THOROUGHFARE PLAN

TYLER COUNTY, TEXAS

April 24, 2017

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EXECUTIVE SUMMARY

The Tyler County Thoroughfare Plan effectively translates the vision and goals of the county into measurable, functional objectives and recommendations to provide improved transportation and access within the county while also coordinating with surrounding counties. All modes of transportation are considered vital for the future of the county; therefore, all have been examined thoroughly keeping in mind both the movement of people and freight.

With the information gathered and examined, this plan provides a county profile and an assessment of existing conditions. Public comments helped to hone in on specific issues the population is concerned about. Keeping these issues in mind, the plan identifies recommendations and potential funding sources. Funding for Tyler County is a unique challenge, and it will continue to be as long as the county is primarily rural. The county, and the cities of the county, must be innovative in their approach to find funds for the priority projects. With this plan, Tyler County is a step ahead for planning its future. This plan is only the beginning of a long history of strategic practices focusing on the goal of bringing and maintaining a great quality of life for all residents within the county.

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CHAPTER 1: INTRODUCTION

1.1 Purpose

This thoroughfare plan is a long-term plan that identifies both the location and type of roadway facilities to meet the needs of projected growth within the county. The growth includes population, economic, and other factors that affect transportation infrastructure. Issues are addressed and recommendations are made for both an immediate impact and for future impacts.

1.2 Context and Background

Tyler County is located in the eastern part of Texas, very close to the Louisiana border *(1)*. It is directly North of the city and Port of Beaumont. The county is forward thinking and preparing for the growth projected in the near and far future. The goal is to eventually have a comprehensive plan for the county that the cities can then reference for their own specific projects and goals. This thoroughfare plan will help to guide the growth and infrastructure capacity as well as improve infrastructure access and management within the county. It can also serve as a model for other rural counties and their own plans.

1.3 Study Area

The study area consists of the county itself and includes insights from the regional plans of counties adjacent to the county to provide a regional perspective. Tyler County has a concern for the future of the county in terms of economic growth, population growth, and the growth of the surrounding counties over the next 25 to 30 years *(2)*. More of the physical features and concerns are detailed later in the plan, which provides everything the cities and county officials need to know about the current state of the community *(3)*. The plan focuses on the issues at hand and how to prioritize them, while it also provides recommendations for how to begin implementing them.

1.4 Major Highways

The county is served locally and regionally by three principal highways (major arterial streets). US 69 runs north-south and connects the cities of Ivanhoe, Woodville (the largest city in Tyler County) and Colmesneil. US 287 connects Woodville and Chester, running from the center to the northwest of Tyler County. US 190 runs east-west approximately dividing the county in half. It connects the cities of Livingston (in Polk County), Woodville (in Tyler County), and Jasper (in Jasper County). This highway is planned for upgrade to an Interstate facility (I-14) and the county expects more development opportunities along this corridor consequently.

Texas Recreational Road 255 (RE 255) is another important highway in the northern half of the county. The only railroad running through the county (in a north-south direction

connecting Colmesneil, Woodville, and Ivanhoe within the county) was operated by Union Pacific, but is currently not in operation.

1.5 Amenities and Other Features

Tyler County has 1 hospital (located in Woodville), 3 parks, 1 airport, 32 water reservoirs and 6 oilfields *(3-5)*. There are 7 primary schools, 2 middle schools and 4 high schools *(6)*. Other areas of significance include the Angelina-Neches/Dam B Wildlife Management Area (located at the confluence of the Neches and Angelina Rivers), Bevilport Paddling Trail, the Big Thicket National Preserve, Dogwood Trail, Martin Dies Jr. State Park Paddling Trails, and Sundew Trail *(7)*. These attractions together offer amenities such as biking, hunting, fishing, paddling, birdwatching, hiking, primitive camping (accessible by boat), and wildlife viewing.

CHAPTER 2: TRANSPORTATION ISSUES AND OPPORTUNITIES

2.1 Local Priorities and Issues

The following priority items and issues were identified during meetings with officials from Tyler County. These along with some other opportunities form the basis for implementation plans and recommendations detailed throughout this document.

1. Occasionally, peak-period traffic backs up north on US-69 from the City of Kountze to the southern border of Tyler County.
2. 18-wheelers and timber logging trucks traveling on US-69 and US-287 have a damaging effect on pavement on these routes. There are two wood mills southeast and three wood mills northwest of Tyler County, and the two routes are used frequently for material transportation purposes. FM 2200 also experiences issues with logging trucks.
3. The current 2-lane configuration and the absence of passing lanes between cities of Ivanhoe and Woodville causes traffic queues on US-69 because of low truck speeds. Because of even lower speeds during rains, the traffic builds up and the problem becomes more severe on this stretch during poor weather conditions.
4. Pipeline failures and occasional oil spills from carrying trucks are concerns for health and environmental reasons.
5. Some low-elevation areas near the eastern border of the county face problems of waterlogging and consequent power outages during poor weather. Some segments along FM 1745 also face water-logging issues during heavy rains because of low elevation, which eventually results in reduced (to no) road connectivity during such instances.

2.2 Opportunities

The following areas of potential improvements and implementation have been identified in addition to the previous section. These can help the county use its natural and human resources more effectively and sustainably.

1. FM 92 can be connected to FM 255 through a paved road network which can serve northbound and southbound traffic, and consequently reduce existing traffic demand on US 69. Currently, FM 92 has a paved surface until approximately 1 mile north of county road 3650, after which the road is gravel. This incremental paved surface connection can benefit both local and regional traffic traveling in the north-south direction.
2. Bike enthusiasts use the north half of the US-287 stretch between the cities of

Woodville and Chester for recreational biking. FM 1745 experiences similar use by recreational bicyclists. Provisions of implementing or improving bike facilities on these stretches for a safer and more enjoyable experience for current and future bicyclists can be considered.

3. Bike trails should be considered near eco-tourism centres for recreational purposes.
4. The Big Thicket National Preserve lies partially within the county boundaries, and, hence, increasing accessibility to it and developing it as an ecotourism centre should be considered as a long-term option.

CHAPTER 3: VISION, GOALS AND OBJECTIVES

The vision for Tyler County was created during meetings held by Texas Target Communities with county residents and officials. The authors then created the goals and objectives from meeting input.

3.1 Vision

Tyler County is dedicated to preserving its culture and maintaining the environment and natural assets, while fostering a high quality of life, supporting education, health, public safety, and economic prosperity of current and future generations.

3.2 Goals and Objectives

The goals and objectives section is included to guide the plan with community needs. The objectives are action-oriented and will help achieve goals to improve the overall transportation system of the county.

Goal 1: Provide an improved road transportation system that will serve the existing and projected travel needs of the county

Objective 1.1: Maintain a hierarchy of road classifications in the county to provide safe and convenient flow of traffic.

Objective 1.2: Identify network deficiencies to create and maintain desirable connections between major arterials and other thoroughfares.

Objective 1.3: Expand right-of-way to allow passing lanes on roads used by slow-moving vehicles like logging trucks.

Goal 2: Provide alternate modes of transportation in the county

Objective 2.1: Provide multi-modal transportation opportunities through bike and pedestrian pathways/trails in ecotourism areas such as Big Thicket National Preserve.

Objective 2.2: Connect the segregated trails of Big Thicket National Preserve in Tyler County through bike lanes via county roads and bike trails in the preserve.

Goal 3: Use existing County funds efficiently and explore more funding opportunities

Objective 3.1: Identify state, federal and other funding opportunities.

Objective 3.2: Link the potential funding sources to each recommendation made in the plan

Goal 4: Plan to ensure timely implementation of the plan

Objective 4.1: Identify responsible agencies for each improvement strategy.

Objective 4.2: Identify priorities for implementation

CHAPTER 4: EXISTING TRAFFIC CONDITION

4.1 Existing Road Classification

The existing road network within Tyler County mainly consists of two principal collector roads (US 69 and US 190) and several other major collector roads. The two principal collector roads (US 69 and US 190) function more like arterial roads and carry a bulk of traffic locally and regionally even though they are classified as collectors. Most of the other collector roads are Farm-to-Market (FM) roads. US 287 is classified as a minor arterial road as per the Texas Department of Transportation (TxDOT) Statewide Planning map *(8)*. However, county roads constitute a majority of the road network in terms of road mileage. Minor collector roads (most of which are FM roads) constitute the least mileage in the existing road network (Figure 1).

Figure 1 shows the road network along with the existing road classification. The principal collector roads run north-south (US 69) and east-west (US 190). As illustrated in Figure 1, some areas within the county are under-served by the current road network.

Road and Pavement Condition

On the basis of right of ownership and maintenance, Tyler County has five classes of roads. They are Private, City, County, State, and Federal highways. In general, all private and county roads are unpaved (dirt or gravel), have no shoulder, no median and the width of the road ranges between 14 and 22 feet. Among the five cities within the county, only Woodville consists of completely paved roads. All other roads are either dirt or gravel roads, unpaved without shoulders or medians. All the city roads range between 12 and 22 feet wide. Both State and Federal roads are bituminous, paved and have standard two-lane configurations. The US highways (US 69, US 287 and US 190) convert to four-lane road configurations only within the city limits (in all five cities within the county) and have an average total road width of 85 feet within the cities.

Table 1 and Table 2 provide more details on road configurations and conditions within the county and specific cities.

Figure 1: County Map Showing Existing Road Classification and Network

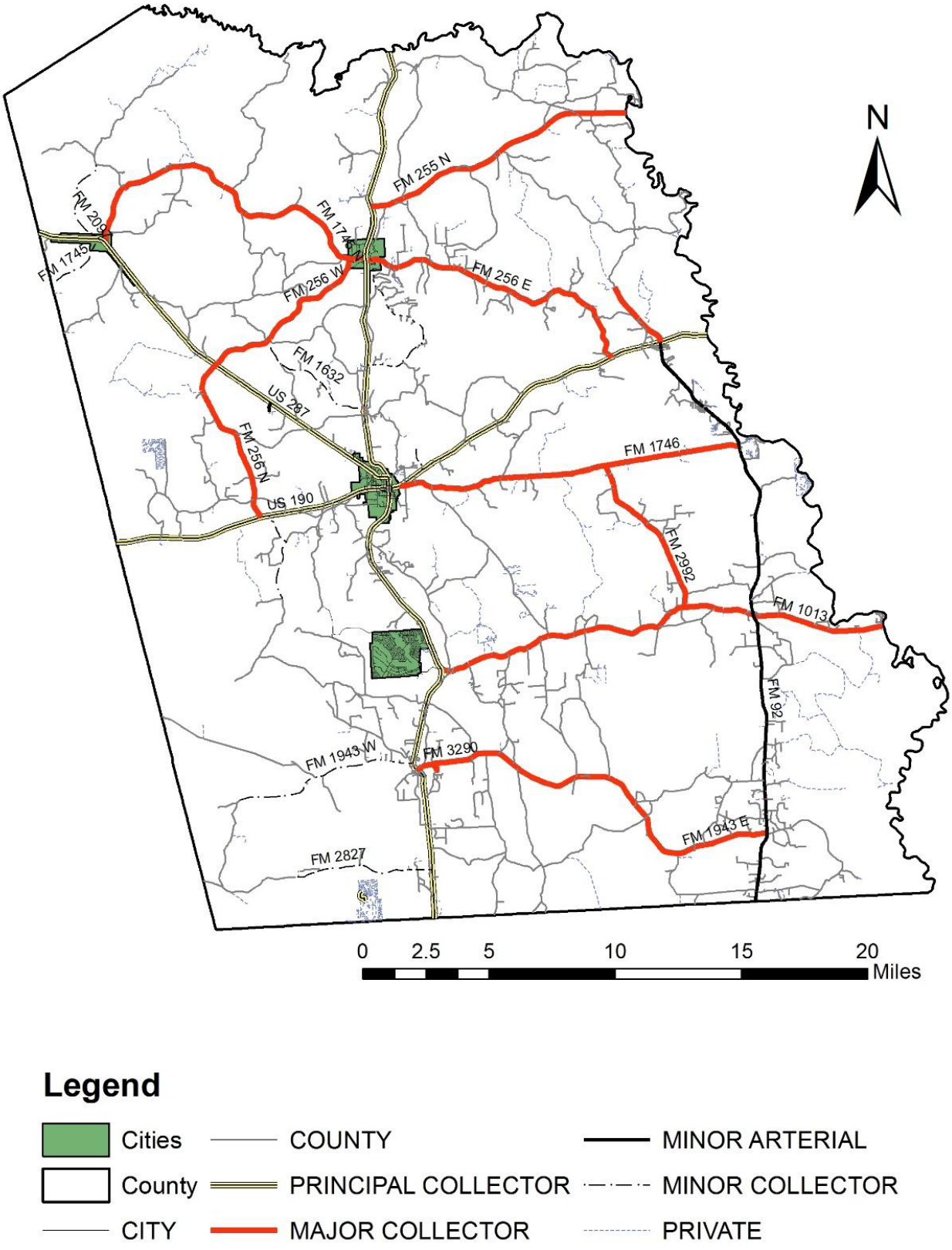


Table 1: Typical Road Configuration and Condition for Different Classes of Roads

Road Classification	Type of Road	Road Condition	No. of Lanes	Shoulder	Median	Road Width	Notes
Private	Gravel	Unpaved	2	No	No	14'-22'	-
City	Gravel, Bituminous	Paved, Unpaved	2	No	No	12'-22'	Excluding US and State Highways
County	Gravel	Unpaved	2	No	No	18'-30'	-
State	Bituminous	Paved	2	Yes	No	20'-30'	-
Federal	Bituminous	Paved	2, 4	Yes	No	45', In Cities: 85'	4 lanes in Cities

Source: Google Earth

Table 2: Typical Road Configuration and Condition within Different Cities in the County

City	Type of Road	Road Condition	No. of Lanes	Shoulder	Median	Road Width	Notes
Ivanhoe	Gravel	Unpaved	1	No	No	14'-22'	Excluding US and State Highways
Woodville	Bituminous	Paved	2	No	No	18'-22'	Excluding US and State Highways
Warren	Gravel	Unpaved	1	No	No	12'-18'	Excluding US and State Highways
Colmesneil	Gravel	Unpaved	1	No	No	12'-18'	Excluding US and State Highways
Chester	Bituminous	Paved	1	No	No	12'-18'	Excluding US and State Highways

Source: Google Earth

4.2 Traffic Volume

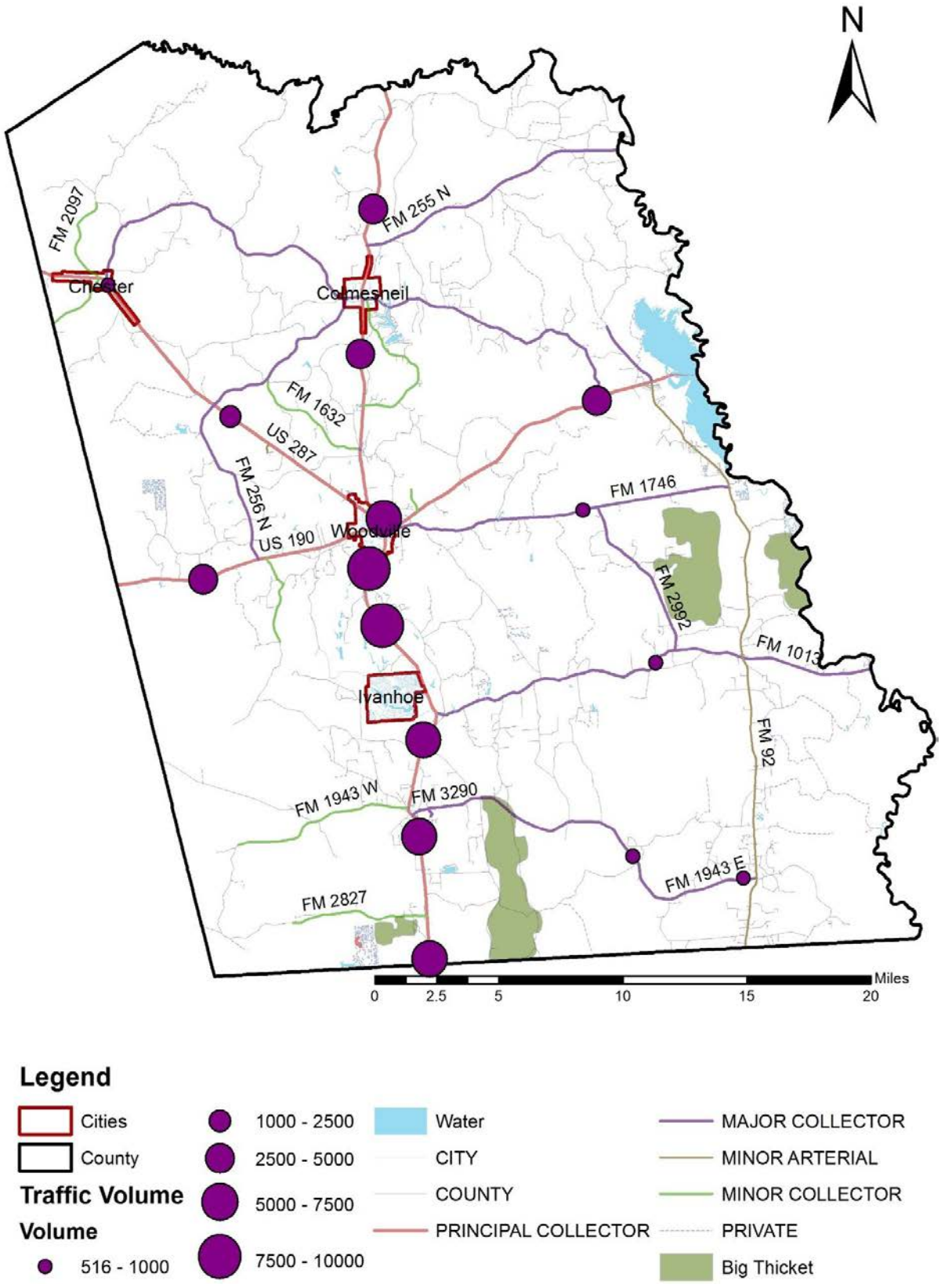
Appendix A provides classified traffic volume counts available on Texas Department of Transportation's (TxDOT's) website *(TxDOT Traffic Count Database System) (9)*. The data come from a traffic count survey conducted in December 2015 by TxDOT. The traffic counter was located on US 69 (5.0 miles south of US 190 or 4.4 miles north of FM 1013), a principal arterial (although classified as a principal collector) which experiences the highest traffic among all the roads in the county.

The data were used to estimate the proportion of different classes of vehicles using the major arterial roads in the county, which is where most of the traffic count locations are situated. In particular, the percentage of trucks in the traffic composition is of interest with regards to some of the issues highlighted in Chapter 2.

The average truck percentage over the entire month of traffic data collection is approximately 9 percent with minor daily fluctuations. 3-axle and above vehicles are counted as trucks (Class 6 through 13 in Appendix A) as per Federal Highway Administration (FHWA) scheme-F vehicle classification provided on the TxDOT Statewide Planning Map *(9)*. The highest proportion of vehicles were found to be passenger cars and 4-tire, single-unit trucks.

Figure 2 shows (unclassified) traffic data collected at different locations within the county as available from the TxDOT Statewide Planning Map. These represent total traffic using different road stretches in the county and provide an idea about the relative concentration of traffic on different roads and road classes.

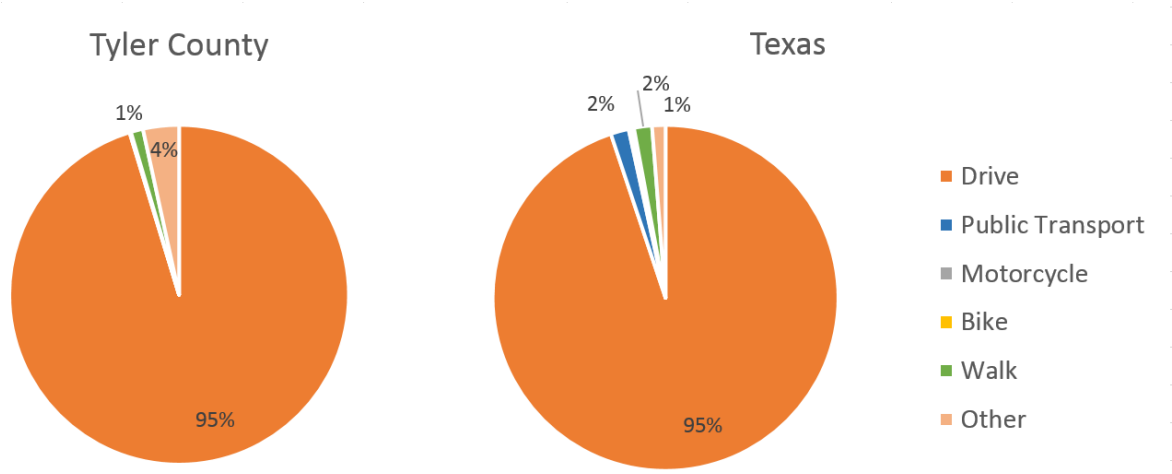
Figure 2: County Map Showing Traffic Volume on Different Road Stretches



4.3 Transportation Mode Share

The mode share (proportion of different transportation modes) observed in commute to work traffic in Tyler County compares similarly to that of the state average. The difference is that there is no public transportation in Tyler County and motorists carpool more in Tyler County (14.2%) than in the state (10.8%) as shown in Figure 3. Bikes are not used to commute to work in the county so there is an opportunity to promote bicycling to ensure a healthy lifestyle through active transportation.

Figure 3: Mode Share while Commuting to Work



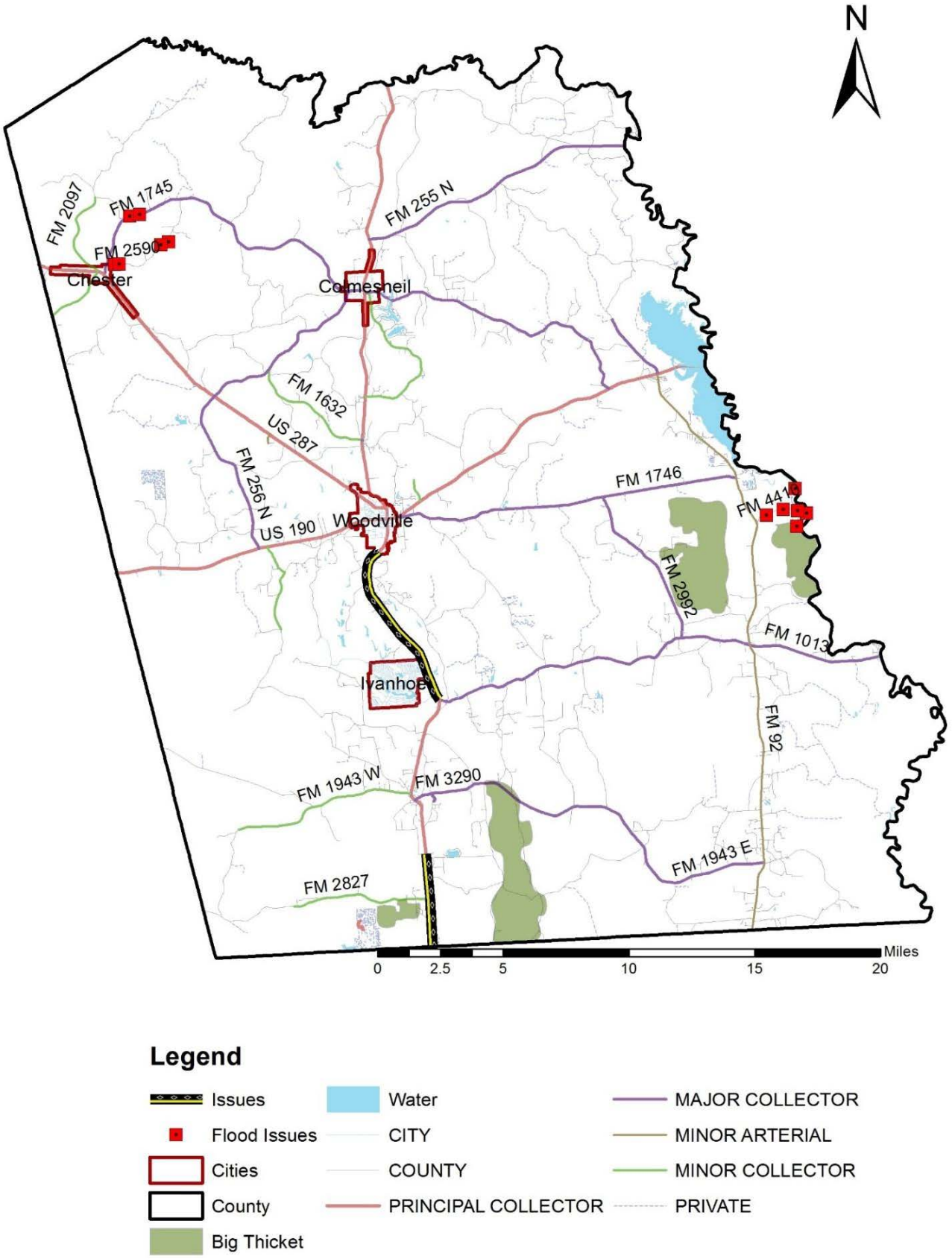
4.4 Issues Identified

The following issues were identified in the meeting with county officials and background studies based on secondary data.

Lack of Connectivity due to Gaps within the Existing Network

As observed in Figure 4, some areas within the county are underserved by the existing road network. More importantly, some of the roads (in particular, US 69, US 287 and US 190) are classified, configured and constructed as collector roads in terms of lane and road width, even though they serve the highest volumes of traffic in the county. The US 69 road southbound from Woodville carries the bulk of traffic locally and regionally but still has a 2-lane configuration with no passing lanes. This in particular is an issue because logging trucks drive on this route and hinder the movement of faster-moving vehicles.

Figure 4: County Map Showing Locations for Transportation-Related Issues



Moreover, many of the local and county roads connect to these principal roads, particularly US 69, without any transition to a minor collector road. This violates the principle of hierarchy between road functional classes and therefore does not allow for smooth flow of traffic from one class of road to the higher class. In the current state, it does not appear to induce a considerable change in speed and traffic flow because even the principal roads have only a two-lane configuration and low travel speeds, but if the county plans to upgrade these high-demand roadways to sustain economic and demographic growth, a better adherence to the hierarchical system would serve well in the long run. With the US 190 corridor planned for conversion to Interstate 14, a comprehensive class system of roads connecting to this future corridor is needed.

The current network would benefit from an upgrade to some of the existing roads to the next higher class. In particular, some of the current county roads should serve as minor collector streets in the future, a few identified minor collector roads should be assigned and constructed as per major collector road guidelines, and the currently-assigned principal collector roads (US 69, US 190) should be upgraded to major arterial roads. These recommendations and possible implementation are discussed in following chapters.

Figure 4 provides a spatial reference to a few of the issues discussed above. As shown on the map, the US 69 road section between Ivanhoe and Woodville experiences difficulty in passing manoeuvres for passenger cars and lighter vehicles because of slow moving (usually timber logging) trucks and lack of passing lanes to assist such manoeuvres.

Freight Movement & Growth

Tyler County is not currently growing at a rapid rate, but is overall increasing in population. Projections show the county will continue increasing at the same or similar rate over the next 10 years. By 2050, the population will most likely be over 40,000. Currently, none of the Texas' top 100 congested roadways run through Tyler County or any neighboring county in the Southeast Texas Regional Planning Commission's authority. However, because the Port of Beaumont is already a top 10 port in the United States in total cargo volume and that number will continue to increase, a great impact on congestion in Beaumont from freight heading into, out of, and through Tyler County will be seen.

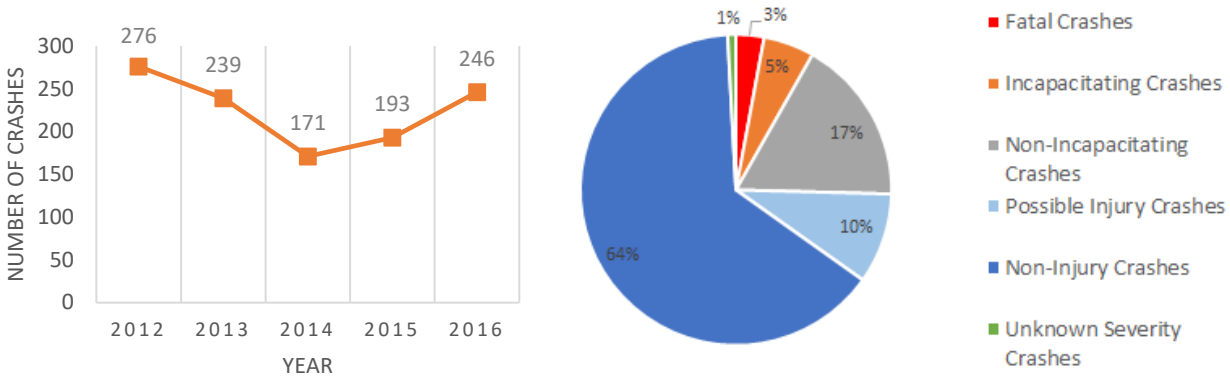
Crashes

Crash data of five years (2012-16) from Crash Records Information System (CRIS) was used to analyse the crash locations, type and causes. It appears that crashes in Tyler County have been on the rise since 2014 (Figure 5). Most of the crashes are located near Ivanhoe and Woodville on US 69. Fatal crashes comprised 3% of the total crashes in last five years and about 50% of them took place on US 69. Moreover, 5% of the crashes were incapacitating* in the last five years in Tyler County (Figure 5). In this time period, about 9% of the crashes were caused by Driving Under the Influence - Alcohol (DUI) and 45% of the crashes were

due to speeding.

* Incapacitating Injury prevents the injured person from walking, driving or normally continuing the activities the person was capable of performing before the injury occurred (www.mmucc.us).

Figure 5: Crashes and Injury in Tyler County, TX (2012-2016)



(Source: Crash Records Information System (CRIS).

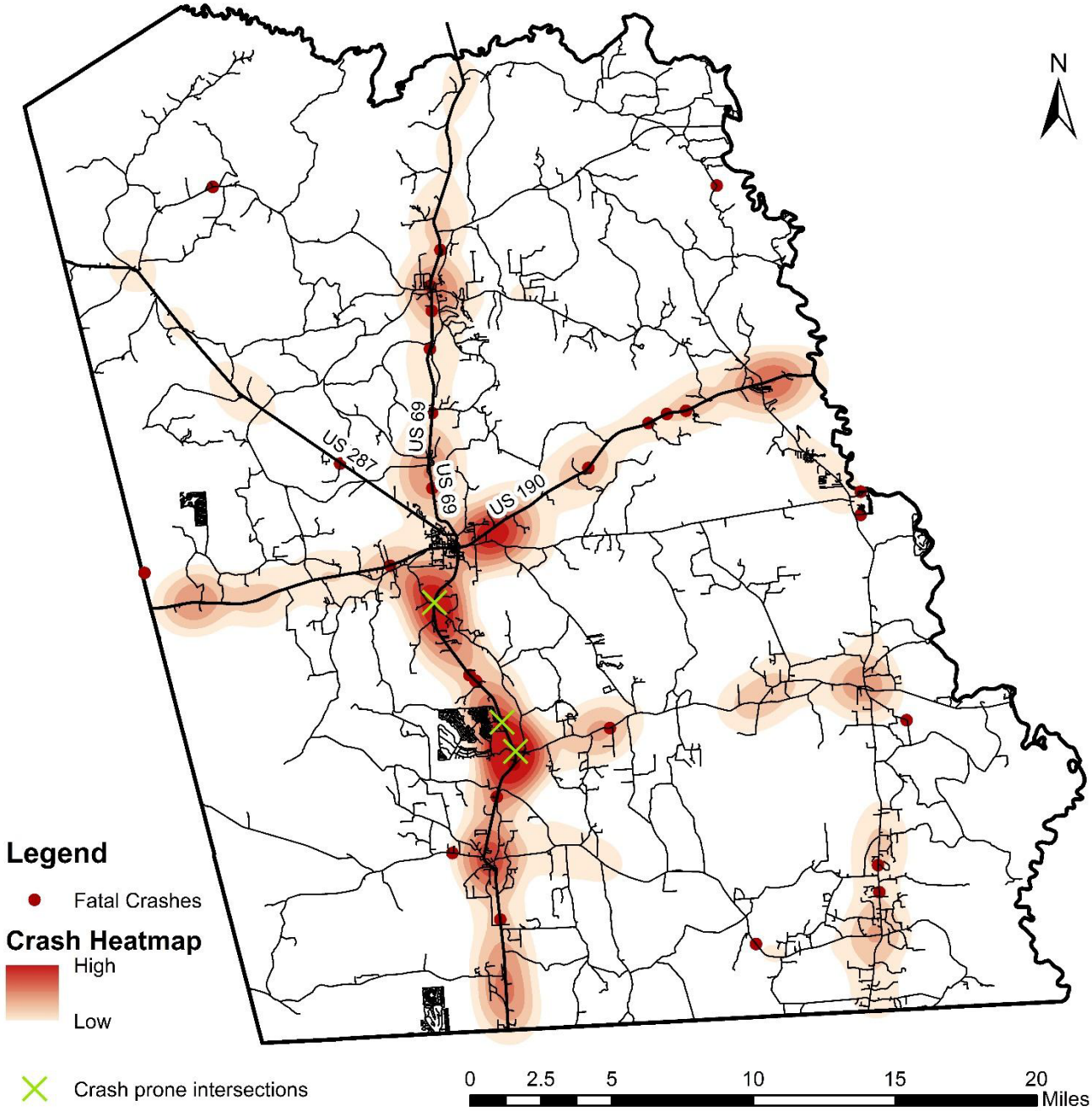
The crash "heatmap" (Figure 6) shows severity of crashes where "high" depicts fatalities and "low" represents non-injury crashes. The heat map relates with the traffic volume in the county - the cities with most traffic volume (Ivanhoe and Woodville) observed more crashes. One of the possible reasons for this is difference in operational speeds of different kinds of vehicles. The US 69 stretch between Woodville and Ivanhoe carries around 10% truck traffic. As trucks travel at lower speeds compared to personal vehicles, this results in a higher speed differential. This issue is confounded by the lack of passing lanes for non-truck traffic on this roadway segment.

Lack of Passing Opportunities on Major Arterials

US 69, US 190 and US 287 serve as major arterials within the area even though they are currently categorized as principal collectors and constructed in a 2-lane configuration. The US 69 road section between the cities of Ivanhoe and Woodville presents issues in terms of lack of passing opportunities for vehicles because of the following reasons:

i. This road section serves the highest traffic demand within the county,
ii. A high proportion of truck traffic uses the corridor for travel within the county and connection with adjoining areas,
iii. Heavy cargo causes trucks to travel at low speeds, which are sometimes significantly different from the operational speeds of other (non-truck) vehicle classes,
iv. The current road configuration (2-lane) with no provision of passing lanes presents issues in terms of lack of adequate passing opportunities for non-truck traffic. This can result in traffic queues moving at low speeds and risky passing maneuvers.

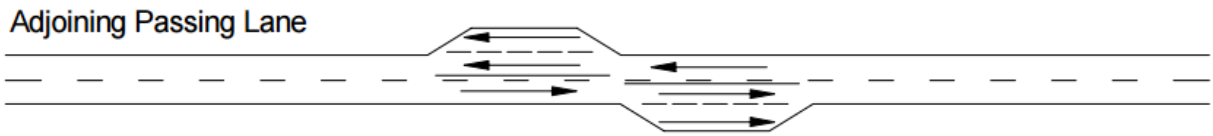
Figure 6: Crash Heatmap based on severity (2012-2016)



Provision of passing lanes on both sides of the US 69 road stretch between the two cities can potentially relieve the situation. Considering the current and anticipated future traffic demand, a long-term solution can be to convert this road section (between Ivanhoe and Woodville) to a four-lane configuration with scope for passing lanes and future expansion. As an interim solution, the road configuration can be converted to a Super Two highway. Within this configuration, a periodic passing lane is provided on a two-lane rural highway *(TxDOT Roadway Design Manual, "Super 2 Highways") (17).* The passing lane alternates between the two directions of travel so as to provide passing opportunities in both directions. The basic design criteria are provided in Section 6 (Super 2 Highways) of the TxDOT Roadway Design Manual *(17).*

Super two lane configuration allows vehicles increased opportunities of passing slower vehicles, improving traffic flow and safety. These lanes will cost much lower than a traditional expansion to four lanes. Considering improvement of passing opportunities in both directions, the tail-to-tail passing lane configuration is recommended as shown in Figure 7. This configuration allows vehicle interaction between the uninterrupted passing lanes in opposite directions. More details on engineering design for super two highway configurations can be found in "Design Guidelines for Passing Lanes on Two-Lane Roadways (Super 2)" report *(18).*

Figure 7: Passing Lane (Super Two Highway) Configuration



Source: Design Guidelines for Passing Lanes on Two-Lane Roadways (Super 2) (No. FHWA/TX-02/4064-1). *(18)*

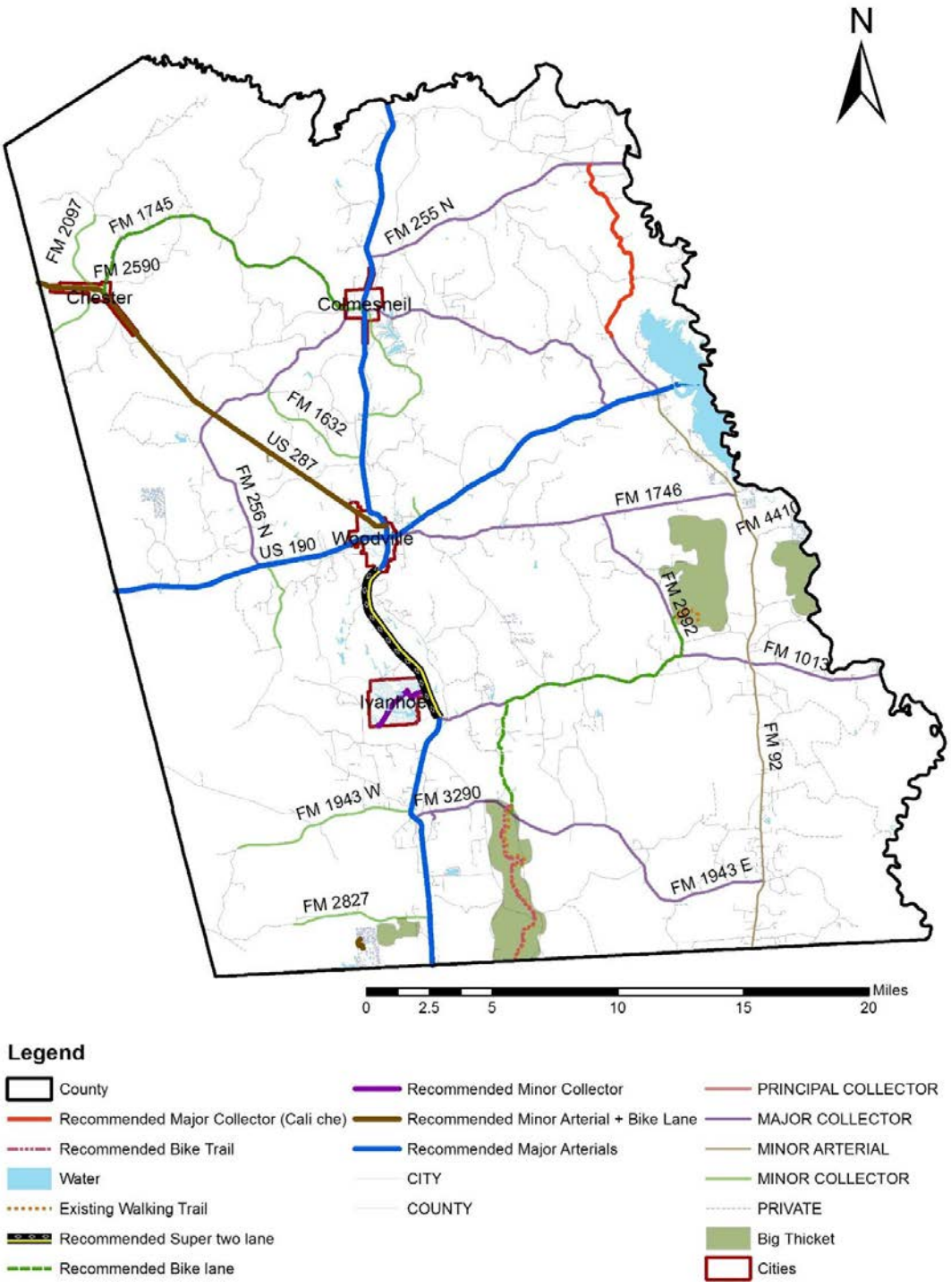
Flood-prone Roadway Segments

There are a few road segments and areas within the county that experience flooding during heavy rainfall. Some of these roads in the county include FM 1745, CR 2590 and CR 4410 (see Figure 4). Flooding causes issues like lack of connectivity to affected areas, traffic congestion and faster deterioration of roads, especially unpaved roads. Although this issue has not been addressed in the recommendation section of this plan, it might need to be addressed by the county based on the severity of the problem and funding resources available in the near future.

CHAPTER 5: RECOMMENDATIONS

This chapter explains the recommendations in detail, which are highlighted in Figure 8. Recommendations addressing different issues and opportunities are provided in respective sub-sections in this chapter.

Figure 8: Recommendations for Tyler County



5.1 Proposals for Road Improvement

Based on current and expected land use patterns, a number of road improvement measures are proposed. These include the following:

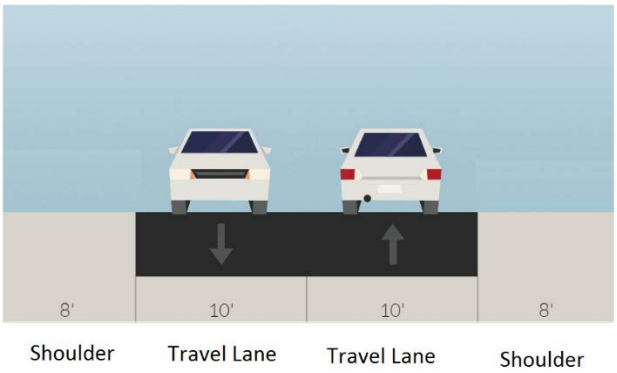
1. Provision of passing lanes (super 2 highway configuration) on US 69 between Ivanhoe and Woodville can be considered as part of a short-term solution to the problem of lack of passing opportunities for non-truck traffic.
2. A long-term solution to the problem of peak-period traffic backing up north from Kountze in Tyler County is upgrading this road segment on US-69 to a four-lane configuration. This can be undertaken by Texas Department of Transportation based on traffic volume counts and queue-length studies.
3. Unpaved county roads can be recommended for road paving. Most, if not all, county roads are currently unpaved. This can be a problem in low elevation areas and during incessant rains, especially for heavy-load carrying vehicles.
4. The existing road connection between FM 92 and FM 255 should be converted to a paved surface to provide better connectivity for northbound and southbound traffic locally and within the region. A bituminous road segment may not be necessary to support the current low traffic demand on this road segment. In order to use resources and funds more cost-effectively, a short-term implementation can look at using caliche as the construction and sub-grade material. Caliche is a sedimentary rock that binds other road materials and is more resistant to weather effects.
   This approach will also help assess the benefits of implementing the paved road connection and the potential need to convert it into a bituminous road surface in the long run.
5. Bike enthusiasts use the north half of US 287 between the cities of Woodville and Chester for recreational biking. FM 1745 experiences similar use by bicyclists because of its picturesque setting. Provisions of implementing or improving bike facilities on these road segments for a safer and more enjoyable experience for bicyclists should be considered. Because this road segment carries relatively low traffic, physical separation of bicyclists may not be required in the current state. Bike lanes and proper demarcation, along with wider right lanes and shoulder should provide adequate on-road space for recreational bikers.
6. Recommendations for improvements in roadway geometry (turning radii, adequate sight distances, etc.) should be explored for some critical intersections with high crash occurrence, particularly along US 69 which has the highest crash occurrences among all roads within the county.
7. Because an alternate route is not available for truck traffic, the pavement on US 69 and US 287 can be examined to match a pavement thickness needed to support heavy truck traffic. This road segment serves as the primary route for trucks carrying timber between wood mills situated northeast and southwest of the county.

5.2 Proposed Cross-sections for Different Road Classes

Typical road cross-sections facilitate easier communication of the potential effects of the thoroughfare plan to all members of the community, and facilitate design and implementation processes by providing a street-level view of design standards laid out in the functional classification hierarchy, such as lane width, and other design elements (bike lanes, shoulder widths, etc.).

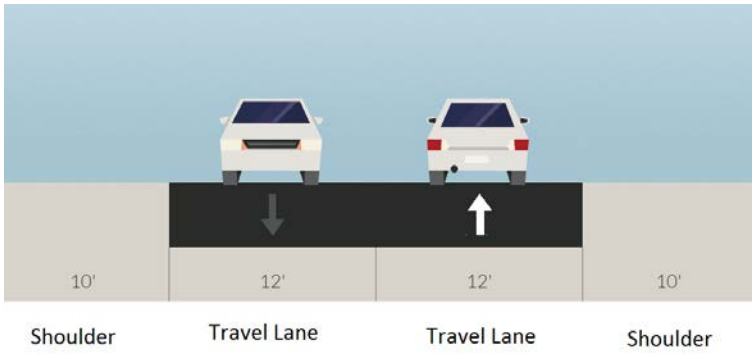
The plan identifies and recommends typical road cross-sections for different road classes considered under the scope of study. Figures 9 through 12 show some recommended typical road cross sections for the proposed arterial and collector roads as per the Texas Roadway Design Manual (TxDOT, 2014) *(16)*. Additional cross sections with passing lanes as needed on US 69 between Ivanhoe and Woodville are included in Figure 11 and Figure 12.

Figure 9: Proposed Cross-Section for Collector Road



Source: TxDOT Roadway Design Manual.
Graphic Source: streetmix.net

Figure 10: Proposed Cross-Section for Arterial Road

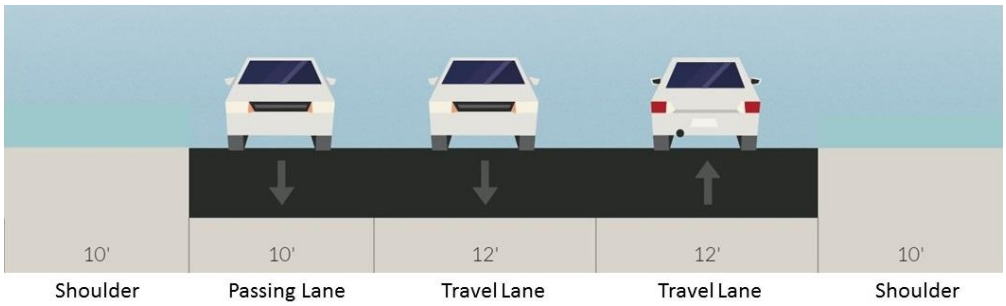


Source: TxDOT Roadway Design Manual.
Graphic Source: streetmix.net

Figure 11: Proposed Arterial Road Cross-Section with Passing Lane (Super 2 configuration) for Northbound Traffic

Source: TxDOT Roadway Design Manual.
Graphic Source: streetmix.net

Figure 12: Proposed Arterial Road Cross-Section with Passing Lane (Super 2 configuration) for Southbound Traffic



Source: TxDOT Roadway Design Manual.
Graphic source: streetmix.net

5.3 Lowering crash rate

Tyler County experiences high truck traffic on the principal collector and arterial roads. These trucks can range from WB-30 to WB-67 (WB represents 'Wheelbase' and the adjoining number signifies the wheelbase value in feet). The TxDOT Roadway Design Manual *(16)* recommends a minimum turning radius of 45 feet for WB-67 trucks which can be used as the design vehicle for intersection geometry. The intersections close to the crash prone locations within the county (as shown in Figure 13) can be checked for conformity to maintain the minimum design criterion for turning radii. This can help address crash occurrences caused due to lack of adequate sight distances and improper geometry. Three intersections near Ivanhoe and Woodville (Figure 14) were studied in detail to assess design issues that might be contributing to the high crash rate.

Figure 13: Crash Prone Intersections near Cities of Ivanhoe and Woodville

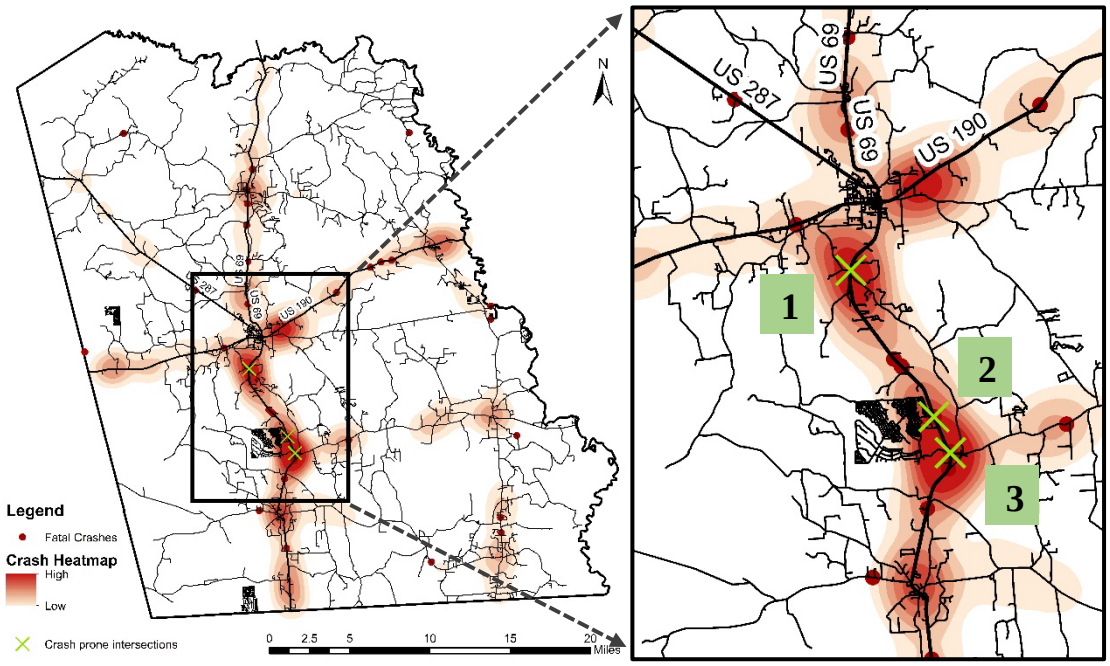


Table 3: Turning Radii at Examined Intersections

Intersection (as shown in Figure 13)	Turning radius (ft.)	TxDOT minimum standard for turning radii (ft.)
1	32	45
2	35	45
3	45	45

As shown in Table 3, the turning radii at two of the examined intersections are lower than the minimum standard listed by TxDOT. Since the third intersection fulfilled the minimum turning radius requirement but has a high crash rate, it was further evaluated to identify other design issues. It appears that there is no visible traffic island separating conflicting movements (northbound right turns and southbound left turns) and the road pavement markings are old and not easily visible (Figure 14). Reduced visibility at night can increase the crash risk on roads at such locations. Similarly, other intersections can be assessed to identify design issues which might be contributing to crash rate in the county.

Figure 14: Low Visibility of Road Markings at Intersection 3

Source: Google street view

Moreover, most of the crashes are located in Woodville and Ivanhoe and half of the crashes in the county are due to over-speeding. Therefore, it is expected that the proposal of passing lanes on this stretch will reduce the conflicts between vehicles with varying speeds (trucks and passenger cars).

Lastly, TxDOT can conduct a study to see if the operational traffic speed is more than the speed limit. The speed limit may need to be increased based on an engineering study in order to remain consistent with operating speeds on this stretch.

5.4 Bike Lanes and Trails

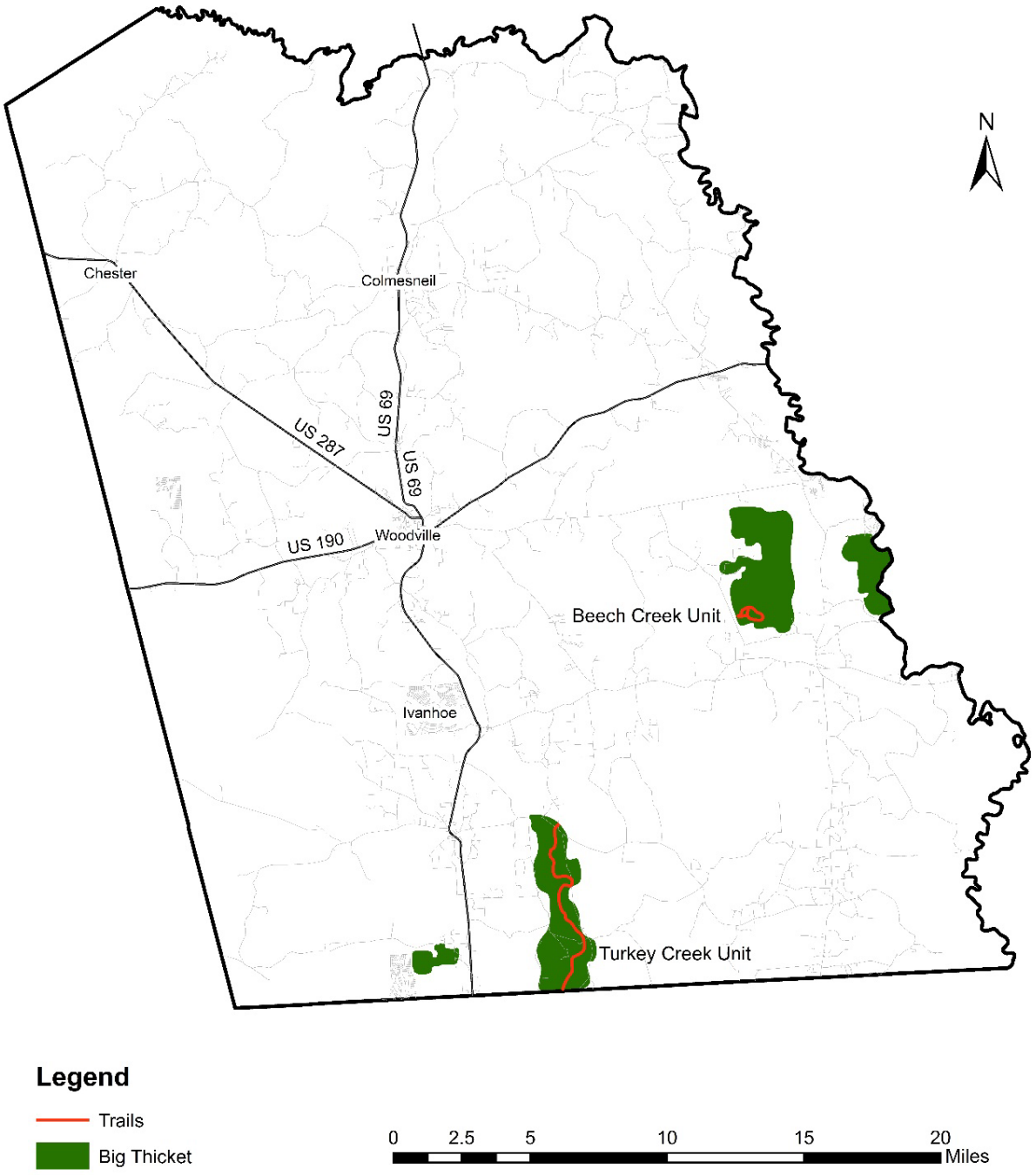
Big Thicket Park and Ecotourism

The Big Thicket has been described as one of the most biodiverse areas in the world outside of the tropics and about half of it falls in Tyler County. Pitcher Plant Trail and Beech Woods Trail are two of the many trails in the Big Thicket National park. These two trails fall in Tyler County (see Figure 15).

Pitcher Plant is a short trail which goes through a mixed pine forest to the edge of a wetland savannah. After the savannah, the trail loops through a mixed hardwood-pine forest and connects to the Turkey Creek Trail which is in Hardin County. The total trail distance is approximately one mile round-trip. The Beech Woods Trail is also a one-mile loop which goes through stands of beech and magnolias.

Because the terrain in the Big Thicket is plain or gently rolling, it is very suitable for all forms of biking. Both of the existing walking trails are too narrow to support shared-use with bikes and therefore, a new trail at an offset of 4-5 feet from the existing walking trail needs to be created for bikes. The trail must be made of natural surface such as crushed aggregate, mulch or dirt to protect the natural integrity of the reserve.

Figure 15: Pitcher Plant Trail and Beech Woods Trail in Big Thicket National preserve in Tyler County

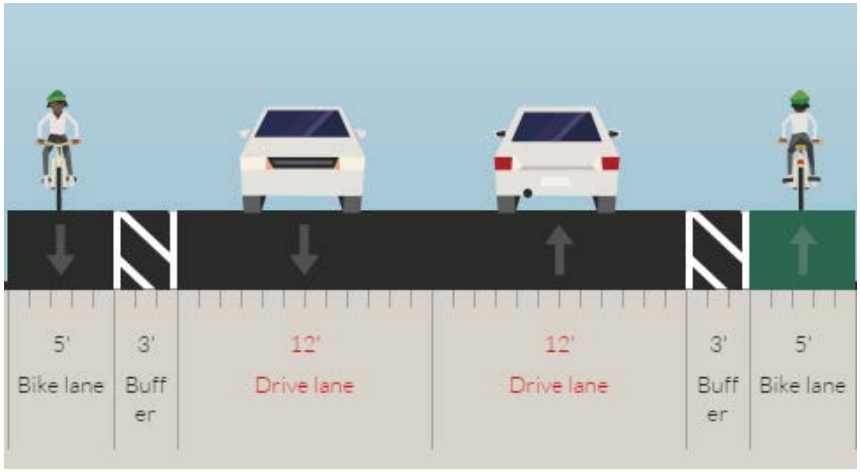


Moreover, the Pitcher Plant and Beech Woods are 10 miles apart with no bike connectivity in between. A bike lane from Beech Woods Trail to County Road 1013 to Turkey Creek can connect it to the Pitcher Plant Trail. A continuous bike lane will not only provide for a recreational opportunity but also help promote ecotourism through bike riders.

Additional Bike Lanes

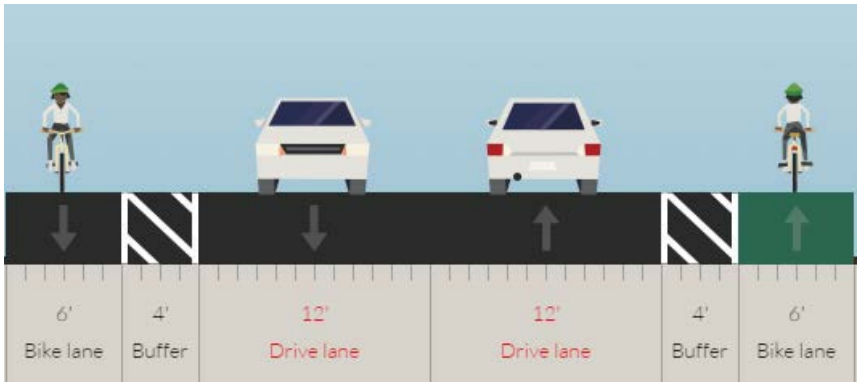
Currently, US 287 and FM 1745 are being used by bikers for recreational purposes. It attracts bikers from nearby counties due to its slightly hilly terrain which makes biking challenging. However, these roads are not designed and configured to accommodate bikers and need to be upgraded in terms of right-of-way. The right of way needs to be widened from 24’ to 32’. For safety purposes, a buffer must be provided between the bike lane and the travel lanes. A 3’ buffer will be ideal and the buffer type depends on the funding availability. A marking on road will be ideal, however, the buffer can be upgraded to a physical separation when funding is available in the future.
Figure 16 and Figure 17 show proposed road cross-sections for these configurations.

Figure 16: Proposed road cross-section for County Road 1013 and FM 1745



Source: TxDOT Roadway Design Manual.
Graphic source: streetmix.net

Figure 17: Proposed road cross-section for US 287



Source: TxDOT Roadway Design Manual.
Graphic source: streetmix.net

CHAPTER 6: IMPLEMENTATION AND FUNDING

6.1 Responsible Agencies

The county must work with other agencies to coordinate the implementation of the goals and policies already outlined. The primary agencies will be the city governments which have the discretion and authority to implement some of these recommendations.

The Texas Department of Transportation has authority over all state roads. Cities within the county have authority over the local roads and county roads, so coordination with the interests of the cities is vital to the county plan fitting together smoothly. Another stakeholder is the Federal Highway Administration due to the reclassification and renaming of U.S. Highway 190 to Interstate Highway 14.

6.2 Funding Sources

Table 4 details the specifics for each recommendation relating to the upgrade type, the segment of road, the length, class, and the potential funding sources and opportunities. It also is organized into a priority list based on the county representatives' comments and suggestions.

Table 4: Recommendation Summary and Priority List for Tyler County

Recommendation	Priority	Road Name	Road Class	Upgrade Type	Road Segment
Road Improvement	1 (Highest)	U.S. 69	Major Arterial	Passing Lanes (Super Two)	From Ivanhoe to Woodville
	2	FM 92/CR 3725	Minor Arterial	Caliche Road	CR 3750 to FM 255
Bike Lanes	3	U.S. 287	Principal Collector	Separated Bike Lanes	From Chester to Woodville
	4	FM 1745	Major Collector	Separated Bike Lanes	U.S. 287 to U.S. 69
	6	CR 1013	Major Collector	Separated Bike Lanes	CR 4490 to FM 2992
		CR 4490	County	Separated Bike Lanes	CR 4455 to CR 1013
Bike Trails (Big Thicket Park)	6 (Lowest)	Beech Creek	-	Bike Trail	-
		Turkey Creek	-	Bike Trail	-
Crashes	5	U.S. 69	Major Arterial	Intersection adjustments	

There are a number of possible funding sources for all aspects of the plan. They are listed here (from the easiest to implement to the difficult):

1. **Texas Department of Transportation (TxDOT) County Infrastructure Fund Grant**
   - Summary: For the use of public county infrastructure projects.
   - Who is Eligible: Counties in Texas. Tyler County has already applied and been awarded over $460,000 to use.
   - Link: http://www.txdot.gov/government/funding/county-fund.html

2. **Impact Fees**
   - Summary: Impact fees are charged to a private company or other agency for their use of a property or roadway. Tyler County can use these for the logging companies coming into the county to cut and haul lumber back out to their mills all while using their roads.
   - Who is Eligible: Cities and Counties
   - Link: https://www.planning.org/policy/guides/adopted/impactfees.htm

3. **Community Facilities Direct Loan & Grant Program**
   - Summary: Cities and towns can apply for this program by the United States Department of Agriculture (USDA) where the population is under 20,000 residents.
   - Who is Eligible: All public bodies, Community-based non-profit corporations
   - Link: https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program

4. **Sales Tax**
   - Summary: Collected by the cities for any public use.
   - Who is Eligible: Cities
   - Link: https://comptroller.texas.gov/taxes/sales/

5. **Tax Increment Financing**
   - Summary: For the use of local property tax on new development within an area which can be collected and appropriated to a public entity.
   - Who is Eligible: Cities and Counties
   - Link: http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.311.htm

6. **Preventative Maintenance and Rehabilitation**
   - Summary: for rehabilitation projects on roadways, bridges, signs, signals, pavement markings, and many other features.
   - Who is Eligible: Cities
   - Link: http://www.txdot.gov/government/programs/stips/info.html

7. **Non-Traditionally Funded Transportation Projects**
    - Summary: For concession and surplus toll revenue funded projects.
    - Who is Eligible: Cities and Counties
    - Link: http://ftp.dot.state.tx.us/pub/txdot-info/fin/funding-sources.pdf

8. **Statewide Connectivity Corridor Projects**
    - Summary: for roadway mobility improvements outside any Metropolitan Planning Organization boundaries. Special interests for Tyler County include hurricane evacuation and toll projects.
    - Who is Eligible: Cities and Counties
    - Link: http://ftp.dot.state.tx.us/pub/txdot-info/fin/funding-sources.pdf

9. **Safety Improvements**
    - Summary: For transportation projects that are primarily in the effort of improving safety.
    - Who is Eligible: Cities and Counties
    - Link: http://ftp.dot.state.tx.us/pub/txdot-info/fin/funding-sources.pdf

10. **Transportation Enhancements**
    - Summary: Surface Transportation Projects (STP) that qualify for TxDOT's Transportation Enhancement Program
    - Who is Eligible: Cities and Counties
    - Link: http://ftp.dot.state.tx.us/pub/txdot-info/fin/funding-sources.pdf

11. **Supplemental Transportation Projects**
    - Summary: Projects not included in other categories are able to find funding assistance through this avenue.
    - Who is Eligible: Specialty projects not qualified for other categories.
    - Link: http://www.txdot.gov/government/programs/stips/info.html

12. **District Discretionary**
    - Summary: can be used for rural mobility projects under the authority of the District
    - Engineer. Tyler County must look to the Beaumont District Engineer.
    - Who is Eligible: State Districts
    - Link: http://www.txdot.gov/government/programs/stips/info/highway-funding.html

13. **Strategic Priority**
    - Summary: For special projects governed by the Texas Transportation Commission in order to handle strategic needs such as system continuity with bordering states. With proximity to the Beaumont port and Port Arthur, the

increased freight tonnage will affect the growth of Tyler County.
- Who is Eligible: Cities and Counties
- Link: http://www.txdot.gov/government/programs/stips/info/highway-funding.html

14. Federal Transit Administration Section 5309
- Summary: A grant funding program available
- Who is Eligible: Regional transit agencies, every 2-3 years
- Link: http://www.txdot.gov/government/programs/stips/info/transit.html

15. Federal Transit Administration Section 5310
- Summary: Federal grant funds to look at for the possibility of providing demand response transit for elderly and disabled populations.
- Who is Eligible:
- Link: http://www.txdot.gov/government/programs/stips/info/transit.html

16. Federal Transit Administration Section 5311
- Summary: SETRC uses these in counties of Hardin, Jefferson, and Orange to provide rural transit to populations under 50,000.
- Who is Eligible: Regional transit agencies, populations under 50,000
- Link: http://www.txdot.gov/government/programs/stips/info/transit.html

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Appendix A

Vehicle Class-wise Traffic Volume Data for Tyler County (2015)

Texas Department of Transportation																	
S20: December 2015 Class Report																	
Location ID:			**S20**						**Functional Class:**			**3**					
County:			**Tyler**						**Axle Factor Group:**			**BEAUMONT**					
Community			**Woodville**														
Description:			**On US 69 at 5.0 Miles S of US 190 or 4.4 Miles North of FM 1013 at Traffic Counter**														

DATE	LANE	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6	CLASS 7	CLASS 8	CLASS 9	CLASS 10	CLASS 11	CLASS 12	CLASS 13	CLASS 14	CLASS 15	TOTAL
Tue 1	NB	7	1980	1331	3	34	59	0	32	339	13	2	1	7	0	0	3808
Tue 1	SB	16	2017	1314	3	48	51	0	39	369	7	2	0	1	0	0	3867
Wed 2	NB	11	1978	1339	2	29	78	0	40	351	6	6	1	5	0	0	3846
Wed 2	SB	15	2047	1290	4	39	50	0	35	326	5	1	2	4	0	0	3818
Thu 3	NB	12	2176	1505	0	33	83	0	42	376	4	3	2	5	0	0	4241
Thu 3	SB	18	2174	1371	3	41	57	0	31	380	2	2	0	0	0	0	4079

DATE	LANE	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6	CLASS 7	CLASS 8	CLASS 9	CLASS 10	CLASS 11	CLASS 12	CLASS 13	CLASS 14	CLASS 15	TOTAL
Fri 4	NB	11	2555	1948	7	41	83	0	54	385	3	5	1	6	0	0	5099
Fri 4	SB	19	2340	1558	2	48	55	0	37	388	4	3	0	1	0	0	4455
Sat 5	NB																
Sat 5	SB																
Sun 6	NB	3	1802	1048	0	7	9	0	13	88	11	5	0	1	0	0	2987
Sun 6	SB	26	1945	1361	3	16	9	0	34	117	12	1	1	1	0	0	3526
Mon 7	NB																
Mon 7	SB																
Tue 8	NB	20	1927	1425	1	42	81	1	34	429	13	5	1	3	0	0	3982
Tue 8	SB	25	1995	1358	2	45	76	1	33	415	9	6	0	2	0	0	3967
Wed 9	NB	24	2001	1368	2	42	77	1	51	365	27	5	0	5	0	0	3968
Wed 9	SB	25	2038	1331	3	37	63	1	28	375	25	4	0	3	0	0	3933
Thu 10	NB	21	2052	1464	1	41	84	3	35	395	11	4	1	1	0	0	4113
Thu 10	SB	22	2034	1391	3	39	66	0	33	389	16	2	1	4	0	0	4000
Fri 11	NB	17	2400	1810	3	35	77	0	47	433	18	5	2	6	0	0	4853
Fri 11	SB	26	2465	1580	3	34	59	0	37	417	16	3	1	5	0	0	4646
Sat 12	NB	13	2127	1479	1	18	38	0	21	183	4	1	2	1	0	0	3888

DATE	LANE	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6	CLASS 7	CLASS 8	CLASS 9	CLASS 10	CLASS 11	CLASS 12	CLASS 13	CLASS 14	CLASS 15	TOTAL
Sat 12	SB	19	2082	1479	2	25	14	0	28	189	2	1	0	0	0	0	3841
Sun 13	NB	8	1550	911	1	12	0	0	9	102	0	1	0	0	0	0	2594
Sun 13	SB	14	1609	1116	2	16	4	0	8	99	2	1	0	1	0	0	2872
Mon 14	NB																
Mon 14	SB																
Tue 15	NB	16	2085	1400	3	47	84	1	53	373	2	4	1	2	0	0	4071
Tue 15	SB	25	2091	1350	2	43	53	0	30	412	7	1	4	1	0	0	4019
Wed 16	NB	9	2072	1346	4	41	68	1	38	388	3	7	0	5	0	0	3982
Wed 16	SB	15	2125	1334	4	40	55	0	38	420	3	2	1	1	0	0	4038
Thu 17	NB	12	2199	1470	1	39	79	0	56	403	8	3	3	3	0	0	4276
Thu 17	SB	21	2276	1400	5	40	49	0	29	427	6	4	0	2	0	0	4259
Fri 18	NB	11	2613	1861	2	39	62	0	50	311	10	5	0	2	0	0	4966
Fri 18	SB	30	2486	1600	2	44	61	0	27	286	8	3	1	5	0	0	4553
Sat 19	NB	14	2289	1512	1	16	50	0	56	153	4	5	1	1	0	0	4102
Sat 19	SB	15	2406	1458	3	18	51	0	17	192	5	2	1	0	0	0	4168
Sun 20	NB	16	1969	1180	2	8	15	0	24	119	4	2	0	0	0	0	3339
Sun 20	SB	23	2061	1338	2	28	19	0	23	148	6	0	0	2	0	0	3650

DATE	LANE	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6	CLASS 7	CLASS 8	CLASS 9	CLASS 10	CLASS 11	CLASS 12	CLASS 13	CLASS 14	CLASS 15	TOTAL
Mon 21	NB																
Mon 21	SB																
Tue 22	NB	9	2103	1465	0	36	45	0	39	332	8	5	1	4	0	0	4047
Tue 22	SB	26	2079	1421	0	45	46	0	29	360	7	4	0	2	0	0	4019
Wed 23	NB	12	2407	1748	0	37	52	0	42	338	2	3	0	4	0	0	4645
Wed 23	SB	22	2450	1611	2	32	43	0	21	335	3	3	1	4	0	0	4527
Thu 24	NB	14	2232	1464	2	27	22	0	31	154	1	2	0	3	0	0	3952
Thu 24	SB	26	2335	1354	2	30	10	0	20	164	0	1	1	1	0	0	3944
Fri 25	NB	11	1837	1106	0	5	1	0	6	22	0	0	0	1	0	0	2989
Fri 25	SB	12	1855	925	1	15	0	0	0	34	0	0	1	1	0	0	2844
Sat 26	NB	8	2458	1554	0	14	4	0	20	94	0	0	1	3	0	0	4156
Sat 26	SB	14	2356	1431	0	15	5	0	19	94	0	0	0	0	0	0	3934
Sun 27	NB	16	1806	1033	5	7	2	0	9	90	2	1	0	0	0	0	2971
Sun 27	SB	20	1994	1167	16	14	6	0	11	94	2	1	0	0	0	0	3325
Mon 28	NB	12	2128	1475	2	35	32	0	34	266	3	3	0	0	0	0	3990
Mon 28	SB	18	2122	1417	2	35	41	0	26	247	4	0	0	3	0	0	3915
Tue 29	NB																

DATE	LANE	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6	CLASS 7	CLASS 8	CLASS 9	CLASS 10	CLASS 11	CLASS 12	CLASS 13	CLASS 14	CLASS 15	TOTAL
Tue 29	SB																
Wed 30	NB																
Wed 30	SB																
Thu 31	NB	10	2328	1687	0	26	39	1	34	241	1	1	1	3	0	0	4372
Thu 31	SB	16	2282	1544	3	28	28	0	22	229	5	1	1	1	0	0	4160

Percentages		**.42**	**54.07**	**35.70**	**.06**	**.77**	**1.10**	**.01**	**.76**	**6.81**	**.16**	**.07**	**.02**	**.06**	**0**	**0**	**100**
Totals		**861**	**111189**	**73410**	**125**	**1583**	**2265**	**11**	**1573**	**14003**	**321**	**136**	**38**	**118**	**0**	**0**	**205633**