

# 2045 REGIONAL ACTIVE TRANSPORTATION PLAN



Photo: Adam Coppola

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# ACKNOWLEDGEMENTS

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# CHAPTER 1

## INTRODUCTION

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# INTRODUCTION

This chapter provides a summary of the 2045 Regional Active Transportation planning process and outcomes.

## PURPOSE OF THE PLAN

The purpose of the 2045 Regional Active Transportation Plan (RATP) is to document and provide a shared vision for the development of a safe and highly-functional active transportation network of pedestrian and bicycle facilities and amenities for the six-county CAMPO Region.

## BACKGROUND

The 2045 Regional Active Transportation Plan is a first of its kind effort for the CAMPO Region. As part of this process CAMPO worked with local governments and partner agencies to develop a comprehensive bicycle and pedestrian facility inventory, a data-drive needs assessment, extensive public outreach and stakeholder engagement, and a thorough review of relevant case studies. In addition, the 2045 Regional Active Transportation Plan was one of the goals outlined in CAMPO's Walkability Action Plan (please view CAMPO website for the action plan). The action plan was completed as part of the National Association of Chronic Disease Directors' 2016 Walkability Action Institute, which provided a peer-exchange and course for MPOs to learn and take action on improving health equity outcomes through walking. This plan will serve as a guide for regional collaboration and standards for the region's future network.

## WHAT IS IN THE PLAN

The Plan includes an inventory of existing and planned active transportation facilities, an analysis of existing data and policies, guidance and recommendations on facility design and policy (the "pattern book"), recommended priority networks, an implementation plan with project priorities, and six county-specific documents.

## ABOUT CAMPO

The Capital Area Metropolitan Planning Organization (CAMPO) is the Metropolitan Planning Organization (MPO) for Bastrop, Burnet, Caldwell, Hays, Travis, and Williamson Counties.

CAMPO coordinates regional transportation planning with counties, cities, Capital Metropolitan Transportation Authority, Capital Area Rural Transportation System, Central Texas Regional Mobility Authority, and Texas Department of Transportation.



# PROCESS AND TIMELINE

CAMPO worked closely with the Active Transportation Advisory Committee (ATAC) to guide the planning process through regular meetings and presentations. Extensive outreach was conducted with local government officials and the public through a series of meetings. Analysis was conducted and deliverables were developed throughout the process.



**PUBLIC  
OUTREACH**



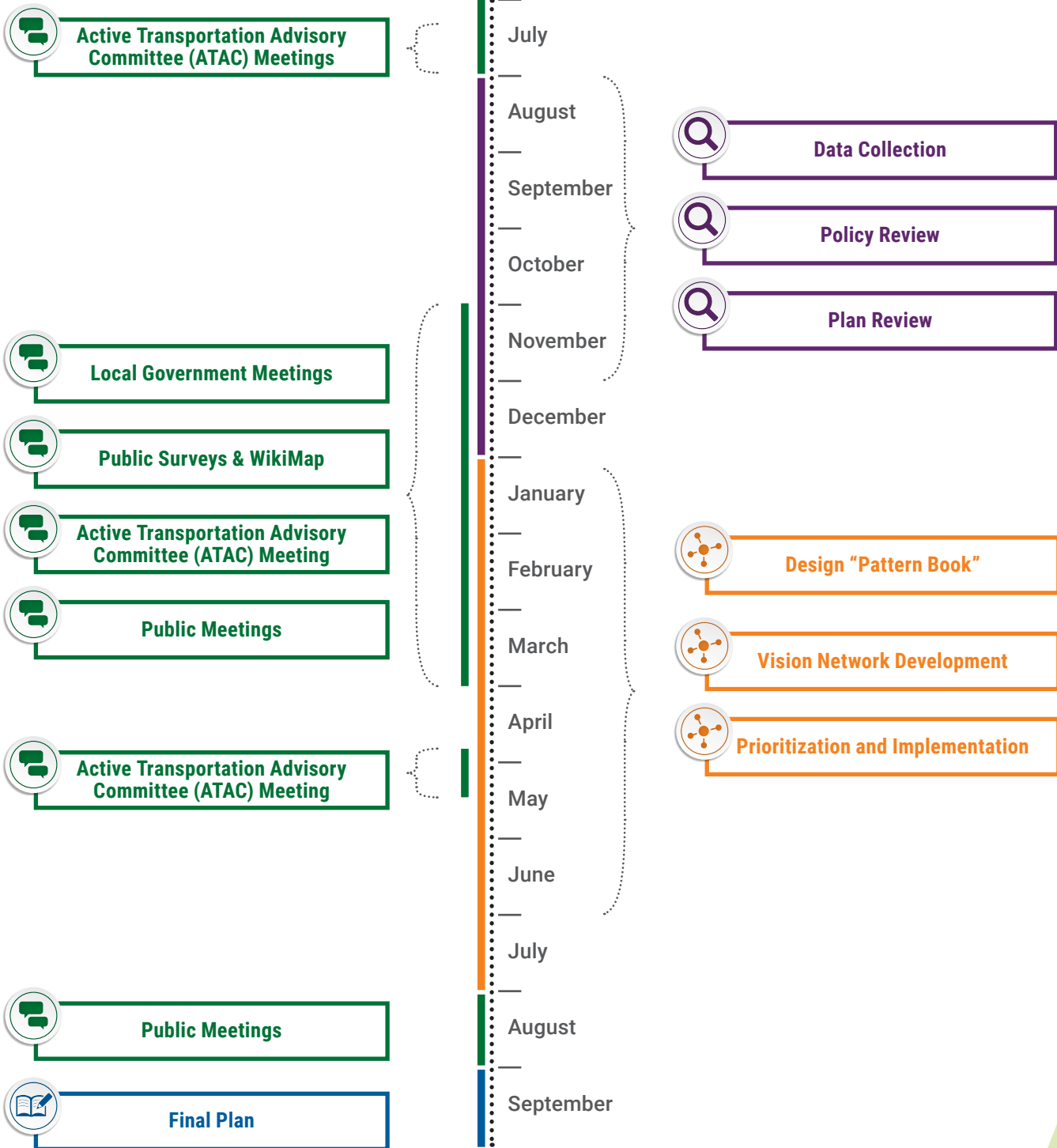
**EXISTING  
CONDITIONS**



**NETWORK  
DEVELOPMENT**



**FINAL  
PLAN**





PUBLIC OUTREACH

# VISION, GOALS, AND OBJECTIVES

## VISION

The CAMPO region’s world-class, regionally-coordinated, and well-maintained Active Transportation network provides safe, efficient, convenient, and comfortable walking and bicycling access to local and regional destinations for all residents and visitors. The vision, goals, and objectives for the 2045 Regional Active Transportation Plan were developed with the Active Transportation Advisory Committee and reviewed and confirmed by the public during community meetings.

## GOALS



### 1 Safety

Increase the safety of walking and bicycling in the region.

**Objectives:**

- Reduce bicycle and pedestrian fatalities
- Reduce the number and severity of crashes involving bicyclists and pedestrians
- Reduce distracted driving, walking, and bicycling
- Increase the personal safety and security of pedestrians and bicyclists



### 2 Accessibility

Create a complete, cohesive Active Transportation network that connects the region for people of all ages and abilities.

**Objectives:**

- Expand Active Transportation facilities to create a complete network
- Fill in gaps in the Active Transportation network
- Retrofit (or enhance) the built environment, where appropriate, to create walkable and bikeable places
- Rehabilitate existing system to provide an ADA-compliant network
- Connect local and regional destinations with Active Transportation



### 3 Functionality

Establish an Active Transportation system that is logical, comfortable, versatile, accommodating, and useful for completing everyday trips, year-round, for all users.

**Objectives:**

- Enhance low-stress network and context-appropriate design
- Improve pedestrian and bicycle wayfinding and intuitive network design
- Enhance comfort and experience, and provide end-of-trip facilities
- Improve multi-modal inter-connectivity (e.g. transit)
- Ensure the Active Transportation network supports a wide variety of trips



### 4 Equity

Ensure that the Active Transportation system is safe and well-designed for the use of all residents in the region regardless of geography, age, income, physical ability, or skill level.

**Objectives:**

- Provide equitable access to world-class Active Transportation facilities for all communities and in places with the most need
- Address high crash rates in vulnerable and underserved populations
- Provide safe, well-connected, context-sensitive, and low stress facilities across the region



## PUBLIC OUTREACH



### 5 Everyday Use

Make walking and bicycling an easy and appealing everyday choice for the region.

#### Objectives:

- Increase walking and bicycle use in particular for short trips
- Support a culture where walking and bicycling are accepted as normal, routine, and accessible activities
- Improve land use and built form to facilitate walking and biking
- Support policies to ensure walking and bicycling are viable and desirable components of the transportation network



### 6 Quality of Life

Improve the economy, public health, sense of place in the region and increase transportation choices through the development of a high-quality Active Transportation system.

#### Objectives:

- Strategically prioritize investments to maximize benefits to the region
- Enhance economic development
- Improve public health
- Increase viable transportation choices
- Reduce auto-dependency, enable auto-independent living, and manage congestion
- Develop a context sensitive system that values places and people



### 7 Regional Coordination and Connectivity

Create a seamless regional Active Transportation network through coordinated governance.

#### Objectives:

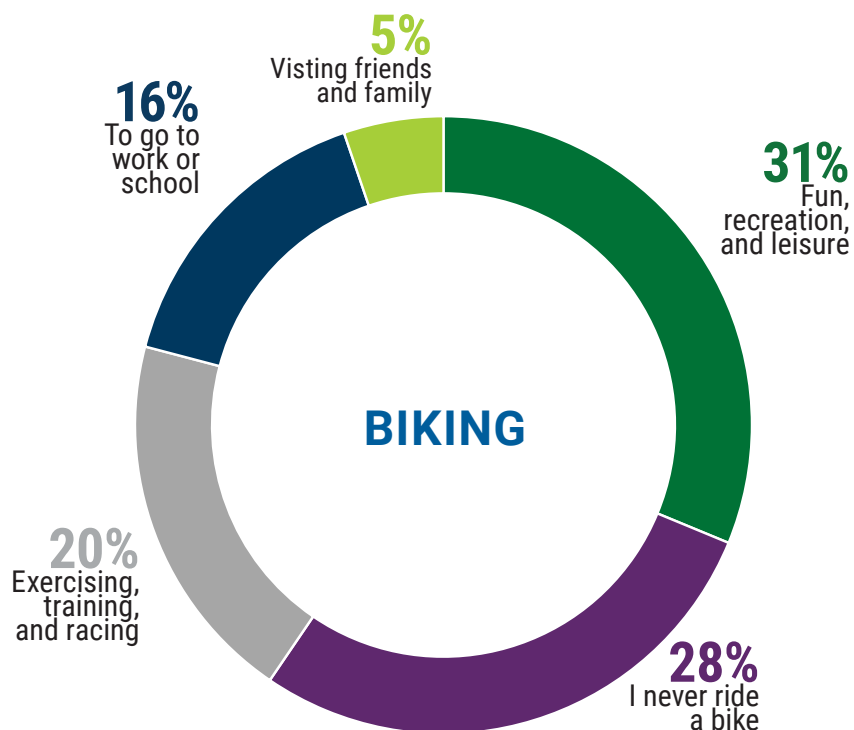
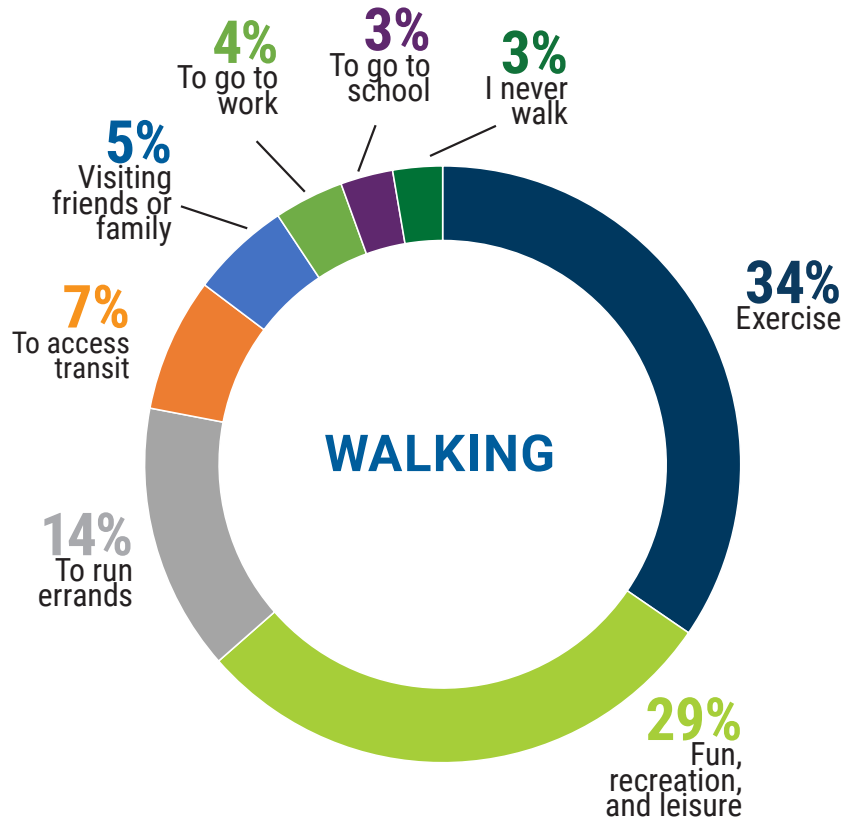
- Improve coordination among cities, counties, municipal utility districts, school districts, homeowners associations, and the region as a whole
- Develop a plan to coordinate funding for the construction and maintenance of facilities across agencies
- Work to establish clear expectations and roles for local governments
- Improve integration of technology into the regional multimodal operation system
- Develop a basic standard of service for regional active transportation infrastructure
- Manage public financial resources in a way that is cost effective and fiscally responsible during the development of the Active Transportation network

PUBLIC OUTREACH

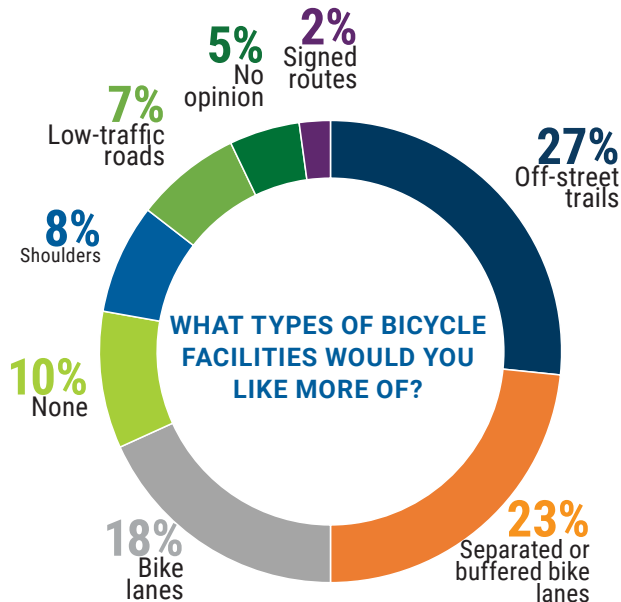
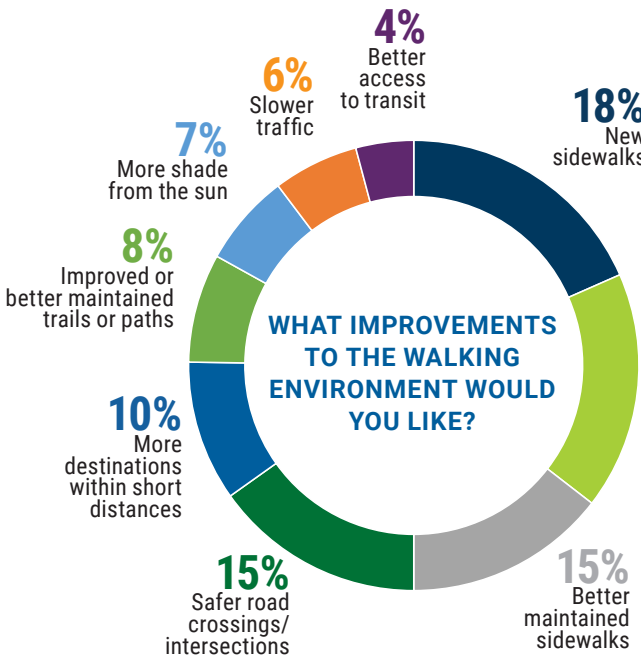
# SURVEY RESULTS

As part of a robust public outreach strategy, CAMPO surveyed residents of the region on their walking and bicycling habits, needs, and desires. Overall, 2,093 people responded, representing 141 different zip codes within the region.

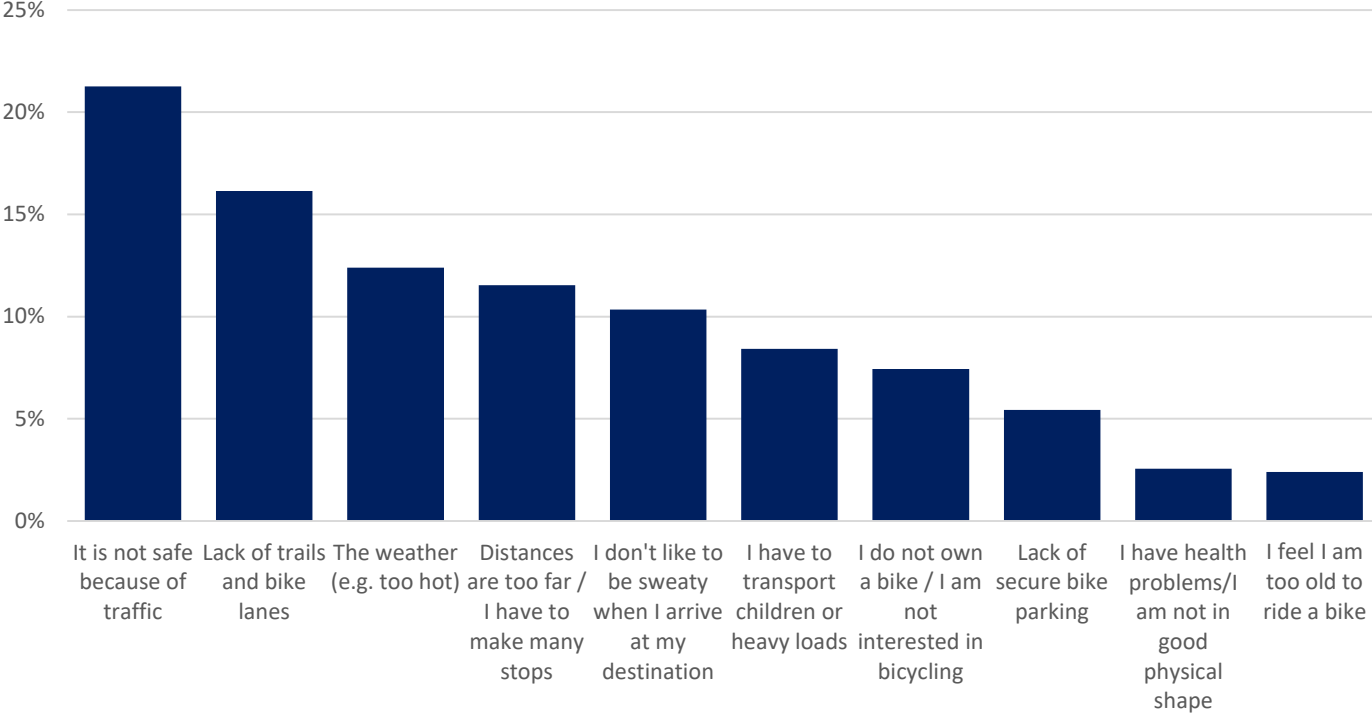
FOR WHAT PURPOSES DO YOU WALK AND BIKE?



**PUBLIC OUTREACH**



**PRIMARY REASONS FOR NOT BIKING MORE**



PUBLIC OUTREACH

# PROFILES OF TYPICAL ACTIVE TRANSPORTATION SYSTEM USERS

The CAMPO region is diverse and so are the people who live here. Using demographic data, surveys, and extensive meetings with members of the public, the project team developed profiles of different types of current and potential users of the active transportation network. These different users live in different contexts and have different transportation needs. This plan is designed to accommodate the specific needs of these—and other—users. See the Profiles chapter for more information on typical active transportation system user needs.



**CRAIG** is a retiree living in rural Caldwell County. Once a week he needs to run errands and attend appointments in Lockhart. Craig would love it if he could drive in to town, park his truck once in Downtown Lockhart, and walk to all of his destinations on well-maintained and shaded sidewalks.



**LAUREN** is a young professional who lives in Williamson County and works in downtown Austin at a tech development company. She walks to her office or uses a bikeshare to travel to her downtown destinations. She cares passionately about the environment, so she sold her car in order to reduce her carbon footprint.



**ERIC** is a father of two living in Bastrop County. His parents live down the street. He doesn't feel safe allowing the kids to walk or bike to their grandparents' house, but wants to keep the family active. Eric would love to see separated bike lanes and better connectivity and maintenance for sidewalks in the area.



**THOMAS** lives in Burnet County and manages several offices around the county. He frequently has to make trips between offices and is usually in a hurry to get to and from his destinations. Thomas primarily uses his car and doesn't want to lose vehicle travel lanes to bike lanes.



**CARLA** lives in South Austin and is a student at Texas School for the Blind and Visually Impaired. She needs to get across town to make it to school in the mornings, then heads to her job after class. She does not drive or ride a bike, so she relies on public transportation and walking to get to where she's going.



**BILLIE** is a serious cyclist living in urban Travis County who loves to bike for exercise and entertainment. She has been a competitive cyclist for years and is currently training for a triathlon.



**MILES** is a Sophomore at Southwestern University in Georgetown. He loves the convenience of biking to class and to run errands, but his bike was stolen last year and he has been nervous parking his bike around town ever since.



**SARAH** is a fifth grader in San Marcos whose school is a few streets away from her house. This is the first year Sarah has been allowed to walk to school by herself.



**ROSA** is a senior citizen living in suburban Hays County. She does not drive and she lives far from any public transportation. She's still very active in her community and regularly walks to visit family and friends who live nearby.



**ALEX AND LEAH** are a young couple living in an inner suburb of Austin. Leah works during the day, and Alex works evenings. The two share one car and take turns caring for their two-year-old daughter Sophie, while the other one is at work.



EXISTING CONDITIONS

# CODE AND POLICY REVIEW AND RECOMMENDATIONS

The creation of a sustainable region-wide bicycle and pedestrian network requires supportive local policies, practices, and initiatives. The Regional Active Transportation Plan contains a review of these policies and recommendations for policy changes. While CAMPO-region jurisdictions are too diverse in size, topography, demographics, built environments, and resources to apply a single set of recommendations to all communities, the following general recommendations provide a foundation for improving the walking and bicycling environment.

## Accessibility

Ensure that planning documents, design guidelines, and development ordinances acknowledge clear links between ADA accessibility standards and active transportation facility design.

## Connectivity

Land development regulations should include variable ranges of minimum and maximum block sizes. Smaller block sizes should be tied to corresponding mixed-use, transect-based, or form-based zoning districts.

Develop street connectivity ratio standards that increase in conjunction with development. Require inter-parcel connectivity among local streets in addition to major thoroughfares.

Develop “connectivity” provisions within land development regulations that require pedestrian access between parcels, and on-site between the street, parking, and buildings.

## Multi-modalism

Prepare bicycle and pedestrian master plans that identify community-wide bikeway and shared-use networks within street rights-of-way and other corridors (i.e. streams, drainage-ways, utility easements, etc.)

Land development regulations should require that new streets on identified bicycle corridors be constructed to include bicycle facilities.

Land development regulations could include minimum bicycle parking requirements. Accessory facilities for bicyclists and pedestrians (i.e. showers, lockers, etc.) should be provided for development of certain intensity or size.

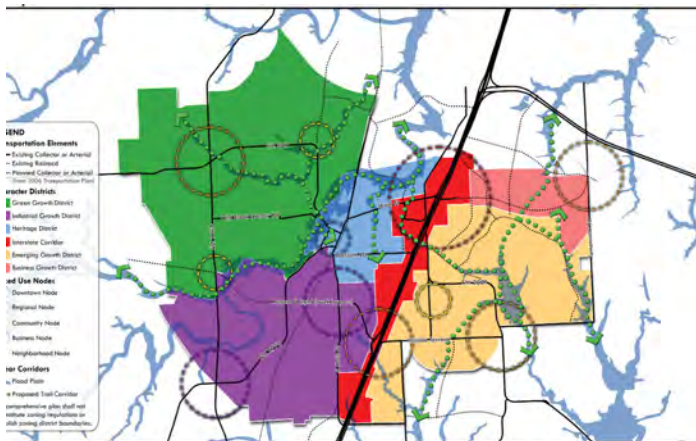
### Policy, Program, and Code Review Considerations

ELEMENT	CONSIDERATION
<b>Accessibility</b>	Are local policies, guidelines, and regulations structured to ensure ADA accessibility?
<b>Connectivity</b>	Is the transportation system designed to provide for inter-connected street and trail networks as part of new development?
<b>Multi-modalism</b>	Do policies, guidelines, or regulations require the incorporation of bicycle/pedestrian facilities as an integral component of public transportation infrastructure?
<b>Safety</b>	Are there local bicycle/pedestrian education, encouragement, and/or enforcement programs?
<b>Mixed-use Development</b>	Is there guidance or are there regulatory tools that promote mixed-use development? Do provisions provide for enhanced bicycle and pedestrian environments?
<b>Complete Streets</b>	Have communities adopted a Complete Streets policy?
<b>Healthy Lifestyles</b>	Does public policy promote or support healthy lifestyles? Is there a linkage between healthy lifestyles, and bicycle and pedestrian mobility?

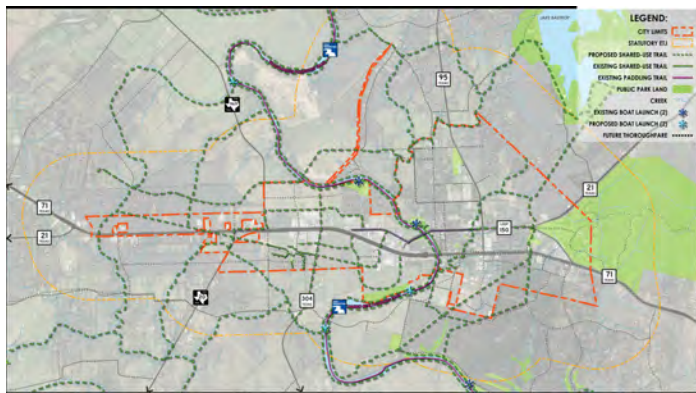
**EXISTING CONDITIONS**



**Walkable downtown in Burnet County**



**Buda Land Use Plan**



**Bastrop Comprehensive Plan**

**Safety**

Create and empower bicycle and pedestrian advisory committees to oversee the development of local bicycle and pedestrian safety curriculums, and to participate in capital project selection for active transportation facilities.

Adopt local safe cycling ordinances that may address issues such as: vision zero, safe passing, lighting, signaling, operation on shared-use facilities, etc. Consider safety programs such as bike equipment and helmet giveaways, and helmet use ordinances for children. Adopt corresponding ordinances addressing motorist behavior including: safe passage ordinances, and motor vehicle encroachments within bicycle and pedestrian infrastructure.

Initiate (or re-initiate) Safe Routes to School programs which are focused on encouragement and education.

**Mixed-use Development**

Long-range planning documents should clearly identify locations where new mixed-use development nodes will be created (includes transit-oriented developments). Mixed-use development nodes should be arranged to provide terminal points at the end of key corridors.

Mixed-use zoning districts should incorporate building and site design standards that generate areas of urban built form (with varying development intensities).

Mixed-use development districts should include provisions requiring context sensitive street design and arrangement.

**Complete Streets**

Complete Streets policies should be adopted by CAMPO communities that provide for street network arrangement and design that is calibrated to local conditions.



NETWORK DEVELOPMENT

# ELEMENTS OF A HIGH QUALITY ACTIVE TRANSPORTATION NETWORK

The Plan includes an inventory of existing and planned active transportation facilities, a review of existing data and policies, guidance and recommendations on facility design and policy (the “pattern book”), recommended priority networks, an implementation plan with project priorities, and 6 county-specific mini-plans. These are some of the topics addressed by the Regional Active Transportation Plan pattern book.



**Sidewalks**



**Trails**



**Street lighting**



**Pedestrian crossings and median islands**

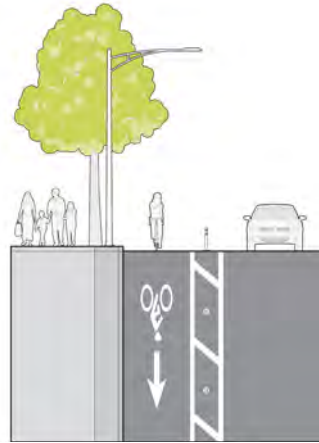


**Curb cuts and other treatments for people with disabilities**



**Transit**

NETWORK DEVELOPMENT



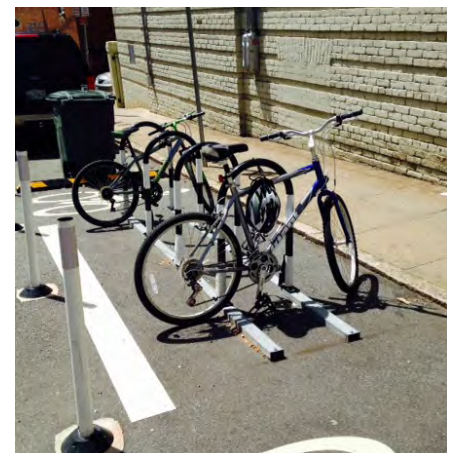
Separated bike lanes



Bicycle detection at traffic lights

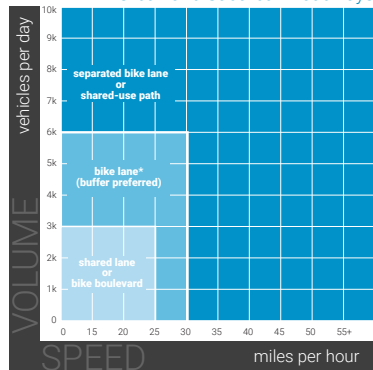


Signs and wayfinding



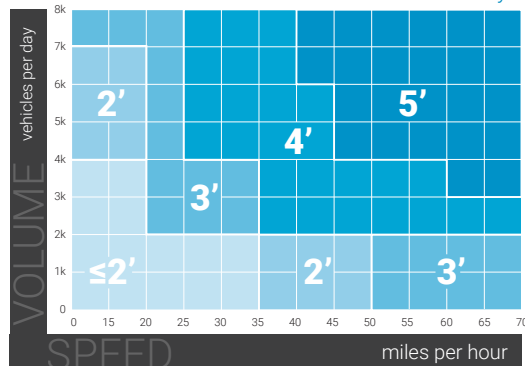
Bicycle parking

**Bicycle Facility Selection Chart**  
Urban and Suburban Roadways



\*advisory bike lanes may be an option where traffic volume < 4k Average Daily Traffic (ADT). Thresholds based on Bicycle Level of Service and adapted CROW manual guidelines.

**Recommended Minimum Shoulder**  
Rural Roadways



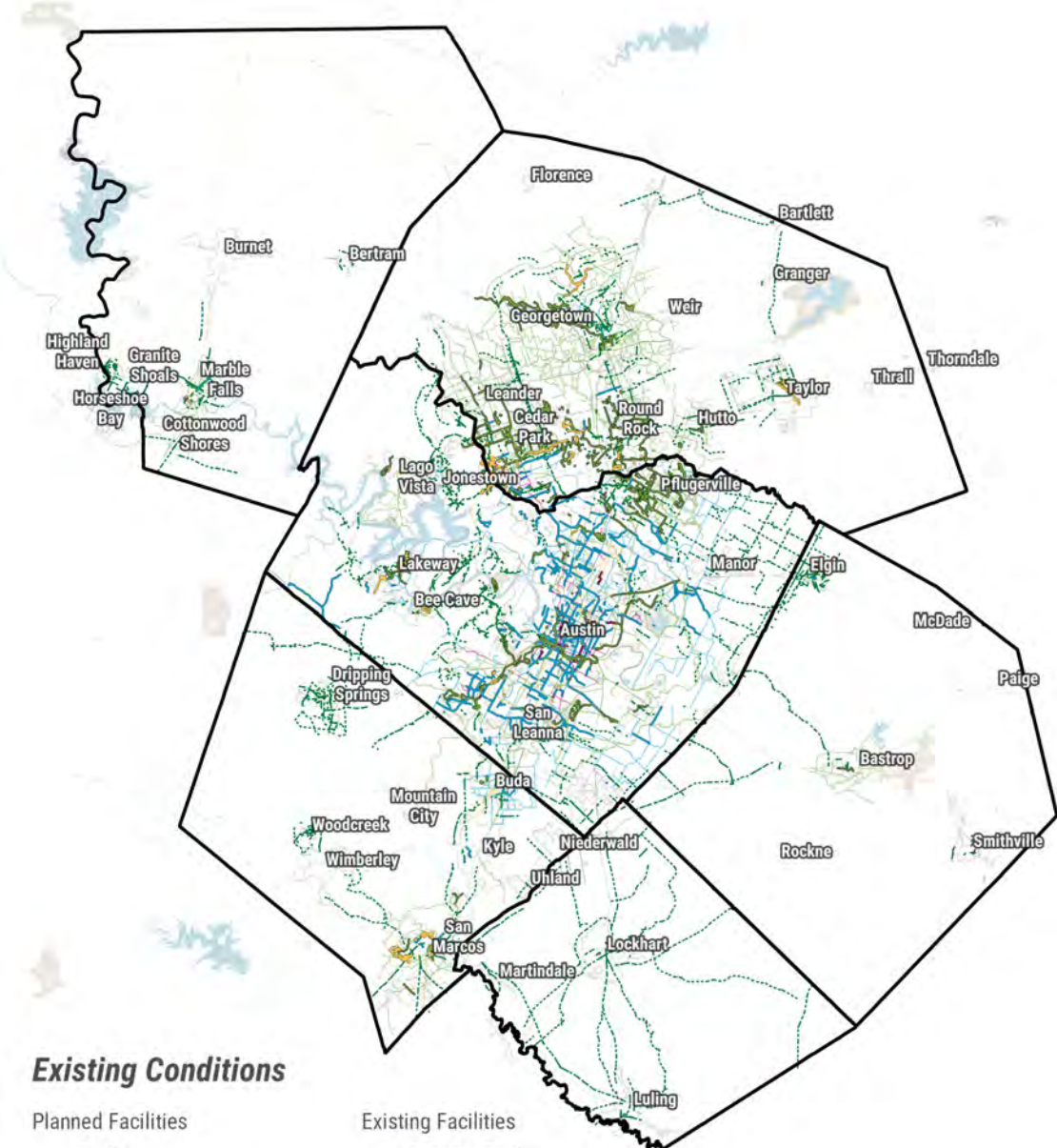
**Bicycle Facility Selection and Land Use**



NETWORK DEVELOPMENT

# EXISTING AND CURRENTLY PLANNED ACTIVE TRANSPORTATION FACILITIES

CAMPO collected data on existing and planned trails, bike lanes, separated bike lanes, shoulders, and sidewalks. Collected data is a resource available to local governments to assist in future planning. See the existing condition chapter for more information on existing facilities.



### Existing Conditions

- Planned Facilities
- Trail
  - Separated Bike Lane
  - Bike Lane
  - Shared Roadway
  - ..... Municipally Identified Need

- Existing Facilities
- Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail

## NETWORK DEVELOPMENT

# LOCAL GOVERNMENT OUTREACH

The Project Team coordinated with local government officials from throughout the region and held two rounds of meetings to collect their input. During the first round of meetings, representatives provided information about existing, planned, and needed facilities in their jurisdictions.

The second round of meetings gave representatives an opportunity to review their input from previous meetings, as well as exhibits for the public open house meetings, and provide additional feedback.

In addition to meeting with local governments in the region, CAMPO met with neighboring MPOs to discuss their respective regional planning efforts.

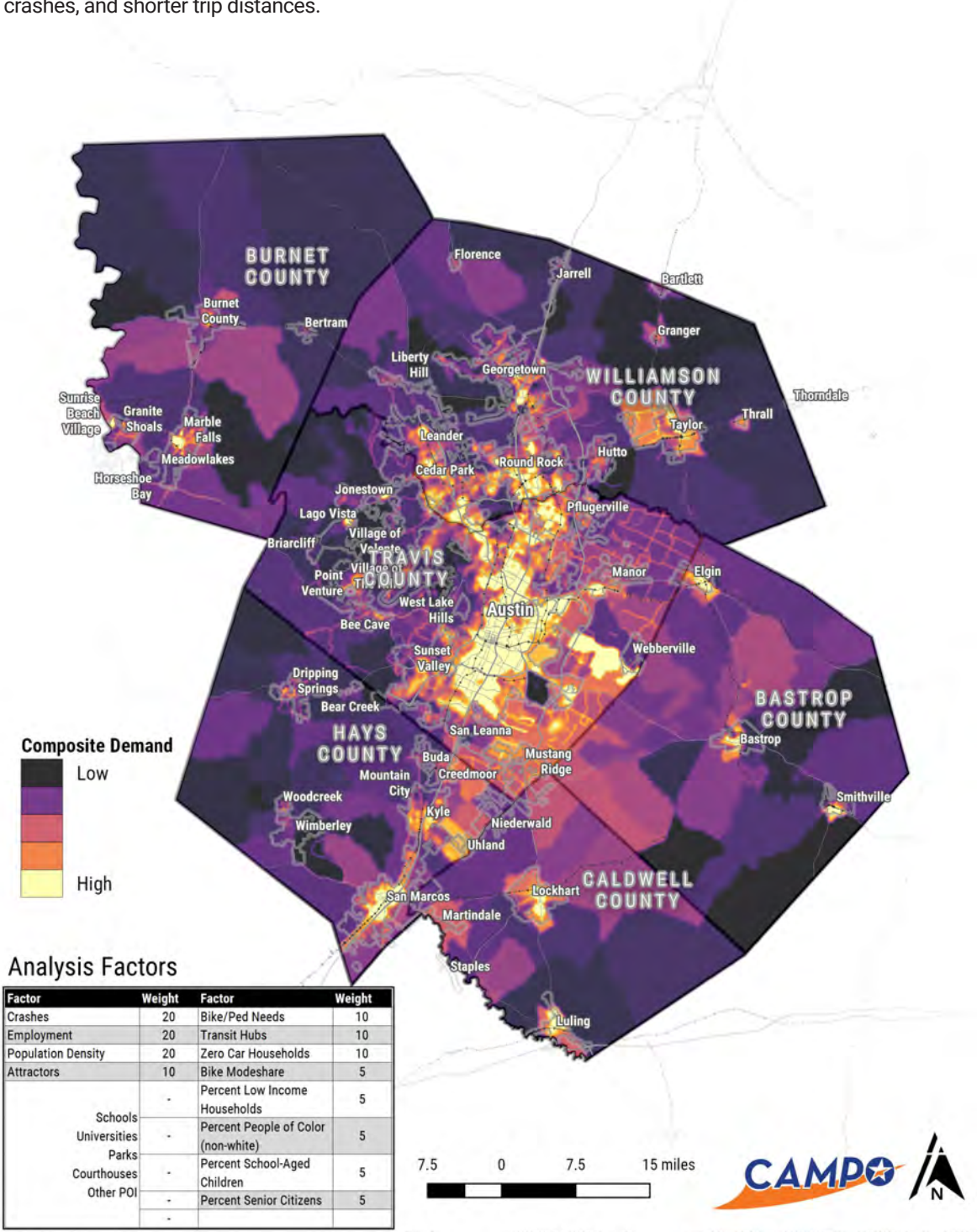


CAMPO staff and members of the project team meet with local government officials to identify bicycle and pedestrian needs. San Marcos (top); Elgin (bottom)

NETWORK DEVELOPMENT

# AREAS OF HIGH DEMAND AND NEEDS FOR 2045 ACTIVE TRANSPORTATION FACILITIES

Using data on population, employment, bike/ped crashes, demographics, poverty, car ownership, transit hubs, and destinations, CAMPO identified areas of high demand and need for active transportation facilities. High-demand areas are brighter. See the Existing Conditions chapter for an explanation of methodology. Demand for bicycling and walking is not spread evenly across the region. Demand is generally concentrated in the denser parts of the region, where there are concentrations of population, employment, bicycling use, crashes, and shorter trip distances.

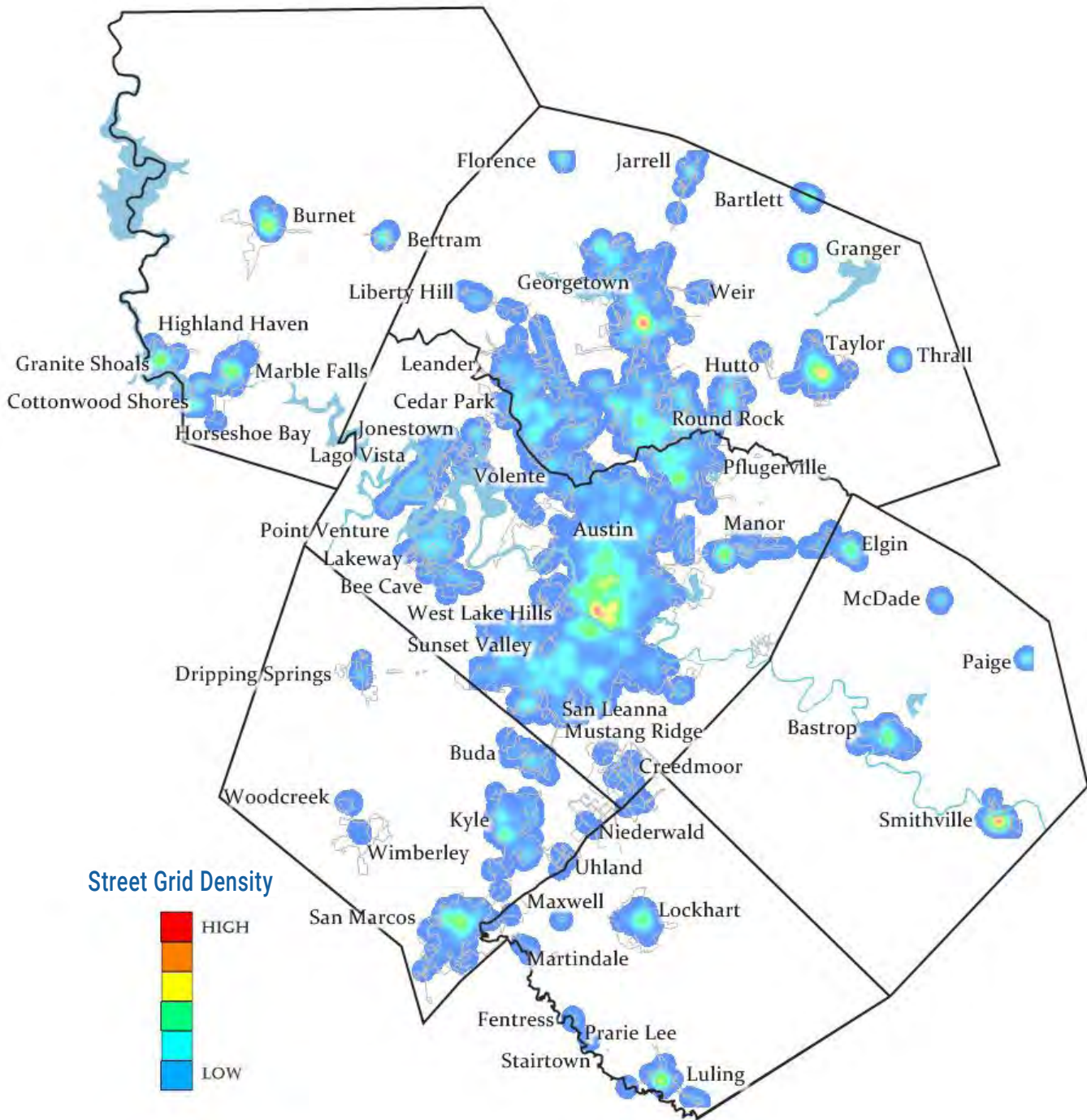




NETWORK DEVELOPMENT

# PEDESTRIAN ZONES

CAMPO identified areas in the region where walking is likely to be concentrated, based on the density of intersections in a community. Areas with more intersections are highlighted in blue and green. These are areas where short trips are more practical and should be encouraged.



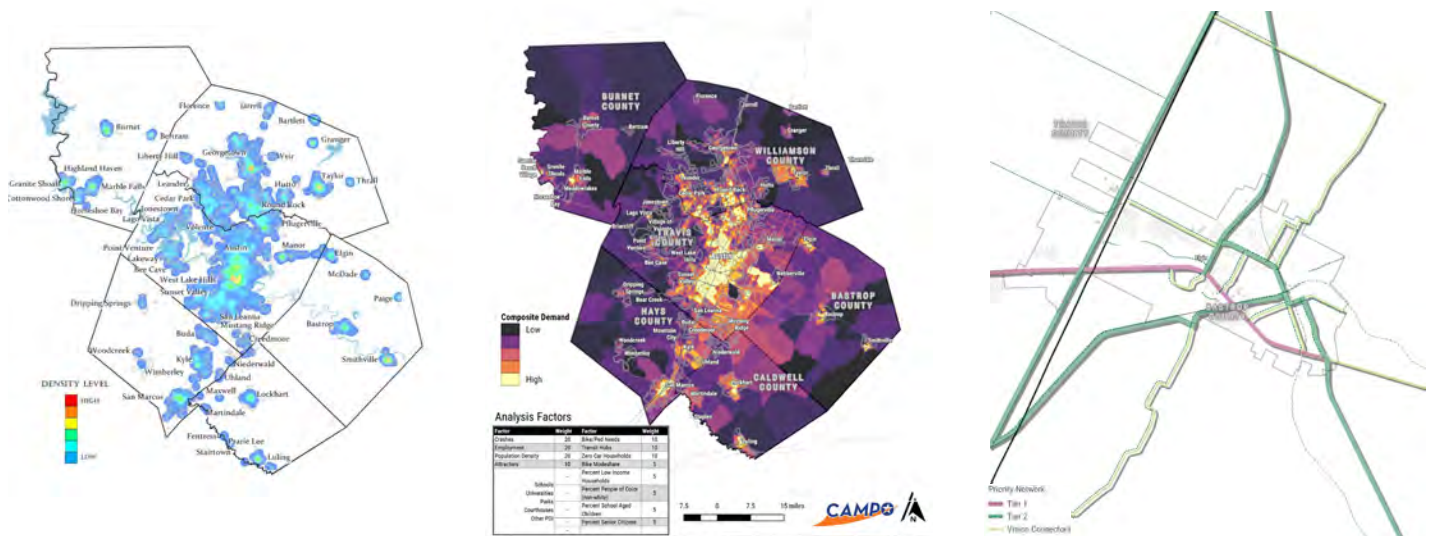


NETWORK DEVELOPMENT

# NETWORK RECOMMENDATIONS

The CAMPO region is diverse and so are the people who live here. Using demographic data, surveys, and extensive meetings with members of the public, the project team developed profiles of different types of current and potential users of the active transportation network. These different users live in different contexts and have different transportation needs. This plan is designed to accommodate the specific needs of these—and other—users.

## Local Systems Supporting Short-Trip Mobility Zones



Map of street intersection density

Demand heat map

Example of local routes and regional priority routes

## Regional “Trunk” Network Establishing Town-to-Town Connections



Tier I network

Tiers I & II networks

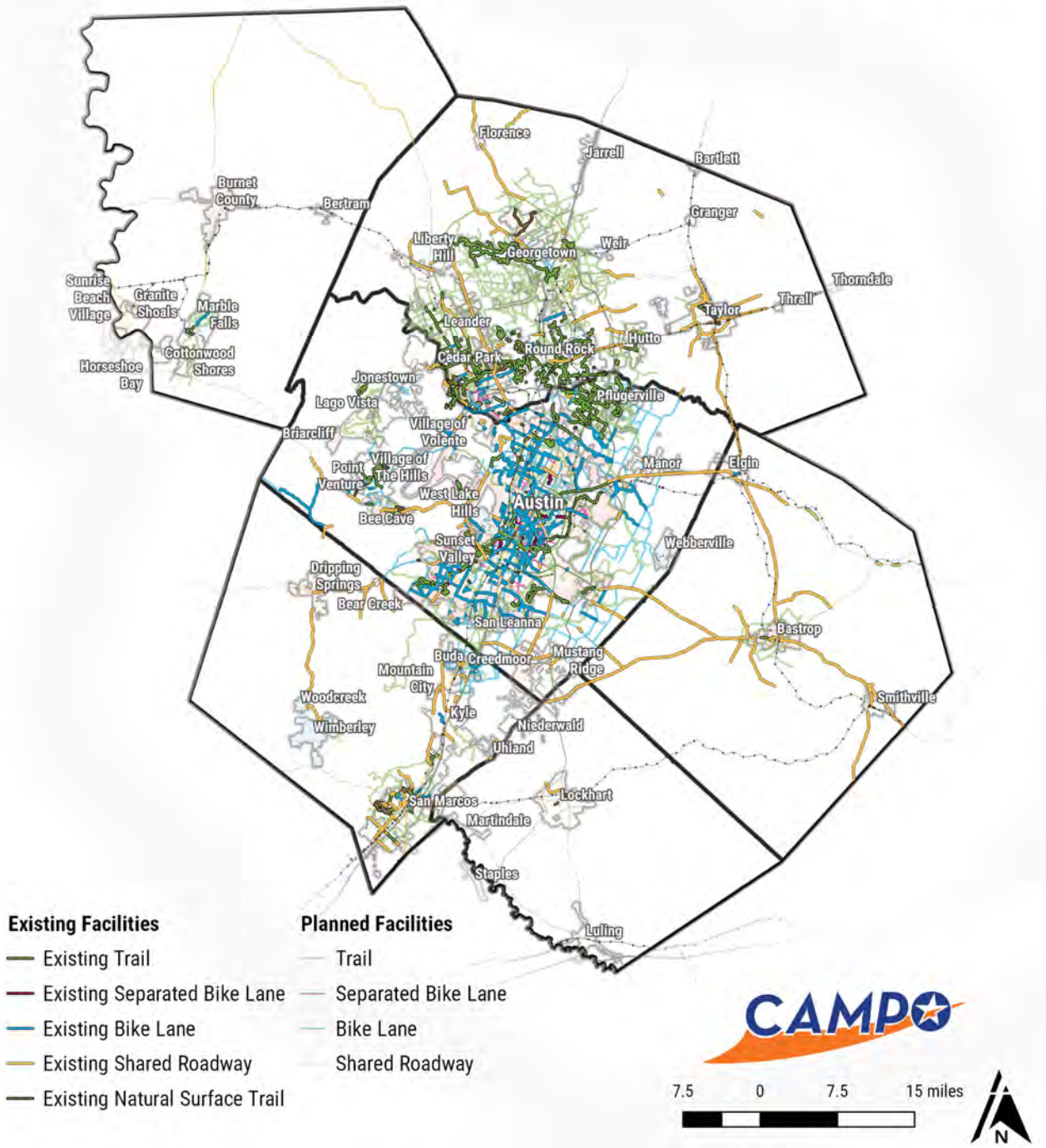
Tiers I and II, and Tier III  
Vision Connectors

NETWORK DEVELOPMENT

**FULL VISION NETWORK**

During a series of meetings with local government officials, CAMPO gathered input on specific needs for bicycle and pedestrian improvements. This “unconstrained” network presents all of those identified needs.

**Unconstrained Network**



NETWORK DEVELOPMENT

# IMPLEMENTATION: FACILITY TYPE DECISION-MAKING PROCESS

There are a wide range of contexts and existing facilities in the CAMPO region. Once a critical connection is identified (e.g., it is on a primary network route or is a priority for short-trip mobility zones), the project type should be determined by an analysis of the existing conditions and the amount of separation needed based on context. For example, if no facility is currently existing, a wide shoulder may be recommended in low traffic volume and speed contexts, or a separated facility in areas with higher volumes and speeds. If a shoulder or bike lane exists, a sidepath, trail, or separated bike lane may be recommended. If a separated facility exists, lighting, signs, bike parking, or benches may be recommended.

**STEP**  
**1**

## Identify the Priority Route

- Regional priority route (Tier I, II, or III Vision Connections)
- Short-trip mobility zone
- Other local priority

**STEP**  
**2**

## Identify current condition

- No facility, potential for an upgraded facility, or a comfortable existing facility
- Urban, suburban, or rural land use

**STEP**  
**3**

## Identify needed improvement based on

- Traffic speed, and
- Traffic volume

### General recommendations for facility improvements

Existing Facility	Improvement to Consider
No facility	Shoulder/Bike Lane or Physically separated facility
Shoulder/Bike Lane	Physically separated facility
Physically separated facility	Upgrade with lighting, signage, benches, bike parking

### General facility recommendation based on land use

Urban/Suburban	Rural/Suburban
Bike Lane	Shoulder
Separated Bike Lane, Sidepath, Trail	Trail or Sidepath

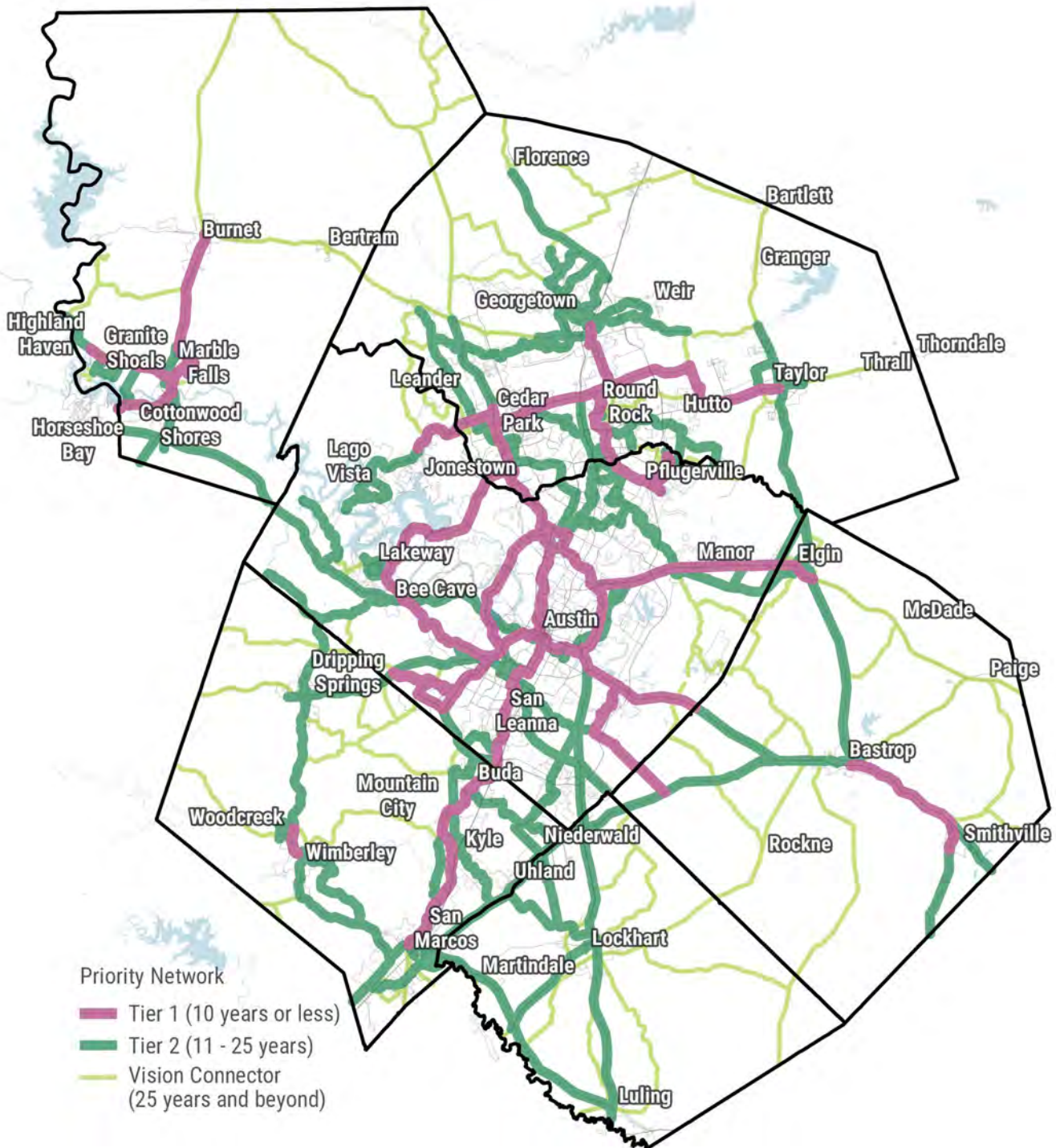
See the Implementation chapter for more detail and photographs.



NETWORK DEVELOPMENT

# THE PRIORITY NETWORK

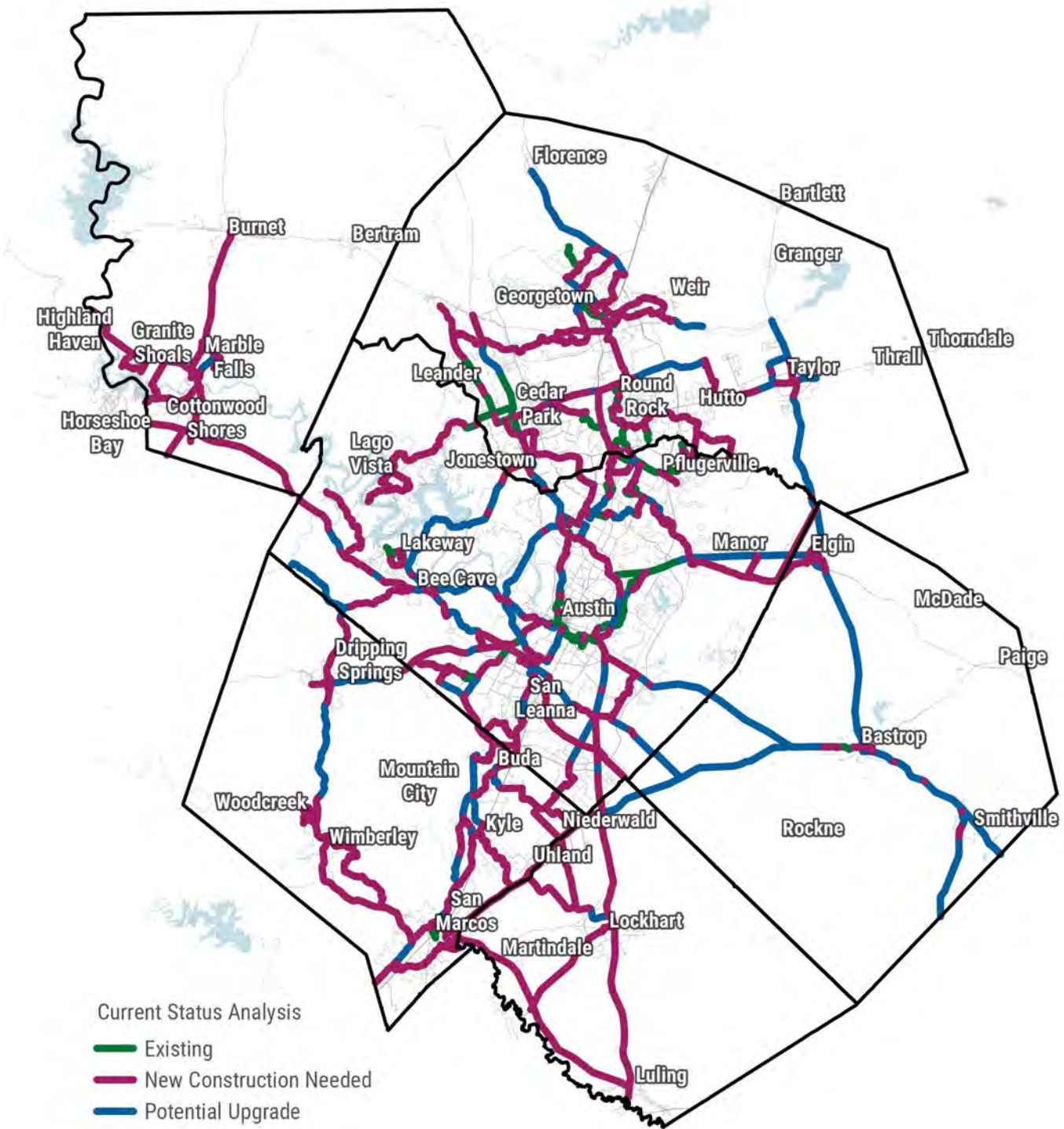
Using existing facilities, currently planned facilities, and locally identified bicycle and pedestrian needs—and an analysis of user demand and trip distance—the planning team identified high-priority regional routes to connect population centers and high-demand locations in the region. In addition to implementation of the priority network, pedestrian and bicycle projects in the short-trip mobility zones will be critical in establishing first/last mile connections to local destinations, neighborhoods, and transit. The series on local maps in the appendices show how local systems align with/and connect to the regional network. The priority network is separated into a Tier I, Tier II, and Vision Connectors (Tier III) to be developed in the next 10 years, 25 years, and 25+ years, respectively.



NETWORK DEVELOPMENT

# THE PRIORITY NETWORK

The priority network is made of different types of facilities and locations where no current bicycle facility exists. This map provides local governments and CAMPO with information on the current conditions of each segment of the priority networks (Tier I and II) to make decisions about where to build new facilities or upgrade current facilities.





# CHAPTER 2

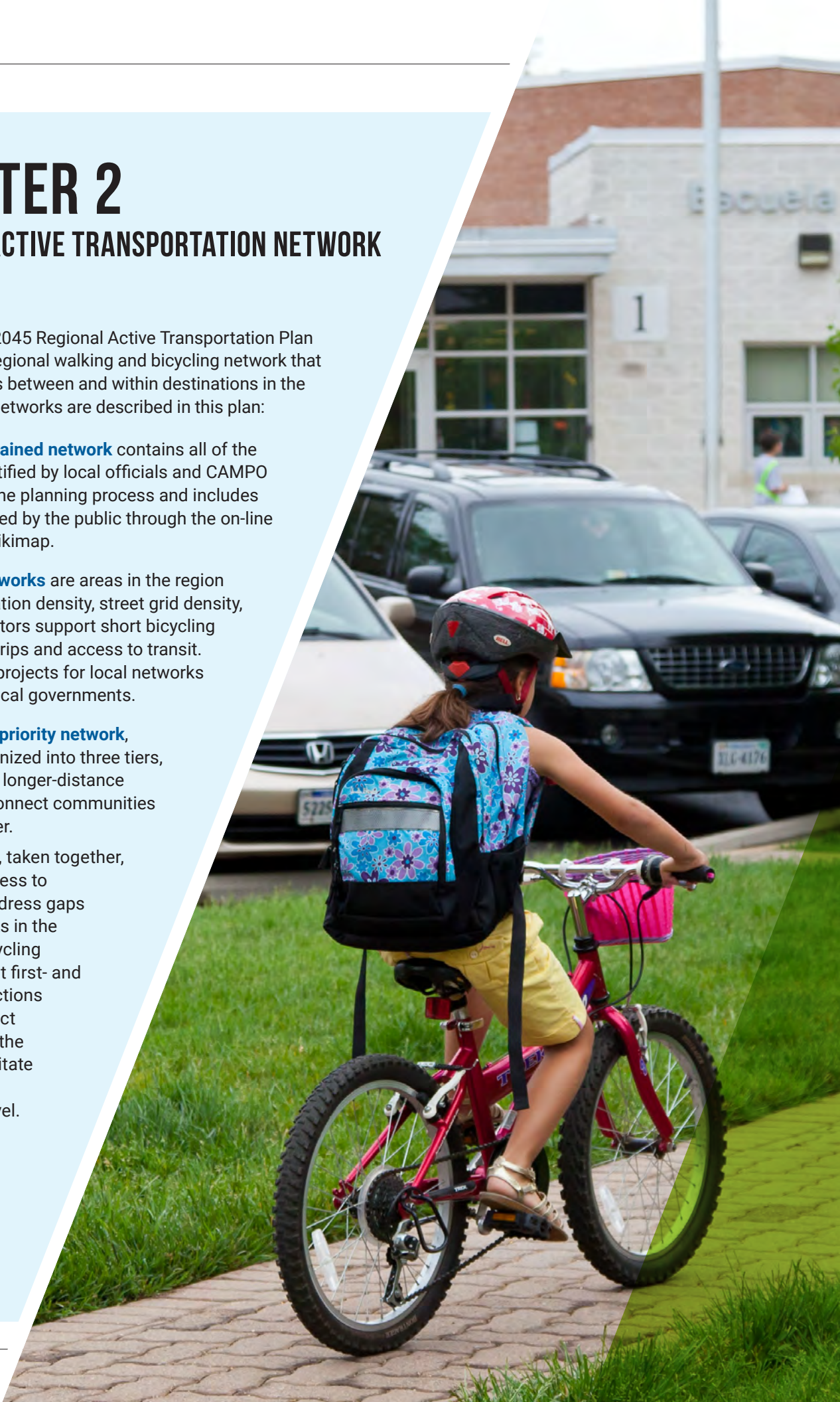
## REGIONAL ACTIVE TRANSPORTATION NETWORK

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The goal of the 2045 Regional Active Transportation Plan is to develop a regional walking and bicycling network that improves access between and within destinations in the region. Several networks are described in this plan:

- The **unconstrained network** contains all of the projects identified by local officials and CAMPO staff during the planning process and includes routes provided by the public through the on-line interactive Wikimap.
- The **local networks** are areas in the region where population density, street grid density, and other factors support short bicycling and walking trips and access to transit. The specific projects for local networks come from local governments.
- The **regional priority network**, which is organized into three tiers, identifies key longer-distance routes that connect communities to one another.

These networks, taken together, will improve access to destinations, address gaps and missing links in the walking and bicycling network, support first- and last-mile connections to transit, connect communities in the region, and facilitate non-motorized inter-county travel.





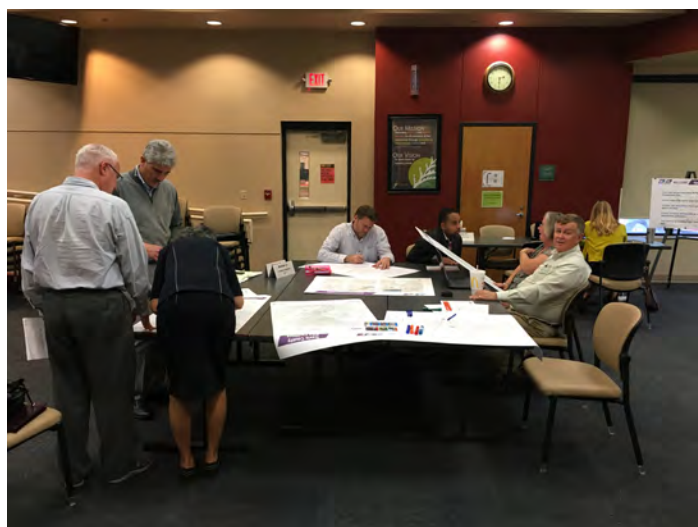
# UNCONSTRAINED NETWORK

## Identifying local needs

During this planning process, CAMPO collected information from local governments and the public on routes that need improvement, specific project priorities, and locations of safety concerns for walking and bicycling. This information makes up the unconstrained network. It is preserved as a GIS layer CAMPO can share with local governments to generate projects for the local networks and with the Texas Department of Transportation (TxDOT) for the consideration of facilities on state roadways. Select corridors identified in the unconstrained network were incorporated into the regional priority network.

The unconstrained network was developed through the following process:

- **Existing and Planned Facilities.** Data on existing and planned facilities was compiled and mapped during the existing conditions phase.
- **Bike/Ped Needs Identified by Local Officials.** During the public outreach phase, CAMPO conducted mini-charrette meetings with dozens of local officials and gathered input at public meetings to identify local project needs.
- **Identified Barriers/Gaps.** CAMPO staff and project team members identified gaps in the existing facilities network and barriers to walking and biking.



CAMPO staff and members of the project team met with local government officials to identify bicycle and pedestrian needs. Marble Falls (top); San Marcos (middle); Williamson (bottom)





# REGIONAL PRIORITY NETWORK

## Establishing Town-to-Town Connections

Projects identified in the unconstrained network feed into the regional priority network. This “trunk” network supports travel *between* communities in the region.

The regional priority network prioritizes connecting communities which are closer together to minimize trip distances. Likely town-to-town trips were identified through a “gravity” analysis, which took into account the estimated demand for bicycling and walking in a community, using the heat map methodology described in the existing conditions chapter, and the distance between communities. Communities with higher demand scores were given a higher “gravity” score, as were communities with shorter distances between them. Projects identified by local officials, as well as existing and planned facilities, were prioritized in the development of the regional networks routes. Gaps in the existing network were identified, which were incorporated into the Tier III network. See “Process for Developing the Regional Priority Network” below for more explanation and page 2-9 through 2-11 for larger maps.

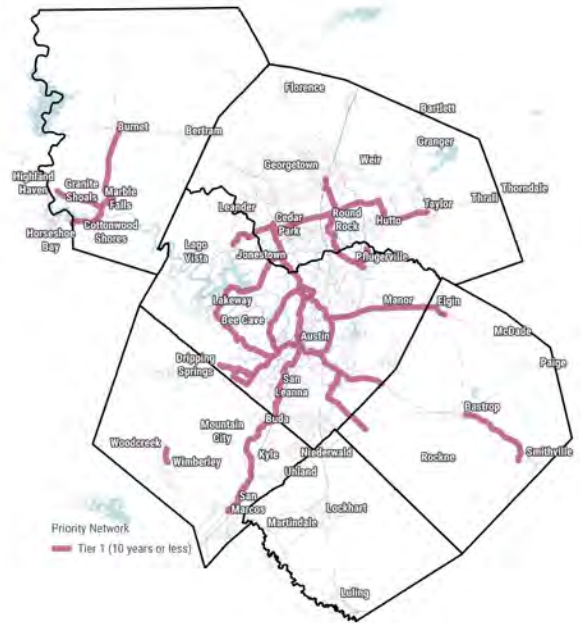


Figure 4. Tier I network

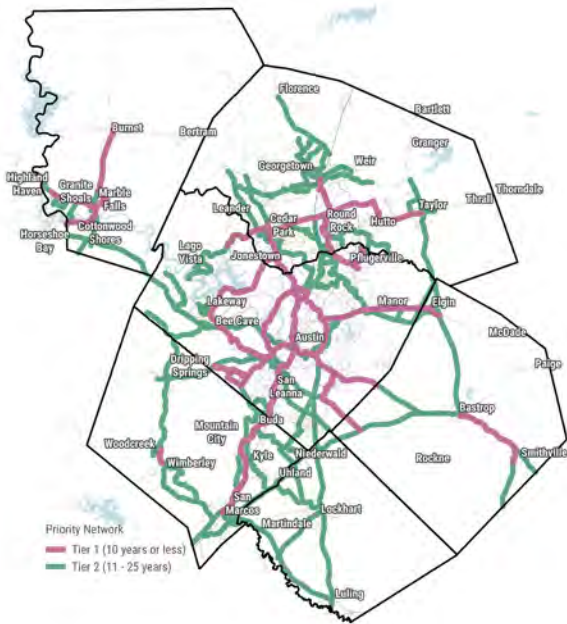


Figure 5. Tiers I & II networks

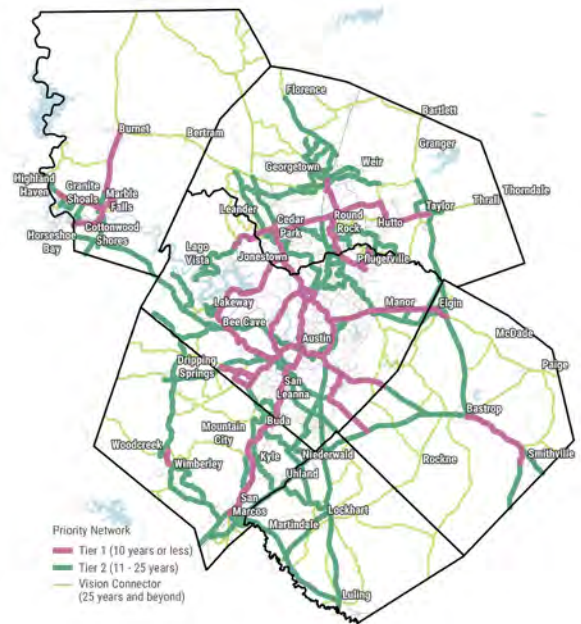


Figure 6. Tiers I and II, and Tier III Vision Connectors

# REGIONAL PRIORITY NETWORK DEVELOPMENT PROCESS

One of the most significant challenges in planning a regional bicycling network is the large size of the CAMPO region. The region is over 5,000 square miles, is about 80 from west to east and approximately 100 north to south. There are long distances between communities (See map in Figure 6.) It is unrealistic to expect large numbers of residents to bike these distances. Nationally, the average length of a bicycle trip is 2.3 miles. The active transportation survey of CAMPO residents indicated that among current bicyclists, 65 percent say their typical bicycle ride distance is under 5 miles and only 22 percent say their average ride distance is over 10 miles.

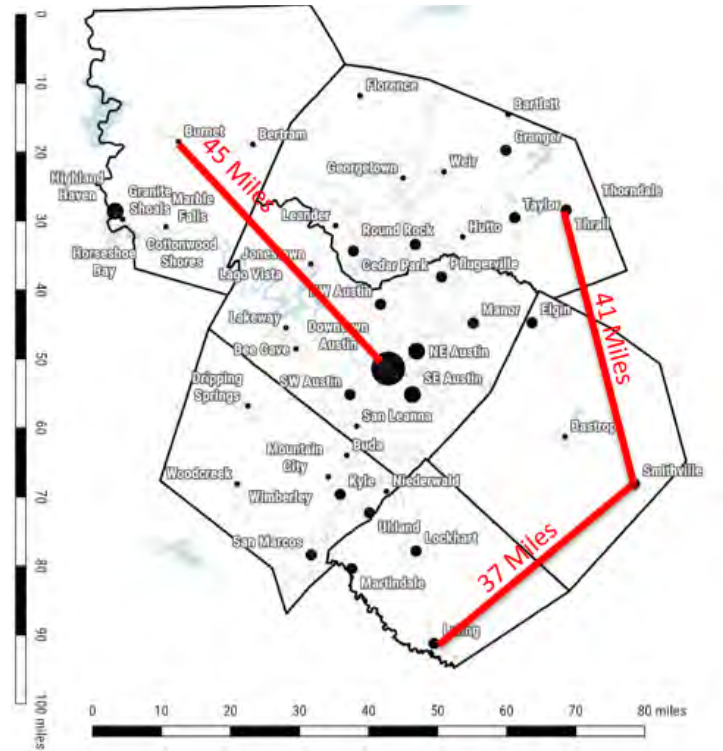


Figure 7. Distances in the CAMPO region.

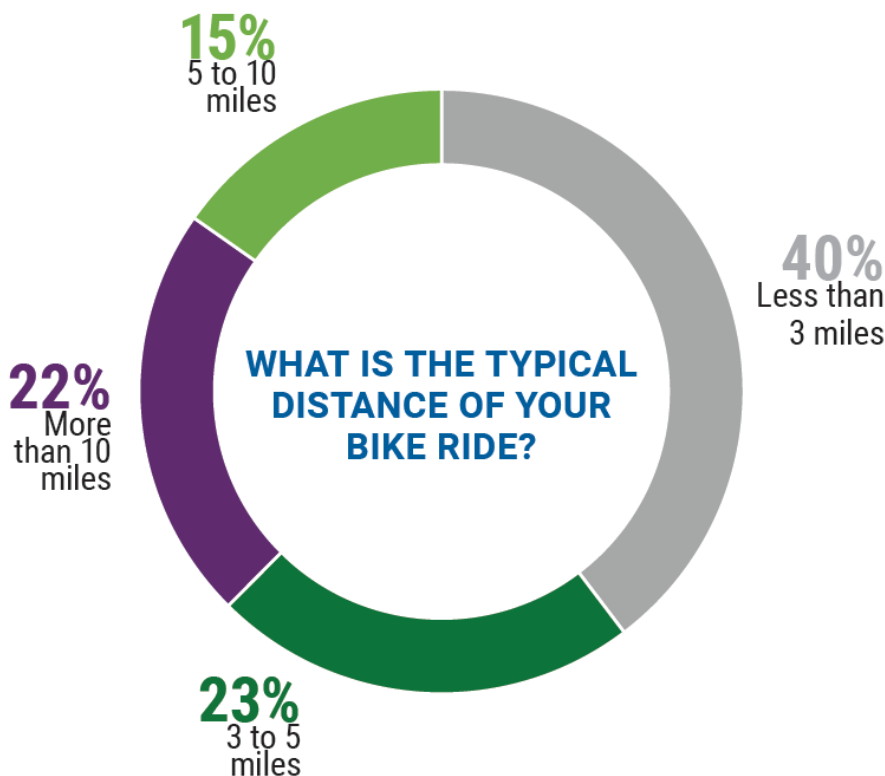


Figure 8. Typical bike ride distances among respondents who current ride bikes.

## Approach

The project team sought to understand what trips are most in-demand and likely to occur, and how to quantify and visualize that understanding. The approach was to measure the “gravitational pull” of different destinations. The “gravity score” is a ratio between the amount of demand between two communities and the distance separating them. As the size of objects increases-- in this case, the amount of demand in a community-- the gravitational pull increases. Conversely, as the distance between objects increases, the gravitational pull decreases. The result is a defined network prioritized by demand for destinations based on proximity.

## Measuring demand

Demand was measured during the existing conditions analysis based on bike/pedestrian crashes, employment, population, attractors such as schools, universities, parks, courthouses, needs identified by officials, transit hubs, zero-car households, low-income households, people of color, school-aged children, senior Citizens, and current bicycle commuter rates.

Demand within each municipal boundary was totaled and a demand score was produced for each municipality. (The demand for Austin was broken into southwest, northeast, southeast, and downtown to avoid having to select one point in the large city.)



Figure 9. Map showing relative demand for bicycling and walking in municipalities across the region.

## Measuring distance

This analysis uses the Euclidian distance (as the crow flies) between two destinations to measure distance. See distances in Figure 10.

## Calculating gravity scores

Each municipality in the region was paired with every other one. The distance between each pair was measured, and the demand score for each was summed to create a total score for the pair. The total demand was divided by the distance, resulting in the gravity score for each pair of municipalities. The scores were normalized on a 100 point scale, where the highest score received 100 points and the other pairs received a score relative to the top scoring pair.

Lines connecting all of the pairs were mapped. See Figure 11. The lowest scoring pairs were removed from the map until a clear picture of the top priority routes emerged. See Figure 12. To develop the network recommendations, the straight lines were converted to real corridors. See Figure 13.

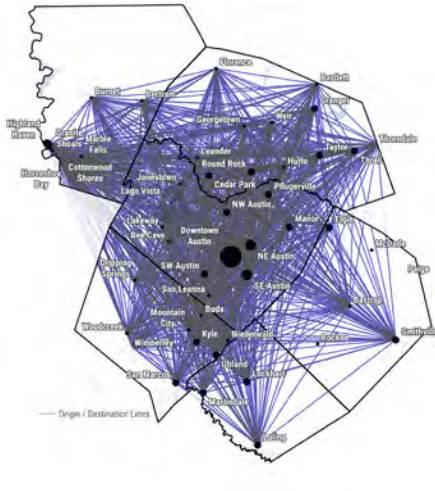
Origin	Destination	Length (mi)	Total Demand Score	Gravity Score
Highland Haven	Granite Shoals	1.6	58	100
Niederwald	Uhland	4.0	50	35
Kyle	Mountain City	3.1	45	32
Kyle	Uhland	5.0	54	28
Cottonwood Shores	Horseshoe Bay	1.5	32	27
Cedar Park	Leander	4.5	47	27
Pflugerville	Round Rock	6.0	58	26
San Marcos	Martindale	6.2	56	26
San Leanna	SW Austin	4.7	51	25
Buda	Mountain City	4.1	42	24
Thorndale	Thrall	5.0	45	24
Taylor	Thrall	7.5	60	24
Lakeway	Bee Cave	3.4	41	23
Marble Falls	Cottonwood Shores	3.5	41	23
Cottonwood Shores	Highland Haven	5.4	53	22
Manor	Elgin	8.5	60	21
Cottonwood Shores	Granite Shoals	3.8	38	21
Kyle	Buda	5.7	47	21
Marble Falls	Highland Haven	7.7	61	21

Figure 10. Table showing distance, demand, and “gravity scores” for pairs of communities in the region.

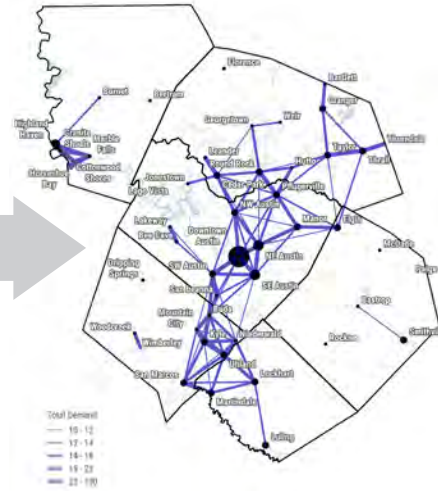
$$\text{Gravity Score} = \text{Demand} / \text{Distance}$$



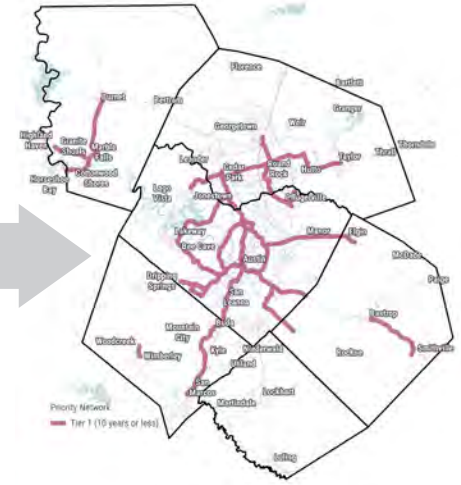
## HOW THE “GRAVITY” ANALYSIS WAS USED TO INFORM THE REGIONAL PRIORITY NETWORK



**Figure 11.** Connections from each municipality to each other



**Figure 12.** Top scoring connections



**Figure 13.** The Tier I priority network connects the highest scoring communities

### Selecting Routes

The project team mapped the following:

- Existing & planned facilities
- Bike/ped needs identified by local officials during mini-charrettes
- Barriers and gaps identified by CAMPO
- Public feedback on the project WikiMap, and
- Gravity corridors (straight blue lines in Figure 12)

Routes connecting communities were selected that contained existing or planned facilities or were identified as local needs or significant gaps during the public outreach process.

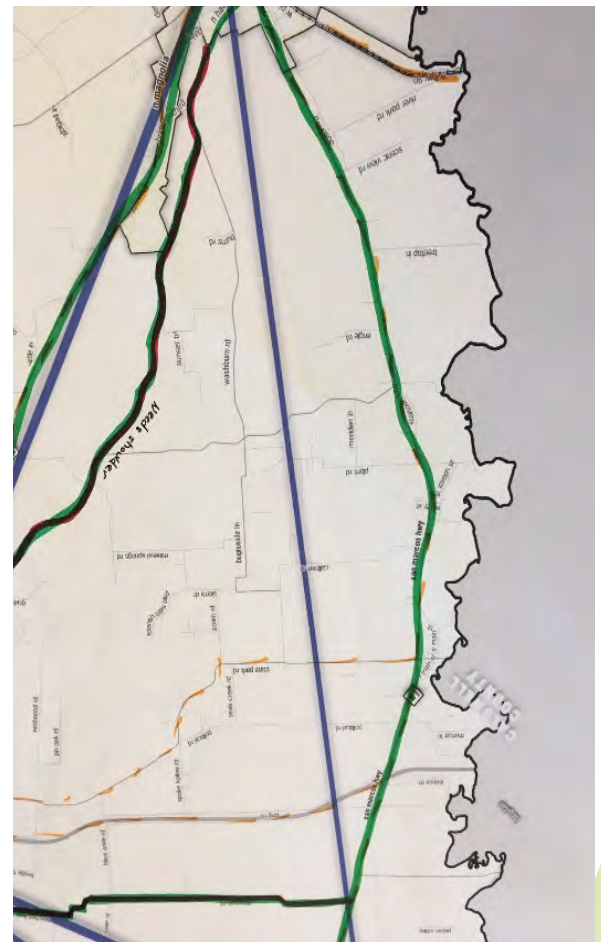
**More than half (56%) of the recommended Tier I network consists of an existing facility, 23 percent is on a planned facility corridor, and an additional 9 percent is located on a corridor where local government officials requested a facility.**

### Prioritization and phasing: Tier I, II, III

Tier I priority routes connect the closest communities with a single direct route. Tier I should be completed in the first phase within 1-15 years.

Tier II priority routes connect to additional municipalities and provide additional routes to communities. Tier II should be completed in the second phase and be completed within the next 15-25 years.

The Tier III Vision Connectors network and the unconstrained network corridors may be completed in the period beyond 25 years. All of these corridors may be improved sooner as opportunities arise (e.g. repaving or resurfacing).



**Figure 14.** The blue line is a straight line between two communities (as the crow flies). The parallel green line is the recommended route along an existing roadway corridor.

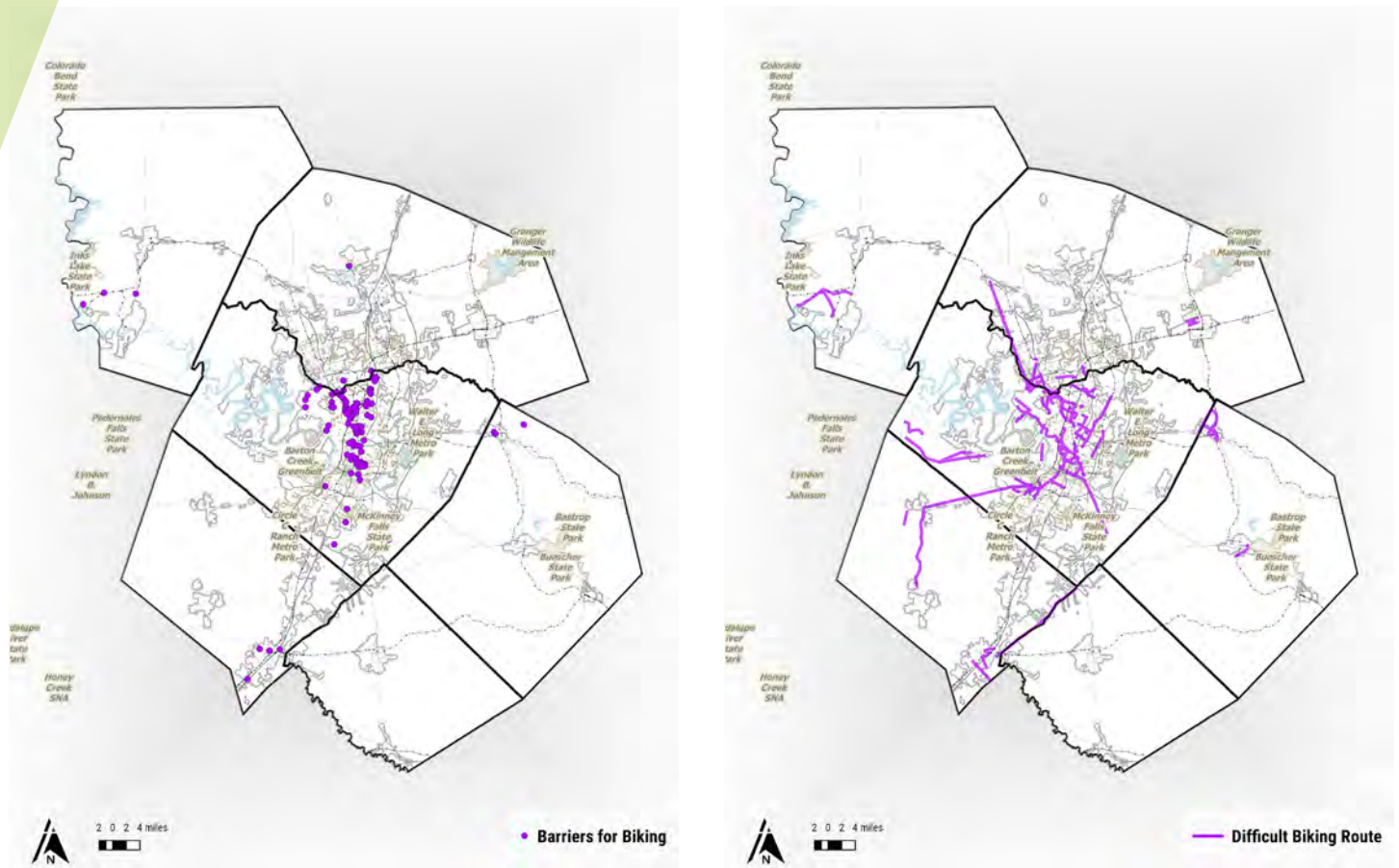


Figure 15. Results from the project WikiMap

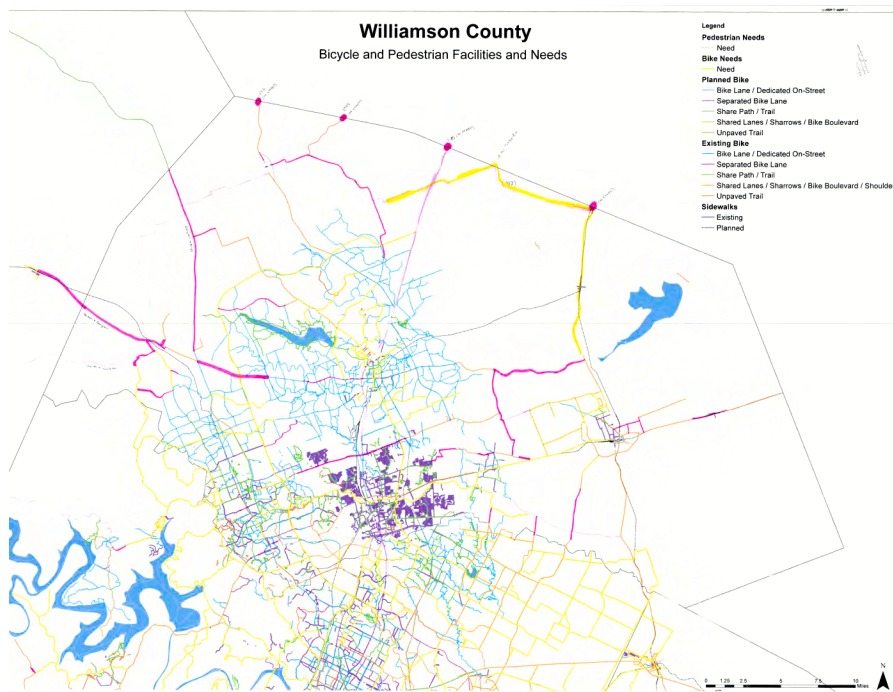


Figure 16. Gaps identified by CAMPO staff



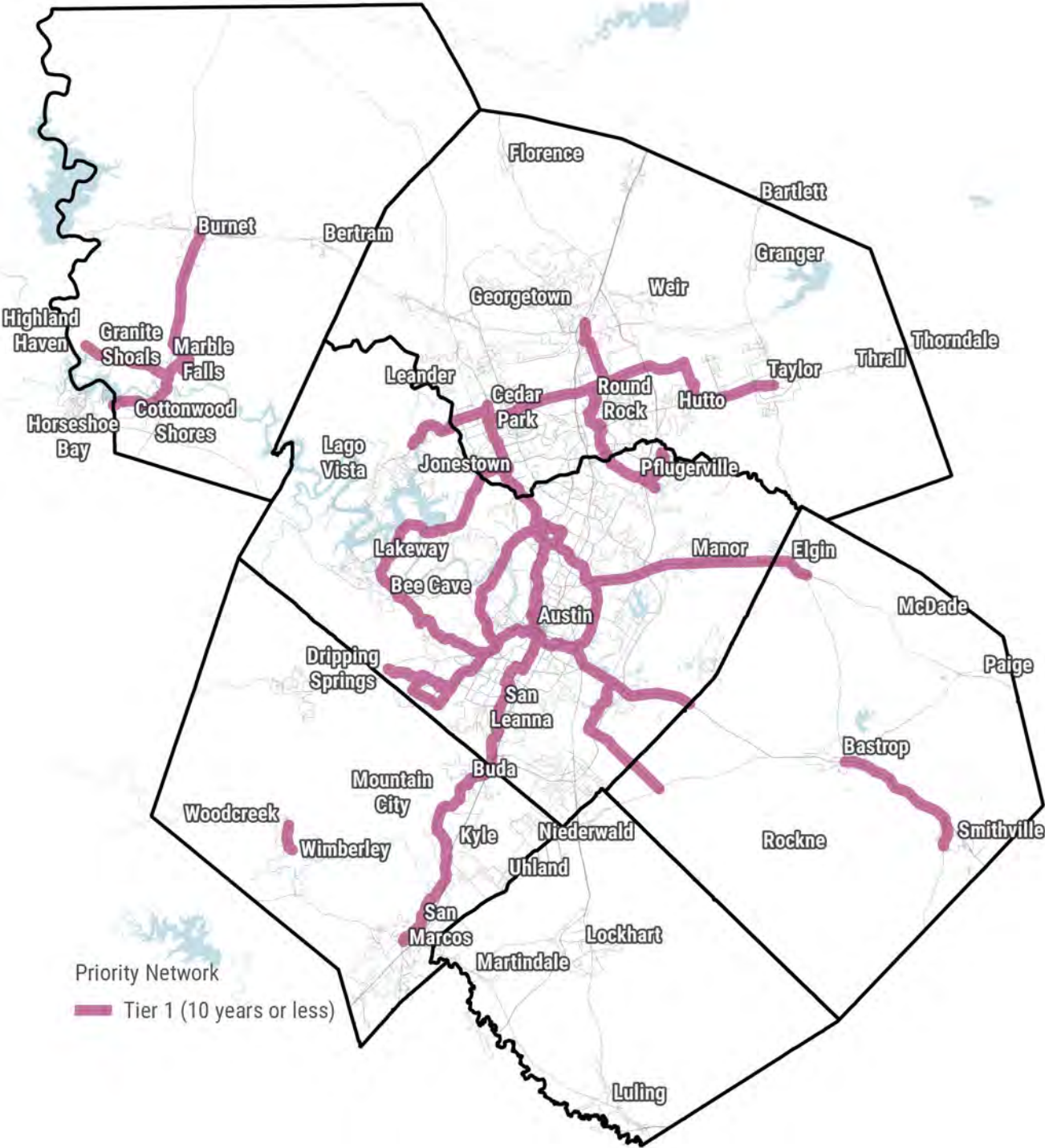


Figure 17. Tier I

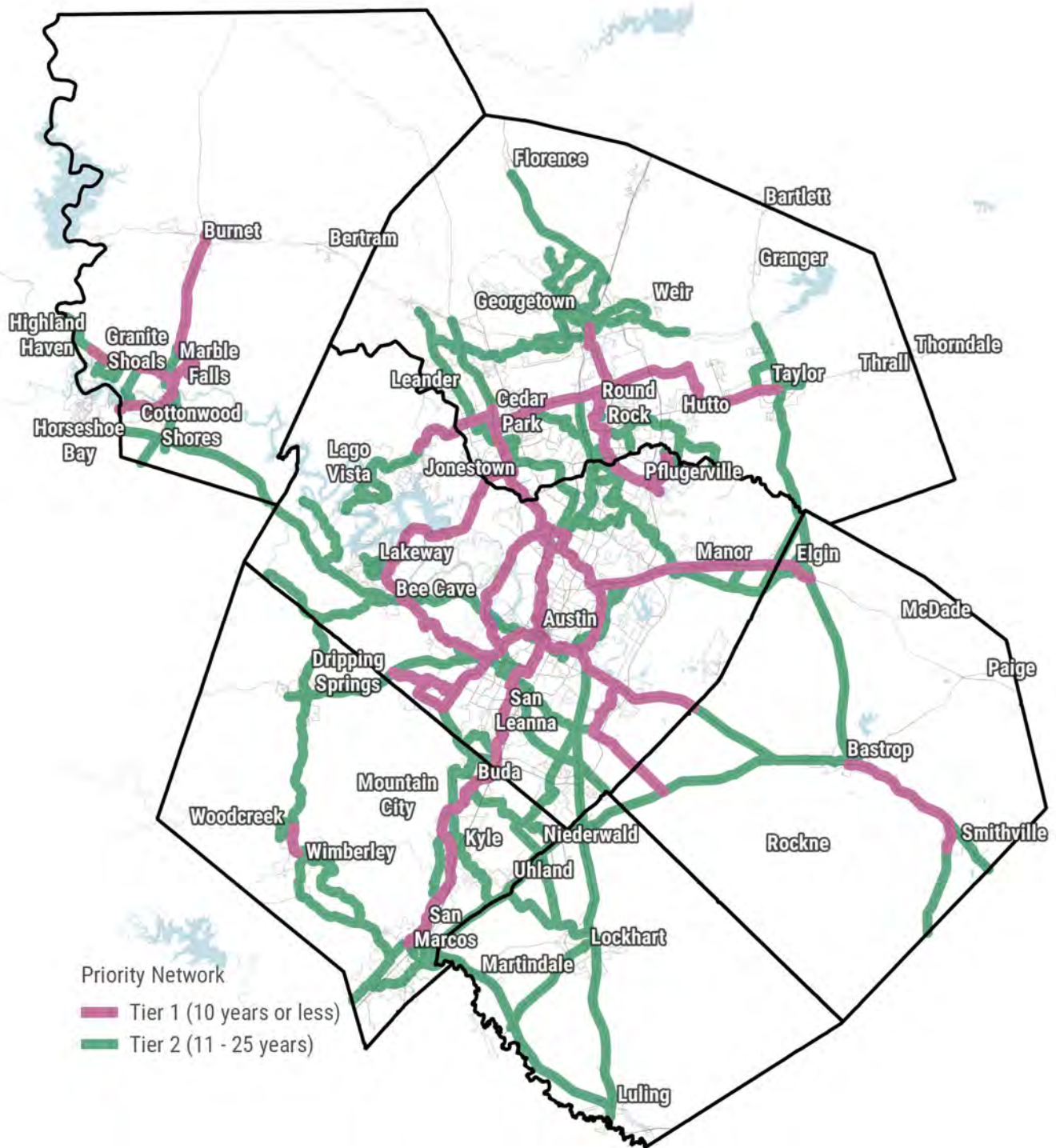


Figure 18. Tiers I and II



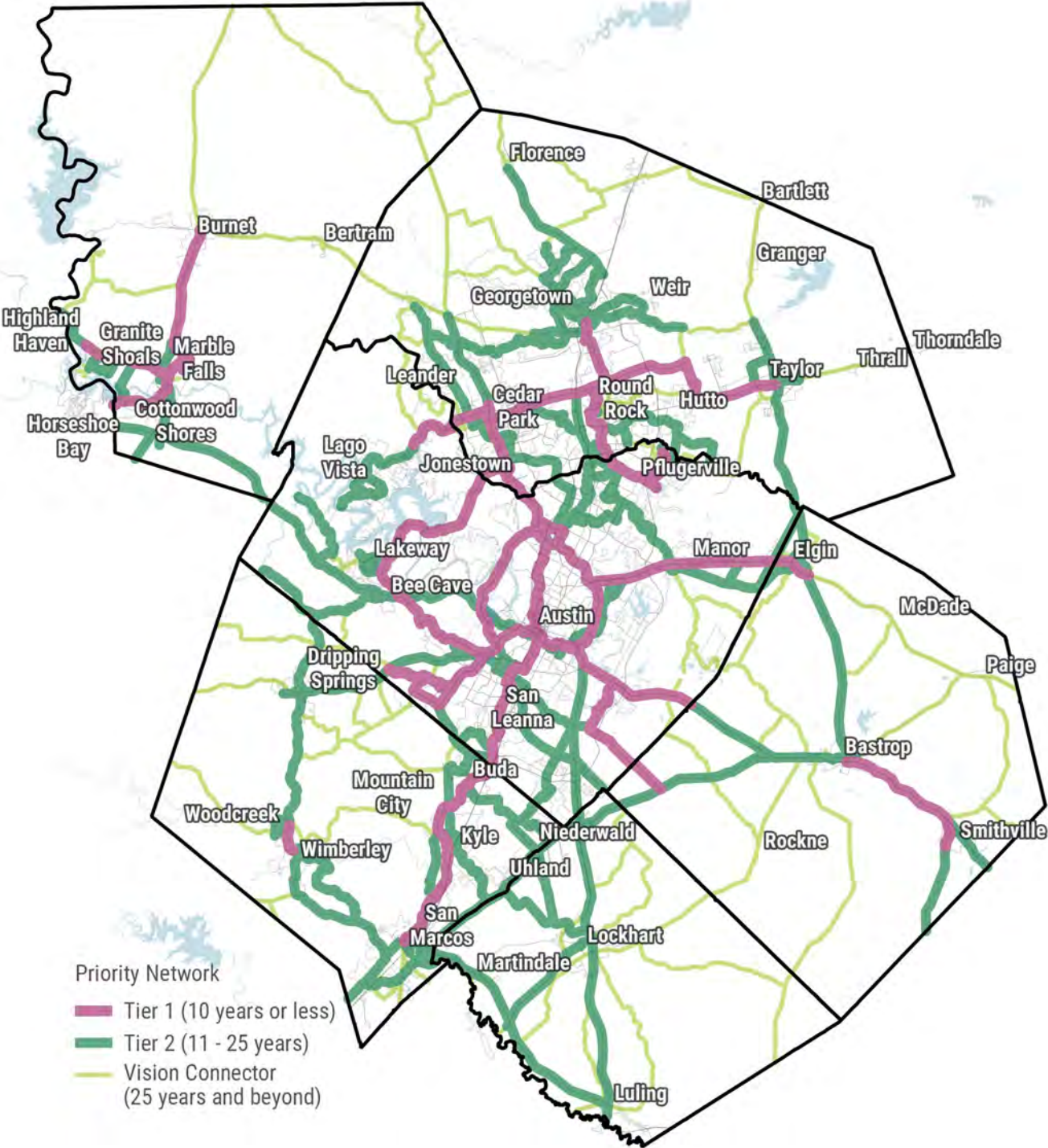
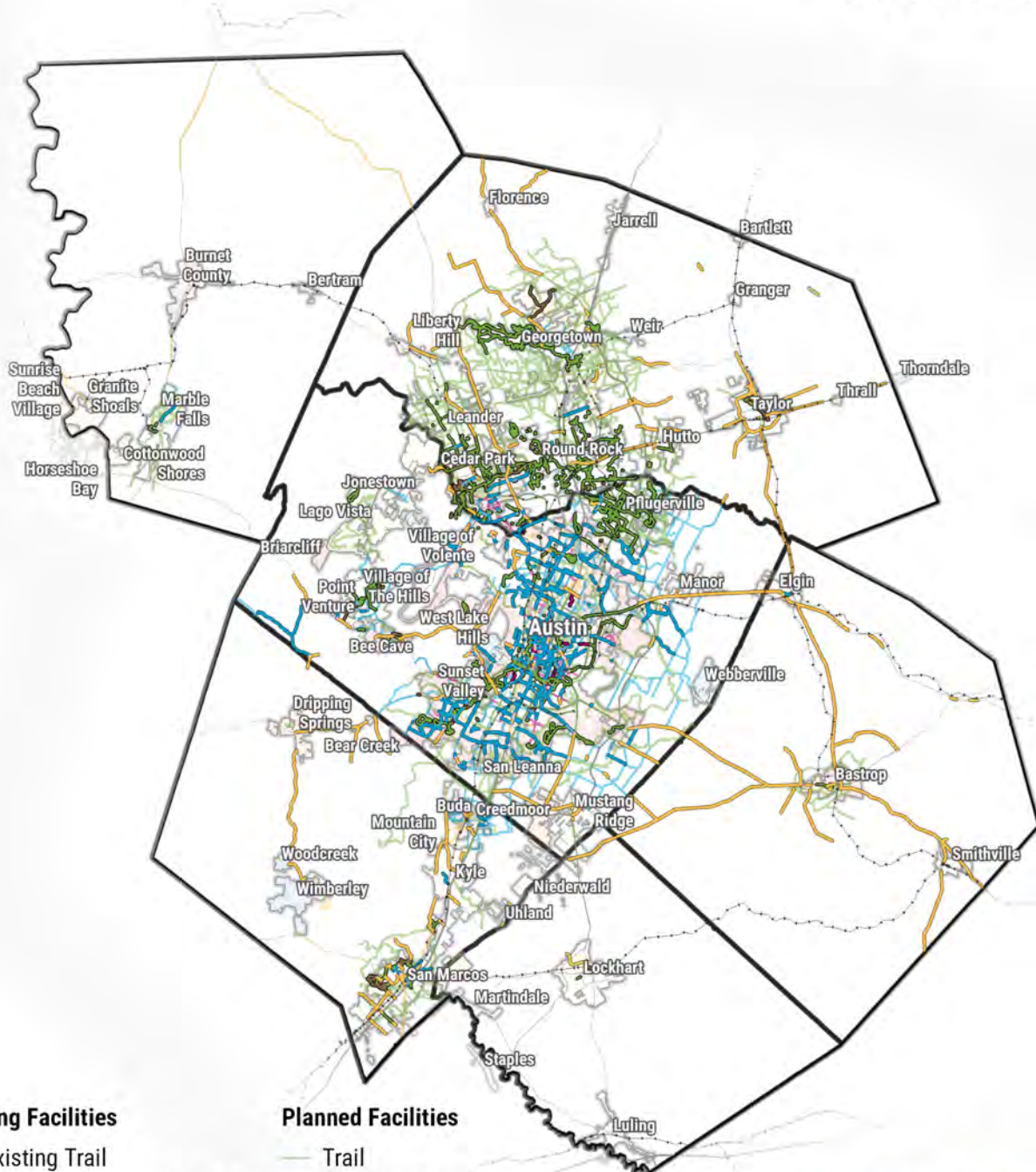


Figure 19. Tiers I and II, and Tier III Vision Connectors

# Unconstrained Network



**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

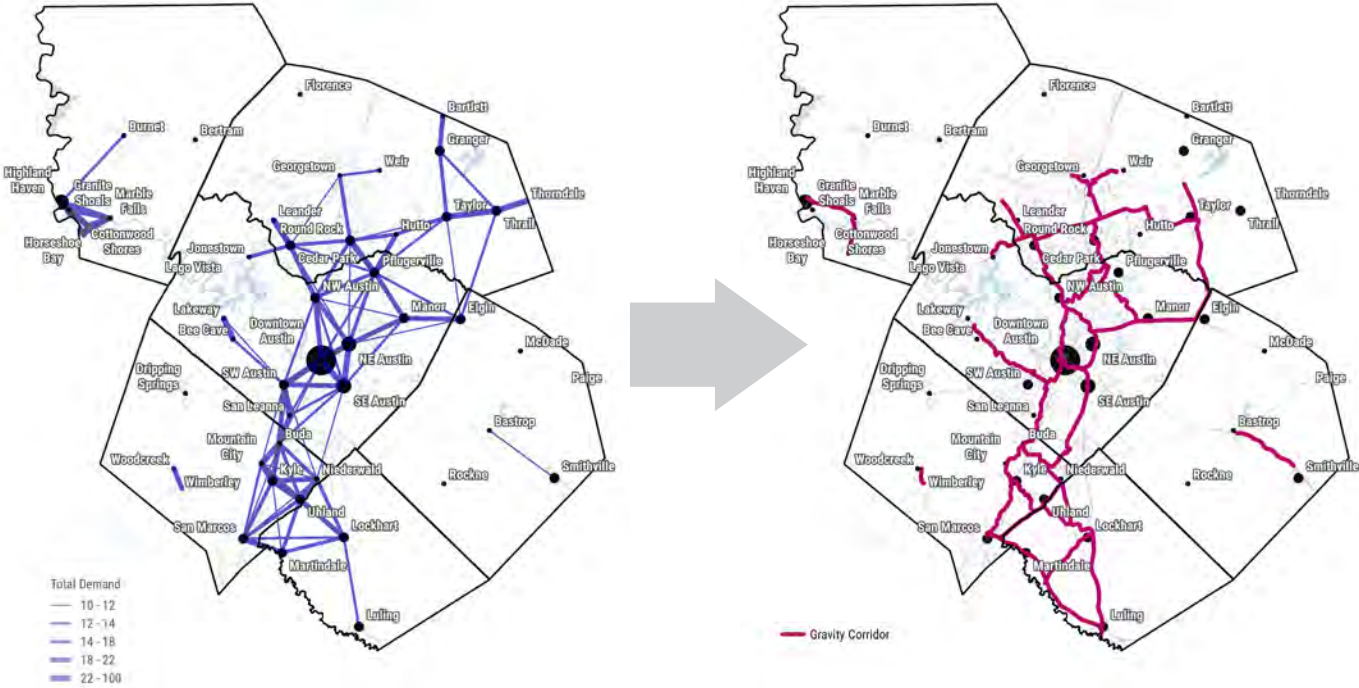
- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway



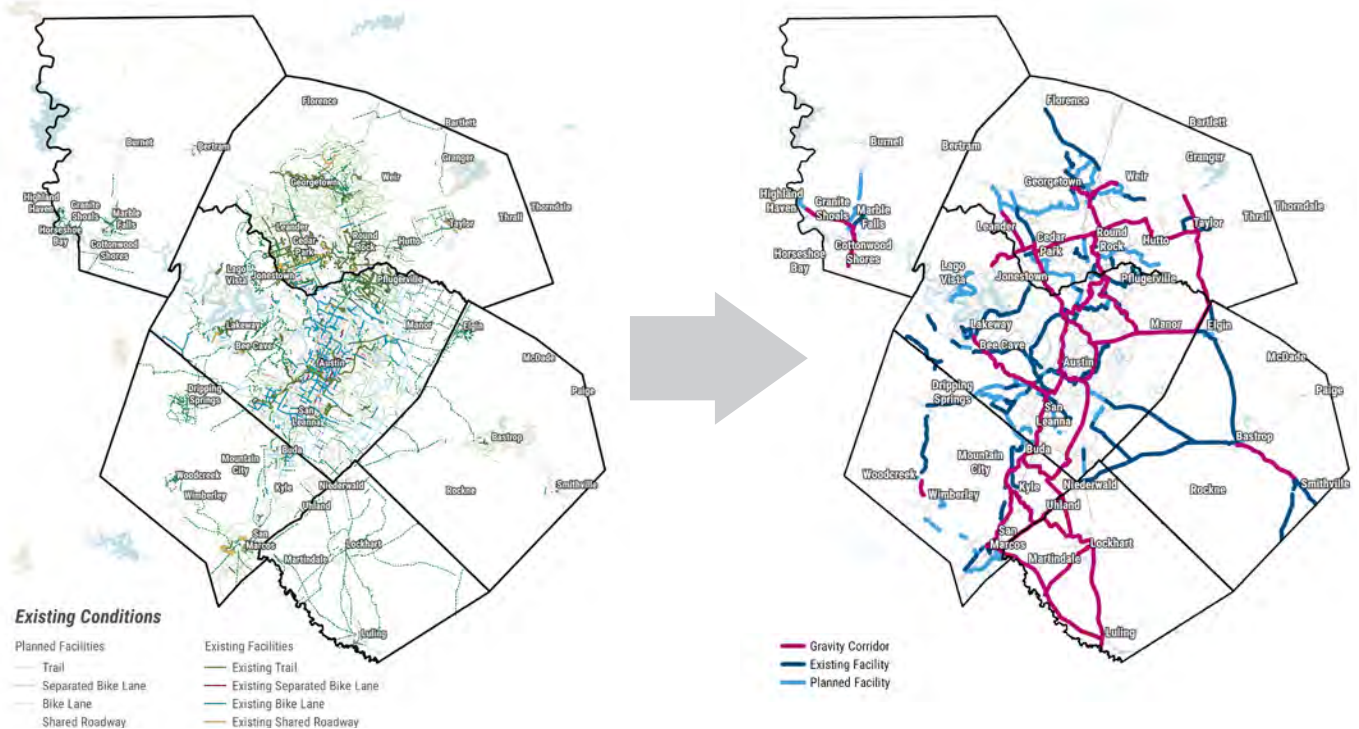


### Origin of Corridors

The priority network routes came from a variety of sources, including the gravity analysis, existing facilities, planned facilities, bike/ped needs identified by local officials, CAMPO-identified barriers, WikiMap feedback, and additional regional connections to complete the network.

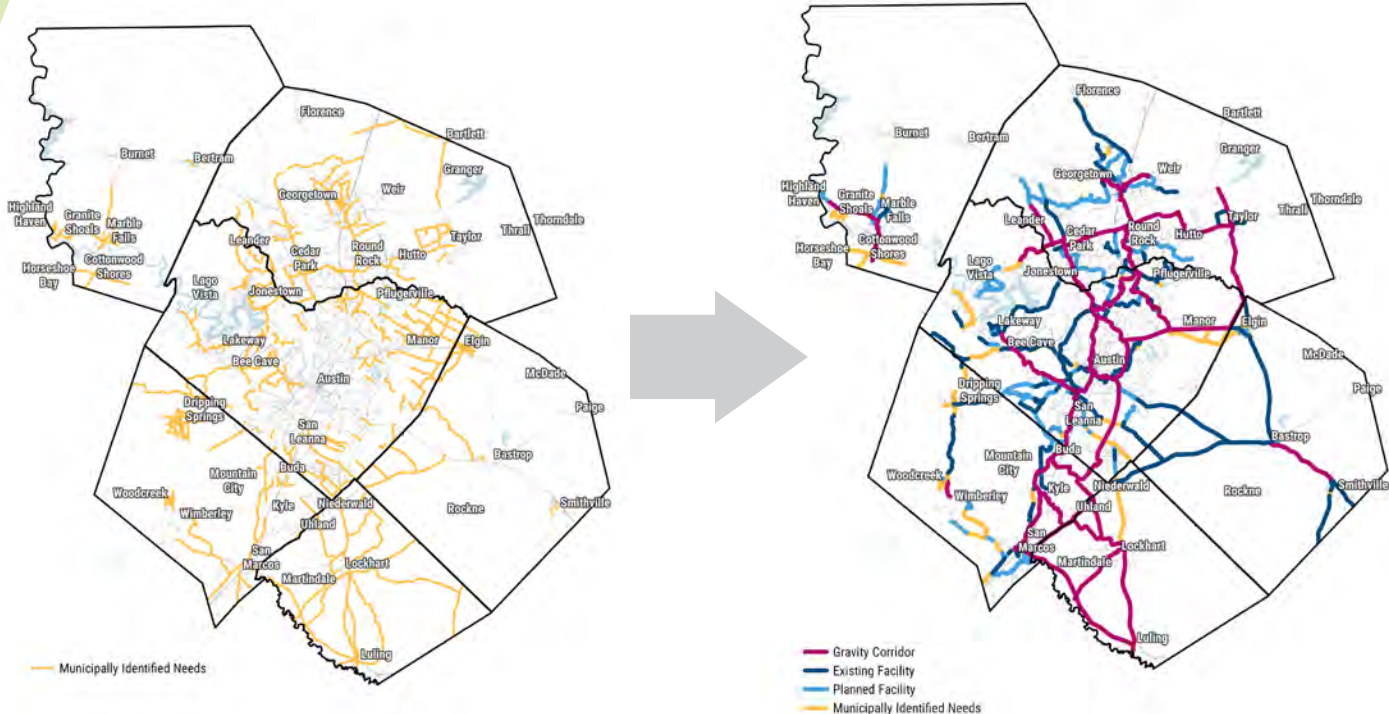


**Gravity Analysis** – The core links in the regional network come from the gravity analysis, which takes into account the demand for bicycling in those locations and distance between communities.

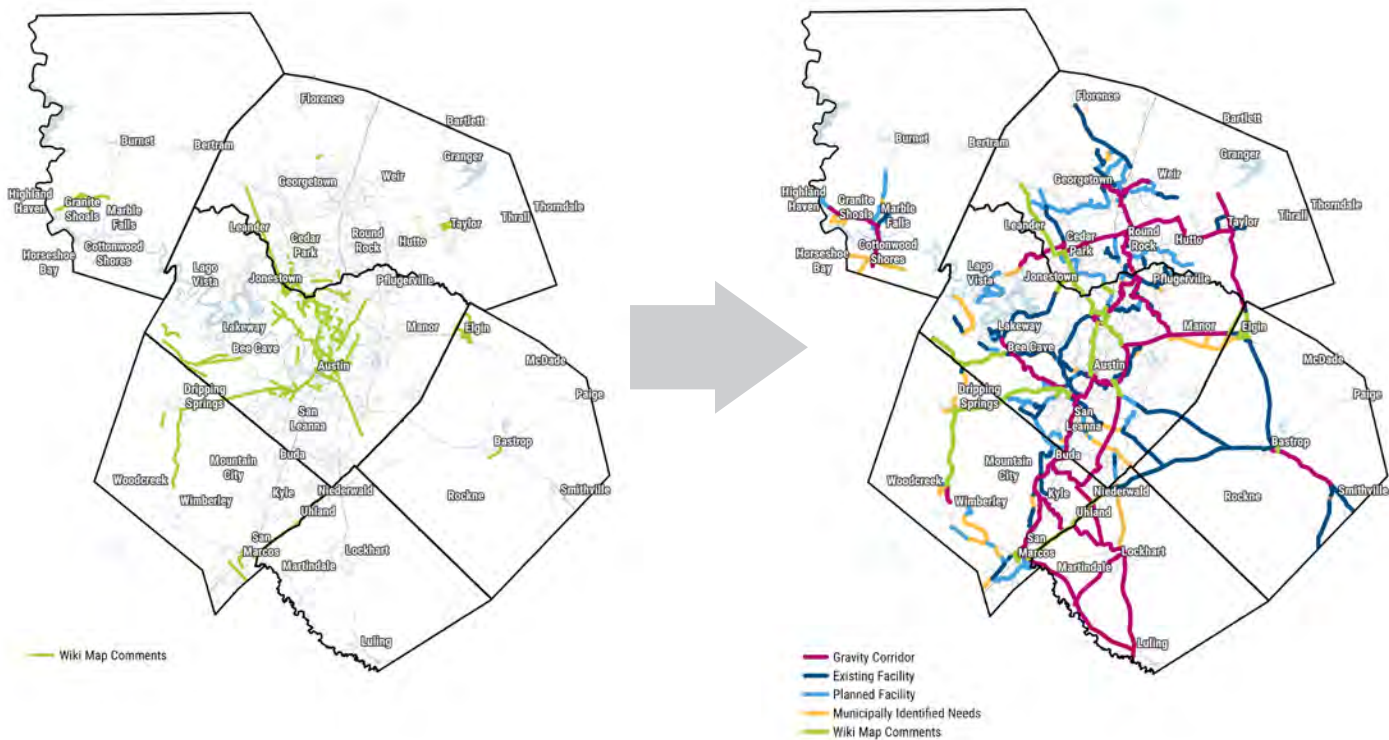


**Existing and Planned Facilities** – The regional network follows along corridors with existing bicycle facilities whenever possible and along routes with planned facilities when possible.

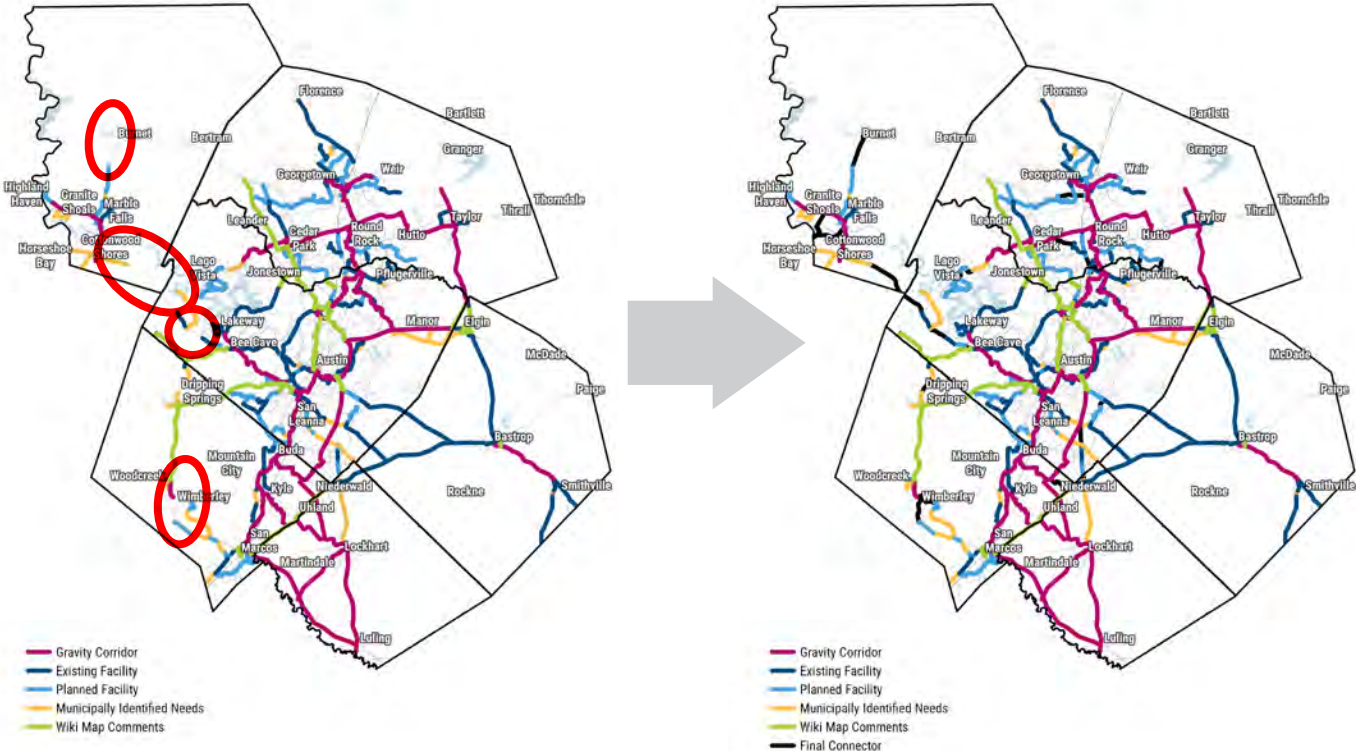




**Locally Identified Needs** – Many important segments in the network came directly from public input and from local government charrette comments.



**WikiMap Comments** – Members of the public identified bicycle and pedestrian needs using the project WikiMap. Several of those routes incorporated into the regional priority network.



**Additional Network Gaps** – Remaining gaps in the network were identified and completed with Final Connector routes.



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# CHAPTER 3

## EXISTING CONDITIONS

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This chapter provides an overview of existing conditions and needs in the CAMPO region and will serve as the basis for the key recommendations of the CAMPO 2045 Regional Active Transportation Plan. This analysis was based on a review of existing plans and policies, an assessment of existing and planned network facilities, and current transportation, safety, and demographic data. The following pages provide an assessment of current needs related to transportation choices, demand for active transportation, and gaps in the existing network.





# EXISTING CONDITIONS

This section contains a summary of the review of the existing policies, plans, and programs related to active transportation in the region, a discussion of the diverse populations residing in different parts of the region, and a review of the existing bicycle and walking facilities.

## EXISTING AND PLANNED FACILITIES

### Summary

There are estimated to be more than 16,000 miles of road in the CAMPO region. According to GIS records compiled during the inventory process, there are approximately 2,000 miles of sidewalk in the six county CAMPO region. While some areas of the region have fairly widespread sidewalk coverage, several jurisdictions have few sidewalks, sometimes only on the main commercial streets. There are opportunities to systematically improve sidewalk connections in the region.

There are approximately 1,300 miles of existing bicycle facilities and 1,759 miles of planned bicycle facilities. Approximately 141 miles of existing facilities have planned upgraded facilities. Note that the existence of a facility may not correspond to comfortable bicycling conditions. Bicycle facilities that do not provide physical separation from motor vehicles sometimes exist next to high speed and high-traffic-volume roadways, and may not be considered comfortable or safe for many potential bicyclists. (See Level of Comfort Analysis.)



### Methodology

A series of existing conditions network maps and data tables were developed by compiling sidewalk, bicycle, and trail network data from jurisdictions and datasets throughout the region. The existing and planned facilities were reviewed by CAMPO and local municipal staff during a series of mini-charrettes. CAMPO staff and the staff of local municipalities drew routes on aerial maps where there is demand for new or improved walking and bicycling infrastructure. The mileage was calculated in GIS software and is summarized in the tables below.

For this analysis, the various types of bicycle facilities in the region were grouped into five categories:

1. Bike lanes and dedicated on-street bicycle facilities,
2. Separated bike lanes,
3. Shared use paths and trails,
4. Shared lanes, sharrows, bicycle boulevards, and shoulders, and
5. Unpaved trails.

### Analysis

Table 1 summarizes the existing and planned mileage of pedestrian and bicycle facilities by county. Sidewalks are most common in the urbanized areas of the region, with Travis County and Williamson County combined accounting for 74 percent of the region's sidewalks. See the table of existing and planned sidewalks for the mileage in each county.

The most common bicycle facility category in the region is Shared Lanes/Sharrows/Bike Boulevard/Shoulder with 472 miles, followed by Shared Path/Trail with 440 miles, and Bike Lane/Dedicated On-Street Facilities with 307 miles. There are also 72 miles of Unpaved Trails and 8 miles of Separated Bike Lanes.



### Bastrop County

Bastrop County has 126 existing miles, 41 planned miles of bicycle facility, and 23 miles of existing and planned sidewalks. The existing bicycle facilities are primarily shoulders on the major roadways in the county, Routes 71, 21, 95, and 304. An example of a shared use path is along Old Austin Highway in Bastrop. There were several bicycle routes identified as needed in Elgin during the municipal meetings.

### Burnet County

Burnet County currently has the fewest miles of sidewalk and existing bicycle facilities, but it has 88 miles of planned bicycle facilities, which is more than two other counties. Shoulders are planned for several of the larger routes in the county. Several routes were identified during local municipal meetings for Granite Shoals and Marble Falls.

### Caldwell County

Caldwell County has 34 miles of sidewalk with 49 planned. Most of its 8 miles of bicycle facilities are paved shoulders, for example, on Silent Valley Road in Lockhart. The County has 2.9 miles of shared use path planned, in addition to its existing 0.75 mile.

### Hays County

Hays County has the third most miles of sidewalk, after Travis and Williamson Counties. There are 99 existing and 161 planned miles of bicycle facility. Most of the existing bicycle facilities (68 miles) are paved shoulders, the County also has shared use paths, bike lanes, and unpaved trails. Several new desired routes were identified for Buda during the municipal meetings.

### Travis County

Travis County has 859 miles of sidewalk, the most for any county in the region. Travis County also has the largest variety of bicycle facility types. It is the only county in the region with separated bike lanes. It has the most miles of bike lanes, and the second most miles of shared use paths and shoulders/shared lanes/bicycle boulevards, after Williamson County.

### Williamson County

Williamson County has 677 miles and 27 miles of existing and planned sidewalks, respectively. Williamson County has 400 miles of existing bicycle facilities and 615 miles of planned bicycle facilities, second in both only to Travis County. Williamson County, though, has slightly more miles of shared use path and shoulders/shared lanes/bicycle boulevards than Travis County. Several communities throughout the county identified new needs for bicycling facilities.

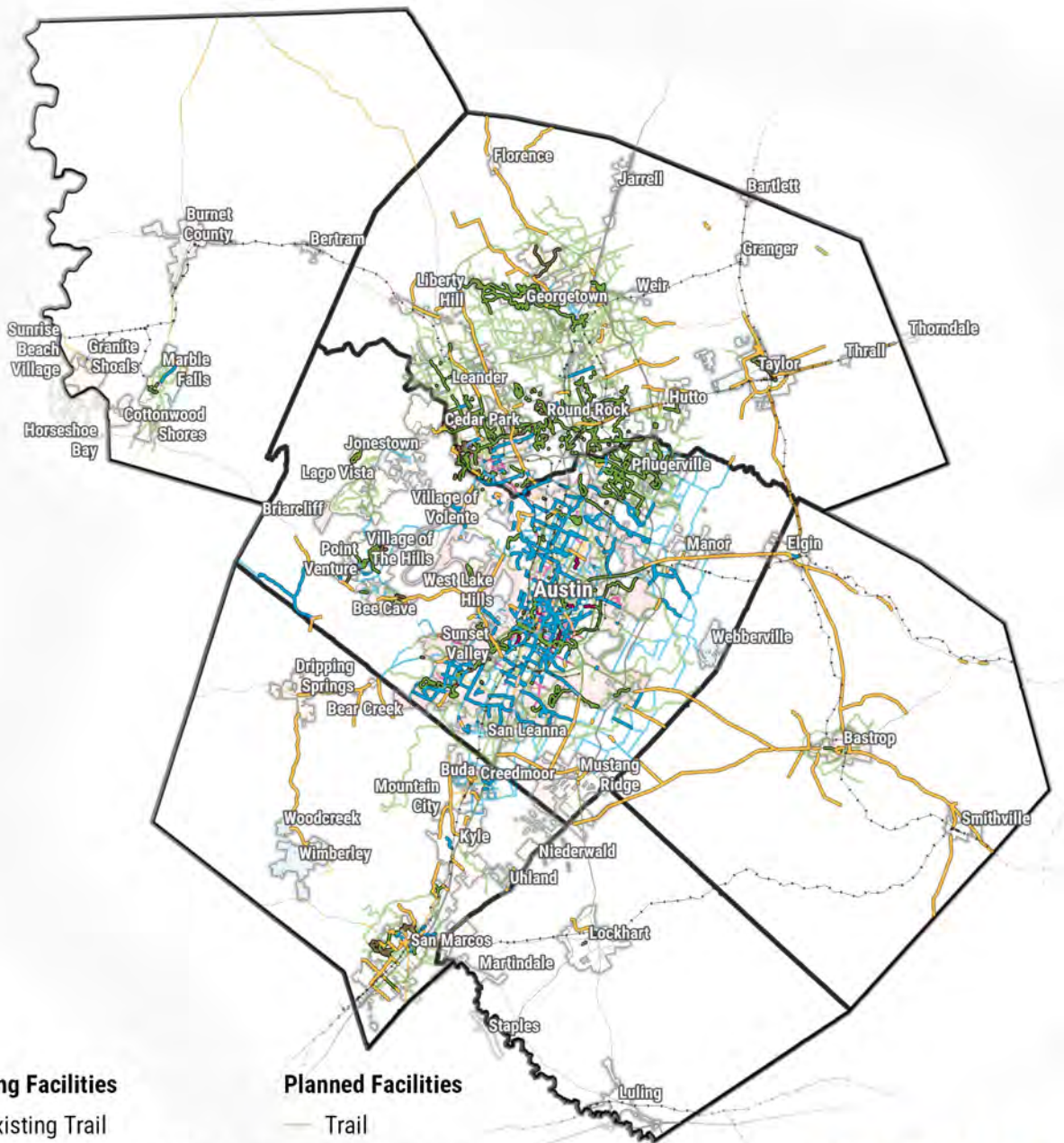
**Table 2: Existing and Planned Bicycle Facilities**

	Existing Miles	Planned and Proposed Miles	Total Miles
<b>Bastrop</b>	126	117	243
Bike Lane / Dedicated On-Street	<1	0	<1
Share Path / Trail	2	41	43
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	104	0	104
Sidewalks	20	3	23
Bicycle/pedestrian needs identified by local governments	N/A	73	73
<b>Burnet</b>	10	165	175
Bike Lane / Dedicated On-Street	2	0	2
Share Path / Trail	1	42	43
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	0	45	45
Sidewalks	7	3	10
Bicycle/pedestrian needs identified by local governments	N/A	75	75
<b>Caldwell</b>	8	6	14
Share Path / Trail	1	3	4
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	7	3	10
Sidewalks	34	49	83
Bicycle/pedestrian needs identified by local governments	N/A	153	153
<b>Hays</b>	484	335	819
Bike Lane / Dedicated On-Street	7	40	47
Share Path / Trail	11	96	107
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	63	25	88
Unpaved Trail	18	0	18
Sidewalks	385	0	385
Bicycle/pedestrian needs identified by local governments	N/A	174	174
<b>Travis</b>	1,490	1,417	2,907
Bike Lane / Dedicated On-Street	275	357	632
Separated Bike Lane	8	53	61
Share Path / Trail	233	532	765
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	148	47	195
Unpaved Trail	18	2	20
Sidewalks	859	6	865
Bicycle/pedestrian needs identified by local governments	N/A	420	420
<b>Williamson</b>	1,073	868	1,941
Bike Lane / Dedicated On-Street	23	14	37
Separated Bike Lane	0	8	8
Share Path / Trail	193	590	783
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	149	2	151
Unpaved Trail	35	<1	36
Sidewalks	677	27	704
Bicycle/pedestrian needs identified by local governments	N/A	226	226
<b>Total Existing Facility Miles</b>	<b>3,225</b>	<b>3,109</b>	<b>6,334</b>
<b>Miles Covered by Existing or Planned Bicycle Facility</b>			<b>3,057*</b>

\*Not double counting facilities planned where there are existing facilities. Figures rounded to nearest whole number, except where under 1.



# Unconstrained Network



**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway



## NEEDS ASSESSMENT

Once the existing conditions were gathered and reviewed, the project team undertook several forms of analysis to assess the degree to which the current network is serving the existing population.

## FACILITY COVERAGE ANALYSIS

### Summary

Transportation professionals use performance metrics to evaluate and prioritize past and future infrastructure investments. The CAMPO Regional Active Transportation Plan will include the development of performance metrics for the proposed active transportation network. Therefore, the project team developed statistics based on the coverage of the existing sidewalk and bicycle facility networks. These measures may be used to compare the amount of access provided by the current network to that of planned future networks.

### Methodology

Statistics were calculated based on the percent of segments of the population living within an eighth mile of any sidewalk segment or half a mile of any bicycle facility. Demographic data came from the 2014 U.S. Census Bureau American Community Survey. The calculations were made in GIS.

### Analysis

#### *Sidewalk Coverage*

Forty percent of the population in the CAMPO region lives within an eighth of a mile of at least one segment of sidewalk. A higher share of people of color (45%) live near sidewalks than Caucasians (36%). This may be attributable to differences in distribution across urban, suburban, or rural areas by race.

Access to sidewalks is important for people who do not drive, choose not to drive, or for whom the cost of vehicle ownership and operations is a significant burden on the household budget. Thirty-six percent of school-age children in the CAMPO region live within an eighth of a mile of a sidewalk, meaning that well over half (64%) do not. This has implications for pedestrian safety, transportation options for accessing schools, and childhood obesity. Fewer than half of seniors (aged 60 and up) in the region (32%) live within an eighth of a mile of a segment of sidewalk. Fifty-two percent of households living in poverty and 58 percent of housing units without a car are near a

sidewalk. This means that 48 percent of households in poverty and a 42 percent of housing units without a car lack convenient access to even one sidewalk.

The lack of sidewalks can impact other transportation modes and access to destinations. The project team heard, anecdotally, that bus stops were not placed in some locations due to the lack of sidewalks. In other places, bus stops were difficult or unsafe to access because of the lack of sidewalks. In surveys and the WikiMap tool, members of the public also requested sidewalk and trail improvements to schools and libraries.

***Quick Fact: Forty-eight percent of households in poverty and forty-two percent of households without a car do not have access to even one sidewalk within an eighth of a mile.***

#### *Sidewalk Condition*

A comprehensive analysis of sidewalk conditions was outside of the scope of the project, but public input and project team experience indicate that many of the existing sidewalks are in need of repair and maintenance. Many of the sidewalks in low income communities are in disrepair.

When asked what improvements to the walking environment “would you most like to see in your community,” 33 percent of respondents selected “better maintained sidewalks” as one of their top three. Survey comments about sidewalk conditions, included the following: “Improve existing sidewalks,” “We have “good trails, sidewalks are non-existent or abysmal in North Lamar,” we need “ramps onto existing sidewalks throughout the historic neighborhoods,” and we need “sidewalks not blocked by vegetation.” In addition for repairing sidewalk, other improvements were mentioned: “Wider, more pleasant sidewalks with street trees, benches, and a planted setback between the street and the sidewalk.”

Several WikiMap commenters noted locations where sidewalks are in disrepair. For example, one commenter noted “very poor sidewalk conditions, incomplete sidewalks.”

Overall, the region will benefit from a better connected and maintained network of sidewalks.



Sidewalk curb cut in disrepair at Lark Creek Drive and Gnarled Oak Cove in Austin

## Population Served by Existing Sidewalks Within 1/8 Mile

Percentage of the Population Served by Sidewalk Within an Eighth Mile



Percentage of Housing Units Served by Sidewalk Within an Eighth Mile



Percentage of the People of Color Served by Sidewalk Within an Eighth Mile



Percentage of Zero-Car Housing Units Served by Sidewalk Within an Eighth Mile



Percentage of the Caucasians Served by Sidewalk Within an Eighth Mile



Percentage of Total Households Served by Sidewalk Within an Eighth Mile



Percentage of the School-Aged Children Served by Sidewalk Within an Eighth Mile



Percentage of Total Households Served by Sidewalk Within an Eighth Mile



Percentage of Seniors Served by Sidewalk Within an Eighth Mile





### Bicycle Facility Coverage

For bicycling, the analysis uses a quarter-mile measure to determine access to a bicycle facility, since bicycle trips are longer than typical walking trips and local roads may often be used to get to bicycle facilities.

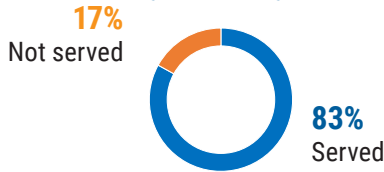
Bicycle commuters are the population most likely to live near a bicycle facility: 83 percent of regular bicycle commuters live within quarter mile of a bicycle facility. This suggests that access to a bicycle facility may influence one’s decision to bike to work and that bicycle commuters may choose to live in areas that already have bicycle facilities within a quarter mile. These areas tend to be the more densely developed areas in the region.

Nearly half of the region’s residents (49%) live within a quarter mile of a bicycle facility, including 51 percent of people of color and 48 percent of Caucasians.

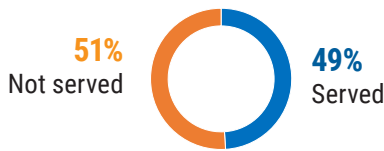
Among the populations who may be more likely to look for alternatives to driving, large portions do not live within a quarter mile of a bicycle facility. 54 percent of school age children and 58 percent of seniors live further than a quarter mile from a bicycle facility. Thirty-six percent of zero-car housing units and a 42 percent of households in poverty are located more than a quarter mile from a bicycle facility.

Population Served by an Existing Bicycle Facility within 1/4 Mile

**Percentage of Bike Commuters Served by an Existing Bicycle Facility within 1/4 mile**



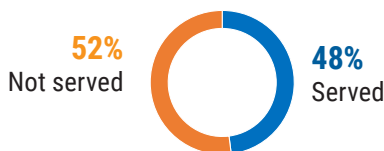
**Percentage of Total Population Served by an Existing Bicycle Facility within 1/4 mile**



**Percentage of People of Color Served by an Existing Bicycle Facility within 1/4 mile**



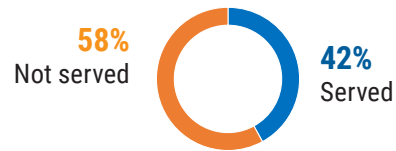
**Percentage of Caucasians Served by an Existing Bicycle Facility within 1/4 mile**



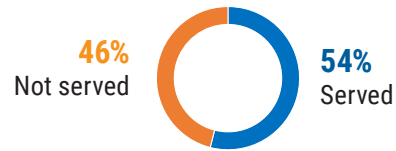
**Percentage of School-Aged Children Served by an Existing Bicycle Facility within 1/4 mile**



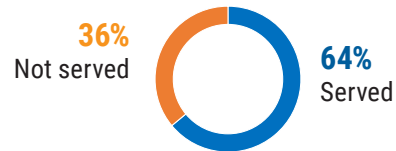
**Percentage of Seniors Served by an Existing Bicycle Facility within 1/4 mile**



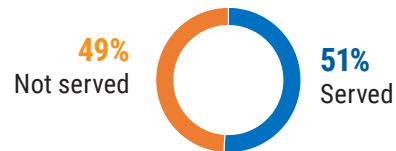
**Percentage of Housing Units Served by an Existing Bicycle Facility within 1/4 mile**



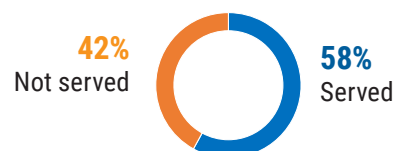
**Percentage of Zero-Car Households Served by an Existing Bicycle Facility within 1/4 mile**



**Percentage of Total Households Served by an Existing Bicycle Facility within 1/4 mile**



**Percentage of Households in Poverty Served by an Existing Bicycle Facility within 1/4 mile**



## CRASH ANALYSIS

### Summary

Improving safety is one of the key goals of the CAMPO Regional Active Transportation Plan. Crashes cause trauma to the people involved and the fear of being involved in a crash often dissuades people from bicycling and walking. For the period of time from 2011 to 2014, there were 2,710 crashes involving pedestrians or bicyclists in the region, including 131 fatalities. The heat map on the next page shows the locations of these crashes. These data are also included in the facility demand analysis below.

### Methodology

Data for TxDOT from between 2011 and 2014, the most recent years available, were located on the accompanying map. Statistics based on mode, crash severity, and year were produced and are included in the tables below.

### Analysis

During the years reviewed, there were 1,108 reported crashes involving bicycles and 1,372 crashes involving pedestrians. Two-thirds of the crashes were non-incapacitating injuries, but nearly a quarter (570) were incapacitating or fatal. See Bicycle and pedestrian crashes, by mode and severity table.

It appears the rate of crashes is declining. There were 787 bicycle or pedestrian crashes recorded in 2011 and 456 in 2014, a reduction of 42 percent.

In many cases, the crash hot spots are located in cities and towns with larger populations and likely correspond with higher levels of bicycling. However, not all towns appear on the map as hot spots and some crash locations appear outside of urbanized areas.

In addition, CAMPO worked with local government officials to identify intersections (see inset map on next page for example) that are perceived to be dangerous or stressful to cross.

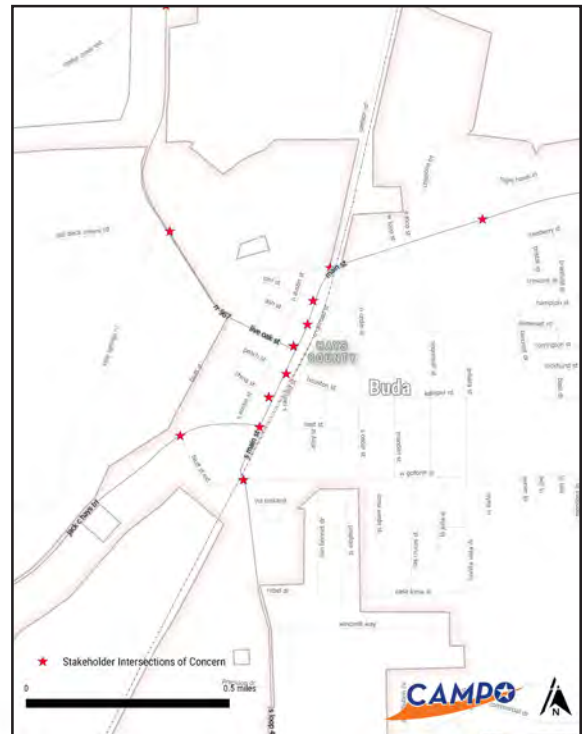
**Quick Fact: Despite declining numbers, there were still 456 crashes involving pedestrians and bicycles in 2014 (the most recent year available).**

**Table 3: Bicycle and pedestrian crashes, by mode and severity**

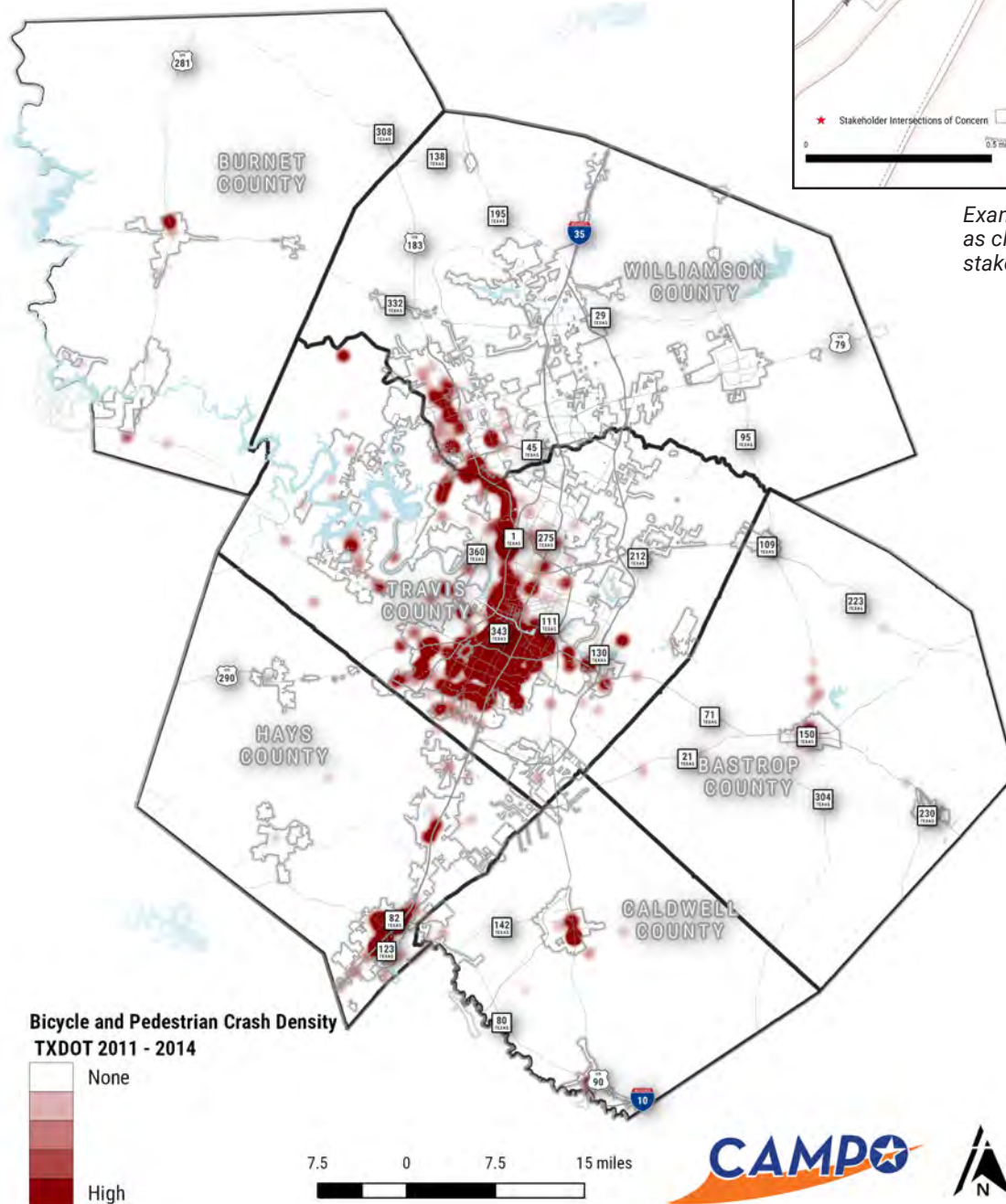
2011 - 2014	BICYCLE	PEDESTRIAN	BICYCLE + PEDESTRIAN
FATALITIES	15	116	131
INCAPACITATING INJURIES	155	284	439
NON-INCAPACITATING INJURIES	813	864	1677
POSSIBLE INJURY/NO INJURY/ UNKNOWN	125	85	231
CRASHES (ALL SEVERITIES)	1108	1372	2,478

**Table 4: Bicycle and pedestrian crashes, all severities, by mode and year**

2011 - 2014	2011	2012	2013	2014	TOTAL
BICYCLE CRASHES	369	260	270	209	1,108
PEDESTRIAN CRASHES	418	347	360	247	1,372
BICYCLE + PEDESTRIAN CRASHES	787	607	630	456	2,710



Map of bicycle and pedestrian crash hot spots



Example of intersections identified as challenging by CAMPO and plan stakeholders.



## DEMAND ANALYSIS

### Summary

The CAMPO region is diverse and includes a broad range of environments, including dense urban, developed suburban, and rural areas. The demand and need for walking and bicycling infrastructure varies significantly across these environments. The demand analysis summarized below uses a data-driven approach to identify the areas of the region with the highest demand for active transportation facilities and the greatest potential to achieve the plan goals: safety, accessibility, functionality, equity, everyday use, quality of life, and regional coordination and connectivity.

### Methodology

To illustrate the areas of the region with the greatest need or demand for bicycling and walking facilities, a heat map was created based on a number of factors such as employment and population density, trip attractors, crashes, demographics, etc. The brighter the colors on the map (yellow and orange), the greater the estimated need and demand for facilities.

Each factor was given a weight correlated to its relative estimated significance for driving demand for walking and bicycling. The weighting was based on standard industry practice and refined by the project team. The table below shows the factor, the factor's weight in the heat map, the data source, and a brief description of the data. The sum of all of the weight scores exceeds 100; therefore the weight was converted to a percentage and applied to each category. For example, a factor with a weight of 20 made up 16 percent of the total weighted score.

***Quick Fact: Estimated demand for walking and bicycling is not spread evenly across the region or across each county. There are hot-spots of demand in each county based on population and employment density, a history of pedestrian and bicycle crashes, destinations, and demographic factors.***

### Analysis

Overall, the demand for walking and bicycling facilities is concentrated in the denser parts of the region, such as the City of Austin and the municipalities in each county. This is expected since population and employment density are heavily weighted factors in the demand analysis. In addition, walking and bicycling are most commonly used for shorter trips and their concentrations are expected in towns and cities where distances between destinations are shorter. Bright spots also appear on the demand map at many of the same locations as they do on the crash map. This reflects the importance of crashes in the demand analysis (highly weighted) as well as the likely correspondence of higher crash concentrations in the same area as higher concentrations of biking and walking activity in the region.

#### Bastrop County

The demand for bicycling and walking is somewhat more spread out in Bastrop County, compared to the other rural counties, with smaller areas of very low demand and more area covered by moderate or somewhat low demand. Demand is greatest in Bastrop, Elgin, and Smithville. The highest demand locations for bicycle and pedestrian facilities in Smithville correspond to the locations of crashes on the crash heat map. Moderate demand appears on either side of FM 812 in the western corner of the county.

#### Burnet County

The highest demand appears in Marble Falls, Granite Shoals, Highland Haven, and central Burnet with moderate demand in the areas to the southeast and southwest of Burnet. Moderate demand appears on the Route 281 corridor between Burnet and Marble Falls. Marble Falls contains a concentration of zero-car households. There is also moderate demand in Bertram.

#### Caldwell County

The demand is concentrated in Lockhart and Luling. The location of the demand in Lockhart corresponds to the location of the recent crashes. Additional pockets of demand appear in the western part of the county around Reedville and Martindale where there is a concentration of school-age children.

## Hays County

The demand in Hays County is concentrated along the I-35 corridor, especially in San Marcos, Kyle, and the eastern corner of the county. The communities in the western part of the county, Dripping Springs and Wimberley, showed relatively low levels of demand.

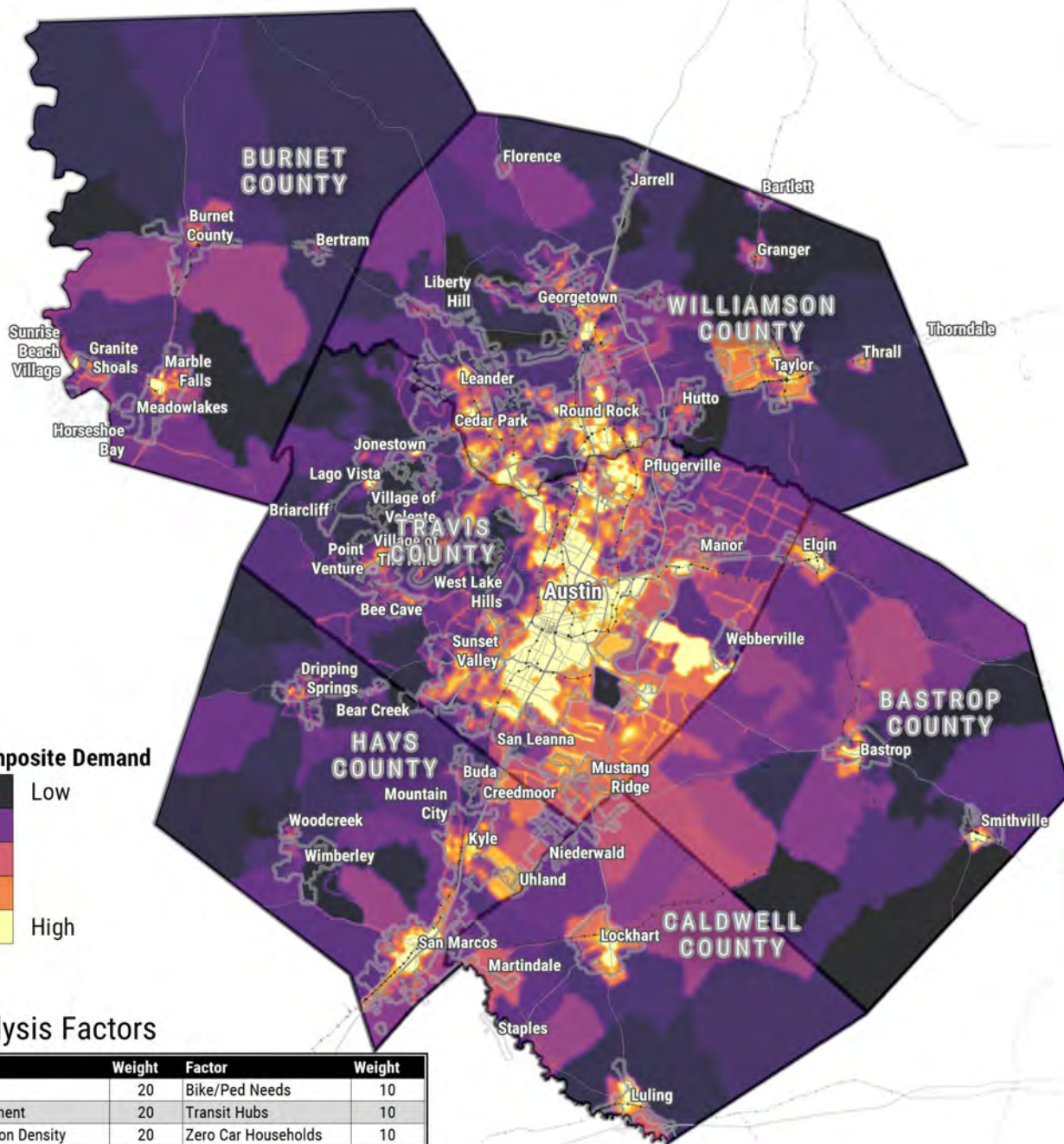
## Travis County

Travis County shows the greatest overall demand for walking and bicycling in the region due to high concentrations of employment, population, and crashes. The City of Austin, the Near Northwest Corridor around US 183 North, and the corridors along routes Loop 1, Loop, SH 130, Lamar Blvd, and Congress Avenue all show significant demand, as do Pflugerville to the north and Mustang Ridge to the south. The dark spot, showing no demand, to the south and east of downtown is the airport. The western part of the county shows less demand than the central and eastern parts, with points of demand in Lago Vista (in part due to transit demand), Jonestown, and Bee Cave.

## Williamson County

Williamson County has several areas of high demand for walking and bicycling, including Cedar Park, Leander, Round Rock, Georgetown, Taylor, Thrall, and Granger. Demand is generally low outside of town centers and the areas bordering Travis County. Transit hubs in Cedar Park and Leander contribute to demand in those areas.



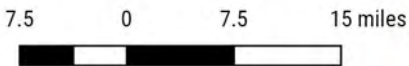


**Composite Demand**



**Analysis Factors**

Factor	Weight	Factor	Weight
Crashes	20	Bike/Ped Needs	10
Employment	20	Transit Hubs	10
Population Density	20	Zero Car Households	10
Attractors	10	Bike Modeshare	5
Schools	-	Percent Low Income Households	5
Universities	-	Percent People of Color (non-white)	5
Parks	-	Percent School-Aged Children	5
Courthouses	-	Percent Senior Citizens	5
Other POI	-		





## LEVEL OF BICYCLING COMFORT ANALYSIS

### Summary

A Level of Bicycle Comfort Analysis (often called Level of Traffic Stress) uses roadway factors to estimate how comfortable an average person would feel riding a bicycle in a particular location. High speeds, high volumes of traffic, and wide roads with multiple traffic lanes are assumed to make bicycling less attractive in this analysis. The presence of a trail or a bicycle lane that provides physical separation from traffic are assumed to make bicycling more appealing.

The accompanying map shows dark red lines on roads where bicycling is restricted. The orange lines show where bicycling is likely to be stressful. The green lines show areas where bicycling is likely to be fairly comfortable. These green lines are further broken down by shades: Light green is somewhat comfortable and dark green is more comfortable.

**Quick Fact: There are an estimated 3,500 miles of high stress roads, 7,700 miles of somewhat comfortable roads, and 5,100 miles of comfortable roads in the CAMPO region. There are about 300 miles of highway in the region, where bicycling is not permitted.**

### Methodology

The Level of Bicycling Comfort Analysis is modified from the methodology detailed in the 2012 Low-Stress Bicycling and Network Connectivity report from the Mineta Transportation Institute. Level of Traffic Stress (LTS) is scored from 1 to 4. LTS 1 (dark green) is for roadways that are likely to be comfortable for children to bike either alone or with supervision. LTS 2 (light green) is for roads that are comfortable for adults who may be hesitant to bicycle. LTS 3 (orange) is for roads that are uncomfortable for all but the most confident regular bicyclists and those bicyclists unbothered by sharing travel lanes with high-speed traffic. LTS 4 (red) indicates roadways where bicyclists are not allowed.

The following data were used in the CAMPO region Level of Comfort Analysis:

- Functional Class
- Number of Travel Lanes
- Roadway Width
- Speed Limit
- Presence Bicycle Facility, by Type of Facility

An important aspect of the CAMPO Level of Comfort methodology to note: Roads with average daily traffic (ADT) data that saw fewer than 1000 cars per day were scored LTS 1. ADT data coverage for the CAMPO region is not widespread. Some residential areas have ADT data while others, even immediately adjacent, do not. In such cases, the methodology scores some roadways LTS 1 (based on ADT) and others LTS 2 when they might have been scored the same had the traffic data been available for both.

Also note that, according to this methodology, the presence of a roadway shoulder does not make a high speed, high volume roadway comfortable for bicycling.

### Analysis

In general, the most comfortable roadways in the region are low-volume rural roads and neighborhood streets both urban and suburban areas. The major roads in the region are generally high stress. Attention should be paid to improving comfort along connections between areas with low-stress roads and along major roads and routes to destinations.

#### Bastrop County

The primary roadways that connect communities in the County – SH 95, SH 21, SH 71, CR 109, SH Loop 150, SH Loop 223, US Route 290, SH 304, and FM 1100 – are considered high stress for bicycling. There are low-volume neighborhood and rural roadways, especially outside of Bastrop and Elgin, and medium-stress roads in Smithville, but in general traveling on major routes with high traffic stress is required to access most destinations.

#### Burnet County

The major roadways in the county are not considered comfortable for the average person to bicycle on. Route 281, including the segment between Burnet and Marble Falls, and Routes 29, 71, 183, and 308, are all high stress. Some of the low-traffic county roads are estimated to be comfortable, but generally the connectivity between low stress roads is low.

### Caldwell County

The major roads and roadway connections in the county – 20 (State Park Road), 86, 90, 130, 142, 183, and county roads 1322, 1386, 2001, and 2720 – are all considered high stress for bicycling. The neighborhood streets in Lockhart and Luling are more comfortable, but comfortable connections to destinations are limited.

### Hays County

Most of the major roadway connections in the county – such as Hwy 290 and RM 12 – are considered high stress, even when these roadways pass through the towns of Dripping Springs and Wimberly. Bicycles are restricted on some of the important roadways in the County, including I-35. There are some low-volume roads, but connectivity is extremely limited.

### Travis County

The streets in downtown Austin are generally considered high stress, according to the methodology, though there are several separated bike lanes and shared use paths in and around downtown that are rated as low stress. Outside of downtown, many arterial streets are considered high stress. There are pockets of low-stress neighborhood roads in communities such as Pflugerville, though the limited access highways act as barriers.

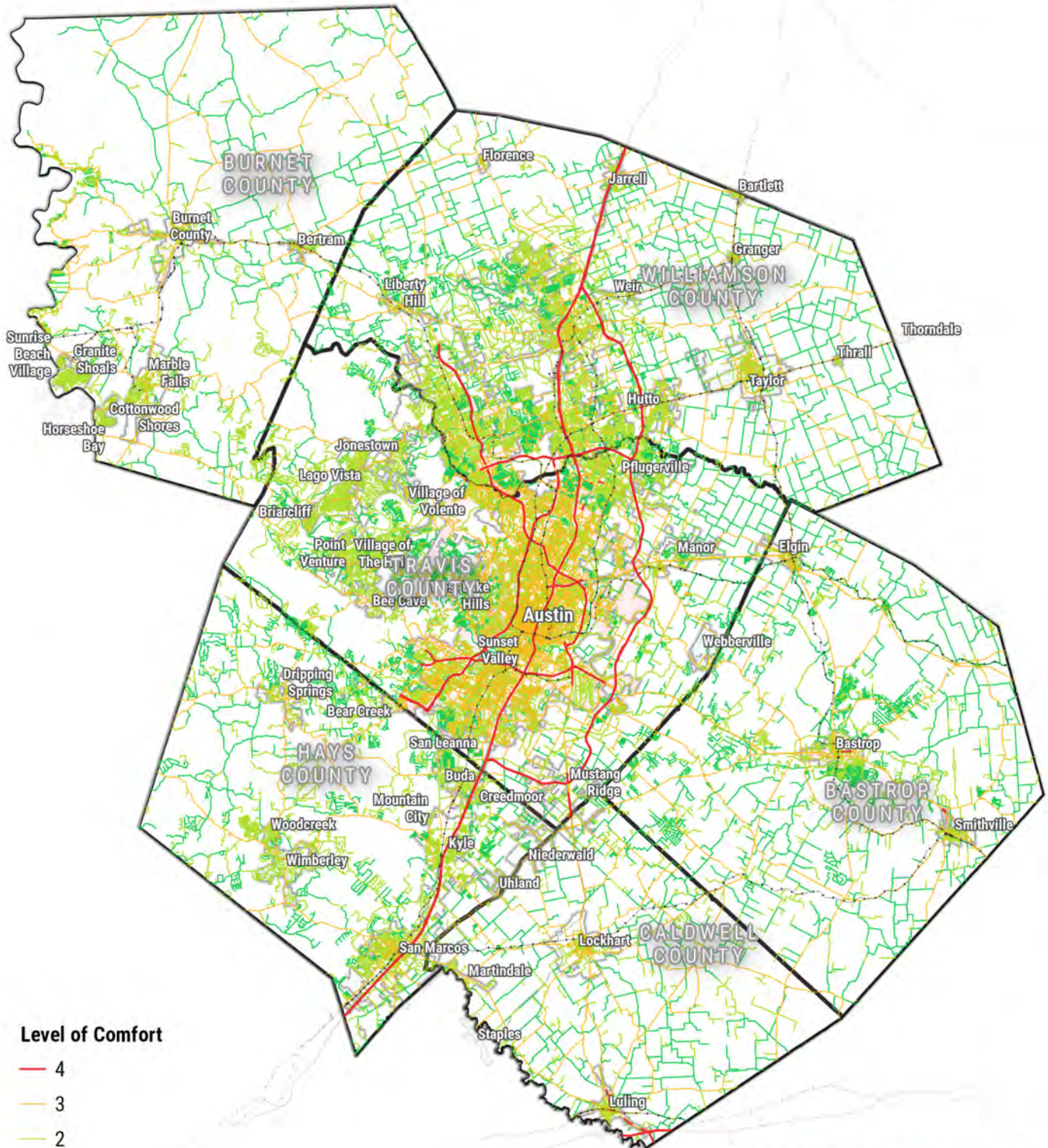
### Williamson County

The County has concentrated pockets of comfortable neighborhood streets in Cedar Park, Round Rock, and Georgetown. However, these streets generally require travel along high-stress roads in order to travel from the neighborhood to reach destinations. Similarly, there are low-volume county roads, but they also generally filter onto higher-stress roads.





# CAMPO Region



**Level of Comfort**

- 4
- 3
- 2
- 1

7.5 0 7.5 15 miles





## OVERALL GAPS ANALYSIS SUMMARY

### Summary

There are estimated to be more than 16,000 miles of road in the CAMPO region, compared to 2,000 miles of sidewalk and 1,200 miles of bicycle facilities (including roadway shoulders). Therefore, there are significant portions of the CAMPO region that lack accommodations for walking and bicycling. While some of these roads carry relatively low volumes of traffic at relatively low speeds, many other corridors in the region present challenging conditions for walking and bicycling.

The map above shows the existing and planned facilities layered over the active transportation demand map. The map below shows several of the corridors and nodes where gaps in the network have been identified.

Due to the large number of gaps in the active transportation network in the region, this analysis focuses on corridors and nodes that were identified during meetings with members of the public and agency staff and through the needs analysis. The nodes represent areas where officials from municipal governments and the general public identified local needs for sidewalks, bicycle facilities, and shared use paths. The corridors identified are areas between communities where there are currently no comfortable bicycling routes – or where gaps between existing trails exist. The gaps and barriers identified below are not exhaustive; there are many other corridors that could have been identified.

**Quick Fact: There are over 16,000 miles of road in the CAMPO region and just 2,000 miles of sidewalk and 1,200 miles of bicycle facilities, resulting in significant gaps in the active transportation network.**

### Methodology

Most roadways connecting communities in the regions were considered high stress for bicycling, providing many potential routes to identify as gaps or barriers. The gaps in the network were identified based on local municipal government input, public meeting feedback, WikiMap comments, locations identified in the demand analysis, and the Level of Bicycling Comfort analysis. Gaps are identified in green on the map on page 3-19.

### Analysis

Important sidewalk gaps exist in most of the municipalities in the region. The regional bicycling network includes routes that are challenging for bicycling between communities as well as routes looping around and connecting into the City of Austin.

#### Bastrop County

Community members and officials in Elgin, Bastrop, and Smithville have identified locations of desired sidewalks, shared used paths, and bicycle facilities. The corridors connecting those communities to each other and to the City of Austin are currently challenging for the average person to bike. From Bastrop, there are currently gaps to the north to Elgin, southeast to Smithville, northwest to Austin, and west and southwest to Lockhart and San Marcos. In addition, the routes from Bastrop to Paige, Paige to Smithville, Paige to McDade, and McDade to Camp Swift are currently gaps in the bicycling network.

#### Burnet County

Burnet, Granite Shoals, Marble Falls, and Bertram were identified as places with specific needs for sidewalks, shared use paths, and bicycle facilities. The lack of facilities along the following routes create barriers to a connected network - Granite Falls to Marble Falls and Burnet, as well as the route from Burnet to Williamson County, via Bertram, and the route from Marble Falls to Bee Cave. The routes from Burnet to Bertram and Burnet to Inks Lake State Park are currently gaps in the bicycling network.

## Caldwell County

Community members and officials in Lockhart and Luling identified locations of desired sidewalks, shared use paths, and bicycle facilities. Regional bicycle connections are missing from Luling north through Lockhart to Austin, and east-west across the county. Most of the state routes in Caldwell County are currently gaps in the bicycling network.

## Hays County

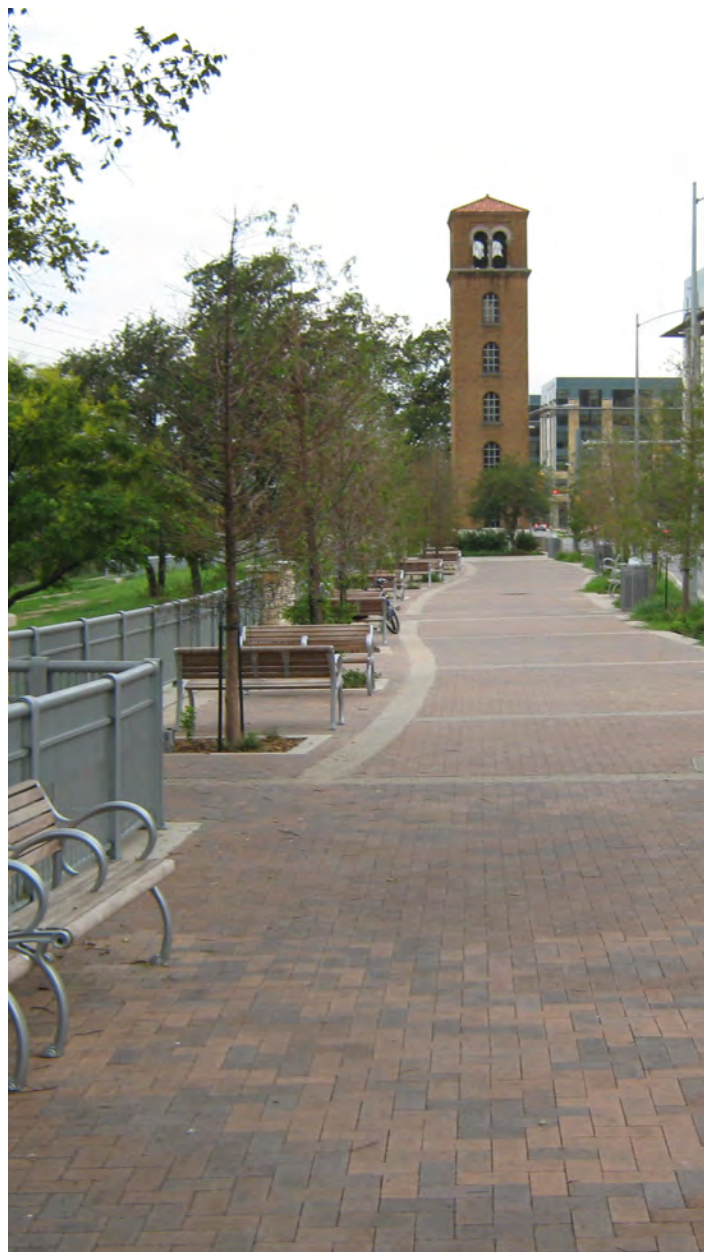
Hays County contains San Marcos, Buda, Wimberley and Dripping Springs, all areas where community members and officials identified active transportation needs. The I-35 corridor from San Marcos to Austin, via Kyle and Buda, was identified as an important gap in facilities. The lack of a northwestern route from San Marcos to Bee Cave, via Wimberley and Dripping Springs was also noted. Specific gaps in the bicycling network include the route west of Dripping Springs, west of Wimberley, and a loop in the southeast corner.

## Travis County

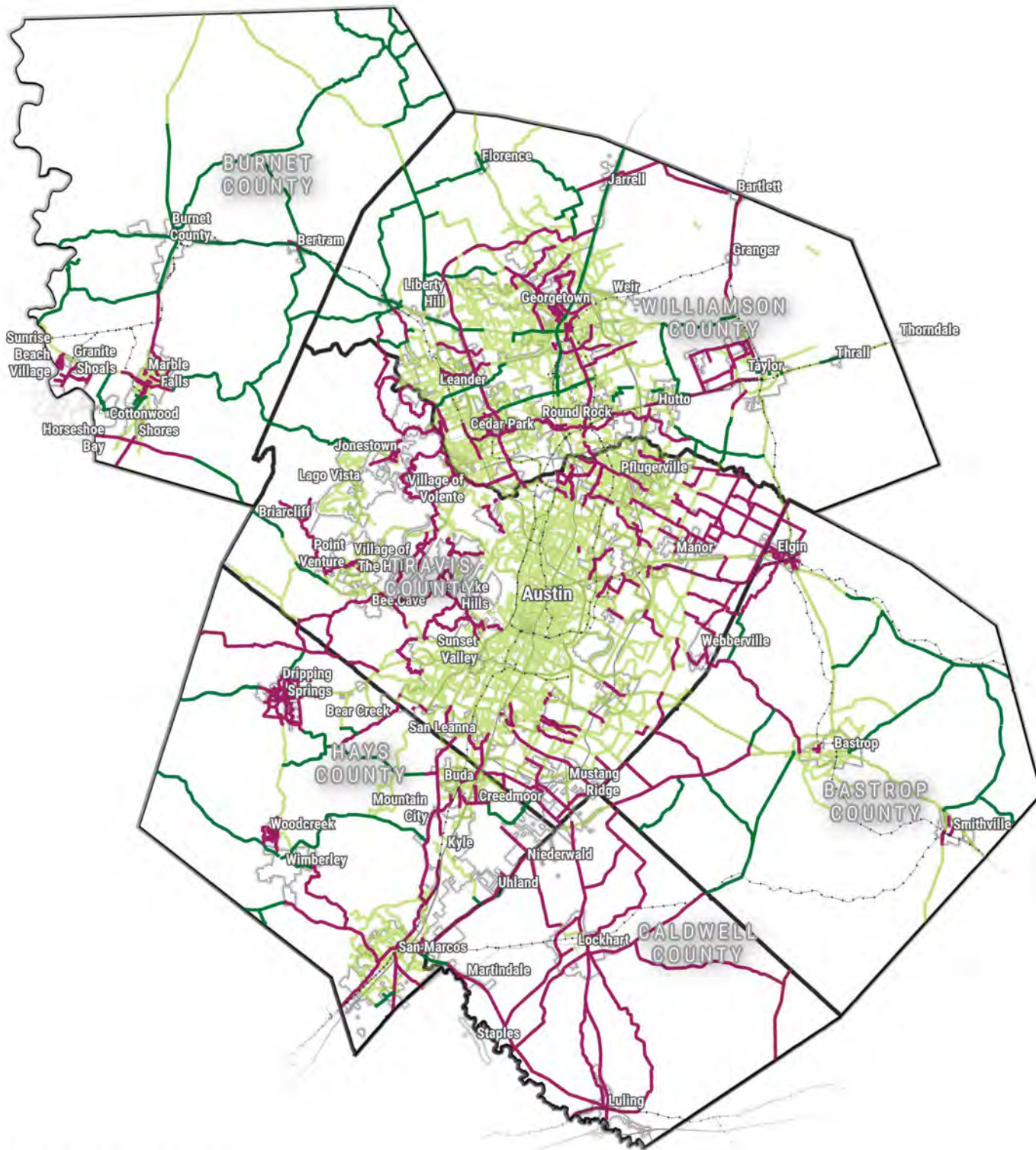
Travis County has the greatest number of sidewalks in the region. Gaps will need to be identified at the local level, especially in Austin. Some local gaps were identified in Bee Cave, Largo Vista and Pflugerville. In terms of gaps in the regional bicycling network, Travis County lacks some comfortable connections outward to communities outside of Austin and in surrounding counties, and along some significant corridors, such as along 183N.

## Williamson County

Community officials have identified active transportation needs in Cedar Park, Georgetown, Hutto, and Taylor. There is a fairly extensive network of planned trails connecting those communities. The east-west gaps identified on the map below indicate opportunities to connect the existing and planned trail network and to continue the shared use path along 183N up through Leander and up to Burnet County. Routes west and north of Liberty Hill are examples of bicycling network gaps.







## Gaps Analysis

- CAMPO Identified Gap
- Municipally Identified Need
- Existing and Planned Network

2 0 2 4 miles





# POLICY, PROGRAM AND CODE REVIEW

Successful implementation of the CAMPO Regional Active Transportation Plan extends beyond investment in publicly-funded active transportation projects. The creation of a sustainable region-wide bicycle and pedestrian network also requires local policies, practices, and initiatives that promote facility usage. The review contained in this section includes recommendations for how CAMPO-area communities may adjust local policies, codes, and programs to support active transportation infrastructure investments, and build bicycle and pedestrian-friendly environments.

## REVIEW PARAMETERS

This chapter presents the findings of the county-by-county policy, program, and code review. Each county summary provides an overview of how the local communities of a particular CAMPO-area county address bicycle and pedestrian mobility as a component of their land use and transportation policies and initiatives (see **Table 1**). The county summaries highlight the bicycle and/or pedestrian practices of one or more communities within each county that may be utilized by other CAMPO-area jurisdictions to encourage more walking and bicycling. Each spread also includes recommendations on how bicycle and pedestrian mobility may be enhanced locally or regionally.

The CAMPO-area contains a number of diverse communities. Not all findings from the bicycle and pedestrian policy review will be applicable to every community in a particular county, or throughout the region as a whole. The county-by-county policy, program, and code review has been prepared under the following assumptions and parameters:

- The bicycle and pedestrian policy review focuses on county-wide themes. Some findings and/or recommendations may not be applicable to individual communities.
- Not all studies, plans, reports, regulations, guidelines, and programs that were evaluated are referenced or listed. Many documents reviewed as part of the audit do not directly address the considerations presented in Table 1.
- Recommendations are broadly stated - recognizing the differing demographic and geographic characteristics of CAMPO-area communities. The necessity and form of implementation will vary on a community-by-community

**Table 1: Policy, Program, and Code Review Considerations**

ELEMENT	CONSIDERATION
<b>Accessibility</b>	Are local policies, guidelines, and regulations structured to ensure ADA accessibility?
<b>Connectivity</b>	Is the transportation system designed to provide for inter-connected street and trail networks as part of new development?
<b>Multi-modalism</b>	Do policies, guidelines, or regulations require the incorporation of bicycle/pedestrian facilities as an integral component of public transportation infrastructure?
<b>Safety</b>	Are there local bicycle/pedestrian education, encouragement, and/or enforcement programs?
<b>Mixed-use Development</b>	Is there guidance or are there regulatory tools that promote mixed-use development? Do provisions provide for enhanced bicycle and pedestrian environments?
<b>Complete Streets</b>	Have communities adopted a Complete Streets policy?
<b>Healthy Lifestyles</b>	Does public policy promote or support healthy lifestyles? Is there a linkage between healthy lifestyles, and bicycle and pedestrian mobility?

basis.

## POLICIES, PROGRAMS, AND CODES: BASTROP COUNTY

The bicycle and pedestrian policy review for Bastrop County public documents and programs for the municipalities of: Bastrop, Elgin, Smithville; and, Bastrop County. Over 18 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Bastrop County communities—individually and collectively—accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

- **Three (3) Comprehensive Plans**
- **Two (2) Transportation Plans**
- **One (2) Safe Routes to School Plans**
- **Twelve (12) Municipal and County Codes**, including subdivision regulations and zoning ordinances.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The degree to which Bastrop County jurisdictions' active transportation policies and initiatives promote healthy and multimodal communities varies greatly. Significant findings include:

- **Accessibility** The cities of Bastrop and Elgin are the only communities that specify ADA access in their codes or ordinances. Few planning documents in Bastrop County discuss ADA access - including the consideration of access deficiencies in existing pedestrian networks. The Elgin Safe Routes to School Plan identifies the need to add ADA ramps to specific intersections near Booker T. Washington Elementary School, among other improvements recommended in that plan.
- **Connectivity** The City of Bastrop Comprehensive Plan identifies pedestrian and bicycle connectivity throughout the community as a priority. The land development codes of Bastrop County, and the cities of Bastrop and Elgin establish maximum block lengths ranging in size from 1,200 to 3,000 feet - distances which are common in auto-centric suburbs and ex-urban areas. Local ordinances do not require inter-parcel pedestrian connectivity, mandatory street connections to adjacent development sites, or general street connectivity ratios.

- **Multimodalism** Bastrop County communities have not previously promoted active transportation facilities as essential components of their transportation networks. Recent transportation master plans developed by Bastrop County and the City of Bastrop however place greater emphasis on the need to develop multimodal transportation systems, but do not establish or identify complete facility networks. The City of Bastrop's comprehensive plan establishes a city-wide system of multi-use trails (including sidepaths) for recreation and transportation.

Bastrop County, City of Elgin, and City of Bastrop land development regulations require sidewalks as part of new development. Sidewalk widths are narrow (5 feet or less), and standards do not require rehabilitation of existing lengths of sidewalk. The City of Smithville does not require sidewalks or bicycle facilities.



*The City of Bastrop has embraced the dual recreation/transportation benefits of multi-use trails. This side path is located along Old Austin Highway.*

- **Safety** The promotion of specific active transportation education, encouragement, and enforcement programs by Bastrop County communities is limited to the recommendations of the Elgin Safe Routes to School Plan (prepared in relation to Booker T. Washington Elementary School and the Neidig Elementary and Elgin Middle School Plans) and Smithville's Safe Routes to School Program.
- **Mixed-use Development** The recently adopted Downtown Bastrop Form-Based Code, facilitates the development of a walkable mixed-use core in downtown Bastrop and surrounding center-city neighborhoods. The Code establishes distinct urban built form for downtown, civic/cultural arts, commercial, and neighborhood character zones.

In the Bastrop Comprehensive Plan, neighborhood development patterns are encouraged that would allow small scale commercial uses to be permitted in predominately residential districts.

The City of Elgin promotes mixed-use development in proposed transit-oriented development areas. Additionally, traditional neighborhood development and mixed-use areas are promoted in the Elgin Comprehensive Plan.

- **Complete Streets** No Bastrop County jurisdiction has adopted a formal Complete Streets policy.
- **Healthy Lifestyles** The Bastrop Comprehensive Plan identifies public health as a substantiating factor for developing a multi-use trail network. In general however, direct references to public health and healthy lifestyles is limited within the plans and policy documents of Bastrop County communities.

## Highlights

Bastrop County communities have adopted or implemented some defining policy recommendations and regulatory tools which provide the backbone for developing bicycle and pedestrian friendly environments. Key policies or initiatives which may be replicated by individual communities in Bastrop County, or the region as a whole, include:

- The cities of Bastrop and Elgin pro-actively acknowledge the need to improve localized ADA accessibility for increased safety.
- Sidewalks provisions are a common requirement within the small urban and suburban areas of Bastrop County communities.
- The City of Elgin's Safe Routes to School Plan illustrates a pro-active effort to improve neighborhood-specific bicycle and pedestrian safety.
- The Downtown Bastrop Form Base Code facilitates the extension of mixed-use development beyond the boundaries of the city's current central business district. Mixed-use development principles are also promoted by the cities of Elgin and Smithville (the former including new transit-oriented development nodes outside of the historic central business district).
- The City of Bastrop's comprehensive plan identifies an interconnected city-wide network of multi-use trails extending into unincorporated Bastrop County.

## Recommendations

Opportunities remain for Bastrop County communities to enhance the bicycling and pedestrian environments in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Maximum block lengths can be reduced in appropriate areas of each city to encourage pedestrian friendly connectivity. Such areas may include mixed-use nodes, traditional neighborhood developments, or other areas where high density development is proposed. Recommended block widths and depths should average between 300 and 600 feet.
- Pedestrian provisions should allow for sidewalks of variable width based on area of built context, the required rehabilitation of existing sidewalk segments that do not meet current design requirements (including ADA accessibility requirements), and on-site pedestrian connectivity requirements.
- Complete Streets policies could be adopted by each community. If engineering design standards already exist in a community, modify these documents (in accordance with the Pattern Book contained in this report) to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Develop specific bicycle and pedestrian capital project criteria.
- Incorporate strategies into local planning documents to promote the development of healthy lifestyles through programming and environmental change. Include health-based metrics into applicable planning documents to measure the impact of bicycle and pedestrian facility development on public health.
- See Pages 3-35 for more general recommendations.



## POLICIES, PROGRAMS, AND CODES: BURNET COUNTY

The bicycle and pedestrian policy review for Burnet County included a review of public documents and programs for the municipalities of Bertram, Burnet, Cottonwood Shores, Granite Shoals, Highland Haven, Horseshoe Bay, Marble Falls; and, Burnet County. Over 21 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Burnet County communities - individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

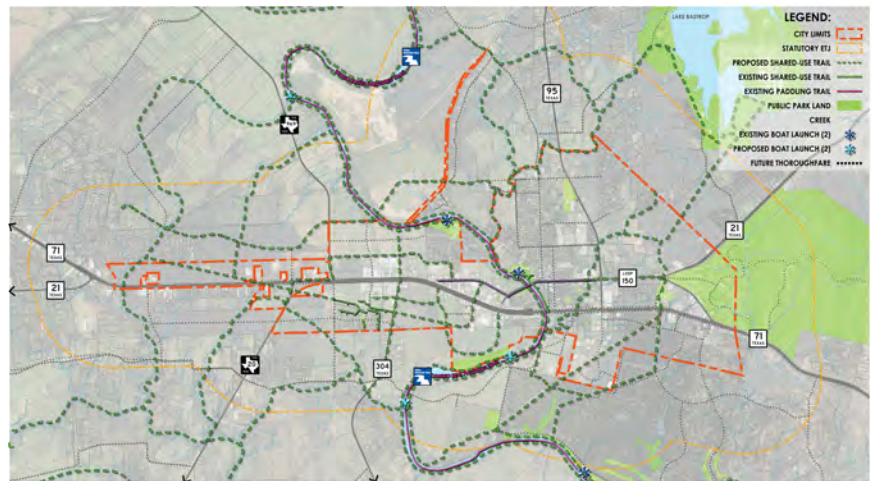
- **One (1) Comprehensive Plan**
- **One (1) Transportation Plan**
- **Two (2) Park Plans**
- **Two (2) Municipal Construction Design Manuals**
- **Fifteen (15) Municipal and County Codes**, including subdivision regulations and zoning ordinances.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The degree to which Burnet County jurisdictions' active transportation policies and initiatives promote healthy and multimodal communities varies greatly. Significant findings include:

- **Accessibility** Some communities require ramps at all street corners, driveway approaches, appropriate mid-block crosswalks, and in locations where accessible parking spaces are provided. Other communities do not specify ADA access requirements. Several communities address the need to provide improved ADA access within their planning documents - with a focus on retrofitting established neighborhoods to promote improved safety and accessibility.
- **Connectivity** There are no code provisions in any Burnet County jurisdiction which promote bicycle or pedestrian connectivity on development sites. Some jurisdictions require that existing street networks be continued into new development. In the Burnet County Comprehensive Transportation Plan, local road connections are required. The Marble Falls Comprehensive Plan recommends local road connections. Some communities encourage increased



*The Bastrop Comprehensive Plan proposes a city-wide network of multi-use trails extending into the city's statutory ETJ. Bastrop's park land dedication ordinance allows the City to require the dedication of trail easements as part of new development based on the routes depicted above.*

pedestrian and trail connectivity within specific planning documents. Alternatively, connectivity in some community planning documents is not addressed.

Development standards within Burnet County communities allow for a wide range of block sizes. Maximum block lengths may extend to between 1,300 feet and 2,000 feet. Block lengths in all communities are flexible between these distances - making no distinction between their applicability to pedestrian-friendly urban environments versus suburban or rural areas.

- **Multimodalism** Most Burnet County jurisdictions require sidewalks as part of new development. Some jurisdictions allow for the construction of separated bicycle facilities in lieu of sidewalks. The City of Marble Falls Comprehensive Plan is the only policy document that directly promotes community-wide bicycle and pedestrian connectivity between neighborhoods and parks via off-street multi-use paths and trails. Marble Falls encourages on-street bicycle lanes to be added to collector streets where appropriate.
- **Safety** While most community plans and regulations include requirements for the construction of sidewalks, none directly address the need to increase bicycle/pedestrian safety as a guiding factor for promoting multimodal transportation networks. The Burnet County Comprehensive Transportation Plan recommends the development of a Safe Routes to School program.
- **Mixed-use Development** The Marble Falls Comprehensive Plan recommends a walkable, mixed-use downtown. The City's land development regulations contain two mixed-use zoning districts within the downtown and surrounding center-city neighborhoods. No other codes, plans, or policies in Burnet County discuss mixed-use development.



*Pedestrian-friendly environments in Burnet County are primarily confined to historic downtown areas.*

- **Complete Streets** No Burnet County jurisdiction has adopted a Complete Streets policy.
- **Healthy Lifestyles** Few planning documents include detailed recommendations regarding the relationship between the built environment and healthy lifestyles. The Marble Falls Comprehensive Plan includes recommendations that encourage and promote healthy transportation choices.

## Highlights

Most local active transportation policies and development activities in Burnet County that promote the development of bicycle and pedestrian friendly environments have been initiated by the City of Marble Falls. Key policies or initiatives in Burnet County which may be replicated by individual communities, or the region as a whole, include:

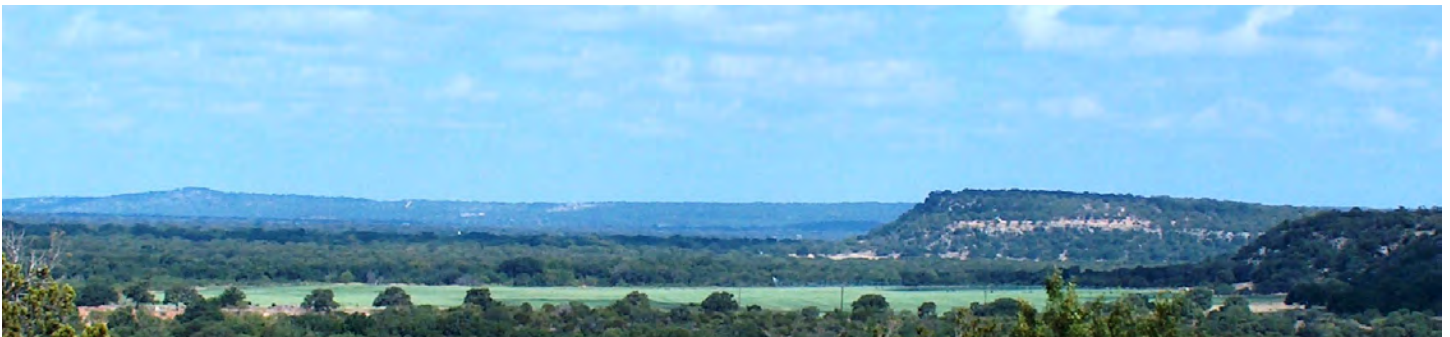
- Many communities acknowledge the need for enhanced ADA accessibility to increase the safety of all community members.
- Burnet County communities acknowledge the need to ensure the safety of its citizens as they use active transportation facilities.

- The City of Marble Falls has taken the initiative to promote bicycle and pedestrian connectivity, a walkable downtown, and encourage an active lifestyle for its residents - including the use of mixed-use districts. Applicable policies and district regulations may be emulated by other Burnet County communities.

## Recommendations

Opportunities remain for Burnet County communities to enhance the bicycling and pedestrian environment in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Individual Burnet County jurisdictions may consider adopting Complete Streets policies. Such policies should serve as a source for subsequent code and design manual amendments (including applicable recommendations illustrated in the Pattern Book contained in this report).
- Land development regulations could be amended to provide for on-site pedestrian connectivity between buildings, rights-of-way, and adjacent property.
- Land development regulations could be amended to promote the future projection of proposed streets (and corresponding bicycle and pedestrian infrastructure) onto undeveloped property.
- Land development regulations may be amended to apply varying block size thresholds depending on the built context (i.e. urban, suburban, rural).
- All communities in Burnet County should focus on promoting a healthy lifestyle for their residents. Recommendations can be made in planning documents to encourage walking and bicycling for health and recreation - even in communities where walking and biking may not be a feasible transportation option. Programs that promote a healthy lifestyle may include creating community walking groups, organizing a Cyclovia, or creating incentives for employees to increase physical activity by providing a reward system.



*Rural areas outside of Burnet County's population centers are attractive to bicyclists for fitness and recreation. Because of the county's scenic beauty, relative close proximity to the larger Austin-Round Rock and Killeen-Temple population centers, and generally lower cost of land, Burnet County may soon see an influx of large residential and mixed-use communities. This offers an opportunity to promote strong bicycle and pedestrian facility development from an early stage.*

## POLICIES, PROGRAMS, AND CODES: CALDWELL COUNTY

The bicycle and pedestrian policy review for Caldwell County included a review of public documents and programs for the municipalities of Lockhart, Luling, Niederwald, Uhland, Martindale, Mustang Ridge; and, Caldwell County. Over 12 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Caldwell County communities – individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

- **One (1) Comprehensive Plan**
- **One (1) Transportation Plan**
- **One (1) Corridor Improvement Plan**
- **One (1) Municipal Construction Design Manual**
- **Eight (8) Municipal and County Codes**, including subdivision regulations, zoning ordinances, etc.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The degree to which Caldwell County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities is fairly consistent across all communities. Significant findings include:

- **Accessibility** The Caldwell County development ordinance requires sidewalks at intersecting streets and street grades along crosswalk areas to be ADA compliant. The Code of Ordinances for the City of Lockhart requires curb ramps to be ADA compliant. Some cities in Caldwell County do not specify ADA access requirements.
- **Connectivity** The cities of Lockhart and Luling require inter-parcel pedestrian connectivity as part of new development, while other communities have no significant inter-parcel connectivity requirements. The Caldwell County Transportation Plan identifies the classification of local roads to increase access to adjacent properties.

Caldwell County land development regulations establish maximum block requirements only for "urban subdivisions." At a maximum length of 1,750 feet however, the County's urban subdivision standards do not guarantee the development of compact blocks which are designed (in part) to promote walking as a preferred mode of travel.

**Transportation Vision:**  
*Lockhart's transportation system shall provide residents and visitors safe, efficient and convenient access to all areas of the City and surrounding region, accommodate current and future demand for movement of people and goods, and allow travelers choices of destinations, routes and modes of travel.*

*-Lockhart 2020 Comprehensive Plan*

Where municipal land development ordinances specify block size, maximum block lengths and widths are similar to County provisions. Similarly, Caldwell County communities do not establish street connectivity index requirements to promote traffic dispersal.

- **Multi-Modalism** Few of the adopted policy documents of Caldwell County communities directly encourage the development of multi-modal transportation systems. An exception is the City of Lockhart's comprehensive plan - which advocates for the construction of hike and bike trails and improved sidewalks as part of new development. Additionally, the Caldwell County Transportation Plan acknowledges the need to provide adequate facilities for bicyclists and pedestrians by leveraging federal, state, and local funding sources. The land development regulations of most Caldwell County communities require sidewalks as part of new development, but do not require the provision of suitable bicycle facilities.
- **Safety** There are currently no local bicycle or pedestrian education, encouragement, and/or enforcement programs in Caldwell County. One project goal addressed in the Caldwell County Transportation Plan is to improve the safety of bicyclists and pedestrians.
- **Mixed-use Development** The Lockhart 2020 Comprehensive Plan envisions the Central Business District (CBD) as a pedestrian-friendly environment. The plan suggests that visitors to downtown Lockhart will be encouraged to explore businesses on foot through the creation of attractive pedestrian-oriented spaces. The cities of Lockhart and Luling have established zoning districts in their downtown areas that allow but do not require) mixed use buildings which combine commercial and residential uses. There are no other examples in Caldwell County of regulatory tools that promote mixed-use development patterns.



- **Complete Streets** Lockhart's Colorado Street Corridor Improvement Plan acknowledges the importance of Complete Streets. However, no communities in Caldwell County have adopted a Complete Streets policy.
- **Healthy Lifestyles** Municipal and county land use and transportation policy documents link transportation choices with the promotion of healthy lifestyles.

## Highlights

Collectively, the active transportation policies and initiatives of Caldwell County communities have placed greater emphasis on pedestrian mobility than bicycle mobility. Key policies or initiatives which may be replicated by individual communities in Caldwell County, or the region as a whole, include:

- Most communities in Caldwell County require sidewalks - including the construction of sidewalks on existing street frontage as part of new development.
- The Colorado Street Corridor Improvement Plan acknowledges the importance of Complete Streets policies as a component of corridor redevelopment.
- Mixed-use zoning districts in downtown Lockhart and Luling promote the preservation of locally relevant and pedestrian-friendly urban centers.
- The City of Lockhart's 2020 future land use and major thoroughfare map identifies nodes at existing and planned intersections where walkable neighborhood centers could be created using enhanced mixed-use and/or form-based zoning tools.

## Recommendations

Opportunities remain for Caldwell County communities to enhance the bicycling and pedestrian environments in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Development regulations could include varying standards for minimum and maximum block sizes in areas of urban, suburban and rural context.
- In conjunction with, or as an alternative to maximum block lengths in suburban and rural areas, communities could develop street connectivity indexes to increase the travel options of non-motorized users.
- Street design standards could incorporate cross-sections that would apply to pedestrian-friendly urban or neighborhood centers; and, those that incorporate bicycle facilities of varying type.



*New development on Lockhart's Colorado Street corridor (above and below) illustrates the City's growing commitment to pedestrian mobility.*



- Mixed-use districts could be modified to focus on built-form as opposed to land use. Future land use plans should identify suitable locations for future mixed-use nodes outside of historic downtown areas.
- Long range plans, multi-modal transportation plans, park plans, and special area plans should incorporate goals and objectives related to active transportation network development.
- Complete Streets policies could be adopted by each community. If engineering design standards already exist in a community, modify these documents to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Incorporate goals and objectives into local planning documents that promote the development of healthy lifestyles through programming and environmental change.

## POLICIES, PROGRAMS, AND CODES: HAYS COUNTY

The bicycle and pedestrian policy review for Hays County included a review of public documents and programs for the municipalities of: Buda, Dripping Springs, Hays, San Marcos, Woodcreek, Kyle, Bear Creek, Wimberley; and, Hays County. Over 38 plans, studies, reports, policies, guidelines, and codes were evaluated to determine the degree and manner by which Hays County communities – individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

- **Six (6) Comprehensive Plans**
- **Five (5) Transportation Master Plans**
- **Five (5) Park Plans**
- **Two (2) Downtown Master Plans**
- **Five (5) Municipal Construction Design Manuals**
- **Fifteen (15) Municipal and County Codes**, including subdivision regulations and zoning ordinances.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The degree to which Hays County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities varies greatly. Significant findings include:

- **Accessibility** Some Hays County communities cross-reference and emphasize the need to meet ADA access requirements in their regulations, codes and ordinances. No planning documents directly discuss the importance of improving local pedestrian networks for enhanced ADA access and comfort.
- **Connectivity** Many of the planning documents adopted by the cities of San Marcos, Kyle, and Buda, encourage increased pedestrian and trail connectivity throughout the community. Improved street network connectivity between development sites is also promoted in the Hays County Transportation Plan. Many other community planning documents do not directly address the need for increased street or bikeway connectivity. Buda and Wimberley require the extension of local streets to adjacent development sites, but local development regulations do not mandate a specific ratio of street links to nodes.

Maximum block lengths in Hays County communities range between a maximum of 1,000 to 2,000 feet, but smaller maximums are not required for areas within local land use planning documents designated as mixed-use nodes.

Land development regulations for the cities of Buda, Dripping Springs, Wimberley, and Kyle, permit each community to require multi-use trail development along identified corridors, but do not always require connections to and from adjacent neighborhoods or other development types. In contrast, Buda's land development regulations specify direct pedestrian connections between buildings on a development site and the adjacent public sidewalk. Similarly, the City of San Marcos zoning regulations require pedestrian connections between new mixed-use developments and existing sidewalks, parks, or open space.

- **Multi-Modalism** The cities of Buda, Dripping Springs, Kyle, Wimberley, and San Marcos require sidewalks as part of new development. The Parks and Trails Master Plan for the City of Buda also requires the incorporation of multi-purpose trails as an integral component of the City's public transportation infrastructure.

In the planning documents for the City of San Marcos, Dripping Springs, and Buda, proposed bike and pedestrian facility standards and routes are identified. A trail corridor network is established in the Buda 2030 Comprehensive Plan and Buda Parks, Recreation, Trails and Open Space Master Plan.

The City of Buda requires the development of pedestrian and bicycle infrastructure as part of the City's street network. In addition to sidewalks, the City requires designated (Type II) bike lanes as part of new arterial streets (and some collector streets). Buda's and Kyle's land use regulations also require the provision of easements for the creation of hike and bike trails. The City of Wimberley subdivision regulations include provisions on the construction of "trails" for bicycle use. The code does not however, specify when trails may be required as part of new development. Further, associated design standards make it difficult to interpret whether the City is attempting to construct multi-use trails, buffer bike lanes, bike lanes, or another facility type.

- **Safety** The Hays County Transportation Plan identifies a Safe Routes to School program. Planning documents for the City of Buda suggest coordination between Hays County and the City of Buda to establish a Safe Routes to School Program. No other communities identify local bicycle or pedestrian education encouragement, and/or enforcement programs in Hays County to support active transportation infrastructure investment.

- **Mixed-use Development**, The cities of San Marcos, Kyle and Dripping Springs have long-range planning documents that promote high-density mixed-use development within their central business districts. The City of Buda identifies a series of mixed-use nodes in their comprehensive plan for the development of pedestrian-friendly development patterns in the historic downtown and other outlying areas.

The cities of Buda and Kyle, apply mixed-use zoning districts to their central business districts. The City of Buda also uses a floating zone to encourage mixed-use development in other areas of the city. Similarly, the City of San Marcos utilizes mixed-use, traditional neighborhood development, and central business district zoning tools to create areas of building form, scale, and arrangement that support non-motorized transportation choice.

- **Complete Streets**, Planning documents for the cities of cities Kyle and Buda, recommend the development of Complete Streets policies. The City of San Marcos incorporates Complete Streets principles on all City street projects scheduled for paving or reconstruction.
- **Healthy Lifestyles**, Parks and open space planning documents adopted by Hays County communities identify a link between the preservation of park land and open space, and healthy lifestyles. In the Buda 2030 Comprehensive Plan, a healthier community is encouraged through the promotion of walking and bicycling.

## Highlights

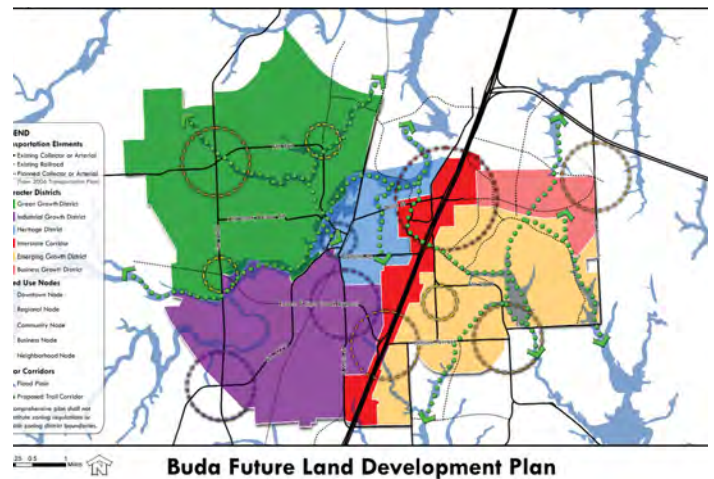
Collectively, there are many active transportation policies and initiatives that Hays County communities have implemented that promote the development of a bicycle and pedestrian friendly environments. Key policies or initiatives which may be replicated by individual communities in Hays County, or the region as a whole, include:

- Pedestrian connectivity is required in most communities in Hays County.
- Mixed-use development is promoted in the cities of San Marcos, Kyle, Buda, and Dripping Springs.
- The City of Buda has incorporated bikeway development requirements into the City street standards.
- The cities of Buda and Kyle promote the development of mixed-use nodes in areas of jurisdiction extending beyond historic downtown districts.

## Recommendations

Opportunities remain for Hays County communities to enhance the bicycling and pedestrian environment in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Reduce maximum block lengths in standard subdivisions and create urban street standards to correspond with mixed-use zoning tools being adopted by Hays County communities.
- Implement one or more bicycle and pedestrian education, encouragement, and/or enforcement programs.
- Complete Streets policies could be adopted by each community. If engineering design standards already exist in a community, modify these documents to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Incorporate bikeway development standards and requirements into municipal street standards (see Pattern Book).
- Incorporate goals and objectives into local planning documents that promote the development of healthy lifestyles through programming and environmental change.
- Adopt comprehensive pedestrian connectivity requirements to promote inter-parcel connectivity, and on-site pathways between buildings, land uses, parking, and the public street.



*The Buda Comprehensive Plan encourages mixed use development at a variety of scales within nodes located throughout the City's jurisdiction. An ongoing update to the City's unified development ordinance seeks to more readily implement the City's adopted development vision.*



## POLICIES, PROGRAMS, AND CODES: TRAVIS COUNTY

The bicycle and pedestrian policy review for Travis County included a review of public documents and programs for the municipalities of: Bee Cave, Lago Vista, Lakeway, Pflugerville, Jonestown, Manor, Rollingwood, West Lake Hills, Sunset Valley, Volente, and Travis County. Over 32 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Travis County communities – individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Some key documents and programs reviewed include:

- **Five (5) Comprehensive Plans**
- **One (1) Vision Report**
- **Two (2) Transportation or Connectivity Plans**
- **Two (2) Land, Water, & Transportation Growth Guidance Plans**
- **One (1) Active Transportation Monitoring Plan**
- **Four (4) Parks and Trails Plans**
- **Seventeen (17) Municipal and County Codes**, including subdivision regulations and zoning ordinances.

Summaries of each document reviewed can be found in Appendix C.

In addition to the public documents and programs of other Travis County communities, this incorporates an overview of the City of Austin's active transportation tools.

## Overview

The degree to which Travis County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities varies greatly by community type. Significant findings include:

- **Accessibility** Travis County, and the municipalities of Bee Cave, Sunset Valley, and Volente acknowledge the need for ADA accessibility in their development regulations. The City of Pflugerville's land development regulations require sidewalk ramps at each street intersection. The codes, regulations, and guidelines of other Travis County communities do not explicitly address ADA accessibility.
- **Connectivity** In the Travis County Land, Water, & Transportation Plan - Growth Guidance Plan, thoroughfare connectivity between activity centers, transit centers, and principal arterials and freeways is encouraged. Trail connectivity along rivers and creek corridors is also promoted. The cities of Bee Cave, Lago Vista, Lakeway, and Pflugerville all encourage the development of a community-wide network of hike and bike trails.

Most communities in Travis County require residential block lengths that range from a maximum of 1,000 feet to 2,000 feet - distances which are common in auto-centric suburbs and ex-urban areas. Most development regulations also require a minimum of two access points from existing streets to new developments, and the extension of streets to adjacent and undeveloped lots. There are no provisions however for new development to adhere to additional street connectivity ratios.

- **Multi-modalism** The planning documents of many communities in Travis County suggest the need to establish multi-modal street networks that incorporate

## CITY OF AUSTIN

The City of Austin is recognized as a leader in bicycling and pedestrian mobility—the city of Buda and Cedar Park adopted the City of Austin Transportation Criteria Manual and the City of Leander adopted the City of Austin's Transportation Criteria Manual. Given the City's national stature in active transportation infrastructure and program development, many CAMPO area communities have chosen to use tools developed by the City of Austin to guide their own bicycle and pedestrian infrastructure investments.

References to the City of Austin's policy, programming, and regulatory tools, as part of the Travis County bicycle and pedestrian policy review, are confined to these sidebars. Key City documents and programs reviewed include: **twelve (12) plans; five (5) programs; three (3) municipal construction design manuals; six (6) chapters of municipal code.**



*Protected bicycle facilities are being incorporated into the street networks of new developments in Austin.*

pedestrian and bicycle accommodations. Some Travis County communities limit bicycle and pedestrian connectivity objectives to trail system development due to a combination of low development densities and challenging topography.

Although most Travis County communities require sidewalks on one or both sides of most streets, the County and some municipalities provide discretion on when sidewalks may be excluded from new development due to individual development characteristics or rural conditions. Where required, most minimum sidewalk widths are between 5 and 6 feet.

Travis County communities do not require the provision of bicycle facilities as part of the street network. Although the City of Manor's subdivision regulations include cross-section diagrams that illustrate bicycle lanes, there is no corresponding text that requires on-street bicycle facilities. The Village of Volente requires showers and lockers for employees who commute by bicycle to be provided.

- **Safety** The City of Pflugerville and Pflugerville Independent School District have partnered to create a School Zone Traffic Safety Team. The team was created following the City's 2010 adoption of a Safe Routes to School Plan, and is intended to promote street system improvements that encourage children to walk and bike to school. Travis County has utilized an appointed Bicycle Safety Task Force to make recommendations on bicycle safety infrastructure projects.
- **Mixed-use Development** The long-range planning documents of Travis County and a handful of other jurisdictions promote mixed-use development through the creation of activity centers.

Some Travis County jurisdictions, such as Bee Cave and West Lake Hills incorporate mixed-use districts into their land development regulations. These districts are designed to permit a mixture of land uses, but corresponding site design and building arrangement provisions remain suburban in nature and do not guarantee compact walkable development. The City of Bee Cave's Town Center District does provide for a compact street pattern and building arrangements, but has been created via the planned development process. The City of Pflugerville does not have a mixed-use zoning district, but its zoning ordinance does incorporate architectural and site design standards that promote pedestrian-friendly site development within many of the city's zoning districts.

- **Complete Streets** The City of Austin is the only Travis County jurisdiction that has adopted a formal Complete Streets policy; although, some planning documents adopted by other communities recommend the development of street design standards that include Complete Streets concepts.

## CITY OF AUSTIN OVERVIEW: PART 1

The degree to which the City of Austin's active transportation policies and initiatives promote healthy and multi-modal communities varies greatly. Significant findings include:

- **Accessibility** The local policies, guidelines and regulations for the City of Austin are structured to ensure ADA accessibility.
- **Connectivity** Increase connectivity is suggested from neighborhoods to parks and greenways through the use of sidewalks, bicycle lanes, multi-use paths and trails. The incorporation of trails throughout the City and region must be considered by developers to connect to or complete the trail system. The City of Austin requires residential block lengths that range from a maximum of 600 feet to 1,500 feet depending on the context of development.
- **Multi-Modalism** The City of Austin requires sidewalks to be installed along new streets and existing frontages. The City of Austin Trails Master Plan recommends the connection of all urban trails to the on-street bicycle and sidewalk network. Similarly, bike facility selection must conform to the facility designation for each roadway in the Austin Bikeway Plan.

The City's commitment to active transportation is apparent with Austin's adoption and enactment of its Complete Streets policy. The City's Transportation Criteria Manual provides the framework for the development of a city-wide transportation network that incorporates bicycle and pedestrian facilities. Active transportation facilities must be incorporated into all new development. Consistent with the City's Complete Streets policies, this manual has also been adopted by reference by many CAMPO-area communities.

- **Safety** The City of Austin's Active Transportation Program seeks to increase quality of life of community members through the creation of a comfortable and connected pedestrian and bicycle system that serves all ages and abilities. Several other local bicycle/pedestrian education, encouragement and/or enforcement programs exist in the City of Austin. These programs include Austin Smart Trips, Vision Zero, Local Area Traffic Management and the Neighborhood Partnering Program.

- **Healthy Lifestyles** Planning documents adopted by Travis County and Sunset Valley reference the connection between multi-use trail development and opportunities for healthy community lifestyles. No other recreational or transportation planning documents adopted by Travis County communities reference the linkage between active transportation and healthy lifestyles.



*Utilization of new separated bicycle facilities in Travis County can be increased by the creation high intensity activity centers that provide urban destinations between intervening corridors.*

## Highlights

Collectively, there are many active transportation policies and initiatives that Travis County communities have implemented to promote the development of bicycle and pedestrian friendly environments. Key policies or initiatives which may be replicated by individual communities in Travis County, or the region as a whole, include:

- Travis County, the City of Bee Cave, Lago Vista, Lakeway and Pflugerville all encourage hike and bike trail connectivity.
- Policies, guidelines, or regulations in most Travis County communities require the incorporation of pedestrian facilities as an integral component of public transportation infrastructure.
- Pflugerville's School Zone Traffic Safety Team provides a direct linkage between public infrastructure investments and encouraging children to bicycle or walk to school.
- The development regulations of some Travis County communities provide for the creation of mixed-use developments, and can be further modified to incorporate building and site design principles that promote walkability.

## CITY OF AUSTIN OVERVIEW: PART 2

- **Mixed-use Development** The City's comprehensive plan, Imagine Austin identifies development nodes of varying size and "activity corridors" where higher intensity, mixed-use, and pedestrian-friendly development is promoted. These recommendations correspond with the development patterns promoted in many of the City's neighborhood plans. Further, the Austin Transportation Plan suggests that transit stops can function as hubs around which mixed-use residential, retail and commercial uses can be created.

The Austin land development regulations include a variety of "base" and "combining" zoning districts which have been used to generate a wide range of mixed use redevelopment types - fostering the gradual increase in urbanized development throughout much of the City. The city's zoning provisions also include building and site design features which generate urban development types on City corridors - particularly on the City's Urban Roadways, and Core Transit Corridors.

Many of the City's existing development tools which promote mixed use development are anticipated to be augmented or replaced by the adoption of the City's new development code: CodeNEXT.



*Austin's active transportation investments should be supported by targeted areas of high density and urban built form.*

- **Healthy Lifestyles** Imagine Austin encourages growth in compact centers, communities, or along corridors that are linked by roads and transit and are designed to increase walking and bicycling. The plan acknowledges a direct linkage between the creation of walkable and bikeable communities and improved public health.
- The City has taken measures to promote community-wide health improvements - in part, through increasing access to the City's bicycle and pedestrian network. The City's initiatives have been supported through an American Planning Association Plan4Health grant.



## Recommendations

Opportunities remain for Travis County communities to enhance the bicycling and pedestrian environment in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Reduce maximum block lengths and street spacing requirements in some Travis County communities to encourage street network inter-connectivity.
- Modify existing mixed-use zoning districts to include design requirements that manage street networks and design, site design, and building form and character.
- Adopt Complete Streets policies. If engineering design standards already exist, modify these documents to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Develop supplemental multi-use trail standards that provide for alternative dimensions and surfaces to allow these facilities to interact with their surrounding environments.<sup>1</sup>
- Where applicable, communities utilizing the City of Austin's Transportation Criteria Manual should duplicate preferred provisions rather than utilizing the manual by reference.
- Expand the scope of the Travis County Bicycle Safety Task Force to lead county-wide bicycle and pedestrian education and encouragement programs that are tailored to the unique needs of the county's suburban and ex-urban communities.

<sup>1</sup> Urban Street Design Guide. Island Press.

## CITY OF AUSTIN OVERVIEW: PART 3

The City of Austin's Active Transportation Division oversees a range of bicycle and pedestrian safety, education, encouragement, and enforcement programs. The City's Complete Streets policy and Transportation Criteria Manual also ensures the continued incorporation of bicycle and pedestrian infrastructure into new and redeveloping portions of the City's transportation system. Completion of the City's Street Design Guide will further assist Austin in ensuring that the right bicycle or pedestrian facility is incorporated into future transportation projects in a manner that is calibrated to local conditions on a case-by-case basis.

Although Austin has worked hard to increase the "feasibility" of bicycling and walking in the City through the provision of adequate facilities, much more must be done to provide a suitable built "environment" that increases active transportation mode share.

There is a direct connection between land use patterns and transportation choice. Much of Austin has developed in a manner similar to other American cities - beginning in the second half of the twentieth century. The low intensity land use patterns in much of present day Austin decrease the likelihood that practical bicycle and pedestrian use for most Austinites will extend beyond recreation and fitness.

Compact nodes of higher intensity development (and redevelopment) will be necessary to create environments where it is feasible to live, work, and shop by walking or biking. Whether or not the pending CodeNEXT land development regulations are adopted by the City of Austin, meaningful volumes of bicycling and walking trips will require development tools in the City of Austin that expand the distribution of areas of urban form.

## POLICIES, PROGRAMS, AND CODES: WILLIAMSON COUNTY

The bicycle and pedestrian policy review for Williamson County included a review of public documents and programs for the municipalities of: Cedar Park, Coupland, Florence, Georgetown, Granger, Hutto, Jarrell, Leander, Liberty Hill, Round Rock, Taylor, Bartlett, Granger, Thrall, and Williamson County. Over 33 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Williamson County communities – individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

- **Five (5) Comprehensive Plans**
- **Three (3) Transportation Plans**
- **Five (5) Park Plans**
- **Two (2) Trail Plans**
- **One (1) Redevelopment Master Plan**
- **Three (3) Municipal Construction Design Manuals**
- **Fourteen (14) Municipal and County Codes**, including subdivision regulations and zoning ordinances.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The manner by which Williamson County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities varies. Significant findings include:

- **Accessibility**, Land development regulations and design manuals for Cedar Park, Georgetown, Hutto, Round Rock, and Taylor directly reference Texas Accessibility Standards to ensure ADA accessibility. The policies, guidelines, and regulations of other Williamson County communities do not include direct references to state or federal ADA accessibility requirements.
- **Connectivity**, The adopted planning documents of most Williamson County jurisdictions promote the extension and connection of pedestrian networks - emphasizing either sidewalk and/or multi-use trail network expansion. The land development ordinances of many communities promote trail system connectivity between residential areas, and commercial and employment centers. Many of these communities require direct pedestrian connections between buildings on a development site and the adjacent public sidewalk.

Most Williamson County communities promote interconnected street networks - with some plans advocating for the extension of local streets to adjacent development sites (in addition major thoroughfare connections). The cities of Georgetown and Hutto have adopted street connectivity index requirements for new development.

Most Williamson County communities require residential block lengths that range from a maximum of 600 feet to 1,320 feet. The City of Florence, limits maximum block size to 600 feet in length unless otherwise requested. The City of Cedar Park's Bell Boulevard Redevelopment Master Plan promotes maximum block sizes of 300 to 550 feet in length to support the development of a planned pedestrian node within the City.

- **Multi-Modalism**, The planning documents adopted by many Williamson County jurisdictions recommend the development of a multi-modal transportation system. The methods by which these communities develop these systems vary greatly.

All communities in Williamson County except for Jarrell and Liberty Hill require sidewalks on one or both sides of the roadway. Standard sidewalk requirements range between 5 to 6 feet in width, although sidewalks of greater width are required by some communities within defined districts (typically in areas where mixed-use development and urban built form is being promoted).

The development regulations of Georgetown, Hutto, and Round Rock suggest that "bikeways" (on-street and separated) may be required on streets where consistent with long-range planning documents. Design guidance for bikeways in these communities varies, and does not always adhere to recommended AASHTO or NACTO standards. In contrast, the City of Hutto requires bike lanes (adhering to AASHTO standards) on all new or improved arterial streets.

The cities of Cedar Park and Leander do not allow on-street bike lanes, but require the construction of "trails" adjacent to roadways where identified in their respective trails plan; and parks, recreation, and open space plan.

- **Safety**, The City of Taylor recommends the creation of a cooperative school sidewalk program to enhance the safety of neighborhood residents. No other communities identify local bicycle or pedestrian education encouragement, and/or enforcement programs in Williamson County to support active transportation infrastructure investment.
- **Mixed-use Development**, Most Williamson County communities promote mixed-use development in their planning documents and regulatory tools. Cedar Park has adopted a Downtown Development District that promotes walkability and urban form in the Town Center development. In their Bell Boulevard Redevelopment Master Plan, an urban

built form is promoted to develop a new pedestrian node within the city. The City of Georgetown actively promotes new forms of compact development through the use of two mixed-use development districts and overlay zoning districts. In the City of Round Rock, a mixed-use Southwest Downtown District has been established. In addition, The Leander Comprehensive Plan specifies mixed-uses in the Station Area Mixed Use District and Transit Supportive Mixed Use Area, while the City of Taylor maintains a central business district.

- **Complete Streets**, No Williamson County jurisdiction has adopted a formal Complete Streets policy.
- **Healthy Lifestyles**, The linkage between bicycle and pedestrian mobility, and healthy lifestyles is established within the adopted parks, recreation, trails, and open space master plans of many Williamson County communities.

## Highlights

Collectively, there are many active transportation policies and initiatives that Williamson County communities have implemented that promote the development of a bicycle and pedestrian friendly environment. Key policies or initiatives which may be replicated by individual communities in Williamson County, or the region as a whole, include:

- The City of Florence promotes the development of small pedestrian-friendly blocks.
- The cities of Cedar Park, Georgetown, Hutto, Leander, and Taylor all promote the connectivity of trail networks as part of new development.
- The cities of Georgetown and Hutto incorporate street connectivity index requirements into their land development regulations.
- Most communities in Williamson County require sidewalks on either one or both sides of the roadway. Cedar Park, Florence, Granger, Georgetown and Leander all require greater sidewalk widths in specified areas.
- The City of Hutto requires bicycle lanes meeting AASHTO standards on all new or redeveloped arterial streets.



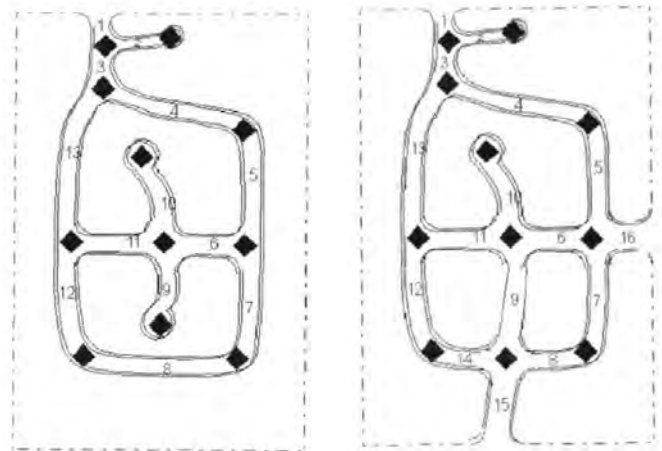
Bicycle connectivity in some Williamson County communities is facilitated by the provision of trails within identified roadway corridors.

- Mixed-use development is promoted in the planning documents and regulatory tools of most Williamson County municipalities.

## Recommendations

Opportunities remain for Williamson County communities to enhance the bicycling and pedestrian environment in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Reduce block lengths in applicable areas of each community to encourage pedestrian friendly connectivity.
- Prepare and implement safe routes to school programs to improve public safety.
- Encourage all communities in Williamson County to promote mixed-use development in their planning documents and regulatory tools - including design requirements that manage street networks and design, site design, and building form and character.
- Adopt Complete Streets policies. If engineering design standards already exist, modify these documents to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Ensure that bikeways located within or adjacent to the road right-of-way meet or exceed AASHTO and NACTO standards, and that corresponding planning documents clearly identify where facilities will be required. Develop supplemental multi-use trail standards that provide for alternative dimensions and surfaces in non-roadway corridors to allow these facilities to interact with their surrounding environments.



The Georgetown Unified Development Code requires a minimum ratio of "links" to "nodes" in new development. The image at the upper right adheres to municipal requirements (City of Geo., UDC, Ch. 12, § 12.03.030)



## REVIEW SUMMARY

As suggested by the CAMPO bicycle and pedestrian policy, program, and code review parameters, the six county policy review studies detailed above include broadly-stated recommendations that may be used to enhance the active transportation environment in CAMPO communities. CAMPO jurisdictions are diverse in size, topography, demographics, built environments, resources, and commitments to a multi-modal transportation making it difficult to provide a single set of recommendations to all communities.

Nonetheless, CAMPO communities' variable approaches to providing bicycling and walking infrastructure for their citizens provide common themes and opportunities. The following recommendations can assist in forming the cornerstone of an individual CAMPO community's effort to increase the viability of walking and bicycling in their jurisdiction.

### Accessibility

- Ensure that planning documents, design guidelines, and development ordinances acknowledge clear linkages between ADA accessibility standards and active transportation facility design.

### Connectivity

- Land development regulations should include variable ranges of minimum and maximum block sizes. Smaller block sizes should be tied to corresponding mixed-use, transect-based, or form-based zoning districts.
- Develop street connectivity ratio standards that increase in conjunction with development. Require inter-parcel connectivity among local streets in addition to major thoroughfares.
- Develop "connectivity" provisions within land development regulations that require pedestrian access between parcels, and on-site between the street, parking, and buildings.

### Multi-modalism

- Prepare bicycle and pedestrian master plans that identify community-wide bikeway and shared-use networks within street rights-of-way and other corridors (i.e. streams, drainage-ways, utility easements, etc.)
- Land development regulations should require that new streets on identified bicycle corridors be constructed to include bicycle facilities.
- Land development regulations should include minimum bicycle parking requirements. Accessory facilities for bicyclists and pedestrians (i.e. showers, lockers, etc.) should be provided for development of certain intensity or size.

### Safety

- Create and empower bicycle and pedestrian advisory committees to oversee the development of local bicycle and pedestrian safety curriculums, and to participate in capital project selection for active transportation facilities.
- Adopt local safe cycling ordinances that may address issues such as: vision zero, safe passing, lighting, signaling, operation on shared-use facilities, etc. Consider safety programs such as bike equipment and helmet giveaways, and helmet use ordinances for children. Adopt corresponding ordinances addressing motorist behavior including: safe passage ordinances, and motor vehicle encroachments within bicycle and pedestrian infrastructure.
- Initiate (or re-initiate) Safe Routes to School programs which are focused on encouragement and education.

### Mixed-use Development

- Long-range planning documents should clearly identify locations where new mixed-use development nodes will be created (includes transit-oriented developments). Mixed-use development nodes should be arranged to provide terminal points at the end of key corridors. It is critical to foster connections to existing residential and other developments.
- Mixed-use zoning districts should incorporate building and site design standards that generate areas of urban built form (with varying development intensities).
- Mixed-use development districts should include provisions requiring context sensitive street design and arrangement.

### Complete Streets

- Complete Streets policies should be adopted by CAMPO communities that provide for street network arrangement and design that is calibrated to local conditions.
- Develop active transportation facility design guidelines including street cross-sections and construction specifications.

### Healthy Lifestyles

- Local planning documents should consider community health rankings, and develop corresponding objectives which may be addressed in part through the provision of active transportation programs and infrastructure.
- Municipal comprehensive plans should include a chapter on community health that addresses preventative health strategies including: risk screening, social support, education, policy improvements, and environmental change.
- Public Health practitioners should be included in the local planning process to ensure that comprehensive, active transportation, and parks and recreation plans incorporate strategies to improve community health.

## PUBLIC INPUT

Throughout the planning process, the project team encouraged community members to share their input on active transportation in the region through written and emailed comments, open-ended responses in the survey, and by providing location-specific comments in the online mapping tool. The team received 120 written and emailed comments regarding the Northwest Corridor Connection Case Study (see additional Case Study Report). The majority of comments on the regional plan were shared through the survey and WikiMap as described in the following pages. Several community members sent follow up emails after the public meetings. As part of the public outreach process, the planning team held an open house at the Texas School for the Blind and Visually Impaired. The themes of the public input are summarized below.

### Themes addressed by comments by the public in follow up emails

- Add “enjoyable” to the list of attributes that describe CAMPO’s envisioned active transportation network
- Concern for safety
- Protected bike lanes are preferred
- Ramps and hand rails are needed in active transportation facilities
- Longer intervals for crosswalk signals are needed

### Themes addressed at the Texas School for the Blind and Visually Impaired open house

- It is difficult for blind pedestrians to navigating parking lots, and having store fronts directly in front of sidewalks makes it much more accessible
- Crosswalks are needed on busy streets
- It is uncomfortable to cross multiple lanes of traffic on fast-moving streets
- Blind pedestrians have difficulty navigating street alignments when streets don’t line up curb-to-curb on either side
- Ramps are needed on all street curbs
- Better maintained sidewalks are needed to make travel easier for those in wheelchairs and blind pedestrians



Photo above and below: Open house at Texas School for the Blind and Visually Impaired



# WikiMap Summary

## Respondent Overview

The project team used an online interactive map tool called a WikiMap to gather input from the community on a variety of topics. The WikiMap was live between November 28, 2016 and February 17, 2017 and allowed residents to identify barriers and difficult routes for walking and biking. Users were also asked to provide information about their preferred routes.

# CAMPO Regional Active Transportation Plan



Adam Coppola Photography

## OUR RESPONDENTS...

The WikiMap received **390** line comments and **385** point comments from **358** users representing **75** zip codes within the study area.

### MALE



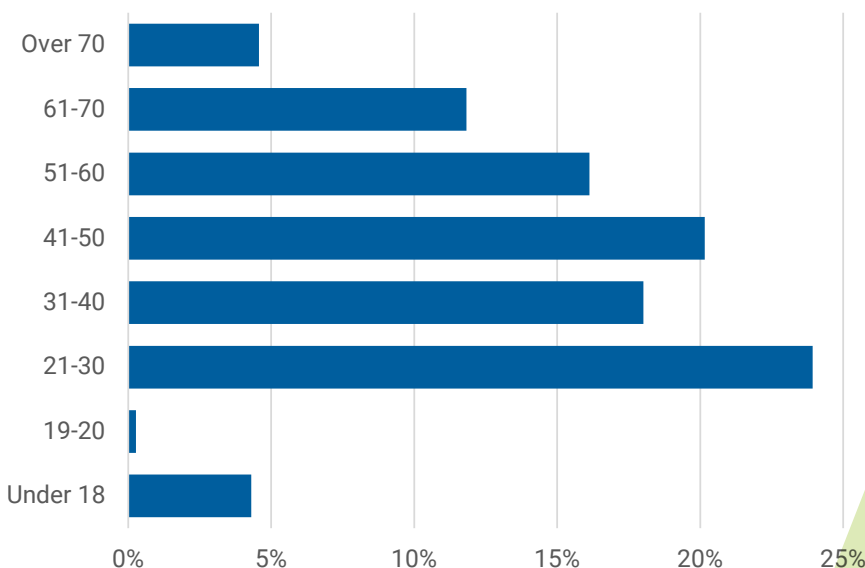
65%

### FEMALE



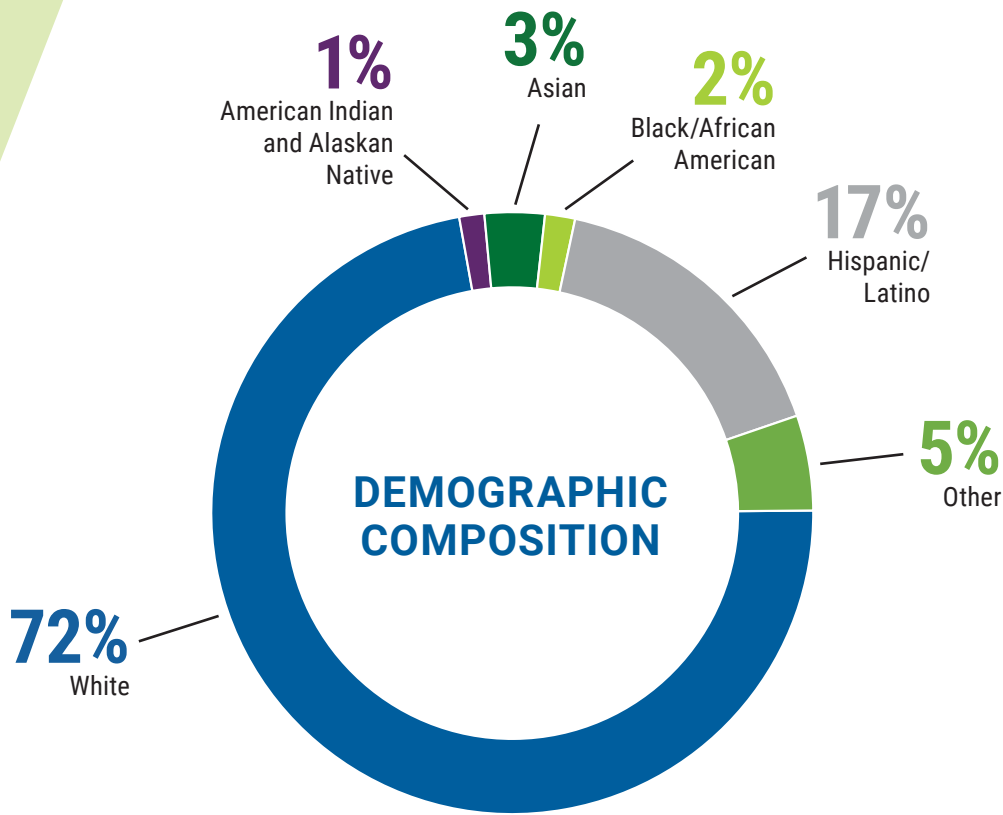
32%

### AGE



\*Not all respondents answered this question





Adam Coppola Photography

## TYPES OF CYCLISTS

**24%**

I do not ride a bicycle and am unlikely to ever do so

**16%**

I prefer not to ride in traffic, so I stay on trails

**40%**

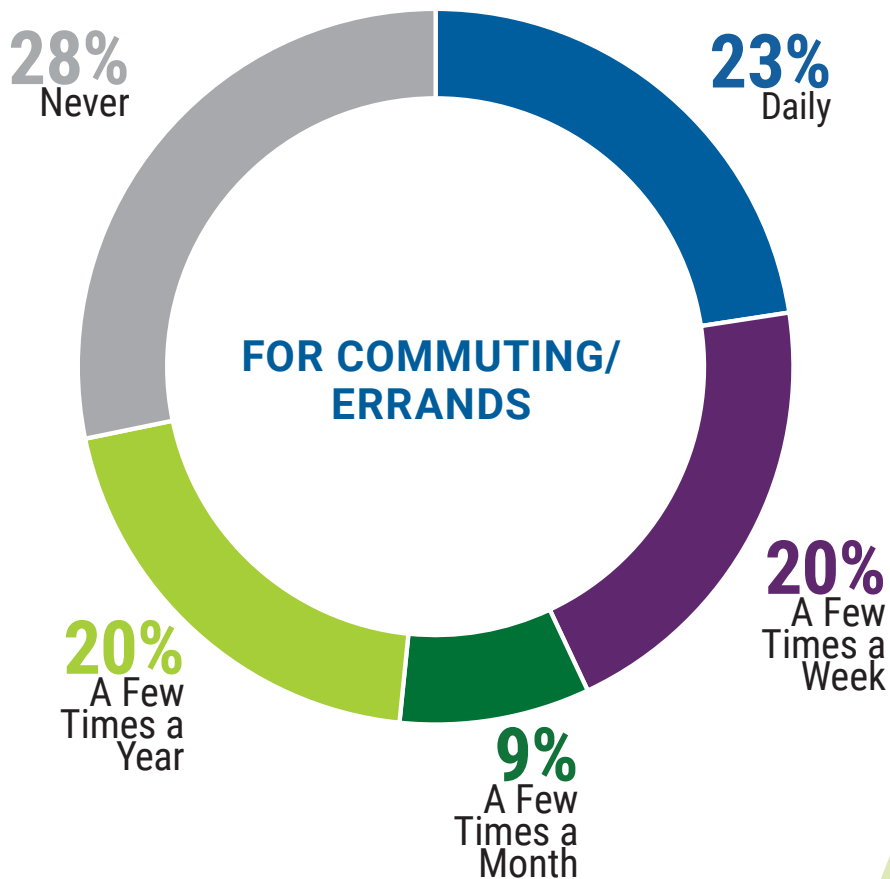
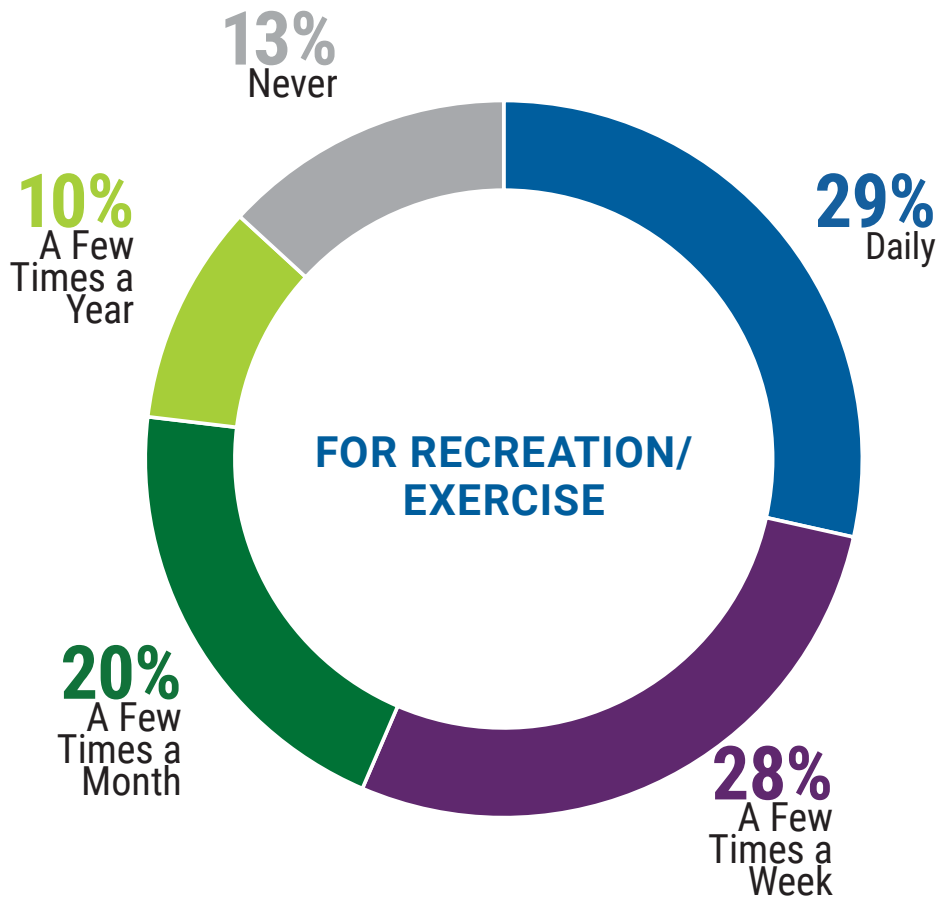
I am willing to ride in traffic, but I prefer dedicated bike lanes and routes

**20%**

I am willing to ride in mixed traffic with cars on almost any type of street



# HOW OFTEN DO YOU WALK AND BIKE?



# Survey Summary

## Respondent Overview

The project team created a survey to gauge the active transportation habits of CAMPO area residents. The survey was launched in October 2016 and was open through March 2017. Over 2,000 responses were received, providing information on reasons that residents do walk and bike and do not walk and bike more often. This information was used to inform the regional active transportation profiles.

# CAMPO Regional Active Transportation Plan



Adam Coppola Photography

## OUR RESPONDENTS...

The Survey received **2,093 responses** from residents representing **141 zip codes** within the study area.

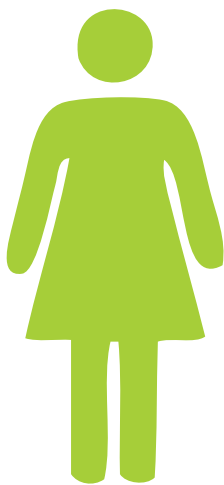
### MALE

### FEMALE

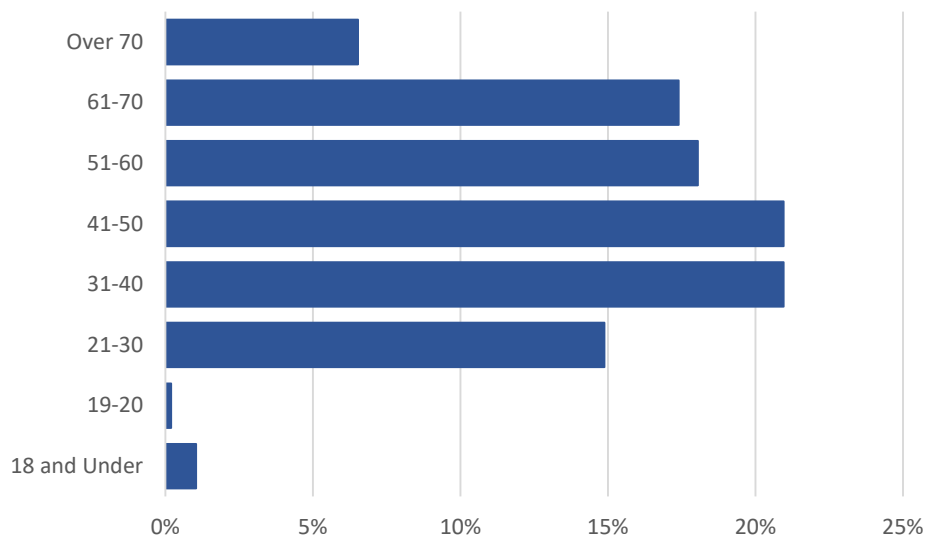
### AGE



**54%**

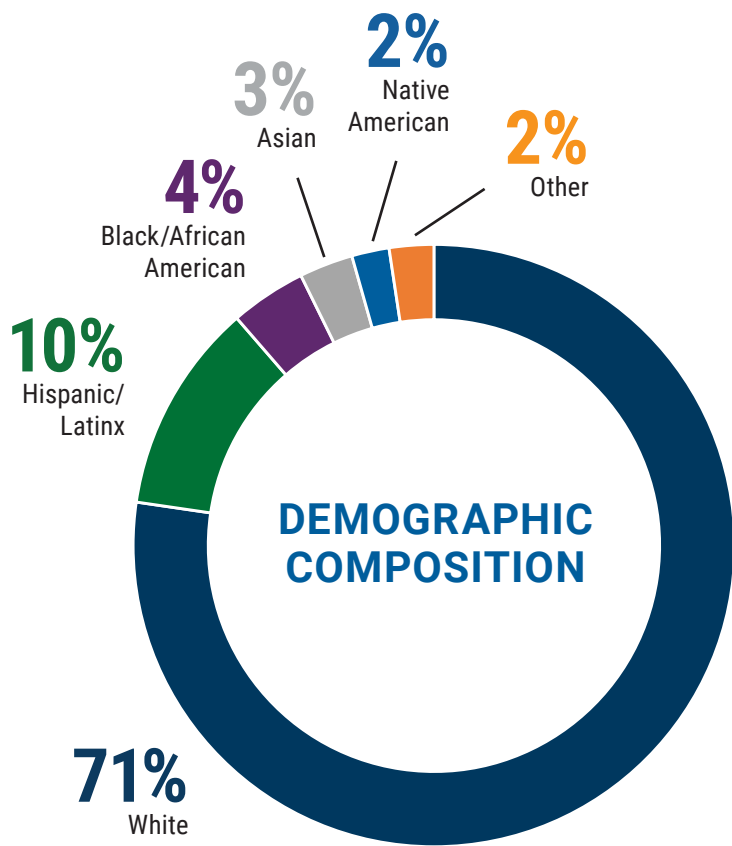


**45%**



\*Not all respondents answered this question



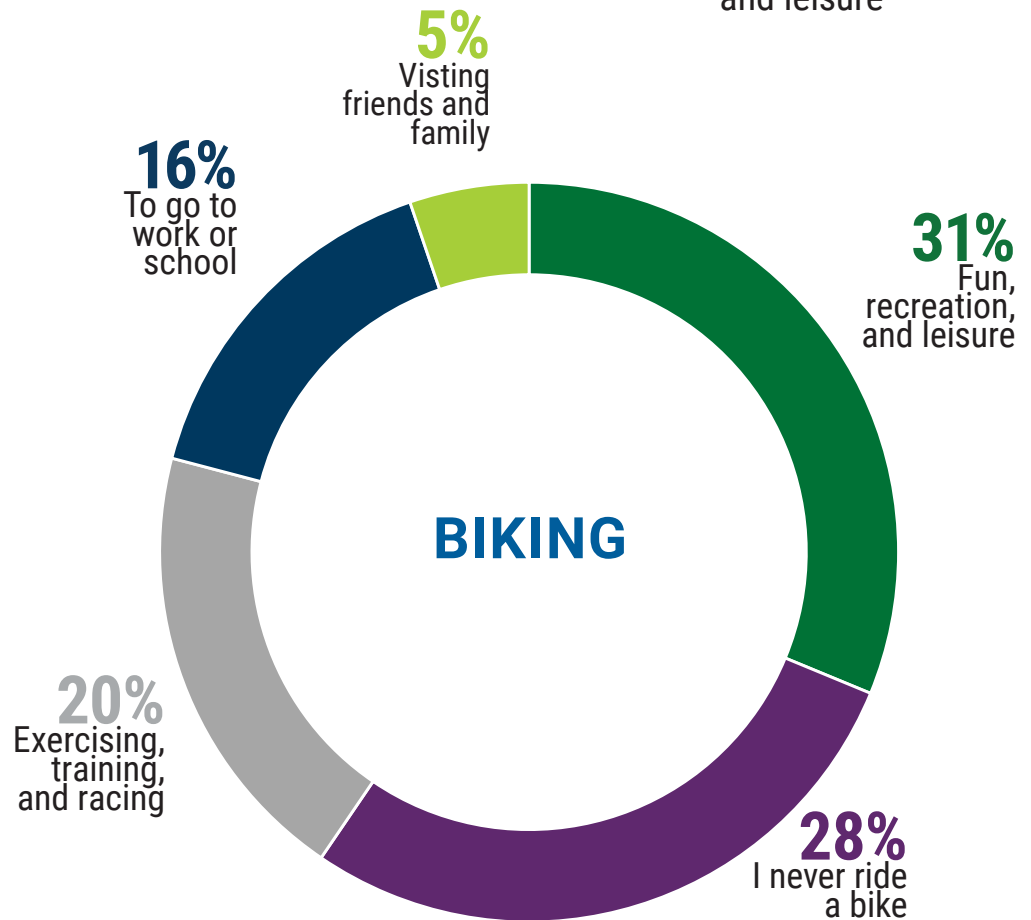
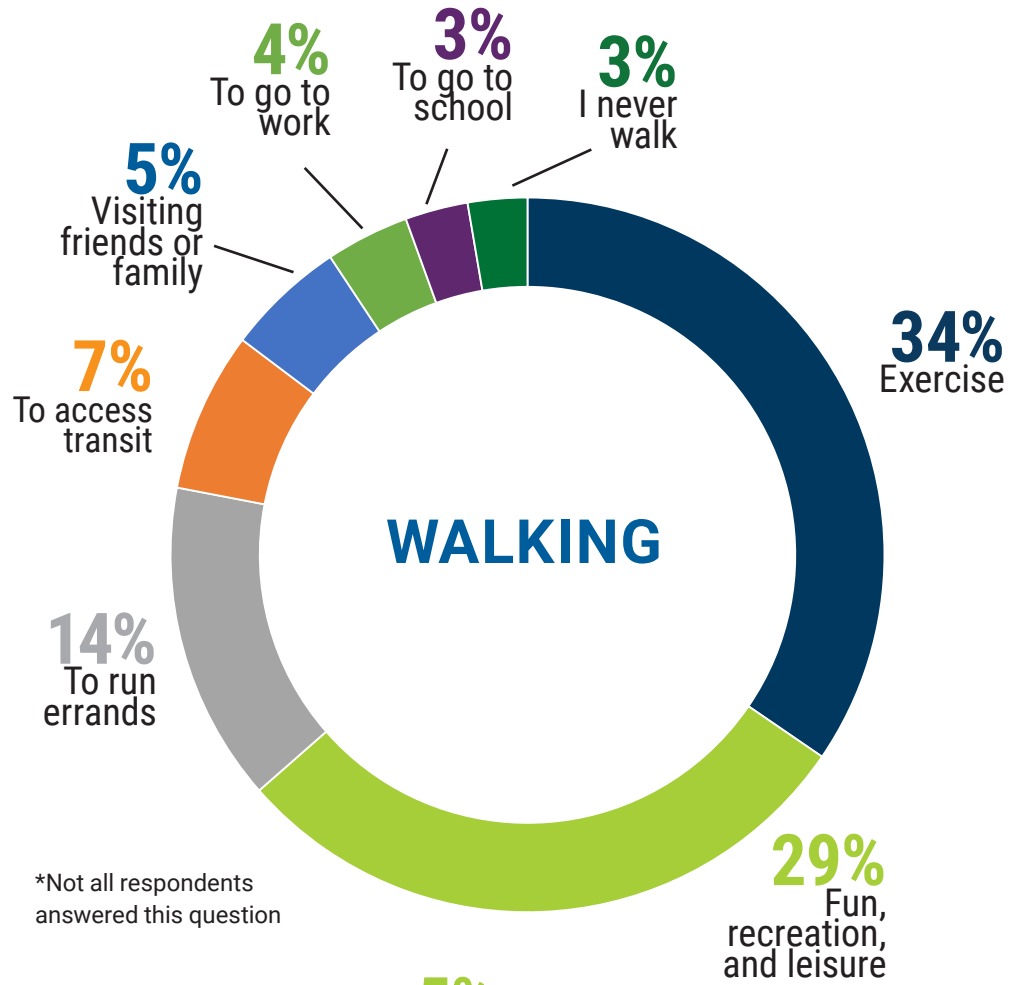


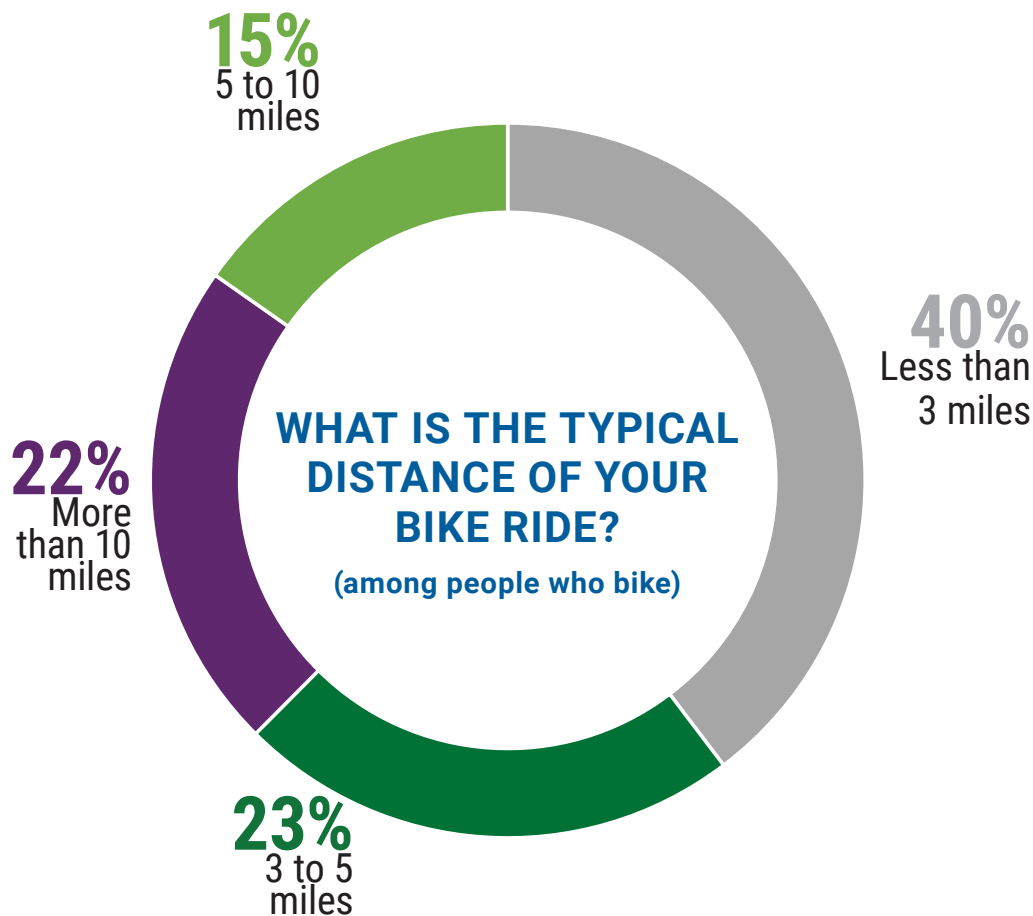
\*Not all respondents answered this question



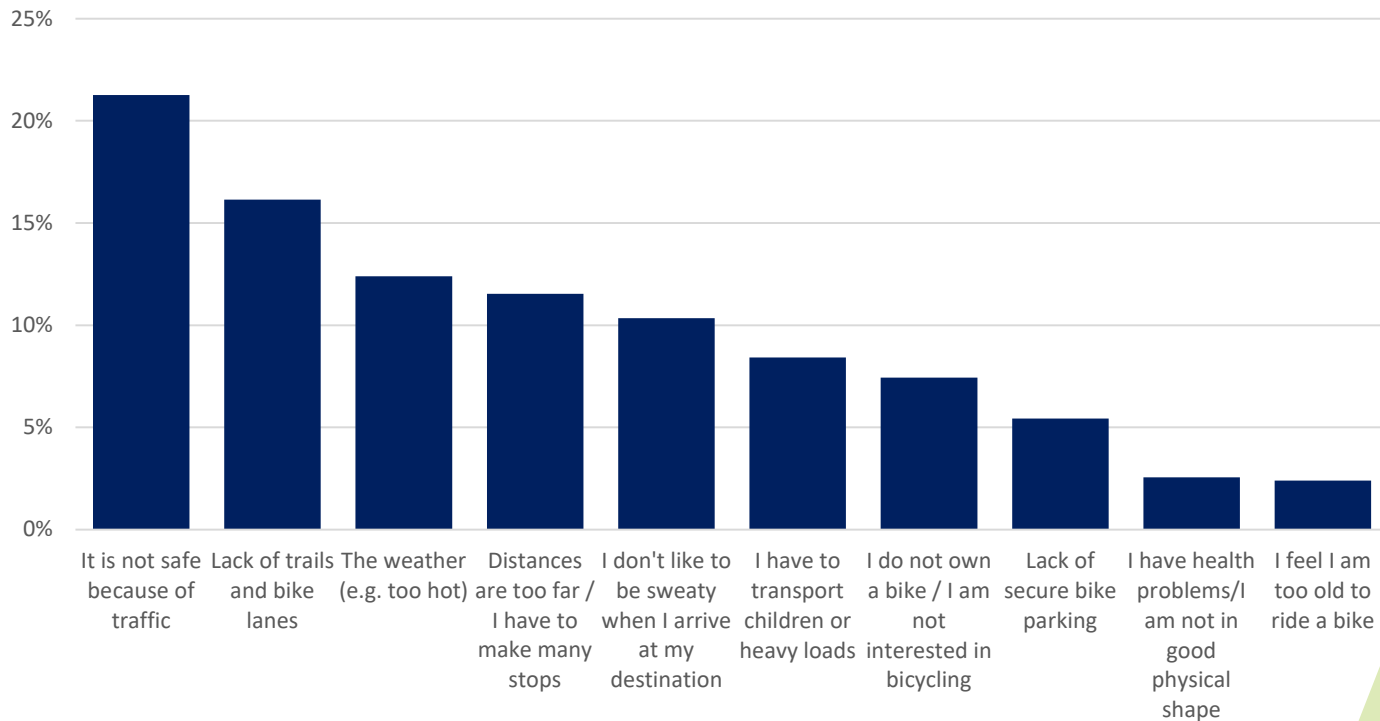
\*Among parents of children under 16 years old

# FOR WHAT PURPOSES DO YOU WALK AND BIKE?

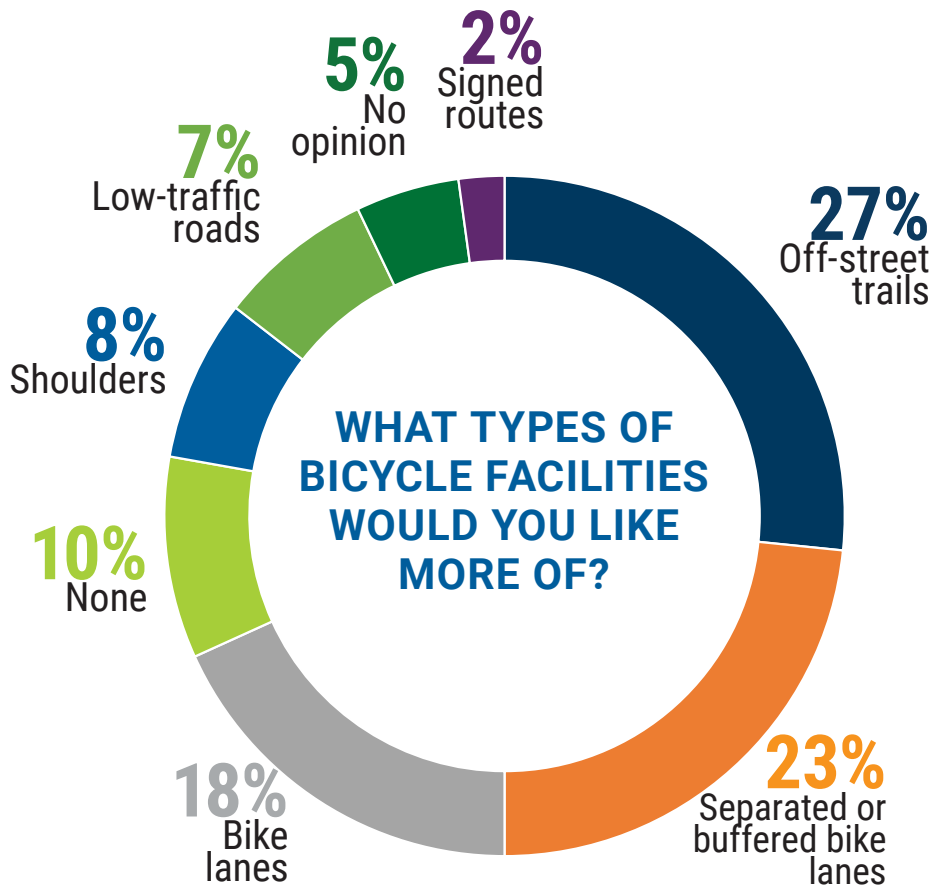
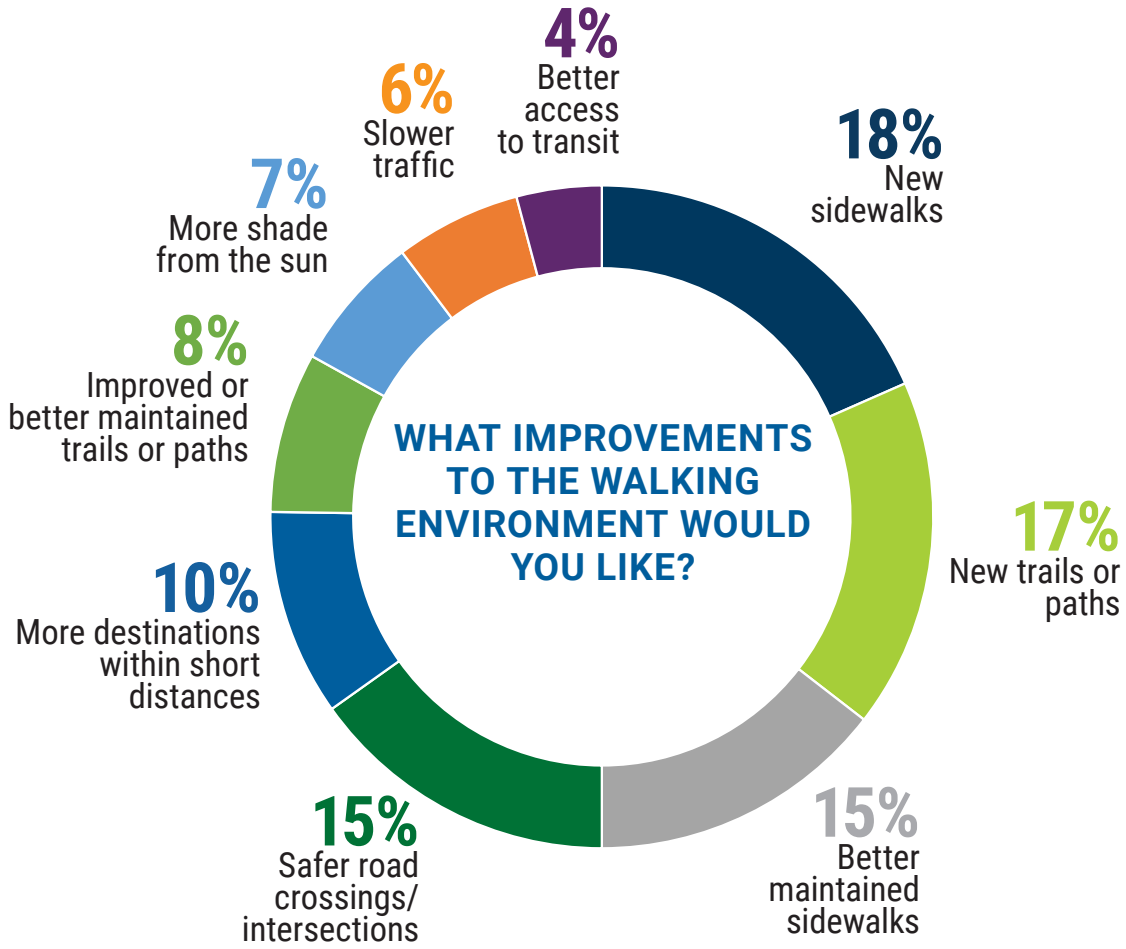




## PRIMARY REASONS FOR NOT BIKING MORE







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# CHAPTER 4

## PROFILES

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# PROFILES OF TYPICAL ACTIVE TRANSPORTATION SYSTEM USERS

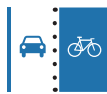
The CAMPO region is diverse and so are the people who live here. Using demographic data, surveys, and extensive meetings with members of the public, the project team developed profiles of different types of current and potential users of the active transportation network. These different users live in different contexts and have different transportation needs. This plan is designed to accommodate the specific needs of these—and other—users.



## NEEDS AND DESIRES OF TYPICAL ACTIVE TRANSPORTATION SYSTEM USERS



Trails



Separated bike lanes



Bike lanes



Bikeable shoulders



Bike parking



Bikeshare



Bikeshare with child seats



Showers and lockers at work



Good sidewalks



ADA treatments



Safe intersections



Pedestrian lighting



Shade from sun



Access to transit



Wayfinding signs



Retail shops





## CRAIG

**Craig** is a retiree living in rural Caldwell County. Once a week he needs to run errands and attend appointments in Lockhart. Craig would love it if he could drive in to town, park his truck once in Downtown Lockhart, and walk to all of his destinations on well-maintained and shaded sidewalks. He also needs highly legible crosswalk and pedestrian timers to feel safe crossings intersections downtown. Craig and his spouse might ride their bikes to town on the weekend to have lunch, but they will only feel comfortable if they have a low-speed, low-traffic, well-defined bike route upon getting to Lockhart, and need secure bike parking once they arrive at their destination.



### SURVEY RESULTS:

#### People who bike zero, once, or twice a week on average.

- **Top purpose to ride a bicycle:** Fun, recreation, exercise, errands
- **Reason not to bike more often:** Traffic, lack of trails, weather, distance
- **Most desired bicycle facilities:** Trails, separated bike lanes
- **Top purpose for walking:** Exercise, fun, recreation, errands
- **Desired walking improvements:** Sidewalks, better maintained sidewalks, trails, safer crossings



# CARLA

**Carla** lives in South Austin and is a student at Texas School for the Blind and Visually Impaired. She does not drive or ride a bike, so she relies on public transportation and walking to get to where she's going. On the weekdays, she needs to get across town to make it to school in the mornings, then heads to her job after class at a grocery store down the street. Carla tries to avoid cracked and crumbling sidewalks on her way to the bus stop and wishes she had more convenient walking routes. When she runs errands on the weekends, it would be much easier if she could walk on sidewalks that lined up with storefronts, rather than crossing through busy parking lots. She needs a more connected network of well-maintained sidewalks to help her get around, along with intersections that have ADA-compatible treatments like audible crossing signals so she feels safe crossing the street.



## SURVEY RESULTS:

### Students at the Texas School for the Blind and Visually Impaired

- **Top purpose for walking:** Fun/recreation, exercise, access to transit
- **Desired walking improvements:** Safer road crossings/intersections, Better maintained sidewalks



# ROSA

**Rosa** is a senior citizen living in suburban Hays County. She does not drive and she lives far from any public transportation. She's still very active in her community and regularly walks to visit family and friends who live nearby. Rosa also loves to take strolls throughout town for pleasure and to get to local shopping destinations, and to her volunteer and social activities, but she worries about tripping on sidewalk cracks and curbs. She would feel much safer walking on well-maintained sidewalks and crossing through intersections with signal timing that makes it easy for pedestrians to cross and has easy to follow pedestrian signs.



## SURVEY RESULTS:

### Over age 60, among people who ride bikes

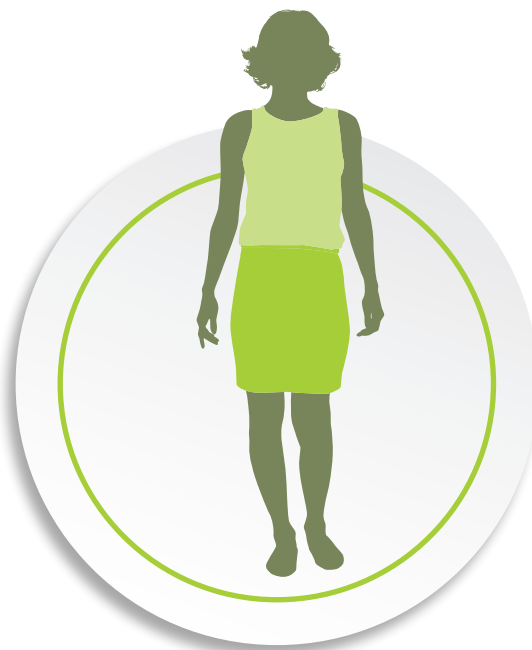
- **Top purpose to ride a bicycle:** fun/recreation, exercise
- **Most desired bicycle facilities:** trails, separated bike lanes
- **Top purpose for walking:** Exercise, fun/recreation, errands
- **Desired walking improvements:** New sidewalks, better maintained sidewalks, new trails





# LAUREN

**Lauren** is a young professional who lives in Williamson County and works in downtown Austin at a tech development company. She cares passionately about the environment, so she sold her car in order to reduce her carbon footprint. Lauren lives near a train station and rides downtown for work. Once she arrives at the downtown station, she walks to her office or uses a bikeshare to travel to her downtown destinations. Lauren loves to try new restaurants with her friends after work and on the weekends, but wishes she could use a bikeshare program when she's closer to home. When she does have the opportunity to bike around her local area, she would like to have the protection of a bike lane. Lauren prefers to walk to run light errands, but would find it much easier to get around if there were more sidewalks and safer pedestrian crossings in her neighborhood.



## SURVEY RESULTS:

### People who do not drive

- **Top purpose to ride a bicycle:** To go to work or school, Fun, recreation
- **Most desired bicycle facilities:** Separated bike lanes, off-street trails, bike lanes
- **Top purpose for walking:** Errands, fun, recreation, exercise, access transit
- **Desired walking improvements:** Safer road crossings, new sidewalks, better maintained sidewalks



## ERIC

**Eric** is a father of two living in Bastrop County. His parents live down the street, but he doesn't feel safe allowing the kids to walk or bike to their grandparents' house. He wants to keep the family active by walking or biking to nearby communities and neighborhoods, but would feel much better about his family walking and biking if road crossings were safer. Eric would love to see separated bike lanes on local roads and better connectivity and maintenance for sidewalks in the area. He thinks that taking the kids out for walks and bike rides during the weekends and the summer would be an inexpensive activity to enjoy together, and wishes there were more trails in his area.



### SURVEY RESULTS:

#### People with Children Under Age 16

- **Reason to ride a bicycle:** exercise, environment, inexpensive, convenient
- **Desired bicycle facilities:** trails, separated bike lanes, bike lanes
- **Reason to walk:** exercise, environment, good sidewalks, inexpensive
- **Desired walking improvements:** new sidewalks, new trails, safer crossings, better sidewalk maintenance



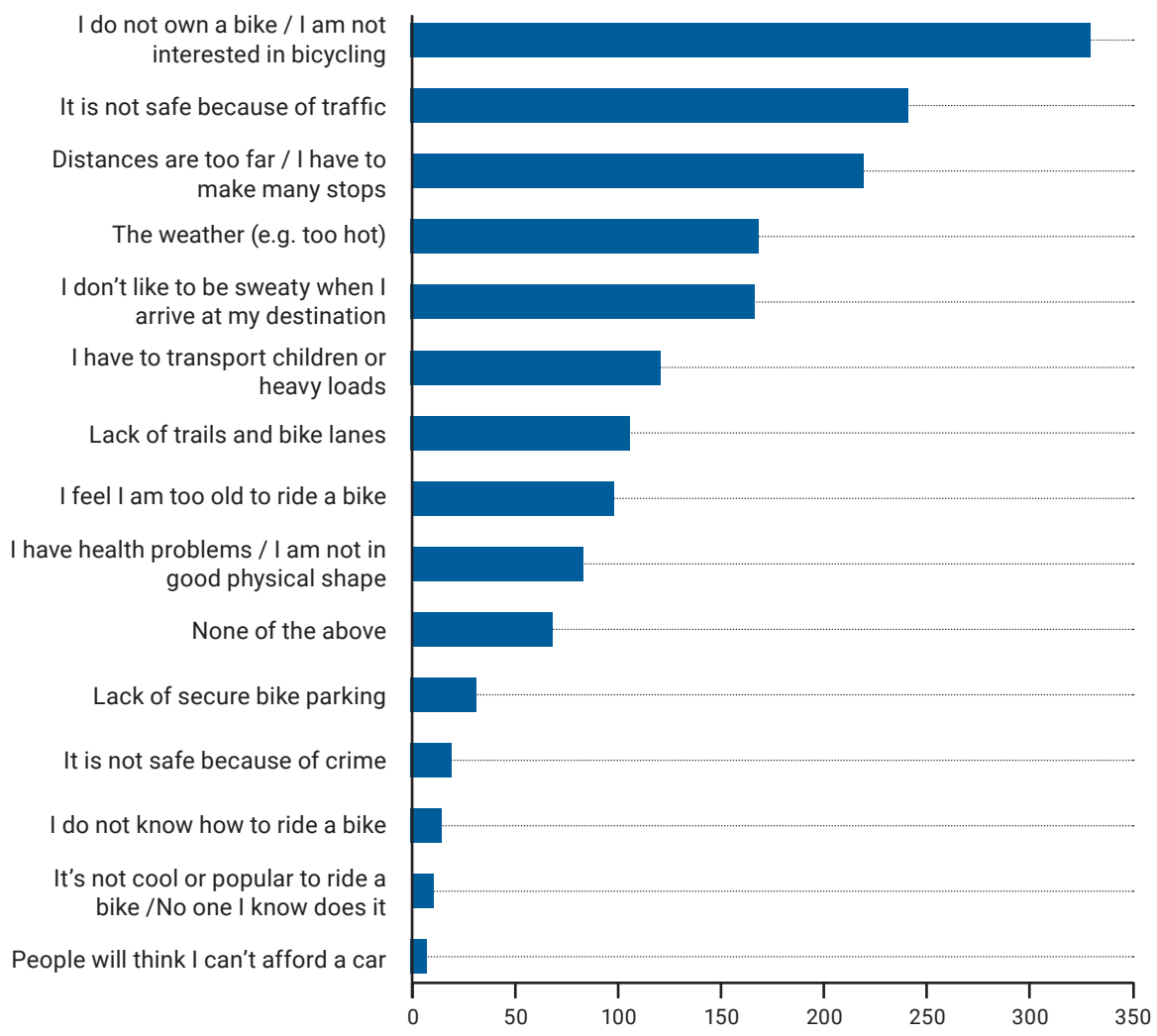
# THOMAS

**Thomas** lives in Burnet County and manages several offices around the county. He frequently has to make trips between offices and is usually in a hurry to get to and from his destinations. Thomas primarily uses his car and doesn't want to lose vehicle travel lanes to bike lanes. Driving on the road with bikes makes him nervous, and he would rather not have to share the street or worry about driving too close to cyclists. He occasionally takes walks in the evening for exercise and leisure and would consider using a trail if one was available.



## SURVEY RESULTS:

### Reasons Non-Bicyclists Do Not Bike







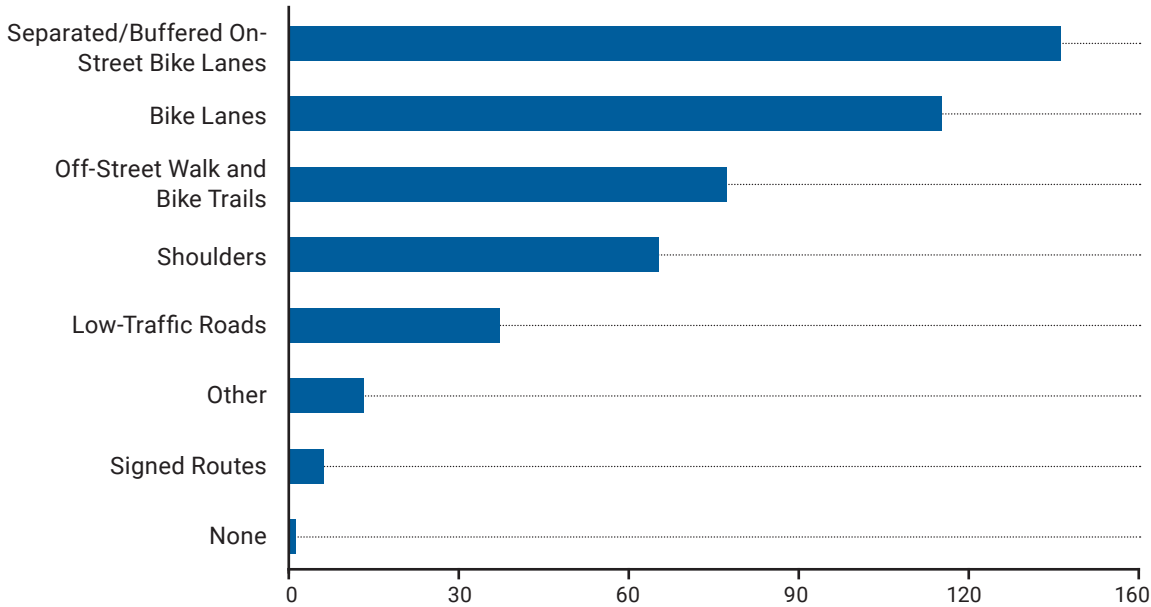
# BILLIE

**Billie** is a serious cyclist living in urban Travis County who loves to bike for exercise and entertainment. She has been a competitive cyclist for years and is currently training for a triathlon. She takes long distance rides throughout suburban areas and often rides out to more rural areas to work on endurance. Billie feels her training and travel would be much safer if there were more well-maintained, wide shoulders. She would love to ride on trails in her community to add more variety to her daily rides.



## SURVEY RESULTS:

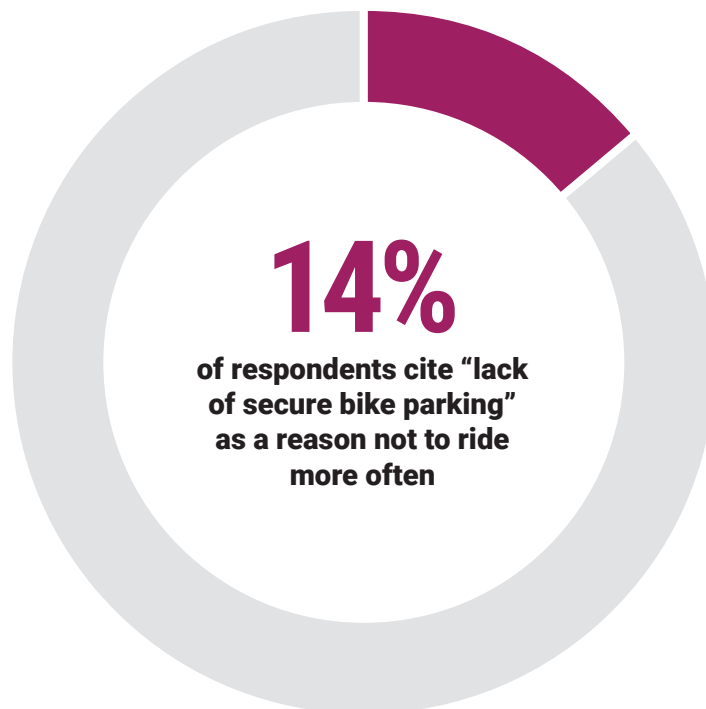
### Desired Facilities for People with Average Bike Trip Over 10 Miles





# MILES

**Miles** is a Sophomore at Southwestern University in Georgetown. He loves the convenience of biking to class and to run errands, but his bike was stolen last year and he has been nervous parking his bike around town ever since. Miles feels more secure riding on a separated bike lane in busy areas and would enjoy riding on trails for recreation over the weekends, but only if he had secure bike parking at or near his destinations to ensure his bike stays safe.





# SARAH

**Sarah** is a fifth grader in San Marcos whose school is a few streets away from her house. This is the first year Sarah has been allowed to walk to school by herself. Sometimes she takes the long way to school because the sidewalks in her neighborhood don't all connect. Other times, Sarah walks on dirt paths next to the curb that connect the sidewalks. Sarah is still working on her biking skills, but has fun riding with her older brother to the park and to visit friends and family. She still isn't allowed to ride alone because her parents don't want her to be in the street, but she would love to use a mixed-use path or trails in her neighborhood.

31% of parents with children under 16 say that it is safe for their children to walk and/or bike to school. 69% say it is not.



# ALEX & LEAH

**Alex and Leah** are a young couple living in an inner suburb of Austin. Leah works during the day at a local department store, and Alex works evenings at a hotel. The two share one car and take turns caring for their two-year-old daughter Sophie, while the other one is at work. When Leah takes the car to work in the mornings, Alex and Sophie walk to the park and to run light errands. Alex wishes there were more shade available when he and Sophie are out on walks, and sometimes has trouble using a stroller where neighborhood streets lack curb cuts and continuous sidewalks. He would love to use a bike share program to help them get around, but there are no options for Sophie unless he brings a bike trailer or seat. When Leah takes Sophie on walks in the evenings, she gets nervous crossing the street and wishes the crosswalks were more clearly marked. Alex and Leah would both love to use a path for recreational walks and bike rides.

Married people in their 20s and 30s desired new sidewalks (55%), safer road crossings (42%), trails (39%), and better maintained sidewalks (34%). Fourteen percent desired more shade to improve walking conditions.





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# CHAPTER 5

## IMPLEMENTATION

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The implementation of the CAMPO Regional Active Transportation Plan and the recommended networks will occur over time by a variety of agency partners in the region. This chapter provides information to help local governments identify project needs, and the appropriate facility based on the existing facility, the land use, and roadway characteristics. It also provides information on prioritization, performance measures, cost estimates, and funding sources.



# FACILITY-SELECTION PROCESS

The regional priority network (Tiers I and II) is over 1,000 miles and is made up of different types of existing facilities and gaps where there are no facilities. This section lays out a process for local jurisdictions to identify appropriate projects and facility types for their community. It will be up to the implementing agency to identify what facility-type is needed to safely and comfortably accommodate bicycling.

The first step is to identify the desired route. Projects may be selected from the regional priority network or from the unconstrained network in short-trip mobility zones (see the Network chapter).

Once a critical connection is identified, the project type should be determined by an analysis of the existing facility (if any, see page 3), the amount of separation needed for safety and comfort, the land-use context, and the design recommendations in the Regional Active Transportation Plan Patternbook.

## STEP 1

### Identify the Priority Route

- Regional priority route (Tier I, II, or III Vision Connections)
- Short-trip mobility zone
- Other local priority

## STEP 2

### Identify current condition

- No facility, potential for an upgraded facility, or a comfortable existing facility
- Urban, suburban, or rural land use

## STEP 3

### Identify needed improvement based on traffic speed and volume

#### General recommendations for facility improvements

Existing Facility	Improvement to Consider
No facility	Shoulder/Bike Lane or Physically separated facility
Shoulder/Bike Lane	Physically separated facility
Physically separated facility	Upgrade with lighting, signage, benches, bike parking

#### General facility recommendation based on land use

Urban/Suburban	Rural/Suburban
Bike Lane	Shoulder
Separated Bike lane, sidepath, trail	Trail or Sidepath

See page 6 for photos of facility types.

These are general recommendations. Specific conditions should dictate facility selection. The specific facility should be determined based on land use and the need for separation from traffic (see page 4, reference table for when separation from traffic is recommended). If no facility currently exists, a wide shoulder may be recommended in low traffic volume and speed contexts, or a separated facility in areas with higher volumes and speeds. If a shoulder or bike lane exists, a sidepath, trail, or separated bike lane may be recommended. If a separated facility exists, lighting, signs, bike parking, or benches may be recommended.

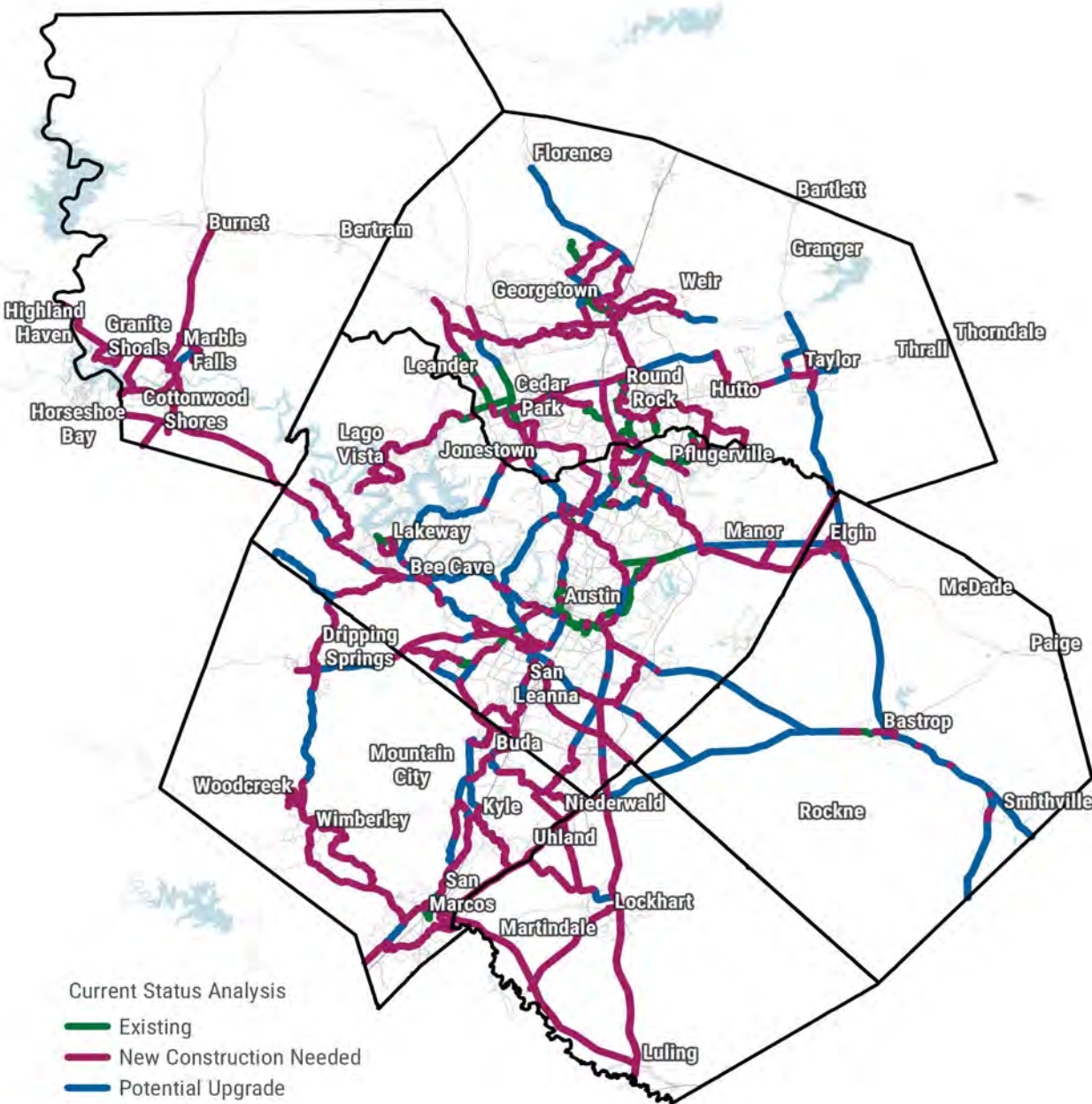
# CURRENT STATUS ANALYSIS

## Definitions for Current Status Analysis map

**Existing:** There is currently a facility that provides separation from motor vehicle traffic that is likely comfortable for a typical person for ride a bicycle. Facility types include trails, sidepaths, and separated bike lanes.

**Potential Upgrade:** There is currently a bicycle facility on this segment. This facility does not provide separation from motor vehicle traffic and may provide comfort for some people to ride on. Facilities types include bike lanes, dedicated shared lanes, sharrows, bike boulevards and paved shoulders.

**New Construction Needed:** There is currently no bicycle facility on this segment.



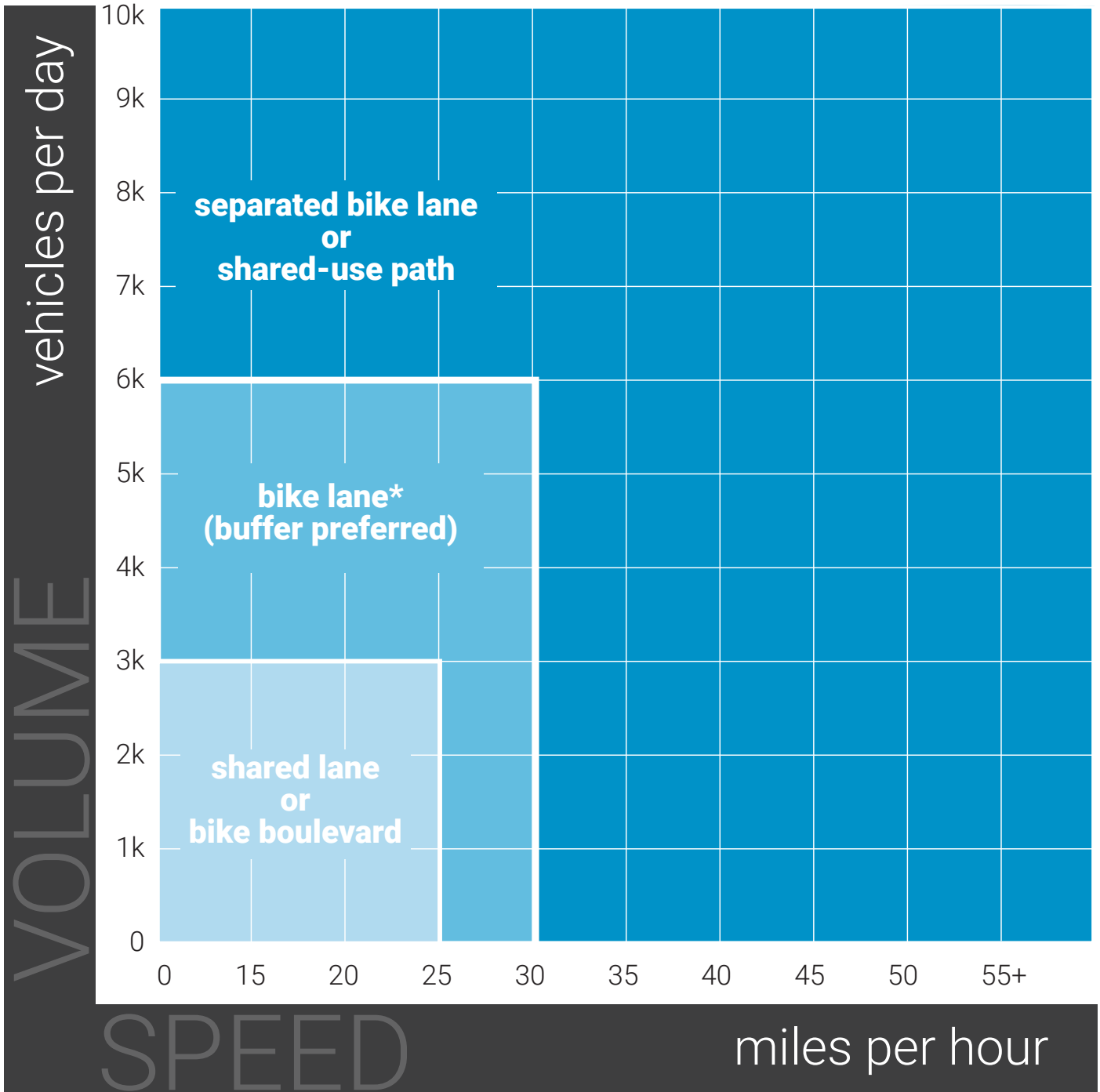


# SELECTION CHARTS

Traffic volume and speed influence bicyclist comfort. The following tables provide general guidelines for how much separation is desirable based on traffic conditions in urban/suburban and rural conditions.

## BICYCLE FACILITY SELECTION CHART

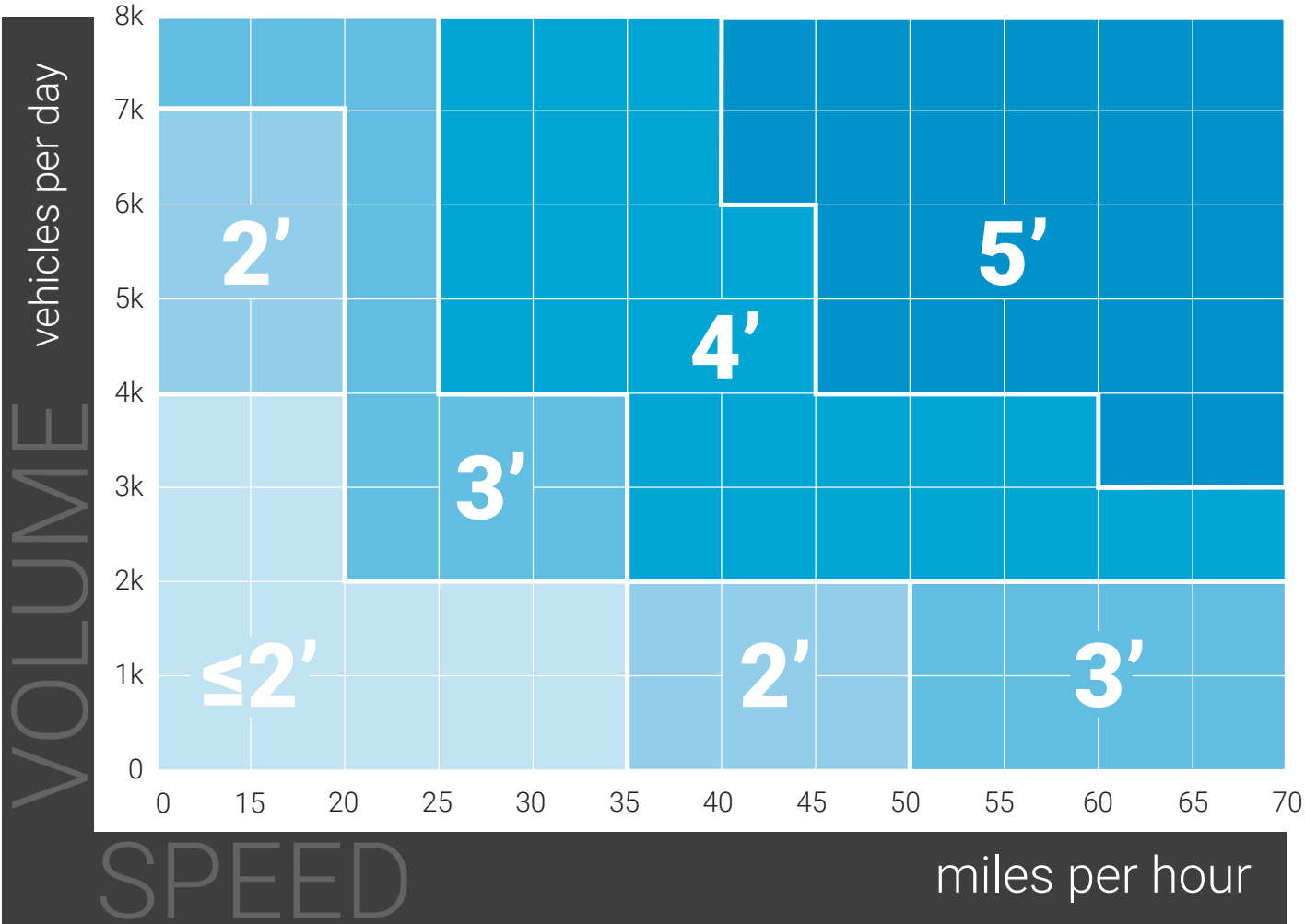
### Urban and Suburban Roadways



\*advisory bike lanes may be an option where traffic volume < 4K Average Daily Traffic (ADT)  
 Thresholds based on Bicycle Level of Service and adapted CROW manual guidelines.

# RECOMMENDED MINIMUM SHOULDER

## Rural Roadways



## Facility Choices

Bicycle facility types can generally be grouped according to shared roadways (no facility), bicycle facilities with no physical barrier (non-separated facilities) and bicycle facilities that are physically separated from traffic with a vertical barrier or non-roadway alignment.

### No facility

No designated bicycle facility may be necessary on roads with very low speeds and traffic volumes.



Commercial Contexts

### Non-separated facility

Non-physically separated bike lanes and shoulders may be appropriate on roadways with low traffic speeds and volumes.



Bike Lanes

### Physically separated facility

Physically separated facilities should be provided on roadways with higher traffic speeds and traffic.



Separated Bike Lanes



Residential Contexts



Paved Shoulders



Side Paths



Rural Contexts



Trails



# LAND USE CONTEXT

Land use varies in the CAMPO region. The characteristics of the land use may influence facility selection.

## RURAL

In rural areas, trails, side paths, and wide shoulders may be most appropriate.



**Williamson County**



**Burnet County**



**Bastrop County**



## SUBURBAN

In suburban areas, trails, side paths, wide shoulders, bike lanes or separated bike lanes may be most appropriate.



Pflugerville



Bastrop



Leander



Cedar Park



Photos by Half Associates



# URBAN

In urban areas, separated bike lanes, bike lanes, trails, or side paths may be most appropriate.



Austin



Austin



Austin



## Prioritization Criteria

The regional priority network sets three tiers of prioritization (Tiers I, II, and III). Additionally, projects in the unconstrained network should be prioritized by local governments, especially in short-trip mobility zones.

CAMPO has developed the Active Transportation Project Selection Criteria. Criteria includes planning, distribution, innovation, connectivity, safety, social and environmental impact, and funding. CAMPO will work with local governments to develop County project lists to create a ranking system that will rank projects highly on CAMPO’s funding criteria. Through CAMPO’s Transportation Improvement Program project sponsors may select projects from this plan or other documents to be ranked as part of a program of projects scored based on the planning factors, readiness, and cost benefit analysis.

Criteria	Value	Performance Measure
<b>Planning</b>	<b>10</b>	The project has undergone a comprehensive planning process and is identified as a priority in a local or regional transportation plan.
<b>Distribution</b>	<b>5</b>	The project is facility where no other facility of this type exists within the jurisdiction or is outside the 5-mile radius of a similar facility.
<b>Innovation</b>	<b>5</b>	The project is a pilot project or includes innovative design elements.
<b>Connectivity</b>	<b>10</b>	Project removes a barrier or provides a connection that did not exist previously.
	<b>10</b>	Project connects to existing facilities such as schools, community facilities, residential, employment centers, etc.
	<b>10-20</b>	The project directly links to a transit connection or is within: <ul style="list-style-type: none"> <li>• 20 points, if .25 miles or less or</li> <li>• 15 points, if .26 to .5 miles or</li> <li>• 10 points, if the project demonstrates a potential for future connection to a transit system.</li> </ul>
<b>Safety</b>	<b>15</b>	The project improves pedestrian and cyclist safety.
<b>Social and Environmental Impact</b>	<b>10</b>	The project serves traditionally underserved populations including low-income, minority, elderly, disabled, and limited English proficiency households.
	<b>10</b>	The project has incorporated measures that reduce, minimize or avoid negative impacts to the environment or cultural resources.
<b>Funding</b>	<b>1-5</b>	The project’s local cost share is overmatched. (5% = 1 point)
<b>Total Points</b>	<b>100</b>	

## Performance Measures

Providing more opportunities for bicycling and walking increasingly requires performance measures to help prioritize projects, evaluate appropriate facility types, and track project progress over time. Using active transportation performance measures, a jurisdiction can evaluate and adopt policies and plans to implement projects that enhance safety, mobility, equity, and accessibility. The following recommendations provide a framework for the CAMPO region to begin charting its progress towards increasing opportunities for active transportation. These measures should be revisited as new plans and priorities occur in the future.

- **Access:** Share of population living within .5 miles of a constructed component of the Tier I and II of the regional priority network – set milestones for 2018 and 2023
- **Equity:** Share of low income residents, people of color, school-aged children, and seniors living within .5 miles of a constructed component of the regional priority network – Tier I and Tier II – set milestones for 2018 and 2023
- **Equity:** Share of zero car households within .5 miles of a constructed component of the regional priority network – Tier I and Tier II – set milestones for 2018 and 2023
- **Access:** Share of constructed facility miles in short trip mobility zones – set milestones for 2018 and 2023
- **Health and Safety:** Reduce bicycle and pedestrian related fatal and injury crash rates in the CAMPO region – set milestones for 2018 and 2023
- **Multimodal:** Establish local jurisdiction bicycle and pedestrian mode share goals across the CAMPO region – set milestones for 2018 and 2023
- **Education:** Track the number of available active transportation programs, participation in these programs, and level of staff training – set milestones for 2018 and 2023
- **Infrastructure:** Increase grant applications for bicycle and pedestrian projects in the CAMPO region – set milestones for percentage of annual increase
- Position CAMPO’s local jurisdictions as officially recognized Walk and Bicycle Friendly Communities through national certification programs – set milestones for 2018 and 2023

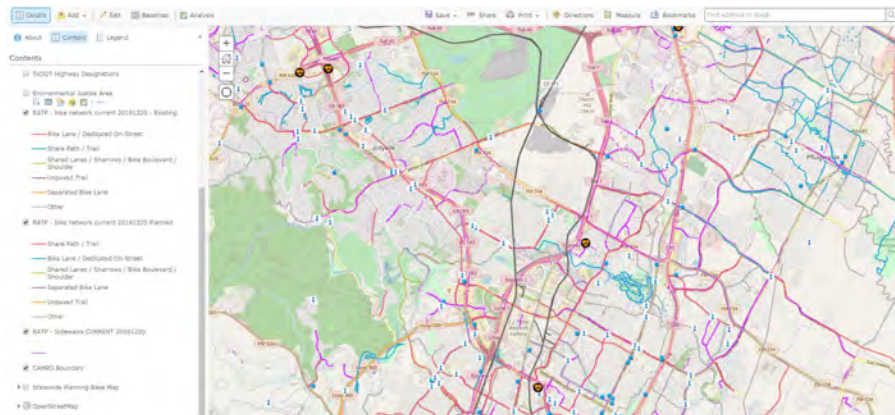
## Cost Estimates for Regional Network

Understanding the potential costs of active transportation projects is an essential component in determining the rate of growth for the regional network, selecting priority projects and in planning project phasing. The cost estimates provided will assist CAMPO and its local partners in understanding the feasibility of constructing various types of facilities along the regional network. As municipalities go through the project selection process weighing cost will be an important factor in how and when projects will be built. Each community will face the challenge of balancing the need for more infrastructure with its ability to provide financial investment—the estimates below begin to inform that decision.

The construction cost estimates below were developed on a per-mile basis by identifying pay items and establishing rough quantities. Unit costs are based on 2017 dollars and were assigned based on historical cost data from the Texas Department of Transportation and other local sources. Please note that the per mile estimates do not include any costs for easement or Right-of-Way acquisition, design, or the cost for ongoing maintenance.

Table 1: Cost Estimates for Regional Network

RECOMMENDATION	COS/MI (\$)	COST/MI (\$) IF REPAVING
Rural Signed Route	\$8,000.00	
Urban Signed Route	\$18,000.00	
Shared Lane Markings	\$30,000.00	\$160,000.00
Bike Lanes	\$83,000.00	\$218,000.00
Bicycle Blvd.	\$190,000.00	\$326,000.00
Buffered Bike Lanes	\$195,000.00	\$326,000.00
Separated Bike Lane	\$1,570,000.00	
Sidepath	\$650,000.00	
Trail	\$1,200,000.00	



The project viewer will allow for regular network updates.

## Regional Network Projects

Project segments are defined by the existing facility (e.g. no facility or potential upgrade). If a current facility type segment is shorter than ¼ mile, the segment may be included in a larger project of a different type. Projects end at county lines.

The proposed time period for Tier I projects is 1 to 15 years. The timeline for Tier II projects is 15 to 25 years. Vision Connectors and unconstrained network projects are in the 25+ years timeframe.

The project list and corresponding maps are represented by county in chapter six. The regional network project list is in appendix C.

Sample Project List - Bastrop County

Project Number	Tier	Type	Project Name	From	To
BA1	Tier 1	Potential Upgrade	FM 812 / FM 812 Rd	FM 812 @ W SH 21	FM 812 Rd @ Doyle Rd
BA2	Tier 2	Potential Upgrade	W SH 21	W SH 21 from W SH 71	Williamson Rd
BA3	Tier 2	New Construction Needed, Potential Upgrade	E SH 71 WB / SH 71 Crossover / W SH 71 / W SH 71 Fr	W SH 71 from Griffin Ln	Old Austin Hwy

## CAMPO Project Viewer

The CAMPO project viewer is being developed to show all projects associated with CAMPO’s Long-range Plan, Transportation Improvement Program, and special studies, such as the Regional Active Transportation Plan. The viewer will allow local governments to not only view projects and see how projects align by various modes, but to also complete select data analysis associated with plans. Basic data such as safety, demographics, environment, facility performance, and public health will be included as information on the viewer. The pedestrian and bicycling data collected as part of the Active Transportation Plan will also be included on the viewer. The viewer will serve as a centralized location for network and inventory updates as local and regional needs evolve. In addition to the local government interface, the viewer will eventually include access for the public to view information.

# FUNDING PROGRAM

Funding that provides for a region-wide system of connected bicycle and pedestrian facilities is derived from a variety of sources. Federal transportation programs administered by TxDOT or CAMPO provide the most reliable funding opportunities for substantial bicycle and pedestrian infrastructure investment, but these resources are best leveraged when they can be augmented by local funding.

This section of the Plan provides a brief description of key funding sources for bicycle and pedestrian plan implementation.

## LOCAL FUNDING SOURCES

Although federal programs provide the bulk of funding for bicycle and pedestrian projects, local municipalities are responsible for remaining project costs not covered through these sources. This section highlights typical local funding sources, as well as several alternative sources, that may be utilized to fund bicycle and pedestrian projects as either stand-alone projects or as part of larger projects.

- **Property Taxes.** Property taxes are typically the main source for local income and contribute to a city's general fund. Subject to local policies, procedures, and availability, these funds may be used at the discretion of each municipality to help in the funding of infrastructure improvements. Property tax increases can be implemented through a public voting process.
- **Sales Taxes.** These funds could be used at the discretion of each municipality to fund bicycle and pedestrian infrastructure improvements. Within Texas, sales taxes are usually a consistent percentage of the selling price and vary between local jurisdictions. Local sales tax is in addition to statewide sales tax. Municipalities can vote to increase sales taxes as an option to fund bicycle and pedestrian projects even though sales taxes are generally added to the general fund.
- **Bonds.** To fund bicycle and pedestrian facilities, either general obligation or revenue bonds may be used. Approval is required of these bonds from voting citizens and needs to be paid back to investors over the duration of the bond. To pay off bonds, revenues from property and sales taxes are normally used.
- **Local Capital Improvement Programs.** Local municipalities use Capital Improvement Programs (CIPs) as an outline for financing upcoming capital projects. Municipalities can decide which projects should be funded each year based on their projected revenues versus operating costs using a variety of local funding sources including property taxes and sales taxes.
- **User Fees.** Those who use a facility are charged a user fee. The price of the facility, finance operations, and to produce extra income are all part of what the fees pay. Usually, user fees are charged for the use of specific public utilities/ services, like public parks, water and sewer facilities, transportation systems, and waste services. To make sure that non-users are not paying extra charges to operate and maintain a facility that they do not use, those who use the facility are charged directly. Off-road facilities and recreational trails may be appropriate facility types to charge a user fee.
- **Impact/Developer Fees.** To fund infrastructure improvements, development impact fees are another funding source that could be used at the local level. If no such fee currently exists, developer fees require policy modifications at the local level. Where development is impacting the local transportation system, developer fees are intended to ensure that developers pay their part of improvements. As growth happens in the area, the use of developer fees to fund bicycle and pedestrian improvements ensures that pedestrian and bicycle amenities/facilities are able to support growth.
- **Special Assessments.** When the cost is directly controlled by those who benefit from the project, a special assessment, which is a way of getting funds for public infrastructure improvements, can be used. One example would be when neighborhoods coordinate to ensure that a portion of their property tax or an extra fee is used to assist with the funding of bicycle and pedestrian enhancements on their street. To fund specific enhancements within certain locations, one example of a special assessment is a tax-increment financing district where properties are taxed at an extra amount above the base tax amount. The difference among the extra rate and the base tax rate (i.e. the increment) is usually used to fund those enhancements.
- **Crowd Funding.** Crowd funding is a growing way to fund bicycle and pedestrian infrastructure enhancements. It lets citizens raise money to mutually fund a certain project. While crowd funding can assist in the funding of projects, it can also raise community awareness for bicycle and pedestrian needs and, in turn, possibly attract other donors and community support for continuous investment in bicycle and pedestrian facilities.
- **Partnerships.** Partnerships with local and regional business, non-profits, and public authorities can be essential to acquiring more funding for bicycle and pedestrian projects, especially when local funding is not readily accessible. For example, some CAMPO



communities are eligible for LCRA community development grants of \$50,000 which can be used to for bicycle or pedestrian projects.

- **Park Land Dedication Ordinances.** Texas communities have postponed most of the cost of getting new or expanded park lands (including trails) to the development interests that generate the need – through the construction of neighborhoods, apartment complexes, and other types of residential and non-residential expansion. Park land dedication ordinances - including park land dedication and development fees that may be used to acquire linear park land and assist in the construction of multi-use trails.

- **Recreational Trails Program (RTP).** *The RTP is a subset of funds from the STBGP Set-aside. The RTP is administered by the TPWD, which receives grant applications from participating local governments. Eligible projects include maintenance and restoration of existing facilities, construction of new trails, acquisition of easements or property for trails, and the development and rehabilitation of trailside/trailhead facilities and trail linkages.*

- **Highway Safety Improvement Program (HSIP).** The HSIP assists public agencies in improving safety along public roadways. HSIP funds are dedicated to projects that reduce conflicts between pedestrian/bicycles and automobiles, such as pedestrian hybrid-beacons and roadway improvements that provide separated facilities (e.g. medians or pedestrian islands). In addition, Section 405 (National Priority Safety Programs) of the HSIP provides funds for bicycle and pedestrian safety and education programs in States where bicycle and pedestrian fatalities exceed 15 percent of all traffic fatalities. Texas is eligible for Section 405 funding.

- **National Highway Performance Program (NHPP).** The NHPP provides funding for the construction of new facilities on the National Highway System (NHS). NHPP funds can be utilized to fund bicycle lanes, bicycle parking, curb cuts and ramps, separated bicycle facilities, and shared use paths, among others. NHPP funds are administered by TxDOT.

## FEDERAL FUNDING SOURCES

The Fixing America's Surface Transportation (FAST) Act is the most recent in a series of federal transportation authorization bills designed to provide long-term certainty in the structure of federal transportation programs. Bicycling and walking projects are broadly eligible for federal transportation program funds. The FAST Act restructured some of the key programs used for bicycling and walking projects.

The following federal funding programs are reliable resources for implementing bicycle and pedestrian projects:

- **Surface Transportation Block Grant Program (STPBG).** The STPBG is the most flexible federal transportation funding program available to States, regions, and local governments, and provides funds for nearly all transportation types - including those projects that may incorporate bicycle and pedestrian improvements. This funding category includes a sub-category of 'set-aside' grants explained below.
- **Surface Transportation Block Grant Program Set-aside (STPBG Set-aside.)** *(Sometimes referred to as the Transportation Alternatives Set-aside).* Allocates funding specifically for bicycle and pedestrian projects (including eligible Safe Routes to School projects), replaces the Transportation Alternatives Program, and incorporates the Recreational Trails Program.
  - **Transportation Alternatives Program (TAP).** *The STPBG Set-aside replaces the TAP with program funding for transportation alternatives. All bicycle and pedestrian projects previously eligible for TAP funding under previous federal authorizations continue their eligibility in the revised STPBG Set-aside. Funding for transportation alternatives projects remains a competitive process, and now requires states and MPOs to provide annual reports on applications for funding and awarded funds.*

- **Federal Transit Administration Programs (FTA).** The FTA provides funds for bicycle and pedestrian investments that relate to public transit programs. Bicycle lanes, bicycle parking, bus shelters/benches, sidewalks, and lighting may be funded but must provide or improve access to existing or proposed transit facilities.

Specific FTA programs that assist in funding bicycle and pedestrian facility investments related to transit include:

- *Urbanized Area Formula Program*
- *Fixed Guideway Capital Investment Grants*
- *Bus and Bus Facilities Formula Grants*
- *Enhanced Mobility of Seniors and Individuals with Disabilities Program*
- *Formula Grants for Rural Areas*

**Table 2 (page 14-15)** provides a summary of common federal funding sources that may be available for bicycle and pedestrian projects in the CAMPO region.

## Other Federal Funding Sources

In addition to the previously referenced federal transportation resources, other federal funding programs may be utilized that directly or indirectly support the development of bicycle and pedestrian infrastructure:

- **Transportation Investment Generating Economic Recovery Discretionary Grant Program (TIGER).** TIGER grants are competitive/discretionary grants that can be utilized to fund surface transportation infrastructure capital investments. TIGER grants primarily focus on projects that provide both economic benefits and improve access to reliable, safe and affordable transportation options. TIGER grants may be used for, but not limited to, bicycle lanes, cross walks, lighting, and bridges. Capital funds provided through the TIGER program are unique in that individual municipalities, counties, and MPOs can receive them directly from the federal government, as opposed to most federal funds that are distributed at the State or transit agency level and then allocated to individual municipalities.
- **The Transportation Infrastructure Finance and Innovation Act (TIFIA).** The TIFIA program provides federal credit assistance through direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance. TIFIA is a helpful tool to advance large-scale projects that may otherwise be delayed due to size, complexity, or timing of revenues.

- **Community Development Block Grants (CDBG) Entitlement Program – Department of Housing and Urban Development (HUD).** The CDBG Entitlement Program, administered through the Department of Housing and Urban Development, provides funds to entitlement communities on a formula basis to develop viable urban communities. As such, funds available through the CDBG Entitlement Program may be eligible for bicycle and pedestrian projects within some CAMPO communities. These grants can be used to fund an array of community development projects, including public facilities and improvements that enhance the quality of life for residents of low- to moderate-income communities. Specifically, the construction or improvement of streets is an approved activity. Eligible projects could include sidewalk improvements, streetscape enhancements that promote economic development, and community-based active transportation facilities.
- **Section 108 – Loan Guarantee Program – Department of Housing and Urban Development (HUD).** As part of the federal CDBG program, the Section 108 - Loan Guarantee Program allows local governments to transform a small portion of their allotted CDBG funds into federally guaranteed loans to pursue revitalization projects for neighborhoods. These loans can be utilized by either the public entity receiving the funds or loaned to a third party to construct community projects.

Table 2: U.S. Department of Transportation Surface Transportation Funding Programs

ACTIVITY	FTA	ATI	CMAQ	HSIP	NHPP/NHS	STBGP	STBGP SET-ASIDE (TAP/TE)	RTP	PLAN	402	FLH	TIGER	TIFIA
Access Improvements to Public Transportation	X	X	X			X	X				X	X	X
Bicycle and/or Pedestrian Plans	X					X			X		X		
Bicycle Lanes On Road	X	X	X	X	X	X	X				X	X	X
Bicycle Parking	X	X	X			X	X				X	X	X
Bike Racks On Transit	X	X	X			X	X				X	X	X
Bicycle Share (Capital/Equipment; Not Operations)	X	X	X		X	X	X				X	X	X
Bicycle Storage or Service Centers	X	X	X			X	X					X	X
Bridges / Overcrossings	X	X	X	X	X	X	X	X			X	X	X
Bus Shelters	X	X				X	X				X	X	X
Coordinator Positions (State or Local)			X			X	O						
Crosswalks (New or Retrofit)	X	X	X	X	X	X	X	X			X	X	X
Curb Cuts and Ramps	X	X	X	X	X	X	X	X			X	X	X
Helmet Promotion						X	O			X			
Landscaping/Streetscaping (Bike/ Ped Route; Transit Access)	X	X				X	X				X	X	X
Maps (For Bicyclists and/or Pedestrians)	X	X	X			X	O			X			
Paved Shoulders			X	X	X	X	X				X	X	X

X Eligible

X Eligible, but not competitive unless part of a larger project

O Eligible under SRTS program

**TABLE KEY:**

FTA: Federal Transit Administration Capital Funds

ATI : Associated Transit Improvement

CMAQ: Congestion Mitigation and Air Quality Improvement Program

HSIP: Highway Safety Improvement Program

NHPP/NHS: National Highway Performance Program (National Highway System)

STP: Surface Transportation Program

TAP/TE: Transportation Alternatives Program / Transportation Enhancement Activities

RTP: Recreational Trails Program

SRTS: Safe Routes to School Program

PLAN: Statewide or Metropolitan Planning

402: State and Community Traffic Safety Program

405: National Priority Safety Programs

FLH: Federal Lands Highway Program (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program)



Table 2: U.S. Department of Transportation Surface Transportation Funding Programs (cont.)

ACTIVITY	FTA	ATI	CMAQ	HSIP	NHPP/NHS	STBGP	TSTBGP SET-ASIDE (TAP/TE)	RTP	PLAN	402	FLH	TIGER	TIFIA
Recreational Trails						X	X	X			X	X	X
Road Diets (Bicycle/Pedestrian Portions)				X	X	X	X				X	X	X
Safety Brochures, Books						O	O			X			
Safety Education Positions						O	O			X			
Separated Bicycle Lanes	X	X	X	X	X	X	X	X				X	X
Shared Use Paths / Transportation Trails	X	X	X	X	X	X	X	X			X	X	X
Sidewalks (New or Retrofit)	X	X	X	X	X	X	X	X			X	X	X
Signs / Signals / Signal Improvements	X	X	X	X	X	X	X				X	X	X
Signed Bicycle or Pedestrian Routes	X	X	X		X	X	X				X	X	X
Spot Improvement Programs	X		X	X		X	X	X				X	X
Traffic Calming	X			X	X	X	X					X	X
Trail Bridges			X	X	X	X	X	X			X	X	X
Trail/Highway Intersections			X	X	X	X	X	X			X		
Training			X			X	X	X		X			
Tunnels / Undercrossings	X	X	X	X	X	X	X	X			X	X	X

X Eligible

X Eligible, but not competitive unless part of a larger project

O Eligible under SRTS program

**TABLE KEY:**

FTA: Federal Transit Administration Capital Funds

ATI : Associated Transit Improvement

CMAQ: Congestion Mitigation and Air Quality Improvement Program

HSIP: Highway Safety Improvement Program

NHPP/NHS: National Highway Performance Program (National Highway System)

STP: Surface Transportation Program

TAP/TE: Transportation Alternatives Program / Transportation Enhancement Activities

RTP: Recreational Trails Program

SRTS: Safe Routes to School Program

PLAN: Statewide or Metropolitan Planning

402: State and Community Traffic Safety Program

405: National Priority Safety Programs

FLH: Federal Lands Highway Program (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program)

## STATE FUNDING SOURCES

- **Texas Department of Transportation (TxDOT).** The FHWA allocates funding to each State in a lump sum for all apportioned programs. TxDOT sub-allocates these funds to the local level using 12 funding classes. Applicable bicycle and pedestrian funding classes include:
  - *Category 1: Preventative Maintenance and Rehabilitation*
  - *Category 2: Metropolitan and Urban Corridor Projects*
  - *Category 4: Statewide Connectivity Corridor Projects*
  - *Category 5: Congestion Mitigation and Air Quality Improvement*
  - *Category 7: Metropolitan Mobility and Rehabilitation*
  - *Category 8: Highway Safety Improvement Program*
  - *Category 9: Transportation Enhancements*
  - *Category 9: Transportation Alternatives Program*
  - *Category 10: Texas Parks and Wildlife Department*
  - *Category 10: Curb Ramp Program*
  - *Category 10: Supplemental Transportation Projects (Federal and Non-Federal)*
  - *Category 11: District Discretionary*
  - *Category 12: Strategic Priority (Economic Development)*
- **Texas Parks and Wildlife (TPWD) Recreational Trails Grants.** This STP set-aside program funds trails for recreational use, including for walking, hiking, bicycling, equestrian use, and more. In the state of Texas, program funds are administered by the Texas Parks and Wildlife Division (TPWD). There is a \$200,000 limit on grants and they cannot exceed 80 percent of the project cost.

# CHAPTER 6

## COUNTY PLANS

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This chapter provides a more local view of the primary recommendations in this plan. Each county in the CAMPO region can use this information to understand their connection to the regional network. The key study components and findings are separated by county in an effort to provide a balance between a forward thinking regional active transportation vision plan and the priorities of local jurisdictions.

Extensive outreach was conducted with local governments and agencies. That outreach led to an understanding of local active transportation needs and many of the proposed projects and ideas that are part of this plan.

Each summary highlights county specific information including existing conditions, policy and codes review, demand analysis, gaps analysis, public outreach survey, county-level network recommendations, and a project list. The county plan summary will assist municipalities in each county to understand their local needs and challenges. This information will in turn prepare them for accessing future funding.





# BASTROP COUNTY

The Bastrop County plan summary provides a county-level look at the results and recommendations of the CAMPO Regional Active Transportation Plan.

## Demographics

Area (miles)	Population	People of Color (Black, Latino, Asian, and other)		White Population		School-aged Children	
		Count	Percentage	Count	Percentage	Count	Percentage
896	75,708	33,488	42%	42,220	58%	14,687	18%

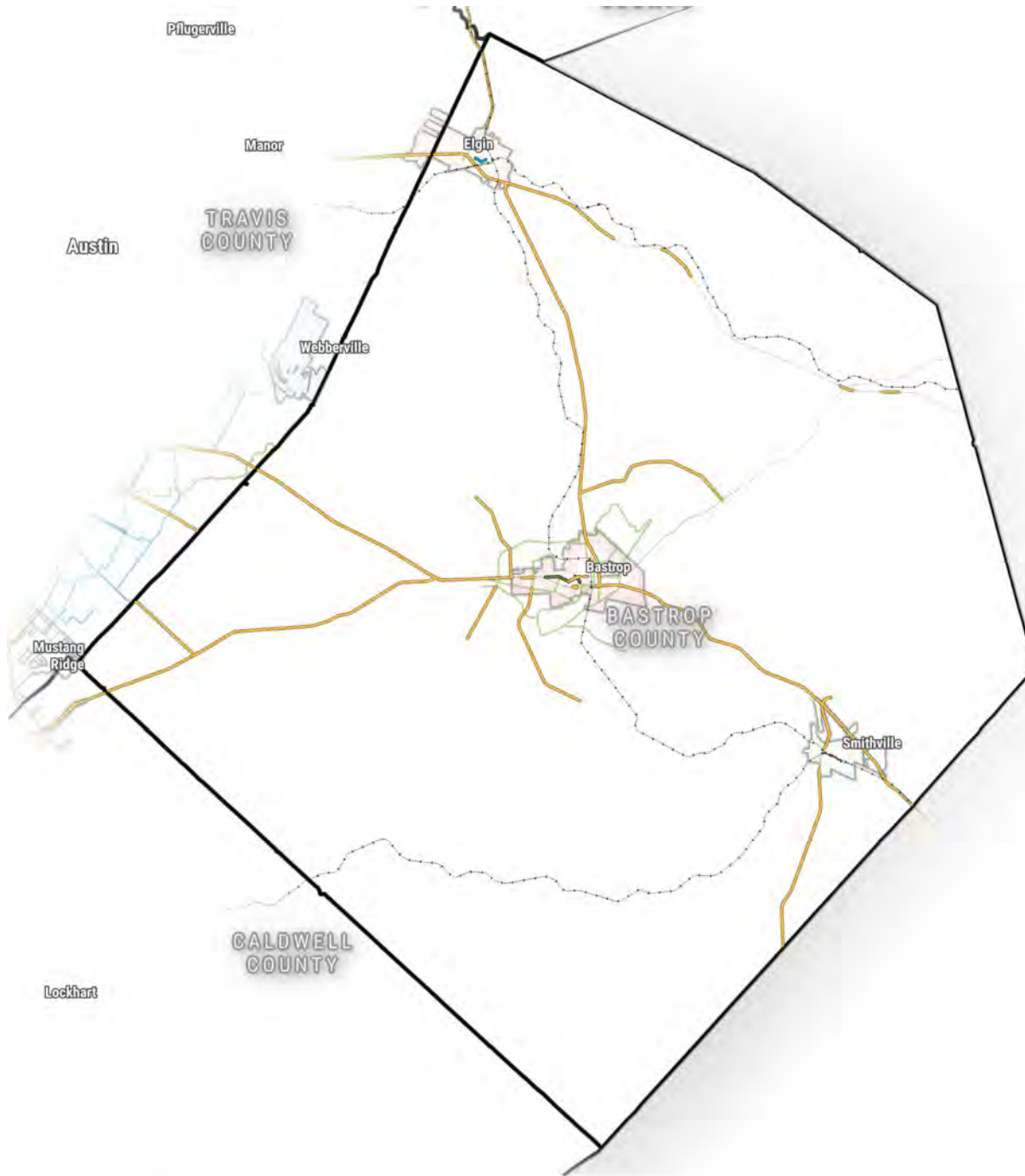
Seniors (60+)	Households	Households in Poverty	Housing Units	Zero Car Housing Units
14,520	20%	25,314	3,350	14%
			25,314	908
				4%

## EXISTING AND PLANNED FACILITIES

Bastrop County has 126 existing miles, 41 planned miles of bicycle facility, and 23 miles of existing and planned sidewalks. The existing bicycle facilities are primarily shoulders on the major roadways in the county, Routes 71, 21, 95, and 304. An example of a shared use path is along Old Austin Highway in Bastrop. There were several bicycle routes identified as needed in Elgin during the municipal meetings.

	Existing Miles	Planned and Proposed Miles	Total Miles
<b>Bastrop County</b>	126	117	243
Bike Lane / Dedicated On-Street	<1	0	<1
Share Path / Trail	2	41	43
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	104	0	104
Sidewalks	20	3	23
Bicycle/pedestrian needs identified by local governments	N/A	73	73

# EXISTING AND PLANNED BICYCLE FACILITIES



**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway



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## POLICIES, PROGRAMS, AND CODES

The bicycle and pedestrian policy scans for Bastrop County included a review of public documents and programs for the municipalities of: Bastrop, Elgin, Smithville; and, Bastrop County. Over 18 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Bastrop County communities—individually and collectively—accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

- **Three (3) Comprehensive Plans**
- **Two (2) Transportation Plans**
- **Two (2) Safe Routes to School Plans**
- **Twelve (12) Municipal and County Codes**, including subdivision regulations, zoning ordinances, etc.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The degree to which Bastrop County jurisdictions’ active transportation policies and initiatives promote healthy and multi-modal communities varies greatly. Significant findings include:

- **Accessibility** The cities of Bastrop and Elgin are the only communities that specify ADA access in their codes or ordinances. Few planning documents in Bastrop County discuss ADA access - including the consideration of access deficiencies in existing pedestrian networks. The Elgin Safe Routes to School Plan identifies the need to add ADA ramps to specific intersections near Booker T. Washington Elementary School among other recommended improvements.
- **Connectivity** The City of Bastrop Comprehensive Plan identifies pedestrian and bicycle connectivity throughout the community as a priority. The land development codes of Bastrop County, and the cities of Bastrop and Elgin establish maximum block lengths ranging in size from 1,200 to 3,000 feet - distances which are common in auto-centric suburbs and ex-urban areas. Local ordinances do not require inter-parcel pedestrian connectivity, mandatory street connections to adjacent development sites, or general street connectivity ratios.



*The City of Bastrop has embraced the dual recreation/ transportation benefits of multi-use trails. This side path is located along Old Austin Highway.*

- **Multi-Modalism** Bastrop County communities have not previously promoted active transportation facilities as essential components of their transportation networks. Recent transportation master plans developed by Bastrop County and the City of Bastrop however place greater emphasis on the need to develop multi-modal transportation systems, but do not establish or identify complete facility networks. The City of Bastrop’s comprehensive plan establishes a city-wide system of multi-use trails (including sidepaths) for recreation and transportation.

Bastrop County, City of Elgin, and City of Bastrop land development regulations require sidewalks as part of new development. Sidewalk widths are narrow (5 feet or less), and standards do not require rehabilitation of existing lengths of sidewalk. The City of Smithville does not require sidewalks or bicycle facilities.

- **Safety** The promotion of specific active transportation education, encouragement, and enforcement programs by Bastrop County communities is limited to the recommendations of the Elgin Safe Routes to School Plan (prepared in relation to Booker T. Washington Elementary School and the Neidig Elementary and Elgin Middle School Plans) and Smithville’s Safe Routes to School Program.
- **Mixed-use Development** The recently adopted Downtown Bastrop Form-Based Code, facilitates the development of a walkable mixed-use core in downtown Bastrop and surrounding center-city neighborhoods. The Code establishes distinct urban built form for downtown, civic/ cultural arts, commercial, and neighborhood character zones.

In the Bastrop Comprehensive Plan, neighborhood development patterns are encouraged that would allow small scale commercial uses to be permitted in predominately residential districts.



The City of Elgin promotes mixed-use development in proposed transit-oriented development areas. Additionally, traditional neighborhood development and mixed-use areas are promoted in the Elgin Comprehensive Plan.

- **Complete Streets** No Bastrop County jurisdiction has adopted a formal Complete Streets policy.
- **Healthy Lifestyles** The Bastrop Comprehensive Plan identifies public health as a substantiating factor for developing a multi-use trail network. In general however, direct references to public health and healthy lifestyles is limited within the plans and policy documents of Bastrop County communities.

## Highlights

There exist some defining policy recommendations and regulatory tools that Bastrop County communities have adopted or implemented which provide the backbone for developing bicycle and pedestrian friendly environments. Key policies or initiatives which may be replicated by individual communities in Bastrop County, or the region as a whole, include:

- The cities of Bastrop and Elgin pro-actively acknowledge the need to improve localized ADA accessibility for increased safety.
- Sidewalks provisions are a common requirement within the small urban and suburban areas of Bastrop County communities.
- The City of Elgin's Safe Routes to School Plan illustrates a pro-active effort to improve neighborhood-specific bicycle and pedestrian safety.
- The Downtown Bastrop Form Base Code facilitates the extension of mixed-use development beyond the boundaries of the city's current central business district. Mixed-use development principles are also promoted by the cities Elgin and Smithville (the former including new transit-oriented development nodes outside of the historic central business district).
- The City of Bastrop's comprehensive plan identifies an interconnected city-wide network of multi-use trails extending into unincorporated Bastrop County.

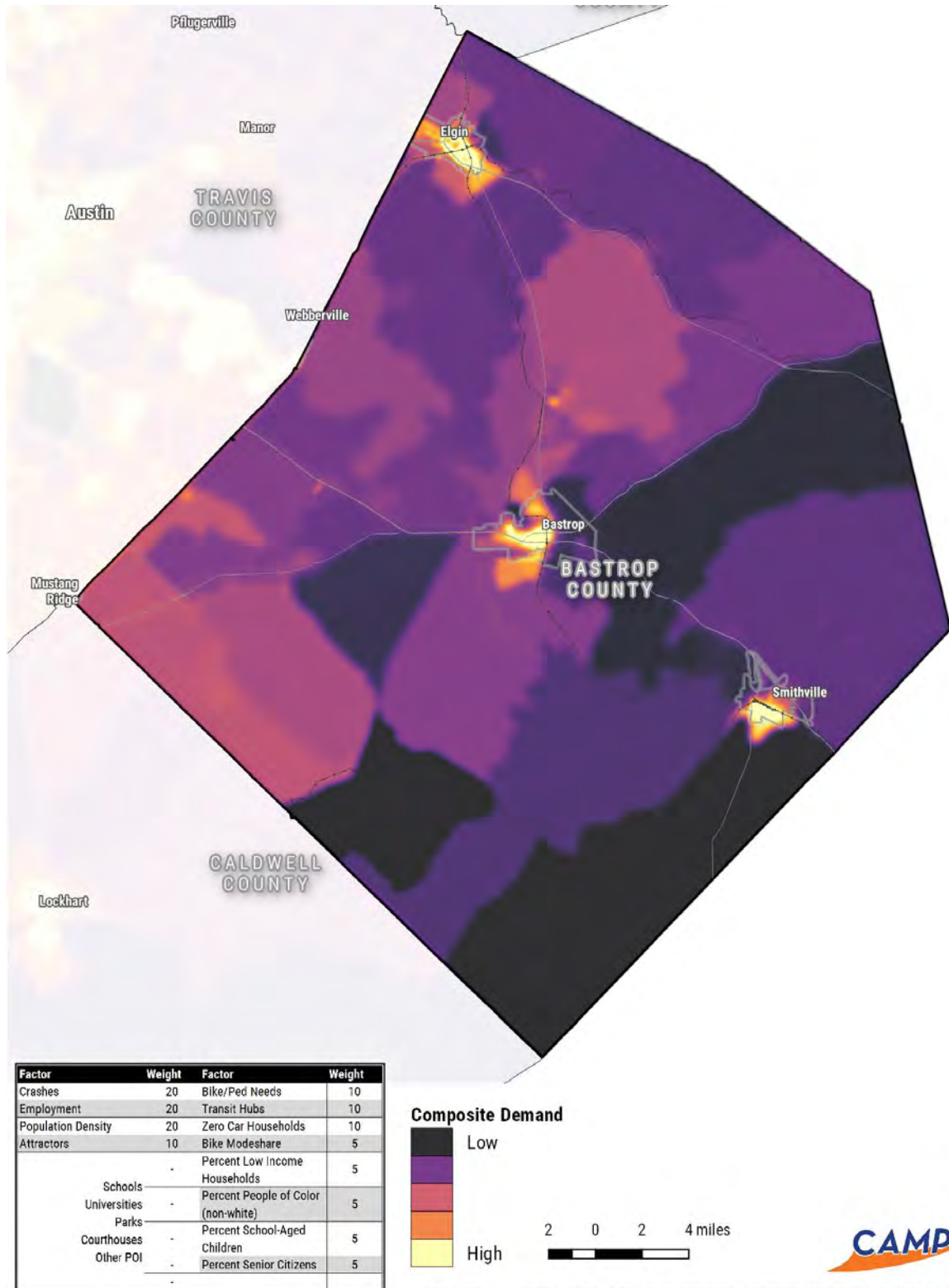
## Recommendations

Opportunities remain for Bastrop County communities to enhance the bicycling and pedestrian environments in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Maximum block lengths can be reduced in appropriate areas of each City to encourage pedestrian friendly connectivity. Such areas may include mixed-use nodes, traditional neighborhood developments, or other areas where high density development is proposed. Recommended block widths and depths should average between 300 and 600 feet.
- Pedestrian provisions should allow for sidewalks of variable width based on area of built context, the required rehabilitation of existing sidewalk segments that do not meet current design requirements (including ADA accessibility requirements), and on-site pedestrian connectivity requirements.
- Complete Streets policies could be adopted by each community. If engineering design standards already exist in a community, modify these documents (in accordance with the Pattern Book contained in this report) to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Develop specific bicycle and pedestrian capital project criteria.
- Incorporate strategies into local planning documents to promote the development of healthy lifestyles through programming and environmental change. Include health-based metrics into applicable planning documents to measure the impact of bicycle and pedestrian facility development on public health.

## DEMAND ANALYSIS

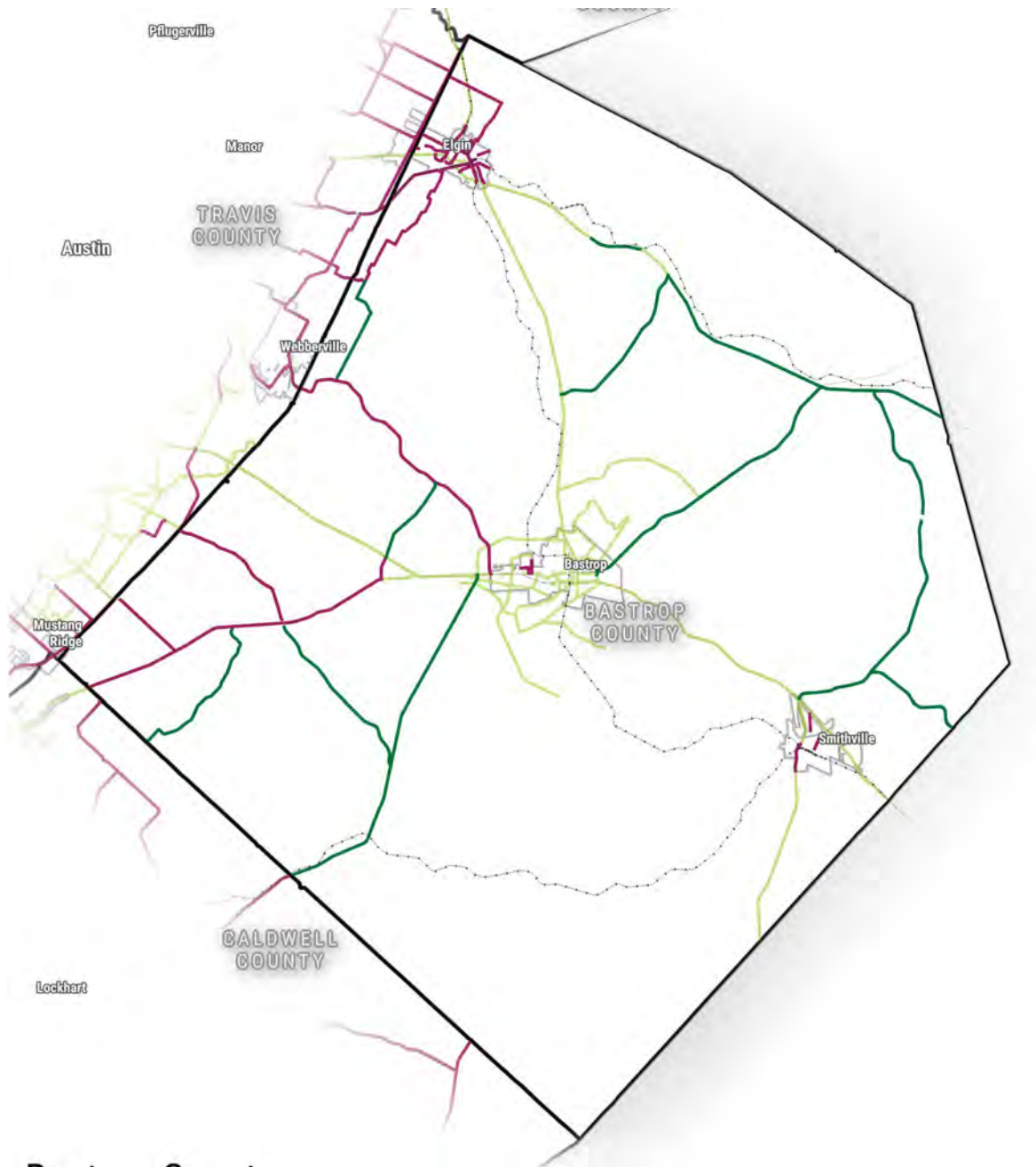
The demand for bicycling and walking is somewhat more spread out in Bastrop County, compared to the other rural counties, with smaller areas of very low demand and more area covered by moderate or somewhat low demand. Demand is greatest in Bastrop, Elgin, and Smithville. The highest demand locations for bicycle and pedestrian facilities in Smithville correspond to the locations of crashes on the crash heat map. Moderate demand appears on either side of FM 812 in the western corner of the county.



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## GAPS ANALYSIS

Community members and officials in Elgin, Bastrop, and Smithville have identified locations of desired sidewalks, shared used paths, and bicycle facilities. The corridors connecting those communities to each other and to the City of Austin are currently challenging for the average person to bike. From Bastrop, there are currently gaps to the north to Elgin, southeast to Smithville, northwest to Austin, and west and southwest to Lockhart and San Marcos. In addition, the routes from Bastrop to Paige, Paige to Smithville, Paige to McDade, and McDade to Camp Swift are currently gaps in the bicycling network.



### Bastrop County

- CAMPO Identified Gap
- Municipally Identified Need
- Existing and Planned Network

2 0 2 4 miles



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## PUBLIC OUTREACH

### Bastrop County Survey Results



For what purposes do you most often ride a bike?	
Fun, recreation, leisure	50%
Exercising, training, racing	35%
To go to work or school	9%

What are the primary reasons you ride a bicycle?	
To exercise	42%
It is good for the environment	21%
It is inexpensive and saves money	16%
It is convenient and saves time	9%

What are reasons you do not ride a bicycle more often?	
Lack of trails and bike lanes	19%
It is not safe because of traffic	18%
Distances are too far / I have to make many stops	12%
The weather (e.g. too hot)	12%

What types of bicycle facilities would you like more of in your community?	
Off street Walk and Bike Trails	31%
Bike lanes	25%
Shoulders	16%
Separated or buffered on-street bike lanes	13%



For what purpose do you most often walk?	
Exercise	37%
Fun, recreation, leisure	26%
To run errands (grocery/corner store, drug store, library, doctors office)	14%

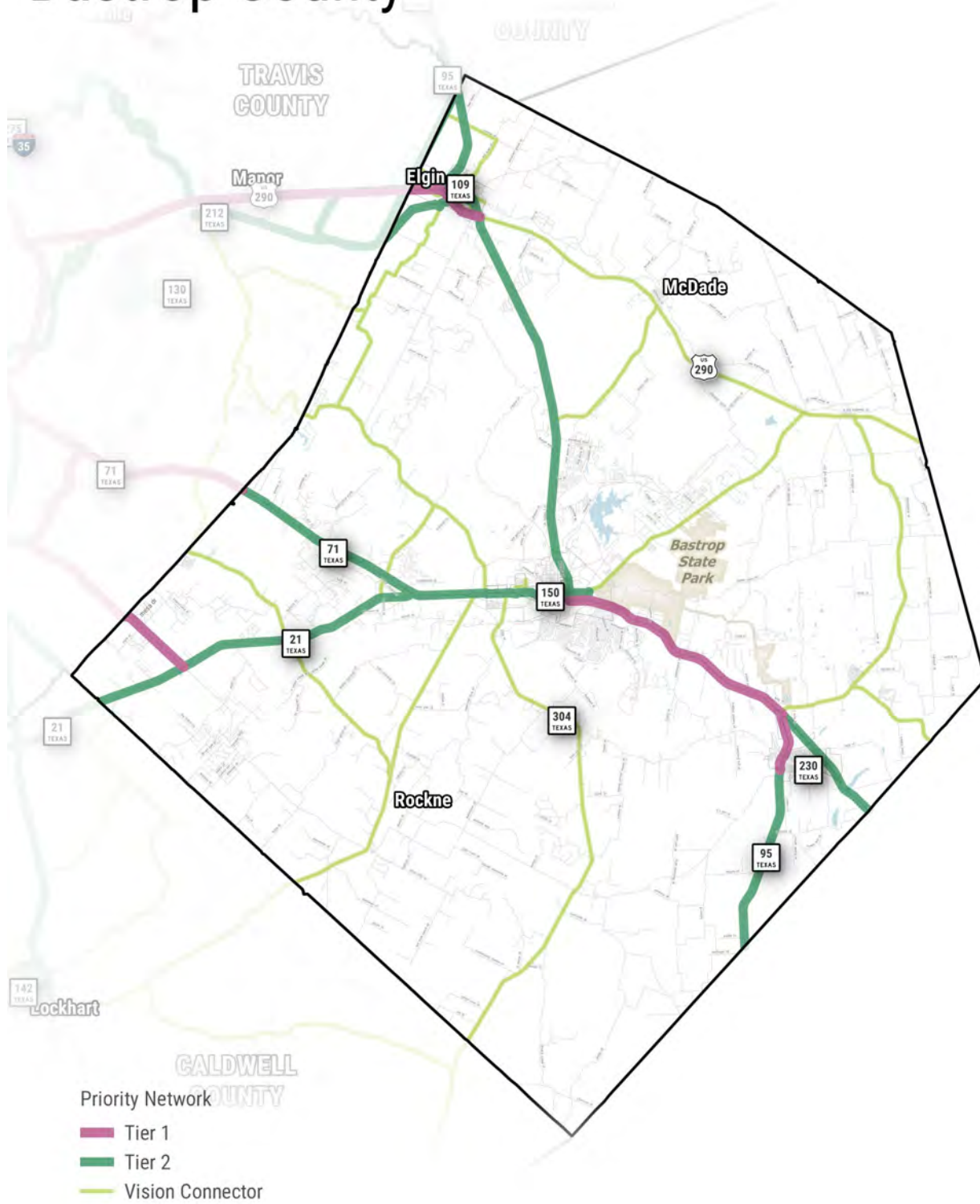
For what reasons do you choose to walk?	
To exercise	43%
It is good for the environment	17%
It is inexpensive and saves money	12%

What three improvements to the walking environment would you most like to see in your community?	
New sidewalks	23%
New trails or paths	20%
Safer road crossings/intersections	16%
Better maintained sidewalks	15%

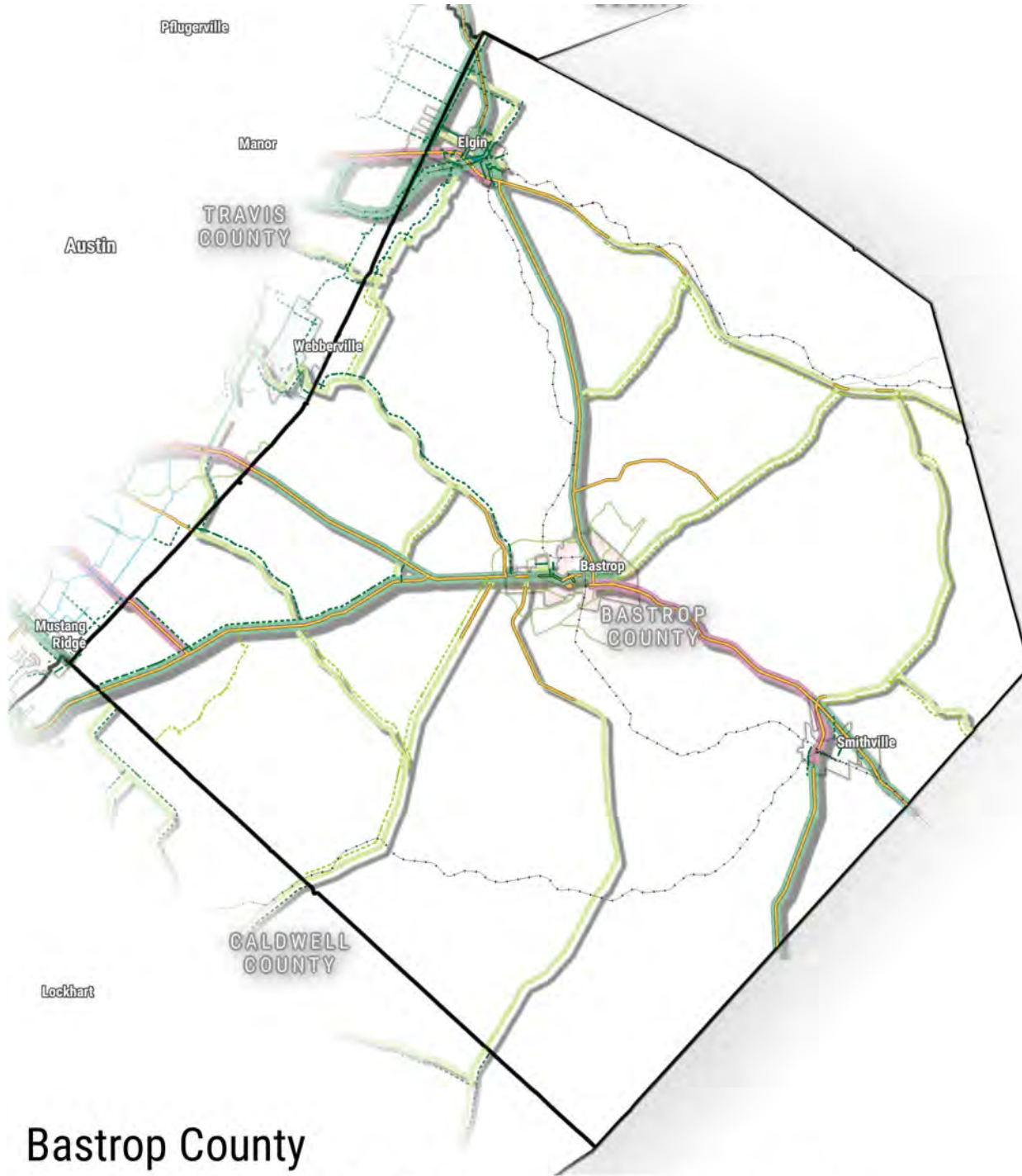
In your opinion, is it safe for your children to walk and/or bike to school?	
No	76%
Yes	24%

## ACTIVE TRANSPORTATION NETWORK

# Bastrop County



## Active Transportation Network - Unconstrained



### Bastrop County

**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

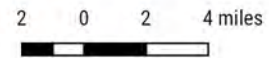
- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway

— Municipally Identified Needs

— CAMPO Identified Gaps

**Priority Network**

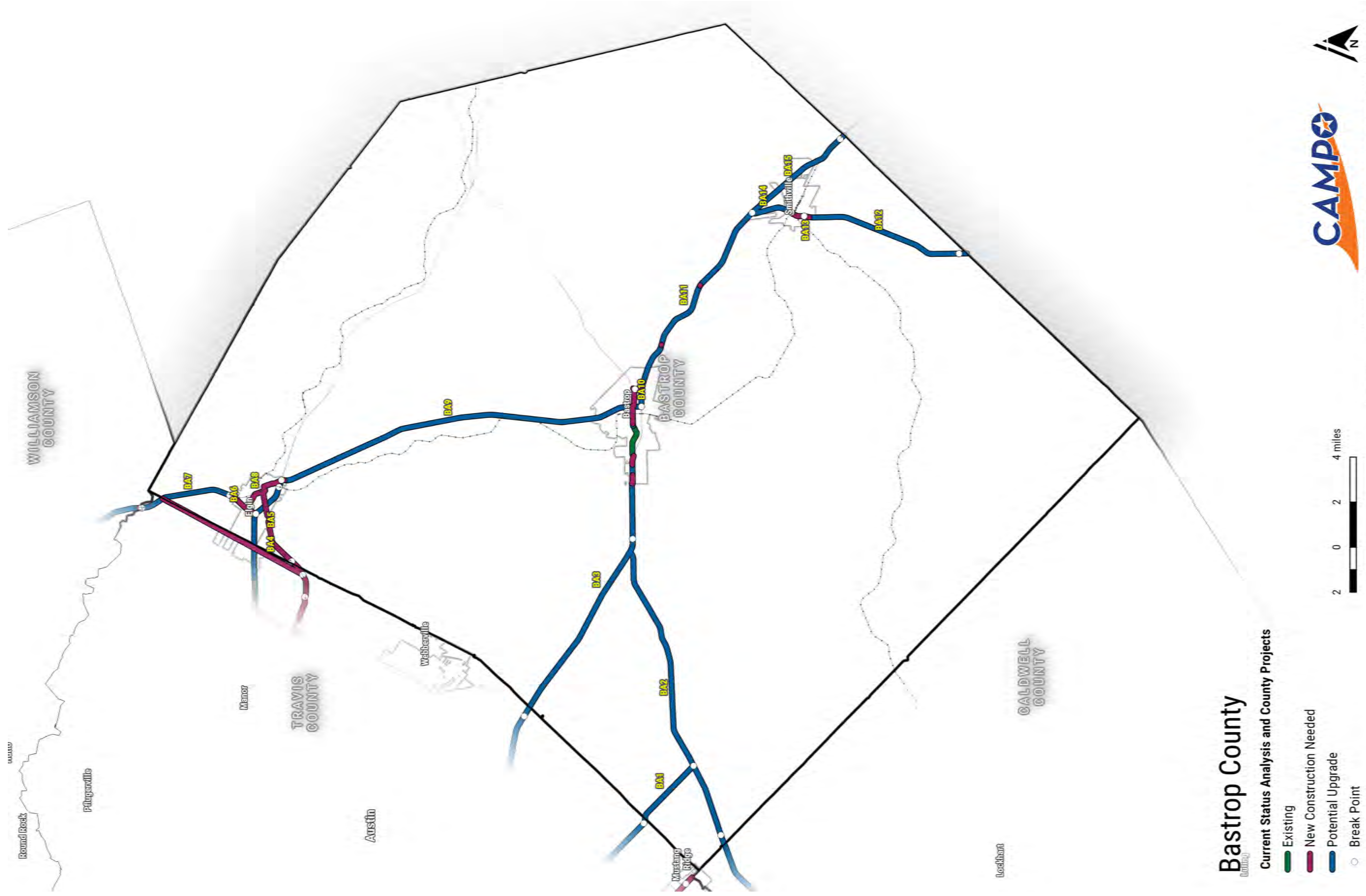
- Tier 1
- Tier 2
- Vision Connectors



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# CURRENT STATUS ANALYSIS AND COUNTY PROJECTS



## Bastrop County

Current Status Analysis and County Projects

- Existing
- New Construction Needed
- Potential Upgrade
- Break Point



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## Project List for Bastrop County

The following projects were identified during the planning process based on an analysis of demand, network gaps, existing conditions, and locally identified needs (pages 2-13 - 2-15).

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
BA1	Tier 1	Potential Upgrade	FM 812	W SH 21	Doyle Rd
BA2	Tier 2	Potential Upgrade	SH 21	W SH 71	Williamson Rd
BA3	Tier 2	New Construction Needed, Potential Upgrade	E SH 71	Griffin Ln	Old Austin Hwy
BA4	Tier 2	New Construction Needed	Central Ave / Littig Rd	S Main St	Monkey Rd
BA5	Tier 1	Potential Upgrade	US 290	County Line Rd	S SH 95
BA6	Tier 2	New Construction Needed, Potential Upgrade	SH 95	W US 290	Taylor City Limits
BA7	Tier 2	Potential Upgrade	SH 95	County Line Rd	Taylor Rd
BA8	Tier 2	New Construction Needed	N Main St / E Brenham St / JR Blvd	N SH 95	S SH 95
BA9	Tier 2	Potential Upgrade	SH 95	US 290	SH 21
BA10	Tier 2	New Construction Needed, Potential Upgrade	Loop 150 West	Colorado River	Bastrop State Park
BA11	Tier 1	New Construction Needed, Potential Upgrade	SH 71	SH 95	FM 153
BA12	Tier 2	New Construction Needed, Potential Upgrade	SH 95	Burner Blvd	W Old Lockhart Rd
BA13	Tier 1	New Construction Needed	SH 95 / Gazley St / Royston St	Harper ST	FM 2571
BA14	Tier 1	Potential Upgrade	SH 95	NW 2nd St	FM 153
BA15	Tier 2	Potential Upgrade	SH 71	FM 153	Fayette / Bastrop County Line

## BURNET COUNTY

The Burnet County plan summary provides a county-level look at the results and recommendations of the CAMPO Regional Active Transportation Plan.

### Demographics

Area (miles)	Population	People of Color (Minorities)		White Population		School-aged Children	
1,021	43,911	10,984	24%	32,927	76%	7331	16%

Seniors (60+)	Households	Households in Poverty		Housing Units	Zero Car Housing Units		
11,947	29%	16,774	2,100	13%	16,774	811	5%

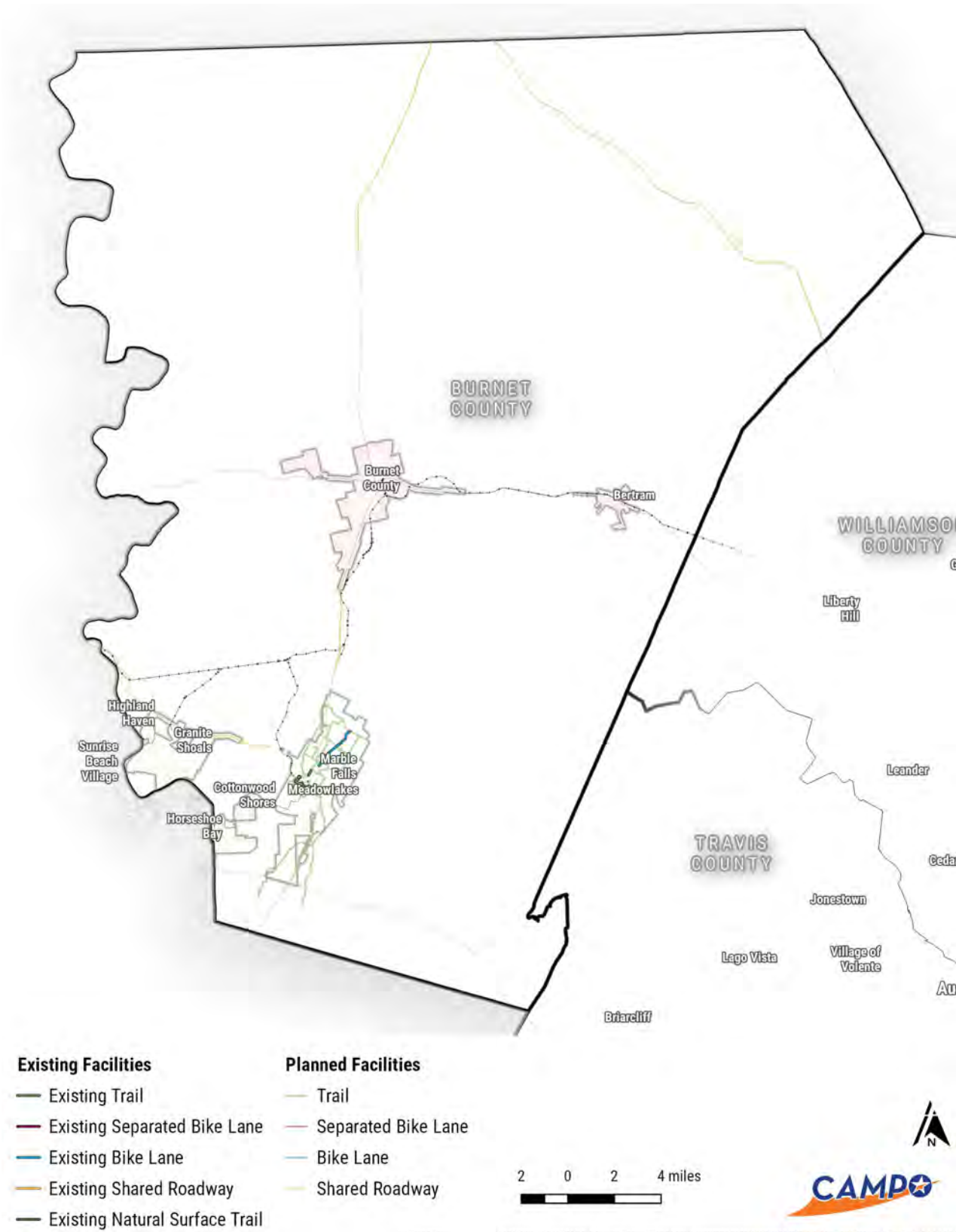
## EXISTING AND PLANNED FACILITIES

Burnet County currently has the fewest miles of sidewalk and existing bicycle facilities, but it has 78 miles of planned bicycle facilities, which is more than two other counties. Shoulders are planned for several of the larger routes in the county. Several routes were identified during local municipal meetings for Granite Shoals and Marble Falls.

	Existing Miles	Planned and Proposed Miles	Total Miles
<b>Burnet County</b>	10	165	175
Bike Lane / Dedicated On-Street	2	0	2
Share Path / Trail	1	42	43
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	0	45	45
Sidewalks	7	3	10
Bicycle/pedestrian needs identified by local governments	N/A	75	75



# EXISTING AND PLANNED BICYCLE FACILITIES



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## POLICIES, PROGRAMS & CODES

The bicycle and pedestrian policy scans for Burnet County included a review of public documents and programs for the municipalities of Bertram, Burnet, Cottonwood Shores, Granite Shoals, Highland Haven, Horseshoe Bay, Marble Falls; and, Burnet County. Over 21 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Burnet County communities - individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

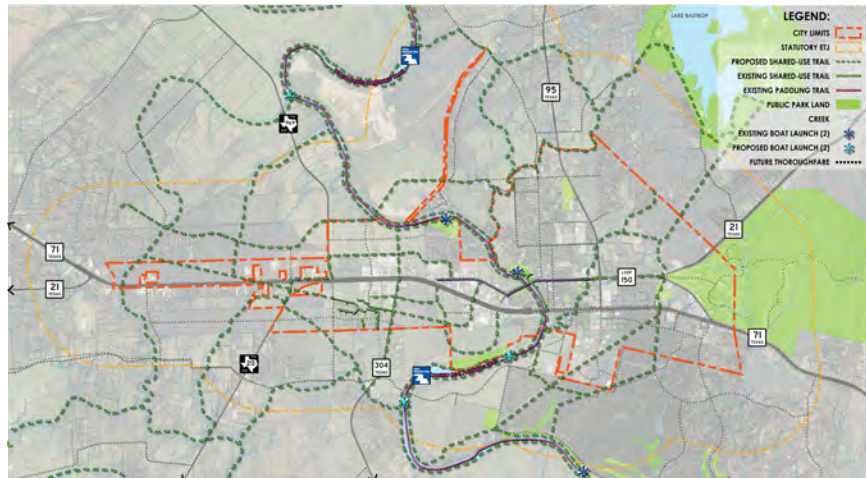
- **One (1) Comprehensive Plan**
- **One (1) Transportation Plan**
- **Two (2) Park Plans**
- **Two (2) Municipal Construction Design Manuals**
- **Fifteen (15) Municipal and County Codes**, including subdivision regulations, zoning ordinances, etc.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The degree to which Burnet County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities varies greatly. Significant findings include:

- **Accessibility** Some communities require ramps at all street corners, driveway approaches, appropriate mid-block crosswalks, and in locations where accessible parking spaces are provided. Other communities do not specify ADA access requirements. Several communities address the need to provide improved ADA access within their planning documents - with a focus on retrofitting established neighborhoods to promote improved safety and accessibility.
- **Connectivity** There are no code provisions in any Burnet County jurisdiction which promote bicycle or pedestrian connectivity on development sites. Some jurisdictions require that existing street networks be continued into new development. In the Burnet County Comprehensive Transportation Plan, local road connections are required. The Marble Falls Comprehensive Plan recommends local road connections. Some communities encourage increased



*The Bastrop Comprehensive Plan proposes a city-wide network of multi-use trails extending into the city's statutory ETJ. Bastrop's park land dedication ordinance allows the City to require the dedication of trail easements as part of new development based on the routes depicted above.*

pedestrian and trail connectivity within specific planning documents. Alternatively, connectivity in some community planning documents is not addressed.

Development standards within Burnet County communities allow for a wide range of block sizes. Maximum block lengths may extend to between 1,300 feet and 2,000 feet. Block lengths in all communities are flexible between these distances - making no distinction between their applicability to pedestrian-friendly urban environments versus suburban or rural areas.

- **Multi-modalism** Most Burnet County jurisdictions require sidewalks as part of new development. Some jurisdictions allow for the construction of separated bicycle facilities in lieu of sidewalks. The City of Marble Falls Comprehensive Plan is the only policy document that directly promotes community-wide bicycle and pedestrian connectivity between neighborhoods and parks via off-street multi-use paths and trails. Marble Falls encourages on-street bicycle lanes to be added to collector streets where appropriate.
- **Safety** While most community plans and regulations include requirements for the construction of sidewalks, none directly address the need to increase bicycle/pedestrian safety as a guiding factor for promoting multi-modal transportation networks. The Burnet County Comprehensive Transportation Plan recommends the development of a Safe Routes to School program.
- **Mixed-use Development** The Marble Falls Comprehensive Plan recommends a walkable, mixed-use downtown. The City's land development regulations contain two mixed-use zoning districts within the downtown and surrounding center-city neighborhoods. No other codes, plans, or policies in Burnet County discuss mixed-use development.



*Pedestrian-friendly environments in Burnet County are primarily confined to historic downtown areas.*

- **Complete Streets** No Burnet County jurisdiction has adopted a Complete Streets policy.
- **Healthy Lifestyles** Few planning documents include detailed recommendations regarding the relationship between the built environment and healthy lifestyles. The Marble Falls Comprehensive Plan includes recommendations that encourage and promote healthy transportation choices.

## Highlights

Most local active transportation policies and development activities in Burnet County that promote the development of bicycle and pedestrian friendly environments have been initiated by the City of Marble Falls. Key policies or initiatives in Burnet County which may be replicated by individual communities, or the region as a whole, include:

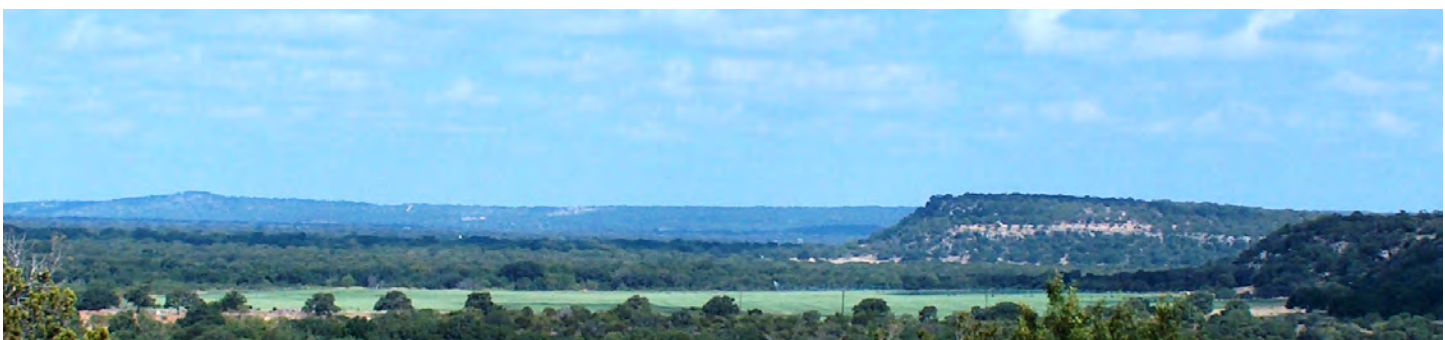
- Many communities acknowledge the need for enhanced ADA accessibility to increase the safety of all community members.
- Burnet County communities acknowledge the need to ensure the safety of its citizens as they use active transportation facilities.
- The City of Marble Falls has taken the initiative to promote

bicycle and pedestrian connectivity, a walkable downtown, and encourage an active lifestyle for its residents - including the use of mixed-use districts. Applicable policies and district regulations may be emulated by other Burnet County communities.

## Recommendations

Opportunities remain for Burnet County communities to enhance the bicycling and pedestrian environment in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Individual Burnet County jurisdictions may consider adopting Complete Streets policies. Such policies should serve as a source for subsequent code and design manual amendments (including applicable recommendations illustrated in the Pattern Book contained in this report).
- Land development regulations could be amended to provide for on-site pedestrian connectivity between buildings, rights-of-way, and adjacent property.
- Land development regulations should be amended to promote the future projection of proposed streets (and corresponding bicycle and pedestrian infrastructure) onto undeveloped property.
- Land development regulations may be amended to apply varying block size thresholds depending on the built context (i.e. urban, suburban, rural).
- All communities in Burnet County should focus on promoting a healthy lifestyle for their residents. Recommendations can be made in planning documents to encourage walking and bicycling for health and recreation - even in communities where walking and biking may not be a feasible transportation option. Programs that promote a healthy lifestyle may include creating community walking groups, organizing a Cyclovia, or creating incentives for employees to increase physical activity by providing a reward system.

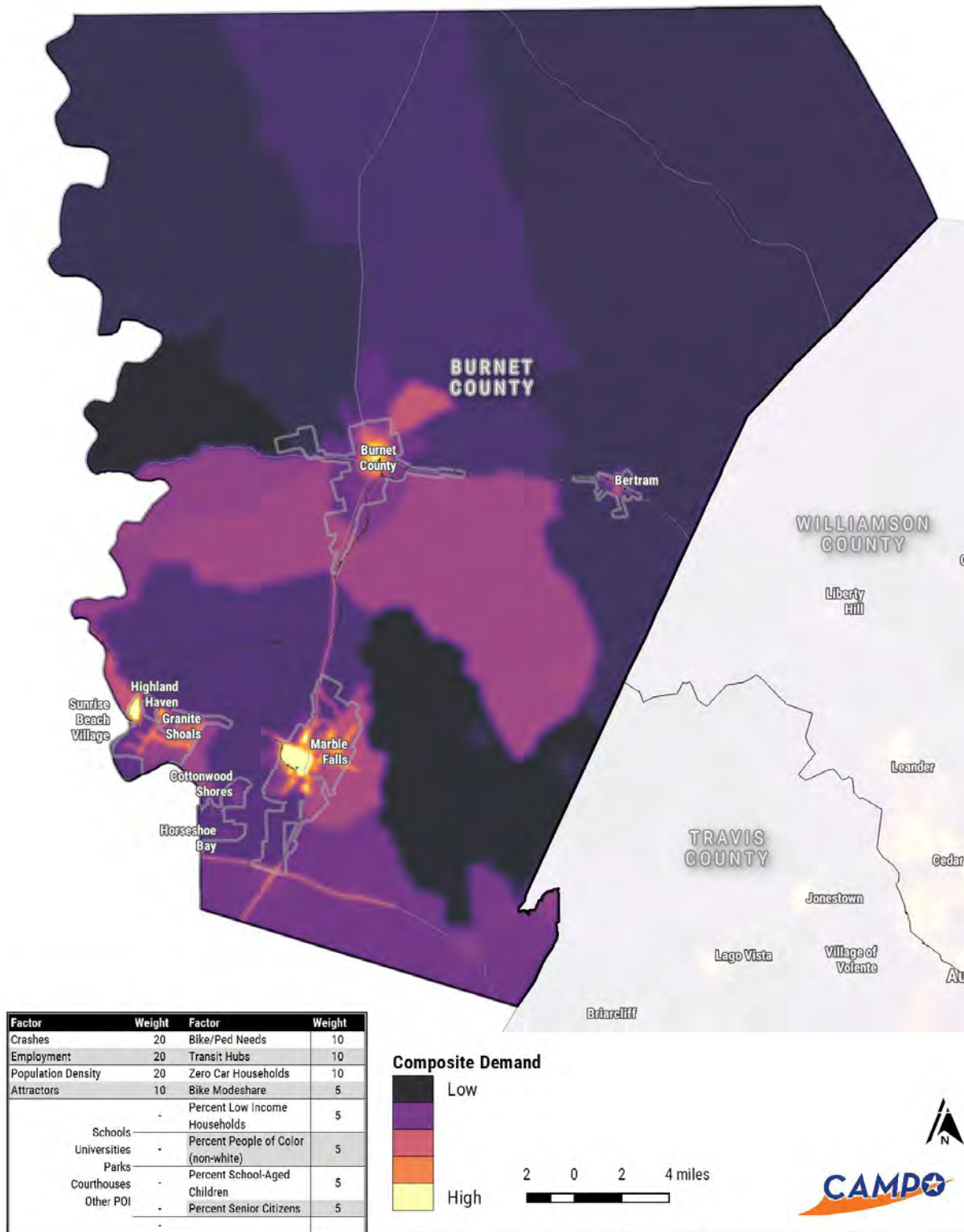


*Rural areas outside of Burnet County's population centers are attractive to bicyclists for fitness and recreation. Because of the county's scenic beauty, relative close proximity to the larger Austin-Round Rock and Killeen-Temple population centers, and generally lower cost of land, Burnet County may soon see an influx of large residential and mixed-use communities. This offers an opportunity to promote strong bicycle and pedestrian facility development from an early stage.*



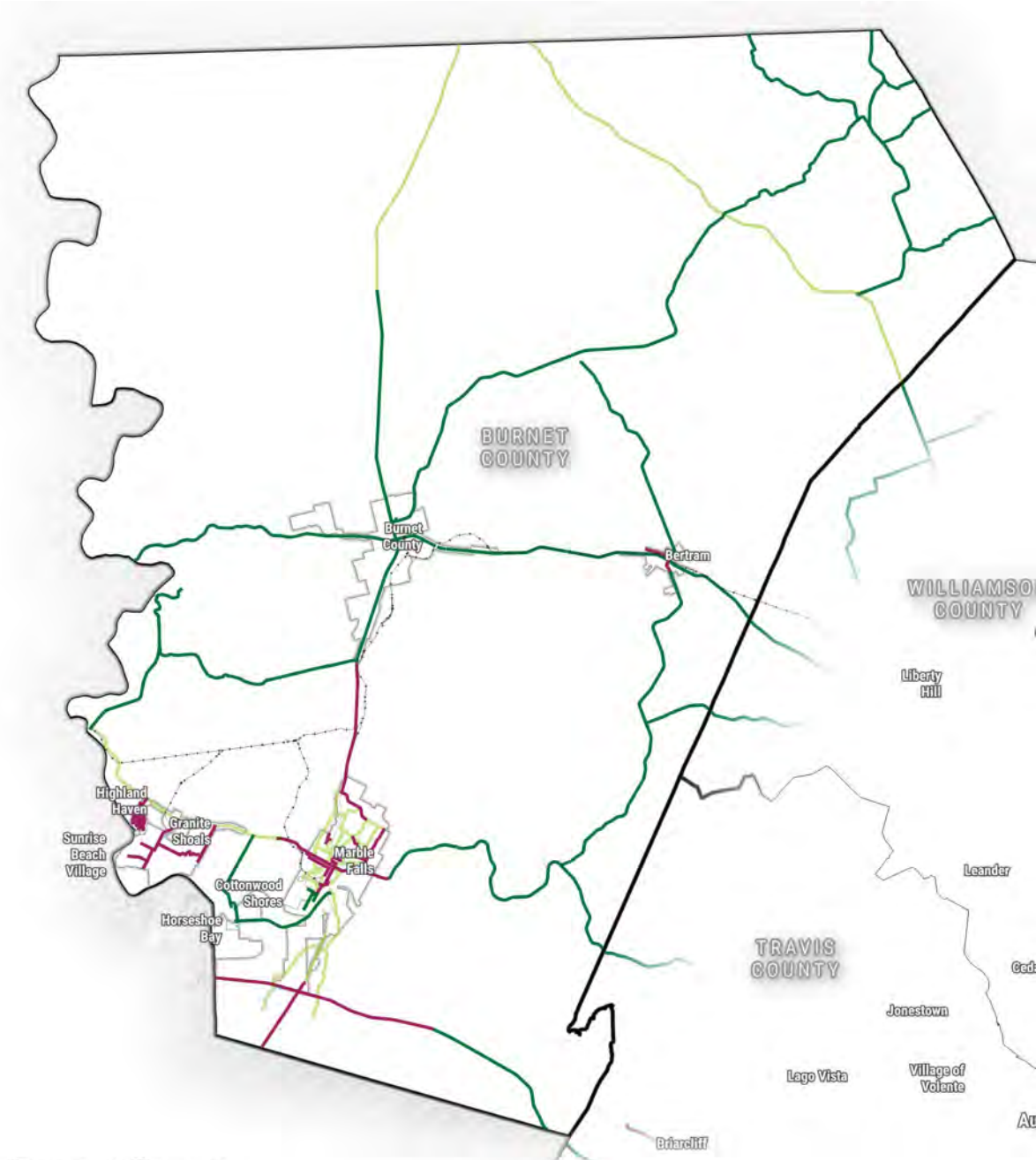
## DEMAND ANALYSIS

The highest demand appears in Marble Falls, Granite Shoals, Highland Haven, and central Burnet with moderate demand in the areas to the southeast and southwest of Burnet. Moderate demand appears on the Route 281 corridor between Burnet and Marble Falls. Marble Falls contains a concentration of zero-car households. There is also moderate demand in Bertram.



## GAPS ANALYSIS

Burnet, Granite Shoals, Marble Falls, and Bertram were identified as places with specific needs for sidewalks, shared use paths, and bicycle facilities. Routes from Granite Falls to Marble Falls and Burnet were identified as barriers, as well as the route from Burnet to Williamson County, via Bertram, and the route from Marble Falls to Bee Cave. The routes from Burnet to Bertram and Burnet to Inks Lake State Park are currently gaps in the bicycling network.



### Burnet County

- CAMPO Identified Gap
- Municipally Identified Need
- Existing and Planned Network

2 0 2 4 miles



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## PUBLIC OUTREACH

### Burnet County Survey Results



For what purposes do you most often ride a bike?	
Fun, recreation, leisure	54%
Exercising, training, racing	27%
Visiting friends and family	12%

What are the primary reasons you ride a bicycle?	
To exercise	55%
It is good for the environment	10%
My friends do it/Makes me feel part of a community/Socialize	10%
It is convenient and saves time	10%
Other	10%

What are reasons you do not ride a bicycle more often?	
I do not own a bike / I am not interested in bicycling	21%
It is not safe because of traffic	19%
Lack of trails and bike lanes	15%
Distances are too far / I have to make many stops	10%

What types of bicycle facilities would you like more of in your community?	
Off street Walk and Bike Trails	25%
Bike lanes	19%
Do not know/No opinion	13%
None	11%
Shoulders	9%



For what purpose do you most often walk?	
Exercise	37%
Fun, recreation, leisure	33%
To run errands (grocery/corner store, drug store, library, doctors office)	8%

For what reasons do you choose to walk?	
To exercise	49%
It is good for the environment	10%
My friends do it/Makes me feel part of a community/Socialize	8%

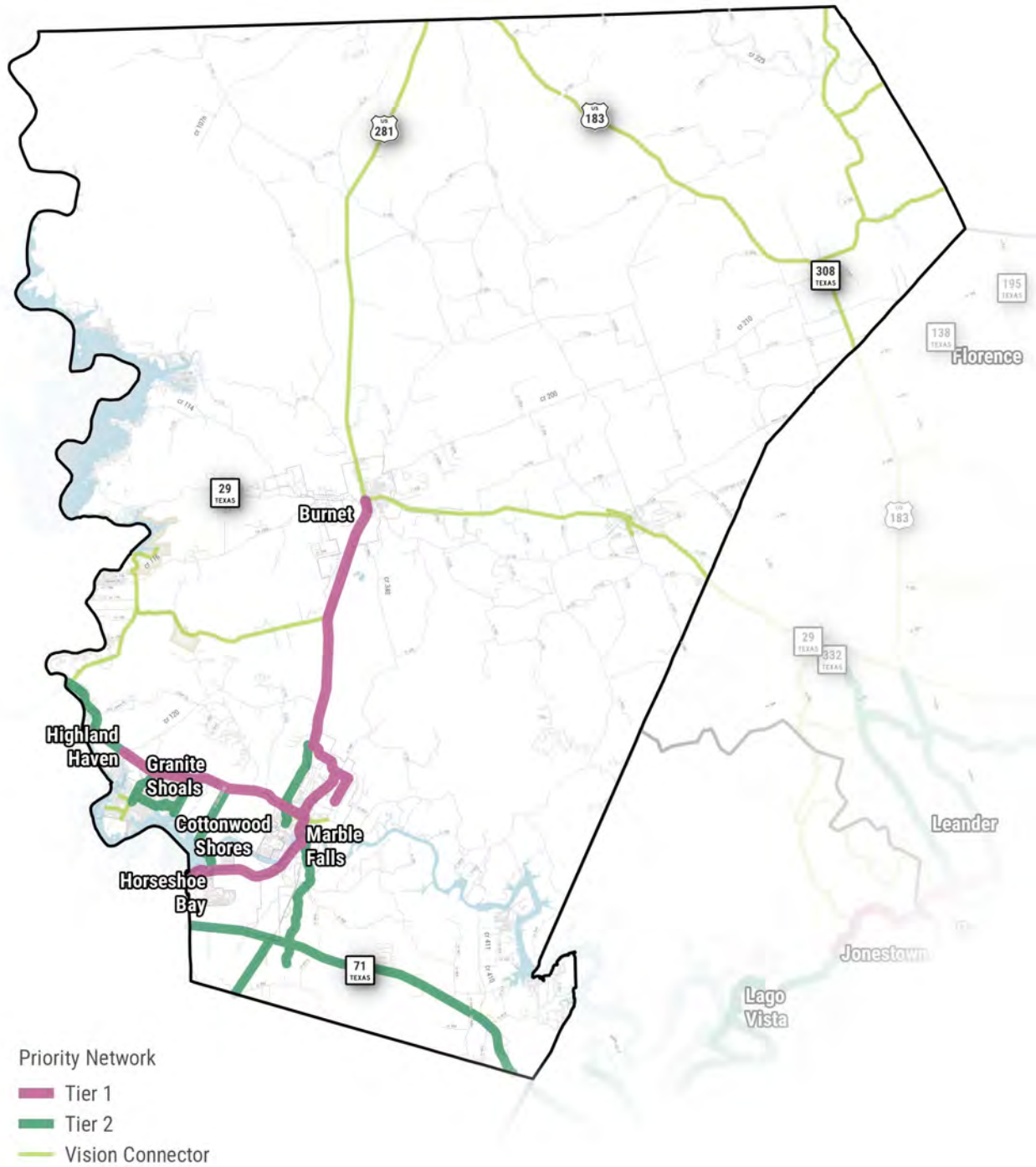
What three improvements to the walking environment would you most like to see in your community?	
New trails or paths	26%
New sidewalks	25%
Safer road crossings/intersections	12%

In your opinion, is it safe for your children to walk and/or bike to school?	
No	100%
Yes	0%

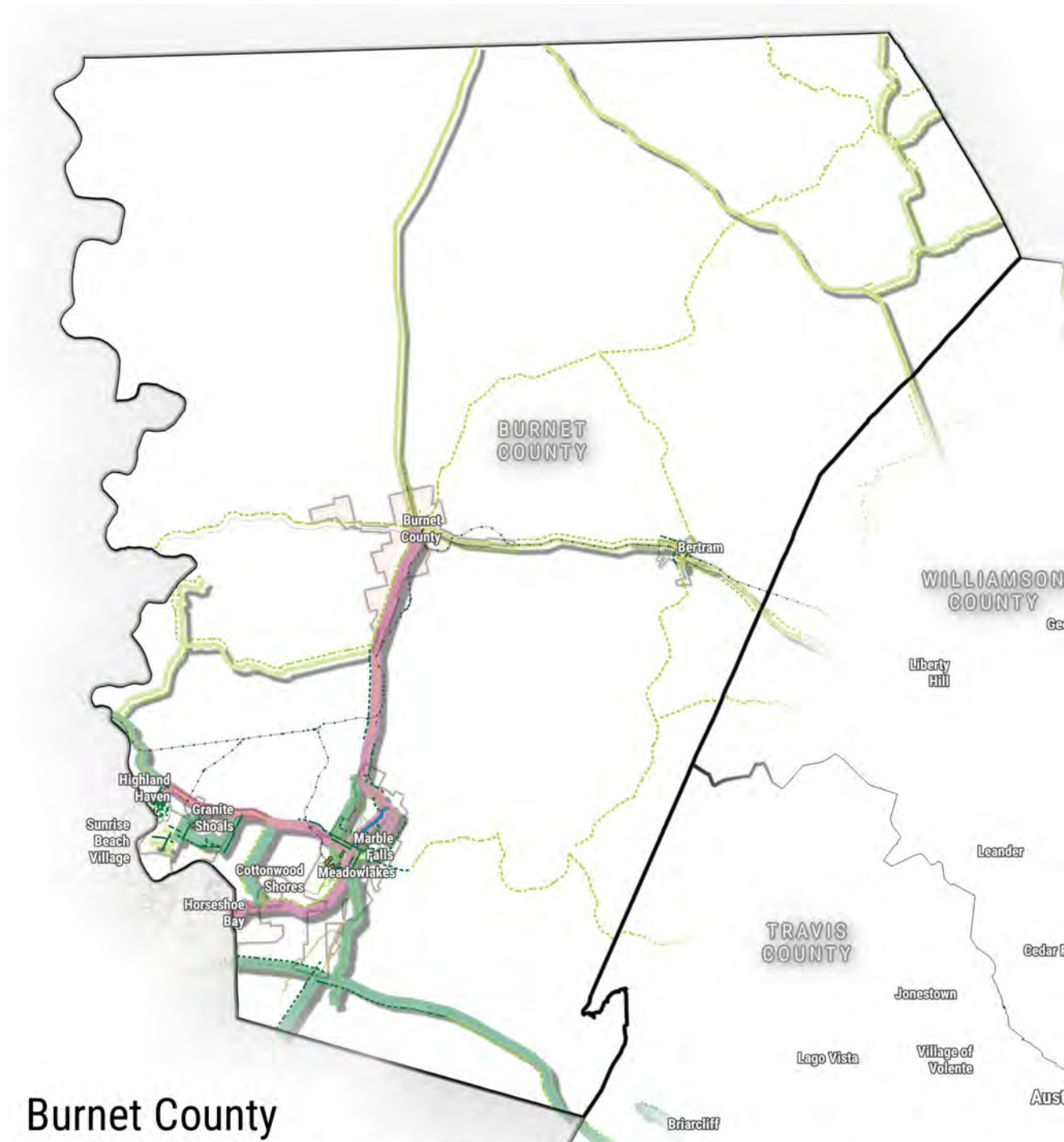


## ACTIVE TRANSPORTATION NETWORK

# Burnet County



## Active Transportation Network - Unconstrained



### Burnet County

**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway

..... Municipally Identified Needs

..... CAMPO Identified Gaps

**Priority Network**

- Tier 1
- Tier 2
- Vision Connectors



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**CURRENT STATUS ANALYSIS AND COUNTY PROJECTS**



**Burnet County**

Current Status Analysis and County Projects

- Existing
- New Construction Needed
- Potential Upgrade
- Break Point



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## Project List for Burnet County

The following projects were identified during the planning process based on an analysis of demand, network gaps, existing conditions, and locally identified needs (pages 2-13 - 2-15).

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
BU1	Tier 2	New Construction Needed	FM 1431	US 281	Burnet / Llano County Line
BU2	Tier 2	New Construction Needed	N Phillips Ranch Rd	Bluebriar Place Dr	W FM 1431
BU3	Tier 2	New Construction Needed	E Granitecastle Dr / Sherwood Forest Dr / Hillwood Dr / Woodland Hills Dr	N Phillips Ranch Rd	Valley View Ln
BU4	Tier 2	New Construction Needed	Valley View Ln	Hill Circle East Dr	FM 1431
BU5	Tier 2	New Construction Needed	Wirtz Dam Rd	FM 1431	FM 2147
BU6	Tier 1	New Construction Needed	FM 1431	Fairland Rd	US 281
BU7	Tier 1	New Construction Needed	FM 2147	Wirtz Dam Rd	US 281
BU8	Tier 2	New Construction Needed	US 281	CR 403	SH 71
BU9	Tier 2	New Construction Needed	New Trail	2nd St	Resource Pkwy
BU10	Tier 2	New Construction Needed	FM 2147 / CR 401	US 281	CR 403
BU11	Tier 1	New Construction Needed	US 281	Gateway North	Mormon Mill Rd
BU12	Tier 1	New Construction Needed, Potential Upgrade	Resource Parkway	US 281	Resource Pkwy
BU13	Tier 1	New Construction Needed	Mormon Mill Rd	US 281	Mormon Mill Rd
BU14	Tier 1	New Construction Needed	US 281	Resource Pkwy	SH 29
BU15	Tier 1	New Construction Needed	New Trail / Mazano Mile	Mormon Mill Rd	Marble Falls High School
BU16	Tier 2	New Construction Needed	SH 71	Twisted Oak Dr	Granite Ridge Rd

# CALDWELL COUNTY

The Caldwell County plan summary provides a county-level look at the results and recommendations of the CAMPO Regional Active Transportation Plan.

## Demographics

Area (miles)	Population	People of Color (Minorities)		White Population		School-aged Children	
547	38,870	22,136	55%	16,734	45%	7,334	17%

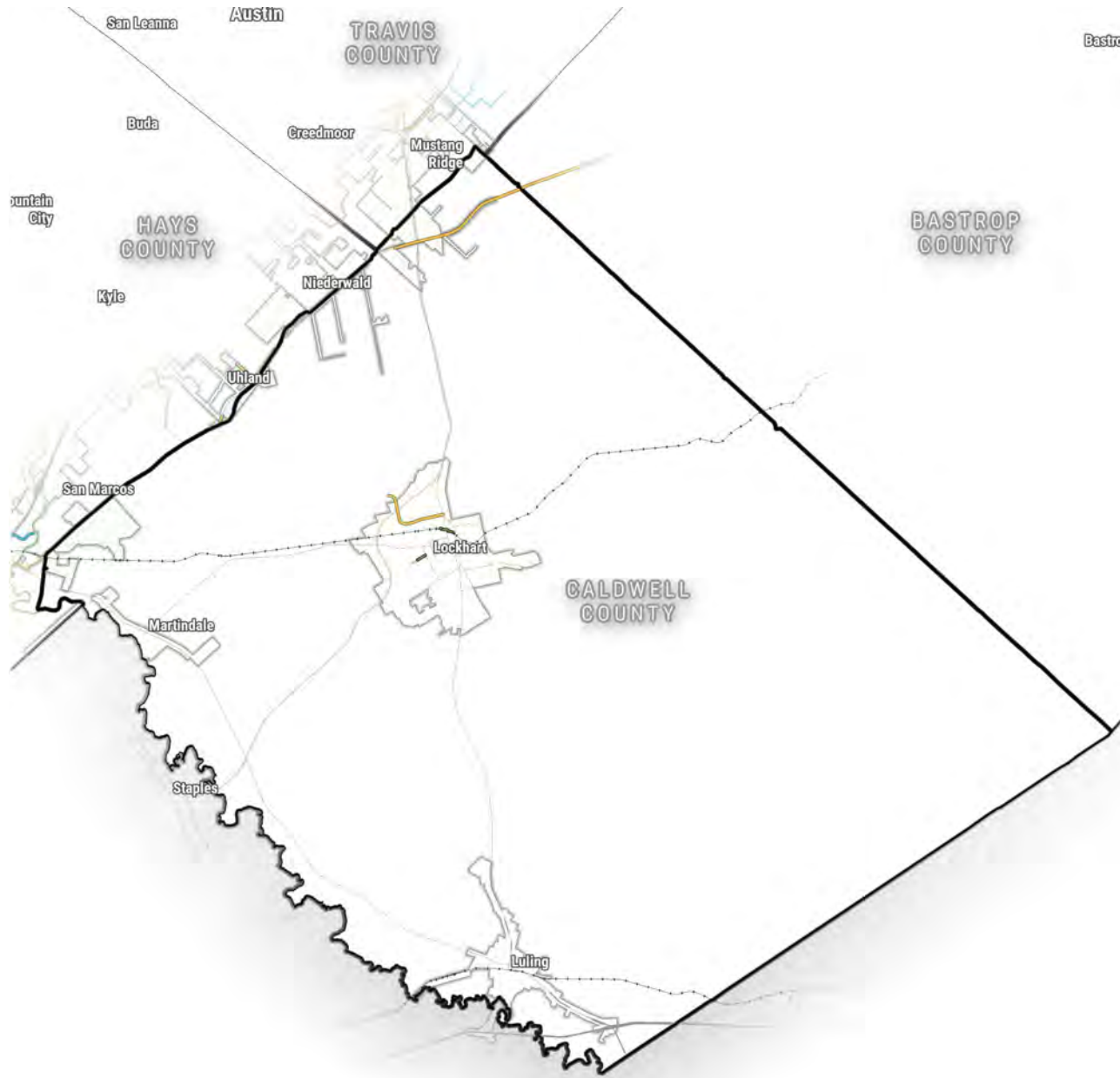
Seniors (60+)	Households	Households in Poverty		Housing Units	Zero Car Housing Units		
6,918	20%	12,059	1,707	15%	12,059	763	7%

## EXISTING AND PLANNED FACILITIES

Caldwell County has 34 miles of sidewalk with 49 planned. Most of its 8 miles of bicycle facilities are paved shoulders, for example, on Silent Valley Road in Lockhart. The County has 2.9 miles of shared use path planned, in addition to its existing 0.75 mile.

	Existing Miles	Planned and Proposed Miles	Total Miles
<b>Caldwell County</b>	8	6	14
Share Path / Trail	1	3	4
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	7	3	10
Sidewalks	34	49	83
Bicycle/pedestrian needs identified by local governments	N/A	153	153

# EXISTING AND PLANNED BICYCLE FACILITIES

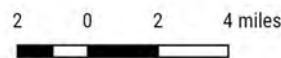


**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway



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## POLICIES, PROGRAMS, AND CODES

The bicycle and pedestrian policy scans for Caldwell County included a review of public documents and programs for the municipalities of Lockhart, Luling, Niederwald, Uhland, Martindale, Mustang Ridge; and, Caldwell County. Over 12 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Caldwell County communities – individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

- **One (1) Comprehensive Plan**
- **One (1) Transportation Plan**
- **One (1) Corridor Improvement Plan**
- **One (1) Municipal Construction Design Manual**
- **Eight (8) Municipal and County Codes**, including subdivision regulations, zoning ordinances, etc.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The degree to which Caldwell County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities is fairly consistent across all communities. Significant findings include:

- **Accessibility** The Caldwell County development ordinance requires sidewalks at intersecting streets and street grades along crosswalk areas to be ADA compliant. The Code of Ordinances for the City of Lockhart requires curb ramps to be ADA compliant. Some cities in Caldwell County do not specify ADA access requirements.
- **Connectivity** The cities of Lockhart and Luling require inter-parcel pedestrian connectivity as part of new development, while other communities have no significant inter-parcel connectivity requirements. The Caldwell County Transportation Plan identifies the classification of local roads to increase access to adjacent properties.

Caldwell County land development regulations establish maximum block requirements only for "urban subdivisions." At a maximum length of 1,750 feet however, the County's urban subdivision standards do not guarantee the development of compact blocks which are designed (in part) to promote walking as a preferred mode of travel. Where municipal land development ordinances specify

*Transportation Vision: Lockhart's transportation system shall provide residents and visitors safe, efficient and convenient access to all areas of the City and surrounding region, accommodate current and future demand for movement of people and goods, and allow travelers choices of destinations, routes and modes of travel.*

*-Lockhart 2020 Comprehensive Plan*

block size, maximum block lengths and widths are similar to County provisions. Similarly, Caldwell County communities do not establish street connectivity index requirements to promote traffic dispersal.

- **Multi-Modalism** Few of the adopted policy documents of Caldwell County communities directly encourage the development of multi-modal transportation systems. An exception is the City of Lockhart's comprehensive plan - which advocates for the construction of hike and bike trails and improved sidewalks as part of new development. Additionally, the Caldwell County Transportation Plan acknowledges the need to provide adequate facilities for bicyclists and pedestrians by leveraging federal, state, and local funding sources. The land development regulations of most Caldwell County communities require sidewalks as part of new development, but do not require the provision of suitable bicycle facilities.
- **Safety** There are currently no local bicycle or pedestrian education, encouragement, and/or enforcement programs in Caldwell County. One project goal addressed in the Caldwell County Transportation Plan is to improve the safety of bicyclists and pedestrians.
- **Mixed-use Development** The Lockhart 2020 Comprehensive Plan envisions the Central Business District (CBD) as a pedestrian-friendly environment. The plan suggests that visitors to downtown Lockhart will be encouraged to explore businesses on foot through the creation of attractive pedestrian-oriented spaces. The cities of Lockhart and Luling have established zoning districts in their downtown areas that allow but do not require) mixed use buildings which combine commercial and residential uses. There are no other examples in Caldwell County of regulatory tools that promote mixed-use development patterns.



New development on Lockhart's Colorado Street corridor (left and right) illustrates the City's growing commitment to pedestrian mobility.

- **Complete Streets** Lockhart's Colorado Street Corridor Improvement Plan acknowledges the importance of Complete Streets. However, no communities in Caldwell County have adopted a Complete Streets policy.
- **Healthy Lifestyles** Municipal and county land use and transportation policy documents link transportation choices with the promotion of healthy lifestyles.

## Highlights

Collectively, the active transportation policies and initiatives of Caldwell County communities have placed greater emphasis on pedestrian mobility than bicycle mobility. Key policies or initiatives which may be replicated by individual communities in Caldwell County, or the region as a whole, include:

- Most communities in Caldwell County require sidewalks - including the construction of sidewalks on existing street frontage as part of new development.
- The Colorado Street Corridor Improvement Plan acknowledges the importance of Complete Streets policies as a component of corridor redevelopment.
- Mixed-use zoning districts in downtown Lockhart and Luling promote the preservation of locally relevant and pedestrian-friendly urban centers.
- The City of Lockhart's 2020 future land use and major thoroughfare map identifies nodes at existing and planned intersections where walkable neighborhood centers could be created using enhanced mixed-use and/or form-based zoning tools.

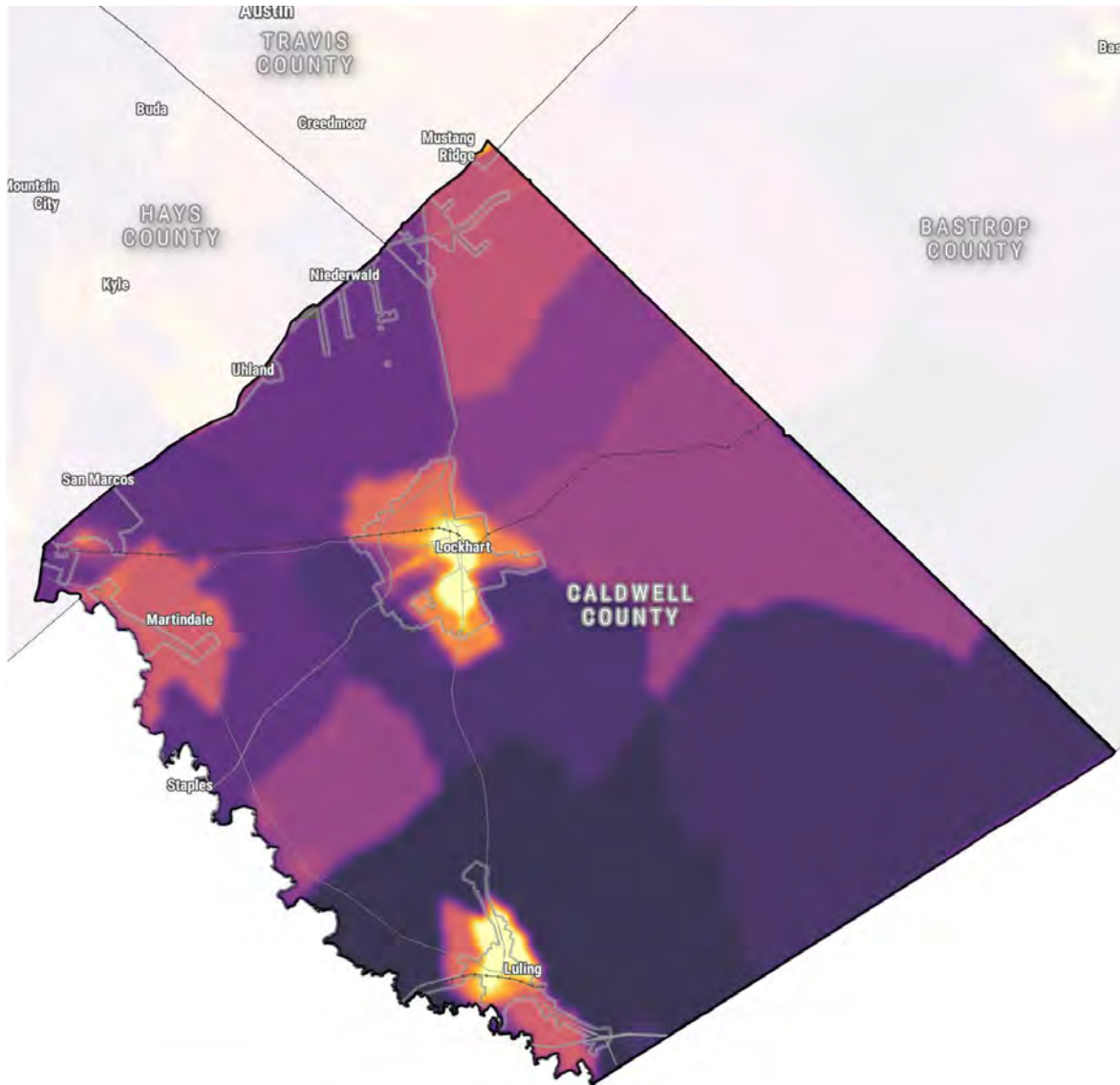
## Recommendations

Opportunities remain for Caldwell County communities to enhance the bicycling and pedestrian environments in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Development regulations should include varying standards for minimum and maximum block sizes in areas of urban, suburban and rural context.
- In conjunction with, or as an alternative to maximum block lengths in suburban and rural areas, communities should develop street connectivity indexes to increase the travel options of non-motorized users.
- Street design standards should incorporate cross-sections that would apply to pedestrian-friendly urban or neighborhood centers; and, those that incorporate bicycle facilities of varying type (see Pattern Book, page ??).
- Mixed-use districts should be modified to focus on built-form as opposed to land use. Future land use plans should identify suitable locations for future mixed-use nodes outside of historic downtown areas.
- Long range plans, multi-modal transportation plans, park plans, and special area plans should incorporate goals and objectives related to active transportation network development.
- Complete Streets policies should be adopted by each community. If engineering design standards already exist in a community, modify these documents to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Incorporate goals and objectives into local planning documents that promote the development of healthy lifestyles through programming and environmental change.

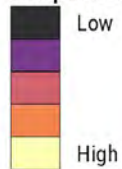
## DEMAND ANALYSIS

The demand is concentrated in Lockhart and Luling. The location of the demand in Lockhart corresponds to the location of the recent crashes. Additional pockets of demand appear in the western part of the county around Reedville and Martindale where there is a concentration of school-age children.



Factor	Weight	Factor	Weight
Crashes	20	Bike/Ped Needs	10
Employment	20	Transit Hubs	10
Population Density	20	Zero Car Households	10
Attractors	10	Bike Modeshare	5
		Percent Low Income Households	5
Schools	-	Percent People of Color (non-white)	5
Universities	-	Percent School-Aged Children	5
Parks	-	Percent Senior Citizens	5
Courthouses	-		
Other POI	-		

**Composite Demand**



2 0 2 4 miles



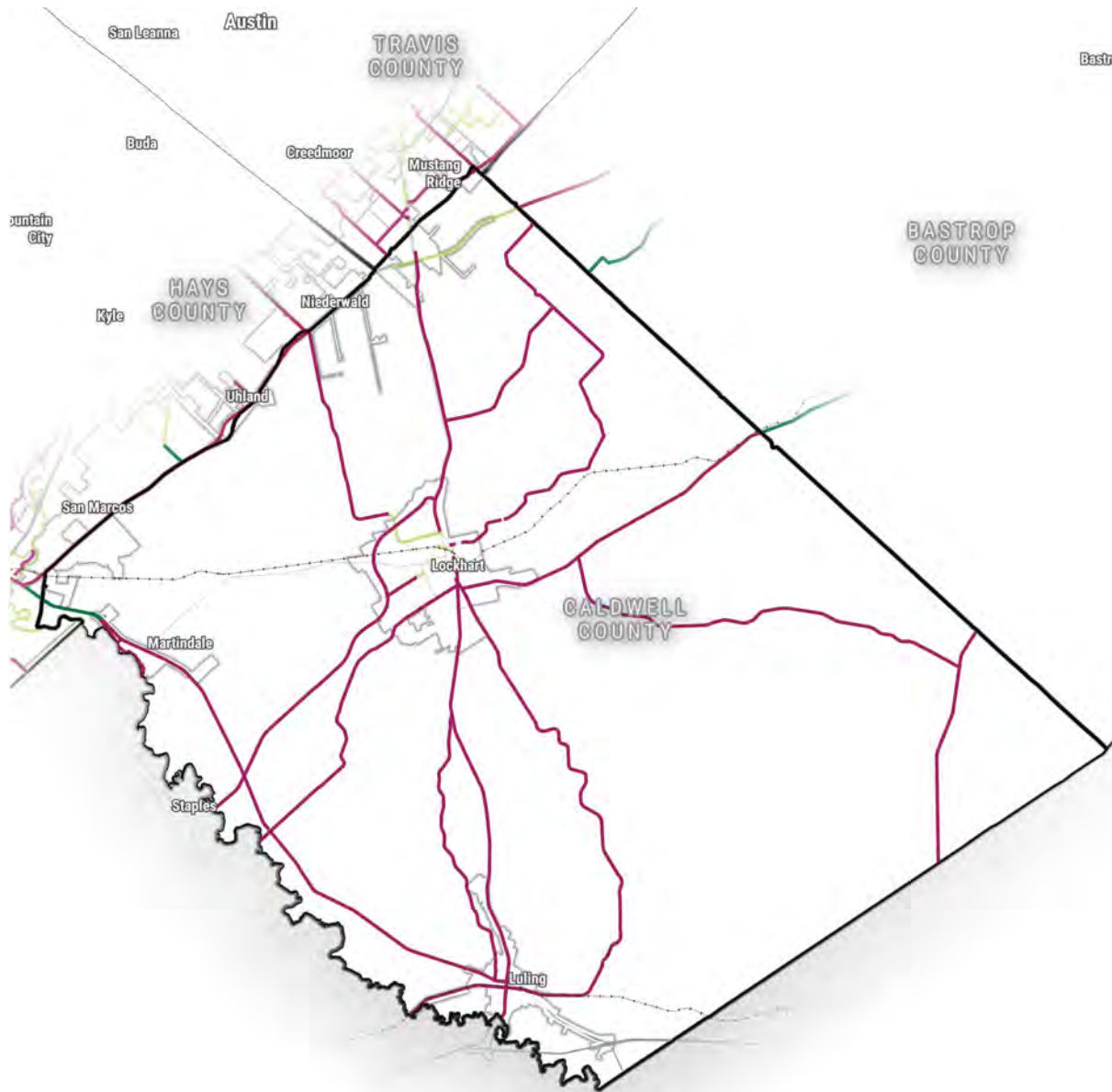
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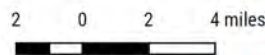
## GAPS ANALYSIS

Community members and officials in Lockhart and Luling identified locations of desired sidewalks, shared used paths, and bicycle facilities. Regional bicycle connections are missing from Luling north through Lockhart to Austin, and east-west across the county. Most of the state routes in Caldwell County are currently gaps in the bicycling network.



### Caldwell County

- CAMPO Identified Gap
- Municipally Identified Need
- Existing and Planned Network



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## PUBLIC OUTREACH

### Caldwell County Survey Results



For what purposes do you most often ride a bike?	
Fun, recreation, leisure	52%
Exercising, training, racing	36%
To go to worship	8%

What are the primary reasons you ride a bicycle?	
To exercise	44%
Other	10%
My friends do it/Makes me feel part of a community/Socialize	10%
It is convenient and saves time	9%
It is good for the environment	9%

What are reasons you do not ride a bicycle more often?	
It is not safe because of traffic	16%
Lack of trails and bike lanes	15%
I do not own a bike / I am not interested in bicycling	11%
Distances are too far / I have to make many stops	10%

What types of bicycle facilities would you like more of in your community?	
Off street Walk and Bike Trails	29%
Low-traffic roads	17%
Bike lanes	15%



For what purpose do you most often walk?	
Exercise	41%
Fun, recreation, leisure	27%
To run errands (grocery/corner store, drug store, library, doctors office)	10%
Visiting friends or family	10%

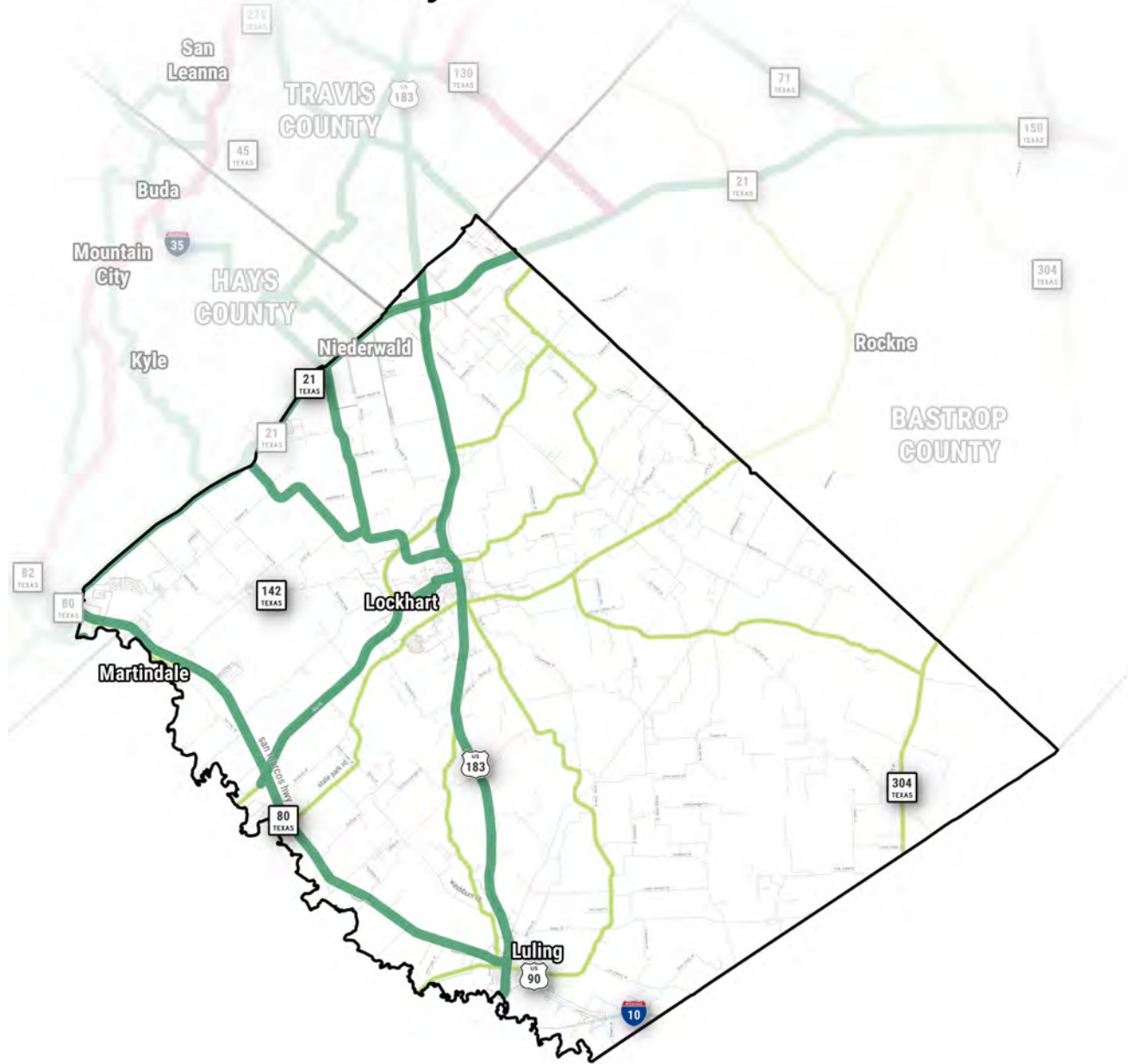
For what reasons do you choose to walk?	
To exercise	53%
It is good for the environment	9%
It is inexpensive and saves money	9%

What three improvements to the walking environment would you most like to see in your community?	
New sidewalks	22%
New trails or paths	15%
Safer road crossings/intersections	14%
Better maintained sidewalks	11%
More shade from the sun	11%

In your opinion, is it safe for your children to walk and/or bike to school?	
No	60%
Yes	40%

## ACTIVE TRANSPORTATION NETWORK

# Caldwell County

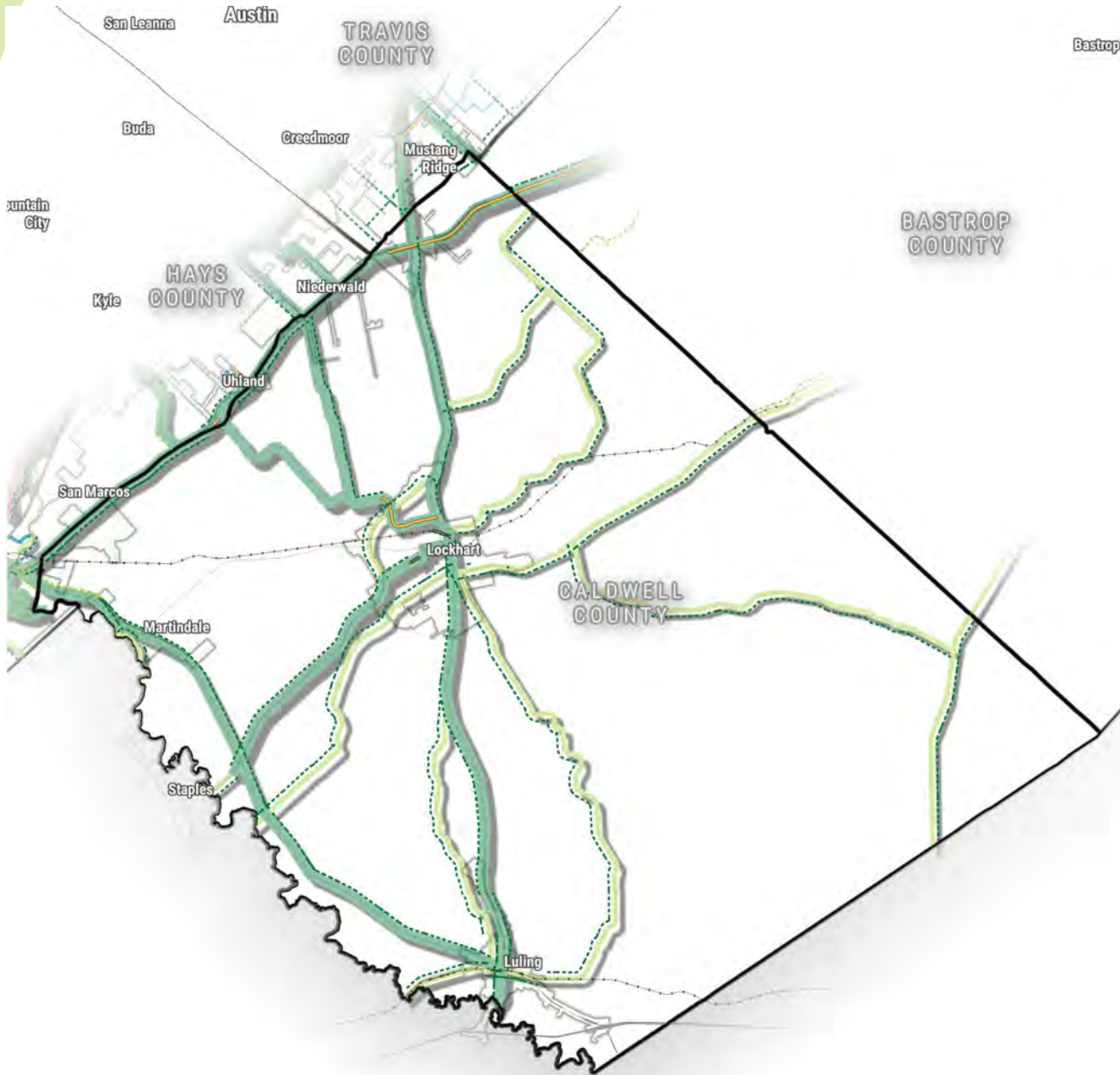


Priority Network

- Tier 1
- Tier 2
- Vision Connector



## Active Transportation Network - Unconstrained



### Caldwell County

**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

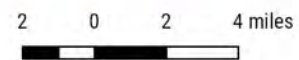
- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway

..... Municipally Identified Needs

..... CAMPO Identified Gaps

**Priority Network**

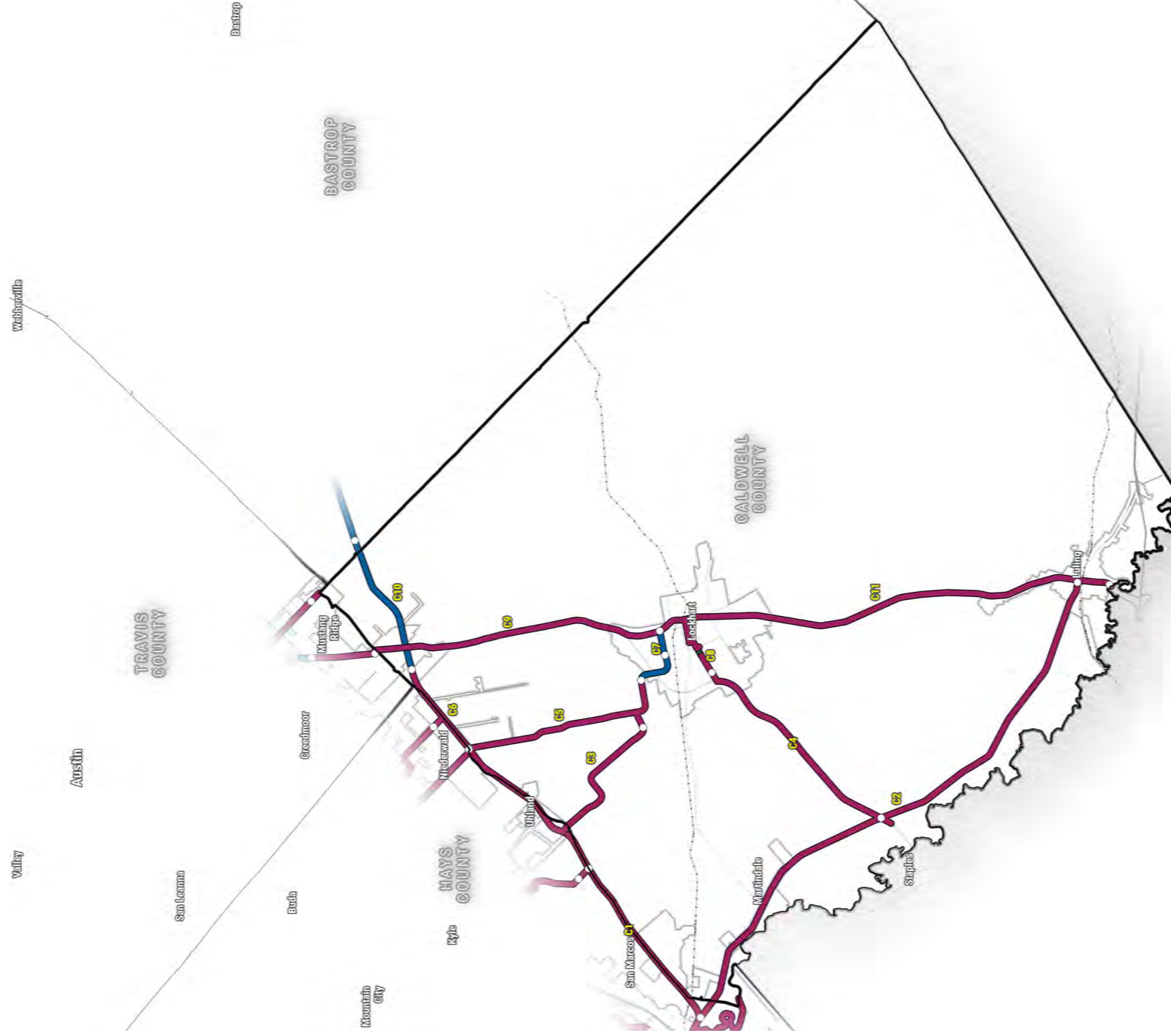
- Tier 1
- Tier 2
- Vision Connectors



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**CURRENT STATUS ANALYSIS AND COUNTY PROJECTS**



**Caldwell County**

**Current Status Analysis and County Projects**

- Existing
- New Construction Needed
- Potential Upgrade
- Break Point



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## Project List for Caldwell County

The following projects were identified during the planning process based on an analysis of demand, network gaps, existing conditions, and locally identified needs (pages 2-13 - 2-15).

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
C1	Tier 2	New Construction Needed	SH 211	SH 80	E RR 150
C2	Tier 2	New Construction Needed	SH 80	SH 130	US 183
C3	Tier 2	New Construction Needed	FM 2720	County View Rd	Old Lockhart Rd
C4	Tier 2	New Construction Needed	SH 130	Boggy Creek Rd	SH 80
C5	Tier 2	New Construction Needed	FM 2001	Hidden Path Rd	SH 21
C6	Tier 2	New Construction Needed	SH 21	FM 2001	Williamson Rd
C7	Tier 2	Potential Upgrade	FM 2001	Silent Valley Rd	Hidden Path Rd
C8	Tier 2	Existing, New Construction Needed	SH 130	Boggy Creek Rd	Silent Valley Rd
C9	Tier 2	New Construction Needed	SH 130	Old Lockhart Rd	Silent Valley Rd
C10	Tier 2	Potential Upgrade	SH 21	Williamson Rd	Caldwell County Line
C11	Tier 2	New Construction Needed	US 183 Hwy	Silent Valley Rd	Caldwell County Line



# HAYS COUNTY

The Hays County plan summary provides a county-level look at the results and recommendations of the CAMPO Regional Active Transportation Plan.

## Demographics

Area (miles)	Population	People of Color (Minorities)		White Population		School-aged Children	
680	170,410	73,026	40%	97,384	60%	30,180	17%

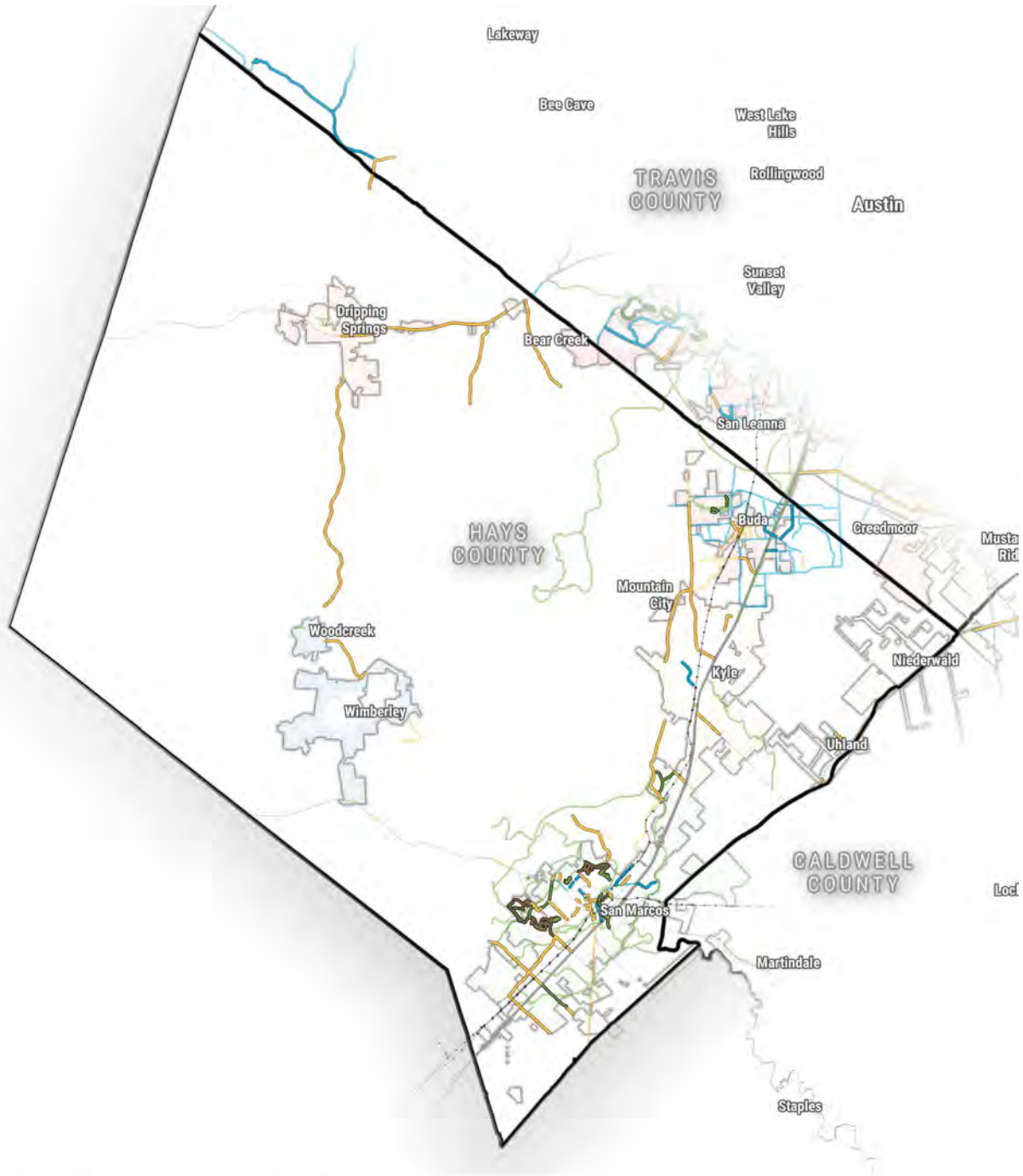
Seniors (60+)	Households	Households in Poverty		Housing Units	Zero Car Housing Units	
24,073	15%	58,749	9,765	18%	0	0%

## EXISTING AND PLANNED FACILITIES

Hays County has the third most miles of sidewalk, after Travis and Williamson Counties. There are 99 existing and 161 planned miles of bicycle facility. Most of the existing bicycle facilities (68 miles) are paved shoulders, the County also has shared use paths, bike lanes, and unpaved trails. Several new desired routes were identified for Buda during the municipal meetings.

	Existing Miles	Planned and Proposed Miles	Total Miles
<b>Hays County</b>	484	335	819
Bike Lane / Dedicated On-Street	7	40	47
Share Path / Trail	11	96	107
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	63	25	88
Unpaved Trail	18	0	18
Sidewalks	385	0	385
Bicycle/pedestrian needs identified by local governments	N/A	174	174

# EXISTING AND PLANNED BICYCLE FACILITIES



**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway



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## POLICIES, PROGRAMS, AND CODES

The bicycle and pedestrian policy scans for Hays County included a review of public documents and programs for the municipalities of: Buda, Dripping Springs, Hays, San Marcos, Woodcreek, Kyle, Bear Creek, Wimberley; and, Hays County. Over 38 plans, studies, reports, policies, guidelines, and codes were evaluated to determine the degree and manner by which Hays County communities – individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

- **Six (6) Comprehensive Plans**
- **Five (5) Transportation Master Plans**
- **Five (5) Park Plans**
- **Two (2) Downtown Master Plans**
- **Five (5) Municipal Construction Design Manuals**
- **Fifteen (15) Municipal and County Codes**, including subdivision regulations, zoning ordinances, etc.

Summaries of each document reviewed can be found in Appendix C.

### Overview

The degree to which Hays County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities varies greatly. Significant findings include:

- **Accessibility** Some Hays County communities cross-reference and emphasize the need to meet ADA access requirements in their regulations, codes and ordinances. No planning documents directly discuss the importance of improving local pedestrian networks for enhanced ADA access and comfort.
- **Connectivity** Many of the planning documents adopted by the cities of San Marcos, Kyle, and Buda, encourage increased pedestrian and trail connectivity throughout the community. Improved street network connectivity between development sites is also promoted in the Hays County Transportation Plan. Many other community planning documents do not directly address the need for increased street or bikeway connectivity. Buda and Wimberley require the extension of local streets to adjacent development sites, but local development regulations do not mandate a specific ratio of street links to nodes.

Maximum block lengths in Hays County communities range between a maximum of 1,000 to 2,000 feet, but smaller maximums are not required for areas within local land use planning documents designated as mixed-use nodes.

Land development regulations for the cities of Buda, Dripping Springs, Wimberley, and Kyle allow each community to require multi-use trail development along identified corridors. They do not always require connections to and from adjacent neighborhoods or other development types. In contrast, Buda's land development regulations specify direct pedestrian connections between buildings on a development site and the adjacent public sidewalk. Similarly, the City of San Marcos zoning regulations require pedestrian connections between new mixed-use developments and existing sidewalks, parks, or open space.

- **Multi-Modalism** The cities of Buda, Dripping Springs, Kyle, Wimberley, and San Marcos require sidewalks as part of new development. The Parks and Trails Master Plan for the City of Buda also requires the incorporation of multi-purpose trails as an integral component of the City's public transportation infrastructure.

In the planning documents for the City of San Marcos, Dripping Springs, and Buda, proposed bike and pedestrian facility standards and routes are identified. A trail corridor network is established in the Buda 2030 Comprehensive Plan and Buda Parks, Recreation, Trails and Open Space Master Plan.

The City of Buda requires the development of pedestrian and bicycle infrastructure as part of the City's street network. In addition to sidewalks, the City requires designated (Type II) bike lanes as part of new arterial streets (and some collector streets). Buda's and Kyle's land use regulations also require the provision of easements for the creation of hike and bike trails. The City of Wimberley subdivision regulations include provisions on the construction of "trails" for bicycle use. The code does not however, specify when trails may be required as part of new development. Further, associated design standards make it difficult to interpret whether the City is attempting to construct multi-use trails, buffer bike lanes, bike lanes, or another facility type.

- **Safety** The Hays County Transportation Plan identifies a Safe Routes to School program. Planning documents for the City of Buda suggest coordination between Hays County and the City of Buda to establish a Safe Routes to School Program. No other communities identify local bicycle or pedestrian education encouragement, and/or enforcement programs in Hays County to support active transportation infrastructure investment.



- **Mixed-use Development**, The cities of San Marcos, Kyle's, and Dripping Springs' long-range planning documents promote high-density mixed-use development within their central business districts. The City of Buda identifies a series of mixed-use nodes in their comprehensive plan for the development of pedestrian-friendly development patterns in the historic downtown and other outlying areas.

The cities of Buda and Kyle, apply mixed-use zoning districts to their central business districts. The City of Buda also uses a floating zone to encourage mixed-use development in other areas of the city. Similarly, the City of San Marcos utilizes mixed-use, traditional neighborhood development, and central business district zoning tools to create areas of building form, scale, and arrangement that supports non-motorized transportation choice.

- **Complete Streets**, Planning documents for the cities of San Marcos, Kyle, and Buda, recommend the development of Complete Streets policies. No Hays County jurisdiction has adopted a formal Complete Streets policy to date.
- **Healthy Lifestyles**, Parks and open space planning documents adopted by Hays County communities identify a link between the preservation of park land and open space, and healthy lifestyles. In the Buda 2030 Comprehensive Plan, a healthier community is encouraged through the promotion of walking and bicycling.

## Highlights

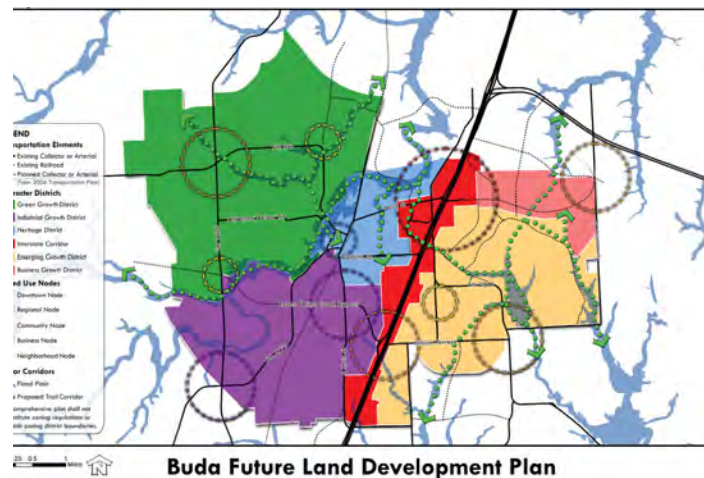
Collectively, there are many active transportation policies and initiatives that Hays County communities have implemented that promote the development of a bicycle and pedestrian friendly environments. Key policies or initiatives which may be replicated by individual communities in Hays County, or the region as a whole, include:

- Pedestrian connectivity is required in most communities in Hays County.
- Mixed-use development is promoted in the cities of San Marcos, Kyle, Buda, and Dripping Springs.
- The City of Buda has incorporated bikeway development requirements into the City street standards.
- The cities of Buda and Kyle promote the development of mixed-use nodes in areas of jurisdiction extending beyond historic downtown districts.

## Recommendations

Opportunities remain for Hays County communities to enhance the bicycling and pedestrian environment in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

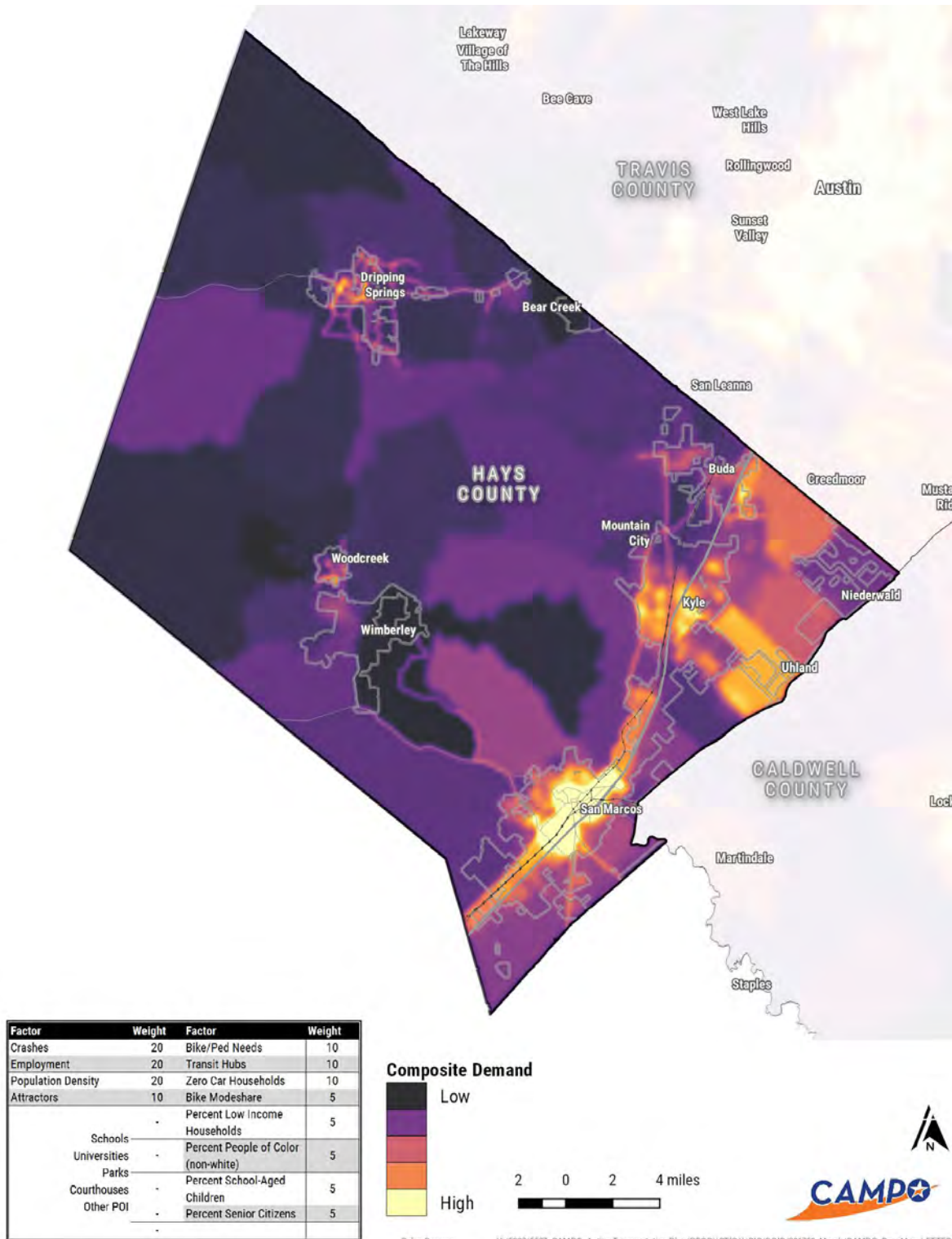
- Reduce maximum block lengths in standard subdivisions and create urban street standards to correspond with mixed-use zoning tools being adopted by Hays County communities.
- Implement one or more bicycle and pedestrian education, encouragement, and/or enforcement programs.
- Complete Streets policies could be adopted by each community. If engineering design standards already exist in a community, modify these documents to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Incorporate bikeway development standards and requirements into municipal street standards (see Pattern Book, page ??).
- Incorporate goals and objectives into local planning documents that promote the development of healthy lifestyles through programming and environmental change.
- Adopt comprehensive pedestrian connectivity requirements to promote inter-parcel connectivity, and on-site pathways between buildings, land uses, parking, and the public street.



*The Buda Comprehensive Plan encourages mixed use development at a variety of scales within nodes located throughout the City's jurisdiction. An ongoing update to the City's unified development ordinance seeks to more readily implement the City's adopted development vision.*

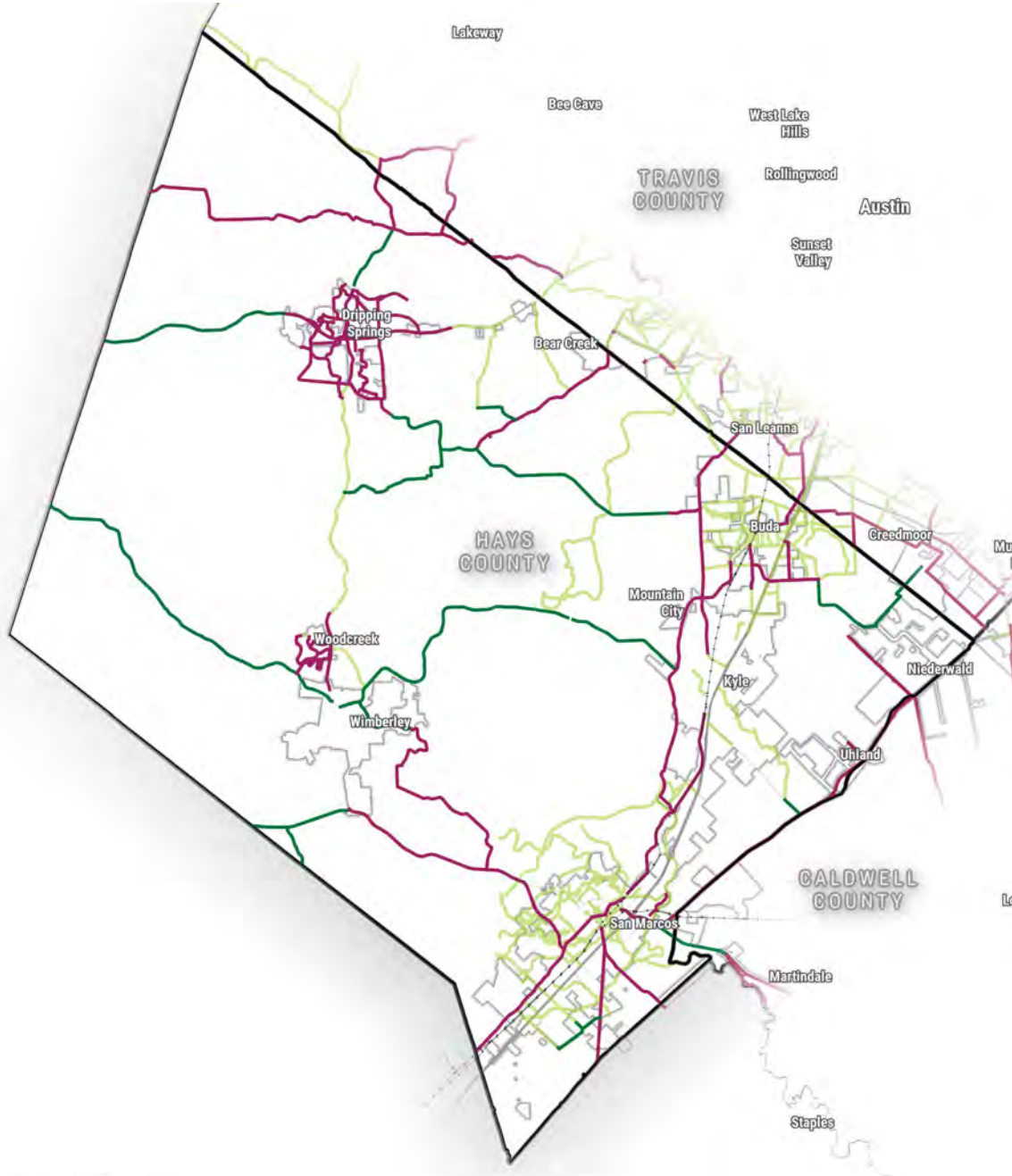
## DEMAND ANALYSIS

The demand in Hays County is concentrated along the I-35 corridor, especially in San Marcos, Kyle, and the eastern corner of the county. The communities in the western part of the county, Dripping Springs and Wimberley, showed relatively low levels of demand.



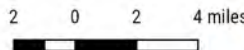
## GAPS ANALYSIS

Hays County contains San Marcos, Buda, Wimberley and Dripping Springs, all areas where community members and officials identified active transportation needs. The I-35 corridor from San Marcos to Austin, via Kyle and Buda, was identified as an important gap in facilities. The lack of a northwestern route from San Marcos to Bee Cave, via Wimberley and Dripping Springs was also noted. Specific gaps in the bicycling network include the route west of Dripping Springs, west of Wimberley, and a loop in the southeast corner.



### Hays County

- CAMPO Identified Gap
- Municipally Identified Need
- Existing and Planned Network



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## PUBLIC OUTREACH

### Hays County Survey Results



For what purposes do you most often ride a bike?	
Fun, recreation, leisure	49%
Exercising, training, racing	27%
To go to work or school	16%

What are the primary reasons you ride a bicycle?	
To exercise	40%
It is good for the environment	18%
It is inexpensive and saves money	17%
It is convenient and saves time	12%

What are reasons you do not ride a bicycle more often?	
It is not safe because of traffic	22%
Lack of trails and bike lanes	15%
Distances are too far / I have to make many stops	11%
The weather (e.g. too hot)	11%
I don't like to be sweaty when I arrive at my destination	11%

What types of bicycle facilities would you like more of in your community?	
Off street Walk and Bike Trails	28%
Bike lanes	21%
Separated or buffered on-street bike lanes	15%
Shoulders	12%



For what purpose do you most often walk?	
Exercise	36%
Fun, recreation, leisure	29%
To run errands (grocery/corner store, drug store, library, doctors office)	12%

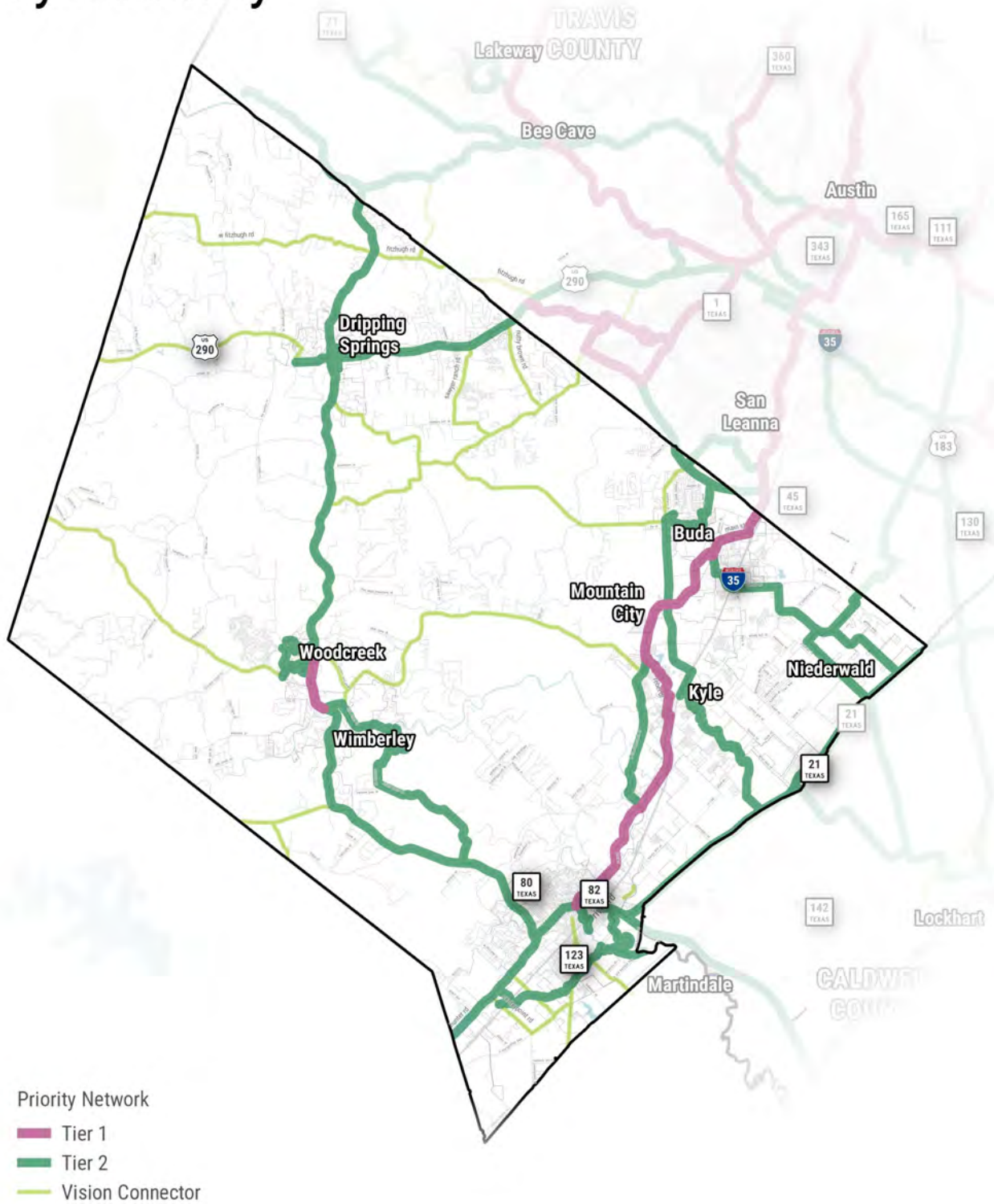
For what reasons do you choose to walk?	
To exercise	40%
It is good for the environment	16%
It is inexpensive and saves money	13%
It is convenient and saves time	11%

What three improvements to the walking environment would you most like to see in your community?	
New trails or paths	22%
New sidewalks	16%
Safer road crossings/intersections	14%
Better maintained sidewalks	11%

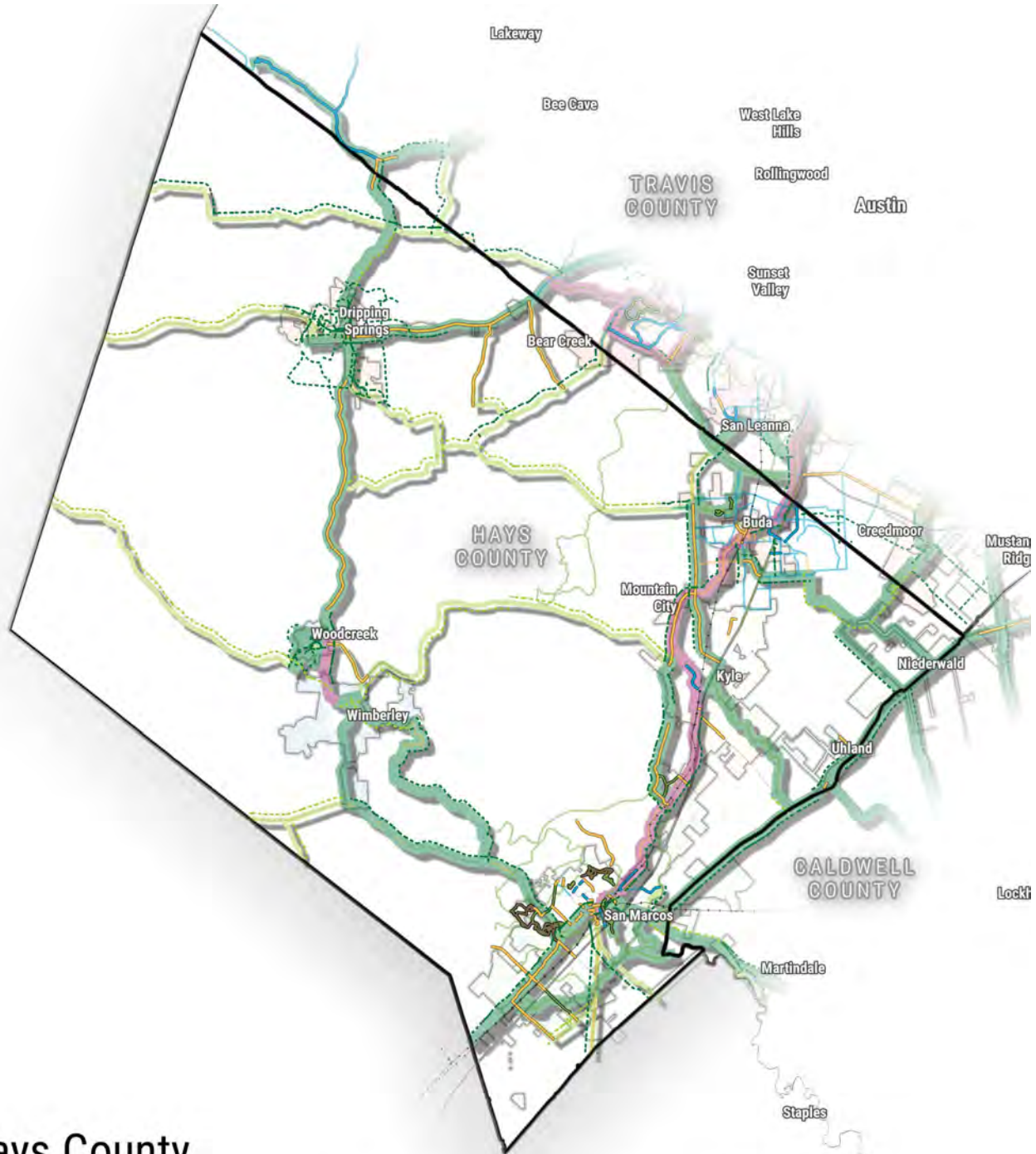
In your opinion, is it safe for your children to walk and/or bike to school?	
No	84%
Yes	16%

## ACTIVE TRANSPORTATION NETWORK

# Hays County



## Active Transportation Network - Unconstrained



### Hays County

#### Existing Facilities

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

#### Planned Facilities

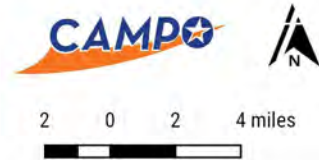
- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway

#### Municipally Identified Needs

- CAMPO Identified Gaps

#### Priority Network

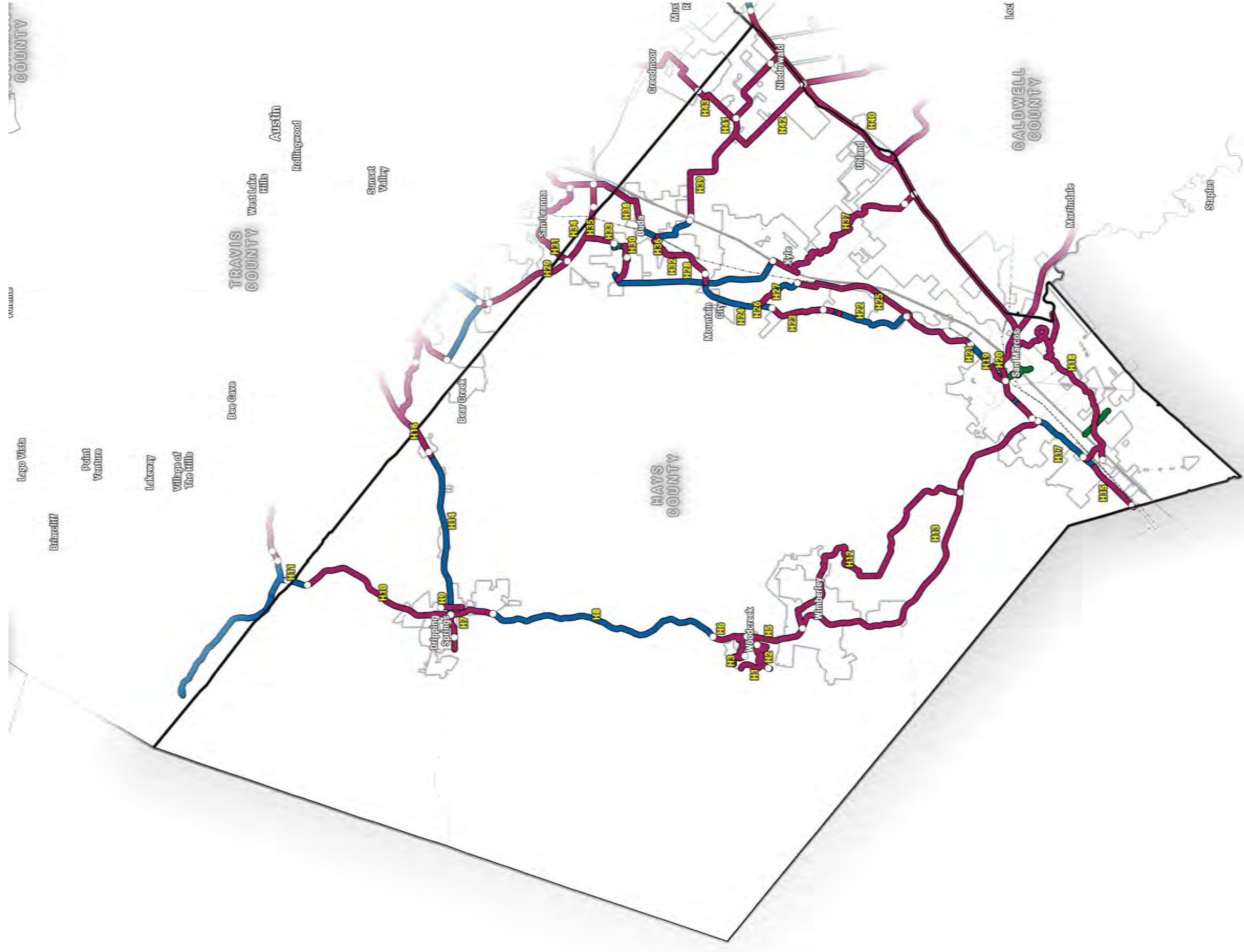
- Tier 1
- Tier 2
- Vision Connectors



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**CURRENT STATUS ANALYSIS AND COUNTY PROJECTS**



**Hays County**

Current Status Analysis and County Projects

- Existing
- New Construction Needed
- Potential Upgrade
- Break Point



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## Project List for Hays County

The following projects were identified during the planning process based on an analysis of demand, network gaps, existing conditions, and locally identified needs (pages 2-13 - 2-15).

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
H1	Tier 2	New Construction Needed	Woodcreek Dr	Camp Young Judea Rd	RR 2325
H2	Tier 2	New Construction Needed	Champions Cir / Woodcreek Dr	Jacobs Well Rd	Woodcreek Dr
H3	Tier 2	New Construction Needed	Brookmeadow Dr / Augusta Dr / Brookhollow Dr	RR 12	Jacobs Well Rd
H4	Tier 2	New Construction Needed	New Trail along city limit	Champions Cir	Champions Cir
H5	Tier 1	New Construction Needed	RR 12	Old Kyle Rd / Wimberley Sq	Winters Mill Pkwy / Woodcreek Dr
H6	Tier 2	New Construction Needed	RR 12	Winters Mill Pkwy / Woodcreek Dr	Jacobs Well Rd
H7	Tier 2	New Construction Needed	Creek Rd / US 290	Roger Hanks Pkwy	RR 12
H8	Tier 2	Potential Upgrade	RR 12	W RR 150	Jacobs Well Rd
H9	Tier 2	New Construction Needed	Shelton Ln	Founders Park Rd	Sports Park Rd
H10	Tier 2	New Construction Needed	RR 12	S of W Cave Blvd	W RR 150
H11	Tier 2	Potential Upgrade	RR 12	N of Saddletree Ln	S of West Cave Blvd
H12	Tier 2	New Construction Needed	Old Kyle Rd / RR 3237 / Flite Acres Rd / Fulton Ranch Rd / Little Arkansas Rd	RR 12	RR 12
H13	Tier 2	New Construction Needed	RR 12 / W Wonder World Dr	RR 3327	Hunter Rd
H14	Tier 2	Potential Upgrade	US 290	RR 12	Heritage Oaks Dr
H15	Tier 2	New Construction Needed	Hunter Rd	Centerpoint Rd	Comal County Line
H16	Tier 2	New Construction Needed	W US 290 Hwy	Heritage Oaks Dr	Cedar Valley Shopping
H17	Tier 2	Potential Upgrade	Hunter Rd	Centerpoint Rd	Wonder World Dr
H18	Tier 1	New Construction Needed	New Trail	Rebel Dr	Trail from San Marcos Hwy To Opal Ln
H19	Tier 1	New Construction Needed	C M Allen Pkwy / University Dr / Aquarena Springs Dr	Post Rd	E Hopkins St
H20	Tier 2	New Construction Needed, Potential Upgrade	Hunter Rd / W Hopkins St / E Hopkins St / SH 80	Wonder World Dr	Old Bastrop Rd
H21	Tier 1	Potential Upgrade	Post Rd	Aquarena Springs Dr	Claremont Dr
H22	Tier 2	New Construction Needed, Potential Upgrade	S Old Stagecoach Rd	Opal Ln	Post Rd
H23	Tier 2	New Construction Needed	Old Stagecoach Rd	Opal Ln	Rebel Dr
H24	Tier 1	Potential Upgrade	Jack C Hays Trl	Rebel Dr	S FM 1626
H25	Tier 1	New Construction Needed	E Center St / N Burluson St / Post Rd / W Center St	Claremont Dr	Spring Branch Dr

## Project List for Hays County continued

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
H26	Tier 1	New Construction Needed	Sampson / Fairway	Scrutchins	Jack C Hays Trl
H27	Tier 1	Potential Upgrade	Scrutchins / Spring Branch Dr	Sampson	N Burleson St
H28	Tier 2	New Construction Needed, Potential Upgrade	RR 967 / S FM 1626	Elm Grove Ln	Kyle Pkwy
H29	Tier 2	New Construction Needed	SH 45 SW Trail	Bliss Spillar Rd	N FM 1626
H30	Tier 2	Existing, New Construction Needed	New Trail	RR 967	Cullen Blvd
H31	Tier 2	New Construction Needed	N/W FM 1626 Rd	SH 45 SW Trail	S of Big Valley Dr
H32	Tier 1	New Construction Needed	Jack C Hays Tr / Bluff Stl	S FM 1626	W Goforth St
H33	Tier 2	New Construction Needed, Potential Upgrade	RR 967 / Manchaca Springs	Cullen Blvd	Garlic Creek Dr
H34	Tier 2	New Construction Needed	SH 45 SW Trail	N FM 1626	Garlic Creek Dr
H35	Tier 2	New Construction Needed	Garlic Creek Dr	Manchaca Springs	SH 45 SW Trail
H36	Tier 1	Potential Upgrade	Main St / S Loop 4 / Robert S Light Blvd	E Loop Stt	IH 35
H37	Tier 2	New Construction Needed	E RR 150 / IH 35	IH 35 Side Path from Kyle Pkwy	Windmill Ctr and Trail from IH 35 to Camino Real
H38	Tier 1	New Construction Needed	Main St	Sequoyah St	Old San Antonio Rd
H39	Tier 2	New Construction Needed	Hillside Terrace Opas	Robert S Light Blvd	Satterwhite Rd
H40	Tier 2	New Construction Needed, Potential Upgrade	Camino Real	FM 2001	E RR 150
H41	Tier 2	New Construction Needed	FM 2001 / Niederwald Strasse	Hillside Ter	SH 21
H42	Tier 2	New Construction Needed	Goforth Rd / Rohde Rd	FM 2001	SH 21
H43	Tier 2	New Construction Needed	Williamson Rd	FM 2001	S of Graef Rd



# TRAVIS COUNTY

The Travis County plan summary provides a county-level look at the results and recommendations of the CAMPO Regional Active Transportation Plan.

## Demographics

Area (miles)	Population	People of Color (Minorities)		White Population		School-aged Children	
1,023	1,092,810	545,817	47%	546,993	53%	178,687	15%

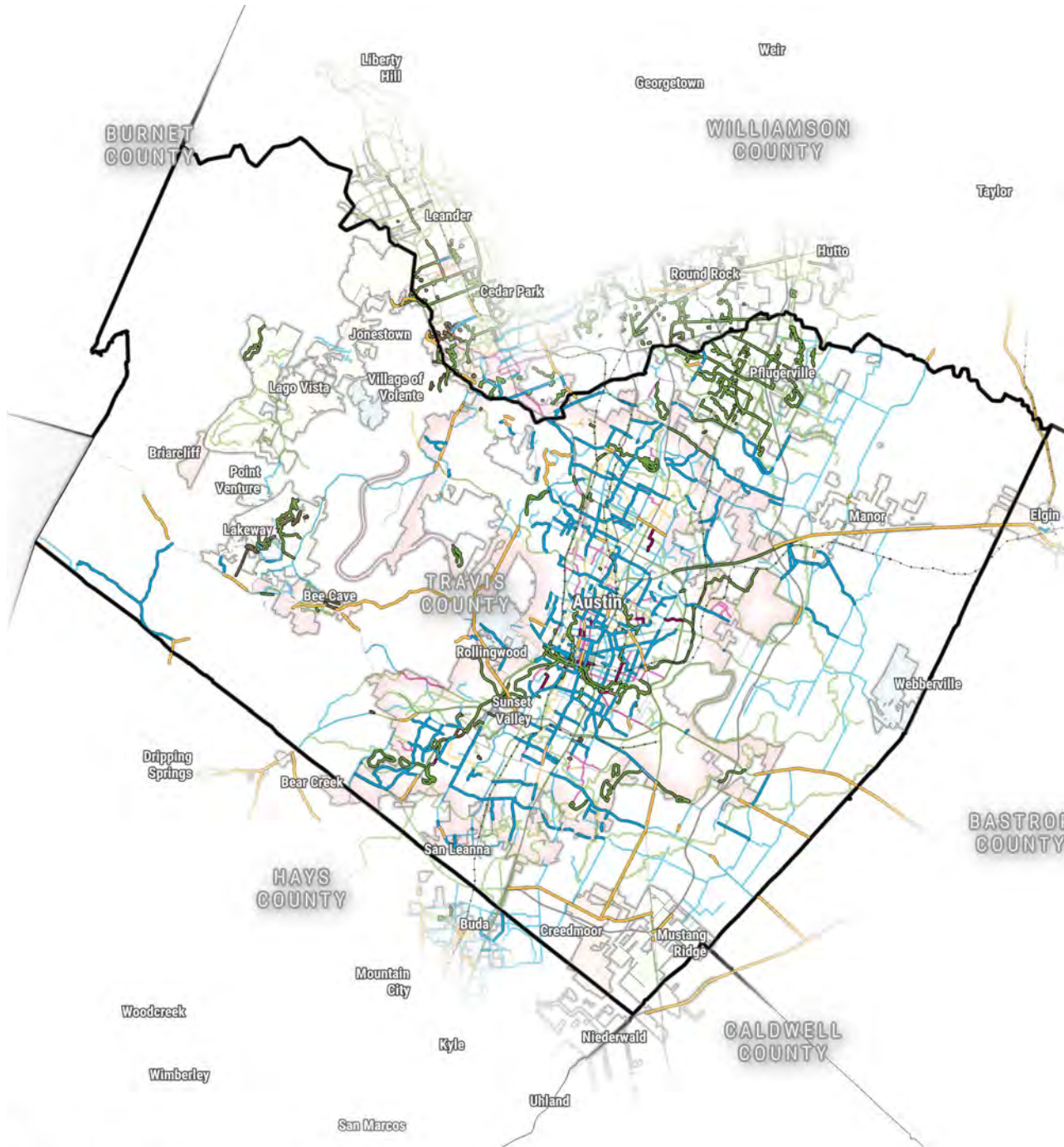
Seniors (60+)		Households	Households in Poverty		Housing Units	Zero Car Housing Units	
135,169	14%	419,496	61,583	16%	419,496	24,879	6%

## EXISTING AND PLANNED FACILITIES

Travis County has 859 miles of sidewalk, the most for any county in the region. Travis County also has the largest variety of bicycle facility types. It is the only county in the region with separated bike lanes. It has the most miles of bike lanes, and the second most miles of shared use paths and shoulders/shared lanes/bicycle boulevards, after Williamson County.

	Existing Miles	Planned and Proposed Miles	Total Miles
<b>Travis County</b>	1,490	1,385	2,875
Bike Lane / Dedicated On-Street	271	343	614
Separated Bike Lane	0	2	2
Share Path / Trail	187	523	710
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	147	47	194
Unpaved Trail	18	2	20
Sidewalks	859	6	865
Bicycle/pedestrian needs identified by local governments	N/A	416	416

# EXISTING AND PLANNED BICYCLE FACILITIES

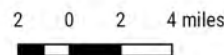


**Existing Facilities**

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

**Planned Facilities**

- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway



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## POLICIES, PROGRAMS, AND CODES

The bicycle and pedestrian policy scans for Travis County included a review of public documents and programs for the municipalities of: Bee Cave, Lago Vista, Lakeway, Pflugerville, Jonestown, Manor, Rollingwood, West Lake Hills, Sunset Valley, Volente; and, Travis County. Over 32 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Travis County communities – individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Some key documents and programs reviewed include:

- **Five (5) Comprehensive Plans**
- **One (1) Vision Report**
- **Two (2) Transportation or Connectivity Plans**
- **Two (2) Land, Water, & Transportation Growth Guidance Plans**
- **One (1) Active Transportation Monitoring Plan**
- **Four (4) Parks and Trails Plans**
- **Seventeen (17) Municipal and County Codes**, including subdivision regulations, zoning ordinances, etc.

Summaries of each document reviewed can be found in Appendix C.

In addition to the public documents and programs of other Travis County communities, this audit incorporates an overview of the City of Austin's active transportation tools.

## Overview

The degree to which Travis County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities varies greatly between community type. Significant findings include:

- **Accessibility** Travis County, and the municipalities of Bee Cave, Sunset Valley, and Volente acknowledge the need for ADA accessibility in their development regulations. The City of Pflugerville's land development regulations require sidewalk ramps at each street intersection. The codes, regulations, and guidelines of other Travis County communities do not explicitly address ADA accessibility.
- **Connectivity** In the Travis County Land, Water, & Transportation Plan - Growth Guidance Plan, thoroughfare connectivity between activity centers, transit centers, and principal arterials and freeways is encouraged. Trail connectivity along rivers and creek corridors is also promoted. The cities of Bee Cave, Lago Vista, Lakeway, and Pflugerville all encourage the development of a community-wide network of hike and bike trails.

Most communities in Travis County require residential block lengths that range from a maximum of 1,000 feet to 2,000 feet - distances which are common in auto-centric suburbs and ex-urban areas. Most development regulations also require a minimum of two access points from existing streets to new developments, and the extension of streets to adjacent and undeveloped lots. There are no provisions however for new development to adhere to additional street connectivity ratios.

- **Multi-modalism** The planning documents of many communities in Travis County suggest the need to establish multi-modal street networks that incorporate

## CITY OF AUSTIN

The City of Austin is recognized as a leader in bicycling and pedestrian mobility. Given the City's national stature in active transportation infrastructure and program development, many CAMPO area communities have chosen to utilize tools developed by the City of Austin to guide their own bicycle and pedestrian infrastructure investments.

References to the City of Austin's policy, programming, and regulatory tools, as part of the Travis County bicycle and pedestrian policy scans, are confined to these sidebars. Key City documents and programs reviewed include: **twelve (12) plans, five (5) programs, three (3) municipal construction design manuals** and **six (6) chapters of municipal code**.



*Protected bicycle facilities are being incorporated into the street networks of new developments in Austin.*



pedestrian and bicycle accommodations. Some Travis County communities limit bicycle and pedestrian connectivity objectives to trail system development due to a combination of low development densities and challenging topography.

Although most Travis County communities require sidewalks on one or both sides of most streets, the County and some municipalities provide discretion on when sidewalks may be excluded from new development due to individual development characteristics or rural conditions. Where required, most minimum sidewalk widths are between 5 and 6 feet in width.

Travis County communities do not require the provision of bicycle facilities as part of the street network. Although the City of Manor’s subdivision regulations include cross-section diagrams that illustrate bicycle lanes, there is no corresponding text that requires on-street bicycle facilities. The Village of Volente requires showers and lockers for employees who commute by bicycle to be provided.

- **Safety** The City of Pflugerville and Pflugerville Independent School District have partnered to create a School Zone Traffic Safety Team. The team was created following the City’s 2010 adoption of a Safe Routes to School Plan, and is intended to promote street system improvements that encourage children to walk and bike to school. Travis County has utilized an appointed Bicycle Safety Task Force to make recommendations on bicycle safety infrastructure projects.
- **Mixed-use Development** The long-range planning documents of Travis County and a handful of other jurisdictions promote mixed-use development through the creation of activity centers.

Some Travis County jurisdictions, such as Bee Cave and West Lake Hills incorporate mixed-use districts into their land development regulations. These districts are designed to permit a mixture of land uses, but corresponding site design and building arrangement provisions remain suburban in nature and do not guarantee compact walkable development. The City of Bee Cave’s Town Center District does provide for a compact street pattern and building arrangements, but has been created via the planned development process. The City of Pflugerville does not have a mixed-use zoning district, but its zoning ordinance does incorporate architectural and site design standards that promote pedestrian-friendly site development within many of the city’s zoning districts.

- **Complete Streets** No Travis County jurisdiction has adopted a formal Complete Streets policy; although, some adopted planning documents recommend the development of street design standards that include Complete Streets concepts.

## CITY OF AUSTIN OVERVIEW: PART 1

The degree to which the City of Austin’s active transportation policies and initiatives promote healthy and multi-modal communities varies greatly. Significant findings include:

- **Accessibility** The local policies, guidelines and regulations for the City of Austin are structured to ensure ADA accessibility.
- **Connectivity** Increase connectivity is suggested from neighborhoods to parks and greenways through the use of sidewalks, bicycle lanes, multi-use paths and trails. The incorporation of trails throughout the City and region must be considered by developers to connect to or complete the trail system. The City of Austin requires residential block lengths that range from a maximum of 600 feet to 1,500 feet depending on the context of development.
- **Multi-Modalism** The City of Austin requires sidewalks to be installed along new streets and existing frontages. The City of Austin Trails Master Plan recommends the connection of all urban trails to the on-street bicycle and sidewalk network. Similarly, bike facility selection must conform to the facility designation for each roadway in the Austin Bikeway Plan.

The City’s commitment to active transportation is apparent with Austin’s adoption and enactment of its Complete Streets policy. The City’s Transportation Criteria Manual provides the framework for the development of a city-wide transportation network that incorporates bicycle and pedestrian facilities. Active transportation facilities must be incorporated into all new development. Consistent with the City’s Complete Streets policies, this manual has also been adopted by reference by many CAMPO-area communities.

- **Safety** The City of Austin’s Active Transportation Program seeks to increase quality of life of community members through the creation of a comfortable and connected pedestrian and bicycle system that serves all ages and abilities. Several other local bicycle/pedestrian education, encouragement and/or enforcement programs exist in the City of Austin. These programs include Austin Smart Trips, Vision Zero, Local Area Traffic Management and the Neighborhood Partnering Program.

- **Healthy Lifestyles** Planning documents adopted by Travis County and Sunset Valley reference the connection between multi-use trail development and opportunities for healthy community lifestyles. No other recreational or transportation planning documents adopted by Travis County communities reference the linkage between active transportation and healthy lifestyles.



*Utilization of new separated bicycle facilities in Travis County can be increased by the creation high intensity activity centers that provide urban destinations between intervening corridors.*

## Highlights

Collectively, there are many active transportation policies and initiatives that Travis County communities have implemented to promote the development of bicycle and pedestrian friendly environments. Key policies or initiatives which may be replicated by individual communities in Travis County, or the region as a whole, include:

- Travis County, the City of Bee Cave, Lago Vista, Lakeway and Pflugerville all encourage hike and bike trail connectivity.
- Policies, guidelines, or regulations in most Travis County communities require the incorporation of pedestrian facilities as an integral component of public transportation infrastructure.
- Pflugerville's School Zone Traffic Safety Team provides a direct linkage between public infrastructure investments and encouraging children to bicycle or walk to school.
- The development regulations of some Travis County communities provide for the creation of mixed-use developments, and can be further modified to incorporate building and site design principles that promote walkability.

## CITY OF AUSTIN OVERVIEW: PART 2

- **Mixed-use Development** The City's comprehensive plan, Imagine Austin identifies development nodes of varying size and "activity corridors" where higher intensity, mixed-use, and pedestrian-friendly development is promoted. These recommendations correspond with the development patterns promoted in many of the City's neighborhood plans. Further, the Austin Transportation Plan suggests that transit stops can function as hubs around which mixed-use residential, retail and commercial uses can be created.

The Austin land development regulations include a variety of "base" and "combining" zoning districts which have been used to generate a wide range of mixed use redevelopment types - fostering the gradual increase in urbanized development throughout much of the City. The city's zoning provisions also include building and site design features which generate urban development types on City corridors - particularly on the City's Urban Roadways, and Core Transit Corridors.

Many of the City's existing development tools which promote mixed use development are anticipated to be augmented or replaced by the adoption of the City's new development code: CodeNEXT.

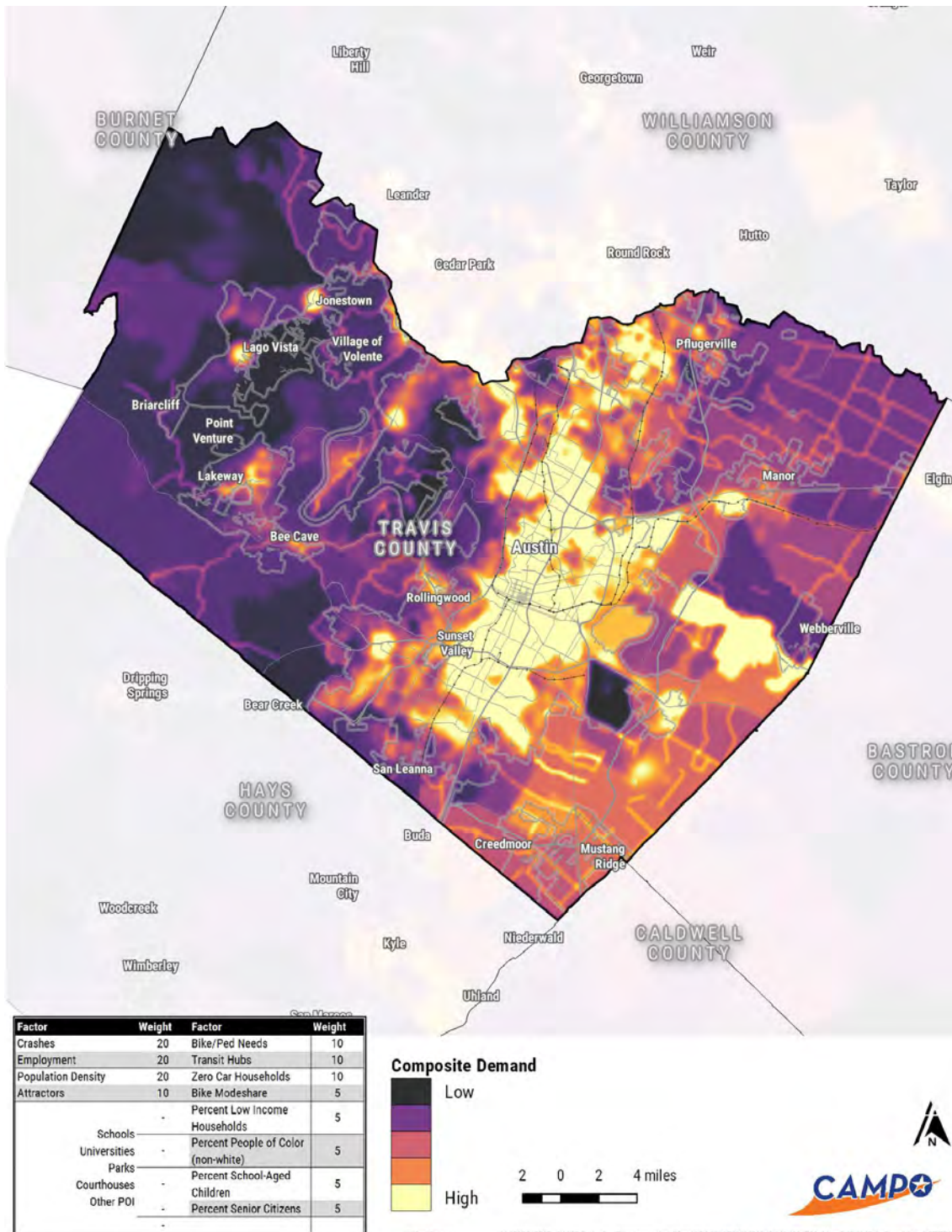


*Austin's active transportation investments should be supported by targeted areas of high density and urban built form.*

- **Healthy Lifestyles** Imagine Austin encourages growth in compact centers, communities, or along corridors that are linked by roads and transit and are designed to increase walking and bicycling. The plan acknowledges a direct linkage between the creation of walkable and bikeable communities and improved public health.
- The City has taken measures to promote community-wide health improvements - in part, through increasing access to the City's bicycle and pedestrian network. The City's initiatives have been supported through an American Planning Association Plan4Health grant.

## DEMAND ANALYSIS

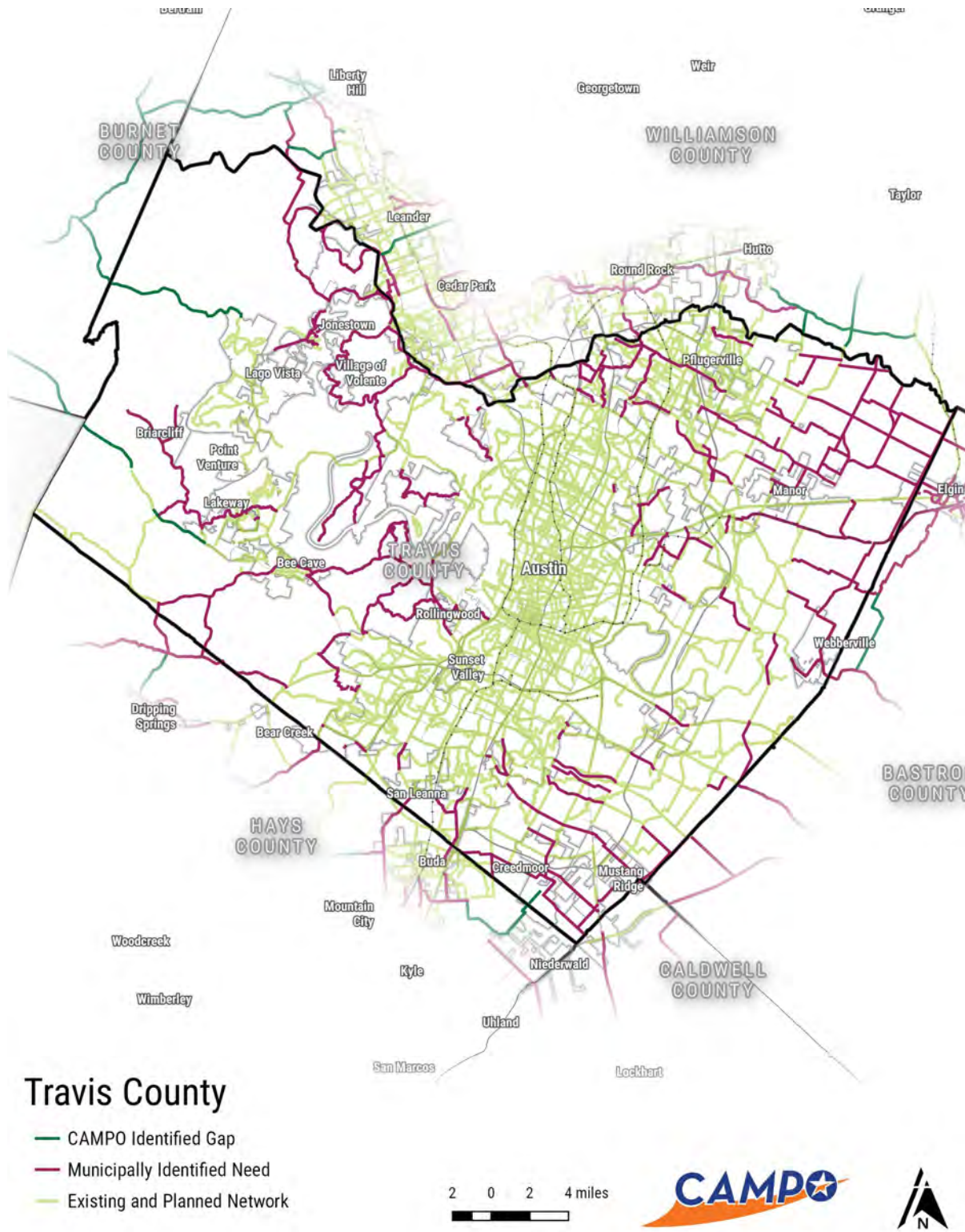
Travis County shows the greatest overall demand for walking and bicycling in the region due to high concentrations of employment, population, and crashes. The City of Austin, the Near Northwest Corridor around US 183 North, and the corridors along routes Loop 1, Loop, SH 130, Lamar Blvd, and Congress Avenue all show significant demand, as do Pflugerville to the north and Mustang Ridge to the south. The dark spot, showing no demand, to the south and east of downtown is the airport. The western part of the county shows less demand than the central and eastern parts, with points of demand in Lago Vista (in part due to transit demand), Jonestown, and Bee Cave.





## GAPS ANALYSIS

Travis County has the greatest number of sidewalks in the region. Gaps will need to be identified at the local level, especially in Austin. Some local gaps were identified in Bee Cave, Lago Vista and Pflugerville. In terms of gaps in the regional bicycling network, Travis County lacks some comfortable connections outward to communities outside of Austin and in surrounding counties, and along some significant corridors, such as along 183N.



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## PUBLIC OUTREACH

### Travis County Survey Results



For what purposes do you most often ride a bike?	
Fun, recreation, leisure	42%
Exercising, training, racing	27%
To go to work or school	23%

What are the primary reasons you ride a bicycle?	
To exercise	28%
It is good for the environment	14%
It is inexpensive and saves money	12%

What are reasons you do not ride a bicycle more often?	
It is not safe because of traffic	20%
Lack of trails and bike lanes	14%
The weather (e.g. too hot)	13%
Distances are too far / I have to make many stops	12%

What types of bicycle facilities would you like more of in your community?	
Off street Walk and Bike Trails	26%
Separated or buffered on-street bike lanes	26%
Bike Lanes	16%



For what purpose do you most often walk?	
Exercise	35%
Fun, recreation, leisure	29%
To run errands (grocery/corner store, drug store, library, doctors office)	13%

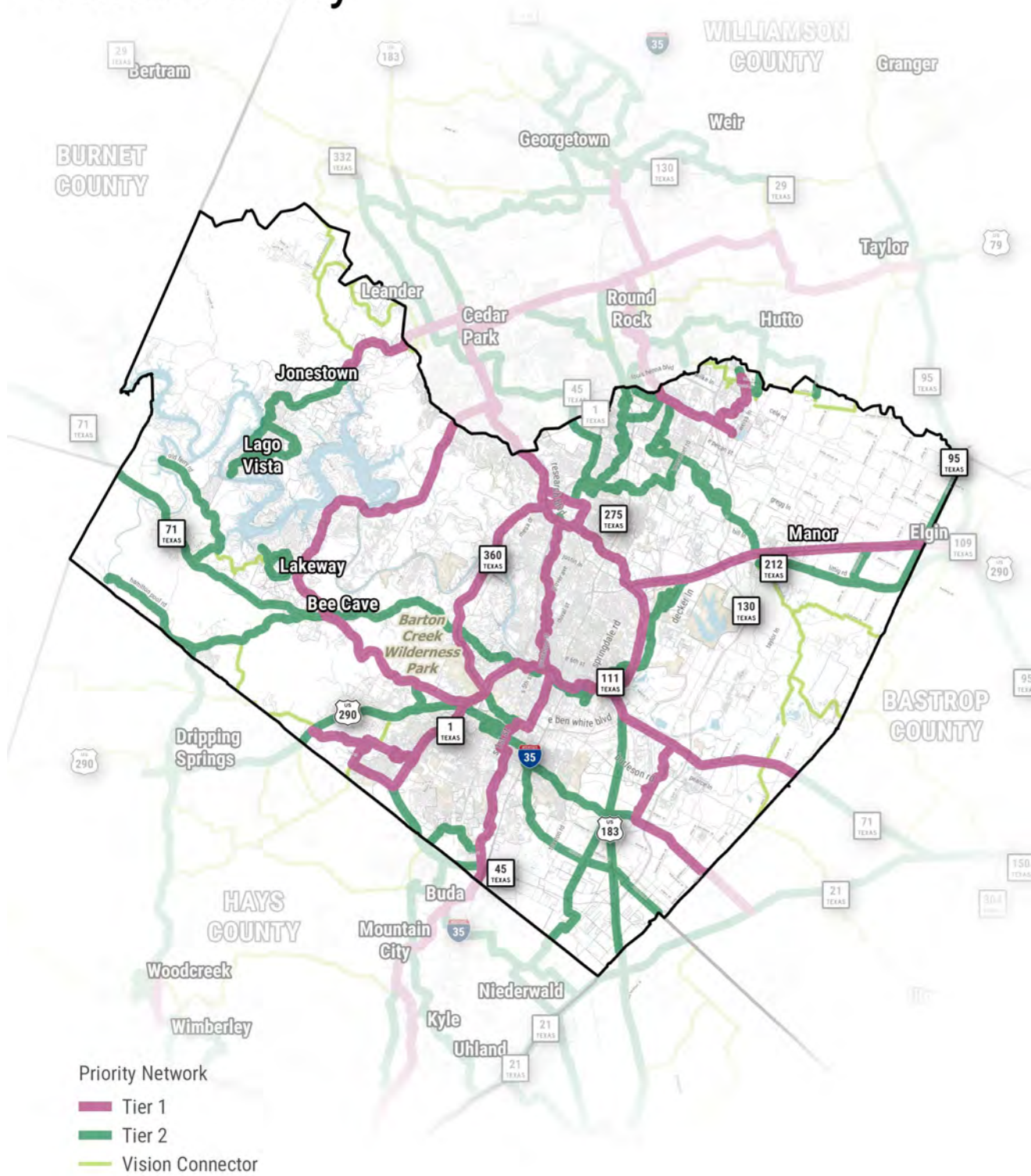
For what reasons do you choose to walk?	
To exercise	43%
It is good for the environment	14%
It is inexpensive and saves money	10%

What three improvements to the walking environment would you most like to see in your community?	
New sidewalks	17%
New trails or paths	15%
Better maintained sidewalks	15%

In your opinion, is it safe for your children to walk and/or bike to school?	
No	68%
Yes	32%

# ACTIVE TRANSPORTATION NETWORK

## Travis County





# Active Transportation Network - Unconstrained



## Travis County

### Existing Facilities

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

### Planned Facilities

- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway

..... Municipally Identified Needs

..... CAMPO Identified Gaps

### Priority Network

- Tier 1
- Tier 2
- Vision Connectors



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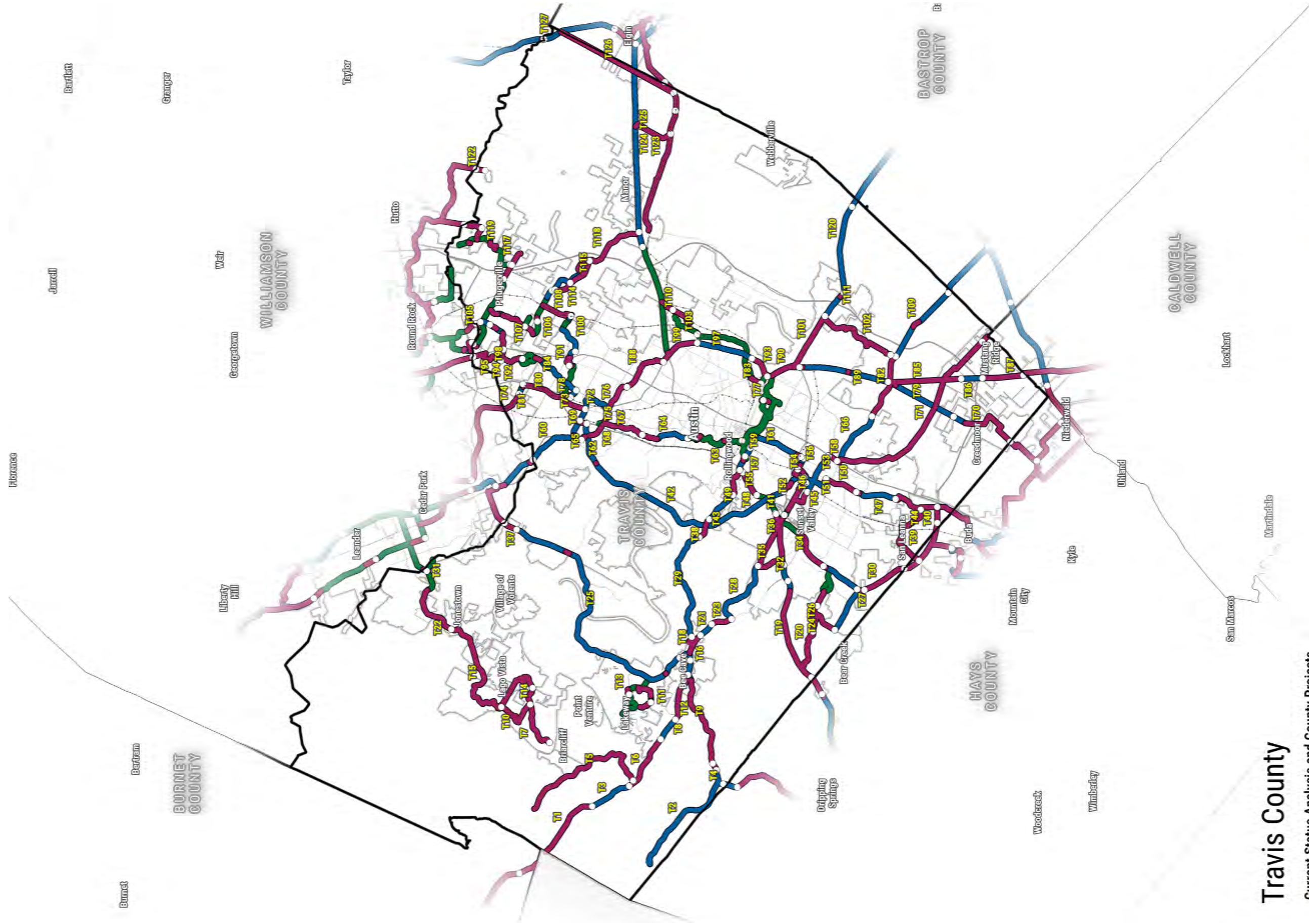


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**CURRENT STATUS ANALYSIS AND COUNTY PROJECTS**



**Travis County**

Current Status Analysis and County Projects

- █ Existing
- █ New Construction Needed
- █ Potential Upgrade
- Break Point



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## Project List for Travis County

The following projects were identified during the planning process based on an analysis of demand, network gaps, existing conditions, and locally identified needs (pages 2-13 - 2-15).

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
T1	Tier 2	New Construction Needed	W SH 71	W of Fall Creek Rd	S Pace Bend Rd
T2	Tier 2	Potential Upgrade	Hamilton Pool Rd	Pedernales River	Longhorn Skwy
T3	Tier 2	Potential Upgrade	W SH 71	R O Dr	S Pace Bend Rd
T4	Tier 2	Potential Upgrade	Brooks Ranch Rd / RR 12	Hamilton Pool Rd	N of West Cave Blvd
T5	Tier 2	New Construction Needed	Bee Creek Rd / Bob Wire Rd / Lake Travis Resort Rd / Old Ferry Rd	Lake Travis Resort Rd	Bee Creek Rd.
T6	Tier 2	New Construction Needed	W SH 71	Bee Creek Rd	R O Dr
T7	Tier 2	New Construction Needed	Boggy Ford Rd / Emerald Rd	National Dr	Robin Trail
T8	Tier 2	Potential Upgrade	W SH 71	Serene Hills Dr	Bee Creek Rd
T9	Tier 2	New Construction Needed, Potential Upgrade	Hamilton Pool Rd	Bee Cave Pkwy / W SH 71	Longhorn Skwy
T10	Tier 2	New Construction Needed	Canyon Oaks Dr / Green Shore Cir / Outpost Trce / National Dr	Dawn Dr	Boggy Ford Rd
T11	Tier 2	New Construction Needed, Potential Upgrade	The Hills Dr / Wingreen Loop	Serene Hills Dr	Wintergreen Loop
T12	Tier 2	New Construction Needed	W SH 71	Bee Cave Pkwy	Serene Hills Dr
T13	Tier 2	New Construction Needed	Lakeway Blvd	Lohmans Crossing Rd	Stoney Creek Cv
T14	Tier 2	New Construction Needed	Dawn Dr / Gary Player Dr / Shoreline Ranch Dr / Boggy Ford Rd /	Camille Ct	National Dr
T15	Tier 2	New Construction Needed	Bar K Ranch Rd / FM 1431	Dawn Dr	Park Rd
T16	Tier 2	Potential Upgrade	W SH 71	Bee Cave Pkwy	S FM 620
T17	Tier 1	New Construction Needed, Potential Upgrade	W SH 71	S FM 620	E of Uplands Ridge Dr
T18	Tier 2	New Construction Needed	New Trail	Primrose School	FM 2244 Rd
T19	Tier 2	New Construction Needed	W US 29	FM 1826	W US 290
T20	Tier 1	New Construction Needed	Slaughter Creek Greenway	W US 290	FM 1826
T21	Tier 1	Potential Upgrade	W SH 71	SE of Uplands Ridge Rd	SE of Texas Wildlife Trl
T22	Tier 1	New Construction Needed	FM 1431	Ridgeway Plaza	Dee Dr



## Project List for Travis County continued

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
T23	Tier 1	New Construction Needed	W SH 71	SE of Texas Wildlife Trl	Southwest Pkwy
T24	Tier 1	New Construction Needed	FM 1826	Slaughter Creek Greenway	SH 45 WB
T25	Tier 1	New Construction Needed, Potential Upgrade	N / S FM 620	Hanging Valley Dr	Bee Cave
T26	Tier 1	New Construction Needed	Slaughter Creek Greenway	FM 1826	Austin City Limit
T27	Tier 1	Potential Upgrade	SH 45 WB / S Mopac Expy SB	W Slaughter Ln	FM 1826
T28	Tier 1	Potential Upgrade	Southwest Pkwy	W William Cannon Dr	W SH 71
T29	Tier 2	New Construction Needed, Potential Upgrade	FM 2244 Rd	W SH 71	Canyon Wren Dr
T30	Tier 2	New Construction Needed	New Trail	S Mopac Expy	Bliss Spillar Rd
T31	Tier 1	New Construction Needed	W New Hope Dr	Cedar Bank Park	W Whitestone Blvd
T32	Tier 2	Potential Upgrade	W US 29	Patton Ranch Rd	FM 1826 Rd
T33	Tier 2	New Construction Needed	W William Cannon Dr	W US 290	Southwest Pkwy
T34	Tier 1	New Construction Needed	S Mopac Expy SB	William Cannon Dr	W Slaughter Ln
T35	Tier 1	New Construction Needed	Southwest Pkwy	Gaines Ranch Loop	W William Cannon Dr
T36	Tier 2	New Construction Needed	W US 290	Brodie Trn	Old Frederick Trn
T37	Tier 1	New Construction Needed	N FM 620	Anderson Mill Rd	Windy Ridge Rd
T38	Tier 2	New Construction Needed	Bee Caves Rd / FM 2244 Rd	Redbud Trl	Canyon Rim Dr
T39	Tier 2	New Construction Needed	W FM 1626 / Twin Creeks Rd	SH 45 SW Trl	Brodie Ln
T40	Tier 2	New Construction Needed	SH 45 SW Trail	E of Garlic Creek Dr	Old San Antonio Rd
T41	Tier 1	New Construction Needed	S Mopac Expy SB	Gaines Ranch Loop	Gaines Ranch Ramp
T42	Tier 1	New Construction Needed, Potential Upgrade	Capital of Texas Hwy	N Mopac Expy	US 290
T43	Tier 2	Potential Upgrade	Bee Caves Rd	Walsh Tarlton Ln	Redbud Trl
T44	Tier 1	New Construction Needed	E FM 1626 Rd / Old San Antonio Rd	Conroy Ln / S 1st St	Conroy Ln
T45	Tier 2	New Construction Needed	W Stassney Ln / West Gate Blvd	Manchaca Rd	Jones Rd
T46	Tier 2	New Construction Needed	Jones Rd / Manchaca Rd	West Gate Blvd	Ernest Robles Way

## Project List for Travis County continued

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
T47	Tier 1	Potential Upgrade	S 1st St	Ralph Ablanedo Dr	E FM 1626
T48	Tier 1	Existing, New Construction Needed	S Mopac Expy	Bee Caves Rd	Tuscanter
T49	Tier 2	New Construction Needed	Bee Caves Rd / Rollingwood Dr	Walsh Tarlton Ln	S Mopac Expy
T50	Tier 1	New Construction Needed	S 1st St	Eberhart Ln	Ralph Ablanedo Dr
T51	Tier 1	Potential Upgrade	Eberhart Ln / Emerald Forest Dr / Speer Ln / Vinson Dr	Aberdeen Dr	S 1st St
T52	Tier 2	New Construction Needed, Potential Upgrade	W St Elmo Rd / Mount Vernon Dr / Casey St / Banister Ln / Redd St / W Ben White Blvd	Vinson Rd	S Lamar Blvd
T53	Tier 2	New Construction Needed, Potential Upgrade	E / W Stassney Ln	S IH 35	Manchaca Rd
T54	Tier 1	New Construction Needed	Vinson Dr Trail	Rishmond Ave	W St Elmo Rd
T55	Tier 2	Potential Upgrade	Barton Springs Rd / S Mopac Expy NB / S Mopac Expy SB	Barton Springs Rd	Andrew Zilker Rd
T56	Tier 1	New Construction Needed, Potential Upgrade	W St Elmo Rd	Vinson Dr	S Congress Ave
T57	Tier 1	New Construction Needed	Barton Springs Rd	Robert E Lee Rd	William Barton Dr
T58	Tier 2	New Construction Needed	S IH 35	E Stassney	E William Cannon Dr
T59	Tier 2	Potential Upgrade	Barton Springs Rd	Robert E Lee Rd	Butler Park
T60	Tier 1	Potential Upgrade	Jollyville Rd	Barrington Way	Great Hills Trl
T61	Tier 1	New Construction Needed, Potential Upgrade	S Congress Ave	Barton Springs Rd	W St Elmo Rd
T62	Tier 1	New Construction Needed	Arboretum Blvd	Great Hills Trl	Research Blvd
T63	Tier 1	Existing, New Construction Needed	Shoal Creek Trail	W 39th 1/2 St	Town Lake Trail/Colorado River
T64	Tier 1	Potential Upgrade	Shoal Creek Blvd	W 39th St	Allandale Rd
T65	Tier 1	New Construction Needed, Potential Upgrade	W Braker Ln	N Mopac Expy	Jollyville Rd
T66	Tier 2	New Construction Needed, Potential Upgrade	E William Cannon Dr	S IH 35	Kinney Falls Pkwy
T67	Tier 1	New Construction Needed, Potential Upgrade	Shoal Creek Blvd	Research SB	Northland Dr
T68	Tier 1	Existing, New Construction Needed	Jollyville Rd / Research Blvd	Research Blvd SB	Burnet Rd

## Project List for Travis County continued

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
T69	Tier 1	New Construction Needed	N Mopac Expy	W Braker Ln	N Capital of Texas Hwy
T70	Tier 2	New Construction Needed, Potential Upgrade	FM 1625 / Turnersville Rd / Williamson Rd	W Evelyn Rd	Williamson Rd
T71	Tier 2	New Construction Needed	Maha Rd / Maha Loop Rd / Von Quintus Rd / Maha Loop Rd / Coulver Rd / Old Lockhart Rd / Bluff Springs Rd	Caldwell County Line	E William Cannon Dr
T72	Tier 1	Potential Upgrade	Kramer Ln / W Braker Ln	Metric Blvd	N Mopac Expy
T73	Tier 2	New Construction Needed	Burnet Rd	W Braker Ln	Gracy Farms Ln
T74	Tier 2	New Construction Needed, Potential Upgrade	New Trail	McNeil Rd	McNeil Merriltown Ln
T75	Tier 1	Potential Upgrade	Metric Blvd	Kramer Ln	Research Blvd
T76	Tier 1	New Construction Needed	New Trail	Payton Gin Rd	Capital Metro Rail-trail
T77	Tier 2	New Construction Needed	N / S Pleasant Valley Rd	S Pleasant Valley	Canterbury St
T78	Tier 2	Potential Upgrade	Gracy Farms Ln	Metric Blvd	Burnet Rd
T79	Tier 2	New Construction Needed, Potential Upgrade	FM 1625	S US 183	W Evelyn Rd
T80	Tier 2	New Construction Needed	Capital Metro Rail-Trail	Howard Ln	Gracy Farms Ln
T81	Tier 2	Potential Upgrade	W Howard Ln	McNeil Merriltown Rd	N Mopac Expy
T82	Tier 2	New Construction Needed	New Trail	McKinney Falls Pkwy	FM 1625
T83	Tier 2	New Construction Needed	Shady Ln	E 5th St	Bolm Rd
T84	Tier 2	New Construction Needed, Potential Upgrade	Metric Blvd / Thermal Dr	Northwest Es	Gracy Farms Ln
T85	Tier 2	New Construction Needed, Potential Upgrade	S US 183	FM 1625	S US 183
T86	Tier 2	Potential Upgrade	S US 183	FM 1327	Evelyn Rd
T87	Tier 2	New Construction Needed	S US 183 SB / Old Lockhart Rd	Evelyn Rd	Old Lockhart Rd
T88	Tier 1	New Construction Needed, Potential Upgrade	E Anderson Ln WB / N Lamar Blvd / Payton Gin Rd	Little Walnut Creek	US 183
T89	Tier 2	New Construction Needed, Potential Upgrade	S US 183	Metro Center Dr	FM 1625
T90	Tier 1	New Construction Needed	S US 183	Montopolis	E SH 71



## Project List for Travis County continued

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
T91	Tier 2	New Construction Needed	Chimney Rock Dr / N Lamar Blvd / Indian Mound Dr / N IH 35	Walnut Creek Park Rd	Canyon Ridge Rd
T92	Tier 2	New Construction Needed	Wells Port Dr	Crystal Shore Dr	Grand Avenue Pkwy
T93	Tier 1	New Construction Needed, Potential Upgrade	Ed Bluestein Blvd NB	Airport Blvd	Smith Rd
T94	Tier 2	New Construction Needed	Bratton Ln / N IH 35	IH 35	Grand Ave Pkwy
T95	Tier 2	New Construction Needed	S IH 35	SH 45	Topcadilly Dr
T96	Tier 2	New Construction Needed	Greenlawn Blvd	SH 45	W Pflugerville Pkwy
T97	Tier 1	Potential Upgrade	Ed Bluestein Blvd NB	Loyola Ln	Smith Rd
T98	Tier 2	Existing, New Construction Needed, Potential Upgrade	Grand Avenue Pkwy	W Black Locust Dr	Bratton Ln
T99	Tier 1	New Construction Needed	E Anderson Ln WB / Ed Bluestein Blvd NB	Ridgepoint Dr	Loyola Ln
T100	Tier 2	Potential Upgrade	Canyon Ridge Dr / Harris Ridge Blvd / Tech Ridge Blvd	N IH 35	E Howard Ln
T101	Tier 1	New Construction Needed	Bastrop Hwy NB / E SH 71 EB / E SH 71 WB / E SH 71 WB / E SH 71 WB to Bastrop NB	US 183	S FM 973
T102	Tier 1	New Construction Needed, Potential Upgrade	FM 812 / Moores Bridge Rd / S FM 973	E SH 71	FM 812
T103	Tier 2	Existing, Potential Upgrade	Loyola Ln	David White Northeast District Park	
T104	Tier 2	Potential Upgrade	Grand Avenue Pkwy	A W Grimes Blvd	W Black Locust Dr
T105	Tier 1	Potential Upgrade	A W Grimes Blvd	Pecos River Trl	Grand Avenue Pkwy
T106	Tier 2	New Construction Needed	E Wells Branch Pkwy	Tudor House Rd	Friendship Quilt Ln
T107	Tier 2	Existing, New Construction Needed	Heatherwilde Blvd	W Olympic Dr	W Olympic Dr
T108	Tier 2	New Construction Needed, Potential Upgrade	Dessau Rd / E Howard Ln	Trail @ Crystal Bend Dr	Trail @ E Howard Ln
T109	Tier 1	New Construction Needed, Potential Upgrade	FM 812	S FM 973	Doyle Rd
T110	Tier 2	New Construction Needed	Johnny Morris Rd	E US 290	Point North Dr

## Project List for Travis County continued

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
T111	Tier 1	Existing, New Construction Needed, Potential Upgrade	E SH 71	S FM 973	Ross Rd
T112	Tier 2	Potential Upgrade	E Wells Branch Pkwy / Killingsworth Ln	Immanuel Rd	Killingsworth Ln
T113	Tier 2	Potential Upgrade	Killingsworth Ln	K Wells Branch Pkwy	Wells Branch Pkwy
T114	Tier 2	New Construction Needed, Potential Upgrade	Wells Branch Pkwy	Killingsworth Ln	Greg Manor Dr
T115	Tier 2	Potential Upgrade	Killingsworth Ln	Wells Branch Pkwy	Cameron Rd
T116	Tier 1	Existing, New Construction Needed	E Pflugerville Pkwy	FM 685	Colorado Sand Dr
T117	Tier 1	New Construction Needed	E Pflugerville Pkwy	E Pflugerville Pkwy	Becker Farm Rd
T118	Tier 2	New Construction Needed	Cameron Rd / Greg Manor Rd	Cameron Rd	E US 290
T119	Tier 1	Existing, New Construction Needed	Casa Navarro Dr / Crispin Hall Ln / Falcon Pointe Blvd / Kelly Ln / Moorlynch Ave	Windy Vane Dr	E Pflugerville Pkwy
T120	Tier 1	Potential Upgrade	E SH 71	SW Metropolitan Park	Tucker Hill Ln
T121	Tier 2	New Construction Needed	Jakes Hill Rd / Rowe Ln / Speidel Dr	Winding Shore Ln	Jakes Hill Rd Trail & Trail Connection
T122	Tier 2	New Construction Needed	Engelmann Ln	Melber Ln	CR 129
T123	Tier 2	New Construction Needed	E Parsons St / Littig Rd / Old Hwy 20	N Lexington St	Littig Rd
T124	Tier 1	Potential Upgrade	E / W US 290	Joyce Turner Dr	County Line Rd
T125	Tier 2	New Construction Needed	Ballerstedt Rd	Littig Rd	US 290
T126	Tier 2	New Construction Needed	County Line Rd	N SH 95	Littig Rd
T127	Tier 2	Potential Upgrade	S SH 95	S of N Lund Rd	County Line Rd

# WILLIAMSON COUNTY

The Williamson County plan summary provides a county-level look at the results and recommendations of the CAMPO Regional Active Transportation Plan.

## Demographics

Area (miles)	Population	People of Color (Minorities)		White Population		School-aged Children	
1,023	457,218	79,344	17.4%	377,874	82.6%	138,273	30.2%

Seniors (60+)	Households	Households in Poverty		Housing Units	Zero Car Housing Units		
66,354	14.5%	419,496	170,987	40.7%	161,793	4,458	2.8%

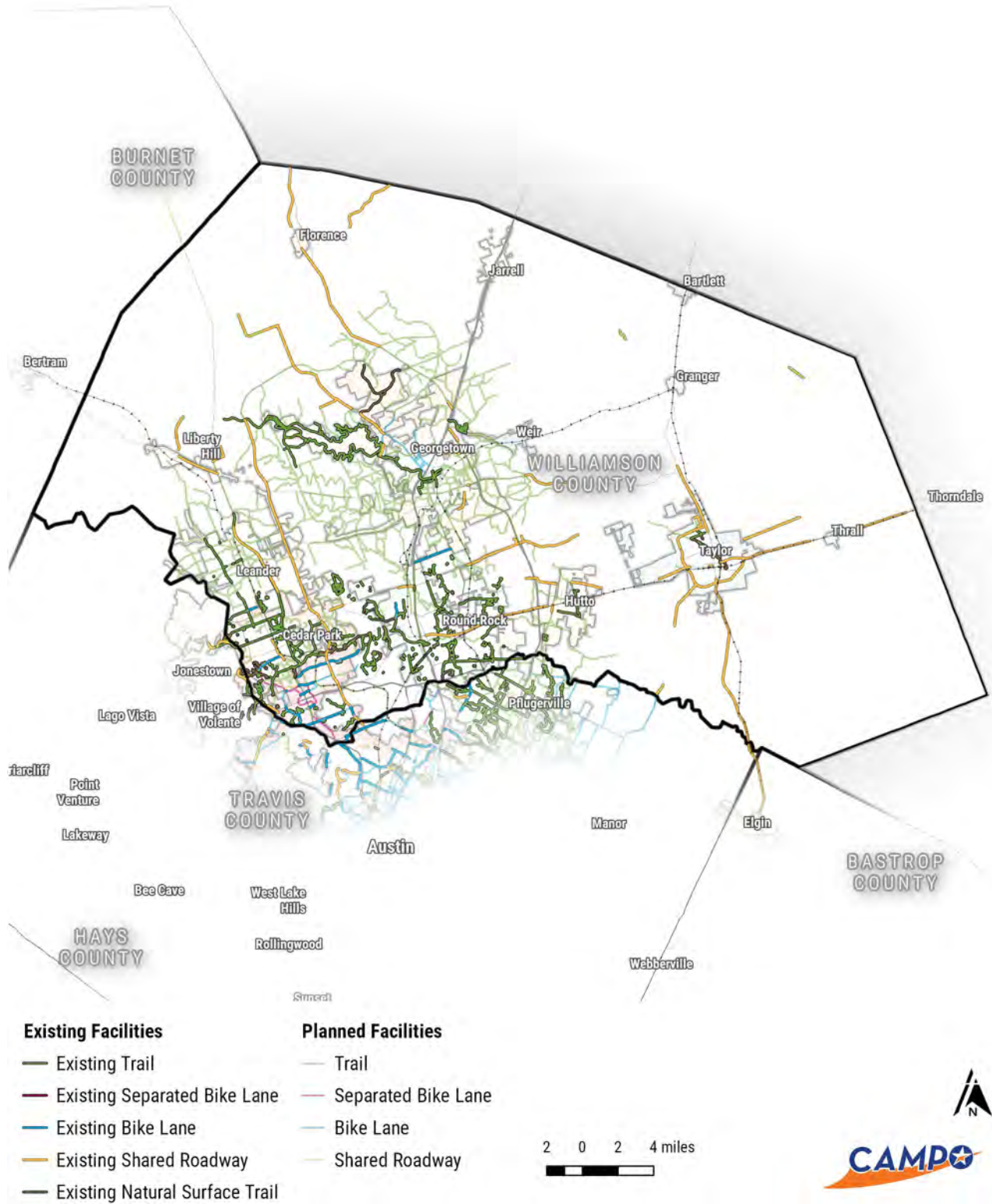
## EXISTING AND PLANNED FACILITIES

Williamson County has 677 miles and 27 miles of existing and planned sidewalks, respectively. Williamson County has 400 miles of existing bicycle facilities and 615 miles of planned bicycle facilities, second in both only to Travis County. Williamson County, though, has slightly more miles of shared use path and shoulders/shared lanes/bicycle boulevards than Travis County. Several communities throughout the county identified new needs for bicycling facilities.

	Existing Miles	Planned and Proposed Miles	Total Miles
<b>Williamson County</b>	1,073	868	1,941
Bike Lane / Dedicated On-Street	23	14	37
Separated Bike Lane	0	8	8
Share Path / Trail	193	590	783
Shared Lanes / Sharrows / Bike Boulevard / Shoulder	149	2	151
Unpaved Trail	35	<1	36
Sidewalks	677	27	704
Bicycle/pedestrian needs identified by local governments	N/A	226	226



# EXISTING AND PLANNED BICYCLE FACILITIES



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## POLICIES, PROGRAMS, AND CODES

The bicycle and pedestrian policy scans for Williamson County included a review of public documents and programs for the municipalities of: Cedar Park, Coupland, Florence, Georgetown, Granger, Hutto, Jarrell, Leander, Liberty Hill, Round Rock, Taylor, Bartlett, Granger, Thrall; and, Williamson County. Over 33 plans, studies, reports, policies, guidelines, codes, and programs were evaluated to determine the degree and manner by which Williamson County communities – individually and collectively - accommodate active transportation as part of their built environments and as an expression of their community values.

Documents and programs reviewed include:

- **Five (5) Comprehensive Plans**
- **Three (3) Transportation Plans**
- **Five (5) Park Plans**
- **Two (2) Trail Plans**
- **One (1) Redevelopment Master Plan**
- **Three (3) Municipal Construction Design Manuals**
- **Fourteen (14) Municipal and County Codes**, including subdivision regulations, zoning ordinances, etc.

Summaries of each document reviewed can be found in Appendix ? and ?.

### Overview

The manner by which Williamson County jurisdictions' active transportation policies and initiatives promote healthy and multi-modal communities varies. Significant findings include:

- **Accessibility**, Land development regulations and design manuals for Cedar Park, Georgetown, Hutto, Round Rock, and Taylor directly reference Texas Accessibility Standards to ensure ADA accessibility. The policies, guidelines, and regulations of other Williamson County communities do not include direct references to state or federal ADA accessibility requirements.
- **Connectivity**, The adopted planning documents of most Williamson County jurisdictions promote the extension and connection of pedestrian networks - emphasizing either sidewalk and/or multi-use trail network expansion. The land development ordinances of many communities promote trail system connectivity between residential areas, and commercial and employment centers. Many of these communities require direct pedestrian connections between buildings on a development site and the adjacent public sidewalk.

Most Williamson County communities promote interconnected street networks - with some plans advocating for the extension of local streets to adjacent development sites (in addition major thoroughfare connections). The cities of Georgetown and Hutto have adopted street connectivity index requirements for new development.

Most Williamson County communities require residential block lengths that range from a maximum of 600 feet to 1,320 feet. The City of Florence, limits maximum block size to 600 feet in length unless otherwise requested. The City of Cedar Park's Bell Boulevard Redevelopment Master Plan promotes maximum block sizes of 300 to 550 feet in length to support the development of a planned pedestrian node within the City.

- **Multi-Modalism**, The planning documents adopted by many Williamson County jurisdictions recommend the development of a multi-modal transportation system. The methods by which these communities develop these systems vary greatly.

All communities in Williamson County except for Jarrell and Liberty Hill require sidewalks on one or both sides of the roadway. Standard sidewalk requirements range between 5 to 6 feet in width, although sidewalks of greater width are required by some communities within defined districts (typically in areas where mixed-use development and urban built form is being promoted).

The development regulations of Georgetown, Hutto, and Round Rock suggest that "bikeways" (on-street and separated) may be required on streets where consistent with long-range planning documents. Design guidance for bikeways in these communities varies, and does not always adhere to recommended AASHTO or NACTO standards. In contrast, the City of Hutto requires bike lanes (adhering to AASHTO standards) on all new or improved arterial streets.

The cities of Cedar Park and Leander do not allow on-street bike lanes, but require the construction of "trails" adjacent to roadways where identified in their respective trails plan; and parks, recreation, and open space plan.

- **Safety**, The City of Taylor recommends the creation of a cooperative school sidewalk program to enhance the safety of neighborhood residents. No other communities identify local bicycle or pedestrian education encouragement, and/or enforcement programs in Williamson County to support active transportation infrastructure investment.
- **Mixed-use Development**, Most Williamson County communities promote mixed-use development in their planning documents and regulatory tools. Cedar Park has adopted a Downtown Development District that promotes walkability and urban form in the Town Center development.

In their Bell Boulevard Redevelopment Master Plan, an urban built form is promoted to develop a new pedestrian node within the city. The City of Georgetown actively promotes new forms of compact development through the use of two mixed-use development districts and overlay zoning districts. In the City of Round Rock, a mixed-use Southwest Downtown District has been established. In addition, The Leander Comprehensive Plan specifies mixed-uses in the Station Area Mixed Use District and Transit Supportive Mixed Use Area, while the City of Taylor maintains a central business district.

- **Complete Streets**, No Williamson County jurisdiction has adopted a formal Complete Streets policy.
- **Healthy Lifestyles**, The linkage between bicycle and pedestrian mobility, and healthy lifestyles is established within the adopted parks, recreation, trails, and open space master plans of many Williamson County communities.

## Highlights

Collectively, there are many active transportation policies and initiatives that Williamson County communities have implemented that promote the development of a bicycle and pedestrian friendly environment. Key policies or initiatives which may be replicated by individual communities in Williamson County, or the region as a whole, include:

- The City of Florence promotes the development of small pedestrian-friendly blocks.
- The cities of Cedar Park, Georgetown, Hutto, Leander, and Taylor all promote the connectivity of trail networks as part of new development.
- The cities of Georgetown and Hutto incorporate street connectivity index requirements into their land development regulations.
- Most communities in Williamson County require sidewalks on either one or both sides of the roadway. Cedar Park, Florence, Granger, Georgetown and Leander all require greater sidewalk widths in specified areas.



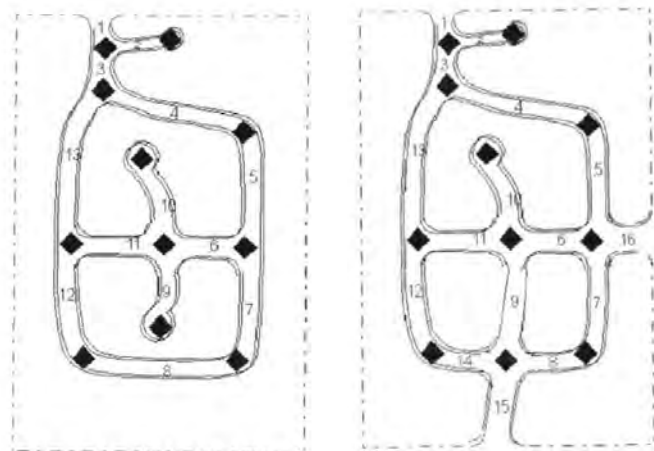
Bicycle connectivity in some Williamson County communities is facilitated by the provision of trails within identified roadway corridors.

- The City of Hutto requires bicycle lanes meeting AASHTO standards on all new or redeveloped arterial streets.
- Mixed-use development is promoted in the planning documents and regulatory tools of most Williamson County municipalities.

## Recommendations

Opportunities remain for Williamson County communities to enhance the bicycling and pedestrian environment in their areas of jurisdiction. Fundamental active transportation policy, program, or code enhancements may include:

- Reduce block lengths in applicable areas of each community to encourage pedestrian friendly connectivity.
- Prepare and implement safe routes to school programs to improve public safety.
- Encourage all communities in Williamson County to promote mixed-use development in their planning documents and regulatory tools - including design requirements that manage street networks and design, site design, and building form and character.
- Adopt Complete Streets policies. If engineering design standards already exist, modify these documents to provide for the application of bicycle and pedestrian facilities that are calibrated to specific built-contexts.
- Ensure that bikeways located within or adjacent to the road right-of-way meet or exceed AASHTO and NACTO standards, and that corresponding planning documents clearly identify where facilities will be required. Develop supplemental multi-use trail standards that provide for alternative dimensions and surfaces in non-roadway corridors to allow these facilities to interact with their surrounding environments.

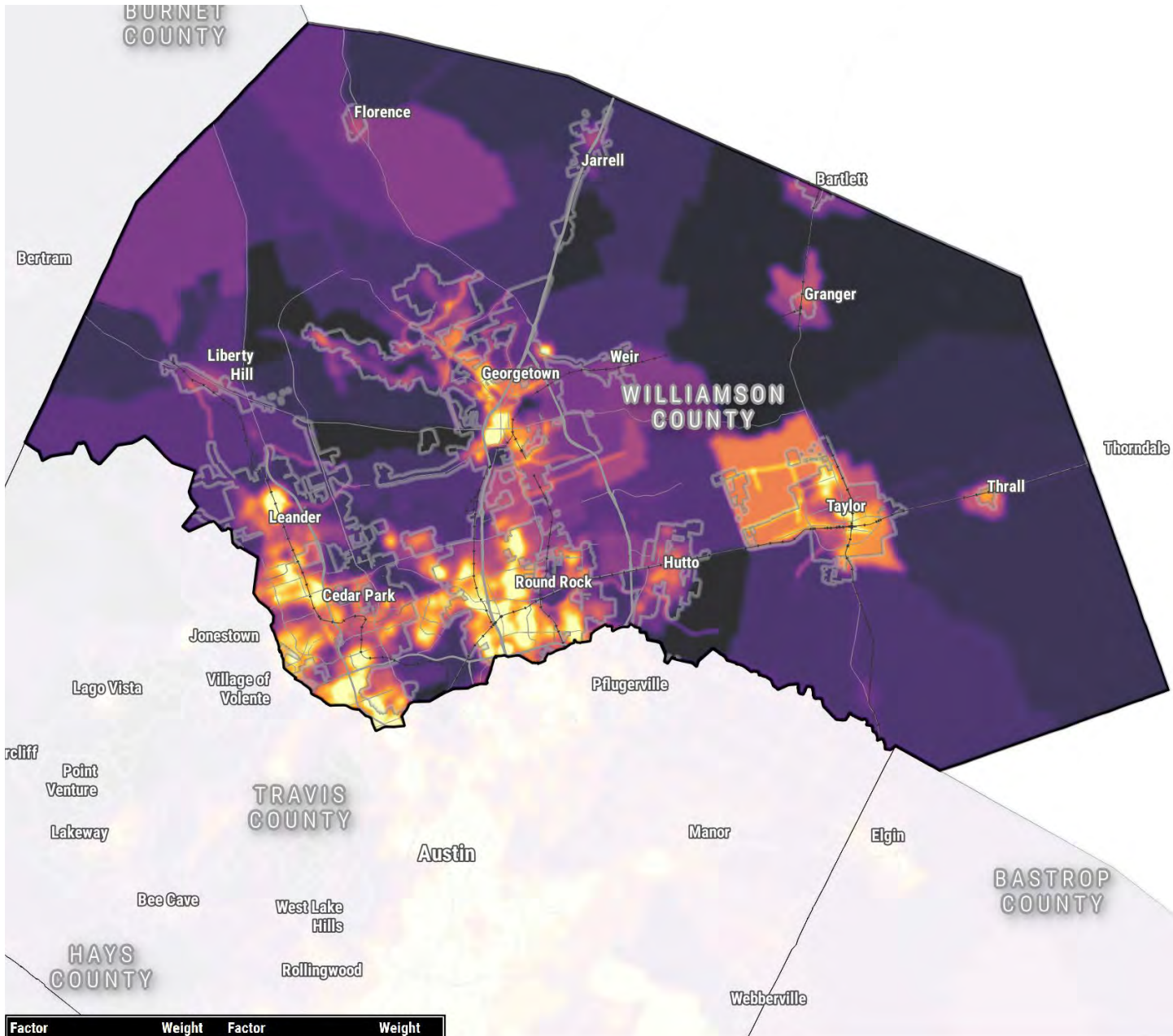


The Georgetown Unified Development Code requires a minimum ratio of "links" to "nodes" in new development. The image at the upper right adheres to municipal requirements (City of Geo., UDC, Ch. 12, § 12.03.030)



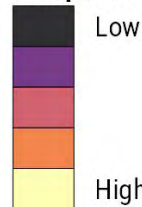
## DEMAND ANALYSIS

Williamson County has several areas of high demand for walking and bicycling, including Cedar Park, Leander, Round Rock, Georgetown, Taylor, Thrall, and Granger. Demand is generally low outside of town centers and the areas bordering Travis County. Transit hubs in Cedar Park and Leander contribute to demand in those areas.



Factor	Weight	Factor	Weight
Crashes	20	Bike/Ped Needs	10
Employment	20	Transit Hubs	10
Population Density	20	Zero Car Households	10
Attractors	10	Bike Modeshare	5
		Percent Low Income Households	5
Schools	-	Percent People of Color (non-white)	5
Universities	-	Percent School-Aged Children	5
Parks	-	Percent Senior Citizens	5
Courthouses	-		
Other POI	-		

### Composite Demand

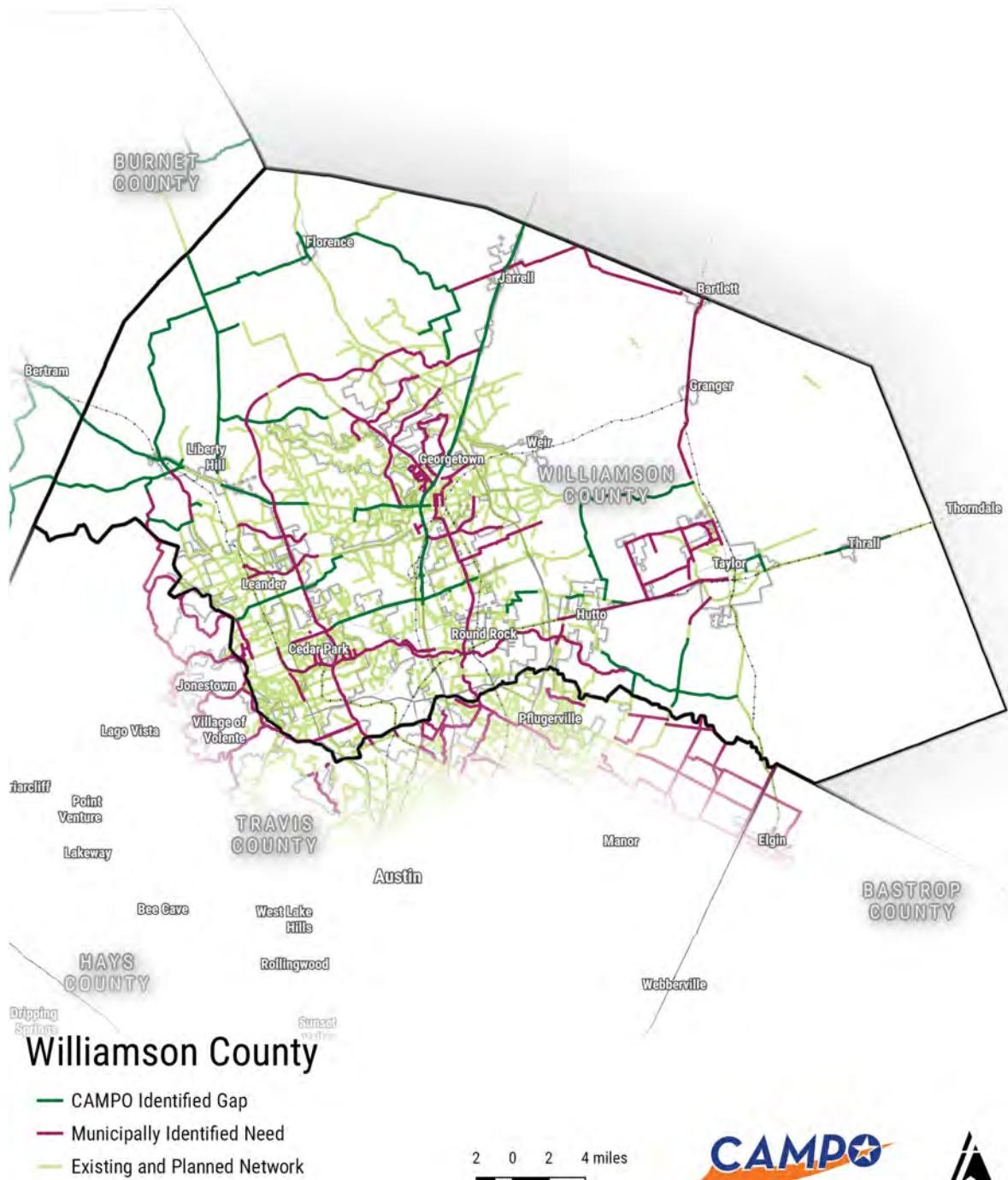


2 0 2 4 miles



## GAPS ANALYSIS

Community officials have identified active transportation needs in Cedar Park, Georgetown, Hutto, and Taylor. There is a fairly extensive network of planned trails connecting those communities. The east-west gaps identified on the map below indicate opportunities to connect the existing and planned trail network and to continue the shared use path along 183N up through Leander and up to Burnet County. Routes west and north of Liberty Hill are examples of bicycling network gaps.



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## PUBLIC OUTREACH

### Williamson County Survey Results



For what purposes do you most often ride a bike?	
Fun, recreation, leisure	48%
Exercising, training, racing	37%
To go to work or school	11%

What are the primary reasons you ride a bicycle?	
To exercise	42%
It is good for the environment	14%
It is inexpensive and saves money	11%
My friends do it/Makes me feel part of a community/Socialize	11%

What are reasons you do not ride a bicycle more often?	
It is not safe because of traffic	22%
Lack of trails and bike lanes	17%
I don't like to be sweaty when I arrive at my destination	11%
The weather (e.g. too hot)	11%
Distances are too far / I have to make many stops	10%

What types of bicycle facilities would you like more of in your community?	
Off street Walk and Bike Trails	29%
Bike lanes	21%
Separated or buffered on-street bike lanes	17%



For what purpose do you most often walk?	
Exercise	41%
Fun, recreation, leisure	34%
To run errands (grocery/corner store, drug store, library, doctors office)	9%

For what reasons do you choose to walk?	
To exercise	43%
I have good sidewalks or trails to walk on	16%
It is good for the environment	12%

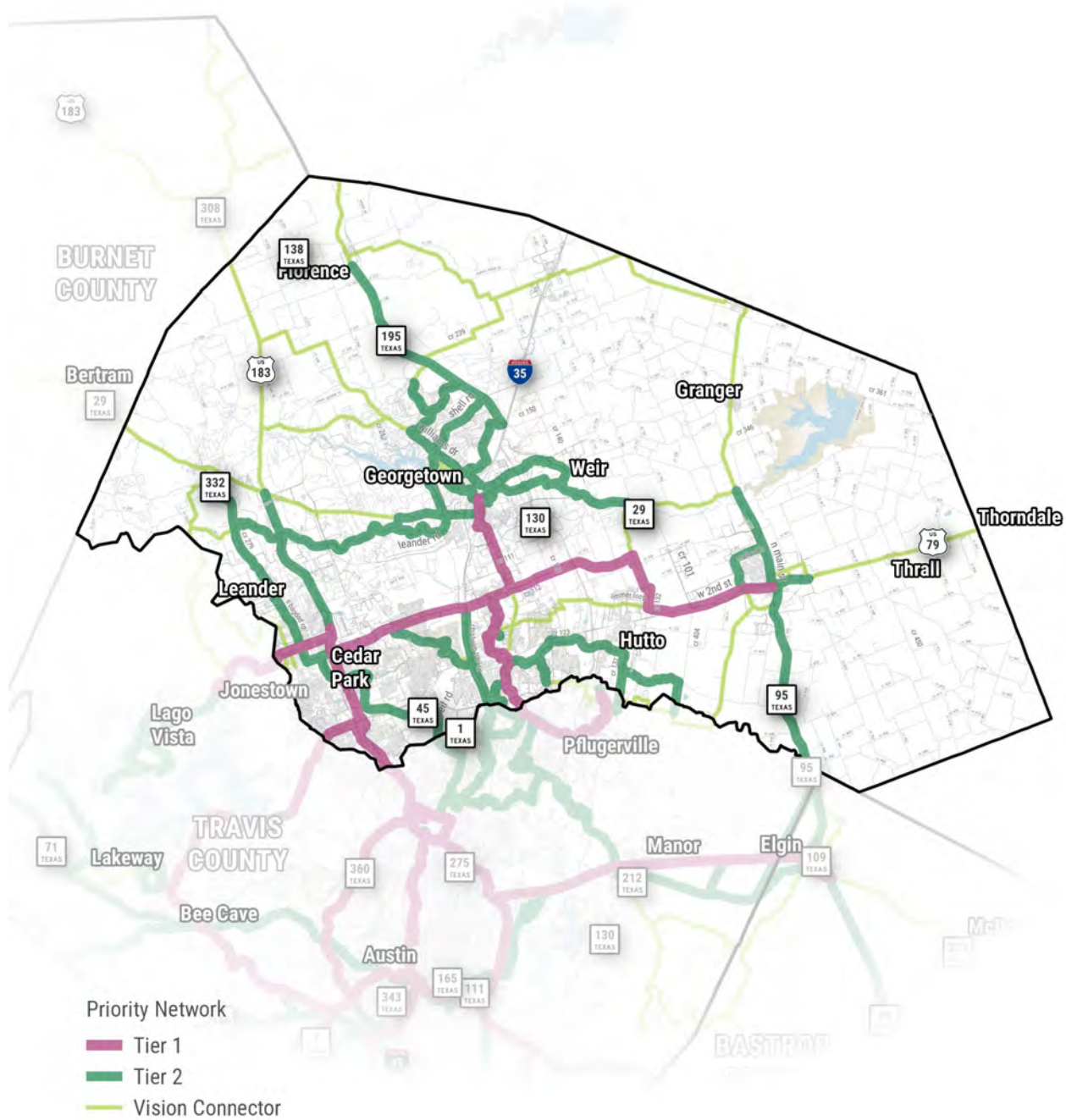
What three improvements to the walking environment would you most like to see in your community?	
New trails or paths	25%
New sidewalks	15%
Safer road crossings/intersections	13%
Better maintained sidewalks	12%

In your opinion, is it safe for your children to walk and/or bike to school?	
No	60%
Yes	40%

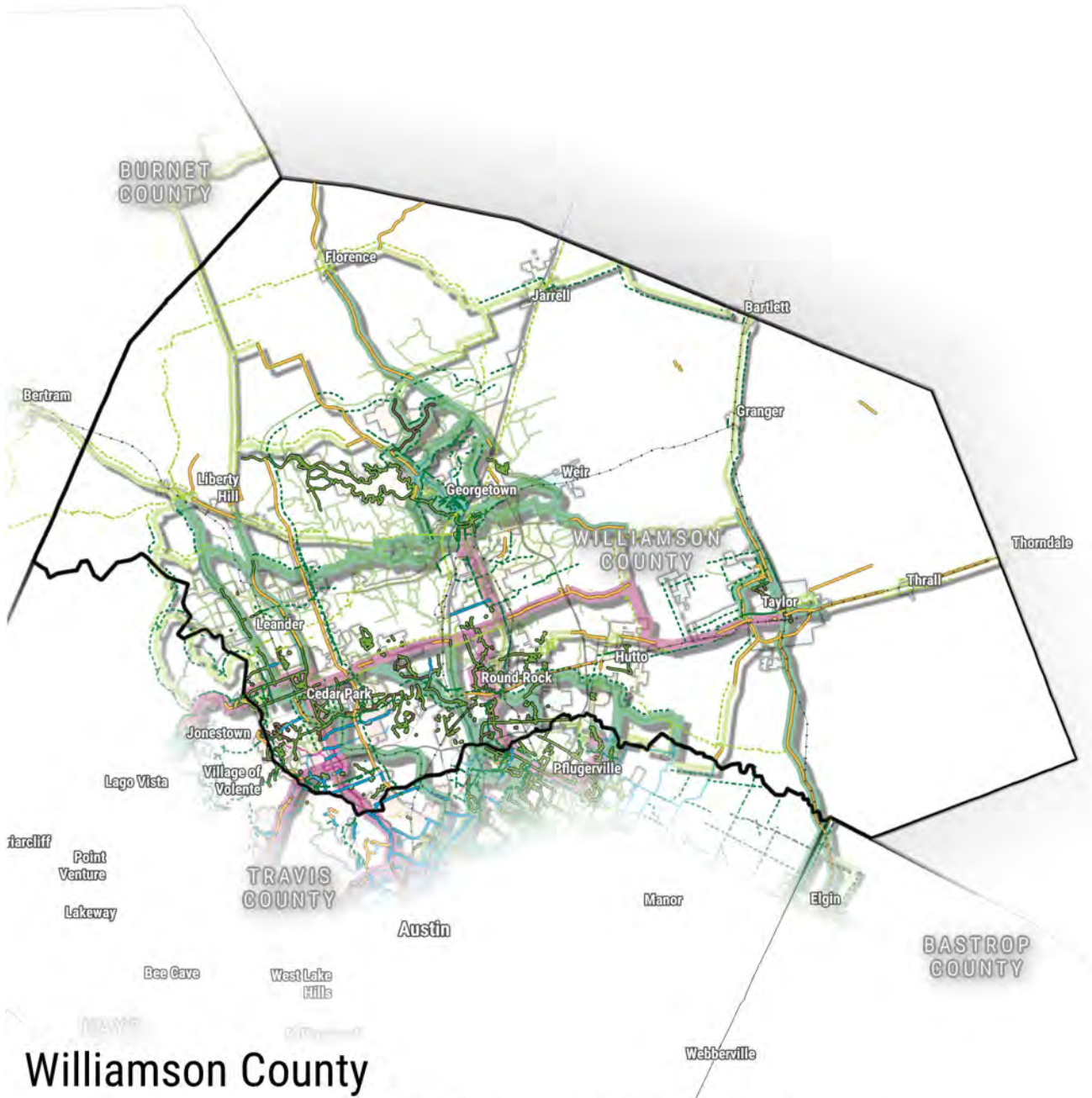


## ACTIVE TRANSPORTATION NETWORK

# Williamson County



# Active Transportation Network - Unconstrained



## Williamson County

### Existing Facilities

- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail

### Planned Facilities

- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway

..... Municipally Identified Needs

- - - - CAMPO Identified Gaps

### Priority Network

— Tier 1

— Tier 2

— Vision Connectors



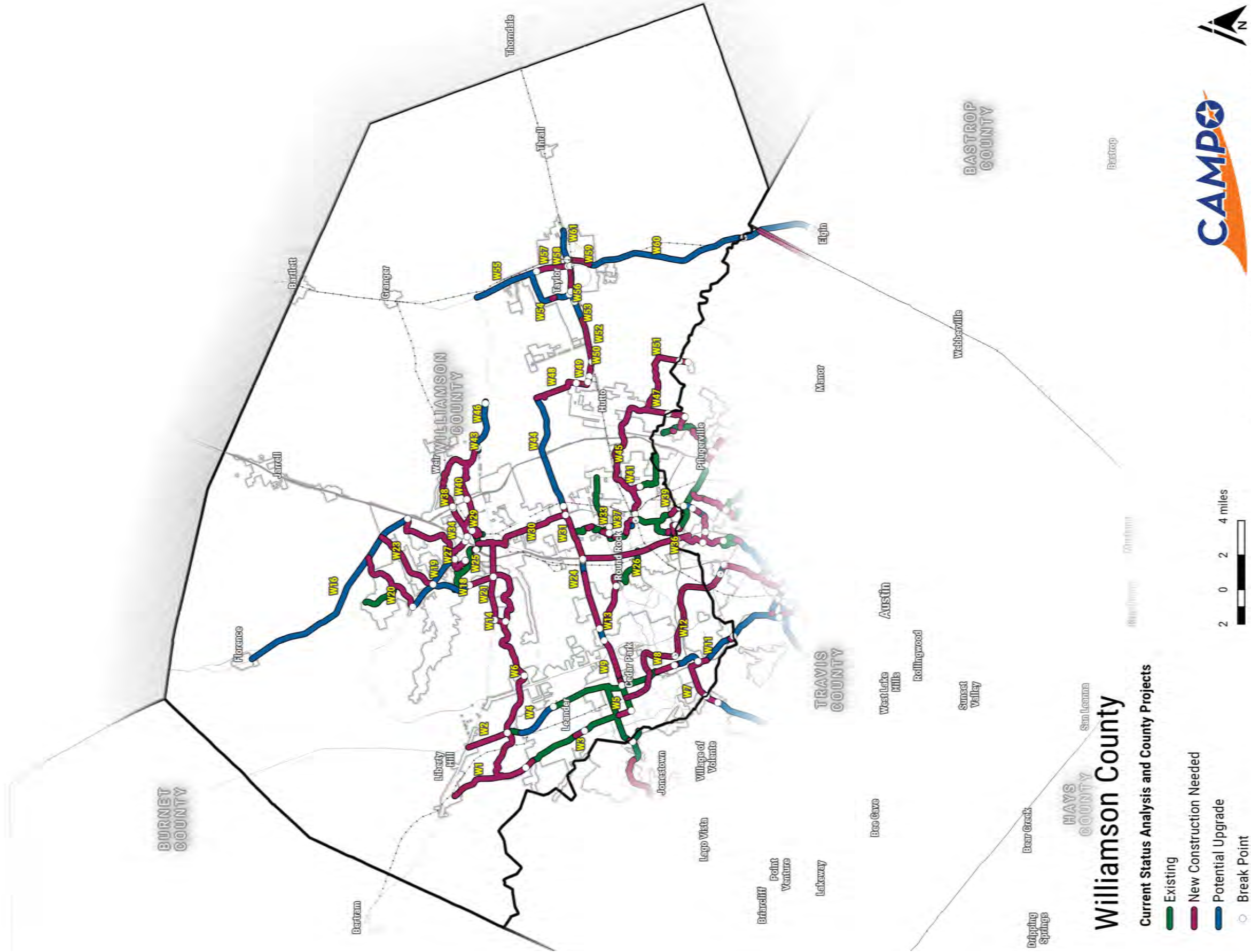
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**CURRENT STATUS ANALYSIS AND COUNTY PROJECTS**



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## Project List for Williamson County

The following projects were identified during the planning process based on an analysis of demand, network gaps, existing conditions, and locally identified needs (pages 2-13 - 2-15).

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
W1	Tier 2	New Construction Needed	CR 279 / Loop 332	Silver Creek Rd	RM 1869
W2	Tier 2	New Construction Needed	US 183	W SH 29	San Gabriel River Trail
W3	Tier 2	New Construction Needed	S Bagdad Rd	Eagles Way	Los Vista Dr
W4	Tier 2	Potential Upgrade	183A Toll Rd	Brushy Creek Main Branch Trail	US 183
W5	Tier 2	New Construction Needed	Bagdad Rd	San Gabriel River Trail from Holly St	SH 130
W6	Tier 2	New Construction Needed	CR 279 / D B Wood Rd / San Gabriel River Trail	Tairl from CR 279	W University Ave
W7	Tier 1	New Construction Needed	FM 620	Anderson Mill Rd	Lake Creek Pkwy
W8	Tier 1	New Construction Needed	North Lake Creek Pkwy	Brushy Creek Trl from US 183	Lakeline Blvd
W9	Tier 1	Existing, New Construction Needed	E Whitestone Blvd	US 183	C-bar Ranch Trl
W10	Tier 1	Potential Upgrade	Lake Creek Pkwy / North Lake Creek Pkwy	Lakeline Blvd	N US 183
W11	Tier 1	New Construction Needed, Potential Upgrade	Barrington Way / Jollyville Rd / Lake Creek Pkwy / N US 183 / N US 183 / Pond Springs Rd / S Bell Blvd	Jollyville Rd	N FM 620
W12	Tier 2	New Construction Needed	New Trail	Brushy Creek Rd	Brushy Creek Rd
W13	Tier 1	Potential Upgrade	E Whitestone Blvd	CR 178	Sam Bass Rd
W14	Tier 2	New Construction Needed	New Trail	W SH 29	South Fork San Gabriel River Trail
W15	Tier 2	New Construction Needed	Sam Bass Rd / W Old Settlers Blvd	Creek Bend Blvd	Wyoming Springs Dr
W16	Tier 2	New Construction Needed, Potential Upgrade	SH 195	Berry Creek Dr	S Patterson Ave
W17	Tier 1	New Construction Needed	E Whitestone Blvd / RM 1431	RM 1431	Sam Bass Rd
W18	Tier 2	Potential Upgrade	D B Wood Rd	Oak Ridge Rd	Shell Rd
W19	Tier 2	Potential Upgrade	Williams Dr	Bootys Crossing Rd	Del Webb Blvd
W20	Tier 2	New Construction Needed	Del Webb Blvd / Sun City Blvd	SH 195	Williams Dr
W21	Tier 2	New Construction Needed	New Trail	W SH 29	S Main St

## Project List for Williamson County continued

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
W22	Tier 2	New Construction Needed	D B Wood Rd	W University Ave	Oak Ridge Rd
W23	Tier 2	New Construction Needed	Shell Rd	Shell Rd from Williams Dr	SH 195
W24	Tier 1	Potential Upgrade	RM 1431	RM 1431	N IH 35 FR
W25	Tier 2	New Construction Needed	San Gabriel RiverTrail	N San Gabriel Trail Section Near Rivery Pond Rd	
W26	Tier 2	Existing, New Construction Needed	N / S IH 35	Exit 252a & 251 NB	Exit 257 NB
W27	Tier 2	New Construction Needed	Northwest Blvd	Entr 263 SB / N IH 35 SB	Lakeway Dr
W28	Tier 2	New Construction Needed	Airport Rd / Berry Creek Dr / Bootys Crossing Rd / Gabriel View Dr / Lakeway Dr / Power Rd	SH 195 WB	Airport Rd.
W29	Tier 2	New Construction Needed	N College St	Holly St	N College St
W30	Tier 1	New Construction Needed	FM 1460 / N Austin Ave / N A W Grimes Blvd / S Austin Ave / S Main St / W 7th St / W University Ave	San Gabriel River	University Blvd
W31	Tier 1	Existing, New Construction Needed	University Blvd	RM 1431	E of N AW Grimes Blvd
W32	Tier 2	New Construction Needed	N College St / San Gabriel Park Cir	N College St	FM 971
W33	Tier 1	Existing, New Construction Needed	Hawk View St / Gulf Way / Lakeside Loop / Settlement Dr / E Old Settlers Blvd / Sunrise Rd	Cheyenne St	Bradley Ln
W34	Tier 2	New Construction Needed	FM 971	E Morrow St	CR 152
W35	Tier 2	New Construction Needed	Bradley Ln	Bradley Ln	Jester Farms Rd
W36	Tier 2	Existing, New Construction Needed	Dell Way / Greenlawn Blvd / Kensington Trail / Louis Henna Blvd	Gattis School Rd	SH 45
W37	Tier 1	Existing, New Construction Needed, Potential Upgrade	Bradley Ln / David Curry Dr / West Mesa Park Dr / E Mesa Park Drive / E Palm Valley Blvd / N A W Grimes Blvd	Jester Farms Park	S AW Grimes Blvd
W38	Tier 2	Potential Upgrade	FM 971	CR 152	Exit 413 SB
W39	Tier 1	New Construction Needed, Potential Upgrade	S A W Grimes Blvd	SH 45	Candelaria Mesa Dr

## Project List for Williamson County continued

Project Number	Tier	Type	Project Name/Adjacent Facility	From	To
W40	Tier 2	New Construction Needed	CR 103 / Rusk Ln	Holly St	SH 130
W41	Tier 2	New Construction Needed	Collingwood Dr	Golden Creek CV	Shady Bluff
W42	Tier 2	New Construction Needed	FM 971	Trail from SH 130	San Gabriel River Trail
W43	Tier 2	New Construction Needed	New Trail	San Gabriel River Trail	E SH 29
W44	Tier 1	Potential Upgrade	Chandler Rd / University Blvd	E of N AW Grimes Blvd	FM 1660
W45	Tier 2	New Construction Needed	New Trail	Play For All Abilities Park	FM 1660
W46	Tier 2	Potential Upgrade	E SH 29	CR 100	Old Hwy 29
W47	Tier 2	New Construction Needed	CR 137 / Jakes Hill Rd	Morningside Cir	CR 197
W48	Tier 1	New Construction Needed	CR 132 / CR 133 / FM 1660	Chandler Rd	Limmer Loop
W49	Tier 1	Potential Upgrade	Limmer Loop	CR 132	E of Mager Ln
W50	Tier 1	New Construction Needed	Limmer Loop / Limmer Loop Spur	E of Mager Ln	US 79
W51	Tier 2	New Construction Needed	CR 129 / FM 1660	Williamson County Line	FM 1660
W52	Tier 1	New Construction Needed	Us 79 / W 2nd St	Limmer Loop Spur	Lorax Ln
W53	Tier 1	Potential Upgrade	W 2nd St	Exit	Lorax Ln
W54	Tier 2	New Construction Needed, Potential Upgrade	NW Carlos G Parker Blvd	N Main St	W 2nd St
W55	Tier 2	Potential Upgrade	N Main St / S SH 95	E SH 29 / N SH 95	T H Johnson Dr
W56	Tier 1	New Construction Needed, Potential Upgrade	W 2nd St	N Main St	Exit to W 2nd St
W57	Tier 2	New Construction Needed, Potential Upgrade	N Main St	E / W 2nd St	T H Johnson Dr
W58	Tier 2	New Construction Needed	E 4th St	N Main St	E 4th St
W59	Tier 2	New Construction Needed	E 2nd St	N Main St	Trail @ Old Coupland Rd / S Main St
W60	Tier 2	New Construction Needed, Potential Upgrade	S SH 95 / S Main St	Old Coupland Rd	N Lund Rd
W61	Tier 2	Potential Upgrade	E 4th St	E 4th St	SE Carlos G Parker Blvd



REGIONAL ACTIVE TRANSPORTATION NETWORK

# PATTERN BOOK



REGIONAL ACTIVE TRANSPORTATION PLAN



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# CHAPTER 1

## INTRODUCTION

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The CAMPO Region contains a diverse range of built environments and has a range of needs for pedestrian and bicycle transportation facilities. This Pattern Book is intended as a visual glossary of the essential building blocks of an active transportation network. Local municipalities may implement these elements to meet their needs to achieve safety and comfort for people walking and bicycling. It provides best practices, case studies, and specific design examples for a variety of treatments.





This Pattern Book is organized into six sections: the Pedestrian Realm, Roadway Elements, Intersections and Crossings, Wayfinding, and End-of-Trip Facilities. Each section includes a number of relevant topics and each topic identifies the use of the element, design recommendations, and other considerations where appropriate. This document is intended to be general guidance for the future of CAMPO's public rights-of-way. It derives from a vision of a world-class walkable, bicycle friendly, transit-served region in which people live, do business and exchange ideas. It is intended to broaden the range of design options for streets in the CAMPO region.

The Pattern Book is a policy and design resource intended to provide guidance to city and county departments, design professionals, private developers, and neighborhood groups throughout the region. It will serve as a comprehensive resource for promoting clear communication of expectations regarding the use and quality of CAMPO's streets by pedestrians, transit users, drivers, bicyclists, residents, workers, and business owners.

Over the course of a year, the planning team visited sites throughout the region, reviewed existing conditions, and assessed past and current standards for street materials, lighting and geometric design. The Pattern Book includes potential new treatments, based on national best practices, that may be utilized including sustainability issues and stormwater impacts.

While the Pattern Book is consistent with, and builds upon, existing engineering and environmental standards and requirements (including the Manual on Uniform Traffic

Control Devices (MUTCD), National Association of City Transportation Officials (NACTO) and AASHTO Policy on Geometric Design of Highways and Streets ("Green Book")), creativity that tailors designs to the particular needs of local neighborhood context is encouraged. Therefore, the Pattern Book remains flexible, and all designs will be subject to case-by-case staff approval based on established engineering standards and professional judgment.

The intent of this Pattern Book is to allow the CAMPO region to establish a system of streets that balances vehicle mobility needs with the needs of other street users and the community-serving functions that streets have traditionally played. This is consistent not only with the region's investments in public transit and its already high share of residents who walk to work, but also with the stated desire for citizens who participate in the project's process to have the choice to safely walk, bike, ride transit or drive.



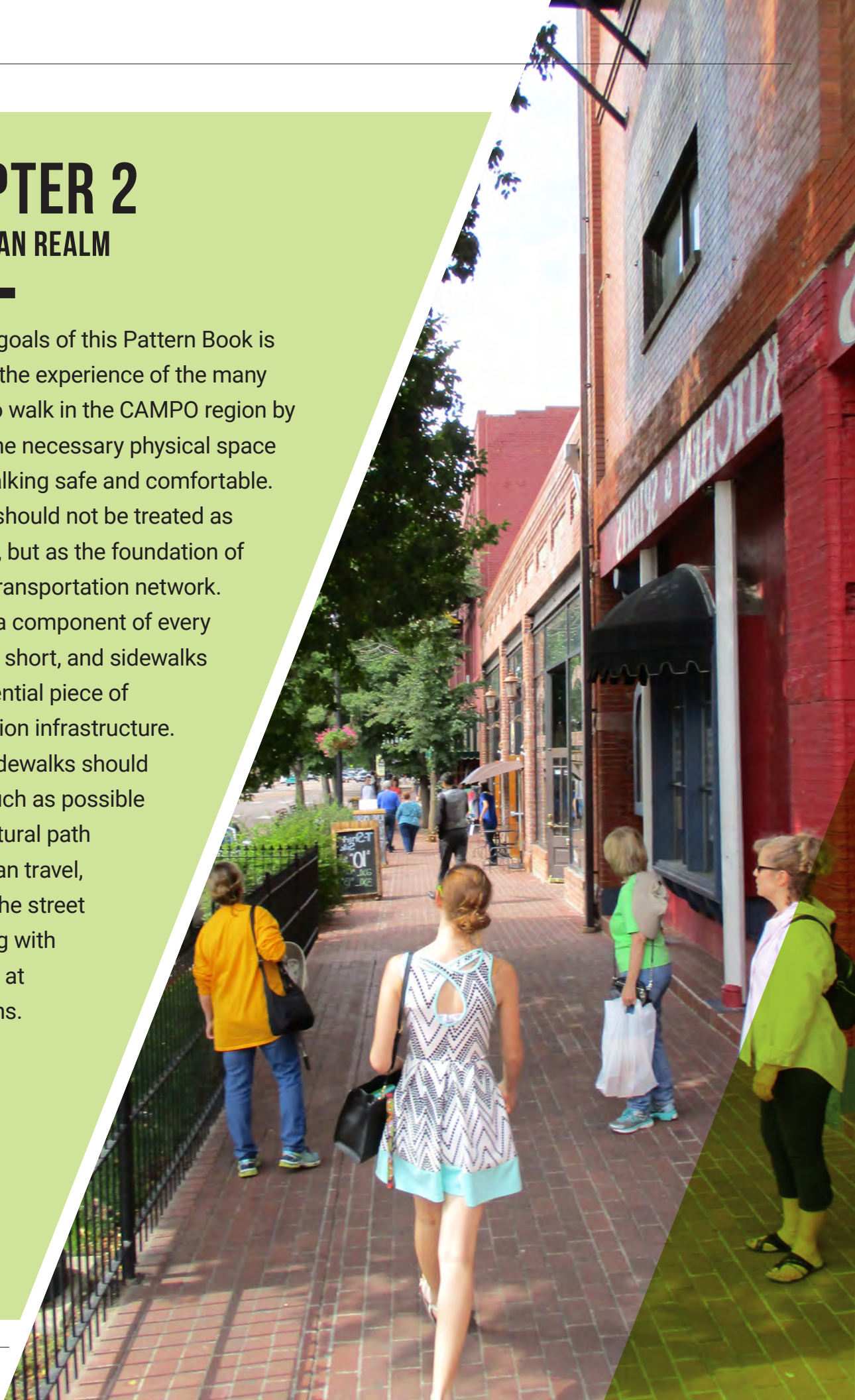
Adam Coppola Photography

# CHAPTER 2

## PEDESTRIAN REALM

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One of the goals of this Pattern Book is to improve the experience of the many people who walk in the CAMPO region by providing the necessary physical space to make walking safe and comfortable. Sidewalks should not be treated as an amenity, but as the foundation of CAMPO's transportation network. Walking is a component of every trip, long or short, and sidewalks are an essential piece of transportation infrastructure. As such, sidewalks should align as much as possible with the natural path of pedestrian travel, parallel to the street and aligning with crosswalks at intersections.





Sidewalks are spaces where people meet for face-to-face activities, support businesses, or walk for recreation. To encourage people to use these spaces, sidewalks must be safe, comfortable, and attractive for people of all ages and abilities. Creating this sidewalk environment can involve supporting healthy trees, providing space for people to rest or wait, and treating stormwater.

## SIDEWALKS

The design of the sidewalk significantly impacts the character of each street. Extending from curb to building face or property line, sidewalks are places for pedestrians, but they also accommodate street trees, stormwater best management practices (BMPs), street lights, street furniture, bicycle racks, and transit stops.

The CAMPO region has three types of development patterns. Downtown Austin, courthouse squares, town centers, and other areas of the region reflect a traditional urban pattern characterized by a regular grid of streets. The grid distributes traffic well and offers many different routing options for pedestrians and travelers using a variety of different travel modes. Mixed land uses are common in these areas with many homes within walking distance of retail, commercial, community and green space amenities.



*Comfortable sidewalk with adequate walking space, shade trees and buffer zone.*

In Austin's outlying areas and farther out into the county, many streets have a more typical suburban development pattern and curve through quiet residential areas with developed tree canopies. The land use is generally of lower intensity with greater separation and more open space. The sidewalk network is generally complete; however curvilinear streets create atypically shaped intersections with increased crossing distances and decreased pedestrian visibility. Though the neighborhood residential streets are lower volume and tree-lined, a handful of very broad corridors with large sized blocks cuts across neighborhoods carrying heavily concentrated traffic.

The third development pattern in the region is the arterial and highway areas that connect the urban areas to the suburban and rural parts of the region. These corridors of vehicular mobility also play a key role in the economic and development growth of the region. Development nodes, strip mall and retail shopping districts have been built at key intersections and interchanges, and this development pattern is projected to continue. The sidewalk and trail portions in these corridors are more critical than in the other areas because the larger, faster roads are a greater barrier and safety concern for vulnerable users of the streets. Providing comfortable crossings at intersections and ADA accessible connections along the arterial corridors is a vital piece of the sidewalk network.

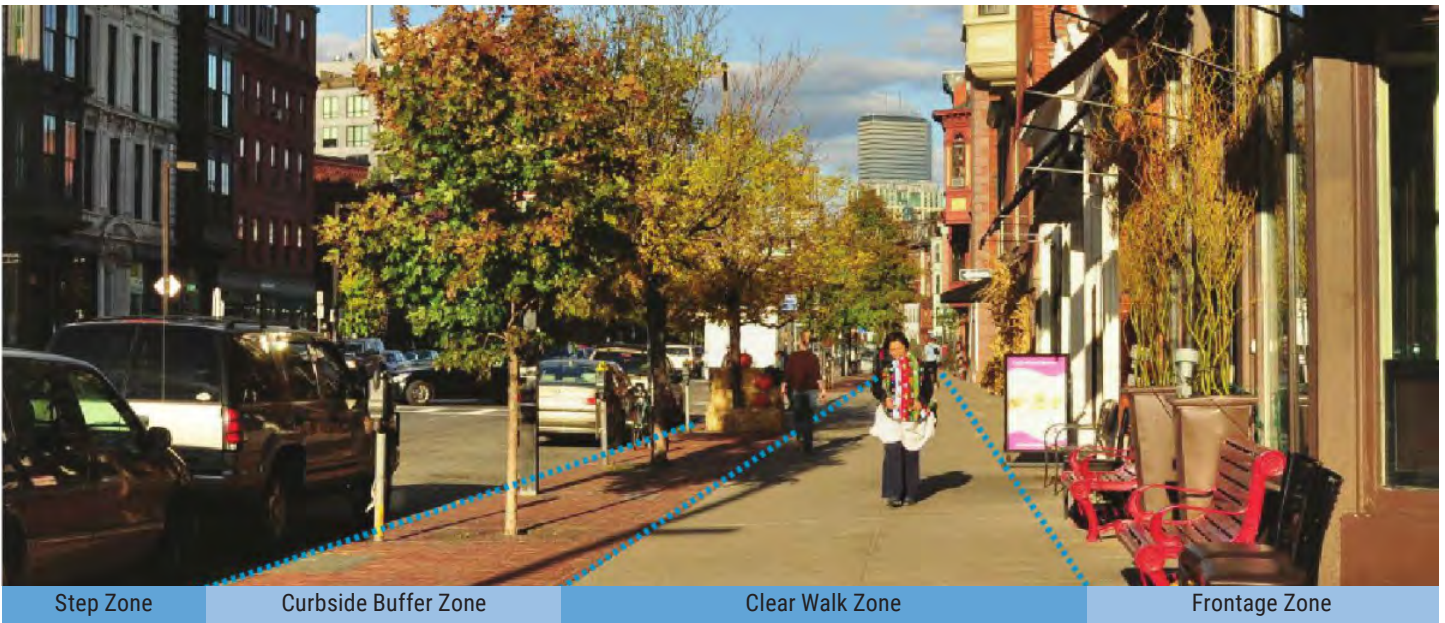
## SIDEWALK ZONES

Sidewalks typically are located in the right-of-way that extends from the curbline to the property line behind it. A sidewalk consists of four parts: 1) the frontage zone, 2) the clear walk zone, 3) the planting/furnishing zone, and 4) the step zone if on-street parking is present.

## FRONTAGE ZONE

The Frontage Zone is the area of sidewalk that immediately abuts the private property along the street. In residential areas, the Frontage Zone may be occupied with front porches, stoops, lawns, or other landscape elements that extend from the front door to the sidewalk edge. The Frontage Zone of commercial properties may include architectural features or projections, outdoor retailing displays, café seating, awnings, signage, and other intrusions into or use of the public right-of-way. Frontage Zones may vary widely in width from just a few feet to several yards.





## CLEAR WALKWAY

Also known as the “walking zone,” the Pedestrian Clear Zone is the portion of the sidewalk space used for active travel. For it to function, it must be kept clear of any obstacles and be wide enough to comfortably accommodate expected pedestrian volumes including those using mobility assistance devices, pushing strollers or pulling carts. To maintain the social quality of the street, the width should accommodate pedestrians passing singly, in pairs, or in small groups as anticipated by density and adjacent land use.

The Pedestrian Clear Zone should have a smooth surface, be well lit, provide a continuous and direct path with minimal to no deviation, and meet all applicable accessibility requirements. Although currently legal throughout most of the region, bicycling on sidewalks is generally discouraged.

## ADA REQUIREMENTS

The Clear Walk Zone must meet the accessibility standards in the Federally Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG). The surface material should be smooth, stable, and slip resistant with minimal gaps, rough surfaces and vibration-causing features. The Clear Walk Zone must have a 4 feet minimum clear width with a 2 percent maximum cross slope.

## DRIVEWAYS

The design of driveways should provide a continuous and level Clear Walk Zone across the vehicular path and encourage vehicles to yield to pedestrians on the sidewalk. Driveways across public sidewalks are needed to link streets to off-street parking facilities and loading zones, however, driveways can create conflicts and require special treatments in order to maintain a safe and comfortable walking environment.



*Continuous sidewalk material across driveway vehicular path.*

## CURBSIDE BUFFER ZONE

The Amenity Zone, or “landscape zone,” lies between the curb and the Pedestrian Clear Zone. This area is occupied by a number of street fixtures such as street lights, street trees, bicycle racks, parking meters, signposts, signal boxes, benches, trash and recycling receptacles, and other amenities. In commercial areas, it is typical for this zone to be hardscape pavement, pavers, or tree grates. In residential or lower intensity areas, it is commonly a planted strip. Stormwater Best Management Practices are commonly located in the Amenity Zone.

## GREEN AND BLUE STORMWATER INFRASTRUCTURE

Trees, shrubs, grasses and other plantings play an important role in making streets comfortable, delightful, memorable, and sustainable. They can help define the character of a street or plaza, provide shade and cooling in strategic locations, reduce energy consumption in buildings, and absorb and cleanse stormwater. They absorb greenhouse gases and help filter airborne pollutants. When selected appropriately, plants can also clean soil contamination and contribute to native wildlife systems.

Green infrastructure is a strategically planned and managed network of wilderness, parks, conservation easements, greenways, trees and plantings that supports native species, maintains natural ecological processes, sustains air and water resources and contributes to the health and quality of life for the community. In the right-of-way, green infrastructure refers to vegetated stormwater management practices.

Blue infrastructure refers to the practice of diverting rainwater from the city’s separate stormwater system into ponds, fields and other more natural settings. In the right-of-way, blue infrastructure refers to non-vegetated stormwater management practices, like permeable pavement.

These guidelines seek to balance the benefits of a healthy greenscape with the realities of limited space and the ongoing need for care and maintenance by a limited number of agency staff.

## GREEN AND BLUE STORMWATER INFRASTRUCTURE CONSIDERATIONS IN STREET DESIGN

- Trees should not be planted in loading zones or within 10’ of bus stop landing pads.
- Tree limbs should be pruned to maintain the clear walk zone, sight lines, maximize visibility of the street wall and provide access to utilities.
- Similar to street trees, green and blue stormwater infrastructure elements have environmental and aesthetic benefits. With careful design, elements can be modified to fit within physical constraints, integrated into medians or added to the curbside buffer or frontage zones of sidewalks.
- Drainage patterns and designing elements that tie into existing pipes can present significant challenges when integrating green and blue infrastructure into street designs. For example, medians are usually at the crown of the roadway, with water draining away from them.
- Lighting should be located in concert with street trees – often alternating trees and lights – so that trees do not block the illumination.
- Light poles should not impede the pedestrian way.

## STREET TREES

Trees play an important role in improving streets. Used appropriately, they can help define the character of a street.

Trees provide the shade that reduces energy use and mitigates the urban heat island effect, a role that is particularly important given the Central Texas climate. Their leaves capture rainwater and evaporation cools the ambient urban air temperature. Trees sequester carbon dioxide and thus contribute to the mitigation of climate change associated with the greenhouse effect. Trees capture gaseous pollutants and particulates in the tree canopy surface, removing as much as 60% of the airborne particulates at street level.

Trees contribute to natural diversity. They provide habitat for a range of living creatures in the urban context, including people.

Psychologically, trees have been found to reduce stress and improve concentration. This may partly explain why studies have found that tree lined retail corridors do better



## SUBURBAN GREEN INFRASTRUCTURE CASE STUDY

### Rain to Recreation Plan - LENEXA KANSAS

Lenexa Kansas is a growing suburb in metropolitan Kansas City that faces increasing pressure from the impacts of new development, including more homes, roads and other impervious surfaces that create more runoff. In an effort to protect local water quality, as well as prevent flooding and improve the quality of life for residents. Lenexa's comprehensive plan, Vision 2020, initiated Rain to Recreation, an innovative and integrated watershed protection programing.

Rain to Recreation outlines a number of policies and programs to protect land from future development and introduce new green infrastructure practices that limit imperviousness and manage runoff on site. Since the program began in 2000, it has grown to include both regulatory and non-regulatory approaches as well as major capital projects and land acquisitions. From protection of priority natural resource areas in the watershed, to creation of riparian greenways through application of the stream setback ordinance, down to requiring low-impact development practices on site.

Significant features of the project include:

- Educating residents on ways to prevent pollution and reduce stormwater runoff
- Finding ways to engage the community – residential and professional – in protecting stormwater
- Responding to emergency spills and pollution complaints
- Issuing permits for commercial businesses, construction sites and land development to prevent pollution
- Inspecting permitted job sites for compliance
- Utilizing green infrastructure and stormwater best management practices to treat and reduce runoff
- Monitoring lakes, creeks and streams for pollution, identifying problem areas and planning protection.





than counterparts lacking street trees. Consumers spend more time on tree lined streets more often than on those streets without trees and spend more time and money there. Research has found that trees on streets and in front yards increase property values, with increases generally in the range of 7% for homes in areas with good tree cover.

A tree’s ability to grow is directly related to the volume of rooting soil available. Providing sufficient rooting soil in a dense, urban environment can be costly, but is worthwhile given the critical benefits that trees provide. Tree roots do not survive well in highly compacted soil because it lacks the void spaces needed for air and water to circulate. Roots in compacted soil will migrate toward the surface for air and water, causing sidewalks to crack and heave. The Austin Region’s desire to have a vibrant urban tree canopy and healthy street tree program requires detailed soil volumes in these guidelines to be incorporated into Municipal Zoning Ordinances.

## SELECTING THE RIGHT TREE

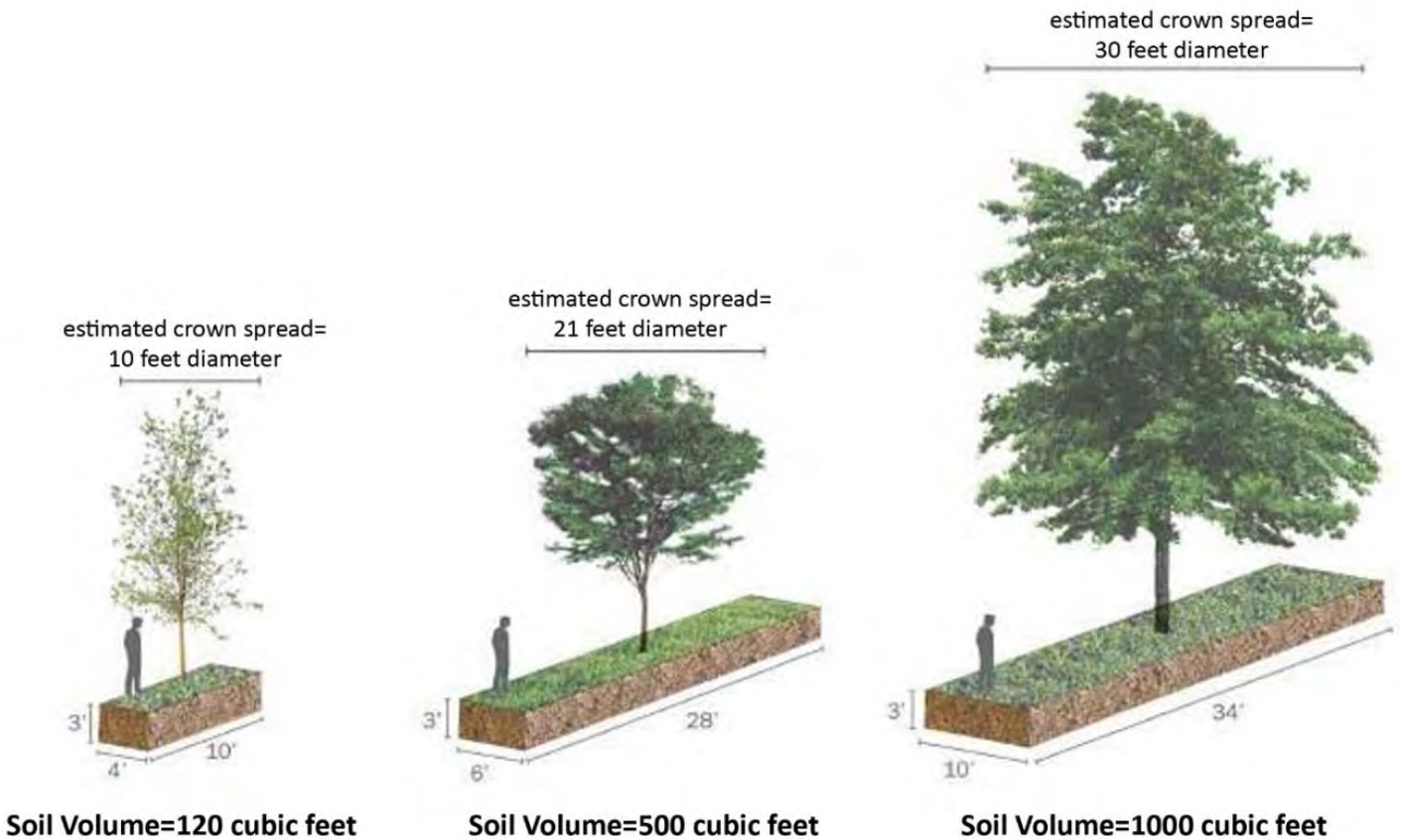
In order to select an appropriate street tree for a specific street, the species must have the appropriate scale and form for the context of the street and the adjacent land

uses and, most importantly, the appropriate amount of soil volume to thrive. Other considerations include

- Sun exposure and culture: whether the trees growth might interfere with sidewalks surfaces, site distances, or other site amenities
- If overhead and subsurface utilities might impede growth
- The desired quality of light and shade
- Mature canopy size in relation to adjacent buildings
- Frequency of curb-running vehicles such as buses

## DESIGN

- Tree species must remain constant along the entire length of a block face.
- Exposed surface area of tree wells shall be a minimum of 4’ by 10’. Larger dimensions may be required if deemed appropriate where part of a development of a master planned area or required as part of the Site Plan process.
- Tree wells shall support a subsurface tree trench



## STORMWATER CASE STUDY

### HAHN DESSERT PARKWAY, ALBUQUERQUE, NM

The Hahn Arroyo Drainage Channel was originally built in the 1960's and was replaced with an innovative, sustainability-oriented rehabilitation project that addresses its drainage function while also making it multi-use. The integrated systems approach to the project included using the old channel concrete for walls, designing cisterns to collect water for use on the landscape (with water quality cleaning devices), water harvesting strategies channel-side which collected all site drainage, use of three water use levels of primarily native plants, interpretive signage, and open space/park land. In addition, some of an adjacent park's water use needs were supplied by the cisterns. Other recreational enhancements include a multi-use trail, dog watering stations, wayfinding signage and tire filling stations for bicyclists.

- Rain garden
- Cistern
- Porous pavers
- Native landscape plantings



**Summarizes the planting area width, spacing and soil volumes for trees in the public right-of-way.**

	Small Deciduous or Ornamental Trees	Medium Deciduous Trees	Large Deciduous Trees
<b>Mature Height</b>	10'-30'	30'-50'	50'
<b>Planting Strip Width*</b>	4' minimum	6' minimum	8' minimum
<b>Spacing between trees</b>	15' minimum 20' recommended	25' minimum 30' recommended	30' minimum 40' recommended
<b>Soil volume minimum</b>	250 ft <sup>3</sup> per tree	450 ft <sup>3</sup> per tree	700 ft <sup>3</sup> per tree; 900 ft <sup>3</sup> preferred per tree

\*Narrower planting strips can be achieved if minimum soil volumes are met.

large enough to provide sufficient arable soil volume and adequate moisture for individual trees, and shall hold a minimum volume of 300 ft.<sup>3</sup> per tree. Continuous trenches which link individual wells shall be provided where possible.

- Planting strips for existing conditions shall be a minimum of 2.5', in continuous width. New development shall be a minimum of 4' in continuous width.
- Planting strips and tree wells should be planted with hardy evergreen ground cover or grass sod or covered with a tree grate. The grate's size, shape, material and design should be approved by an Arborist where part of a development of masterplanned area.
- In densely urban areas or those with limited sidewalk width, tree grates are preferred.
- For areas with mid-high residential density, consider low growing shrubs, such as euonymus, that can better withstand the impacts from dogs.
- As street trees mature, they must be limbed up to a height of 7' from finished grade in order to provide clearance for pedestrians.
- Shade trees should be spaced approximately one tree for every 30 linear feet on center.
- Ornamental trees should be specified where overhead utilities are present.

- Ornamental trees should be spaced approximately 20 feet apart feet on center.
- Evergreen trees are not to be used as street trees.
- Street trees do not apply toward crown coverage allowances.

## MAINTENANCE

For established street trees, standard maintenance consists of structural pruning on a regular cycle (typically every 3-5 years depending on the species, size, and location of the tree) and regular inspection by a certified arborist (recommended every 1-2 years) to assess the condition of the tree and determine the presence of any disease or damage that could lead to failure of the tree. Seasonal maintenance includes watering to ensure establishment of plant material; mulching to minimize water use, discourage weeds and protect against erosion; and pruning low shrubs and groundcover to control overgrowth onto sidewalks.

## STREET LIGHTS

Street lights add comfort and safety to the street, while providing character and scale. Street lighting is typically oriented into the vehicle or pedestrian travel ways, however additional street lighting can highlight public art, architectural features or be an artistic expression itself.

Street lighting can also be an expression of street type.



## STREET TREE CASE STUDY

### MARQ2, MINNEAPOLIS MINNESOTA - SOIL VOLUMES

The MARQ2 project (Marquette Ave and 2nd Ave Busways) originated in response to the Minneapolis Ten Year Transportation Plan, to improve transit service by redefining lanes, lane widths, and sidewalk zones and widths. Stakeholders requested that healthy trees be part of the project.

The project included the installation of approximately 200 trees along downtown sidewalks. The approach combined Silva cells and porous pavers, which is a unique structural system that supports the sidewalk, but provides thousands of cubic yards of loose fertile soil to support healthy street trees. The trees and soil cells collect runoff from the sidewalks along two of Minneapolis' main downtown streets through pervious pavers that drain into the underlying structural cells. On average, each tree pit collects runoff from about a 300 square foot watershed. With 167 trees, this adds up to an estimated 50,118 square feet or 1.15 acres of sidewalk runoff captured.

#### Project Details

- Owners: City of Minneapolis
- Year of completion: 2009
- Tree Planting Method: Suspended pavement with Silva Cells
- Number of trees in Planting Method: 167
- Approximate Installed Cost Per Tree: \$8,038
- Cubic feet of soil per tree: average of 588 cubic feet per tree



Higher activity commercial streets typically have a higher level of street lighting overall, while lower-intensity areas such as residential streets and parkways will generally have less frequent street lights and lower lighting levels.

Lighting levels should be consistent along the street without pools of light and dark. Lighting should be managed to reduce energy consumption and light pollution. The spectrum of light should ideally mimic sunlight as possible as this is more pleasing to the human eye.

## DESIGN

- In general, lighting should reflect the character and urban design of the street type to create a recognizable hierarchy of roads and spaces.
- Comply with lighting requirements in areas with existing design guidelines.
- Lighting is typically located in the Amenity Zone of the street. Depending on conditions, lighting may be permitted in medians, however this is less common and often restricted.
- Light poles are typically located 18" off the front of curb.
- Lighting should be oriented toward travelers both in the roadway and on the sidewalk. Adequate lighting at intersections and crossings is essential.
- Pedestrian scale lighting (lower than 20') should be used alone or in combination with roadway scale lighting in high-activity areas to encourage nighttime use and as a traffic calming device.
- Critical locations such as ramps, crosswalks, transit stops and seating areas that are used at night must be visible and lit.
- Lighting may either alternate on either side of a street or be arranged parallel. Parallel arrangements are more formal and common in retail nodes.



*Street lights not only provide comfort and safety at night and during low light conditions, but also add character and scale to the streetscape.*



# CHAPTER 3

## ROADWAY ELEMENTS

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A streetscape consists of a variety of components and contexts that when combined properly create a dynamic, engaging space. Understanding and providing space for the various components is essential in creating a successful street. The previous section of this Pattern Book discussed the edges of the streetscape and the pedestrian realm, but from a spatial context, the roadway area between the curbs is the largest area and has the biggest impact on how a streetscape looks and how it is experienced by all users. The roadway elements of the street make up the vehicular realm and consist of everything from on street parking, bicycle facilities, bus loading and unloading zones, to medians, and the travel lanes.

The width and alignment of these roadway elements help dictate the speed and driver behavior along the street and can contribute to feelings of hostility and danger, regardless of how statistically safe the street is. Streets within the CAMPO region should be classified and designed, based on their function for all users, rather than just the needs of just automobiles.

Bicycles and pedestrians are exceedingly more vulnerable in the built environment than drivers and those riding transit. The vehicular realm and the pedestrian realm should seamlessly fuse their associated materials and finishes to create a thriving public space.





# TRAVEL LANE WIDTHS

## OVERVIEW

Lane width has many implications in street design from slowing traffic to increasing opportunities for active transportation. The width of travel lanes should be determined by a combination of factors including the physical dimensions of cars and trucks, adjacent land uses, desired speeds, and type of roadway. Drivers are typically inclined to travel at higher speeds on roads with wider lanes. As speed and volumes increase, additional lane width is often considered desirable to accommodate the variations in lateral placement of the vehicle within a lane. Greater lane widths also help accommodate wider vehicles such as trucks, buses and recreational vehicles (RVs).

## DESIGN

The recommendation of this Pattern Book is that the minimum travel lane width should be 10 feet, the typical condition is 11 feet, and the maximum should be 12 feet on Industrial streets where heavy truck traffic is expected. Although each design decision will need to be based on local conditions.



*Bicycle lanes and on-street parking can be implemented when excess travel lane widths are reallocated and restriped.*

Narrower lane widths are most appropriate in urban areas as space is limited and streets tend to have higher levels of pedestrian activity. In this context, narrower lane widths encourage lower speeds, shorten pedestrian crossing distances and may enable the provision of on-street parking and transit stops. Residential streets do not typically require wide travel lanes and the higher travel speeds that wide lanes tend to encourage are directly in conflict with the walkability, safety, and ambiance desired in residential areas.

## CONSIDERATIONS

In considering the use of narrower lanes, however, designers should recognize that narrow travel lanes reduce vehicle separation from other vehicles and from bicyclists. They can also create complications for buses, trucks and other large vehicles by forcing these vehicles to infringe on multiple lanes when turning. The cumulative relationship between the components of the street must be taken into account. Using minimum dimensions for multiple, adjacent elements should be avoided. For example, when parking lanes and vehicular travel lanes are adjacent, the cumulative width must be a minimum of 18 feet.

# MEDIANS

## OVERVIEW

A median can be used to narrow the roadway, reduce motor vehicle speeds and improve pedestrian crossings. Medians also provide locations for utilities, opportunities to introduce green elements in the right-of-way and can be used to absorb stormwater and reduce the heat island effect.

## DESIGN

- Medians with crosswalks and pedestrian refuges improve pedestrian safety and access by reducing crossing distances and enabling pedestrians to cross roadways in two stages. Islands with crossings should be designed with a stagger, or a “z” pattern, forcing pedestrians to face oncoming traffic before progressing through the second phase of the crossing. Center islands with crosswalks should meet all accessibility requirements:
  - 6 feet in width minimum for pedestrian refuge island;

- 8 feet in width is preferred to provide adequate refuge for pedestrians with strollers or bicycles;
- The sidewalk across the median should be 5 feet wide.
- Medians can reduce the risk of head-on collisions by limiting left turn opportunities to the most desirable locations such as a signalized intersection.
- Medians should be carefully designed to ensure proper drainage and maximize the potential for on-site stormwater retention and infiltration.
- Sidewalks should not be reduced in width and bicycle lanes should not be eliminated in order to provide space or additional width for medians.
- Medians can be combined with mid-block pedestrian crossings to reduce crossing distances.
- Medians must meet the width and soil volume minimums to accommodate street trees.



Medians can act as a refuge island for mid-block pedestrian crossings.

## BICYCLE FACILITIES

The bicycle network in the CAMPO region is a combination of shared-use paths and bike lanes, striped bicycle lanes and shared-use streets with visual pavement markings. Because the CAMPO Region's streets vary in width and many serve multiple purposes, the construction of bicycle

routes may need to use a variety of design features to fit within existing constraints.

This section of the Pattern Book details bicycle facilities and provides the CAMPO region with a broader design framework for constructing formalized bicycle facilities. This guidance is intended to be used as a toolkit, allowing a project designer to select facilities that are appropriate to the street's other uses and design elements, to the type of route being constructed, and to the surrounding land uses and community characteristics.

## STANDARD BICYCLE LANES OVERVIEW

Bicycle lanes provide an exclusive space for bicyclists in the roadway. Bicycle lanes are established through the use of lines and symbols on the roadway surface. Bicycle lanes are for one-way travel and are normally provided in both directions on two-way streets and/or on one side of a one-way street. Bicyclists are not required to remain in a bicycle lane when traveling on a street and may leave the bicycle lane as necessary to make turns, pass other bicyclists, or to properly position themselves for other necessary movements. Bicycle lanes may only be used temporarily by vehicles accessing parking spaces and entering and exiting driveways and alleys. Stopping, standing and parking in bike lanes is prohibited.



*Standard bicycle lanes.*



## DESIGN

- Bicycle lanes can be used on one-way or two-way streets with single or multiple lanes.
- Bicycle lanes may be placed adjacent to a parking lane or against the curb if there is no parking. Conventional bicycle lanes are located on the right side of the roadway.
- Bicycle lanes are typically installed by reallocating existing street space (i.e., narrowing other travel lanes, converting travel lanes and/or reconfiguring parking lanes).
- The minimum width of bicycle lanes is 5'. Bicycle lanes may be 6', but if more street width is available, the street should be evaluated for other treatments.
- When bike lanes are adjacent to parking, the combined width (from face of curb) of parking and bicycle lane should be at least 12'.
- Bike lanes are indicated by a solid white line along the left side of the lane. Use dotted or dashed line marks to indicate areas of bicycle/vehicle conflict.

## CONSIDERATIONS

- Bicycle lane design should consider parking configurations and turnover, the presence of medians, the continuity of the facility and the configuration and complexity of turning movements at intersections.
- If bicycle lanes are adjacent to guardrails, walls or other vertical barriers, additional bicycle lane width is desired to account for bicyclist “shy” distance from the edge. Similarly, provide additional space if bicycle lanes are at sidewalk level and adjacent to the curb and travel lanes.
- Ensure gutter seams, drainage inlets and utility covers are flush with the roadway surface. Where possible, these features should be kept out of the bike lane.
- Where wider lanes are possible, consider providing a buffered bicycle lane, discussed later in this section.
- On constrained corridors with high parking turnover, consider designing pavement markings to guide bicyclists outside of the door zone of parked vehicles. Treatments include installing a buffer on the parking side of the bicycle lane, door zone,

hatch marks, or using parking T's instead of a longitudinal parking line.

- Consider using colored pavements to highlight areas where conflicts might occur, such as at intersection and driveway crossings.
- It is critical that bicycle lanes receive the same treatment as the remainder of a street surface with regard to cleaning. In addition, bicycle lanes need to have regular cleaning of storm drains, especially during spring and autumn seasons when fallen leaves or other tree debris may collect in drains and cause pooling or flooding of stormwater in curbside bicycle lanes.

## BUFFERED BICYCLE LANES

Buffered bicycle lanes are created by painting or otherwise creating a flush buffer zone between a bicycle lane and the adjacent travel lane. While buffers are typically used between bicycle lanes and motor vehicle travel lanes to increase bicyclists' comfort, they can also be provided between bicycle lanes and parking lanes in locations with high parking turnover to discourage bicyclists from riding too close to parked vehicles.

Buffered bicycle lanes are distinct from separated bicycle lanes (discussed below) in that they have no vertical barrier between travel lanes and/or parking. Like separated bicycle lanes, buffered bicycle lanes have been found to dramatically increase bicycling comfort for a wide range of community bicyclists.



*Buffered bicycle lanes.*



## DESIGN

- The recommended minimum width of a buffer is 3 feet; however width may vary depending upon the available space and need for separation. Total assembled width of bicycle travel way (lane) and buffer should be at least 7 feet.
- Buffers should be painted with solid white lines and channelization markings.
- Buffers can be useful on multi-lane streets with higher speeds, but are not required in these locations.

## CONSIDERATIONS

- Where only one buffer can be installed on a constrained corridor with on-street parking, the buffer should typically be placed between the bicycle lane and parking lane, depending upon roadway speeds and parking turnover.
- Generally speaking, there is no upper limit for buffer width and buffers of 5 to 6 feet are common where travel lanes are converted to buffered bicycle facilities, HOWEVER, wide buffers without vertical separators may invite illegal use for vehicle travel. It is best to divide the buffer space in half to allow the painted buffer be on each side of the bike lane, as opposed to all on one side.
- Consider using removable vertical elements such as flexposts, rubber curbing, or planters to further establish the bicycle facility. (See below under separated bike lanes.)
- Because they do not require construction of a separating element, buffered bicycle lanes may be established through simple street resurfacing and may enable trial or phasing prior to the installation of separated facilities.
- Buffered bicycle lanes, like separated bicycle lanes, may transition at intersections to provide adequate visibility and safety.



*Separated bicycle lane.*

## SEPARATED BIKE LANES OVERVIEW

Separated bicycle lanes, also known as cycle tracks, are exclusive bicycle facilities physically separated by a vertical element from the adjacent motor vehicle lanes. Separation can be achieved through a vertical curb, a parking lane, flexposts, plantings, removable curbs or other measures. Buffered bike lanes that do not include a vertical element are not considered separated bike lanes.

There are four basic configurations for separated bike lanes:

1. Sidewalk level bike lanes
2. Bike lanes constructed at an intermediate level between the sidewalk and the street
3. Street level bike lanes separated from traffic or parking by a curb
4. Street level bike lanes separated from traffic by parking or other vertical objects

Separated bike lanes dramatically increase rider comfort and decrease stress. They are usable by a broad spectrum of bicyclists including very young riders and more cautious bicyclists. Separated bike lanes may be used on many different street types and are especially welcome on higher speed, higher volume roadways. Studies show that bicyclists prefer separation from motor vehicles on most

types of roadways and can contribute to expanding bicycle mode share. Separated bike lanes can be one-directional or two-directional; may be provided on both sides of two-way streets or on one side of one-way streets.

## DESIGN

Separated bike lanes are appropriate on streets with operating speeds of 25 mph and higher and volumes that exceed 4,000 vehicles per day.

Separated bike lanes can be useful on streets that provide connections to off-street trails, since bicyclists on these streets may be more accustomed to riding in an area separated from traffic.

Intersection design for separated bike lanes is complex and requires careful attention to conflicts with turning vehicles. For more information, see the NACTO Bikeway Design Guide.

Adjacent to on-street parking, a minimum 2 to 3 foot buffer should be provided between parking and the separated bike lane; the buffer serves as a pedestrian loading and unloading zone and helps keep bicyclists out of the door zone of parked vehicles.

For street level separated bike lanes without a raised median, vertical objects are needed in the street buffer to provide separation. Examples of vertical objects include flexible delineator posts, parking stops, planter boxes, concrete barriers or rigid bollards. They must be supplemented with a painted median to mark the buffer. The horizontal placement of vertical objects within the buffer should consider the need for shy distance to the bike lane and to the travel lane. Preference should be given to locating the vertical object to maximize the width of the

bicycle lane.

It may be necessary to utilize more frequently spaced vertical objects where motor vehicle encroachment in the bike lane is observed or anticipated. Where on-street parking is located adjacent to the street buffer, it may not be necessary to provide vertical objects to improve separation, except in locations where parking is absent, such as near intersections. Exceptions include locations where on-street parking is prohibited for portions of the day, commercial areas where on-street parking turnover is high, or locations where parking demand is low.

Capital costs for vertical objects are typically lower than raised medians, making them ideal for retrofit projects. However, vertical objects may require routine maintenance and replacement, increasing long-term costs. Some vertical objects may be temporarily removed to accommodate standard sweeping. Most vertical objects are non-continuous, which facilitates positive drainage along the established roadway crown to existing catch basins.

Ensuring the vertical separation is visible to approaching bicyclists and motorists should be considered. Vertical objects in the street buffer are considered delineators and must be retroreflective, per the MUTCD.

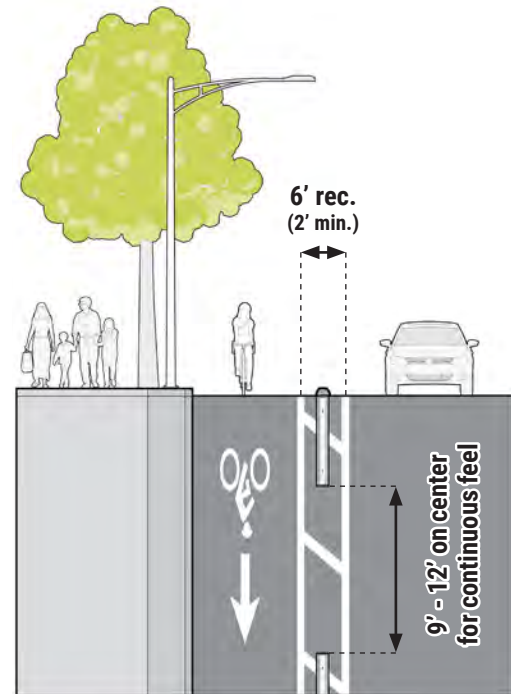
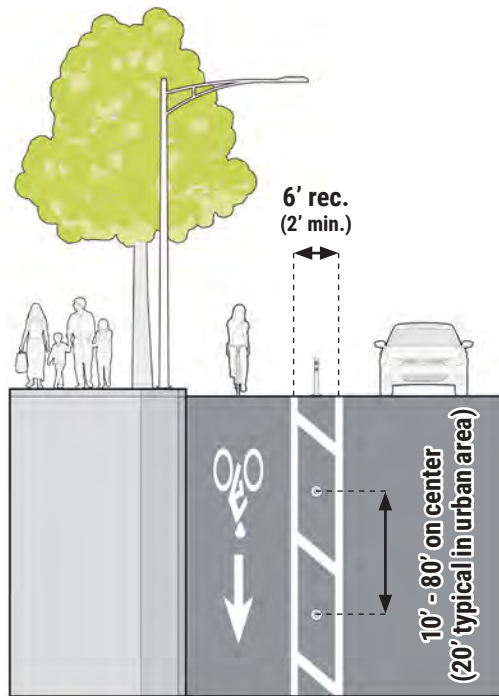
## CONSIDERATIONS

- Separated bike lanes require increased parking restrictions approaching intersections compared to standard bicycle lanes to provide for visibility at intersection transitions.
- Vertical curb separation should be considered where on-street parking is not present. Stormwater drainage will need to be considered with this option.

	One-Way		Two-Way	
	Minimum	Preferred	Minimum	Preferred
<b>Separated Bike Lane Width</b>	5'	7'	8'	12'

1. Dimensions are for bike lane only and do not include sidewalk or street buffer.
2. Minimum width will not accommodate passing. 6.5 feet is required for two bicyclists to pass one another. Edge condition impacts ability to comfortably pass or ride two abreast. The minimum width is discouraged when a separated bike lane is located between raised curbs. If width is constrained, designer should consider options that allow bicyclists to use the buffer space to pass another user. Width may include gutter pan.
3. Passing may occur in opposing lane.

## Vertical Objects in the Street Buffer Zone



### Flexible Delineator Posts

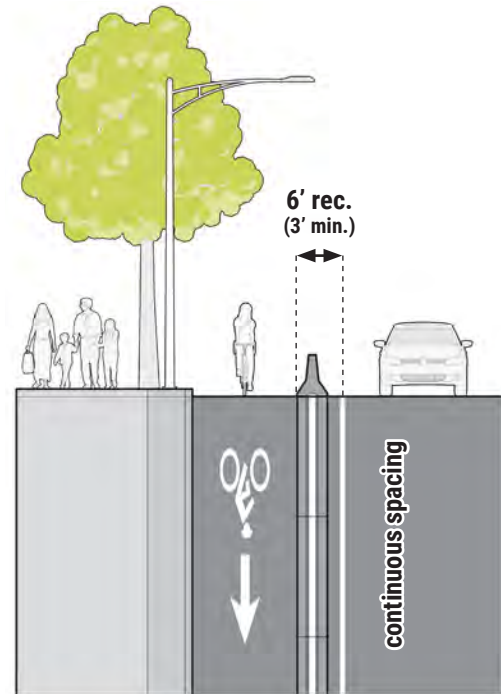
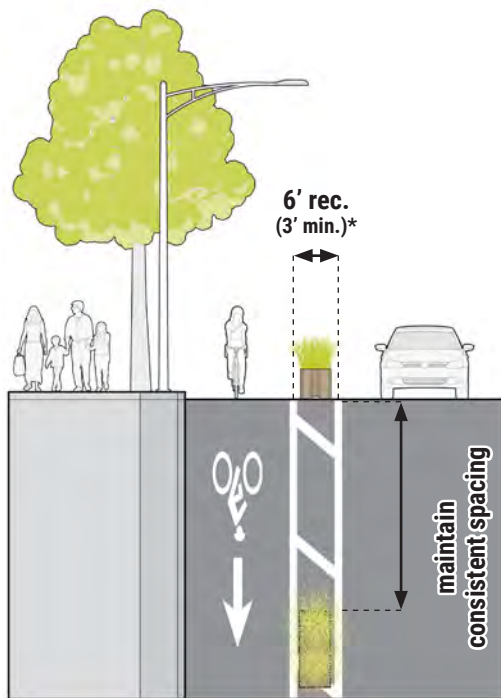
- Removable
- Lowest initial capital costs
- May require closer spacing where parking encroachment is likely
- Small footprint compatible with variety of buffer designs
- Low durability
- May need routine replacement, increasing long-term maintenance costs.

### Parking Stops

- Maintain consistent spacing between parking stops
- Removable
- Highly durable
- May need supplemental vertical objects or on-street parking to increase visibility



## Vertical Objects in the Street Buffer Zone



### Planter Boxes

- Removable
- May be closely spaced for near-continuous vertical separation
- Can be used to enhance community aesthetics
- May serve as a gateway treatment
- May be incompatible with clear zone requirements for roadways with higher motor vehicle speeds
- Plants require routine care, increasing long-term maintenance costs

\* Buffer may need to be wider when adjacent to on-street parking to accommodate an open motor vehicle door.

### Concrete Barriers

- Provides continuous vertical separation
- Highly durable
- Recommended for locations where physical protection from motor vehicles is needed, for example on bridges with high speed traffic
- May need crash cushion at barrier ends
- Incompatible with on-street parking

## SEPARATED BIKE LANE CASE STUDY

### LIVING LAB PILOT PROJECTS – BOULDER COLORADO

In 2013, Boulder introduced a “Living Laboratory” program to introduce and test new bike facility treatments. The goal of the pilot program was to increase trips by enhancing the existing system for bicyclists of all ages and riding abilities. This pilot approach allowed city officials to quickly test out infrastructure treatments, including separated bike lanes, and gather public input to guide design refinements and determine which projects should be made permanent. The program minimized much of the upfront costs for project design. Using a pilot approach allowed the City, which prides itself on civic engagement, to be experimental while still maintaining its reputation responsiveness before permanent separated bike lane designs were finalized. Boulder’s planners use the program to actively identify successful separated bike lanes and test these perceptions in real-time.



Street level separated bike lanes may be combined with islands at corners and crossings.

- At transit stops, separated bike lanes should be routed between the stop's passenger waiting area and the sidewalk to reduce conflicts while passengers are boarding and alighting. Signage and/or markings may be added to alert transit riders and bicyclists of the conflict zone as pedestrians cross the bike lane from the sidewalk to the transit stop.
- The presence of drainage and utility structures along the curb may reduce the effective width of a separated bike lane.
- Maintenance should be considered, including street sweeping.

## SEPARATED BIKE LANES AND BUS STOPS

### OVERVIEW

Separated bike lanes can be integrated with a variety of bus stop designs. They are compatible with mid-block, near-side and far-side bus stop locations. Where feasible, separated bike lanes should be routed behind bus stops to eliminate conflicts between buses and bicyclists. This recommended configuration—referred to as “a floating bus stop”—repurposes the street buffer into a dedicated passenger platform between the motor vehicle lane and the bike lane.

Bus passengers must cross the separated bike lane when entering and exiting the platform. Designers can

communicate expectations for people bicycling and taking transit by following these principles to the maximum extent feasible:

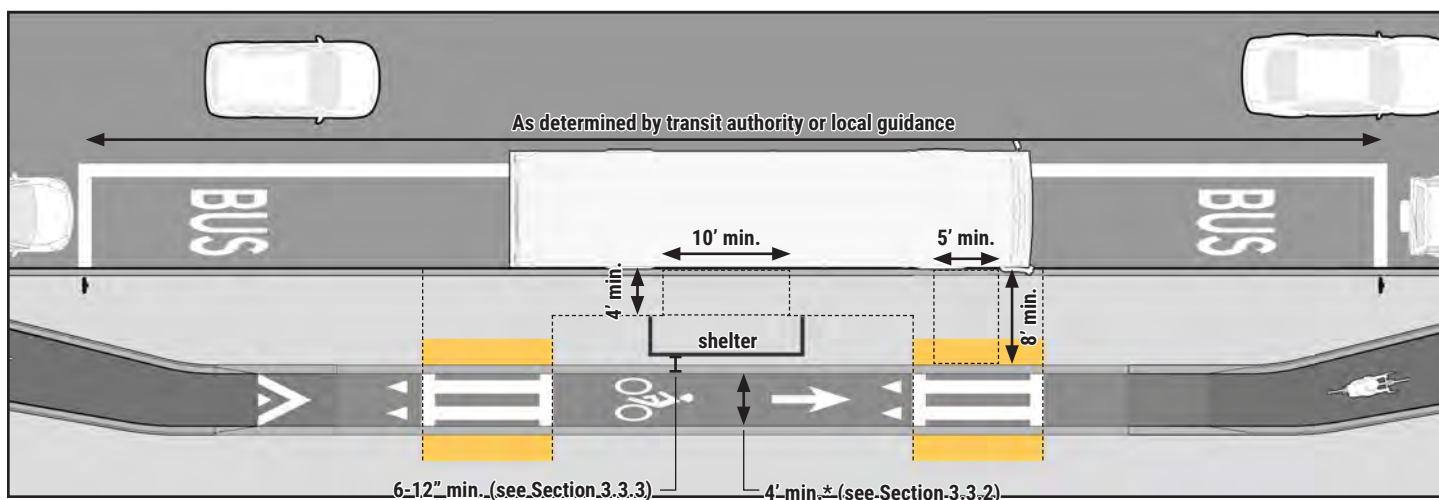
- Guide bus passengers across the bike lane at clearly marked locations.
- Provide clear direction to people bicycling when they are expected to yield to pedestrians crossing the bike lane at bus stops.

Designers should consider in-lane bus stops to preserve space for the street buffer, maintain separated bike lane width, and simplify bus re-entry into traffic. Where on-street parking is present, a curb extension is required to provide an in-lane stop.

Bus stops are natural locations for bike parking. Bike racks increase the catchment area of bus stops, providing a longer-range and faster first- and last-mile connection compared to walking.

### DESIGN

- All bus stops should include a common set of required design elements to provide accessible, high-quality transit service. Elements that may influence separated bike lane design are highlighted in this section. Designers should consult local guidelines for more detail, including for the design of amenities beyond the scope of this Pattern Book (e.g., trash receptacles, informational signage, etc.).
- Preserve a clear boarding and alighting area that connects to a pedestrian access route. Advanced lateral deflection of the bike lane may be necessary to accommodate the boarding and alighting area.





- Maintain a pedestrian access route between the sidewalk, the boarding and alighting area, and shelters and benches. Two pedestrian crossings are recommended, but not required.
- Include a rear door clear zone connected to a pedestrian access route. It is preferable to have a continuous clear zone to connect the boarding and alighting area and the rear door clear zone.
- Additional design elements are recommended to improve operations at bus stops.
- Transition the bike lane to sidewalk level in constrained situations or to provide level pedestrian crossings. Locate bicycle transition ramps near crosswalks and outside of any lateral shift of the bike lane.
- Locate shelters and other vertical objects that are 36 in. or higher a minimum of 6-12 in. from the bike lane edge.
- Place railings or planters (3 ft. maximum height) at the back of the platform for high ridership stops or along two-way separated bike lanes to channelize pedestrians to designated crossings. Ends of railings should be flared inward toward the bus stop and away from the bike lane for a safer bicycling environment.



*Green color pavement in separated bicycle lane*

## CONTRASTING GREEN COLOR PAVEMENT

### OVERVIEW

The use of contrasting green color is used primarily to highlight areas with a potential for bicycle-vehicle conflicts, such as intersection crossings where a bicyclist is susceptible to conflicting left or right turning traffic or merge areas where right turning vehicles must cross a through bicycle movement to enter a right turn lane.

### DESIGN

- Green pavement markings enhance the conspicuity of a conflict area within a bicycle lane approaching an intersection or within an extension of a bicycle lane through an intersection.
- The material used for green color can be paint, colored asphalt or concrete, or other marking materials with the proper chromaticity and slip resistance.
- If a pair of dotted lines is used to extend a bicycle lane across an intersection or driveway, or a ramp, green colored pavement should be installed in the same dotted pattern as the white edge lines.
- Green color may also be utilized to enhance the conspicuity of a bicycle lane or shared lane marking symbol by outlining the symbol in a green box.

## OFF-STREET PATHS

Off-street paths, often referred to as shared-use paths or trails, are facilities that provide off-street space intended for use by bicyclists and/or pedestrians. They often parallel roadways and are typically separated from the roadway by green space or a physical barrier. Off-street paths may be designated for one-way or two-way travel. Most off-street paths accommodate both bicyclists and pedestrians within the same space, however paths may also be designated for exclusive use by bicyclists or pedestrians.

A defining feature of off-street paths is that they place bicyclists and pedestrians in an off-street location, where they become subject to all applicable laws pertaining to pedestrian movement at intersections and driveways.



*Off street path*

## APPLICABILITY AND USE

- Off-street paths are desirable along high volume or high speed roadways, where accommodating bicyclists within the roadway in a safe and comfortable way is impractical.
- Off-street paths typically have a lower design speed for bicyclists than in-street facilities do and may not provide appropriate accommodation for bicyclists who desire to travel at greater speeds.
- In addition, greater numbers of driveways or intersections along a corridor can further decrease bicycle travel speeds and traffic signals can increase delay for bicyclists on off-street paths compared to bicyclists using in-street bicycle facilities such as bike lanes.
- Many bicyclists express a strong preference for the separation from motorized vehicles provided by off-street paths compared to, especially less experienced or slower bicyclists. Off-street paths should not be considered a substitute for accommodating bicycles within the roadway.
- Off-street paths have a relationship with roadways similar to that of sidewalks to roadways, in that they function as parallel facilities located in close proximity to vehicle travel lanes. Conflicts with vehicles turning across the path of bicycles and pedestrians at driveways and intersections are an inherent drawback of off-street paths.

- Off-street paths may be used to provide two-way bicycle and pedestrian travel adjacent to one-way roadways.

## DESIGN CONSIDERATIONS

- Off-street paths intended for use by bicycles should be designed to meet adopted guidelines. This includes widths, clearance, design speed, stopping and sight distance.
- Off-street paths intended for use by pedestrians must meet accessibility requirements under the Americans with Disabilities Act (ADA). Grades may meet but not exceed the grade of the adjacent roadway.
- Crossings must be designed in a way that facilitate sight distance for drivers, bicyclists, and pedestrians, provide stacking room for vehicles waiting to enter the roadway or cross the off-street path, and allow bicyclists and pedestrians to anticipate and react to vehicular turning movements.
- Off-street paths should be designed to maintain constant cross slope and running slope through driveways.
- The desired buffer width between the off-street path and the roadway is a minimum of 5 feet, with a desired minimum of 6 feet, which may be planted.
- One-way paths may be used in park settings to minimize conflicts between users where there are high volumes of bicyclists or pedestrians. Because pedestrians walk at relatively slow speeds, one-way pedestrian paths are generally not encouraged.
- When one-way paths for bicycles are desired, consideration should be given to discourage wrong way cycling.
- When one-way paths for bicycles are provided within roadway corridors, the paths in opposite directions should be provided in pairs. Generally a pair of one-way off-street paths will be provided on opposite sides of the roadway to allow bicyclists to travel adjacent to motorized traffic in the same direction.
- If an off-street path is for the exclusive use of bicyclists, a sidewalk or other pedestrian facility should be provided to ensure that pedestrians do not encroach into the facility intended for exclusive bicycle use.



## LOW STRESS BICYCLE NETWORK CASE STUDY

### LOW STRESS BICYCLE NETWORKS – AUSTIN TEXAS AND BOULDER COLORADO

The development of low-stress bicycle networks - already widespread in European municipalities - is becoming more common in the United States as bicycling grows as a transportation option and municipalities seek to attract new riders. Low-stress network strategies recognize that a significant portion of people interested in riding are not comfortable interacting or sharing a roadway with high-volume motor vehicle traffic.

The City of Austin is combining its paved trails, low-volume streets, and on-street separated bike lanes to create an “all ages and abilities network,” or one that provides even novice cyclists, the young, and the old with the ability to travel extensively by bicycle in the city via lower stress facilities. The City’s highly popular Bluebonnet Lane separated bike lane runs adjacent to an elementary school and is frequently populated with young children commuting to and from school on two wheels.





- On a one-way path, an off-street facility should transition to an on-road bike lane or separated bike lane configuration in advance of an intersection or driveway. This allows bicyclists to take advantage of the comfort of off-street paths in mid-block locations with the operational benefits of in-street cycling at intersections.
- Enhanced traffic control devices such as bike signals at intersections may be appropriate in some locations.
- At intersections with low-volume minor roadways, the crossing of an off-street path and/or sidewalk may be raised, in the form a raised crosswalk, table for intersection to serve as a traffic calming feature for motor vehicles. Raised paths through intersections are more difficult to construct and maintain as grades present issues for ADA compliance and drainage.

- Neighborhood slow streets are best accomplished in neighborhoods with a grid street network (where motor vehicle through-traffic can be directed to parallel routes), but can also be accomplished by combining a series of road and trail segments to form one continuous route.
- Ideally, neighborhood slow streets should not carry more than 1,000 motor vehicles per day to be comfortable for pedestrians and bicyclists. Traffic management devices are typically used to discourage motor vehicle through-traffic while still enabling local traffic access to the street.
- Neighborhood slow streets should be long enough to provide connectivity between neighborhoods and common destinations such as schools or parks.

## SIGNED ROUTE, NEIGHBORHOOD BIKEWAY, NEIGHBORWAYS OR BIKE BOULEVARDS

### OVERVIEW

What most influences the way people drive isn't the speed limit, a caution sign, or the threat of a ticket. Rather, drivers take their cues from the design of the street. Narrower lanes, trees, wayfinding signage, pavement markings, people walking, and biking give the impression that pedestrians and bicyclists are a priority, so drivers slow down.

Neighborhood slow streets are a network of quiet, often residential streets that are designed for slower speeds. These streets are designed to give priority to pedestrians and bicyclists. They are excellent places to play, walk a dog, or ride a bicycle that connect across neighborhoods and the city.

### DESIGN

- Design features that reduce operating speeds are used to maintain low speeds (20 mph or less) on neighborhood slow streets.

## CONSIDERATIONS

- At major street crossings, neighborhood slow streets may need additional treatments other than marked crosswalks for pedestrians and bicyclists. Treatments can include signage, median refuge islands, curb extensions, advisory bike lanes, rapid flash beacons, pedestrian-actuated signals and/or bicycle signal heads.

## TRAFFIC CALMING

### OVERVIEW

Traffic calming is the combination of physical measures and supporting policies that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.

Through design, traffic calming aims to slow the speeds of motorists to the desired speed (usually 20 mph or less for residential streets and 25 to 35 mph for boulevards and avenues) in a context-sensitive manner by working with the stakeholders (i.e., residents, business owners, and agencies). Traffic calming is acceptable on all street types where pedestrians are allowed. Traffic calming is applicable to all sizes of towns and cities as well as rural areas.

Compared with conventionally designed streets, traffic calmed streets typically have fewer collisions and even higher reductions in injuries and fatalities. These benefits are mostly the result of slower speeds for motorists that result in greater driver awareness, wider fields of vision, shorter stopping distances, and less kinetic energy during

a collision. At 20 mph or less, chances are very high that a motorist will not kill or severely injure a pedestrian if a collision occurs.

## APPLICABILITY AND USE

There are both physical and visual elements that can help slow vehicle traffic. Visually narrowing a street, or changing its aesthetics can effectively calm traffic and can be more widely applicable than geometric measures. Treatments include:

- Curb and gutter, which defines the traveled part of the roadway
- Sidewalks, which indicate that motorists should expect to see pedestrians
- Outdoor cafes or other activities in the pedestrian zone, such as street furniture
- Street trees, which create a sense of enclosure
- On-street parking, which creates an activity zone to which drivers must pay attention
- Pavement type and road striping
- Buildings that are closer to the street (i.e., no parking or drive-through between the street and adjacent buildings)
- Neighborhood signage, painted intersections and public art programs.

The physical narrowing of roadways is an effective way to slow traffic. Treatments depend on the roadway classification and traffic volumes, as well as the volume of large vehicles and include:

- Bump-outs, either at intersections or mid-block crossings, which also shorten pedestrian crossing distances
- Reduction in curb radii, in order to slow turning movements
- Lane diets or roadway diets, which reduce the number of lanes or amount of lane space and can result in slowed vehicle travel

Creating vertical or horizontal deflection of the vehicle path is a very effective way to slow traffic, and may be appropriate on residential streets. Horizontal deflection is typically most effective. Treatments include:



*ADA ramps and crosswalks help direct pedestrians and indicate to motorists that pedestrians may be present.*

- Bump-outs, either at intersections or mid-block crossings.
- Neighborhood traffic circles, which force drivers to slow at intersections and yield to users approaching from the left.
- Speed humps provide a gentle rise on the roadway.
  - Speed humps are not appropriate on collector streets and require a speed study showing 85th percentile at least 5 mph over the speed limit. Speed humps can be a relatively easy retrofit but reduce on-street parking.
- Chicanes force drivers and bicyclists to navigate a narrowed “s” shaped pathway along the street created by the placement of Bump-outs that alternate from one side of a street to the other, typically in groups of three.

## TRAFFIC CALMING INTERSECTION TREATMENTS DESIGN

Blocking or restricting access is highly effective, but can have the unintended effect of creating traffic problems on neighboring streets. Treatments include:

- Diverter Median Barriers restrict a driver's ability to cross an intersecting street.
- Diverter Islands restrict turn or through movements for vehicle traffic and may allow bicycle and pedestrian traffic in all directions. Diverter islands are typically used at intersections to deter heavy vehicle volumes and eliminate cut-through traffic. They should be part of a larger traffic calming strategy that evaluates and handles accessibility through the adjacent street network and considers emergency vehicle response times. Effects are generally limited to the intersection; the street may require additional traffic calming in addition to the intersection treatments to be effective.
- Right In/Right Out restrictions, which restrict left turns into and left turns out of a street.



*Mid-block crossing with marked crosswalk and refuge median island*

## CONSIDERATIONS

Traffic calming measures that may be applied depend on the context of the street. Special consideration should be given to:

- Street classification
- Traffic operational analysis
- Mix of traffic, including consideration of bus, bike or truck routes
- Adjacent land uses
- First responder vehicle needs
- Effect on on-street parking

## SPEED HUMPS

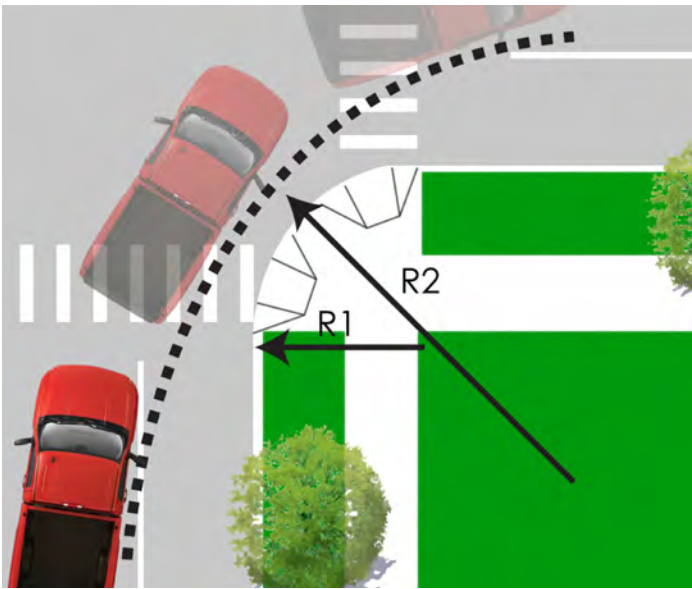
Speed humps are a roadway design feature that consists of raised pavement, approximately 3 to 4 inches high at their center, which extend the full width of the street. The height of a speed hump tapers near the drain gutter to allow unimpeded bicycle travel. Speed humps should not be confused with speed bumps commonly found in parking lots.

Speed humps may be considered on low volume neighborhood streets in order to control vehicle speeds. Streets that have high traffic volumes, are transit routes, or have frequent freight travel are typically not good candidates for speed humps.

## DESIGN

- Speed humps should have a smooth leading edge, a parabolic rise, and be engineered for a speed of 25 to 30 mph, so they can be negotiated by large vehicles.
- Speed humps should be clearly marked with reflective markings and signs.
- Typically speed humps are 22 feet in length, with a rise of 6 inches above the roadway, and should extend the full width of the roadway. They should be tapered at the edges to the gutter to accommodate drainage.
- Grade should be considered; do not use on roadways with greater than 5 percent grade.
- Do not use on collector or arterial streets.
- Parking must be restricted adjacent to humps.
- A speed study showing 85th percentile at least 5 mph over the speed limit should be required prior to implementation.





## CURB RADII

Curb returns or radii are the curved connection of curbs at the corners formed by the intersection of two streets, which guide vehicles in turning corners. The shape of a corner curb radius has a significant effect on the overall operation and safety of an intersection.

## APPLICABILITY AND USE

The shape and dimensions of curb radii vary based on street type, transportation context, and design vehicle (vehicle type used to determine appropriate turn radius at an intersection). Smaller corner radii increase pedestrian safety by shortening crossing distances, increasing pedestrian visibility, and decreasing vehicle turning speed. Smaller corner radii also provide better geometry for installing perpendicular curb ramps for both crosswalks at each corner, resulting in simpler, more appropriate crosswalk placement that is in line with the approaching sidewalk.

## DESIGN

Factors to consider when designing curb radii:

- Curb radius: the actual radius proscribed by the curb line at an intersection.
- Effective radius: The radius available for the design vehicle to make the vehicle turn, accounting for the presence of parking, bike lanes, medians, or other features.

Curb radii can be designed:

- To allow for the selected design vehicle to complete a turn fully within its designated travel lane or lanes.
- To accommodate a vehicle turn by allowing for a particular vehicle type to complete a turn with some latitude to partially use adjacent or opposing lanes on the origin or destination streets.

## CONSIDERATIONS

The effective turning radius (rather than the actual curb radius), should typically be used to determine the ability of vehicles to negotiate a turn. Determination of the design vehicle should consider and balance the needs of the

## CHICANES

Chicanes can take the form of curb extensions, center islands, or staggered on-street parking. These traffic calming features slow vehicles by compelling them to shift laterally or pass through a narrowed section of roadway.

## DESIGN

- The size of chicanes will vary based on the targeted design speed and roadway width, but must be 20-foot wide curb to curb at a minimum to accommodate emergency vehicles.
- Can incorporate stormwater treatment and low growing landscaping.
- Chicanes may affect parking to a greater extent than other traffic calming measures.

## CONSIDERATIONS

Chicanes may be considered on residential streets where:

- There is a high volume of high speed cut-through traffic
- Children frequently walk or bicycle to and from school
- A comprehensive neighborhood traffic calming program is present, particularly in neighborhoods
- Other traffic calming measures have been implemented

various users of a street—from pedestrians and bicyclists to emergency vehicles and large trucks—considering the volume and frequency of these various users. The design vehicle should be selected according to the types of vehicles using the intersection with considerations to relative volumes and frequencies. The designer should balance designing for a larger vehicle versus accommodating the needs of large vehicles, which may allow encroachment into another lane. A typical curb radius of 20 feet (smaller radii may be considered) should be used wherever possible including where:

- There are higher pedestrian volumes
- There are few larger vehicles
- Bicycle and parking lanes create a larger effective radius.

Factors that may affect the curb radii must be taken into consideration:

- The street type
- The angle of the intersection
- Bump-outs
- The number and width of receiving lanes
- Large vehicles
- Effective turning radius

## BUMP-OUTS

Bump-outs (or curb extensions) are created by extending the sidewalk or curb line into the roadway. Bump-outs are intended to improve lines of sight and may improve safety and provide extra space along sidewalks for pedestrians and amenities such as street furniture.

## APPLICABILITY AND USE

- Bump-outs shorten crossing distances (exposure time) and increase visibility between roadway users: the waiting pedestrian can better see approaching traffic and drivers can better see pedestrians waiting to cross the road.
- Bump-outs calm traffic, particularly for right turning vehicles.

- This treatment is particularly valuable in locations with high volumes of pedestrian traffic. Bump-outs can be located at intersections or at mid-block pedestrian crossings.
- Bump-outs should only be considered where on-street parking is present.
- They cannot be used along arterials that have peak-hour parking restrictions to move traffic more efficiently.
- They may provide space for ADA compliant, directional curb ramps where sidewalks are narrow.
- They may be used at transit stops (i.e., bus Bump-outs) to increase transit stop waiting area capacity and facilitate in-lane stopping of transit vehicles.
- They may provide space for utilities, signs and amenities such as bus shelters or waiting areas, bicycle parking, public seating, public art, street vendors, newspaper stands, trash and recycling receptacles, and green infrastructure elements.



*Bulbouts at intersections or mid-block help shorten pedestrian crossings and visually narrow the roadway*

## DESIGN

- The turning needs of larger vehicles should be considered in Bump-outs design.
- When Bump-outs conflict with turning movements, they may be installed on only one side of a crossing, rather than eliminated.

## TRAFFIC CALMING CASE STUDY

### CITY OF SUNNYVALE CALIFORNIA NEIGHBORHOOD TRAFFIC CALMING – CANARY DRIVE

Canary Drive is located in the southern portion of Sunnyvale and connects an arterial roadway with a residential connector. Canary Drive became a popular cut-through as traffic and congestion built up on these adjoining roadways. The neighborhood's main concern was speed of traffic and unsafe driving (passing, tailgating) along the route which had a posted speed limit of 25 mph and a junior high school and city park located along it. The City collected data which showed the average daily volume was 1200 vehicles per day and the 85th percentile speed was 35 mph, 10 mph over the posted limit.

Initial mitigation measures included posting additional police enforcement to monitor speeding, additional speed limit signage, and striping the roadway with a double yellow stripe. The final design solution included the installation of the following traffic calming measures: an entry/exit median island, a rubber speed hump, and a mini traffic circle.

One month after implementation of the traffic calming measures, the speed monitoring data showed that the 85th percentile speed had been reduced to 26.5 mph. Neighborhood response from residents on Canary has been positive and over 75% of residents approve of the plan and its success.

The community learned several lessons about the process from this project:

- Police Enforcement is not the cure for all for speeding issues.
- Traffic Engineering and Police Departments need to work closely together to be effective.
- Police and Fire should be informed and approve of any plans.
- Keep neighborhood informed throughout the project.
- Educate residents on advantages and disadvantages of each traffic calming measure.
- Encourage neighborhood participation in all stages of study. Neighborhood buy-in is key.





- Minimum bump out width is 6 feet.
- Bump-outs should generally be 1 foot narrower than the parking lane to not encroach upon a travel lane or bicycle lane. The bump out should be sized so that the gutter pan joint is outside of the bike lane.
- The minimum length of a bump out shall be the width of the crosswalk, allowing the curvature of the bump out to start 5' after the crosswalk. The overall length of a bump out can vary depending on the intended use (i.e., stormwater management, bus bump out, restrict parking) and potential for sight line improvement.
- The angled portion of the bump out should be 30 degrees from the main curb line with 5-foot radii.
- Bump-outs may also impact underground utilities, curbside parking, delivery access, garbage removal, and street sweepers. These impacts should be evaluated when considering whether to install a bump out.
- Bump out installation may require the relocation of existing storm catch basins which can increase costs substantially. Catch basins should be centered at least 5 feet from the beginning of the bump out.
- Placing Bump-outs at corners with fire hydrants can also help to ensure fire access is not blocked by parked cars.

## ACCESS MANAGEMENT OVERVIEW

Access management is a transportation approach that continues to grow in popularity throughout the United States. This popularity has occurred because access management techniques, when applied properly, can improve safety and vehicle mobility. The mainstream of the practice, however, has developed primarily within rural and suburban communities where goals of increasing vehicle speeds and reducing congestion are overriding concerns. Within cities, these concepts can often be misapplied and cause more harm than good to the urban environment. It is imperative, therefore, that a region such as CAMPO have a set of tailored access management strategies that recognize the region's unique context and goals.

A major challenge in street design is balancing the number of access points to a street. There are many benefits of well-connected street networks, however, most conflicts

between users occur at intersections and driveways. The presence of multiple driveways in addition to the necessary intersections creates many conflicts between vehicles entering or leaving a street and bicyclists and pedestrians riding or walking along the street. When possible, the number of new driveways should be minimized and existing driveways should be eliminated or consolidated. Where possible, raised medians should be placed to limit left turns into and out of driveways and reduce potential conflicts.

Access management through limiting driveways and providing raised medians has many benefits:

- The number of conflict points is reduced, especially by replacing center-turn lanes with raised medians since left turns by motorists account for a high number of crashes with bicyclists and pedestrians.
- Pedestrian crossing opportunities are enhanced with a raised median.
- Universal access for pedestrians is easier, since the sidewalk is less frequently interrupted by driveway slopes.
- Fewer driveways result in more space available for higher and better uses.
- Improved traffic flow may reduce the need for road widening, allowing part of the right-of-way to be recaptured for other users.

The following possible effects of access management should be considered and addressed:

- Streamlining a street may increase motor vehicle speeds and volumes, which can be detrimental to other users.
- Reduced access to businesses may require out-of-direction travel for all users, including walkers and bicyclists.
- Concrete barriers and overly-landscaped medians act as barriers to pedestrian crossings. Medians should be designed with no more than normal curb height and with landscaping that allows pedestrians to see to the other side.
- Adjacent land uses can experience decreased access. This can impact businesses as well as residents. Careful planning of access management must consider this.

Where angle parking is proposed for on-street parking, designers should consider the use of reverse-in angle (or front out) parking in place of front-in angled parking. Motorists pulling out of reverse-in angled parking can

better see the active street they are entering. This is especially important to bicyclists. Moreover, people exiting cars do so on the curb side and aren't likely to step into an active travel lane.



*Head-out angled parking provides direct sight lines for motorists to see other vehicles and bicyclists*

Another tool for on-street parking is the park assist lane. Often when on-street parking is provided on busy roads, drivers find it difficult to enter and leave their parked vehicle. Where space is available, consideration should be given to adding a park assist lane between the parking lane and travel way to provide 3 feet of space so car doors can be opened and vehicles can enter or depart with a higher degree of safety and less delay. Bike lanes can serve this function as well. Parking assist lanes also narrow the feel of the travel lane and slow traffic.

It is also imperative that access management consist of more than just access denial. In many cases, designers mistakenly believe that simply adding a median along a corridor to prevent left turns is the extent of access management. As envisioned in CAMPO, access management is a much more complete system of community mobility creation and management. The following are a set of basic access management principles that should be followed when designing high capacity corridors in CAMPO:

1. **Assure a Supporting Street and Circulation System:** Well-planned communities provide a full network of local, collector, and primary streets to accommodate circulation and access to land uses. Interconnected street networks support all modes of transportation

and provide mobility for bicyclists, pedestrians, and drivers.

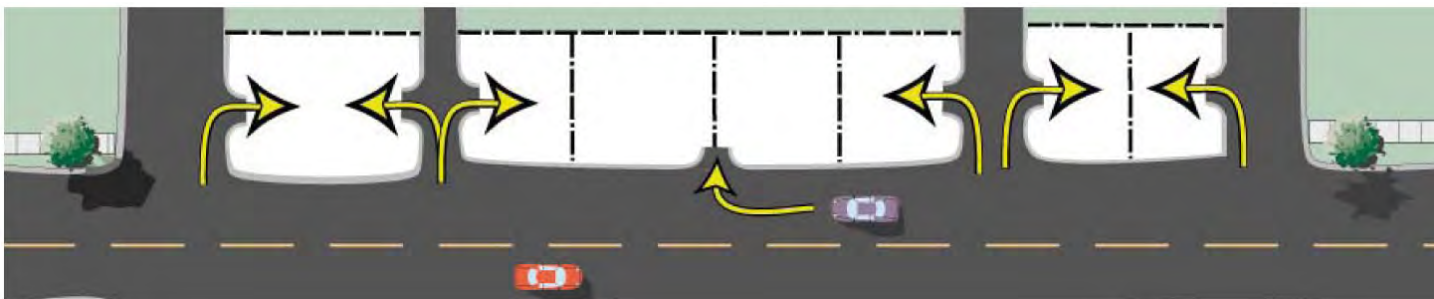
2. **Manage Conflict Points:** Drivers make more mistakes and are more likely to have collisions when they are presented with more conflict points than necessary. A less complex environment is accomplished by limiting the number and type of conflicts between all users and by providing clear and simple directions to them. Drivers, in particular, need sufficient time to address one set of potential conflicts before facing another. The necessary spacing between conflict areas increases as travel speed increases, to provide drivers adequate perception and reaction time.
3. **Promote Intersection Hierarchy:** CAMPO's transportation network should provide effective transitions from one type of facility to another. The areas close to an intersection are critical to its safe operation and should be simplified to provide clear and visible guidance to all users. For example, on-street parking or driveway access connections too close to intersections can cause serious conflicts that result in crashes and congestion. Proper spacing of intersections and signals on major streets enhance the ability to coordinate signals and create adequate and safe movement opportunities for bikes and pedestrians.
4. **Limit Direct Access to Primary Streets (Based on Scale):** Streets that serve higher volumes of regional through traffic and have greater numbers of vehicle travel lanes may need more access control to preserve their function. Frequent and direct driveway access is more compatible with the function of local and collector roadways. At the greatest extreme, commercial strip development with separate driveways for each business forces even short trips onto arterial roadways, thereby reducing safety and impeding mobility. The spacing of intersections and long-term elimination of driveways on major streets will likely be a key part of an access management strategy.
5. **Strategically Manage Turning Vehicles:** Provide non traversable medians and other techniques that minimize left turns. Medians channel turning movements on major roadways to controlled locations and left turning lanes can provide a protected area for turning vehicles on high vehicular volume streets. This may reduce the severity and duration of conflict between turning vehicles and through traffic and improve the safety of some intersections.

It is worth noting that none of the above principles assume that automobile speeds are a primary expected outcome. The application of these principles, like all other design processes described within this Pattern Book, must take into account the goals of the particular neighborhood and context. Sometimes these goals may include improving automobile throughput on a given corridor; in other cases the safety of bikes and pedestrians may be paramount; in yet others, an improved commercial environment along a street may be primary.

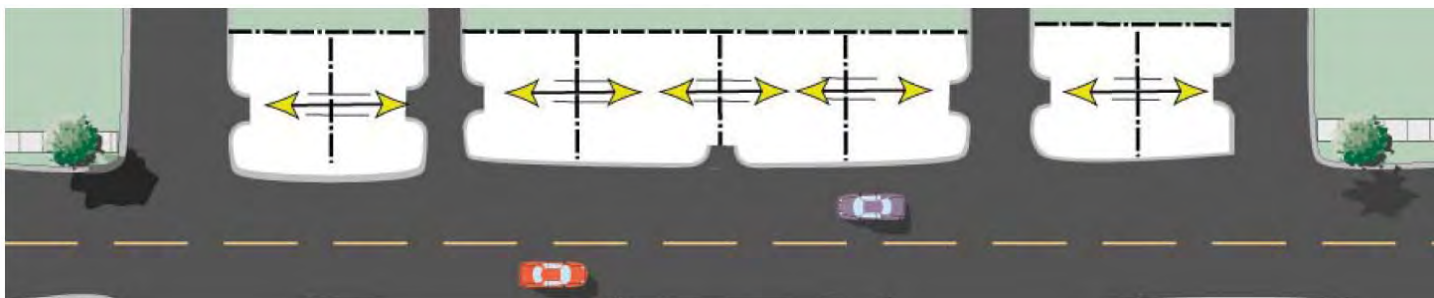
Building a complete network of streets with a well-planned hierarchy is always the best option. Sometimes, however, we are forced to make decisions regarding the retrofit of communities for whom reality has overtaken initial planning assumptions. Issues such as property rights, neighborhood “cut-throughs” and relative costs can all make the creation of effective network a daunting task. The following are some tools that might be used in retrofit areas where the creation of a full network might be a challenging or long term proposition.

## SUPPORTING NETWORK

Connected street networks are critically important to design. While this Pattern Book describes how particular streets will be configured to serve their users, the application of design criteria rely on many system-wide factors such as how thoroughly a network of streets is connected. Smaller block sizes (along with building to the street and utilizing rear access) are design patterns that best utilize valuable land efficiently. These patterns have the additional advantages of making walking easier and keeping traffic off of already busy streets. Generally, smaller blocks add travel alternatives and spare main roads and intersections from carrying all of a region’s traffic, but they also provide many advantages to multimodal transportation concerns and parking. Network, as characterized by regular intersections, turning opportunities, and redundant paths, actually generates efficiency and enriches a transportation system’s effects on the community it serves in a number of ways:



**Shared Driveways** - The concept of shared driveways encourages access along the side street for corner parcels and joint access driveways when side street access is not available.



**Cross-Access Connections** - Cross-access connections allow motorists to complete short trips between adjacent uses without having to return to the primary arterial. Connections are provided through aisles and alleys that connect adjacent parcels and parking lots to one another. By minimizing the number of vehicles turning off and onto the arterial, through traffic is able to flow in a more efficient manner. In addition, cross-access connections that are coordinated and well planned may begin to form a second parallel roadway.



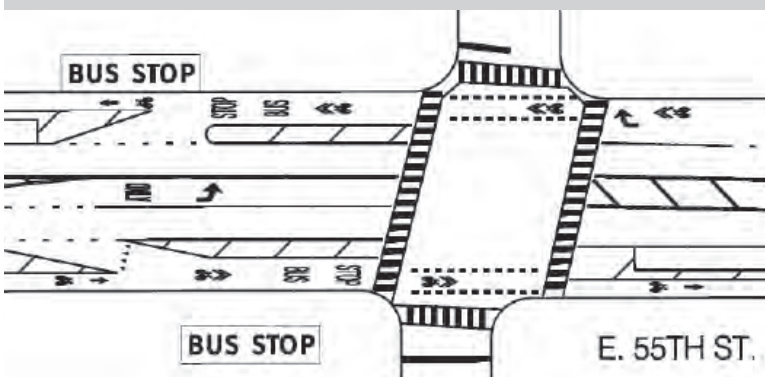
## BUS STOP CASE STUDY

### DESIGNING FOR BUS STOPS AND SEPARATED BICYCLE LANES – CHICAGO ILLINOIS

The Chicago Transit Authority (CTA) has a primary bus route along the 55th Street corridor, with headways ranging from 5 to 20 minutes throughout the day. The city coordinated extensively with the CTA on the design of the road diet project that resulted in one-way separated bicycle lanes being installed along it. The overall design and layout of the bus stops in coordination with the separated bicycle lanes was a critical issue to maintain efficient bus operation.

The 55th Street Road Diet experienced the following results after installation.

- Speeding had been an issue on the corridor prior to the road diet, but since the conversion, drivers have been closely adhering to the 30 mph speed limit.
- One business owner was concerned about losing on-street parking spaces, but overall he felt that cars were driving slower now and he saw the bicycle lane as an important addition.
- According to a city engineer, the road diet has made it easier for pedestrians to cross 55th Street at intersecting roadways.
- The community expressed that the road diet has benefited livability. Since 55th Street runs along the University of Chicago campus, the addition of bicycle lanes was a great advantage to students, staff, and visitors



## TRANSIT STOPS OVERVIEW

Providing safe and comfortable walking and bicycling connections to transit stations and bus stops allows non-drivers to increase the distances they can conveniently travel and increases the effectiveness of transit. Bikes-on-Buses and expanded short- and long-term bicycle parking at transit stations can encourage first-mile/last-mile bicycle connections to transit. Connecting transit stops and stations with a network of trails, sidewalks, and bicycle facilities is an important element of an active transportation network. Safe and convenient routes that serve pedestrians and bicyclists should be viewed as essential support strategies in increasing transit ridership.

Planning for first mile/last mile connections should consider:

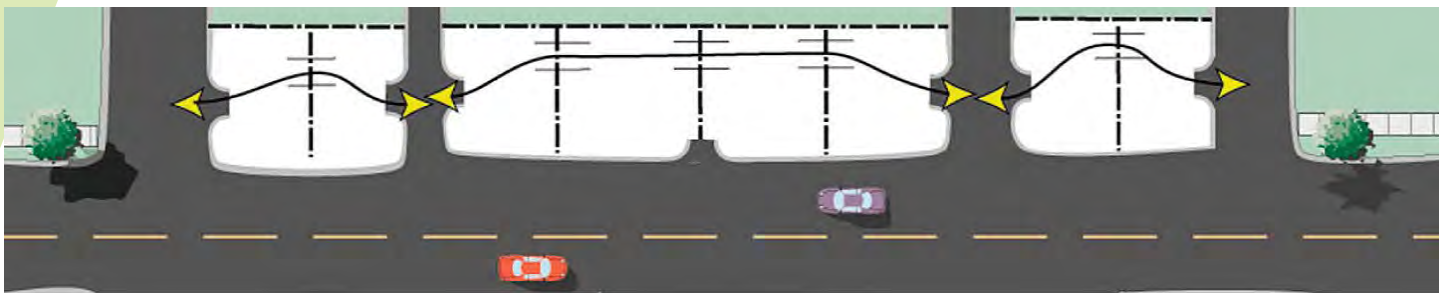
- Bicycle access on transit vehicles, including bikes-on-buses
- Low-stress pedestrian and bicycle routes to transit stations and stops
- Direct bicycle access (without dismounting) to long-term, short-term, and sheltered bike parking

Sidewalks provide space for passengers to wait at bus stops and accommodate bus shelters and other transit stops. Shelters and other features improve operations, ridership and the value of transit to the community.

## DESIGN

All transit stops should be fully ADA accessible for passengers. Transit stops may also be located on curb extensions and floating islands where on-street parking is present.

The area on the sidewalk where passengers load and unload at bus doors is called the landing zone (also known as the landing pad), which should be free from all obstructions including sign posts and bus stop amenities. The landing zone should be a minimum of 5 feet wide and 8 feet deep.



**Cross-Access Connections** - Reverse “frontage road” provides cross access easements in the rear of the parcels, creating a second parallel roadway. Wherever possible, access is provided from the side street instead of the primary arterial. By encouraging driveway access from the side street, the number of “friction points” along the primary arterial is drastically reduced.

A well placed and configured transit stop offers the following characteristics:

- Clearly defines the stop as a special place
- Provides a visual cue on where to wait for a transit vehicle
- Does not block the path of travel on the adjacent sidewalk
- Allows for ease of access between the sidewalk, the transit stop, and the transit vehicle



*Floating transit stop in Seattle gives separation for buses and bicyclists and provides refuge for transit riders to wait*

## CONSIDERATIONS

- Consolidate streetscape elements to create a clear waiting space and minimize obstructions between the sidewalk, waiting area, and boarding area
- Use special paving treatments or curb extensions (where there is on-street parking) to distinguish transit stops from the adjacent sidewalks
- Integrate transit stops with adjacent activity centers whenever possible to create active and safe places
- Avoid locating bus stops adjacent to driveways, curb cuts, and land uses that generate a large number of automobile trips (gas stations, drive-thru restaurants, etc.)

Transit stops are required by the Americans with Disabilities Act (ADA) to be accessible. Specifically, ADA requires a clear loading area (minimum 5 feet by 8 feet) perpendicular to the curb with a maximum 2 percent cross-slope to allow a transit vehicle to extend its lift to allow people with disabilities to board. The loading area should be located where the transit vehicle has its lift and be accessible directly from a transit shelter. The stop must also provide 30 by 40 inches of clear space within a shelter to accommodate wheelchairs. The greater use of low-floor transit vehicles may make this requirement moot; but it will still be necessary to provide enough room so wheelchair users can access all doors.

# DRIVEWAYS

## OVERVIEW

Numerous areas in the CAMPO region developed during an era of suburbanization when the provision of driveways for each parcel was in vogue. This type of access creates safety issues for drivers, pedestrians and bicyclists and results in unnecessary delays for automobiles. While the region has largely discontinued these practices for new development, there are numerous areas where retrofit consolidation of driveways will be necessary. The following are some approaches that can be utilized to maintain access while creating more effective networks.

Driveways provide access to properties from public streets. Driveways occur wherever there are land uses that require vehicle access from the street network. Driveways often cross sidewalks, bike and parking lanes, and affect moving traffic. These crossings can create conflicts between various users. To the extent possible, the number of driveways should be minimized, particularly along commercial corridors, in order to minimize conflicts. As an access management principle, driveways should be avoided within the functional area of an intersection to reduce the potential for conflicts with turning vehicles and pedestrians in the crosswalk.

## DESIGN

As a general rule, driveways should be designed to look like driveways, not roadway intersections, and incorporate the following design principles:

- Sidewalks should be continuous across driveways at a continuous grade and cross-slope. The driveway flares should be contained within the boulevard space and not intrude on the pedestrian travel way.
- The pedestrian zone should be consistent with ADA guidelines to ensure that all pedestrians using wheeled mobility devices can safely cross the driveway.
- A standard driveway has a 4 foot flare on each side to prevent high speed turning movements.
- Driveway width should be minimized to the extent appropriate for traffic conditions, use, type and location.
- Driveways should be located outside the functional area of the intersection, with an absolute minimum of 100 feet from intersections in commercial corridors and 40 to 60 feet in residential corridors.
- The functional area of an intersection includes areas upstream and downstream of the intersection. In contrast with the physical area of an intersection, the functional area varies depending on several site specific variables including: amount of queuing at an intersection; distance traveled during perception-reaction time; and deceleration distance.
- In locations where a driveway must function as a leg of an intersection, it should be designed with pedestrian safety features such as crosswalks, small corner radii, and pedestrian signal indications if part of a signalized intersection.
- Truncated domes should not be used where driveways cross the sidewalk zone unless the driveway is functioning as a leg of an intersection and curb ramps are present.
- Site obstructions (signs, landscaping, decorative fencing, signal boxes, building features etc.) should be carefully located to maximize visibility between turning motorists and pedestrians at driveways.

# BRIDGE DESIGNS

## OVERVIEW

There are several opportunities within the CAMPO region to add additional network by connecting streets across barriers with new bridge structures. These barriers may be natural features like waterways or nature preserves and sensitive areas, or may be manmade and large roadways or highway crossings. Adding grade separated crossings over these barriers for all modes of transportation will help alleviate congestion by providing a sustainable and resilient street network. Removing the gaps in the system and opening up the network's full potential will constrain traffic growth on individual streets by limiting the number of lanes needed on each street, while providing maximum travel options through collectively providing more lanes across the network overall.

## DESIGN

Bridge designs that complete street networks come in many forms, but have the following overarching principles in common. Bridge designs should:

- Shape and respond to the natural and built environment.
- Prioritize trips by foot and bike and accommodate these uses with dedicated space.



- Prioritize locations and connections to the adjacent street networks in order to accommodate pedestrians, since they are in need of the most direct route.
- Work in harmony with other transportation networks, such as pedestrian, bicycle, transit, and vehicle networks. Large parts of all of these networks coincide with the street network, but if any parts are separate from the proposed bridge network, they must connect and interact with the bridge.
- Protect, respect, and enhance CAMPO's natural features and ecological systems.

## CONSIDERATIONS

- The bridge designs should enhance the community character. The design of the bridge should reflect the area that it goes through while maintaining elements that give the bridge a unique appearance and identity.
- The bridge should provide direct linkages to adjoining neighborhoods, businesses, institutions, and other community destination points for transit riders, bicyclists, and pedestrians.
- The bridge design should incorporate public art and decorative lighting, so that the new bridges will become locations for both identity elements and discovered elements.
- The bridge locations should connect major green open spaces and parks to create a long term network of open park space that can develop into a comprehensive connected park system.
- Landscape plantings and buffering should be used as needed to provide screening for the adjacent communities from the bridge and any adjacent uses.



## CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

In order to attract users and create a pleasant walking or biking experience, safe infrastructure is paramount. Off-road trails and separated bicycle lanes are the gold standard for safety. The growing popularity of trails and urban bicycle facilities are creating a shift from seeing bicycle facilities as “nice to have” to being “critical community assets”. As bicycle networks expand in response to this shift, safety should be top of mind for planners. A well-used and thoughtfully designed bicycle or pedestrian facility is a safe facility. The success and usefulness of a facility can be directly tied to crime prevention and perceptions of safety just as much as statistical safety.

Studies have shown that trails, sidewalks, and bike lanes themselves do not generate crime. However in many communities, crime and safety are serious, pervasive issues, and even the perception of a lack of safety may influence bicycle/pedestrian facility use. The concept of Crime Prevention through Environmental Design (CPTED) refers to a multi-disciplinary approach of deterring criminal behavior through environmental design in which a collaborative process is used by planners, community members and law enforcement officials during the planning, building and programming of a facility. CPTED takes into account all potential users' perceptions of what a safe place is and pairs it with proven design and programming standards that reduce the risk of criminal behavior, including:

- Maintenance of open sight lines along the facilities
- Provision of adequate lighting
- Connections to well used community destinations
- Provision of clear signage so users know and can report their location in an emergency
- Regular patrols by law enforcement
- Ensuring any off-street facility is included and recognized in the 911 emergency locator system
- Marketing and programming that is attractive to residents and visitors

Community outreach and facility programming can be the most effective deterrent to crime and negative perceptions of safety. When communities host events on facilities they become shared spaces which hold value. Volunteer service days, neighborhood picnics, and educational tours are just some of the programming

and outreach elements that help foster a shared sense of ownership of a trail, sidewalk, or bike facility. The community should be involved in the design process to influence amenities that attract a diversity of users. Such amenities may include but are not limited to:

- Public gathering spaces
- Fitness stations
- Sport fields
- Playgrounds
- Public art
- Benches and rest areas
- Community gardens
- Water stations
- Interpretive signage
- Access points at residential and commercial areas



*Crime Prevention Through Environmental Design is a design approach to deterring crime with small and large scale interventions to get “eyes on the street” and influence offender decisions that precede criminal acts.*

# CHAPTER 4

## INTERSECTIONS AND CROSSINGS

Intersections are places where a high level of activity occurs and there is great potential for conflict. They are transportation hubs that must move people and goods as safely and efficiently as possible in sometimes complex and challenging environments. Intersections must be safe, accessible, and multimodal nodes that balance the needs of all users and enhance the quality of life. The majority of motor vehicle crashes involving bicycles and pedestrians occur at intersections, so safe design is imperative. The completion of CAMPO's bicycle system will require that continuity through difficult intersections (complicated geometries and large stretches between approaching and departing legs, etc.) be provided.





## CORNERS AND CURB RADII

The AASHTO Green Book provides guidance on turn radii at corners for different types of vehicles (large trucks, school buses, etc). However, designing for the largest vehicle that might use an intersection results in large curb radii that can encourage drivers to make higher speed turns, lengthen crossing distances for pedestrians, and leave less space for sidewalks and other uses. Where large vehicles need to be accommodated, designers should consider the following factors to increase the effective curb radius without increasing the actual, physical curb radius:

- Cross-street lane width. On streets with heavy bus or truck traffic, wider lanes may be needed to provide adequate turning space while maintaining a tight corner radius.
- However, on streets with moderate heavy vehicle traffic, designs that assume the turning vehicles will encroach into the opposite travel lane on the receiving street may be acceptable.
- Placement of stop lines on non-divided cross-streets. On cross-streets where traffic volumes do not create pressure to locate vehicle stop lines as close to the intersection as possible, moving the stop line back from the intersection can add cushion space for large vehicles to make right or left turns.



*Flush crossing with textured vehicular ramps and color contrast between vehicular and pedestrian zones*

- On-street parking or near-side bus stops. Multiple travel lanes, space used for buses, bike lanes and on-street parking can help a large vehicle make a wider turn at an intersection, especially when coupled with the ability to bend outside of the immediate lane width on the street receiving the turn movement. The diagram in Figure 36 illustrates this concept. The curb radius allows shorter crossing distances for pedestrians, while, the effective radius defines the path that vehicles may follow from one travel lane to another. In this example, on-street parking allows vehicles to navigate a wider path without colliding with the corner curb. This is important with large trucks and other heavy vehicles as it can keep a smaller radius and give pedestrians a shorter crossing distance.

## CURB EXTENSIONS

### OVERVIEW

Curb extensions, also known as neckdowns, bulb-outs, or bump-outs, are created by extending the sidewalk at corners or mid-block. Curb extensions are intended to increase safety, calm traffic, and provide extra space along sidewalks for users and amenities.

Curb extensions have a variety of potential benefits including:

- Additional space for pedestrians to queue before crossing
- Improved safety by reducing motor vehicle speeds and emphasizing pedestrian crossing locations
- Less pedestrian exposure to motor vehicles by reducing crossing distances
- Space for ADA compliant curb ramps where sidewalks are too narrow
- Enhanced visibility between pedestrians and other roadway users
- Restricting cars from parking too close to the crosswalk area
- Space for utilities, signs, and amenities such as bus shelters or waiting areas, bicycle parking, public seating, street vendors, newspaper stands, trash and recycling receptacles, and planting, and landscape elements

## CURB EXTENSION CASE STUDY

### PEDESTRIAN SAFETY IMPACTS OF CURB EXTENSIONS – ALBANY OREGON

In 2003, the Town of Albany installed curb extensions, continental markings and advance stop bars at several uncontrolled intersections along the U.S. Highway 20 one-way couplet.

At the intersection of 4th Avenue and Lyon Street, the nearside crosswalk had a curb extension on only one side of the street, thus allowing for an analysis of motorist behavior toward pedestrians crossing from either the side with the curb extension or the side without. The findings of this study suggest that curb extensions contribute to a significant reduction in the average number of vehicles that pass a waiting pedestrian before yielding to the pedestrian. Pedestrians approaching from the curb extension side experienced a vehicle yielding sooner than those coming from the non-improved side of the crosswalk. This reduction in the average number of passing vehicles yielding is best explained by the increased visibility offered by the curb extension.



## DESIGN

- Curb extensions should be considered only where parking is present or where motor vehicle traffic deflection is provided through other curbside uses.
- Curb extensions are particularly valuable in locations with high volumes of pedestrian traffic, near schools, at unsignalized pedestrian crossings, or where there are demonstrated pedestrian safety issues.
- A typical curb extension extends the approximate width of a parked car, or about 6' from the curb.
- The minimum length of a curb extension is the width of the crosswalk, allowing the curvature of the curb extension to start after the crosswalk which should deter parking; NO STOPPING signs should also be used to discourage parking. The length of a curb extension can vary depending on the intended use (i.e., stormwater management, transit stop waiting areas, restrict parking).
- Curb extensions should not reduce a travel lane or a bicycle lane to an unsafe width.
- Curb extensions at intersections may extend into either one or multiple legs of the intersection, depending on the configuration of parking.
- Street furniture, trees, plantings, and other amenities must not interfere with pedestrian flow, emergency access, or visibility between pedestrians and other roadway users.
- Curb extensions may be located at corners or midblock locations.

## CONSIDERATIONS

- The turning needs of larger and emergency vehicles should be considered in curb extension design.
- Care should be taken to maintain direct routes across intersections aligning pedestrian desire lines on either side of the sidewalk. Curb extensions often make this possible as they provide extra space for grade transitions.
- Consider providing a 20' long curb extension to restrict parking within 20' of an intersection.
- In order to move traffic more efficiently, curb extensions should not be installed on arterials with peak hour parking restrictions.

- When curb extensions conflict with turning movements, the width and/or length should be reduced rather than eliminating the extension wherever possible.
- Emergency access is often improved through the use of curb extensions as intersections are kept clear of parked cars.
- Curb extension installation may require the relocation of existing storm drainage inlets and above ground utilities. They may also impact underground utilities, parking, delivery access, garbage removal, and street sweepers. These impacts should be evaluated when considering whether to install a curb extension.

## CROSSING ISLANDS OVERVIEW

As the number of travel lanes increases, pedestrians feel more exposed and less safe entering the intersection. Crossing islands are raised islands that provide a pedestrian refuge for crossing multilane roadways. They enable pedestrians to find gaps in traffic and allow a two stage crossing movement. At mid-block crossings, islands should be designed with a stagger, or in a “z” pattern, forcing pedestrians to face oncoming traffic before progressing through the second phase of the crossing. When these crossings are installed, education should be provided to pedestrians who are blind and visually impaired to orient them to the new design. Pedestrian education programs should be implemented to teach about the new standard.



*Mid-block crossing with a marked crosswalk and “z” pattern island refuge*



## STREET CROSSING CASE STUDY

### PEDESTRIAN CROSSING AT MARYVALE HIGH SCHOOL – PHOENIX ARIZONA

The City of Phoenix is committed to improving pedestrian safety for all residents and visitors through continued application of sound engineering, educational and enforcement techniques. The City is committed to an overall 10% reduction in pedestrian crashes, injuries and deaths. The City prioritized locations based on the posted speed limit, presence of a school, crash history, lighting conditions, and pedestrian and traffic volumes.

One of the selected locations was at the Clarendon Street intersection at the Maryvale High School. Because this was an unsignalized crossing area, the City installed a painted crosswalk and a H.A.W.K. signal to increase visibility, yielding behavior, and create a safer pedestrian crossing environment.



## DESIGN

Crossing islands should:

- Be used in locations where there is a demand for pedestrians to cross the road, but where the numbers of pedestrians are not high enough to warrant a signalized pedestrian crossing.
- Include at-grade pedestrian cut-throughs as wide as the connecting crosswalks, detectable warnings, and be gently sloped to prevent standing water and ensure adequate drainage.
- Be at least 6' wide, preferably 8–10'. Where a 6'-wide median cannot be attained, a narrower raised median is still preferable to nothing. The minimum protected width is 6', based on the length of a bicycle or a person pushing a stroller. The refuge is ideally 40 feet long.
- Accommodate turning vehicles. Crossing islands at intersections or near driveways may affect left-turn access.
- Have a "nose" which extends past the crosswalk. The nose protects people waiting on the crossing island and slows turning drivers.
- Include curbs, bollards, or other features to protect people waiting.
- Include street lights, signs, or reflectors to highlight or illuminate islands and ensure that motorists see them.
- Be enhanced using plantings or street trees. Plantings may require additional maintenance responsibilities and need to be maintained to ensure visibility.

## CONSIDERATIONS

- Crossing islands should be considered where crossing distances are greater than 50'.
- To guide motorists around crossing islands, consider incorporating diverging longitudinal lines on approaches to crossing islands.
- If there is enough width, center crossing islands and curb extensions can be used together to create a highly visible pedestrian crossing and effectively calm traffic.
- Where possible, stormwater management techniques should be used on crossings islands

with adequate space. Plantings should be low growing to maximize visibility and ideally should require minimum maintenance.

## RAISED CROSSINGS AND INTERSECTIONS

### OVERVIEW

Raised crossings and intersections create a safe, slow-speed crossing and additional public space at minor intersections. They are created by raising the level of the roadway to the same level as the sidewalk. Raised intersections are a similar concept to speed tables, but are applied to the entire intersection. These treatments provide an array of benefits especially for people with mobility and visual disabilities because there are no vertical transitions to navigate.

Raised crossings and intersections:

- Make it physically more difficult for drivers to go through crossings and intersections at unsafe speeds.
- Improve drivers' awareness by prioritizing pedestrian crossings and helping define locations where pedestrians are expected.
- Eliminate standing water and debris collection at the base of ramps.
- Increase visibility between drivers and pedestrians by raising pedestrians in the motorists' field of vision and give pedestrians an elevated vantage point from which to look for oncoming traffic.
- Create pedestrian crossings which are more comfortable, convenient and accessible since transitioning between the sidewalk and roadway does not require negotiating a curb ramp.

### DESIGN

- Raised crossings and intersections are appropriate in areas of high pedestrian demand. They should also be considered in school zones and locations where pedestrian visibility and motorist yielding have been identified as concerns.
- Care should be taken to maintain direct routes across intersections aligning pedestrian desire lines on either side of the sidewalk.

## RAISED INTERSECTION CASE STUDY

### RAISED INTERSECTION DESIGN FOR REVITALIZATION – WEST PALM BEACH FLORIDA

By 1993, the downtown area of West Palm Beach was considered to be a quintessential blighted community and unpleasant for pedestrians. Roughly 80 percent of downtown property was vacant, crime rates were high, and the wide multi-lane, one-way streets were designed so that drivers could move quickly through town without having to stop. At the time, the City was also \$10 million in debt and had only \$6,000 in capital reserves.

West Palm Beach wanted to rejuvenate its economy and community by redesigning downtown to accommodate and attract pedestrians. In 1993 Mayor Nancy Graham turned her focus to an ambitious downtown revitalization, including traffic calming measures to attract pedestrians.

In the heart of the downtown area, a critical intersection was rebuilt as a raised intersection, emphasizing the pedestrian priority. Clematis Street was converted from a three-lane, one-way street with parking to a two-lane, two-way street with parking. Mid-block narrowings, intersection curb extensions/bulb-outs, a raised intersection and streetscaping reduced the physical and visual road width of Clematis Street resulting in slower vehicle traffic, a shorter pedestrian crossing distance, wider sidewalks, and a general softening of the street's appearance. Other improvements to public space were also made including a new plaza.

Today, the area has an 80 percent commercial occupancy rate and pedestrian activity has increased tremendously since the beginning of the revitalization effort. Property values increased by more than six times their value before the improvements. The City is now planning to create a 24-hour downtown by encouraging new mixed use and residential development to enhance the pedestrian-orientation of the area.





- Raised crossings can be provided along side streets of major thoroughfares to slow traffic exiting the main street.
- Raised crossings should provide pavement markings for motorists and appropriate signage at crosswalks per the MUTCD.
- Design speeds and emergency vehicle routes must be considered when designing approach ramps.
- Raised crossings and intersections require detectable warnings at the curb line for persons with visual disabilities.

## CONSIDERATIONS

- Raised crossings are particularly valuable at unsignalized mid-block locations, where drivers are less likely to expect or yield to pedestrians.
- Raised intersections and crossings can be used as gateway treatments to signal to drivers when there are transitions to a slower speed environment that is more pedestrian-oriented.
- High-visibility or textured paving materials can be used to enhance the contrast between the raised crossing or intersection and the surrounding roadway.



Standard painted crosswalk with ADA compliant curb ramps

- Designs should ensure proper drainage. Raised intersections can simplify drainage inlet placement by directing water away from the intersection. If the intersecting streets are sloped, catch basins should be placed on the high side of the intersection at the base of the ramp.

## CROSSWALK DESIGN

Well-designed crosswalks are an important component of a pedestrian-friendly city. Safety for all pedestrians, especially for those with limited mobility and disabilities, is the single most important criteria informing crosswalk design.

## STANDARD CROSSWALKS OVERVIEW

The recommendation of this Pattern Book is to use the standard style crosswalk, with 8" wide stripes parallel to the path of travel. Textured pavement and colored crosswalks are discouraged, as they often fade over time and lack sufficient retro-reflectivity. For areas with high pedestrian traffic and locations with unsignalized crossings, crosswalks should be the high visibility ladder treatment. These would have the current parallel bars and add 24" bands every 24".

## DESIGN

- Crosswalks should be at least 10 feet wide or the width of the approaching sidewalk if it is greater. In areas of heavy pedestrian volumes, crosswalks can be up to 25 feet wide.
- Crosswalks should be aligned with the approaching sidewalk and as close as possible to the parallel street to maximize the visibility of pedestrians while minimizing their exposure to conflicting traffic.
- Designs should balance the need to reflect the desired pedestrian walking path with orienting the crosswalk perpendicular to the curb; perpendicular crosswalks minimize crossing distances and therefore limit the time of exposure .
- ADA-compliant curb ramps should direct pedestrians into the crosswalk. The bottom of the

ramp should lie within the area of the crosswalk (flares do not need to fall within the crosswalk).

- Stop lines at stop-controlled and signalized intersections should be striped no less than 4 feet and no more than 30 feet from the approach of crosswalks.

## CONSIDERATIONS

Legal crosswalks exist at all locations where two streets cross, including T-intersections, regardless of whether pavement markings are present. Motor vehicles are legally required to yield to pedestrians at intersections even when there are no pavement markings.

Crosswalks should be used only at locations where significant pedestrian activity is occurring or anticipated to help ensure that motorists associate crosswalk and pedestrian activity. Identify a location for a marked crosswalk by identifying desire lines and destinations such as schools, parks, civic buildings, retail areas, and transit stops. Then, identify where it is safest for people to cross. These observations should inform location and prioritization of crossing improvements.

Marked crosswalks help guide pedestrians to locations where they should cross the street as well as inform drivers of pedestrian movements. In addition to intersections, marked crosswalks are used in locations where pedestrians may not be expected, such as at mid-block crossings or uncontrolled crossings (crossings where motorists do not have signals or stop signs).

As with any installation of traffic control devices, the most essential tool for crosswalk installation is the use of engineering judgment. Engineering judgment should be used and, if applicable, an engineering study performed when considering the marking of crosswalks.

## MARKED CROSSWALKS AT CONTROLLED LOCATIONS

Intersection controls are one of the most important factors in intersection design. The goal of controlling intersections is to provide the safest, most efficient means to move people across an intersection, whether walking, riding a bicycle, taking transit, or driving. Specific attention should be given to vulnerable users, such as pedestrians and bicyclists.

Engineering judgment should be used to establish the

most appropriate controls on a site-specific basis. The following factors should be considered when determining intersection controls:

- Vehicular, bicycle, and pedestrian traffic volumes on all approaches
- Number and angle of approaches
- Approach speeds
- Sight distance available on each approach
- Reported crash experience

Depending on the type of intersection and the selected control devices, it may not always be appropriate to mark crosswalks at all legs of an intersection. Alternate treatments may be necessary to optimize safety and visibility, which are discussed in the sections that follow.



*Electronic pedestrian push button at traffic signal*

## MARKED CROSSWALKS AT STOP-CONTROLLED INTERSECTIONS

Stop-controlled approaches are easiest for pedestrians to cross because motorists and bicyclists must stop and yield the right of way to pedestrians. Stop-controlled intersections also help reduce pedestrian delay. However, the use of stop signs must balance safety with efficient

traffic flow for all modes, including bicycles and transit vehicles. Stop sign installation requires specific warrants be met as determined by the MUTCD.

For neighborhood residential streets, marked crosswalks should be used at locations where pedestrian crossings are more frequent, such as school walking routes, park entrances, or other locations. Stop lines should be striped at stop-controlled intersections no less than 4' and no more than 30' from the approach of crosswalks, unless determined otherwise by an engineering study.

## SIGNALIZED INTERSECTIONS

This Pattern Book's goal is to prioritize the safety, comfort, and convenience of all users at signalized intersections. All signalized intersections should contain indications for motor vehicles and pedestrians, in addition to signals for bicyclists and transit where appropriate. By optimizing signal phasing and timings, multiple modes are able to safely move through the intersection with limited conflicts, low delay, and more comfort.

## SIGNAL TIMING FOR PEDESTRIANS

### OVERVIEW

Signal timing for pedestrians is provided through the use of pedestrian signal heads. Pedestrian signal heads display the three intervals of the pedestrian phase:

The Walk Interval, signified by the WALK indication—the walking person symbol—alerts pedestrians to begin crossing the street.

The Pedestrian Change Interval, signified by the flashing DON'T WALK indication—the flashing hand symbol accompanied by a countdown display—alerts pedestrians approaching the crosswalk that they should not begin crossing the street. The countdown display alerts pedestrians in the crosswalk how much time they have left to cross the street.

The Don't Walk Interval, signified by a steady DON'T WALK indication—the steady upraised hand symbol – alerts pedestrians that they should not cross the street. The beginning of the Don't Walk Interval is called the Buffer Interval, which should be displayed for a minimum of a

three seconds prior to the release of any conflicting motor vehicle movements.

The total time for the pedestrian change interval plus the buffer interval is called the pedestrian clearance time, or the time it takes for a pedestrian to clear the intersection leaving at the onset of the DON'T WALK indication.

- Pedestrian signal heads should be provided at all signalized intersections for all crosswalks
- Install crosswalks on all legs of a signalized intersection unless it is determined to be unnecessary due to pedestrian travel patterns
- Signal timing for pedestrians should be provided at all newly constructed signalized intersections and incorporated into all signalized intersection improvements

For information on requirements for accessible pedestrian signals, see Accessible Pedestrian Signals later in this chapter.

The following design goals can help improve pedestrian crossing safety and comfort at signalized intersections:

- Reduce vehicle speeds
- Minimize crossing distance
- Minimize delay for WALK indication
- Minimize conflicts with turning vehicles
- Provide sufficient signal time to cross the street

### DESIGN

- Pedestrian signals should allocate enough time for pedestrians of all abilities to safely cross the roadway. The MUTCD specified pedestrian walking speed is 3.5 feet per second to account for an aging population. The pedestrian clearance time, which is the total time for the pedestrian change interval plus the buffer interval, is calculated using the pedestrian walking speed and the distance a pedestrian has to cross the street.
- Countdown pedestrian displays inform pedestrians of the amount of time in seconds that is available to safely cross during the flashing Walk Interval. All pedestrian signal heads should contain a countdown display provided with the DON'T WALK indication.
- In areas with higher pedestrian activity, such as



## PEDESTRIAN SIGNALS CASE STUDY

### SMART TRAFFIC SIGNAL SYSTEM IN NORTHERN VIRGINIA – RESTON, VA

The Northern Virginia District of the Virginia Department of Transportation oversees the District Smart Traffic Smart System which is focused on improving pedestrian accessibility, particularly for persons with disabilities. The explosive growth of the NOVA/Washington DC area has contributed to congestion and increased demand for multi-modal planning.

VDOT has implemented several measures under the Smart Traffic system. The first was the Rest-in-Walk Pilot Project in the planned, mixed-use community of Reston, VA. Reston Parkway, with an average of 29,000 vehicles per day, bisects the community and requires pedestrians traveling between several commercial village centers to cross a four-lane arterial road. At nine of the seventeen intersections, the walk indication displays were coordinated with the green signal, rather than requiring the pedestrian to activate it through a pushbutton system that resulted in up to a three minute wait. The intent was to reduce the number of pedestrians illegally and dangerously crossing the street out of frustration. These intersections are also now being considered for accessible pedestrian signal installation.

Second, an advanced pedestrian walk phasing was installed at a high-traffic intersection between an 8-lane arterial and a popular avenue. The advance display for the walk indication gives time for pedestrians to establish their presence in the crosswalk before being overtaken by right-turning vehicles. Third, a pedestrian countdown signal was installed at a busy regional hub for subway and bus transit. Fourth, an Accessible Pedestrian Signal (APS) featuring a locator tone, vibration and a verbal message indicating in which direction to cross for visually impaired persons was also installed. The location of the pushbutton was also moved to be more accessible. Due to strict demands for federally approved equipment, such improvements were previously not possible, and the project included efforts to break down institutional barriers. Three additional intersections are now identified to receive the same improvements.

The last measure undertaken was the installation of signing placards along an intensive business corridor spanning the length of Fairfax County. The eighteen placards clearly explain pedestrian signal operations to the diverse pedestrian population living along the corridor.

Constituents were pleased with the results of the initiatives, and several citizens were quoted as saying that the improvements have “made it much safer to get across.” Costs associated with the project were minimal, and more key intersections are scheduled for the future. Institutional barriers to implementing federally unapproved Accessible Pedestrian Signaling were relaxed to allow for more creative problem-solving.



near transit stops, along Main Streets, and in neighborhood centers, pedestrian push-button actuators may not be appropriate. Pedestrians should expect to get a pedestrian cycle at every signal phase, rather than having to push a button to call for a pedestrian phase.

- At more complex intersections (e.g., where there is more than one signal phase for each direction), where pedestrian volumes are lower, or uneven or variable volumes of users exist, push buttons should be provided. The responsiveness of the actuated signal should be as prompt as possible (as low as 5 seconds) based on the necessary transition time for approaching motorists to come safely to a stop.
- Along corridors where traffic signals are synchronized, they should be designed to meet target speeds to maintain safe vehicular travel speeds and discourage speeding.

## CONSIDERATIONS

- One of primary challenges for traffic signal design is to balance the goals of minimizing conflicts between turning vehicles with the goal of minimizing the time required to wait at the curb for a WALK indication.



*Rectangular rapid flashing beacon (RRFB) at a mid-block crossing*

- Intersection geometry and traffic controls should encourage turning vehicles to yield the right-of-way to pedestrians.
- Requiring pedestrians to wait for extended periods can encourage crossing against the signal. The 2010 Highway Capacity Manual states that pedestrians have an increased likelihood of risk-taking behavior (e.g., jay-walking) after waiting longer than 30 seconds at signalized intersections.
- Opportunities to provide a WALK indication should be maximized whenever possible. Vehicular movements should be analyzed at every intersection in order to utilize non-conflicting phases to implement Walk Intervals. For example, pedestrians can always cross the approach where vehicles cannot turn at a four-leg intersection with the major road intersecting a one-way street when the major road has the green indication.

## LEADING PEDESTRIAN INTERVAL

The Leading Pedestrian Interval (LPI) initiates the pedestrian WALK indication three to seven seconds before motor vehicles traveling in the same direction are given the green indication. This technique allows pedestrians to establish themselves in the intersection in front of turning vehicles, increasing visibility between all modes.

## DESIGN

- The LPI should be used at intersections with high volumes of pedestrians and conflicting turning vehicles and at locations with a large population of elderly or school children who tend to walk more slowly.
- The LPI should be at least three seconds to allow pedestrians to cross at least one lane of traffic to establish their position ahead of turning traffic.
- A lagging protected left arrow for vehicles should be provided to accommodate the LPI.
- Newly-installed LPIs should provide accessible pedestrian signals to notify visually-impaired pedestrians of the LPI. Additionally, without an accessible pedestrian signal, visually-impaired pedestrians may begin to cross with the vehicular movement when motorists are less likely to yield to them.

## RECTANGULAR RAPID FLASHING BEACON CASE STUDY

### RECTANGULAR RAPID FLASHING BEACONS IN ST. PETERSBURG FLORIDA

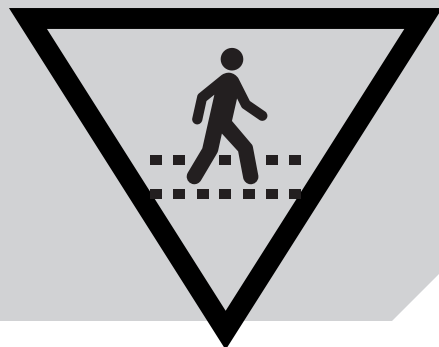
Motorists often fail to yield to pedestrians in crosswalks. Many serious pedestrian-vehicle crashes happen at uncontrolled mid-block crossings. When motorists do stop for pedestrians, other motorists sometimes try to pass the stopped motorist or are unable to see the pedestrian because their sight line is blocked by the stopped vehicle.



**The City of St. Petersburg, Florida has over 100 uncontrolled crosswalks and, as of 2003, its pedestrian injury rate of 49.23 per 100,000 people was higher than the rate for both the county and state.**

RRFBs were an attractive alternative to traffic signals and hybrid signals because their cost of \$10,000-\$15,000 for the purchase and installation of two units was significantly less expensive than other options. The solar power needed to operate the LED beacons also reduced operating costs.

After success with an initial installation and study, the City installed 17 more RRFBs and conducted a two-year review of 19 crosswalks during which over 16,000 individual crossings were evaluated. As a result of this two-year study, it was determined that RRFBs led to sustained yielding over time.





# RECTANGULAR RAPID-FLASH BEACONS (RRFBs)

## OVERVIEW

At some uncontrolled crossings, particularly those with four or more lanes, it can be difficult to achieve compliance with laws that require motorists to yield to pedestrians. Vehicle speeds and poor pedestrian visibility combine to create conditions in which very few drivers are compelled to yield.

One type of device shown to be successful in improving yielding compliance at these locations is the Rectangular Rapid Flash Beacon (RRFB). RRFBs are a pedestrian crossing sign combined with an intensely flashing beacon that is only activated when a pedestrian is present. RRFBs are placed curbside below the pedestrian crossing sign and above the arrow indication pointing at the crossing. They should not be used without the presence of a pedestrian crossing sign. The light-emitting diode (LED) flash is a “wig-wag” flickering pattern at a rate of 190 flashes per minute. The beacons are activated by a pedestrian call button.

Another LED panel should be placed facing the pedestrian to indicate that the beacon has been activated. The pushbutton and other components of the crosswalk must meet all other accessibility requirements.

## DESIGN

- The design of RRFBs should be in accordance with FHWA’s Interim Approval 11 (IA-11) for Optional Use of Rectangular Rapid Flashing Beacons issued July 16, 2008 and the Interpretation Letter 4(09)-41 (I) - Additional Flash Pattern for RRFBs issued July 25, 2014.
- RRFBs can be used when a signal is not warranted at an unsignalized crossing. They are not appropriate at intersections with signals or STOP signs.
- RRFBs are installed on both sides of the roadway at the edge of the crosswalk. If there is a pedestrian refuge or other type of median, an additional beacon should be installed in the median.

## CONSIDERATIONS

- RRFBs are considerably less expensive to install than mast-arm mounted signals. They can also be installed with solar-power panels to eliminate the

need for a power source.

- RRFBs should be limited to locations with critical safety concerns and should not be installed in locations with sight distance constraints that limit the driver’s ability to view pedestrians on the approach to the crosswalk.
- RRFBs should be used in conjunction with advance yield pavement lines and signs, which are discussed on the previous page .
- Usually implemented at high-volume pedestrian crossings, but may also be considered for priority bicycle route crossings or locations where bike facilities cross roads at mid-block locations.

## HAWK SIGNALS



*HAWK signal at an unsignalized intersection*

“HAWK” stands for High-intensity Activated Crosswalk and is also referred to as a pedestrian hybrid beacon. A HAWK signal is a push button-activated pedestrian signal that increases pedestrian safety at crossings while stopping vehicle traffic only as needed. The following describes how a HAWK signal works:

1. The signal remains dark until a pedestrian activates the walk indication by pushing a button.
2. The signal will then flash yellow to warn drivers that a pedestrian will be entering the crosswalk.
3. A steady yellow indication follows the flashing indication advising drivers to stop if safe to do so.
4. The signal then turns solid red, requiring vehicles to stop at the stop line. The pedestrian will see the

walk indication and proceed into the crosswalk.

5. Once the walk time is completed, the signal will flash red. This lets the driver know that once they come to a complete stop they may proceed through the intersection if there are no pedestrians in the crosswalk.
6. The HAWK will return to the dark or “off” position until the push button is activated again.
7. When HAWK signals are installed in a community for the first time, it is recommended that education be provided to drivers who may be unfamiliar with the treatment. News media, information fliers, and YouTube videos have been used for such educational purposes.

## DESIGN

HAWK signals may be used at mid-block crossings (including off-street path crossings) and should be considered where high traffic volumes and speeds (typically based on study of 35 mph or less, per MUTCD) make it difficult for pedestrians to cross the street at locations that do not meet traffic engineering ‘warrants’ for a conventional signal. HAWK signals provide a protected crossing while allowing vehicles to proceed through a pedestrian crossing as soon as it is clear, thus minimizing vehicle delay. HAWK signals may also provide audible information as to when the WALK signal is on for visually impaired pedestrians.

## CONSIDERATIONS

HAWK signals must be accompanied by the following crossing treatments:

- Crosswalk pattern to match the intensity of the crossing, likely a higher-visibility crosswalk
- Advanced stop bar placed 20 to 50 feet from crosswalk
- MUTCD R10-23 signs mounted both on the mast arm and the supporting pole.

The HAWK Signal indicates a preferred crossing location and thus does not improve crossing at all quadrants of an intersection as a signalized intersection would. It does not improve movement through the intersection for cyclists in on-street lanes as they are subject to motor vehicle indications.

## BICYCLE ACCOMMODATIONS AT INTERSECTIONS

The majority of motor vehicle crashes involving bicycles in urban areas occur at intersections. In Texas, on-street bicycles are operating vehicles and are required to follow the same rules of the road as motorists. Good intersection design makes bicycling more comfortable and attractive, reduces conflicts with motor vehicles and pedestrians, and contributes to reduced crashes and injuries. The following principles are applied to intersection design in order to accommodate bicyclists:

- Provide a direct, continuous facility to the intersection
- Provide a clear route for bicyclists through the intersection
- Reduce and manage conflicts with turning vehicles
- Provide signal design and timing to accommodate bicyclists, based on an engineering study.
- Provide access to off-street destinations.

Intersection improvements for bicycles should be considered during all roadway improvement projects, street redesign, and safety improvements or upgrades.



*Continued bicycle lane striping and markings through the intersection*

## BICYCLE LANES AT INTERSECTIONS OVERVIEW

Bicycle lanes provide a dedicated space for bicyclists to predictably ride along roadways and through intersections. When designing intersections for bicyclists, the approaches should be evaluated and designs should maintain continuity of bicycle facilities to the maximum extent feasible.

Streets with dedicated bicycle lanes should continue striping through unsignalized and complicated intersections to provide additional guidance and safety measures for bicyclists. This design principle is especially important at intersections where there are conflicting vehicular movements, unsignalized crossings, and/or crossings of more than four travel lanes. Signalized intersections may not require striping through each intersection, and should be evaluated on a case-by-case basis.

### DESIGN

- Standard details for bicycle lane markings at intersections are provided in the NACTO Urban Bikeway Design Guide. Additional guidance can also be found in the MUTCD and AASHTO “Bike Guide.”
- Dedicated bicycle lanes should be provided on intersection approaches where space is available.
- At intersections with a dedicated right turn lane, bicycle lanes should be provided to the left of the right turn only lane unless bicycle signals and dedicated phasing is provided.

### CONSIDERATIONS

- Bicycle lane markings, including green-colored pavement, shared lane markings, dashed bicycle lane lines, and signage may be provided through intersections per engineering judgment.
- Selective removal of parking spaces may be needed to provide adequate visibility and to establish sufficient bicycle lane width at approaches to intersections.
- Shared lane markings may be used where space is not available for bicycle lanes at intersections,

however this should only be done if no other design is possible.

- Although the minimum recommended width of a bicycle lane within the intersection is 5', 4' bicycle lanes can be provided in extremely constrained conditions.
- Bicycle lanes at the entrance and exit of a circular intersection should allow direct access to a shared use bicycle/pedestrian path around the perimeter of the intersection via curb ramps; ramps should be provided for bicyclists to mount the sidewalk prior to the intersection. Designs should also enable bicyclists to mix with traffic and proceed through the intersection.

## BICYCLES AT SIGNALIZED INTERSECTIONS OVERVIEW

Signal progression should be designed in order to balance the needs of all users, with appropriate design speeds and traffic signal coordination settings. Bicycles have different operating characteristic than motor vehicles and special consideration is necessary in designing traffic signals that accommodate both motorists and bicyclists. Bicyclists generally accelerate slower than motorists, and traffic signal design should include adjustment of minimum green intervals, clearance time and extension time to account for this disadvantage. Appropriate signal timing also can reduce delay, discourage bicyclists from running red lights and help minimize conflicts.

The AASHTO Guide for the Development of Bicycle Facilities provides a specific formula to estimate minimum green time for bicycles from a standing position. It is based on the average adult bicyclists who can operate at 10 miles per hour. A slower speed or extended time may be appropriate at locations with young children, such as near schools.

### DESIGN

Where actuated signals are present, the signal system should automatically detect bicycles as well as motor vehicles. In order for bicyclists to prompt the green phase at these intersections, bicycle detection devices should be installed.



Detection devices can also include:

- Video detection
- Infra-red detection
- Microwave detection
- Magnetometers (special locations such as on or under bridges)

Detection devices should be located within bicycle lanes or bicycle boxes, marked with a bicycle detector symbol, and supplemented by appropriate signage.

When it is not feasible for the detection device to be located within the bicycle lane or bicycle box, detection devices should be located prior to the stop bar and span an appropriate distance to provide for left, through, and right turning bicyclists.

## CONSIDERATIONS

- Reference the latest edition of the AASHTO Bike Guide and the NACTO Urban Bikeway Guide for more details on the signal timing needs of bicycles at intersections. The AASHTO Bike Guide provides the technical information necessary to calculate minimum green time and other aspects of signal design to accommodate bicycles. The NACTO Urban Bikeway Design provides less technical detail, but provides information regarding bike signal heads.
- Where right-turn-only lanes for motor vehicles exist, bicycle lanes should be designed to the left of the turn lane.
- Special attention should be given to signal timing at locations with higher vehicular speeds and longer crossing distances. At these locations, bicyclists are more likely to have different signal timing needs than motorists, such as extending the green time to allow bicyclists to clear the intersection before the yellow/red phases. The AASHTO Bike Guide contains detailed guidance for bicyclists' signal timing needs at wide intersections.
- Bicycle signal heads provide dedicated signal indications to bicyclists and should be positioned to maximize visibility to bicycle traffic. They should be coordinated with pedestrian and non-conflicting vehicular movements to increase safety and minimize overall delay.
- Bicycle signal heads will be installed on a case-by-

case basis determined by an engineering study.

- Bicycle detection devices, particularly loop detectors, need regular testing to ensure the equipment is working correctly.



*Bicycle detection loop in the pavement and marked with a bicycle detector symbol*

## RAILROAD CROSSINGS OVERVIEW

Railroad tracks that cross roads or shared use paths on a diagonal can create safety challenges for bicyclists. There are several design considerations to mitigate difficulties for bicycling.

### DESIGN

Design considerations for bicycle travel near or at rail crossings are to:

- Provide best track surface treatment for bicyclists as practical
- Reduce the flangeway width
- Provide clear delineation with pavement markings indicating to bicyclists where they should travel to cross railroad tracks at an optimum location
- Provide firm, stable and slip resistant pavement
- Design rail crossings to between 60 and 90 degrees
- Provide adequate sight lines for approaching bicyclists to see approaching trains at rail crossings
- Provide warning signs to alert bicyclists of the crossing ahead

# CHAPTER 5

## WAYFINDING

The ability to navigate through the CAMPO region is informed by landmarks, natural features, signs, and other visual cues. Wayfinding is a cost-effective and highly visible way to improve the bicycling and pedestrian environment by familiarizing users with the bicycle network, helping users identify the best routes to destinations, addressing misperceptions about time and distance, and helping overcome a barrier to entry for infrequent bicyclists and pedestrians (e.g., “interested but concerned” cyclists).





A bikeway wayfinding system is typically composed of signs indicating the following:

- Direction of travel, location of destinations, and travel time/distance to those destinations;
- Pavement markings indicating to bicyclists that they are on a designated route or bike boulevard and reminding motorists to drive courteously;
- Maps providing users with information regarding destinations, bicycle facilities, and route options.

## GENERAL PRINCIPLES

- Messages must be clear and concise
- Related signs should be combined to limit visual clutter
- Signs should be limited in number and content as to not overpower the reader
- Signs should be placed in such a way that primary regulatory signs are not overlooked
- Groups of wayfinding signs should have a graphically standardized appearance
- Signs must be maintained to ensure current information and adequate condition
- Destination names will be kept generic to the extent possible to avoid advertising
- Private campus areas, such as a college campus, may provide its own internal system of wayfinding to facilitate site circulation. These systems should be developed independently from city or county wayfinding systems within the public right-of-way.

## GENERAL WAYFINDING

Primary signing may be accomplished through street name signs. Street name signs follow MUTCD standards. Street name signs are posted on one of the quadrants at residential intersections. At collector and arterial street intersections signs are posted on diagonally opposite corners. Signs may be mounted on stand-alone posts, light poles, or on signal mast arms. The signs list the street name, generalized street address range for that block and, if on a bike route, a bike symbol. Street signs are installed in conjunction with street reconstruction and are replaced to maintain good visibility.

Wayfinding information should also be provided for people with visual impairments in an accessible format. These formats include braille, talking tactile maps, Smart Camera mobile phone apps, and talking crosswalk signals.

## DESIGN

Refer to Manual on Uniform Traffic Control Devices (MUTCD and OK MUTCD) standards for sign installation, such as mounting height, lateral placement from edge of path or roadway and other guidance.

- Mounting height should generally be above the eye of the intended user.
- Font size should be legible to the intended user
- Signs should be combined horizontally or vertically, where possible
- Lines of sight and visibility should be reviewed when placing signs
- A sign should be as simple and as short as possible to convey the intended message
- Pavement markings can also be used to assist with wayfinding in some locations and can also be a placemaking tool
- Wayfinding may be part of a broader district wayfinding/ branding initiative.





## PEDESTRIAN WAYFINDING

- Pedestrian wayfinding is primarily provided near major attractions, such as theaters or event centers.
- Pedestrian wayfinding may be useful in areas where large volumes of pedestrians may be walking to transit stops.
- Signs should meet all needs for public accessibility

posted at all major decision points along the trail (feeder trail intersections, forks in the trail, etc.) and after all roadway crossings (local streets and arterials).

- Street name signs should be installed at all locations where trails intersect streets. This type of sign should have a sign blade for both the street name and the trail name.
- Wayfinding signs may be part of a larger regional network and/ or branding system.

## BICYCLE ROUTE WAYFINDING

This guidance is appropriate for on-street bicycle routes or sidepaths adjacent to roadways.

- Route identification signs may be placed generally every ½ mile at the far side of intersections with major bike routes and at decision points.
- MUTCD D11-1c series Bicycle Route Signs with route name, such as “RIVER BIKEWAY,” in place of “BIKE ROUTE” or M1-8 series signs should be used to identify bicycle routes.
- Decision signs should be placed in advance of intersections with other major bike routes and at decision points.
- Decision signs should include destinations and directional arrows, and may include distance
- D1-3 series Destination Supplemental Signs should be used and, where feasible, consolidated with route identification signs to minimize size and clutter.
- Destinations should be listed with the closest destinations towards the top of a sign assembly, with a maximum of three destinations used on any single sign.

## TRAIL WAYFINDING

This guidance is appropriate for trails located on independent rights-of-way.

- Where bikeways managed by multiple agencies or from multiple systems share a common segment, wayfinding signs appropriate for either agencies or systems may be used.
- Wayfinding or route identification signs should be

# CHAPTER 6

## END-OF-TRIP FACILITIES

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Bicycle parking and end-of-trip facilities are essential elements in a multimodal transportation system. Each year in the United States more than 200,000 bicycles are reported stolen, according to Federal Bureau of Investigations data and a lack of secure bicycle parking has long been named on surveys as an influential factor in the decision not to bicycle. The provision of end-of-trip facilities, such as lockers, showers, and repair stations, is associated with higher rates of bicycling.





# BIKE PARKING

## OVERVIEW

Providing ample, well-designed bicycle parking is a key component of the region's strategy to increase bicycling. Good bicycle parking designs maximize capacity, maintain an orderly appearance, and are secure and simple to use. Bicycle racks should be permanently affixed to a paved surface; movable bicycle racks are only appropriate for temporary use.

Bicycle parking types generally be categorized as long-term parking, short-term parking, and event parking.

**Short-term bike parking** – Sometimes called visitor parking, short-term parking is intended for shorter stays at locations such as businesses and other institutions.

**Long-term bike parking** – Long-term parking is intended for residents in multi-unit buildings, employees, transit users, and others making longer stays. Long-term parking types include the following:

**Bike Rooms** – Rooms in residential, employment, or transit buildings designed for the purpose of safely parking a number of bicycles.

**Bicycle Cages** – Bicycle cages are controlled-access, enclosed fenced areas that contain a number of bicycle racks. They may be part of a basement, garage, or another room, or may be a stand-alone, outdoor, covered structure. They typically require administration by building or transit management to issue key fobs or access codes.

**Bike Lockers** – Bicycle lockers are self-contained units that store an individual bicycle and related accessories and provide a high level of security. They should be constructed from a strong, weather resistant, and maintenance-free material. Aesthetics may also be considered to integrate bike lockers into the site in a visually appealing way. Information regarding how to rent a locker should be provided on the locker or nearby. PHOTO .

**Bicycle Stations** – Bicycle parking stations, also known as bicycle transit centers, bike stations, or cycle stations, are buildings or structures specifically designed for bicycle parking. They may be staffed or unstaffed and may provide additional end-of-trip services, such repair stations, bike shops, vending machines, lockers or showers. Business models vary from publicly subsidized to user fees, with many stations using a mix of funding.

**Temporary event parking** – Bike parking for special events, such as large rides, concerts, sports events, and festivals, where more people than usual are expected to arrive by bicycle. Temporary event parking may be supervised (e.g., valet) or unsupervised.

Bicycle parking should adhere to these basic principles:

**Quality** – Bicycle racks should be designed, built, located, and installed to ensure safety, security, and convenience.

**Location** – Bicycle parking should be located close to destinations, building entrances, and bicycle routes and facilities.

**Access** – Just as motor vehicle operators drive into their parking spaces, bicycle parking should be designed so that bicyclists may dismount as close to the rack as possible. Site design should result in racks that are well-spaced from one another and other objects so that users can easily reach and use them.

**Bicyclist Safety** – The location, lighting, and visibility of bicycle parking should provide personal safety for people locking and unlocking their bikes.

**Bicycle Security** – Bicycle parking should deter theft of, and minimize damage to, parked bicycles.

## DESIGN

A typical bicycle parking space is 2 feet by 6 feet and





racks should be placed 4 feet apart to allow users to easily maneuver and lock and unlock their bike. Some bike parking spots at each location should accommodate larger bikes and additional equipment, such as bicycle trailers.

The location of short-term bicycle parking should:

- Be easily accessible by bike to bicycle facilities, such as the street or shared use paths.
- Be within 50 feet of building entrances, preferably within 25 feet.
- Be placed in locations with high levels of pedestrian traffic and visible to passers-by and people entering buildings to promote usage and enhance security.
- Be covered, if practical, where visitors may leave their bikes for a longer amount of time.
- Allow reasonable clearance for opening of passenger-side doors of parked cars.
- Not impede movement by pedestrians, including those with visual impairments and users of walkers and wheelchairs.
- Not impede routine maintenance activities.
- Not block pedestrian access to buildings, bus boarding, or freight loading.
- Not block pedestrian lines of sight, in the case of larger structures such as lockers and cages.

Short-term and long-term bicycle racks should meet the following criteria:

- Support the bicycle at two points above its center of gravity.
- Be intuitive for first-time users.
- Accommodate high security U-shaped bike locks.
- Accommodate bicycles and attachments of a variety of shapes and sizes.
- Not contain protruding elements or sharp edges.
- Not bend wheels or damage other bicycle parts.
- Not require the user to lift the bicycle off the ground.

## CONSIDERATIONS

The quantity of needed bicycle parking may be assessed proactively or reactively.

A proactive approach provides parking sufficient to accommodate all residents, employees, customers, students, or other visitors to a location or uses a future benchmark, such as a community's bicycling mode share goal, to estimate future demand. This is especially important in locations where later retrofits may be difficult.

A reactive approach assesses the need for bike parking based on local bicyclist feedback, requests for parking, demand demonstrated at locations where the presence of parked bicycles nears, meets, or exceeds existing bike rack capacity (e.g. bikes parked to signs), and systematic counts of bike rack capacity during peak times.

## LOCKER ROOMS, SHOWER, AND REPAIR STATIONS (END-OF-TRIP FACILITIES)

### OVERVIEW

End-of-trip facilities, such as lockers for storing helmets and clothes, changing rooms, showers and bicycle repair stations with air pumps and tools to complete simple repairs support the needs of bicyclists after they arrive at their destinations. They address potential concerns, such as physical appearance and hygiene and the operating condition of the bicycle. End-of-trip facilities should be well maintained and attractive to users. Wayfinding should be provided and information about the facilities should be included in employee, tenant, and building occupant welcoming packets.

## LOCKER ROOMS

### OVERVIEW

Locker rooms provide a space to store helmets, a change of clothes, and other supplies. Lockers should be secure and designed to ensure proper ventilation. Locker use should be monitored on a regular basis to ensure cleanliness and availability.

## DESIGN

The dimensions of lockers vary. Smaller lockers may only accommodate a bicycle helmet. Taller lockers allow for hanging clothing and should fit clothes hangers, which are commonly 16 to 18 inches in length.

# SHOWERS AND SHOWER ROOMS

## OVERVIEW

Showers allow bicycle commuters and others to clean up and change after their ride. In the case of commuters, this allows the maintenance of a professional appearance.

## DESIGN

- Shower rooms should have non-slip surfaces, adequate lighting and ventilation. Building operators should include the shower area in regular cleaning and maintenance schedule.
- Shower and changing rooms may also include mirrors, toilets, sinks, outlets for hair dryers and electric razors, ironing boards and irons, first aid kits, and hooks for towels.
- Showers and shower rooms should be accessible and meet Americans with Disabilities Act (ADA) requirements.

# REPAIR STATIONS

## OVERVIEW

Repair stations allows bicyclists to complete routine maintenance tasks.

## DESIGN

- Repair stands may be installed indoors or outdoors.
- A basic repair stand should support a bicycle off of the ground by the seat post.

- Basic tools may be attached to the stand with tamper-proof hardware or provided in the room, if the room is access controlled.
- An air pump may be attached to the stand with tamper-proof hardware.
- Sufficient space to maneuver and work on the bicycle should be provided. Recommended dimensions are 90 to 120 inches in length with the repair stand located at least 12 inches from the wall and 48 inches of work space in front of the stand.









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# APPENDIX A:

## COMMUNITY OUTREACH REPORT

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An essential component of creating CAMPO's Regional Active Transportation Plan was the development of a robust community outreach program to identify the active transportation needs and priorities of the public. To better serve the needs of the community, the Regional Active Transportation Plan project team engaged with community members throughout the region to discuss planning considerations and gather ideas and feedback on the Plan. Community input received during this public engagement phase will help shape the Plan's development in creating a network of active transportation facilities that will address the priorities of the community in CAMPO's six-county region.



# SUMMARY OF PROJECT PROMOTION

## DATABASE

A database of stakeholders was developed early in the community outreach process through initial research and contact with community groups such as homeowner’s associations, local businesses, school districts, and civic groups. As stakeholders were contacted, they were asked to spread the word about the Plan to neighbors, employees, and community members. The database was updated throughout the duration of the public participation portion of the planning process and grew to 643 email addresses, including 394 emails for the Near Northwest Corridor Connection Case Study.



## PHONE OUTREACH

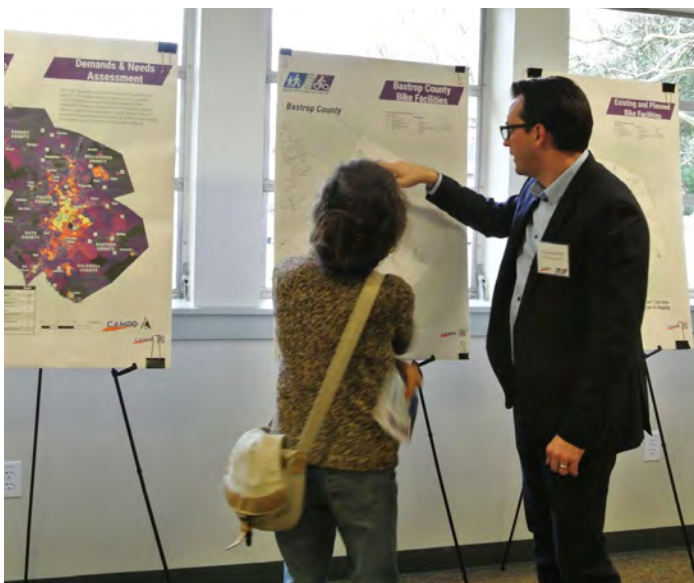
Community and civic groups throughout the region were contacted by phone to promote awareness and participation in the study. The project team used phone outreach to partner with organizations that could distribute information to their members and suggest events for the project team to attend. Groups contacted included local Independent School Districts (ISDs), chambers of commerce, businesses, environmental groups, and cycling and safety organizations, among others. Phone calls were also made to local, city, and county officials from all six counties in the region to promote awareness of the study and encourage attendance at open house meetings and local government meetings.

## FLYERS

Two informational flyers were created to share details with community members about the study including background information, the purpose and goals of the Plan, and contact information for the team. Flyers were distributed at community events and at public open houses.

## MEDIA COORDINATION

A media release was sent to media contacts on January 13, 2017 to share information about the Plan and promote upcoming open house meetings. Contacts included media outlets throughout CAMPO’s six-county region from local radio, television, and print publications.





## SOCIAL MEDIA

Social media, in the form of Facebook and Twitter posts and advertising, was used throughout the public engagement portion of the study to generate awareness and participation in the study. Social media posts promoted information about the project survey, Wikimap input, and about attendance at public open houses. Posts were made by CAMPO on the following dates:

PLATFORM	DATE POSTED
Facebook and Twitter	January 9
Facebook and Twitter	January 17
Facebook and Twitter	January 18
Facebook and Twitter	January 23
Facebook and Twitter	January 25
Facebook and Twitter	January 26
Facebook and Twitter	January 30
Facebook and Twitter	January 31
Facebook	February 1
Facebook and Twitter	February 2
Facebook	February 3
Facebook and Twitter	February 11
Facebook and Twitter	February 14
Facebook and Twitter	August 22
Facebook and Twitter	August 23
Facebook and Twitter	August 24
Twitter	August 30
Facebook and Twitter	August 31
Facebook	September 6
Facebook and Twitter	September 15
Facebook and Twitter	September 20



Facebook post from 2/14/17



Series of Twitter ads

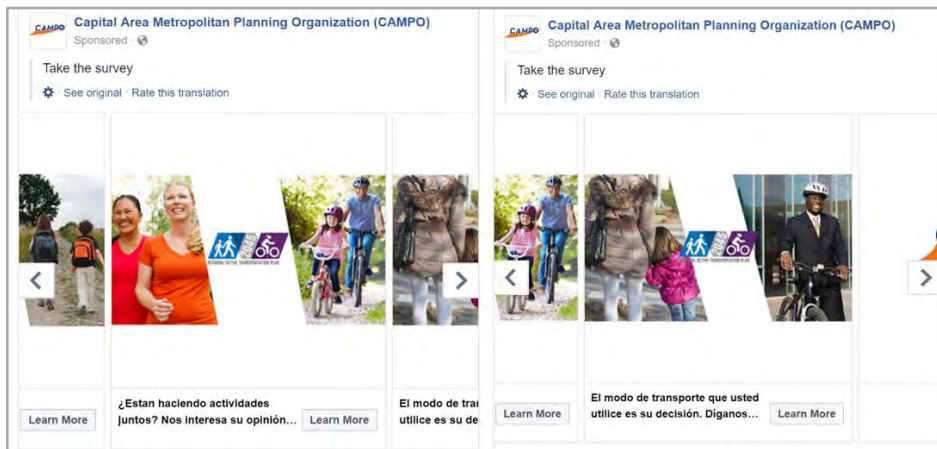


## SOCIAL MEDIA ADVERTISING

Social media advertising campaigns also helped promote survey participation and inform the public about the study. These ads were targeted to reach specific demographics and expand the reach of the community outreach program. Facebook ads were created in both English and Spanish to reach a diverse group of community members. The top four keyword hits for Twitter Ads were walking, biking, trails, and commuting.

### Advertising Campaigns and Reach

PLATFORM	DATES RUN	IMPRESSIONS GENERATED	DIRECT SURVEY LINK CLICKS
Twitter	Jan. 20–Feb. 3	41,630	112
Facebook	Jan. 20–Feb. 12	73,246	877
Facebook	Sept. 7 – Sept. 11	39,691	609



Facebook Carousel Ad-- Created in English and Spanish



Bike Austin RATP

## EMAIL CAMPAIGNS

The project team kept stakeholders updated on study information and opportunities to share input through periodic email updates. Individual community members and leaders were contacted throughout the public engagement process, and mass emails were sent to the study mailing list on:

- December 28, 2016 – Notice of all upcoming Regional Active Transportation Plan (RATP) meetings, sent to 309 email addresses from the RATP database.
- January 13, 2017 – Notice of all upcoming Regional Active Transportation Plan meetings, sent to 286 email addresses from the RATP database.
- January 20, 2017 – A reminder of all upcoming Regional Active Transportation Plan meetings, sent to 4,919 email addresses, including contacts from the RATP database, the Northwest Corridor Study database, and CAMPO’s Constant Contact Database.
- January 23, 2017 – A reminder of all upcoming Regional Active Transportation Plan meetings, sent to 4,996 email addresses, including contacts from the RATP database, the Northwest Corridor Study database, and CAMPO’s Constant Contact Database.
- February 13, 2017 – A reminder of survey and Wikimapping opportunities and deadline, sent to 5,040 email addresses, including contacts from the RATP database, the Northwest Corridor Study database, and CAMPO’s Constant Contact Database.
- August 7, 2017 - Notice of all upcoming Regional Active Transportation Plan (RATP) meetings, sent to 6,232 email addresses.

# COMMUNITY EVENTS

In an effort to reach stakeholders where they were already gathered, the project team attended seven community events throughout CAMPO’s six-county region. At these events and meetings, the team visited with community members about the Plan and the community outreach process, distributed project materials, and administered paper and iPad surveys. The outreach team also conducted surveys at public transit facilities, libraries, community and senior centers, and bike shops.



## Community Outreach Activities

DATE	COUNTY	ACTIVITIES/EVENTS
10/1/2016	Burnet	Marble Falls City-Wide Garage Sale
10/4/2016	Travis	Elroy National Night Out
10/8/2016	Williamson	Good Life Taylor Family Festival
10/8/2016	Caldwell	Night in Old Luling
10/15/2016	Hays	Kyle Fair and Music Festival
10/22/2016	Bastrop	29th Annual Hogeeye Festival
10/29/2016	Travis	Community Connections Resource Fair
1/16/2017	Bastrop	MLK Day Program
1/31/2017	Travis	Intercept Surveys
2/1/2017	Travis	Intercept Surveys
2/2/2017	Williamson	Intercept Surveys
2/3/2017	Regional	Intercept Surveys
3/1/17	Travis	Transportation Works: Identifying and Removing Barriers Through Innovation
4/29/17	Travis	ACC Dia de la Familia
8/12/17	Travis	AISD Back to School Bash
8/30/17	Hays	TxState Welcome Week w/ the Bike Cave

## Additional Engagement Meetings and Presentations

Independent Living Council  
(March 2017)

Bicycle Advisory Council  
(December 2016 and September 2017)

Austin Chamber of Commerce Transportation Committee  
(August 2017)

Meeting with Bike Austin, Walk Austin, and Vision Zero ATX  
(September 2017)

## ENVIRONMENTAL JUSTICE OUTREACH

Targeted outreach to Environmental Justice communities was conducted to ensure that low-income, underserved, and minority communities were represented in the planning efforts. Ads in Spanish were placed on social media to reach the Limited English Proficiency population, which contributed to the 19 surveys collected from Spanish-speaking participants. The tabling event at Huston Tillotson University, a Historically Black University, provided a good opportunity to receive input from the African American community. The project team also attended the Travis County Community Connections Resource Fair, an event marketed to promote awareness of resources available to low-income and underserved communities, to reach Environmental Justice populations.

## PUBLIC MEETINGS

Public open house meetings were held in late January and early February to share study information and give the public the opportunity to provide input about their active transportation needs and priorities. To make attendance convenient for community members throughout the region, at least one meeting was held in each county. Meetings typically took place from 4–7 p.m., with three daytime meetings available to accommodate varying schedules. The same information and materials were available at all open house meetings.

At these open house meetings, the project team requested information from community members about their experiences with active transportation and the Plan in general. Exhibit boards were available for attendees to view and discuss with the project team. The boards included information about existing active transportation facilities and connectivity, planning considerations and goals, and details about the public engagement process. Open house flyers with a project overview, contact information, and upcoming meeting locations were also provided.

Attendees were given the opportunity to share input by indicating which proposed goals were most important to them, providing feedback using an online survey and Wikimap, and marking input on county and local jurisdiction maps.

To better understand the active transportation needs of the blind and visually impaired and mobility-challenged community in the study area, an open house meeting was held at the Texas School for the Blind and Visually Impaired. Flyers and



Texas State student rates project goals



Open house participant explores tactile town

boards were made available in braille and large print, and the project team provided a guided walk-through of the exhibits. An interactive Tactile Town exhibit was also created to allow attendees to feel the difference between ideal active transportation facilities, like those envisioned for the Plan, and less than ideal conditions that might currently exist. Surveys were verbally administered to attendees at this meeting, and verbal comments were recorded.

### Open House Dates, Locations, and Attendance

DATE	COUNTY	LOCATION	ATTENDEES
1/23/17	Burnet	Lakeside Pavilion - Marble Falls	10
1/24/17	Williamson	Cedar Park Library - Cedar Park	56
1/25/17	Bastrop	Fleming Community Center - Elgin	16
1/25/17	Caldwell	Eugene Clark Library - Lockhart	16
1/26/17	Hays	Texas State University LBJ Student Center - San Marcos	36
1/30/17	Travis	ACC Highland Business Center - Austin	11
1/31/17	Williamson	Taylor Public Library - Taylor	26
2/1/17	Hays	Wimberly Community Center - Wimberly	10
2/2/17	Travis	Travis County Fire and Rescue - Del Valle	10
2/3/17	Travis	Texas School for the Blind and Visually Impaired - Austin	27
2/7/17	Travis	The University of Texas at Austin - Austin	10
8/21/17	Hays	San Marcos Public Library – San Marcos	15
8/22/17	Bastrop	Smithville Public Library – Smithville	6
8/23/17	Williamson	Taylor City Hall – Taylor	1
8/24/17	Caldwell	Eugene Clark Library – Lockhart	3
8/29/17	Burnet	Marble Falls Public Library – Marble Falls	6
8/30/17	Bastrop	Austin Community College - Elgin	11
8/31/17	Hays	Wimberley Community Center – Wimberley	4
9/6/17	Williamson	Cedar Park Public Library – Cedar Park	6
9/7/17	Travis	Hampton Branch Oak Hill Library - Austin	
9/12/17	Travis	Huston-Tillotson University – Austin	23
9/15/17	Travis	Texas School for the Blind and Visually Impaired - Austin	10



## LOCAL GOVERNMENT MEETINGS

The project team coordinated with local government officials from throughout the region and held two rounds of meetings to collect their input. During the first round of meetings, representatives provided information about existing, planned, and needed facilities in their jurisdictions. The second round of meetings gave representatives an opportunity to review their input from previous meetings, as well as exhibits for the public open house meetings, and provide additional feedback.

In addition to meeting with local governments in the region, CAMPO met with neighboring MPOs to discuss their respective regional planning efforts. With the rapid growth seen in these areas the importance of coordination will prove to be an invaluable effort.



Project team discussed facilities with local government officials

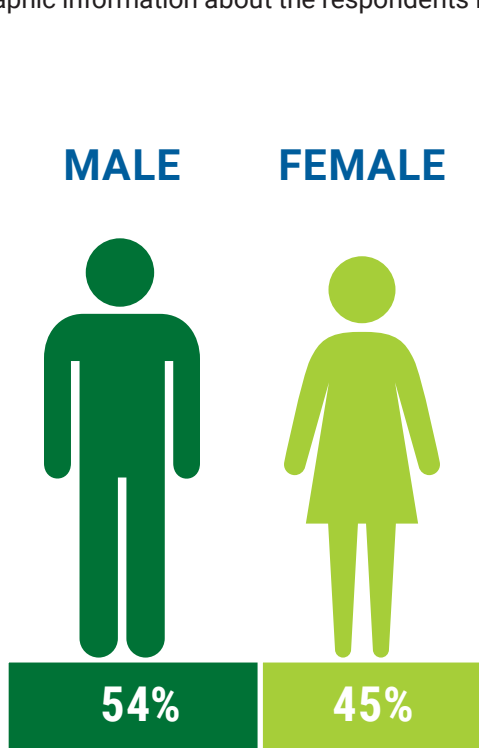
### Local Government Meeting Dates, Locations, and Attendance

DATE	COUNTY	LOCATION	ATTENDEES	AGENCIES REPRESENTED
<b>FIRST ROUND</b>				
8/29/16	Bastrop	Bastrop Public Library	6	Bastrop Co., Elgin, Bastrop
8/30/16	Burnet	Bertram Library	6	Granite Shoals, Bertram, Highland Haven, Marble Falls, Burnet Co., TxDOT
8/31/16	Williamson	Pflugerville Public Library	7	Travis Co., Pflugerville
9/7/16	Travis	Cepeda Library	3	Austin, Sunset Valley
9/14/16	Williamson	Taylor Public Library	5	Georgetown, Taylor Williamson Co.
9/19/16	Hays	Buda Public Library	6	Kyle, Buda, Hays, Hays Co.
9/20/16	Williamson	Cedar Park Library	9	TxDOT, Georgetown, Manor, Jonestown, Round Rock, Hutto, Liberty Hill, Lago Vista
9/21/16	Caldwell	Luling City Hall	6	Luling, Martindale, Lockhart, Uhland
9/21/16	Hays	Wimberley Community Center	1	Dripping Springs
9/29/16	Travis	Lake Travis Community Library	8	TxDOT, Hills of Lakeway, Hutto, Bee Cave, Horseshoe Bay, Travis Co.
<b>SECOND ROUND</b>				
1/23/17	Burnet	Lakeside Pavilion - Marble Falls	5	Granite Shoals, Highland Haven, Marble Falls
1/24/17	Williamson	Cedar Park Library - Cedar Park	7	Granite Shoals, Highland Haven, Marble Falls
1/25/17	Bastrop	Fleming Community Center - Elgin	8	Bastrop County, Elgin
1/25/17	Caldwell	Eugene Clark Library	7	Lockhart, Caldwell County, KFH Group
1/26/17	Hays	Texas State University LBJ Student Center - San Marcos	1	Buda
1/30/17	Travis	ACC Highland Business Center - Austin	2	Travis County
1/31/17	Williamson	Taylor Public Library - Taylor	7	Taylor, Westlake Hills, Hutto, Williamson County
2/1/17	Hays	Wimberley Community Center - Wimberley	3	Buda, Dripping Springs, Woodcreek
2/8/17	Bexar	San Antonio VIA Community Room	75	Alamo Area MPO
2/15/17	Bell	Belton, TX	staff only	Killeen-Temple MPO

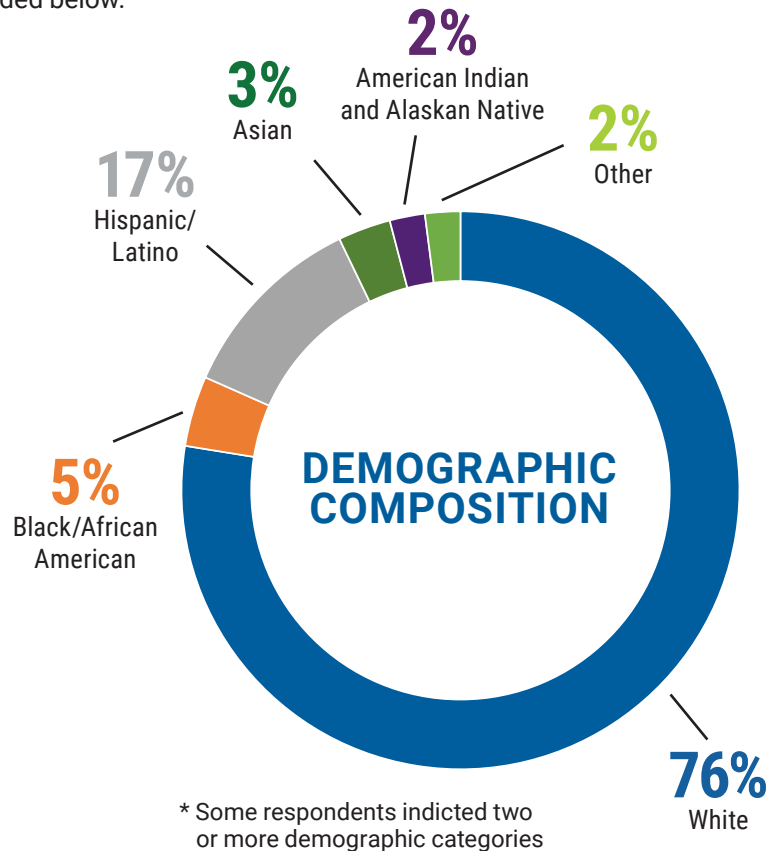
## STUDY SURVEY

As a companion to the public outreach efforts an initial online survey was developed and administered to assess public opinion on a number of topics. The survey provided a space to assess public opinion on a number of topics. The survey was open from November 2016 through March 2017 and was completed by over 1,500 residents from throughout the region.

Demographic information about the respondents is provided below.

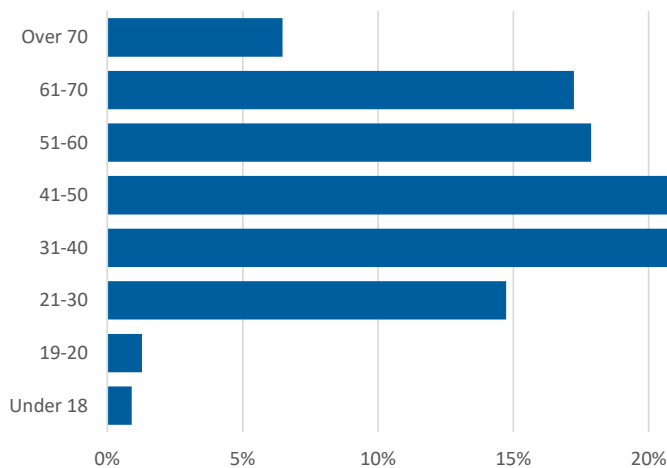


\*Not all respondents answered this question

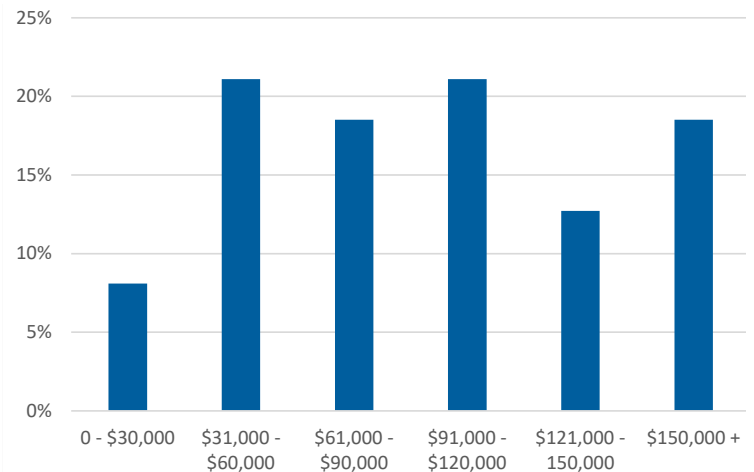


\* Some respondents indicated two or more demographic categories

### AGE



### INCOME



## TABLET ARMY

CAMPO's "Tablet Army" was created to engage the public by administering the online survey through tablets brought to community locations and events. The Tablet Army administered the survey on local bus and park and ride routes to reach those with limited transportation resources and attended campus events at local Austin universities to reach out to students and faculty. These survey collection events are listed in the table at right:

## ACTIVE TRANSPORTATION ADVISORY COMMITTEE

An Active Transportation Advisory Committee (ATAC) was formed to guide the process and provide a shared vision for the development of a safe and highly-functional Active Transportation network of pedestrian and bicycle facilities and amenities for the six-county CAMPO region. The ATAC consists of 15 members representing 15 jurisdictions and agencies and met periodically throughout the development of the plan.

The ATAC committee helped to identify opportunities for community outreach, such as community events, and to promote public meetings. ATAC members and the groups they represent are listed in the table at right. The ATAC was given the chance to review the Draft Plan and make suggestions before it was presented to the public. They will remain as an ongoing subcommittee and will provide CAMPO's Technical Advisory Committee (TAC) and Transportation Policy Board (TPB) with recommendations on regional pedestrian and bicycle issues.



DATE	LOCATION
1/11/17	Oak Hill Park and Ride
1/12/17	Leander Station Park and Ride
1/19/17	Capital Metro Route 10 and Route 2
2/7/17	University of Texas "Kickstand"
3/23/17	Capital Metro Route 7
3/23/17	Huston Tillotson University
4/19/17	Austin Community College Alternative Transportation Fair

NAME	REPRESENTING
Chris Cervini	Austin Community College
Jolinda Marshall	Capital Metro
Nathan Wilkes	City of Austin
Tom Gdala	City of Cedar Park
Justin Word	CTRMA
Celina Bley	Del Valle ISD
Amy Miller	City of Elgin
Nat Waggoner	City of Georgetown
Leigh Ann Ganzar	Public Health
Sabas Avila	City of San Marcos
Christopher Tabb	Texas School for the Blind and Visually Impaired
Diana Vargas	TxDOT
Charlie Watts	Travis County
Wanda Nelson	The University of Texas
Katie Cromwell	Williamson County



# WIKIMAP

## RESPONDENT OVERVIEW

The project team used an online interactive map tool called a WikiMap to gather input from the community on a variety of topics. The WikiMap was live between November 28, 2016 and February 17, 2017 and allowed residents to identify barriers and difficult routes for walking and biking. Users were also tasked with providing information about their preferred routes.



Photo by Adam Coppola

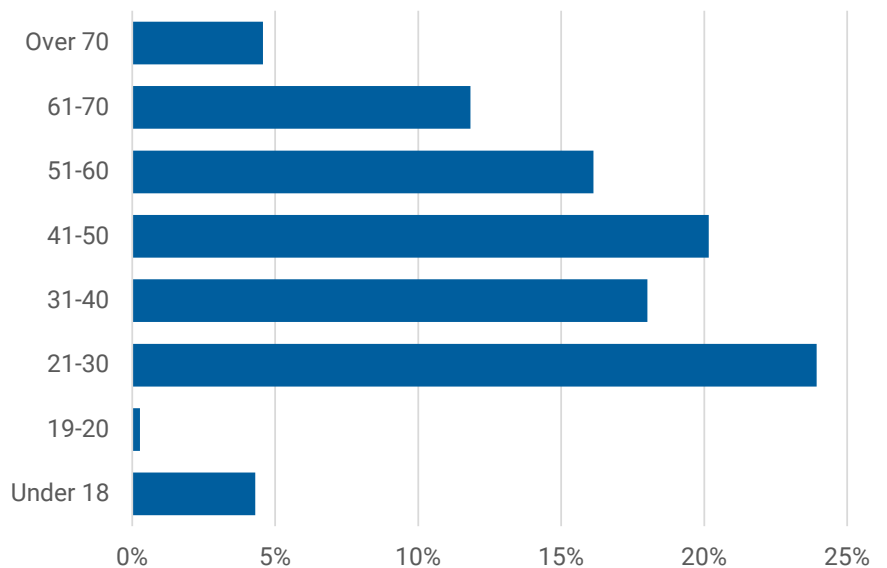
## OUR RESPONDENTS...

The WikiMap received **390** line comments and **385** point comments from **358** users representing **75** zip codes within the study area.

### MALE

### FEMALE

### AGE



“Not all respondents answered this question”

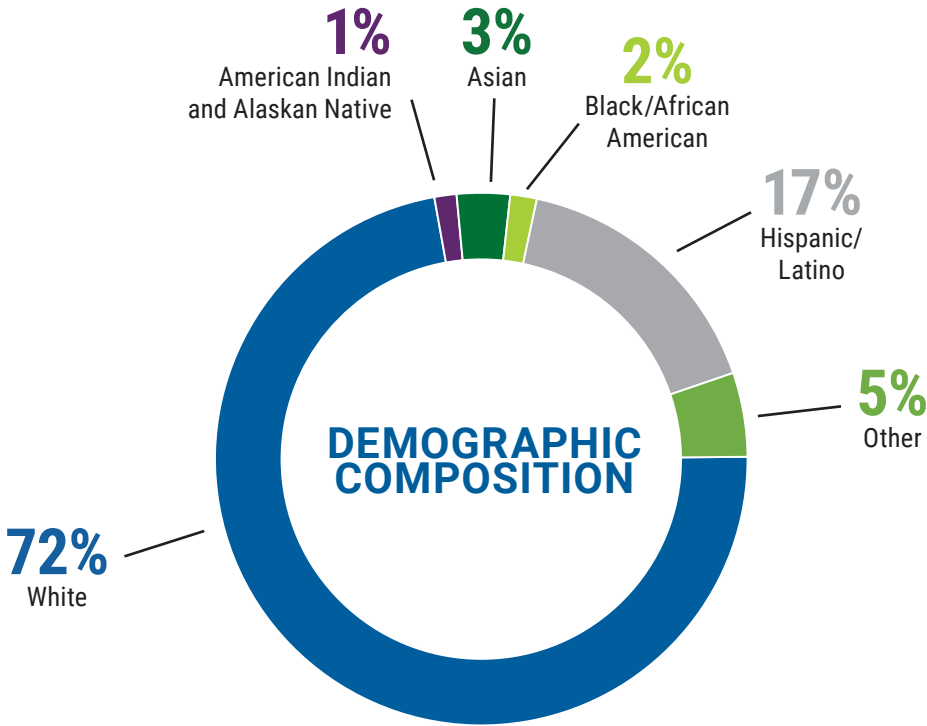


Photo by Adam Coppola

### TYPES OF CYCLISTS

**24%**

I do not ride a bicycle and am unlikely to ever do so

**16%**

I prefer not to ride in traffic, so I stay on trails

**40%**

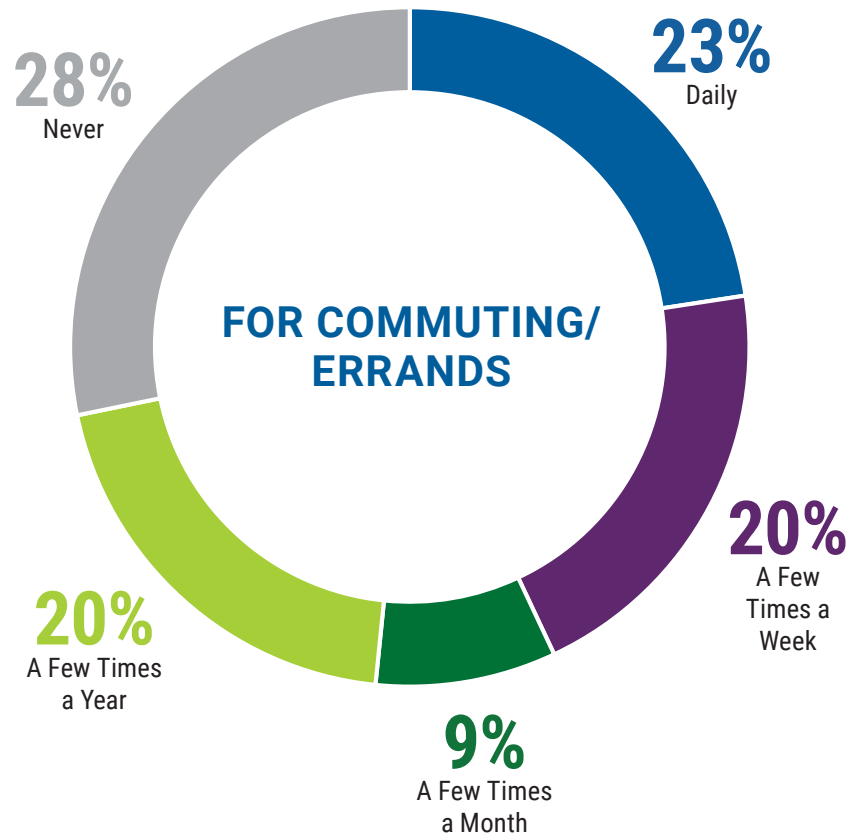
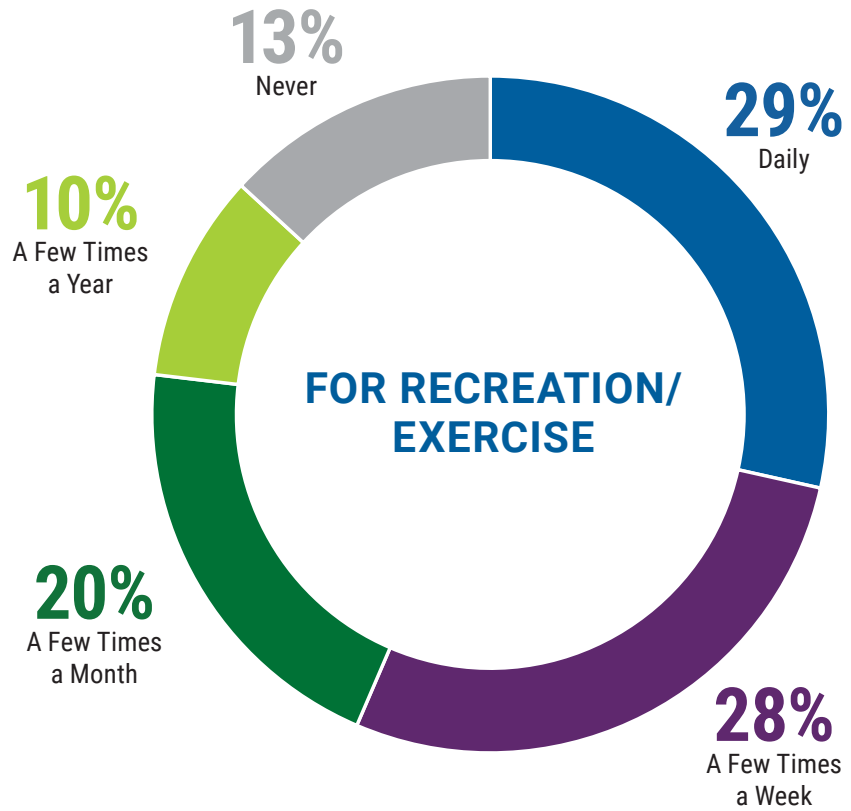
I am willing to ride in traffic, but I prefer dedicated bike lanes and routes

**20%**

I am willing to ride in mixed traffic with cars on almost any type of street



## HOW OFTEN DO YOU WALK AND BIKE?





# APPENDIX B

## OVERVIEW OF ORDINANCES AND REGULATIONS

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# ORDINANCES AND REGULATIONS

## BASTROP COUNTY

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Bastrop County</b>	Subdivisions Regulations (Section 5.7 and 9.8)	<ul style="list-style-type: none"> <li>Residential, collector, and minor arterial streets require sidewalks on either one or both sides.</li> <li>Block lengths vary in rural and urban subdivisions, and commercial/industrial areas.</li> </ul>	<ul style="list-style-type: none"> <li>Provides for consistent pedestrian network within new developments.</li> <li>Variation in block lengths reflect differing built forms.</li> </ul>
<b>Bastrop (City)</b>	Subdivisions (Code of Ordinances, Chapter 10)	<ul style="list-style-type: none"> <li>Industrial areas are required to have sidewalks on both sides of the street.</li> <li>Block length varies in commercial/industrial areas.</li> <li>Park land dedication provisions require greenway trail reservation.</li> </ul>	<ul style="list-style-type: none"> <li>Variation in block lengths reflect differing built forms and land uses.</li> <li>Greenway easement dedication forms the backbone of an off-street shared use network throughout the city and ETJ.</li> </ul>
<b>Bastrop (City)</b>	Zoning Ordinance, Downtown Bastrop Form-Based Code (Code of Ordinances, Chapter 14, Exhibit B)	<ul style="list-style-type: none"> <li>Minimum building frontages are required at build-to-lines.</li> <li>Sidewalks are required for all new development and all new streets. Six (6) foot minimum sidewalk width and more depending on frontage type.</li> <li>Bicycle parking is required equivalent to 5 percent of all provided automobile spaces.</li> </ul>	<ul style="list-style-type: none"> <li>Built environments support bicycle and pedestrian infrastructure investment.</li> <li>Sidewalk standards are flexible depending on development intensity in the urban core.</li> <li>End-of-trip facility requirements accommodate bicycle use.</li> </ul>
<b>Elgin</b>	Subdivision Ordinance (Chapter 36 - Subdivisions)	<ul style="list-style-type: none"> <li>Sidewalks for all street classifications shall be installed on both sides of the street right-of-way or within a sidewalk easement.</li> <li>Trails may be required in lieu of sidewalks where in the 'best interest of the city.'</li> <li>Large maximum block lengths are specified in residential areas and along major streets.</li> </ul>	<ul style="list-style-type: none"> <li>Option for sidewalk installation within easements provides options where rights-of-way are constrained.</li> <li>Shared use path or sidepath construction (in lieu of sidewalks) could be tied to an adopted route map.</li> <li>Large block lengths discourage traffic dispersal. Smaller blocks could be encouraged in downtown, center-city neighborhoods, and future mixed-use districts.</li> </ul>
<b>Elgin</b>	Construction Standards (Chapter 4)	<ul style="list-style-type: none"> <li>Minimum concrete sidewalk width is four feet wide.</li> </ul>	<ul style="list-style-type: none"> <li>Narrow sidewalk width may decrease comfort and could cause conflicts among users. The community may consider increasing the minimum to 5 feet wide where possible.</li> </ul>
<b>Smithville</b>	Subdivision Regulations (Chapter 10 - Subdivision Regulation)	<ul style="list-style-type: none"> <li>The maximum block width is 300 feet and the minimum block width is 240 feet.</li> </ul>	<ul style="list-style-type: none"> <li>Block widths are considered to be pedestrian-friendly and promote traffic dispersal.</li> </ul>

## Overview of Ordinances and Regulations (Burnet County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Burnet County</b>	Subdivision Regulations (Article 3)	<ul style="list-style-type: none"> <li>Maintenance bond required guaranteeing that the owner maintains sidewalks for two years.</li> <li>Roads and streets from adjoining subdivisions must continue through new subdivisions.</li> </ul>	<ul style="list-style-type: none"> <li>Sidewalks that are properly maintained will provide safer routes for pedestrians.</li> <li>Street connectivity between subdivisions will increase the usage of bicycle and pedestrian facilities by providing multiple route options.</li> </ul>
<b>Bertram</b>	Subdivision Regulations (Section 28, 42, 45, and 61)	<ul style="list-style-type: none"> <li>Sidewalks must be installed by the developer on both sides of all streets within and immediately adjacent to a proposed development.</li> </ul>	<ul style="list-style-type: none"> <li>Sidewalk standards along existing streets decrease gaps in the sidewalk system and reduce the cost of future publicly-funded connections.</li> </ul>
<b>Bertram</b>	Zoning Ordinance (Section 20, 34, 35, 37, and 38)	<ul style="list-style-type: none"> <li>Commercial, restricted commercial, office, and light industrial districts require sidewalks.</li> <li>There is an incentive for end-of-trip facilities that support bicycling and walking.</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian network extends into non-residential areas.</li> <li>Bicycling and walking encouraged through the provision of facilities at destination points.</li> </ul>
<b>Burnet (City)</b>	Subdivision Ordinance (Chapter 98)	<ul style="list-style-type: none"> <li>Bikeway design criteria established by the city TCSS and the city engineer.</li> <li>Maximum block length of 600 feet increases pedestrian connectivity.</li> </ul>	<ul style="list-style-type: none"> <li>Presence of bikeway design criteria provides the option to incorporate bicycle facilities in new or retrofitted street segments.</li> <li>Maximum block lengths promotes traffic dispersal.</li> </ul>
<b>Burnet (City)</b>	Zoning Ordinance (Chapter 118)	<ul style="list-style-type: none"> <li>Commercial, restricted commercial, office, and light industrial districts require sidewalks.</li> <li>Reduction in parking incentive may be offered for provision of showers or lockers for bicyclists OR covered, secure bicycle parking.</li> </ul>	<ul style="list-style-type: none"> <li>Some zoning districts permit flexible pedestrian connectivity solutions. In the Residential Estate District, common walkways will be required in place of sidewalks.</li> </ul>
<b>Burnet (City)</b>	City of Burnet Standard Specifications	<ul style="list-style-type: none"> <li>Sidewalks along arterial/parkway/collector Streets shall be shown on the construction plans as a public improvement and constructed when the street is built.</li> </ul>	<ul style="list-style-type: none"> <li>Minimum sidewalk widths of four (4) feet may create a conflict with pedestrians and bicyclists.</li> </ul>
<b>Cottonwood Shores</b>	Zoning Ordinance (14000)	<ul style="list-style-type: none"> <li>Commercial, restricted commercial, office, and light industrial districts require sidewalks.</li> <li>Reduction in parking incentive may be offered for provision of showers or lockers for bicyclists OR covered, secure bicycle parking.</li> </ul>	<ul style="list-style-type: none"> <li>There are no sidewalk requirements in residential areas under the assumption that traffic volumes will remain limited.</li> </ul>



# BURNET COUNTY

## Overview of Ordinances and Regulations (Burnet County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Granite Shoals</b>	Subdivision Regulations (Chapter 10, 32 and 40)	<ul style="list-style-type: none"> <li>Sidewalks are required on at least one side of residential and collector streets within a residential subdivision, within all nonresidential developments, and along all perimeter roadways of all subdivisions and developments.</li> </ul>	<ul style="list-style-type: none"> <li>Extensive sidewalk standards promote system connectivity throughout the community.</li> </ul>
<b>Highland Haven</b>	Subdivision Regulations (Section 42, 45, and 60)	<ul style="list-style-type: none"> <li>Sidewalks shall be installed by the developer on both sides of all streets within and immediately adjacent to a proposed development.</li> <li>Existing streets in adjoining areas shall be extended.</li> </ul>	<ul style="list-style-type: none"> <li>Development standards promote transportation system connectivity.</li> </ul>
<b>Highland Haven</b>	Zoning Ordinance (Section 3)	<ul style="list-style-type: none"> <li>Paved sidewalks are required in PUD's for mixed use development.</li> </ul>	<ul style="list-style-type: none"> <li>Requirement ensures that developers of PUDs may not 'opt out' of pedestrian connectivity requirements.</li> </ul>
<b>Horseshoe Bay</b>	Zoning Ordinance (Chapter 14)	<ul style="list-style-type: none"> <li>Escondido Private Residence Club: All sidewalks, walkways and plazas will be paved with concrete, flagstone or material of similar type.</li> </ul>	<ul style="list-style-type: none"> <li>The flexible use of materials allows for the development of pedestrian facilities that support the character of varying community districts.</li> </ul>
<b>Horseshoe Bay</b>	Subdivision Regulations (Chapter 10)	<ul style="list-style-type: none"> <li>A maintenance bond is required that guarantees owner/developer's responsibility to maintain all infrastructure construction for period of 2 years.</li> </ul>	<ul style="list-style-type: none"> <li>Short-term maintenance requirements ensure that facilities have been properly constructed and are not prone to failure.</li> </ul>
<b>Marble Falls</b>	Subdivision Regulations (Appendix B)	<ul style="list-style-type: none"> <li>Sidewalks shall be installed on both sides of residential and collector streets; within nonresidential developments; and along perimeter arterials for all subdivisions and developments.</li> <li>Maximum block lengths approach 1,600 feet.</li> </ul>	<ul style="list-style-type: none"> <li>Long block lengths decrease direct pedestrian routes between destinations and have the potential to decrease utilization.</li> </ul>
<b>Marble Falls</b>	Construction Specifications	<ul style="list-style-type: none"> <li>Grade of sidewalk exactly that of curb; material, and reinforcement specifications</li> </ul>	<ul style="list-style-type: none"> <li>Standards address construction of pedestrian facilities in an environment with steep slopes.</li> </ul>

## Overview of Ordinances and Regulations (Caldwell County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Caldwell County</b>	Development Ordinance (Appendix A)	<ul style="list-style-type: none"> <li>Maximum block lengths: residential blocks in urban subdivisions 1,300' up to 1,700' along arterials.</li> </ul>	<ul style="list-style-type: none"> <li>Maximum block length inhibits direct bicycle and pedestrian connectivity to destinations and may decrease utilization.</li> </ul>
<b>Lockhart</b>	Subdivision Regulations (Chapter 52)	<ul style="list-style-type: none"> <li>Sidewalks required to be constructed on public streets abutting property that is already developed, or abutting land areas dedicated for a public park prior to plat being recorded.</li> <li>Sidewalks shall be four (4) foot wide on all classifications of streets except for minor residential: both sides of street and cul-de-sacs longer than 350'.</li> <li>Built in right-of-way, but sidewalk may be constructed in public access easement along the street right-of-way in instances where construction of a required sidewalk in the public right-of-way is not feasible.</li> <li>Inter-parcel connectivity requirements at City discretion.</li> </ul>	<ul style="list-style-type: none"> <li>Standards allow the City to maximize pedestrian connectivity, while providing flexibility in the design, construction, and location of sidewalk and walkway facilities.</li> <li>Narrow sidewalk requirements may decrease pedestrian comfort in areas of higher pedestrian activity.</li> </ul>
<b>Luling</b>	Subdivisions (Chapter 98)	<ul style="list-style-type: none"> <li>Four (4) foot sidewalks are required on both sides of major road/arterial street and collector streets.</li> <li>Blocks near schools, parks, or shopping centers that are longer than 1000' may require 6' pedestrian access easement with 4' sidewalk at mid-block locations.</li> </ul>	<ul style="list-style-type: none"> <li>The City has the option to provide for inter-parcel connectivity and 'short cuts' between long blocks to increase the feasibility of pedestrian travel.</li> </ul>
<b>Luling</b>	Zoning Ordinances (Appendix B)	<ul style="list-style-type: none"> <li>In nonresidential and multifamily districts, an extra-wide sidewalk may be permitted so as to allow encroachment of vehicle overhang while maintaining an unobstructed three (3) foot minimum sidewalk width.</li> <li>Medium and high density residential districts (including single family and two-family) a paved walkway is required to connect the front door of each ground floor unit to a parking area.</li> </ul>	<ul style="list-style-type: none"> <li>Multi-family pedestrian connectivity requirements ensure the development of extensive on-site walkway networks between parking, dwelling units, and other buildings.</li> </ul>

# CALDWELL COUNTY

## Overview of Ordinances and Regulations (Caldwell County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Niederwald</b>	Zoning Ordinance (Section 8)	<ul style="list-style-type: none"> <li>Sidewalks may be required on single-family parcels where new buildings or redevelopment results in a 10 percent increase in property value.</li> </ul>	<ul style="list-style-type: none"> <li>The provision ties the extension of the municipal sidewalk system to single-family development activity that greatly increases the value of the individual property.</li> </ul>
<b>Niederwald</b>	Subdivision Ordinance (Section 12)	<ul style="list-style-type: none"> <li>Block lengths range from minimum of 300' to a maximum of 1,500'.</li> </ul>	<ul style="list-style-type: none"> <li>Maximum block lengths make bicycle and pedestrian connectivity more difficult.</li> </ul>
<b>Niederwald</b>	Engineering Design Standards	<ul style="list-style-type: none"> <li>Residential lots and lots adjacent to local streets and minor collectors require a 4' sidewalk. Commercial lots and lots adjacent to major and minor arterials, major collectors, industrial streets require a 6' sidewalk. Sidewalks shall be located parallel, 1' inside ROW and no more than 2' above or below adjacent curb grade. Ramps are required at all street intersections.</li> </ul>	<ul style="list-style-type: none"> <li>Narrow sidewalk standards on local streets may decrease functionality.</li> </ul>
<b>Uhland</b>	Zoning Ordinance (Section 8)	<ul style="list-style-type: none"> <li>Sidewalks may be required on single-family parcels where new buildings or redevelopment results in a 10 percent increase in property value.</li> <li>The city, at its discretion, may be compensated for future sidewalk construction in lieu of developer constructed sidewalks.</li> </ul>	<ul style="list-style-type: none"> <li>Fee-in-lieu of sidewalk provision allows the City to wait until most improvements are in place prior to constructing the sidewalk network.</li> </ul>
<b>Uhland</b>	Subdivision Regulations (Chapter 1)	<ul style="list-style-type: none"> <li>Sidewalks installation is not a requirement prior to the final plat.</li> <li>Developer is required to furnish a 2 year maintenance bond on sidewalks to City before City accepts subdivision.</li> </ul>	<ul style="list-style-type: none"> <li>Timing of final plat recording and bonding may decrease the chances that sidewalks will be damaged by subsequent construction activity.</li> </ul>



## Overview of Ordinances and Regulations (Hays County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Hays County</b>	Development Regulations (Chapter 721)	<ul style="list-style-type: none"> <li>If bicycle paths are constructed along local roadways or minor collectors, then the amount of ROW dedicated for bicycle use will be credited against the width of required shoulders. The city may then reduce the estimated ADT per lot in determining design criteria for the roadway.</li> </ul>	<ul style="list-style-type: none"> <li>Development incentives for bicycle facilities along roadways can result in the construction of shared use facilities that also serve pedestrians.</li> </ul>
<b>Bear Creek</b>	Subdivision Ordinance (Section 10)	<ul style="list-style-type: none"> <li>Subdivision requires dedication of 25 foot right-of-way - 15 feet of which is used for utilities, drainage facilities, and/or pedestrian access to greenbelts or parks.</li> </ul>	<ul style="list-style-type: none"> <li>Right-of-way dedications may increase pedestrian connectivity to greenbelts or parks.</li> </ul>
<b>Buda</b>	Unified Development Code (Chapter 6, 7 and 9)	<ul style="list-style-type: none"> <li>Sidewalks shall be constructed along all streets in subdivisions and site developments.</li> <li>Sidewalk easement may be required where adequate right-of-way does not exist.</li> <li>Pedestrian connectivity between the right-of-way and principal buildings may be required.</li> <li>Each space designated for bicycle parking shall be a minimum of two (2) feet wide and six (6) feet long.</li> <li>Bikeways must conform to the City of Austin design manual.</li> <li>Pedestrian paths may be required through the mid-section of long blocks.</li> </ul>	<ul style="list-style-type: none"> <li>Cumulative development standards promote bicycle and pedestrian facilities throughout the City - including public street rights-of-way, other linear corridors, and within development sites.</li> </ul>
<b>Dripping Springs</b>	Title II Building and Development Regulations, Zoning (Chapter 30)	<ul style="list-style-type: none"> <li>Vehicle stopping devices are required in parking lots to prevent parked vehicles from overhanging a public right-of-way line, public sidewalk, or adjacent private property.</li> </ul>	<ul style="list-style-type: none"> <li>The safety of pedestrians and bicyclists is increased by allowing a clear travel path.</li> </ul>
<b>Dripping Springs</b>	Title II Building and Development Regulations, Subdivision and Site Development (Chapter 28)	<ul style="list-style-type: none"> <li>A five (5) foot planting strip is required between the curb and sidewalk.</li> <li>Greenway trail development is encouraged.</li> </ul>	<ul style="list-style-type: none"> <li>Separation of sidewalks from the street increases user comfort.</li> <li>Required greenway development is tied to route maps developed as part of the City's park and recreation master plan.</li> </ul>

# HAYS COUNTY

## Overview of Ordinances and Regulations (Hays County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Hays</b>	Subdivision Regulations (Chapter 92)	<ul style="list-style-type: none"> <li>Sidewalks shall be constructed on new streets within a subdivision and on all existing through-streets adjacent to the subdivision.</li> <li>Street connectivity is required between subdivisions.</li> </ul>	<ul style="list-style-type: none"> <li>The subdivision process allows for the extension of the sidewalk network, and for the reduction in existing gaps.</li> </ul>
<b>Kyle</b>	Code of Ordinances: Subdivisions (Chapter 41)	<ul style="list-style-type: none"> <li>Sidewalks are required in residential subdivisions and will be required as appropriate to the area and use in commercial and industrial subdivisions.</li> <li>Sidewalks shall be not less than four (4) feet in width. Such sidewalks shall be constructed on both sides of each residential street in dedicated right-of-way.</li> <li>Hike and bike trail dedication may be required per park land dedication requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Minimum sidewalk widths may decrease user comfort, and do not vary regardless of thoroughfare type.</li> <li>Standards prioritize the development of, and access to, the City's hike and bike trail network - as envisioned in the park and recreation master plan.</li> </ul>
<b>Kyle</b>	Code of Ordinances: Zoning (Chapter 53)	<ul style="list-style-type: none"> <li>There is a reduction in parking incentive for end-of-trip bicycle/pedestrian facilities.</li> <li>In the Neighborhood Commercial zoning district parking must be set back 10 feet from the front building line. In the Community Commercial district, 75 percent of parking must be located behind the front building line.</li> <li>The Neighborhood Commercial district specifies use of pedestrian-oriented lighting.</li> </ul>	<ul style="list-style-type: none"> <li>Development provisions within center-city zoning districts encourage the design of an environment that promotes pedestrian activity.</li> </ul>
<b>San Marcos</b>	Land Development Code (Chapter 7)	<ul style="list-style-type: none"> <li>Sidewalks are required for all residential subdivisions except in residential areas where all lots are equal to or exceed one acre.</li> <li>The City has adopted street tree requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Sidewalks are required in areas where pedestrian travel is likely, and motor vehicle traffic may be heavier. Where required, street tree requirements increase user comfort.</li> </ul>
<b>San Marcos</b>	Zoning Regulations - part of Land Development Code (Chapter 7)	<ul style="list-style-type: none"> <li>Mixed Use and Vertical Mixed Use zoning districts specify that all uses shall provide connections to existing sidewalks, parks, or open space.</li> <li>For multifamily residential development: 1 sheltered bicycle parking space may be required for every 10 dwelling units, and must be located close to building entrances.</li> </ul>	<ul style="list-style-type: none"> <li>Zoning standards require on-site pedestrian connectivity between the streets, parking, and buildings.</li> <li>Bicycle parking requirements are an acknowledgement of substantial bicycle use due to the presence of a university.</li> </ul>

## Overview of Ordinances and Regulations (Hays County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>San Marcos</b>	SmartCode (Downtown)	<ul style="list-style-type: none"> <li>Sidewalk requirements vary by street type.</li> <li>'Cross-block passages,' require that a minimum 8-foot-wide pedestrian access be reserved between buildings.</li> <li>The code identifies three (3) bicycle facility types: bicycle trail, bicycle lane, and bicycle route.</li> <li>The code establishes frontage requirements including built-to line requirements and locating parking behind buildings.</li> </ul>	<ul style="list-style-type: none"> <li>The downtown Smart Code controls the design of streets and private development including pedestrian-friendly block sizes.</li> <li>Bicycle and pedestrian facility requirements are augmented by accessory provisions regarding street trees and pedestrian scale lighting treatments.</li> <li>The built environment reduces motor vehicle conflict points by consolidating driveways and removing parking areas to the rear of buildings.</li> </ul>
<b>Wimberley</b>	Subdivision Ordinance (Chapter 154)	<ul style="list-style-type: none"> <li>Sidewalks shall be installed to provide all residential areas with direct access to all neighborhood facilities, including elementary schools, parks and playgrounds, churches, and shopping centers.</li> <li>Pedestrian ways and sidepaths should be separated from roadways used by vehicular traffic.</li> <li>Sidepaths should clearly separate bicycle from pedestrian use areas.</li> </ul>	<ul style="list-style-type: none"> <li>Sidewalks and shared use networks are encouraged throughout the community.</li> <li>The code prioritizes a clear separation of all modes of travel.</li> </ul>
<b>Wimberley</b>	Zoning Ordinance (Chapter 155)	<ul style="list-style-type: none"> <li>In non-residential and multi-family districts an extra-wide sidewalk on private property may be permitted so as to allow encroachment of vehicle overhang while maintaining an unobstructed 3-foot minimum sidewalk width.</li> <li>In commercial areas, the construction of paths and walkways the use of pervious materials, to the maximum extent possible, is encouraged.</li> </ul>	<ul style="list-style-type: none"> <li>Active transportation facility design is intended to reflect the community's rural heritage through surfacing and facility arrangement.</li> </ul>
<b>Wood Creek</b>	Subdivision Regulations (Chapter 155)	<ul style="list-style-type: none"> <li>Block lengths shall not exceed 1,800 feet or be less than 500 feet.</li> <li>Where appropriate to the neighborhood pattern, existing streets in adjoining areas shall be continued and tied into the street layout to increase connectivity.</li> </ul>	<ul style="list-style-type: none"> <li>Block lengths reflect the rural character of the community.</li> </ul>



# TRAVIS COUNTY

## Overview of Ordinances and Regulations (Travis County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Travis County</b>	Subdivision Standards (Subchapter B - Subdivision Standards)	<ul style="list-style-type: none"> <li>The requirement for sidewalks will be determined by the county on a case-by-case basis and will be based upon development density, proximity to schools</li> </ul>	<ul style="list-style-type: none"> <li>This provision requires sidewalks in necessary locations.</li> </ul>
<b>Austin</b>	Code of Ordinances (Title 25, Land Development) (Chapter 25-1)	<ul style="list-style-type: none"> <li>Chapter 25-2 (Zoning) building design standards require a direct relationship between the building and the street on 'core transit' and 'urban roadways,' connectivity between sites, shade, shelter, and other pedestrian amenities.</li> <li>Chapter 25-3 (Traditional Neighborhood District) includes subdivision and site development standards that generate development of pedestrian scale - include building scale and block sizes.</li> <li>Chapter 25-4 (Subdivisions) For residential blocks longer than 900', block must be transected by a pedestrian path that is located not less than 300' from each block end. The pedestrian path must be not less than 5' wide, comply with City standards for a sidewalk or trail, and be located within an easement or right-of-way, that is not less than 15' wide.</li> <li>Chapter 25-6 (Transportation) Bicycle end-of-trip facilities: Minimum parking can be reduced with provision of shower and changing facilities available to both genders.</li> </ul>	<ul style="list-style-type: none"> <li>Bicycle and pedestrian accommodation is provided through a mixed of base, combining, and overlay zoning provisions - many of which are structured to promote new-urban design principles in the City.</li> <li>Many of the City's existing development tools which promote mixed use development are anticipated to be augmented or replaced by the adoption of the City's new development code: CodeNEXT.</li> </ul>
<b>Austin</b>	Austin/Travis County Subdivision (Chapter 30)	<ul style="list-style-type: none"> <li>Sidewalks must be designed in accordance with state and federal accessibility standards and the Transportation Criteria Manual.</li> </ul>	<ul style="list-style-type: none"> <li>Provides construction standards for sidewalks along roadways.</li> </ul>

## Overview of Ordinances and Regulations (Travis County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Austin</b>	Design Manuals (Building Criteria Manual, Standard Specifications Manual, Traditional Neighborhood Development, Transportation Criteria Manual)	<ul style="list-style-type: none"> <li>The Building Criteria Manual and Traditional Neighborhood Development Manual include TND, TOD, and UNO overlay standards including streetscape designs.</li> <li>Standard specifications have been developed for 'urban transportation' including bicycle and pedestrian facilities.</li> <li>Sidewalk design criteria accounts for streetscape elements, bridges, intersections, etc.</li> <li>Design standards are provided for multiple bikeway types.</li> </ul>	<ul style="list-style-type: none"> <li>The City's Transportation Criteria Manual is the most thorough design guide in the region, and is utilized by multiple surrounding jurisdictions.</li> </ul>
<b>Bee Cave</b>	Code of Ordinances (Chapter 16)	<ul style="list-style-type: none"> <li>Requirements regarding the placement and location of facilities in a public right-of-way vary based on the type of street and right-of-way involved, such types being: arterial streets, collector streets, local/residential streets, rural streets, Bee Cave Parkway—Hill Country Galleria, Bee Cave Parkway-PH 1 (BCCP), Vail Divide, or other transportation element, such as bikeways and bike lanes.</li> </ul>	<ul style="list-style-type: none"> <li>The location of bikeways and bike lanes varies based on road classification.</li> </ul>
<b>Jonestown</b>	Code of Ordinances (Chapter 3)	<ul style="list-style-type: none"> <li>Lighting is spaced at shorter distances along walkways compared to driveways.</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian safety is increased by providing an environment that has sufficient lighting.</li> </ul>
<b>Jonestown</b>	Zoning Ordinance (Chapter 14)	<ul style="list-style-type: none"> <li>Requires pedestrian walkways within the front yard setback that connect to adjacent property lines.</li> </ul>	<ul style="list-style-type: none"> <li>This provision requires pedestrian connections between adjacent properties outside of the street right-of-way.</li> </ul>
<b>Lago Vista</b>	Code of Ordinances - Site Development (Chapter 10.5)	<ul style="list-style-type: none"> <li>Low wattage or low voltage fixtures and luminaires are required. Such lighting is limited to pedestrian areas including plazas, patios, landscape features, and primary entries into buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian safety is increased by providing an environment that has sufficient lighting.</li> </ul>
<b>Lago Vista</b>	Subdivision Regulations (Chapter 10)	<ul style="list-style-type: none"> <li>Provides for a standard maximum block length of 1,200'.</li> </ul>	<ul style="list-style-type: none"> <li>Maximum block lengths may decrease pedestrian connectivity without mid-block provisions.</li> </ul>
<b>Lakeway</b>	Subdivision Regulations (Chapter 28)	<ul style="list-style-type: none"> <li>Trails may be required as part of park land dedication.</li> </ul>	<ul style="list-style-type: none"> <li>Provides a mechanism to ensure the implementation of a city-wide multi-use trail network.</li> </ul>

# TRAVIS COUNTY

## Overview of Ordinances and Regulations (Travis County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Manor</b>	Subdivision Regulations (Section 15, 42 and 45)	<ul style="list-style-type: none"> <li>Sidewalks shall be installed by the developer on both sides of the street.</li> </ul>	<ul style="list-style-type: none"> <li>Ensures the continuity of an expanded pedestrian mobility network.</li> </ul>
<b>Pflugerville</b>	General Regulations (Chapter 90)	<ul style="list-style-type: none"> <li>When a sidewalk, driveway, curb, or gutter becomes defective, unsafe or hazardous, it shall be the duty of the owner of the abutting property to reconstruct or repair same and the expense of such work shall be borne by the abutting property owner.</li> </ul>	<ul style="list-style-type: none"> <li>Sidewalk maintenance is important to ensure the safety of pedestrians.</li> </ul>
<b>Pflugerville</b>	Land Use (Chapter 3 and 150)	<ul style="list-style-type: none"> <li>Pflugerville's hike and bike trail system is to be designed to provide for inter-connectivity between neighborhoods and community destinations, such as schools, parks and shopping areas.</li> </ul>	<ul style="list-style-type: none"> <li>Provision requires continuous connections of the bicycle and pedestrian network.</li> </ul>
<b>Rollingwood</b>	Subdivision Regulations (Chapter 10)	<ul style="list-style-type: none"> <li>Cross streets shall be spaced a maximum of 1000' apart.</li> </ul>	<ul style="list-style-type: none"> <li>Can reduce the number of pedestrian crosswalks, but could be combined with mid-block access requirements.</li> </ul>
<b>Sunset Valley</b>	Subdivision Regulations (Chapter 3)	<ul style="list-style-type: none"> <li>Sidewalks are required on the subdivision side of all through streets adjacent to the subdivision.</li> </ul>	<ul style="list-style-type: none"> <li>Fills existing sidewalk network gaps in conjunction with new development.</li> </ul>
<b>Volente</b>	Subdivision Ordinance (Section 33)	<ul style="list-style-type: none"> <li>Includes a wide range of recommended block widths: 1,100' maximum &amp; 500' minimum. Residential Collectors: Block Length - 2,000' maximum &amp; 500' minimum.</li> </ul>	<ul style="list-style-type: none"> <li>Maximum block lengths may decrease pedestrian connectivity without mid-block provisions.</li> </ul>
<b>Volente</b>	Zoning (Section 30)	<ul style="list-style-type: none"> <li>Provide showers &amp; lockers for employees who commute by bicycle.</li> </ul>	<ul style="list-style-type: none"> <li>Encouraging the use of alternative modes of transportation can be increased access to end of trip facilities.</li> </ul>



## Overview of Ordinances and Regulations (Williamson County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Cedar Park</b>	Subdivision Regulations (Chapter 12)	<ul style="list-style-type: none"> <li>Sidewalks shall be installed on both sides of the street next to a proposed development.</li> <li>Hike and bike trails will be constructed in accordance with the City's recreational trails system plan.</li> </ul>	<ul style="list-style-type: none"> <li>Bicycle accommodation is provided via the construction of hike and bike trails (shared use paths), and the acquisition of linear park land.</li> </ul>
<b>Cedar Park</b>	Zoning Ordinance (Chapter 11)	<ul style="list-style-type: none"> <li>Town Center Code provisions include development principles regarding the provision of pedestrian and bicycle paths.</li> <li>Town Center development standards include parkway, boulevard, and street designs that provide pedestrian-friendly environments.</li> <li>Mixed Use Development District standards will limit blocks to 300' to 600', and will require mid-block connections (proposed zoning update, 03.24.17).</li> <li>Mixed Use Development District standards will include a variety of sidewalk widths that compliment surrounding urban form (proposed zoning update, 03.24.17).</li> </ul>	<ul style="list-style-type: none"> <li>Existing and proposed mixed-use development districts include provisions that provide for an enhanced pedestrian environment.</li> </ul>
<b>Coupland</b>	Subdivision Regulation (Section 22 and 42)	<ul style="list-style-type: none"> <li>Sidewalks must be installed on both sides of the street within &amp; immediately adjacent to a proposed development.</li> </ul>	<ul style="list-style-type: none"> <li>A multi-modal network for bicyclists and pedestrians will be created.</li> </ul>
<b>Florence</b>	Subdivision Regulations (Chapter 10)	<ul style="list-style-type: none"> <li>Sidewalk are required for each residential street &amp; a min. of 4' wide. Sidewalks in commercial areas shall be a min. of 6' wide.</li> </ul>	<ul style="list-style-type: none"> <li>A 4' wide sidewalk is too narrow, while a 6' sidewalk does provide sufficient space for all users.</li> </ul>
<b>Georgetown</b>	Design Manuals	<ul style="list-style-type: none"> <li>The UDC is accompanied by street cross-section - including those for context sensitive street types.</li> <li>The Downtown Master Plan provides street, sidewalk, and intersection design standards that provide for an improved pedestrian environment.</li> </ul>	<ul style="list-style-type: none"> <li>Development ordinances are complimented by design manuals that promote context-sensitive street and site development in downtown districts.</li> </ul>

# WILLIAMSON COUNTY

## Overview of Ordinances and Regulations (Williamson County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Georgetown</b>	Unified Development Code (Chapters 4 and 7, Zoning Districts and Non-residential Design Standards)	<ul style="list-style-type: none"> <li>Zoning regulations include two (2) mixed use development districts. The Downtown Overlay District standards include maximum 'build-to' lines.</li> <li>Pedestrian routes shall be provided between parking and buildings on a development site.</li> </ul>	<ul style="list-style-type: none"> <li>Development standards provide for pedestrian circulation in downtown districts, and in conjunction with other non-residential development.</li> </ul>
<b>Georgetown</b>	Unified Development Code (Chapter 12, Pedestrian and Vehicle Circulation)	<ul style="list-style-type: none"> <li>Bicycle lanes may be required on new or retrofitted collector or arterial streets (which qualify as 'comprehensive plan streets')</li> <li>Sidewalks are required on all collector and arterial streets, and most local street types.</li> <li>Sidewalks in the downtown overlay district must be separated from the street by a minimum four (4) foot wide planting strip and street trees.</li> <li>Required bicycle lanes may be combined with sidewalks to create a shared use path.</li> <li>Regional trails depicted on the city's trails master plan must be constructed during property development.</li> <li>Code includes a minimum street connectivity index.</li> <li>Mid-block pedestrian connections are required for blocks exceeding 1,000' in length.</li> </ul>	<ul style="list-style-type: none"> <li>Major thoroughfare standards require bicycle lanes in conjunction with all regionally-identified thoroughfares.</li> <li>Sidewalks standards vary by development context.</li> <li>Trail construction is required as part of new development. Bicycle and pedestrian accommodation may also be combined as shared use paths on regionally-identified major thoroughfares.</li> <li>Development provisions provide for pedestrian connectivity in excess of minimum street connectivity requirements.</li> </ul>
<b>Granger</b>	Subdivision Regulations (Article III)	<ul style="list-style-type: none"> <li>Residential and commercial sidewalks are required for each residential street and shall be constructed by the owner, subdivider or developer.</li> </ul>	<ul style="list-style-type: none"> <li>Provides for consistent pedestrian network within new developments.</li> </ul>
<b>Hutto</b>	Unified Development Code (Chapter 4)	<ul style="list-style-type: none"> <li>Intra-parcel walkway connectivity is required as a component of new development.</li> </ul>	<ul style="list-style-type: none"> <li>This provision states that connections between parcels are required to increase pedestrian access.</li> </ul>
<b>Hutto</b>	Subdivision Regulations (Chapter 5)	<ul style="list-style-type: none"> <li>Minimum 5' tree lawns are required between the sidewalk and street.</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian safety is increased by providing a buffer between the sidewalk and the street.</li> </ul>
<b>Hutto</b>	SmartCode (Article 3, 5 and 6)	<ul style="list-style-type: none"> <li>One (1) bicycle rack shall be provided within the public or private frontage for every 10 vehicular parking spaces.</li> </ul>	<ul style="list-style-type: none"> <li>Encouraging the use of alternative modes of transportation can be increased by providing these end of trip facilities.</li> </ul>

## Overview of Ordinances and Regulations (Williamson County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
Jarrell	Code of Ordinances (Chapter 9)	<ul style="list-style-type: none"> <li>Shared use paths shall be between six (6) and 12 feet in width.</li> </ul>	<ul style="list-style-type: none"> <li>Conflicts will decrease with a wider walkway.</li> </ul>
Leander	Subdivision Regulation (Chapter 10)	<ul style="list-style-type: none"> <li>Thoroughfare requirements include trail interconnectivity throughout the City consistent with the City roadway plan.</li> <li>Fees-in-lieu associated with park land dedication - including linear parks.</li> </ul>	<ul style="list-style-type: none"> <li>Trail interconnectivity requirements complement street connectivity to provide access for pedestrians.</li> <li>Park land dedication requirements can provide for linear park corridors or trail easements.</li> </ul>
Leander	Zoning Ordinance (Chapter 14)	<ul style="list-style-type: none"> <li>Multifamily and nonresidential: sidewalks are required on both sides of the street. Single-family &amp; two-family residential: sidewalks shall be installed on major arterial roadways, &amp; sidewalks shall be installed on all other roads, parallel to both sides of the roadways.</li> <li>Sidewalks at least six (6) feet in width and set back at least five (5) feet from the back of curb.</li> <li>City has adopted the Smart Code to guide development in its Transit Oriented Development district.</li> <li>City of Austin Transportation Criteria Manual adopted by reference.</li> </ul>	<ul style="list-style-type: none"> <li>Standard site design requirements provide separation between pedestrian facilities and the street.</li> <li>Smart Code adoption will promote the development of a multi-modal district in the vicinity of the City's CapMetro station.</li> </ul>
Liberty Hill	Unified Development Code (Appendix A)	<ul style="list-style-type: none"> <li>Minimum shared-use path width (6ft.) is narrow. Code refers to the facility as shared sidewalk.</li> </ul>	<ul style="list-style-type: none"> <li>Narrow sidewalks could increase bicycle and pedestrian conflicts.</li> </ul>
Round Rock	Design and Construction Standards	<ul style="list-style-type: none"> <li>Includes extensive street, sidewalk, and bikeway design criteria. Some provisions derived from City of Austin's Transportation Criteria Manual.</li> </ul>	<ul style="list-style-type: none"> <li>Provides the building blocks to construct a multi-modal transportation system.</li> </ul>
Round Rock	Subdivision Regulations (Chapter 36 and 43)	<ul style="list-style-type: none"> <li>Sidewalks on both sides of the street may be located in the right-of-way or within a sidewalk easement. Sidewalks on one side only along rural streets. Sidewalks are required along street frontage of parks.</li> </ul>	<ul style="list-style-type: none"> <li>Recommended sidewalk density correlates with anticipated development intensity.</li> </ul>
Round Rock	Zoning Ordinance (Chapter 46)	<ul style="list-style-type: none"> <li>Connectivity to transit facilities may be required during the development review process.</li> </ul>	<ul style="list-style-type: none"> <li>Increased bicycle and pedestrian connections to transit facilities can create opportunities for users to enhance mobility options.</li> </ul>



# WILLIAMSON COUNTY

## Overview of Ordinances and Regulations (Williamson County)

JURISDICTION	DOCUMENT TITLE	RELEVANT PROVISIONS	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Taylor</b>	Subdivision Regulations (Appendix C)	<ul style="list-style-type: none"> <li>New development, all residential districts: Sidewalks on one side of street. New commercial development, sidewalks are required adjacent to existing public street right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Code provisions anticipate that pedestrian needs will be greater at destinations which are located on higher-volume thoroughfares.</li> </ul>
<b>Taylor</b>	Zoning Ordinance (Appendix B)	<ul style="list-style-type: none"> <li>Construction or replacement of sidewalks on existing streets is required in association with expansion/redevelopment in the MF-2 District.</li> </ul>	<ul style="list-style-type: none"> <li>Providing improved sidewalks in high density areas will create adequate facilities for residents who live nearby.</li> </ul>

# POLICY DOCUMENTS

## Overview of Policy Documents (Bastrop County)

## BASTROP COUNTY

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Bastrop (City)</b>	<i>City of Bastrop Comprehensive Plan (2016)</i>	<ul style="list-style-type: none"> <li>Objectives and actions promote the development of bicycle and pedestrian educational programs.</li> <li>Actions suggest projects and ordinance amendments that can improve walkability in downtown.</li> <li>Closer coordination with BISD is suggested to improve safe routes to school.</li> <li>Land development ordinance amendments are recommended to distinguish between, and provide for, sidewalks, shared use paths, and side paths.</li> <li>Updates to City subdivision regulations and site development standards are recommended to support connectivity and 'Complete Streets' principles.</li> <li>Development of a city-wide multi-use trail network is proposed.</li> </ul>	<ul style="list-style-type: none"> <li>Downtown enhancements and linkages to school bus stops would provide high-priority pedestrian connections.</li> <li>Recommended ordinance amendments and projects would support development of a city-wide multi-use trail network.</li> </ul>
<b>Elgin</b>	<i>Comprehensive Plan (2016)</i>	<ul style="list-style-type: none"> <li>Construct a trail and sidewalk network that connects neighborhoods to parks, schools, and commercial areas.</li> <li>Extend bicycle and pedestrian amenities to industrial areas.</li> <li>Expand upon previous Safe Routes to School planning efforts in partnership with the Elgin ISD.</li> </ul>	<ul style="list-style-type: none"> <li>Connectivity of bicycle and pedestrian facilities to key destinations in the community would increase the use of these facilities.</li> <li>Expanded Safe Routes to School efforts can assist the City in prioritizing capital pedestrian investments.</li> </ul>
<b>Smithville</b>	<i>City of Smithville Comprehensive Plan (2011-2012)</i>	<ul style="list-style-type: none"> <li>Complete Safe Routes to School projects and implement pedestrian improvements</li> </ul>	<ul style="list-style-type: none"> <li>Safe Routes to School will target active transportation investments within school zones.</li> </ul>

# BURNET COUNTY

## Overview of Policy Documents (Burnet County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Burnet County</b>	<i>Burnet County Comprehensive Transportation Plan (2010)</i>	<ul style="list-style-type: none"> <li>Plan policies, goals, and objectives promote the general enhancement of bike and pedestrian facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Expands consideration of multi-modal solutions in future transportation system investments.</li> </ul>
<b>Horseshoe Bay</b>	<i>City of Horseshoe Bay Parks Master Plan (2013)</i>	<ul style="list-style-type: none"> <li>Objectives include steps to develop and implement a system of hiking trails.</li> <li>Suggests that hiking trail development be a high priority within three (3) trail corridors where excellent opportunities already exist.</li> </ul>	<ul style="list-style-type: none"> <li>This provision suggests the creation of scenic recreational trail routes along key corridors for bicyclists and pedestrians.</li> </ul>
<b>Marble Falls</b>	<i>Marble Falls Comprehensive Plan (2016)</i>	<ul style="list-style-type: none"> <li>Policy, goal, objective, and action statements suggest the amendment of development regulations to improve pedestrian inter-connectivity and access.</li> <li>Recommends major thoroughfare updates to provide for bicycle facilities.</li> <li>Promotes the development of a sidewalk master plan.</li> <li>Includes multiple actions related to city-wide multi-use trail network development.</li> <li>Suggests the adoption and implementation of a Citywide “Complete Streets” policy.</li> </ul>	<ul style="list-style-type: none"> <li>Recommended Complete Streets policy and thoroughfare modifications may allow the City to incorporate bicycle facilities into new or retrofitted streets.</li> <li>Sidewalk master plan can augment existing capital improvement processes.</li> </ul>
<b>Marble Falls</b>	<i>Marble Falls Park, Recreation, &amp; Open Space Master Plan Update (2017)</i>	<ul style="list-style-type: none"> <li>Includes a series of ‘connectivity’ actions to extend and improve the City’s multi-use trail network.</li> <li>Recommends the development of a trails master plan.</li> <li>Encourages the acquisition of linear corridors for resource preservation and trail development.</li> </ul>	<ul style="list-style-type: none"> <li>Promotes city-wide coverage of existing recreational trail networks, providing transportation benefit.</li> </ul>



## CALDWELL COUNTY

### Overview of Policy Documents (Caldwell County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Caldwell County</b>	<i>Caldwell County Transportation Plan (2013)</i>	<ul style="list-style-type: none"> <li>Goals include a recommendation that roadway improvements and new facilities should consider Complete Street concepts.</li> </ul>	<ul style="list-style-type: none"> <li>The implementation of this concept may provide for greater bicycle and pedestrian accommodation in some areas of the County.</li> </ul>
<b>Lockhart</b>	<i>Lockhart's 2020 Comprehensive Plan</i>	<ul style="list-style-type: none"> <li>The vision of Lockhart's 2020 Comprehensive Plan regarding Central Business Districts is to create a lively entertainment and cultural district that is pedestrian friendly.</li> </ul>	<ul style="list-style-type: none"> <li>This will be accomplished through the creation of a aesthetically pleasing pedestrian environment.</li> </ul>
<b>Lockhart</b>	<i>Colorado Street Corridor Improvement Plan</i>	<ul style="list-style-type: none"> <li>Includes recommendations regarding the adoption of Complete Streets principles.</li> </ul>	<ul style="list-style-type: none"> <li>Identifies the need for multi-modal solutions on this major community thoroughfare.</li> </ul>

### Overview of Policy Documents (Hays County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Hays County</b>	<i>Hays County Transportation Plan (2013)</i>	<ul style="list-style-type: none"> <li>Goals promote the development of a multi-modal transportation system.</li> <li>Policy statement recognizes the value of the previously developed Safe Routes to School Program.</li> </ul>	<ul style="list-style-type: none"> <li>Plan acknowledges the value in providing active transportation options.</li> </ul>
<b>Buda</b>	<i>Buda 2030 Comprehensive Plan (2011)</i>	<ul style="list-style-type: none"> <li>Cumulative series of goals, objectives, and actions recommend a multi-modal approach to transportation issues that reflects the desired character of the community.</li> </ul>	<ul style="list-style-type: none"> <li>A variety of transportation alternatives can be created in a multi-modal network.</li> </ul>
<b>Buda</b>	<i>City of Buda Transportation Master Plan Update (2013)</i>	<ul style="list-style-type: none"> <li>Key action recommends the continued enforcement of street connectivity ratios.</li> </ul>	<ul style="list-style-type: none"> <li>City plans promotes street inter-connectivity to serve motorists and active transportation modes.</li> </ul>
<b>Dripping Springs</b>	<i>The City of Dripping Springs Comprehensive Plan (2010)</i>	<ul style="list-style-type: none"> <li>The Plan indicates that the City should ensure connectivity between new subdivisions and existing neighborhoods.</li> </ul>	<ul style="list-style-type: none"> <li>The use of pedestrian and bicycle facilities could be increased with a greater number of connections to new neighborhoods.</li> </ul>

# HAYS COUNTY

## Overview of Policy Documents (Hays County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Kyle</b>	<i>City of Kyle Comprehensive Plan (2010)</i>	<ul style="list-style-type: none"> <li>Includes goals and actions that promote the enhancement of roadway connections to provide more convenient and safer links between neighborhoods, commercial, employment, and civic areas.</li> </ul>	<ul style="list-style-type: none"> <li>Recommended street connections can provide greater traffic dispersal, and can be coupled with safer pedestrian and bicycle connectivity.</li> </ul>
<b>Kyle</b>	<i>Kyle Connected Transportation Master Plan 2040</i>	<ul style="list-style-type: none"> <li>Recommends the creation of a system of interconnected and safe bicycle paths, routes, trails, and pedestrian facilities.</li> </ul>	<ul style="list-style-type: none"> <li>These connections may increase use of the alternative modes of transportation.</li> </ul>
<b>Kyle</b>	<i>City of Kyle Parks, Recreation and Open Space Master Plan (2016)</i>	<ul style="list-style-type: none"> <li>Plan actions promote the construction of multi-use trails along key roadway and non-roadway corridors.</li> <li>Actions recommend the amendment of land development ordinances to incorporate provisions for the development of sidepaths.</li> <li>Promotes continued multi-use trail system development, including uniform design standards.</li> </ul>	<ul style="list-style-type: none"> <li>Trail system development recommendations are intended to meet many local recreation and transportation needs.</li> </ul>
<b>San Marcos</b>	<i>San Marcos Transportation Master Plan (2004)</i>	<ul style="list-style-type: none"> <li>Includes a series of goals, objectives, and actions that promote pedestrian connectivity to community destinations, and within development sites.</li> <li>Promotes bicycle and pedestrian linkages to public transit.</li> <li>Includes objectives and actions that promote the expansion of the City's bicycle network.</li> <li>Acknowledges the dual recreation-transportation use of shared use paths.</li> </ul>	<ul style="list-style-type: none"> <li>Cumulative provisions promote the development of multi-modal facilities.</li> <li>Measurable actions related to bicycle and pedestrian facility expansion accompany general policy statements.</li> </ul>
<b>San Marcos</b>	<i>City of San Marcos Parks, Recreation &amp; Open Space Master Plan (2010)</i>	<ul style="list-style-type: none"> <li>Includes an action to construct a multi-modal path from I-35 to River Center.</li> </ul>	<ul style="list-style-type: none"> <li>Promotes development of a key shared-use corridor.</li> </ul>
<b>San Marcos</b>	<i>City of San Marcos Downtown Master Plan (2008)</i>	<ul style="list-style-type: none"> <li>Promotes the establishment of pedestrian-friendly connections to downtown.</li> </ul>	<ul style="list-style-type: none"> <li>This provision encourages pedestrian connections between downtown, Texas State University, and surrounding central-city neighborhoods.</li> </ul>

## Overview of Policy Documents (Travis County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Travis County</b>	<i>Travis County Land, Water, &amp; Transportation Plan - Growth Guidance Plan (2014)</i>	<ul style="list-style-type: none"> <li>• Policy relies on CAMPO's Priority Pedestrian District Map and Regional Bicycle Corridor Map to prioritize active transportation project investment.</li> <li>• Promotes roadway system development that is compatible for all modes of transportation.</li> <li>• Recognizes the importance of trail linkages as an extension of the transportation system.</li> <li>• Connect transportation bicycle facilities with recreational bicycle facilities, particularly where recreational facilities are destinations.</li> </ul>	<ul style="list-style-type: none"> <li>• Policy establishes a general methodology for active transportation project selection.</li> <li>• Promotes the use of the recreational trail network to support bicycle and pedestrian mobility needs.</li> </ul>
<b>Travis County</b>	<i>Travis County Parks Master Plan (2016)</i>	<ul style="list-style-type: none"> <li>• Recommends the development of a comprehensive greenway and multi-use trail system.</li> </ul>	<ul style="list-style-type: none"> <li>• Proposed greenways are intended to provide scenic routes for trail users, and increase accessibility to the County park system.</li> </ul>
<b>Austin</b>	<i>City of Austin Urban Trails Master Plan (2014)</i>	<ul style="list-style-type: none"> <li>• Policies encourage coordination with other adopted municipal plans.</li> <li>• Promotes the development of 'urban trails' which are designed to be accessible to a maximum amount of user groups. Includes a series of appropriate design recommendations.</li> <li>• Design emphasize trail development in concert with natural resource preservation and habitat enhancement.</li> <li>• Goals and objectives prioritize linkages to the on-street bicycle system and sidewalk systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Cumulative recommendations balance trail accessibility for recreational and transportation purposes, with resource preservation in environmentally sensitive habitats.</li> </ul>



# TRAVIS COUNTY

## Overview of Policy Documents (Travis County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Austin</b>	<i>Austin Comprehensive Plan (2012)</i>	<ul style="list-style-type: none"> <li>• Policies promote the development of activity centers and street corridors that serve as vibrant gathering spaces.</li> <li>• The plan emphasizes the continued implementation of Complete Streets principles and connectivity between neighborhoods.</li> <li>• Plan actions promote alternative street designs that support bicycling, walking and transit.</li> <li>• Plan actions cumulatively promote the continued development of on- and off-street physically separated bicycle and walking routes or trails linking all parts of Austin and the region.</li> </ul>	<ul style="list-style-type: none"> <li>• Plan policies and actions promote a built environment that promotes community activity and public gathering.</li> <li>• Plan policies and actions emphasize the sustained development of a multi-modal transportation system.</li> </ul>
<b>Austin</b>	<i>Downtown Austin Plan (2011)</i>	<ul style="list-style-type: none"> <li>• Develop a multi-modal transportation system that improves access to and mobility within Downtown.</li> </ul>	<ul style="list-style-type: none"> <li>• Alternative modes of transportation can be utilized if a multi-modal system is in place.</li> </ul>
<b>Austin</b>	<i>Neighborhood, Corridor, and TOD Planning Documents (Various)<sup>1</sup></i>	<ul style="list-style-type: none"> <li>• Plans promote the creation of interconnected street grids defining relatively small blocks.</li> <li>• Actions seek to improve bicycle and pedestrian traffic safety on neighborhood streets, and connectivity across barriers within roadway and non-roadway corridors.</li> <li>• High-density built environments in TOD plans are intended to make walking and bicycling feasible for commuting to work, shops, and recreational areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Neighborhood, corridor, and TOD plans collectively seek to increase urban form that provides feasible bicycle and pedestrian activity nodes, while blending with (or transitioning from) surrounding neighborhood scale.</li> </ul>
<b>Austin</b>	<i>Austin Metropolitan Area Transportation Plan (1994)</i>	<ul style="list-style-type: none"> <li>• A principal goal is to ensure that transit stops and stations, integrated with pedestrian and bicycle routes, can function as centers around which mixed-use residential, retail and commercial activity can be developed.</li> </ul>	<ul style="list-style-type: none"> <li>• Promotes the creation of multi-modal destinations that provide anchors for pedestrian and bicyclist activity and promote the use of intervening facilities.</li> </ul>

<sup>1</sup> Includes: Martin Luther King Boulevard TOD Station Area Plan, North Burnet/Gateway Neighborhood Plan (2007), Plaza Saltillo TOD Station Area Plan, Regulating Plan for the East Riverside Corridor Zoning District (2013), Waller Creek District Master Plan (2010)

## Overview of Policy Documents (Travis County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Bee Cave</b>	<i>City of Bee Cave Comprehensive Plan (2009)</i>	<ul style="list-style-type: none"> <li>Promotes pedestrian-friendly street design, including accessory features such as street trees, proportional lighting, and signage.</li> <li>Street and park design is intended to provide for bicycle accessibility.</li> </ul>	<ul style="list-style-type: none"> <li>The Plan promotes a multi-modal street network that is ADA accessible and fashioned to promote overall community aesthetics.</li> </ul>
<b>Bee Cave</b>	<i>Bee Cave Connectivity Plan (2016)</i>	<ul style="list-style-type: none"> <li>The principal plan's goal is to develop a series of interconnecting, multi-modal transportation corridors for walkers, runners, cyclists, hikers and other non-motorized users.</li> </ul>	<ul style="list-style-type: none"> <li>Identifies an active transportation network that can be constructed in conjunction with new development.</li> </ul>
<b>Lago Vista</b>	<i>City of Lago Vista Comprehensive Plan (2016)</i>	<ul style="list-style-type: none"> <li>Plan actions suggest the development of residential areas with diversified housing styles - including those with front porches that encourage street-side interaction safety with "eyes on the street."</li> <li>Promotes the development of a City-wide park and trail system that allows access to all major destinations in Lago Vista.</li> <li>Recommends City street cross-sections that incorporate bicycle facilities.</li> </ul>	<ul style="list-style-type: none"> <li>The creation of this system will facilitate the implementation of a safe and connected network of bicycle and pedestrian facilities.</li> </ul>
<b>Pflugerville</b>	<i>Pflugerville 2030 Comprehensive Plan (2010)</i>	<ul style="list-style-type: none"> <li>Plan goals include the desire to develop a 'national caliber' network of trails linking residential neighborhoods with community destinations.</li> <li>The plan proposes the development of a street design manual that includes conventional standards for each roadway type and, incorporates Context Sensitive Design (CSD) and 'Complete Streets' standards where deemed applicable.</li> </ul>	<ul style="list-style-type: none"> <li>Promotes the development of a city-wide on-street and off-street network of bicycle and pedestrian facilities.</li> </ul>
<b>Pflugerville</b>	<i>Old Town Pflugerville Vision Report (2009)</i>	<ul style="list-style-type: none"> <li>Recommends the development of improved bicycle connections to Old Town.</li> </ul>	<ul style="list-style-type: none"> <li>Requires the construction of bicycle facilities resulting in a more connected bike network.</li> </ul>

# TRAVIS COUNTY

## Overview of Policy Documents (Travis County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Pflugerville</b>	<i>Pflugerville Master Transportation Plan (2015)</i>	<ul style="list-style-type: none"> <li>• Recommends the continued implementation of an active Safe Routes to School program to encourage walking and bicycling to schools.</li> <li>• Promotes the development of a street design manual that includes conventional standards for each roadway type and, incorporates Context Sensitive Design (CSD) and 'Complete Streets' standards where deemed applicable (as previously promoted in the City's 2010 comprehensive plan).</li> </ul>	<ul style="list-style-type: none"> <li>• Recognizes the importance of Safe Routes to School connections as the principal factor for increasing on-street pedestrian connectivity.</li> </ul>
<b>Sunset Valley</b>	<i>Trails Master Plan Sunset Valley, Texas (2009)</i>	<ul style="list-style-type: none"> <li>• Proposes a city-wide network of multi-use trails.</li> </ul>	<ul style="list-style-type: none"> <li>• Intended to increase recreational opportunities and quality of life in the community.</li> </ul>
<b>Village of Volente</b>	<i>Village of Volente Comprehensive Plan (2004)</i>	<ul style="list-style-type: none"> <li>• Proposes a village-wide hike and bike trail system which would be required to be compliant with the Americans with Disabilities Act (ADA), and be constructed of a natural surface such as compacted crushed stone (no cement and/or asphalt surfaces)</li> </ul>	<ul style="list-style-type: none"> <li>• The proposed trail surfacing reflects the preferred community-wide aesthetic.</li> </ul>



## Overview of Policy Documents (Williamson County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Williamson County</b>	<i>Williamson County Long-Range Transportation Plan (2009)</i>	<ul style="list-style-type: none"> <li>Plan goals suggest that as future roads are built, cities should take advantages of opportunities to install sidewalks and bicycle lanes.</li> </ul>	<ul style="list-style-type: none"> <li>Plan goal promotes city-county coordination to ensure the development of a multi-modal transportation system.</li> </ul>
<b>Williamson County</b>	<i>Williamson County Comprehensive Park Master Plan (2008)</i>	<ul style="list-style-type: none"> <li>The plan includes a series of policies and actions that promote the extension of the current trails network. Actions address trail design, and suggest partnerships for trail construction and promotion.</li> </ul>	<ul style="list-style-type: none"> <li>The Plan recognizes the quality of life value of an inter-connected multi-use trail network.</li> </ul>
<b>Williamson County</b>	<i>Williamson County Trails Master Plan</i>	<ul style="list-style-type: none"> <li>The Plan recommends the development of priority trail segments that link existing trails and increase pedestrian / bicycle conveyance and connectivity within the County.</li> </ul>	<ul style="list-style-type: none"> <li>Consistent with the County park plan, the trails master plan recognizes the value of an inter-connected multi-use trail network, and proposes the development of key corridors.</li> </ul>
<b>Cedar Park</b>	<i>City of Cedar Park Comprehensive Plan (2014)</i>	<ul style="list-style-type: none"> <li>The Plan promotes development and street enhancements that promote a walkable environment.</li> <li>Improved pedestrian safety and connectivity is proposed on major corridors and in redevelopment nodes such as portions of Bell Boulevard.</li> </ul>	<ul style="list-style-type: none"> <li>Promotes the general improvement of the built environment in a manner that improves the walkability and connectedness of Cedar Park for pedestrians and bicyclists.</li> </ul>
<b>Cedar Park</b>	<i>City of Cedar Park Transportation Master Plan</i>	<ul style="list-style-type: none"> <li>Includes a series of actions to provide for continuous bicycle and pedestrian connectivity throughout the City. Connections may include roadway and non-roadway corridors.</li> <li>Promotes grade-separated solutions for bicycle and pedestrian connectivity across major barriers.</li> <li>Actions promote adjustments to street standards to better provide for bicycle accommodation.</li> </ul>	<ul style="list-style-type: none"> <li>Transportation system improvement recommendations are intended to provide for bicycle and pedestrian accessibility in Cedar Park, while mitigating conflicts with motor vehicles.</li> </ul>

# WILLIAMSON COUNTY

## Overview of Policy Documents (Williamson County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Cedar Park</b>	<i>Cedar Park Hike &amp; Bike Trails Master Plan (2010)</i>	<ul style="list-style-type: none"> <li>• Actions recommend varying methods for acquiring trail rights-of-way or easements.</li> <li>• The plan identifies as series of priority linkages to connect existing trail segments, or to provide short-cuts where there is a lack of street inter-connectivity.</li> </ul>	<ul style="list-style-type: none"> <li>• The plan recognizes the dual recreation-transportation role of multi-use trails, and that the resulting system will support corresponding recommendations from other City policy documents.</li> </ul>
<b>Cedar Park</b>	<i>Cedar Park Parks and Recreation Master Plan</i>	<ul style="list-style-type: none"> <li>• The plan includes goals, objectives, and actions cumulatively intended to develop pedestrian and bikeway corridors and pathways to connect all parts of the city such as neighborhoods, parks, schools, civic facilities and businesses.</li> </ul>	<ul style="list-style-type: none"> <li>• Provision calls for connections of bicycle and pedestrian facilities between destinations.</li> </ul>
<b>Georgetown</b>	<i>City of Georgetown Comprehensive Plan (2009)</i>	<ul style="list-style-type: none"> <li>• Plan actions recommend the adjustment of development standards for subdivision connectivity and accommodation of pedestrian and bicycle circulation.</li> <li>• Plan policies and actions promote more compact, higher density development (e.g., traditional neighborhoods, Transit-Oriented Development, mixed-use, and walkable neighborhoods) within appropriate infill locations.</li> </ul>	<ul style="list-style-type: none"> <li>• Plan policies and actions recognize the need to provide for varying development types - including corresponding adjustments to street standards.</li> </ul>
<b>Georgetown</b>	<i>City of Georgetown Parks Master Plan (2009)</i>	<ul style="list-style-type: none"> <li>• Cumulative plan objectives and actions recommend the development of a substantial trail and linear park network.</li> </ul>	<ul style="list-style-type: none"> <li>• Trail and linear park networks will provide increased access to the municipal park system from surrounding residential areas.</li> </ul>

## Overview of Policy Documents (Williamson County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Georgetown</b>	<i>Georgetown Overall Transportation Plan (2004)</i>	<ul style="list-style-type: none"> <li>The plan promotes a multi-modal transportation system - including public transportation - and the safety of all types of transportation users.</li> <li>Plan recommendations suggest that streets should be retrofitted to advance bicycle and pedestrian mobility options.</li> <li>Includes bicycle facility design recommendations.</li> <li>Plan goals support the concept of creating 'walkable' development types in the City.</li> </ul>	<ul style="list-style-type: none"> <li>Plan recognizes that to create bikeable and walkable communities, street design and site design features must align.</li> <li>Policies and goals are being implemented through land development regulation amendments.</li> </ul>
<b>Georgetown</b>	<i>City of Georgetown Sidewalk Master Plan (2015)</i>	<ul style="list-style-type: none"> <li>Provides a series of sidewalk design and implementation recommendations.</li> </ul>	<ul style="list-style-type: none"> <li>Influences the City's capital improvements program.</li> </ul>
<b>Hutto</b>	<i>Hutto Comprehensive Plan</i>	<ul style="list-style-type: none"> <li>Policies, goals, and action statements collectively promote the development of a transportation network which safely accommodates drivers, pedestrians and cyclists.</li> </ul>	<ul style="list-style-type: none"> <li>Recommends bicycle and pedestrian accommodation through the use of roadway and non-roadway corridors.</li> </ul>
<b>Hutto</b>	<i>Hutto Parks, Recreation, Open Space &amp; Trails Master Plan (2015)</i>	<ul style="list-style-type: none"> <li>Includes a project to construct 1.25 miles of trail as part of a Texas Parks and Wildlife Hike &amp; Bike Trail Application (FY2017).</li> </ul>	<ul style="list-style-type: none"> <li>Recognizes the role of linear parks and trails in providing recreational opportunity and park access.</li> </ul>
<b>Hutto</b>	<i>City of Hutto Pedestrian Mobility Plan (2012)</i>	<ul style="list-style-type: none"> <li>Includes a series of recommended projects to increase city-wide pedestrian accessibility.</li> <li>Prioritizes pedestrian routes which coincide with the City's Safe Routes to School plan.</li> </ul>	<ul style="list-style-type: none"> <li>Influences the City's capital improvements program.</li> </ul>
<b>Hutto</b>	<i>Hutto Thoroughfare Plan (2011)</i>	<ul style="list-style-type: none"> <li>Policy indicates that the City will ensure that all new roadways are designed to accommodate automobiles, pedestrians, and in many cases, bicyclists.</li> </ul>	<ul style="list-style-type: none"> <li>Indicates an intent to construct a multi-modal transportation system in the City.</li> </ul>



# WILLIAMSON COUNTY

## Overview of Policy Documents (Williamson County)

JURISDICTION	DOCUMENT TITLE	RELEVANT THEMES	IMPACT ON BICYCLE AND PEDESTRIAN TRAVEL
<b>Leander</b>	<i>Leander Comprehensive Plan (2015)</i>	<ul style="list-style-type: none"> <li>Includes a goal to work with the ACC design and construction team to ensure that their trail/sidewalk planning is in harmony with the City's other adopted plans.</li> </ul>	<ul style="list-style-type: none"> <li>Defers to previously adopted City plans to guide active transportation facility and program development.</li> </ul>
<b>Leander</b>	<i>City of Leander Parks, Recreation &amp; Open Space Master Plan (2011)</i>	<ul style="list-style-type: none"> <li>Provides the City's overall policy for promoting active transportation modes. Bicycle and pedestrian accommodation throughout the City is recommended.</li> <li>Plan objective recommends that arterial and connector streets be identified which are suitable for bike lanes and incorporate bike lanes into new street construction.</li> <li>Recommends a city-wide trails network - including sidepaths within road rights-of-way - and establishes the network as a key method for ensuring city-wide bicycle and pedestrian connectivity.</li> </ul>	<ul style="list-style-type: none"> <li>The City's principle policy document for providing city-wide bicycle and pedestrian accommodation.</li> </ul>
<b>Round Rock</b>	<i>Round Rock Strategic Plan (2015)</i>	<ul style="list-style-type: none"> <li>Recommends improvements to neighborhood connectivity.</li> </ul>	<ul style="list-style-type: none"> <li>Provision encourages the implementation of a continuous and connected network of bicycle and pedestrian facilities.</li> </ul>
<b>Round Rock</b>	<i>Comprehensive Transportation Master Plan (2004)</i>	<ul style="list-style-type: none"> <li>Bicycle facilities are promoted along arterial roadways and other specific roadways in Round Rock.</li> </ul>	<ul style="list-style-type: none"> <li>A multi-modal transportation network is created along primary routes.</li> </ul>
<b>Taylor</b>	<i>City of Taylor Comprehensive Plan (2004)</i>	<ul style="list-style-type: none"> <li>Recommends the development of a cooperative school sidewalk program to enhance the safety, appearance, and access for neighborhood residents.</li> <li>Promotes the development of a municipal trail network.</li> </ul>	<ul style="list-style-type: none"> <li>Focuses on improving walkability in the City.</li> </ul>
<b>Taylor</b>	<i>City of Taylor Parks &amp; Recreation Master Plan (2016)</i>	<ul style="list-style-type: none"> <li>Identifies specific corridors for near-term trail development.</li> </ul>	<ul style="list-style-type: none"> <li>Influences the city's capital improvements program.</li> </ul>

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# APPENDIX C

## REGIONAL ACTIVE TRANSPORTATION NETWORK PROJECT LIST

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# REGIONAL NETWORK PROJECT LIST

The following projects were identified during the planning process based on an analysis of demand, network gaps, existing conditions, and locally identified needs (pages 2-13 - 2-15).

## BASTROP COUNTY

Project Number	Tier	Type	Project Name	From	To
BA1	Tier 1	Potential Upgrade	FM 812 / FM 812 Rd	FM 812 @ W SH 21	FM 812 Rd @ Doyle Rd
BA2	Tier 2	Potential Upgrade	W SH 21	W SH 21 from W SH 71	Williamson Rd
BA3	Tier 2	New Construction Needed, Potential Upgrade	E SH 71 WB / SH 71 Crossover / W SH 71 / W SH 71 Fr	W SH 71 from Griffin Ln	Old Austin Hwy
BA4	Tier 2	New Construction Needed	Central Ave / Littig Rd	Central Ave from S Main St	Littig Rd and Littig Rd from Central Ave to S of Monkey Rd
BA5	Tier 1	Potential Upgrade	E US 290 / W US 290	W US 290 from E of County Line Rd	S SH 95
BA6	Tier 2	New Construction Needed, Potential Upgrade	N SH 95	N SH 95 from W US 290	S of Marek Rd
BA7	Tier 2	Potential Upgrade	N SH 95	N SH 95 from County Line Rd	S of Marek Rd
BA8	Tier 2	New Construction Needed	E Brenham St / N Main St / S Main St / S Martin Luther King Jr Blvd / S SH 95	N Main St @ N SH 95 / Wildcat Dr	S SH 95
BA9	Tier 2	Potential Upgrade	N SH 95 / SH 95 / S SH 95	SH 95 from US 290	SH 21
BA10	Tier 2	New Construction Needed, Potential Upgrade	American Legion Dr / Chestnut St / Loop 150 West	Chesnut St from Colorado River	American Legion Dr and Legion Drive from SH 190 to SH 95
BA11	Tier 1	New Construction Needed, Potential Upgrade	E SH 71 / W SH 71	E SH 71 from Jackson St / SH 95	FM 153
BA12	Tier 2	New Construction Needed, Potential Upgrade	S SH 95	S SH 95 from Harper St	W Old Lockhart Rd
BA13	Tier 1	New Construction Needed	Gazley St / Royston St / S SH 95	Royston St @ N 2nd St	Harper St
BA14	Tier 1	Potential Upgrade	FM 153 / NW Loop 230 / Royston St	Royston St @ FM 2571 / NW 2nd St	FM 153 @ W SH 71
BA15	Tier 2	Potential Upgrade	E SH 71 / W SH 71	W SH 71 @ FM 153	E SH 71



## BURNET COUNTY

Project Number	Tier	Type	Project Name	From	To
BU1	Tier 2	New Construction Needed	W FM 1431	W FM 1431 @ CR 120 / Highland Dr	W FM 1431 @ W RR 1431
BU2	Tier 2	New Construction Needed	N Phillips Ranch Rd	N Phillips Ranch Rd @ Bluebriar Place Dr	W FM 1431
BU3	Tier 2	New Construction Needed	E Granitecastle Dr / Hill Wood Dr / Sherwood Forest Dr / Woodland Hills Dr	E Granitecastle Dr @ N Phillips Ranch Rd / W Granitecastle Dr	Woodland Hills Dr @ Valley View Ln
BU4	Tier 2	New Construction Needed	Valley View Ln	Valley View Ln @ Hill Circle East Dr	W FM 1431
BU5	Tier 2	New Construction Needed	N Wirtz Dam Rd / S Wirtz Dam Rd	N Wirtz Dam Rd @ W FM 1431	W FM 2147
BU6	Tier 1	New Construction Needed	FM 1431 / W FM 1431	W FM 1431 @ Fairland Rd	N US 281
BU7	Tier 1	New Construction Needed	W FM 2147 / W FM 2147	W FM 2147 @ Gateway North / S US 281	W of Highlands Blvd
BU8	Tier 2	New Construction Needed	N US 281 / S US 281	N US 281 @ CR 403	SH 71
BU9	Tier 2	New Construction Needed		Trail @ 2nd St / Avenue P	Resource Pkwy
BU10	Tier 2	New Construction Needed	Gateway North / Gateway Pkwy	Trail	Gateway North @ S US 281 / W FM 2147
BU11	Tier 1	New Construction Needed	N US 281 / S US 281	S US 281 @ Gateway North / W FM 2147	N US 281 @ Mission Hill Dr / Mormon Mill Rd
BU12	Tier 1	New Construction Needed, Potential Upgrade	Mormon Mill Rd	Mormon Mill Rd @ Mission Hill Dr / N US 281	Resource Pkwy
BU13	Tier 1	New Construction Needed	Mormon Mill Rd / Resource Pkwy	Resource Pkwy from N US 281	Mormon Mill Rd
BU14	Tier 1	New Construction Needed	N US 281 / S US 281 / S Water St	S Water St @ N Water St / W Polk St	S US 281 @ Pr 4 S and S Water St @ N Water St / W Polk St to S US 281 @ Pr 4 S
BU15	Tier 1	New Construction Needed		Trail from Resource Pkwy	Marble Falls High School
BU16	Tier 2	New Construction Needed	E SH 71 / W SH 71	W SH 71 from W of Twisted Oak Dr	S of Granite Ridge Rd

## CALDWELL COUNTY

Project Number	Tier	Type	Project Name	From	To
C1	Tier 2	New Construction Needed	Airport Highway 21 / Camino Real	Airport Highway 21 @ SH 80	E RR 150
C1	Tier 2	New Construction Needed	Airport Highway 21 / Camino Real		
C2	Tier 2	New Construction Needed	E Austin / San Marcos Hwy	San Marcos Hwy @ Little Elpaso Rd	San Marcos Hwy @ N Old Bastrop Hwy / Old Bastrop Rd / SH 80
C3	Tier 2	New Construction Needed	County View Rd / FM 2720 / Old Lockhart Rd / S Old Spanish Trl	County View Rd @ FM 2001	Old Lockhart Rd @ S Camino Real
C4	Tier 2	New Construction Needed	SH 130 Seg 5 & 6	SH 130 Seg 5 & 6 @ Boggy Creek Rd	SH 130 Seg 5 & 6
C5	Tier 2	New Construction Needed	FM 2001	FM 2001 @ Hidden Path Rd	Camino Real
C6	Tier 2	New Construction Needed	Camino Real	Camino Real from FM 2001	Williamson Rd
C7	Tier 2	Potential Upgrade	FM 2001 / Silent Valley Rd	Silent Valley Rd @ N Colorado St	FM 2001 @ Hidden Path Rd
C8	Tier 2	Existing, New Construction Needed	Boggy Creek Rd / City Line Rd / E San Antonio St / Maple St / San Jacinto St / S Medina St / W San Antonio St	Trail	E San Antonio St @ N Colorado St / S Colorado St. Trail to E San Antonio St @ N Colorado St / S Colorado St. Trail to E San Antonio St @ N Colorado St / S Colorado St. Trail to E San Antonio St @ N Colorado St / S Colorado St
C9	Tier 2	New Construction Needed	Connector to Hwy 183 Rd / N Colorado St / N US 183 Hwy / SH 130 Seg 5 & 6 / S US 183 Hwy NB	S US 183 Hwy NB @ Old Lockhart Rd	Silent Valley Rd
C10	Tier 2	Potential Upgrade	Camino Real	Camino Real @ Williamson Rd	Camino Real @ W SH 21
C11	Tier 2	New Construction Needed	N Colorado St / N Magnolia / S Colorado St / S Magnolia / S US 183 Hwy	S Colorado St @ Silent Valley Rd	S Laurel Ave

## HAYS COUNTY

Project Number	Tier	Type	Project Name	From	To
H1	Tier 2	New Construction Needed	Woodcreek Dr	Woodcreek Dr from Camp Young Judea Rd	RR 2325
H2	Tier 2	New Construction Needed	Champions Cir / Woodcreek Dr	Municipal Need @ Jacobs Well Rd	Woodcreek Dr
H3	Tier 2	New Construction Needed	Augusta Dr / Brookhollow Dr / Brookmeadow Dr	Trail @ Augusta Dr / Brookhollow Dr	Trail @ Jacobs Well Rd
H4	Tier 2	New Construction Needed		Municipal Need @ Champions Cir	Municipal Need @ Champions Cir
H5	Tier 1	New Construction Needed	RR 12	RR 12 @ Old Kyle Rd / Wimberley Sq	RR 12 @ Winters Mill Pkwy / Woodcreek Dr
H6	Tier 2	New Construction Needed	RR 12	RR 12 @ Winters Mill Pkwy / Woodcreek Dr	RR 12 @ Jacobs Well Rd
H7	Tier 2	New Construction Needed	Creek Rd / W US 290	W US 290 @ E US 290 / RR 12	Creek Rd @ Roger Hanks Pkwy
H8	Tier 2	Potential Upgrade	RR 12	RR 12 from W RR 150	Jacobs Well Rd
H9	Tier 2	New Construction Needed	Shelton Ln	Municipal Need @ Founders Park Rd	Municipal Need @ E US 290 / Shelton Ln Municipal Need @ Founders Park Rd
H10	Tier 2	New Construction Needed	RR 12	RR 12 from S of W Cave Blvd	W RR 150
H11	Tier 2	Potential Upgrade	RR 12	RR 12 from N of Saddletree Ln	S of West Cave Blvd
H12	Tier 2	New Construction Needed	Flite Acres Rd / Fulton Ranch Rd / Little Arkansas Rd / Old Kyle Rd / RR 3237	Old Kyle Rd @ RR 12 / Wimberley Sq	Fulton Ranch Rd @ RR 12
H13	Tier 2	New Construction Needed	RR 12 / W Wonder World Dr	RR 12 from RR 3327	Hunter Rd
H14	Tier 2	Potential Upgrade	E US 290 / W US 290	E US 290 @ RR 12 / W US 290	W US 290 @ Belterra Dr / Heritage Oaks Dr
H15	Tier 2	New Construction Needed	Hunter Rd	Centerpoint Rd	County Line
H15	Tier 2	New Construction Needed	Hunter Rd		
H16	Tier 2	New Construction Needed	W US 290 / W US 290 Hwy	W US 290 Hwy from Heritage Oaks Dr	Cedar Valley Shopping
H17	Tier 2	Potential Upgrade	Hunter Rd	Centerpoint Rd	Wonder World Dr
H18	Tier 1	New Construction Needed		Trail from Rebel Dr	Opal Ln, Trail from San Marcos Hwy To
H19	Tier 1	New Construction Needed	Aquarena Springs Dr / N C M Allen Pkwy / University Dr	Post Rd	E Hopkins St
H20	Tier 2	New Construction Needed, Potential Upgrade	E Hopkins St / Hunter Rd / SH 80 / W Hopkins St	Hunter Rd @ Wonder World Dr / W Wonder World Dr	SH 80 @ N Old Bastrop Hwy / Old Bastrop Rd / San Marcos Hwy
H21	Tier 1	Potential Upgrade	Post Rd	Post Rd @ Aquarena Springs Dr	Post Rd @ Claremont Dr



## Hays County continued

Project Number	Tier	Type	Project Name	From	To
H22	Tier 2	New Construction Needed, Potential Upgrade	S Old Stagecoach Rd	Hunter Rd from Opal Ln	Post Rd, Hunter Rd from Centerpoint Rd To
H23	Tier 2	New Construction Needed	N Old Stagecoach Rd / S Old Stagecoach Rd	Opal Ln	Rebel Dr
H24	Tier 1	Potential Upgrade	Jack C Hays Trl	Jack C Hays Trl @ S FM 1626	Fairway / Meadow Woods Dr
H24	Tier 2	Potential Upgrade	Jack C Hays Trl	Jack C Hays Trl @ S FM 1626	Fairway / Meadow Woods Dr
H25	Tier 1	New Construction Needed	E Center St / N Burseson St / Post Rd / W Center St	Post Rd @ Claremont Dr	N Burseson St @ Spring Branch Dr
H26	Tier 1	New Construction Needed	Fairway / Sampson	Sampson @ Scrutchins	Fairway @ Jack C Hays Trl / Meadow Woods Dr
H27	Tier 1	Potential Upgrade	Scrutchins / Spring Branch Dr		
H28	Tier 2	New Construction Needed, Potential Upgrade	RR 967 / S FM 1626 / S FM 1626 Opas	RR 967 @ Elm Grove Ln	S FM 1626 Opas @ IH 35 Fr / Kyle Pkwy
H29	Tier 2	New Construction Needed	SH 45 SW Trail	SH 45 SW Trail @ Bliss Spillar Rd	SH 45 SW Trail @ N FM 1626
H30	Tier 2	Existing, New Construction Needed		Trail from RR 967	Cullen Blvd
H31	Tier 2	New Construction Needed	N FM 1626 / W FM 1626 Rd	W FM 1626 Rd from SH 45 SW Trail	S of Big Valley Dr
H32	Tier 1	New Construction Needed	Bluff St Ext / Jack C Hays Trl	Bluff St Ext @ S Loop 4 / S Main St / W Goforth St	Jack C Hays Trl @ S FM 1626
H33	Tier 2	New Construction Needed, Potential Upgrade	Manchaca Springs / RR 967	RR 967 @ Cullen Blvd	Manchaca Springs @ Garlic Creek Dr
H34	Tier 2	New Construction Needed	SH 45 SW Trail	SH 45 SW Trail @ N FM 1626	Garlic Creek Dr
H35	Tier 2	New Construction Needed	Garlic Creek Dr	Garlic Creek Dr @ Manchaca Springs	Garlic Creek Dr @ SH 45 SW Trail
H36	Tier 1	Potential Upgrade	Main St / Robert S Light Blvd / S Loop 4 / S Main St	S Loop 4 @ Bluff St Ext / S Main St / W Goforth St	Robert S Light Blvd @ Hillside Terrace Opas / IH 35 Fr S Loop 4 @ Bluff St Ext / S Main St / W Goforth St
H36	Tier 2	Potential Upgrade	Main St / Robert S Light Blvd / S Loop 4 / S Main St	S Loop 4 @ Bluff St Ext / S Main St / W Goforth St	Robert S Light Blvd @ Hillside Terrace Opas / IH 35 Fr S Loop 4 @ Bluff St Ext / S Main St / W Goforth St
H37	Tier 2	New Construction Needed	E RR 150 / IH 35 Fr	I 35 Side Path from Kyle Pkwy	Windmill Ctr and Trail from I-35 to Camino Real
H38	Tier 1	New Construction Needed	Main St / Old San Antonio Rd	Main St @ E Loop St / Sequoyah St	Old San Antonio Rd
H39	Tier 2	New Construction Needed	Hillside Ter / Hillside Terrace Opas	Hillside Terrace Opas @ IH 35 Fr / Robert S Light Blvd	Hillside Ter @ FM 2001 / Satterwhite Rd

## Hays County continued

Project Number	Tier	Type	Project Name	From	To
H40	Tier 2	New Construction Needed, Potential Upgrade	Camino Real / N Camino Real / S Camino Real	Camino Real from FM 2001	E RR 150
H41	Tier 2	New Construction Needed	FM 2001 / Niederwald Strasse	FM 2001 @ Hillside Ter / Satterwhite Rd	Niederwald Strasse @ Camino Real
H42	Tier 2	New Construction Needed	Goforth Rd / Rohde Rd	Goforth Rd @ FM 2001	Rohde Rd @ Camino Real / FM 2001
H43	Tier 2	New Construction Needed	Williamson Rd	Williamson Rd from FM 2001	S of Graef Rd

## TRAVIS COUNTY

Project Number	Tier	Type	Project Name	From	To
T1	Tier 2	New Construction Needed	W SH 71	W SH 71 from W of Fall Creek Rd	S Pace Bend Rd
T2	Tier 2	Potential Upgrade	Hamilton Pool Rd	Hamilton Pool Rd from Pedernales River	Longhorn Skwy
T3	Tier 2	Potential Upgrade	W SH 71	W SH 71 @ R O Dr	W SH 71 @ S Pace Bend Rd
T4	Tier 2	Potential Upgrade	Brooks Ranch Rd / RR 12	RR 12 from Hamilton Pool Rd	N of West Cave Blvd
T5	Tier 2	New Construction Needed	Bee Creek Rd / Bob Wire Rd / Lake Travis Resort Rd / Old Ferry Rd	Lake Travis Resort Rd	Bee Creek Rd.
T6	Tier 2	New Construction Needed	W SH 71	W SH 71 @ Bee Creek Rd	W SH 71 @ R O Dr
T7	Tier 2	New Construction Needed	Boggy Ford Rd / Emerald Rd	Boggy Ford Rd @ National Dr	Emerald Rd @ Robin Trl
T8	Tier 2	Potential Upgrade	W SH 71	W SH 71 @ Serene Hills Dr	W SH 71 @ Bee Creek Rd
T9	Tier 2	New Construction Needed, Potential Upgrade	Hamilton Pool Rd	Hamilton Pool Rd @ Bee Cave Pkwy / W SH 71	Hamilton Pool Rd @ Longhorn Skwy
T10	Tier 2	New Construction Needed	Canyon Oaks Dr / Green Shore Cir / Lakefront Dr / National Dr / Outpost Trce / Rimrock Dr	Canyon Oaks Dr from Dawn Dr	National Dr and National Dr from Lakefront Dr to Boggy Ford Rd
T11	Tier 2	New Construction Needed, Potential Upgrade	The Hills Dr / Wingreen Loop	The Hills Dr from Serene Hills Dr	Wintergreen Loop
T12	Tier 2	New Construction Needed	W SH 71	W SH 71 @ Bee Cave Pkwy / Hamilton Pool Rd	W SH 71 @ Serene Hills Dr
T13	Tier 2	New Construction Needed	Lakeway Blvd	Lakeway Blvd @ Lohmans Crossing Rd	Lakeway Blvd @ Stoney Creek Cv
T14	Tier 2	New Construction Needed	Boggy Ford Rd / Dawn Dr / Gary Player Dr / Shoreline Ranch Dr	Dawn Dr from Camille Ct	Gary Player Ln, Gary Player Ln from Dawn Dr to Shoreline Ranch Rd
T15	Tier 2	New Construction Needed	Bar K Ranch Rd / FM 1431 Rd / Lakeshore Dr / Park Dr / Paseo De Vaca	Trail @ Bar K Ranch Rd / Foothill Cv	FM 1431 Rd
T16	Tier 2	Potential Upgrade	W SH 71	W SH 71 @ S FM 620 Rd / Shops Pkwy	Bee Cave Pkwy / Hamilton Pool Rd
T17	Tier 1	New Construction Needed, Potential Upgrade	W SH 71	W SH 71 from S FM 620 Rd	E of Uplands Ridge Dr
T18	Tier 2	New Construction Needed		Trail from Primrose School/ calixas Yachts	FM 2244 Rd
T19	Tier 2	New Construction Needed	W US 290 Hwy	W US 290 Hwy from FM 1826 Rd	W US 290
T20	Tier 1	New Construction Needed	Slaughter Creek Greenway	Slaughter Creek Greenway from W US 290	FM 1826



## Travis County continued

Project Number	Tier	Type	Project Name	From	To
T21	Tier 1	Potential Upgrade	W SH 71	W SH 71 from SE of Uplands Ridge Rd	SE of Texas Wildlife Trl
T22	Tier 1	New Construction Needed	FM 1431 Rd	FM 1431 Rd @ Dee Dr / Vista Rock Dr	FM 1431 Rd @ Georgetown Dr / Ridgeway
T23	Tier 1	New Construction Needed	W SH 71	W SH 71 from SE of Texas Wildlife Trl	Southwest Pkwy
T24	Tier 1	New Construction Needed	FM 1826 Rd	FM 1826 Rd @ Slaughter Creek Greenway	FM 1826 Rd @ SH 45 WB
T25	Tier 1	New Construction Needed, Potential Upgrade	N FM 620 Rd / S FM 620 Rd	S FM 620 Rd from Hanging Valley Dr	Bee Cave
T26	Tier 1	New Construction Needed	Slaughter Creek Greenway	Slaughter Creek Greenway from Fleenor Dr / FM 1826 Rd	Eastern End
T27	Tier 1	Potential Upgrade	SH 45 WB / S Mopac Expy SB	S Mopac Expy SB @ W Slaughter Ln	SH 45 WB @ FM 1826 Rd
T28	Tier 1	Potential Upgrade	Southwest Pkwy	Southwest Pkwy @ W William Cannon Dr	Southwest Pkwy @ W SH 71
T29	Tier 2	New Construction Needed, Potential Upgrade	FM 2244 Rd	FM 2244 Rd from W SH 71	Canyon Wren Dr
T30	Tier 2	New Construction Needed	SH 45 EB / SH 45 SW Trail / S Mopac Expy NB / S Mopac Expy SB	SH 45 SW Trl from S Mopac Expy	Bliss Spillar Rd
T31	Tier 1	New Construction Needed	W New Hope Dr	W New Hope Dr from Cedar Bank Park	W Whitestone Blvd
T32	Tier 2	Potential Upgrade	W US 290 Hwy / W US 290 Hwy EB	W US 290 Hwy @ Patton Ranch Rd	FM 1826 Rd
T33	Tier 2	New Construction Needed	W William Cannon Dr	W William Cannon Dr @ W US 290 Hwy	Southwest Pkwy
T34	Tier 1	New Construction Needed	S Mopac Expy SB / S Mopac Expy Svrdr SB / William Cannon to Mopa SB Ramp	S Mopac Expy Svrdr SB @ William Cann Trn	W Slaughter Ln
T35	Tier 1	New Construction Needed	Southwest Pkwy	Trail from Gaines Ranch Loop	W William Cannon Dr
T36	Tier 2	New Construction Needed	W US 290 Hwy Svrdr WB / W US 290 Hwy WB	W US 290 Hwy Svrdr WB @ W US 290 Hwy EB at Brodie Trn	Old Frederick Trn
T37	Tier 1	New Construction Needed	N FM 620 Rd	N FM 620 Rd from Anderson Mill Rd	Windy Ridge Rd
T38	Tier 2	New Construction Needed	Bee Caves Rd / FM 2244 Rd	Bee Caves Rd @ Redbud Trl	FM 2244 Rd @ Canon Wren Dr / Canyon Rim Dr
T39	Tier 2	New Construction Needed	Twin Creeks Rd / W FM 1626 Rd	W FM 1626 Rd from SH 45 SW Trl	Brodie Ln
T40	Tier 2	New Construction Needed	SH 45 SW Trail	SH 45 SW Trail E of Garlic Creek Dr	Old San Antonio Rd / Puryear Rd

## Travis County continued

Project Number	Tier	Type	Project Name	From	To
T41	Tier 1	New Construction Needed	S Mopac Expy Svrd SB	S Mopac Expy @ Gaines Ranch Loop	
T42	Tier 1	New Construction Needed, Potential Upgrade	N Capital of Texas Hwy / N Capital of Texas Hwy NB / N Capital of Texas Hwy SB / S Capital of Texas Hwy SB / S Capital of Texas Hwy Svrd SB	N Capital of Texas Hwy from N Mopac Expy	Us 290
T42	Tier 2	New Construction Needed, Potential Upgrade	N Capital of Texas Hwy / N Capital of Texas Hwy NB / N Capital of Texas Hwy SB / S Capital of Texas Hwy SB / S Capital of Texas Hwy Svrd SB	N Capital of Texas Hwy from N Mopac Expy	Us 290
T43	Tier 2	Potential Upgrade	Bee Caves Rd	Bee Caves Rd @ Walsh Tarlton Ln	Redbud Trl
T44	Tier 1	New Construction Needed	E FM 1626 Rd / Old San Antonio Rd	E FM 1626 Rd @ Conroy Ln / S 1st St	@ Conroy Ln
T45	Tier 2	New Construction Needed	West Gate Blvd / W Stassney Ln	W Stassney Ln @ Manchaca Rd	West Gate Blvd @ Jones Rd
T46	Tier 2	New Construction Needed	Jones Rd / Manchaca Rd	Jones Rd @ West Gate Blvd	Jones Rd @ Ernest Robles Way
T47	Tier 1	Potential Upgrade	S 1st St	S 1st St @ Ralph Ablanado Dr	S 1st St @ Conroy Ln / E FM 1626 Rd
T48	Tier 1	Existing, New Construction Needed	S Mopac Expy Svrd NB	S Mopac Expy Svrd NB @ Bee Caves Rd / S Mopac SB at Wallingwood Trn / Wallingwood Dr	S Mopac Expy Svrd NB @ Via Fortuna
T49	Tier 2	New Construction Needed	Bee Caves Rd / Rollingwood Dr	Bee Caves Rd @ Old Walsh Tarlton / Rollingwood Dr	Bee Caves Rd @ Walsh Tarlton Ln
T50	Tier 1	New Construction Needed	S 1st St	S 1st St @ Eberhart Ln	S 1st St @ Ralph Ablanado Dr
T51	Tier 1	Potential Upgrade	Eberhart Ln / Emerald Forest Dr / Speer Ln / Vinson Dr	Vinson Dr @ Aberdeen Dr	Eberhart Ln @ S 1st St
T52	Tier 2	New Construction Needed, Potential Upgrade	Banister Ln / Casey St / Mount Vernon Dr / Pack Saddle Pass / Redd St / W Ben White Blvd Svrd EB / W St Elmo Rd	W St Elmo Rd	W Ben White Blvd Svrd EB @ S Capital of Texas Hwy Svrd SB / S Lamar Blvd NB / S Lamar Blvd Svrd NB / W Ben White Blvd WB
T53	Tier 2	New Construction Needed, Potential Upgrade	E Stassney Ln / W Stassney Ln	E Stassney Ln @ S IH 35	W Stassney Ln @ Manchaca Rd
T54	Tier 1	New Construction Needed		Vinson Dr Trail from Rishmond Ave	W St Elmo Rd
T55	Tier 1	Potential Upgrade	Barton Springs Rd / S Mopac Expy Svrd NB / S Mopac Expy Svrd SB	S Mopac Expy Svrd NB @ Barton Springs Rd	S Mopac Expy Svrd SB @ Andrew Zilker Rd

## Travis County continued

Project Number	Tier	Type	Project Name	From	To
T55	Tier 2	Potential Upgrade	Barton Springs Rd / S Mopac Expy Svrđ NB / S Mopac Expy Svrđ SB	S Mopac Expy Svrđ NB @ Barton Springs Rd	S Mopac Expy Svrđ SB @ Andrew Zilker Rd
T56	Tier 1	New Construction Needed, Potential Upgrade	W St Elmo Rd	W St Elmo Rd from Vinson Dr	S Congress Ave
T57	Tier 1	New Construction Needed	Barton Springs Rd	Barton Springs Rd @ Robert E Lee Rd	William Barton Dr
T58	Tier 2	New Construction Needed	S IH 35 NB	S IH 35 NB @ E Stassney Ln / S IH 35 SB	S IH 35 NB @ E William Cannon Dr / S IH 35 SB
T59	Tier 2	Potential Upgrade	Barton Springs Rd	Barton Springs Rd from Robert E Lee Rd	Butler Park
T60	Tier 1	Potential Upgrade	Jollyville Rd	Jollyville Rd from Barrington Way	Great Hills Trl
T61	Tier 1	New Construction Needed, Potential Upgrade	S Congress Ave	S Congress Ave from Barton Springs Rd	W St Elmo Rd
T62	Tier 1	New Construction Needed		Arboretum Blvd from Great Hills Trl	Research Blvd
T63	Tier 1	Existing, New Construction Needed	N Lamar Blvd / W 31st St	Shoal Creek Trail from W 39th 1/2 St	Downtown Austin/colorado River
T64	Tier 1	Potential Upgrade	Shoal Creek Blvd	Shoal Creek Blvd @ W 39th Half St	Shoal Creek Blvd @ Allandale Rd / Northland Dr
T65	Tier 1	New Construction Needed, Potential Upgrade	W Braker Ln	W Braker Ln @ N Mopac Expy Svrđ NB	W Braker Ln @ Jollyville Rd / Morado Cir
T66	Tier 2	New Construction Needed, Potential Upgrade	E William Cannon Dr	E William Cannon Dr @ S IH 35 NB	Kinney Falls Pkwy
T67	Tier 1	New Construction Needed, Potential Upgrade	Shoal Creek Blvd	Shoal Creek Blvd	Trail @ Allandale Rd / Northland Dr / Shoal Creek Blvd
T68	Tier 1	Existing, New Construction Needed	Jollyville Rd / Research Blvd Svrđ SB	Trail @ Mopac	Jollyville Rd @ Research Sv Ramp
T69	Tier 1	New Construction Needed	N Mopac Expy Svrđ SB	N Mopac Expy from W Braker Ln	N Capital of Texas Hwy
T70	Tier 2	New Construction Needed, Potential Upgrade	FM 1625 Rd / Turnersville Rd / Williamson Rd	FM 1625 Rd @ W Evelyn Rd	Williamson Rd
T71	Tier 2	New Construction Needed	Bluff Springs Rd / Coulver Rd / Maha Loop Rd / Maha Rd / Old Lockhart Rd / Von Quintus Rd	Maha Rd	Municipal Need @ Coulver Rd / FM 1625 Rd



## Travis County continued

Project Number	Tier	Type	Project Name	From	To
T72	Tier 1	Potential Upgrade	Kramer Ln / W Braker Ln	Kramer Ln @ Metric Blvd	W Braker Ln @ N Mopac Expy Svrđ NB
T73	Tier 2	New Construction Needed	Burnet Rd	Burnet Rd @ W Braker Ln	Burnet Rd @ Gracy Farms Ln / N Mopac Expy Svrđ NB
T74	Tier 2	New Construction Needed, Potential Upgrade	Mc Neil Merriltown Rd / W Howard Ln	Trail from Mcneil Rd	W Howard Ln
T75	Tier 1	Potential Upgrade	Metric Blvd	Metric Blvd @ Research Blvd	Station to Metric Blvd and Metric Blvd @ Research Blvd to Station to Metric Blvd
T76	Tier 1	New Construction Needed		Trail @ Payton Gin Rd	Trail @ Capital Metro Rail-trail
T77	Tier 2	New Construction Needed	N Pleasant Valley Rd / S Pleasant Valley Rd	S Pleasant Valley Rd @ S Pleasant Valley	Station to N Pleasant Valley Rd @ Canterbury St
T78	Tier 2	Potential Upgrade	Gracy Farms Ln	Gracy Farms Ln @ Metric Blvd	Gracy Farms Ln @ Burnet Rd / N Mopac Expy Svrđ NB
T79	Tier 2	New Construction Needed, Potential Upgrade	FM 1625 Rd	FM 1625 Rd @ S US 183 Hwy	FM 1625 Rd @ W Evelyn Rd
T80	Tier 2	New Construction Needed	Capital Metro Rail-Trail	Capital Metro Rail-trail	Trail
T81	Tier 2	Potential Upgrade	W Howard Ln	W Howard Ln @ Mcneil Marriltown Rd	N Mopac Expy
T82	Tier 2	New Construction Needed		Municipal Need from Mckinney Falls Pkwy	FM 1625
T83	Tier 2	New Construction Needed	Shady Ln	Shady Ln @ E 5th St	Shady Ln @ Bolm Rd
T84	Tier 2	New Construction Needed, Potential Upgrade	Metric Blvd / Thermal Dr	Thermal Dr from Northwest Es	Gracy Farms Ln
T85	Tier 2	New Construction Needed, Potential Upgrade	S US 183 Hwy	S US 183 Hwy @ FM 1625 Rd	S US 183 Hwy
T86	Tier 2	Potential Upgrade	S US 183 Hwy / S US 183 Hwy SB	S US 183 Hwy from FM 1327	Evelyn Rd
T87	Tier 2	New Construction Needed	Old Lockhart Rd / S US 183 Hwy SB	S US 183 Hwy SB from Evelyn Rd	Old Lockhart Rd
T88	Tier 1	New Construction Needed, Potential Upgrade	E Anderson Ln Svrđ WB / N Lamar Blvd / Payton Gin Rd	E Anderson Ln from Little Walnut Creek	Us 183
T89	Tier 2	New Construction Needed, Potential Upgrade	S US 183 Hwy / S US 183 Hwy SB	S US 183 Hwy SB from Metro Center Dr	FM 1625
T90	Tier 1	New Construction Needed	Bastrop Hwy SB / Bastrop Hwy Svrđ SB / S US 183 Hwy SB	Bastrop Hwy SB from Montopolis Dr	E Riverside Dr

## Travis County continued

Project Number	Tier	Type	Project Name	From	To
T90	Tier 2	New Construction Needed	Bastrop Hwy SB / Bastrop Hwy Svrdr SB / S US 183 Hwy SB	Bastrop Hwy SB from Montopolis Dr	E Riverside Dr
T91	Tier 2	New Construction Needed	Chimney Rock Dr / Indian Mound Dr / N IH 35 Svrdr NB / N Lamar Blvd / Old Cedar Ln / Willow Bend Dr	N Lamar Blvd @ Chimney Rock Dr	Indian Mound Dr @ N IH 35 NB / N IH 35 Svrdr NB
T91	Tier 2	New Construction Needed	Chimney Rock Dr / Indian Mound Dr / N IH 35 Svrdr NB / N Lamar Blvd / Old Cedar Ln / Willow Bend Dr		
T92	Tier 2	New Construction Needed	Wells Port Dr	Wells Port Dr from Crystal Shore Dr	Grand Avenue Pkwy
T93	Tier 1	New Construction Needed, Potential Upgrade	Ed Bluestein Blvd NB / Ed Bluestein Blvd Svrdr NB / Levander Loop	Trail from Airport Blvd	Smith Rd
T94	Tier 2	New Construction Needed	Bratton Ln / N IH 35 Fr	Bratton Ln from I-35	Grand Ave Pkwy
T95	Tier 2	New Construction Needed	S IH 35 Fwy	S IH 35 Fwy from SH 45	Topicadilly Dr
T96	Tier 2	New Construction Needed	Greenlawn Blvd	Greenlawn Blvd from SH 45	W Pflugerville Pkwy
T97	Tier 1	Potential Upgrade	Ed Bluestein Blvd NB / Ed Bluestein Blvd Svrdr NB	Ed Bluestein Blvd from Loyola Ln	Smith Rd
T98	Tier 2	Existing, New Construction Needed, Potential Upgrade	Grand Avenue Pkwy	Grand Avenue Pkwy @ W Black Locust Dr	Bratton Ln
T99	Tier 1	New Construction Needed	E Anderson Ln Svrdr WB / Ed Bluestein Blvd NB / Ed Bluestein Blvd Svrdr NB / Ed Bluestein NB to 290 EB Ramp / E US 290 Hwy Svrdr EB	Ed Bluestein Blvd from Ridgepoint Dr	Loyola Ln
T100	Tier 2	Potential Upgrade	Canyon Ridge Dr / Harris Ridge Blvd / Tech Ridge Blvd	Canyon Ridge Dr from I-35	Tech Ridge Blvd, Tech Ridge Blvd from Canyon Ridge Rd to E Howard Ln
T101	Tier 1	New Construction Needed	Bastrop Hwy NB / E SH 71 EB / E SH 71 Svrdr WB / E SH 71 WB / E SH 71 WB to Bastrop NB Ramp	E SH 71 from US 183	S FM 973 Rd
T102	Tier 1	New Construction Needed, Potential Upgrade	FM 812 Rd / Moores Bridge Rd / S FM 973 Rd	S FM 973 Rd from E SH 71	FM 812
T103	Tier 2	Existing, Potential Upgrade	Loyola Ln	Loyola Ln @ David White Northeast District Park	

## Travis County continued

Project Number	Tier	Type	Project Name	From	To
T104	Tier 2	Potential Upgrade	Grand Avenue Pkwy	Grand Avenue Pkwy @ A W Grimes Blvd / W Pflugerville Pkwy	Grand Avenue Pkwy @ W Black Locust Dr
T105	Tier 1	Potential Upgrade	A W Grimes Blvd	A W Grimes Blvd @ Pecos River Trl	A W Grimes Blvd @ Grand Avenue Pkwy / W Pflugerville Pkwy
T106	Tier 2	New Construction Needed	E Wells Branch Pkwy	E Wells Branch Pkwy @ Tudor House Rd	E Wells Branch Pkwy @ Friendship Quilt Ln
T107	Tier 2	Existing, New Construction Needed	N Heatherwilde Blvd / S Heatherwilde Blvd	S Heatherwilde Blvd @ W Olympic Dr	N Heatherwilde Blvd @ W Olympic Dr
T108	Tier 2	New Construction Needed, Potential Upgrade	Dessau Rd / E Howard Ln	Trail @ Crystal Bend Dr	Trail @ E Howard Ln
T109	Tier 1	New Construction Needed, Potential Upgrade	FM 812 Rd	FM 812 from S FM 973 Rd	Doyle Rd
T110	Tier 2	New Construction Needed	Johnny Morris Rd	Johnny Morris Rd from E US 290	Point North Dr
T111	Tier 1	Existing, New Construction Needed, Potential Upgrade	E SH 71 EB / E SH 71 WB	E SH 71 from S FM 973	Ross Rd
T112	Tier 2	Potential Upgrade	E Wells Branch Pkwy / Killingsworth Ln	E Wells Branch Pkwy @ Immanuel Rd	Killingsworth Ln
T113	Tier 2	Potential Upgrade	Killingsworth Ln	Killingsworth Ln Inner Loop from Wells Branch Pkwy	Wells Branch Pkwy
T114	Tier 2	New Construction Needed, Potential Upgrade		Wells Branch Pkwy from Killingsworth Ln	Greg Manor Dr
T115	Tier 2	Potential Upgrade	Killingsworth Ln	Wells Branch Pkwy from Killingsworth Ln	Cameron Rd
T116	Tier 1	Existing, New Construction Needed	E Pflugerville Pkwy	E Pflugerville Pkwy from FM 685	Colorado Sand Dr
T117	Tier 1	New Construction Needed	E Pflugerville Pkwy	E Pflugerville Pkwy from Colorado Sand Dr Becker Farm Rd	
T118	Tier 2	New Construction Needed	Cameron Rd / Gregg Manor Rd	Gregg Manor Rd from Cameron Rd	E US 290
T119	Tier 1	Existing, New Construction Needed	Casa Navarro Dr / Crispin Hall Ln / Falcon Pointe Blvd / Kelly Ln / Moorlynch Ave	Trail Casa Navarro Dr from Windy Vane Dr	E Pflugerville Pkwy
T119	Tier 2	Existing	Casa Navarro Dr / Crispin Hall Ln / Falcon Pointe Blvd / Kelly Ln / Moorlynch Ave	Trail Casa Navarro Dr from Windy Vane Dr	E Pflugerville Pkwy



## Travis County continued

Project Number	Tier	Type	Project Name	From	To
T120	Tier 1	Potential Upgrade	E SH 71 WB	E SH 71 WB from SW Metropolitan Park	Tucker Hill Ln
T121	Tier 2	New Construction Needed	Jakes Hill Rd / Rowe Ln / Speidel Dr	Speidel Dr from Winding Shore Ln	Jakes Hill Rd Trail & Trail Connection
T121	Tier 3	New Construction Needed	Jakes Hill Rd / Rowe Ln / Speidel Dr	Speidel Dr from Winding Shore Ln	Jakes Hill Rd Trail & Trail Connection
T122	Tier 2	New Construction Needed	Engelmann Ln	Engelmann Ln @ Melber Ln	CR 129
T123	Tier 2	New Construction Needed	E Parsons St / Littig Rd / Old Hwy 20	E Parsons St @ N Lexington St / W Parsons St	Littig Rd
T124	Tier 1	Potential Upgrade	E US 290 Hwy WB / W US 290	E US 290 Hwy from Joyce Turner Dr	County Line Rd
T125	Tier 2	New Construction Needed	Ballerstedt Rd	Ballerstedt Rd @ Littig Rd	US 290
T126	Tier 2	New Construction Needed	County Line Rd	County Line Rd from N SH 95	Littig Rd
T127	Tier 2	Potential Upgrade	S SH 95	S SH 95 from S of N Lund Rd	County Line Rd

## WILLIAMSON COUNTY

Project Number	Tier	Type	Project Name	From	To
W1	Tier 2	New Construction Needed	CR 279 / Loop 332	CR 279 @ Live Oak Rd	CR 279 @ C2 Trail / CR 280 CR 279 @ Live Oak Rd to CR 279 @ C2 Trail / CR 280
W10	Tier 1	Potential Upgrade	Lake Creek Pkwy / North Lake Creek Pkwy	North Lake Creek Pkwy @ Lakeline Blvd	Lake Creek Pkwy @ N US 183 Hwy Svrđ NB / US 183 NB to SH 45 EB Ramp
W11	Tier 1	New Construction Needed, Potential Upgrade	Barrington Way / Jollyville Rd / Lake Creek Pkwy / N US 183 Hwy Svrđ NB / N US 183 Hwy Svrđ SB / Pond Springs Rd / S Bell Blvd	Jollyville Rd	N US 183 Hwy Svrđ SB @ N FM 620 Rd NB / N SH 45 W EB
W11	Unconstrained		Barrington Way / Jollyville Rd / Lake Creek Pkwy / N US 183 Hwy Svrđ NB / N US 183 Hwy Svrđ SB / Pond Springs Rd / S Bell Blvd		
W12	Tier 2	New Construction Needed	Brushy Creek Rd	Trail	Trail
W12	Tier 2	New Construction Needed	Brushy Creek Rd		
W13	Tier 1	Potential Upgrade	E Whitestone Blvd	E Whitestone Blvd @ CR 178	E Whitestone Blvd @ CR 175 / RM 1431 / Sam Bass Rd
W14	Tier 2	New Construction Needed		Trail from W SH 29	South Fork San Gabriel River Trl
W15	Tier 2	New Construction Needed	Sam Bass Rd / W Old Settlers Blvd	W Old Settlers Blvd @ Creek Bend Blvd	Sam Bass Rd @ Wyoming Springs Dr
W16	Tier 2	New Construction Needed, Potential Upgrade	SH 195 / SH 195 WB	SH 195 WB @ Berry Creek Dr	SH 195 @ S Patterson Ave
W17	Tier 1	New Construction Needed	E Whitestone Blvd / RM 1431	RM 1431	E Whitestone Blvd @ CR 175 / RM 1431 / Sam Bass Rd
W18	Tier 2	Potential Upgrade	D B Wood Rd	D B Wood Rd @ Oak Ridge Rd	D B Wood Rd @ Shell Rd / Williams Dr
W19	Tier 2	Potential Upgrade	Williams Dr	Williams Dr @ Bootys Crossing Rd / Lakeway Dr	Williams Dr @ Del Webb Blvd
W2	Tier 2	New Construction Needed	Us 183	Us 183 @ N US 183 / W SH 29	Us 183 @ San Gabriel River Trail
W20	Tier 2	New Construction Needed	Del Webb Blvd / Sun City Blvd	Sun City Blvd @ CR 147 / SH 195	Del Webb Blvd @ Williams Dr
W21	Tier 2	New Construction Needed	W SH 29 / W University Ave	Trail @ W SH 29	W SH 29 Trail @ W SH 29 To
W22	Tier 2	New Construction Needed	D B Wood Rd	D B Wood Rd @ W University Ave	D B Wood Rd @ Oak Ridge Rd
W23	Tier 2	New Construction Needed	Shell Rd	Shell Rd from Williams Dr	SH 195

## Williamson County continued

Project Number	Tier	Type	Project Name	From	To
W24	Tier 1	Potential Upgrade	RM 1431	RM 1431 @	RM 1431
W25	Tier 2	New Construction Needed	N San Gabriel Trail	N San Gabriel Trail Section Near Rivery Pond Rd	
W26	Tier 2	Existing, New Construction Needed	N IH 35 Fwy / S IH 35 Fwy	S IH 35 Fwy @ Exit 252a & 251 NB / N IH 35 Fwy / SH 45	N IH 35 Fwy @ / Exit 257 NB
W27	Tier 2	New Construction Needed	Northwest Blvd	Northwest Blvd @ Entr 263 SB / N IH 35 SB	Northwest Blvd @ Lakeway Dr
W28	Tier 2	New Construction Needed	Airport Rd / Berry Creek Dr / Bootys Crossing Rd / Gabriel View Dr / Lakeway Dr / Power Rd	Berry Creek Dr @ SH 195 WB	Airport Rd.
W29	Tier 2	New Construction Needed	N College St	N College St @ Holly St / San Gabriel Pedestrian Bridge / S San Gabriel Trail	N College St
W3	Tier 2	New Construction Needed	S Bagdad Rd	S Bagdad Rd @ Eagles Way	S Bagdad Rd @ Los Vista Dr / Sunflower Ct
W30	Tier 1	New Construction Needed	FM 1460 / N Austin Ave / N A W Grimes Blvd / S Austin Ave / S Main St / W 7th St / W University Ave	N A W Grimes Blvd from San Gabriel River	University Blvd
W31	Tier 1	Existing, New Construction Needed	RM 1431 / University Blvd	University Blvd from RM 1431	E of N A W Grimes Blvd
W32	Tier 2	New Construction Needed	N College St / San Gabriel Park Cir	N College St	Municipal Need @ FM 971 / Parkview Dr
W33	Tier 1	Existing, New Construction Needed	E Old Settlers Blvd / Gulf Way / Hawk View St / Lakeside Loop / Settlement Dr / Sunrise Rd	Sunrise Rd @ Bradley Ln / David Curry Dr	Settlement Dr. Sunrise Rd @ Bradley Ln / David Curry Dr to Settlement Dr. Sunrise Rd @ Bradley Ln / David Curry Dr to Settlement Dr
W34	Tier 2	New Construction Needed	FM 971	FM 971 @ E Morrow St	FM 971 @ CR 152. FM 971 @ E Morrow St to FM 971 @ CR 152
W35	Tier 2	New Construction Needed	Bradley Ln	Bradley Ln	Bradley Ln @ Jester Farms Rd
W36	Tier 2	Existing, New Construction Needed	Dell Way / Greenlawn Blvd / Kensington Trail / Louis Henna Blvd	Kensington Trl from Gattis School Rd	SH 45
W37	Tier 1	Existing, New Construction Needed, Potential Upgrade	Bowman Park Trail / Bradley Ln / Chisholm Crossing Trail / David Curry Dr / E Mesa Park Dr / E Palm Valley Blvd / N A W Grimes Blvd / Plateau Vista Blvd / W Mesa Park Dr	Bradley Ln from Jester Farms Park	W Mesa Park Dr, W Mesa Park Dr from Bradley Ln to Chisholm Crossing Trl. Crisholm Crossing Trl E Palm Valley Blvd. Saw Grimes Blvd to Play For All Abilities Park



## Williamson County continued

Project Number	Tier	Type	Project Name	From	To
W37	Tier 2	Existing	Bowman Park Trail / Bradley Ln / Chisholm Crossing Trail / David Curry Dr / E Mesa Park Dr / E Palm Valley Blvd / N A W Grimes Blvd / Plateau Vista Blvd / W Mesa Park Dr	Bradley Ln from Jester Farms Park	W Mesa Park Dr, W Mesa Park Dr from Bradley Ln to Chisholm Crossing Trl. Crisholm Crossing Trl E Palm Valley Blvd. Saw Grimes Blvd to Play For All Abilities Park
W38	Tier 2	Potential Upgrade	FM 971	FM 971 @ CR 152	FM 971 @ Exit 413 SB
W39	Tier 1	New Construction Needed, Potential Upgrade	A W Grimes Blvd / S A W Grimes Blvd	S A W Grimes Blvd from SH 45	Candelaria Mesa Dr
W4	Tier 2	Potential Upgrade	183A Toll Rd	183all Rd @ Brushy Creek Main Branch Trail / RM 2243	183a Toll Rd @ US 183
W40	Tier 2	New Construction Needed	CR 103 / Rusk Ln	San Gabriel River Trail from Holly St	SH 130
W41	Tier 2	New Construction Needed	Collingwood Dr	Collingwood Dr @ Lake Forest Trail / Shady Bluff Cv	Collingwood Dr @ Brushy Creek Trail / Golden Creek Dr
W42	Tier 2	New Construction Needed	FM 971	Trail from SH 130	San Gabriel River Trl
W43	Tier 2	New Construction Needed		San Gabriel River Trl	E SH 29
W44	Tier 1	Potential Upgrade	Chandler Rd / University Blvd	University Blvd E of N A W Grimed Blvd	FM 1660
W45	Tier 2	New Construction Needed		Trail from Play For All Abilities Park	FM 1660
W46	Tier 2	Potential Upgrade	E SH 29	E SH 29 @ CR 100	E SH 29 @ CR 126 / Old Hwy 29
W47	Tier 2	New Construction Needed	CR 137 / Jakes Hill Rd	Jakes Hill Rd from Morningside Cir	CR 197
W48	Tier 1	New Construction Needed	CR 132 / CR 133 / FM 1660	FM 1660 @ Chandler Rd	CR 132 @ Limmer Loop
W49	Tier 1	Potential Upgrade	Limmer Loop	Limmer Loop @ CR 132	E of Mager Ln
W5	Tier 2	New Construction Needed	Bagdad Rd	San Gabriel River Trail from Holly St	SH 130
W50	Tier 1	New Construction Needed	Limmer Loop / Limmer Loop Spur	Limmer Loop E of Mager Ln	Us 79
W51	Tier 2	New Construction Needed	CR 129 / Engelmann Ln / FM 1660	FM 1660	Engelmann Ln
W52	Tier 1	New Construction Needed	Us 79 / W 2nd St	Us 79 @ Limmer Loop Spur	W 2nd St @ Lorax Ln
W53	Tier 1	Potential Upgrade	W 2nd St	W 2nd St @ Exit	W 2nd St to Lorax Ln
W54	Tier 2	New Construction Needed, Potential Upgrade	NW Carlos G Parker Blvd	NW Carlos G Parker Blvd @ N Main St	W 2nd St
W55	Tier 2	Potential Upgrade	N Main St / S SH 95	S SH 95 @ E SH 29 / N SH 95	N Main St @ T H Johnson Dr

## Williamson County continued

Project Number	Tier	Type	Project Name	From	To
W56	Tier 1	New Construction Needed, Potential Upgrade	W 2nd St	W 2nd St @ E 2nd St / N Main St	W 2nd St @ Exit to W 2nd St / NW Carlos G Parker Blvd / SW Carlos G Parker Blvd
W57	Tier 2	New Construction Needed, Potential Upgrade	N Main St	N Main St @ E 2nd St / W 2nd St	N Main St @ T H Johnson Dr
W58	Tier 2	New Construction Needed	E 4th St	E 4th St @ N Main St / W 4th St	E 4th St
W59	Tier 2	New Construction Needed	E 2nd St	E 2nd St @ N Main St / W 2nd St	Trail @ Old Coupland Rd / S Main St
W6	Tier 2	New Construction Needed	CR 279 / D B Wood Rd / San Gabriel River Trail	Trl from CR 279	W University Ave
W60	Tier 2	New Construction Needed, Potential Upgrade	S Main St / S SH 95	S SH 95 from Old Coupland Rd	N Lund Rd
W61	Tier 2	Potential Upgrade	E 4th St	E 4th St	E 4th St @ Exit to SE Carlos G Parker Blvd / FM 619
W7	Tier 1	New Construction Needed	N FM 620 Rd / N FM 620 Rd NB	N FM 620 Rd from Anderson Mill Rd	Lake Creek Pkwy
W7			N FM 620 Rd / N FM 620 Rd NB	N FM 620 Rd from Anderson Mill Rd	Lake Creek Pkwy
W8	Tier 1	New Construction Needed	North Lake Creek Pkwy	Brushy Creek Trl from US 183	Lakeline Blvd
W9	Tier 1	Existing, New Construction Needed	E Whitestone Blvd	E Whitestone Blvd @ 183all Rd	C-bar Ranch Trl

# APPENDIX D

## COMMUNITY NETWORK MAPS

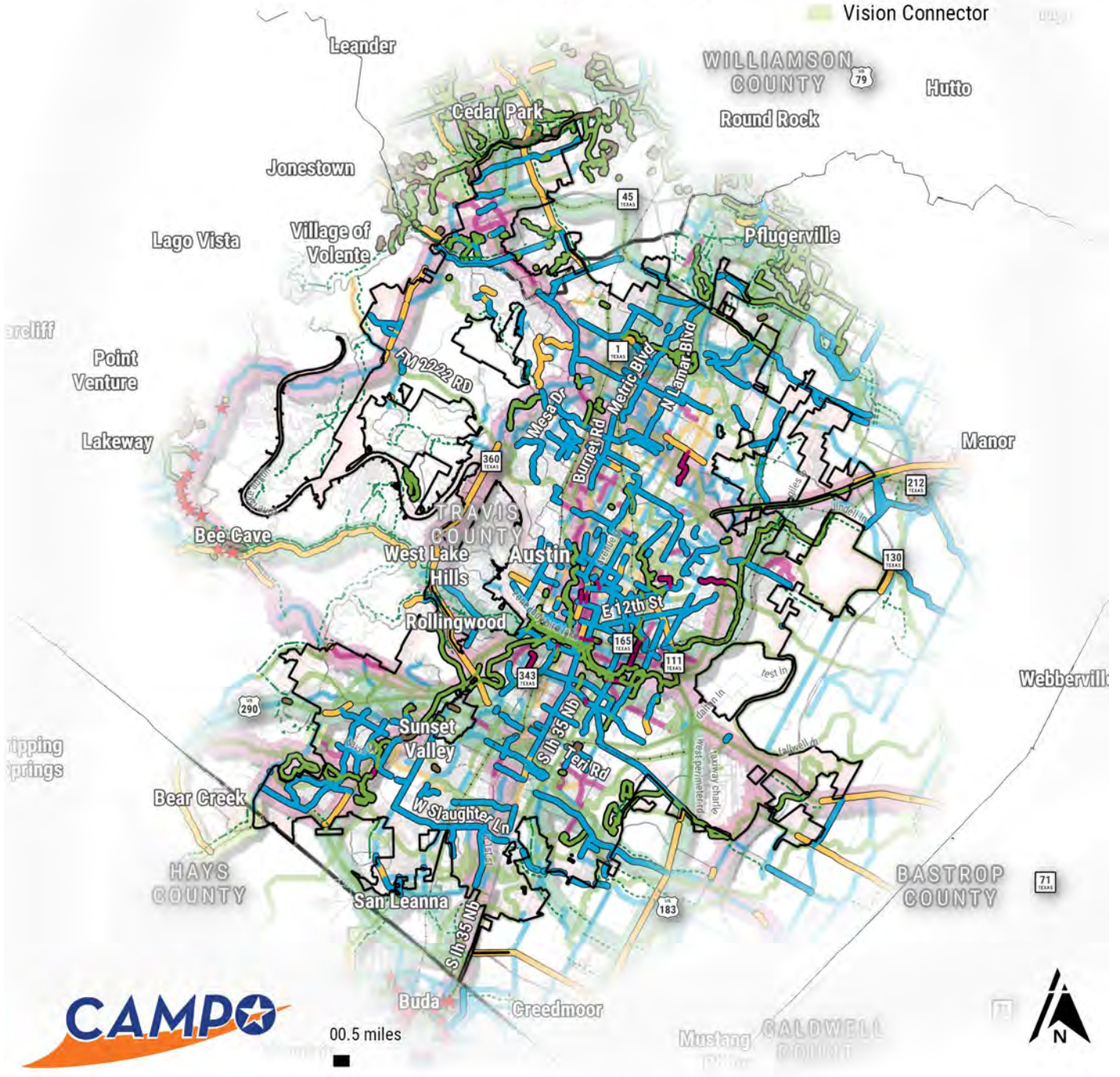
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# Unconstrained Network Austin

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network Bartlett

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Other**
  - Bike Lane
  - Shared Roadway
  - Problem Intersection



0 0.5 miles





# Unconstrained Network Bastrop

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



0 0.5 miles





# Unconstrained Network Bear Creek

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
  - Problem Intersection
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Bike Lane
- Shared Roadway



# Unconstrained Network Bee Cave

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network Bertram

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector





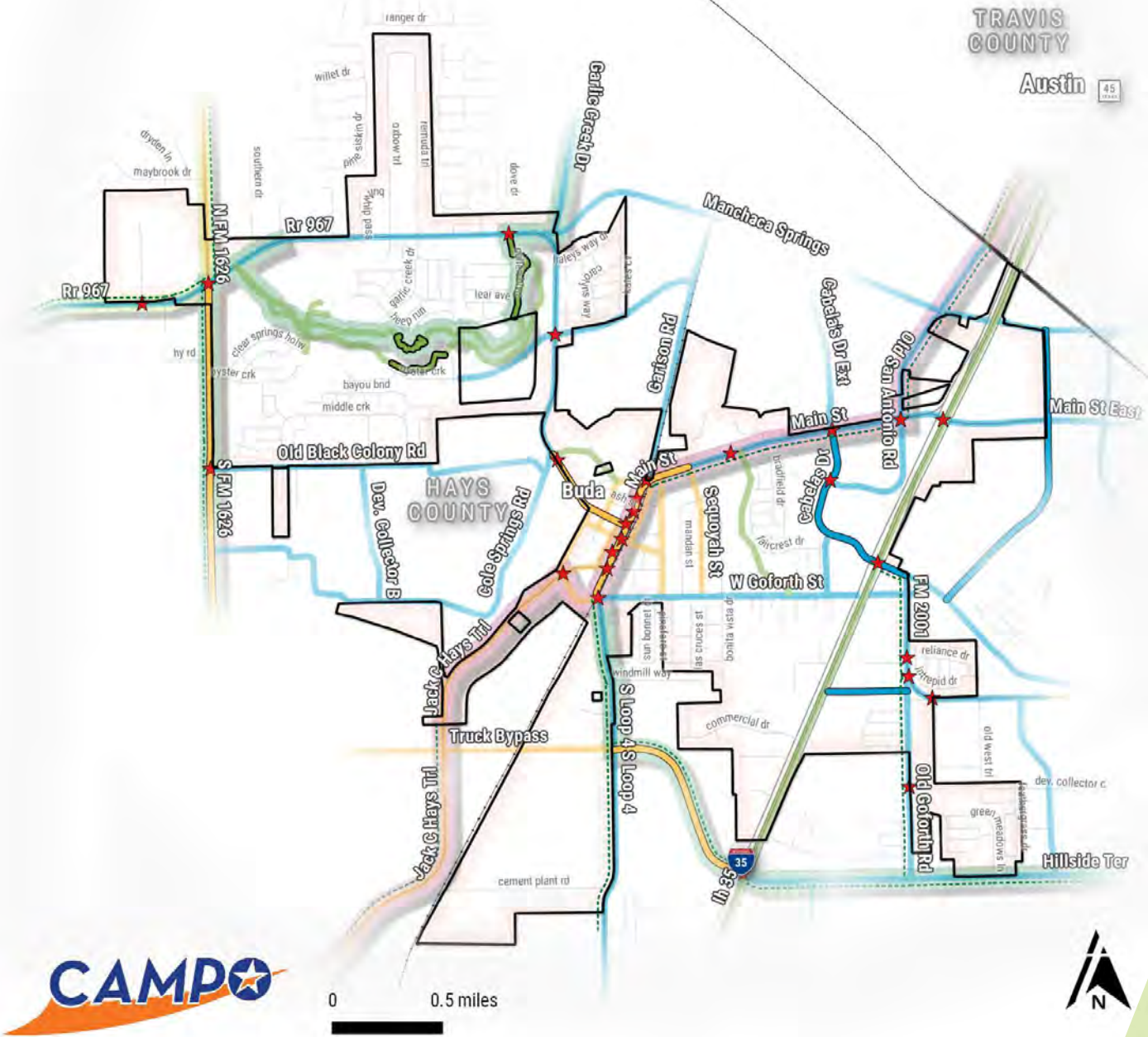
# Unconstrained Network Briarcliff

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network Buda

- Existing Facilities**
- Existing Trail
- Existing Separated Bike Lane
- Existing Bike Lane
- Existing Shared Roadway
- Existing Natural Surface Trail
- Planned Facilities**
- Trail
- Separated Bike Lane
- Bike Lane
- Shared Roadway
- Bike Need**
- Municipally Identified Need
- CAMPO Identified Gap
- Problem Intersection
- Priority Network**
- Tier 1
- Tier 2
- Vision Connector



# Unconstrained Network Burnet

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



0 0.5 miles





# Unconstrained Network Cedar Park

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Bike Lane
  - Shared Roadway
  - Municipally Identified Need
  - CAMPO Identified Gap
- Priority Network**
  - Problem Intersection
  - Tier 1
  - Tier 2
  - Vision Connector

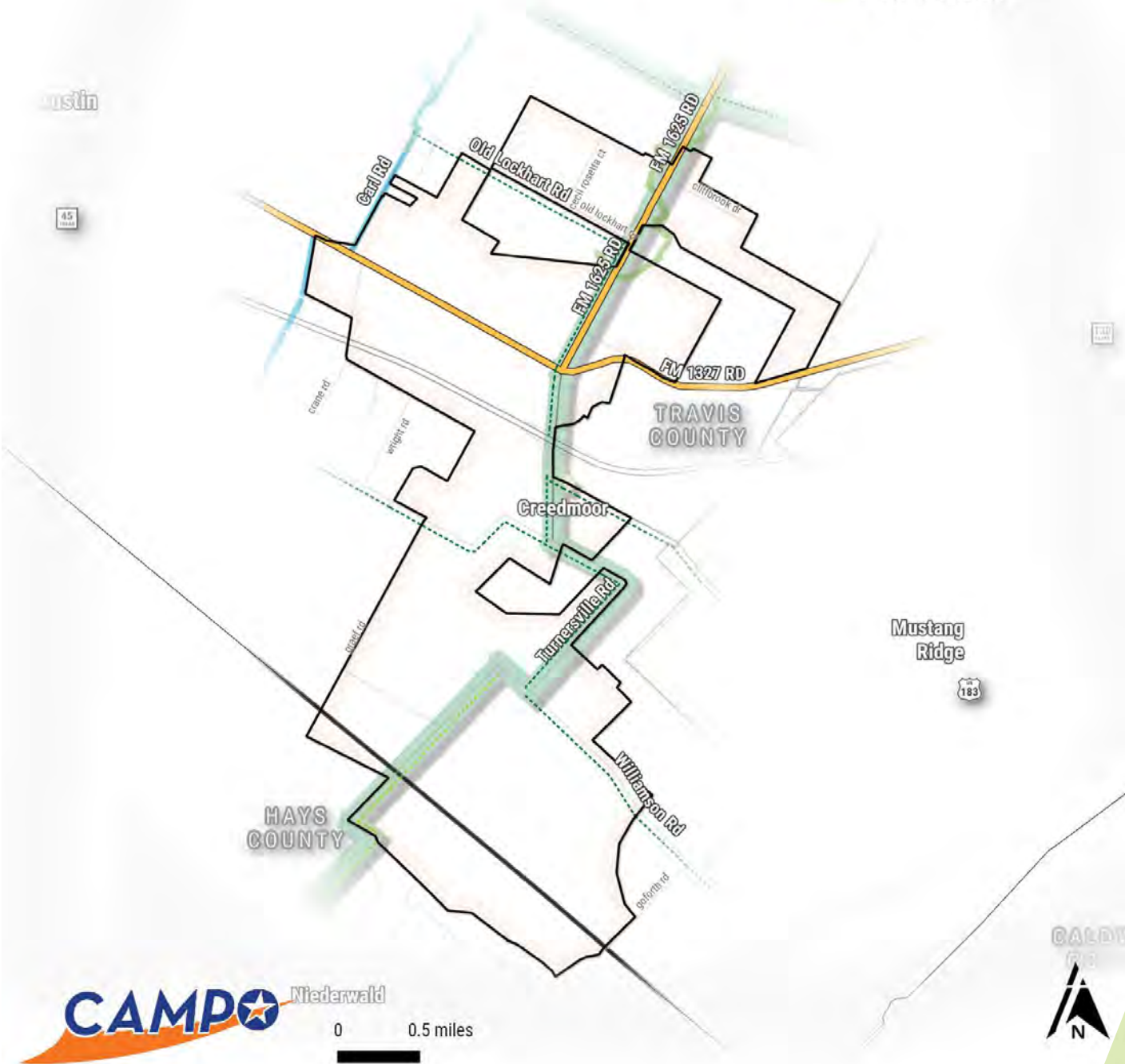






# Unconstrained Network Creedmoor

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
  - Problem Intersection
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Bike Lane
- Shared Roadway



Niederwald

0 0.5 miles





# Unconstrained Network

## Dripping Springs

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



0 0.5 miles



# Unconstrained Network Elgin

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



0 0.5 miles



# Unconstrained Network Florence

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |

138  
TOTAL

229

226

FM 970

0

0.5 miles





# Unconstrained Network Georgetown

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector

Jarrell



0 0.5 miles



# Unconstrained Network Granger

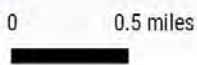
- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |





# Unconstrained Network Granite Shoals

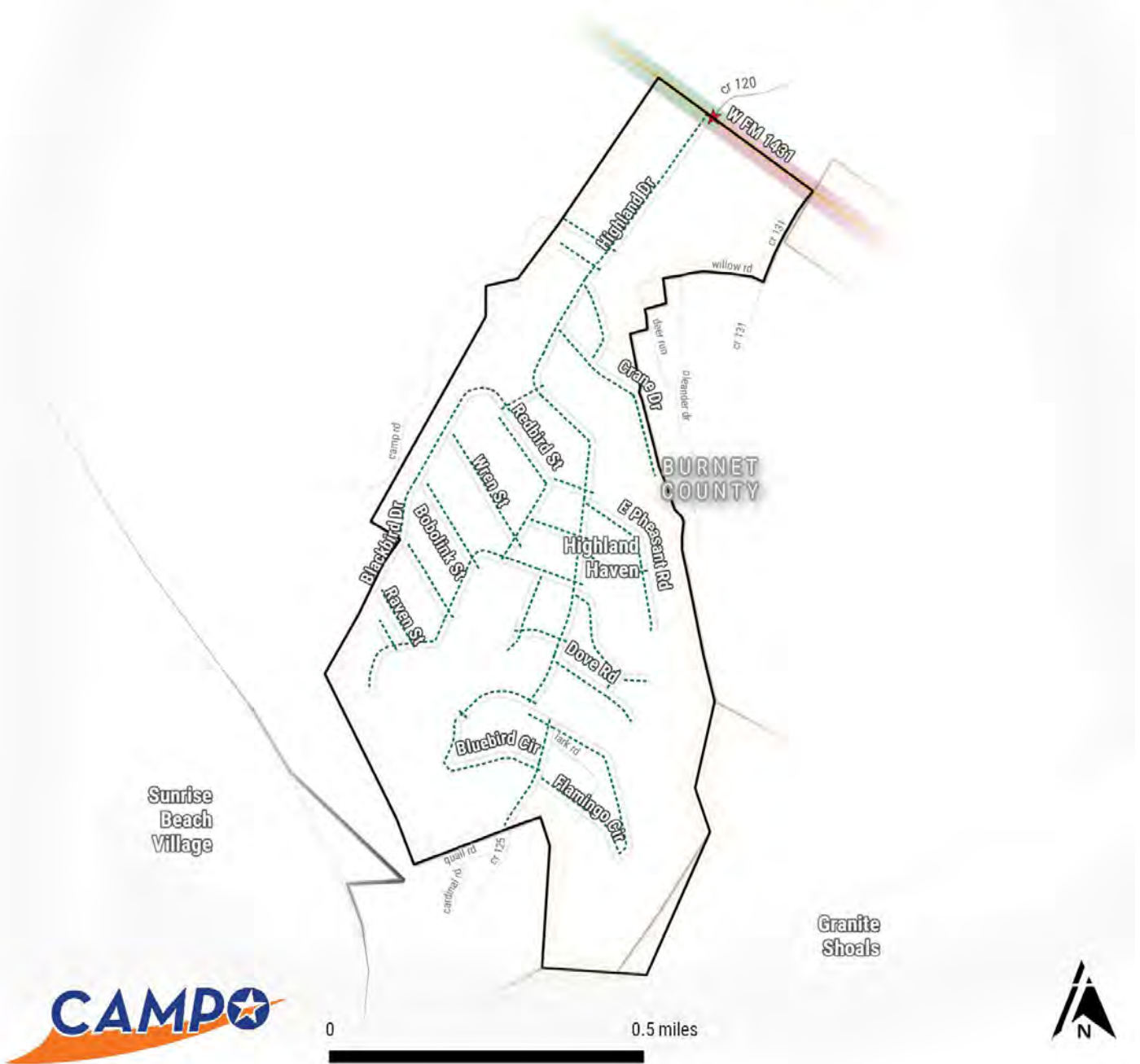
- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector





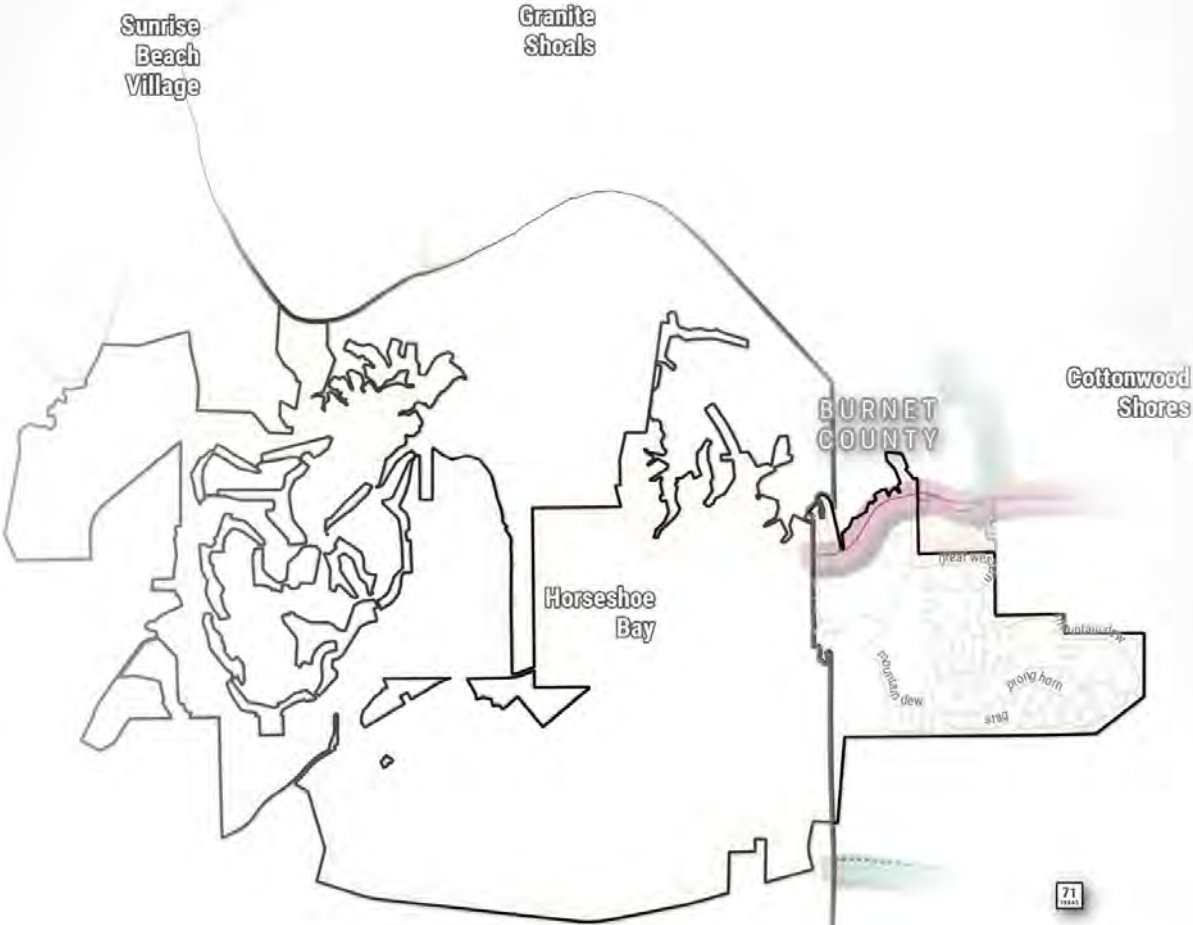
# Unconstrained Network Highland Haven

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network Horseshoe Bay

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection** (★)
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



0 0.5 miles



# Unconstrained Network

## Hutto

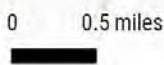
- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |





# Unconstrained Network Jarrell

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Other**
  - Bike Lane
  - Shared Roadway
  - Problem Intersection



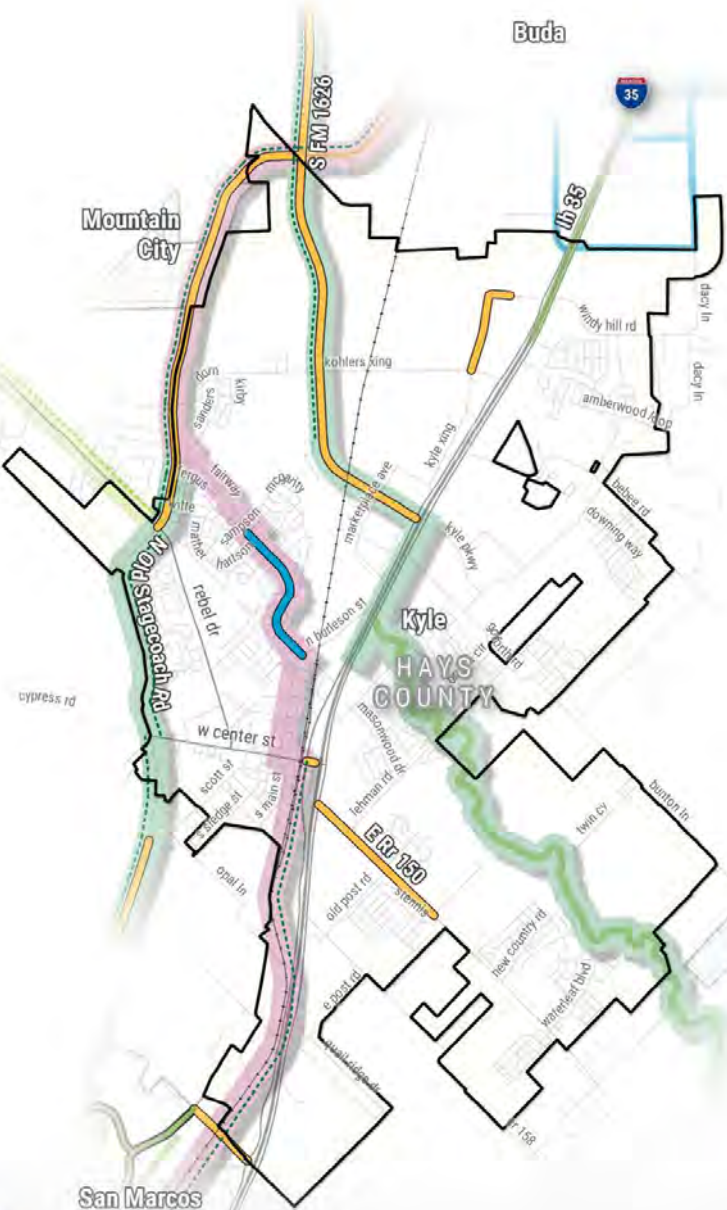
# Unconstrained Network Jonestown

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network Kyle

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
  - Problem Intersection
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Bike Lane
- Shared Roadway



0 0.5 miles





# Unconstrained Network Lago Vista

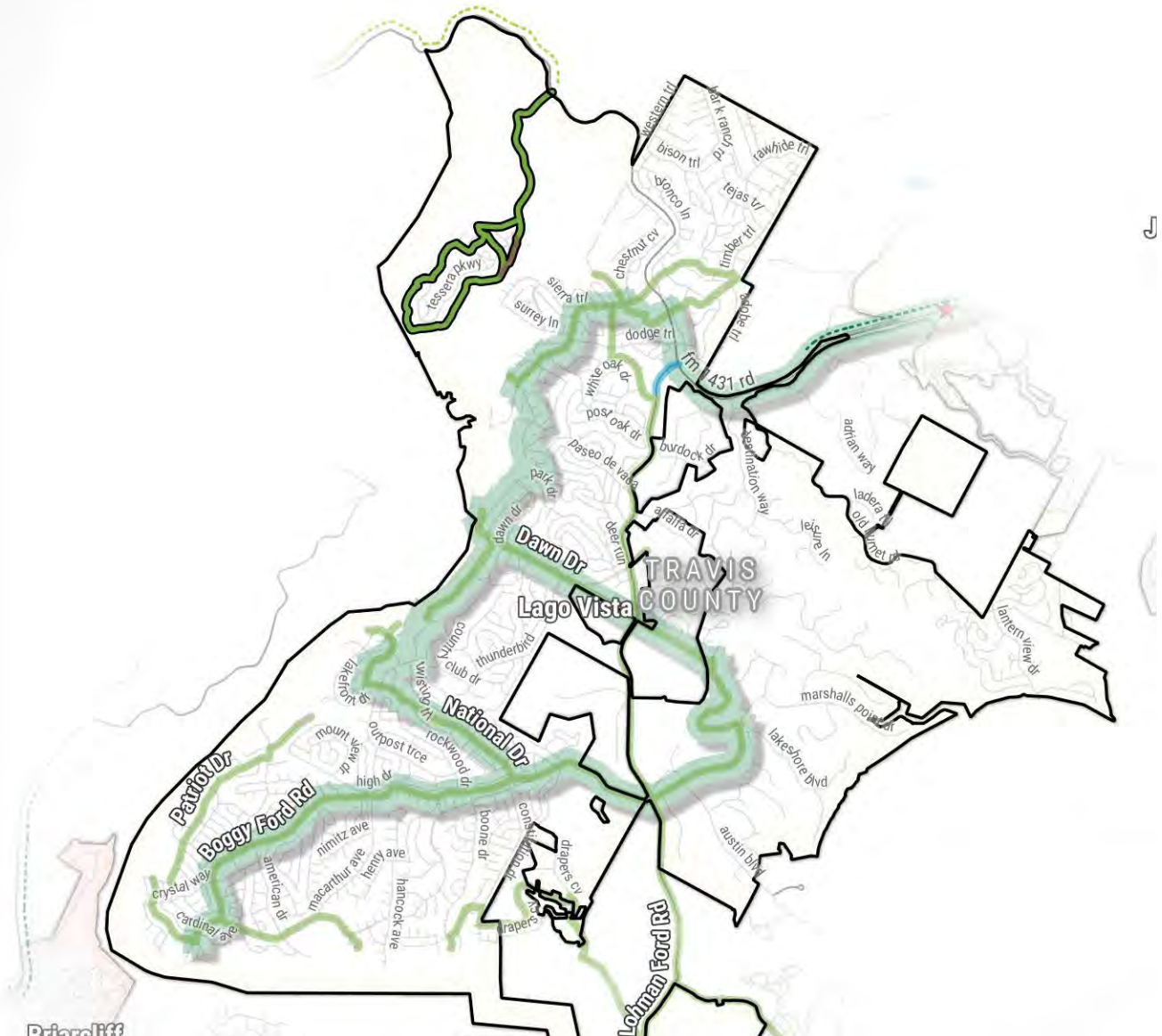
## Existing Facilities

-  Existing Trail
-  Existing Separated Bike Lane
-  Existing Bike Lane
-  Existing Shared Roadway
-  Existing Natural Surface Trail

## Planned Facilities

-  Trail
-  Separated Bike Lane

-  Bike Lane
-  Shared Roadway
- Bike Need**
-  Municipally Identified
-  CAMPO Identified
-  Problem Intersection
- Priority Network**
-  Tier 1
-  Tier 2
-  Vision Connection

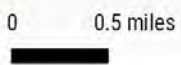


# Unconstrained Network Lakeway

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector

Marcliff

Lago Vista





# Unconstrained Network Leander

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |





# Unconstrained Network Liberty Hill

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



# Unconstrained Network Lockhart

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



0 0.5 miles



# Unconstrained Network Luling

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Other**
  - Bike Lane
  - Shared Roadway
  - Problem Intersection





# Unconstrained Network Manor

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network Marble Falls

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
  - Problem Intersection
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Bike Lane
- Shared Roadway



0 0.5 miles



# Unconstrained Network Martindale

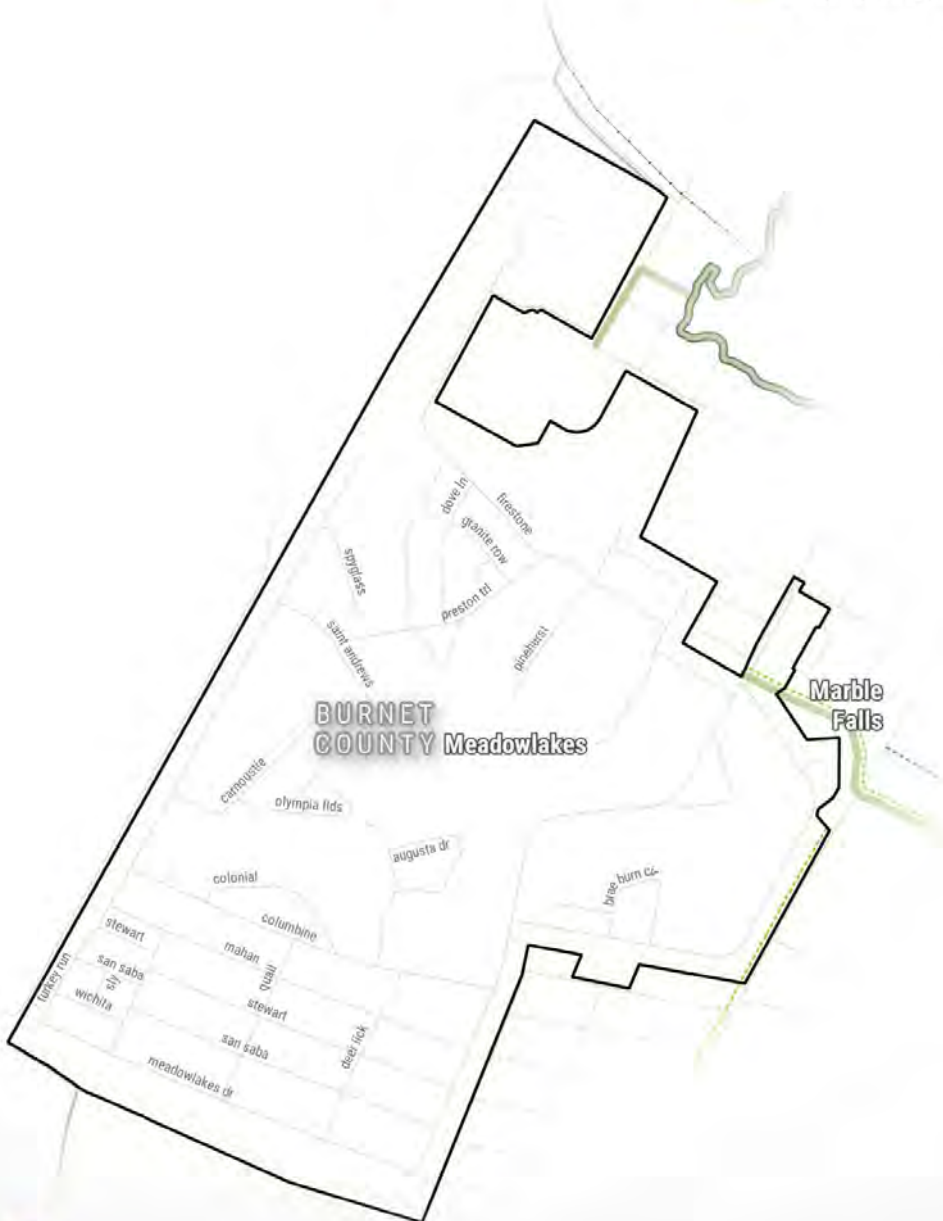
- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |





# Unconstrained Network Meadowlakes

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
  - Problem Intersection
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Bike Lane
- Shared Roadway



# Unconstrained Network Mountain City

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network Mustang Ridge

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
  - Bike Lane
  - Shared Roadway
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
  - Problem Intersection
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



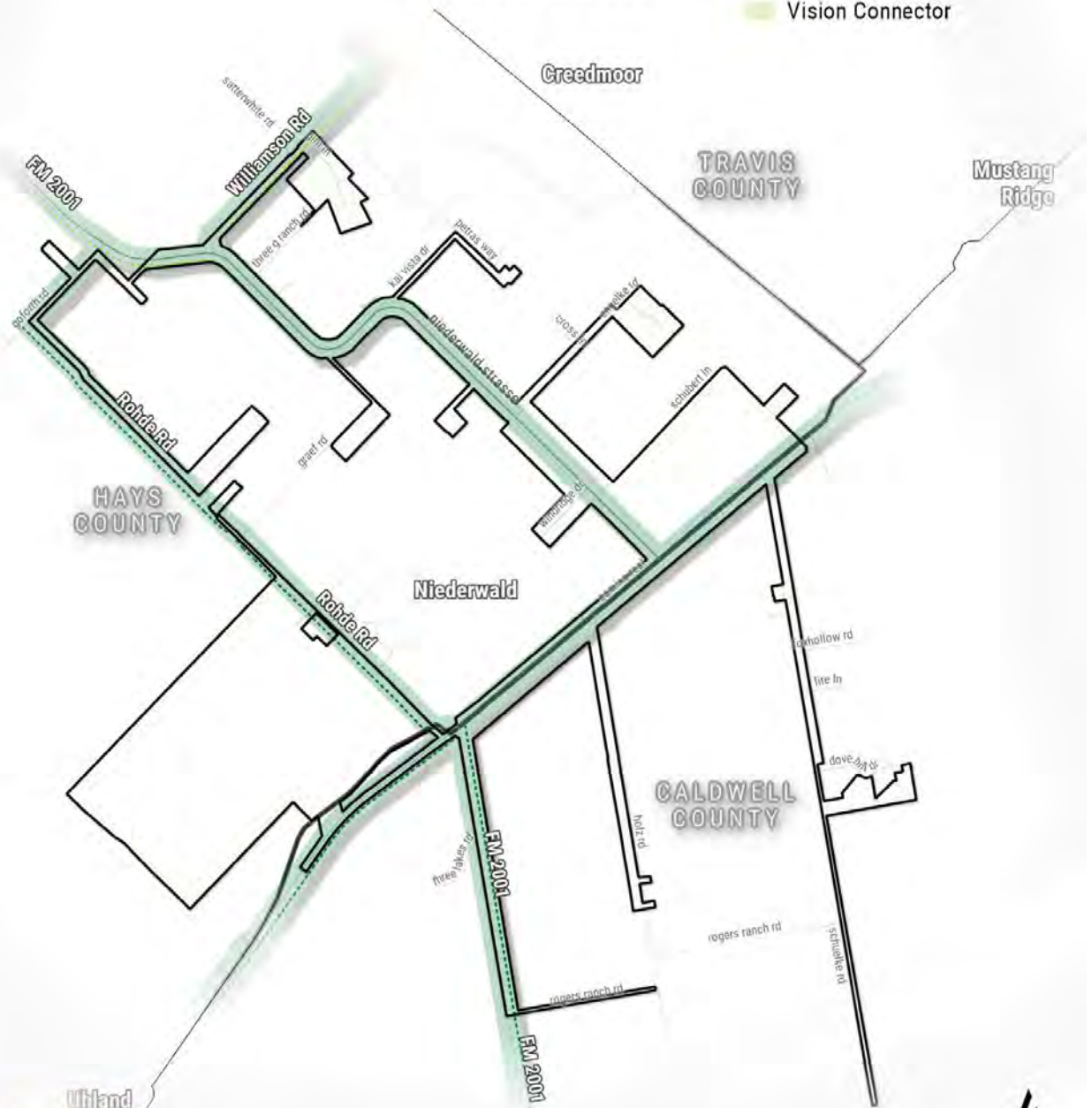
0 0.5 miles





# Unconstrained Network Niederwald

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



0 0.5 miles



# Unconstrained Network Pflugerville

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



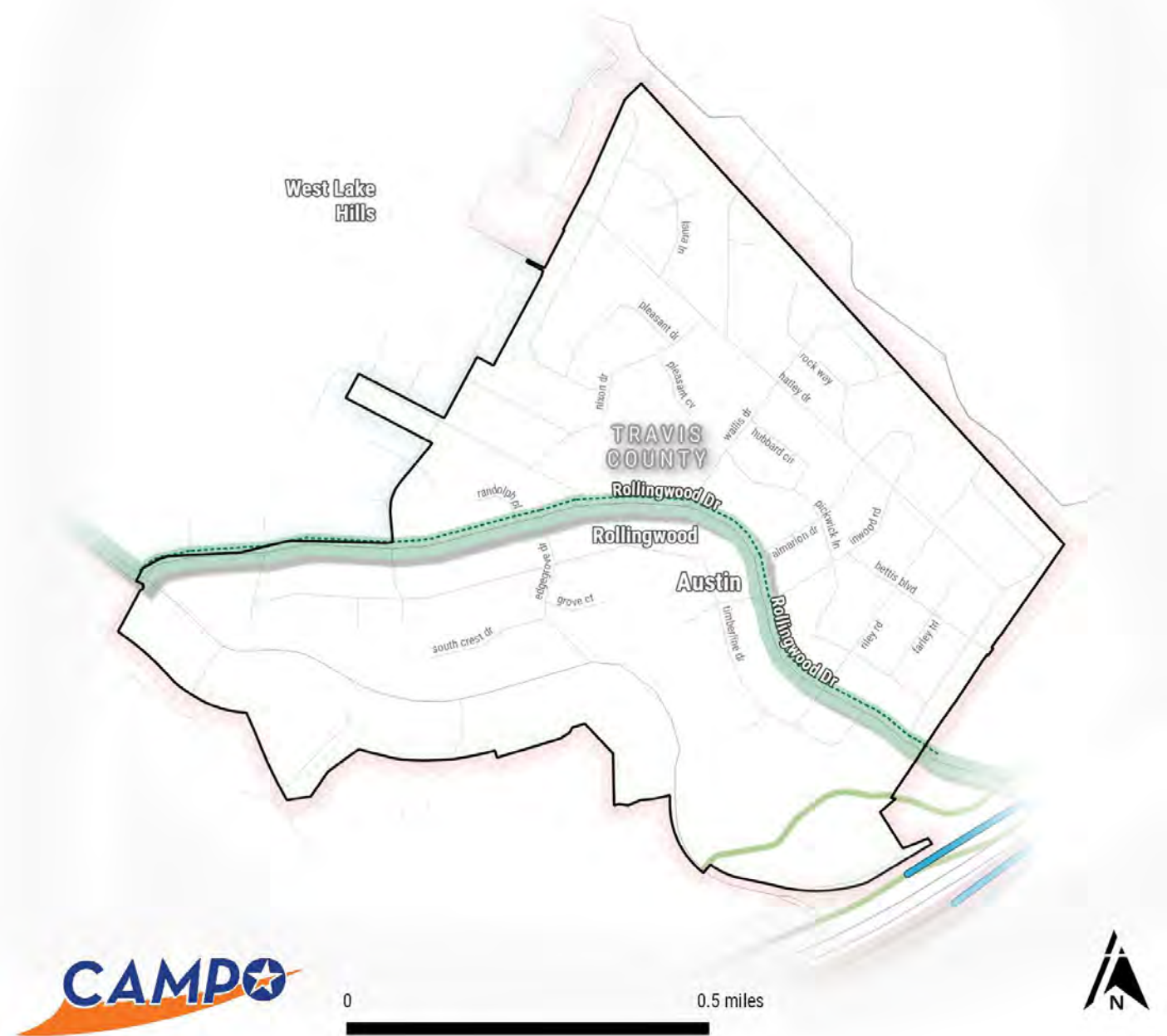
0 0.5 miles





# Unconstrained Network Rollingwood

- |   |   |
|---|---|
| <b>Existing Facilities</b>  |  Bike Lane                   |
|  Existing Trail                  |  Shared Roadway              |
|  Existing Separated Bike Lane   | <b>Bike Need</b>  |
|  Existing Bike Lane             |  Municipally Identified Need |
|  Existing Shared Roadway        |  CAMPO Identified Gap        |
|  Existing Natural Surface Trail |  Problem Intersection        |
| <b>Planned Facilities</b>   | <b>Priority Network</b>   |
|  Trail                           |  Tier 1                      |
|  Separated Bike Lane            |  Tier 2                      |
|   |  Vision Connector            |





# Unconstrained Network Round Rock

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



0 0.5 miles



# Unconstrained Network San Leanna

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



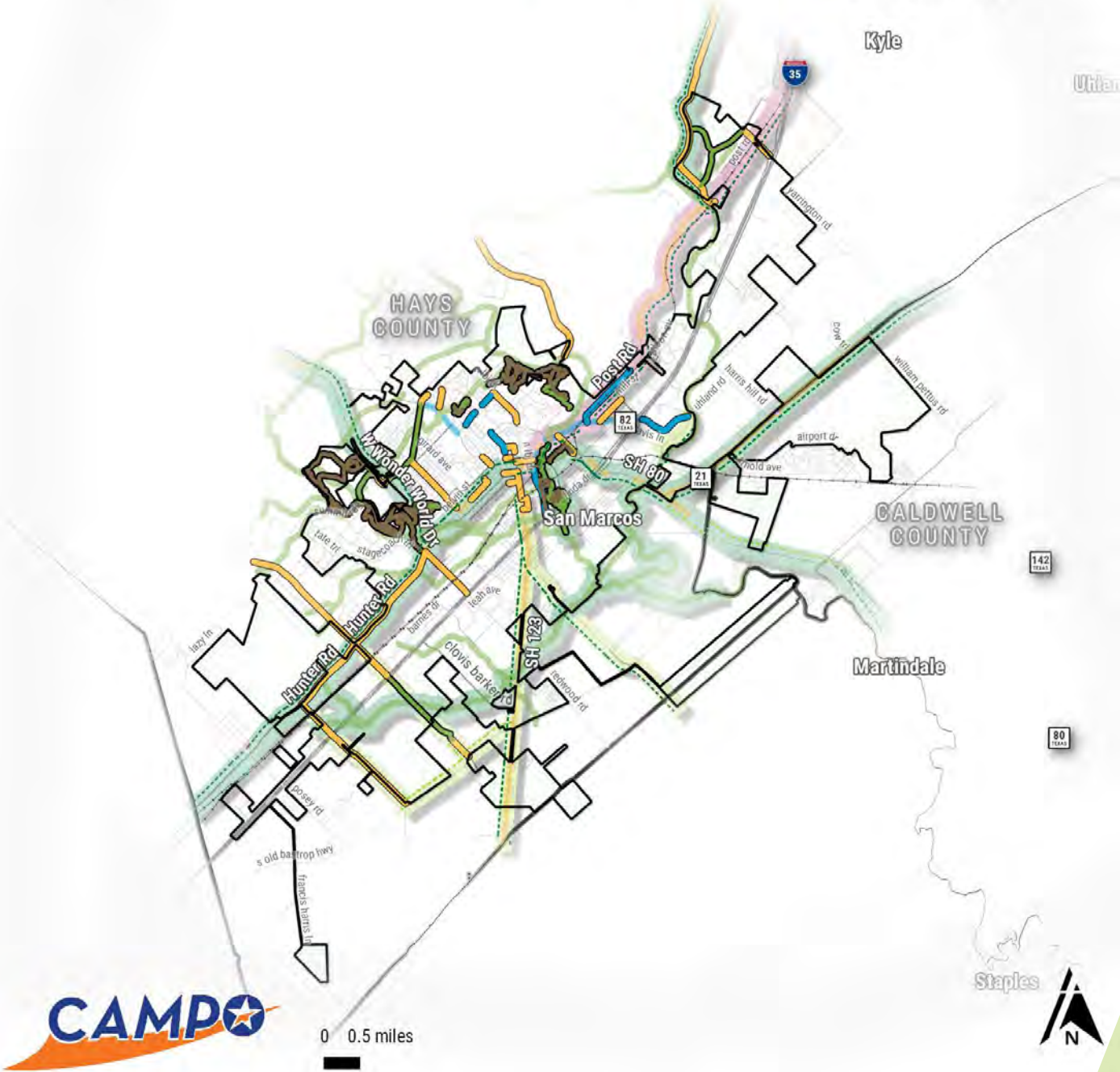
0 0.5 miles





# Unconstrained Network San Marcos

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



0 0.5 miles





# Unconstrained Network Smithville

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network Sunset Valley

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



0 0.5 miles



# Unconstrained Network Taylor

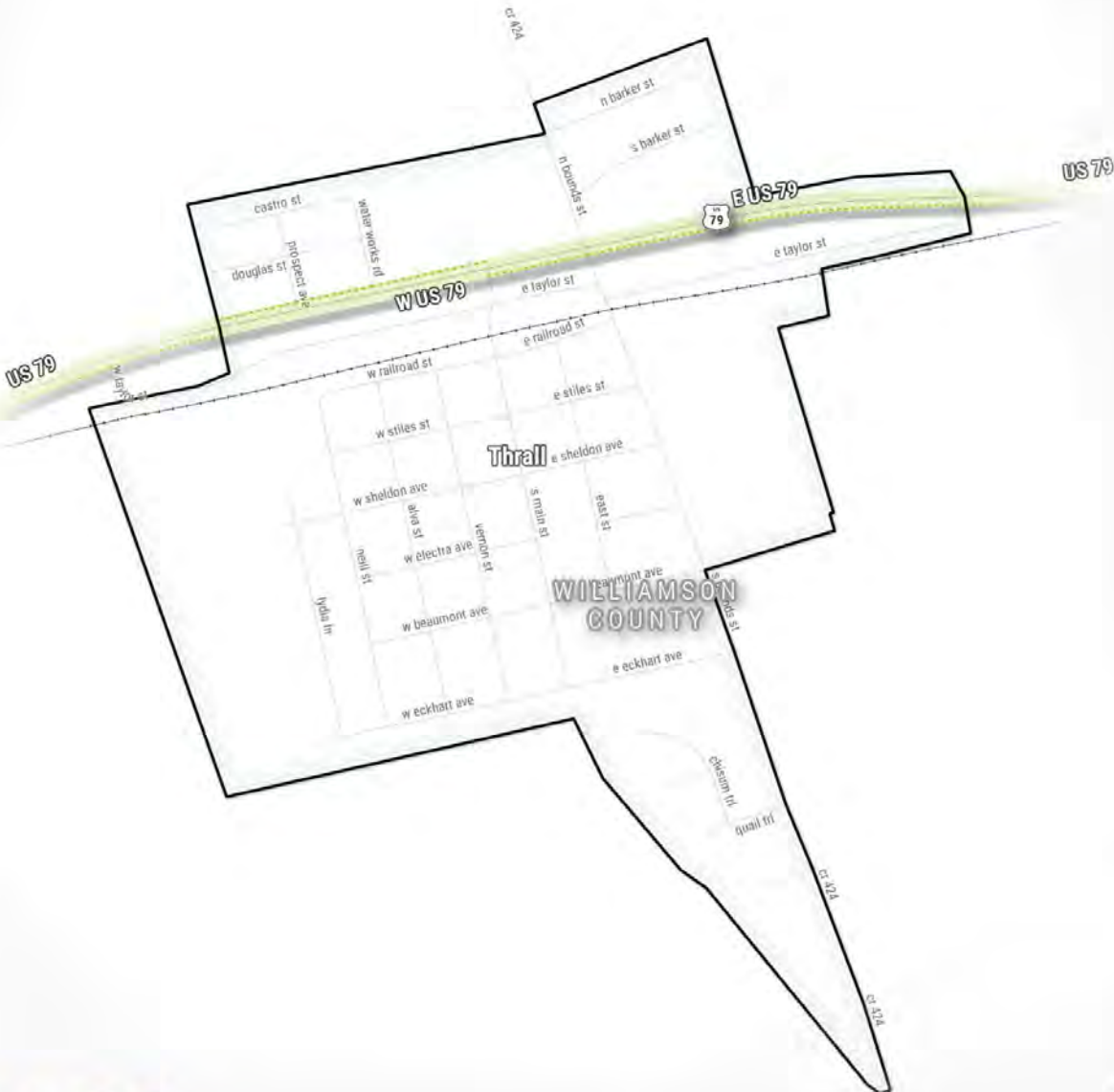
- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |





# Unconstrained Network Thrall

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Bike Lane
- Shared Roadway
- Problem Intersection



# Unconstrained Network Uhland

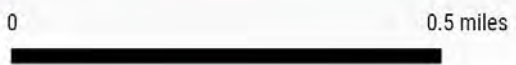
- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



# Unconstrained Network

## Village of The Hills

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
- Shared Roadway**
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector





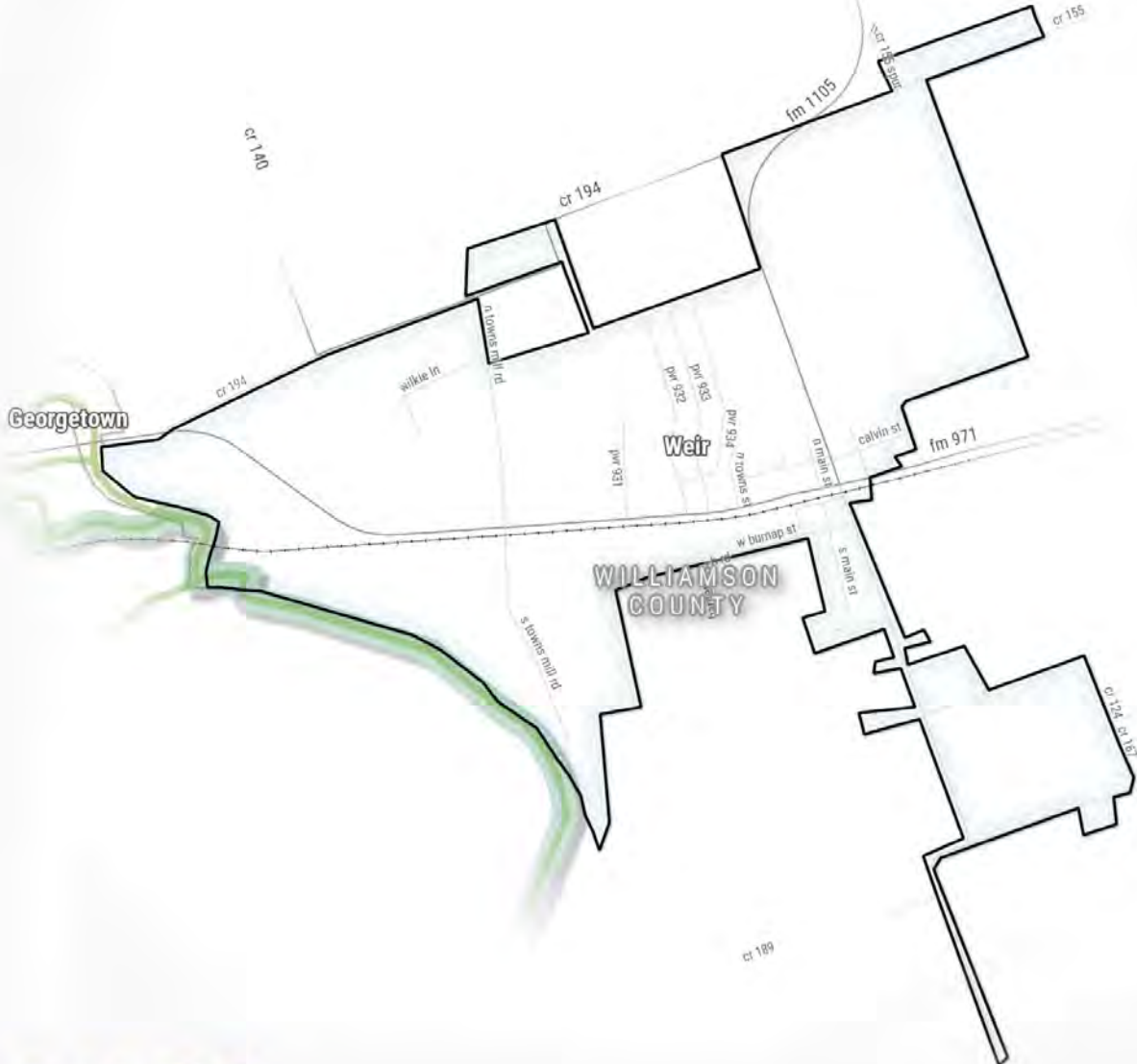
# Unconstrained Network Webberville

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



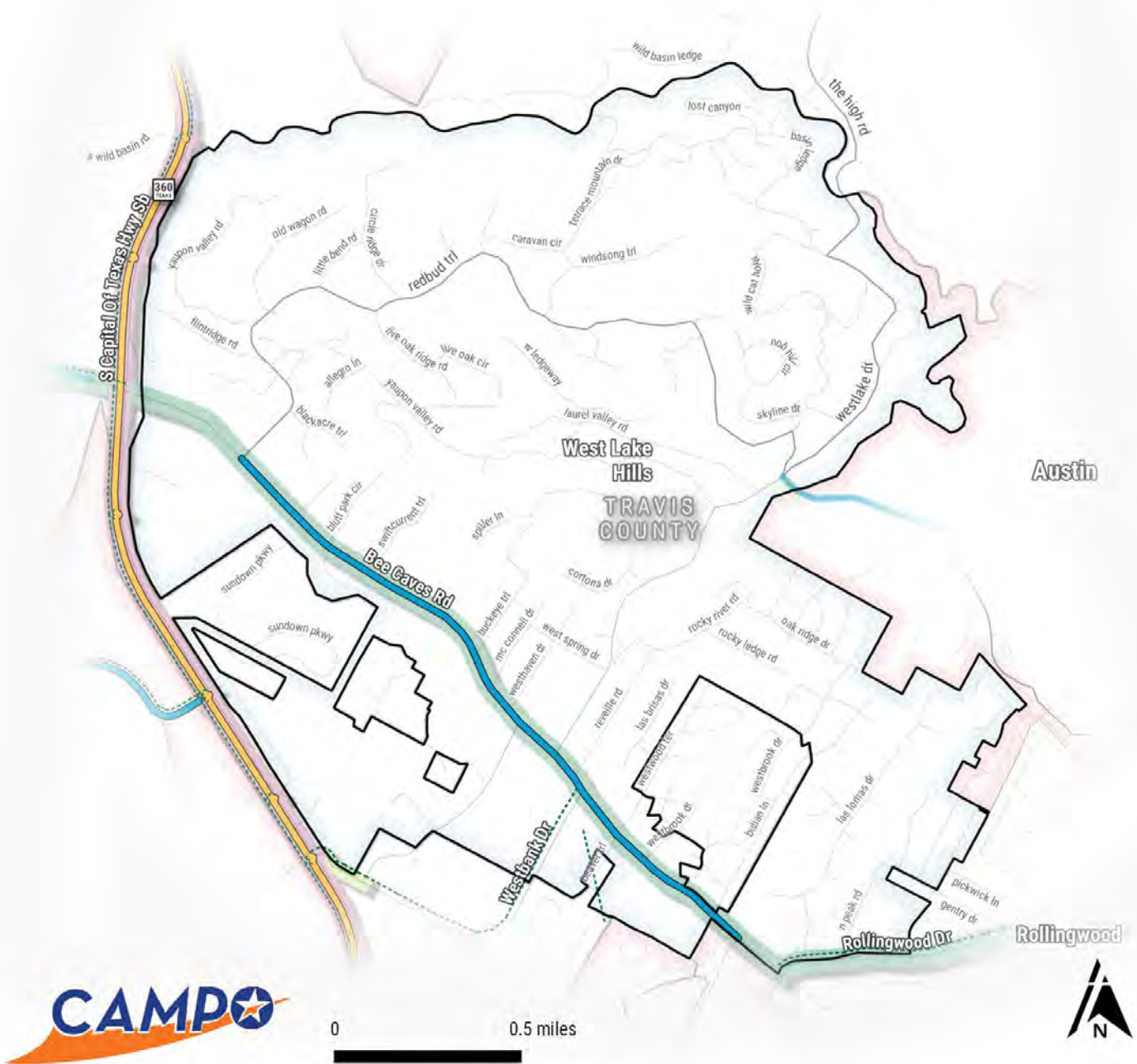
# Unconstrained Network Weir

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Lane**
  - Bike Lane
  - Shared Roadway
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Problem Intersection**
  - Problem Intersection
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector



# Unconstrained Network West Lake Hills

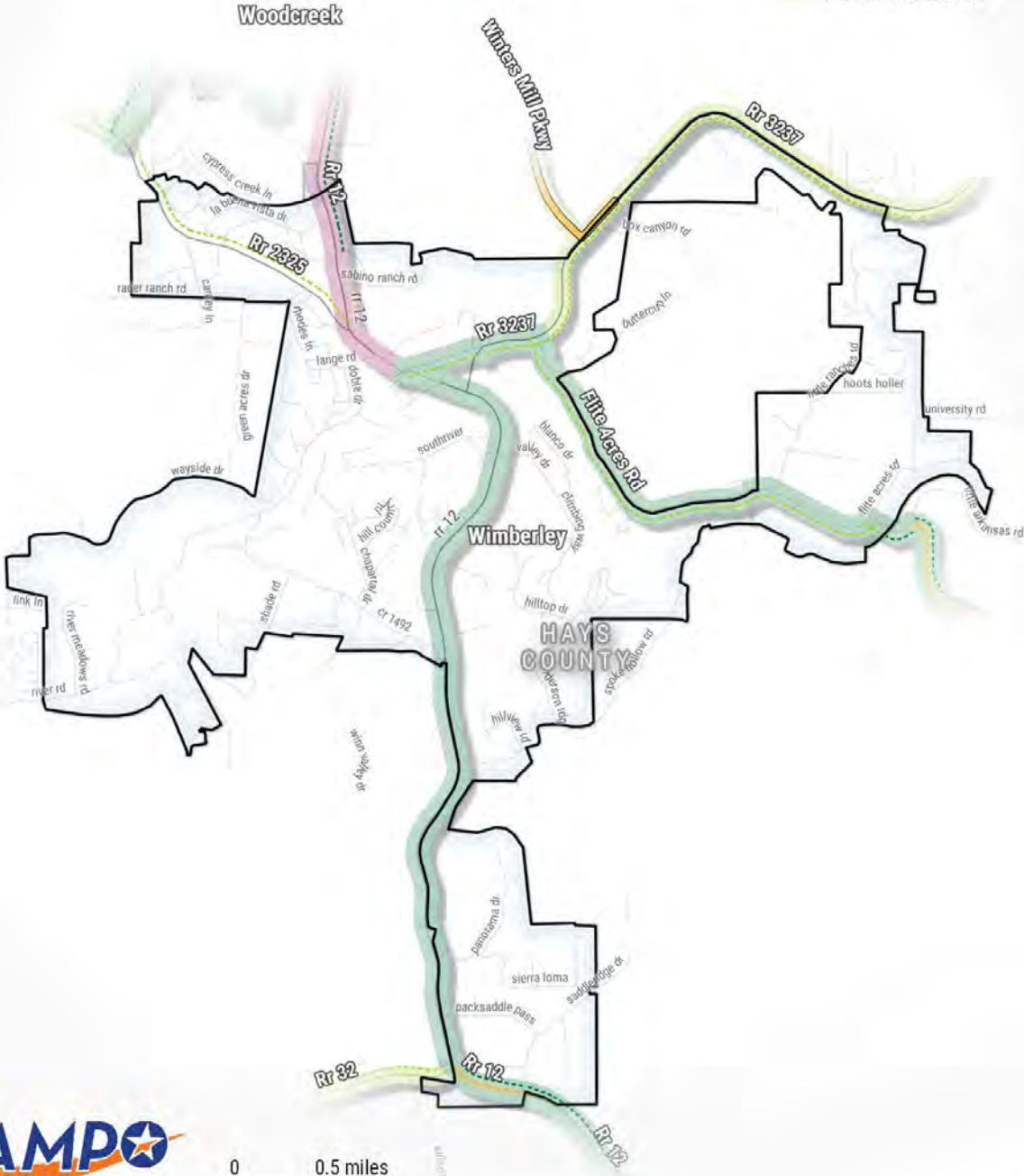
- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |





# Unconstrained Network Wimberley

- Existing Facilities**
  - Existing Trail
  - Existing Separated Bike Lane
  - Existing Bike Lane
  - Existing Shared Roadway
  - Existing Natural Surface Trail
- Planned Facilities**
  - Trail
  - Separated Bike Lane
- Bike Need**
  - Municipally Identified Need
  - CAMPO Identified Gap
- Priority Network**
  - Tier 1
  - Tier 2
  - Vision Connector
- Other Symbols**
  - Bike Lane
  - Shared Roadway
  - Problem Intersection (Red Star)



0 0.5 miles



# Unconstrained Network Woodcreek

- |                                |                             |
|--------------------------------|-----------------------------|
| <b>Existing Facilities</b>     | Bike Lane                   |
| Existing Trail                 | Shared Roadway              |
| Existing Separated Bike Lane   | <b>Bike Need</b>            |
| Existing Bike Lane             | Municipally Identified Need |
| Existing Shared Roadway        | CAMPO Identified Gap        |
| Existing Natural Surface Trail | Problem Intersection        |
| <b>Planned Facilities</b>      | <b>Priority Network</b>     |
| Trail                          | Tier 1                      |
| Separated Bike Lane            | Tier 2                      |
|                                | Vision Connector            |



0 0.5 miles  
Wimberley

