated they feel safe on bikeways or trails separated from traffic, compared to 53% who feel comfortable riding in bicycle lanes or wide shoulders.

Participants ranked “improving safety” as the highest general priority, followed by “building a connected network.”

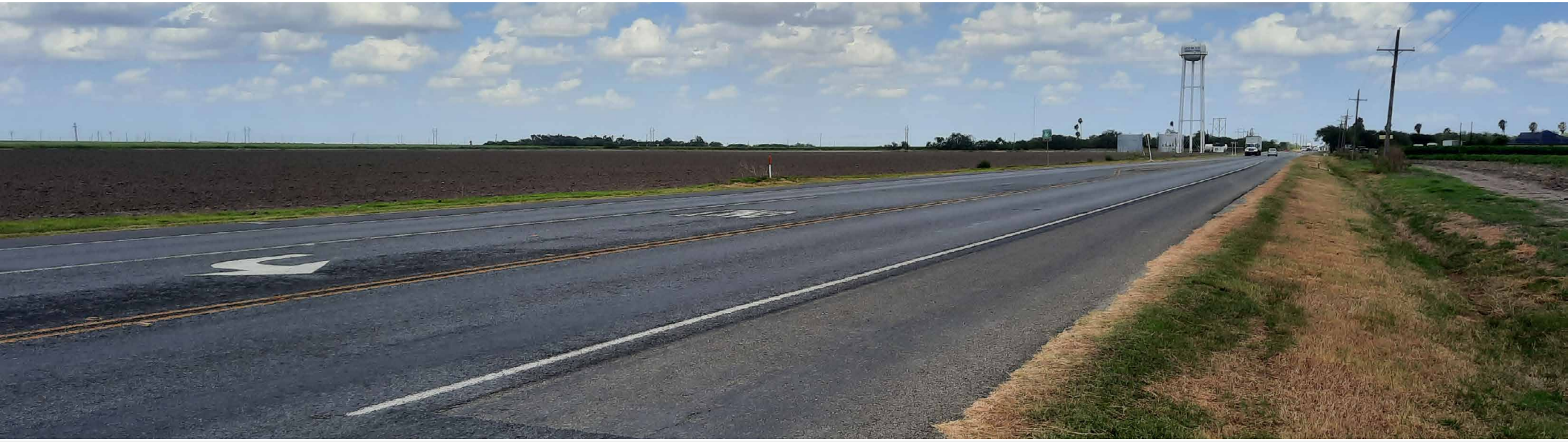
Plan Recommendations Survey

Background

The Plan Recommendations map survey allowed stakeholders and community members to review draft recommendations and provide comments on whether those recommendations could better address existing needs and opportunities in the Pharr District. Figure 7 shows the concentration of comments collected in the second interactive map survey, which gathered input on the draft priority network, BTTs, and network functions from September to October 2023.

Comment Type	Count	Percent
Locations I Like to Bicycle	348	38.3%
Safety Concern	243	26.8%
Poor Biking Condition	223	24.6%
Biking Gap or Barrier	94	10.4%
Total	**908**	**100%**

Table 1: Bicycling Interactive Input Map Comments by Type



Key Findings and Comments

Respondents could indicate their agreement with priority levels, bikeway network functions, and BTT routes. The majority of comments were related to bikeway network functions, including a number of specific comments suggesting that TxDOT should prioritize making frontage roads more comfortable for bicyclists. In general, comments supported the idea that an all-ages-and-abilities network may improve transportation access and mobility for people living in low-income areas and for those unable to afford a car.

Most comments related to the BTT indicated support for the proposed network. Several comments noted that BTT segments see active use, suggesting network improvements would be beneficial. Improvements suggested by respondents included improved line markings, signage, and wider shoulders.

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 plans' purpose and products and invited attendees to respond to the second online mapping survey. The meeting had three goals:

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

Input and comments collected during the virtual public meeting are reflected above via survey responses.

Figure 8. Virtual Public Meeting Announcement

THREE
Existing Conditions

District Overview

Population and Economic Dynamics

The Pharr District includes eight counties (Brooks, Cameron, Hidalgo, Jim Hogg, Kenedy, Starr, Willacy, and Zapata) and is comprised of a series of urbanized communities throughout the Rio Grande Valley and along the U.S.-Mexico border, as well as more sparsely populated agricultural communities outside of the border region. The Rio Grande Valley is growing quickly, with the overall population of the district increasing from around 1 million in 2000 to 1.4 million in 2020. Major population centers include the greater McAllen metropolitan area, which includes the sizeable cities of Macallen, Pharr, and Mission, and forms a transnational community with the Mexican city of Reynosa on the opposite side of the Rio Grande, as well as the greater Brownsville-Harlingen metropolitan area, which is located across the Rio Grande from the City of Matamoros.

The Rio Grande Valley region boasts a growing tourism industry, supported by both international travel associated with the U.S.-Mexico border and travel to destinations such as South Padre Island and recreational and historic sites such as the array of National Wildlife Refuges and historic battlefield sites. The region is also noted for transnational communities – more than three-quarters of the population speaks Spanish at home, and many families have members on both sides of the border – and for a high degree of international travel for employment, tourism, and commercial purposes.

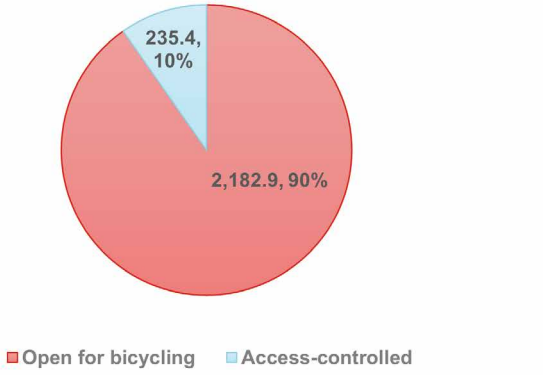


Figure 9. TxDOT On-system Highway Miles in the Pharr District
Source: Bicycle Conditions Map, 2023 Online Survey

Pharr District Roadway Network and Border Crossings

The communities across the Pharr District are connected by 2,418 miles of SHS roadways, of which 149 miles, or about 6%, are access controlled, while the remaining 2,269 road miles are open for bicycling. On-system highways that are eligible for bicycling include frontage roads, rural highways, farm-to-market (FM) roads, state highways, and U.S. highways. Many of these highways function as thoroughfares in incorporated communities.

The Pharr District's highway network and travel patterns are shaped by the local economy, featuring significant agricultural production, and the proximity to the U.S.-Mexico border, including the presence of 11 international bridges. These dynamics produce significant volumes of freight truck traffic, which, according to feedback from local stakeholders, contributes to unsafe conditions for bicyclists. Congestion caused by freight trucks is also a major consideration for prioritization and the design of future highway system upgrades and expansions.

Border traffic also shapes the demand for bicycling infrastructure. Of the more than 17.8 million northbound border crossings in 2022, about 5.5 million, or 31% of all crossings, were classified as pedestrian trips, which include individuals traveling by bicycle. Of the non-motorized northbound crossings in 2022, more than 2 million total trips took place at the McAllen-Hidalgo crossing alone and another 2 million took place across the four Brownsville ports of entry.

Crossing by Type	Annual Total (2022)	Share of Crossings
Commercial Trucks	1,148,152	6.4%
Buses	15,804	0.1%
Privately Owned Vehicles	11,126,030	62.4%
Pedestrians*	5,532,182	31.0%
Total	**17,822,168**	**100%**

Includes bicyclists

Table 2: Total Northbound Border Crossing Trips – Pharr District, 2022
Source: TxDOT Border Crossing Data (2022)

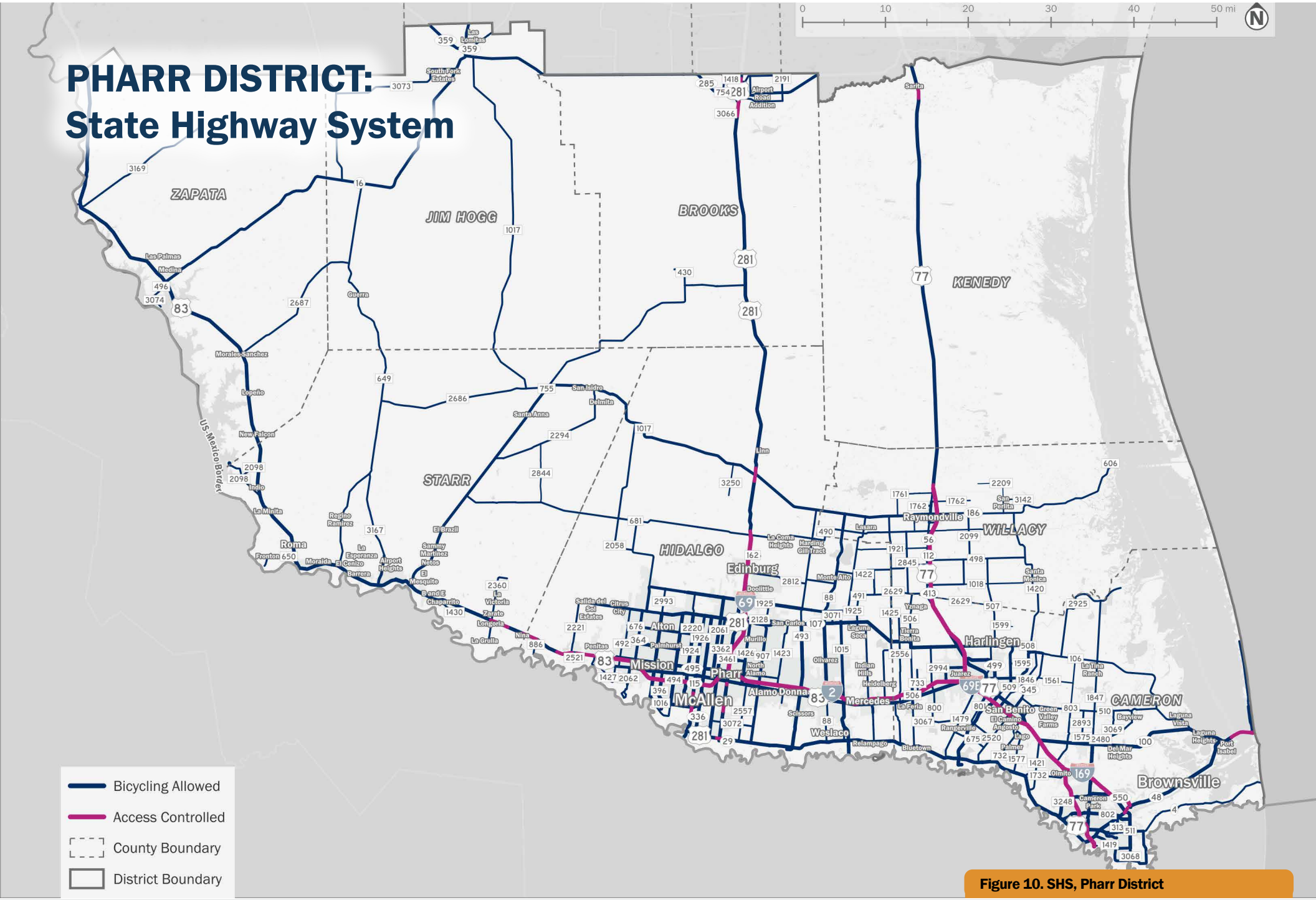


Figure 10. SHS, Pharr District

Community Needs

Given the unique demographic and socioeconomic characteristics of the Pharr District, residents and visitors are likely to benefit from expanded transportation options, including greater access to jobs, transit, day-to-day needs (e.g., grocery stores), and other community resources. As shown in Figure 11, the district's residents are significantly more likely than the average Texan to be part of a lower-income household, with over half of households in the Pharr District living below 200% of the federal poverty line. The population in the Pharr District is also substantially younger than the state overall – 32.1% of the population is younger than 18 years old, compared to 26.0% at the state level – and a higher share of households have zero cars. Overall, about three out of ten households are housing-cost burdened, which further contributes to the need to reduce transportation costs by expanding travel options. As described in the Benefits section, expansion of comfortable bicycling routes in these communities offers additional low-cost travel options to Pharr District communities.

Community Profile

PHARR DISTRICT

Population Under 18
32.1% DISTRICT
26.0% STATEWIDE

Population Over 65
11.7% DISTRICT
12.3% STATEWIDE

Population Non-White Latino
91.7% DISTRICT
39.3% STATEWIDE

Population Below 200% of Federal Poverty Line
56.1% DISTRICT
33.6% STATEWIDE

Households with Disabled Residents
32.0% DISTRICT
24.3% STATEWIDE

Zero-Car Households
6.6% DISTRICT
5.3% STATEWIDE

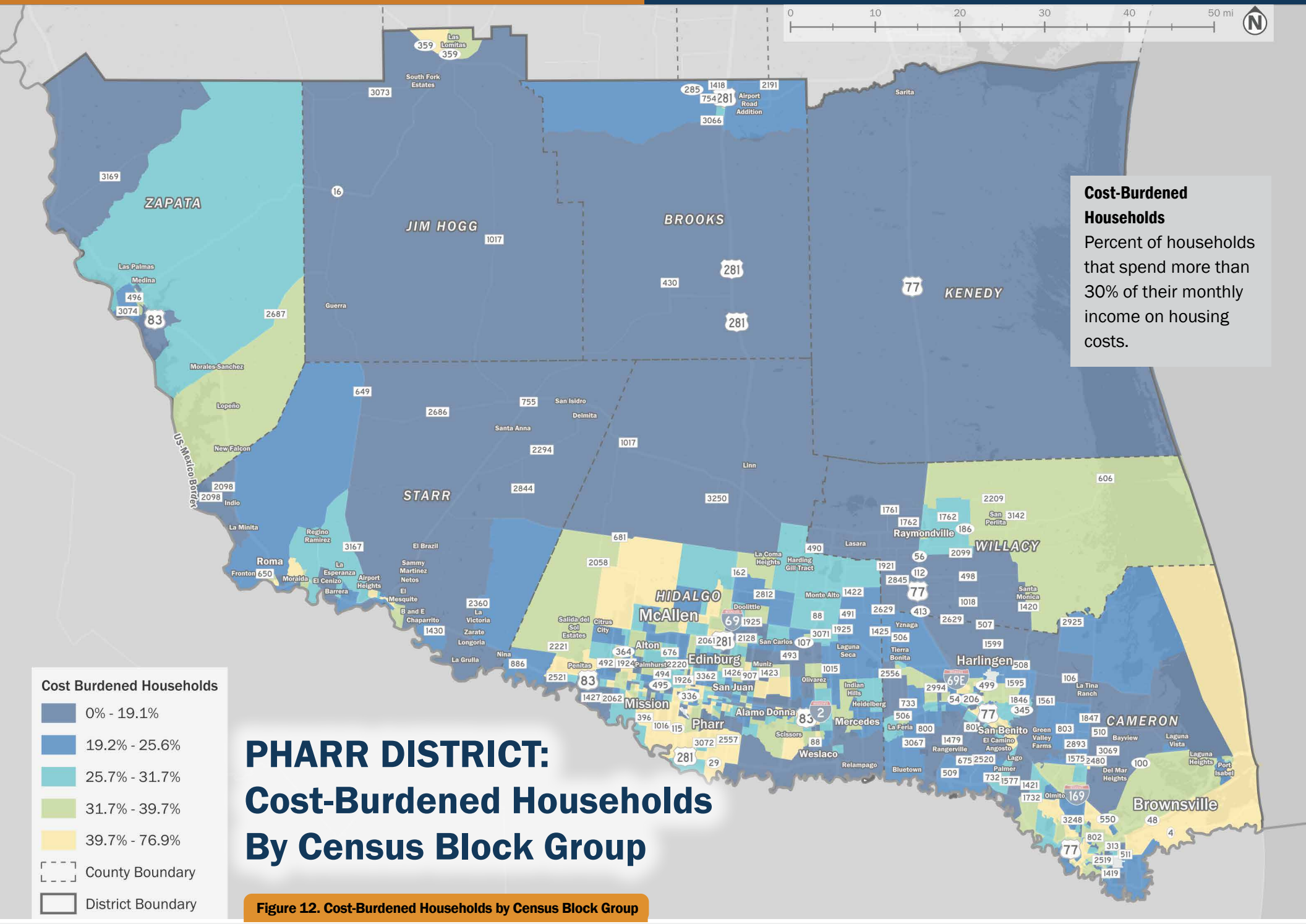
Housing Cost-Burdened Households
29.9% DISTRICT
29.5% STATEWIDE

Population (18+) With Asthma
8.3% DISTRICT
8.6% STATEWIDE

Population (18+) With Heart Disease
6.6% DISTRICT
5.4% STATEWIDE

Fatal and Severe Crashes Per Million Residents
8,472 DISTRICT
12,829 STATEWIDE

Figure 11. Community Needs Indicators in the Pharr District



Cost-Burdened Households
Percent of households that spend more than 30% of their monthly income on housing costs.

PHARR DISTRICT: Cost-Burdened Households By Census Block Group

Figure 12. Cost-Burdened Households by Census Block Group

Biking Conditions Along the State Highway System

More than half of the on-system highway network in the Pharr District features some form of bikeway, with paved bikeable shoulders forming the vast majority of the network. Paved bikeable shoulders are present in all counties across the district, including along state and U.S. highways in more rural areas (e.g., Starr and Willacy counties). Formal bicycle lanes are most prevalent in the more populated Cameron and Hidalgo counties. However, conditions for people bicycling can be characterized as high stress in most circumstances, and there are few bikeways that are separated from traffic through any form of vertical barriers or horizontal buffers.

At the local level, there are growing networks of both on-street bikeways, plus hike-and-bike trails in incorporated communities such as McAllen, Pharr, and Brownsville. Regional planning efforts are also ongoing to create vast networks of regional bikeways and recreational trails (e.g., the proposed Caracara Trails network in Cameron County). Expanding bikeways along the on-system highway network provides opportunities to integrate regional bikeways with local facilities and trails and to provide access to recreational and tourist sites and regional institutions such as the University of Texas-Rio Grande Valley campuses.

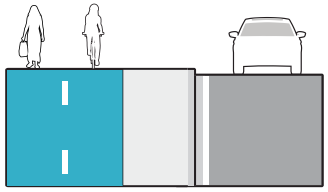
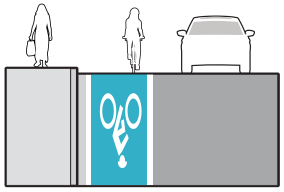
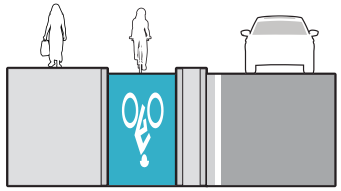
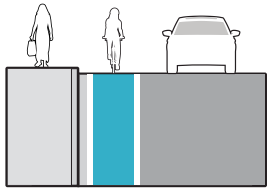
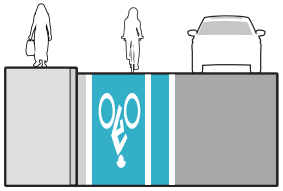
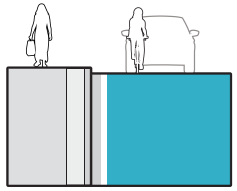
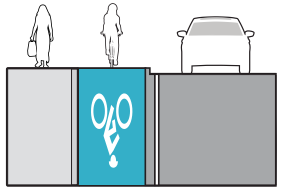
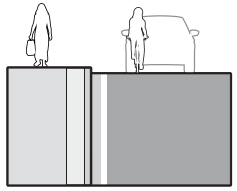
Table 3: Existing On-System Bikeways by County (Centerline Miles)

Facility Type	Brooks	Cameron	Hidalgo	Jim Hogg	Kenedy	Starr	Willacy	Zapata	Total
Paved Shoulders	90.8	293.7	369.6	64.9	46.6	100.2	86.6	96.5	1,149
Bicycle Lane	0	21.2	47.7	0	0	0	0	0	69
Buffered Bicycle Lane	0	3.9	0	0	0	0	0	0	4
Shared-Use Path	0	0.4	0	0	0	0	0	0	0
Shared Lane	0	0.7	0	0	0	0	0	0	1
No Bikeways	35.6	292.9	343.8	77.9	1.0	132.0	140.2	22.8	1,046.2
Total	**118.0**	**612.8**	**737.0**	**142.7**	**2.1**	**230.4**	**220.6**	**119.3**	**2,182.9**

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.

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

Bikeway Facility Types — PHARR DISTRICT

Facility Type	Miles		Facility Type	Miles	
Shared-Use Path	0.4		Bicycle Lane	68.9	
Separated Bicycle Lane	0.0		Bicycle-Accessible Shoulder	1,149.0	
Buffered Bicycle Lane	3.9		Shared Lane	0.7	
Raised Bicycle Lane	0.0		None	1,046.2	

Total District Miles: 2,269.1

Figure 13. Pharr District Bikeway Types and Mileage

Barriers to Bicycling

General Observations

While the Pharr District features many of the ingredients necessary for bicycle travel to become a major form of transportation for commuting and recreational purposes, popular routes are often also the most dangerous for bicyclists, especially those riding long distances. The plan development process revealed a range of barriers and challenges to more widespread bicycling activity in the region. Challenges to bicycling today in the region include:

- Traffic conditions, vehicle speed, and bicycle-unfriendly roadway design often are significant barriers to high-activity destinations.
- Frontage roads are often lined with key destinations and retail opportunities but lack shoulders or trails for bicyclists.
- High levels of truck freight traffic in the border region affect user safety and comfort.
- Wide shoulders and bike lanes in urbanized areas without clear buffers or barriers can be mistaken for turn lanes or used as passing lanes.
- Jurisdictions have limited ability to implement bikeways and trails along rail corridors.
- The access route to South Padre Island, Queen Isabella Causeway, does not include bikeways, which significantly limits the ability to access the region's most popular tourist destination.

Figure 14: Car Traveling in Bicycle Lane along US 83

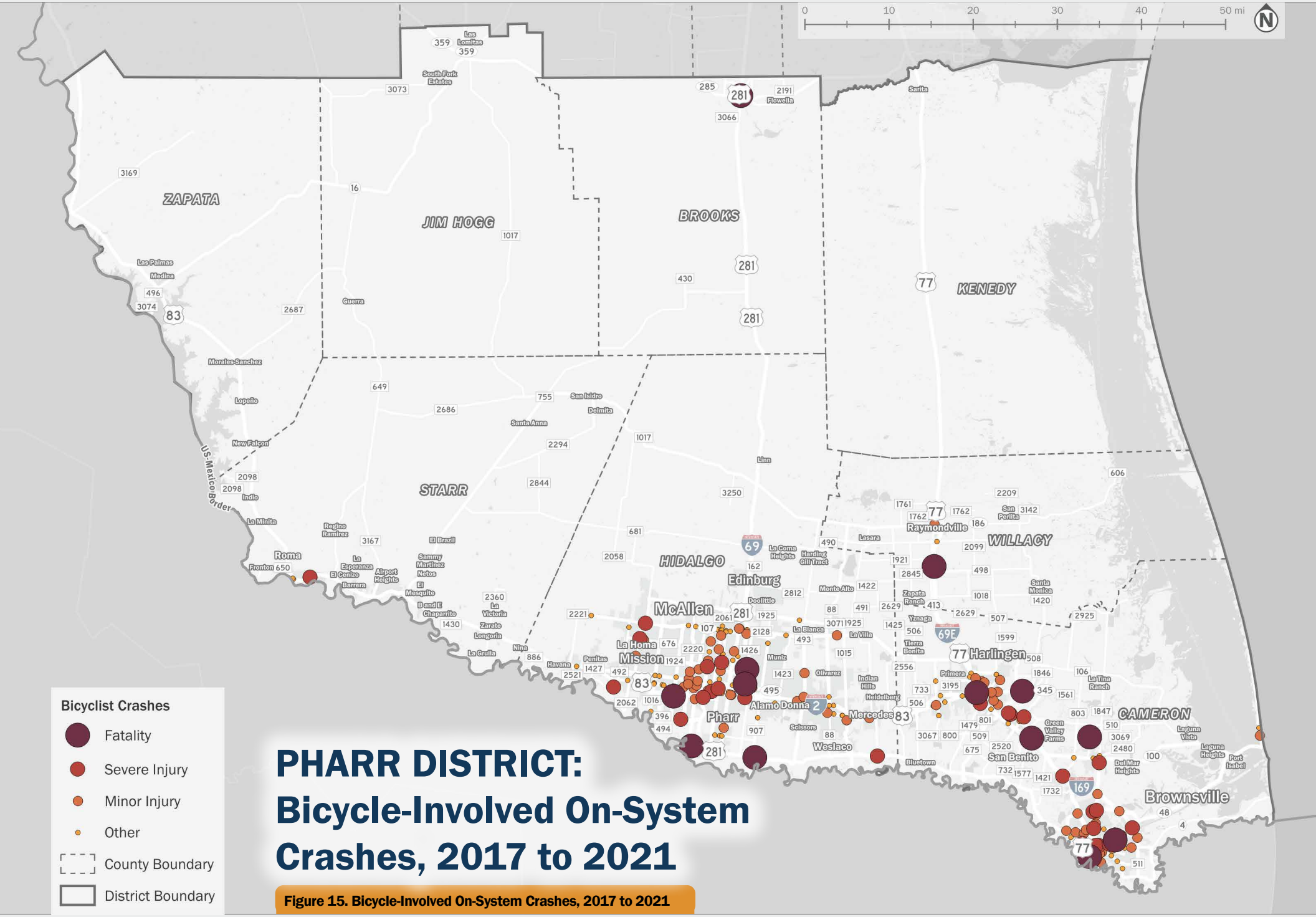
Safety Conditions

Bicyclist-involved crashes in the Pharr District are concentrated in the Brownsville and Harlingen areas, with major hot spots along Interstate 69E frontage roads and other high-speed highways. Other corridors of note include highways 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.

Table 4 summarizes the total number of bicyclist-involved crashes from 2017 to 2021 in the Pharr District, while Figure 15 depicts locations where these crashes occurred. During this period, 595 bicycle-involved crashes occurred within the district, resulting in 16 fatalities and 52 serious injuries. Of the total district bicycle-involved crashes, approximately 49% occurred on the SHS, including 14 fatalities and 29 serious injuries.

Crash Severity	District Total	On-System	On-System, Percent of District Total
Fatal	16	14	87.5%
Suspected Serious Injury	52	29	55.8%
Suspected Minor Injury	193	90	46.6%
Possible Injury	232	99	42.7%
No Injury	102	59	57.8%
Total	595	291	48.9%

Table 4: Bicycle-Involved Crashes by Injury Type



PHARR DISTRICT: Bicycle-Involved On-System Crashes, 2017 to 2021

Figure 15. Bicycle-Involved On-System Crashes, 2017 to 2021

Local Plans and Policies

Integrating improvements along TxDOT on-system highways with bikeways as well as trails owned and maintained by local jurisdictions can expand opportunities for people to travel within and across the Pharr District by bicycle. This section summarizes local and regional plans that can help TxDOT and agency partners identify complementary investment opportunities and integrate local and regional bikeway and trail networks. Many local and regional plans identify improvements along TxDOT on-system highways through incorporated communities that may be pursued by local agencies in coordination with TxDOT. Such improvements may require maintenance agreements. Where local datasets were available, existing on-street bikeway and trail connections to on-system highways were included in the prioritization criteria (see Chapter 5).

Rio Grande Valley Metropolitan Planning Organization Active Transportation Plan

The RGVMPO Active Transportation Plan (ATP) covers the three counties in the Metropolitan Planning Organization (MPO) planning area - Hidalgo, Starr, and Cameron. The stated purpose of the ATP is to build a culture that supports active transportation and to expand the regional active transportation facilities.

The RGVMPO ATP identifies benefits from active transportation as an effective tool to address the economic inequities, health disparities, and unreliable access to private vehicles that disproportionately affect the region's low-income people of color. The plan includes specific project recommendations as well as funding sources at the federal, state, and local level.

The ATP considers both local and regional connections through a priority project list and the identification of a series of regional bike routes that could be achieved via improvements along TxDOT on-system highways. Facility selection is based on the Federal Highway Administration's Bikeway Selection Guide; however, the ATP emphasizes that existing conditions and restraints, planning and engineering expertise, and community input should take precedence in facility selection.

The RGVMPO ATP provides the following guidance for selecting appropriate facility types:

1. Identify community needs and routes
2. Understand current conditions
3. Identify solutions based on local context and traffic/speed and volume

1. USBR 55 Combes-San Benito
2. USBR 55 San Benito-Los Indios
3. USBR 55 Los Indios-Brownsville
4. USBR 55 Brownsville-Port Isabel
5. USBR 55 Port Isabel-SPI
6. USBR 55 Port Isabel-Laguna Atascosa NWR
7. USBR 55 Laguna Atascosa NWR-Rio Hondo
8. USBR 55 Rio Hondo-Combes
9. USBR 55 Combes-Willacy Co.
10. USBR 55 Combes-Elsa
11. La Paloma-Bayview
12. Laguna Vista-San Pedro
13. Brownsville-Los Fresnos
14. Rio Hondo-San Benito
15. Harlingen South
16. Progreso-Los Indios
17. Weslaco-Progreso
18. Weslaco-Elsa
19. Elsa-Delta Lake Park
20. Edinburg-Elsa
21. McAllen-Edinburg
22. 83 Bypass
23. McAllen-Weslaco
24. Hidalgo-Progreso
25. Southern Nature Connector
26. Mission-Sullivan City
27. Mission-Alton
28. Monte Cristo Connector
29. Edinburg-Willacy Co.
30. McCook Connector
31. Mission-McAllen
32. McAllen-Hildalgo
33. Weslaco-Harlingen

Figure 16. Regional Bicycle Routes from the RGVMPO ATP

Lower Rio Grande Valley Active Transportation and Active Tourism Plan

The Lower Rio Grande Valley Active Transportation and Tourism Plan – developed by the Lower Rio Grande Valley Development Corporation – highlights the role that active transportation facilities can play in promoting healthy lifestyles and stimulating economic development through increased tourism and job creation. A cornerstone of the plan is the Caracara Trails system, envisioned as a 428-mile trail network that connects a variety of outdoor recreation and cultural and historic landmarks across Cameron County. The county and local and regional partners have implemented a growing number of trails over the last several years, with additional segments planned as funding and right-of-way (ROW) permits.

Noteworthy projects include the Brownsville Historic Battlefield Trail, which connects to the Palo Alto Battlefield National Historic Park Trails in the Bahia Grande area are currently in design. As part of the Caracara Trails network, the plan also proposes a series of USBRs, many of which coincide with the 2018 BTT Example Network. The proposed network was further referenced during the update to the BTT network (see Chapter 6).

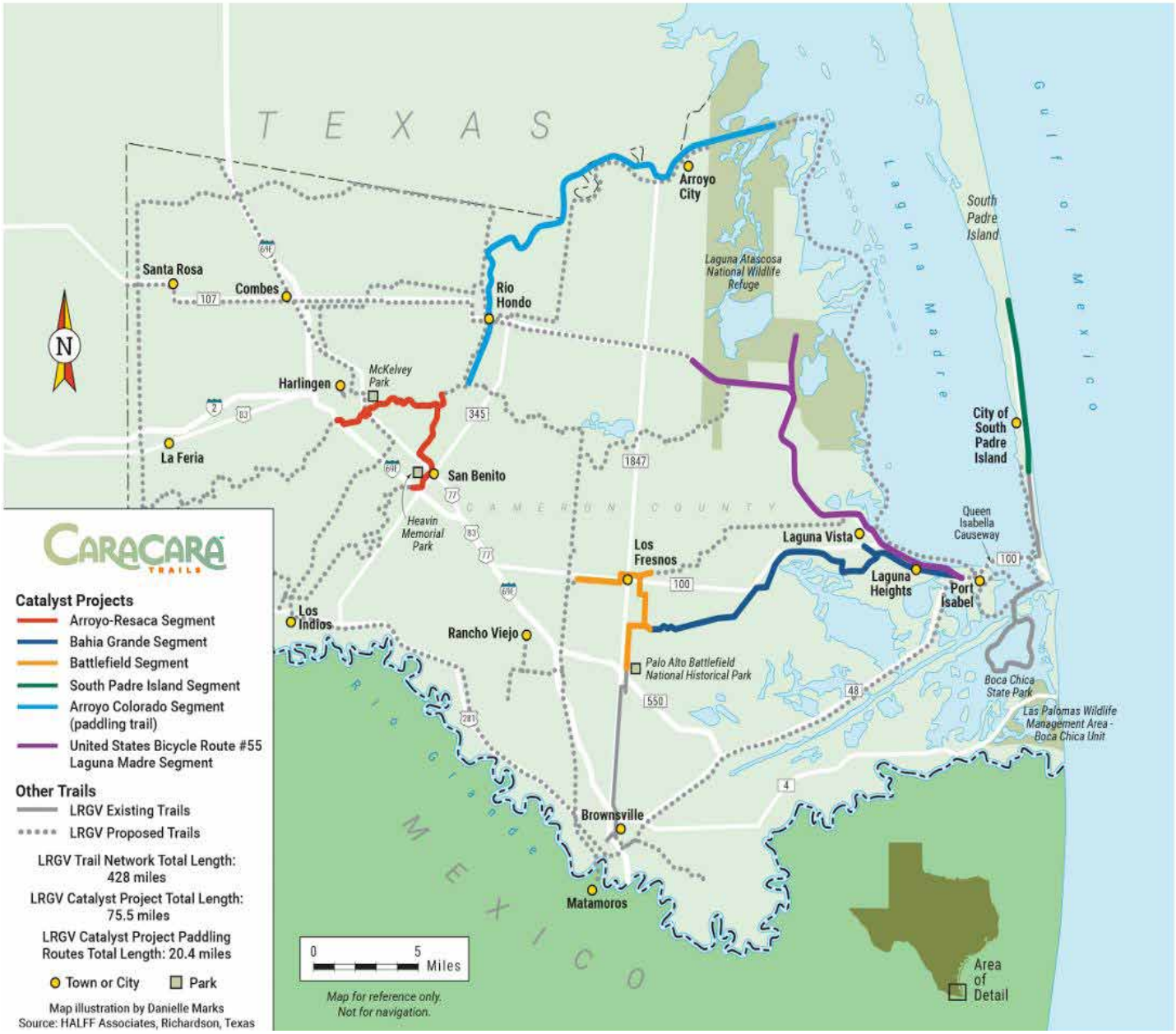


Figure 17: Current and Proposed Caracara Trails Network

Source: https://www.railstotrails.org/media/841105/caracara-handout_pages.pdf

Local Trails and Bikeways Master Plans

A growing number of communities have local active transportation or trail plans that outline specific investment priorities, design considerations, and supporting policies. Noteworthy recent examples are listed below:

- The **Pharr Pedestrian Safety and Wellness Plan** identifies city-wide bikeway and trail networks and includes recommendations along key TxDOT facilities. A high-priority project is to upgrade bike lanes to buffered or protected bike lanes along Cage Boulevard (US 285).
- The **Brownsville Sidewalk and Trail Master Plan** guides the city on its maintenance of existing infrastructure and future development of sidewalks, trails, and bicycle infrastructure. Proposed trails are intended to connect key destinations, including cultural districts, institutions, local attractions, and major employers.
- The **City of Harlingen Trails Master Plan** and **Parks and Recreation Master Plan** both prioritize the implementation of a major city-wide network of paved trails, beginning with a "spine" network. The plan categorizes projects as "very-high-priority corridor," "high-priority corridor," and "long-term-priority corridor."

General and Comprehensive Plans

Other local bikeway and trail projects are identified in General Plans, many of which contain policy support for active transportation and clear goals and objectives to expand opportunities for people to bicycle across their communities. For example, the **Envision McAllen 2040 Comprehensive Plan** contains design guidance for street typologies, including innovative bikeway designs such as protected bicycle lanes and sidepaths along certain street types. The plan also recommends development of a Complete Streets policy and supports the expansion of the hike-and-bike trail network. The **San Benito Downtown Revitalization Plan** specifically mentions bikeways as part of the set of desired physical infrastructure improvements needed to further invigorate its downtown area.

Planned Projects and Improvements

Many locally planned projects are not reflected in the recommendations and summary maps contained in this Pharr District Bicycle Plan. Several noteworthy projects are listed below:

- Growing networks of hike-and-bike trails:
  - Planned projects intersect with, or are along, TxDOT on-system highways and proposed BTT segments, such as hike-and-bike trails in Hidalgo's Second Precinct and the Bahia Grande Trail near Brownsville/Port Isabel.
  - The City of Pharr and Hidalgo County are pursuing a hike-and-bike trail along I Road and Military Highway between Pharr and the Santa Ana National Wildlife Refuge.
- A second causeway to South Padre Island is in the environmental review stages. If cleared, it will provide an opportunity to improve bicycle and pedestrian connections to the island that is impossible at present.
- New highways planned near Rio Grande City (State Loop 195) and towns in eastern Hidalgo County (State Highway [SH] 68) provide opportunities to include high-quality bicycle facilities as the highways are built, rather than as retrofits.

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 RGVMPO ATP and the Caracara Trails system, 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.

Figure 18 demonstrates, against the backdrop of a generalized example location, how multiple types of needs may be closely spaced or overlap, creating barriers to comfortable, safe bicycling in local communities.

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. Within 2 miles of a K-12 school (where school districts do not typically provide school bus services), it identifies road segments without buffered or separated bikeways that would support safe and comfortable bicycle trips for young riders. Higher-education schools serve adult students who are typically able to ride longer distances and navigate a wider range of 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.
- **BTT Need:** BTTs 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).

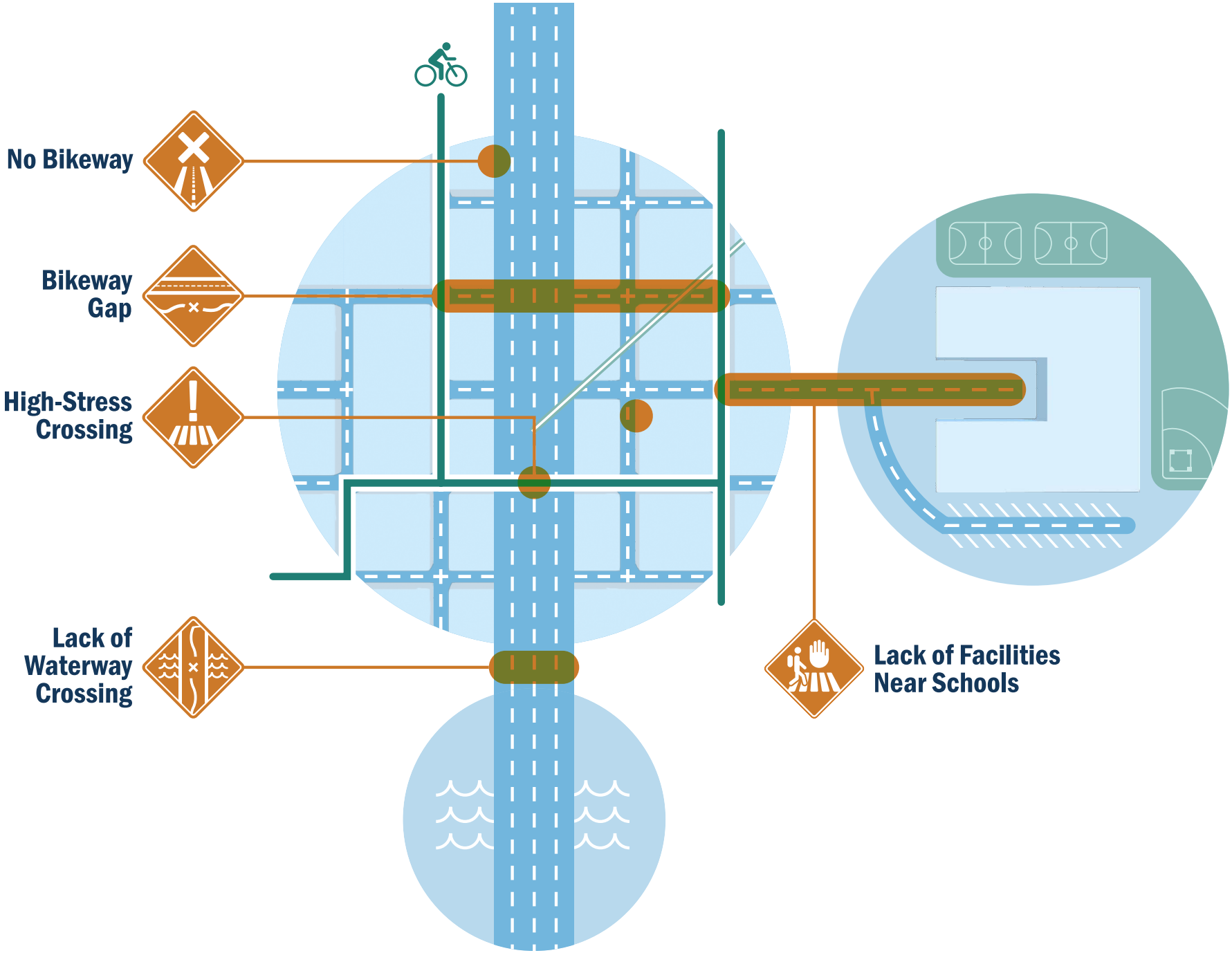


Figure 18: Illustration of Bicycle Need Types

- **Lack of Crossing Opportunity:** Where intersections and grade-separated crossings are sparse, highways and other on-system roads become barriers for people 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 bicyclists 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; projects from local plans; or 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.

Bicycle Needs in the Pharr District

Overall, 87.2% of the TxDOT on-system network segments in the Pharr District exhibited at least one bicycling need. As demonstrated in Table 5, some segments feature several needs. Among the locations with the highest number of needs are:

- US 77 (Business Loop) through Harlingen
- US 83 (Business Loop) across the district
- FM 494 in McAllen
- FM 1426 in Pharr and Edinburg
- FM 493 to the north and south of Donna
- SH 48 in Brownsville

The most common bicycling need type across the Pharr District is “Access to Schools,” reflecting the role that many TxDOT highways play in connecting people to key community destinations. Other frequent need types include “No Bikeway” and “Inadequate Bikeway.” See Table 5 for the distribution of needs by type along on-system highways.

Need Type	Segment Miles	Percent of On-System Roadways
Access to Schools	1,114.2	46.1%
No Bikeway	1,055.5	43.6%
Inadequate Bikeway	756.6	27.7%
Lack of Crossing Opportunity	322.0	13.3%
Locally Identified Need	176.4	7.3%
Bicycle Tourism Trail	166.34	6.9%
Gap between Existing Bikeways	36.4	1.5%

Table 5. Pharr District Need Type Distribution *Note: The segment miles refer to the length of the segments in which a need is present rather than the length of the need.*

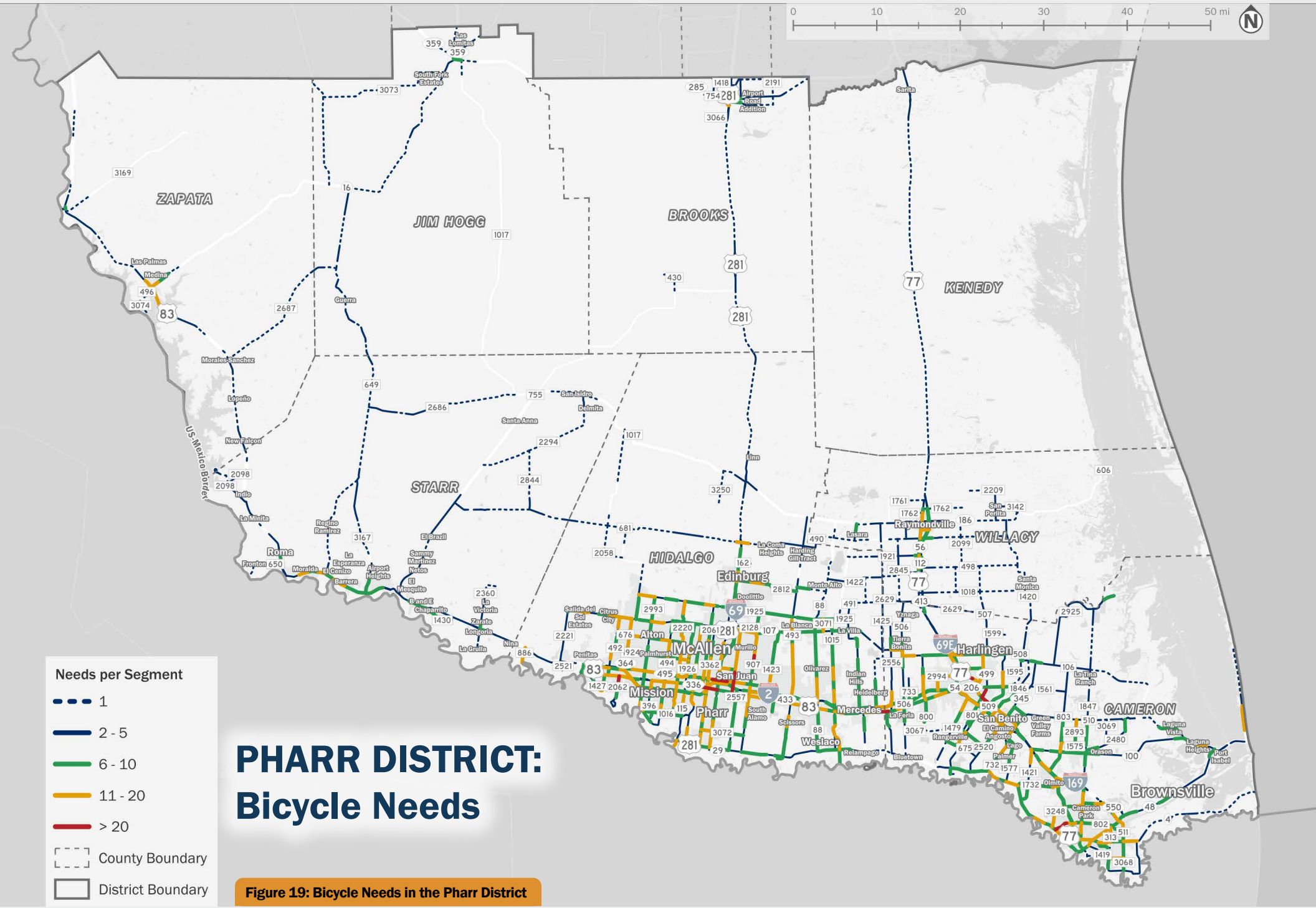


Figure 19: Bicycle Needs in the Pharr District

FIVE

Bikeway Development Priorities

As discussed in the Needs Assessment chapter, there are many locations in the Pharr District's on-system highway 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 Pharr 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 would require more detailed study and local engagement than a districtwide plan can offer.

Goals for Biking in the Pharr District

(Adapted from the TxDOT 2023 to 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 Pharr District into segments 0.25 mile to 2 miles in length, which is the appropriate scale for future project development efforts. Segments generally start and end at clear landmarks that will be familiar to local community members, 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 6. Some of these measures look at characteristics of the route itself that influence bicycling conditions, such as posted speeds or the presence of an existing bikeway. Other measures consider 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 identify opportunities to efficiently use public funding by combining bikeway improvements with other upcoming projects, such as repaving, signal replacements, or bridge repair. To reflect local values and preferences, the weight calculations utilize scoring factors based on input from Pharr District staff (see Table 6).

Goal Area	Weight	Measure Definition
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	**10%**	• 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	**20%**	• Locations with higher numbers of public comments in winter 2022 to 2023 TxDOT District Bicycle Plan survey
Optimize System Performance	**15%**	• Areas where people make more trips of 3 miles or less • Near local destinations such as supermarkets, libraries, healthcare, universities, and parks • Connections to existing and planned local bikeways • Connections to transit stops and stations
Preserve Our Assets	**15%**	• Bridge quality • Pavement quality
Foster Stewardship	**15%**	• 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 6: Scoring Factors for the Pharr 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

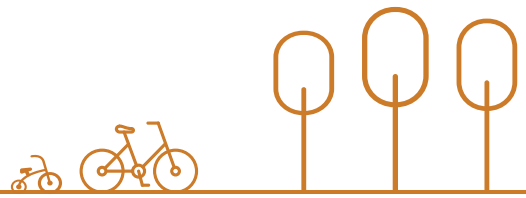
To address geographic equity, we assigned segments to different community size groups based on the population of the surrounding city or rural place:

- 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 Pharr District staff reviewed the draft prioritization results and shared them with the TWGs, CNWGs, and the 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 Pharr 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.

Taken together, these 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 20 through Figure 27 show the locations of prioritized segments within the Pharr District. High-priority segments include US 77 Business Loop through Harlingen, SH 48 from Brownsville towards South Padre Island, and various segments along US 281, including central Brownsville and around the Santa Ana National Wildlife Refuge near the City of Pharr.

Opportunistic Improvement	Proactive Improvement	Constrained Corridor	High-Priority Improvement
Percent of Pharr District need segments assigned to this category: 84.0%	Percent of Pharr District need segments assigned to this category: 13.7%	Number of Pharr District need segments assigned to this category: 1.8%	Number of Pharr District need segments assigned to this category: 0.5%
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 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?** Between high-scoring locations within the district, a few rose to the top through a combination of technical analysis and public feedback. These are places where communities, agency partners, and TxDOT feel it is most important to advance bikeway improvements in the near term.

Table 7: Bikeway Development Priority Categories

BROOKS COUNTY:
Priority Development Categories

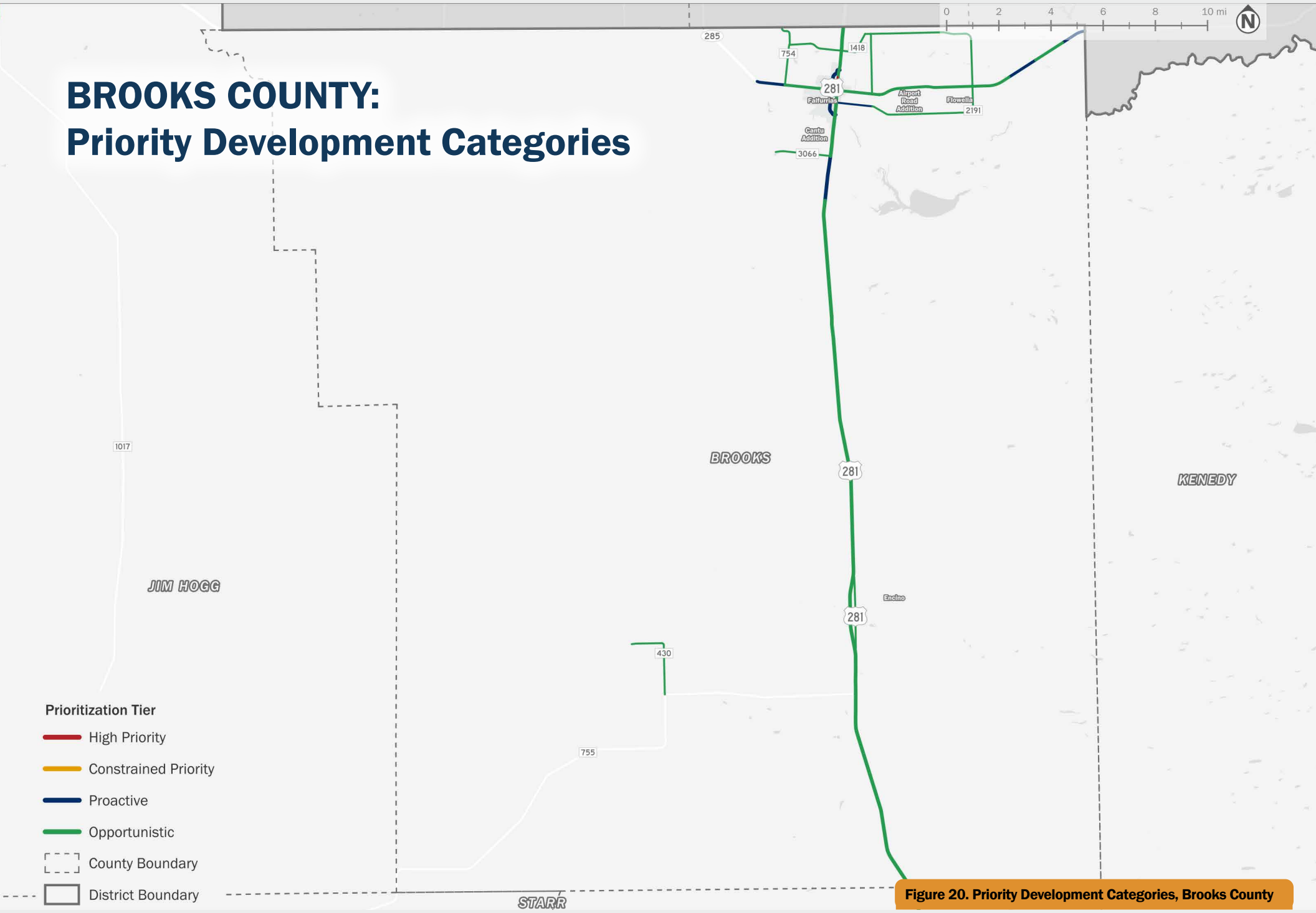


Figure 20. Priority Development Categories, Brooks County

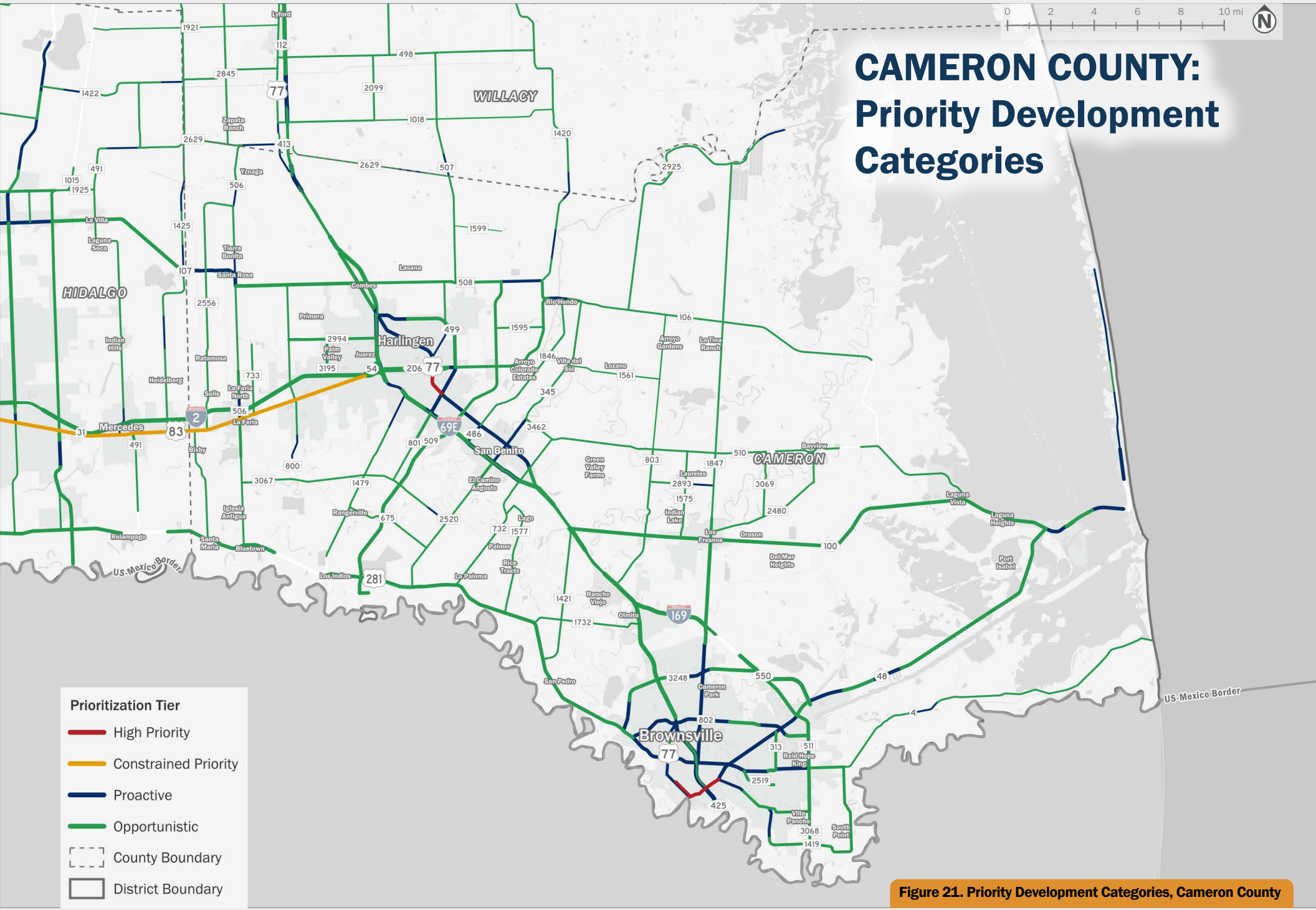


Figure 21. Priority Development Categories, Cameron County

HIDALGO COUNTY:
Priority Development Categories

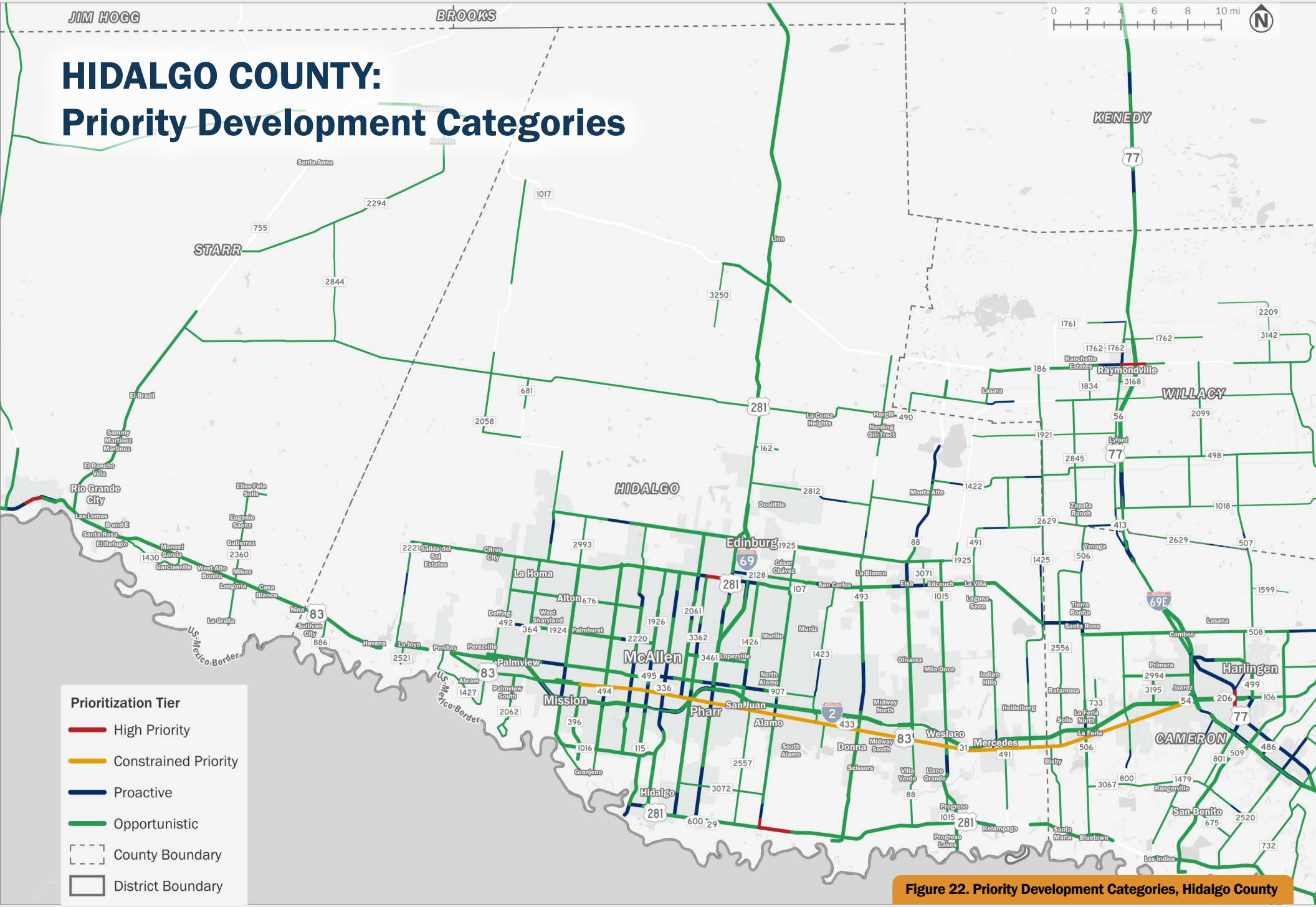


Figure 22. Priority Development Categories, Hidalgo County

JIM HOGG COUNTY: Priority Development Categories

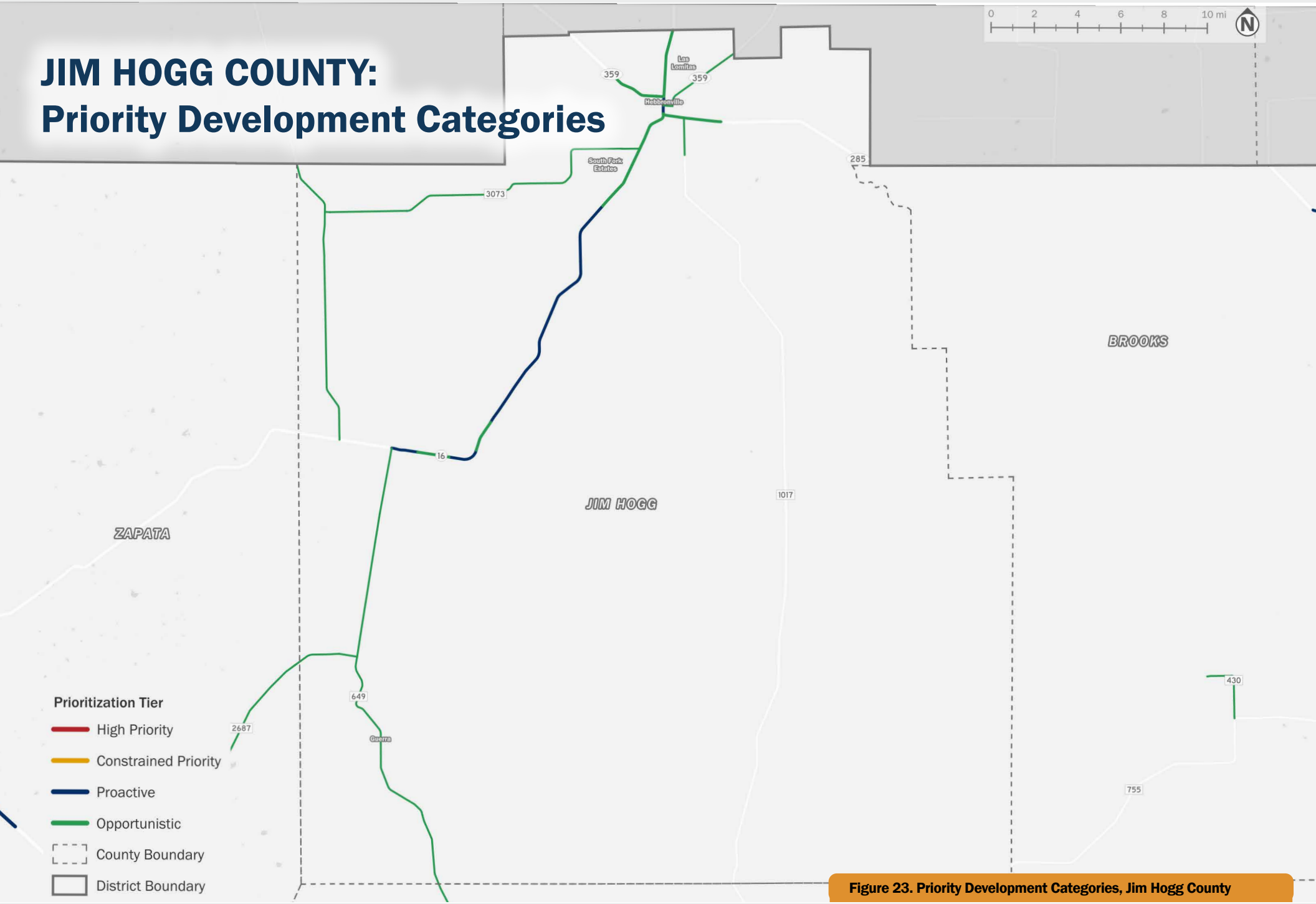
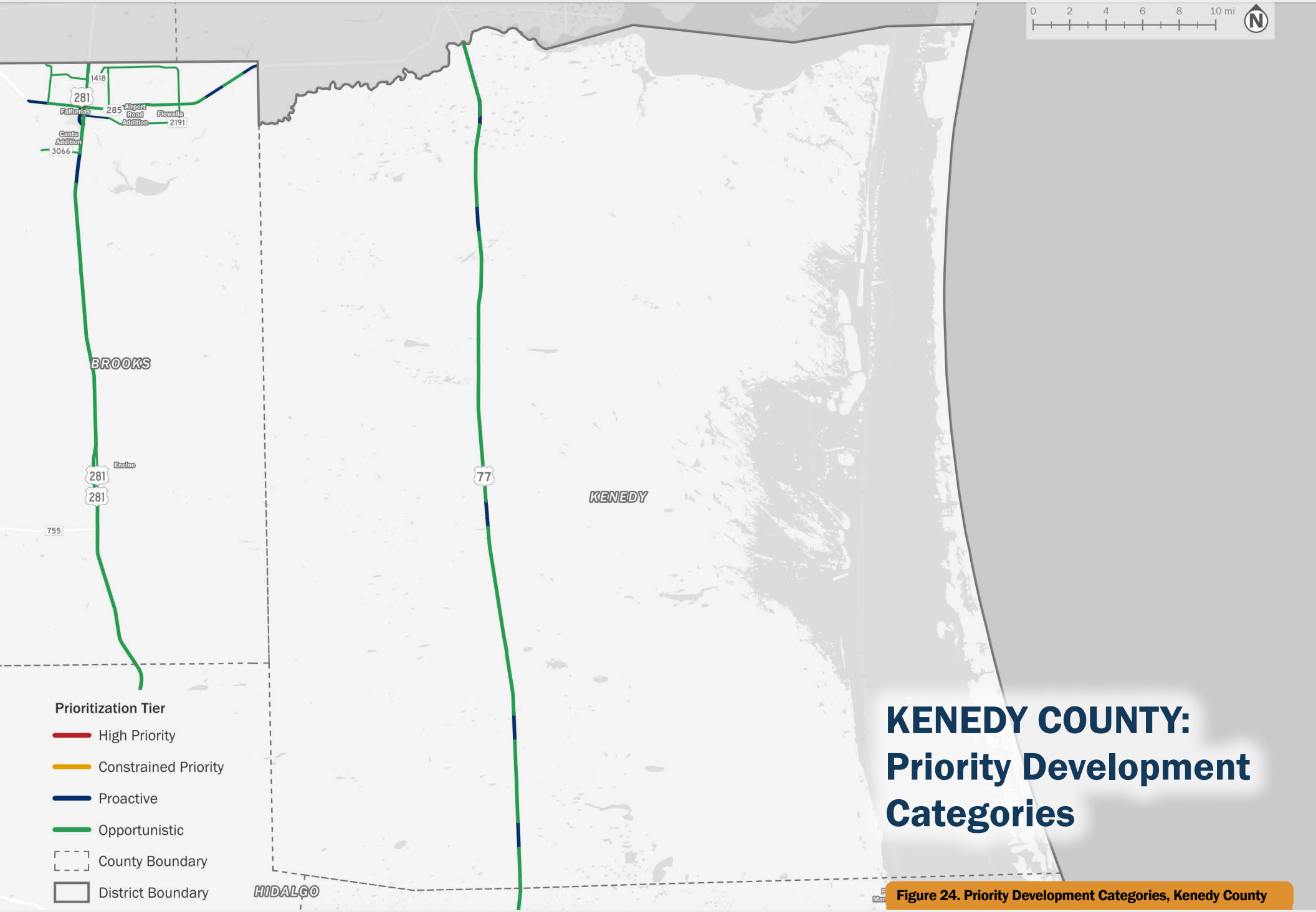


Figure 23. Priority Development Categories, Jim Hogg County



KENEDY COUNTY: Priority Development Categories

Figure 24. Priority Development Categories, Kenedy County

STARR COUNTY:
Priority Development Categories

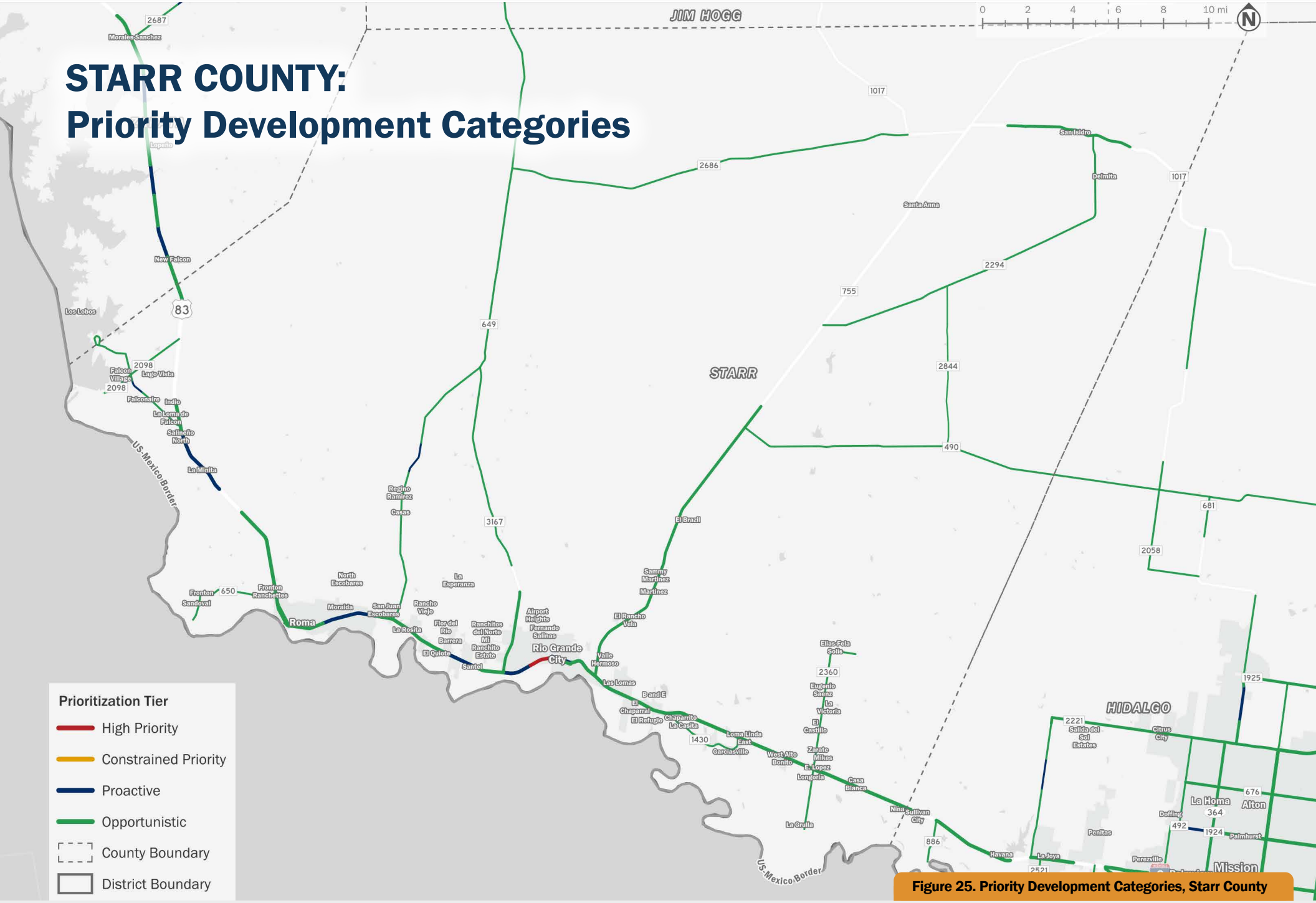


Figure 25. Priority Development Categories, Starr County

WILLACY COUNTY:
Priority Development Categories

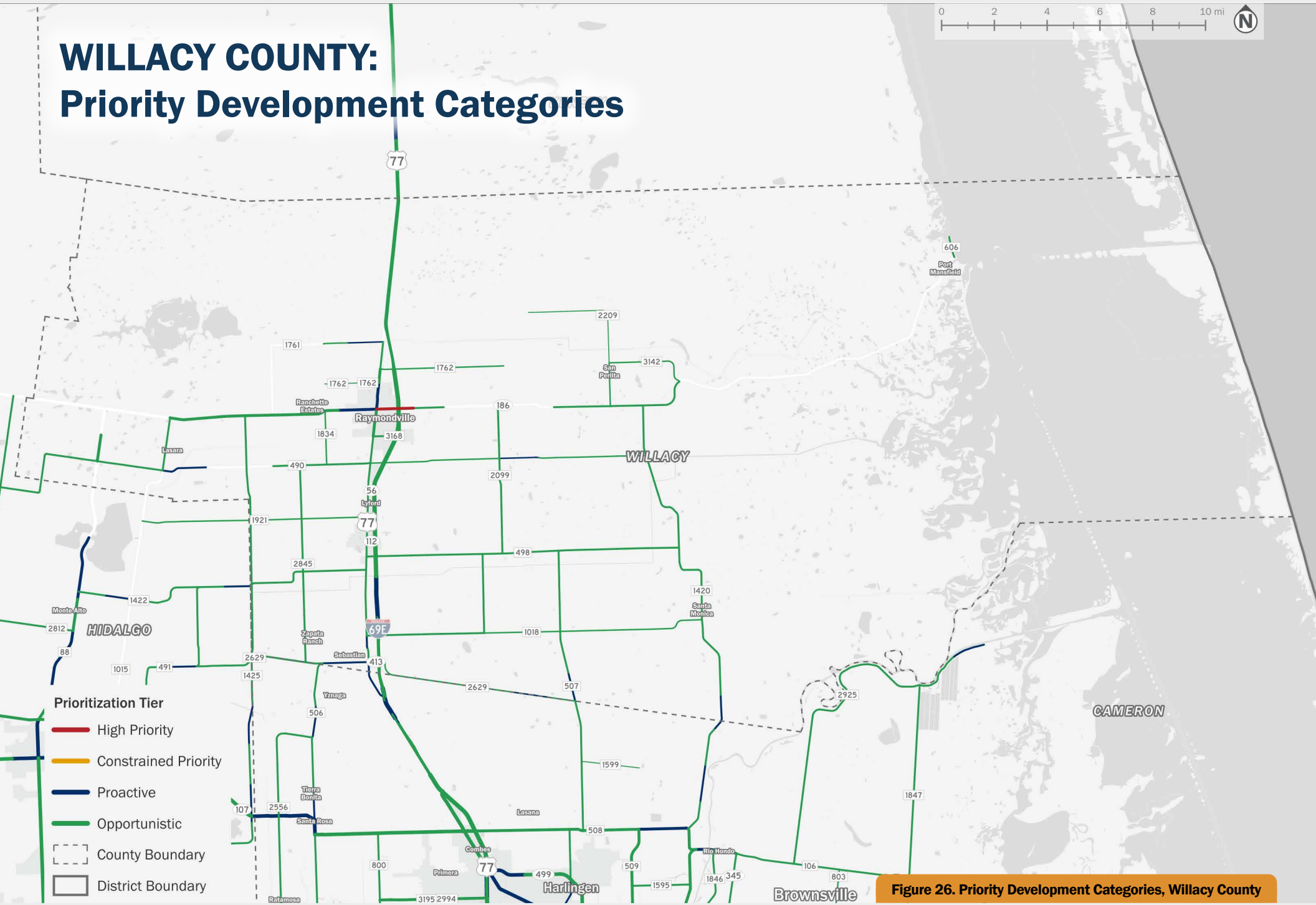


Figure 26. Priority Development Categories, Willacy County

ZAPATA COUNTY:
Priority Development Categories

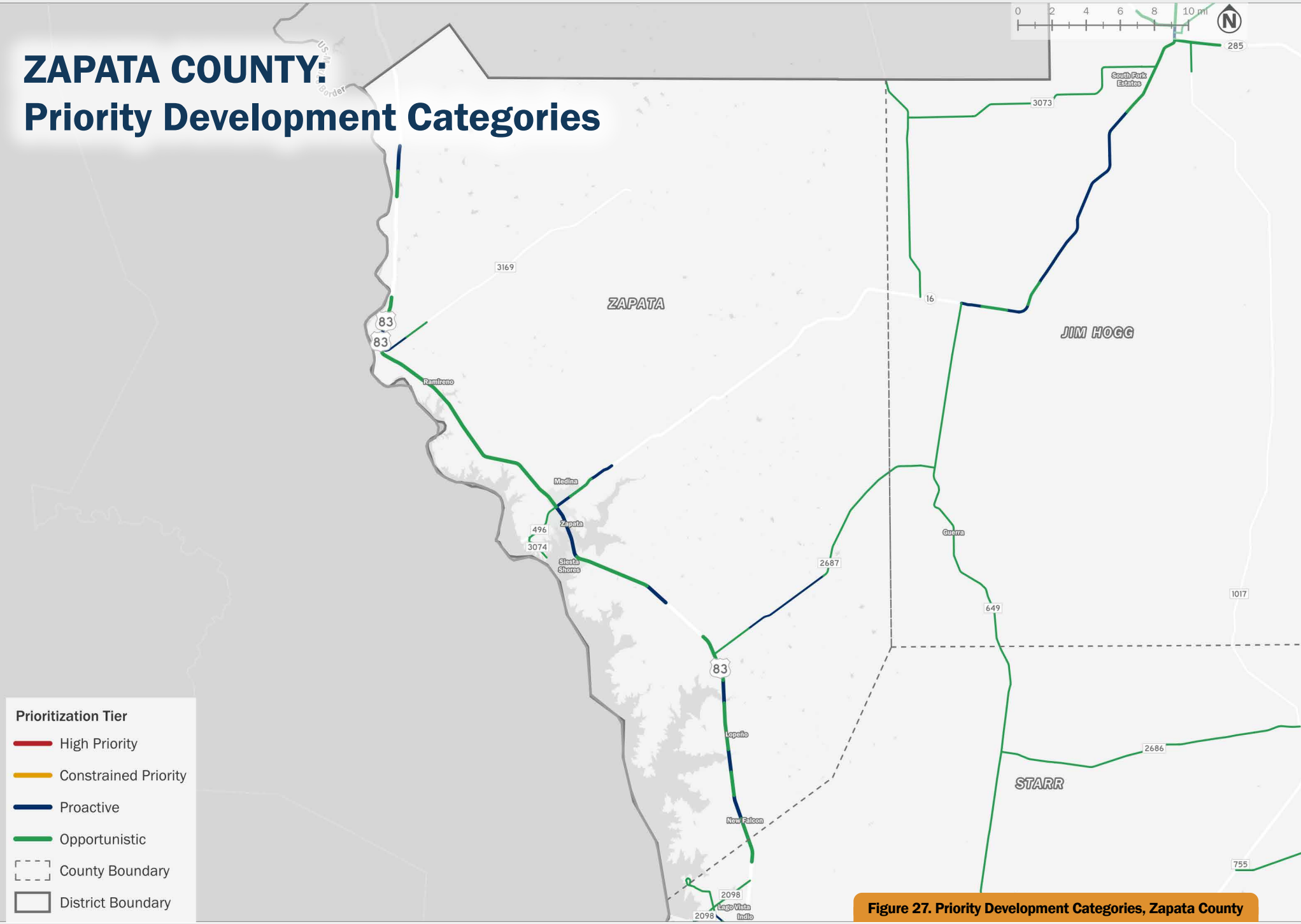


Figure 27. Priority Development Categories, Zapata County

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 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.

Figure 28. Texas BTT Study (2018)

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.. 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 Bicycle Tourism Trail 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 and can be leveraged to support applications for federal funds managed and distributed through the RGVMPO. BTT Example Network designations are also incorporated in the Bikeway Development Priorities identified through the Pharr District Bicycle Plan.

BTT Example Network designations are supported by design standards contained in the TxDOT Road Design Manual (RDM). In particular, the RDM 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 the Bicycle Tourism Trail Network

The TxDOT District Bicycle Plan development process included a more detailed review of bicycling needs and conditions and provided an opportunity to review and refine the BTT Network routes for the Pharr District. In addition to a review of needs and barriers, the project team mapped key recreational and tourism destinations (such as parks, campgrounds, and open spaces) as well as places where travelers could get services (such as community centers and grocery stores).

The project team also reviewed the existing and proposed paved trails from the Caracara Trails network. Based on these sets of needs and opportunities, as well as input generated from TxDOT staff and members of the RGVMPO BPAC, the project team recommended both refinements to the previously proposed network and additional routes for inclusion in the BTT Network. Ultimately, the recommended updates to the BTT Network are intended to take advantage of the local and regional planning work and infrastructure investments and further create a network of low-stress facilities.

Proposed Refinements to Existing Routes

This plan proposes two realignments of routes proposed on the 2018 BTT Example Network.

- Realign the route along US 83 from Harlingen to McAllen to the parallel US 281 (Military Highway) from International Boulevard in Hidalgo to Los Indios, where US 281 is already part of the BTT Network. While US 83 provides more direct access to community destinations, bikeways are present only along portions of the corridor, there are a high number of bikeway needs, and much of the surrounding land is built out and/or constrained by the railroad, which limits opportunities for bikeway implementation. By contrast, US 281 features continuous bikeable shoulders and lower traffic volumes, which better support long-distance bicycling trips. US 281 also provides access to recreational and tourism sites, including the Santa Ana National Wildlife Refuge, Las Palomas Wildlife Management Area, and Estero Grande State Park (via FM 1015).
- Realign the proposed Caracara Trail route between US 281 west of Los Indios to US 77 Business Loop in Harlingen (Los Indios to San Benito Trail and San Benito to Rio Hondo Trail) to Rangerville Road (FM 1479) from US 281 west of Los Indios to I-69E in Harlingen. The route would utilize the Harlingen trail system to connect from I-69E to US 77 Business Loop. The Caracara Trail alignment should be pursued at the regional level, but uncertainty over ROW means that TxDOT should not build the BTT around this route.

Additional Routes

Additional routes were identified to create a complete, well-connected regional network and further integrate recommendations from the Caracara Trails network, including proposed USBRS routes. Additional routes provide connections to tourism destinations, including South Padre Island, which are not currently connected via BTT routes. Most of the proposed additions to the BTT Network are located on the on-system road network, with a few proposed routes that are off-system or on a proposed hike and bike trail. See Figure 29 and Table 8 for additional routes proposed for inclusion in the BTT Network.

Regional Interest in the BTT Network

Updating and refining the BTT Network was a high priority among local and regional stakeholders, who see an opportunity to further support active transportation and build upon regional tourism initiatives. Reviewing the network and considering additional alignments were the subject of a dedicated workshop with members of the RGVMPO BPAC.

PHARR DISTRICT: Proposed BTT Network

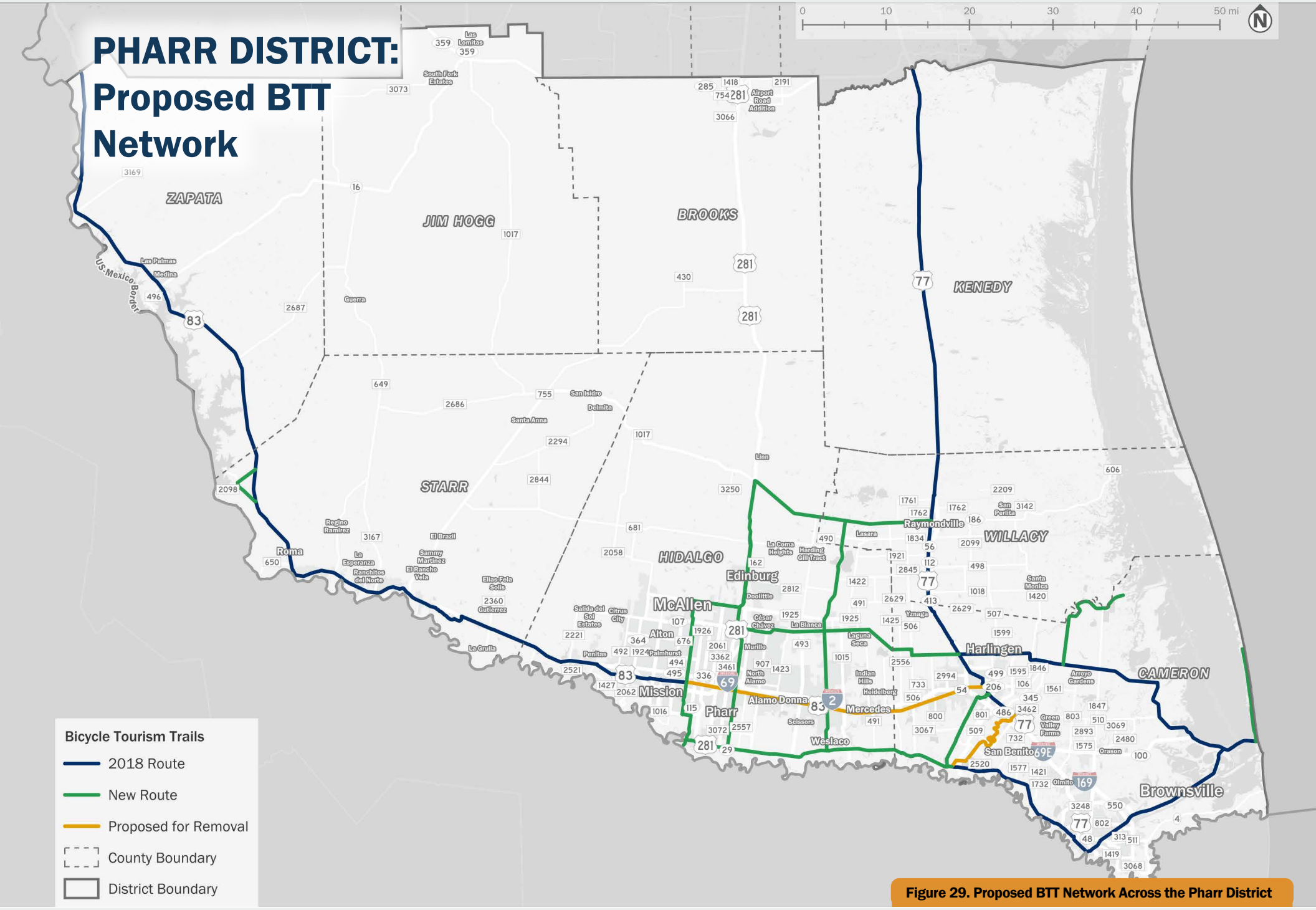


Figure 29. Proposed BTT Network Across the Pharr District

Route	Termini	BTT Route Rype
US 281 (Military Highway)	FM 1016 (International Boulevard) to FM 907 (Alamo Road)	Connecting Spur
US 281 (Military Highway)	FM 907 (Alamo Road) to 3C (Proposed Caracara Trail)	Connecting Spur
FM 2220 (Ware Road), FM 1016 (Military Highway), SS 115 (23rd Street), International Boulevard	US 83 to Border Crossing	Regional Route
I Road / Veterans Boulevard	US 83 (Center Avenue) to US 281 (Military Highway)	Regional Route
FM 88 (Texas Boulevard)	SH 186 to US 281 (Military Highway)	Regional Route
FM 1479 (Rangerville Road)	US 281 west of Los Indios to I-69E in Harlingen	Regional Route
SH 106	Edinburg (I-69C Frontage Roads) to Combes (US 77 Business Loop)	Regional Route
SH 107	I-69 C Frontage Roads to US 77 Business Loop	
SH 186	US 281 to US 77 Business Loop (7th Street)	Regional Route
PR 100 (Padre Boulevard)	Northern PR 100 Terminus to Queen Isabella Causeway	Regional Route
FM 2098	US 83 to PR 46	Regional Route
FM 2925 (Brown Tract Road)	FM 106 (General Grant Road) to Eastern end of FM 2925	Regional Route
FM 1925 (Monte Cristo Road)	FM 2220 (North Ware Road) to US 281 (Closher Road)	Regional Route
US 281	SH 186 to FM 1925 (Monte Cristo Road)	Regional Route

Table 8: Proposed BTT Network Routes

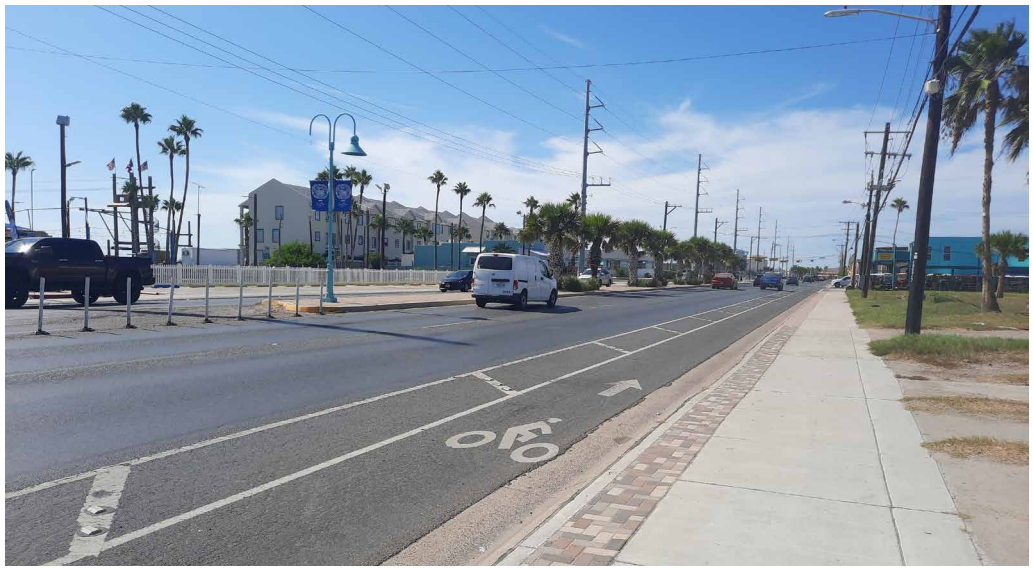


Figure 30: Buffered Bicycle Lanes along Proposed BTT Route on Park Road 100 (Padre Boulevard), South Padre Island

Seven

Bikeway Functions and Design Selection

Bikeway functions are the last component of the planning resources produced in the Pharr 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 are also useful for design decisions around separation, width, intersection improvements, and maintenance. The Bikeway Design User Guide, described on 62 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

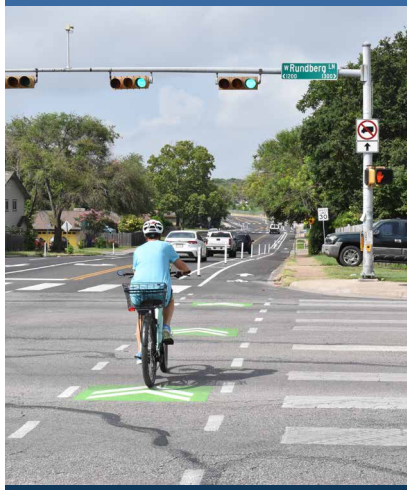
Figure 31 indicates the different roles state highways in the Pharr District can play in local and regional bicycle travel and which types of users they serve. Bikeway network functions were developed through spatial analysis then refined by TxDOT staff using feedback from agency partners and the public. The bikeway function categories include:

- **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. All-ages bikeways in the Pharr District are predominately located within the cities and more urban areas and include roadways that directly serve local community destinations such as schools. Given the wide range of comfort levels, ages, and abilities of riders who use these facilities, all-ages bikeways should feature the highest level of separation between motorists and bicyclists.
- **Daily-Travel Bikeway**: Daily-travel bikeways are generally located along the edges of more developed or urbanized areas and support the utilitarian and recreational needs of more confident bicyclists. Examples include segments of SH 336 and SH 115 to the south of Military Highway and SH 336 in the greater McAllen area.
- **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. Examples of long-distance bikeways include US 77, SH 186, US 83 to the west of the McAllen metropolitan area, and US 281 between McAllen and Brownsville. Many BTT routes outside of incorporated boundaries are designated as long-distance bikeways.
- **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. Basic bikeways are generally found in more rural areas along highways that provide less critical connections for recreational or utilization trips. Lower traffic volumes mean there are likely to be relatively few conflicts among motorists and occasional bicyclists. Examples include FM 1420 to the north of Rio Hondo through northern Cameron County and Willacy County and FM 3167 to the north of Rio Grande City in Starr County.

Note: Bikeway function categories are not assigned to roadways that are access controlled and where there is no parallel frontage road.

Bikeway Functions

Within 1 mile of K-12 school, rec center, community center, or senior center?



All-Ages Bikeway

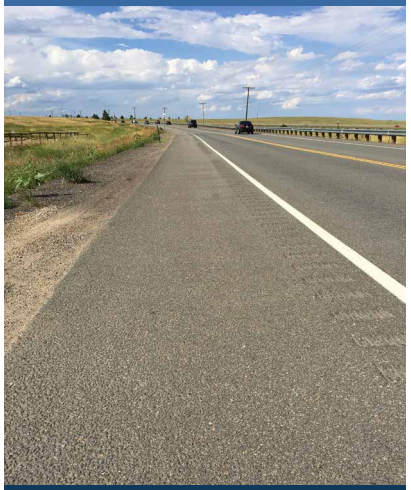
IF NOT, THEN →

Located within an incorporated city or place with a population of 2,500 or greater?

Daily Travel Bikeway

IF NOT, THEN →

On a BTT or other popular recreational riding route?



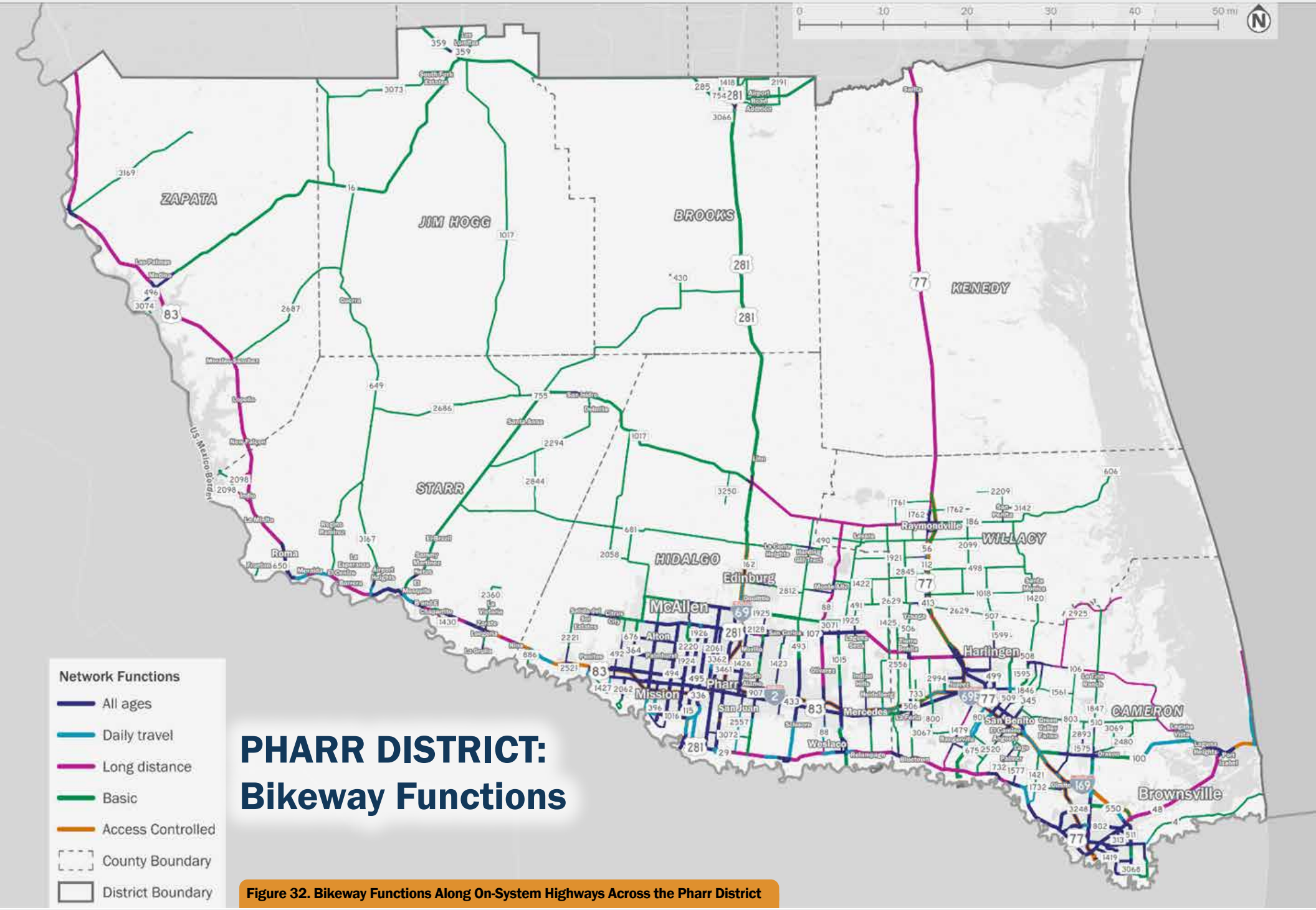
Long-Distance Bikeway

IF NOT, THEN →

Does not meet criteria for the other functions?

Basic Bikeway

Figure 31. Bikeway Function Identification Methodology



PHARR DISTRICT: Bikeway Functions

Figure 32. Bikeway Functions Along On-System Highways Across the Pharr District

Bikeway Design User Guide

TxDOT has recently updated its Roadway Design Manual (RDM)[18] to match new national standards and best practices for developing bikeways. While the Pharr 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 Pharr District Bicycle Plan and the data it produced provide a foundation for answering many of these questions.

18 Texas Department of Transportation, RDM, Section: 6.4: http://onlinemanuals.txdot.gov/txdotmanuals/rdw/rdw.pdf.

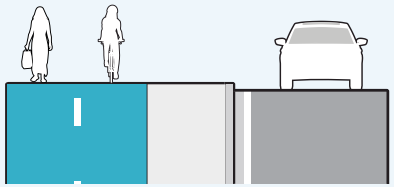
Bikeway Types

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

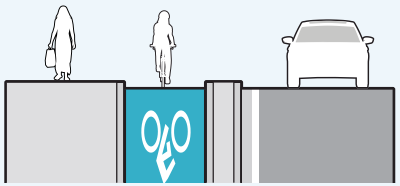
Different bikeway types serve different target design users. Section 6.4.4 of the Roadway Design Manual describes each bikeway type, applicability, and design considerations.

Shared Use Path



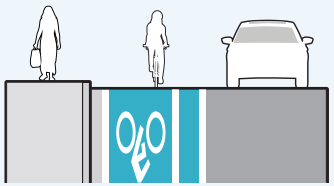
Shared-use paths are shared by pedestrians, bicyclists, and micromobility users. They can be located between the roadway and the ROW line or on an independent alignment with their own ROW. When located along a roadway, they are separated from vehicular traffic by a curb and buffer space. Shared-use paths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

Separated Bicycle Lane



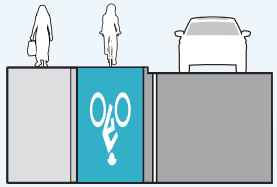
Separated bicycle lanes are located between vehicles and pedestrians. They are buffered from adjacent vehicular traffic by a horizontal buffer space that includes a vertical element such as a raised median or flexible posts. If on-street parking is present, the people on bicycles are buffered from opening 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 Lane



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 Lane



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.

MORE SEPARATION / PROTECTION

SUITABLE FOR ALL RIDERS

Figure 33. 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 Pharr 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[19]. 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 Pharr District Bicycle Plan when developing UTP projects, TxDOT will be able to identify bicycling 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, and Category 9 – TA.
- **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.

19 RDM Sections 6.3 and 6.4 describe 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 Pharr 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 Pharr District when reviewing development proposals that may impact TxDOT facilities.

Advancing Bicycle Tourism Trails

The BTT Example Network has been evaluated and updated for the Pharr 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 Pharr 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 Pharr District designs projects that affect BTT routes, the district and its 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 bicycling 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 Pharr District. More than 80% of Pharr 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

Regional Funding

- RGVMPO Transportation Improvement Program, which includes regional apportionments of federal formula funds

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)
    - Highway Safety Improvement Program (HSIP)
    - TA Program
- Enhanced Mobility of Seniors and Individuals with Disabilities (Section 5310)
- Transportation Alternatives Set-Aside Program

What's Next?

The Pharr 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 Pharr 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.