



ACTIVE TYLER TRANSPORTATION PLAN

Active Transportation Plan for
Tyler Area MPO
MARCH 2019



2019



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ACTIVE
TYLER

INTRODUCTION



Active Transportation & the Greater Tyler Area

- What is Active Transportation?
- Intent
- Focus Area
- Existing Conditions
- Takeaways





WHAT IS ACTIVE TRANSPORTATION?

Human-powered travel between destinations, including bicycling, walking, wheeling, and more.



As a Roadway User: Why support active transportation?

Choosing to walk or bicycle for trips pays dividends. Users reap many benefits from choosing to walk or bicycle for trips; they can:

IMPROVE AND MAINTAIN HEALTH

The World Health Organization has identified inactivity is one of the leading risk factors around the world (1). People who use active transportation generally add to their daily activity by adding their travel time, and in some cases, those who commute by bike spend more time exercising in other capacities (like recreation or fitness reasons) than those who do not (2).

SAVE ON TRAVEL COSTS

The estimated cost of driving ranges between 47 and 62 cents per mile; the average annual cost of operating an automobile for a year is over \$8,400 per year (3), which is 17% of the median household income in Smith County (4). Conversely, the cost of operating a bicycle for a year is estimated at only \$308 (5), which consumes less than 1% of the median household income.

ENJOY COMMUNITIES MORE

Research suggests that bicycling improves mood and overall happiness (6). Allowing people to explore the Tyler region on foot and by bicycle allows roadway users to experience their communities in an entirely new way.



////////////////////

As a Community: Why invest active transportation?

Communities in the Tyler region can choose to change the transportation narrative in the Tyler region. Communities around the country that choose to focus investments in bicycling and walking infrastructure, policy, and programming also:

ENCOURAGE ECONOMIC VITALITY

Walkable neighborhoods typically have lively, populated streets and promote commercial exchanges. Having spaces that are enjoyable to walk or bicycle to can encourage more interaction at storefronts and attract more potential buyers (7).

ENSURE COMMUNITY GROWTH

Active transportation infrastructure, especially for bicycles, are powerful draws for highly-skilled employees and for younger people (8). Investing in active transportation now can encourage community growth and diverse industry development for years to come.

CREATE SAFER PLACES FOR PEOPLE

Safety for active transportation users can be viewed in terms of fatalities, total crashes, or user comfort. More active transportation users and well-designed infrastructure can help reduce fatalities and crashes and increasing pedestrian and bicyclist comfort (9).

CAPTURE ECONOMIC BENEFITS

Increasing land values around trails and walkable areas show that people desire to live closer to active transportation facilities; people, including those that do not bike or walk for trips often, are willing to make investments in places with better transportation choices. Similarly, a study of 11 cities around the US found that bicycle projects created 50% more jobs than vehicle-centric roadway projects (10).

PROVIDE OPTIONS & PROMOTE EQUITY

While some people may choose to bicycle or walk for trips, others cannot afford a personal vehicle or do not have access to any other modes of transportation. Over 3,500 households, or about 4% of the total households, in Smith County do not own a personal vehicle (11). Walking and bicycling provides cheaper transportation options for people who do not have personal vehicles—if safe, connected infrastructure provides comfortable routes to destinations.

As a community leader: What will help most?

User preference surveys indicate how people's travel choices will change in response to bicycle and pedestrian investments in infrastructure and programming. The most powerful factors include:

SAFE ROUTES BETWEEN DESTINATIONS

Bicyclists are willing to add additional time to their trips—up to 20 minutes—on a less direct route if it means that they can ride on a safer, more comfortable facility (12). This means that more people may be willing to bicycle to destinations even if it takes them longer than driving, so long as they feel safe during their trips.

PRIORITIZING USER COMFORT

People choose to walk or ride bicycles where it is safe and comfortable. Results from regional surveys indicate that people would be more willing to bicycle or walk if infrastructure is complete, safe, and makes them feel comfortable.



- (1) World Health Organization (2018). "Physical Inactivity."
- (2) Panik, Morris, Voulgaris (2019). "Does walking and bicycling more mean exercising less? Evidence from the US and the Netherlands."
- (3) Stepp, E. (2017). "AAA Reveals the True Cost of Operating a Vehicle."
- (4) Smith County, TX | Data USA. (2018).
- (5) League of American Bicyclists. (2013). "The New Majority: Pedalling Towards Equity"
- (6) Morris, E. A., & Guerra, E. (2015). "Mood and mode: does how we travel affect how we feel?"
- (7) Litman, Todd (2018). "Economic Value of Walkability."

- (8) Love, L. L., & Crompton, J. L. (1999). The Role of Quality of Life in Business (Re)Location Decisions."
- (9) Jacobsen, P. L. (2003). "Safety in numbers: more walkers and bicyclists, safer walking and bicycling."
- (10) Garrett-Peltier, H. (2011). "Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts."
- (11) US Census Bureau (2017) "Tenure By Vehicles Available."
- (12) Transportation Research Board, & National Academies of Sciences, Engineering, and Medicine. (2006). "Guidelines for Analysis of Investments in Bicycle Facilities."

INTENT: WHAT WILL THIS PLAN DO?

Investing in active transportation benefits communities of all kinds when done strategically and with public input and buy-in. The Active Tyler Plan serves as a tool to help guide investment for transportation projects in each of the communities in the Tyler region and encourage active transportation in the greater Tyler area. **The Plan's goals are.**

ACTIVE TYLER PLAN GOALS

ENCOURAGE ACTIVE TRANSPORTATION AS A MODE CHOICE

- As more people use the transportation network for bicycling and walking, more people benefit. The Plan's approach focuses on recommendations that most effectively encourage more people to bicycle and walk.

EDUCATE PEOPLE ABOUT THE BENEFITS OF BICYCLING AND WALKING

- As a part of the Active Tyler planning process and from its programming recommendations, people living in the region should know about bicycling and walking options, trade-offs, and benefits.

CREATE A VISION FOR A NETWORK OF BICYCLING AND WALKING FACILITIES

- The Active Tyler Plan identifies a network of bicycling and walking routes that connect people to important places in the greater Tyler area.

IDENTIFY A PATH FOR SUCCESS

- The Active Tyler Plan answers the question "What does success after this look like?" with measurable benchmarks of success and a path forward, bringing the vision to reality.



FOCUS AREA: GREATER TYLER

This plan will provide guidance and recommendations for the greater Tyler area and the Tyler Area Municipal Planning Organization (MPO), which is responsible for transportation planning and improvements throughout, within, and around these jurisdictions. The MPO boundary (Figure 1-1) contains the City of Tyler as well as several surrounding incorporated towns stretching North to Lindale and Winona, South to Bullard and Troup, East to Arp and West to Noonday.

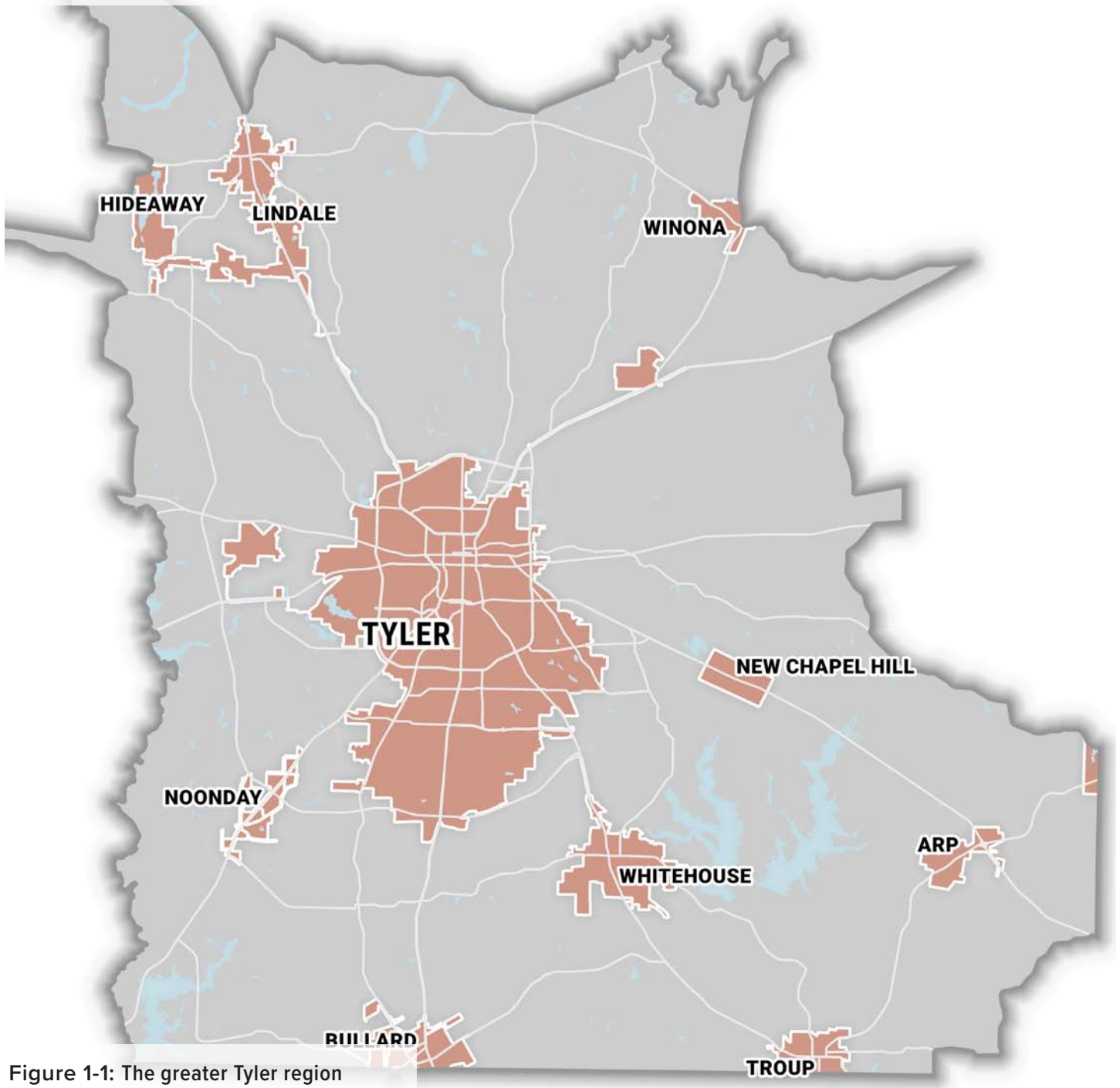


Figure 1-1: The greater Tyler region

EXISTING CONDITIONS

The Active Tyler Plan's foundation (see p.14) developed from evaluating current conditions and connections to existing bicycle and pedestrian infrastructure. At the time of this plan, the City of Tyler had over 5 miles of existing bike lanes on sections of East Campbell Parkway, Sunnybrook Drive, South Donnybrook Drive and Golden Road. Tyler also has multiple existing paved and natural surface trails connecting Faulkner Park, Southside Park, Lindsey Park and other areas throughout the city.

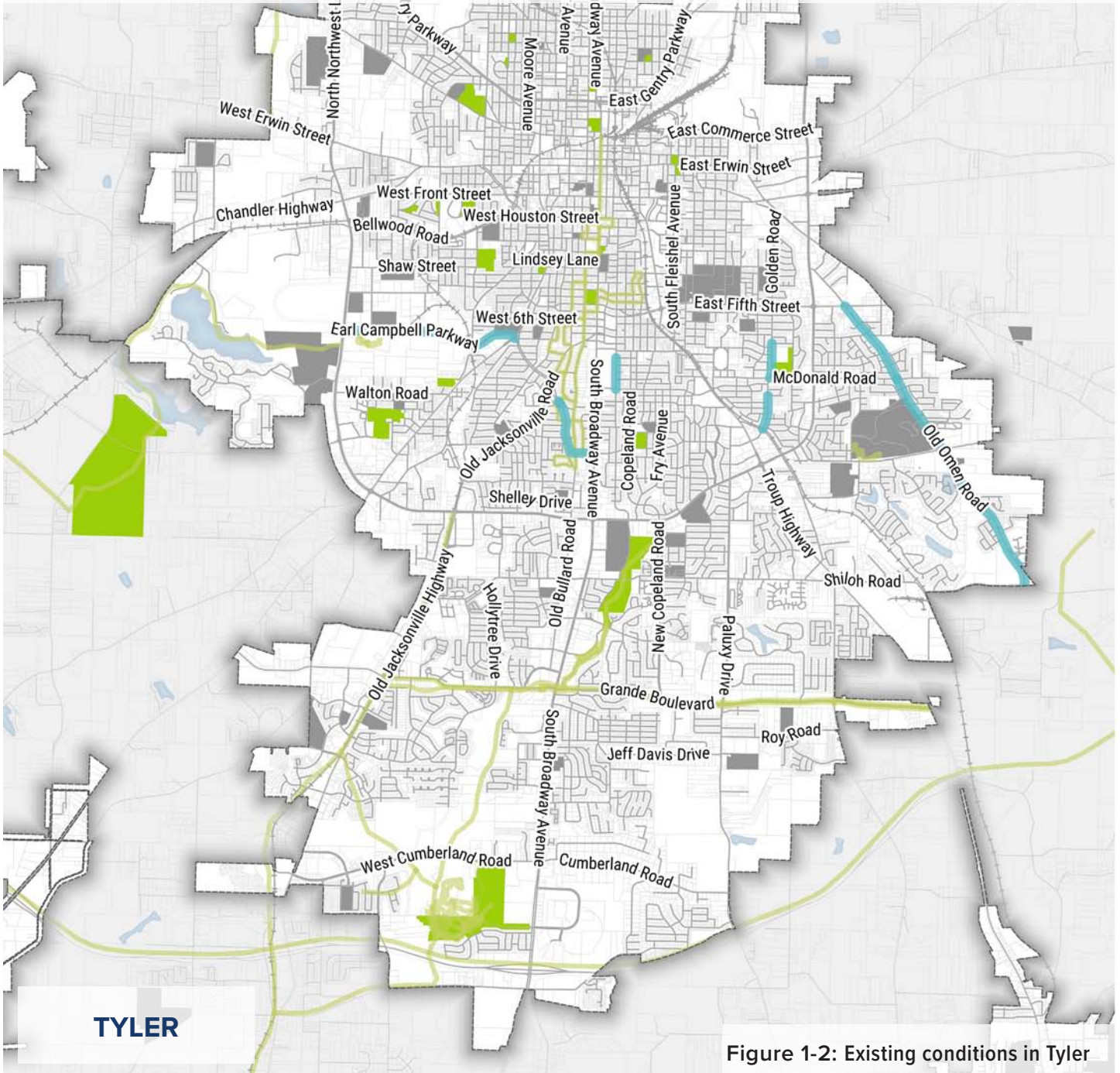
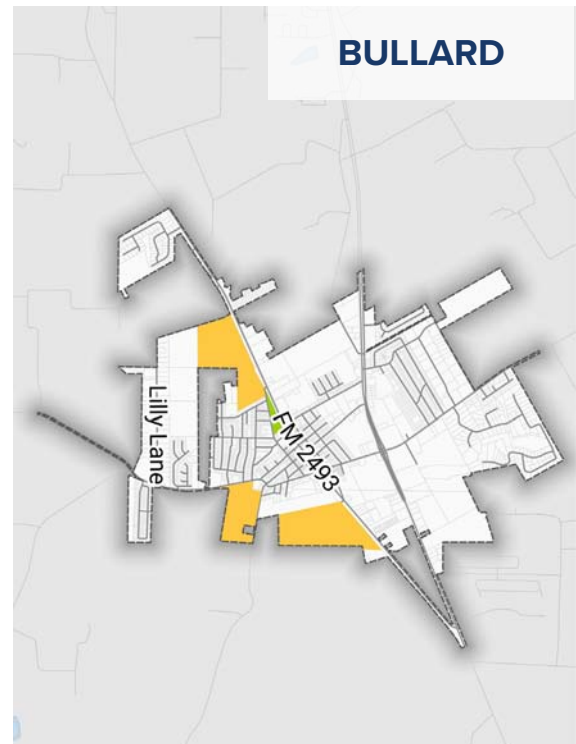
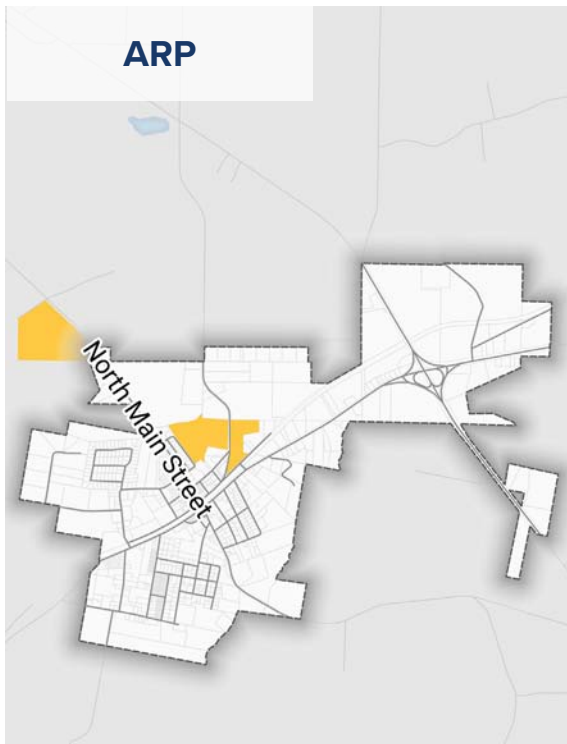
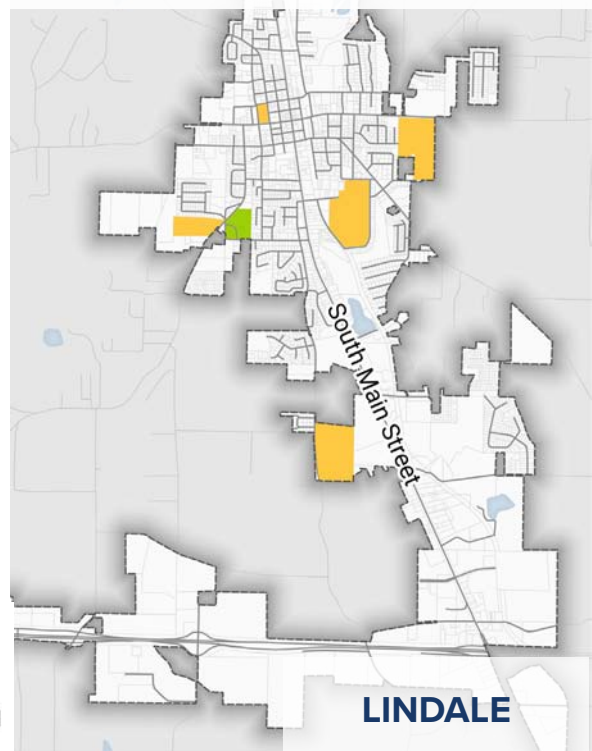
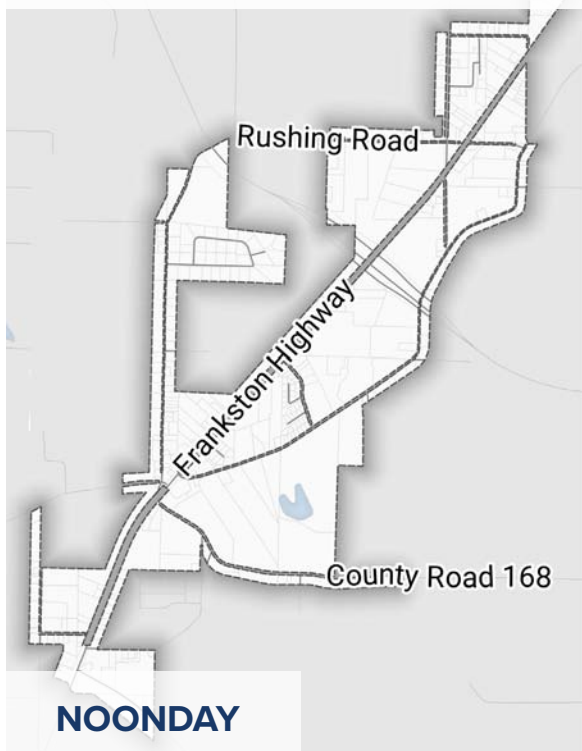


Figure 1-2: Existing conditions in Tyler

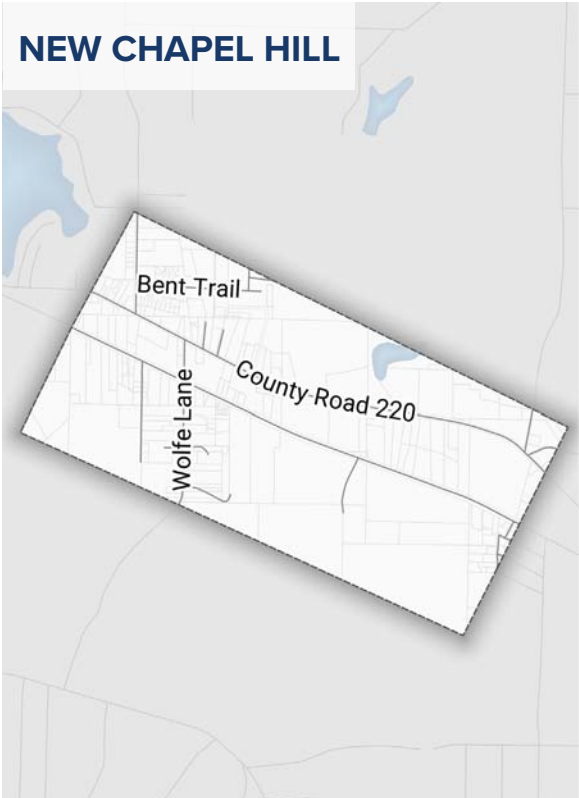


While the communities surrounding Tyler have little existing bicycle or pedestrian infrastructure, there are opportunities for improving the bicycling and walking environment. The following maps show schools and parks that are prime for active transportation connections in several smaller communities in the focus areas.

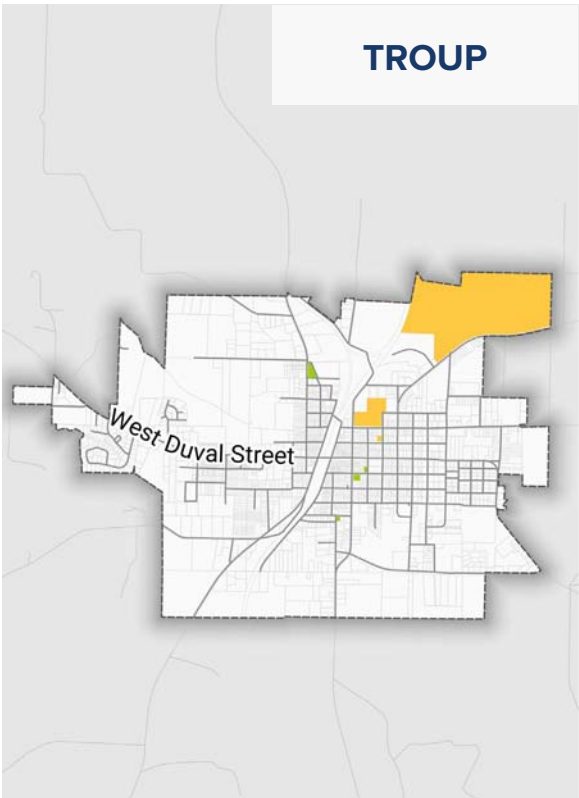


- Trail
- Park
- School

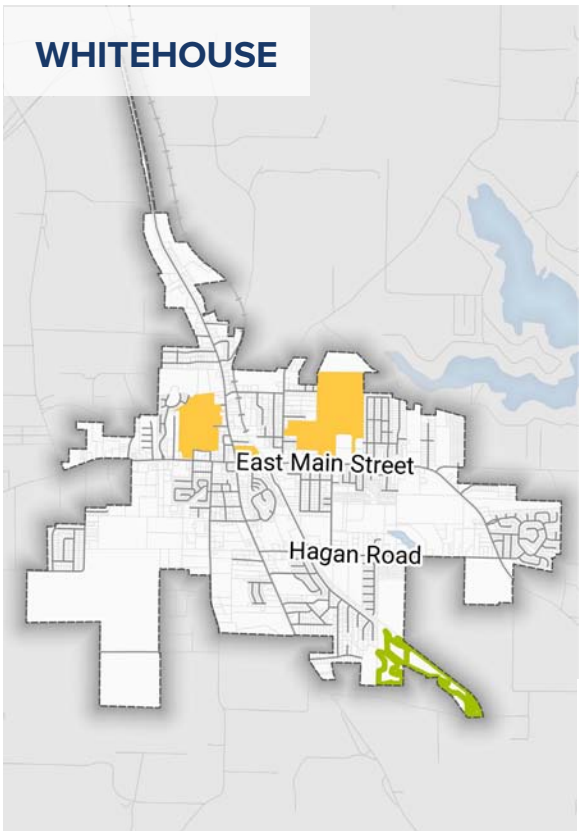
NEW CHAPEL HILL



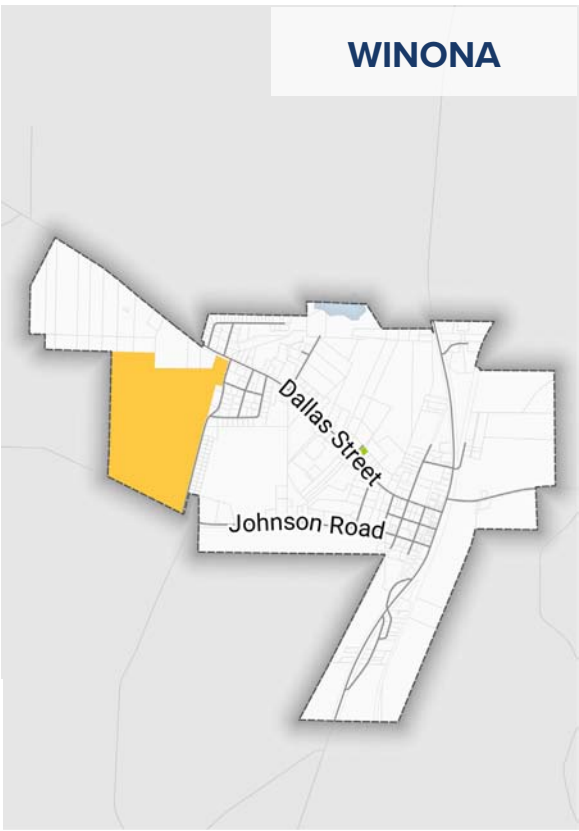
TROUP



WHITEHOUSE



WINONA



- Trail
- Park
- School

TAKEAWAYS

The Greater Tyler Area is ripe for changes to its active transportation infrastructure.

All communities in the focus area contain destinations (schools, parks, community facilities, etc.) that are important to connect with walking and bicycling routes.

In Tyler and Whitehouse, there are existing bicycling routes that can be expanded upon.

Expansions of active transportation networks should begin with existing connections. In Tyler and Whitehouse, there are opportunities to significantly boost connectivity and mobility by connecting existing facilities to new infrastructure.

In the future, there can be long-distance, regional connections between communities.

Regional roadways, like Highway 110, Highway 64, Highway 69, and others, connect smaller communities to Tyler. While it may be challenging to imagine bicycling/walking routes alongside these highways today, the Active Tyler Plan creates a long term vision for direct active transportation corridors between Tyler and its surrounding towns.



PUBLIC & STAKEHOLDER OUTREACH

Engaging &
encouraging
the Tyler area
community

- Approach
- Engagement Themes
- Partnering Workshops
- Pop-Up Events
- Online Engagement
- Open House Meetings

2

APPROACH

I'm looking forward to this project being completed; I'm ready to ride with my kids anywhere and everywhere.

- Survey Respondent



Hearing the public share their active transportation experience laid the foundation for developing recommendations in the Active Tyler Plan. Additionally, public input formed the active transportation strategies that will be essential for beginning implementation, sustaining momentum, and attracting new users as the Plan is implemented. The Active Tyler planning process used a twofold approach to public engagement: 1) to interact with the public in places where active transportation occurs daily; and 2) to organize events that were informational and interactive to educate the public and gather valuable input from a broad cross-section of people. MPO staff and a consultant team conducted a variety of stakeholder meetings, pop-up events, online engagement activities, and open house meetings.



PARTNERING WORKSHOPS

Engaging stakeholders



OPEN HOUSE MEETINGS

Inviting people to learn casually



POP-UP EVENTS

Gathering input at local destinations



ONLINE ENGAGEMENT

Creating hundreds of impressions

ENGAGEMENT THEMES

People in the greater Tyler area care about bicycling and walking.

Well-attended public meetings, workshops, and online engagement tools show that people are interested in learning about and contributing to a network of active transportation facilities.

People want to bicycle and walk more, and they will as facilities improve.

Findings from surveys indicate that people would be more interested bicycling and walking for trips if there were more bicycle facilities, improved sidewalks, and safer street crossings.

Connectivity to trails and off-road facilities are important for recreation and transportation.

Stakeholders and community members alike indicated that they want more access to trails and other recreational facilities.

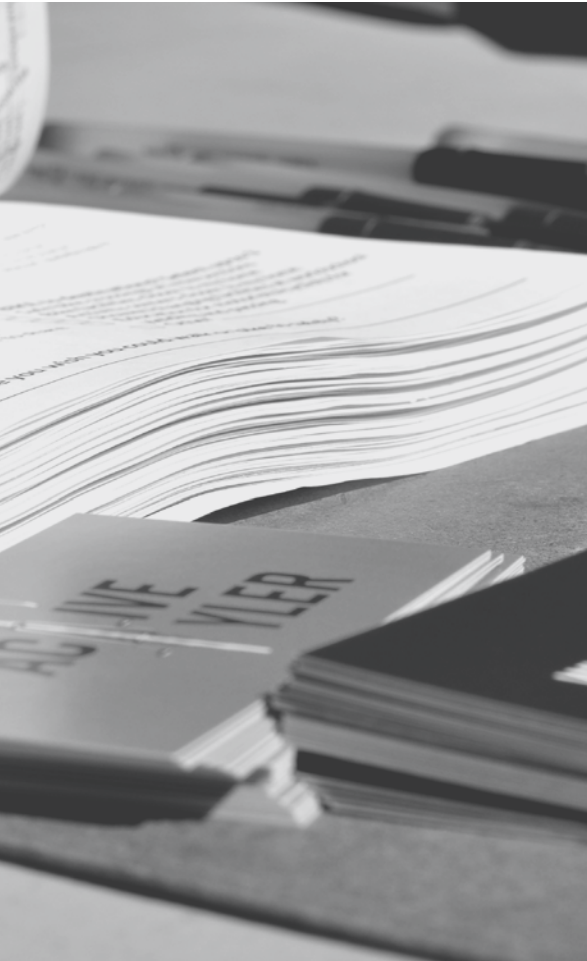
There are concerns about unsafe roadways and intersections.

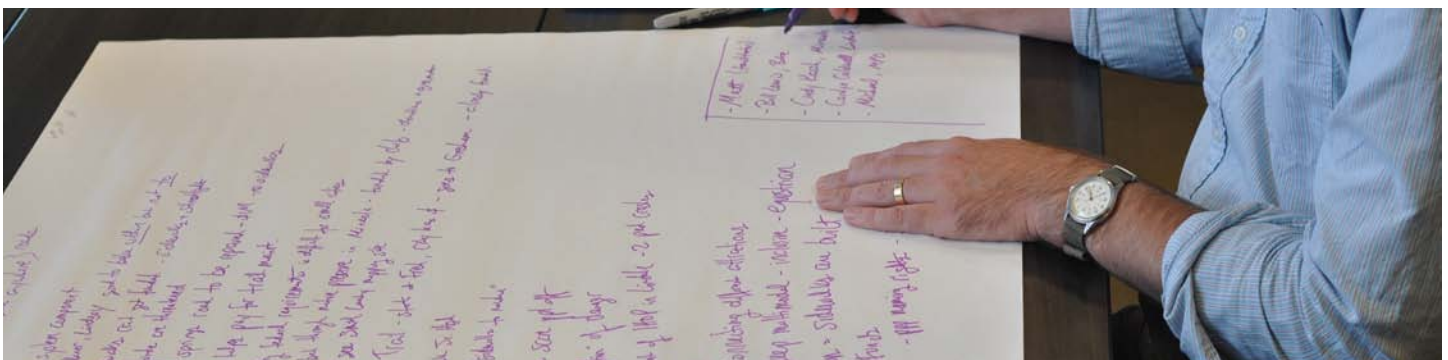
Comments from the surveys show that there are certain streets within the roadway network that deter people from bicycling and walking. User comfort must be a top priority when implementing new bicycle and pedestrian infrastructure.

Physical Health
+
Mental Health
+
Transportation
+
Fun
+
Community

PARTNERING WORKSHOPS

Stakeholders were invited to facilitated discussions coined “Partnering Workshops.” Three separate Partnering Workshops were held over the course of the planning process. Representatives from a variety of organizations were invited to attend each workshop and a majority of organizations that attended stayed involved throughout the entire process. Each workshop included a presentation that updated stakeholders on the planning process along with opportunities for attendees to provide feedback. The outline below describes each Partnering Workshops in more detail.

- 
- 01** **04.19.18 | Introductory Workshop**
 - 02** **05.16.18 | Existing Conditions Workshop**
 - 03** **11.13.18 | Network Development Workshop**
 - 04** **Stakeholder Meetings**





An introductory workshop provided stakeholders with information about the consultant team, the overall Active Tyler Plan approach, project timelines, and next steps. Participants provided feedback on goals and objectives for the plan and keys to success.

MPO staff and the consultant team facilitated discussion about public engagement and existing conditions. A mapping exercise provided allowed attendees to identify existing barriers to active transportation throughout the region. Additional “meeting-in-a-box” training gave participants resources to host their own pop-up meetings to collect public input on active transportation needs.

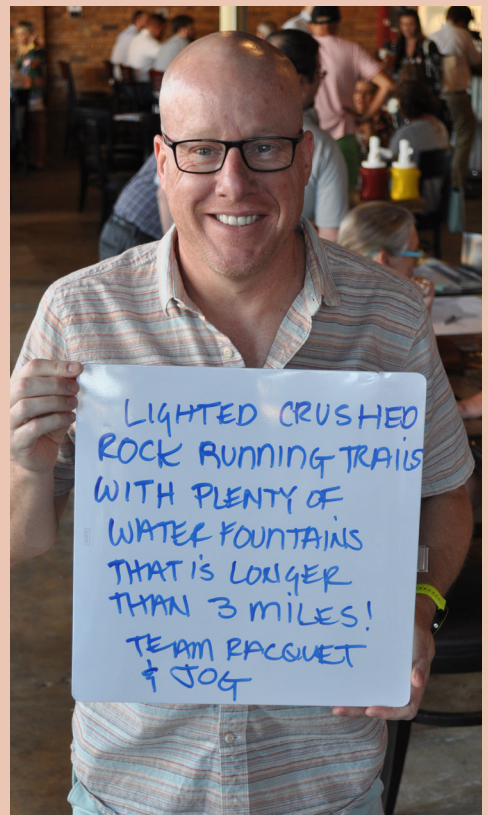
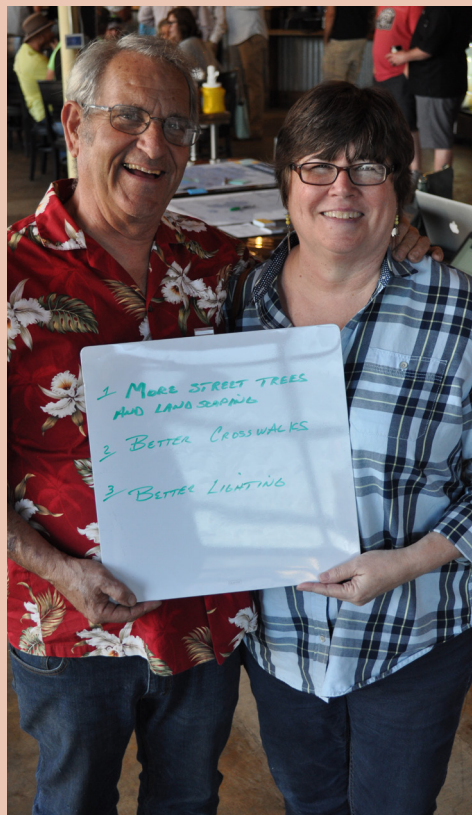
Stakeholders learned about the network development process so they could understand the Plan’s facility recommendations. They were provided with a draft network of facilities, which showed both local and regional connections. Attendees provided feedback on alignments and missing connections throughout the region during a small group mapping exercise.

Additional stakeholders were invited to join all partnering workshops to expand the interests that had a “seat at the table.” Several one-on-one stakeholder meetings were conducted outside of the Partnering Workshops due to scheduling conflicts for participants. Meetings were organized specifically for City of Tyler and MPO staff as well as a separate meeting for downtown business owners. All stakeholder meetings reviewed materials from the partnering workshops and collected input from participating stakeholders to be incorporated into the network development and recommendations.





WHAT DOES SUCCESS LOOK LIKE TO YOU?



POP-UP EVENTS

Casual but crucial conversations with people about active transportation in Tyler.

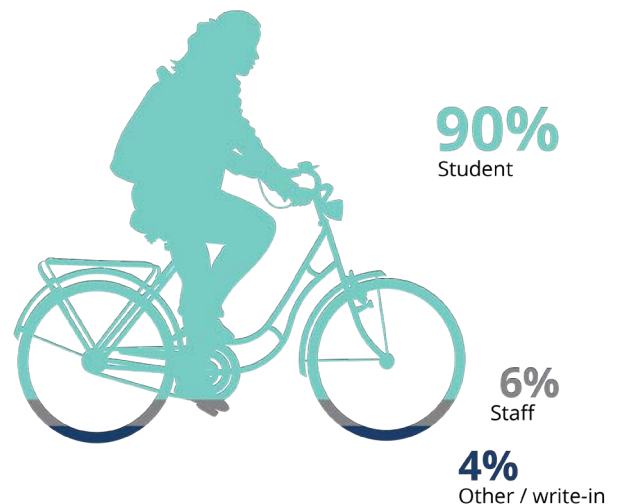
Pop up events, or informal activities at places where people gather or pass by, expanded the input used in the Active Tyler Plan.

Pop-Up Event Locations:

- College Campuses
- Racquet & Jog Run Club
- Cyclology Group Ride



CAMPUS SURVEY RESPONSES



ONLINE ENGAGEMENT

Receiving input from anyone with an electronic device.

INTERACTIVE MAPS

An online interactive map (Wikimap) provided the public opportunities to identify desired bicycle and walking connections throughout the region. The Wikimap allowed users to note preferred routes, destinations, and barriers at a local and regional scale. Results from the Wikimap were included as another layer to analyze during network development. The proposed network considered the key destinations that users desired to access by bicycling or walking to recommend connections that would increase safety and accessibility for all existing and potential users. Additionally, barriers and problem intersections identified by the public were reviewed for targeted improvements as part of the overall network, as well as serving as a key consideration for prioritization of projects. Figure 2-1 below illustrates two iterations of the online map that collected feedback from participants.

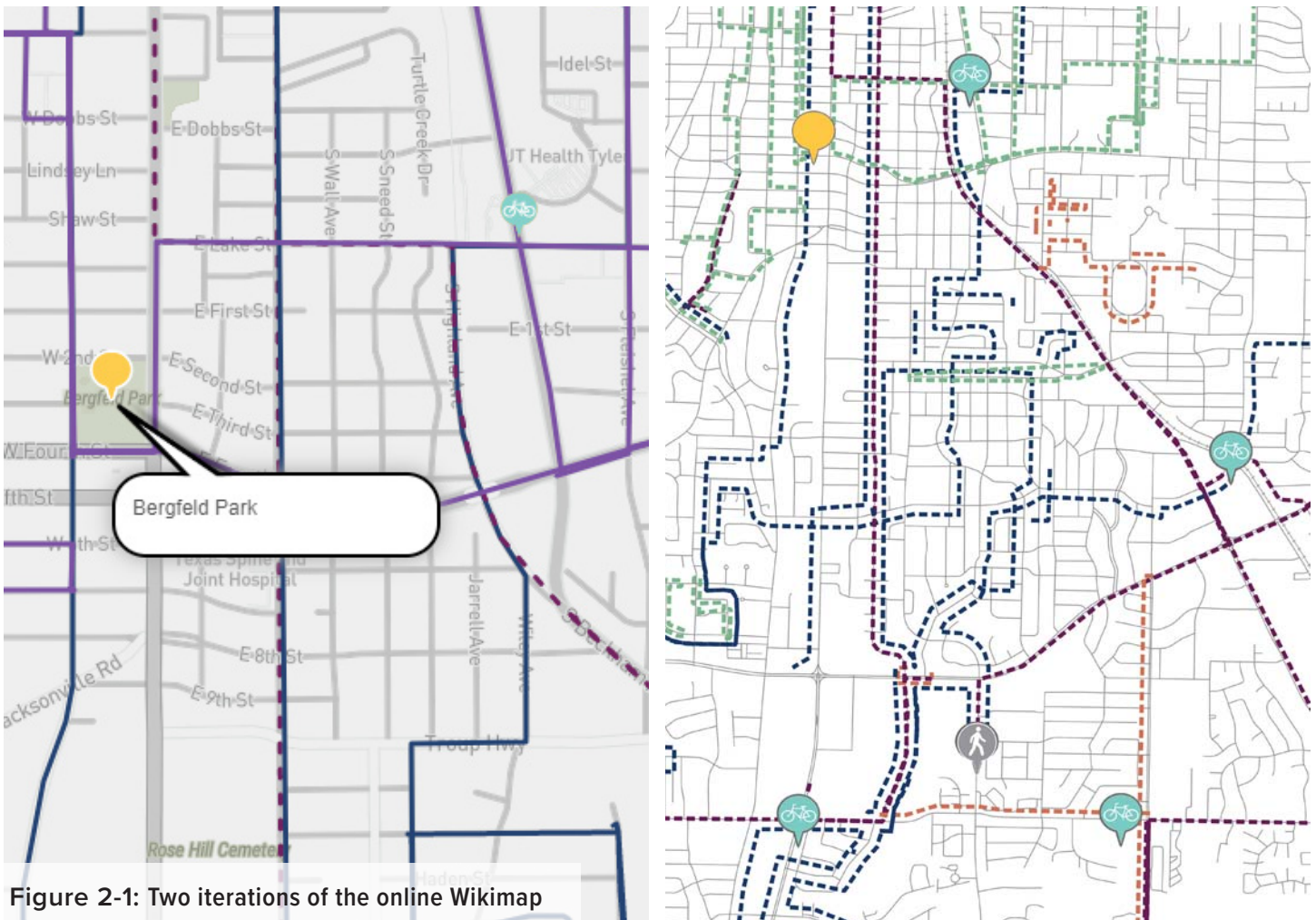


Figure 2-1: Two iterations of the online Wikimap

ONLINE SURVEYS

Over 400 survey responses informed the Active Tyler planning process. The survey’s focus was to understand demographics and active transportation perceptions while informing the network development. The survey was available via the project website and in hard-copy format at each pop-up meeting, partnering workshop, and open house meeting. Some key findings are illustrated in Figure 2-2 below.

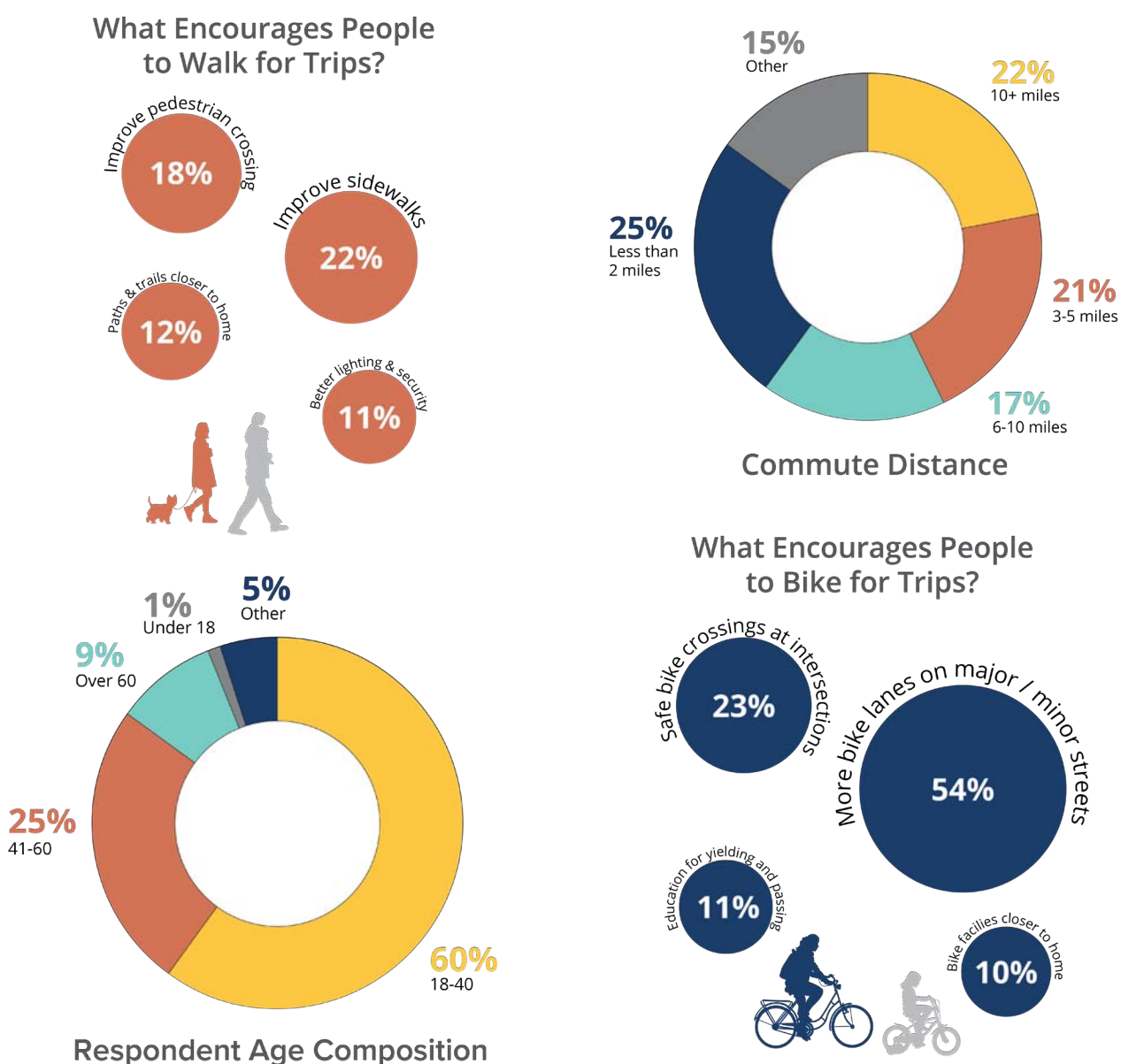


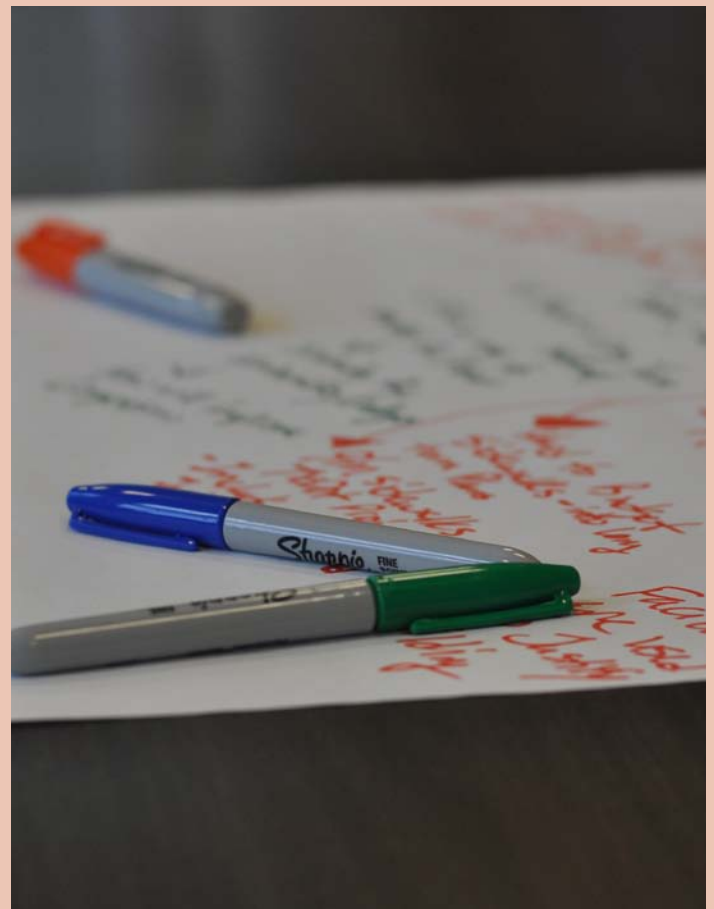
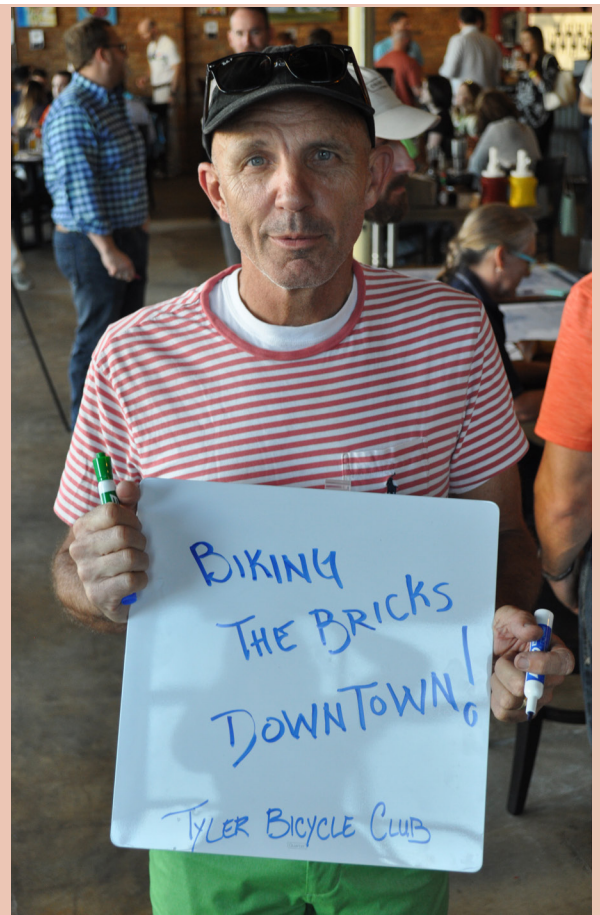
Figure 2-2: Results from the public engagement process

OPEN HOUSE MEETINGS

////////////////////////////////////
Encouraging people to learn and give feedback in a casual, inviting environment.

The greater Tyler community participated in two open house meetings as a part of the Active Tyler planning process. Attendees shared their bicycling and walking experiences, completed surveys, vetted the proposed network, and joined visioning activities. Open house meeting locations included ETX Brewery and Gallery Main Street.







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NETWORK DEVELOPMENT



Routes to connect people to places

- Approach
- Technical Analysis
- Network Refinement
- Network
Recommendations

3

APPROACH

The Active Tyler Plan recommends a network of safe, connected facilities to connect active transportation users in the greater Tyler area to important destinations. **Recommendations in the Plan result from multiple layers of analysis, including public opinion, existing conditions, and much more (see list below).** This data-driven approach ensures that the recommended infrastructure is most effectively serving all communities and people, but especially those who will most benefit from it. Recommendations also underwent a detailed vetting process that included key stakeholders in the community in order to optimize analyses and the resulting recommendations. The methodologies for each analysis is described in the Technical Analysis section. The development of facilities recommendations were guided by the following principles:

MORE USERS AND SAFETY ARE RELATED

- Bicyclists and pedestrians are more likely to use facilities where they feel safer, and people are safer when more people bicycle and walk. The network in the Active Tyler Plan is designed to attract new users on active transportation facilities and improve network safety.

CONNECTED FACILITIES INCREASE MOBILITY

- The Plan proposes a network of carefully selected bicycle and pedestrian facilities that are connected to one another and to existing facilities. Each project in the Active Tyler Plan is a vital part of connecting the entire region safely.

IMPLEMENTATION IS KEY

- The projects identified in the Plan are strategically selected, carefully vetted, and prioritized for efficiency in implementation. The Plan provides guidance and flexibility for implementing active transportation infrastructure on and off the recommended network.

Six primary drivers factored into the selection and prioritization of recommendations across the region.

>> **01 PUBLIC INPUT RESULT:**
visualizing the public experience

>> **02 DEMAND:**
determining “where” works best

>> **03 BICYCLE TRAFFIC COMFORT:**
seeing the bicyclist’s perspective

>> **04 BICYCLE NETWORK ANALYSIS:**
measuring bicycle connectivity

>> **05 PEDESTRIAN ZONES:**
identifying pedestrian hotspots

>> **06 EQUITY ANALYSIS:**
recognizing community need

TECHNICAL ANALYSIS

Using a data-driven approach to identify the best bicycle and pedestrian network.

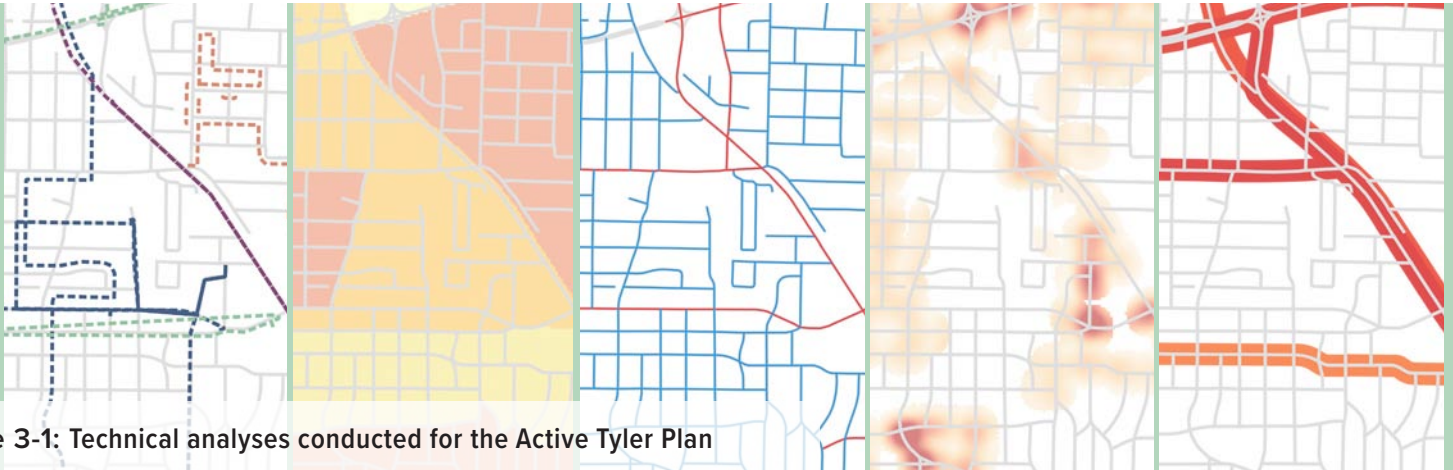


Figure 3-1: Technical analyses conducted for the Active Tyler Plan

PUBLIC INPUT RESULTS

The public voice helped shape the network of recommended bicycle and pedestrian facilities in the **Active Tyler Plan**. Results from the Active Tyler Wikimap were a starting point for identifying destinations and routes that are important to community members. Over 400 people shared comments and/or identified routes and destinations on the Wikimap. While the final network of recommended facilities does not necessarily capture each suggestion from the Wikimap, the communities' feedback identified major destinations and general routes to connect them.



DEMAND ANALYSIS

The demand analysis highlights 1) places where people are likely to bike and walk and 2) where people are already walking and biking—or areas with high demand. Places with high existing/potential demand are also places where bicycle and pedestrian infrastructure can be the most impactful.

The Active Tyler Plan prioritizes infrastructure and funding in these high-demand areas. The factors identified in Table 3-1 were used to identify demand at the census block level. Figure 3-2 shows a sample of the demand analysis conducted for the Active Tyler Plan.

Table 3-1: Demand Analysis Criteria

CRITERIA	RATIONALE	WEIGHTS
Population Density population per census block* (standardized by block group area)	Enhancing infrastructure in densely populated areas impacts the most users per given area	- High: 20 points - Mid: 10 points - Low: 5 points
Attractors includes parks, downtown area, schools, and universities	These common attractors are often destinations for people walking and people on bicycles	- At least one park: 10 points - At least one school or university: 10 points - Downtown planning area: 10 points
Employment Density number of employees per census block (standardized by block group size)	Walking and bicycling (1) from home to work or (2) from work to other locations are common active travel trips; infrastructure should support these trips.	- High: 20 points - Mid: 10 points - Low: 5 points
Transit includes bus routes and bus stops	Active transportation and transit go hand in hand; it is important that active transportation facilities around transit stops and routes are safe and connected for users	- More than one stop: 10 points - One stop: 5 points - Connecting route: 10 points
Existing Bicycle Facilities includes bike lanes, signed routes, and trails	Existing bicycle facilities attract users. These facilities should be integrated into any new network recommendations.	Based on miles of facilities: - High: 10 points - Mid: 7 points - Low: 5 points
Public Input summarized results of desired walking/bicycling routes from online Wikimap	Results from the Wikimap highlight places where people desire to bicycle/walk. Locals, who are understand the region provided desired connections.	Based on miles of desired routes: - High: 10 points - Low: 5 points

*WHAT IS A CENSUS BLOCK?

Census blocks are a unit used by the US Census Bureau to calculate demographic information. Census blocks are bounded by landmarks, such as roads, water bodies, etc., or by legal boundaries. They are not defined by population, but rather by size and geographic features. (Source: Census.gov)

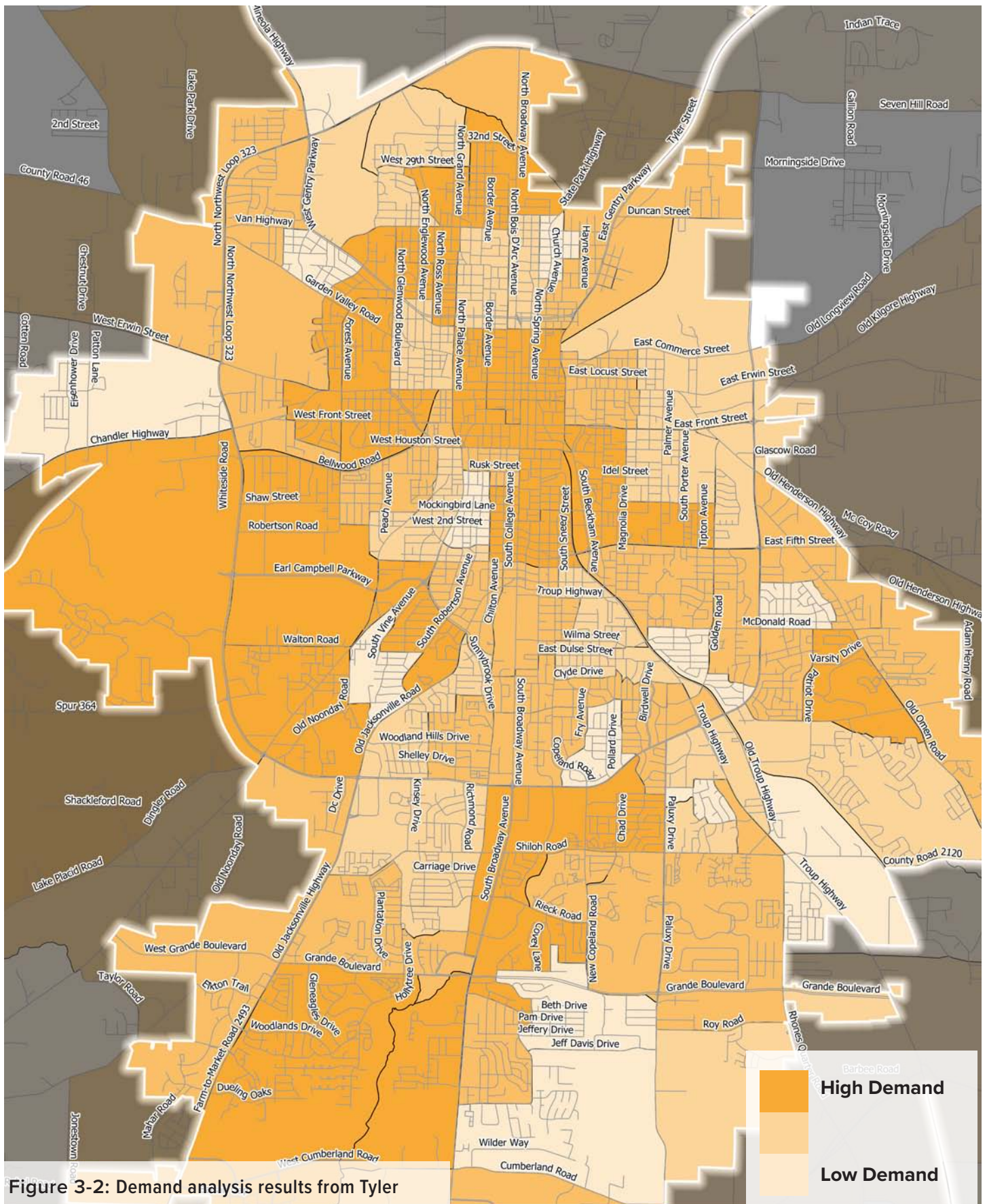


Figure 3-2: Demand analysis results from Tyler

BICYCLE LEVEL OF COMFORT

Low-stress, connected bicycle networks have emerged as one of the most important parts of encouraging and supporting bicycling for people of all ages and abilities. For people to choose to ride a bicycle, they must feel comfortable at each step of their trip.

One intimidating road segment or intersection can rule out an entire journey for less confident bicyclists. The Active Tyler Plan uses a traffic comfort analysis to assess bicycling stress in the MPO.

The purpose of the bicycling level of comfort analysis is to illustrate the experience of a bicyclists using the existing network in the MPO by categorizing streets and roads as “high-comfort” or “low-comfort.” For example, trails are typically classified as high-comfort, and high-speed arterials with several travel lanes in each direction are typically classified as low-comfort.

People have different levels of comfort interacting with motor vehicle traffic when they are biking or when they are considering biking (see Figure 3-3). The traffic comfort analysis, when compared with the demand analysis, can highlight roadway segments in areas where demand for bicycling trips is high, but traffic comfort is also low.

BACKGROUND

Research findings (1) shows that most people have little tolerance for interacting with traffic while riding a bike; “would-be” bicyclists may choose not to bike for trips because they are afraid or uncomfortable in mixed-traffic scenarios. This group of people, often called the “interested but concerned group,” comprise approximately 51% of the US population. They prefer slow-speed streets, trails, and other “low-stress” or “high-comfort” places to bike that have limited motor vehicle traffic or are separated from traffic. The visual and physical separation between bicyclists and motorized traffic helps bicyclists feel safer and more confident.



Figure 3-3: Bicycling stress tolerance

I'm honestly too scared to [bike] unless it's a group ride.

- Survey Respondent



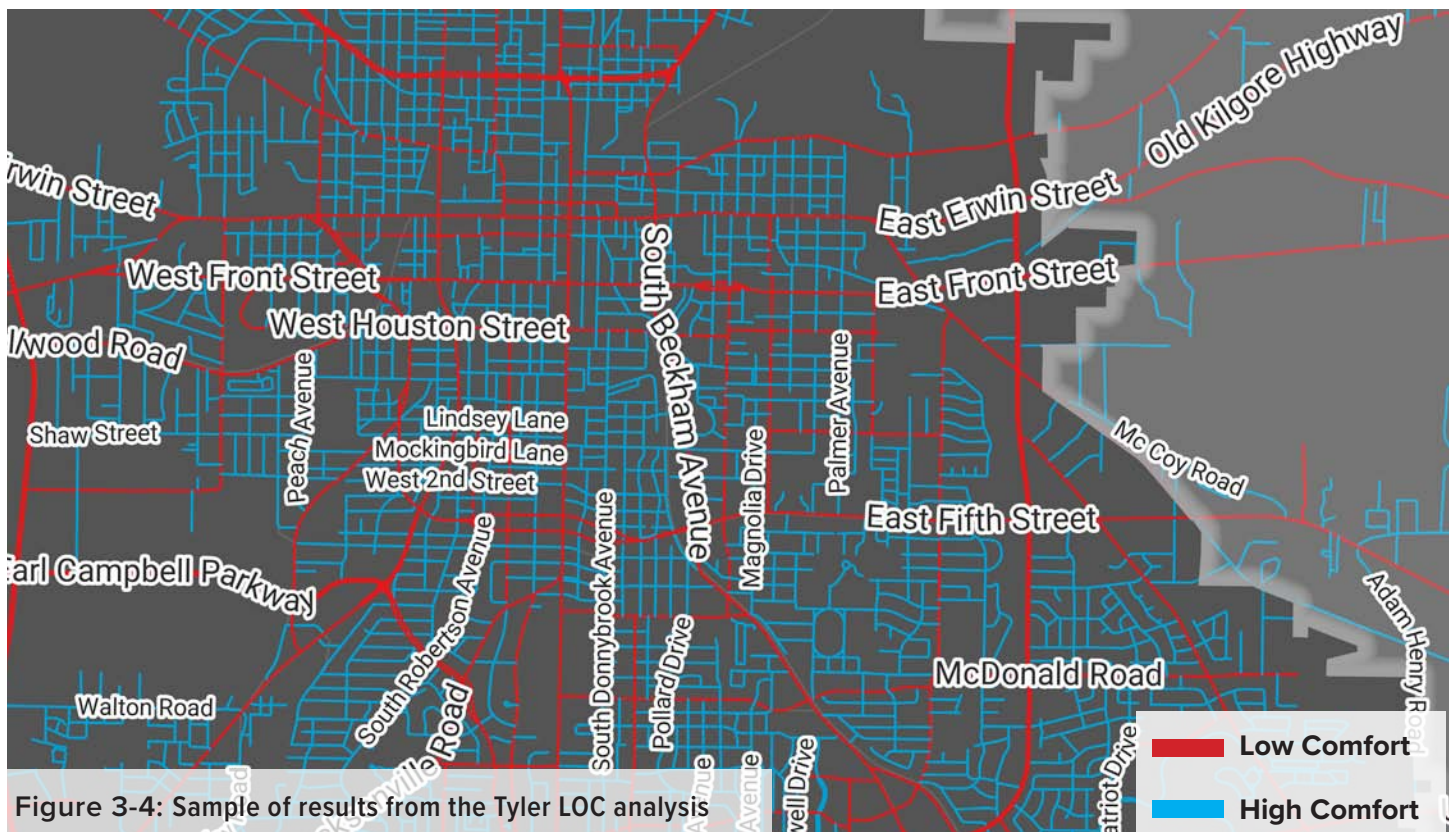
(1) Mineta Transportation Institute (2012). "Low Stress Bicycling and Network Connectivity."

METHODS

The Active Tyler Plan utilizes the Level of Traffic Comfort (LOC) method, developed by the Mineta Transportation Institute (1). **The analysis quantifies bicyclists' experience using a given segment of road based on the roads conditions (listed below).** The analysis has been adapted for the Active Tyler Plan; roadways are sorted into two categories: high-comfort and low-comfort. This analysis (see Figure 3-4) uses data from Open Streets Maps, a freely available, crowd-sourced database of road conditions.

FACTORS DETERMINING LOC SCORES:

- Number of Lanes
- Speed Limit
- Lane Widths
- Traffic Volumes
- And other factors



BICYCLE NETWORK ANALYSIS

Low-stress and connected bicycle networks are one of the most important parts of encouraging and supporting bicycling for people of all ages and abilities. For people to choose to ride a bicycle, they must not only feel comfortable on one street during their trip; they must feel safe from the beginning to the end of their trips. Breaks in a “low stress” network, then, can discourage the “interested but concerned” group from using bicycling as a mode for trips.

In addition to the traffic stress analysis, the Active Tyler Plan uses tool a tool—bicycle network analysis (BNA)—to measure connectivity of a community’s existing transportation network to key destinations in the communities from the bicyclists’ perspective.



BNA METHODOLOGY

The BNA tool builds upon the existing traffic stress analysis (see Figure 3-5). Based on the stress “scores” for each road segment, the analysis then evaluates every census block in the area to determine how well the road network connects important destinations to one another. Two census blocks are considered connected if there is an unbroken, low-stress street/road between them that does not require a bicycle trip more than 25% longer than the shortest car trip.

The BNA also summarizes the number and types of destinations available in each census block, including population, opportunities (jobs and education), core services, recreation, retail, and transit. Pairing this information with the knowledge of which census blocks are connected on the low-stress network, the BNA tool calculates a score for each census block by comparing the number and type of reachable destinations on the low-stress network to the destinations reachable by car within the same distance.

The BNA tool is used to test the impact of potential bikeway improvements aimed at increasing network connectivity and access. This information provides valuable guidance for project prioritization. See a sample of results in Figure 3-5

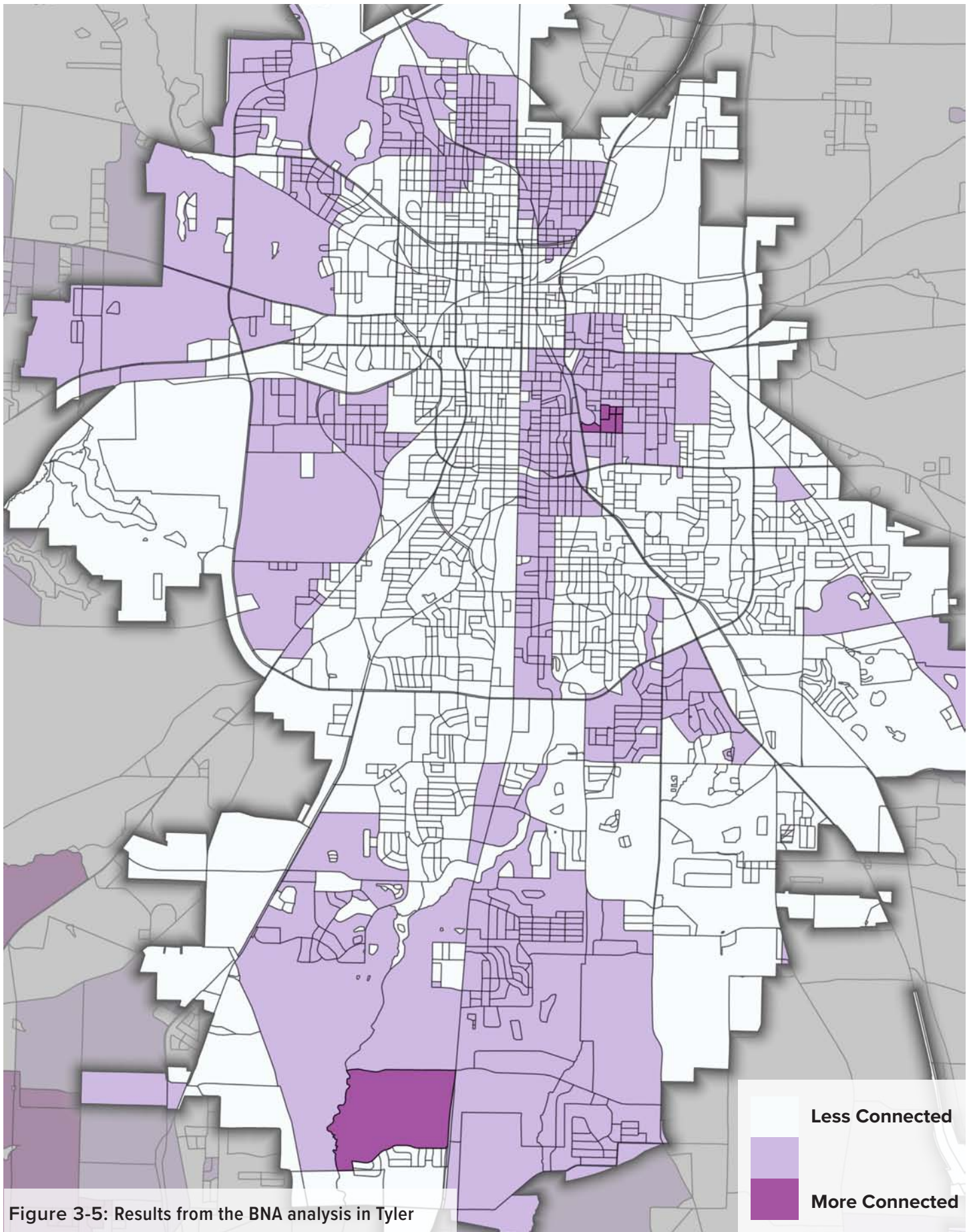


Figure 3-5: Results from the BNA analysis in Tyler

PEDESTRIAN ZONES

The way streets and their buildings are designed—often called urban form—greatly influences how people feel when walking. Short block lengths (generally less than 200’), spacious and safe sidewalks, and a continuous network of sidewalks help pedestrians feel safe and comfortable. Good urban form both supports those who are already walking and encourages others to walk for trips.

The Active Tyler Plan highlights areas in the communities that are most suitable for walking today, shown in the pedestrian zone heatmap (Figure 3-6). The map is based on intersection density (i.e., how close intersections are to one another) and existing sidewalks. The two factors are weighted equally.

The “hotspots” (or light areas) on the map indicate areas that are more accommodating to walking today. The hotspots have a higher concentration of intersections in a smaller area, and they also have existing sidewalk networks in place. These areas may benefit the most from new or improved infrastructure that encourages walking. Areas that are less suitable for walking today were viewed as different opportunities to encourage walking; these areas need more sidewalks and trails that connect to the existing sidewalk network.

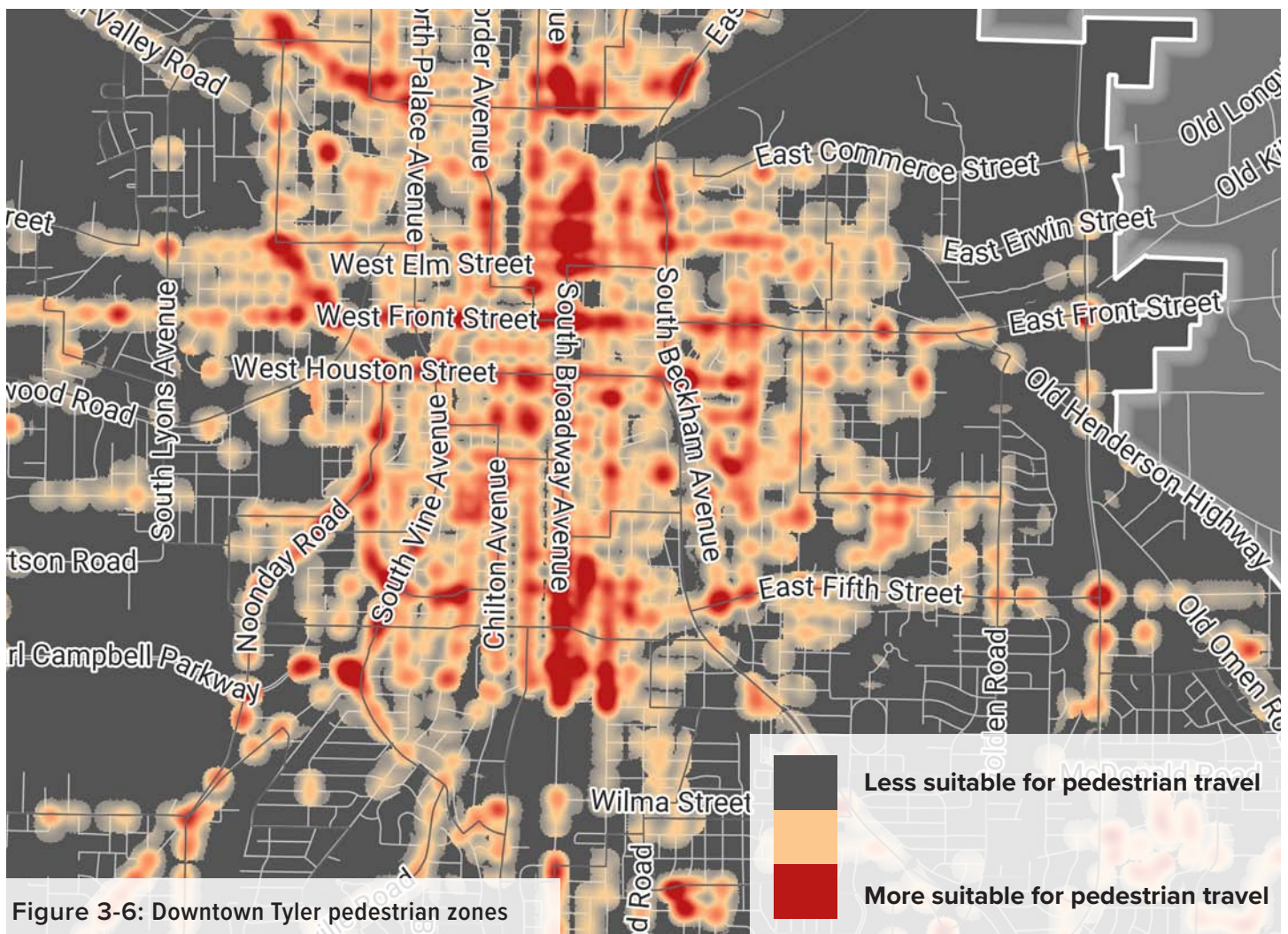


Figure 3-6: Downtown Tyler pedestrian zones

EQUITY ANALYSIS

The proposed bicycle and pedestrian facilities are also reflective of social factors to ensure that the network provides access to those who need it most. Results from an equity analysis (sampled below in Figure 3-7) highlight places within the communities that may be underserved, are minority communities, and/or may benefit more from improved bicycle and pedestrian infrastructure. This analysis was conducted on the block group level.

The complete list of factors used in the equity analysis are shown in the table below:

FACTORS USED IN EQUITY ANALYSIS:

- Zero Car Households
- Percent of Population with Low Household Income
- Percent of Population Identifying as Minority
- Percent of Population School Aged
- Percent of Population of Senior Citizens

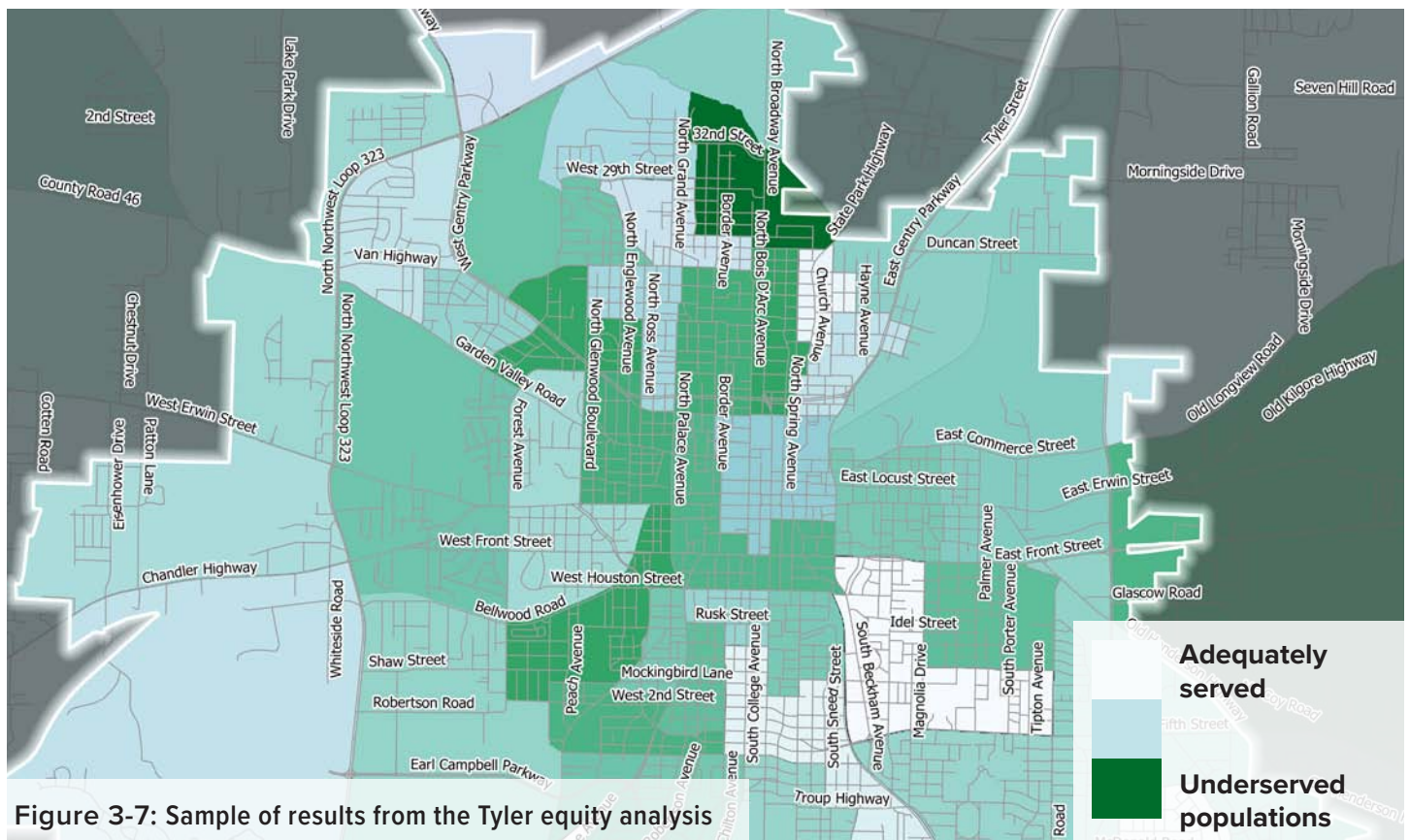


Figure 3-7: Sample of results from the Tyler equity analysis

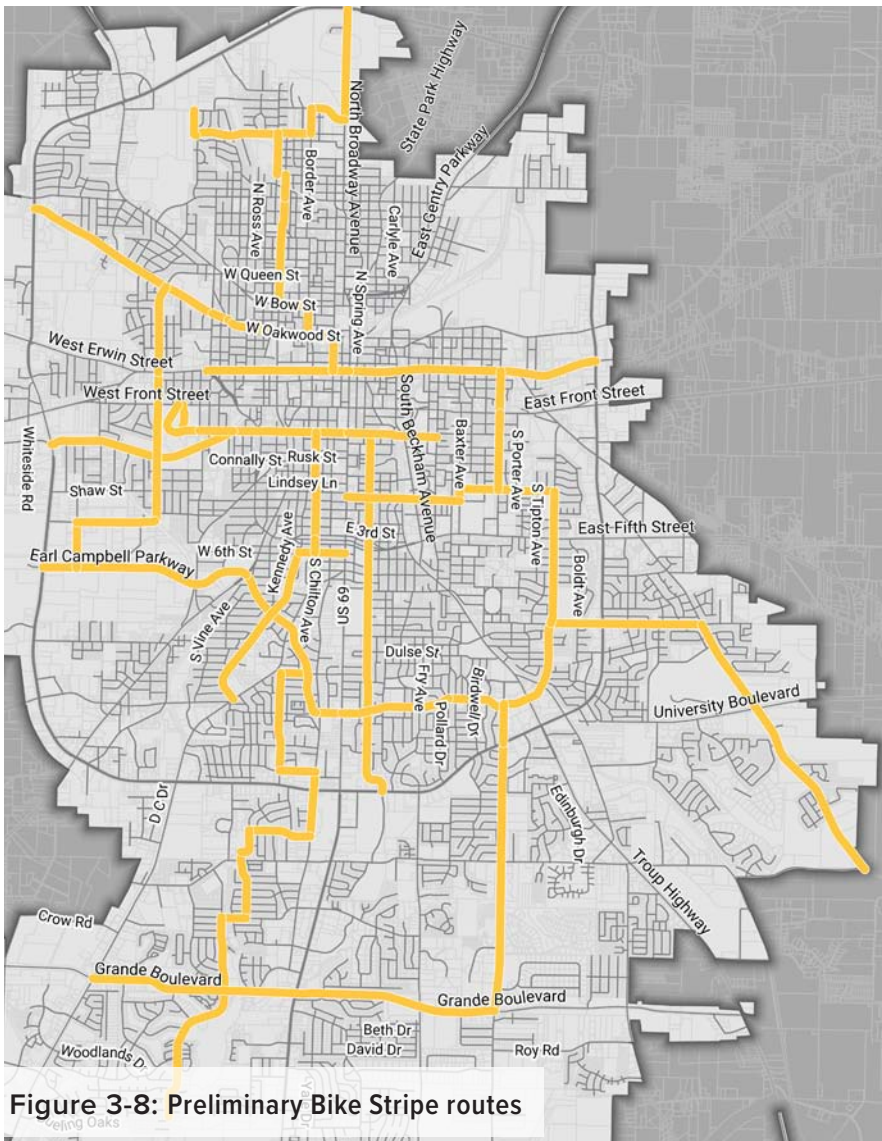
NETWORK REFINEMENT

In addition to technical analyses, the proposed network was also vetted by the public and stakeholders. **An open house meeting allowed community members opportunities to provide feedback so that the final network serves their mobility needs.** An additional group of stakeholders assessed the network during a partnering workshop—a time in which key community leaders shared ideas about bicycling and walking in their jurisdictions and reviewed proposed connections.



BIKE STRIPE PROGRAM

In 2018, the City of Tyler approved planning and design of over 100 miles of bike lanes across the City of Tyler. These routes, collectively called the Bike Stripe Program, will connect three college campuses within the city—UT Tyler, Texas College, and Tyler Junior College. A major goal of the Active Tyler Plan is to create a vision for a network of connected bicycle facilities. While the routes in the Bike Stripe Program are subject to change at the time the Active Tyler Plan was completed, the Plan and accompanying network recommendations are intended to connect to the preliminary Bike Stripe routes (Figure 3-9). The bike stripe alignments were reviewed but not included as specific recommendations in this plan.



NETWORK FLEXIBILITY

The preliminary Bike Stripe routes shown in the adjacent map is subject to change. To ensure that the Active Tyler network's bicycle routes are logical, intuitive, and connected to important destinations, the network recommendations are also subject to change; as the Bike Stripe routes become more concrete, planned bicycle connections resulting from the Active Tyler Plan may need to be rerouted to connect to the final Bike Stripe routes.

The following sections describes how to determine the appropriate facility type for active transportation for the proposed network categories of Regional Connections, Local Connections, and Sidewalks. Specific facility design guidance is provided in Appendix B.

NETWORK RECOMMENDATIONS

The remainder of this chapter outlines recommended bicycle and pedestrian facilities for the greater Tyler area. These recommendations are intended to be used collectively to form a better environment for bicycling and walking; no recommendation should be implemented on its own.

RECOMMENDED ACTIVE TRANSPORTATION FACILITIES

The proposed network does not specifically identify any one type of bicycle or pedestrian facility to be implemented. Instead, they are categorized more generally:

- **Equestrian Trail** – a conceptual regional equestrian trail is proposed to link the Texas Rose Horse Park to the Mineola Nature Preserve. An additional link to Old Sabine Bottom Wildlife Management Area is also shown here. This natural surface route would follow existing stream corridors. **Regional Connection** – a long distance route that may connect several communities and contexts. These longer distance recommendations may have a variety of street typologies that should be considered during implementation.
- **Local Connection** – shorter distance connections within a municipality that should consider both bicycle and pedestrian facilities based upon the context and typology of the street. In areas where pedestrian facilities exist, adding bicycle facilities is recommended.
- **Sidewalk** – recommendations for pedestrian facilities can increase walkability and access for residents and visitors. Width of sidewalks and buffers from travel lanes varies based upon context and typology.

EQUESTRIAN TRAIL

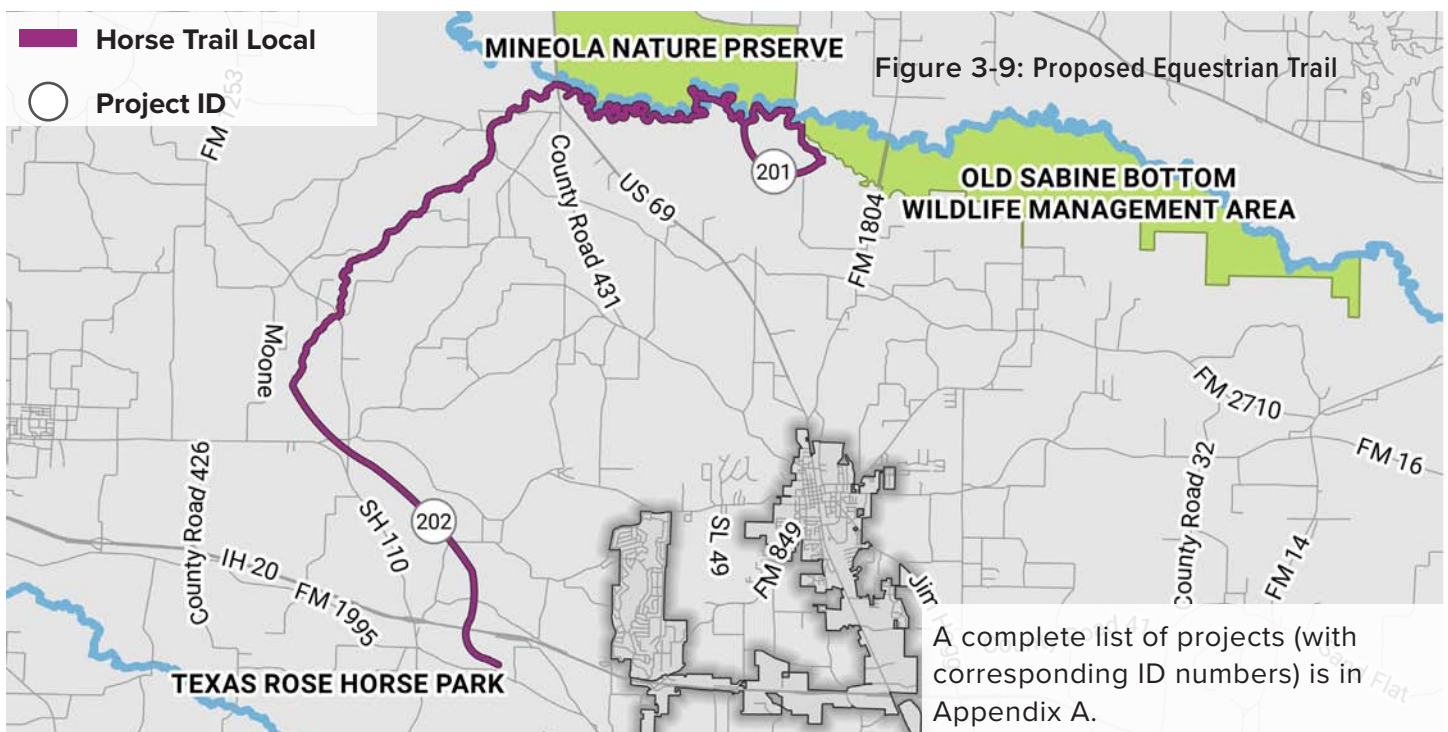


Figure 3-10: Downtown Tyler recommendations

A complete list of projects (with corresponding ID numbers) is in Appendix A.

A complete list of projects (with corresponding ID numbers) is in Appendix A.

NORTH TYLER NETWORK RECOMMENDATIONS

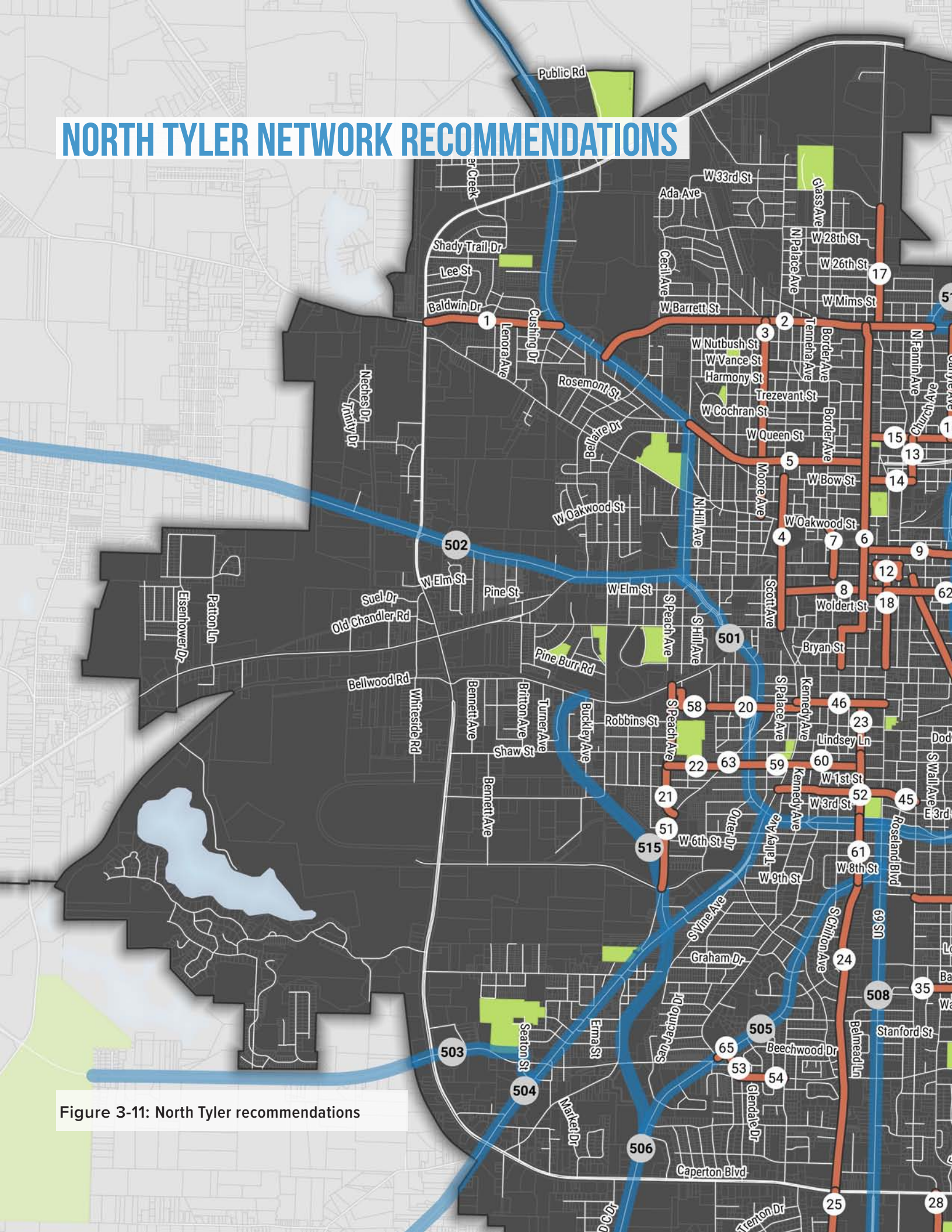


Figure 3-11: North Tyler recommendations

SOUTH TYLER NETWORK RECOMMENDATIONS

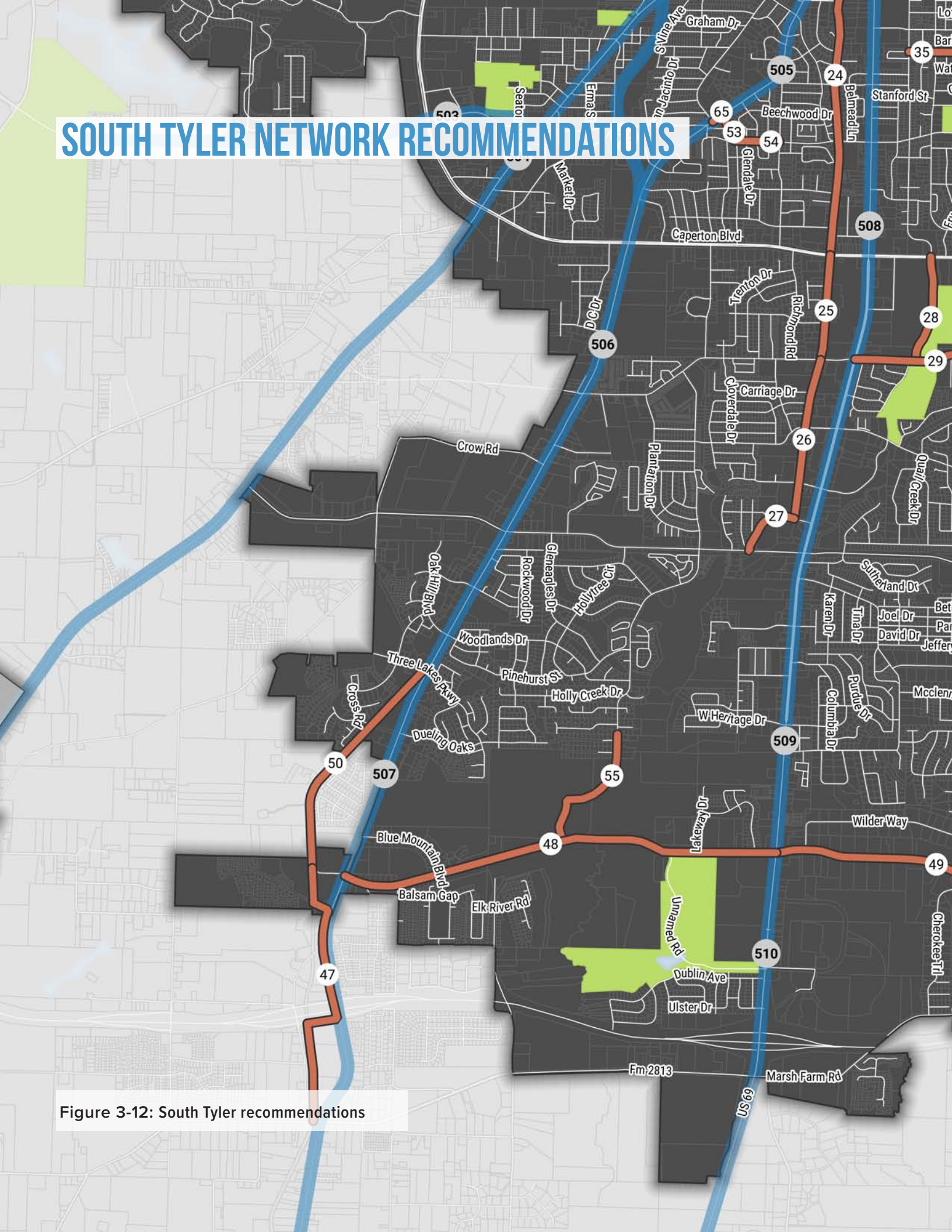
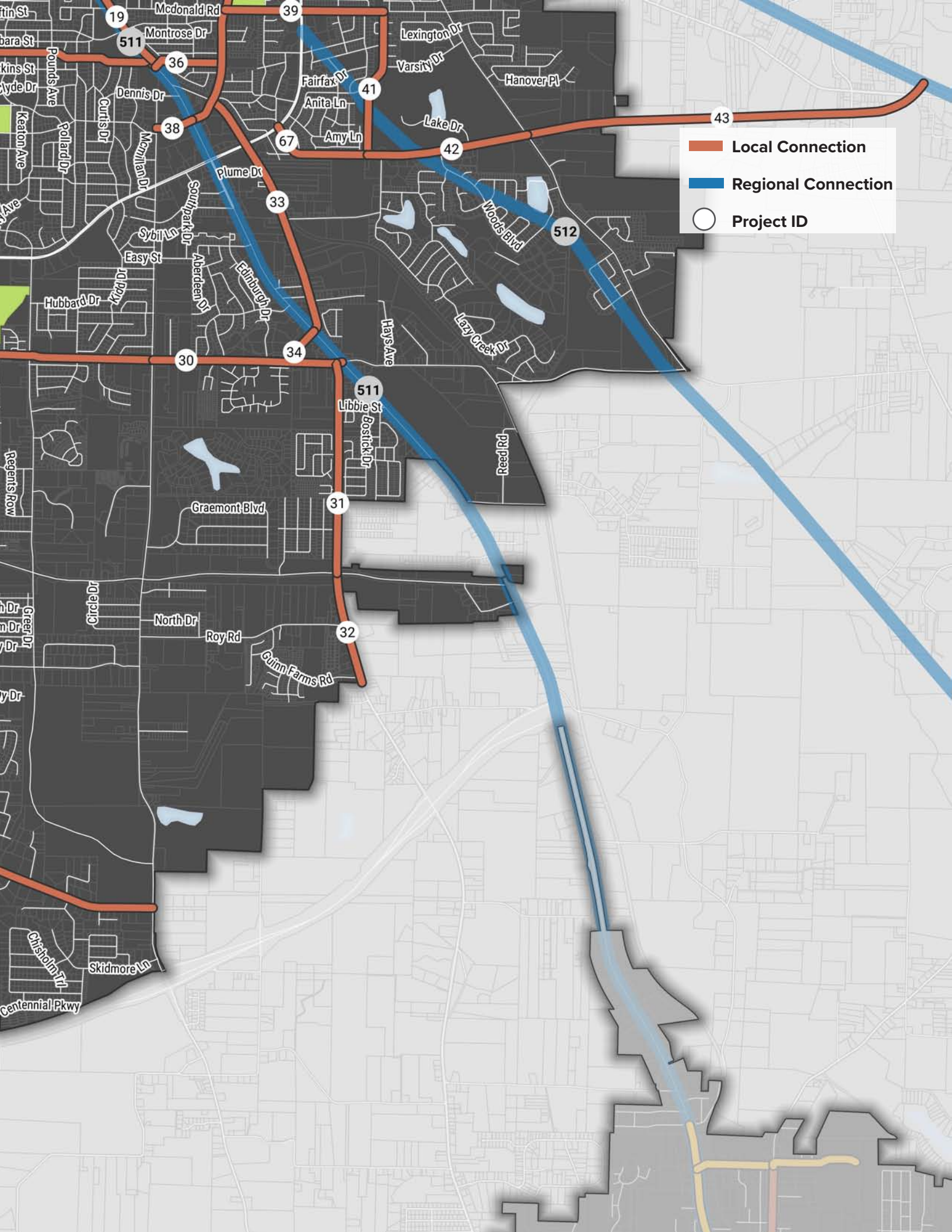
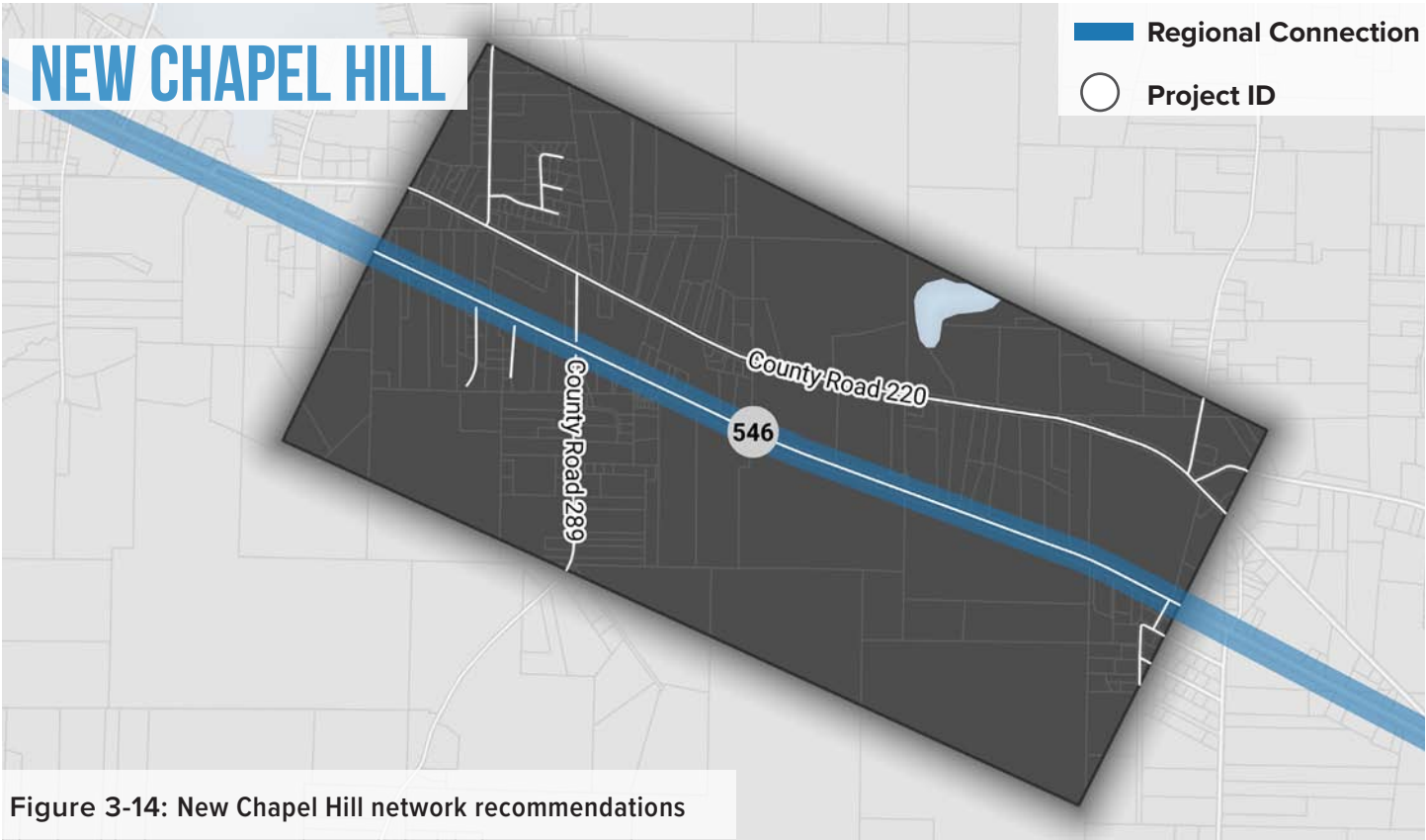


Figure 3-12: South Tyler recommendations



- Local Connection
- Regional Connection
- Project ID

NETWORK RECOMMENDATIONS



NETWORK RECOMMENDATIONS

BULLARD

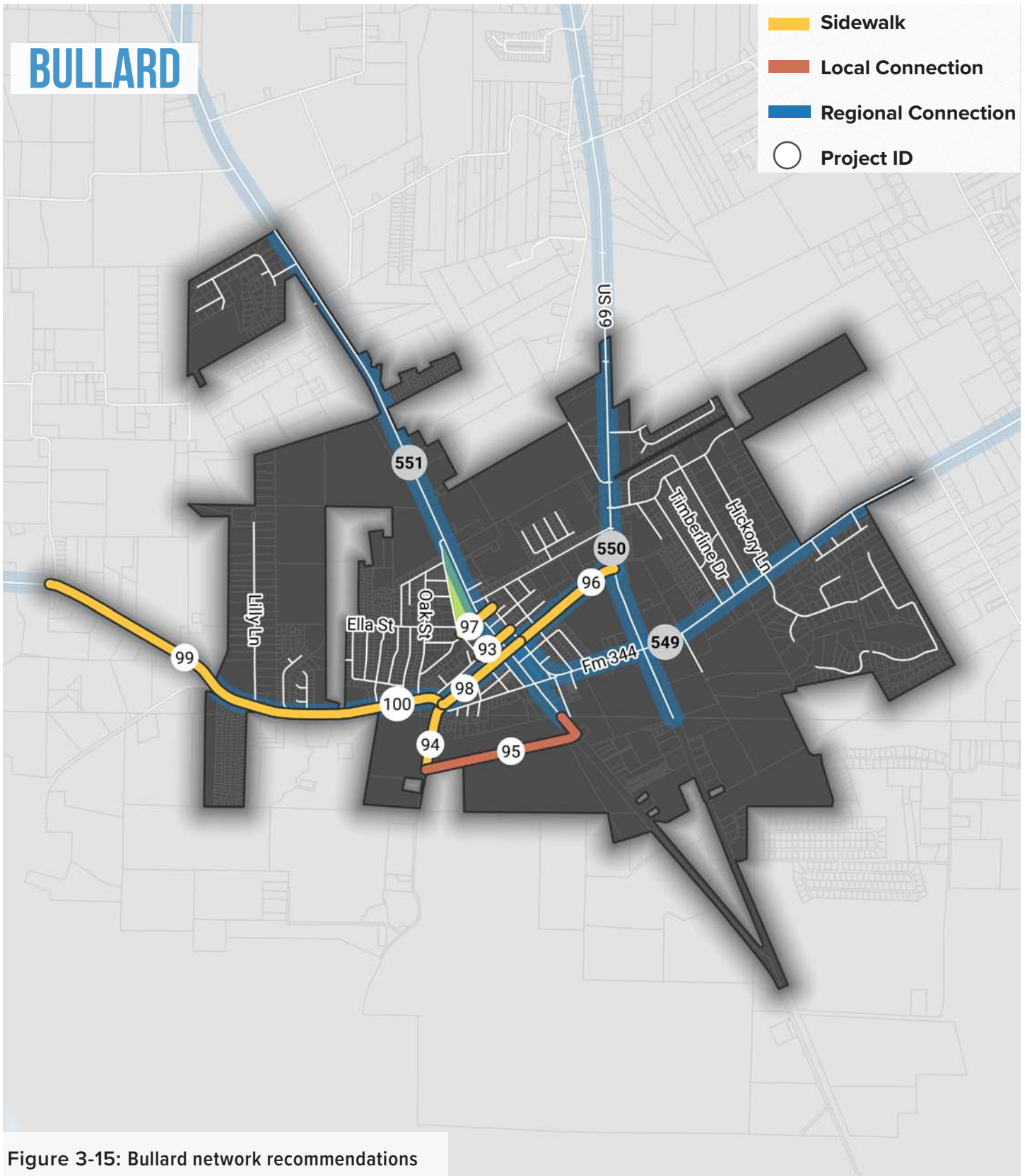


Figure 3-15: Bullard network recommendations

NETWORK RECOMMENDATIONS

NOONDAY

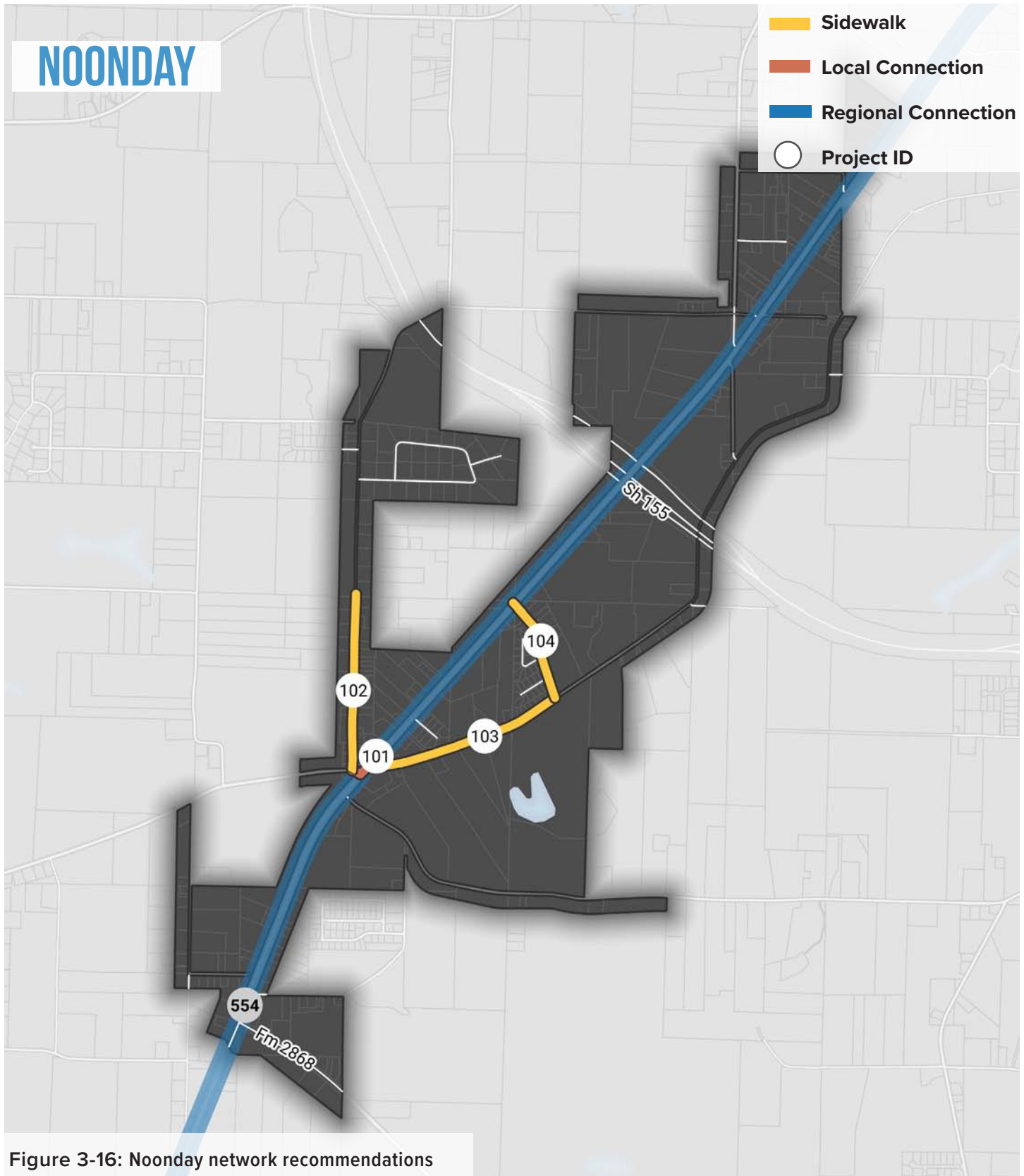


Figure 3-16: Noonday network recommendations

NETWORK RECOMMENDATIONS

LINDALE

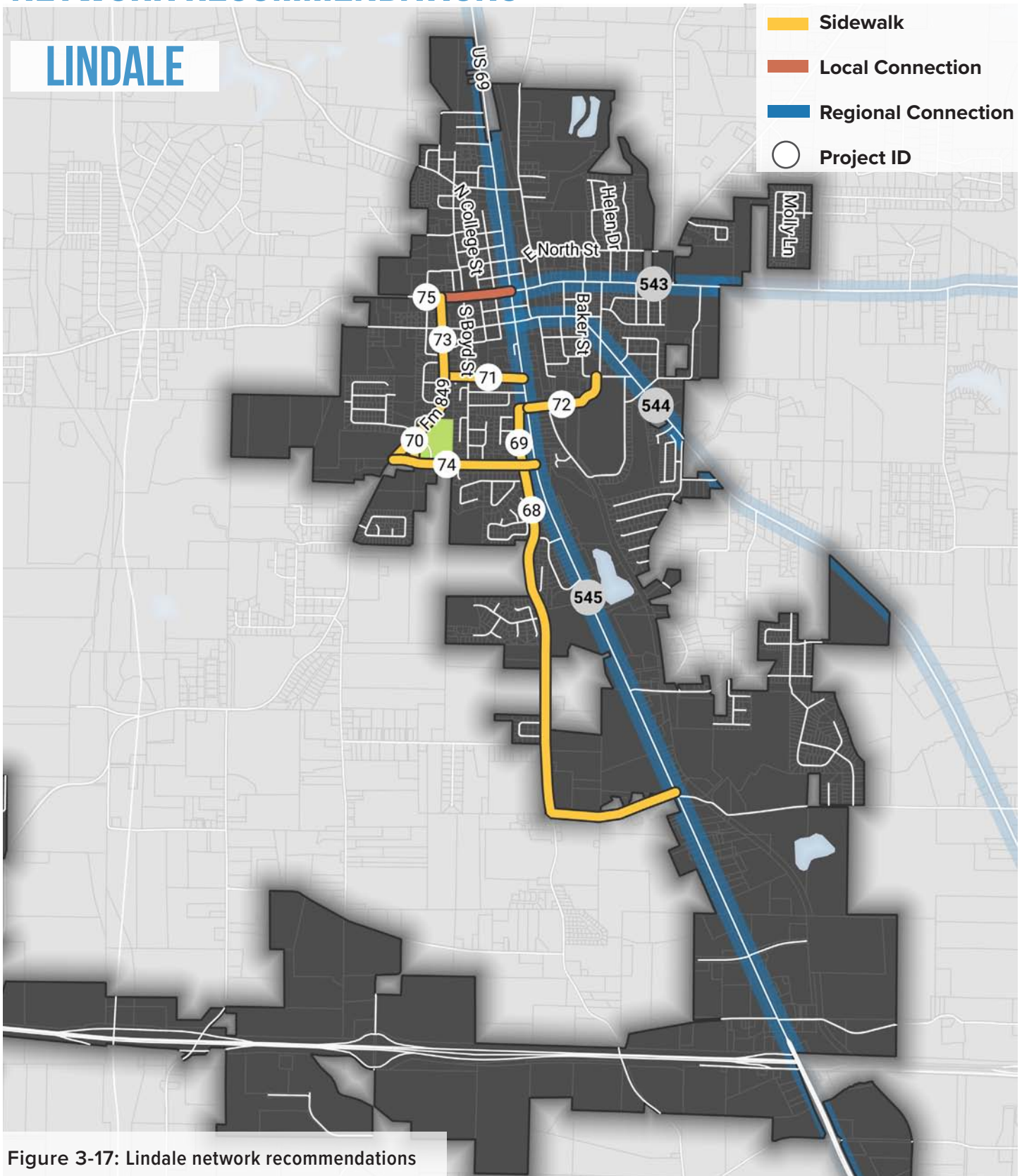


Figure 3-17: Lindale network recommendations

NETWORK RECOMMENDATIONS

TROUP

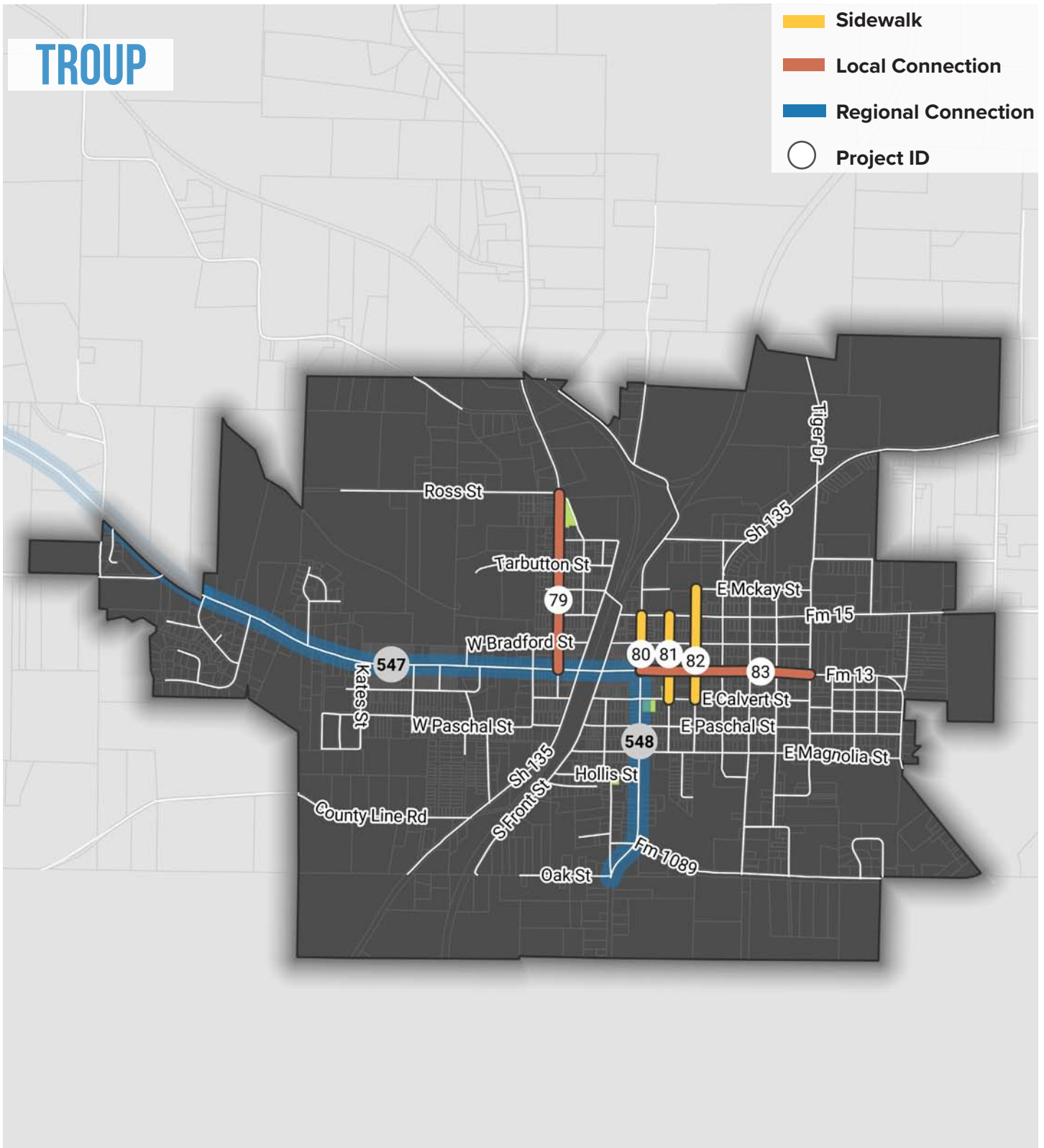


Figure 3-18: Troup network recommendations

NETWORK RECOMMENDATIONS

WINONA

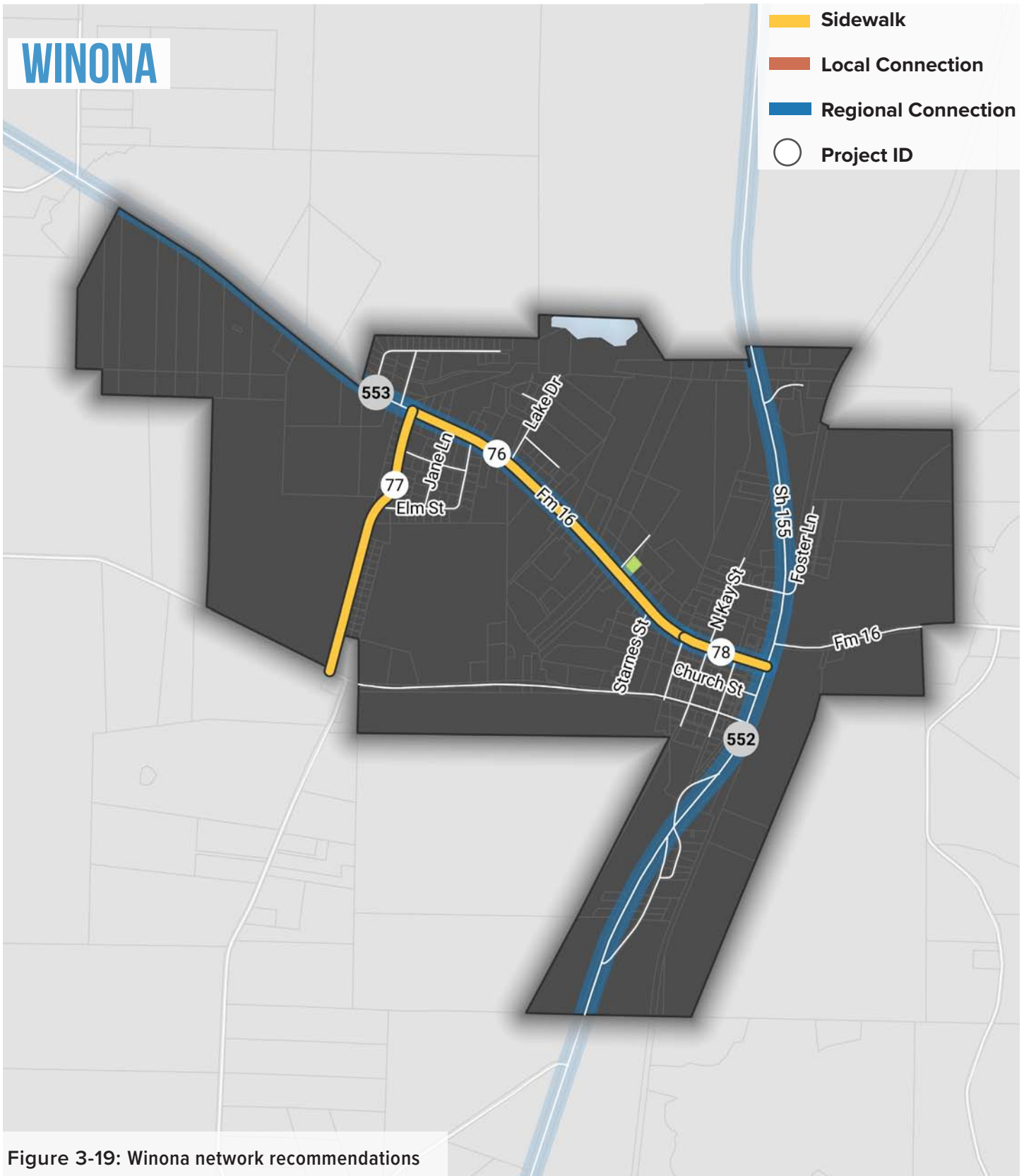


Figure 3-19: Winona network recommendations

NETWORK RECOMMENDATIONS

WHITEHOUSE

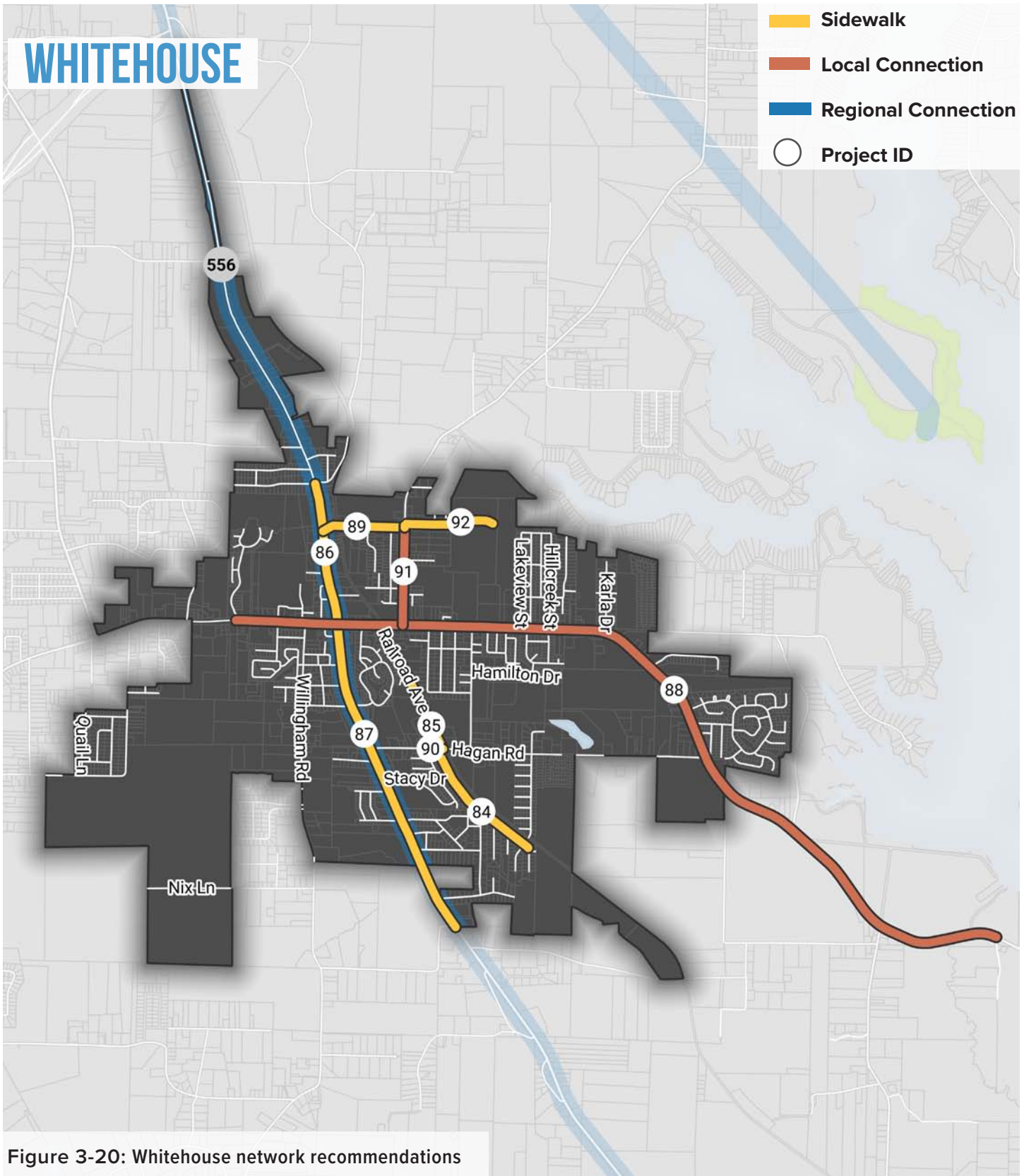
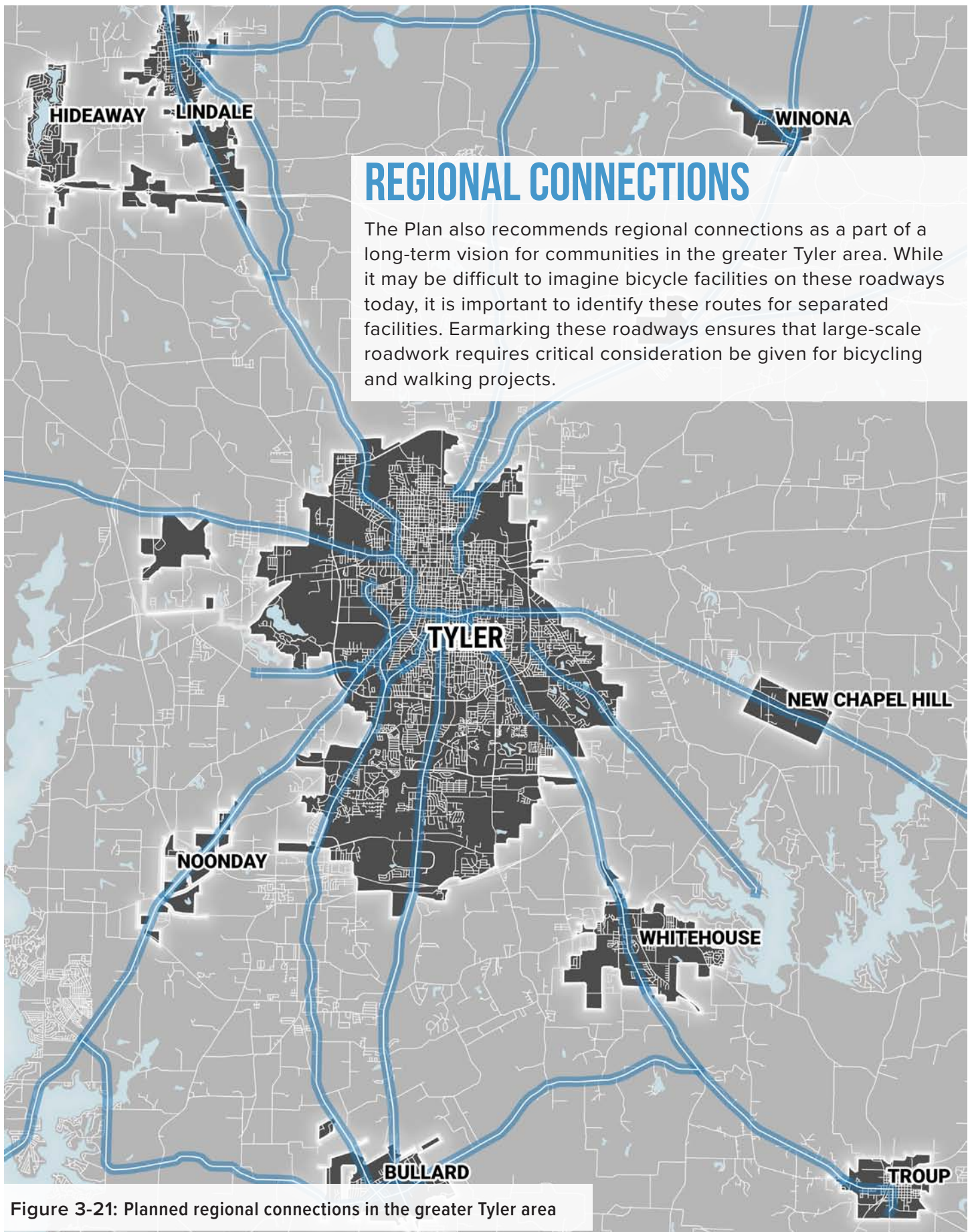


Figure 3-20: Whitehouse network recommendations





ACTIVE
TYLER

IMPLEMENTATION PLAN



Moving towards a vision

- Moving Forward
- Beyond Planning
- Funding Opportunities
- Policy & Practice Strategies
- Performance Measures

4

MOVING FORWARD

The Active Tyler Plan creates a vision for better bicycling and walking in the greater Tyler area. To begin moving this vision to fruition, the Plan prioritizes individual projects within a proposed network and recommends strategies for selecting and installing active transportation facilities on streets not identified as project, creating a roadmap to implementation. The full list of prioritized projects can be found in Appendix A.

PRIORITIZATION PROCESS

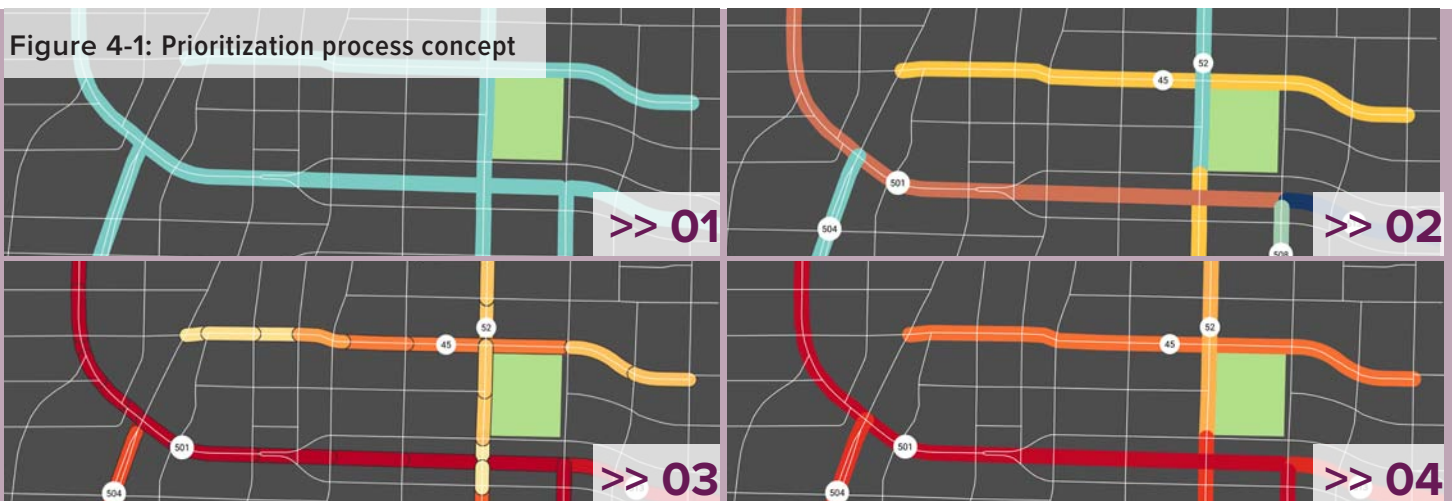
While the regional network provides a vision for bicycle and pedestrian connections across Tyler and the surrounding communities, implementation begins with realistically-scaled individual projects. This process is described below.

-
- >> 01** Individual projects were identified by dividing the network at major intersections and municipal boundaries.

 - >> 02** Each project was further broken into road segments separated at every intersection.

 - >> 03** Project segments received weighted scores based on the factors listed in Tables 4-1 and 4-2 to calculate a bicycle prioritization score and pedestrian prioritization score.

 - >> 04** Individual segment scores were averaged by project to produce a bicycle and pedestrian prioritization score.



ENVISIONING CHANGE



BICYCLE PRIORITIZATION METHODS

Table 4-1: Demand Analysis Criteria for Bicycle Projects

Description		Scoring Mechanism
Equity 	Underserved/vulnerable populations are often the most effected by limited transportation access and can benefit significantly by having inexpensive alternative transportation options. Areas of high concern have the highest numbers of minority residents, over 65 or under 18 residents, residents in poverty, and carless residents.	Network: intersects/is within an area of high concern: 5 points Intersects/is within an area of medium concern: 3 points Intersects/is within an area of low concern: 0 points
Public Input 	Local residents are the experts in which routes could make the greater Tyler area more connected. In addition to the community input that helped shape the overall network, projects were prioritized that had been directly identified by public input.	Network: Identified as a route: 10 points Not identified: 0 points
Mobility 	The Bicycle Network Analysis (BNA) tool (see Chapter 3, Network Development) is used to test the impact of potential bikeway improvements aimed at increasing network connectivity and access. The BNA assigns scores to census blocks quantifying how connected they are to one another.	Network's BNA Score: High: 10 points Medium: 5 points Low: 0 points
Connectivity 	To leverage existing and funded bicycle infrastructure, proximity to these facilities were prioritized. Increased connectivity may be achieved by expanding the existing network that the community has already implemented. Segments along the network were scored based upon the proximity to existing or funded infrastructure to determine the connectivity weight.	Network's Connection to Bike Stripe route & existing facilities: Connection to Bike Stripe route: 5 points Connection to Existing Facility: 5 points Not connecting: 0 points
Transit 	Those who commute by public transit require active transportation infrastructure for first- and last-mile connectivity; proposed network segments in close proximity to transit stops received higher priority scores.	Network is within: ¼ mile of bus stop: 5 points Else: 0 points
Safety 	The proposed network includes a variety of streets that vary in level of stress for bicycle users. Based upon the level of traffic stress analysis completed for the entire street network, projects were given a score depending on the stress of individual street segments. Projects along high stress streets were given a high score due to the need for a designated facility to increase safety.	Network facility is: - High stress: 10 points - Low stress: 0 points
Cost 	While higher degrees of separation greatly increase safety, buffered and separated facilities naturally require higher construction and ROW acquisition costs. Slow street and delineated facilities were given slightly higher prioritization scores in order account for the difference in costs but not discredit the importance safety and other factors.	Network is: Along a high-stress a route: 10 points Along a low-stress route: 0 points

PEDESTRIAN PRIORITIZATION METHODS

Table 4-2: Demand Analysis Criteria for Pedestrian Projects

Description		Scoring Mechanism
Equity 	Underserved/vulnerable populations are often the most effected by limited transportation access and can benefit significantly by having inexpensive alternative transportation options. Areas of high concern have the highest numbers of minority residents, over 65 or under 18 residents, residents in poverty, and carless residents.	Network: intersects/is within an area of high concern: 5 points Intersects/is within an area of medium concern: 3 points Intersects/is within an area of low concern: 0 points
Public Input 	Local residents are the experts in which routes could make the greater Tyler area more connected. In addition to the community input that helped shape the overall network, projects were prioritized that had been directly identified by public input.	Network is: Identified as a route: 10 points Not identified: 0 points
Transit 	Those who commute by public transit require active transportation infrastructure for first- and last-mile connectivity; proposed network segments in close proximity to transit stops received higher priority scores.	Network is within: ¼ mile of bus stop: 5 points Else: 0 points
Walk Friendly 	The Pedestrian Zone Analysis (see Chapter 3, Network Development), highlights areas in the communities that are most suitable for walking today. These areas may benefit the most from new or improved infrastructure that encourages walking.	Network is in an area with a: High Ped Zone Score: 10 points Medium Ped Zone Score: 5 points Low Ped Zone Score: 0 points

Complete lists of prioritized projects for each community in the greater Tyler area are included in Appendix A. Each project list includes a three-level prioritization metric (where Tier 1 is the highest, and Tier 3 is the lowest) for the proposed projects. These lists will provide a path forward to implementing the Active Tyler Plan.

NEXT STEPS

The Active Tyler Plan has not prescribed facilities for each project in the communities' networks. This Plan understands that facility types and project alignments are subject to change due to a variety of factors (e.g., new development, available funding, public input, etc.) at the time of implementation. The recommendations in this Plan are therefore generalized.

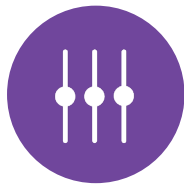
BEYOND PLANNING

Facility selection and design for streets will depend on circumstantial factors such as existing right of way, lane widths, budgetary constraints, etc. These details are specific to each project and jurisdiction and may vary greatly at the time of project implementation; therefore, these details were not explored in the Active Tyler Plan. Instead, specific facility selection and design should be left to the judgement of local design staff at the time of implementation.

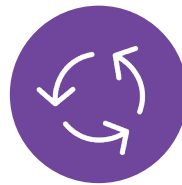
The Plan does, however, provide strategies for design decisions through (1) a series of facility design menus that are based upon street typology and land use context and (2) generalized design guidelines for common facility types. Notable benefits to this approach include:



FLEXIBILITY



CONSISTENCY



IMPLEMENTATION EASE



APPROPRIATE DESIGN

DESIGN & NETWORK FLEXIBILITY

Due to the rapidly changing landscape in Tyler region, recommendations in the Active Tyler Plan are subject to change. In particular, the routes outlined in the Plan should adjust to connect to the final Bike Stripe routes and other active transportation facilities; the highest priority is connecting to people to destinations on safe and continuous implemented/existing facilities and destinations. When evaluating changes to the Active Tyler recommendations, the following factors should be considered in creating new alignments:

- **CONNECTING DESTINATIONS:** Routes and projects in the Active Tyler Plan are strategically selected to connect important places to each other. If a route must be adjusted, ensure that the connections ultimately still serves the same destinations.
- **ROADWAY COMFORT:** Before re-routing connections between destinations, planners should evaluate existing Level of Comfort. Lower-comfort roadways often require more separation from vehicular traffic, which can be expensive and challenging to design. Consider higher-comfort alternative routes that connect the same destinations when possible.
- **EQUITY:** The Active Tyler Plan's focus on equity ensured that the planned infrastructure connected communities who would benefit from it the most. Alterations to these routes should be mindful of continuing that spirit to ensure that the transportation system is accessible for all.
- **RIGHT-OF-WAY:** When considering alternative routes, ensure that there is enough right-of-way to implement the necessary infrastructure; safety should not be compromised in any project.

FACILITY SELECTION TOOLS

As communities in the greater Tyler area begin implementing the recommendations in the Active Tyler Plan, they will need to select appropriate facilities for each project. The following sections provide guidance on selecting facilities, using the following tools:

STREET TYPOLOGY

Characterizing roadways based on their features and traffic

LAND USE CONTEXT

Classifying land uses in terms of active transportation

FACILITY MENU

Choosing facilities based on their context, street typology, and expected users.



STREET TYPOLOGY

To develop a plan that meets the needs of the region and is also implementable, the Active Tyler Plan has developed recommendations to align with previously adopted transportation policy documents, specifically the City of Tyler Master Streets Plan (MSP), adopted in September 2012. The MSP guides the preservation, design and development of transportation corridors in the Tyler Metropolitan Area and connects land use context and transportation. It establishes several policies and guidelines that affect walking and bicycling facility design, including: roadway classifications, context types, design elements, cross sections and bicycle facilities.

The MSP and its predecessors have designated a hierarchy among streets and highways in the Tyler area, using a conventional system for balancing access - the ability to get to every-day places - with mobility - the ability for people and goods to freely move. It defined four functional classifications or street typologies under this hierarchy:

- **FREEWAYS**, including interstates and tollways, which quickly move large numbers of vehicles but have limited access.
- **ARTERIALS**, including Major Arterials, which facilitate large traffic volumes between major trip generators, but allow greater access to abutting property. The region’s major arterial system creates a hub and spoke pattern, in which the city’s historic center is the hub. This classification also included Minor Arterials, which connect medium levels of traffic from local and collector streets to major arterials.
- **COLLECTORS**, which move smaller levels of traffic over shorter distance and connect neighborhood uses to the arterial system.
- **LOCAL STREETS**, which generally move the smallest volume of traffic and provide the highest level of access to properties - mostly residential and neighborhood-serving amenities.

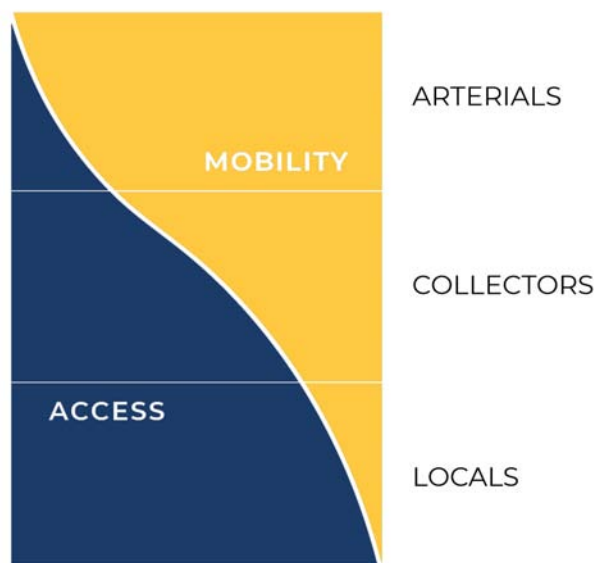


Figure 4-2: Mobility-Access Graph

LAND USE CONTEXT

The 2012 MSP also introduced four land use context types, covering the spectrum between urban and rural to supplement the previously adopted MSP street hierarchy. The intent is to provide for more flexible and diverse roadway design options by allowing surrounding land use types and densities to inform street design. Context describes and characterizes the landscape, building form and placement, and roadway network design. In addition to the four contexts described in the MSP, these recommendations expand on the contexts by adding a rural town context that aligns with several small communities in the region. The five types, illustrated in Figure 4-3, include:

- **URBAN CORE:** The center of the City of Tyler is characterized by the original street network, high development density, and a mix of land uses. This context is highly favorable toward walking, and so often features slower vehicular speeds and on-street parking.
- **URBAN:** Surrounding the urban core, this type features a mix of housing and commercial development types at a lower density than the urban core, and with a mix of on- and off-street parking.
- **SUBURBAN:** This context is comprised largely of single-family residential homes and some multi-family apartments, and auto-oriented commercial development, all with off-street parking.
- **RURAL:** Featuring the least amount of urbanization, the rural context features large lots, single-family homes, agricultural uses, large recreational spaces and undeveloped land.
- **RURAL TOWN:** Often islands in a rural countryside, this context typically includes more dense development around a small street network. Uses include commercial, civic, and institutional.

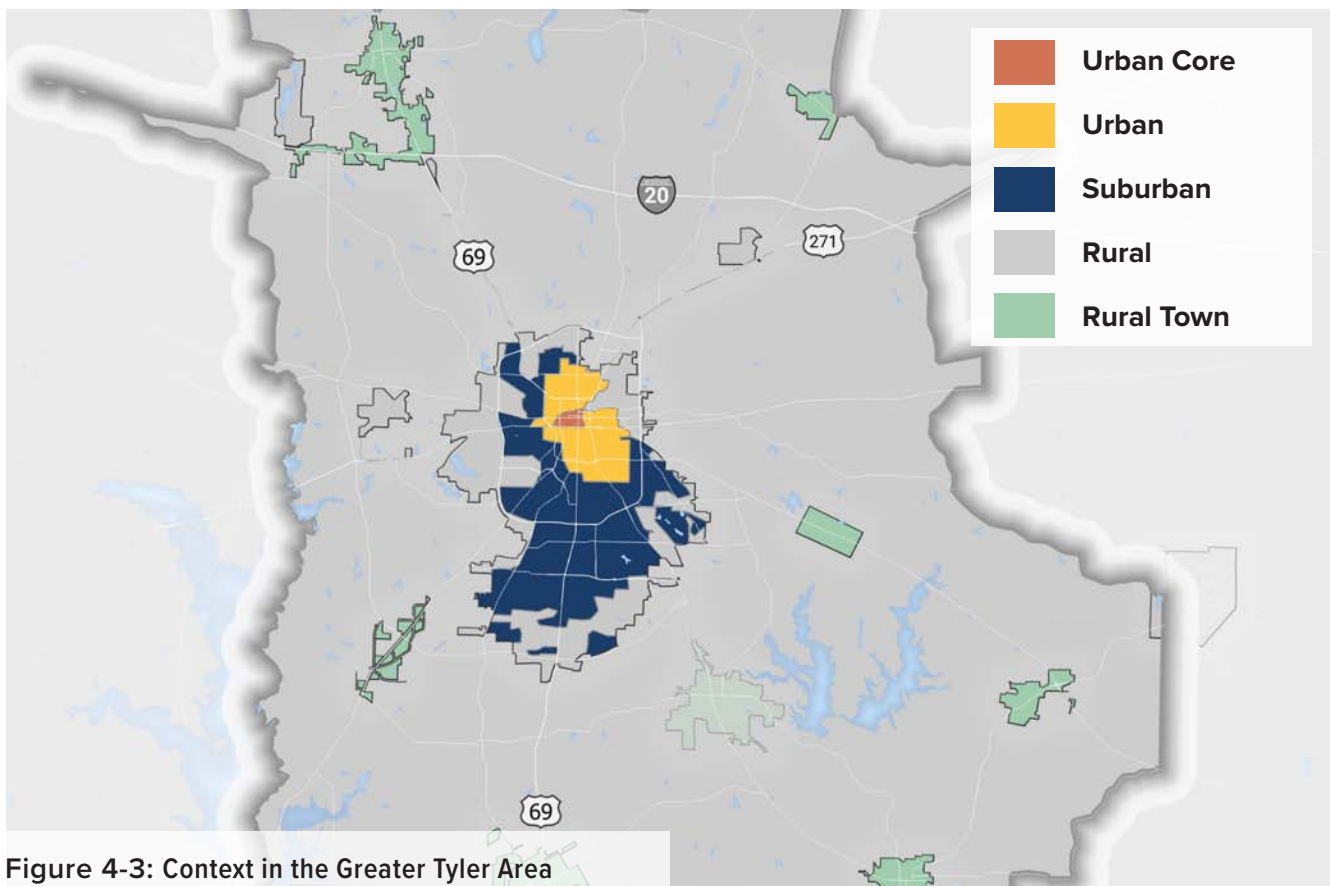


Figure 4-3: Context in the Greater Tyler Area

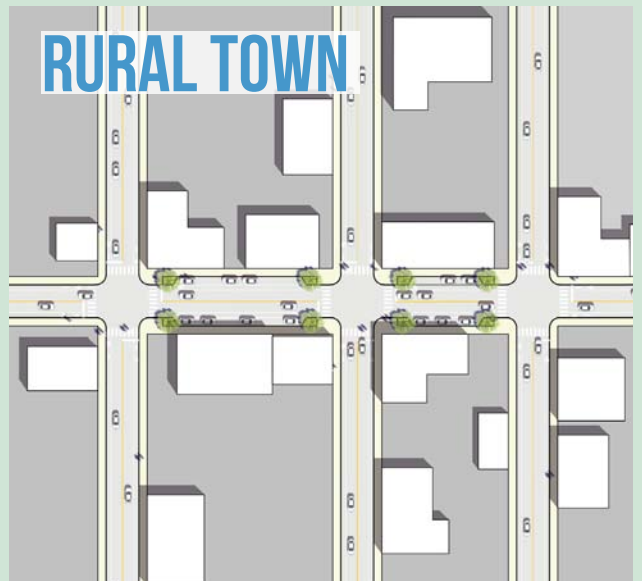
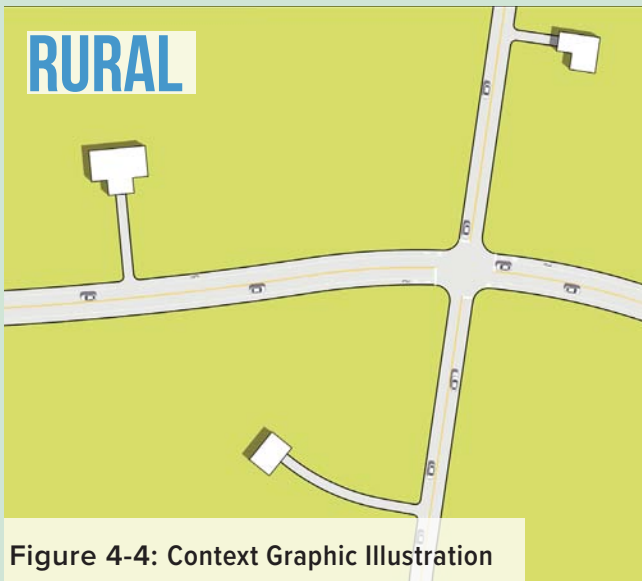
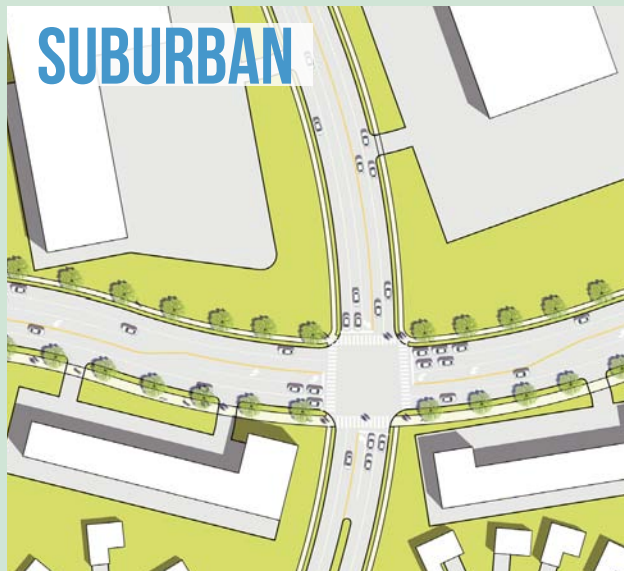
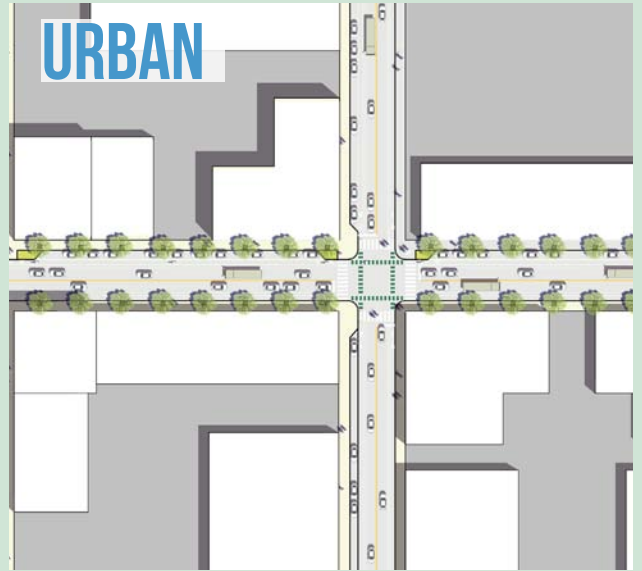
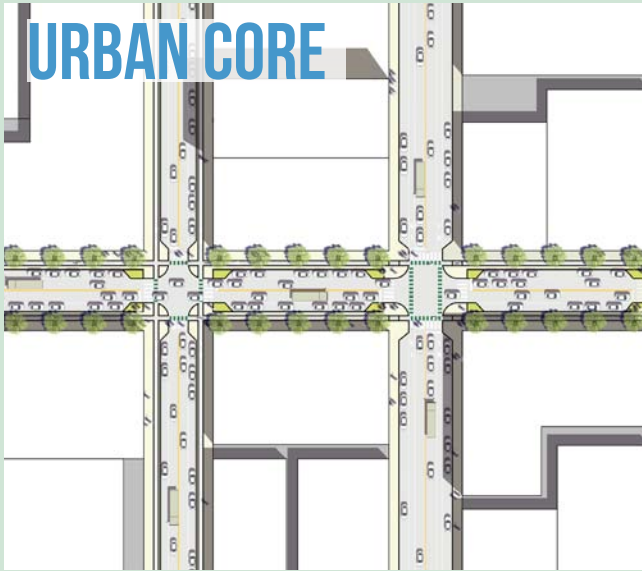


Figure 4-4: Context Graphic Illustration

TPOLOGY AND CONTEXT MATRIX

These two sets of classifications-- street typology and context-- create 20 possible combinations of thoroughfare capacity and context type (see Table 4-3). While providing vehicular capacity thresholds/ recommendations for each scenario, the MSP provides limited guidance specific to pedestrian and bicycle facility selection. The MSP also proposes a Bicycle and Trail Plan, consisting of regional thoroughfares designated for future development of on-street and off-street facilities. The following recommendations propose to elevate the active transportation facilities for the greater Tyler area and identify specific updates that should be considered when the MSP is updated. Table 4-3 identifies specific streets on the proposed Active Tyler Plan network in each street typology and context.

The street typology should be verified at the time of design and implementation with the most updated classifications through the master streets plan. Classifications should also be reviewed to ensure that the street typology aligns how each street functions on a day-to-day basis.

Table 4-3: Typology - Context Matrix

TPOLOGY	Urban Core	Urban	Suburban	Rural	Rural Town
MAJOR ARTERIAL	Gentry Pkwy Beckham Ave Front Street Palace Ave Broadway Ave	Loop 323 Gentry Pkwy Front Street SH 110 Broadway Ave	Grande Blvd SH 110 SH 31 US 69	SH 110 US 271 SH155 US 69	W Duval St US 69 FM 848 (some sections) FM 2493 Hwy 64
MINOR ARTERIAL	Broadway Ave (some sections)	Erwin St MLK Jr Blvd Glenwood Blvd	Cumberland Rd FM 2661 Paluxy Dr	FM 16 CR 246 FM 2661 CR 384	Hwy 64 (some sections) FM 848
COLLECTOR	Bonner Ave Elm St Erwin St Ferguson St	Donnybrook Ave Golden Rd Houston St Copeland Rd	Old Noonday Rd CR 134 Hollytree Dr	CR 1131 Eastside Rd CR 15 McElroy Rd	E South St Rushing Rd
LOCAL STREET	N Liberty Ave N Ellis Ave	Haden St Mockingbird Ln W 26th St	Manorway Cir Top Hill Drive Hollybrook Dr	Helen Dr Stiles St	Dobbs St S Virginia St

FACILITY SELECTION MENU

Active transportation facility selection should consider the users and be planned and designed to provide safe and comfortable bicycling and walking infrastructure to serve existing users and attract people of all ages and abilities. The proposed network map (see Chapter 3, Network Development) identifies key projects that are recommended based upon public and stakeholder input along with several layers of technical analysis.

The Active Tyler Plan recognizes that implementation of the recommended network will be accomplished through local and regional efforts. Based upon the varying levels of funding throughout the region, a menu of active transportation facility types has been developed based upon street typologies and context. Although the facility design menus align with the proposed network recommendations, implementing new bicycle or pedestrian facilities should be considered during the planning and design phase of any roadway project.



SIDEWALK

Space for pedestrians in the public right of way.



RURAL SHOULDER

Simple accommodations for walking/biking.



SPEED HUMP

Vertical elements causing slowed driving speeds.



TRAFFIC CALMING

Horizontal elements slowing traffic.



Table 4-4 illustrates the options for bicycle and pedestrian facilities according to a street’s typology and context. Facility types include sidewalks, buffers between sidewalks and curbs (such as landscaping), on-street bike lanes (traditional, buffered, and separated), striped shoulders, off-street shared use-paths. It is important to recognize that even streets that fall within the same typology may vary greatly in character, capacity, and context. By providing a menu of options, the Active Tyler Plan provides flexibility to encourage implementation. Field observations, surveys, and engineering judgment should play a role in the selection of facilities in street design projects.

		   	  	 	
		Major Arterial	Minor Arterial	Collector	Local
 Urban Core	 	wide sidewalk with buffer	wide sidewalk with buffer	medium sidewalk	sidewalk
		separated bike lane	separated bike lane, buffered bike lane	separated bike lane, buffered bike lane	bike lane, shared lane marking
 Urban	 	wide sidewalk with buffer	medium sidewalk, buffer optional	medium sidewalk	sidewalk, traffic calming
		separated bike lane	separated bike lane	buffered bike lane	bike lane
 Suburban	 	wide sidewalk with buffer	wide sidewalk, buffer optional	sidewalk	sidewalk, traffic calming, paved shoulder
		separated bike lane, shared use path	separated bike lane, shared use path	buffered bike lane, shared use path	bike lane, shared lane marking
 Rural	 	shared use path	shared use path	medium sidewalk	traffic calming, paved shoulder
				bike lane, buffered bike lane, paved shoulder	shared lane marking
 Rural Town	 	shared use path	shared use path	medium sidewalk	traffic calming, paved shoulder
			separated bike lane	separated bike lane, bike lane, buffered bike lane	shared lane marking

Table 4-4: Context-Typology-Facility Matrix

FACILITY SELECTION PROCESS

The selection of an active transportation facility type requires a balance of community priorities of local land use context, analysis, engineering judgment, and physical/financial constraints based on the existing the roadway typology. The facility selection process is iterative; as more data about the roadway and surrounding context is gathered, the type of facility that designers and planners feel is most appropriate may change. It is important to consider all the tools previously listed to make the best selection for the given project. More information about the facility selection process is included in Figure 4-5.

Existing Conditions Data

Facility selection requires an understanding of the project's existing conditions; the existing traffic conditions, roadway configuration, and context provide a framework for selecting a preferred bicycle or pedestrian facility. The following information should be collected, reviewed, and analyzed to determine facility selection constraints and opportunities.

- **Existing right-of-way (ROW):** informs opportunity of new infrastructure and cost estimates
- **Jurisdiction/roadway ownership:** determines which entities will have influence over design and construction
- **Number of lanes and width (may vary within a single project):** influences travel volumes and speed
- **On-street parking presence:** parallel parking or angled parking can influence safe facility design
- **Curb-to-curb or pavement width:** determines ability to reallocate space for potential restriping
- **Speed limit:** indicates potential need for separation of travel modes
- **Level of comfort:** provides base-level guidance about what type of infrastructure (separated, delineated, or shared) is most appropriate
- **Curb cut count:** limits certain types of separated bicycle facilities due to increased conflict points
- **Project length:** gives an understanding of total project cost over the length of the roadway
- **Existing stormwater controls:** presence of curb and gutter or drainage ditches can influence infrastructure design

CONSIDERATIONS

- Each project may require a different process to plan, design and implement active transportation facilities.
- Local stakeholders and the public should be involved in facility selection early in the process to ensure that the final infrastructure will align with community goals and context.
- Design of bicycle or pedestrian facilities should be comprehensive and review the design for safety of all modes, including vehicular and transit where applicable.
- Safety of vulnerable users should be the highest priority during the facility selection and design process; human safety and welfare must be prioritized over facility cost, potential property damage, or simplicity of design.
- A single cross section may not be appropriate for the entire project length.

Supportive Policies

Policies that encourage bicycle and pedestrian travel and ease in infrastructure development and design should be put into place to facilitate ease in facility selection and implementation.

Plan

The Active Tyler Plan serves as the baseline route selection and goal setting for the bicycle and pedestrian facility recommendations. While the network outlined in the Plan is flexible, it should ultimately connect similar places and existing/planning infrastructure.

Project Purpose

The project purpose should identify both the intended use of the project (to connect people to a nearby amenity, to connect neighborhoods, etc.) and the design user. The facility should be appropriate for both the use and the user.

Identify Desired Facility Type

Based on the previous steps, identify the ideal facility type. The Active Tyler Plan includes the context and typology for each project. The Context-Typology-Facility Matrix should be used to identify appropriate facility types for any given project.

Assess and Refine Feasibility

Under more detailed review of the existing conditions data, research feasibility of bicycle and pedestrian facility improvements. Cost considerations can be added here. For larger projects, a separate feasibility study may be needed.

Explore Alternatives

It may become clear that the ideal facility is not feasible for the given roadway and conditions. In this case, explore alternatives.

Select Preferred Facility Type

Prepare for the next phase of implementation: design.

Downgrade Bikeway Type and Designate Parallel Route

If the ideal facility is not feasible for the given roadway constraints, consider selecting a less ideal facility that is feasible and cost-sensitive and selecting a parallel route that is more accommodating for the preferred facility and meets the plan's goals.

Downgrade Bikeway Type and No Parallel Route

If the ideal facility is not feasible for the given roadway constraints and there is not a feasible parallel option, it should be understood that active transportation use may be suppressed and user safety reduced. Returning to the planning process can help identify how the goals outlined in the planning process can be met through other means.

Figure 4-5: Facility selection process

For more detailed information about this process, see the Federal Highway Administration's (FHWA) 2018 Bikeway Selection Guide. While the guide focuses on bicycle facility selection, many of the same principles can be applied to pedestrian facilities.

FUNDING OPPORTUNITIES

LOCAL FUNDING SOURCES

Dedicated local funding is the most consistent and reliable funding source to implement bikeway projects. It signals a community’s commitment to bicycle and pedestrian projects and strengthens applications for federal, state, and private funding. The following descriptions apply to individual municipal governments within the Tyler MPO.

////////////////////////////////////

Capital Improvement Program (CIP)

The CIP allocates funds for all major capital improvement projects, regardless of the funding source. This program is an important tool for improving bicycle facilities and utilizes funds from a variety of sources including bonds, fees, and state and federal grant sources. The CIP shows a five-year prioritization of infrastructure projects and is revised annually. Incorporating bikeways into the street design of projects as part of the CIP project development process will aid in the ability to fund implementation of this plan.

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Municipal Bonds

The City of Tyler and other cities have the authority to issue municipal bonds to finance infrastructure projects. Examples abound of municipalities tapping into this resource as a way to fund bikeways, most notably, the City of Houston’s \$100 million referendum on the Bayou Greenways 2020 Initiative to support the nearly \$100 million in philanthropic donations. Cities should consider including priority Plan projects in future bond referenda.

////////////////////////////////////

Impact Fees

Municipal governments in Texas have the authority to shift the fiscal burden of expanding public infrastructure to developers through impact fees for water, sewer, drainage, and roads to capture the impact imposed by development on municipal budgets. Best practices tie these impact fees to new demand for public infrastructure, such as traffic impacts on the transportation network. Some communities have given developers opportunities to reduce impact fees by contributing to on- or off-street bikeway improvements. Fees paid-in-lieu of providing required off-street parking may also contribute to the funding of new or improved bicycle parking facilities. And while not impact “fees” per se, development code requirements to build sidewalks as part of any new development are an effective policy for ensuring future pedestrian accessibility while reducing burden on public resources. Area municipalities should consider including these incentive approaches in its land use policies.

Voter-Approved Sales Taxes

Sales taxes have also been utilized in cities to pay for bicycle facilities. Currently, the cities of Tyler, Whitehouse, Lindale, Bullard, and Troup impose an 8.25% sales-and-use tax rate, which is the maximum allowed by the State of Texas. However, Noonday (7.75%), Flint (6.75%), Hideaway (6.75%), New Chapel Hill (7.75%), and Winona (8.00%) are each set below the cap and have the ability to dedicate a portion of sales taxes up to 8.25% for bicycle and pedestrian improvements.[1]

General Fund

A municipality's General Fund supports core public services. Allocations from the general fund to the Public Works, Parks and Recreation and Public Safety departments could support program and project operating expenses housed within them, such as staff time, outreach and education materials, facility maintenance and other small capital expenses.

Economic Development Corporation

The Tyler Economic Development Corporation (EDC) was created in 1989 as a type B non-profit development corporation.[2] The EDC has supported numerous infrastructure initiatives over the years and may consider funding additional facilities that provide direct access to economic activities or in conjunction with EDC investments in the MPO area . The EDC, as well as special purpose district, are eligible to apply for a Chapter 380 Agreement with the City of Tyler to promote economic development by providing loans or grants to developers and non-profits that stimulate business and commercial activity.

SPECIAL PURPOSE DISTRICTS

Special purpose districts are local funding mechanisms that can be used to generate revenue for active transportation projects.

Tax Increment Reinvestment Zones (TIRZs)

TIRZs are special zones created by city councils in efforts to attract new investment and redevelopment to blighted areas. TIRZs cap property tax revenues within the designated zone, then issue bonds to make near-term public infrastructure investments, and consequently, capture property tax revenue increments that capitalize due to the investment and repay bonds over the life of the TIRZ with the increments. Public improvements can include bicycle facilities and amenities. Coordinating and leveraging funding with TIRZs is an important strategy that cities can embrace in order to build out the bicycle network and maintain amenities and end of trip facilities, such as, bike parking, showers, or education and encouragement programs.

Municipal Management Districts (MMDs)

MMDs are special districts created through the Texas legislature. Businesses within a geographic area can opt to self-impose an assessment fee by establishing an MMD to help with beautification, maintenance, signage and branding, and general marketing of the business district to attract more commercial development and invest in quality infrastructure. These districts are empowered to promote transportation and economic development, along with several other functions within their boundaries. Beyond infrastructure investment, MMDs provide maintenance activities for transportation facilities and implement bicycle programs. Most MMDs are able to issue bonds (not to the level of a TIRZ) and receive funding from ad-valorem taxes, assessments, impact fees, or other funds in order to provide improvements and services. MMDs can be an important avenue for area cities to pursue bicycle infrastructure and ensure investments are well-maintained.

Parking Benefit Districts

Parking Benefit Districts can finance infrastructure improvements in popular employment or commercial centers by dedicating parking fees and ticket revenue to bicycle and pedestrian enhancements. Within a parking benefit district, public parking spaces (on and off-street) are charged hourly rates to aid turnover of spaces for customers that also generates revenue for facade improvements, sidewalks, landscaping, and bike facilities. It is encouraged that off-street parking facilities (surface lots or parking structures) be provided nearby where people can pay a lower price to park-once-and-walk, with higher premiums on the on-street parking supply to incentivize turnover and disarm the misconception of insufficient parking near popular store fronts and commercial corridors. According to case studies in Austin, Texas and Washington, D.C., the Federal Highway Administration has found that parking benefit districts have reduced the need for surface parking and improve traffic congestion - all while funding local improvements within the district.

STATE FUNDING SOURCES

In addition to local funds, state funding sources can also be leveraged for implementing active transportation infrastructure. The following sources are state-level funding items in Texas.

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State Recreational Trails Program

Texas Parks and Wildlife Department (TPWD) administers the Federal Highway Administration’s (FHWA) National Recreational Trails Fund in the State of Texas. The Recreational Trails Program is an annual competitive cost-sharing opportunity that can fund up to 80% of project costs, with maximum awards up to \$200,000 for trail grants. Eligible projects include construction of recreational trail projects, land acquisition for trails, enhancing existing trails or to develop trailheads and trailside facilities.

FEDERAL FUNDING SOURCES

The primary federal transportation funding program for bicycling projects comes from a set-aside of the Surface Transportation Block Grant (STBG) Program funding for transportation alternatives (TA). These set-aside funds are eligible for a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, and safe routes to school projects. For most projects under the TA set-aside, the Federal share is generally 80 percent Federal and 20 percent State or local match. The TA set-aside and other federal funding sources that are pertinent to the Tyler MPO are summarized in the following sections.



Federal Transportation Alternatives

Transportation Alternatives funding is distributed to states and Metropolitan Planning Organizations (MPOs) for urbanized areas over 200,000 in population as well as small communities in a variety of scenarios. The program encompasses a variety of small-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, and safe routes to school projects.

POLICY & PRACTICE STRATEGIES

This section outlines strategies and best practices most appropriate for implementing Active Tyler’s recommendations. This guide is not an exhaustive list of strategies. Conditions may evolve, opportunities arise, and new approaches may be developed that fall outside of these strategies. New strategies should be considered over time to implement bicycle and pedestrian facilities.

The following policy and practice strategies are primarily intended for local connection projects in each individual community. Implementation of this plan along Texas Department of Transportation (TXDOT) roadways will be considered during mobility and/or capacity widening projects.

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Coordinate Upcoming Roadway Projects to Account for Bicycle Facility and Sidewalk Implementation

The most cost-effective and coordinated way to provide bicycle and pedestrian infrastructure (shared use paths, bike lanes, trails, sidewalks, curb extensions, etc.) may be as part of a larger roadway reconstruction, rehabilitation, or repaving project. When such opportunities arise, bikeways and sidewalks may be funded using the same source of funding as the roadway project and could be incorporated at a relatively modest cost. For example, providing bicycle accommodations as part of a larger roadway project often means simply adding a few additional feet of pavement. Depending on right-of-way constraints and the selected bikeway type, the impact on the project cost can be cost-effective. Cities within the MPO area can implement this strategy by adopting Complete Streets policies that apply to new construction, reconstruction, and 3R (resurfacing, restoration, or rehabilitation) projects on all streets and roads in the community. For projects that affect a city but cross jurisdictional boundaries, the cities should seek opportunities to collaborate with the Texas Department of Transportation and neighboring cities to achieve the desired outcomes for bicycle and pedestrian accommodations.

////////////////////////////////////

Enhance Bicycle Routes on Local Streets with Wayfinding, Traffic Calming, and Pavement Markings

Many streets in the Tyler MPO area are suitable for bicycling without robust accommodations (such as shared use paths, bike lanes, or trails). However, additional treatments could greatly enhance them as convenient routes for bicycling. Such treatments include traffic calming countermeasures, shared-lane markings (sharrows), bike route and wayfinding signs, intersection treatments, and a publicly available map of preferred bike routes. These simple, relatively low-cost treatments help people bicycling by confirming that they are on a designated bikeway without the necessity of major capital costs.

////////////////////////////////////

Federal Transit Administration Urban Areas Formula Funds (5307) & Enhanced Mobility of Seniors and Individuals with Disabilities Grant (5310)

FTA provides funding to urbanized areas (geographies with a population of 50,000 or more designated by the U.S. Census Bureau) for transit capital improvements. Eligible activities include: planning, engineering, design and evaluation of projects that provide accessibility bus stops. Tyler MPO may coordinate with Tyler Transit to budget 5307 funding to projects that improve pedestrian infrastructure around priority bus stops. FTA's 5310 grant program aims to improve mobility for seniors and individuals with disabilities by removing barriers to transportation service and expanding transportation mobility options. A portion of FTA 5310 funds are eligible for sidewalk and pedestrian improvements, though must further mobility for seniors and people with disabilities. Up to 45% of Tyler Transit's 5310 apportionment are eligible for projects that:

- Exceed the ADA minimum requirements
- Improve access to fixed-route service and decrease reliance by individuals with disabilities on ADA-complementary paratransit service, or
- Provide alternatives to public transportation that assist seniors and individuals with disabilities with transportation.

////////////////////////////////////

Better Utilizing Investments to Leverage Development (BUILD) Transportation Grants

BUILD (previously known as TIGER) grants are nationally competitive grants for capital investments on surface transportation projects that achieve a significant impact for a local or metropolitan area. \$1.5 billion has been allocated to BUILD Grants, which the U.S. Department of Transportation aims to benefit a greater number of projects located in rural areas. States are eligible to receive up to \$150 million in BUILD Grants.

Acquire Right-of-way Early On

In some cases, a bikeway or sidewalk might not be included as part of a roadway project due to lack of near-term feasibility, funding, or demand. In these situations, the roadway project should not preclude future bikeway or sidewalk additions. This applies to new construction, reconstruction, right-of-way acquisition, bridge replacement, and other significant undertakings along future bikeway corridors. Examples are listed below:

- If a new roadway is being constructed, the City should acquire adequate right-of-way to provide a sidepath alongside the roadway in the future.
- When a bridge is replaced, it should be adequately designed to accommodate a bikeway now or in the future.
- When above- and below-ground utilities are installed or replaced along a roadway, place them so that they do not obstruct the future bikeway and sidewalks.
- Where a grade-separated crossing may be needed in the future, acquire adequate right-of-way for ramps, approaches, structures, and related appurtenances.

Reconfigure Streets to Better Utilize Existing Pavement

The available pavement width on many streets in the Tyler MPO area is one of the most significant opportunities for providing bicycle and pedestrian facilities. Many arterial streets in the area have more travel lanes than are needed for their traffic volumes, or have lanes that are wider than recommended, or contain an underutilized center turning lane. In these locations, narrowing lanes or reallocating a motor vehicle lane or turning lane can provide adequate space for the provision of bike lanes and appropriate buffers. This strategy most often employs the use of 11-foot travel lanes and requires other considerations such as the presence of truck routes.

Employ Interim Solutions Prior to Full-Build Implementation

Along many segments of the future bikeway network, it may be advantageous to identify and develop interim solutions until the full bikeway can be developed as envisioned. Interim solutions offer a near-term mobility option that did not previously exist and are not seen as an alternative to a more comprehensive solution. One example of how an interim solution can be implemented is to provide an on-street bikeway accommodation (e.g., a bike lane) that may adequately serve more confident bicyclists until a lower-stress bikeway can be funded and constructed (e.g., a separated bike lane or shared use path). Another example is to provide a low-stress on-street bikeway along a parallel route that might not be very direct or might not be highly-accessible until a bikeway can be established along the preferred alignment.

PERFORMANCE MEASURES

The Active Tyler Plan not only provides the tools needed to implement an active transportation network in the greater Tyler area, but it also proposes performance measures. Performance measures point municipalities and the MPO in the right direction, and will help each community define what success looks like to them.

Table 4-5: Performance Measures

Success Areas	Progress	Success
EDUCATION	- Municipalities engage with local school systems to implement a bicycling and walking safety course for grade school children.	- All children in the greater Tyler area have the opportunity to learn about safe bicycling and walking practices through school safety courses.
ENCOURAGEMENT	- Local communities plan and host first bicycling/walking event. - Encourage people to participate in Bike/Walk to Work Day(s).	- Host annual bicycling/walking events. - Local municipalities publicize and sponsor Bike/Walk to work Day(s) annually.
CONNECTIVITY & ACCESS	- 50% of municipalities in the region are connected to the active transportation network.	- 75% of municipalities in the region are connected to the active transportation network.
IMPLEMENTATION & MAINTENANCE	- Municipalities create their own action plan benchmarking measures/timeline for implementing the Active Tyler Plan. - Include active transportation funding into municipal budget/capital improvements project list. - Municipalities plan a sidewalk improvement program. - Municipalities implement Tier 1 projects.	- Municipalities implement a sidewalk maintenance program to regularly add and maintain sidewalks - Active transportation facility implementation and maintenance receives an annual budget from municipalities. - Municipalities implement Tier 2 and begin implementing Tier 3 projects.
SAFETY & DATA	- Municipalities implement a bicycle and pedestrian counting and crash record keeping program.	- Municipalities conduct annual review/report of activity and crash data in their communities.



Please keep making human powered transportation a priority!

- Survey Respondent



Thank you for initiating this!

- Survey Respondent





Excited about the possibility of a safer place to bike.

- Survey Respondent

Thank you for your efforts to make walking and biking more accessible to our community! Please keep up the hard work.

- Survey Respondent



APPENDIX

//////////////////// Project lists by jurisdiction

- Facility Selection by Project
- Arp
- Bullard
- Lindale
- New Chapel Hill
- Tyler
- Noonday
- Troup
- Whitehouse
- Winona
- Smith County

FACILITY SELECTION BY PROJECT

The following information provides a step-by-step description of how to identify the appropriate facility for each individual project. Facility selection considered a variety of factors that are described in the Implementation chapter and the end of Appendix B. Each project should consider existing conditions, community priorities, and engineering judgement to determine the right facility based upon context and street typology.



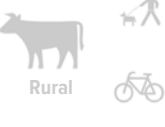
SELECT A PROJECT

Use the project maps and tables to locate a specific project. The project tables in this appendix (Appendix A) are listed by jurisdiction. Regional projects are longer term and may require multiple jurisdictions to coordinate.

ID	CATEGORY	LENGTH (FT)	STREET	CONTEXT	STREET TYPOLOGY
49	Local Connection	9583	CUMBERLAND RD	RURAL	Minor Arterial
50	Local Connection	6871	RR ROW	SUBURBAN	Trail
51	Local Connection	2167	OLD NOONDAY RD	RURAL	Collector
52	Local Connection	1791	S COLLEGE AVE	URBAN	Local
53	Local Connection	825	SILVERWOOD DR	SUBURBAN	Local
54	Local Connection	1288	WOODLARK DR	SUBURBAN	Collector
55	Local Connection	3950	MAPLE LN - HOLLYTREE DR	RURAL	Collector
56	Local Connection	306	TROUP HWY	SUBURBAN	Local

IDENTIFY CONTEXT AND TYPOLOGY

The project tables (Appendix A) lists a variety of project attributes include the land use context and the street typology. Descriptions of Context and Street Typology can be found in the Implementation chapter. The context and the street typology can be used to determine the appropriate facility options for each project.

	Major Arterial	Minor Arterial	Collector	Local
 Urban Core	wide sidewalk with buffer	wide sidewalk with buffer	medium sidewalk	sidewalk
	separated bike lane	separated bike lane, buffered bike lane	separated bike lane, buffered bike lane	bike lane, shared lane marking
 Urban	wide sidewalk with buffer	medium sidewalk, buffer optional	medium sidewalk	sidewalk, traffic calming
	separated bike lane	separated bike lane	buffered bike lane	bike lane
 Suburban	wide sidewalk with buffer	wide sidewalk, buffer optional	sidewalk	sidewalk, traffic calming, paved shoulder
	separated bike lane, shared use path	separated bike lane, shared use path	buffered bike lane, shared use path	bike lane, shared lane marking
 Rural	shared use path	shared use path	medium sidewalk	traffic calming, paved shoulder
			bike lane, buffered bike lane, paved shoulder	shared lane marking
 Rural Town	shared use path	shared use path	medium sidewalk	traffic calming, paved shoulder
		separated bike lane	separated bike lane, bike lane, buffered bike lane	shared lane marking

USE MATRIX FOR FACILITY OPTIONS

The Active Tyler Plan recommendations were developed on the foundation that active transportation facilities should meet the needs of local users. The Context-Typology-Facility Matrix (Table 4-4) should be used to identify the appropriate facility options for each project. This matrix combines land use context (rows) and street typology (columns) to identify bicycle and pedestrian facility options. This matrix may be used on all projects recommended in the Active Tyler Plan but also may be used as a resource for project opportunities not specifically identified by this plan. If project transition across multiple contexts or typologies, this matrix may be helpful to identify bicycle and pedestrian facilities that serve each unique scenario.

Supportive Policies

Policies that encourage bicycle and pedestrian travel and ease in infrastructure development and design should be in place to facilitate ease in facility selection and implementation.

Plan

The Active Tyler Plan serves as the baseline route selection and goal setting for the bicycle and pedestrian facility recommendations. While the network outlined in the Plan is flexible, it should ultimately connect similar places and existing/planning infrastructure.

Project Purpose

The project purpose should identify both the intended use of the project (to connect people to a nearby amenity, to connect neighborhoods, etc.) and the design user. The facility should be appropriate for both the use and the user.

Identify Desired Facility Type

Based on the previous steps, identify the ideal facility type. The Active Tyler Plan includes the context and typology for each project. The Context-Typology-Facility Matrix should be used to identify appropriate facility types for any given project.

Assess and Refine Feasibility

Under more detailed review of the existing conditions data, research feasibility of bicycle and pedestrian facility improvements. Cost considerations can be added here. For larger projects, a separate feasibility study may be needed.

Explore Alternatives

It may become clear that the ideal facility is not feasible for the given roadway and conditions. In this case, explore alternatives.

Select Preferred Facility Type

Prepare for the next phase of implementation: design.

Downgrade Bikeway Type and Designate Parallel Route

If the ideal facility is not feasible for the given roadway constraints, consider selecting a less ideal facility that is feasible and cost-sensitive and selecting a parallel route that is more accommodating for the preferred facility and meets the plan's goals.

Downgrade Bikeway Type and No Parallel Route

If the ideal facility is not feasible for the given roadway constraints and there is not a feasible parallel option, it should be understood that active transportation use may be suppressed and user safety reduced. Returning to the planning process can help identify how the goals outlined in the planning process can be met through other means.

REVIEW ALTERNATIVES AND IMPLEMENT NEW FACILITY

After identifying facility options based upon context and street typology, a review of existing conditions, community priorities, and constraints should be conducted. Alternative facility options should be compared to determine the appropriate facility given local users, safety concerns, and available funding. The facility selection process chart (Figure 4-5) should be used to refine the facility selection before moving into design and construction.

PROJECT LISTS

The following tables detail each project identified in the Active Tyler Plan. All projects are prescribed an ID, and all local projects are broken into prioritized tiers (where Tier 1 projects are the highest priority). Regional connections and the proposed horse trail are not given prioritization tiers. Each project is also given street typology and land use context classifications to assist in the selection of appropriate facility types (see Table 4-4 for more for facility selection guidance).

ARP

Table A-1: Arp Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	ARP BICYCLE TIER	ARP PED TIER
555	Regional	7,748	SH 64	CR 252 (ARP NORTH TOWN LIMIT)	ARP SOUTH TOWN LIMIT	Rural Town	Major Arterial	N/A	N/A

BULLARD

Table A-2: Bullard Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	BULLARD BICYCLE TIER	BULLARD PED TIER
93	Sidewalk	896	E Emma St	N RATHER ST	N HOUSTON ST	Rural Town	Local	2	1
94	Sidewalk	1,471	Main St	W TYLER ST	PANTHER XING	Rural Town	Local	1	2
95	Local	3,920	Panther Crossing - Fm 2493	MAIN ST	SMITH COUNTY LIMIT	Rural Town	Local	2	2
96	Sidewalk	2,623	E Main St	N HENDERSON ST	N LOVELESS ST	Rural Town	Local	2	1
97	Sidewalk	905	Sawyer St	N RATHER ST	N HENDERSON ST	Rural Town	Local	2	2
98	Sidewalk	2,215	FM 344	W TYLER ST	N HENDERSON ST	Rural Town	Local	1	1
99	Sidewalk	8,085	FM 344	CHRISTOPHER LN	ASH DR	Rural Town	Local	2	2
100	Sidewalk	1,483	FM 344	ASH DR	W TYLER ST	Rural Town	Local	1	2
549	Regional	10,180	FM 344	E MAIN ST	BULLARD TOWN LIMIT	Rural Town	Minor Arterial	N/A	N/A
550	Regional	8,609	US 69	BULLARD TOWN LIMIT	SIMTH COUNTY LIMIT	Rural Town	Major Arterial	N/A	N/A
551	Regional	12,527	FM 2493	BULLARD TOWN LIMIT	SIMTH COUNTY LIMIT	Rural Town	Minor Arterial	N/A	N/A

LINDALE

Table A-3: Lindale Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	LINDALE BICYCLE TIER	LINDALE PED TIER
68	Sidewalk	11284	WOOD SPRINGS RD - COUNTRY ROAD 474	PERRYMAN RD	S MAIN ST	RURAL TOWN	Local	1	2
69	Sidewalk	1444	EAGLE SPIRIT DR - WOOD SPRINGS RD	S MAIN ST	PERRYMAN RD	RURAL TOWN	Local	2	1
70	Sidewalk	555	PENNY LN	MOUNT SYLVAN ST	PERRYMAN RD	RURAL TOWN	Local	2	1
71	Sidewalk	1778	COOPER ST	MOUNT SYLVAN ST	S MAIN ST	RURAL TOWN	Local	2	1
72	Sidewalk	1932	EAGLE SPIRIT DR	S MAIN ST	PIERCE ST	RURAL TOWN	Local	2	1
73	Sidewalk	4075	MOUNT SYLVAN ST	W HUBBARD ST	PERRYMAN RD	RURAL TOWN	Minor Arterial	2	1
74	Sidewalk	3200	PERRYMAN RD	MOUNT SYLVAN ST	S MAIN ST	RURAL TOWN	Local	1	1
75	Local Connection	1895	W HUBBARD ST	N STADIUM ST	S MAIN ST	RURAL TOWN	Minor Arterial	1	1
543	Regional Connection	4706	E HUBBARD ST	S MAIN ST	LINDALE TOWN LIMIT	RURAL TOWN	Minor Arterial	N/A	N/A
544	Regional Connection	4978	E SOUTH ST	S MAIN ST	WOODLANDS DR (LINDALE TOWN LIMIT)	RURAL TOWN	Minor Arterial	N/A	N/A
545	Regional Connection	21787	N MAIN ST - S MAIN ST	WALNUT SPRINGS RD (LINDALE TOWN LIMIT)	I 20	RURAL TOWN	Major Arterial	N/A	N/A

NEW CHAPEL HILL (NCH)

Table A-4: New Chapel Hill Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	NCH BICYCLE TIER	NCH PED TIER
546	Regional Connection	10159	SH 64	NEW CHAPEL HILL EAST TOWN LIMIT	NEW CHAPEL HILL WEST TOWN LIMIT	RURAL TOWN	Major Arterial	N/A	N/A

Table A-5: Tyler Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	TYLER BICYCLE TIER	TYLER PED TIER
1	Local Connection	3775	VAN HWY	SL 323	US 69	SUBURBAN	Major Arterial	3	3
2	Local Connection	9575	W MLK JR BLVD	US 69	CHURCH AVE	URBAN	Minor Arterial	2	2
3	Local Connection	5496	N MOORE AVE	W MLK JR BLVD	W OAKWOOD ST	URBAN	Local	2	2
4	Local Connection	4227	N PALACE AVE	W BOW ST	SH 31	URBAN	Major Arterial	2	3
5	Local Connection	5317	W GENTRY PKWY	N GLENWOOD BLVD	BOIS D ARC AVE	URBAN	Major Arterial	1	2
6	Local Connection	10195	N BOIS D ARC AVE - SH 31 - CHILTON AVE	W MLK JR BLVD	HOUSTON ST	URBAN	Local	2	2
7	Local Connection	1508	N BONNER AVE	W OAKWOOD ST	ERWIN ST	URBAN_CORE	Collector	2	3
8	Local Connection	2982	ELM ST	PALACE AVE	BROADWAY AVE	URBAN_CORE	Collector	2	1
9	Local Connection	6981	LOCUST ST	BOIS D ARC AVE	MCMURREY DR	URBAN	Local	3	2
10	Local Connection	1663	SAUNDERS AVE	ERWIN ST	SH 31	URBAN	Local	2	1
11	Local Connection	1659	FLEISHEL AVE	ERWIN ST	SH 31	URBAN	Collector	1	1
12	Local Connection	2826	FERGUSON ST	ERWIN ST - S COLLEGE AVE	ERWIN ST - S SPRING AVE	URBAN_CORE	Local	2	1
13	Local Connection	1227	N FANNIN AVE	QUEEN ST	BOW ST	URBAN	Local	3	2
14	Local Connection	1326	W BOW ST	BOIS D ARC AVE	N FANNIN AVE	URBAN	Local	3	2
15	Local Connection	2377	QUEEN ST	BOIS D ARC AVE	CARLYLE AVE	URBAN	Local	3	2
16	Local Connection	3135	CARLYLE AVE	MLK JR BLVD	E QUEEN ST	URBAN	Local	3	3
17	Local Connection	3365	N BROADWAY AVE	32ND ST	W MLK JR BLVD	URBAN	Minor Arterial	1	2
18	Local Connection	2542	S BROADWAY AVE	ERWIN ST	HOUSTON ST	URBAN_CORE	Minor Arterial	1	1
19	Local Connection	13809	RR ROW	ERWIN ST	FAULKNER ST	URBAN	Major Arterial	2	1
20	Local Connection	2467	CONNALLY ST	VINE AVE	VINE AVE	URBAN	Local	3	3
21	Local Connection	3755	PEACH AVE	BELLWOOD RD	OLD NOONDAY RD	SUBURBAN	Local	3	3

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	TYLER BICYCLE TIER	TYLER PED TIER
22	Local Connection	1578	MOCKINGBIRD LN	S PEACH AVE	OLD NOONDAY RD	SUBURBAN	Local	3	3
23	Local Connection	1437	S COLLEGE AVE	RUSK ST	MOCKINGBIRD LN	URBAN	Local	3	3
24	Local Connection	8850	OLD BULLARD RD	FM 2493	SL 323	SUBURBAN	Collector	1	2
25	Local Connection	2978	OLD BULLARD RD	SL 323	RICE RD	SUBURBAN	Collector	1	2
26	Local Connection	4558	OLD BULLARD RD	RICE RD	OLD RANDE AVE	SUBURBAN	Collector	2	2
27	Local Connection	1850	OLD GRANDE BLVD	OLD BULLARD RD	W GRANDE BLVD	SUBURBAN	Collector	1	2
28	Local Connection	3047	DONNYBROOK AVE	SL 323	SHILOH RD	SUBURBAN	Collector	3	2
29	Local Connection	7141	SHILOH RD	US 69	PALUXY DR	SUBURBAN	Minor Arterial	1	2
30	Local Connection	5343	SHILOH RD	PALUXY DR	SH 110	SUBURBAN	Minor Arterial	2	2
31	Local Connection	5944	RHONES QUARTER RD	SHILOH RD	GRANDE BLVD	SUBURBAN	Minor Arterial	2	3
32	Local Connection	3178	RHONES QUARTER RD	GRANDE BLVD	GUINN FARMS RD	RURAL	Minor Arterial	2	3
33	Local Connection	7292	OLD TROUP HWY	GOLDEN RD	SH 110	SUBURBAN	Collector	1	2
34	Local Connection	1174	THISTLE DR	SH 110	SHILOH RD	SUBURBAN	Collector	2	2
35	Local Connection	5494	E DULSE ST	DONNY BROOK AVE	SH 110	SUBURBAN	Collector	3	2
36	Local Connection	1999	FAULKNER ST	SH 110	GOLDEN RD	SUBURBAN	Local	3	3
37	Local Connection	6968	GOLDEN RD	E FITH ST	SH 110	SUBURBAN	Collector	1	2
38	Local Connection	1056	GOLDEN RD	SH 110	PALUXY DR	SUBURBAN	Collector	2	2
39	Local Connection	4479	MCDONALD RD	GOLDEN RD	PATRIOT DR	SUBURBAN	Collector	2	3
40	Local Connection	1957	GOLDEN RD	DEVINE ST	E FITH ST	SUBURBAN	Collector	2	2
41	Local Connection	4177	PATRIOT DR	MCDONALD RD	UNIVERSITY BLVD	SUBURBAN	Collector	3	3
42	Local Connection	4560	UNIVERSITY BLVD	PATRIOT DR	OLD OMEN RD	SUBURBAN	Minor Arterial	1	3
43	Local Connection	11503	UNIVERSITY BLVD	OLD OMEN RD	SH 54	RURAL	Minor Arterial	1	2
44	Local Connection	3336	TROUP HWY	DONNY BROOK AVE	S BECKHAM AVE	URBAN	Minor Arterial	2	1

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	TYLER BICYCLE TIER	TYLER PED TIER
45	Local Connection	3968	W 2ND ST	VINE AVE	DONNY BROOK AVE	URBAN	Local	3	2
46	Local Connection	2484	RUSK ST	VINE AVE	BROADWAY AVE	URBAN	Local	2	1
47	Local Connection	8194	RR ROW	MAHAR RD	SALINE CREEK RD	RURAL	Trail	3	3
48	Local Connection	12490	W CUMBERLAND RD	OLD JACKSONVILLE HWY	US 69	RURAL	Minor Arterial	2	3
49	Local Connection	9583	CUMBERLAND RD	US 69	PALUXY DR	RURAL	Minor Arterial	3	3
50	Local Connection	6871	RR ROW	THREE LAKES PKW	MAHAR DR	SUBURBAN	Trail	3	3
51	Local Connection	2167	OLD NOONDAY RD	S PEACH AVE	EAST CAMPBELL PKWY	RURAL	Collector	2	3
52	Local Connection	1791	S COLLEGE AVE	SHAW ST	W FOURTH ST	URBAN	Local	3	2
53	Local Connection	825	SILVERWOOD DR	OLD JACKSONVILLE RD	WOODLARK DR	SUBURBAN	Local	3	3
54	Local Connection	1288	WOODLARK DR	SILVERWOOD DR	BROOKSIDE DR	SUBURBAN	Collector	2	3
55	Local Connection	3950	MAPLE LN - HOLLYTREE DR	DUELING OAKS DR	WEST CUMBERLAND RD	RURAL	Collector	3	3
56	Local Connection	306	TROUP HWY	E DULSE STREET	FAULKNER ST	SUBURBAN	Local	2	3
57	Local Connection	3745	FLEISHEL AVE	E FRONT ST	LAKE ST	URBAN	Collector	2	1
58	Local Connection	1479	GROVE ST - CONNALLY ST	S PEACH AVE	S GASTON AVE	URBAN	Local	3	3
59	Local Connection	2799	MOCKINGBIRD LN	OLD NOONDAY RD	ROBERTSON AVE	SUBURBAN	Local	2	2
60	Local Connection	1036	MOCKINGBIRD LN	ROBERTSON AVE	S COLLEGE AVE	URBAN	Local	2	2
61	Local Connection	1814	S COLLEGE AVE	W FOURTH ST	OLD JACKSONVILLE RD	URBAN	Local	3	3
62	Local Connection	1951	ELM ST	S BROADWAY AVE	S BECKHAM AVE	URBAN	Collector	2	1
63	Local Connection	74	OLD NOONDAY RD	MOCKINGBIRD LN	MOCKINGBIRD LN	SUBURBAN	Local	2	3
64	Local Connection	483	MCMURREY DR	E LOCUST ST	E ERWIN ST	URBAN	Local	2	2
65	Local Connection	278	OLD JACKSONVILLE RD	ROBERSTON AVE	SILVERWOOD DR	SUBURBAN	Local	3	3

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	TYLER BICYCLE TIER	TYLER PED TIER
66	Local Connection	1148	SAUNDERS AVE	E FRONT ST	HOUSTON ST	URBAN	Local	3	1
67	Local Connection	2935	UNIVERSITY BLVD	SL 323	PATRIOT DR	SUBURBAN	Minor Arterial	1	3
501	Regional Connection	43943	US 69 - GENTRY PKWY- GLENWOOD BLVD -	TYLER CITY LIMIT	BROADWAY AVE	RURAL	Major Arterial	N/A	N/A
502	Regional Connection	10937	DALLAS HWY - W ERWIN ST - S GLENWOOD BLVD	TYLER CITY LIMIT	N GLENWOOD BLVD	RURAL	Major Arterial	N/A	N/A
503	Regional Connection	4114	TOWNE PARK DR - SEATON ST	TYLER CITY LIMIT	FRANKSTON HWY	SUBURBAN	Minor Arterial	N/A	N/A
504	Regional Connection	12941	SH 155	US 69	DINGLER RD	SUBURBAN	Major Arterial	N/A	N/A
505	Regional Connection	7183	OLD JACKSONVILLE RD	S BROADWAY AVE	SILVERWOOD DR	SUBURBAN	Minor Arterial	N/A	N/A
506	Regional Connection	13319	OLD JACKSONVILLE RD	W GRANDE BLVD	S ROBERTSON AVE	RURAL	Minor Arterial	N/A	N/A
507	Regional Connection	11954	OLD JACKSONVILLE RD - FM 2493	W GRANDE BLVD	OLD CREEK BLVD	SUBURBAN	Minor Arterial	N/A	N/A
508	Regional Connection	18938	SOUTH BROADWAY AVE	W FIFTH ST	W GRANDE BLVD	SUBURBAN	Major Arterial	N/A	N/A
509	Regional Connection	8533	BROADWAY AVE	W GRANDE BLVD	W CUMBERLAND RD	SUBURBAN	Major Arterial	N/A	N/A
510	Regional Connection	6373	S BROADWAY AVE	W CUMBERLAND	MARSH FARM RD	RURAL	Major Arterial	N/A	N/A
511	Regional Connection	19709	S BECKHAM AVE - TROUP HWY	E FIFTH ST	TYLER CITY LIMIT	SUBURBAN	Major Arterial	N/A	N/A
512	Regional Connection	14435	WATER ROW	SL 323	TYLER CITY LIMIT	SUBURBAN	Trail	N/A	N/A
513	Regional Connection	14449	FIFTH ST	BROADWAY AVE	OLD HENDERSON HWY	URBAN	Major Arterial	N/A	N/A
514	Regional Connection	47190	S BECKHAM AVE - E GENTRY PKWY	E FRONT ST	FM 3270	RURAL	Major Arterial	N/A	N/A
515	Regional Connection	14287	RR ROW	BELLWOOD RD	SL 323	SUBURBAN	Trail	3	3
516	Regional Connection	3985	ST PARK HWY - E MLK JR BLVD	TYLER CITY LIMIT	E GENTRY PKWY	URBAN	Minor Arterial	N/A	N/A

NOONDAY

Table A-6: Noonday Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	NOONDAY BICYCLE TIER	NOONDAY PED TIER
101	Local Connection	500	BIG EDDY RD - FRANKSTON HWY	RUSHING RD	OLD NOONDAY RD	RURAL TOWN	Major Arterial	2	2
102	Sidewalk	3040	RUSHING RD	FOOD PANTRY	BIG EDDY RD	RURAL TOWN	Collector	1	2
103	Sidewalk	3397	OLD NOONDAY RD	FRANKSTON HWY	SUNSHINE DR	RURAL TOWN	Collector	1	1
104	Sidewalk	1835	SUNSHINE DR	FRANKSTON HWY	OLD NOONDAY RD	RURAL TOWN	Local	1	2
554	Regional Connection	1044	SH 155	NOONDAY TOWN LIMIT	NOONDAY TOWN LIMIT	RURAL TOWN	Major Arterial	N/A	N/A

TROUP

Table A-7: Troup Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	TROUP BICYCLE TIER	TROUP PED TIER
79	Local Connection	2271	N JARVIS ST	W ROSS ST	W DUVAL ST	RURAL TOWN	Local	1	1
80	Sidewalk	718	N GEORGIA ST	S BRYANT ST	W DUVAL ST	RURAL TOWN	Local	1	2
81	Sidewalk	1088	N VIRGINIA ST	W BRYANT ST	W CALVERT ST	RURAL TOWN	Local	2	2
82	Sidewalk	1430	N CAROLINA ST	E MCKAY ST	E CALVER ST	RURAL TOWN	Local	2	1
83	Local Connection	2193	E DUVAL ST	N GEORGIA ST	N CROSS ST	RURAL TOWN	Local	1	1
547	Regional Connection	5863	W DUVALST	OAKWOOD DR (TROUP TOWN LIMIT)	N GEORGIA ST	RURAL TOWN	Major Arterial	N/A	N/A
548	Regional Connection	2802	S GEORGIA ST	E DUVAL ST	OAK ST (SMITH COUNTY LIMIT)	RURAL TOWN	Local	N/A	N/A

WHITEHOUSE

Table A-8: Whitehouse Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	WHITEHOUSE BICYCLE TIER	WHITEHOUSE PED TIER
84	Sidewalk	3630	COREY DR	HAGAN RD	LANDON DR	RURAL TOWN	Minor Arterial	2	2
85	Sidewalk	3679	RAILROAD AVE	E MAIN ST	HAGAN RD	RURAL TOWN	Minor Arterial	2	2
86	Sidewalk	3754	SH 110	WOODHAVEN DR	E MAIN ST	RURAL TOWN	Major Arterial	2	1
87	Sidewalk	8665	SH 110	E MAIN ST	WILDWOOD DR	RURAL TOWN	Major Arterial	1	2
88	Local Connection	23839	E MAIN ST	SHAHAN RANCH BLVD	CONCESION PARK	RURAL TOWN	Minor Arterial	1	1
89	Sidewalk	7190	ACKER TAP ST	SH 110	BASCOM RD	RURAL TOWN	Collector	2	2
90	Sidewalk	165	HAGAN RD	COREY DR	RAILROAD AVE	RURAL TOWN	Minor Arterial	2	2
91	Local Connection	2559	BASCOM RD	ACKER TAP ST	E MAIN ST	RURAL TOWN	Major Arterial	1	1
92	Sidewalk	2462	E ACKER TAP ST - BASCOM RD	ACKER TAP ST	WHITEHOUSE HIGH SCHOOL	RURAL TOWN	Collector	2	2
556	Regional Connection	11935	SH 110	SL 49 (WHITEHOUSE TOWN LIMIT)	WOODHAVEN DR	RURAL TOWN	Major Arterial	N/A	N/A

WINONA

Table A-9: Winona Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY	WINONA BICYCLE TIER	WINONA PED TIER
76	Sidewalk	4172	DALLAS ST	WILDCAT DR	DALE ST	RURAL TOWN	Major Arterial	2	1
77	Sidewalk	3221	WILDCAT DR	DALLAS ST	CR 345	RURAL TOWN	Local	2	2
78	Sidewalk	1022	DALLAS ST	DALE ST	N MAIN ST	RURAL TOWN	Major Arterial	1	1
552	Regional Connection	8414	MAIN ST	WINONA NORTH TOWN LIMIT	WINONA SOUTH TOWN LIMIT	RURAL TOWN	Major Arterial	N/A	N/A
553	Regional Connection	611	DALLAS ST	WINONA TOWN LIMIT	WILDCAT DR	RURAL TOWN	Major Arterial	N/A	N/A

SMITH COUNTY

Table A-10: Smith County Project List

ID	CATEGORY	LENGTH (FT)	STREET	TO	FROM	CONTEXT	STREET TYPOLOGY
201	Horse Trail	61608	HORSE TRAIL	US 69	OLD SABINE BOTTOM WMA	RURAL	Trail
202	Horse Trail	79213	HORSE TRAIL	TEXAS ROSE HORSE PARK	US 69	RURAL	Trail
517	Regional Connection	17008	US 69	I 20	TYLER CITY LIMIT	RURAL	Major Arterial
518	Regional Connection	37992	SH 64	SMITH COUNTY LIMIT	TYLER CITY LIMIT	RURAL	Major Arterial
519	Regional Connection	32520	FM 2493	OLD CREEK BLVD (TYLER CITY LIMIT)	BULLARD TOWN LIMIT	RURAL	Minor Arterial
520	Regional Connection	20165	SH 155	FM 2601	SMITH COUNTY LIMIT	RURAL	Local
521	Regional Connection	14675	SH 155	NOONDAY TOWN LIMIT	FM 2601	RURAL	Major Arterial
522	Regional Connection	39731	FM 344	SH 155	CR 173 (BULLARD TOWN LIMIT)	RURAL	Local
523	Regional Connection	46665	US 271	FM 3270	SMITH COUNTRY LIMIT	RURAL	Major Arterial
524	Regional Connection	24722	SH 155	WINONA TOWN LIMIT	SMITH COUNTY LIMIT	RURAL	Major Arterial
525	Regional Connection	29730	US 69	BULLARD TOWN LIMIT	MARSH FARM RD (TYLER CITY LIMIT)	RURAL	Major Arterial
526	Regional Connection	8448	TROUP HWY	TYLER CITY LIMIT	SL 49 (WHITEHOUSE TOWN LIMIT)	RURAL	Major Arterial
527	Regional Connection	34082	FM 344	BULLARD TOWN LIMIT	SH 110	RURAL	Major Arterial
528	Regional Connection	32331	SH 110	WHITEHOUSE TOWN LIMIT	TROUP TOWN LIMIT	RURAL	Major Arterial
529	Regional Connection	26164	WATER ROW	LAKE TYLER	TYLER CITY LIMIT	RURAL	Trail
530	Regional Connection	24877	SH 64	OLD HENDERSON HWY (TYLER CITY LIMIT)	NEW CHAPEL HILL TOWN LIMIT	RURAL	Major Arterial
531	Regional Connection	22899	SH 155	WINONA TOWN LIMIT	US 271	RURAL	Major Arterial
532	Regional Connection	29905	STATE PARK HWY	FM 16	I 20	RURAL	Major Arterial
533	Regional Connection	22968	STATE PARK HWY	SMITH COUNTY LIMIT	FM 16	RURAL	Major Arterial
534	Regional Connection	40735	FM 16	LINDALE TOWN LIMIT	STATE PARK HWY	RURAL	Minor Arterial
535	Regional Connection	29341	JIM HOGG RD	CR 4191 (LINDALE TOWN LIMIT)	US 69	RURAL	Minor Arterial
536	Regional Connection	40607	US 69	SMITH COUNTY LIMIT	WALNUT SPRINGS RD (LINDALE TOWN LIMIT)	RURAL	Minor Arterial
537	Regional Connection	9082	SPUR 364	LINDSY PARK	TYLER CITY LIMIT	RURAL	Minor Arterial
538	Regional Connection	37083	SH 155	CR 196 (NOONDAY TOWN LIMIT)	TYLER CITY LIMIT	RURAL	Major Arterial
539	Regional Connection	30449	FM 16	STATE PARK HWY	WINONA TOWN LIMIT	RURAL	Major Arterial
540	Regional Connection	18316	SH 64	ARP TOWN LIMIT	SMITH COUNTY LIMIT	RURAL	Major Arterial
541	Regional Connection	37600	SH 64	NEW CHAPEL HILL TOWN LIMIT	ARP TOWN LIMIT	RURAL	Major Arterial
542	Regional Connection	30407	FM 14	I 20	TYLER CITY LIMIT	RURAL	Major Arterial



APPENDIX



Design guidance

- Background
- Sidewalks
- Rural Striped Shoulders
- Bike Lanes
- Buffered Bike Lanes
- Separated Bike Lanes
- Shared Use Path
- Traffic Calming
- Other Resources

B

BACKGROUND

The material in this section serves as a guide for designing bicycle and pedestrian infrastructure. It should not be used as stand-alone guidance separate from the Active Tyler Plan; instead, this document should be used to assist engineers/planners understand important considerations as they plan and design safe and comfortable infrastructure in the greater Tyler area.

POTENTIAL BICYCLE USERS

Why design bicycle infrastructure using these guidelines? Estimates show that most of the US population—upwards of 60-70%—would like to bicycle for some trips, but who are uncomfortable interacting with intense vehicular traffic. This group, commonly identified as the “Interested but Concerned” category, are most comfortable cycling separated from motorized vehicles.

Conversely, roughly 1% of the US population indicate they are “Experienced and Confident” bicyclists. They are comfortable sharing the road with motorized vehicles. In the middle, approximately 7% are in the “Casual and Confident” category; and may be comfortable cycling for short distances with motorized vehicles.



Figure B-1: Bicycling Stress Tolerance

If the greater Tyler area’s goal is to increase bicycling, it is essential to select and design facilities that will allow more people to feel comfortable bicycling for trips. Less confident bicyclists (i.e., “interested but concerned,” and “casual and somewhat confident”) prefer physical separation as traffic volumes and speeds increase. The bikeway facility selection chart below identifies bikeway facilities that improve operating environment for users based on vehicle speeds and traffic volumes.

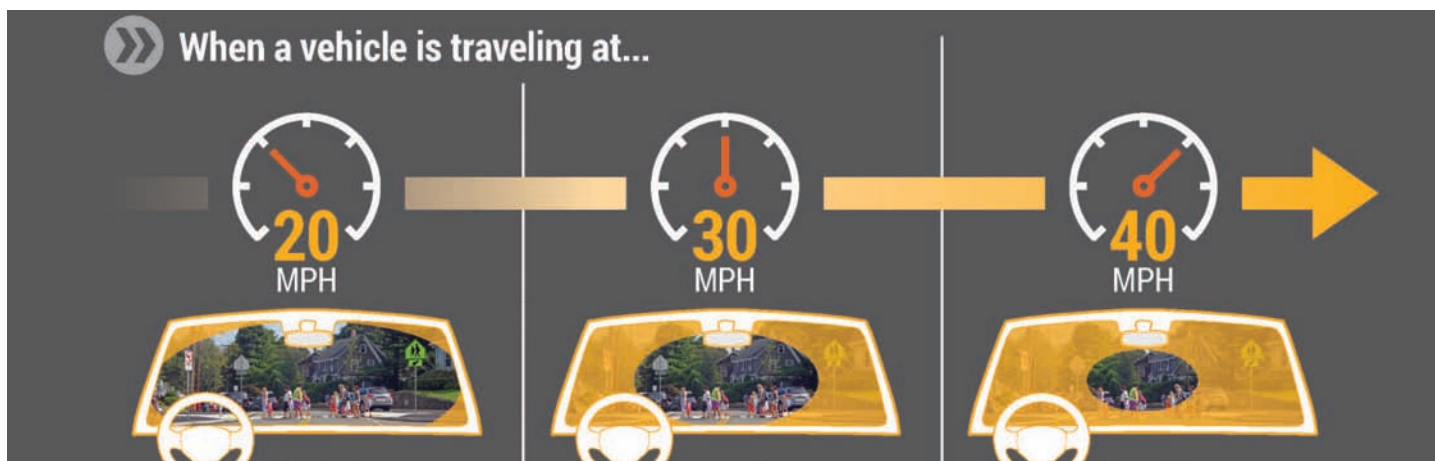


Figure B-2: Motorist Cone of Vision

WALKING AND WHEELING FOR TRIPS

Why design pedestrian infrastructure using these guidelines? Walking and wheeling (traveling via wheelchair or other mobility assisting device for people with disabilities) is the most basic and sustainable form of transportation. Walking/wheeling serves as cheap way to travel between destinations that is accessible to nearly the entire population.

To encourage walking in the greater Tyler area, infrastructure must be safe, comfortable, visible, and accessible. In most contexts, pedestrian traffic flow should be separated from motorized travel horizontally and/or vertically (i.e., via curb or grade separation). Exceptions include low-speed neighborhood streets or rural pedestrian lanes. Separation both protects users from high-speed traffic and helps people walking feel more at ease. Also, well-designed pedestrian infrastructure makes people more visible to cars (and vice versa). Finally, all infrastructure should be compliant with guidelines from the Americans with Disabilities Act (ADA) to ensure that the network of routes for people walking/wheeling is accessible to all, regardless of age or ability.



Figure B-3: ADA-compatible facilities

FACILITY TYPE OVERVIEW

The appropriate bicycle and pedestrian facility types varies based on context, roadway widths, speed, and right of way; not all facilities are suitable for all roadway scenarios and contexts. This appendix provides design guidance for the following facility types:

- **Pedestrian Only Facilities: Sidewalks**
- **Bicycles Only Facilities: Rural striped shoulders, Bike lanes, Buffered bike lanes, Separated bike lanes**
- **Bicycles and pedestrians: Shared use paths**

SIDEWALKS

Sidewalks play a critical role in the character, enjoyment, and accessibility of neighborhoods, main streets, and other community destinations. Sidewalks are typically reserved for pedestrians within the public right-of-way, adjacent to property lines or the building face. They provide vertical and/or horizontal separation between vehicles and pedestrians. The spaces between sidewalks and roadways also accommodate street trees and plantings, stormwater infrastructure, street lights, bicycle racks, and other street furnishings/amenities.

Sidewalks should be designed by “zone”:

● Frontage Zone:

The Frontage Zone immediately abuts buildings along the street. In residential areas, the Frontage Zone may be occupied by front porches, stoops, lawns, or other landscape elements. 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.

● Pedestrian Zone:

Also known as the “walking zone,” the Pedestrian Zone is the portion of the sidewalk space used for active travel. It must be kept clear of any obstacles and be wide enough to comfortably accommodate the contexts’ 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).

● Amenity Zone:

The Amenity Zone, or “landscape zone,” lies between the curb and the Pedestrian Zone. This area is occupied by street fixtures such as street lights, street trees, bicycle racks, parking meters, signposts, signal boxes, benches, trash and recycling bins, 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.

● The Curb:

Although not a zone per se, the curb is a vital element of the street. It is the demarcation line between the pedestrian domain and the vehicular domain. The curb is typically a physical barrier providing vertical separation between the street and sidewalk. The curb coupled with gutter and stormwater inlets also plays a role in roadway and adjacent property drainage designs.

See Figure B-4 for an example of pedestrian zones.

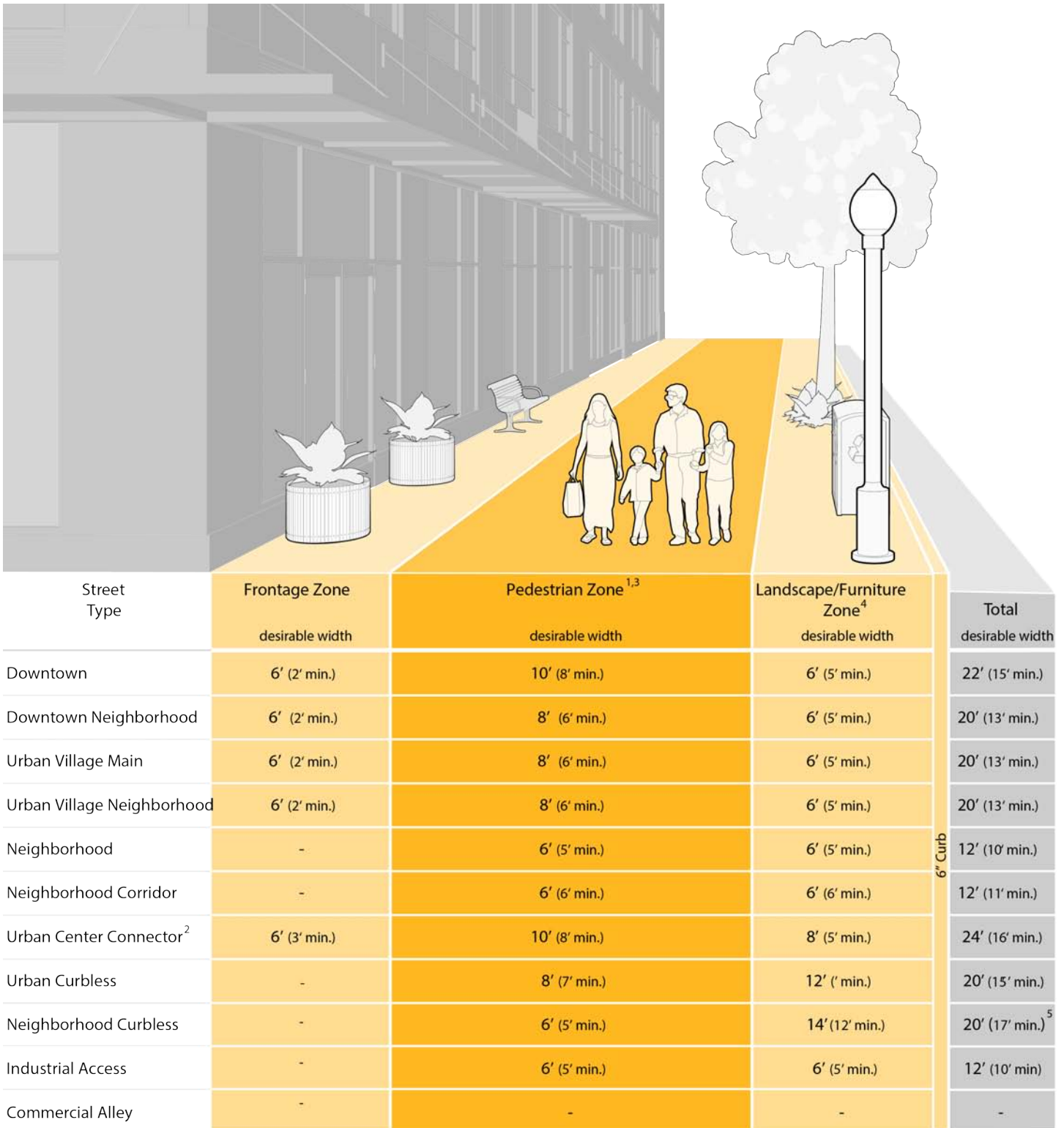


Figure B-4: Pedestrian Zones on a Streetscape

RURAL STRIPED SHOULDERS

Paved shoulders provide a range of benefits: they reduce motor vehicle crashes, reduce long-term roadway maintenance, ease short-term maintenance, and provide space for bicyclists and pedestrians (although they typically do not meet accessibility requirements for pedestrians). Paved shoulders should be reserved for rural road cross-sections; rarely (if ever) are striped shoulder appropriate for accommodating bicyclists and pedestrians in suburban or urban contexts.

Where 5-foot or wider paved shoulders exist already, it is acceptable or potentially desirable to mark them as bike lanes in various circumstances, such as to provide continuity between other bikeways. If paved shoulders are marked as bike lanes, they need to also be designed as bike lanes at intersections. Where a roadway does not have paved shoulders already, paved shoulders can be retrofitted to the existing shoulder when the road is resurfaced or reconstructed. In some instances, adequate shoulder width can be provided by narrowing travel lanes; reducing travel lane width on existing roads—also known as a “lane diet”—is one way to increase paved shoulder width.

There are several situations in which additional shoulder width should be provided:

- **Motor vehicle speeds exceeding 50 mph,**
- **Moderate to heavy volumes of traffic,**
- **And above-average bicycle or pedestrian use.**

If poorly designed, rumble strips placement may significantly degrade the functionality of paved shoulders for bicyclists. Rumble strips should be placed as close to the edge line as is practicable.

Updating rumble strip design and implementation should be review as new guidance is available through the American Association of State Highway and Transportation Officials (AASHTO).

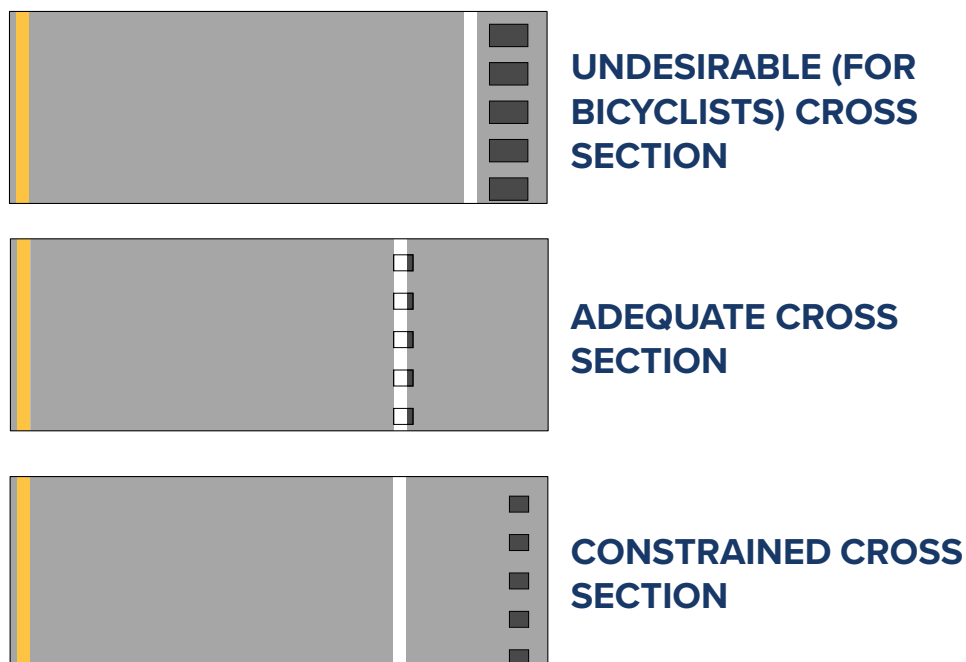


Figure B-5: Rumble Strip Placement

Sufficiently wide shoulders greatly improve bicyclist safety and comfort, particularly on higher-speed, higher-volume roadways. People bicycling must be provided least 4 feet of usable space, and the width must continue along the length of the roadway and through intersections. Allow at least 5 feet where there are guardrails, curbs, or other roadside barriers. Designers should consider wider shoulders if vehicle speeds are greater than 50 mph (as per the AASHTO Bike Guide). Designers may use the Bicycle Level of Service model, which includes factors for vehicle speeds, traffic volumes, and lane widths to determine the appropriate shoulder width.

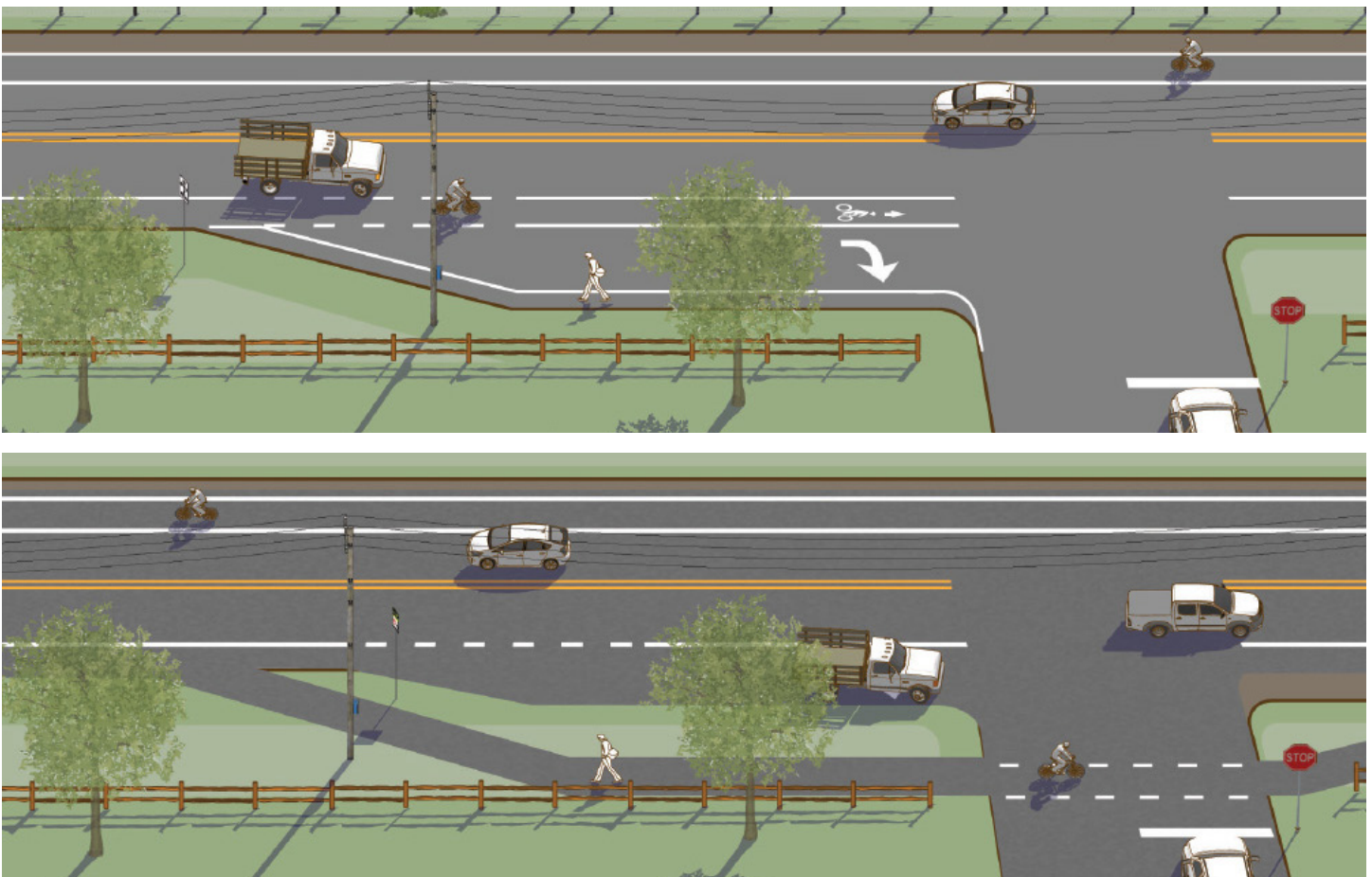


Figure B-6: Rural Shoulder Designs at Intersections (FHWA Rural Design Guide)

There are several options to reconfigure paved shoulders through intersections (as the outside lane often accommodates a right-turn lane):

- **On-street bike lanes:** For a bike lane, add a right turn lane to the right of the bike lane. Use dotted line extensions to define the tapered entrance into the right-turn lane. For more information, refer to the guidance on bike lanes and FHWA MUTCD.
- **Separated bike lanes or shared use paths:** For a one-way separated bike lane or shared use path, transition the paved shoulder in advance of the intersection and continue through the intersection (see figure above and guidance on separated bike lanes).

BIKE LANES

Bike lanes provide a designated space for bicyclists in the roadway. They are typically installed by reallocating existing street space. Bike lanes are established using lines and symbols on the roadway surface. Bike 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. Contra-flow bike lanes may be used to allow two-way bicycle travel on streets designated for one-way travel for motorists to improve bicycle network connectivity.

Bicyclists are not required to remain in a bike lane when traveling on a street and may depart the bike lane as necessary to make turns, pass other bicyclists, or to properly position themselves for other necessary movements. Bike 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 may be problematic in areas of high parking demand and deliveries, especially in commercial areas, but this behavior should be strictly prohibited. In places where delivery vehicles or others regularly need to park, alternative bike lane routes should be considered.

Wider bike lanes or buffered bike lanes (see Buffered Bike Lanes guidance) are preferable at locations with high parking turnover. The minimum width of a bike lane adjacent to a curb or parking is 5 feet exclusive of a gutter, a desirable width is 6 feet. Parking T's or hatch marks can highlight the door zone on constrained corridors with high parking turnover to guide bicyclists away from doors.

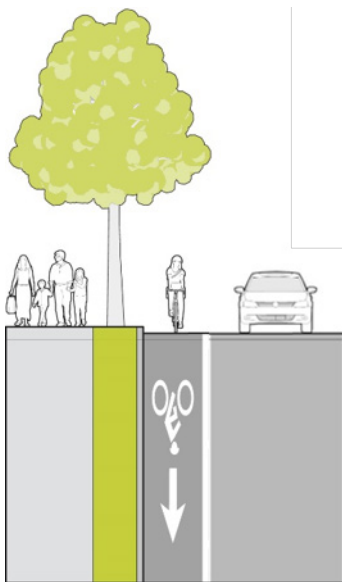


Figure B-7: Bike Lane Section, no parking

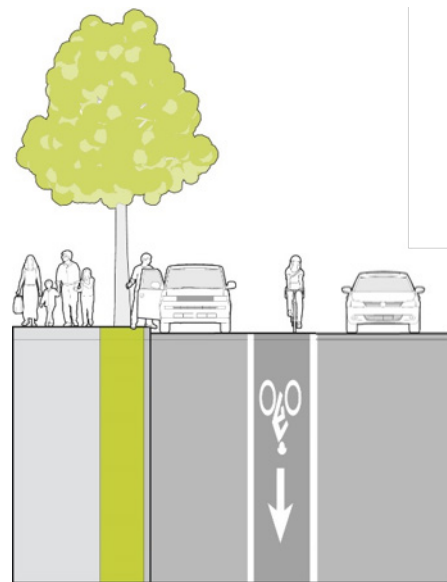


Figure B-8: Bike Lane Section, with parking and door zone

BUFFERED BIKE LANES

Buffered bike lanes are created by painting a flush buffer zone between a bike lane and the adjacent travel lane. Like bike lanes, they are often installed by reallocating existing street space. Where there is 7 feet of roadway width available for a bike lane, a buffered bike lane should be installed instead of a conventional bike lane.

Research has documented buffered bike lanes increase the perception of safety. While buffers are typically used between bike lanes and motor vehicle travel lanes to increase bicyclists' comfort, they can also be provided between bike lanes and parking lanes in locations with high parking turnover to discourage bicyclists from riding too close to parked vehicles.

Buffered bike lanes have several applications. First, they can be used in both one-way or two-way street scenarios. Depending on roadway width constraints, they may be preferable to conventional bike lanes when used as a contra-flow bike lane on one-way streets. Second, buffers also create a natural space for cars' door zones where there is commercial or metered parking. Third, extra delineated space allows bicyclists to ride side by side or to pass slower moving bicyclists, so buffered bike lanes can be used in places where larger volumes of bicycles are expected or where a higher-speed design user is expected.

Because buffers create additional comfort for people bicycling, they are most applicable on higher-speed and higher-volume streets, in comparison to streets where bike lanes are appropriate. Consider placing a buffer next to the travel lane where speeds are 30 mph or greater or when traffic volume exceeds 6,000 vehicles per day.

The minimum width of a buffered bike lane adjacent to parking is 5 feet, a desirable width is 6 feet. The minimum buffer width is 18 inches. There is no maximum. Diagonal cross hatching should be used for buffers < 3 feet in width. Chevron cross hatching should be used for buffers > 3 feet in width. Note that the buffers are to be broken where curbside parking is present to allow cars to cross the bike lane.

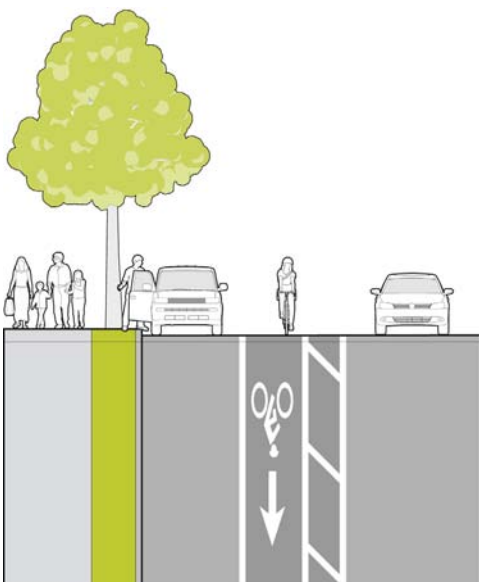


Figure B-9: Buffered Bike Lane, with parking / door zone

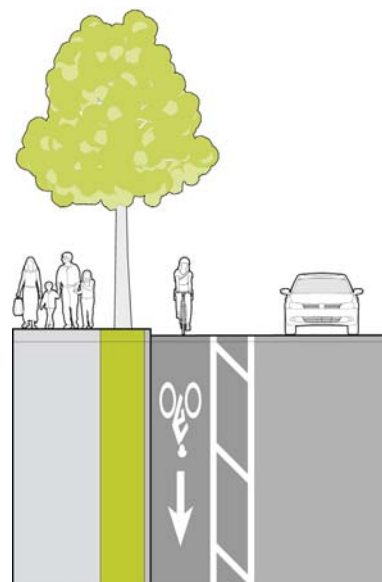


Figure B-10: Buffered Bike Lane, with no parking

SEPARATED BIKE LANES

Separated bike lanes (SBLs) are an exclusive bikeway facility type that combines the user experience of a shared use path with the on-street infrastructure of a conventional bike lane. They are physically separated from motor vehicle traffic while also being distinct from the sidewalk. Separated bike lanes are preferred over shared use paths in higher density areas, commercial and mixed-use development, and near major transit stations or locations where pedestrian volumes are anticipated to exceed 200 people per hour on a shared use path.

Separated bike lanes are more attractive to a wider range of bicyclists than striped bikeways on higher volume and higher speed streets. They eliminate the risk of a bicyclist being hit by an opening car door and prevent motor vehicles from driving, stopping or waiting in the bikeway. They also provide greater comfort to pedestrians by providing separation from bicyclists operating at higher speeds.

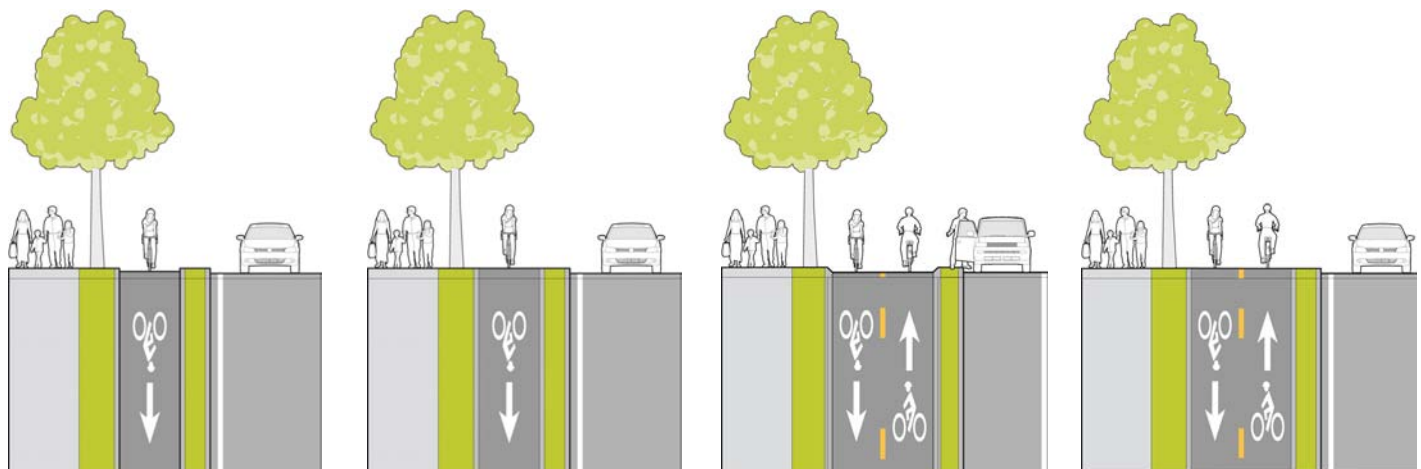
Separated bike lanes can provide different levels of separation:

- SBLs with flexible delineator posts (“flex posts”) alone offer the least separation from traffic and are appropriate as interim solution.
- SBLs that are raised with a wider buffer from traffic provide the greatest level of separation from traffic but will often require road reconstruction.
- SBLs that are protected from traffic by a row of on-street parking offer a high-degree of separation.

Separated bike lanes can generally be considered on any street with one or more of the following characteristics:

- 3 lanes or more traffic lanes,
- Posted speed limit of 30 mph or more,
- Traffic: 9,000 vehicles per day or more,
- Frequent on-street parking turnover,
- Frequent (or likely frequent) bike lane obstruction,
- And/or bus routes or truck routes.

Figure B-11: Separated Bike Lanes



(from left to right: one-way street level, one-way sidewalk level, two-way street level, two-way sidewalk level)

LIFE OF A BIKE LANE

Permanent separation designs provide a high level of protection and often have greater potential for placemaking, quality aesthetics, and integration with features such as green stormwater infrastructure. Agencies often implement permanent separation designs by leveraging private development (potentially through developer contribution), major capital construction, and including protected bike lanes in roadway reconstruction designs.

Often permanent physical separation designs can be expensive, even prohibitively so. However, separated bike lanes have been implemented in many cases as low-cost retrofit or demonstration projects (e.g. using flexible delineator posts and paint within the existing right-of-way). These projects allow for quick implementation, responsiveness to public perception and ongoing evaluation. Separation types for short-term separated bike lane designs often include non-permanent separation, such as flexible delineator posts, planters or parking stops. Pilot projects allow the implementing agency to:

- Test the separated bike lane configuration for bicyclists and traffic operations,
- Evaluate public reaction, design performance, and safety effectiveness,
- Make changes if necessary, and
- Transition to permanent design as funds become available.

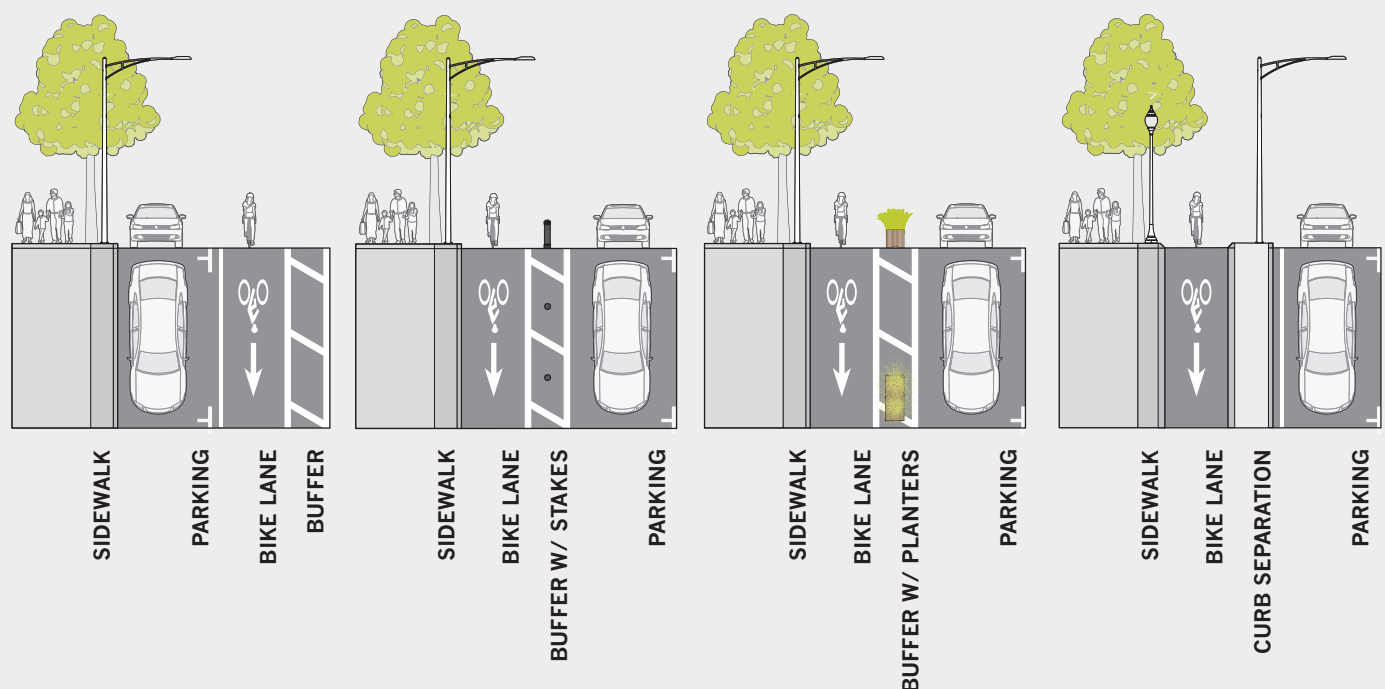


Figure B-12: Bike Lane Upgrading Process

SHARED USE PATH

A shared use path is a two-way facility physically separated from motor vehicle traffic and used by people walking, wheeling, and bicycling. Shared use paths are sometimes referred to as paved trails (when located in an independent alignment, such as a greenbelt or abandoned railroad) or sidepaths (when they follow roadways). Many people express a strong preference for the separation between bicycle and motor vehicle traffic provided by shared use paths when compared to on-street bikeways. Shared use paths may be desirable along high-volume and/or high-speed roadways, where accommodating the targeted type of bicyclist within the roadway in a safe and comfortable way is impractical.

According to AASHTO, “Shared use paths should not be used to preclude on-road bicycle facilities, but rather to supplement a network of on-road bike lanes, shared roadways, bicycle boulevards, and paved shoulders.” In other words, in some situations it may be appropriate to provide an on-road bikeway in addition to a sidepath along the same roadway.

Paths typically have a lower design speed for bicyclists than on-street facilities and may not provide appropriate accommodation for more confident bicyclists who desire to travel at greater speeds. In addition, greater numbers of driveways or intersections along a shared use path corridor can decrease bicycle travel speeds and traffic signals can increase delay for bicyclists on off-street paths compared to cyclists using in-street bicycle facilities such as bike lanes. Therefore, paths should not be considered a substitute to accommodating more confident bicyclists within the roadway.

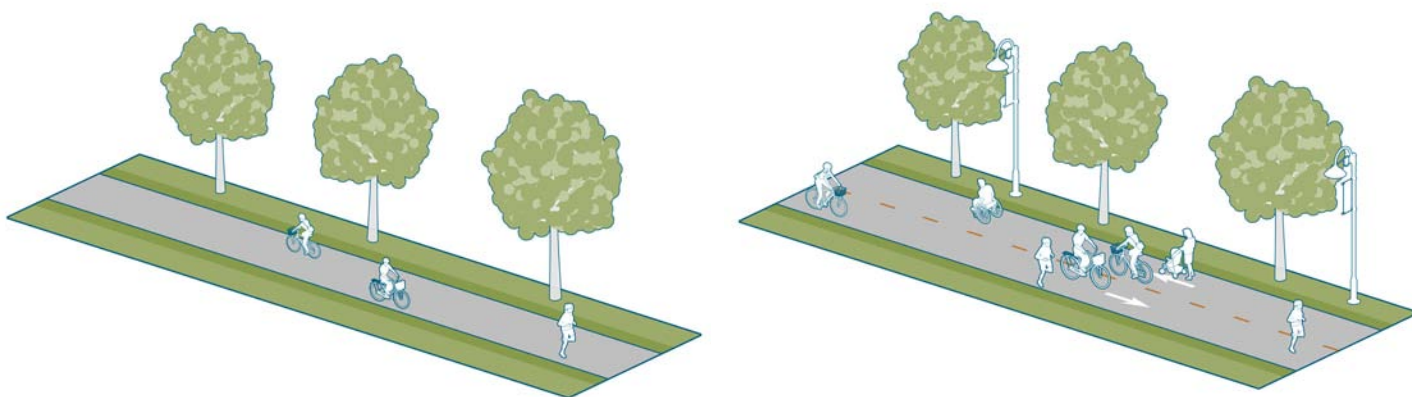


Figure B-13: Examples of Shared Use Paths (left, 8 foot path; right, 14 foot path)

Path material and path width should be determined based on three main characteristics: the number of users, the types of users, and the differences in their speeds. For example, a path that is used by higher-speed bicyclists and children walking to school may experience conflicts due to their difference in speeds. By widening the path to provide space to accommodate passing movements, conflicts can be reduced. Also, it can be useful to include soft surface parallel paths alongside hard surface paths; softer surfaces are preferred by some users, such as runners and walkers.

In general, shared use path width should be between 10 – 12 feet. Widths as narrow as 8 feet are acceptable for short distances under physical constraint. Warning signs should be considered at these locations. In locations with heavy volumes or a high proportion of pedestrians, widths exceeding 10 feet are recommended. A minimum of 11 feet is required for users to pass with a user traveling in the other direction. It may be beneficial to separate bicyclists from pedestrians by constructing parallel paths for each mode.

Paths must be designed according to state and national standards. This includes establishing a design speed (typically 18 mph) and designing path geometry accordingly. Consult the AASHTO Guide for the Development of Bicycle Facilities for guidance on geometry, clearances, traffic control, railings, drainage, and pavement design.

Shared use paths, however, may present increased conflicts between path users and motor vehicles at intersections and driveway crossings if not properly designed. Conflicts can be reduced by minimizing the number of driveway and street crossings present along a path and otherwise providing high-visibility crossing treatments and speed reduction counter measures at conflict points.

Path clearances are another important element in path design and reducing user conflicts. Vertical objects close to the path edge can endanger users and reduce the comfortable usable width of the path. Along the path, vertical objects should be set back at least two feet from the edge of the path. Path shoulders may also reduce conflicts by providing space for users who step off the path to rest, allowing users to pass one another, or providing space for viewpoints.



Figure B-14: Examples of Shared Use Paths

TRAFFIC CALMING

Traffic calming aims to slow the speeds of motorists to a “desired speed” (usually 20 mph or less for residential streets and 25 to 35 mph for collectors and minor arterials). The greatest benefit of traffic calming is increased safety and comfort for all people on and crossing the street. Compared with conventionally-designed streets, traffic calmed streets typically have fewer collisions and far fewer injuries and fatalities. These safety benefits are the result of slower speeds for motorists that result in greater driver awareness, shorter stopping distances, and less kinetic energy during a collision.

Prior to permanently implementing a traffic calming measure, it may be useful to introduce a temporary measure using paint, cones, or street furniture, as changes can easily be made to the design. A formal policy or procedure can help a community objectively determine whether traffic calming measures should be installed on a street or in a neighborhood. Such a procedure should include traffic and speed studies and a way to gather input and approval from neighborhood residents.



Figure B-15: Neighborhood Bicycle Boulevard



Figure B-16: Neighborhood Traffic Circle



Figure B-17: Simple Curb Extension

SPEED HUMPS & CUSHIONS: VERTICAL ELEMENTS SLOWING DRIVING SPEED

Vertical deflections such as speed humps and speed cushions should have a smooth leading edge, a parabolic rise, and be engineered for a speed of 25 to 30 mph. Speed humps or speed cushions are not typically used on collector or arterial streets. They should be clearly marked with reflective markings and signs so that they are visible at night.

Typically speed humps are 22 feet long, with a rise of 6 inches above the roadway. They should extend the full width of the roadway and should be tapered to the gutter to accommodate drainage. Speed humps are not typically used on roads with rural cross-sections; however, if they are used on such roads, they should match the full pavement width (including paved shoulders).



Figure B-18: Speed Bump



Figure B-20: Speed Hump/Cushion Profiles



Figure B-19: Neighborhood Traffic Circles

HORIZONTAL ELEMENTS: CURB EXTENSIONS, CHICANES, & NEIGHBORHOOD TRAFFIC CIRCLES

Horizontal traffic calming reduces speeds by narrowing lanes, which creates a sense of enclosure and additional friction between passing vehicles. Narrower conditions require more careful maneuvering around fixed objects and when passing bicyclists or oncoming automobile traffic. Horizontal treatments are most effective if they deflect motorists mid-block (with chicanes) or within intersections (with neighborhood traffic circles).

Horizontal traffic calming treatments can be appropriate along street segments or at intersections where width contributes to higher motor vehicle speeds. It can be particularly effective at locations where:

- On-street parking is low-occupancy during most times of day,
- And/or there is a desire to remove or decrease stop control at a minor intersection.

Some treatments may slow traffic by creating a yield situation where one driver must wait to pass. Horizontal traffic calming treatments must be designed to deflect motor vehicle traffic without forcing the bicycle path of travel to be directed into a merging motorist.

Neighborhood traffic circles should be considered at local street intersections to prioritize the through movement of bicyclists (by removing stop control or converting to yield control) without enabling an increase in motorist's speeds.

The size of chicanes will vary based on the targeted design speed and roadway width but must be 20 feet wide curb-to-curb at a minimum to accommodate emergency vehicles. A typical curb radius of 20 feet should be used wherever possible, including where there are higher pedestrian volumes and fewer larger vehicles.

Infrastructure costs will range dependent upon the complexity and permanence of design. Simple, interim treatments such as striping and flexible delineator posts are low-cost options. Curbed, permanent treatments that integrate plantings or green infrastructure are higher-cost.



Figure B-21: Chicanes as Traffic Calming



Figure B-22: Bulb Out Extending Pedestrian Zone

OTHER RESOURCES

The following publications provide additional information for planning and designing safe, comfortable active transportation infrastructure in various contexts:

- Massachusetts Department of Transportation's (MASSDOT) Separated Bike Lane Planning and Design Guidance
- FHWA's Separated Bike Lane Planning and Design Guide
- FHWA's Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts
- FHWA's Incorporating On-Road Bicycle Networks into Resurfacing Projects
- National Association of City Transportation Officials' (NACTO) Urban Street Design Guide
- NACTO's Transit Street Design Guide
- NACTO's Urban Bikeway Design Guide
- American Association of State Highway and Transportation Officials' (AASHTO) Guide for the Development of Bicycle Facilities (new for 2017)
- AASHTO's Guide for the Planning, Design, and Operations of Pedestrian Facilities



APPENDIX



Opinion of probable cost

- Probable Cost
- Sidewalks
- Rural Striped
Shoulders
- Bike Lanes
- Buffered Bike Lanes
- Separated Bike Lanes
- Shared Use Path
- Traffic Calming

C

PROBABLE COST

The following tables detail probable costs for the types of bicycle and pedestrian facilities recommended in the Active Tyler Plan. Several of the facility types include both a rural and urban context cost. Categorizing facility costs in this manner should provide more accurate project estimates to budget for design and construction.

The costs presented in the tables are planning-level estimates for a facility; more detailed costs should be calculated based on individual project criteria and constraints. Where applicable, costs reflect on one side of the roadway. It is also important to note that costs are based on TXDOT bid unit prices for November 2018 through January 2019; construction costs should be adjusted for inflation at the time of implementation.

SIDEWALKS

Table C-1: Rural Sidewalk Costs

SIDEWALKS - RURAL CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Excavation	CY	\$7.00	0.11	\$0.78
Concrete Sidewalks (4")	SY	\$50.00	0.56	\$27.78
Furnishing and Placing Topsoil	SY	\$0.50	0.67	\$0.33
Block Sodding	SY	\$2.50	0.67	\$1.67
Mailbox Install	EA	\$300.00	-	\$0.17
Sign Relocation	EA	\$350.00	-	\$0.13
TOTAL				\$30.86
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Traffic Control	LS	0.5%	-	\$0.15
Utilities	LS	0.5%	-	\$0.15
Erosion Control	LS	2.0%	-	\$0.62
Mobilization	LS	10.0%	-	\$3.09
UNKNOWNNS TOTAL				\$4.01
CONTINGENCY (30%)				\$9.26
TOTAL ESTIMATE COST PER LF				\$44.13

Assumptions:

1. Assume 3 Mailbox Relocations per Mile
2. Assume 2 Sign Relocations per Mile

Table C-2: Urban Sidewalk Costs

SIDEWALK - URBAN CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Excavation	CY	\$7.00	0.11	\$0.78
Concrete Sidewalks (4")	SY	\$50.00	0.56	\$27.78
Concrete Curb (Type I)	LF	\$25.00	1.00	\$25.00
Furnishing and Placing Topsoil	SY	\$0.50	0.67	\$0.33
Block Sodding	SY	\$2.50	0.67	\$1.67
Mailbox Install	EA	\$300.00	-	\$0.17
Sign Relocation	EA	\$350.00	-	\$0.13
TOTAL				\$55.86
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Traffic Control	LS	4.0%	-	\$2.23
Utilities	LS	2.0%	-	\$1.12
Erosion Control	LS	2.0%	-	\$1.12
Mobilization	LS	10.0%	-	\$5.59
UNKNOWNNS TOTAL				\$10.05
CONTINGENCY (30%)				\$16.76
TOTAL ESTIMATE COST PER LF				\$82.67

Assumptions: N/A

RURAL STRIPED SHOULDERS

Table C-3: Rural Striped Shoulder Costs

STRIPED SHOULDERS - RURAL CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Reflective 4" White Stripe	LF	\$0.65	1.00	\$0.65
TOTAL				\$0.65
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Traffic Control	LS	2.0%	-	\$0.01
Utilities	LS	0.0%	-	\$0.00
Erosion Control	LS	1.0%	-	\$0.01
Mobilization	LS	5.0%	-	\$0.03
UNKNOWNNS TOTAL				\$0.05
CONTINGENCY (30%)				\$0.20
TOTAL ESTIMATE COST PER LF				\$0.90

Assumptions:

1. Assumes existing shoulder width is sufficient.

BIKE LANES

Table C-4: Rural Bike Lane Costs

BIKE LANES - RURAL CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Reflective 4" White Stripe	LF	\$0.65	1.00	\$0.65
Reflective Bike Symbol	EA	\$250.00		\$0.09
Reflective Arrow	EA	\$80.00	1.00	\$0.03
Signing	EA	\$350.00	-	\$0.13
TOTAL				\$0.91
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Traffic Control	LS	2.0%	-	\$0.02
Utilities	LS	0.0%	-	\$0.00
Erosion Control	LS	1.0%	-	\$0.01
Mobilization	LS	5.0%	-	\$0.05
UNKNOWNNS TOTAL				\$0.07
CONTINGENCY (30%)				\$0.27
TOTAL ESTIMATE COST PER LF				\$1.25

Assumptions:

1. Assumes existing shoulder width is sufficient.
2. Assumes 2 'Bike Lane' Signs per Mile
3. Assumes 2 Bike Lane Symbols per Mile

Table C-5: Urban Bike Lane Costs

BIKE LANES - URBAN CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Reflective 4" White Stripe	LF	\$0.65	1.00	\$0.65
Reflective Bike Symbol	EA	\$250.00		\$0.09
Reflective Arrow	EA	\$80.00	1.00	\$0.03
Signing	EA	\$350.00	-	\$0.13
TOTAL				\$0.91
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Lane Reassignment (Misc.)	LS	50.0%		\$0.45
Traffic Control	LS	5.0%	-	\$0.05
Utilities	LS	0.0%	-	\$0.00
Erosion Control	LS	1.0%	-	\$0.01
Mobilization	LS	15.0%	-	\$0.14
UNKNOWNNS TOTAL				\$0.64
CONTINGENCY (30%)				\$0.27
TOTAL ESTIMATE COST PER LF				\$1.82

Assumptions:

1. Assumes existing shoulder width is sufficient.
2. Assumes 2 "Bike Lane" Signs per Mile
3. Assumes 2 Bike Lane Symbols per Mile
4. Assumes misc. lane restriping for length of Bike Lane

BUFFERED BIKE LANES

Table C-6: Rural Buffered Bike Lane Costs

BUFFERED BIKE LANES - RURAL CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Reflective 4" White Stripe	LF	\$0.65	2.00	\$1.30
Reflective Chevron	LF	\$29.75	-	\$2.98
Signing	EA	\$350.00	-	\$0.13
TOTAL				\$4.41
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Lane Reassignment (Misc.)	LS	50.0%		\$2.20
Traffic Control	LS	2.0%	-	\$0.09
Utilities	LS	0.0%	-	\$0.00
Erosion Control	LS	1.0%	-	\$0.04
Mobilization	LS	5.0%	-	\$0.22
UNKNOWNNS TOTAL				\$2.56
CONTINGENCY (30%)				\$1.32
TOTAL ESTIMATE COST PER LF				\$8.29

Assumptions:

1. Assume 1 Chevron/10-ft. (6-ft Wide, 8.5' of 12" Stripe)
2. Assumes 2 'Bike Lane' Signs per Mile
3. Assume pavement is to remain as-is

Table C-7: Urban Buffered Bike Lane Costs

BUFFERED BIKE LANES - URBAN CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Reflective 4" White Stripe	LF	\$0.65	2.00	\$1.30
Reflective Chevron	LF	\$29.75	-	\$2.98
Reflective Bike Symbol	EA	\$250.00		\$0.09
Reflective Arrow	EA	\$80.00	1.00	\$0.03
Signing	EA	\$350.00	-	\$0.13
TOTAL				\$4.53
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Lane Reassignment (Misc.)	LS	50.0%	-	\$2.27
Traffic Control	LS	5.0%	-	\$0.23
Utilities	LS	0.0%	-	\$0.00
Erosion Control	LS	1.0%	-	\$0.05
Mobilization	LS	10.0%	-	\$0.45
UNKNOWNNS TOTAL				\$2.99
CONTINGENCY (30%)				\$1.36
TOTAL ESTIMATE COST PER LF				\$8.88

Assumptions:

1. 1 Chevron/10-ft. (6-ft Wide, 8.5' of 12" Stripe)
2. 2 'Bike Lane' Signs per Mile
3. Pavement to Remain As-Is

SEPARATED BIKE LANES

Table C-8: Rural Separated Bike Lane Costs

SEPARATED BIKE LANES (6' WIDE) - RURAL CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Concrete Curb (Type I)	LF	\$25.00	2.00	\$50.00
Stabilized Base	TN	\$76.00	0.03	\$2.53
6' Asphalt (110lb/SY)	SY	\$3.50	0.67	\$2.33
Furnishing and Placing Topsoil	SY	\$0.50	0.67	\$0.33
Remove Stab. Base/Asph.(6")	SY	\$6.00	0.11	\$0.67
Reflective Bike Symbol	EA	\$250.00	-	\$0.09
Signing	EA	\$350.00	-	\$0.13
TOTAL				\$56.09
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Lane Reassignment (Misc.)	LS	10.0%	-	\$5.61
Traffic Control	LS	20.0%	-	\$11.22
Utilities	LS	10.0%	-	\$5.61
Erosion Control	LS	5.0%	-	\$2.80
Mobilization	LS	20.0%	-	\$11.22
UNKNOWNNS TOTAL				\$36.46
CONTINGENCY (30%)				\$16.83
TOTAL ESTIMATE COST PER LF				\$109.38

Assumptions:

1. 6' Separation
2. 2 'Bike Lane' Signs per Mile
3. 2 'Bike Lane' Signs per Mile
4. One-Way Directional Separation
5. Existing Pavement Width Used
6. Patch on both sides of Curb & Gutter

Table C-9: Urban Separated Bike Lane Costs

SEPARATED BIKE LANES (6' WIDE) - URBAN CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Concrete Curb (Type I)	LF	\$25.00	3.00	\$75.00
Stabilized Base	TN	\$76.00	0.03	\$2.53
6' Asphalt (110lb/SY)	SY	\$3.50	0.67	\$2.33
Furnishing and Placing Topsoil	SY	\$0.50	0.67	\$0.33
Remove Stab. Base/Asph.(6")	SY	\$6.00	0.11	\$0.67
Reflective Bike Symbol	EA	\$250.00	-	\$0.09
Signing	EA	\$350.00	-	\$0.13
TOTAL				\$81.09
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Lane Reassignment (Misc.)	LS	5.0%		\$4.05
Traffic Control	LS	30.0%	-	\$24.33
Planting/Landscape	LS	10.0%		\$8.11
Utilities	LS	15.0%	-	\$12.16
Erosion Control	LS	5.0%	-	\$4.05
Mobilization	LS	15.0%	-	\$12.16
UNKNOWNNS TOTAL				\$64.88
CONTINGENCY (30%)				\$24.33
TOTAL ESTIMATE COST PER LF				\$170.30

Assumptions:

1. 6' Separation
2. 2 'Bike Lane' Signs per Mile
3. 2 'Bike Lane' Signs per Mile
4. One-Way Directional Separation
5. Existing Pavement Width Used
6. Patch on both sides of Curb & Gutter

SHARED USE PATH

Table C-10: Rural Shared Use Path Costs

SHARED USE PATH (12' WIDE) - RURAL CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Stabilized Base	TN	\$76.00	0.20	\$15.20
12' Asphalt (110lb/SY)	SY	\$3.50	1.33	\$4.67
Furnishing and Placing Topsoil	SY	\$0.50	1.67	\$0.83
Earthwork	CY	\$25.00	0.56	\$13.89
Mailbox Install	EA	\$300.00	-	\$0.17
Signing	EA	\$350.00	-	\$0.13
TOTAL				\$34.89
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Lane Reassignment (Misc.)	LS	5.0%	-	\$1.74
Traffic Control	LS	10.0%	-	\$3.49
Utilities	LS	20.0%	-	\$6.98
Erosion Control	LS	5.0%	-	\$1.74
Mobilization	LS	20.0%	-	\$6.98
UNKNOWNNS TOTAL				\$20.94
CONTINGENCY (30%)				\$10.47
TOTAL ESTIMATE COST PER LF				\$66.29

Assumptions:

1. 12-ft wide path and 15-ft landscape buffer.

Table C-11: Urban Shared Use Path Costs

SHARED USE PATH (12' WIDE) - URBAN CONTEXT				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Concrete Curb (Type I)	LF	\$25.00	1.00	\$25.00
Stabilized Base	TN	\$76.00	0.20	\$15.20
12' Asphalt (110lb/SY)	SY	\$3.50	1.33	\$4.67
Furnishing and Placing Topsoil	SY	\$0.50	0.67	\$0.33
Earthwork	CY	\$25.00	0.22	\$5.56
Reflective Bike Symbol	EA	\$250.00	-	\$0.09
Mailbox Install	EA	\$300.00	-	\$0.17
Signing	EA	\$350.00	-	\$0.13
TOTAL				\$51.15
UNKNOWNNS				
Item	Unit	Cost (TXDOT)	Quantity	Cost Per Linear Foot
Lane Reassignment (Misc.)	LS	5.0%		\$2.56
Traffic Control	LS	20.0%	-	\$10.23
Planting/Landscape	LS	5.0%		\$2.56
Utilities	LS	10.0%	-	\$5.12
Erosion Control	LS	5.0%	-	\$2.56
Mobilization	LS	20.0%	-	\$10.23
UNKNOWNNS TOTAL				\$33.25
CONTINGENCY (30%)				\$15.35
TOTAL ESTIMATE COST PER LF				\$99.75

Assumptions:

1. 12-ft wide path and 6-ft landscape buffer.

TRAFFIC CALMING

Table C-12: Traffic Calming Costs

TRAFFIC CALMING MEASURES			
ITEM	UNIT	COST	ASSUMPTIONS
MID-BLOCK CROSSINGS	EA	\$14,500.00	40' x 8', Assumes curb and gutter, DWS included
CURB EXTENSIONS	EA	\$13,000.00	40' x 8' on oneside of roadway
PEDESTRIAN SIGNALS (SINGLE APPROACH)	EA	\$2,200.00	Includes push button pole, Push button, countdown head
RECTANGULAR RAPID FLASHING BEACON	EA	\$15,000.00	Two units, solar powered, and signage for both approaches
HIGH INTENSITY ACTIVATED CROSSWALK	EA	\$85,000.00	Assuming connection to electricity exists and is easily retrofitted
RAISED CROSSING	EA	\$15,000.00	40' x 10', approaches assumed to be 6'
CHICANE	EA	\$25,000.00	40' x 8' on both sides of the road
ADA CURB RAMP	EA	\$3,200.00	Includes misc. curb and gutter repair, DWS
RAISED MEDIAN	LF	\$59.00	Type I C&G on both sides, Landscaped, Sawcut and removal required
NEIGHBORHOOD TRAFFIC CIRCLE	EA	\$5,437.00	Assume 10' diameter. Concrete center, not landscaped, 6" tall, Includes 5,000 Clear and Grubbing Cost
MEDIAN PEDESTRIAN REFUGE	EA	\$6,000.00	40' long, C&G, sawcut and removal required, with DWS
CROSSWALK - STANDARD	EA	\$600.00	8' wide, 40' long
CROSSWALK - HIGH VISIBILITY	EA	\$1,200.00	12' wide, 40' long