



Lubbock Metropolitan Planning Organization

Working Together



Resolution 2019-02

WHEREAS, the Transportation Policy Committee (TPC) of the Lubbock Metropolitan Planning Organization (LMPO) appointed 17 citizens to serve on the Oversight Planning Committee (OPC) to assist the Transportation Advisory Committee (TAC) in guiding the planning consultants in the development, facilitation, production and delivery of the Comprehensive Regional Bicycle and Pedestrian Master Plan for the Lubbock Metropolitan Urbanized Area (UA); and

WHEREAS, over the course of approximately thirteen months, the OPC and TAC worked with consultants, held several meetings open to the public, solicited and encouraged community feedback, conducted four public open houses, and regularly apprised the TPC and TAC of its progress throughout the plan development process; and

WHEREAS, at its regularly scheduled meeting on December 4, 2018 the TAC recommended the Walk and Bike Lubbock Pedestrian and Bicycle Master Plan to the Transportation Policy Committee.

NOW, THEREFORE, BE IT RESOLVED BY THE TRANSPORTATION POLICY COMMITTEE OF THE LUBBOCK METROPOLITAN PLANNING ORGANIZATION:

Section 1: That, the project team successfully reached out to the public and stakeholders to receive feedback on what the vision of the plan should be; A unified and integrated bike and pedestrian system that connects people of all ages and abilities to desired destinations and encourages their participation for transportation and/or recreational purposes in a safe manner.

Section 2: That, the plan is Coherent, Comfortable, Complete, Compliant, Connected, Constructible, and Maintainable, Continuous and Culture (8 C's).

Section 3: That, the public and stakeholders all agree on the benefits of walking and bicycling; Economy, Environment, Health, Livability, Mobility, and Safety.

Section 4: That, the goals of the Public Engagement Plan were met and serve to demonstrate that increasing awareness and subtly improving perception combined with education and enforcement of laws can have a significant impact on the culture of the community towards walking and bicycling as well the culture of those who participate in biking and walking.

Section 5: That, the Transportation Policy Committee of the LMPO has elected, upon recommendation of the TAC and the OPC, to give formal approval to the Walk and Bike Lubbock Master Plan.

Passed by the Transportation Policy Committee this 18th day of December, 2018.



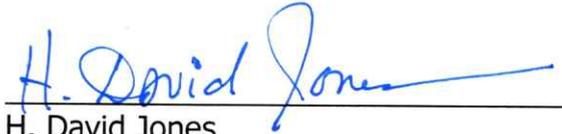
Jeff Griffith, Chairman
LMPO Transportation Policy Committee

Attest:



Tammy Walker, MPO Secretary

Approved as to Content:

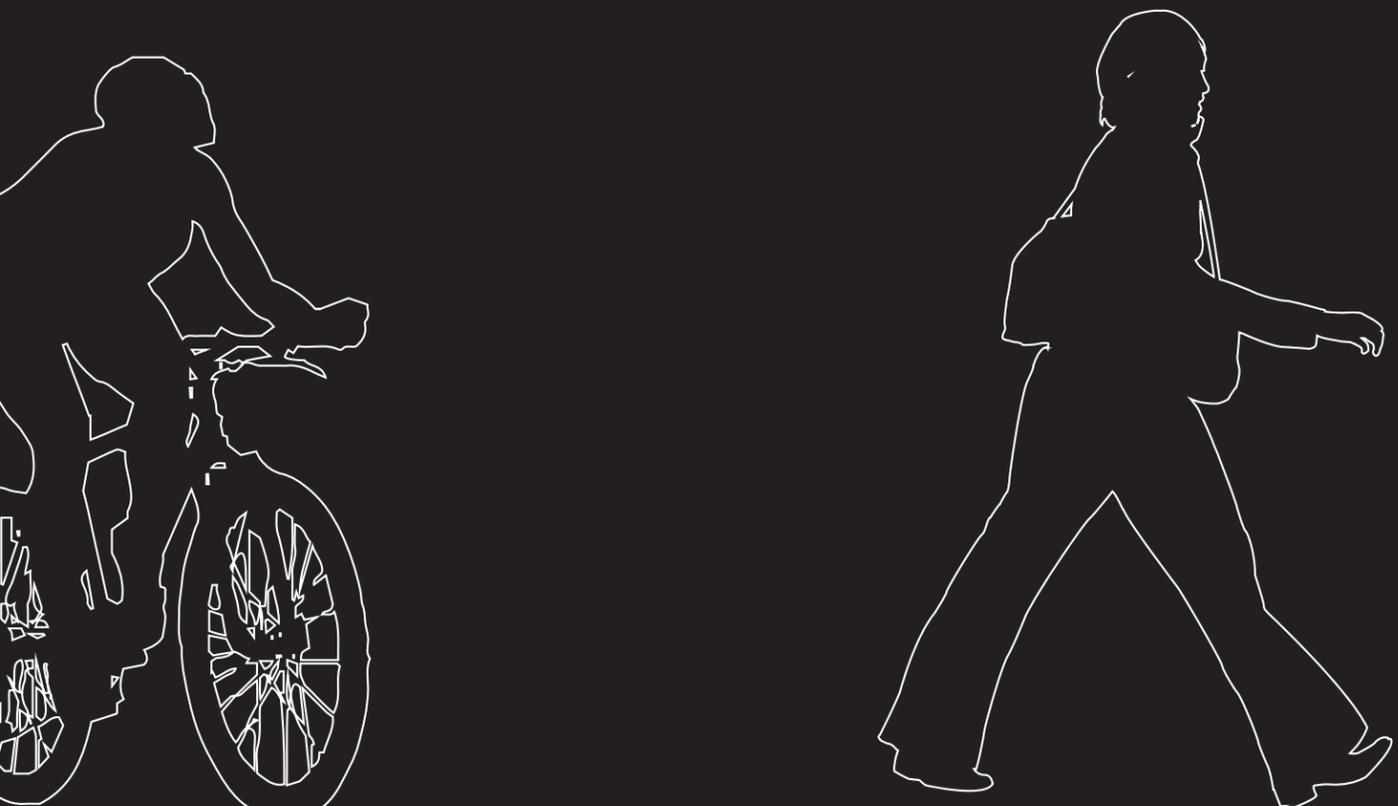


H. David Jones
Transportation Planning Director

Approved as to form:



Matt Wade
Attorney for the MPO



LUBBOCK PEDESTRIAN AND BICYCLE MASTER PLAN

WALK & BIKE
LUBBOCK

F I N A L D R A F T

Pedestrian and Bicycle Master Plan

Prepared for:
LUBBOCK METROPOLITAN PLANNING ORGANIZATION

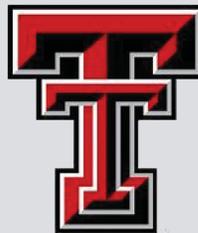


DECEMBER 2018
Prepared by:
Kimley»Horn
TOOLE
DESIGN

ACKNOWLEDGMENTS

Thank you to all the citizens, stakeholders, MPO and City Staff that contributed to the creation of the Walk and Bike Lubbock Plan. Thank you specifically to the members of the Study Oversight Committee, listed below:

STUDY OVERSIGHT COMMITTEE



Prepared for the Lubbock Metropolitan Planning Organization

Project Team:



This project will further the safety of bicycle and pedestrians through improved infrastructure, enhanced policies, and new programs. During this plan development, one bicyclist, John David Nelson, was killed during his ride. This plan is dedicated to him and all bicyclists and pedestrians who have lost their lives.

Prepared by Kimley-Horn

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Chapter 1: Introduction

The Walk and Bike Lubbock Plan sets the stage for bringing the bicycle and pedestrian systems together into a unified network in the Lubbock Metropolitan Area. This plan builds on the work accomplished by the 1994 Comprehensive Bicycle Master Plan. Since the development of that plan, the Lubbock Metropolitan Area has seen the addition of more than 14 miles of bike lanes and now has more than 72 miles of signed bike routes, 12 miles of paved trails, and 15 miles of partially paved trails. Pedestrian improvements have been added recently as well, including shared sidepaths, curb ramps, and enhanced crossings.

Bicycle and Pedestrian design has also grown and evolved since the development of the 1994 Comprehensive Bicycle Master Plan. There is now a stronger push toward separated bicycle facilities and an enhanced pedestrian experience. Since 1994, national standards have been updated to reflect these advancements in building safer facilities. The purpose of the Walk and Bike Lubbock Plan is to establish, for the first time, a plan for pedestrian facilities in Lubbock and to re-examine the existing bicycle network through the lens of current best practices in both planning and design.

Vision and Goals

The project team reached out to the public and stakeholders of the Walk and Bike Lubbock Plan to receive feedback on what the vision for the plan should be. Based on the feedback received, the vision of the Walk and Bike Lubbock Plan is:

Walk and Bike Lubbock will create a **unified and integrated** regional bicycle and pedestrian system that **connects** people of **all ages and abilities** to desired destinations and encourages them to walk or bike for **transportation or recreational** purposes in a **safe** manner.

THE WALK AND BIKE LUBBOCK PLAN IS:

- » Coherent
- » Comfortable
- » Complete
- » Compliant
- » Connected
- » Constructible and Maintainable
- » Continuous
- » Culture

This vision will be accomplished with a focus on these eight C's:

COHERENT

The plan should be easy to understand on the map and on the ground. Proper signage and pavement markings can make bicycle and pedestrian routes simpler to navigate in a safe and efficient manner.



COMFORTABLE

Walking and biking in Lubbock should be a comfortable, low-stress experience. This can be accomplished when proper facilities are in place which provide a high level of safety and protection.



CULTURE

A focus on culture is key to a successful bicycle and pedestrian system. Creating a culture that is friendly to all modes of travel includes education, enforcement, awareness, and visibility. It is common that individuals may simply not know the laws and regulations regarding governing bicycle use on public roadways. Individuals may be unaware that walking or biking to their destination is a viable option, or they may feel discouraged from doing so because of a negative perception. The aim of this plan is to provide potential pedestrians and bicyclists additional options for walking and biking and to make it easier to understand how to get where they need to go. Added routes, facilities, signage, and markings can naturally make the bicycle and pedestrian system more visible to all, increasing awareness and subtly improving perception. When combined with education and enforcement of existing laws, carefully planned bicycle and pedestrian improvements can have a significant impact on culture.

Benefits of Active Transportation

The following table highlights several benefits that can be gained by promoting walking and bicycling in Lubbock.

Category	Definition	Potential Benefits
Economy	Strong economies are supported by job growth, increased sales revenue, and land development	Improving walk- and bike-ability can be a boon to homeowners and business owners
Environment	Environmental stewardship holds the community accountable to protect natural resources	More people walking and riding bikes can result in lower levels of motor vehicle emissions, cleaner air, and stronger preservation of streams and open spaces
Health	Health includes the mental state and physical condition of individuals and collective communities.	Walking and biking are low impact forms of exercise that can reduce stress and diseases such as high blood pressure, diabetes, and obesity
Livability	Livability comprises quality of life, sense of place, and community vibrancy for residents and visitors	Infrastructure features that increase comfort for bicyclists can enhance the character of communities by reducing motor vehicle speeds and improving safety
Mobility	Mobility is the equitable availability of transportation options for everyone	Walking or bicycling can be an attractive travel mode for short trips that would otherwise be made by driving
Safety	Safe travel conditions result from effective design, enforcement, and education.	The presence of bike and pedestrian infrastructure and people walking and riding bicycles naturally calms traffic, and fully separated facilities can provide safe and comfortable travel ways

Exhibit 1: Percent in Poverty

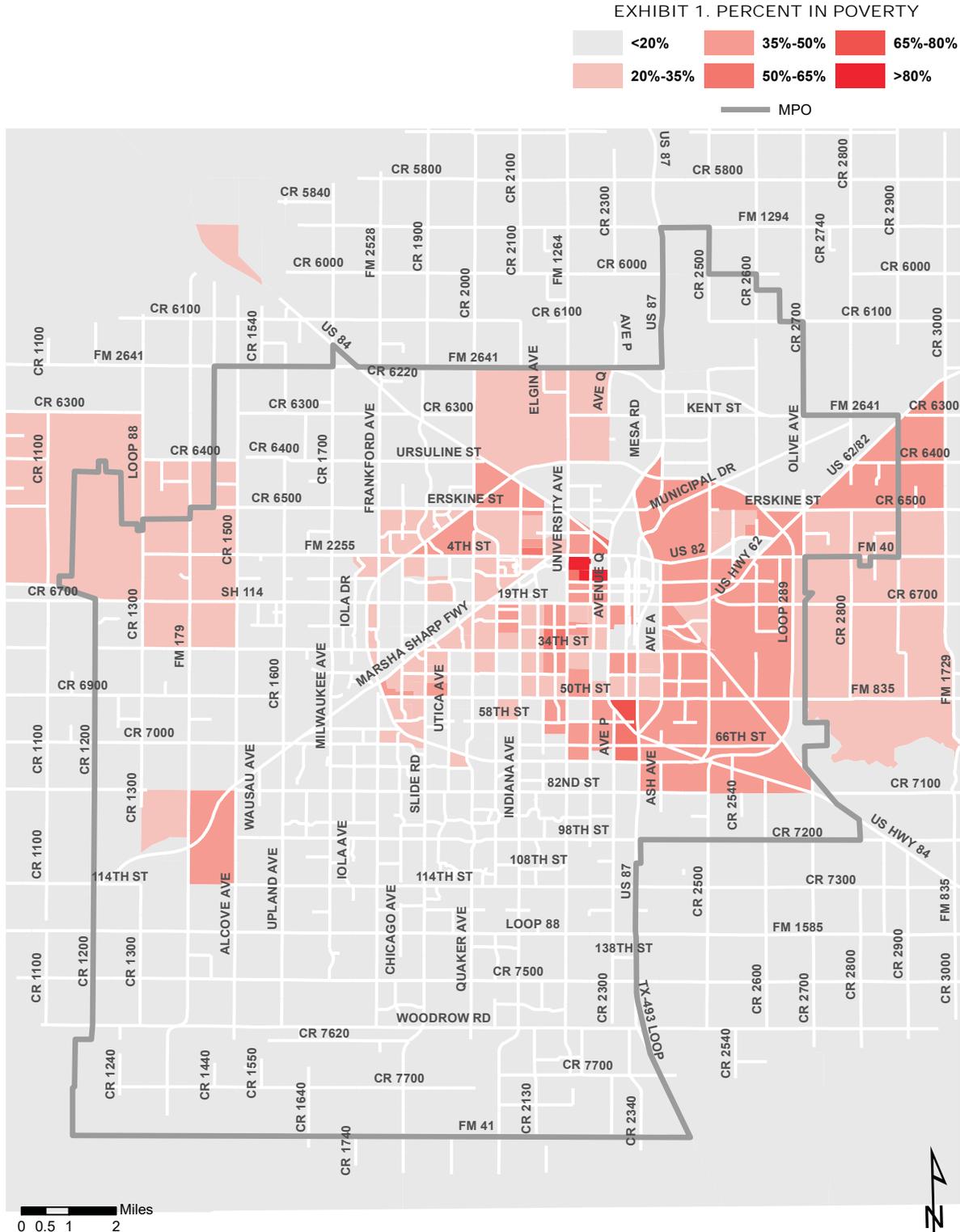


Exhibit 2: Percent in Minority

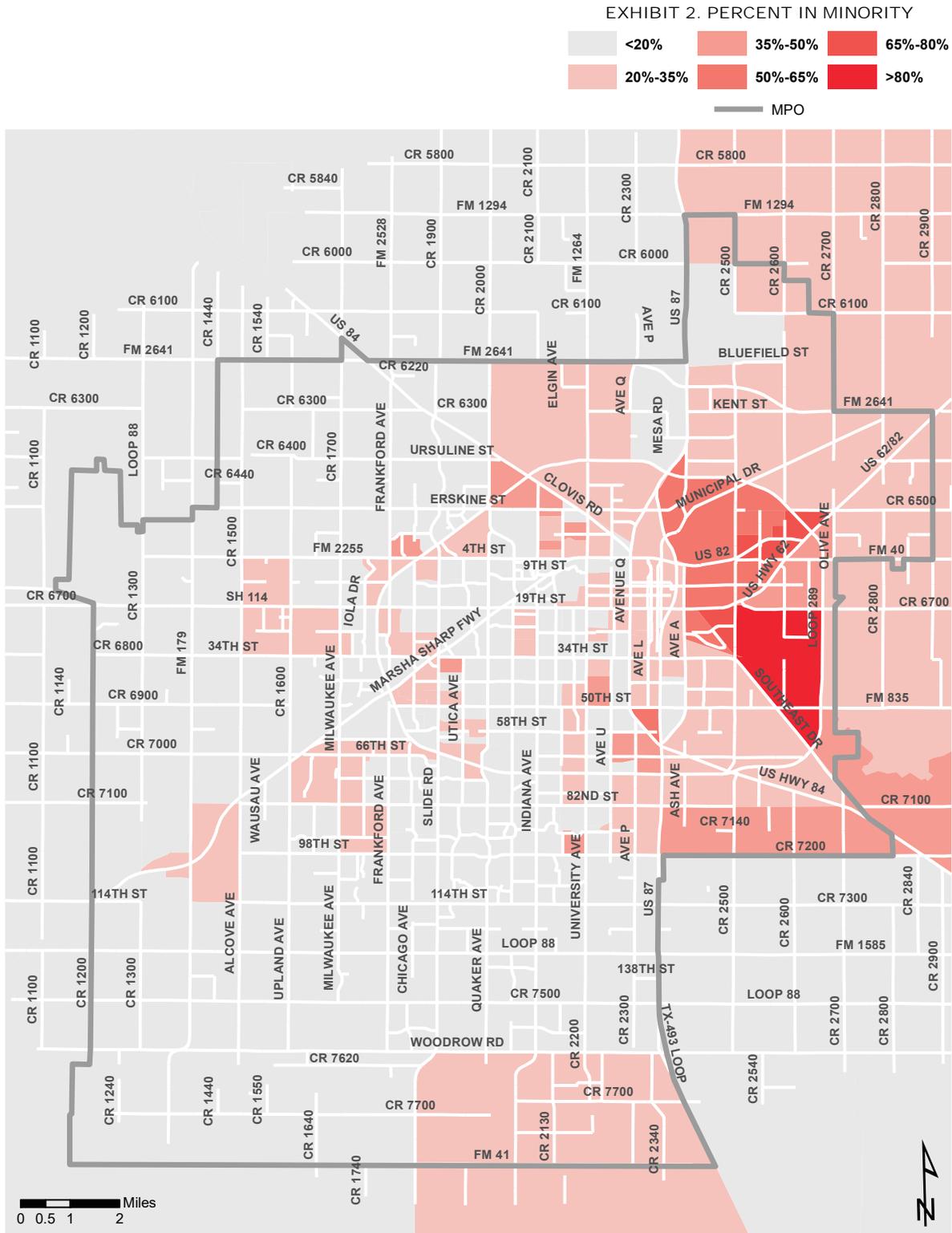


Exhibit 3: Percent Over 64

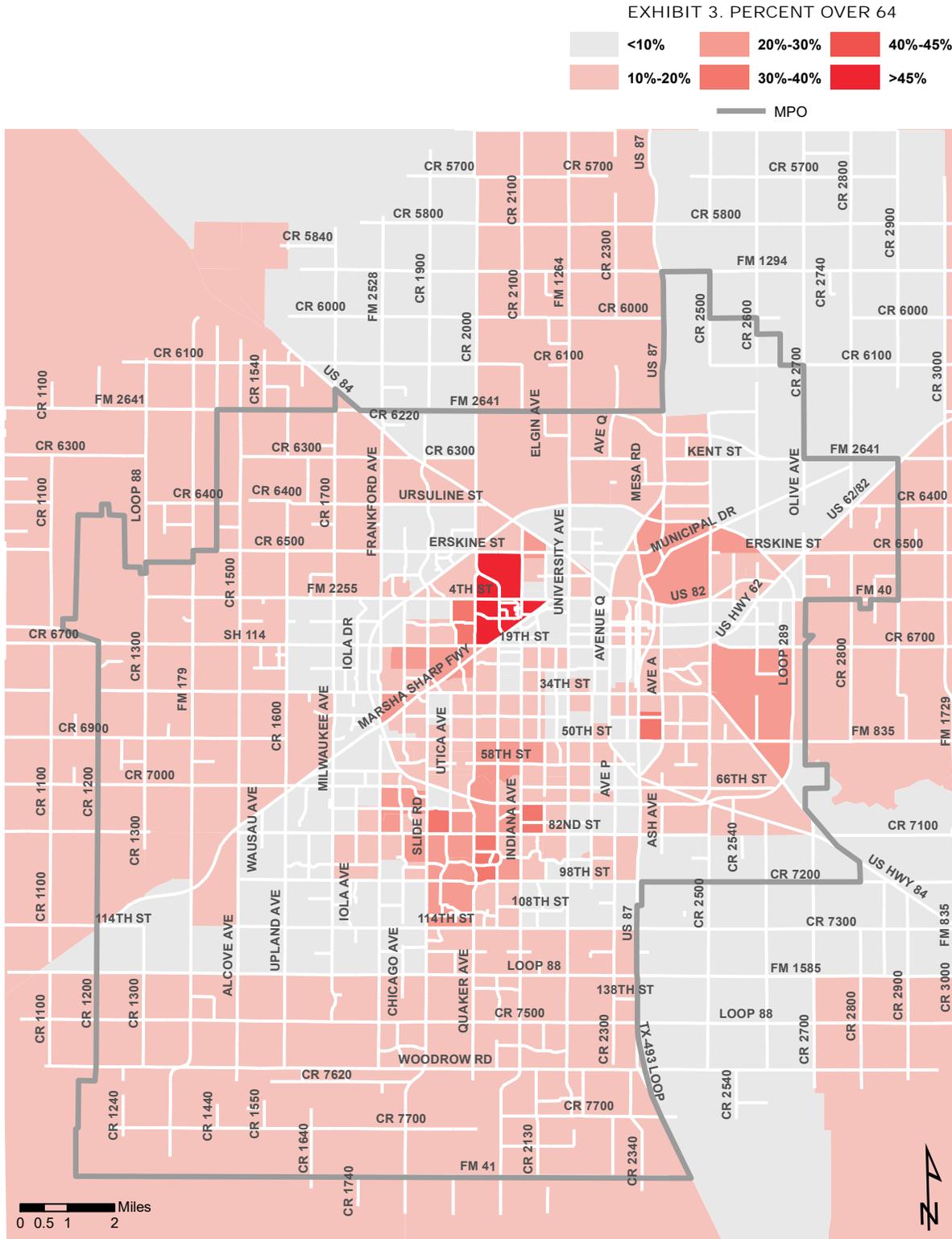


Exhibit 4: Percent Without a Motor Vehicle

EXHIBIT 4. PERCENT WITHOUT A MOTOR VEHICLE

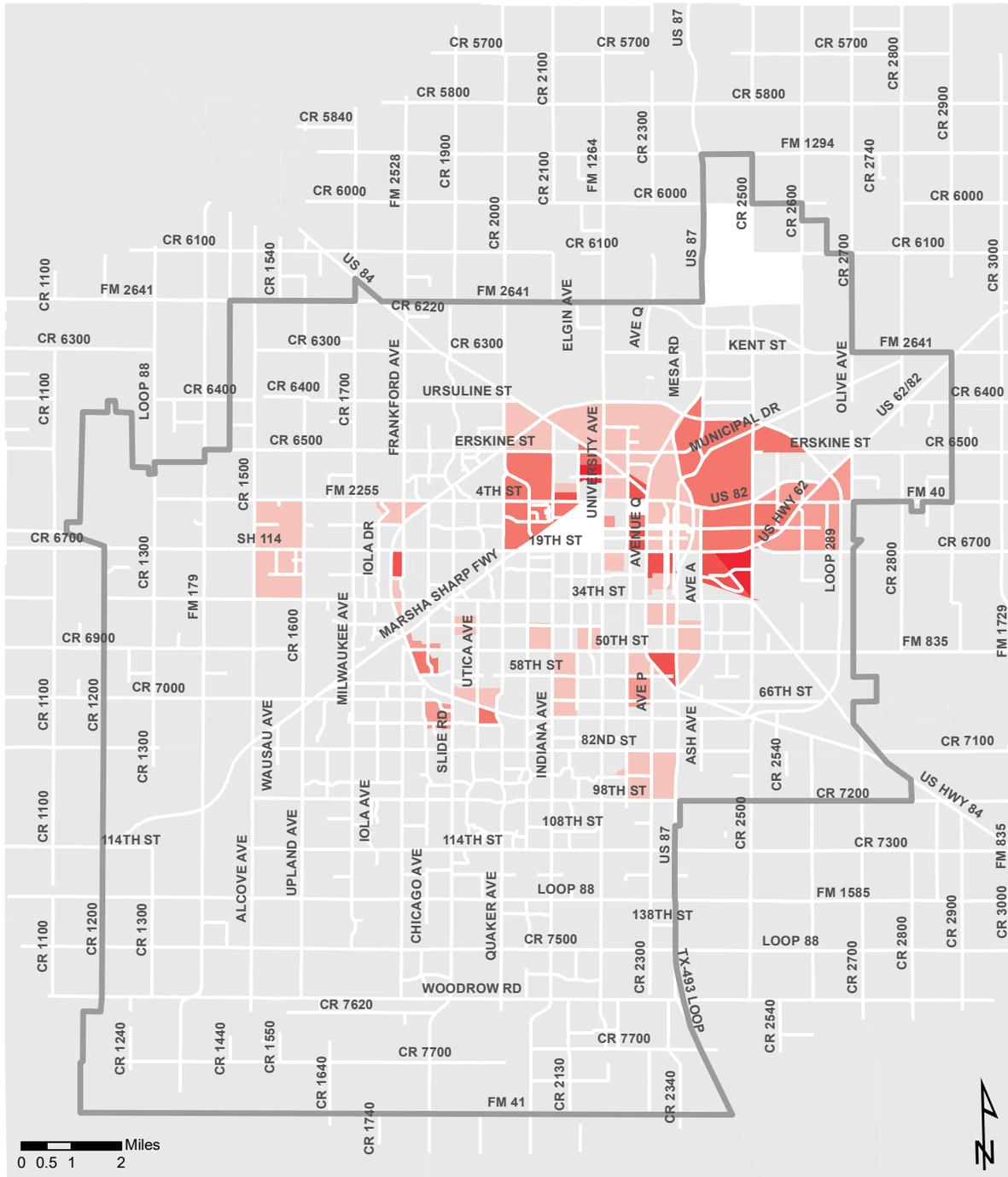


Exhibit 5: Percent of Trips Walking or Biking

EXHIBIT 5. PERCENT TRIPS WALKING OR BIKING



MPO

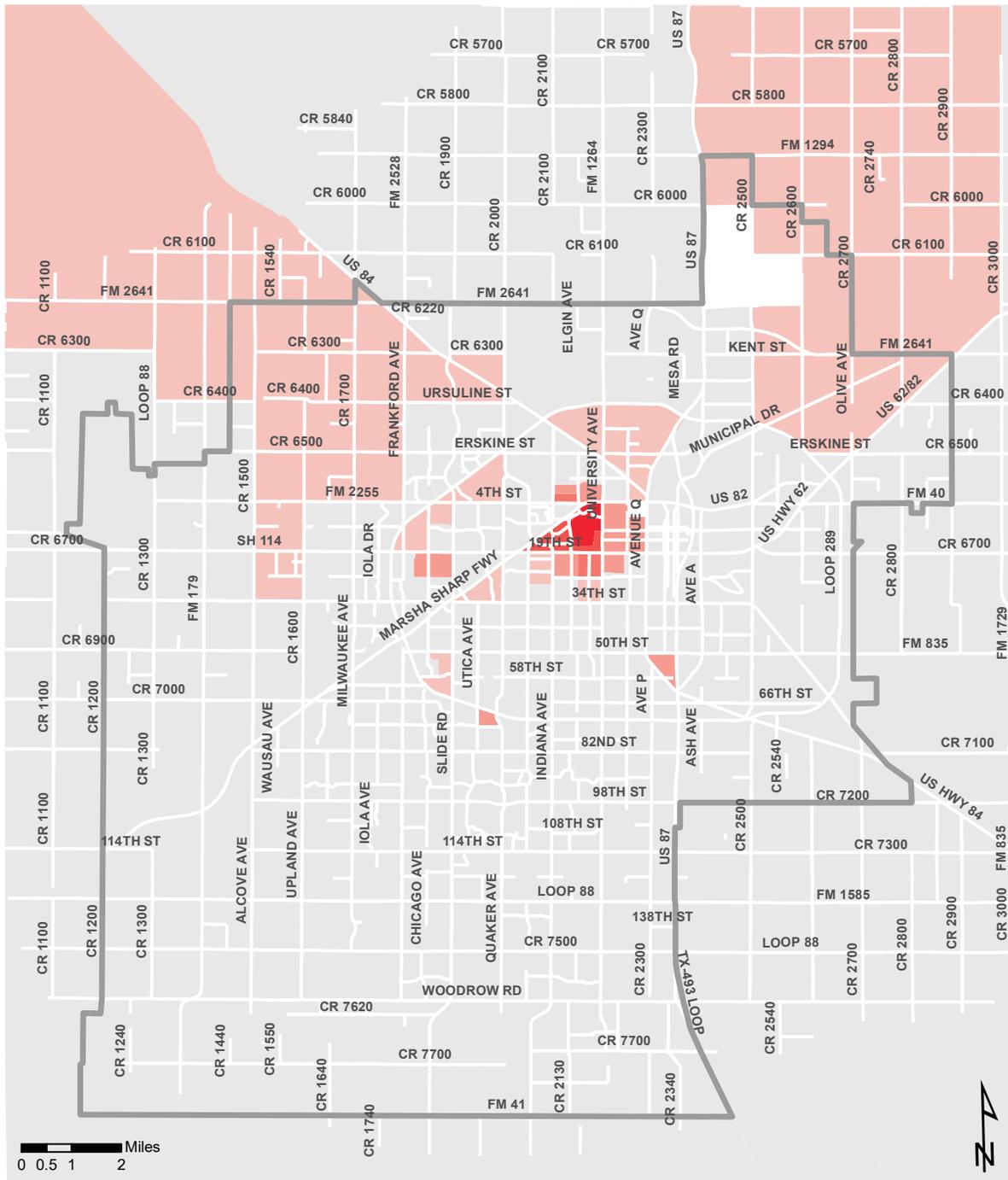


Exhibit 6: Percent of Trips on Public Transit

EXHIBIT 6. PERCENT TRIPS ON PUBLIC TRANSIT

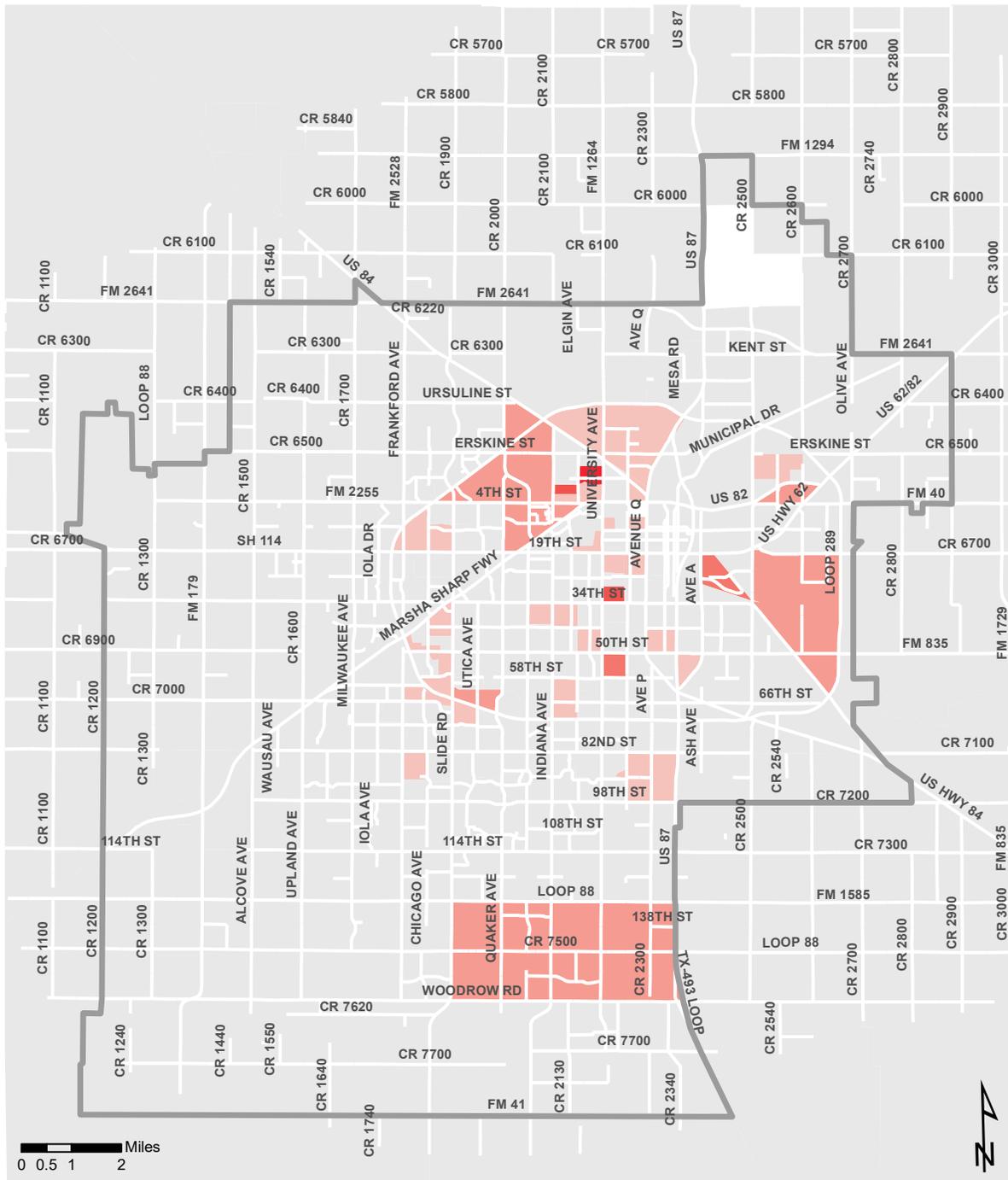
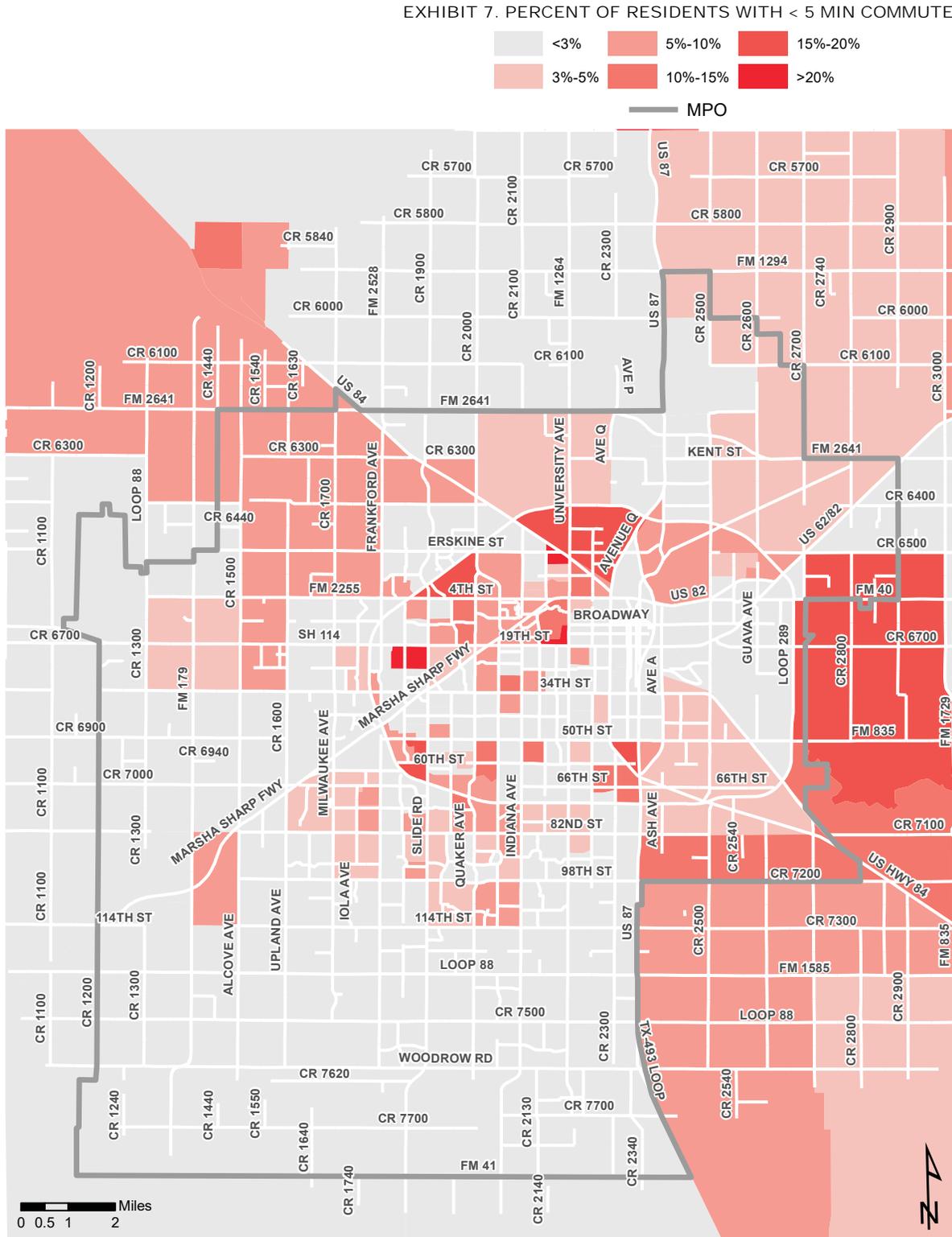


Exhibit 7: Percent of Residents with Less Than Five-Minute Commute



Street Network

The Lubbock street system was built on a solid foundation of a grid network with arterials spaced out every half-mile and collectors spaced at half-mile intervals between the arterials. The arterials in Lubbock are generally built with five-seven lanes and include wide outside lanes. Most of them have sidewalk gaps or other pedestrian barriers, no dedicated bicycle facilities, and are generally high volume and high speed. This makes crossing arterials as a pedestrian or bicycling on arterials in Lubbock difficult without a traffic signal or midblock crossing.

The top reasons individuals choose not to walk or bicycle in Lubbock are the discontinuous pedestrian facilities, relative lack of existing bikeways, and because they feel it is unsafe. A major barrier to bicycling along Lubbock's streets is the fear of collisions with motorists, which is heightened along roadways with fast-moving motor vehicle traffic, high volumes of motor vehicle traffic, or large percentages of truck traffic. Other physical barriers to walking and bicycling include Loop 289, poor pavement conditions, difficult crossings and gaps in the collector street network.

The Lubbock Master Thoroughfare Plan (MTP) was updated as part of Plan Lubbock 2040, the City of Lubbock's comprehensive long-term plan. In the updated MTP, pedestrian and bicycle facilities were incorporated into the new roadway functional classifications. All roadways in the MTP will be built with either sidewalks or shared-use paths, and some will be built with bike lanes. The bicycle plan, which is presented in Chapter 5 of this document, was based largely on the bicycle facilities identified in the MTP. In particular, all future principal arterials are planned to include shared-use sidepaths and all new minor arterials are planned to include buffered bicycle lanes, with the alternate option to include a shared-use sidepath.

Crash Statistics

The Texas Department of Transportation (TxDOT) collects and analyzes crash data submitted by Texas law enforcement officers. This dataset provides insight in highlighting key corridors and intersections for improvement. Streets that are characterized by a high frequency of motor vehicle crashes, a high severity of motor vehicle crashes, or both are generally unsafe environments for bicycle travel.

Between January of 2012 and December of 2017, a total of 38,587 crashes were reported along roadways in Lubbock County. In this same time, there were 651 reported crashes involving bicyclists and/or pedestrians in Lubbock County. A high concentration of bicycle and pedestrian crashes occurs near Texas Tech. A heat map illustrating the highest frequencies of bicycle- and pedestrian-involved crashes are shown in **Exhibit 8**.

Exhibit 8: Frequencies of Bicycle- and Pedestrian-Involved Crashes

EXHIBIT 8. BICYCLE AND PEDESTRIAN CRASHES
2012-2017

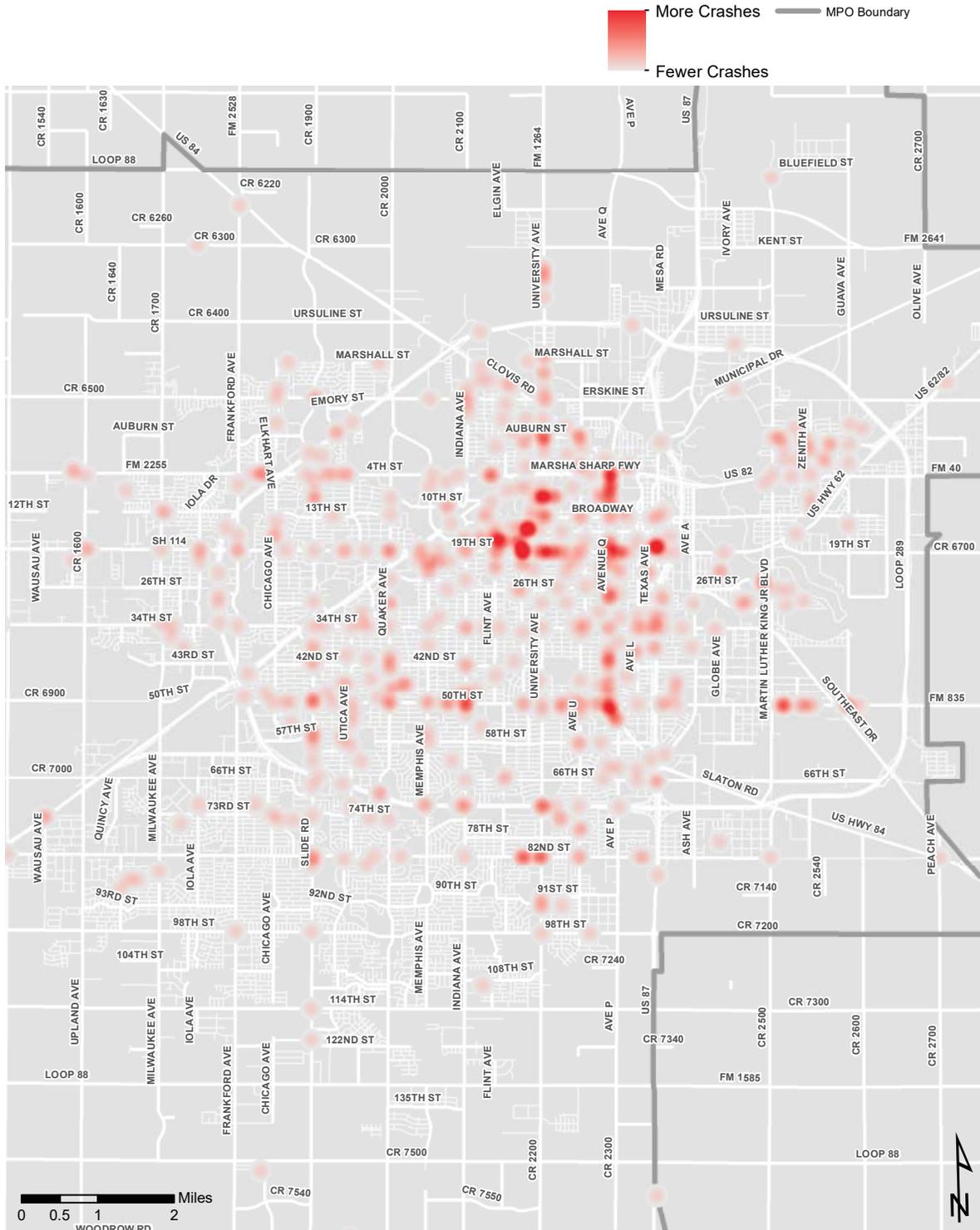
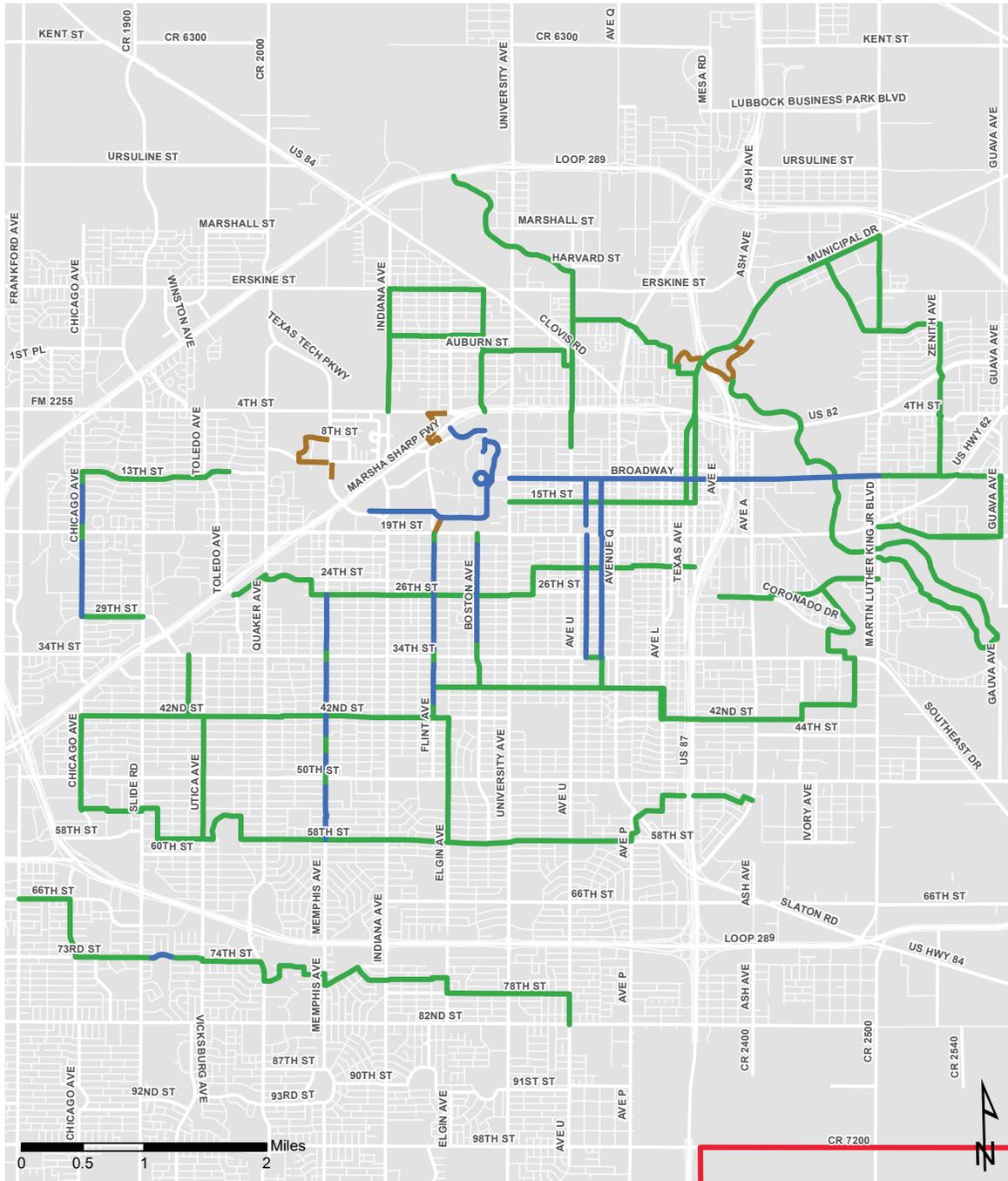


Exhibit 9: Existing Bicycle Infrastructure

EXHIBIT 9. EXISTING BIKE FACILITIES

- Existing Bike Lane
- Existing Bike Route
- Existing Bike Trail
- MPO Boundary



Programs and Policies

Within its subdivision ordinance, the City of Lubbock requires sidewalks to be built and maintained. Installation of sidewalks is required with the permit for construction of improvements on an individual platted lot or tract. The ordinances do not require developers to construct bicycle facilities.

The West Texas Cycling Association, the bicycle advocacy group for West Texas, plans and regularly hosts rides in Lubbock. These rides vary from easy to fast pace and occur several times a week starting from multiple locations throughout Lubbock. The weekday rides are held in the Spring, Summer, and Fall months; and the weekend rides are held year-round.

Citibus, which operates nine public bus routes throughout Lubbock, supports bicycling. Their bike policy states that all buses are equipped with external bicycle racks able to accommodate two bicycles.

Previous Planning Efforts

Walk and Bike Lubbock is intended to build upon the foundation of past transportation planning efforts in Lubbock and the surrounding region. To date, there has not been an adopted pedestrian plan developed in Lubbock. The latest planning effort for bicycles was the Lubbock Metropolitan Area Comprehensive Bicycle Plan. The key findings and recommendations of this plan are summarized in the following table.

Lubbock Metropolitan Area Comprehensive Bicycle Plan	
Goals	
<ol style="list-style-type: none"> 1. The percentage of trips made by bicycle in the Lubbock Metropolitan Area will double by 2005 and continue to increase during the life of the Comprehensive Bicycle Plan 2. The number of bicycle related traffic accidents will be reduced by 10 percent by 2005 and continue to decrease during the life of the Comprehensive Bicycle Plan 3. To increase awareness of bicycling as a viable transportation alternative both in the planning community and among the general public 	
Objectives	
Objective	Benefit of Updating
O-1: The new transportation facilities in the Lubbock Metropolitan Area will, at a minimum, accommodate group A cyclists.	Current best practices no longer refer to groups
O-2: In key corridors identified by the Comprehensive Bicycle Plan, all new transportation facilities in the Lubbock Metropolitan Area will also facilitate travel by bicycle for all types of cyclists in the area.	Focus is now on all ages and abilities of cyclists and pedestrians
O-3: The Comprehensive Bicycle Plan will identify strategies for accommodating bicyclists of all abilities in key corridors in the area. Recommendations for action in each of these corridors will be made.	

Objectives	
Objective	Benefit of Updating
O-4: The Comprehensive Bicycle Plan will identify strategies for overcoming major barriers to bicycle travel in the area.	Renewed focus on this very important issue
O-5: The Comprehensive Bicycle Plan will identify an appropriate leadership role for the MPO in implementing the plan. This will include recommendations for assisting local agencies, neighborhood groups, and user groups in developing future neighborhood and corridor plans for bicycling.	Critical for funding
O-6: The Comprehensive Bicycle Plan will identify a set of performance measures to gauge the success of the achievements of the overall goals.	Update to best practices

Progress Since 1994

Since adoption of the Lubbock Metropolitan Area Comprehensive Bicycle Plan, several projects and milestones have been completed. They are as follows:

- » 1996 Statewide Transportation Enhancement Grant
 - 14 miles of bike lanes; 62.5 miles of signed routes
- » 2008 – City of Lubbock built 200 – 300 feet of sidewalk and amenities to link the Arnett Benson and Jackson Mahon neighborhoods
- » 2014, Phase II of North University Gateway
 - ½ mile of sidewalk, pedestrian lighting, and ADA curb ramps
 - 15 bike route signs
- » 2015 Final Stage of Gateway
 - Amherst to US 84
- » Five Elevated bike/pedestrian crossings along Marsha Sharp in the Texas Tech area
- » Improvements to 19th Street
 - 10 feet of shared path
 - Enhanced crosswalks at Indiana, Boston, Marsha Sharp and Texas Tech Parkway
 - ADA curb ramps

As of 2017:

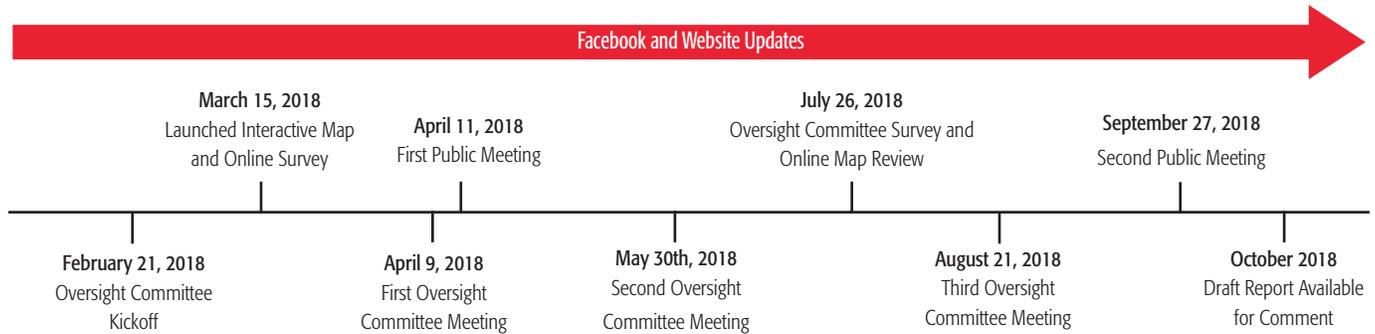
- 72.6 miles of signed bike routes
- 14.4 miles of bike lanes
- 12.2 miles of paved trails
- 15.6 miles of partially paved trails

Walk and Bike Lubbock looks to build on these successes to create a more connected and safe environment for cyclists and pedestrians.

Chapter 3: Public Engagement

To help guide the plan, the project team reached out to the public to better understand their experiences walking and biking in Lubbock, and to receive feedback on the projects they feel would be most beneficial.

The public engagement process took several different forms. These included both online and in-person opportunities to provide feedback. Below is a timeline demonstrating the process of public engagement for the Walk and Bike Lubbock Plan.

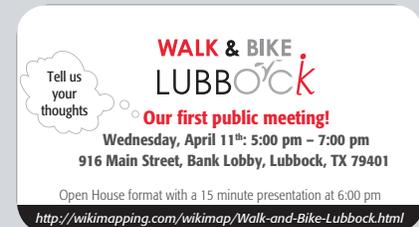


Goals of Public Engagement Plan

- » Create **public awareness** of the BPMP and facilitate active and collaborative participation by the public
- » Maintain an open and **transparent process** throughout the engagement effort
- » Provide project information to the public in a clear and **easy to access** format
- » **Use public input** and comments in the development and refinement of the Plan
- » **Inform and engage** a broad range of **diverse stakeholders** in the process
- » Develop a process with **convenient, accessible, and exciting opportunities** to get involved
- » **Streamline** the public engagement and input collection efforts through online activities

OUTREACH EFFORTS

At the beginning of the project, an email was sent out to key stakeholders, in addition to handing out printed business cards and providing updates to the Walk and Bike Lubbock Facebook Page.



Study Oversight Committee

The Study Oversight Committee met four times over the course of developing the Walk and Bike Lubbock plan. The Study Oversight Committee included representation from the following entities and groups:

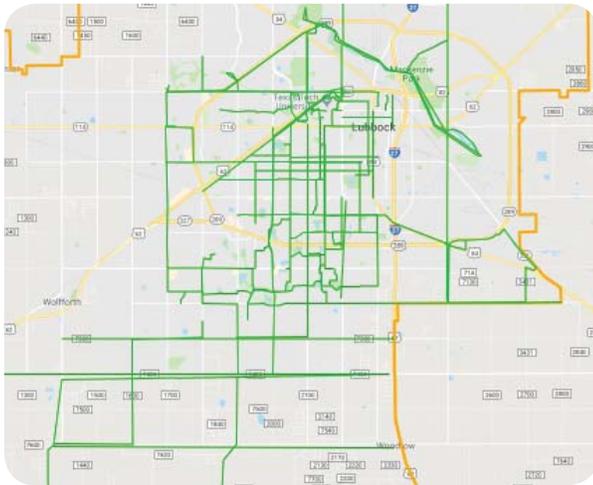
- » The Lubbock Metropolitan Planning Organization
- » The City of Lubbock
- » The City of Wolforth
- » Citibus
- » Texas Tech University
- » The West Texas Cycling Association
- » Lubbock County
- » Texas Department of Transportation (TXDOT)

Interactive Map

The project team also developed an online interactive map which allowed users to draw desired walking and biking routes, desired destinations, and safety concerns to walking and biking. The interactive map received a lot of helpful feedback. The feedback for each category is summarized below.

Desired Bike Routes

- » Strong desire for Loop 289 Crossing from the South
- » Emphasis on collectors
- » Several key arterials
 - 4th Street
 - MLK Jr Boulevard
 - 34th Street
 - 114th Street



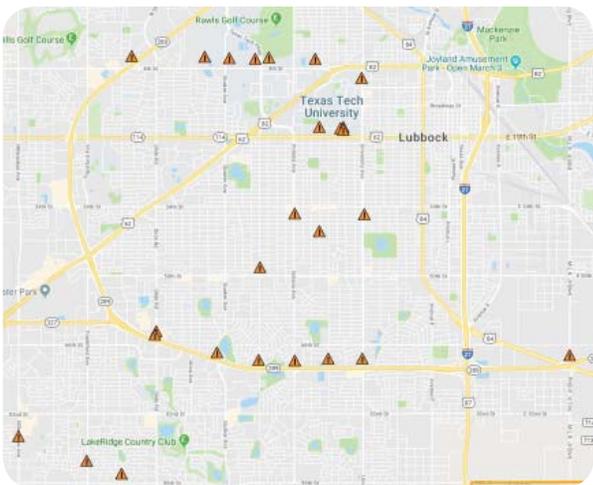
Desired Pedestrian Routes

- » Focus on:
 - Parks
 - Downtown
 - Texas Tech
- » High Interest in off-street trails



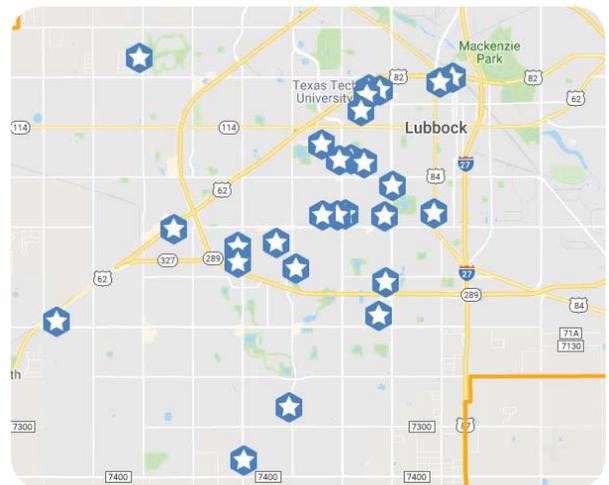
Safety Concerns

- » Discontinuous bike facilities
- » Need for dedicated or separated bike facilities
- » Need for safe bike crossing on South Loop 289



Destinations

- » Most destinations within the loop
- » Some destinations to the south and to the west



Public Meetings

The project team held public meetings on April 11, 2018 and September 27, 2018. The April 10th meeting was held to gather feedback from the public on their experience walking and biking in Lubbock, and to understand their priorities for future projects, programs, and policies.

April 11, 2018

The April 11th meeting consisted of three feedback stations and a brief presentation, followed by discussion. The three feedback stations were:



1. Map Station – citizens drew desired routes and destinations on the maps, similar to the online interactive map



2. Thought Wall Station – citizens provided open form comments about what they thought should be included in the Walk and Bike Lubbock Plan



3. Toolbox Station – citizens provided feedback on whether they liked or disliked the proposed toolbox elements.

The strongest points of feedback received at the three stations and in the discussion during the April 10th public meeting are presented below:



September 27, 2018

The September 27th meeting also consisted of three feedback stations and a brief presentation, followed by discussion. The three feedback stations are below. The strongest points of feedback received at the three stations and in the discussion during the September 27th public meeting are presented in the thought bubbles below:



1. The Plan Station – citizens provided feedback on the proposed Bicycle and Pedestrian Plans

Need for a bicycle/
pedestrian program
coordinator

Better Education and
Enforcement of bicycle/
pedestrian laws



2. Programs and Policies Station – citizens provided feedback on the proposed programs and policies of the plan

3. Implementation Station – citizens provided feedback on how bicycle and pedestrian projects should be implemented moving forward



Need for
improved signage
and pavement
markings

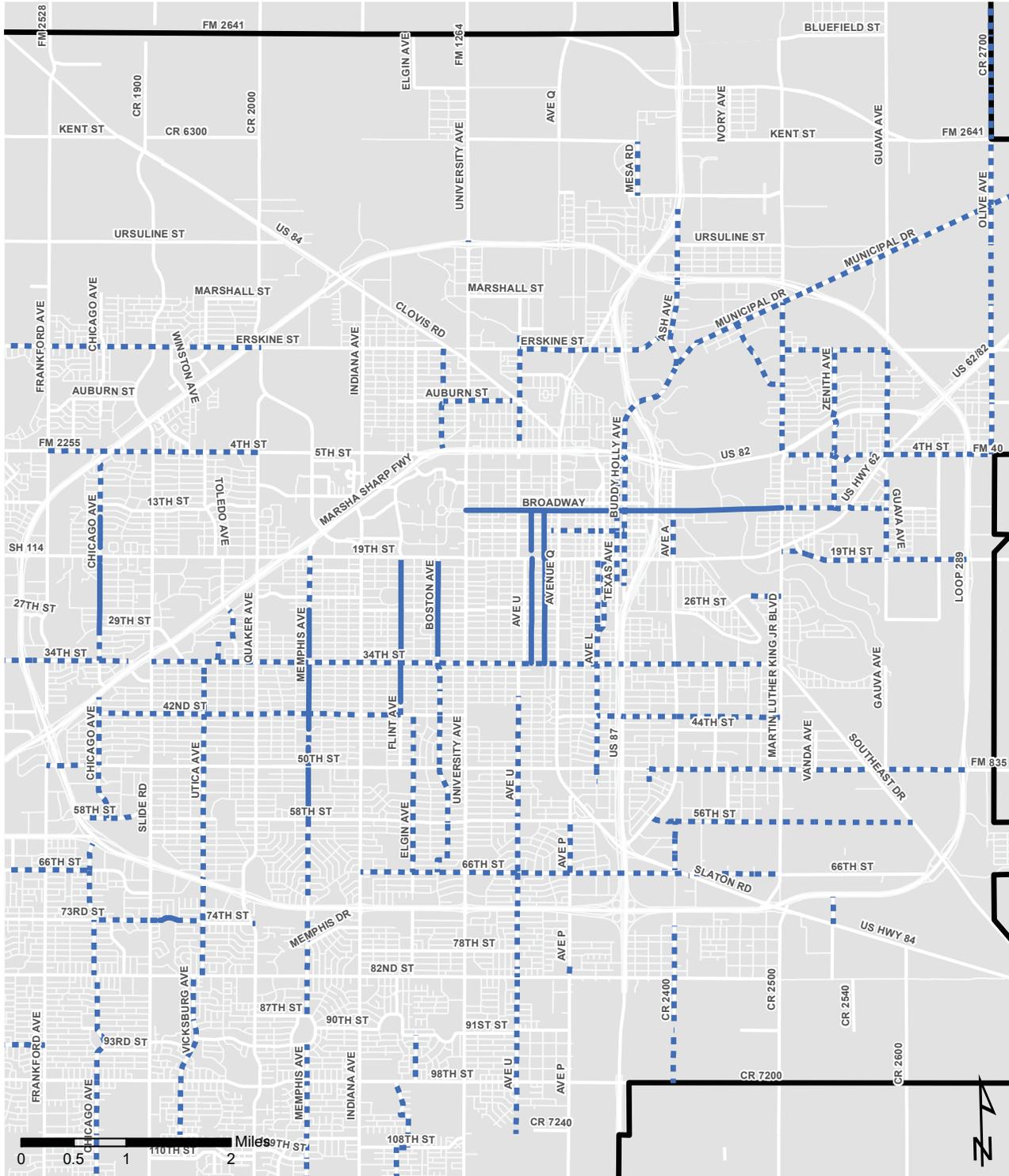
Online Interactive Map Response

In addition to the public meeting, many citizens responded to the proposed bicycle and pedestrian plans via the online interactive map. The responses from the online interactive map are summarized as follows:

- » Need more sidewalk connectivity
- » Prefer separated facilities over on-street facilities
- » In favor of bicycle/pedestrian bridge over Loop 289

BIKE LANES

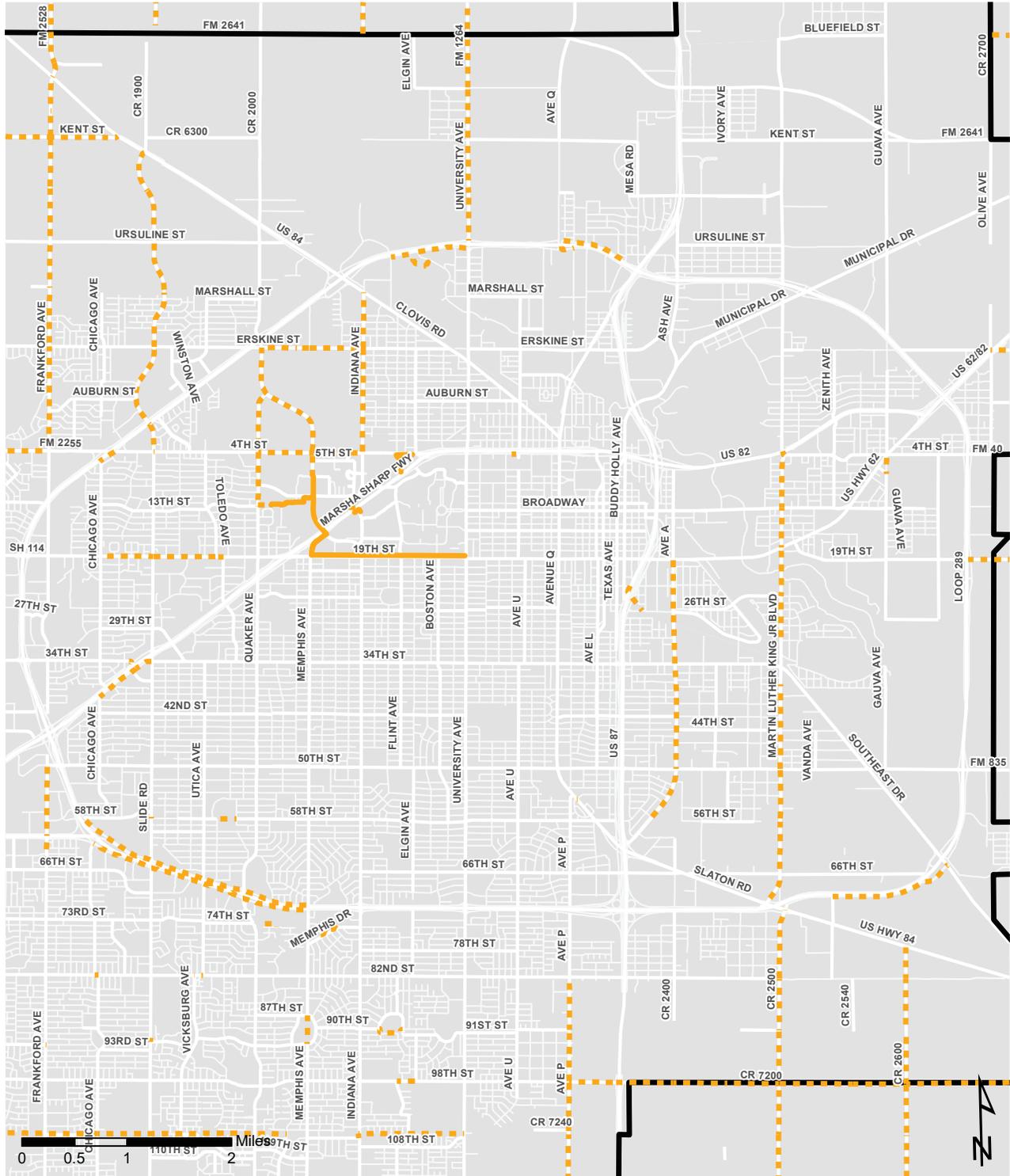
- Bike Lane, Existing
- - - Bike Lane, Proposed
- MPO Boundary



Pedestrian and Bicycle Master Plan

SIDEPATHS

- Sidepath, Existing
- - - Sidepath, Proposed
- MPO Boundary



BICYCLE BOULEVARDS

Description

Bicycles may be operated on all roadways, except where prohibited. However, certain roads may be more desirable for use due to low traffic speeds and volumes and do not necessitate a separated bike facility. These roadways can be designated as bicycle boulevards with route signage and pavement markings to designate shared use of the travel lanes. Traffic calming measures may also be used as a means of increasing the comfort level for bicyclists. However, bicycle boulevards should not be used as a substitute for conventional bike lanes when space permits.

Typical Use

- On streets with low traffic volume ($\leq 1,500$ ADT preferred, 3,000 ADT maximum)
- On streets with low travel speeds (≤ 25 mph)
- To fill a gap or transition between bike facilities

Facility Benefits

- Bicycle Boulevards can be used to connect bicycle routes where bike lanes and sidepaths cannot be accommodated due to limited ROW
- Bicycle Boulevards typically experience side benefits for pedestrians by increasing safety through speed and volume management strategies
- Bicycle Boulevards provide an opportunity for street beautification through the implementation of green infrastructure such as street trees and other plantings.

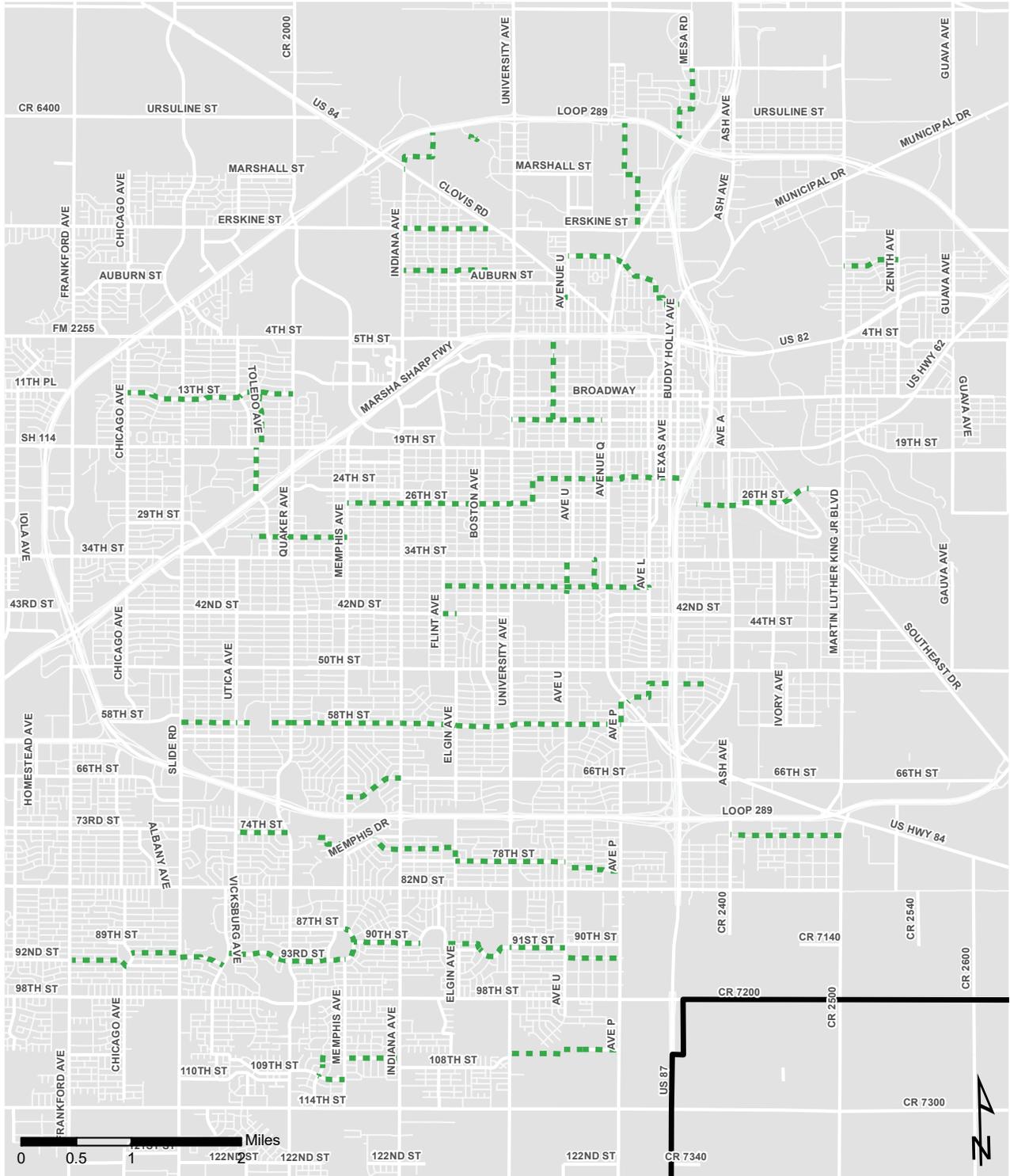


Design Elements

- Bicycle Boulevards should ideally be 2-5 miles in length, similar to a typical urban bike trip.
- Branding the street as a Bicycle Boulevard through the use of modified street signs, shared lane markings, and wayfinding signs is recommended.
- Turns or jogs along discontinuous routes should have signs and/or markings indicating the direction of the route.
- Speed management strategies such as reduced speed limits, vertical deflection, and horizontal deflection are recommended to bring vehicle speeds closer to bicycle speeds.

BICYCLE BOULEVARDS

- - - Bicycle Boulevard, Proposed
- MPO Boundary



INTERSECTION TREATMENTS

Design Elements

Bike Boxes

- Bike boxes may be used at signalized intersections to designate an area for bicyclists to wait ahead of traffic during red signal phases. Bike boxes are typically 10 - 16" deep, and stop lines should be used to indicate where motor vehicles should stop during a red signal.
- A "No Turn on Red" sign should be used with bike boxes to prevent vehicles from entering the bike box area.
- Bike boxes may be appropriate at intersections of major roadways where a separate right-turn lane is not present. Positioning bicycles ahead of traffic can reduce "right-hook" conflicts of turning vehicles.
- A "two-stage turn queue box" may be used to turn left at multi-lane roadways.

Two-Stage Turn Queue Box

- Turn queue boxes provide a space for bicyclists to make a left turn across an intersection with multiple lanes.
- The queue box should be placed in a protected area, typically between the bike lane and the pedestrian crossing. It may also be placed within the sidewalk space to allow turns at midblock locations.
- Colored pavement should be used in the queue box to increase visibility of the space.

Median Refuge Island

- Median refuge islands allow bicyclists to cross a two-way street one direction at a time.
- The desirable width of a median refuge is 10 feet or greater, with an area large enough to accommodate two-way bicycle travel.
- This treatment is recommended where bikeways cross streets with higher volumes and higher speeds, particularly at unsignalized intersections.
- Median refuge islands may be used to connect routes at an off-set intersection.

Bike Box



Median Refuge Island

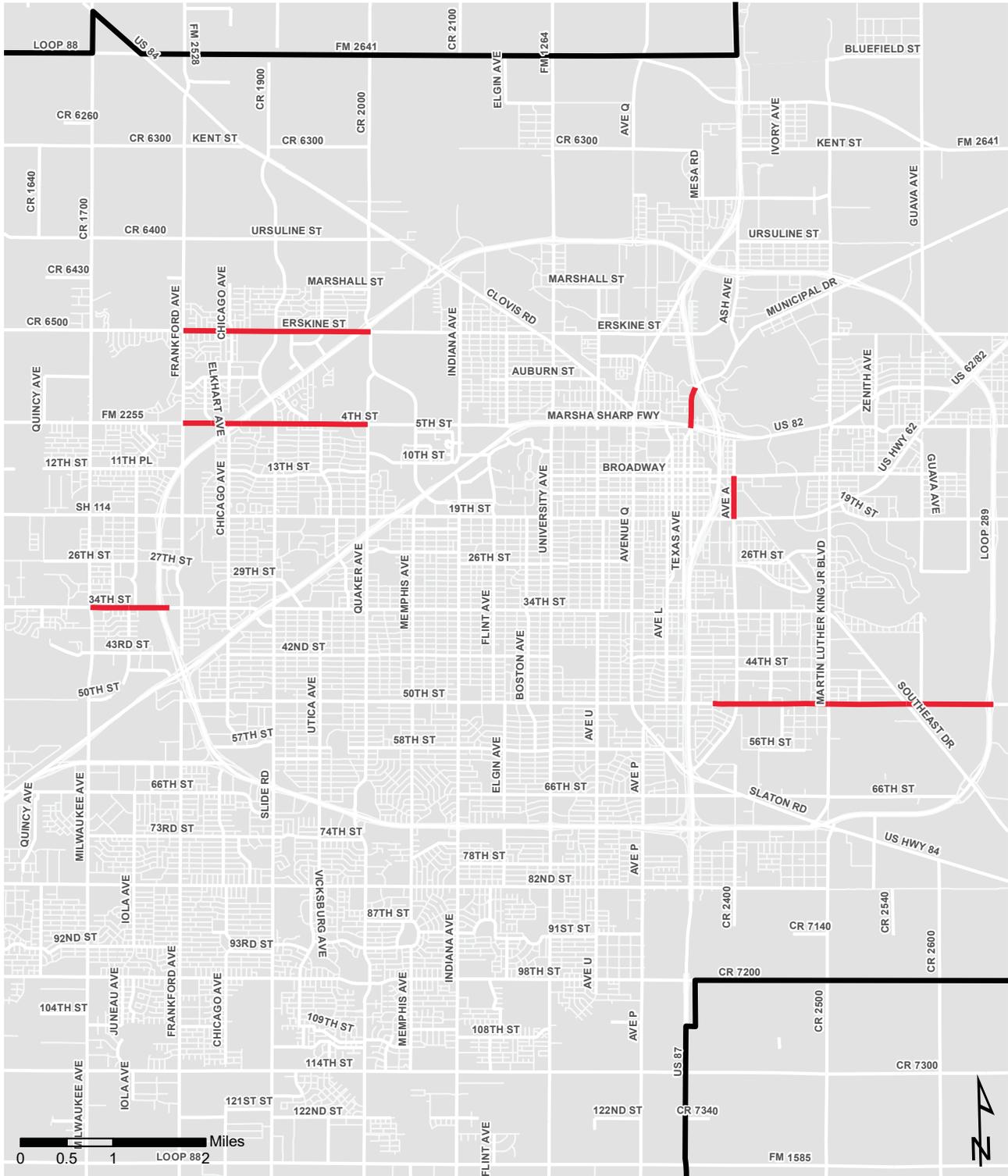
Bike Lanes at Intersections

- When an intersection approach has a right-turn only lane, a through bike lane should be provided to allow bicyclists to position themselves to the left of the right turn lane.
- A dotted bike lane transition area should be striped at least 50 feet before an intersection, and 100 feet before on higher speed roadways. This indicates where motor vehicles should merge into the turn lane and alerts motorists to yield to bicyclists.
- Right-turn only lanes should be as short as possible to prevent high speed traffic on both sides of the through bike lane.
- When an intersection cannot accommodate a through bike lane, bicycle travel may transition to a shared right-turn only lane. Signage and pavement markings should indicate the shared lane and that bicyclists may continue straight at the intersection.

Pedestrian and Bicycle Master Plan

ROADWAY LANE CONVERSIONS

- Proposed Conversions
- MPO Boundary



AT-GRADE RAILROAD CROSSINGS

Description

Many urban areas served by light rail transit, commuter rail, and freight trains include at-grade railroad crossings. Providing appropriate treatments insure that bicyclists and pedestrians are safely navigation these crossings. Treatment devices include warning signs, flashing lights or active warning devices, pavement markings, channelization devices, detectable warnings, gate arms, and pedestrian gates. Providing crossing treatments, or a combination of treatments, is an important design element and defines safe crossing locations for pedestrians. Providing consistency among materials, pavement marking colors, and treatment selections can also help pedestrians easily recognize and navigate safe crossing locations.

Typical Use

- Locations where roadways or sidewalks cross railroad tracks.

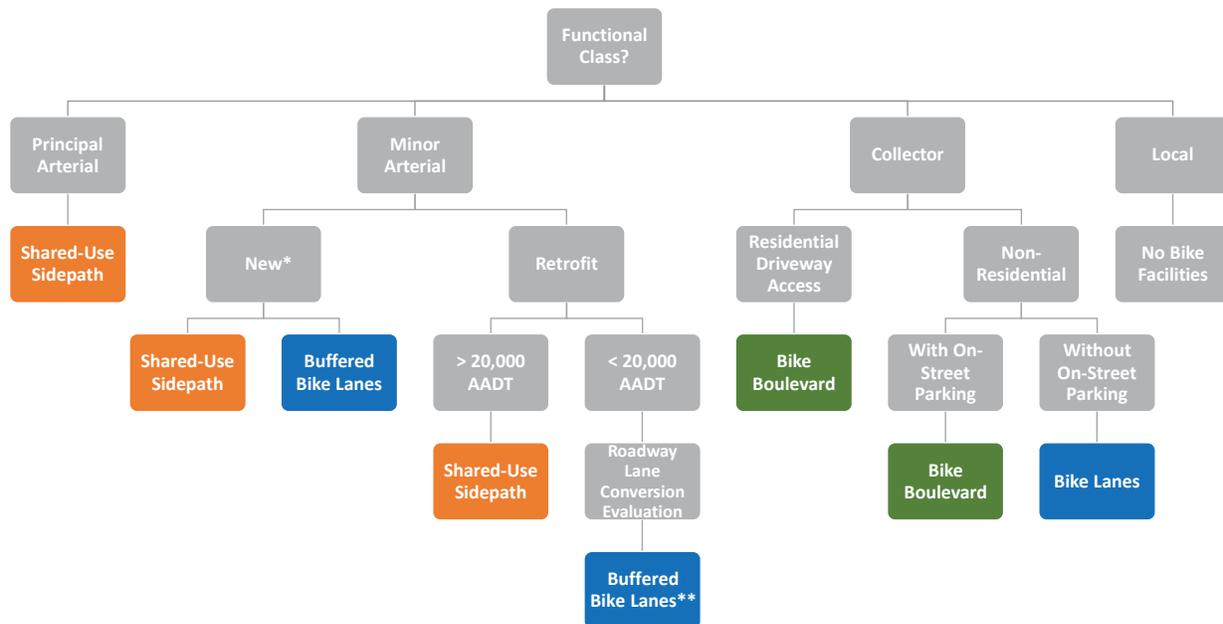
Facility Benefits

- Provides safe crossings and alerts pedestrians when trains are approaching an at-grade crossing.



Design Guidelines

- Place crossings perpendicular to railroad tracks.
- Add pedestrian gate arms or active warning signals at locations near parks or other areas with high pedestrian volumes.
- Pedestrians and bicyclist often take the shortest path from where they are to where they want to go. Implement barriers or fences to channelize users to the safest crossing location.



*Based on the City of Lubbock Master Thoroughfare Plan

**Buffered bike lanes to be implemented only if roadway lane conversion is determined to be appropriate based on roadway capacity analysis

Bicycle Plan

The central vision of this plan is to promote a bicycle network that is continuous, complete, and connected. This can be achieved by ensuring that the future network accommodates trips fully from a bicyclist's origin to their destination, free of gaps or unfinished segments.

The goals of this plan are achieved by the following key design considerations:

- » Designing for all ages and abilities by providing mostly dedicated and separated bicycle facilities
- » Creating improved connections between the outer and inner loop of the city
- » Planning future infrastructure that accommodates bicycles and pedestrians without the need to retrofit

It is important to note that this section was from a regional perspective, and does not currently include a section regarding Texas Tech's bicycle network. An individual plan for the campus will part of Texas Tech's Master Plan.

Inside Loop 289

The focus of the Bicycle Plan is divided between two distinct areas of Lubbock:

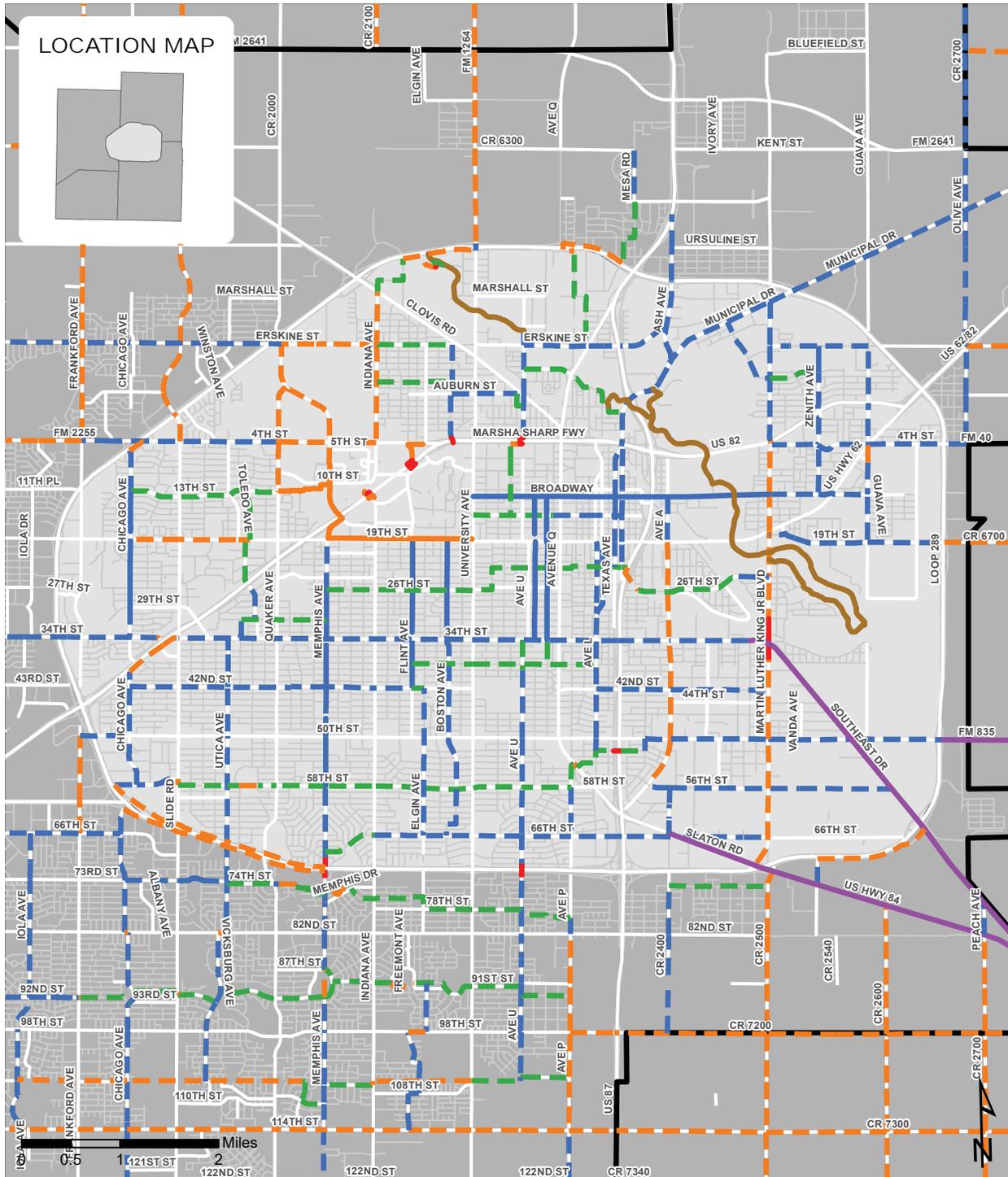
1. Inside Loop 289
2. Outside Loop 289

Inside Loop 289, most of the roadway infrastructure is built out, and bicycle projects consist of retrofitting existing roads with bicycle facilities. The Bicycle Plan for the inner loop is presented in **Exhibit 10**.

Exhibit 10: Bicycle Plan for Inside Loop 289

2018 BIKE PLAN: INSIDE LOOP 289

- Bike Lane, Existing
- Bike Lane, Proposed
- Bike Boulevard, Proposed
- Sidepath, Existing
- Sidepath, Proposed
- Paved Shoulder, Existing
- Bridge, Existing
- Bridge, Proposed
- Canyon Lake Trail, Existing
- MPO Boundary



Bridging the Gap

During the public engagement process, one of the main concerns repeated in comments from survey respondents and attendants at the public meetings was the need for a safe crossing at Loop 289. Early in the preliminary planning process, the project team identified Memphis Avenue as a key north-south corridor for bicyclists due to its length, lower speeds, lower volumes and ability to accommodate bike lanes. However, Memphis Avenue does not currently cross Loop 289. Based on these observations, the project team developed a concept to construct a bicycle and pedestrian overpass bridge along Memphis Avenue to create a safe way for users to cross Loop 289. The following sections present the two concept designs developed as potential options for this crossing.

OPTION 1

Option 1 for this bicycle/pedestrian bridge is proposed to be located in the middle of Memphis Avenue. This option allows for a simple, direct, and safe crossing over Loop 289. Due to the slope needed to achieve necessary vertical clearance, the entrance and exit for the crossing are set farther back from the Loop.

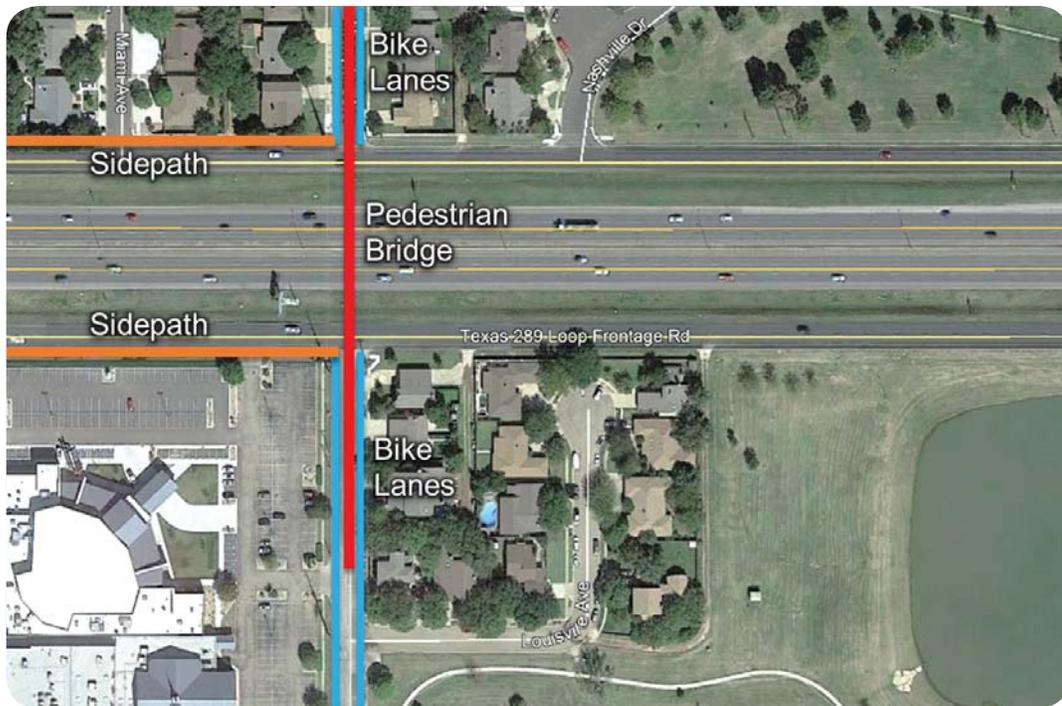


Exhibit 11: Outside Loop 289 (Northwest)

2018 BIKE PLAN: OUTSIDE LOOP 289 (NORTHWEST)

- Bike Lane, Existing
- - - Sidepath, Existing
- Bridge, Existing
- MPO Boundary
- - - Bike Lane, Proposed
- - - Sidepath, Proposed
- - - Bridge, Proposed
- - - Bike Boulevard, Proposed
- Paved Shoulder, Existing
- Canyon Lake Trail, Existing

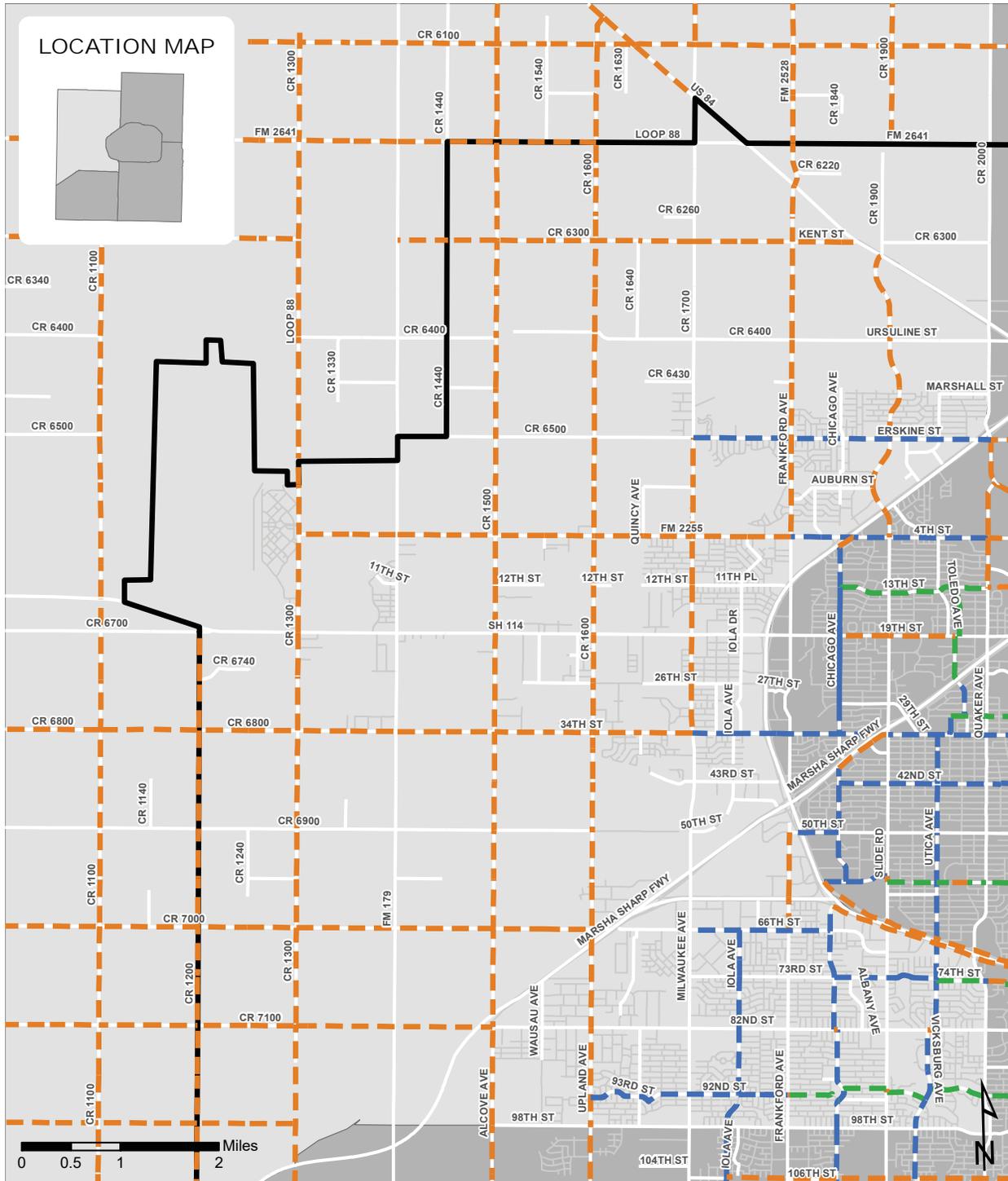


Exhibit 12: Outside Loop 289 (Northeast)

2018 BIKE PLAN: OUTSIDE LOOP 289 (NORTHEAST)

- Bike Lane, Existing
- Sidepath, Existing
- Bridge, Existing
- MPO Boundary
- Bike Lane, Proposed
- Sidepath, Proposed
- Bridge, Proposed
- Bike Boulevard, Proposed
- Paved Shoulder, Existing
- Canyon Lake Trail, Existing

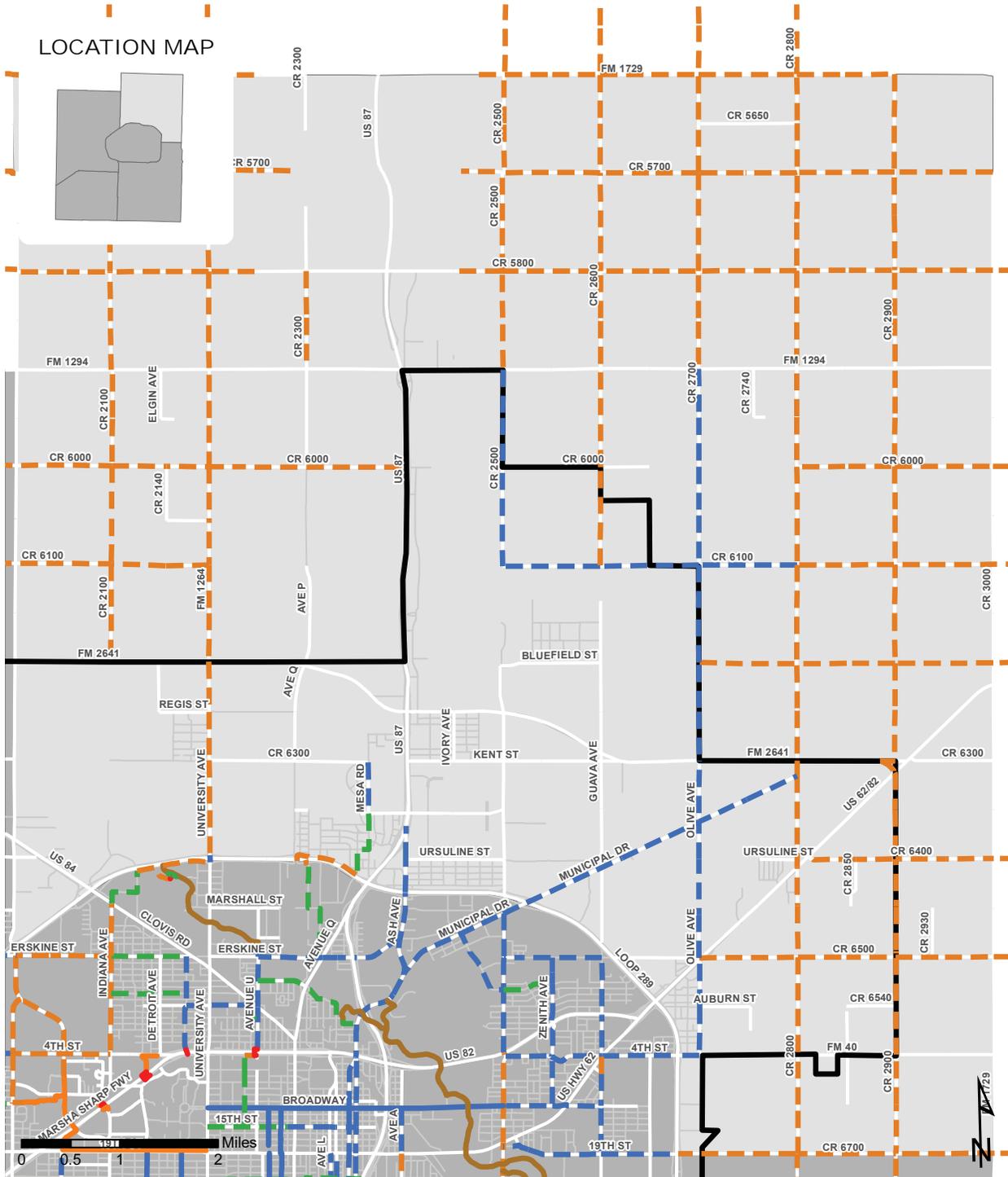


Exhibit 13: Outside Loop 289 (Southwest)

2018 BIKE PLAN: OUTSIDE LOOP 289 (SOUTHWEST)

- Bike Lane, Existing
- Sidepath, Existing
- Bridge, Existing
- MPO Boundary
- Bike Lane, Proposed
- Sidepath, Proposed
- Bridge, Proposed
- Bike Boulevard, Proposed
- Paved Shoulder, Existing
- Canyon Lake Trail, Existing

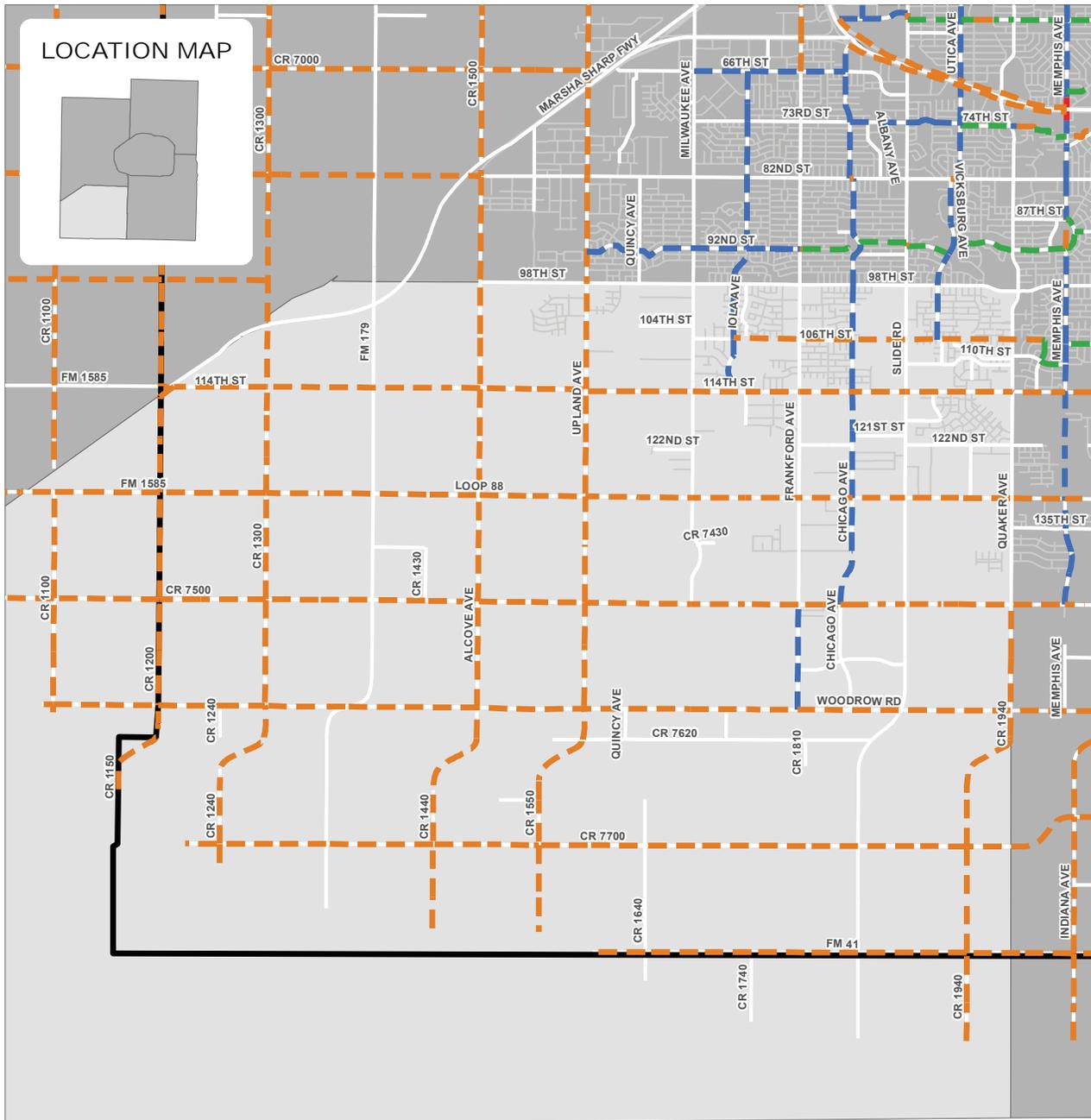
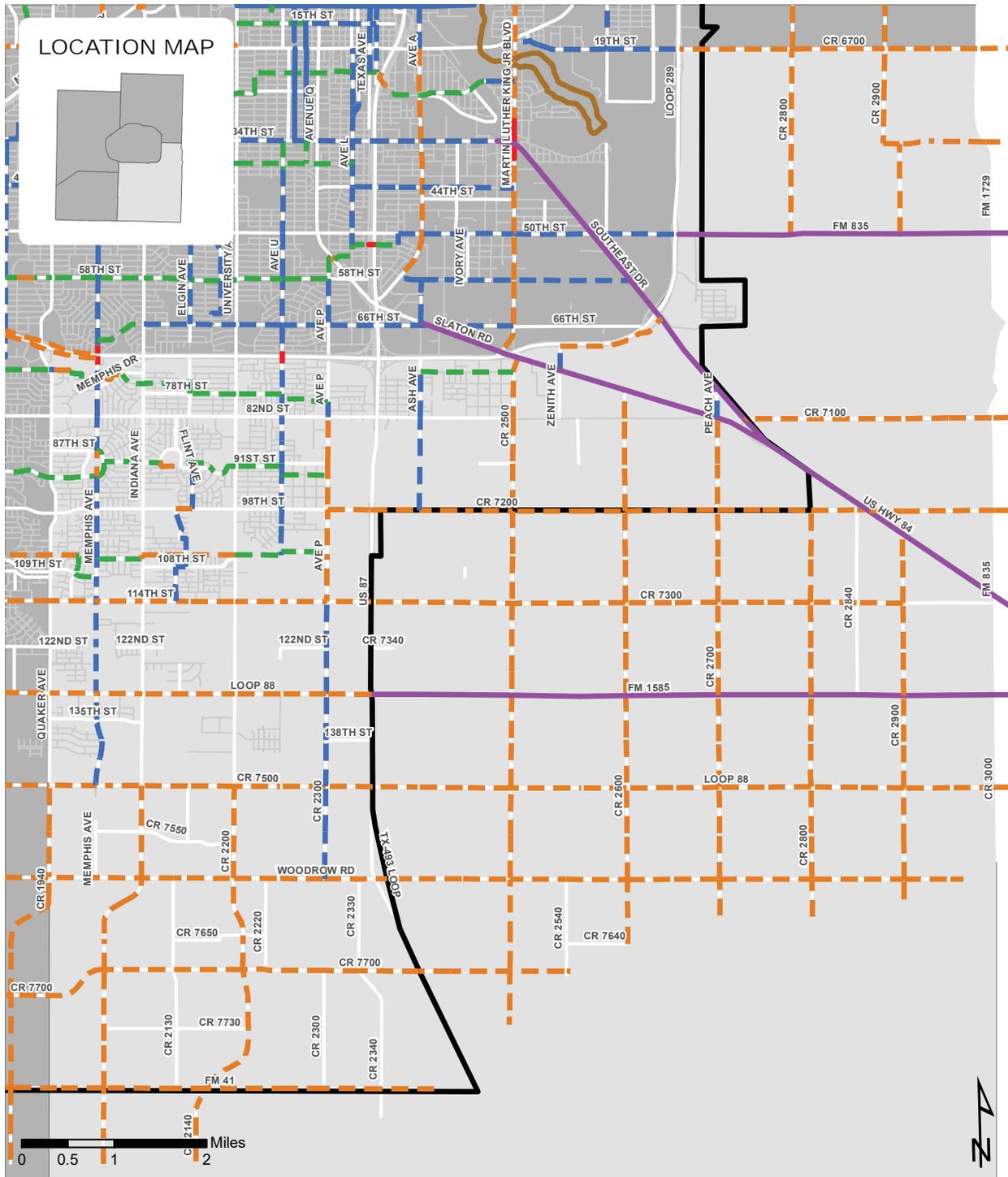


Exhibit 14: Outside Loop 289 (Southeast)

2018 BIKE PLAN: OUTSIDE LOOP 289 (SOUTHEAST)

- Bike Lane, Existing
- Sidepath, Existing
- Bridge, Existing
- MPO Boundary
- Bike Lane, Proposed
- Sidepath, Proposed
- Bridge, Proposed
- Bike Boulevard, Proposed
- Paved Shoulder, Existing
- Canyon Lake Trail, Existing



Summary

This updated bicycle plan heavily expands upon the current bicycle network in Lubbock. A larger focus in this update plan was given to the area around and outside the inner loop in this plan, and provided a better framework for the region's bicycle network. Compared to the previous plan, which focused on the inside portion of the loop, the updated plan is larger in scale and adds over 500 lane-miles of new bicycle facilities. This was achieved by focusing on converting shared facilities into separated ones, adding much more mileage to the network. The table below compares the lane miles of each bicycle facility type of the previous plan to the updated plan.

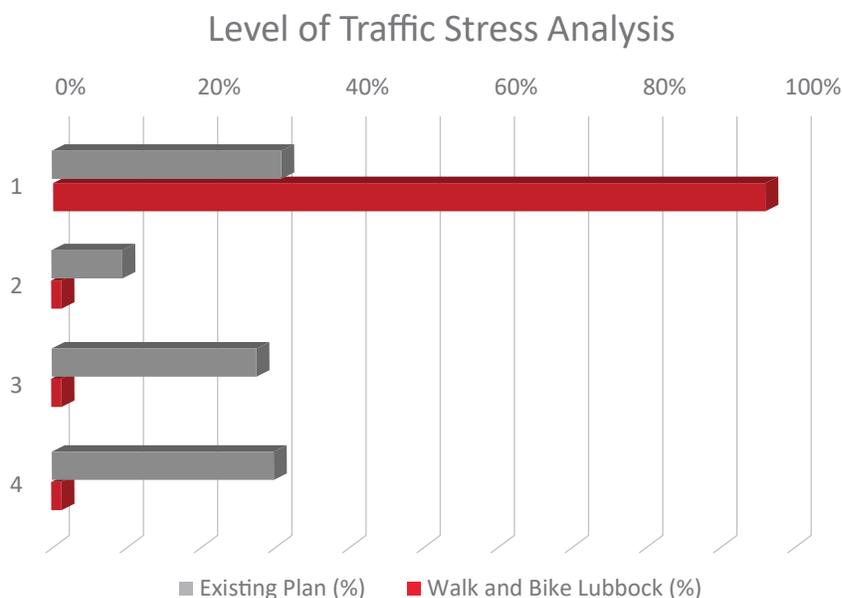
Facility Type	1994 Bicycle Master Plan		2018 Update Plan	
	Previous Plan (Miles)	Percent of System	Updated Plan (Miles)	Percent of System
Bike Routes/Bike Boulevards	132.25	79%	32.21	5%
Bike Lanes	18.56	11%	121.96	18%
Sidepaths/Trails	16.35	10%	526.72	77%
Total	167.16	100%	680.89	100%

* Bicycle Plan is based on City of Lubbock MTP and includes facilities outside the Lubbock MPO boundaries

Level of Stress Analysis

The level of traffic stress (LTS) is a measure of how comfortable it is to bicycle on a given roadway network or segment. It is based on the type of roadway, traffic volumes, speed, and the type of bicycle facilities present (if any). It is scored on a scale of 1-4, with 1 being the most comfortable conditions and 4 being the least comfortable. The project team evaluated the LTS of the previous Bike Plan and compared it to the LTS of the proposed Bicycle Plan presented in this document. Based on the results of the LTS evaluation, the proposed bicycle plan will increase the percentage of roadway miles on the bicycle network with a stress level of 1 from 31% to 96%, as shown below.

LTS	Target Bicycle User Type
1	All Ages and Abilities
2	Interested but Concerned (Mainstream Adults)
3	Enthusied and Confident (Adult Commuters)
4	Strong and Fearless (Long-Distance Recreational Bicyclists)



Preliminary Cost Comparison

The table below displays the approximate per mile planning level cost of constructing the new bicycle network. These per mile costs were used to estimate system wide costs, which are separated into new and retrofit projects both inside and outside the loop. In this case, retrofit projects are defined as modifications to existing roadways, including new sidepaths. New projects are defined as bicycle facilities to be incorporated into future roadways and future widening projects.

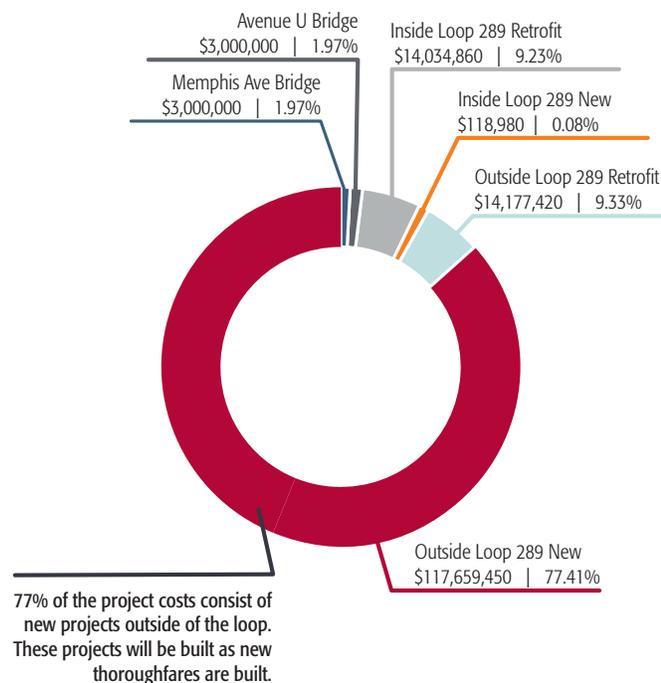
Inside the loop, most bicycle projects are retrofits to existing infrastructure, with some new facilities. Outside the loop, most projects are facilities planned on future roadways and can be incorporated into the cost of the roadway when it is constructed. Given this understanding, the need for dedicated funding for bicycle projects is relatively insignificant compared to the amount of facilities that can be implemented with other projects. It is important to note that the per mile cost estimates are not exact, and the actual design and construction costs may vary by project.

Bicycle Facility	Planning Level Cost* (per mile)
Bike Boulevards (signing and marking)	\$6,000
Bike Lanes (Signing and marking)	\$35,000
Bike Lane Roadway Lane Conversion** (signing, marking and travel lane reconfiguration)	\$50,000-\$150,000
10' Shared-Use Sidepath (on both sides of road)	\$650,000

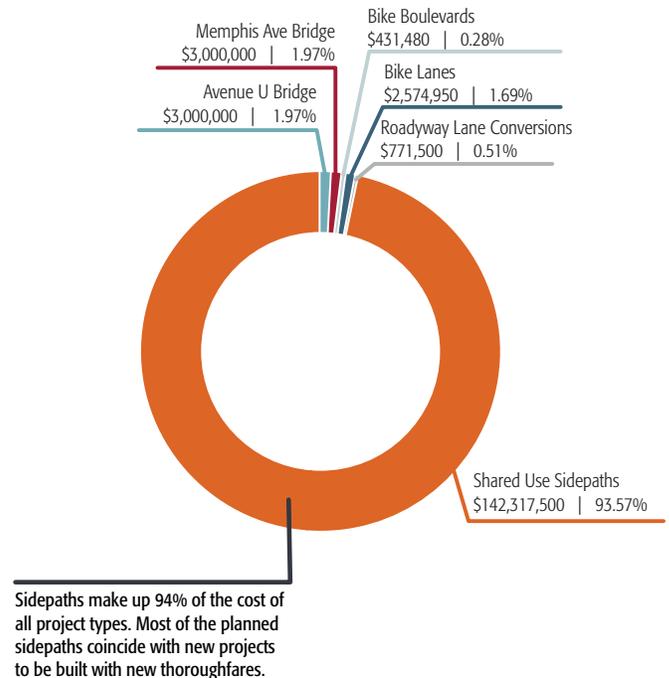
*These values represent planning level cost estimates based on past experience. No design or engineering has been performed.

**Planning level cost varies depending on the type of separation buffer implemented with the bicycle facility.

Bicycle Plan Cost Comparison by Project Type and Location



Bicycle Plan Cost Comparison by Facility Type



Why Plan for Pedestrians?

During most trips, all travelers become pedestrians for at least a short distance. Whether it's walking from the parking lot, walking to the bus stop, walking to school, walking to work, walking to a restaurant, or taking a stroll with family members — many residents living and working in Lubbock walk to some extent on a regular basis. However, the pedestrian network, which includes sidewalks, ramps near intersections, and pedestrian crossing signals, can make the pedestrian experience either pleasant or uncomfortable. A pedestrian network that makes walking uncomfortable will influence how confident people feel walking, and thus the likelihood that people will walk.

The eight Cs presented in Chapter 1 provide an effective checklist for determining if proposed changes to the pedestrian network will fulfill this plan's vision and accompanying benefits to the environment, health, livability, mobility, and safety.

Economy	A complete pedestrian network comprised of sidewalks, trails, and frequent places to safely cross the street can increase property values and contribute to walkable neighborhoods that are rich in desirable locations. Walkabout neighborhoods can lead to an increase in economic activity. According to a study completed by the Robert Wood Johnson Foundation, property values have shown an increase of \$700 to \$3,000 for each additional point on WalkScore.
Environment	A complete pedestrian network in neighborhoods has the potential to replace vehicle trips with walking trips, reducing emissions and contributing to cleaner air.
Health	An improved pedestrian network will encourage people of all ages and abilities to walk, whether to school, during the day while at work, or for exercise with friends, improving the overall health of the community.
Livability	A complete pedestrian network can greatly increase the livability of historically underrepresented communities, especially by providing a safe means of transportation for able-bodied citizens who do not own a motor vehicle.
Mobility	A complete pedestrian network improves mobility by adding another option for transportation, including easier access to public transit. Pedestrian connections between destinations that are away from streets can shorten walking trips and connect neighborhoods in a tangible way.
Safety	A complete pedestrian network mitigates safety risks pedestrians take when walking along roads with no sidewalks or enough places to cross the street.

Improving both Pedestrian and Bicycle infrastructure will enable the Lubbock Region to be efficient in how it addresses changes that impact alternative transportation. The pedestrian component of this plan will give the City a blueprint for how to systematically improve Lubbock's pedestrian network.

Pedestrian and Bicycle Master Plan

Pedestrian Signals	Rectangular Rapid Flashing Beacon (RRFB)	X	X	Any unsignalized designated crossings of roadways with five or fewer lanes.
				High volume pedestrian and bicycle crossings along priority pedestrian/bicycle routes.
Pedestrian Signal Timing and Countdown Indicator	Pedestrian Hybrid Beacon (HAWK)	X	X	Any unsignalized designated crossings of roadways with seven or more lanes.
				The MUTCD recommends minimum volumes of 20 pedestrians or bicyclists an hour for major arterial crossings.
Pedestrian Signal Timing and Countdown Indicator		X	X	Any signalized intersection or mid-block crossing where pedestrians are present.
Right turn on Red Restrictions			X	Areas with high levels of walking and bicycling, or with pedestrians who walk slower, such as downtown or at a college campus.
Leading Pedestrian Intervals (LPI)			X	At intersections with high volumes of pedestrians and conflicting turning vehicles.
				Locations with large numbers of pedestrians who walk slower such as near schools and senior living areas.

FHWA offers the table below as a guide for when to use the toolbox elements described above based upon the number of travel lanes, vehicle speeds, and number of daily vehicles.

Roadway Configuration	Speed Limit								
	≤30 mph			35 mph			≥40 mph		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
2 lanes*	1 2 3 4 5 6	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7
3 lanes with raised median*	1 2 3 4 5	1 3 5 7	1 3 5 7	1 3 4 5 7	1 3 5 7	1 3 5 7	1 3 4 5 7	1 3 5 7	1 3 5 7
3 lanes w/o raised median†	1 2 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7
4+ lanes with raised median†	1 3 5	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7
4+ lanes w/o raised median‡	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8

*One lane in each direction †One lane in each direction with two-way left-turn lane ‡Two or more lanes in each direction

Given the set of conditions in a cell,

- 1 Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- 3 Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- High-visibility crosswalk markings, parking restriction on crosswalk approach, adequate nighttime lighting levels
- Raised crosswalk
- Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- In-Street Pedestrian Crossing sign
- Curb extension
- Pedestrian refuge island
- Pedestrian Hybrid Beacon
- Road Diet

This table was developed using information from: Zegeer, C. V., Stewart, J. R., Huang, H. H., Lagerwey, P. A., Feaganes, J., & Campbell, B. J. (2005). Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines (No. FHWA-HRT-04-100); Manual on Uniform Traffic Control Devices, 2009 Edition, Chapter 4F. Pedestrian Hybrid Beacons; the Crash Modification Factors (CMF) Clearinghouse website (<http://www.cmfclearinghouse.org>); and the Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE) website (<http://www.pedbikesafe.org/PEDSAFE/>).

Dangerous Intersections

Concern: I feel uncomfortable crossing at the intersection.

Best practices for intersection design and operation is to slow motor vehicle speeds to reduce crash risk between all travelers. Higher speeds affect motorists' ability to see and react to other roadway users, including the most vulnerable: pedestrians.

While pedestrians are especially at risk of being hit by a motorist making a left turn across a crosswalk, they are also at risk of being hit by motorists turning right on a red light. Techniques to reduce crash risks include reducing crossing distances, slowing motor vehicle speeds, and prohibiting motor vehicles from traveling across crosswalks when pedestrians are present.



Improved right-turn crossing

Dangerous Intersections Implementation Countermeasures

The following table describes Pedestrian Toolbox dangerous intersection treatment elements and when they should be used.

Pedestrian Toolbox Element	To Slow Speeds	To Mitigate the Effect of Speed	Considerations
Shortening crossing distances	X	X	Shorter pedestrian crossing distances result from: <ul style="list-style-type: none"> Reducing the curb radii Extending the curb through a bulb-out Installing a median half-way across a long crossing
			Curb extensions (bulb-outs) can help define on-street parking
			Tight corner radii can accommodate larger vehicles with: <ul style="list-style-type: none"> Truck aprons Bike lanes (especially with buffers)
Operations: No Right turn on Red; permissive (or protected) right- or left-turn phases		X	To be considered where there are large numbers of pedestrians or near schools where children cross
			Can be implemented throughout the day or during peak hours only
			Can be combined with a leading pedestrian interval
			Permissive turns can be leading (i.e., occurring before the walk phase begins) or lagging (i.e., occurring after the walk phase ends)
Slip lane design	X	X	Tighter turning radii and narrow slip lanes can slow motor vehicle speeds and reduce crossing distances.
			Consider converting the slip lane to sidewalk space.

Auto-Oriented Parking Lots

Concern: I don't have a safe place to walk in a parking lot.

Few parking lots are designed with pedestrians in mind, even though all users walk through them at least twice – going to their destination, then coming back to their car. Subdivision and development ordinances can be revised to require pedestrian (and bicyclist) pathways in parking lots. In doing so, three other requirements should be reviewed:

1. the number of parking spaces required;
2. opportunities for shared parking; and
3. parking lot driveway consolidation.

City ordinances set minimum parking requirements for commercial and larger, multi-family developments based upon the anticipated number of motor vehicles the development will generate and anticipated parking occupancy. As cities re-think the way they view pedestrian and bicyclists networks, there is a trend to better define space for these modes in the public right-of-way and large parking lots. When walking in a large parking lot between one's parked car and the building entrance, there is typically not a defined space for pedestrians to use, unless they have parked in a handicapped space. Motorists often are surprised to see pedestrians in motor vehicle travel lanes and can become impatient if they slow speeds or impede access to a parking spot.

Since pedestrians make the trip between car and front door twice, they would benefit from defined space that is safe and direct. This type of space can mitigate various safety risks:

- » Parked cars can block the line-of-sight for both pedestrian and motorists;
- » People walking along a parking lot aisle with motorists pulling in or backing out creates uncertainty for pedestrians and motorists; and
- » People crossing an aisle-way or driveway at the head of a parking lot can be as problematic for them as crossing a moderately busy street.



Illustration of a typical supermarket parking lot without pedestrian pathways

Auto-Oriented Parking Lots Implementation Countermeasures

Some companies are responsive to requests from municipalities to include low impact design features into their parking lots. In doing so, they can incorporate pedestrian walkways. For example, some low impact design features include:

- » Providing a sidewalk down the full length of the parking lot every other aisleway
- » Providing direct pathway between the adjacent sidewalk and store entrance
- » Providing a painted pathway between the parking aisles and the building entrance

These concepts are illustrated in the photos on the next page :

Examples of Improved Pedestrian Accommodations in Parking Lots

Painted Pedestrian Pathway



Sidewalk-to-Storefront Pathway



Full length aisleway sidewalks

Commercial establishments may be hesitant to reduce the number of parking spaces, even if the number exceeds required minimums. On most days, however, motorists tend to park as close as possible to the building entrance in very large parking lots, leaving spaces unused even. Weather and a desire to minimize walking distances are likely factors in the decision where to park. In addition, wide interior aisleways allow more maneuvering space for motorists, especially at locations where there is a greater number of SUVs and trucks. Parking minimum requirements set by zoning codes often limit the amount of space available for walkways and bikeways. In order to provide a safer environment for pedestrians in parking lots, the following may be considered:

- » Reducing or removing required minimum parking stalls for some uses
- » Require that walkways be included in parking lots with more than 25 stalls
- » Require walkways every 150' or every three parking aisles for lots more than 25,000 square feet

Inadequate Rail Crossings

Concern: There is no sidewalk or way to know if a train is coming.

Railroad crossings are especially important to ensure that all users are aware of a train approaching, and aware of having to cross the tracks, which can pose a physical challenge for certain pedestrians.

Inadequate Rail Crossings Implementation Countermeasures

Elements that can be used to improve railroad crossings include:

- » Ensuring that crossings are perpendicular to train tracks
- » Adding pedestrian gates or arms
- » Implementing barriers or fences to channelize users to the safest crossing.
- » Public Education Campaign

Railroad line owners are partners in establishing safe crossings, as they work to increase safety and manage their liability.

Dunbar-Manhattan Heights Crossing Example

Lubbock has several freight rail lines operated by BNSF and the West Texas and Lubbock railroads. All lines concentrate in the Dunbar-Manhattan Heights neighborhood and adjacent areas, owing to a rail yard. Land uses in the area are a mix of industrial and residential. There are limited opportunities to cross this rail yard. The primary location is along 24th Street where this a small, uninviting sidewalk. Improving the 24th crossing and exploring other safe crossing opportunities closer to 34th Street is recommended. In addition, there are no level (i.e., at- no barriers to prevent people walking along or crossing the tracks which can create unsafe conditions.



Well-equipped railroad crossing in rural Ohio town

The map below shows an example of where a safe pedestrian rail-crossing could be implemented to provide another path for pedestrians between the Dunbar-Manhattan Heights neighborhood and other areas west of the train tracks.



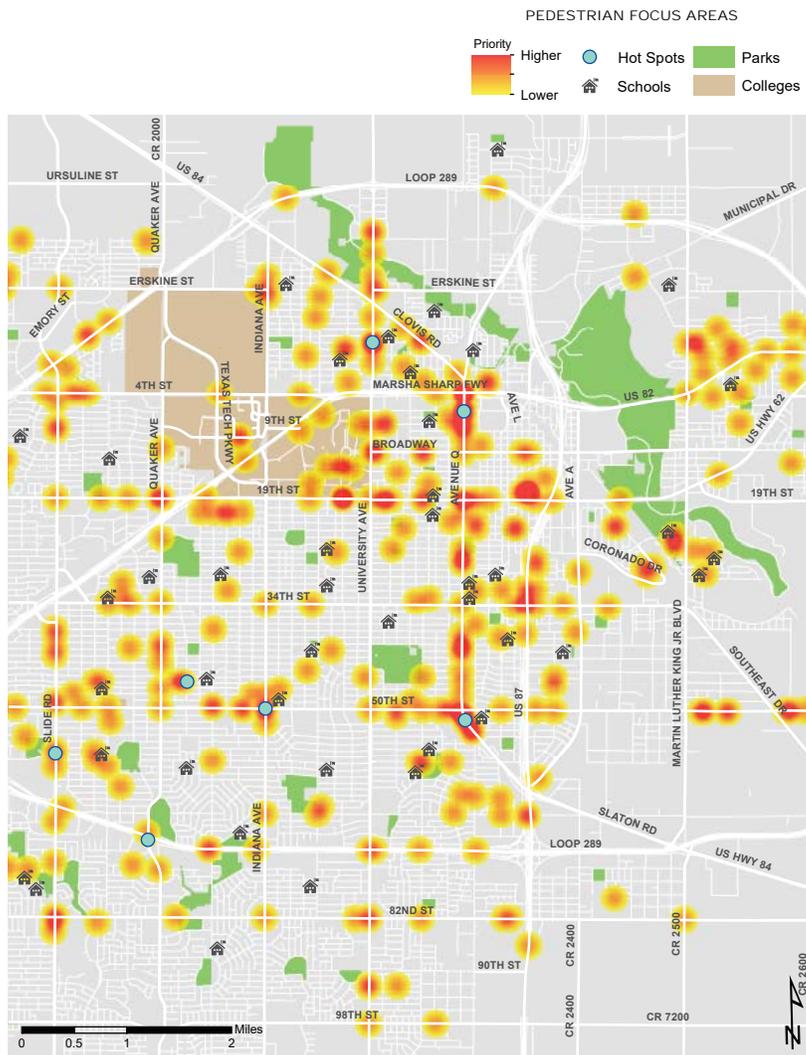
Pedestrian Plan

How does all this work in Lubbock?

While it is unrealistic to immediately implement pedestrian network improvements along every roadway and at every intersection in Lubbock, certain locations have a higher need for pedestrian infrastructure. For Lubbock's Pedestrian and Bicycle Master Plan, the toolbox was applied to about two dozen example locations based on a set of criteria. The four basic criteria used for determining priority locations were:

- » More than four pedestrian crashes between 2012 and 2017
- » Located along a transit route
- » Located near schools and other amenities
- » High proportion of households that do not own a vehicle and older adults

The map shown to the right shows the result of the data-driven prioritization. Selecting which of these areas to use as examples for applying the toolbox was the next step.



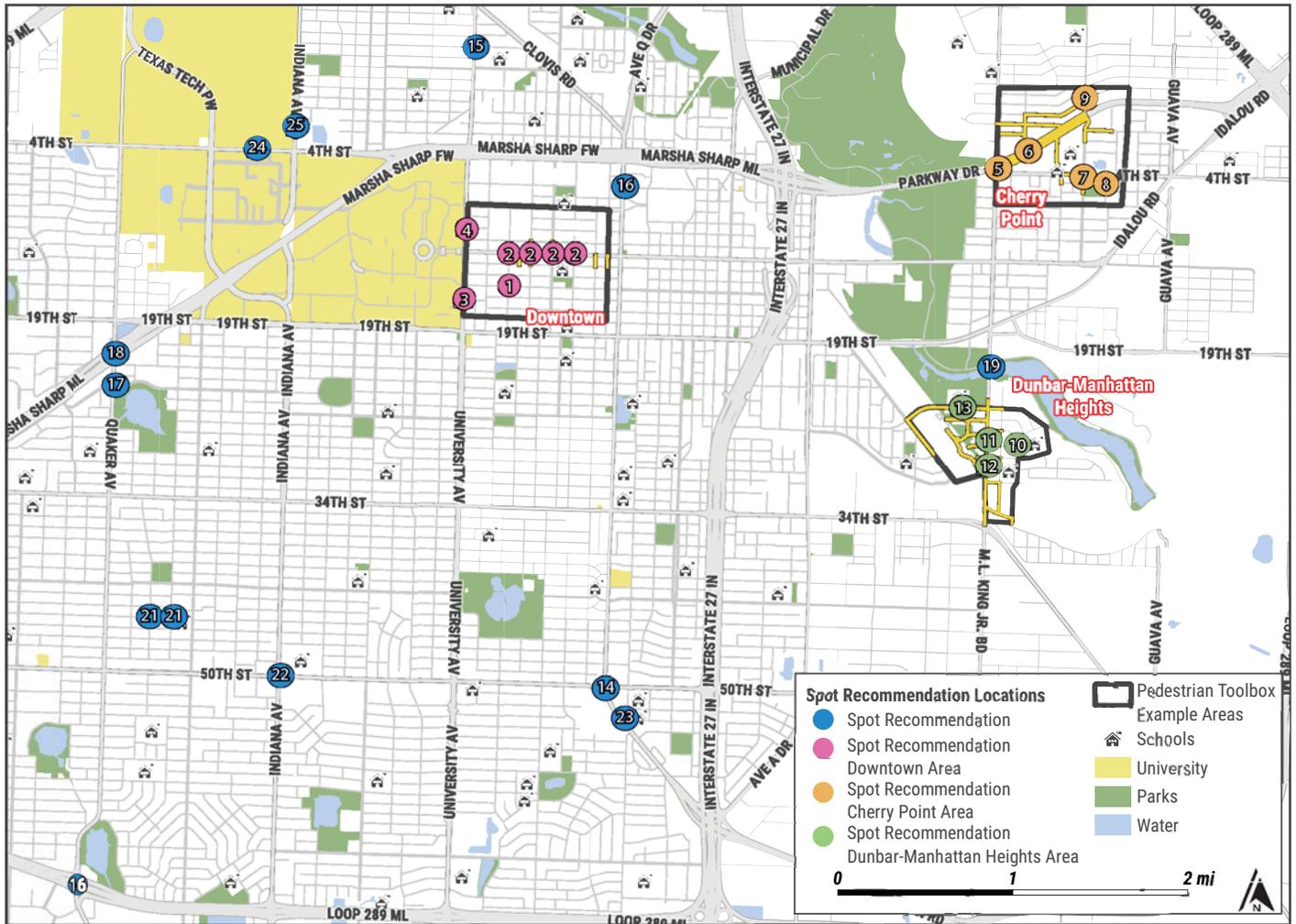
The Pedestrian Plan: Implementation Examples

The Pedestrian Plan included in here provides tools for future action through resources, examples, and policy direction. It reflects answers to several questions such as:

- » What are the goals for the eight Cs, especially continuous, connectivity, coherent, compliant?
- » What types of facilities that benefit pedestrians and encourage walking make sense for Lubbock?
- » Are there priority networks? Or priority destinations?
- » How do we establish an implementation plan based on priority networks and destinations?
- » How soon will the resources included here be used?

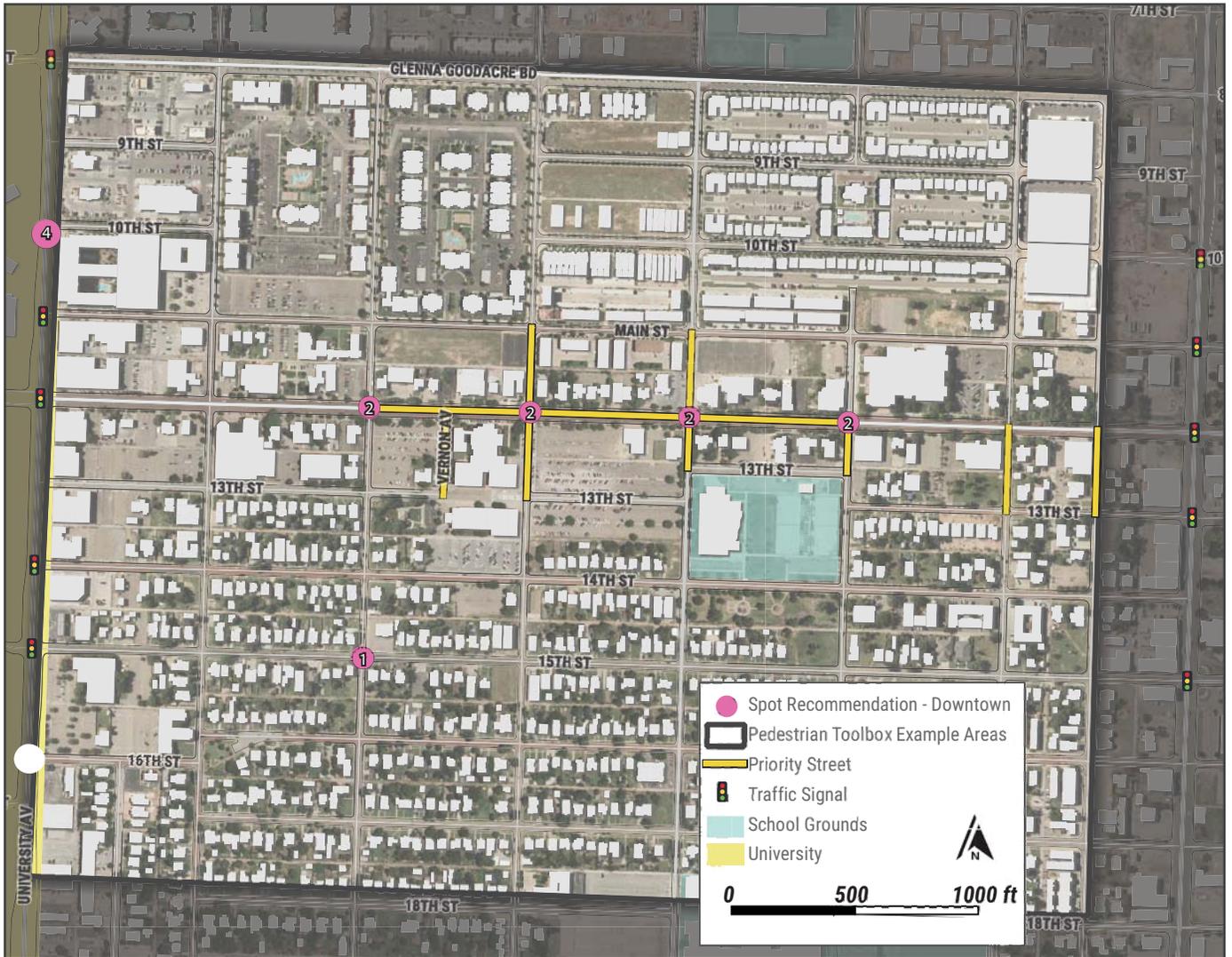
Applying the Pedestrian Toolbox and Counter Measures

The prioritization and toolbox resources described in above sections were applied to a series of locations identified through the prioritization process. These example locations serve as a model for identifying and implementing projects going forward. The location selected, shown on the Citywide overview map below and the accompanying table, represent typical issues for pedestrians with respect to safety, comfort and connectivity. The locations were selected, based on the data-driven analysis described above and stakeholder input, provide an opportunity to apply a range of facility types included in the toolbox. The project team visited each location shown in the map above and applied infrastructure elements from the pedestrian toolbox. Following overview map is a series of maps which display at concept-level these infrastructure elements. The below table shows toolbox elements used in the example areas.



		Bus Stop Shelter and Landing Pads	Curb bulb outs, curb radii	Curb Ramps and detectable warning surface	Marked Crosswalks	Medians	Multituse Trails	Other turn restrictions	Pedestrian capacity at corners	Pedestrian Hybrid Beacon	Pedestrian Signal	Pedestrian Signal Timing and Countdown Indicator	Rectangular Rapid Flash Beacon	Road Diet, Roadway re-allocation	Sidewalks	Slip lane modification	Stop signs
Map Number	Improvement Location																
Downtown		●	●	●	●						●						
1	Avenue W and 15th St		●	●													
2	Broadway St at Study Area Intersections	●	●	●	●												
3	University Ave and 16th St			●	●						●						
4	University Ave and 10th St			●	●						●						
Cherry Point			●	●	●	●				●			●		●		●
5	MLK Jr. Blvd and Parkway Dr		●	●	●										●		
6	Redbud Ave and parkway Dr			●	●	●				●							●
7	Zenith Ave and E 4th St		●	●	●										●		●
8	Beech Ave and E 4th St		●	●	●								●		●		●
9	Zenith Ave and E Auburn St		●	●	●	●											●
Dunbar-Manhattan Heights			●	●	●	●				●			●		●		
10	Teak Ave and E 27th St		●	●	●										●		
11	MLK Jr. Blvd and Canyon Lake Dr		●	●	●	●				●							
12	MLK Jr. Blvd and E 29th St		●	●	●					●							
13	E 24th St and Oak Ave		●	●	●	●											
14	50th St and Avenue Q			●	●	●						●			●		
15	University Ave and Baylor Street			●	●	●				●					●		●
16	Avenue Q and Mac Davis Lane		●	●	●	●		●									
17	Quaker Ave and 24th St		●	●	●	●		●							●		
18	Quaker Ave and Ramps to Marsha Sharp Freeway			●	●										●	●	
19	ML King Jr. Blvd and Canyon Lake Dr			●	●	●				●				●	●		
20	Quaker Ave and Loop 289				●						●						
21	45th St and Orlando Ave		●	●	●												
	45th St and Nashville Ave		●	●	●												
22	50th St and Indiana Ave					●		●							●		
23	Avenue Q and Avenue P		●	●	●										●		
24	4th St west of Joliet Ave			●		●	●			●				●			
25	Indiana Ave south of 2nd Place			●	●	●	●			●							

Pedestrian Toolbox Example Areas – Downtown



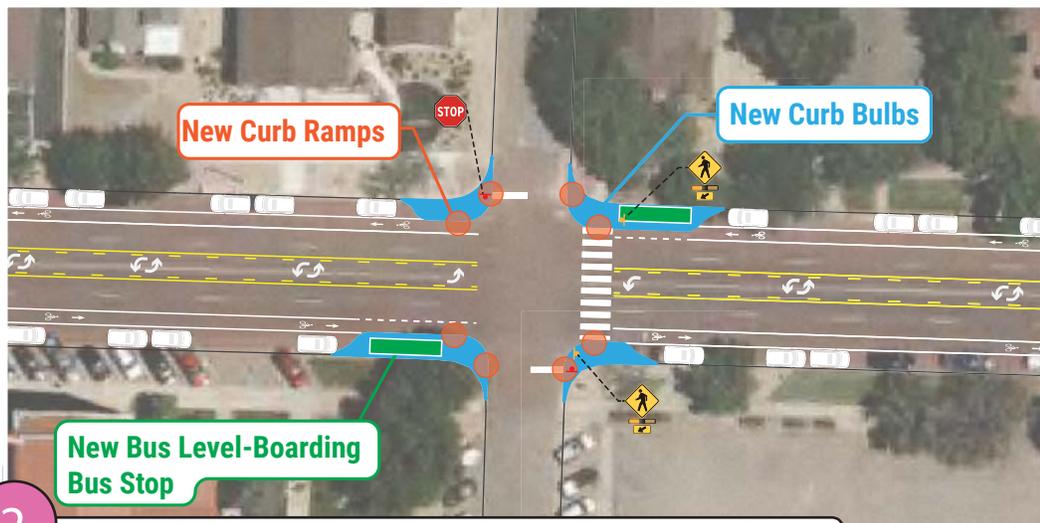
Downtown Spot Improvements



1 Avenue W and 15th Street

RECOMMENDATIONS

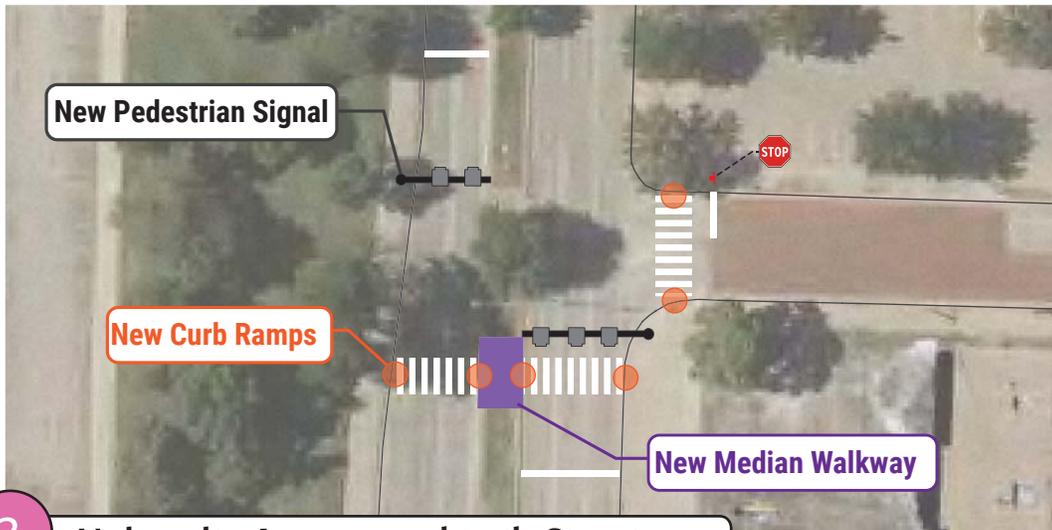
- Construct curb bulbs with ADA ramps to shorten pedestrian crossing distance to slow turning vehicle speeds
- Curb bulbs will need to be designed to work with the existing traffic circle to allow motorists to safely travel through the intersection



2 Broadway Street at Study Area Intersections

RECOMMENDATIONS

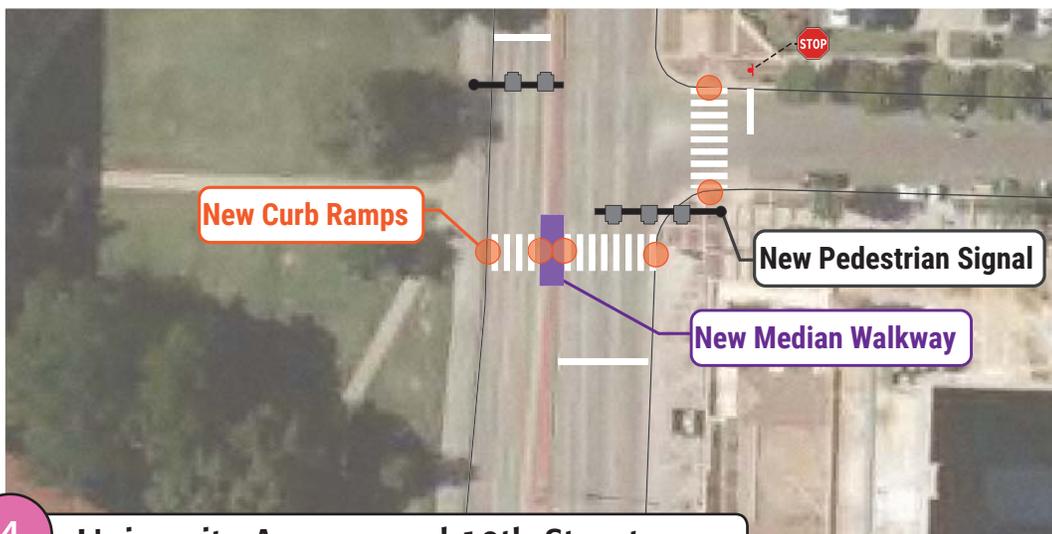
- Install curb bulbs to shorten pedestrian crossing distance and turning vehicle speeds and provide level-boarding at bus stops



3 University Avenue and 16th Street

RECOMMENDATIONS

- Install pedestrian signal and coordinate with existing traffic signals
- Install high-visibility crosswalks with pedestrian crossing signage, modified existing median to accommodate pedestrian travel, and ADA ramps



4 University Avenue and 10th Street

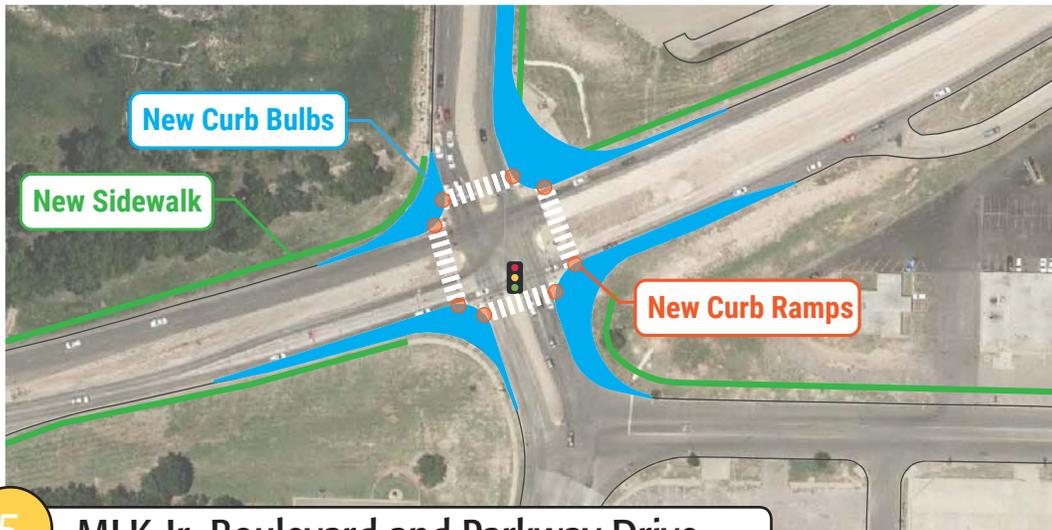
RECOMMENDATIONS

- Install pedestrian signal and coordinate with existing traffic signals
- Install high-visibility crosswalks with pedestrian crossing signage, modified existing median to accommodate pedestrian travel, and ADA ramps

Pedestrian Toolbox Example Areas – Cherry Point



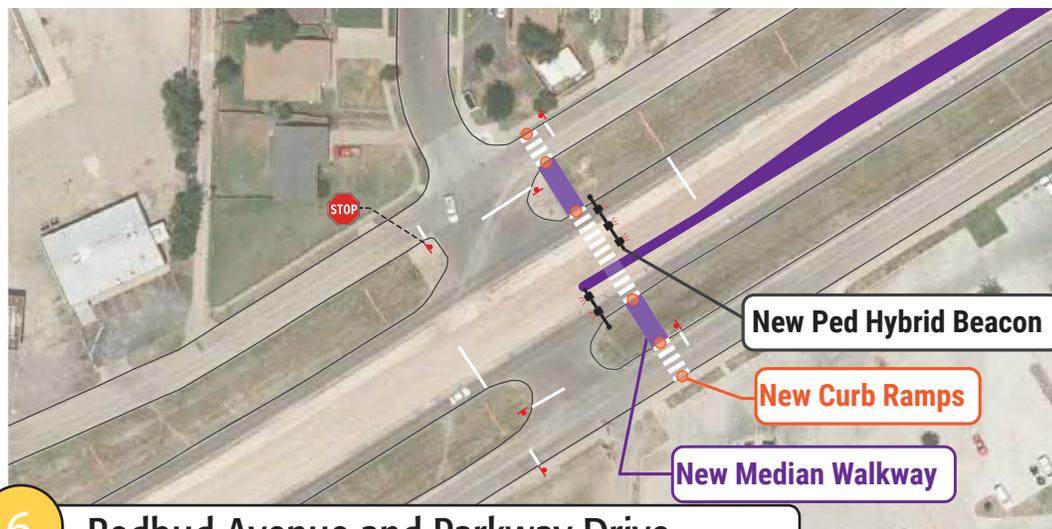
Cherry Point Spot Improvements



5 **MLK Jr. Boulevard and Parkway Drive**

RECOMMENDATIONS

- Construct curb bulbs with high-visibility crosswalks and ADA ramps to shorten pedestrian crossing distance to slow turning vehicle speeds
- Install sidewalks to fill existing sidewalk gaps



6 **Redbud Avenue and Parkway Drive**

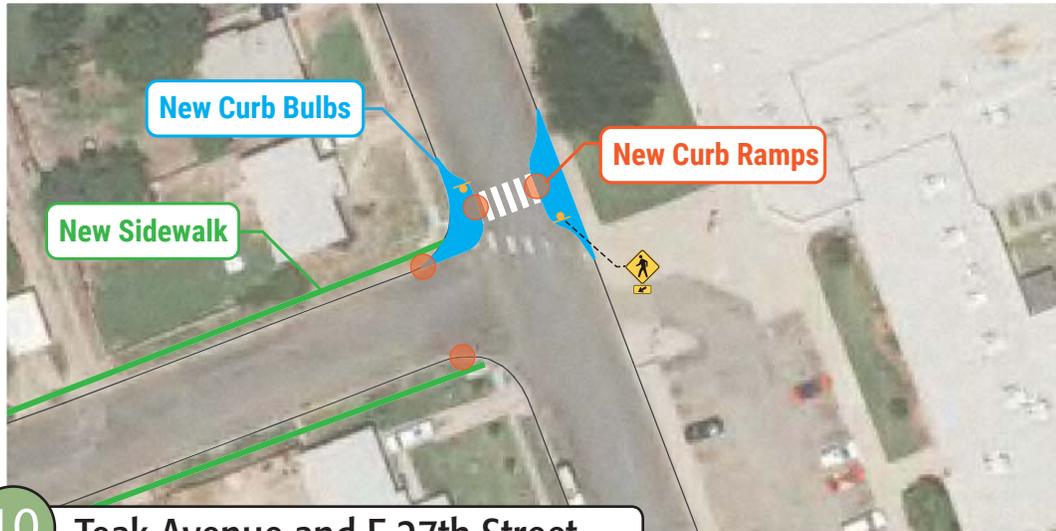
RECOMMENDATIONS

- Install Pedestrian Hybrid Beacons with stop bars and crosswalks
- Install stop signs at cross streets
- Modify existing medians to provide pedestrian walkways with ADA ramps

Pedestrian Toolbox Example Areas – Dunbar-Manhattan Heights



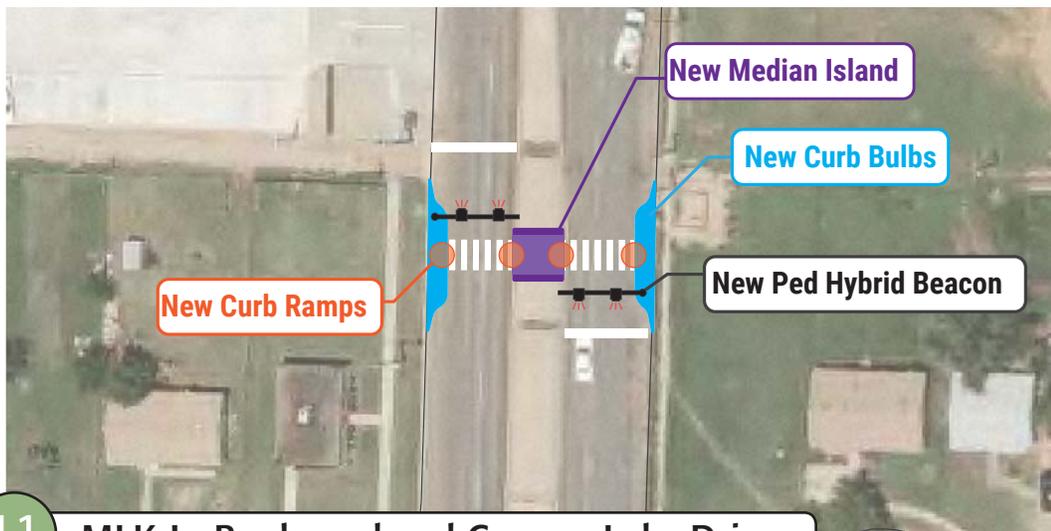
Dunbar-Manhattan Heights Spot Improvements



10 Teak Avenue and E 27th Street

RECOMMENDATIONS

- Construct curb bulbs to shorten pedestrian crossing to Dunbar Middle School
- Install high-visibility crosswalks with pedestrian crossing signage
- Install new ADA curb ramps at crossings
- Construct sidewalks along E 27th Street

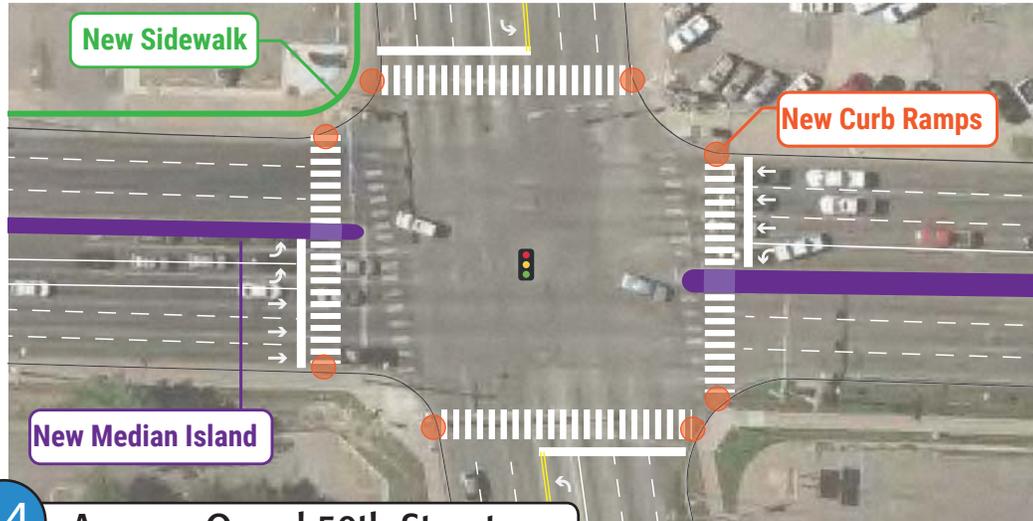


11 MLK Jr. Boulevard and Canyon Lake Drive

RECOMMENDATIONS

- Install high-visibility crosswalks with pedestrian crossing signage, pedestrian median island, and ADA ramps
- Install Pedestrian Hybrid Beacons with stop bars

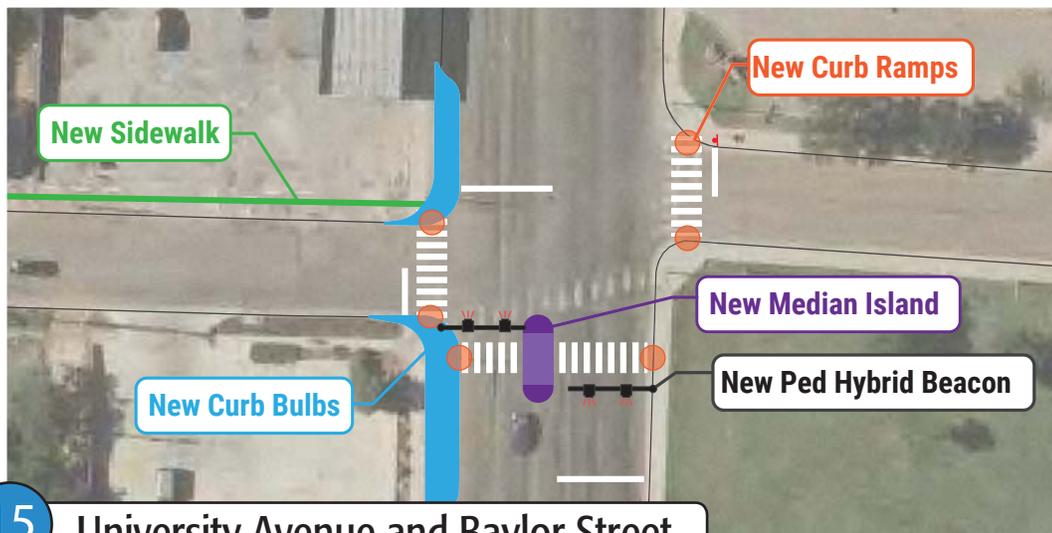
Pedestrian Toolbox Example Areas – Spot Improvements



14 Avenue Q and 50th Street

RECOMMENDATIONS

- Install high-visibility crosswalks with new median crossing islands, pedestrian crossing signage, and ADA curb ramps
- Construct sidewalk to fill existing sidewalk gap
- Install pedestrian push buttons and ensure appropriate pedestrian crossing signal times
- Install six-foot pedestrian island to cross 50th Street



15 University Avenue and Baylor Street

RECOMMENDATIONS

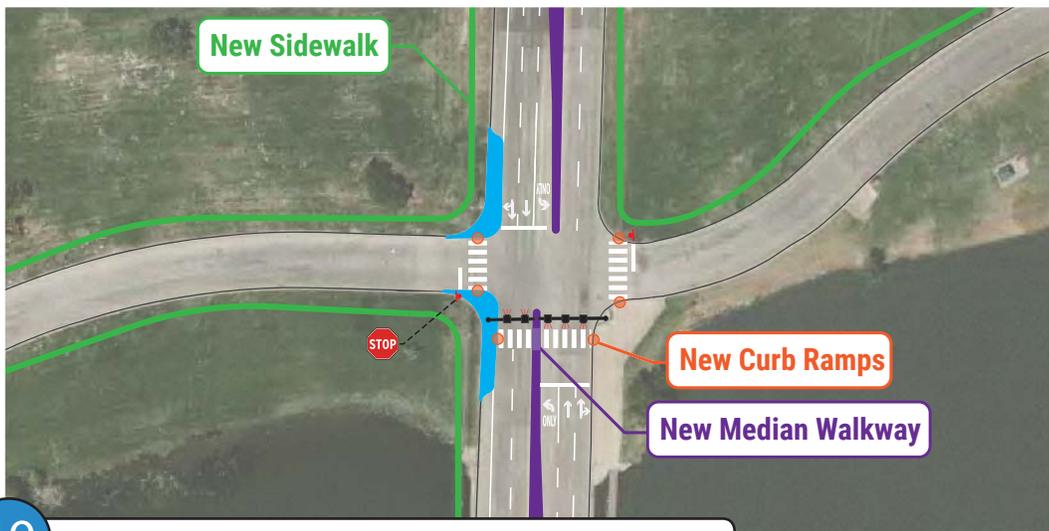
- Install Pedestrian Hybrid Beacons with stop bars
- Construct median island with ADA ramps and high-visibility crosswalk
- Install sidewalk to fill existing sidewalk gap



18 Quaker Avenue and Marsha Sharp Freeway

RECOMMENDATIONS

- Install high-visibility crosswalks with pedestrian crossing signage, ADA ramps, and pedestrian push buttons
- Install raised crosswalks at slip lanes to slow turning vehicle speeds and improve yield rates
- Construct sidewalks to connect to fill sidewalk gaps



19 MLK Jr. Boulevard and Canyon Drive

RECOMMENDATIONS

- Install new Ped Hybrid Beacons with stop bars
- Remove outside lane on west side of street and install high-visibility crosswalks with pedestrian crossing signage, modified median to accommodate pedestrians, and new ADA ramps
- Construct sidewalks to fill existing sidewalk gaps

Corridor-long: Re-thinking the Thoroughfare

Understanding and Unlocking Lubbock's One-mile Grid

Lubbock's grid of thoroughfare and collector streets function to accommodate and facilitate the movement of large quantities of vehicles, at high speeds, for long distances. Posted speed limits range from 40 MPH to 50 MPH. The resulting 80 feet or so provides ample space for motor vehicle but can serve as a barrier for people to walk across.

Local streets function in the opposite way, in that these streets are used for shorter trips, have slower moving vehicles, and have lower traffic volumes. Local streets can provide an excellent walking environment for pedestrians because of slower moving vehicles, lower traffic volumes, and more comfortable crossing conditions. Local street crossings are smaller than arterial and collector street intersections because the right of way width and the number of lanes is significantly smaller. These roadway characteristics often lead to safer and more comfortable environments for pedestrians and are often very appealing to walk along.



Typical one-mile grid in Lubbock

While local streets can provide comfortable walking conditions, they do not provide direct or convenient access to popular destinations especially when there are not safe and convenient crossings at major streets. Safe crossing opportunities need to be available to pedestrians where it is convenient for them to cross. Distances between existing crossings that are too far can result in people choosing to cross at unsafe locations or choosing to not make the potential trip on-foot.

The figure above represents a typical Lubbock neighborhood comprised of predominately residences with some commercial land uses on the periphery. Most everyday destinations are located outside or along thoroughfares and collectors. For example, walking to work (location A) can be challenging and inconvenient in this neighborhood. Walking in a straight-line west leads to an unsignalized intersection at a major street. Crossing a major street without a signal can be challenging and uncomfortable for most people. Major streets that have five to seven lanes are even more uncomfortable and potentially risky to attempt to cross. Walking to the nearest signalized intersection to safely cross can more than double the walking distance and time. Conversely, walking to the grocery store (B) is convenient and easy because there is a Pedestrian Hybrid Beacon that requires vehicles to stop for pedestrians to cross the street. Location C illustrates the potential network improvement for pedestrians if a crossing with some type of signal is available at a location directly across from a shopping area. Without this crossing, pedestrians will need to walk out of their way to the nearest traffic signal to make their trip.



Thoroughfares provide ample space for motor vehicles but can be a barrier for walking between neighborhoods

Over time and in conjunction with changes to the bicycle network, Lubbock’s thoroughfares and collectors can become more comfortable for people to walk along and safe to cross. Changes include well-established pedestrian-friendly infrastructure such as:

- » Wider, continuous sidewalks with buffer space between the street
- » Pedestrian-scale street lights, benches, more trees and other street-scape features for protection against the heat and wind
- » Bus stop build-outs based on universal design principals (which also meets ADA guidelines)
- » More places to cross the street with signals that create space between motor vehicles
- » Shorter crossing distances by re-purposing areas of the roadway for pedestrian islands
- » Traffic calming in places where congestion can increase the crash risk for all travel modes

Corridor Level Analysis

The optimal way to improve thoroughfares to safely accommodate bicycles and pedestrians is to incorporate bicycle and pedestrian-friendly elements in the design from the beginning. However, there are still many opportunities to retrofit existing thoroughfares in Lubbock. The following section details an example on 50th Street of how to approach this process.

Retrofit Process

For existing roadways that need to be retrofitted to provide enhanced walkability we recommend the following process:



Step 1: Establish Purpose

The fundamental first step to any project is establishing its purpose. The purpose of the project will shape the outcome and define the success of the result. By establishing the purpose of the project from the beginning, a unified vision of success can be shared and promoted by transportation officials, key stakeholders, and the public.

Step 2: Existing Roadway Conditions

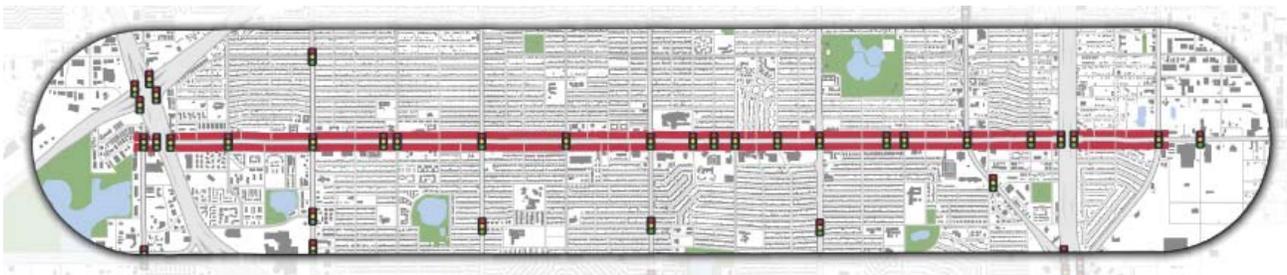
A corridor evaluation should begin with an evaluation of existing conditions. This may include the following elements:

- » Number of lanes
- » Speed limit
- » Traffic volumes
- » Distance between crossings
- » Streetside conditions (sidewalks, sidewalk buffers, shade)
- » Bus routes
- » Driveway density
- » ADA compliance of existing structures
- » Location of utility poles, drainage elements, and other obstructions
- » Existing crossing opportunities

The Bicycle Plan recommends converting the outside lanes of 50th Street between Avenue D and Loop 289 to buffered bike lanes. Improved pedestrian conditions can accompany and complement this change. The more typical portion of 50th Street is west of Avenue D and can also be modified to better serve pedestrians.

These changes would include:

- » Increase the number of safe opportunities to cross the street from 20 to 30.
- » Shorten crossing distances by 1,320 feet. The max distance between existing and proposed crossings is roughly ¼ miles apart. Existing signalized crossings are typically spaced every ½ mile, so adding Pedestrian Hybrid Beacons and RRFBs between existing signals reduces the crossing distance by one-quarter mile (1,320 feet).
- » Increase sidewalk widths to 6 feet, allowing at least two people to walk together sociably, including children walking to school.
- » Increase the space between the sidewalk and motor vehicle travel by three feet, and up to six feet where there is a bicycle lane.



50th Street case study corridor

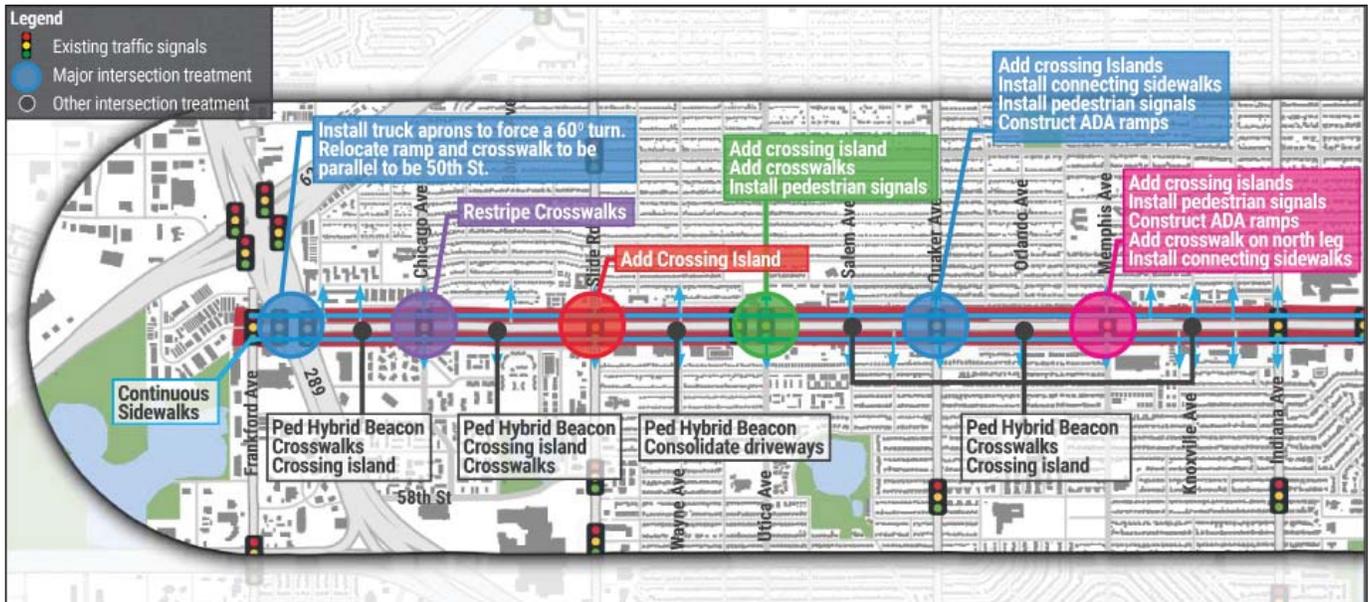
Existing Roadway Conditions

Characteristic	Description
Number of lanes	5-7 lanes are the typical cross section along this corridor. This may contribute to an uncomfortable walking environment and poses safety risks for pedestrians. Wide right of way means there are long distances for pedestrians to cross. The greater distance a pedestrian must cross, the more at risk they are for being involved in a crash, and the more inconvenient and uncomfortable the crossing experience will be. Reconfiguring the right of way to limit pedestrian exposure to moving vehicles can improve pedestrian crossings.
Speed limit	40 mph is the posted speed limit along the corridor. Higher speed limits have a strong and positive relationship to increased crash risk and severity for pedestrians.
Traffic Volumes	50th Street currently experiences moderate to light traffic volumes east of IH-27 and moderate to heavy traffic volumes west of IH-27.
Distance Between Crossings	1-mile is the typical walking distance between traffic signals without a controlled or enhanced pedestrian crossing between traffic signals. This makes crossing the street challenging and sometimes not possible.
Streetside Conditions	Sidewalk gaps are present along 50th Street and on intersecting streets that discourage and, in some cases, prohibit some people from being able to make trips as a pedestrian. There are visible “goat paths” that have developed from people walking on the grass where there is not a sidewalk. These goat paths show that there is demand for sidewalks and that people want to make trips as pedestrians, but don’t have the infrastructure to support their trips.

Characteristic	Description
Streetside Conditions	<p>Lack of tree canopies along 50th Street contribute to higher surface temperatures and greater discomfort for pedestrians. Trees can block the sun and lower the atmospheric temperature along the sidewalk and contribute to a more comfortable environment to walk in.</p> <p>Sidewalk buffers that separate the sidewalk from the street are often too narrow or nonexistent. Sidewalk buffers provide pedestrians with a higher level of comfort and safety when walking next to a major street.</p>
Transit Routes/ Amenities	<p>Bus shelters are present at only some of the bus stops. Waiting for a bus next to a wide street without any protection from the sun can discourage people from walking and using transit. Additionally, there are several locations with bus stops that are located very close to each other. Bus stop consolidation and relocations can help improve transit access and improve bus service times.</p>
Driveway Density	<p>Driveway crossings are a frequent challenge along 50th Street. Driveways can be viewed as barriers and high-risk locations. Driveways require pedestrians and motorists to interact while a motorist is either entering or exiting a parking lot. This interaction increases the risk of a crash. Reducing the number of driveways limits the number of interactions between both modes and can improve pedestrian safety. Additionally, some driveways have sloped surfaces, raised sidewalks without ramps that make it difficult for some people to travel on. Providing a level and straight surface without any obstacles can greatly improve the pedestrian environment.</p>
ADA Compliance	<p>A lack of curb ramps at intersections is a common characteristic along 50th Street. Curb ramps make it accessible for everyone to be able to cross the street and access the sidewalk. Some curb ramps are outdated and are not ADA compliant, making it challenging or impossible for people of all abilities to use.</p>
Presence of Obstructions	<p>Utility poles along the sidewalks, driveways, and corners are barriers for pedestrians and can make walking on the sidewalk challenging or impossible. These barriers can also act as a shield, blocking the view of motorists and pedestrians that can increase the risk of a crash.</p> <p>Large drainage treatments at Avenue A prevents people from being able to safely stand on corners, and in some cases pedestrians must cross three legs of an intersection rather than crossing just one leg, increasing their exposure to moving vehicles. These drainage features are not unique to 50th Street but are present at several other locations throughout Lubbock.</p>
Existing Crossing Opportunities	<p>Few crossing opportunities along 50th Street means people must travel much farther in order to reach their destinations. In some cases, people will choose to cross the street at unmarked crosswalks. These uncontrolled crossings along roadways with 5-7 lanes can be challenging and risky for pedestrians. More often than not, people will choose to not make the trip because the extra distance, time, inconvenience, and perception of risk of making the trip on-foot is greater compared to other modes of transportation.</p>

Develop Concepts: West of Indiana Avenue Example

The figure below displays a sample of treatment concept focused on improving the pedestrian network along 50th Street west of Indiana Avenue. Much of this portion has existing sidewalks. Some areas lack an adequate buffer space to separate motorists and pedestrians and some spots have utilities, uneven sidewalks, and vegetation encroaching the pedestrian space. Driveway consolidation should be explored along the eastern portion of this study area. Typical treatments along this portion of 50th Street aim to provide crossings controlled for pedestrians where there are no traffic signals. In addition, this concept aims at providing more comfortable and accessible crossings at signalized intersections.



Recommendations along 50th Street west of Indiana Avenue

Develop Concepts: East of Indiana Avenue Example

Figure 8 displays a collection of potential treatments that can improve the pedestrian network along 50th Street from Indiana Ave to Avenue A. This area of 50th Street has more commercial land uses and driveways that impact the pedestrian realm than in Figure 7. Typical concepts for this portion of 50th St consist of reducing lane widths at major intersections, installing Pedestrian Hybrid Beacons (HAWKS) at uncontrolled crossings, installing pedestrian signals, and installing curb bulbs. Additional analysis to consolidate driveways, side street access control should be explored, and reducing the number of lanes along 50th Street.

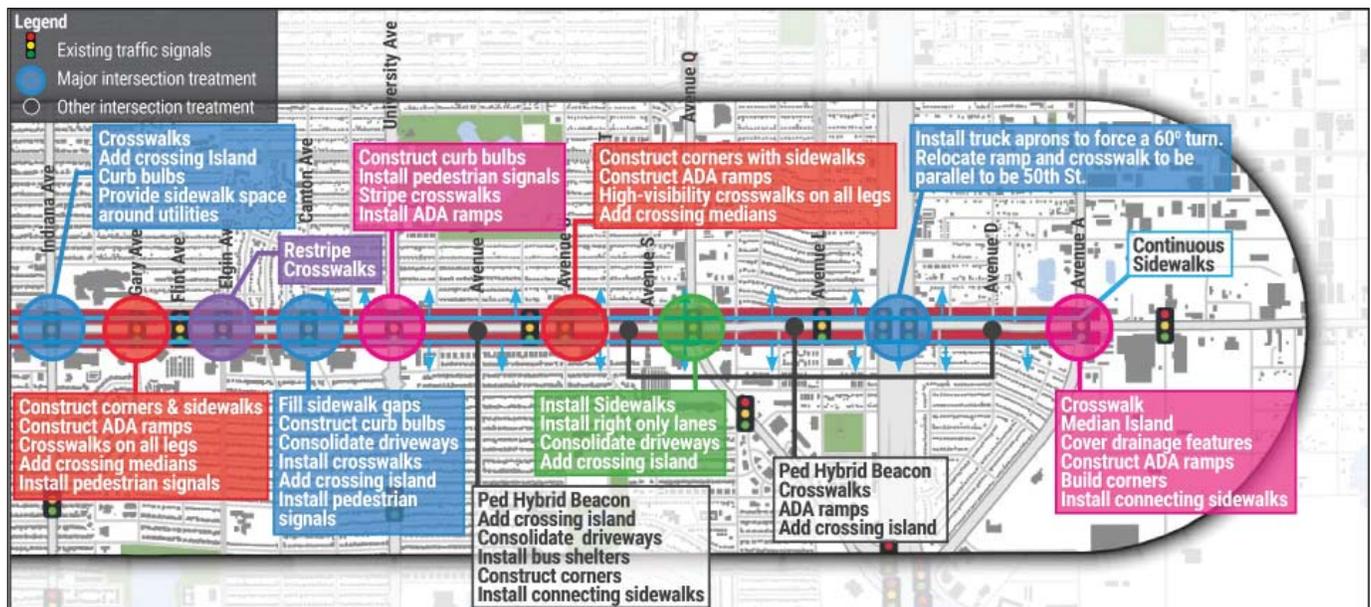


Figure 8. Recommendations along 50th Street east of Indiana Avenue

Engage the Public

This example illustrates the process and types of treatments to improve 50th Street to provide an all ages and abilities route. However, this example was illustrative of the process and techniques to upgrade a corridor for pedestrian enhancement. Further public involvement and analysis would be recommended on the proposed improvements prior to implementation.

Summary

High Level Cost of Implementation

Unit costs for the most common pedestrian toolbox elements range vary, depending on the type of material and typical unit used for costing. These costs are valid as of the date of this plan and may change to reflect current prices in Lubbock at the time of implementation.

Toolbox Element	Unit Cost
Sidewalk, 5 feet wide	<ul style="list-style-type: none"> » \$40 per linear foot » Typical 600-foot block of 5-foot wide sidewalk would be \$24,000 per side
Bus stop outfitted with shelter, landing pad, light, and trashcan	<ul style="list-style-type: none"> » Standard shelter with bench and light = \$15,000 » Shelter pad (min 15' x 6'; using sidewalk cost) = \$750 » ADA-compliant landing pad (5' x 8'; using sidewalk cost) = \$350
Pedestrian-oriented lighting along 600-foot block face with 30 to 50-foot spacing per IESNA standards	<ul style="list-style-type: none"> » Pole and installation (includes permit and inspection; service drop) = \$2,500 » Typical 600-foot block with about 15 lights (depending on the location) = \$37,50
Shade trees along 600-foot block face, planted 30 feet apart (2.5-inch caliper tree installed with staking, 2-foot depth topsoil, 3-inch depth mulch, watering bag and 2 years' watering)	<ul style="list-style-type: none"> » \$1,000 each » Typical 600-foot block with 14-20 trees (depending on the location) = \$14,000 to \$20,000
Rectangular Rapid Flash Beacon	<ul style="list-style-type: none"> » \$20,000 for a set of two
High visibility crosswalk, 10 feet wide	<ul style="list-style-type: none"> » \$10 per linear foot
Pedestrian Hybrid Beacon	<ul style="list-style-type: none"> » \$200,000 for a set of signals
Curb ramp (ADA-compliant), 4-foot wide	<ul style="list-style-type: none"> » \$2,000 to 4,000 each » A typical intersection with two curb ramps on each of four corners = \$16,000 to \$32,000
Right turn on red restriction	<ul style="list-style-type: none"> » \$500 for sign post
Raised Curb extension (Bulb Outs)	<ul style="list-style-type: none"> » \$20 per square foot

Chapter 6: Implementation

Project Prioritization

To begin the process of prioritizing projects, the project team met with the Transportation Advisory Committee and the Transportation Policy Committee to discuss the key components of the bicycle and pedestrian master plan. In the meeting, the joint committee members expressed a desire to prioritize a larger number of smaller projects first, in addition to a small number of catalytic projects. The bicycle and pedestrian response to these initial projects would help to guide further projects in the future. The following sections discuss the high priority bicycle and pedestrian projects identified by the project team.

Bicycle Network

For the bicycle network, the project team identified two high priority catalytic projects which have the potential to make a significant impact to the bicycle network immediately. These projects are:

1. The Memphis Avenue bicycle/pedestrian bridge
2. A pedestrian/bicycle shared-use path in the existing utility easement between 98th Street and 114th Street.

In addition to the catalytic projects, several key corridors were identified as high priority projects. The high priority projects consist of bike lane and bike boulevard corridors which are intended to fill in some critical missing links in the network early on. These include bike lanes along Memphis Avenue, buffered bike lanes along 34th street, and a bike boulevard along 58th street.

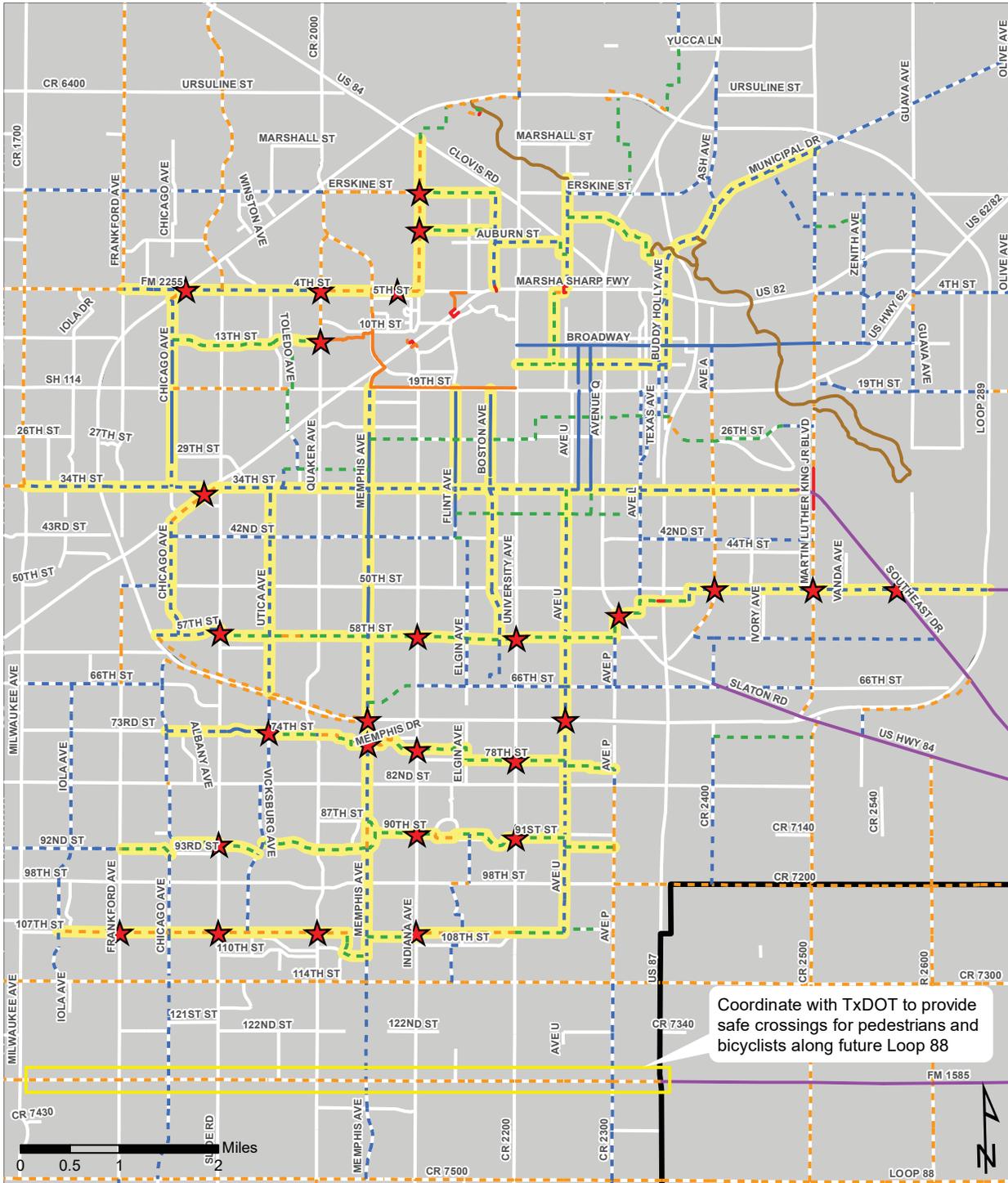
The projects identified as high priority are intended to be implemented early in the process and will serve to establish a baseline level of bicycle connectivity in the region. Projects not identified as high priority are to be built out later in the process, or built with new roads as the roadway network develops.

The bicycle high priority projects are presented in **Exhibit 15**.

Exhibit 15: Bicycle High Priority Projects

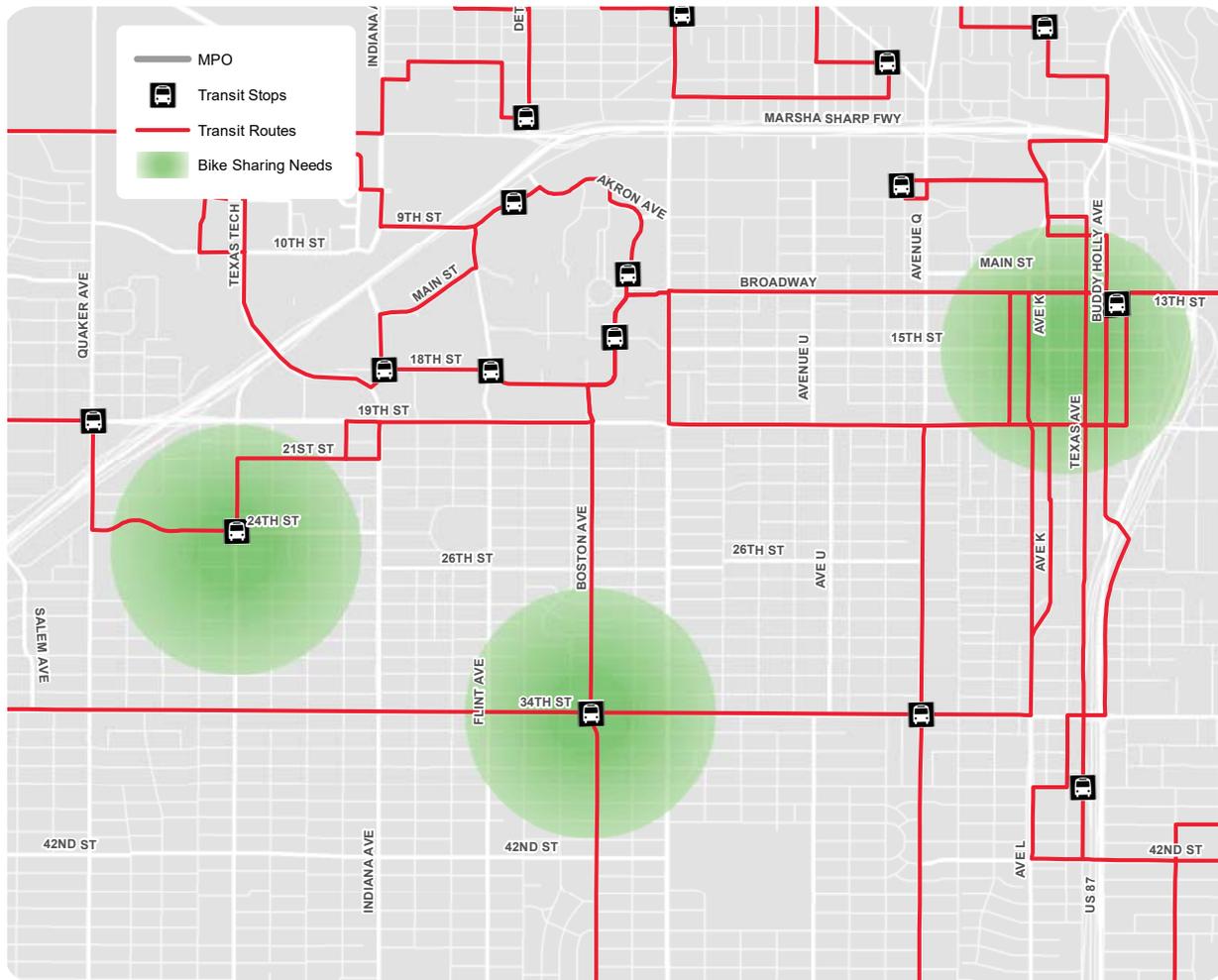
2018 BIKE PLAN: HIGH PRIORITY PROJECTS

- Bike Lane, Existing
- Sidepath, Existing
- Bridge, Existing
- MPO Boundary
- - - Bike Lane, Proposed
- - - Sidepath, Proposed
- - - Bridge, Proposed
- ★ Crossing Treatments
- - - Bike Boulevard, Proposed
- Paved Shoulder, Existing
- Canyon Lake Trail, Existing



Bike Sharing

In addition to pursuing the high priority bicycle projects, another component of the bicycle network that can quickly increase bicycle connectivity is to expand bike sharing beyond the Texas Tech University Campus. Expanding bike sharing allows for short trips to be completed via bicycle for people who live or work near a bike sharing station. Several locations have been identified as potential areas to introduce bike sharing stations. These locations were based on proximity to transit routes and in areas with high potential pedestrian activity, such as Downtown Lubbock. Texas Tech campus already has bike sharing and is not shown as a location. The potential bike sharing locations are shown below.



Pedestrian Network

Based on the project team’s evaluation and feedback from the public and project committees, the pedestrian network in Lubbock faces three main challenges:

1. Continuity (sidewalk gaps)
2. ADA Compliance
3. Lack of dedicated funding for pedestrian improvements

Currently, there is a dedicated funding source set aside for ADA related improvements. This funding is designated to address individual spot improvements throughout the City, but an ADA transition plan has not been performed. In addition, a thoroughfare inventory of existing sidewalk gaps has not been completed, and there isn't a specified funding source to address sidewalk gaps. Based on these observations, the project team identified the following as the top priority investments in the pedestrian network:

1. Perform a sidewalk gap inventory
2. Complete an ADA Transition Plan
3. Set aside a dedicated funding source for pedestrian facility improvements.
4. Make improvements to the pedestrian example areas provided in Chapter 5.
5. Evaluate Pedestrian Connectivity in eastern Lubbock and Tech Terrace.

Programs and Policies

In addition to investing in new facilities and maintenance, the successful implementation of the plan will require complimentary programs and policies which can help to create an all-around better experience for bicyclists and pedestrians in Lubbock. The project team and project committees worked together to identify programs and policies which align with the vision and goals established in Chapter 1 of this plan. These programs and policies are presented in the following tables.

Similar to the bike and pedestrian projects, high priority programs and policies which are anticipated to have the greatest immediate impact have been identified within each category. These are recommended to be implemented in the short-term time frame in or order to act as catalysts to other programs and policy changes. These priority programs and policies are shown in red bold.

Coherent	
Regularly update crosswalks and add new crosswalks.	While crosswalks do not need to be striped to be legal, striped crosswalks serve two important purposes, especially when combined with other crossing treatments: they show pedestrians where to cross and they tell motorists to expect pedestrians. Keeping crosswalk stripes fresh makes them visible during the day and night, so annual maintenance is important. High visibility striping is a best practice across streets with higher traffic volumes and speeds.
Upload the Bike Plan to a mobile web application	By uploading the Bike plan to an interactive mobile application, bicyclists can view routes are near them based on their location in real time.
Update standards to evaluate pedestrian and bicycle walkability within a parking lot.	By updating standards for parking lots, pedestrians can be more safely accommodated while still providing adequate parking for vehicles.
Develop a Bicycle Signage Plan	The development of a bicycle signage plan will allow for the uniform implementation of standard signage and wayfinding, making it less difficult for bicyclists to follow bicycle routes.

Comfortable	
Develop and promote pedestrian and bicycle circulation systems in parking lots	People walk in parking lots all the time, yet except for pathways from handicapped parking spaces, there are no designated places for pedestrians to travel to and from their cars and from bus stops on the street side edges. Motorists are often bewildered about why pedestrians are in their way; pedestrians are confused about why they are at risk. Designating walking routes does not have to reduce the total number of available parking spaces.
Establish a local Safe Routes to School program	Safe Routes to School programs promote safe walking and bicycling to and from schools to improve the health and well-being of school children. Resources and guidance are provided for project applicants through TxDOT's TAP program.
Identify and prioritize locations for bicycle rack installation	Properly installed and conveniently-located bicycle racks encourage bicyclists to park their bicycles in secure and convenient locations. Adequate bicycle parking also reduces the likelihood of damage that may result from locking bicycles to trees, sign posts, or other objects.
Regularly update the City's traffic calming policy	Traffic calming policies enable jurisdictions to retrofit streets with physical and visual features that reduce travel speeds and, in turn, make streets safer and more comfortable environments for bicyclists. Existing traffic calming measures are outlined in the City of Lubbock's Neighborhood Traffic Management Program.
Identify up to five Safety Improvement Corridors	Using crash data to isolate bicycle and pedestrian crashes, safety improvement corridors can be identified. These corridors would become candidates for bicycle and pedestrian improvements aimed at increasing safety.

Compliant	
Update curb ramps to meet ADA; replace corner steps with curb ramps	Curb ramps that meet current ADA standards are needed to fully meet the needs of people with disabilities. Compliant curb ramps also assist people traveling strollers, carts, on bicycles, and other wheeled items. Best practices call for one curb ramp in each path of travel designed for the specifics of the location.
Develop PROWAG Guidelines	PROWAG (Public Rights-of-Way) guidelines are intended to address public ROW elements that can pose unique challenges to accessibility, including sidewalks and streets, curb ramps, and wheelchair capabilities in parking conditions.

Complete	
Adopt a local Complete Streets policy.	Complete Streets policies establish a process which requires planning and designing for all roadway users, including pedestrians, bicyclists, transit users, and motorists. A local Complete Streets policy would supplement TxDOT's Complete Streets policy and would be specifically applicable to City-owned streets.
Adopt Thoroughfare Cross Sections with Bicycle Facilities	In addition to a complete streets policy, having standard cross sections which include bicycle facilities can greatly increase the completeness and connectivity of the Bicycle network.

Connected	
Develop an approach to the pedestrian network based on the existing motor vehicle thoroughfare network	The one-mile thoroughfare network grid works for motor vehicle travel, but is not fine enough for pedestrians. Using the thoroughfare network, develop a similar approach to the pedestrian network that identifies maximum distances between signalized crossings, complete sidewalks with a minimum width, and sufficient buffers to the roadway.
Implement Bicycle Parking Requirement Within Zoning Code	Implementing a Bicycle Parking Requirement within the zoning code will help to ensure that bicyclists have a safe place to store their bikes when they reach their destination.
Update Standards to evaluate pedestrian and bicycle connectivity to new development	Requiring the evaluation of bicycle and pedestrian activity to new development will help to ensure bicyclists and pedestrian have adequate options for reaching their destination. For example, how to students in a new residential development walk to school safely?

Constructible and Maintainable	
Regularly update local street design standards to reflect national best practices.	Local street design standards dictate how roadways can be built according to the local Complete Streets policy. Road design guidelines often control the inclusion and design of bicycle infrastructure.
Develop a pedestrian and bicycle facility maintenance program	A bicycle and pedestrian facility maintenance program can help to keep an inventory of bicycle and pedestrian facilities and their conditions, enabling the prioritization and implementation of facility maintenance. Maintenance cycles and triggers should be based on the impact of surfaces and debris on bicyclists and pedestrians, rather than thresholds used for motor vehicle travel lanes.
Develop Standard Details for Bicycle Facility Pavement Markings	Having a standard for Bicycle Facility Pavement Markings will ensure that the bicycle network is uniform and continuous throughout the City
Incorporate recommendations into all New, Reconstruction, and Maintenance Projects	The most efficient and cost-effective way to build a bicycle and pedestrian network is to include bicycle and pedestrian facilities as part of other ongoing roadway projects. This includes new, reconstruction, and maintenance projects.
Evaluate and Identify Funding Sources	Evaluating and identifying potential funding sources such as federal and state grants is a critical step toward feasibly implementing new pedestrian and bicycle facilities.

Culture	
<p>Create a Bicycle Pedestrian Program and hire a Program Coordinator.</p>	<p>The role of a local Bicycle Pedestrian Program and the Program Coordinator is to promote bicycling and walking through encouragement, engineering, and design. The Program Coordinator is also responsible for advocating for bicycling and walking in transportation planning processes.</p>
<p>Support International Walk to School Day (October) and National Bike to School Day (May)</p>	<p>These events in the fall and spring are used as springboards for getting more students to walk and bike to school and to gain support from policy and decision makers about safer and more complete infrastructure. In the fall 2017, 202 Texas schools participated in International Walk to School Day; in May 2018, 39 school participated in Bike to School Day. Participating communities include Amarillo, Plano, Houston and surrounds, and Dallas-Ft. Worth and surrounds.</p>
<p>Distribute bike lights, helmets, and bells.</p>	<p>Bike lights, helmets, and bells are important features of safe bicycling. Distribution of safety equipment will promote responsible bicycling behavior and create safer conditions for both bicyclists and motorists sharing the roadways.</p>
<p>Create a local Bicycle Benefits program.</p>	<p>Bicycle Benefits is a program designed to reward individuals and businesses alike for their commitment to creating a more livable and sustainable community. Bicyclists benefit by receiving discounts from participating businesses, and businesses benefit from increased customer traffic.</p>
<p>Conduct police training on bicycle and pedestrian safety.</p>	<p>Police departments should provide officers with training to improve their understanding of bicyclists' and pedestrians' rights and responsibilities. Increased knowledge will allow officers to properly enforce laws that prevent crashes and enhance safety for all road users.</p>
<p>Conduct regular bicycle and pedestrian counts.</p>	<p>Regular bicycle and pedestrian counts can guide planning and funding decisions. Counts can also be used to quantify the benefits of investments in bicycle and pedestrian infrastructure. The challenge is to conduct counts in a way to supports increases in walking and biking, especially roadway crossings. For example, identifying locations where pedestrians and bicyclists are crossing without visible crossing facilities is one way to know where bicycle and pedestrian infrastructure is needed.</p>
<p>Create a Nexus Between Complete Streets and Vision Zero</p>	<p>Actively working to promote the principles of complete streets and active transportation can be done as part of a broader effort to strive to accomplish the goal of vision zero, which is to have no serious injuries or fatalities involving road traffic.</p>

Program Name	Administered by	General Provisions
<p>Transportation Alternatives Set-Aside (formerly the Transportation Alternatives Program – TAP)</p> <p>(also see the FHWA website)</p>	<p>MPOs and TxDOT are responsible for selecting projects independent of one another:</p> <p>Metropolitan Planning Organizations (MPO) (large urbanized areas with populations over 200,000) administer TA Set-Aside funds according to their needs.</p> <p>TxDOT administers TA Set-Aside funds for locally sponsored bicycle and pedestrian infrastructure projects in communities less than 200,000</p> <p>The Lubbock Metropolitan Planning Organization is the Lubbock MPO.</p>	<ul style="list-style-type: none"> » Includes all projects and activities that were previously eligible under TAP, encompassing smaller-scale transportation projects such as: <ul style="list-style-type: none"> ▪ Pedestrian and bicycle facilities ▪ Recreational trails ▪ Safe routes to school projects ▪ Community improvements such as historic preservation and vegetation management, ▪ Environmental mitigation related to storm-water and habitat connectivity » Allows an urbanized area with a population of more than 200,000 to use up to 50% of its sub-allocated TA funds for any STBG-eligible purpose » Eliminates TAP’s “Flexibility of Excess Reserved Funding” provision (which allowed the use of excess TAP funds for any TAP-eligible activity or for projects eligible under the Congestion Mitigation and Air Quality Improvement Program)
<p>Recreational Trail Program</p>	<p>TX Department of Parks & Wildlife, under FHWA approval</p>	<ul style="list-style-type: none"> » Maximum \$200,000 for non-motorized trail grants » October 1 application deadline for fall 2018 » Up to 80% of project cost » Maximum of \$200,000 for non-motorized trail grants » Eligible projects include <ul style="list-style-type: none"> ▪ New recreational trail construction ▪ Existing trail improvements ▪ Trailhead or wayside facilities development ▪ Trail corridor acquisition

Other sources of funding to consider include philanthropic foundations such as those established by Walmart, Rails to Trails, and the National Parks and Recreation Association. Local businesses may be a source for responding to small funding requests as part of their community service programs.

Program Priorities and Organizational Capacity

The consideration of multiple funding sources allows the MPO to work on more than one implementation approach. A combination of larger and more complex projects that require significant funding and smaller projects with lesser funding needs should be pursued. While a large project such as the Memphis Avenue bicycle and pedestrian bridge is an important connection in the bicycle network for which BUILD funding should be pursued, smaller projects and programs can begin to shift the community's perception of Lubbock towards being more pedestrian- and bicycle-friendly, i.e., its Culture. For example, a more visible safe routes to school program with monthly walk and roll to school days supported by crossing guards at key locations and strong media coverage reaches people of all ages. Public art and crosswalk design will engage other parts of the community and can be funded through foundation grants or a '1% arts' line item in the MPO's operating budget.

Municipalities that are most successful in receiving grants to support their transportation system have the organizational capacity to track funding opportunities and apply for grants. This work is often done by staff in the City Manager's Office or by City Council staff, coordinating with a designated staff person in streets or engineering, planning, or parks and recreation. This plan recommends the MPO to establish a bicycle and pedestrian coordinator position. This person would be responsible for the overall management of both infrastructure and programs related to walking and bicycling, and would also work to identify and apply for infrastructure project funds.

Additional Funding Sources

Three primary funding sources were highlighted in the previous section of this chapter. The following are additional funding sources, with a brief overview of the program.

Funding Source	Overview
Section 402 State and Community Highway Safety Grant Program	The Section 402 program provides grants to states to improve driver behavior and reduce deaths and injuries from motor vehicle-related crashes. The program is jointly administered by the National Highway Traffic Safety Administration and the Federal Highway Administration at the federal level and by State Highway Safety Offices at the state level.
Metropolitan and Statewide Planning and Nonmetropolitan Transportation Planning (5303, 5304, 5305)	This funding source is three different programs that are financed with federal funding from both FHWA and FTA, administered by TxDOT. This grant provides funding for multimodal transportation planning in metropolitan areas and states. Plans should be cooperative, continuous, and comprehensive and result in long-range plans and short-range prioritized programs. Plans can and should incorporate bicycle and pedestrian facilities, however funding is for planning only (not infrastructure).
Texas County Transportation Infrastructure Program	TxDOT has received applications from counties for a grant under the County Transportation Infrastructure Fund Grant Program (Program), which was created by the 83rd Legislature in Senate Bill 1747, and is being administered by TxDOT. TxDOT finalized application review and has calculated eligible grant awards for all eligible applicant counties.
Highway Safety Improvement Program (HSIP) in Texas	HSIP funds are available for safety projects aimed at reducing traffic fatalities and serious injuries. Bike lanes, roadway shoulders, crosswalks, intersection improvements, underpasses and signs are examples of eligible projects. Projects in high-crash locations are most likely to receive funding. States that have identified bicycle safety and pedestrian safety as Emphasis Areas are more likely to fund bicycle and pedestrian safety projects. HSIP funds are available through the TxDOT. This funding is available to TxDOT staff and local governments, and can be used to make improvements on any public roadway.

Funding Source	Overview
Surface Transportation Block Grant (STBG)	The STBG provides flexible funding that may be used by states and localities for projects to preserve and improve the conditions and performance on any federal-aid highway, bridge, and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. Larger Metropolitan Planning Organizations control a share of the funds to distribute locally through a competitive process.
Congestion Mitigation and Air Quality Improvement (CMAQ) Program in Texas	The CMAQ program supports transportation projects that to contribute air quality improvements and provide congestion relief. TxDOT sub-allocates a portion of available CMAQ funds to Metropolitan Planning Organizations in U.S. EPA-designated air quality areas through the Metropolitan Planning Organizations and Large Cities Program. Bicycling and walking projects can be funded through this program because of their link to air quality improvements.
ArtPlace National Creative Placemaking Fund	The National Creative Placemaking Fund invests in planning and development projects where arts and culture play a central role. ArtPlace funds a variety of creative placemaking projects across the United States. Since 2011, the National Creative Placemaking Fund has invested in 227 projects across 152 communities of all sizes in 43 states and the District of Columbia.
Rivers, Trails, and Conservation Assistance Program	This program, administered by the National Park Service, helps to connect Americans to their parks, trails, rivers, and other places. When a community asks for assistance with a project, NPS staff provides free, on-location facilitation and planning expertise from conception to completion. Assistance can include visioning and planning, developing concept plans for trails, parks and natural areas, setting priorities and identifying funding sources.
Bike Shop Sponsorships	Trail and bicycle programs have a positive effect on the economy. Many of those who benefit would like to give back. Bike shops are often willing to donate a portion of their proceeds towards community events or the completion of a particular project.
Boy Scouts of America	The Boy Scouts of America is one of the nation's largest youth development organizations. The BSA provides a program for young people that builds character, trains them in the responsibilities of participating citizenship, and develops personal fitness.
Bristol-Myers Squibb	The Bristol-Myers Squibb Foundation promotes health equity and seeks to improve the health outcomes of populations disproportionately affected by serious diseases by strengthening health care worker capacity, integrating medical care and community-based supportive services, and mobilizing communities in the fight against disease.
Crowdfunding	Crowdfunding focuses on raising money for projects through many small donations, typically via the internet. Websites, such as gofundme.com, ioby.com and indiegogo.com, allow fundraising campaigns to be easily established. In 2014, Memphis raised \$70,000 in this way to build a separated bicycle lane. In 2015, Denver launched a crowdfunding campaign focused on corporate donors for the planning and design of bicycle facilities.

Funding Source	Overview
Home Owners Associations	As more and more communities recognize the benefits of biking and walking, they are willing to support extensions of existing systems or connections to their neighborhood. Home Owners Associations and other neighborhood groups are often willing to fund all or part of a project to hasten its completion.
Knight Foundation	The Knight Foundation funds projects and programs related to communities, attracting and keeping talented people in them, expanding economic opportunity and creating a culture of engagement in addition to arts programming focused on weaving the arts into the fabric of communities to engage and inspire the people living in them. The Foundation works in 26 communities where brothers John S. and James L. Knight owned newspapers.
National Recreation and Park Association (NRPA)	NRPA routinely partners with foundations to provide grants for projects in parks, such as the Walk With Ease Grant, which is a partnership between the NRPA and the Centers for Disease Control, or the NFL Play 60 After-School Kick Off Grant, a partnership with the NFL Network to fund fields, equipment and staff. Additional fundraising resources and strategies are also provided.
People for Bikes Grant	People for Bikes Grants support bicycle infrastructure projects and advocacy initiatives that make it easier and safer for all people to ride. Most grant funds are awarded towards infrastructure projects such as bike paths, lanes, trails, and bridges, and end-of-trip facilities such as bike racks, bike parking, and bike storage.
The Conservation Fund	The Conservation Fund provides loans for land acquisition to support the creation of bicycle and pedestrian facilities. Their loan program offers flexible financing as well as sustained and expert technical assistance to organizations aiming to protect key properties in their communities.
Walmart Foundation	Walmart Foundation provides significant funding for projects that align with their key focus areas: Opportunity, Sustainability, and Community. In addition, staff are encouraged to participate in volunteer projects and can provide smaller levels of financial support.
Workplace Giving	Workplace giving programs let employees donate to the charities they care about, primarily through payroll deductions, often contributing a few dollars per paycheck. Once a year, the donor decides which issues and organizations are most important to them and contributes accordingly. Donations through workplace giving enables organizations to spend less time and money fundraising and more time working toward their goals. EarthShare is an example non-profit which coordinates campaigns focused on the environment. The Combined Federal Campaign is another example program, which focuses on federal and military donors.
Southwest Airlines Heart of the Community Program	Launched in 2014 with lead partner Project for Public Spaces, the Heart of the Community grants provide financial and technical assistance to local community partners who seek to bring new life to their public spaces through collaboration. The program funds activities focused on place-making in a downtown core. Funded projects focus on physical and programmatic improvements to publicly accessible outdoor space that can be completed within one year of award.
ArtPlace National Creative Placemaking Fund	The National Creative Placemaking Fund invests in planning and development projects where arts and culture play a central role. ArtPlace funds a variety of creative placemaking projects across the United States. Since 2011, the National Creative Placemaking Fund has invested in 227 projects across 152 communities of all sizes in 43 states and the District of Columbia.
County Highway Safety Program	This program provides funds to counties for highway safety treatments or corrective activity designed to alleviate a safety problem or potentially hazardous situation. The County Engineers Association of Ohio (CEAO) serves as the program manager and is responsible for project selection, funding criteria, and program priorities.