# 6. TRANSPORTATION

BASTROP COMPREHENSIVE PLAN UPDATE (2016 - 2036)

**DRAFT** (10-06-16)

CHAPTER SIX

# TRANSPORTATION

**Chapter 6** of the Bastrop Comprehensive Plan is designed to support the growth and land use vision discussed in prior chapters. It presents a series of policies, programs, and initiatives to guide the City in providing its citizens with a high quality transportation network based on comfort, sense of safety, and quality of place.

An efficient and safe transportation system is a vital component of the local economy and quality of life. Businesses depend on the transportation system to send and receive shipments and attract customers; workers need reliable transportation options to commute to and from work; and parents demand safe travel options to get their children to school.

This chapter evaluates Bastrop's existing transportation system and highlights current transportation problem areas, potential future problem areas, and key opportunities. The chapter lays out an approach to address identified issues and opportunities to help ensure a transportation system that serves the long-term needs of residents and businesses.

**Bastrop's future transportation network will be designed to provide community-wide interconnectivity and accessibility to all users, while promoting the character of the city's varied districts and neighborhoods.**

# TRANSPORTATION POLICY.

## DUAL-PLANNING APPROACH

This chapter incorporates key findings and recommendations from the Bastrop Transportation Master Plan, which is a separate document developed concurrently with this plan. The Bastrop Transportation Master Plan provides a more detailed analysis of the city's transportation system and contains a prioritized list of transportation investments for building out the future major thoroughfare network. In contrast, this chapter of the comprehensive plan provides a broad policy framework for making transportation decisions that support the City's overall development approach - including support of desired land uses, growth patterns, and economic development.

Development of the Bastrop Transportation Master Plan concurrently with the Bastrop Comprehensive Plan provides the City with a unique opportunity to develop a transportation system that supports and correlates with the non-transportation-related goals articulated by the community.

## TRANSPORTATION PARTNERS

This chapter incorporates the input of key regional transportation planning partners, including the Capital Area Metropolitan Planning Organization (CAMPO), Texas Department of Transportation (TxDOT), Bastrop County and the Capital Area Rural Transportation System (CARTS). Engaging with these partners helped align the strategies recommended in this chapter with regional transportation plans, planning processes, and implementation time lines. By extension, the City's transportation plans have been prepared to ensure the most efficient use of available funds and the best integration of the local transportation system with the regional system.

## EXISTING PLANS AND STUDIES

The development of this chapter included the review and analysis of existing transportation-related plans and studies from the City, the County, and the Capital Area Metropolitan Planning Organization (CAMPO).

A summary of existing transportation plans and studies is listed below to provide context for how this chapter fits into the goals and objectives that have previously been articulated by the Bastrop community and its regional partners.

### THE CITY OF BASTROP COMPREHENSIVE PLAN (2001)

This plan is a road map for policy decisions related to growth, economic development, and transportation in Bastrop from 2000 to 2020. Major transportation elements included strategies to ensure safe and efficient movement of people and goods, and addressing transportation related challenges associated with growth. Key goals expressed in this plan were to connect neighborhoods, relieve traffic congestion, preserve existing character and promote non-automobile transportation options.

### THE BASTROP COUNTY COMPREHENSIVE TRANSPORTATION PLAN (2010)

This plan provides a blueprint for developing a safe and efficient County transportation system. Key themes in the plan include improving and enhancing mobility, preserving the environment, addressing and improving safety and planning for future growth and development. An update to the Bastrop County Transportation Plan is currently under development, with an expected completion date of September 2016.

### THE CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION (CAMPO) 2040 REGIONAL TRANSPORTATION PLAN (RTP)

This document guides regional transportation and land use planning for the six-county CAMPO region, which includes Bastrop, Burnet, Caldwell, Hays, Travis, and Williamson counties. CAMPO's main function is to coordinate regional transportation planning amongst the numerous jurisdictions, transit providers, and mobility authorities in the region, as well as the Texas Department of Transportation (TxDOT). The CAMPO 2040 Regional Transportation Plan includes a prioritized list of transportation projects for the region over the next 25 years.

## COMMUNITY INPUT

**Chapter 1**, ***Planning Context***, describes methods that were utilized to solicit public input during the comprehensive planning process. Input received through public surveys and open houses regarding transportation suggests that the general public would like to see the following key issues addressed:

- *Congestion caused by operational deficiencies*
- *Unsafe travel conditions, especially for vulnerable users such as children and the mobility impaired*
- *Lack of east-west connectivity*
- *Lack of Colorado River crossings*
- *Lack of bicycle facilities*
- *Lack of sidewalk connectivity*
- *Limited public transportation options*

**Figure 6.1** below illustrates how community members prioritize future transportation investment. Based on feedback from the community combined with technical analysis and input from City and CAMPO staff, a series of goals and objectives were developed for the transportation element of the comprehensive plan. **A summary list of all Transportation goals and objectives can be found at the end of this chapter (page 6-43).**

**FIGURE 6.1. TRANSPORTATION SPENDING PRIORITIES, PUBLIC OPEN HOUSE (2015)** [1]

| COMMUNITY INPUT | |
|---|---|
| TRANSPORTATION INVESTMENT | NUMBER OF DOTS |
| FUNDING FOR A REGIONAL PASSENGER / COMMUTER RAIL SYSTEM | 55 |
| NEW ROAD CONSTRUCTION AND ROAD EXPANSION | 39 |
| EXPAND AND ENHANCE BICYCLE AND TRAIL NETWORKS | 37 |
| MAINTENANCE AND PRESERVATION OF EXISTING SYSTEM | 34 |
| IMPROVE PEDESTRIAN EXPERIENCE AND EXPAND SIDEWALK NETWORK | 29 |
| INCREASED FREQUENCY AND COVERAGE OF LOCAL AND REGIONAL TRANSIT SERVICE | 16 |

[1] *September 3, 2015. Participants were given a number of "dots" to prioritize transportation investments. The table above illustrates the transportation investments chosen most frequently by community members.*

## TRANSPORTATION NETWORK EFFICIENCY.

The following sections provide a brief overview of existing and future traffic conditions in the Bastrop area, including travel patterns, capacity deficiencies, and operational deficiencies.

### TRAVEL PATTERNS

US Census estimates (2010) indicate that over 55 percent of all workers age 16 and over who reside in Bastrop work in areas outside of the city, with more than 46 percent of them working in Austin. This statistic underscores the importance of the city's east-west corridors connecting to Austin and other communities. In particular, SH 71 is the key transportation corridor for the local economy and Bastrop residents who commute to and from the Austin metro area for work. To illustrate this point, estimates of 2010 daily traffic volumes on state highways and major arterials in the city are shown in **Map 6-A, *2010 Daily Traffic Flow*** (page 6-6). Traffic volumes were derived by applying the approved 2040 CAMPO Regional Travel Demand Model (TDM), which uses 2010 as the base year.

Results from the travel demand model confirm that SH 71 - along with SH 21 - are the most heavily-used roadways in the study area, which is to be expected as these serve as major linkages between the population centers of Austin and Houston, and San Marcos and Bryan-College Station, respectively. Other heavily traveled roadways in the area include SH 95 between Bastrop and Elgin, FM 969, which links Bastrop to Austin, and SH 304 just south of the Bastrop study area.

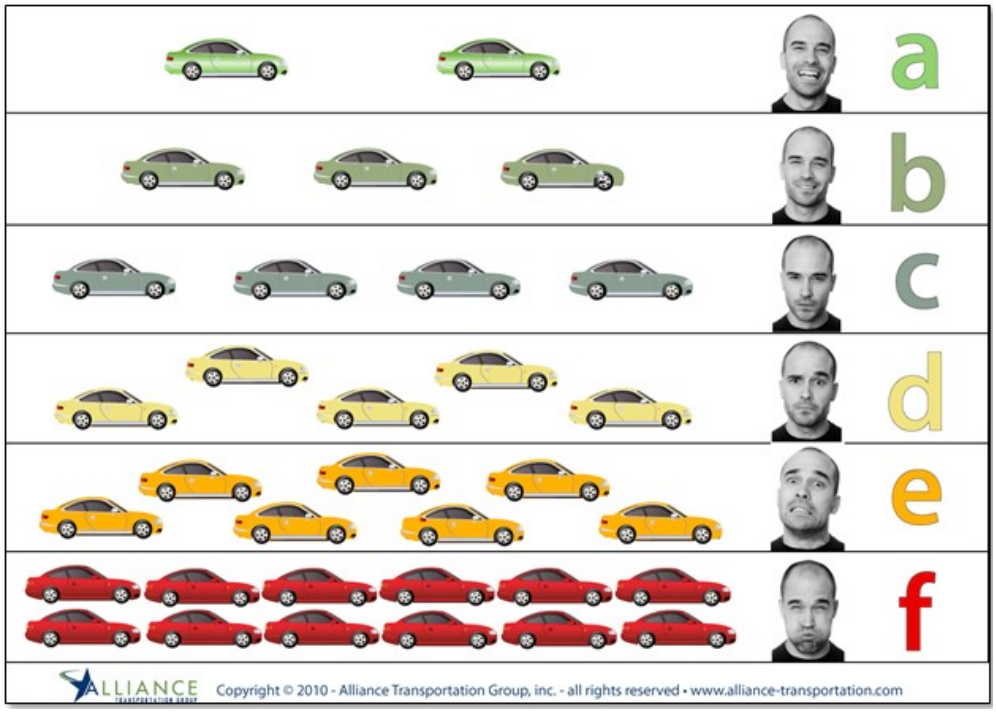
Future travel patterns are likely to change as the Bastrop area attracts new residents and employers in the coming years. **Map 6-B, *Forecast 2040 Daily Traffic Flow*** (page 6-7), shows projected 2040 daily traffic volumes in the Bastrop area - as projected by the 2040 CAMPO TDM.

Traffic projections for future growth show that SH 71 and SH 21 will continue to see the highest total traffic volumes in Bastrop in 2040. Notably, SH 95, FM 969 and FM 157 are projected to see a sharp rise in traffic due to substantial residential growth expected to occur north of Bastrop, particularly the XS Ranch development.

### CAPACITY DEFICIENCIES

The CAMPO TDM was utilized to identify roadway capacity deficiencies in the Bastrop study area by calculating roadway Level of Service (LOS) (which is a qualitative measure that characterizes conditions within a traffic stream and how those conditions are perceived by users of the facility). LOS is measured on an A to F scale, and is calculated as the ratio of traffic volume to roadway capacity. LOS A describes free flow conditions with low volumes and high speeds, while LOS F describes severe congestion with stop-and-go traffic. Typically, planning agencies in larger metropolitan areas strive to achieve between an LOS C and D when planning for future roadway capacity. **Map 6-C, *2010 AM Level of Service***, and **Map 6-D, *Forecast 2040 AM Level of Service*** (pages 6-8 and 6-9), show 2010 and 2040 roadway LOS for state highways and principal arterials in Bastrop and the surrounding area during AM peak period. ***Figure 6.2*** (page 6-5) shows typical traffic conditions for each Level of Service.

**FIGURE 6.2, LEVEL OF SERVICE ILLUSTRATION**




*The figure above illustrates traffic conditions associated with each Level of Service classification.*

**Maps 6-A** through **6-D** collectively show that there are a few areas with Level of Service problems on other roadways in 2010 (problem areas being principally confined to SH 71). By 2040, planned improvements along 71 will have helped congestion in key locations; but, new growth will have created congestion on a variety of other roadways and areas where improvements are not currently proposed.

The following takeaways serve as an overview of the results from the 2010 and 2040 travel demand model runs. A comprehensive and detailed review of the 2010 and 2040 models is included in the Bastrop Transportation Master Plan.

**2010 MODEL OF CURRENT CONDITIONS:**

- *Commuters between Bastrop and surrounding cities, particularly Austin, create capacity deficiencies on SH 71 west of FM 304 during AM and PM peak periods.*
- *Colorado River crossings show capacity deficiencies, particularly on SH 71 and Loop 150/ Chestnut Street.*
- *Model results show capacity deficiencies on SH 71 west of Tahitian Village during AM and PM peak periods.*

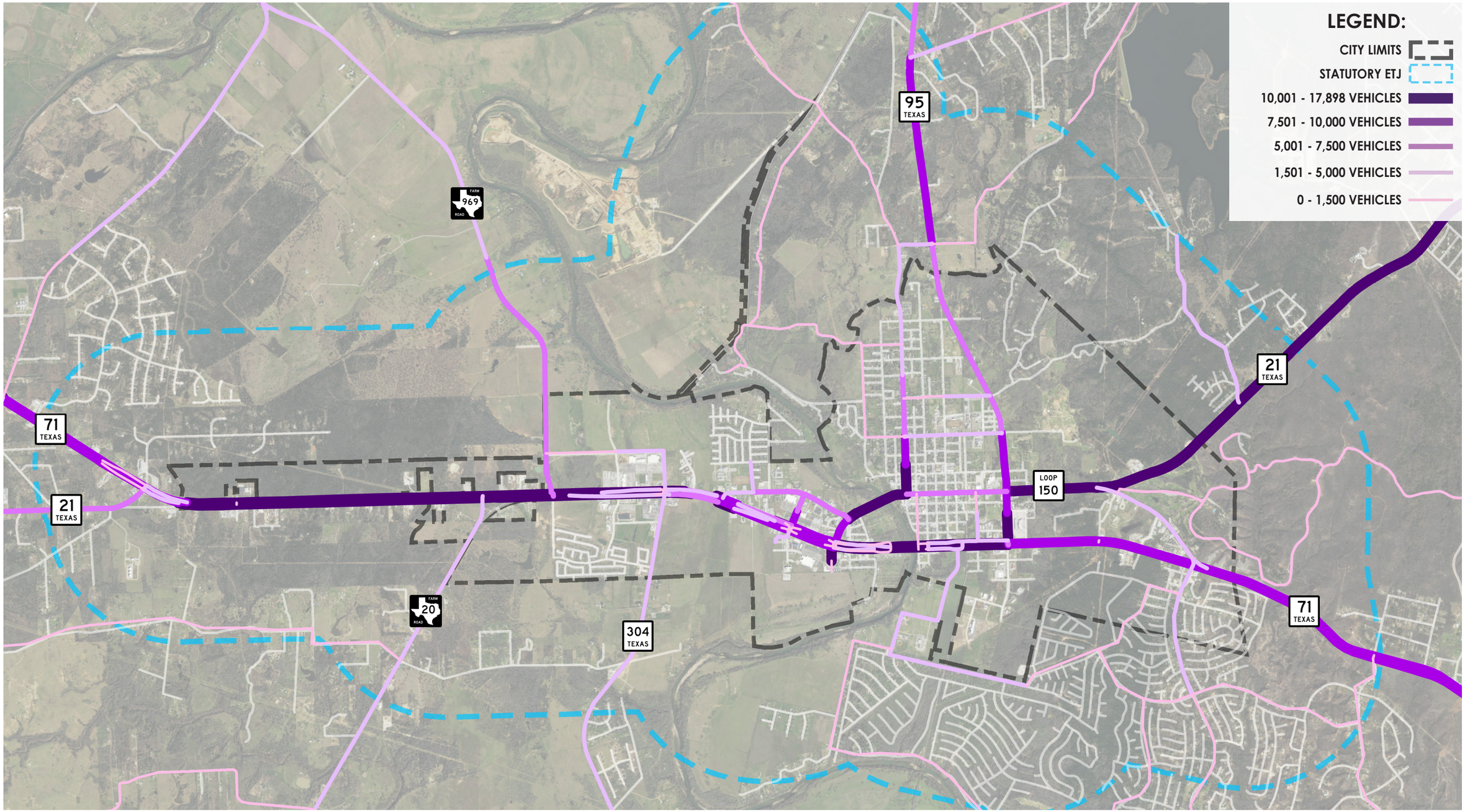
**2040 MODEL OF FUTURE CONDITIONS:**

- *Significant increases throughout entirety of city and ETJ.*
- *Some portions of SH 71 see improved capacity over 2010.*
- *SH 71 west of FM 20 shows significant congestion increases.*
- *SH 21 and FM 969 show significant increases in traffic.*
- *Significant increases along Main Street and SH 95 extend northward from SH 71 to the north of the city.*
- *Traffic congestion spreading out from SH 71 into downtown to the north and residential areas to the south of SH 71.*
- *FM 157 north out of the city shows a severe increase in congestion due to increased residential development.*

**Goals and objectives that are associated with network capacity considerations begin on page 6-10.**

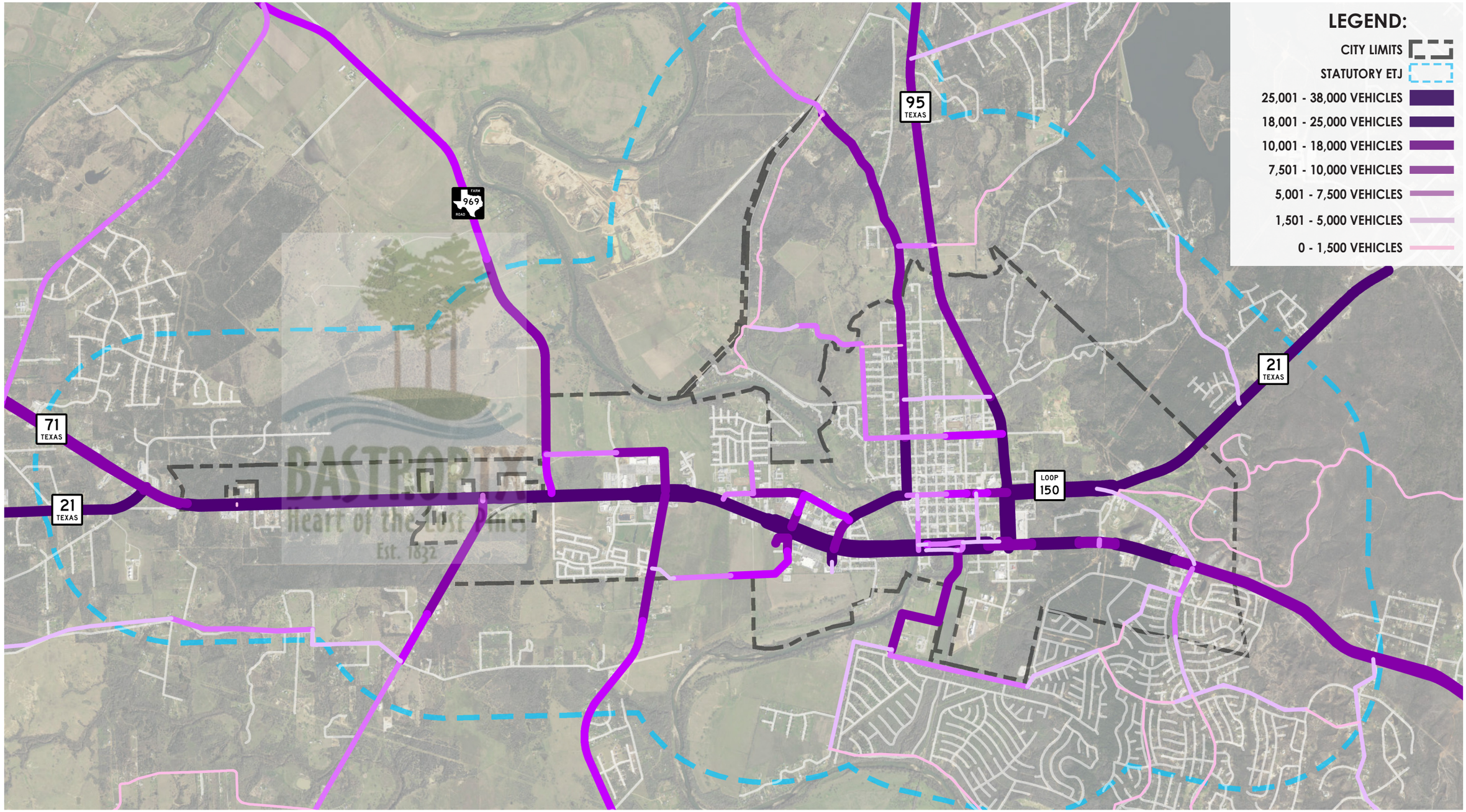
# 2010 DAILY TRAFFIC FLOW

# MAP 6-A:



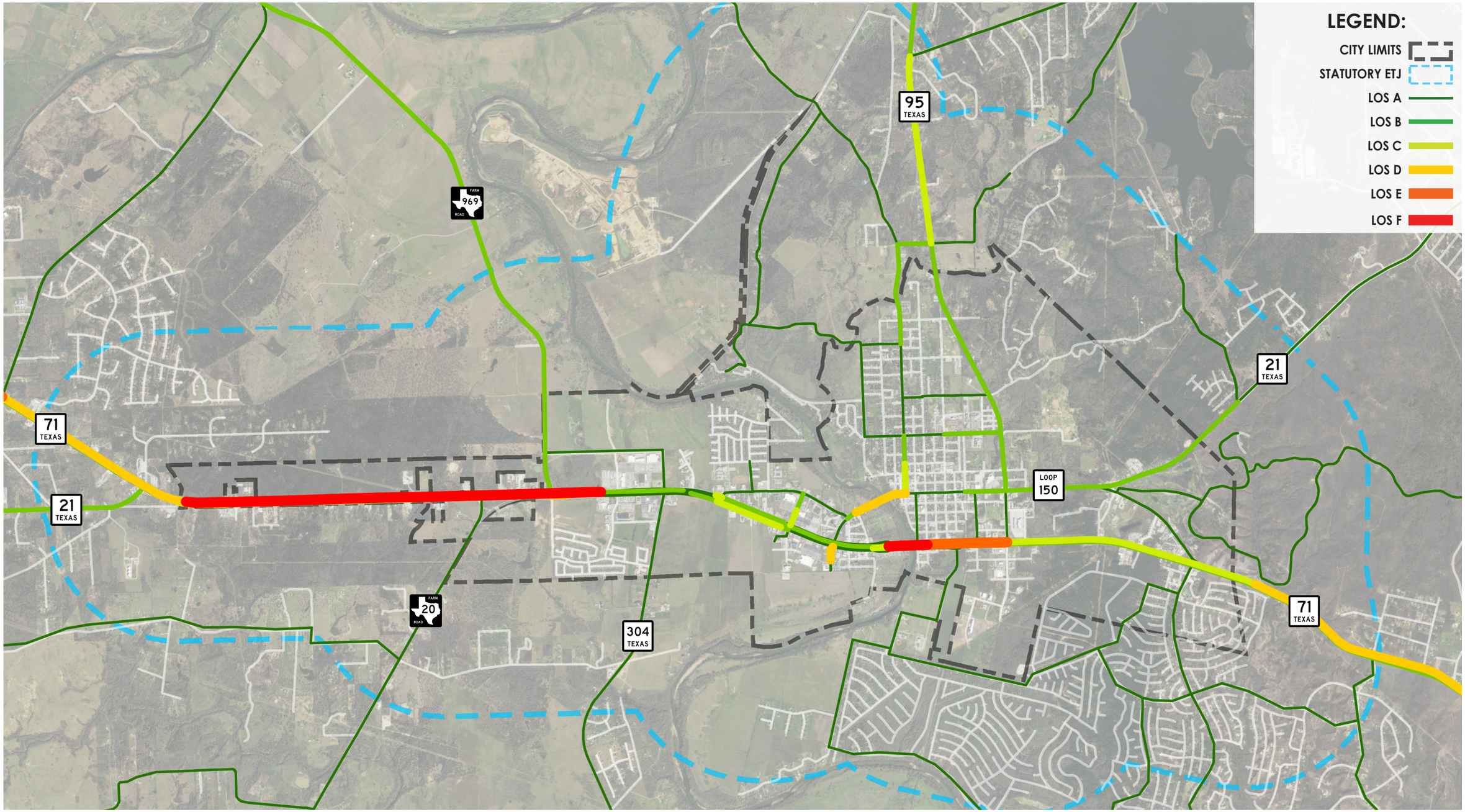
# FORECAST 2040 DAILY TRAFFIC FLOW

# MAP 6-B:



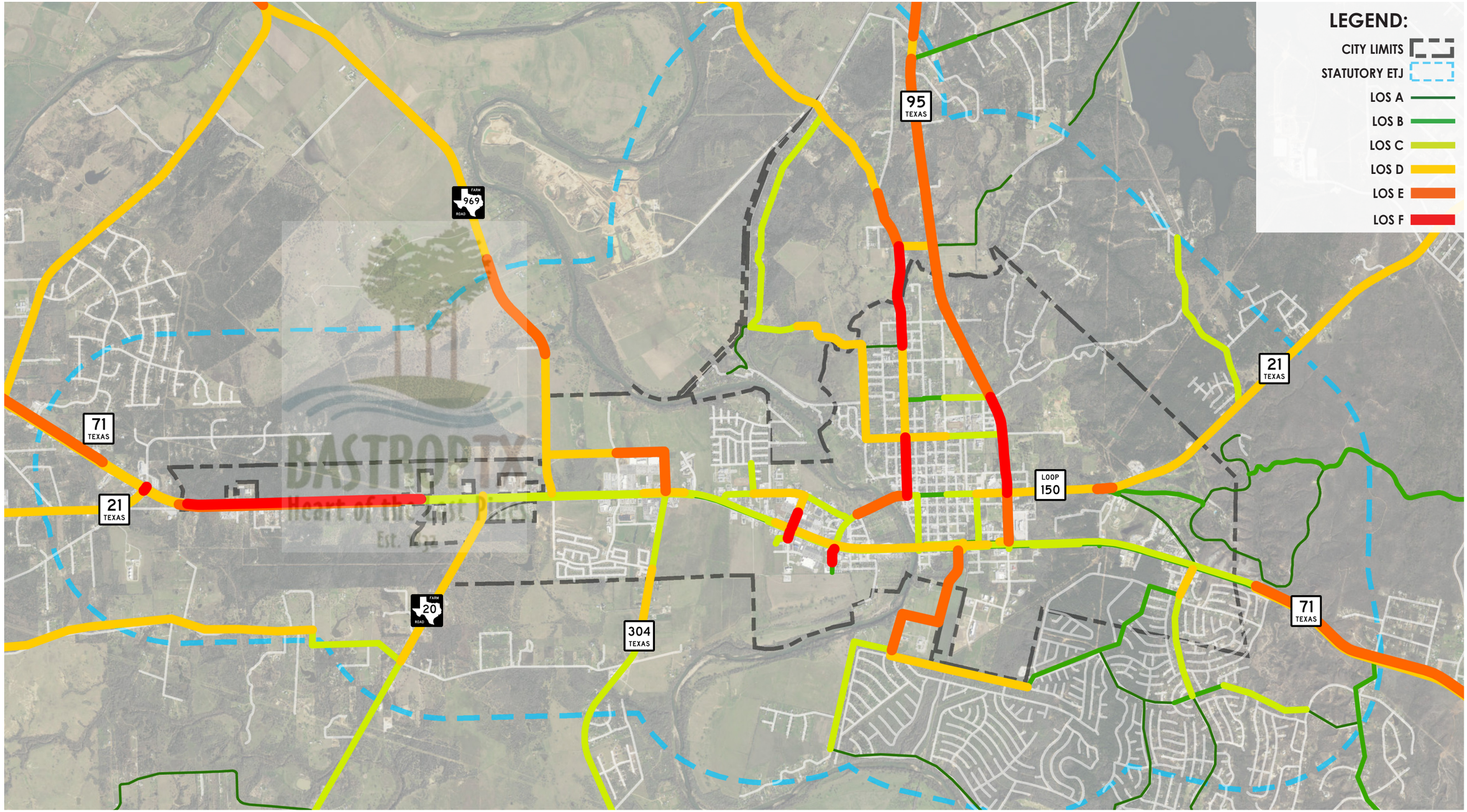
# 2010 AM LEVEL OF SERVICE

# MAP 6-C:



# FORECAST 2040 AM LEVEL OF SERVICE

# MAP 6-D:



## Goal 6.1: Manage traffic congestion and improve system reliability.

### Objective 6.1.1: Reduce vehicle miles traveled through Travel Demand Management strategies.

1. *Promote public transportation and ride-sharing programs by providing informational resources on the City of Bastrop website and through other City marketing materials.*
2. *Work with businesses that receive City incentives to develop programs to encourage employees to use alternative transportation options.*
3. *Develop and promote a program for City of Bastrop employees to take advantage of flexible work schedules, telecommuting, or free or reduced transit passes.*

### Objective 6.1.2: Maximize the performance of the existing transportation system.

1. *Improve intersection throughput/performance.*
2. *Place signage and way-finding at strategic locations to alert drivers and reduce congestion in downtown area.*
3. *Ensure that signal timing is appropriate during peak periods to increase vehicle throughput.*
4. *Create a comprehensive access management policy/program for the City of Bastrop that considers access management best practices to ensure efficient traffic flow and reduce queuing, such as innovative intersection treatments like roundabouts.*

### Objective 6.1.3: Identify strategic opportunities to expand roadway capacity.

1. *Coordinate transportation planning with TxDOT, CAMPO and Bastrop County to ensure that future roadway capacity adequately accommodates projected growth.*
2. *Identify locations where right of way may be required to expand roadway capacity.*

### Objective 6.1.4: Ensure reliable commuting options for Bastrop residents who work in Austin and Travis County.

1. *Coordinate transportation planning with TxDOT, CAMPO and Bastrop County to ensure that key corridors to/from Travis County such as SH 71 and FM 969 are identified as priority corridors in transportation planning documents.*
2. *Work with CARTS to ensure adequate commuter service to/from Austin and Travis County.*

### Objective 6.1.5: Improve emergency response and incident clearance times.

1. *Develop an Incident Management Plan in conjunction with Bastrop Police and Fire Departments to identify emergency response needs with respect to the existing and future transportation network.*
2. *Evaluate crash data to identify and prioritize areas with high crash frequencies for targeted enforcement.*
3. *Coordinate with TxDOT and the Central Texas Regional Mobility Authority (CTRMA) to explore the feasibility of implementing a roadside assistance program such as the Highway Emergency Response Operator (HERO) Program to provide traffic control and assistance to emergency response personnel during emergency incidents on SH 71 and US 290.*

## TRANSPORTATION SYSTEM CONNECTIVITY

In addition to roadway capacity and operational characteristics, connectivity between, and accessibility to, destinations are crucial factors for the ability of the transportation system to serve the needs of area residents and businesses. This section discusses current conditions of the Bastrop transportation system related to connectivity and emergency access. Connectivity refers to the directness of links and the density of connections in the transportation system. Emergency access refers to the ability of emergency responders (police, fire, EMS, etc.) to travel to the sites of emergency need.

A frequent concern raised by local stakeholders and members of the public is the lack of connectivity in the Bastrop street network. Residents have indicated that the street network needs additional east/west corridors to provide relief from the frequent bottlenecks that occur on Loop 150 and SH 71 at the Colorado River. These two (2) corridors currently represent the only crossing points for vehicles over the river, although an additional bridge is planned near the XS Ranch development just north of Bastrop. Residents of Tahitian Village have expressed a desire for a bridge to connect their neighborhood to the west side of the Colorado River.

Several stakeholders also expressed frustration over being forced to use the SH 71 frontage roads to access commercial establishments located along the SH 71 corridor, which includes many key destinations for residents, such as the HEB, Wal-Mart, and Home Depot.

To increase system connectivity, it is necessary to identify key gaps in the road network and prioritize funding for projects that connect gaps and promote connectivity. Another high priority item is to identify a long-term solution to increasing connections across the Colorado River. As previously highlighted, the limited Colorado River crossings are a major concern for residents. The City should identify priority locations and funding mechanisms for construction of new bridges. Additional considerations should prioritize pedestrian and bicycling connectivity throughout the city so that all travelers experience improved connectivity.

In stakeholder meetings with emergency response representatives, the lack of Colorado River crossings was mentioned as a chief impediment to ensuring rapid emergency response times and providing effective evacuation routes for area residents. Congestion or other incidents that cause delay at Bastrop's two (2) Colorado River crossings were also identified as a cause for concern for area emergency response personnel.

In addition to low water crossings and bridges, State Highway 71 was identified as a crucial corridor for emergency response. The only Trauma (Level IV) facility in the area, Seton Smithville Regional Hospital, is located over 12 miles from Bastrop on SH 71. While there are other emergency facilities in the area, none have in-patient services; if a patient were to require admittance to a hospital, the patient would be transferred to an Austin facility. Congestion on SH 71 is, therefore, a potential obstacle to the timely transfer of individuals to Austin area facilities. Emergency response

representatives also expressed a desire to improve SH 71 as it is a designated Hurricane Evacuation Route from the Gulf Coast region.

As traffic increases in Bastrop, a key objective is to ensure adequate facilities are in place to improve emergency response and incident clearance times. In order to do this, the City of Bastrop will need to coordinate with the Bastrop Police and Fire Departments to identify emergency response needs with respect to the existing and future transportation network. A thorough evaluation of up-to-date crash data will help identify and prioritize areas with high crash frequencies for targeted enforcement. Additional coordination with TxDOT and the Central Texas Regional Mobility Authority (CTRMA) to explore the feasibility of implementing a roadside assistance program such as the Highway Emergency Response Operator (HERO) Program would provide traffic control and assistance to emergency response personnel during emergency incidents on SH 71 and US 290. Efficient emergency operations will improve system reliability and quick responses will improve traffic congestion when an incident does occur.

**Goals and objectives that are associated with these system connectivity considerations are listed on pages 6-12 and 6-13.**

## Goal 6.2: Enhance transportation system connectivity.

**Objective 6.2.1:** Ensure that subdivision ordinances/regulations and site development standards promote connectivity.

1. ***Establish neighborhood connectivity standards for new developments that establish requirements for block spacing, access points, and discourage cul-de-sacs, gated communities or other restricted access streets. The policy should establish context-sensitive standards for different development types.***
2. ***Site plan review staff should coordinate with the City Engineer to ensure new site plans comply with connectivity standards.***
3. ***Update subdivision ordinances and site development standards to support connectivity and 'Complete Streets' principles.***

**Objective 6.2.2:** Identify gaps in the road network and prioritize funding for capital projects that connect these gaps.

1. ***Consult with emergency response personnel to identify areas where a lack of connectivity hinders emergency response times.***
2. ***Priority should be given to capital projects that improve emergency response times and expand evacuation options.***
3. ***Utilize City GIS to identify areas of the city with a low Connectivity Index.***

**Objective 6.2.3:** Identify long-term priority locations for new Colorado River crossings.

1. ***Identify locations where bottlenecks occur due to lack of Colorado River crossings and use observed origin-destination patterns to identify potential sites for new river crossings.***
2. ***Consult with emergency response personnel to identify areas where a lack of Colorado River crossings hinders emergency response times.***
3. ***Explore opportunities for federal or state grants to help fund new bridges.***
4. ***Ensure that connectivity across the Colorado River is identified in the CAMPO MTP as a high priority for Bastrop.***

**Objective 6.2.4:** Enhance east-west connectivity in Bastrop.

1. ***Identify and prioritize capital projects that increase connectivity to the SH 71 commercial corridor.***
2. ***Identify and prioritize capital projects that increase east-west access into Downtown Bastrop.***

**Objective 6.2.5:** Prioritize pedestrian and bicycling connectivity.

1. ***Require sidewalk construction on at least one (1) side of the street for all new developments within two (2) miles of a school or a quarter mile of a commercial area or park, or if there is an existing sidewalk network adjacent to the development.***
2. ***Where dead-end streets must exist, encourage the construction of paths to provide shortcuts for pedestrians and bicyclists.***
3. ***Complete a Bastrop Trails Plan to identify opportunities to enhance connectivity along the Colorado River and to/from Bastrop State Park.***

**Objective 6.2.6:** Develop, implement and maintain way-finding signage plans.

1. ***Expand upon recently created Main Street way-finding plan to implement a city-wide way-finding signage plan that will guide visitors to key destinations throughout Bastrop and the surrounding area.***

## MAINTAINING EXISTING TRANSPORTATION ASSETS

This section provides an analysis of the existing transportation system assets, including operational issues, access issues, and system conditions.

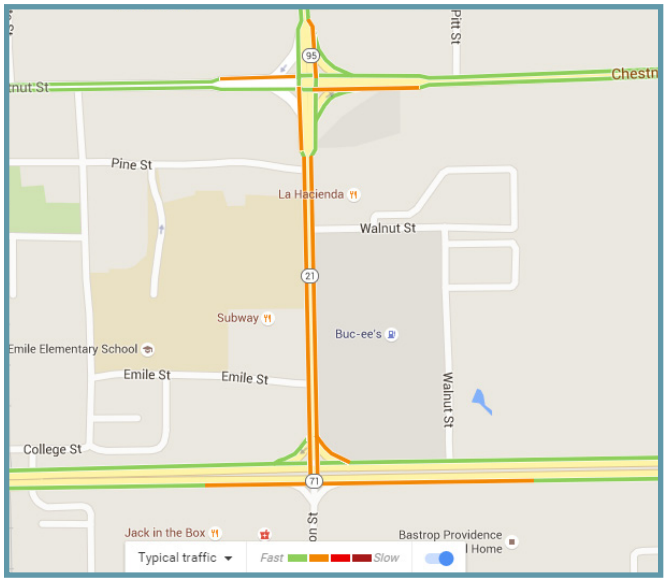
### OPERATIONAL ANALYSIS

The intersections of SH 95/21 and SH 71, along with SH 95/21 and Chestnut Street, were the most frequently mentioned locations by stakeholders and the public as areas with operational issues. Analysis of traffic data confirmed severe congestion at these locations, which is particularly noticeable during peak periods (see **Figure 6.3**, right). Drivers turning left from SH 71 onto SH 95/21 frequently experience intersection delay, often for multiple signal cycles (as do drivers turning left onto SH 71 from SH 95/21). Another likely cause of delay in this area is the ingress/access issues associated with the Buc-ee's on the east side of SH 95/21, as well as traffic entering/exiting Emile Elementary on the west side of the road. It should be noted that construction on an overpass at SH 71 is already programmed by TxDOT, and the preliminary work began in December 2015. This mobility project is expected to benefit through traffic.

Congestion on Chestnut Street through Downtown Bastrop has been a frequent concern raised by stakeholders and the public, and is confirmed through traffic data. In field reviews, the project team noticed that delays are often caused by drivers trying to make left turns off of Chestnut, which causes long backups for other drivers. Delays may also be caused by signal timing issues. **Figure 6.4** (page 6-15) shows congested segments on Chestnut Street.

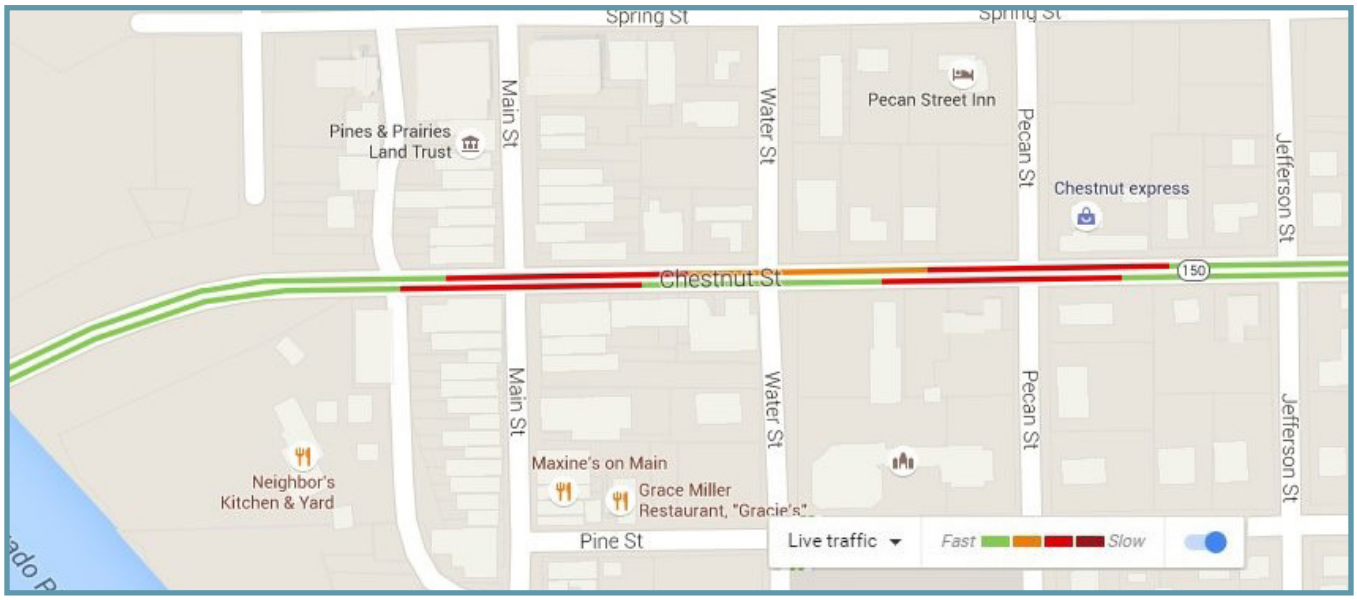
While the locations referenced herein were most frequently identified as "congestion hot-spots" by Bastrop residents during public outreach sessions, these are not the only areas of the Bastrop transportation network experiencing operational issues. The Bastrop Transportation Master Plan delves into operational analysis and deficiencies at much greater detail.

**FIGURE 6.3, SH 95 AND VICINITY (TYPICAL TRAFFIC, MONDAYS AT 5:50 PM)**




*The combined intersections of SH 95/21 and SH 71, and SH 95/21 and Chestnut Street, present severe operational challenges, but also produce barriers between city neighborhoods and districts.*

**FIGURE 6.4, CHESTNUT STREET (LIVE TRAFFIC, TUESDAY 10/27/2015 3:15 PM)**




*Congestion on Chestnut Street through Downtown Bastrop has been a frequent concern raised by stakeholders and the public, and is confirmed through traffic data.*

## ACCESS MANAGEMENT

Another major concern identified by stakeholders during the public outreach process was poor access management design along major roadways. Access management refers to the ability to access adjacent businesses, residential areas, or other attractions from the roadway. The public's concerns are due to too many driveways and access points leading to vehicle conflicts. Stakeholders mentioned that additional, unnecessary driveways could be impacting crash clusters not located at intersections. Additional comments also mentioned obstructed views and poor visibility exiting businesses along major roadways as access problems related to safety. An example of inadequate driveway spacing is shown in **Figure 6.5** (page 6-16).

Development of subdivisions and shopping centers will also create more conflict points (driveways and intersections) along major roadways. In order to efficiently manage congestion and safety along roadways, the City of Bastrop will need to ensure that proper access management is considered to limit conflict points along major roadways, potentially leading to fewer crashes and less traffic congestion. Access management principles are designed to direct traffic to and from private land uses in a safe and efficient manner. Effective access management can also lead to congestion relief along roadways whereby turning movements do not stop traffic flow, resulting in a smoother functioning roadway.

**FIGURE 6.5, FREQUENT DRIVEWAY SPACING ON SH 71/21**

***The image above illustrates nine (9) driveways cuts along an 1,100 foot segment of the SH 71/21 frontage road. Pervasive curb cuts absent cross-access and space for vehicle stacking, can severely limit roadway function.***

Some key principles of access management are:

- *Limiting left-turn movements from driveways along busy corridors to eliminate potential conflicts;*
- *Encouraging shared access between businesses along a corridor to limit the number of driveway entrances/exits along the roadway; and*
- *Managing median space and left-turn lanes to ensure enough stacking space to minimize traffic impedance.*

Access management principles are implemented during the site planning stage for new development or retrofits and during the design phase of roadway projects. City officials should work with businesses, TxDOT and other governmental entities to ensure access points along roadways are managed to reduce conflict points and help ease future traffic congestion.

## CONDITION OF TRANSPORTATION ASSETS

Street maintenance is generally provided by the governmental entity with jurisdiction over each roadway, unless a prior agreement is in place. Many comments throughout the public involvement process identified street maintenance as an issue and cited illegal dumping/littering and debris along the roadway as a key safety concern. In addition, recent flooding events have created deterioration on many streets.

### PAVEMENT PRESERVATION

Preservation of the existing transportation network pavement is integral to ensuring that the system is as efficient as possible until future capital improvements can be made. If the existing pavement is not preserved, any major repairs or construction not previously anticipated can have a major impact on the efficiency and reliability of the system, particularly if the repair is along main corridors. It will be important to monitor and quickly repair any faults with the existing pavement as traffic increases in the area, as detoured traffic from repair and construction projects will place a significant strain on the existing roadways not built to handle the increased demand.

### SIGNALIZATION AND SIGNAGE MAINTENANCE

There is a limited number of signalized intersections within Bastrop, however the optimization and maintenance of these signals has a significant impact on traffic flow.

The majority of signalized intersections are located along SH 71/21, the frontage roads associated with SH 71/21, or downtown along Chestnut Street (although these concentrations are not exclusive). Additional electronic signalization occurs at railroad crossings. While most other streets use stop signs at intersections, some key locations have flashing beacons centrally located above the intersection to provide an additional visual alert of the intersection. Operational analysis tools being provided through the Transportation Master Plan will provide the City with the capability to evaluate these locations and to identify when upgrades may be necessary.

### BRIDGE MAINTENANCE

Bridges cross barriers to transportation flow, therefore when any bridge fails, significant negative transportation impacts follow. When a bridge fails, it may cause traffic to be rerouted to already over used alternative bridges, or it may create a barrier that prevents traffic from entering or exiting a section of the city. Bridge failures can also create serious problems for emergency responders.

There are two (2) major bridges in Bastrop that cross the Colorado River. The Colorado River Bridge along Loop 150 serves as a major connection between downtown, SH 71 and the commercial areas west of the Colorado River. The other bridge over the Colorado River is along SH 71/21 to the south of downtown. Additionally, multiple bridges over other features are situated along SH 71/21. Minor bridges within the city can be found along Hunters Point Drive, Hunters Crossing, Home Depot Way, Carter Street, the northern portion of Main Street, Lovers Lane, Martin Luther King Junior Drive, Pine Street, SH 95, Chestnut Street and Farm Street.

**Goals and objectives that are associated with these topics are listed on page 6-18.**

## Goal 6.3: Preserve and maintain existing transportation assets.

### Objective 6.3.1: Adequately maintain existing roadways.

1. *Manage a consistent infrastructure inspection and repair system.*
2. *Coordinate with County and TxDOT to ensure roadways not under Bastrop jurisdiction are adequately maintained.*
3. *Schedule regular roadway resurfacing to improve existing roadways and extend their life.*
4. *Identify and prioritize roadways in need of upgrades.*
5. *Implement citizen reporting system to identify major roadway issues or dilapidation.*

### Objective 6.3.2: Improve maintenance along roadways.

1. *Coordinate with the Public Works Department to ensure that roadways and edges are clear of debris and trash.*
2. *Implement debris or trash reporting system to provide residents with specific contact to report debris or trash within the roadway and along the edges.*
3. *Coordinate with Bastrop Police/Department of Public Safety to monitor illegal dumping and littering along roadways.*

### Objective 6.3.3: Improve function of existing roadway capacity.

1. *Implement a cohesive and connected signal timing system to improve flow through the existing transportation network. Coordinate with TxDOT on TxDOT roadways.*
2. *Identify opportunities to limit left turn movements where backup occurs.*
3. *Develop tools to monitor the operational efficiency of the city transportation system.*

## TRANSPORTATION SYSTEM SAFETY

Safety concerns related to the transportation system were frequently mentioned in conversations with area stakeholders and members of the public. The following safety issues were brought up most frequently throughout the public outreach process:

- *Intersections along roadways are dangerous due to speeds, inattentive driving and poor visibility.*
- *Driveways along high speed corridors create too many conflict points.*
- *High speeds contribute to accident rates and create unsafe conditions along roadways.*
- *Congestion on SH 71 creates safety concerns for merging traffic.*
- *Narrow and curvy roads with blind corners and high-speed turns are dangerous.*
- *Overgrown grass and trees contribute to poor visibility and obstruct views of signage.*
- *Inadequate bicycle and pedestrian facilities lead to conflicts/incidents along roadways.*
- *School bus safety is a major concern, specifically motorists passing stopped buses along roadways.*
- *Development of subdivisions along SH 71 leads to more conflict points.*

### CRASH ANALYSIS

Crash data from the Texas Department of Transportation's (TxDOT) Crash Records Information System (CRIS) was analyzed in order to gain a better understanding of crash patterns and causes in the Bastrop study area. Key findings from the analysis were:

- *There were a total of 2,660 crashes in Bastrop and its ETJ between 2010 and 2015. These crashes resulted in 976 injuries, 93 incapacitating injuries (i.e. any injury that prevents the person from performing activities they were capable of performing before the injury), and 16 fatalities.*
- *While only 31.2% of crashes occur at intersections, 39.2% of injury crashes and 37.5% of fatality crashes occur at intersections, suggesting that intersection crashes are more likely to result in injury or death.*
- *Approximately 87% of crashes in Bastrop occurred during clear or cloudy conditions, while 13% occurred during weather events, with rain contributing to the most accidents at 11%.*
- *There were 19 crashes involving school buses between 2010 and 2015, resulting in 7 injuries.*
- *Alcohol and drug impairment make up a disproportionate number of fatalities in Bastrop. While crashes whose primary cause is alcohol or drug impairment account for less than 3% of all crashes, they account for over 12% of fatalities.*
- *The time period between 4-7 PM has the highest hourly crash rate of any three-hour time period, while most fatalities occur during the AM peak (6-9 AM) and Evening (7-9 PM) periods.*

**Map 6-E, *Crashes, 2010-2015***, shows all crashes, including crashes involving incapacitating injuries and fatalities that occurred in the Bastrop area from 2010 through 2015.

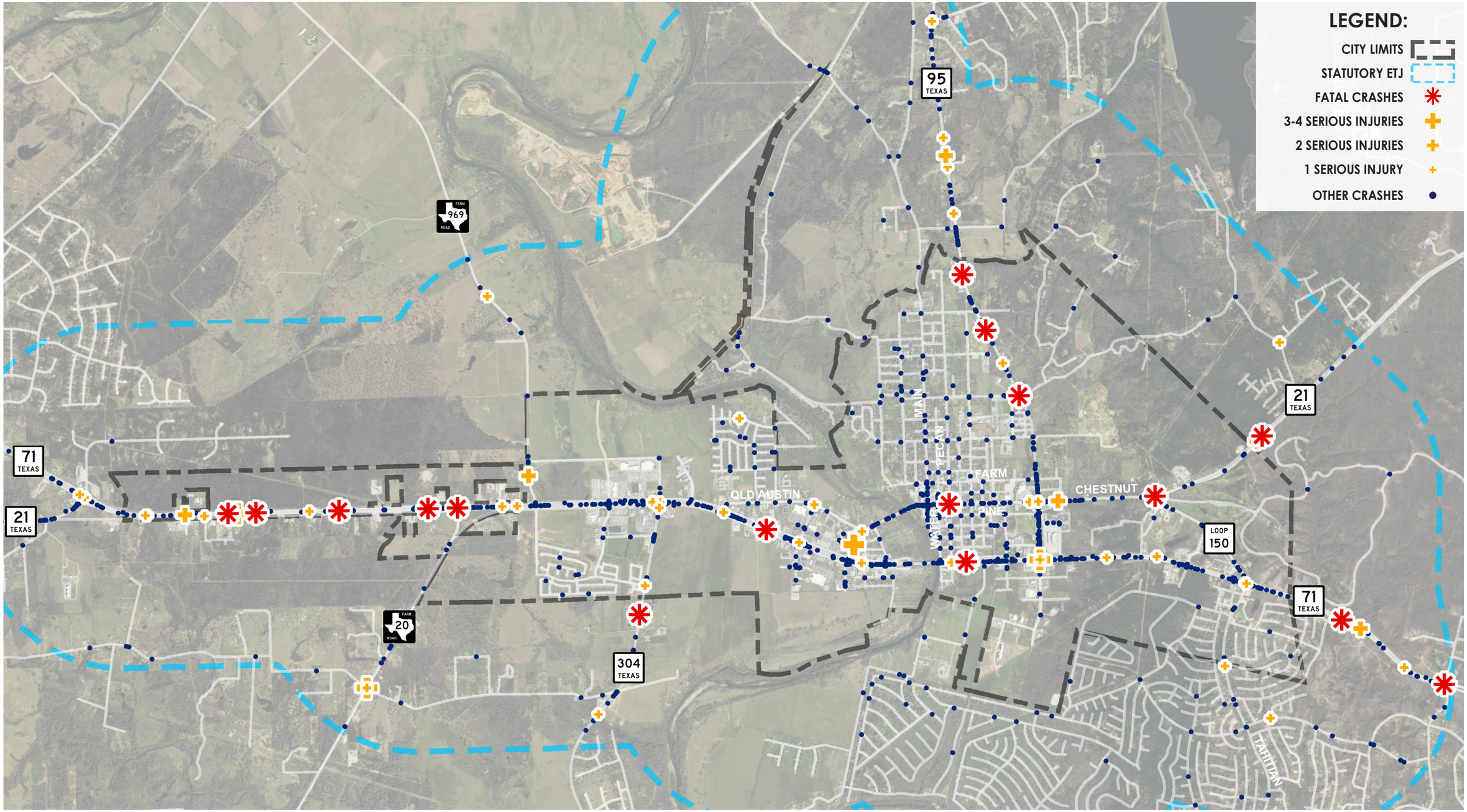
### SCHOOL BUS SAFETY

School bus safety was also identified as a major concern by stakeholders, the general public and the project team. The CRIS data shows that 19 crashes within the city between 2010 and 2015 involved a school bus. Community members identified the lack of pedestrian access to bus stops along major roads and automobiles not stopping for buses as key contributing factors to those incidents. **Map 6-F, *Crashes Involving School Buses*** (page 6-21) shows the locations of these school bus involved crashes.

Transportation network safety is a guiding principle of this chapter. All policies and recommendations should consider the safety of people who bike, drive or walk throughout Bastrop.

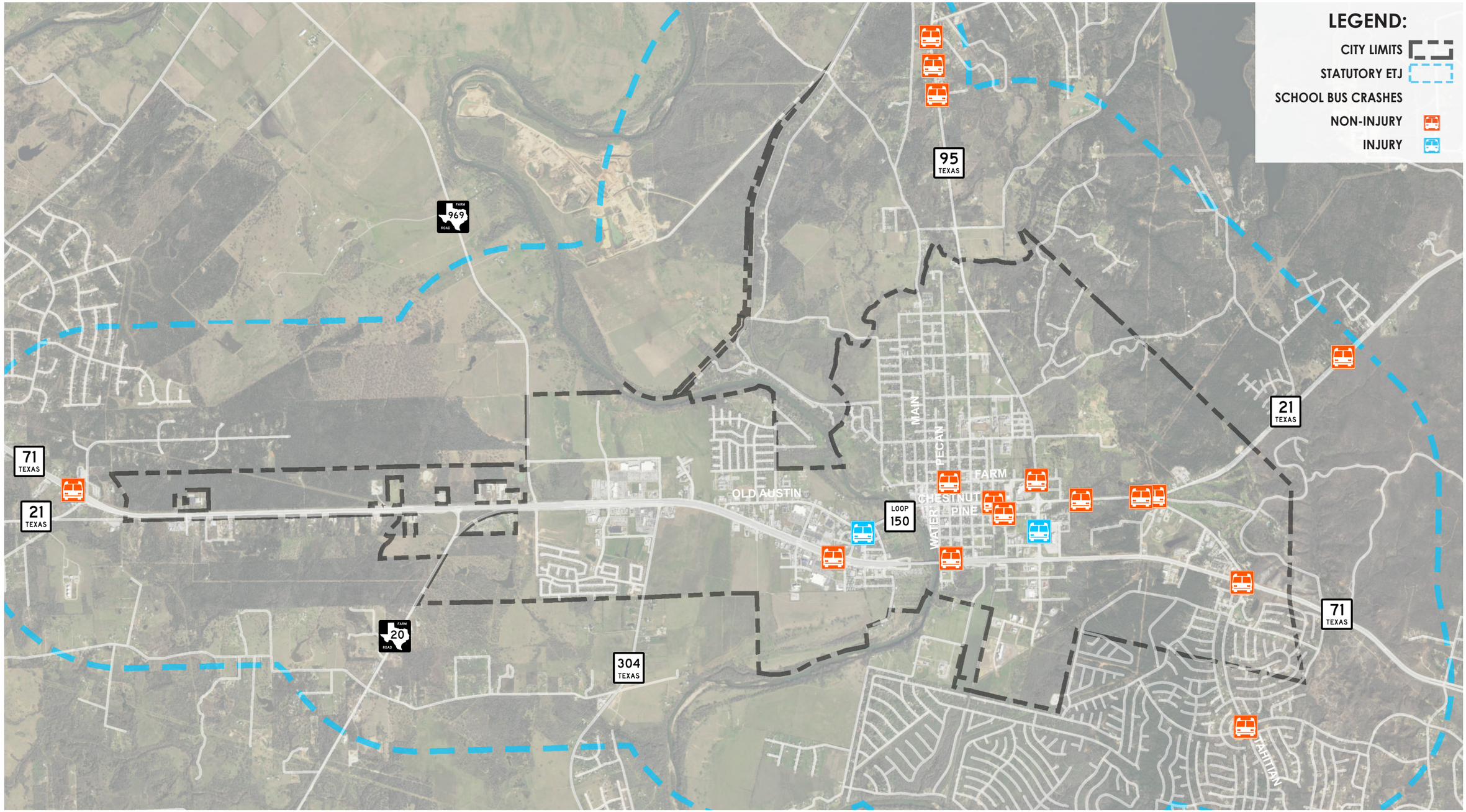
# CRASHES, 2010-2015

# MAP 6-E:



# CRASHES INVOLVING SCHOOL BUSES, 2010-2015

# MAP 6-F:



### TRAFFIC CALMING

One major theme identified throughout the public participation process was that traffic speed is a significant factor in safety in Bastrop. Many traffic calming techniques are relatively low-cost and can vastly improve the safety of automobiles, pedestrians and bicyclists along Bastrop roadways. Hunters Point Drive is an example of traffic calming principles applied through an extension of the "curb" that includes pedestrian and bicycle infrastructure that reduce lane widths. See **Figure 6.6** (page 6-23). Some great traffic calming examples, such as crosswalk enhancements, currently exist along Chestnut Street. Future intersection improvements should build upon this basic crosswalk design already implemented by the City to calm traffic.

### RAILROAD CROSSINGS

Union Pacific currently operates a freight line through the City of Bastrop. The existing rail line enters Bastrop from the south and runs mostly north/south. The rail line shifts to east/west alignment to the north of Bastrop High School and heads northwest out of the city towards Elgin. The rail line enters Bastrop from the south under SH 71. There are several at-grade rail crossings throughout the city, which can pose vehicle, bicycle and pedestrian conflicts and create safety issues. Train derailments or crashes have the potential to create hazardous materials incidents that must be addressed by local emergency responders.

**Goals and objectives associated with system safety topics are listed on pages 6-23 and 6-24.**

***WHAT IS TRAFFIC CALMING?***

***A popular and effective practice used to combat high speeds, traffic calming is a series of roadway design techniques that slow traffic along roadways, leading to a safer environment for all users within the public right-of-way.***

***EXAMPLES:***

***Chicanes.*** *Chicanes are vertical barriers in the street that require motorists to slow down to safely travel around them. Some specific enhancements could include median landscaping, curb extensions, bollards and traffic circles.*

***Curb Extensions.*** *Extensions of the sidewalk or landscaping that extends further into travel lanes to reduce number of lanes or lane width that shortens pedestrian crossing to a safer distance.*

***Signage.*** *Increased signage and warnings can assist in slowing traffic and increase safety near intersections and pedestrian crossings.*

***Raised Crosswalks.*** *A raised crosswalk is an above grade crossing with a flat top at an intersection or mid-block crossing that enhances visibility of the crosswalk and consequently slows traffic. Treatment requires adequate signage and may be paired with a textured or colored crosswalk.*

***Pedestrian Refuge Islands.*** *Pedestrian refuge islands are a combination of mid-block crossings, landscaped medians, and chicanes. Pedestrian refuge islands are generally landscaped medians that allow pedestrians a stopping point mid-way between road edges. Their vertical elements alert drivers and divert them around them, ultimately slowing traffic. Sometimes pedestrian refuge islands are paired with raised crosswalks.*

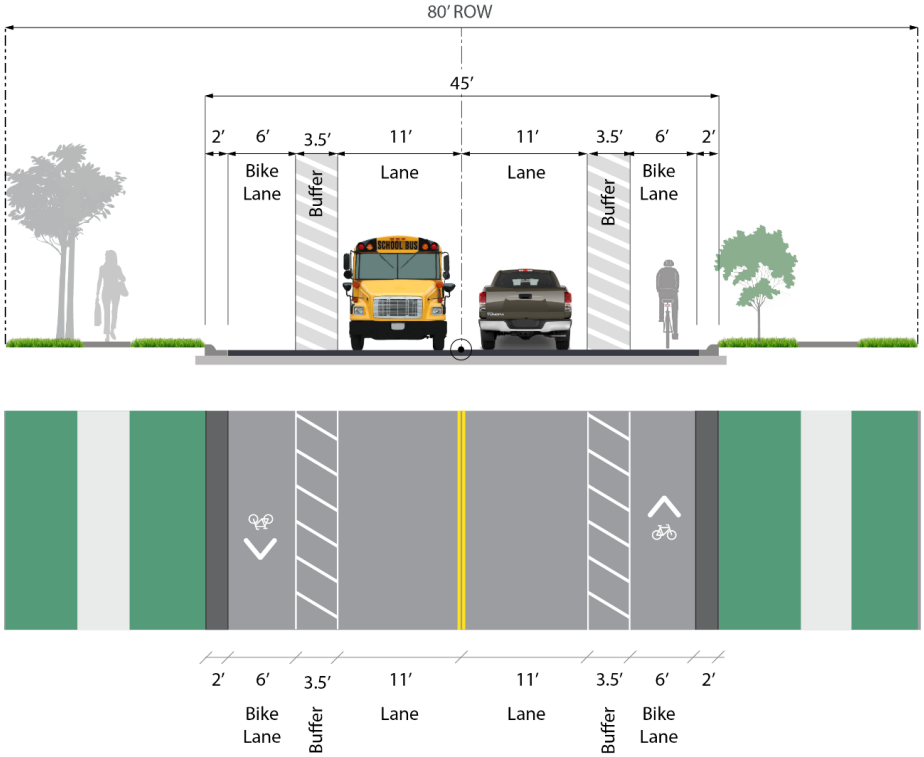
***Textured or Colored Pavement.*** *Textured or colored pavement at crosswalks is meant to alert drivers of an impending crosswalk and slow them down. Textures can also serve as an alerting mechanism.*

***Landscaped Median.*** *A landscaped median is a planted median that forces traffic to slow to avoid the median.*

***OUTCOMES:***

***A recent statistic states that there is a 5% chance for a fatality if a pedestrian is hit by a vehicle traveling 20MPH. If that same car is traveling 30 MPH, the chance of a fatal incident increases to 45%. At 40 MPH, pedestrians and automobile incidents result in a fatality 85% of the time. These statistics are a strong basis for slowing travel speeds along roadways. Using traffic calming mechanisms throughout Bastrop will help increase pedestrian safety. (Source: http://www-nrd.nhtsa.dot.gov/Pubs/811090.pdf)***

**FIGURE 6.6, HUNTERS POINT DRIVE TRAFFIC CALMING EXAMPLE, CURB EXTENSION**




*The cross-section above illustrates a low-cost method by which a community's traffic calming objectives, and bicycle and pedestrian objectives can be met through modified street design. The example above shows a reduction in lane widths using bicycle and pedestrian facilities that serve as an extension of the "curb". Consistent with recommendations found in Chapter 5, Bastrop should consider the development of alternative street design (including areas extending beyond the DB-FBC area).*

## Goal 6.4 - Improve the safety of the Bastrop transportation system for all users.

### Objective 6.4.1: Enhance safety by reducing conflict points through the implementation of sound access management principles.

1. ***Create a comprehensive access management policy/program for the City of Bastrop that considers access management best practices, including:***
   - ***Limiting direct access to major roadways from businesses by providing a comprehensive service road system.***
   - ***Requiring a minimum distance between intersections and driveways.***
   - ***Encouraging shared access between businesses to limit the number of driveways along major corridors.***
   - ***Limiting left-turn movements out of driveways along busy corridors.***
   - ***Managing median openings to allow left turn movements where appropriate.***
2. ***Identify intersections to limit left turn movements.***
3. ***City site plan review staff should coordinate with the City Engineer during the site plan review process to ensure compliance with the City's access management policies.***

**Objective 6.4.2:** Reduce dangerous driving behavior by implementing strategic traffic calming interventions.

1. *Conduct public outreach with Bastrop residents, law enforcement, and neighborhood organizations to identify streets with frequent speeding.*
2. *Identify and prioritize opportunities in residential areas for constructing speed humps, traffic circles, chicanes or other context-sensitive traffic calming treatments.*
3. *Identify and prioritize key locations where increased signage could reduce speeding.*
4. *Identify and prioritize locations where curb extensions, raised crosswalks, pedestrian refuge islands, or other treatments can assist in safer pedestrian crossing.*
5. *Identify and prioritize opportunities in Downtown Bastrop to calm traffic through the use of textured pavement, raised intersections, or other treatments consistent with the Downtown district design overlay.*

**Objective 6.4.3:** Address locations with poor visibility on the Bastrop transportation network.

1. *Develop a prioritized list of areas with poor visibility and high crash rates.*
2. *Conduct public outreach with Bastrop residents to identify locations on the Bastrop street network with poor visibility due to horizontal or vertical curves, overgrown foliage, etc.*
3. *Develop a program to regularly cut or trim overgrown grass, trees, or brush along roadways and sidewalks.*
4. *Place signage to alert road users of conditions in areas with poor visibility.*

**Objective 6.4.4:** Improve safety near school bus pickup and drop-off locations.

1. *Develop a plan, in conjunction with BISD and other area schools, to reevaluate the placement of school bus stop locations. Guidance for appropriate bus stop locations can be found in the "Selecting School Bus Stop Locations: A Guide for School Transportation Professionals" report (2010) developed by the National Center for Safe Routes to School and the Pedestrian and Bicycle Information Center.*
2. *Work with the Bastrop Police Department to develop a targeted enforcement program near bus stops and area schools during morning and afternoon busing periods.*
3. *Perform public outreach to parents, BISD, and other area school representatives to identify and prioritize locations with the greatest school bus safety concerns.*
4. *Place highly visible signage alerting motorists to reduce their speed near bus stop locations.*

**Objective 6.4.5:** Develop an ongoing City program to promote traffic safety education.

1. *Partner with law enforcement, BISD or other organizations to provide free community workshops on traffic safety.*
2. *Host law enforcement training workshops on bicycle and pedestrian laws and safety.*
3. *Promote traffic safety and education through City marketing materials and campaigns such as National Walking Day or Bike Day.*

**Objective 6.4.6:** Develop an ongoing City program for monitoring and enforcement.

1. *Develop and maintain a comprehensive dataset of Bastrop area crashes, including location, date, number of people involved, contributing factors, and severity.*
2. *Utilize crash data to identify and prioritize locations with high crash rates where engineering or enforcement interventions may be necessary.*
3. *Coordinate with Bastrop Police Department to identify priority locations for targeted enforcement of speeding and other unsafe behaviors.*

**Objective 6.4.7:** Improve safety at rail crossings.

1. *Coordinate with Union Pacific Railroad to improve safety at rail crossings.*
2. *Coordinate with emergency responders to ensure that evacuation routes are available in case of a hazardous cargo incident.*

## ACTIVE TRANSPORTATION.

While the majority of Bastrop residents either drive alone or carpool to work, local stakeholders and the public have expressed a growing desire for additional transportation options within the city. This section describes existing conditions and stakeholder comments related to non-automobile transportation options in Bastrop, as well as outlines strategies to increase active transportation awareness and participation moving forward.

### BICYCLE NETWORK

While there are currently low levels of bicycle commuting, Bastrop has a growing recreational cycling community, particularly on weekends. Park Road 1C between Bastrop State Park and Buescher State Park is an especially popular route for cyclists and is part of the annual MS-150 Bicycle Race from Houston to Austin. The Pedal through the Pines race is also a popular bicycling event in the community.

#### BICYCLE NETWORK CONDITIONS

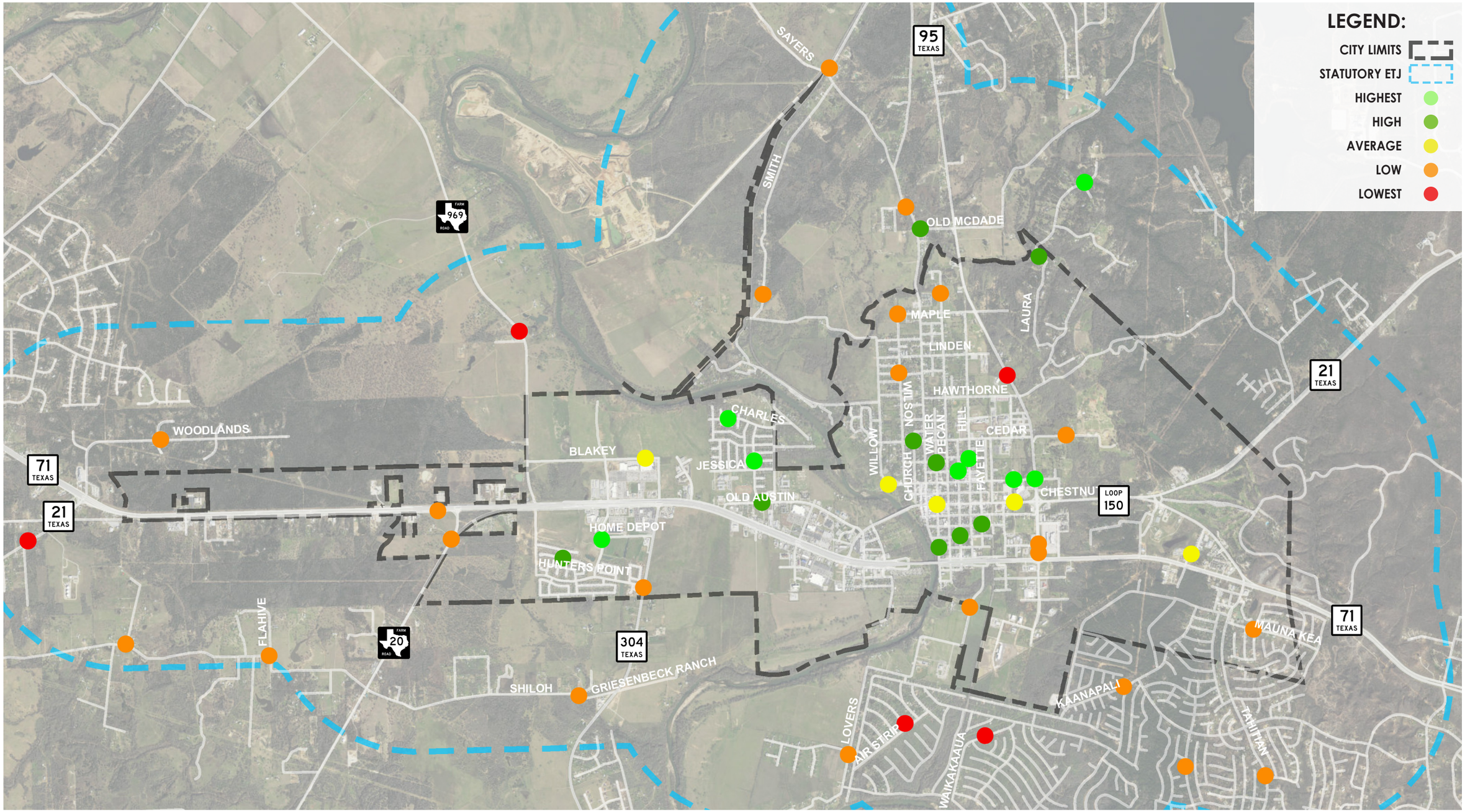
As part of the analysis of the multi-modal transportation system within the city, a evaluation of bicycling conditions in the area was undertaken to better understand the physical condition of Bastrop's bicycling environment. The project team utilized evaluation criteria adopted from the Bicycle Environmental Quality Index (BEQI), a planning tool developed by the San Francisco Department of Public Health that allows planners to assign a bicycling suitability score to locations on the street network based on environmental variables that either enhance or detract from favorable bicycling conditions. The rating system was applied to 50 randomly chosen locations throughout the Bastrop area in order to acquire a high-level characterization of bicycling conditions in the area. **Map 6-G, *Bicycling Suitability Results***, shows the results of the bicycling assessment, including the geographic distribution of BEQI scores for the chosen locations.

While this assessment includes a relatively small sample size of roads in the area, the results suggest that there are a number of deficiencies in the Bastrop transportation system that result in **below average** bicycling conditions. A lack of dedicated bicycling facilities and high posted speeds for vehicular traffic, especially on narrow roads without shoulders, creates a real and perceived safety hazard and likely discourages many potential bicyclists from riding on Bastrop roads. Stakeholders have expressed a desire for more bicycle infrastructure, particularly bike lanes.

Due to its many natural resources and the city's historic Downtown, Bastrop has the potential to significantly grow its bicycle tourism industry. In addition, the number of people who choose to commute or travel via bike throughout the city on a daily basis may increase if safer bicycle infrastructure is added. However, to accomplish this, significant enhancements to bicycle infrastructure are required. Part of the Complete Streets principles (discussed on page 6-37) that the City is using to develop its transportation infrastructure includes creating a well-connected network of on-street bicycling facilities for all ages and abilities.

# BICYCLING SUITABILITY RESULTS

# MAP 6-G:



## GUIDING PRINCIPLES

In addition to plan goals and strategies aimed towards improving active transportation options, Bastrop should identify and prioritize key active transportation investments to create a robust network. To assist in those efforts, four (4) guiding principles are identified that the City should follow when selecting improvements:

- ***Develop an All Ages and Abilities Network.*** *The most important guiding principle is that projects be prioritized based on the project's ability to contribute to the development of an "all ages and abilities" network. An "all ages and abilities" network can be utilized by all types of users, ranging from experienced to novice, regardless of their age. The goal is to create a low stress, inviting network that attracts riders who may not have previously thought about commuting or traveling via bicycle. In essence, Bastrop should provide initial facilities that accommodate the entire spectrum of users to best attract new users and accommodate current riders.*
- ***Connect Major Destinations.*** *Creating a well-connected network requires identifying key locations where people travel and prioritizing investments between them. Projects that enhance pedestrian and bicycling conditions near major employers, schools and residential areas should be given highest priority, as they have the potential to attract the greatest number of trips. Additional consideration should be made to connect transit stops/stations.*
- ***Focus on Major Corridors.*** *Focusing on major corridors in Bastrop will create an active transportation network that is continuous. Major corridors should be prioritized for facility enhancements such as buffered bike lanes, upgraded way-finding and signage, or streetscape features such as lighting, bicycle parking and trees.*
- ***Address Barriers.*** *Barriers can take the form of dangerous intersections, controlled access highways or bridges, railroad track crossings, water bodies, or gaps in the current sidewalk or bicycle network. Key network barriers should be identified throughout Bastrop and investments should aim to remove those barriers.*

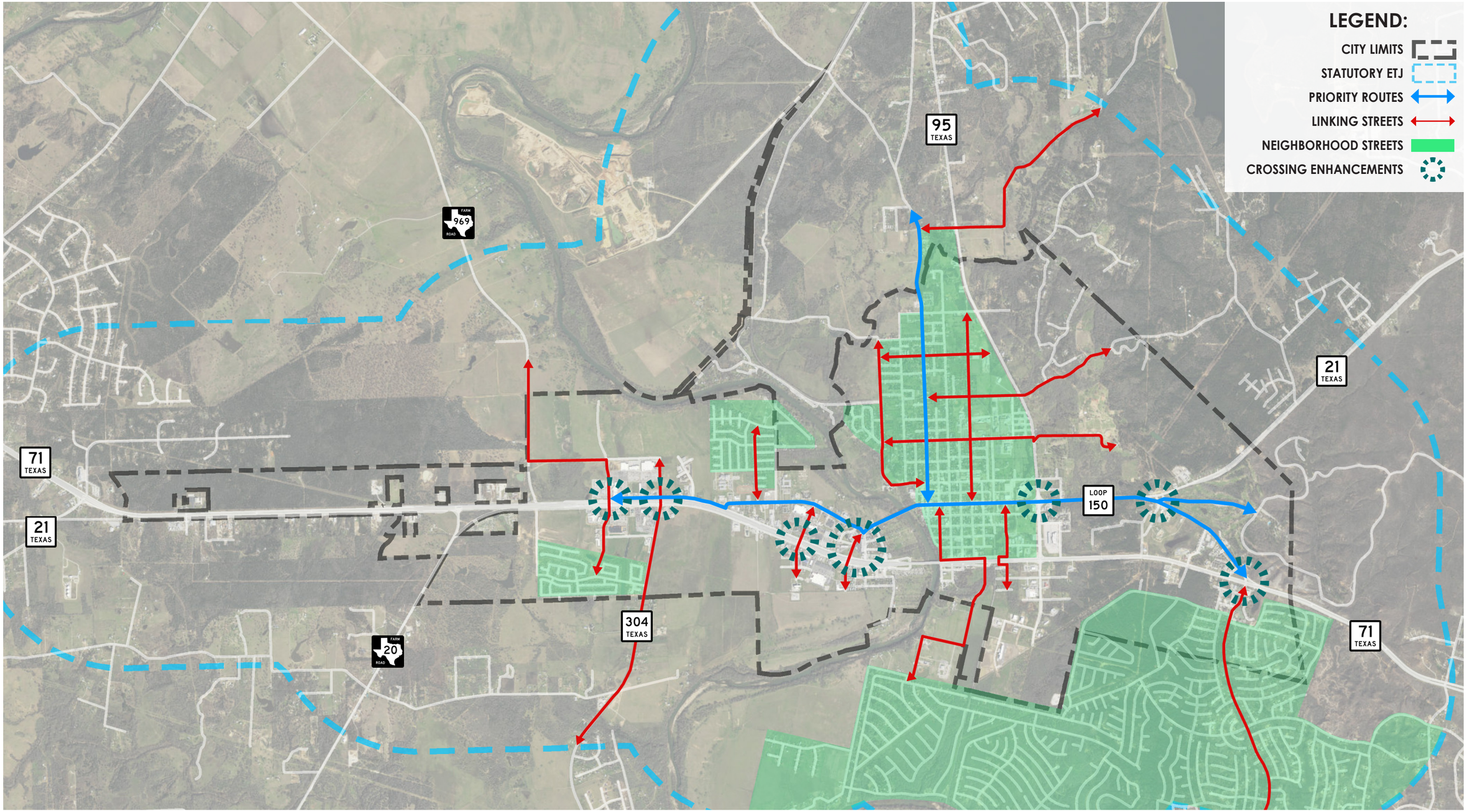
## CONCEPTUAL BICYCLE FRAMEWORK

The following conceptual bike plan is meant to serve as a framework for future bicycle infrastructure investment. The framework is separated into three (3) main categories: priority routes, linking streets and neighborhood streets. Additionally, the conceptual bike plan highlights key intersections throughout Bastrop where upgrades would improve the safety and connectivity of the bicycle network. A high level roadway bicycle framework sketch can be found in **Map 6-H, *Conceptual Bicycle Framework***.

- ***Priority Routes.*** *Priority routes should be the main focus of initial transportation investment and should focus on major corridors. Priority routes consist of Main Street and Chestnut Street/Old Austin Highway. Priority route bicycle elements include basic and buffered bike lanes, increased bicycle safety signage and enhanced way-finding.*
- ***Linking Streets.*** *Linking streets are designed to move bicyclists to and from neighborhood streets to priority routes. Linking streets also connect key destinations, such as the high school, to priority routes. Bicycle enhancements include shared lane markings and increased bicycle safety signage and way-finding. Some linking streets may also be suited for implementation of bike lanes.*
- ***Neighborhood Streets.*** *Neighborhood streets connect residents and bicyclists to linking streets and their final destination (i.e. home, school, business). Priority bicycle enhancements on neighborhood streets include increased bicycle awareness signage and pavement maintenance.*
- ***Crossing Upgrades.*** *Crossing upgrades should be implemented at various locations throughout the bicycle network to ensure safety at busy locations. Most major upgrades are required along SH 71, Loop 150, and SH 95 where major intersections occur. Bicycle safety should be prioritized at these intersections.*

# CONCEPTUAL BICYCLE FRAMEWORK

# MAP 6-H:



## PEDESTRIAN NETWORK

Stakeholders indicated a desire for better sidewalk connectivity in neighborhoods and between key destinations. A grant was awarded to Bastrop in 2014 to enhance pedestrian connectivity between the city and Bastrop State Park.

### SIDEWALK CONDITION AND DESIGN

Pedestrian conditions were assessed using evaluation criteria adopted from the Pedestrian Environmental Quality Index (PEQI), which was also developed by the San Francisco Department of Public Health. Similar to the BEQI, the PEQI utilizes a combination of qualitative and quantitative indicators to assign an overall score representing the quality of the pedestrian environment for individual locations. Factors that are included in the rating system include the quality/completeness of sidewalks, presence or absence of traffic calming features or crosswalks, and presence of other pedestrian amenities such as public seating and lighting, among others.

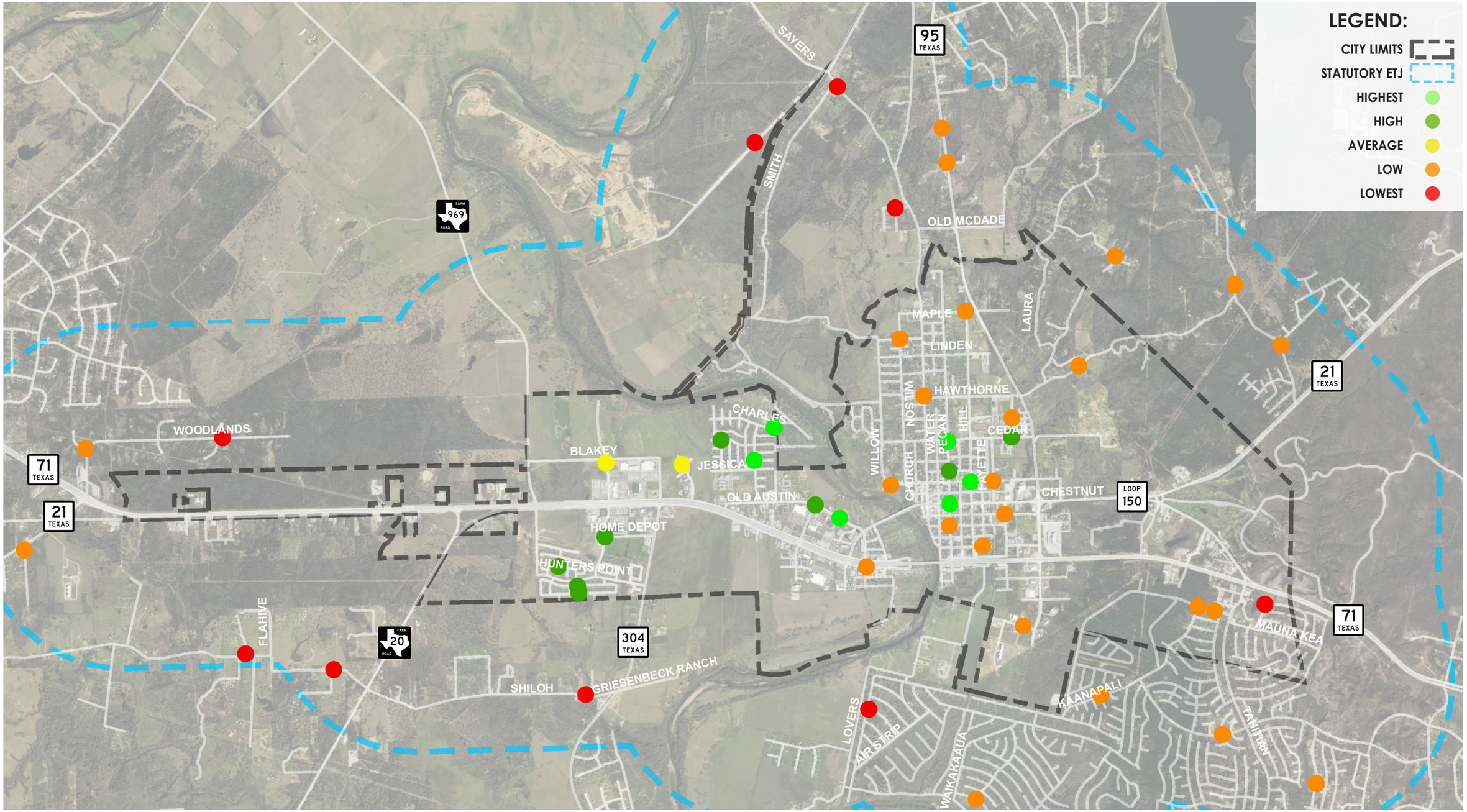
The PEQI rating system was applied to 50 randomly chosen locations throughout the Bastrop area in order to acquire a high-level characterization of pedestrian conditions. **Map 6-I, *Pedestrian Suitability Results***, shows the results of the pedestrian assessment, including the geographic distribution of PEQI scores for the chosen locations.

Results from the pedestrian assessment suggest that, in general, the Bastrop transportation system provides **below average** conditions for pedestrians. Conditions that detract from the pedestrian environment that were frequently observed included a lack of crosswalks and signage to alert drivers of crossing pedestrians, along with high posted speeds. Conditions that were observed that enhance the quality of the pedestrian environment include adequate lighting throughout neighborhoods, abundant tree coverage for shade and those residential areas that included sidewalk and curb features.

Stakeholders have voiced concerns about the high speeds, the lack of separation between pedestrians and motor vehicles on the Bastrop street network and a desire for more pedestrian facilities. Current conditions leave stakeholders feeling unsafe and therefore most people do not walk between destinations. During a site review, people were observed driving from one business to another although the businesses were immediately adjacent due to a lack of pedestrian amenities connecting the two businesses. Future projects should include enhanced pedestrian facilities along roadways. Also, crosswalk upgrades paired with appropriate signage will promote a more pedestrian friendly environment throughout Bastrop. Accommodating pedestrian travel is a principal aspect of the Complete Streets philosophy described beginning on page 6-37.

# PEDESTRIAN SUITABILITY RESULTS

## MAP 6-I:



## MULTI-USE NETWORK

A multi-use network is a series of well-connected pathways or trails for active transportation modes that connect key destinations, as well as flow seamlessly into on-road bicycle and pedestrian facilities. An extensive multi-use network should be planned and would significantly aid in improving connectivity and safety for pedestrians and bicyclists in Bastrop. Connecting the multi-use network to regional trails would increase regional connectivity and potentially lead to an increase in tourism and improve community image.

Existing shared-use trails are located near the Colorado River to the west of downtown, along Old Austin Highway and in the Hunters Crossing subdivision to the south of SH 71. **Map 7-D, *Proposed Multi-Use Trail Network*** (see Chapter 7, page 7-14) proposes specific shared-use trails. As outlined in that map, the Colorado River is a main priority for multi-use trail construction. Connections to other natural resources, such as Lake Bastrop and Bastrop State Park should also receive a high degree of priority. Design guidelines for multi-use trails can also be found in the parks and recreation chapter. Implementation of goals, objectives and policies regarding active transportation and multi-use networks should consider and follow complimentary objectives outlined in **Chapter 7, *Parks and Recreation***.

## ACTIVE TRANSPORTATION RESOURCES

An increase in active transportation activity could assist in easing future traffic congestion issues for the City. Providing adequate facilities and resources for those who choose to bicycle or walk is important for the success of a truly multi-modal transportation network in Bastrop. Bastrop should use the numerous resources that are available to assist in the design and implementation of an all ages and abilities active transportation network. The American Association of State Highway and Transportation Officials' (AASHTO) Guide to the Development of Bicycle Facilities (2012) has traditionally operated as the primary national resource for planning, designing, and operating bicycle and pedestrian facilities; however, recently the Federal Highway Administration has expressed support for flexible and local, context-sensitive bicycle and pedestrian facility design as outlined in the NACTO Urban Street and Urban Bikeway Design Guidelines. Additional resources can be found in the City of Bastrop's Transportation Master Plan.

**Goals and objectives that are associated with active transportation topics are listed below.**

### Goal 6.5: Improve active transportation options.

**Objective 6.5.1:** Identify, prioritize and fund bicycle facilities that improve safety, connectivity and accessibility.

1. ***Use bicycle suitability results to identify and prioritize key locations for new or upgraded facilities.***
2. ***Implement a bike route way-finding system to help bicyclists identify optimal safe routes.***
3. ***The City should participate in regional active transportation planning initiatives, such as the CAMPO Active Transportation Plan.***
4. ***Place signage along high volume roads to alert drivers of bicyclists.***

5. *Identify, prioritize and fund key roadway projects to connect key destinations along the bicycle network and key trails projects that align with the goals outlined in the Parks and Recreation Chapter.*
6. *Encourage businesses to include bicycle parking during site planning and development process in support of the City's Complete Streets goals.*

### Objective 6.5.2: Identify, prioritize and fund pedestrian facilities that improve safety, connectivity and accessibility.

1. *Use pedestrian suitability results to identify key locations for upgraded or new facilities.*
2. *Improve pedestrian crossings and crosswalks throughout Bastrop.*
3. *Identify key locations for enhanced crosswalks.*
4. *Identify key locations for enhanced mid-block crossings along busy corridors.*
5. *Ensure adequate signage is posted at crossings and before crossings to alert drivers.*
6. *Increase ADA compliance at intersections and crosswalks to increase network accessibility and compliance with ADA Standards.*
7. *Develop and maintain a list of non-compliant crosswalks and intersections.*
8. *Prioritize ADA enhancements along major corridors with high pedestrian traffic.*

### Objective 6.5.3: Create and sponsor bicycle and pedestrian programs and resources.

1. *Work with public to create unique brand and slogan for active transportation in Bastrop to increase awareness and tourism (i.e. Bike Bastrop or Walk, Bike, Run Bastrop, etc.)*
2. *Develop bicycle resource pamphlet including maps of bicycle routes, key destinations, bike shops and additional resources for bicyclists.*
3. *Identify bicycle resources and key destinations through active public dialogue with bicyclists.*
4. *Place maps/pamphlets at key destinations throughout Bastrop.*
5. *Implement promotional campaigns to encourage safe roadway travel behavior, such as:*
   - *"Share the Road"*
   - *"Street Smarts"*
   - *"Drive Kind, Ride Kind"*
6. *Actively promote or sponsor programs that encourage people to bike or walk to school and work, such as:*
   - *"Bike/Walk to School Day"*
   - *"Bike/Walk to Work Week"*

## PUBLIC TRANSPORTATION.

Public transportation is a key opportunity for Bastrop to increase alternative transportation options and relieve congestion on major highways. Public transportation is currently provided in Bastrop by Capital Area Rural Transportation System (CARTS), which provides a variety of fixed route and on-call transit services. These services include:

- ***Interurban Coach*** *routes 1518 Purple and 1519 Blue, which connect the city to Smithville and La Grange;*
- ***Country Bus*** *curb-to-curb service, which provides service for mobility impaired persons;*
- ***Municipal Bus****, provides intercity service within Bastrop;*
- ***Weekday Commuter*** *service between Bastrop and Downtown Austin;*
- ***Grasshopper*** *service for Interurban Coach users, providing connecting rides between Austin CARTS headquarters and medical appointments; and*
- ***Door-to-door Medical Transportation*** *for appointments and non-emergency medical services.*

Many stakeholders expressed a strong desire to expand public transportation options and services to provide connections both within the city and to areas outside the city. Coordination with CARTS will be key in improving transit coverage and frequency within the city and its ETJ. Stakeholders supportive of public transportation also indicated that priority should be given to identifying and funding park and ride inter-modal facilities at an appropriate location within the city for inter-city commuters. As shown in **Figure 6.1** (page 6-3), funding a regional passenger/commuter rail system connecting Bastrop to regional activity centers is a top priority to the public. The City would need to work collaboratively with regional planning partners to advance service of this type, which requires resources and commitment from a broad range of stakeholders and agencies.

### Goal 6.6: Expand and enhance transit services.

**Objective 6.6.1:** Expand coverage and increase frequency of the CARTS service within Bastrop.

1. ***Coordinate with CARTS to provide higher frequency inter-city service.***
2. ***Coordinate with CARTS to increase transit coverage within Bastrop to increase access, particularly for low income or elderly residents, to key destinations.***
3. ***Maintain active dialogue with CARTS to improve bus stops and transit facilities within Bastrop.***

**Objective 6.6.2:** Expand commuter bus service into Austin and Travis County.

1. ***Work with CARTS to identify, prioritize and fund park and ride/inter-modal facilities.***
2. ***Coordinate with Capital Metro on potential Bus Rapid Transit between Austin and Bastrop.***

**Objective 6.6.3:** Promote and market transit services within Bastrop.

1. ***Prioritize transit as an alternative mode of transportation to and from Austin.***
2. ***In coordination with CARTS, market transit services through the City's website and other public outreach venues.***

**Objective 6.6.4:** Enhance bus stop amenities and areas surrounding transit stops.

1. ***Connect bus stops to bicycle and pedestrian transportation facilities.***
2. ***Create shelter and other enhancements at transit stops, including waiting areas in park and ride facilities.***

## INTER-MODAL TRANSPORTATION.

As part of the Comprehensive Plan, the inter-modal transportation system in Bastrop was examined. Freight, rail and air modes were considered. The Bastrop Transportation Master Plan goes into more detail on inter-modal operations in the city. The movement of freight into and through Bastrop supports local economic development. However, freight movement can also have negative impacts on the movement of other transportation system users. Therefore, it is important to balance the transportation needs of both people and goods.

### MOTOR FREIGHT

Due to Bastrop's central location in Bastrop County, the intersection of multiple state highways (SH 71, SH 95, SH 21) and its proximity to Austin, San Antonio and Houston, Bastrop's roadways see frequent freight movement. Motor freight is the primary method by which local businesses receive freight deliveries and distributions. Therefore, in designing roadway configurations near local businesses, the needs of motor freight carriers should be taken into consideration.

### AIRPORTS

Bastrop is well served by airports, with the Austin-Bergstrom International Airport (ABIA) approximately 20 miles to the west and the Smithville Municipal Airport approximately 15 miles to the east, both located on SH 71. Total passenger activity for ABIA from January to December 2015 was just under 11.9 million, an airport record. Air cargo was upwards of 157 million pounds during 2015. The Smithville airport averages approximately 25 aircraft operations a day, while housing 45 aircraft on the field. The runway dimensions are 4,000 x 75 ft. According to the City of Smithville website, current operations include local (67%) and transient (33%) general aviation. As there is no airport within the City of Bastrop, roadway and transit connectivity to these regional airports needs to be maintained.

### Goal 6.7: Enhance multi-modal freight capacity

**Objective 6.7.1:** Improve motor freight access to local businesses.

1. ***When street improvements are planned, motor freight access to local businesses should be taken into consideration, and where possible relegated to the rear of the business.***

**Objective 6.7.2:** Reduce impacts of motor freight on traffic congestion .

1. ***Consider the freight movement when designing access management strategies, congestion management strategies, and safety improvement strategies.***

## TRANSPORTATION-LAND USE CONNECTION - COMPLETE STREETS.

The Comprehensive Plan outlines specific land use goals and strategies to mitigate the effects of a rapidly growing population as well as economic development goals and strategies. The transportation system is inherently linked to land uses in Bastrop and plays a distinct role in future economic development throughout the city. Ensuring that transportation and land use policies and economic development policies are in harmony is essential to achieving the desired growth and development in Bastrop. This section outlines the correlation between land use, economic development and transportation policy and creates a framework to ensure transportation, economic development, and land use policy decisions align with each other. Linking land use, economic development and transportation decisions to one another will create a better functioning and more harmonious city.

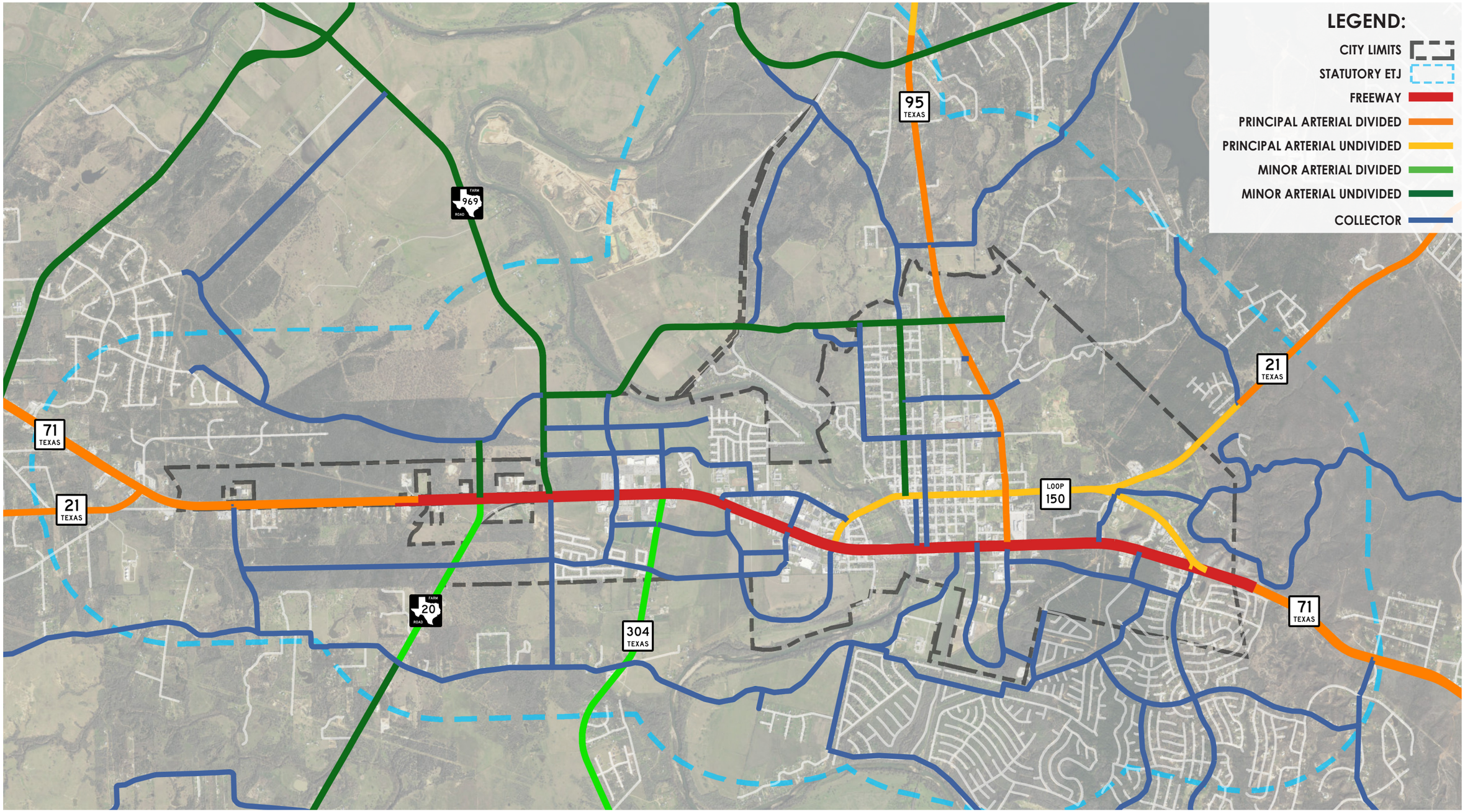
The backbone of the transportation system is the creation of a major thoroughfare plan that guides the use and development of the roadway system for the city, a system that takes into consideration the needs of all users, and the movement of both people and goods.

### MAJOR THOROUGHFARE PLAN

A Major Thoroughfare Plan has been developed for the city that supports the land use patterns and economic development goals of Bastrop as reflected in the respective chapters of the Comprehensive Plan. **The details of the development of the Major Thoroughfare Plan and a description of the roadway classification system can be found in the companion Bastrop Transportation Master Plan.** The proposed major thoroughfare map generated through the transportation master planning process is hereby inserted as a component of this Plan as **Map 6-J, *Major Thoroughfare Map, 2040***.

# MAJOR THOROUGHFARE MAP, 2040

# MAP 6-J:



## COMPLETE STREETS POLICY

The Complete Streets approach to transportation planning encourages planners and engineers to consider all transportation modes and users when designing roadways, which can lead to increased mobility and accessibility for system users and acts as a driver of economic development by stimulating increased local spending and tourism.

To integrate transportation, land use and economic policies, the City will gradually implement a Complete Streets approach to transportation planning, which considers all transportation modes as well as the land use and economic activities supported by the transportation system. Additionally, the City will employ a Context Sensitive Solutions approach when designing the transportation system. Transportation facilities should reflect the context and character of the surrounding area, be it rural, urban or small town. Considering community context and character during the planning process helps preserve that character and sustain the community's quality of life.

Conversations with area stakeholders and the public revealed general support for Complete Streets principles and the promotion of all modes of transportation. There is an especially strong desire for increased sidewalk connectivity between key destinations and improved streetscape quality to enhance downtown character. There have been a number of efforts in recent years to enhance the pedestrian environment in Bastrop. The Downtown Bastrop Form-Based Code, adopted in March 2015, provides regulatory tools to guide development of Downtown Bastrop as a "mixed use, walkable destination for local residents and visitors." Notably, the code requires or recommends sidewalks and/or trails for all new development along priority streets and corridors. It also provides design standards for sidewalk and trail width, and streetscape features such as bicycle racks, bus shelters and trees, among others. In addition, the City of Bastrop is currently in the preliminary planning and design phase for reconstruction of Main Street through the heart of Downtown Bastrop, which is expected to include new sidewalks from Pine Street to Spring Street.

In order to fully integrate Complete Streets into future transportation investments, the City should develop a Complete Streets Policy that can be adopted into the subdivision ordinance and that:

- *Includes a vision for how and why the community wants to complete its streets*
- *Specifies that "all users" includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses and automobiles*
- *Applies to both new and retrofit projects, including design, planning, maintenance and operations*
- *Makes any exceptions specific and sets a clear procedure that requires high level approval of exceptions*
- *Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes*
- *Is adoptable by all agencies to cover all roads*
- *Directs the use of the latest and best design criteria and guidelines while recognizing the need for flexibility in balancing user needs*

- *Directs that Complete Streets solutions will complement the context of the community*
- *Establishes performance standards with measurable outcomes*
- *Includes specific next steps for implementation of the policy*

While these specific elements should be included into an adopted Complete Streets Policy, it is important to tailor the policy to match goals and objectives outlined within this chapter and the overall Bastrop Comprehensive Plan.

### CONTEXT SENSITIVE STREET DESIGN

In order to create a cohesive feel between land use and the transportation system, future street design should be cognizant of its context. Similar to the character areas described in Chapter 5, roadways should mirror the land use feel for each area. Downtown roadways should match the quaint small town charm of Downtown Bastrop and prioritize pedestrian and bicycle activity while discouraging high speeds.

### STREETSCAPE

Streetscape design is integral to creating a sense of place. The previously mentioned character areas aim to prescribe a distinct feel to each area of Bastrop. Enhanced streetscape design paired with context sensitive street design can establish an environment where transportation and land use complement one another. Elements that make up a streetscape include, but are not limited to, parking, medians/planting strips and furnishings. Streetscape improvements should use the recently adopted (March 2015) Downtown Bastrop Form-Based Code as a regulatory guide to enhancing the streetscape throughout Downtown Bastrop. Additional coordination with the Downtown Bastrop Main Street Program to identify potential enhancements to the existing way-finding signage and streetscape will be useful.

***Typical streetscape elements include lighting, plantings, way-finding, and signage.***

### PARKING

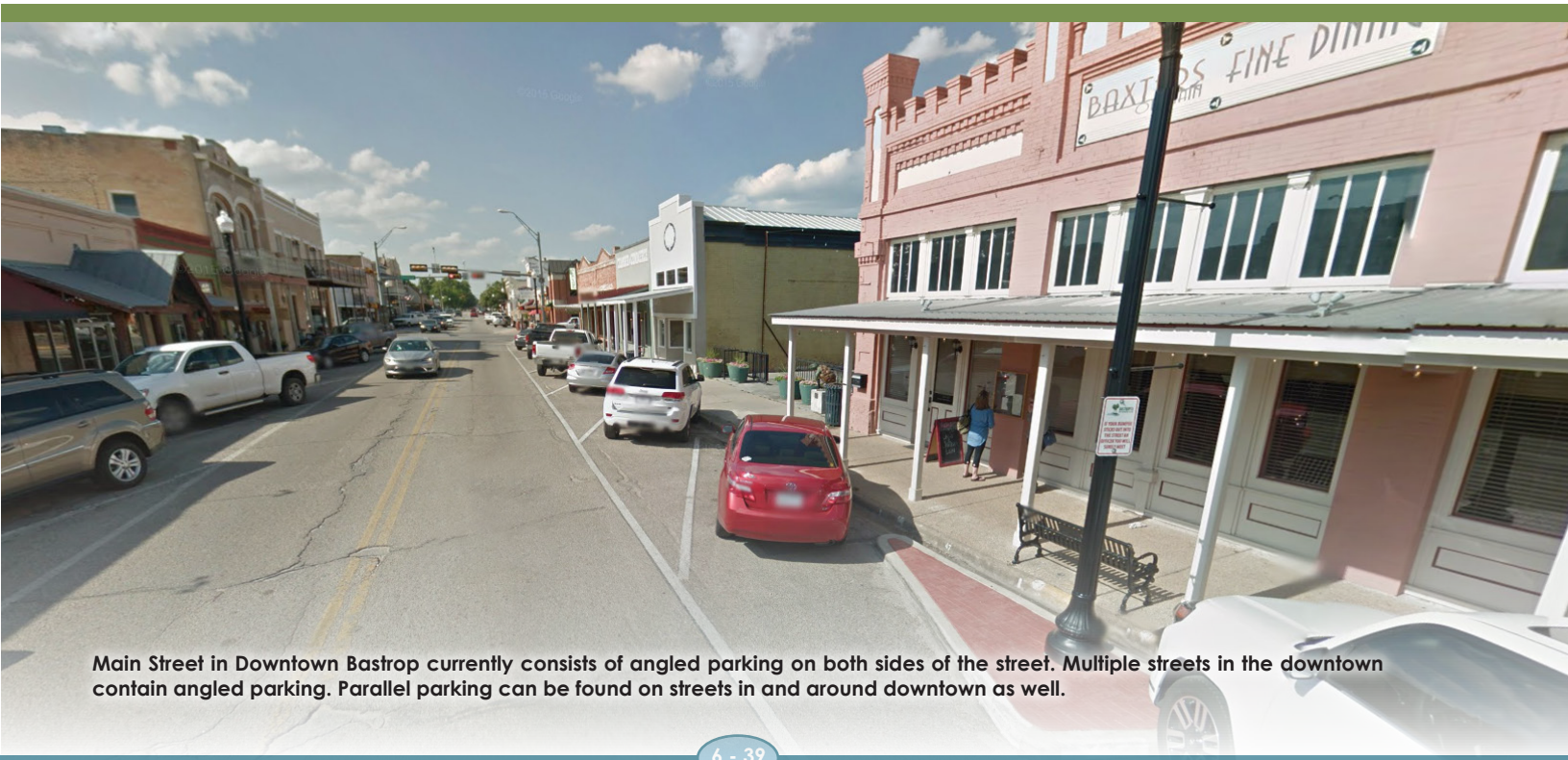
Parking is a major component of the Downtown Bastrop character. Parking in Downtown Bastrop generally consists of either angled or parallel parking. Main Street from Pine Street to Farm Street consists of angled parking on both sides of the street. Additional angled parking is scattered throughout downtown on various side streets. Pine Street, Water Street and Spring Street contain a mixture of both angled and parallel parking. Multiple private lots are also scattered throughout downtown and contain a combination of direct pull-in and angled parking. The City is currently planning a parking garage on Water Street. Ample parking is integral to the success of downtown businesses due to the draw of tourists to the historic downtown, however, too much parking in the downtown could diminish the walkability and historic fabric of downtown.

### MEDIANS AND PLANTING STRIPS

Medians and planting strips are a great way to increase the visual aesthetics of a streetscape. Currently no medians exist in Downtown Bastrop. If future medians are constructed within the city, they should be designed and constructed to include visual enhancements such as tree or flower plantings. In general, sidewalks in downtown are not buffered from travel lanes except where on-street parking is present. Some sidewalks do contain tree plantings. Adding planting strips along sidewalk edges would both increase the visual aesthetics of downtown and improve pedestrian safety. Both trees and flowers could provide an aesthetic enhancement to the downtown area.

### STREETSCAPE FURNISHINGS

Streetscape furnishings include items like hanging baskets, street lights, banners, planting pots and bollards. Furnishings are meant to enhance the streetscape visually and assist in creating a sense of place.




**Main Street in Downtown Bastrop currently consists of angled parking on both sides of the street. Multiple streets in the downtown contain angled parking. Parallel parking can be found on streets in and around downtown as well.**

*Medians can positively impact both pedestrian and vehicle conditions along roadways. An example median with plantings is shown above.*

*Street plantings and furnishings typically have a dedicated space within the right-of-way, as shown above.*

## FUTURE LAND USES SUPPORTED BY THE TRANSPORTATION PLAN

**Chapter 5, *Land Use and Community Image***, describes the land use policies of this Comprehensive Plan. Chapter 5 identifies and classifies different geographic areas of the city into 11 character areas based on recommended future developments and "character." The Downtown Bastrop character area provides a good example of how the Complete Streets and Context Sensitive Solutions approach to transportation planning supports the land use goals of the City.

The Downtown Bastrop character area has a small urban feel and includes both modern and historic buildings. This character area also has a wide range of land uses and is an economic center for the city, thus generating transportation needs for people and goods. All transportation modes are needed, therefore the Downtown Bastrop character area is one of the most effective areas for starting implementation of the Complete Streets and Context Sensitive Solutions approach to transportation planning. In conjunction with the Form-Based Code already developed by the City, this transportation approach can meet the diverse transportation, economic development and land use needs that exist in the Downtown Bastrop character area.

The Form-Based Code (DB-FBC) adopted in March of 2015 provides the regulatory tools for new development and redevelopment consistent with the Illustrative Vision for Downtown Bastrop as a mixed use, walkable destination for local residents and visitors. The code is designed to implement this vision by:

- *Preserving and enhancing the existing development character of downtown and adjoining neighborhoods through a*

*comprehensive form based approach to achieve mixed uses, transitions, and pedestrian-oriented design.*

- *Creating appropriate Downtown Character Zones to implement the vision for different areas of downtown – the Historic Main Street corridor, the Chestnut Street commercial area, Civic/ Cultural Arts District, neighborhoods north and south of Chestnut Street, and the SH 71 and 95 corridors.*
- *Establishing appropriate urban design standards associated with each Downtown Character Zone including building form, use, signage, and civic/open space standards with a focus on implementing pedestrian-oriented design.*
- *Establishing neighborhood standards with appropriate infill and redevelopment standards for the neighborhoods adjoining downtown; and*
- *Establishing a clear review, approval, and appeals process for all development.*

The DB-FBC divides Downtown Bastrop into six (6) different "Character Zones". Each Character Zone is intended to create a distinct urban form based on the Illustrative Vision for different sections within downtown.

Each Character Zone has different use and building form standards, including standards for building height, bulk, location, functional design, and parking. The six zones from the code are:

- ***Historic Main Street (HMS)***
- ***Downtown Mixed Use (DMU)***
- ***Civic/Cultural Arts (CCA)***
- ***Commercial Mixed Use (CMU)***
- ***Live-Work (LW)***
- ***Neighborhood (N)***

Each of these character zones within the Downtown character area includes a description of the transportation needs that will support the "character" of the area. Through the application of Complete Streets and Context Sensitive transportation planning approaches, the integration of land use, economic development and transportation can be used to support the character and quality of life of the City of Bastrop.

**Goals and objectives that are associated with the transportation-land use connection are listed on page 6-42.**

## Goal 6.8: Build a network of complete streets and preserve quality of place.

**Objective 6.8.1:** Incorporate Complete Streets principles in the design and construction of roadway projects, both new and retrofits.

1. *Adopt a Complete Streets Policy as part of the subdivision ordinance for Bastrop that enumerates strategies for the safe and efficient travel of all modes along roadways and utilizes design guidance specified in the NACTO Urban Street Design Guide.*
2. *Review and update Traffic Impact Analysis (TIA) requirements and developer participation regulations to incorporate Complete Streets policy guidelines into the subdivision regulations.*

**Objective 6.8.2:** Implement educational programs to inform the public and partner agencies of the City's commitment to Complete Streets

1. *Identify existing locations within the city that embody Complete Streets concepts and hold them out as examples of what could be achieved in other areas.*
2. *Disseminate information regarding the Bastrop Complete Streets Policy, including typical/ preferred cross sections, to TxDOT, CAMPO, and Bastrop County for inclusion in relevant transportation planning efforts.*
3. *Host annual Complete Streets design guidance workshops for local planners, engineers and other interested transportation professionals.*
4. *Construct low-cost, temporary pilot projects (i.e. tactical urbanism) to demonstrate the viability of Complete Streets.*

## Goal 6.9: Support City's land use, economic development and urban design goals.

**Objective 6.9.1:** Implement a Context Sensitive Approach to transportation planning

1. *Future street design should be cognizant of its context.*
2. *Streetscape improvements should use the recently adopted (March 2015) Downtown Bastrop Form-Based Code as a regulatory guide to enhancing the streetscape throughout Downtown Bastrop.*
3. *Streetscape design should coordinate with the Downtown Bastrop Main Street Program to identify potential enhancements to the existing way-finding signage and streetscape.*
4. *Parking in the downtown should be carefully designed so as not to diminish the walkability and historic fabric of downtown character.*
5. *Where possible, freight access to commercial buildings should be in the rear of the building.*
6. *Trees and other plantings should be used to enhance the character of the area where possible.*
7. *For all transportation projects, ensure that design supports the context or character of the area through which the facility passes.*

## SUMMARY OF GOALS AND OBJECTIVES (TRANSPORTATION).

Chapter 6, *Transportation*, of the Bastrop Comprehensive Plan provides a summary of the city's transportation system needs and how they relate to the city's projected growth and development patterns. The chapter identifies principles and policies that should be applied by local decision-makers when considering future land use and transportation priorities and investments. Goals and objectives from the transportation chapter are incorporated into the City's overall comprehensive plan work program (Chapter 9, *Implementation*) and align with recommendations in the *Bastrop Transportation Master Plan*.

The eight (8) goals and 37 objectives that are recommended throughout this chapter have been compiled into **Figure 6.9** below. Detailed initiatives and actions that correspond to the listed goals and objectives may be found on the page numbers referenced within the figure.

**FIGURE 6.9. TRANSPORTATION**, SUMMARY OF GOALS AND OBJECTIVES

| GOAL/OBJECTIVE: | PAGE: |
|---|---|
| **GOAL 6.1: MANAGE TRAFFIC CONGESTION AND IMPROVE SYSTEM RELIABILITY.** | 6-10 |
| **OBJECTIVE 6.1.1:** Reduce vehicle miles traveled through Travel Demand Management strategies. | 6-10 |
| **OBJECTIVE 6.1.2:** Maximize the performance of the existing transportation system. | 6-10 |
| **OBJECTIVE 6.1.3:** Identify strategic opportunities to expand roadway capacity. | 6-10 |
| **OBJECTIVE 6.1.4:** Ensure reliable commuting options for Bastrop residents who work in Austin and Travis County. | 6-10 |
| **OBJECTIVE 6.1.5:** Improve emergency response and incident clearance times. | 6-10 |
| **GOAL 6.2: ENHANCE TRANSPORTATION SYSTEM CONNECTIVITY.** | 6-12 |
| **OBJECTIVE 6.2.1:** Ensure that subdivision ordinance/regulations and site development standards promote connectivity. | 6-12 |
| **OBJECTIVE 6.2.2:** Identify gaps in the road network and prioritize funding for capital projects that connect those gaps. | 6-12 |
| **OBJECTIVE 6.2.3:** Identify long-term priority locations for new Colorado River crossings. | 6-13 |
| **OBJECTIVE 6.2.4:** Enhance east-west connectivity in Bastrop. | 6-13 |
| **OBJECTIVE 6.2.5:** Prioritize pedestrian and bicycling connectivity. | 6-13 |
| **OBJECTIVE 6.2.6:** Develop and implement way-finding and signage plans. | 6-13 |
| **GOAL 6.3: PRESERVE AND MAINTAIN EXISTING TRANSPORTATION ASSETS.** | 6-18 |
| **OBJECTIVE 6.3.1:** Adequately maintain existing roadways. | 6-18 |
| **OBJECTIVE 6.3.2:** Improve maintenance along roadways. | 6-18 |
| **OBJECTIVE 6.3.3:** Improve function of existing roadway capacity. | 6-18 |
| **GOAL 6.4: IMPROVE THE SAFETY OF THE BASTROP TRANSPORTATION SYSTEM FOR ALL USERS.** | 6-23 |
| **OBJECTIVE 6.4.1:** Enhance safety by reducing conflict points through the implementation of sound access management principles. | 6-23 |
| **OBJECTIVE 6.4.2:** Reduce dangerous driving behavior by implementing strategic traffic calming interventions. | 6-24 |

**FIGURE 6.9. TRANSPORTATION**, SUMMARY OF GOALS AND OBJECTIVES

| GOAL/OBJECTIVE: | PAGE: |
|---|---|
| Objective 6.4.3: Address locations with poor visibility on the Bastrop transportation network. | 6-24 |
| Objective 6.4.4: Improve safety near school bus pickup and drop-off locations. | 6-24 |
| Objective 6.4.5: Develop an ongoing City program to promote traffic safety education. | 6-24 |
| Objective 6.4.6: Develop an ongoing City program for monitoring and enforcement. | 6-24 |
| Objective 6.4.7: Improve safety at rail crossings | 6-24 |
| **GOAL 6.5: IMPROVE ACTIVE TRANSPORTATION OPTIONS.** | 6-31 |
| Objective 6.5.1: Identify, prioritize and fund bicycle facilities that improve safety, connectivity and accessibility. | 6-31 |
| Objective 6.5.2: Identify, prioritize and fund pedestrian facilities that improve safety, connectivity and accessibility. | 6-32 |
| Objective 6.5.3: Create and sponsor bicycle and pedestrian programs and resources. | 6-32 |
| **GOAL 6.6: EXPAND AND ENHANCE TRANSIT SERVICES WITHIN BASTROP AND TO KEY REGIONAL DESTINATIONS.** | 6-33 |
| Objective 6.6.1: Expand coverage and increase frequency of the CARTS service within Bastrop. | 6-33 |
| Objective 6.6.2: Expand commuter bus service into Austin and Travis County. | 6-33 |
| Objective 6.6.3: Promote and market transit services within Bastrop. | 6-33 |
| Objective 6.6.4: Enhance bus stop amenities and areas surrounding transit stops. | 6-33 |
| **GOAL 6.7: ENHANCE MULTI-MODAL FREIGHT CAPACITY** | 6-34 |
| Objective 6.7.1: Improve motor freight access to local businesses. | 6-34 |
| Objective 6.7.2: Reduce impacts of motor freight on traffic congestion. | 6-34 |
| **GOAL 6.8: BUILD A NETWORK OF COMPLETE STREETS AND PRESERVE QUALITY OF PLACE.** | 6-42 |
| Objective 6.8.1: Incorporate Complete Streets principles in the design and construction of roadway projects, both new and retrofits. | 6-42 |
| Objective 6.8.2: Implement educational programs to inform the public and partner agencies of the City's commitment to Complete Streets. | 6-42 |
| **GOAL 6.9: SUPPORT THE LAND USE, ECONOMIC DEVELOPMENT AND URBAN DESIGN GOALS OF THE COMPREHENSIVE PLAN.** | 6-42 |
| Objective 6.9.1: Implement a Context Sensitive Approach to transportation planning. | 6-42 |

Many of the goals and objectives identified in this chapter complement recommendations located in the *Bastrop Transportation Master Plan*. Other goals and objectives listed herein are unique to this plan. Efforts have been made to ensure that the recommendations in both planning documents align. **Where appropriate, consideration should be given to the *Bastrop Transportation Master Plan* when implementing the recommendations contained in this chapter**.

## IMPLEMENTATION OF TRANSPORTATION GOALS AND OBJECTIVES

Implementation of the transportation goals and objectives must occur in coordination with those recommended in other chapters (and the *Bastrop Transportation Master Plan*). Goals and objectives - and corresponding actions and initiatives - contained in all seven (7) topic-specific chapters of the Bastrop Comprehensive Plan are important; but, several variables must be considered when determining the order of implementation. These variables include: **A)** The timing of expected growth and development impacts; **B)** Costs versus revenues; **C)** The availability of grants, loans and other financing methods; **D)** Staffing and other public resources; and **E)** Dependence on, or completion of, another action or initiative.

In consideration of these inter-related implementation variables, many of the recommendations summarized in **Figure 6.5** have been incorporated into Bastrop's overall comprehensive plan work program located in Chapter 9, *Implementation*. Please reference Chapter 9 for a full overview on the methods and timing by which the City of Bastrop's transportation actions and initiatives will be implemented to the benefit of Bastrop's citizens, business owners and property owners.