4/19/2016

FM 2493
Old Jacksonville Highway Corridor Study

Tyler Area Metropolitan Planning Organization

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TBPE FIRM NO. F-1046

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Chapter 1: Introduction

This study was commissioned by the Tyler Area Metropolitan Planning Organization (MPO), a voluntary association of local governments and local elected officials in the Tyler area (see **Figure 1**). The Tyler Area MPO works to promote efficient and accountable use of local, state, and federal tax dollars; provide a forum for cooperative decision making concerning transportation improvements by the principal elected officials of the local governments, and provides continuity of various transportation planning and improvement efforts throughout the Tyler urbanized area.

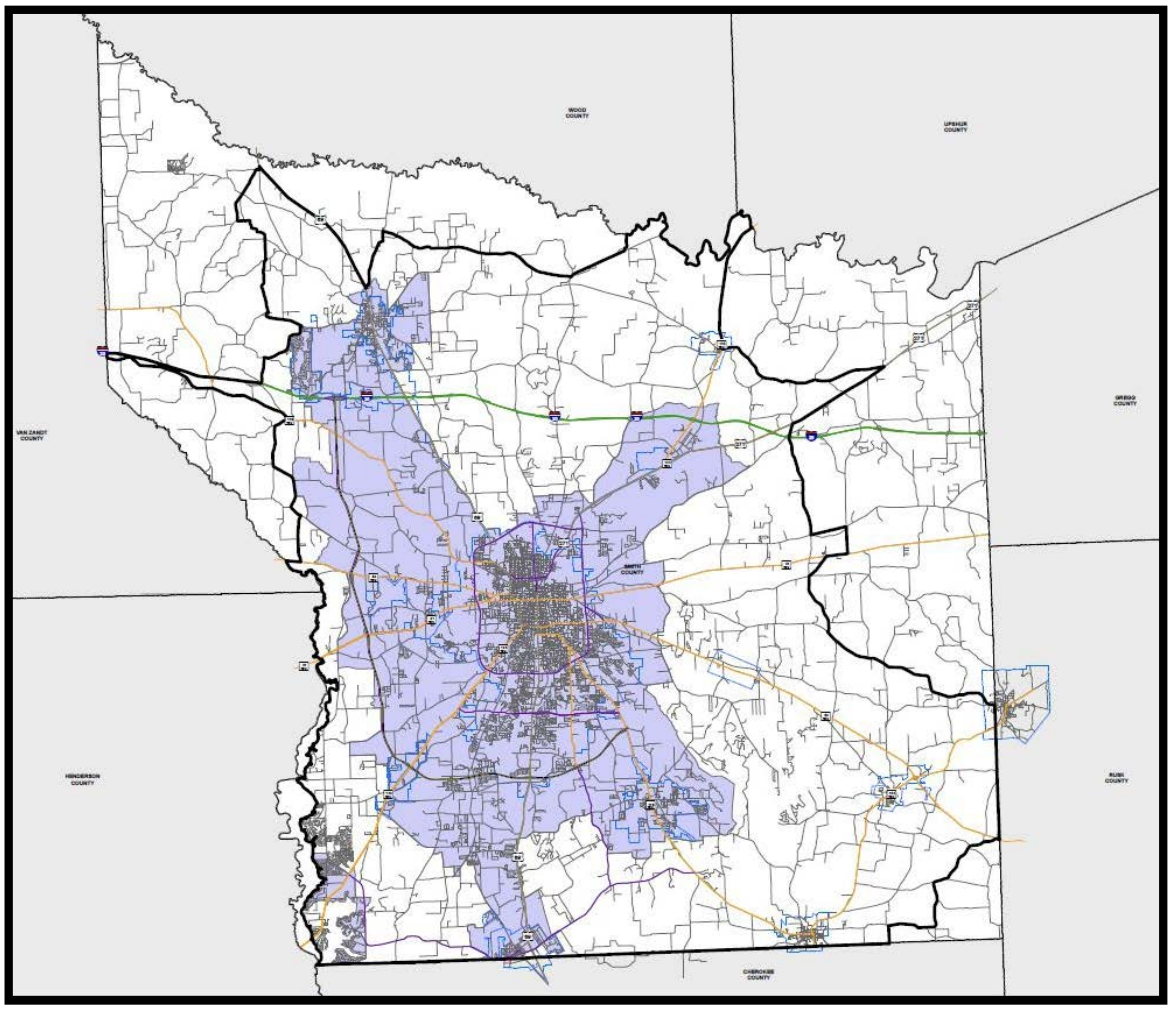


Figure 1 - Tyler Metropolitan Planning Area

The rate of growth in the Tyler area is predicted to be approximately 18% between the years 2012 and 2035. This holds many opportunities for economic growth and diversification of the local economy. Such fantastic growth also presents many challenges to the natural and built environment. The regional transportation network is one such challenge. If it cannot provide an acceptable level of service in the

main travel corridors, the economy, community, and environment as a whole will suffer. This regional dilemma is being addressed by the Tyler Area MPO, the City of Tyler and TxDOT.

Given such challenges, Tyler Area MPO recognizes developing a viable transportation system not only includes building new roadways and adding transit, but also managing the access and demand for travel on these systems. "Access Management" is a set of strategies designed to make best use of existing transportation facilities as well as enhancing transportation improvements. Using strategies such as installing raised medians and providing adequately spaced driveways, access management will significantly improve the level of safety, efficiency, and effectiveness of the transportation system.

Access management approaches can include:

- Strategies to integrate transportation and land-use planning
- Model ordinances designed to standardize driveway spacing, deceleration lanes, corner clearance, sight distance, and raised median installations

The purpose of this corridor study is to identify transportation measures that will improve public safety and traffic flow, reduce motorist delay, enhance air quality, and improve bicycle and pedestrian access. Intergovernmental coordination will be needed on this project since the FM 2493 study corridor is a TxDOT facility that travels through the City of Tyler, the unincorporated cities of Gresham and Flint as well as the City of Bullard. A majority of the study corridor is in Smith County with a small portion of the southern section in Cherokee County.

FM 2493 provides north-south mobility and access to many retail, commercial, and residential developments. In addition, this corridor intersects with three major facilities (Loop 323, Toll 49 and US 69). As described in greater detail in **Chapter 2,** this corridor experiences peak hour delays at many of its major intersections.

This study will ultimately provide the appropriate agencies with a list of short-term operational and access management improvements. In addition, bicycle, pedestrian and transit improvements will be identified. Recommendations for long range improvements will be compiled into what could become an access management plan for the corridor. These improvements will include driveway spacing guidelines, shared access provisions, and several other access related techniques aimed at increasing safety and reducing traffic congestion.

1.1 Study Team

The project team listed below, along with several local and state agencies were responsible for the development of FM 2493 Corridor Study.

- Tyler Area Metropolitan Planning Organization (MPO)
- Texas Department of Transportation (TxDOT)
- City of Tyler
- Brown & Gay Engineers, Inc. (BGE)
- CW Engineering, LLC
- Yvonne Newman Engineering, Inc.

1.2 Study Process

The study process followed the rational planning approach in which the study team conducted an extensive data collection effort, base map development, data analysis, and development of a final report. At appropriate stages during the process, public meetings and stakeholder meetings were conducted to help the team refine options and give overall guidance. The Tyler MPO Technical Advisory Committee (TAC) played a crucial role in providing the team with insightful guidance and review oversight. The general process that was followed is in **Table 1**.

Table 1 - Project Schedule

January 2015	Project Kickoff
January 2015	Technical Advisory Committee #1
February 2015	Assembly & Review of Data
March 2015	Define Goals & Objectives
April 2015	Stakeholders Meeting – Introduce Project & Seek Input
May 2015	Evaluate Categories for Measures of Effectiveness
June 2015	Public Meeting #1 – Introduce Project & Seek Input
July 2015	Evaluate Existing Corridor
September 2015	Develop Short Term Recommendations
September 2015	Technical Advisory Committee #2
September 2015	Public Meeting #2 – Present Short Term Recommendations
December 2015	Develop Long Term Recommendations
December 2015	Public Meeting #3 – Present Long Term Recommendations
January 2016	Final Report

Chapter 2: Public Involvement Process

2.1 Introduction

An important element of the FM 2493 corridor study has been the proactive public involvement program, which provided opportunities for the public and various interest groups to participate in the study process and ultimately provided guidance in forming the proposed improvements. The program provided opportunities for the public and various interest groups to participate in the planning process. Arriving at consensus on the short- and long-range alternatives during the study process will enable the next phase, programming improvements and detail design, to focus on design details rather than bigger picture issues. This chapter describes the various public involvement activities and techniques that were used during the development of the FM 2493 corridor study.

2.2 Purpose of Public Involvement Program

The purpose of the public improvement program for the FM 2493 corridor study was to promote open, proactive communication with the public and stakeholders in the corridor in order to develop a meaningful dialogue. As such, the suggested alternatives and other decisions made as a part of the study may be more widely accepted, although there may not have unanimous agreement. The public involvement program provided access to information about the project, an opportunity for the public to give input on needs and solutions, and a mechanism by which decision-makers can value and seriously consider the public input received. It also served as a means to reflect that the input received was considered in the development of the study recommendations.

2.3 Outreach

An outreach program to increase awareness of and interest in transportation plans and the transportation planning process, as well as encourage participation in these efforts, was crucial to the project's success. The FM 2493 corridor has many stakeholders, including residents, businesses, employees, commuters, bicycle groups, civic and homeowner organizations, community planning groups and city councils, resource agencies, major land owners, and others who are affected by transportation issues in the corridor.

The following approaches were used to contact and involve project stakeholders in the study process:

- Direct Mail
- Public Notices
- Media Coverage
- Stakeholder Meeting
- Public Meetings
- Web Site

Direct Mail

To conduct a public involvement process touching as many affected parties as possible, the Tyler Area MPO identified and assembled a comprehensive list of area residents, property owners and businesses, public officials, civic organizations, resource agencies, community groups, and media representatives who will likely have interest in this project. Before each public meeting, direct mail notices were mailed out.

Public Notices

Timely access to public outreach activities is also achieved via public notices and announcements. To ensure notification, public notices were placed in local community newspapers including the *Tyler Morning Telegraph* prior to each public meeting and posted on the Tyler MPO website.

Media Coverage

Prior to all public meetings, press releases were issued throughout the corridor to newspapers, radio stations, and television stations. The purpose of the press release was to provide a wide range of coverage concerning upcoming public meetings and key decisions of the study. A number of key media contacts were also included on the general mailing list and received notice of all meetings. Television and newspaper reports were present at the meetings and they provided a recap of the meetings to the public.

Stakeholder Meeting

The project team met with key stakeholders on April 14, 2015 at the Grace Fellowship Church in Flint in order to provide educational information as well as update interested parties on the study progress, alternatives under consideration, and key decision points. The main function of this meeting was to serve as a method to consider individual issues and possibly incorporate those issues into the study recommendations.

Public Meetings

Public meetings are the best opportunity for most people to learn about a project and directly interface with the project team. The meetings, which were open to all interested parties, were conducted primarily in an open house format so that people could arrive at their convenience and review information at their own pace. There were also occasions where brief presentations were made, and questions and comments from the meeting attendees were encouraged.

At the meetings, large roll plots and poster-sized graphic displays providing information about the study were available for review. Displays were staffed by team members who were knowledgeable about the project so that attendees could have questions answered and provide direct input regarding the project. These meetings intended to relay the purpose, process, and progress of the study, and were held in the evenings at venues near the middle of the project corridor. This maximized public convenience and allowed discussions to focus in on sub-areas as well as whole-corridor issues.

The public meeting dates and locations were as follows:

Meeting	Location	Date
Project Introduction and Public Input	Lanes Chapel 8720 Old Jacksonville Hwy, Tyler	June 18, 2015
Short Term Improvements	Southside Baptist Church 8875 Old Jacksonville Hwy, Tyler	September 24, 2015
Long Term Improvements	Southside Baptist Church 8875 Old Jacksonville Hwy, Tyler	December 8, 2015

Public Input

Members of the public were afforded the following opportunities for providing input into the study:

- Questionnaires with specific questions and open-ended response opportunities.
- Comment forms for general notes, comments, and ideas.
- Verbal communication with members of the project team.
- Letters, e-mails, and phone calls to Tyler Area MPO.

All comments received from the public meetings and in response to the questionnaires were documented and analyzed as input into the study as it progressed.

2.4 Agency Participation

Technical Advisory Committee

The Technical Advisory Committee (TAC) is a 25 member cross section of individuals with knowledge and expertise in various transportation fields. The TAC's purpose is to provide professional opinions and technical expertise for the Tyler MPO. The project team met with the TAC twice to receive comments and direction, assess progress on the study, coordinate with their respective agencies, and provide oversight of major activities associated with the study. The TAC is comprised of representatives from TxDOT, Tyler MPO, City of Tyler, Tyler Transit, Smith County and other local government leaders. The attended TAC meetings were held on the following dates:

- January 8, 2015
- September 3, 2015

2.5 Public Meeting Summaries

Summary of First Public Meeting

This first public meeting focused on providing the public information on the study corridor and to gather input for the public on what they consider the most important features for in an improved corridor in the future. Approximately 75 people attended this meeting. The following is a summary of the public comments received during this meeting. These were derived from replies to questionaires from the attending public.

1. The public ranked safety as the top priority for the corridor study focus. Mobility was ranked second with acess ranked third.

2. Improvements in traffic signal timings and intersection geometrics were ranked the most important. How the public ranked the importance of improvements is summarized in **Table 2.**

Table 2 - How the Public Ranks Importance of Improvements

Improvements	Rank
Traffic signal, timing improvements	1
Intersection geometric (i.e. added/modified turn bays)	2
Roadway widening	3
Frontage roads	4
Consolidated driveways (fewer access points)	5
Raised medians	6
Transit Improvements	7

3. For multimodal improvements, moving buses out of the travel lane when loading and unloading was deemed the most important. Improving the sidewalks and adding bike trails were next in importance.

Summary of Second Public Meeting

Approximately 50 people were in attendance for the second public meeting, which focused on short term improvements for FM 2493. The public was encouraged to walk around and view the exhibits displayed on tables, then a short presentation followed. Consultants and Tyler Area MPO staff listened to the public's input. In addition, the public was encouraged to fill out a comment card.

Three options were presented with short term recommendations. The displays presented focused on the section of the corridor between Grande Blvd. and Three Lakes Parkway. Option C was viewed most favorably by the public. This option consisted of restriping the current pavement width to provide four through lanes with two one-way left turn-lanes. Pavement widening at Grande Boulevard was needed to increase left turn storage capacity by providing dual left turn lanes for northbound and southbound traffic. The public's responses to Option C are depicted in **Figure 2**.

Figure 2 - Public Responses to Short Term Recommendation - Option C

The public was mostly against raised medians which are featured in both Option A and B. Option A had left turn bay lengths that are required for multilane highways with a speed limit of 50 mph. This greatly reduced the access from current conditions. Option B used deceleration assumptions and reduced speed limit assumptions to reduce the left turn bay lengths. Medians were also removed in certain locations to aid with access. The public liked Option B more than Option A, but still thought option C was a better choice since full access was provided. The options presented will be discussed in more detail in **Chapter 6 – Short Term Improvement**.

Summary of Third Public Meeting

Approximately 60 people were in attendance for the third and final public meeting, which focused on long term improvements for FM 2493. The public was encouraged to once again walk around and view the exhibits displayed on tables and on poster boards. Consultants and Tyler Area MPO staff listened to the public's input. In addition, the public was encouraged to fill out a comment card.

Numerous poster boards were set up around the room depicting the proposed lane configurations of the future signalized intersections. This included a display that showed a grade separation on Grande at Old Jacksonville. These future lane configurations are shown in greater detail in **Chapter 7 - Long Term Corridor Improvements**.

Three options were presented with long-term recommendations. The displays presented focused on the section of the corridor between Grande Blvd. and Three Lakes Parkway. The options presented will be discussed in more detail in **Chapter 7**. Option A was viewed most favorably by the public. This option consisted of widening FM 2493 to six lanes with raised medians with full access provided at most driveways. The public's responses to Option A are depicted in **Figure 3**.

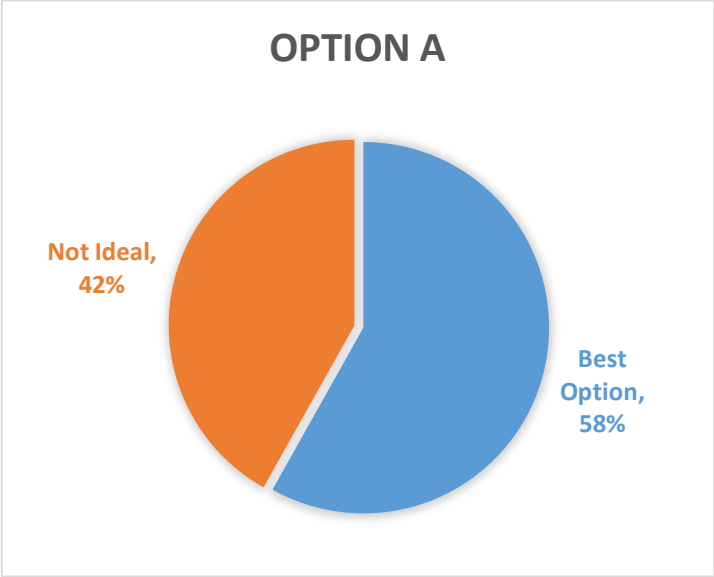


Figure 3 - Public Responses to Long Term Recommendation - Option A

Chapter 3: Corridor Goals and Objectives

3.1 Corridor Goals and Objectives

FM 2493 Corridor Goals

Through an extensive public outreach program and the recognition of the current and projected deficiencies in the corridor, the study team established five corridor goals, which are later discussed in detail, as follows:

- Improve Safety
- Identify Short-Term Transportation Recommendations
- Improve Traffic Flow
- Reduce Motorist Delay
- Identify Long-Term Transportation Recommendations

The application of this study's access management recommendations and actions will move the involved communities toward the goals listed above. The following section details how these goals will be achieved and measured.

Goal 1: Improve Safety

Access management saves lives and also reduces the frequency of injury and property damage crashes. The American Association of State Highway and Transportation Officials (AASHTO) indicates that 50% to 70% of all accidents are access related and could be relieved with proper access management strategies. **Chapter 4** discusses in detail the existing traffic condition on FM 2493 that are leading to a high vehicle crash risk.

Measure 1: Driveway Density Ratio

In order to accurately quantify safety improvements the team is measuring the effectiveness of reducing driveways per mile. A 30-driveways per mile driveway density is a desirable goal within the corridor. This density will be measured against the actual driveway density to establish a driveway density ratio. Therefore, the calculation for improving safety is:

$$\frac{\text{Actual Driveway Density (X)}}{\text{Goal Driveway Density (30)}}$$

Strategies to meet this goal include:

- Relocating driveways
- Consolidating or eliminating driveways
- Promoting shared driveways

Measure 2: Conflict Point Reduction

The second measure of effectiveness for safety improvements comes from reducing the amount of conflict points at driveways and unsignalized intersections. Intersections without access management considerations typically have 18 potential conflict points. So, a corridor section with 50 driveways per mile and no access management treatments has 900 potential conflict points. The formula for calculating the conflict points per mile is as follows:

Driveways Per Mile x Conflict Points = Total Conflict Points Per Mile

Strategies to meet this goal include:

- Relocating driveways
- Consolidating or eliminating driveways
- Promoting shared driveways
- Increasing corner clearance
- Improving driveway geometrics
- Installing raised medians

This process is one in which face to face meetings will need to be conducted to negotiate the best possible scenario for all effected stakeholders. **Chapter 6,** Safety Improvements, summarizes the measures of effectiveness for the proposed safety improvements.

Goal 2: Identify Short-Term Transportation Solutions

This goal will be achieved by providing a list of projects that also lists the benefits of each project. The toolbox displayed in **Chapter 6,** contains a list of improvements. The list will also be used to identify funding sources and implementing agencies.

Goal 3: Improve Traffic Flow

This measure will establish the improved traffic flow and the subsequent level of service (LOS) benefits from each of the improvements established in the above goal.

Measure 1: Level of Service

This measure will be evaluated by using our operations model to estimate the LOS before and after improvements. The LOS will be evaluated at each intersection and on the corridor segments between the intersections.

Measure 2: Median Capacity Adjustments

The increased capacity resulting from conversion of a two way left turn lane to raised medians will be incorporated into our operations model. A percentage of increased capacity will be added to simulate the reduction inside friction and the benefits of each improvement will be measured against the no build alternative.

Goal 4: Reduce Motorist Delay

Reducing the overall corridor delay and the individual intersection delay is a major issue throughout the corridor. The measures described below will allow for the subsequent improvements to be evaluated and the benefits of each improvement documented.

Measure 1: Time Delay Benefits

Similar to the LOS analysis described above, this measure of effectiveness will evaluate the travel time benefits from the improvements.

Measure 2: Median and Driveway Speed Adjustment

Additional travel time benefits will be derived from the increased speed realized from introducing raised medians and also from the reduction in driveway density.

Chapter 6 summarizes the measures of effectiveness of improvements aimed at improving traffic flow and reducing motorist delay.

Goal 5: Assess Long-Term Corridor Needs

A major goal of the corridor is to establish long-term corridor needs. These could include:

- Developing a corridor overlay describing design standards
- Making thoroughfare plan recommendations
- Recommending changes to local municipal codes
- Pedestrian and bicycle needs
- Investigating the viability and funding opportunities for transit service

Chapter 4: Existing Conditions

The following sections define existing traffic characteristic, roadway and access inventory, and current corridor conditions along Old Jacksonville Highway, FM 2493. The corridor is split into two different segments as displayed in **Figure 4.**

Figure 4 – Corridor Map

1) The northern segment from Loop 323 to just south of FM 168/FM 2813 is a five-lane, curb and gutter section with a two-way center left turn lane. This suburban section contains the majority of the development that has occurred with numerous driveways and cross streets in this section. A majority of the signalized intersections are located within this segment. Also, the Tyler ISD has recently built a school on Three Lakes Parkway and Walmart is in the process of building a store near Grande Blvd.

2) The corridor transitions to a two-lane roadway with open ditches just south of FM 168/FM 2813. This southern segment is more rural with some all way stops intersections in the City of Bullard and in Flint. The Bullard ISD and the Brook Hill private school have existing schools along this section of the corridor. TxDOT has plans to widen this section to a five-lane from where the five-lane section currently ends to FM 346 in Flint.

4.1 Existing Traffic Characteristics

Daily Traffic Volumes

Turning movement counts (TMCs) were collected for typical weekday traffic at the following critical study intersections on the dates shown:

- Loop 323 — Thursday, February 12, 2015
- Brookshire's Grocery Distribution Center — Wednesday, September 17, 2014
- Capital Drive — Tuesday, September 8, 2015
- Rice Road — Tuesday, March 3, 2015
- Grande Blvd — Thursday, February 19, 2015
- Three Lakes Blvd — Wednesday, March 18, 2015
- Toll 49 Frontage Roads — Wednesday, March 4, 2015
- FM 2813 — Tuesday, March 3, 2015
- CR 140 — Tuesday, September 8, 2015
- FM 346 — Wednesday, February 11, 2015
- FM 344 — Thursday, February 26, 2015
- US 69 — Thursday, February 26, 2015

The TMCs were collected over a 2-hour period during the peak periods from 7 – 9 AM, 11:30 AM – 1:30 PM and 4 – 6 PM. The TMC data can be found in **Appendix A**.

In addition to the turning movement counts, seven 24-hour bidirectional tube counts were collected along Old Jacksonville Highway on Tuesday, January 27, 2015 (except the counts collected north of Cumberland Road which were collected on Tuesday, September 8, 2015). These tube counts were collected at the following locations:

- North of Rice Road
- Between Grande Blvd and Three Lakes Blvd.
- North of Cumberland Road
- North of Toll 49
- South of 2813
- North of FM 344
- Between FM 344 and US 69

The 24-hour tube count volumes were used to determine the peak hours of traffic along the corridor, 24-hour traffic volume graphs are located in **Appendix B.**

Figure 5 shows a summary of the TMCs for the AM and PM peak hours as well as the 24-hour tube count volumes and locations. The AM peak was from 7:15 AM to 8:15 AM, the PM peak was from 5:00 PM to 6:00 PM.

Truck percentages were reviewed from the TxDOT Statewide Planning Map. This truck percentage is 4.8% north of Toll 49 and 4.2% south of Toll 49.

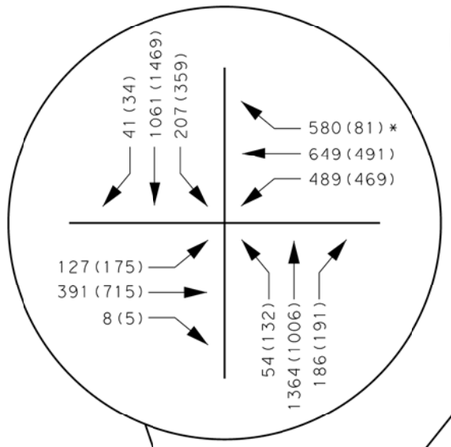
Corridor Travel Speeds

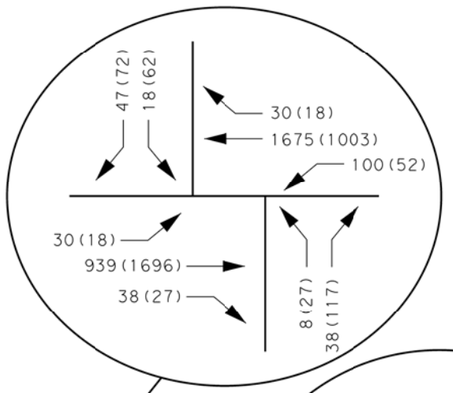
The posted speed limit along the corridor is broken into the following segments:

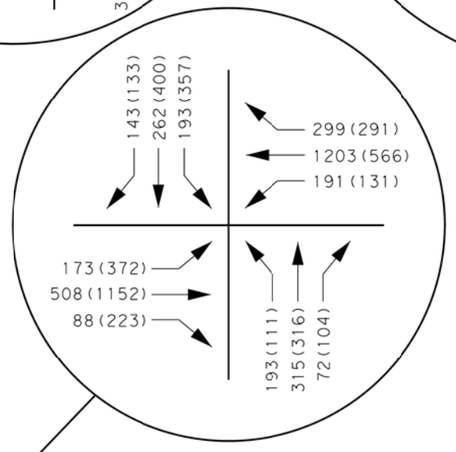
- 45 mph from Loop 323 to Capital Drive
- 50 mph from Capital Drive to Tyler City Limits
- 55 mph from Tyler City Limits to Toll 49
- 45 mph from Toll 49 to FM 2813
- 55 mph from FM 2813 to FM 346
- 45 mph from FM 346 to Craft Lane / Walnut Hill Road
- 55 mph from Craft Lane / Walnut Hill Road to Goodson Spur Road
- 60 mph from Goodson Spur Road to Lynch Drive
- 50 mph from Lynch Drive to W. Emma Street
- 40 mph from W. Emma Street to Panther Crossing
- 55 mph from Panther Crossing to US 69

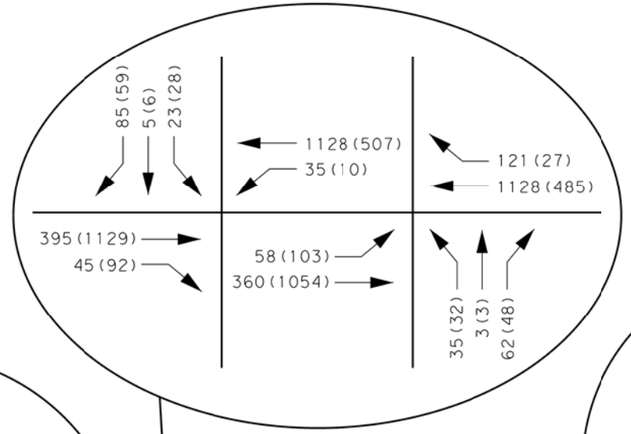
The travel times were collected by driving the corridor four times for northbound and southbound directions for the AM and PM peak periods. **Table 3** shows a summary of the corridor travel times. The travel times were collected on Tuesday, January 27, 2015 and Wednesday January 28, 2015. The collected travel time data can be found in **Appendix C**.

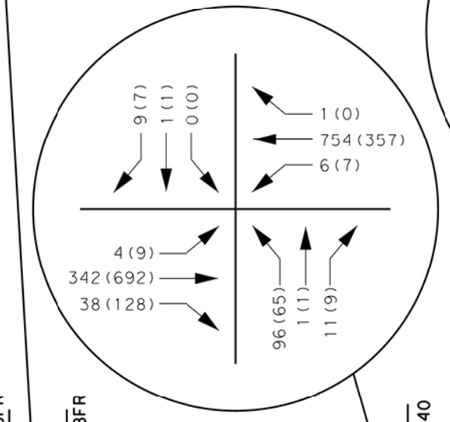
* FREE RIGHT TURNS ESTIMATED

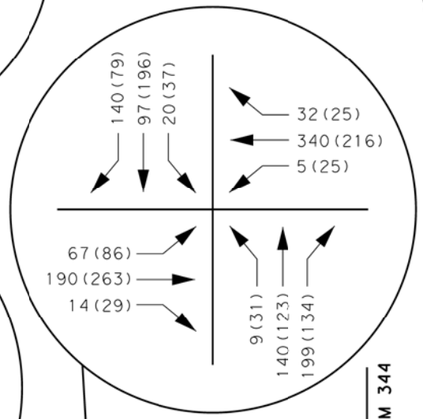


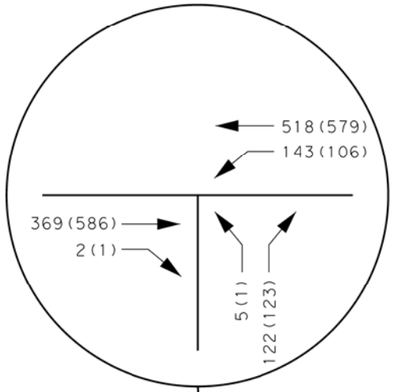


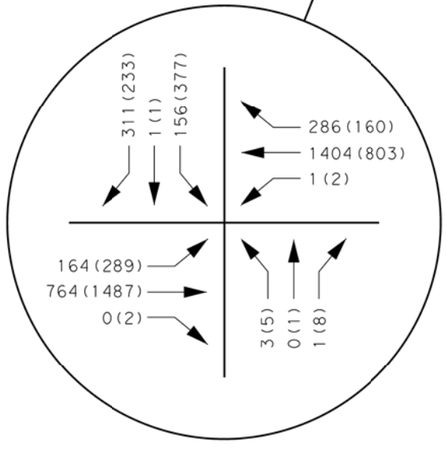


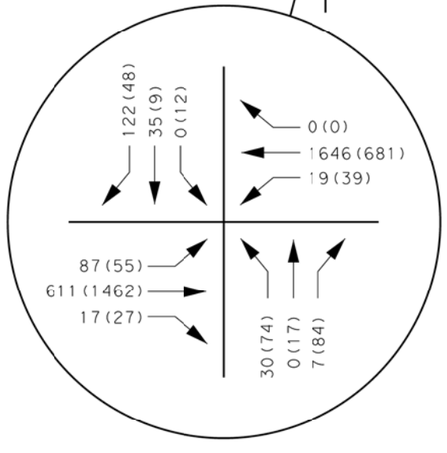


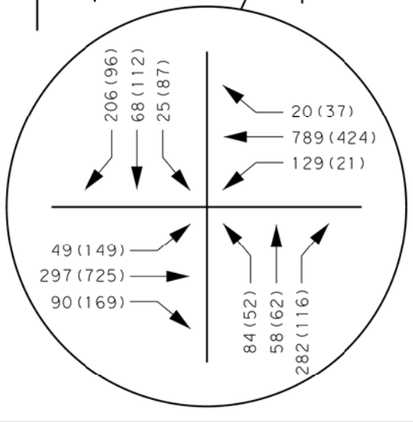


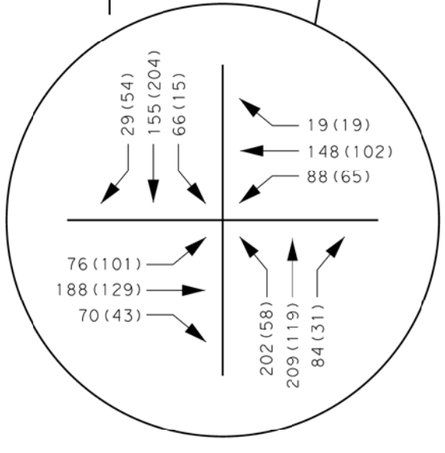












LOOP 323

BROOKSHIRES

CAPITAL DR.

13970

13891

RICE RD

W GRANDE BLVD

12949

13635

THREE LAKES PKWY

10623

10890

CUMBERLAND RD

8844

8557

TOLL49 WBFR

TOLL49 EBFR

FM 2493

FM 2813

6914

6911

CR 140

FM 346

3089

2970

FM 344

1681

1637

US 69

US 69

N

N. T. S.

LEGEND

AM (PM) THROUGH VOLUME

AM (PM) TURNING VOLUME

24 HOUR TUBE COUNT LOCATION

NOTE:
AM PEAK FROM 7:15-8:15
PM PEAK FROM 5:00-6:00

Brown & Gay Engineers, Inc.
2595 Dallas Parkway, Suite 204, Frisco, TX 75034
Tel: 972-464-4800 • www.browngay.com
TBPE Registration No. F-1046

TRAFFIC VOLUME DATA
OLD JACKSONVILLE HIGHWAY

DATE:		
1/2016	N. T. S.	FIG. 5

Table 3 - Travel Time Summary

RUN TITLE	TRAVEL TIME	# OF STOPS	AVG SPEED *(MPH)*	TOTAL DELAY *(SEC)*	TIME *(SEC)* = 0 MPH	TIME *(SEC)* <= 35 MPH	TIME *(SEC)* <= 50 MPH
Northbound AM Peak	21:37	7.5	38.4	342.8	120.5	405.3	1087.5
Southbound AM Peak	19:33	4.5	42.4	220.3	39.5	250.8	914.3
Northbound PM Peak	21:21	6.8	39.0	325.5	143.5	393.3	1008.8
Southbound PM Peak	19:57	5.8	41.6	243.3	59.0	276.0	978.3

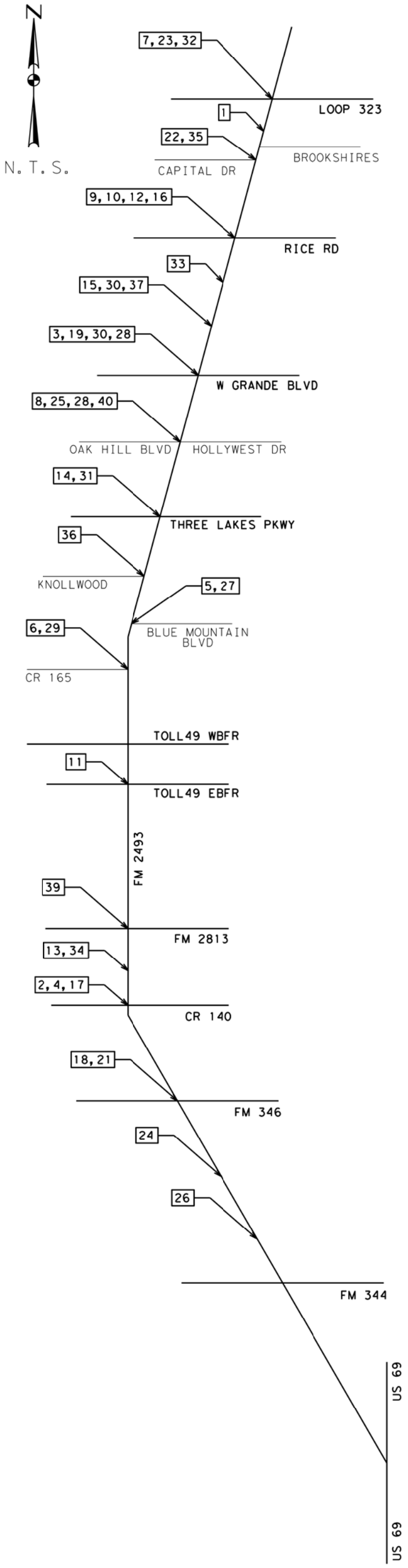
Crash Data

Crash data was collected by TxDOT from police reports from January 2012 to December 2014. **Figure 6** shows the locations, dates, descriptions of the collisions and the crash severity of the 40 crashes collected in that time frame.

The two-way left-turn lane appears to have been a contributing factor in nine of the crashes recorded. 14 of the crashes occurred at a signalized intersections. 16 appear to have occurred at unsignalized intersections or at driveways, with four of these involving a turning movement and the other twelve involved both vehicles traveling straight through the intersection or driveway. Read-end collisions accounted for 13 of the recorded crashes, only one of the crashes was a sideswipe.

- 32 of the recorded crashes were non-incapacitating
- 7 crashes were incapacitating
- 1 crash had a fatality

The northern portion of corridor north of Toll 49 had a majority of the crashes. The crash rate was computed in the section at 30 crashes per 100 million vehicle miles travel (VMT). This is below the 2014 TxDOT crash rate average for FM roads in an urban environment of 232.45 per 100 million VMT and 292.97 per 100 million VMT for 4 lane undivided roads.



Crash ID	Crash Date	Manner of Collision	Crash Severity
1	01/11/2012	MOVING REAR END	NON-INCAPACITATING
2	02/03/2012	ANGLE - BOTH GOING STRAIGHT	INCAPACITATING INJURY
3	03/20/2012	MOVING REAR END	NON-INCAPACITATING
4	03/23/2012	STOPPED REAR END	INCAPACITATING INJURY
5	04/03/2012	MOVING REAR END	NON-INCAPACITATING
6	05/15/2012	MOVING REAR END	NON-INCAPACITATING
7	06/10/2012	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING
8	07/30/2012	ANGLE - ONE STRAIGHT-ONE LEFT TURN	NON-INCAPACITATING
9	08/12/2012	OPPOSITE DIRECTIONS IN LEFT TURN LANE	NON-INCAPACITATING
10	08/22/2012	STOPPED REAR END	NON-INCAPACITATING
11	10/08/2012	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING
12	12/07/2012	OPPOSITE DIRECTIONS IN LEFT TURN LANE	INCAPACITATING INJURY
13	01/09/2013	OPPOSITE DIRECTIONS IN LEFT TURN LANE	NON-INCAPACITATING
14	02/26/2013	MOVING REAR END	NON-INCAPACITATING
15	05/16/2013	ANGLE - ONE STRAIGHT-ONE LEFT TURN	INCAPACITATING INJURY
16	07/17/2013	STOPPED REAR END	NON-INCAPACITATING
17	09/12/2013	MOVING REAR END	NON-INCAPACITATING
18	09/20/2013	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING
19	10/10/2013	ANGLE - ONE STRAIGHT-ONE LEFT TURN	INCAPACITATING INJURY
20	10/10/2013	ANGLE - ONE STRAIGHT-ONE LEFT TURN	NON-INCAPACITATING
21	11/07/2013	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING
22	11/09/2013	MOVING REAR END	NON-INCAPACITATING
23	12/05/2013	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING
24	12/20/2013	STOPPED REAR END	NON-INCAPACITATING
25	01/08/2014	ANGLE - BOTH GOING STRAIGHT	INCAPACITATING INJURY
26	03/07/2014	OPPOSITE DIRECTIONS HEAD ON COLLISION	NON-INCAPACITATING
27	03/16/2014	OPPOSITE DIRECTIONS HEAD ON COLLISION	NON-INCAPACITATING
28	05/03/2014	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING
29	05/03/2014	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING
30	05/11/2014	OPPOSITE DIRECTIONS HEAD ON COLLISION	NON-INCAPACITATING
31	05/11/2014	STOPPED REAR END	NON-INCAPACITATING
32	06/19/2014	ANGLE - BOTH GOING STRAIGHT	INCAPACITATING INJURY
33	08/28/2014	SIDESWIPE	NON-INCAPACITATING
34	09/25/2014	OPPOSITE DIRECTIONS IN LEFT TURN LANE	NON-INCAPACITATING
35	10/07/2014	SINGLE VEHICLE	FATAL
36	11/10/2014	OPPOSITE DIRECTIONS IN LEFT TURN LANE	NON-INCAPACITATING
37	11/18/2014	MOVING REAR END	NON-INCAPACITATING
38	11/26/2014	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING
39	12/07/2014	OPPOSITE DIRECTIONS IN LEFT TURN LANE	NON-INCAPACITATING
40	12/09/2014	ANGLE - BOTH GOING STRAIGHT	NON-INCAPACITATING

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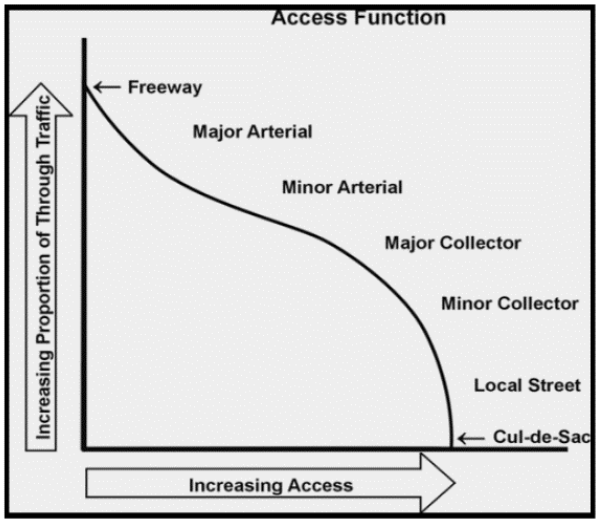
CRASH DATA ANALYSIS
OLD JACKSONVILLE HIGHWAY

DATE:		
1/2016	N. T. S.	FIG. 6

4.2 Roadway and Access Inventory

Functional Classifications

A complete functional design system provides a series of distinct travel movements. The six recognizable stages in most trips include main movement, transition, distribution, collection, access, and termination.



For example, the main movement of vehicles is usually uninterrupted, high speed, longer-trip-length flow. When approaching destinations from the freeway, vehicles reduce speed on the ramps, which act as transition roadways. Vehicles then enter a moderate-speed arterial that brings them closer to their destination. Next, they enter collector roads that penetrate the neighborhoods. Finally, the vehicle enters local access roads that provide a direct connection to individual residences or other terminations. Each of the six stages is handled by a separate facility designed specifically for its function. Additionally, functional classifications are generally classified by the surrounding land use form and degree of access. For example, urban and rural areas have fundamentally different characteristics in regard to density and types of land use, density of street and highway networks, nature of travel patterns, and the way each of these elements is related. **Figure 7** demonstrates the relationship of facility types to access.

The Tyler 2012 Master Street Plan incorporates all of Smith County into the Tyler MPO study area. This plan classifies the thoroughfares into four general categories: local streets, collectors, arterials, and freeways. For planning purposes, the Tyler MPO study area has created four separate context zones, or area types: urban core, general urban, suburban and rural.

The FM 2493 study corridor is classified as a **minor arterial**. Major crossing streets on the corridor include a freeway at Toll 49 and major arterials at Loop 323, Grande Blvd., FM 346 and US 69. The northern portion of the study corridor from Loop 323 to FM 346 in Flint is considered a suburban area while the study corridor south of FM 346 is considered rural.

Traffic Signals

The existing signal system is currently uncoordinated. Cycle lengths for the corridor range from 90 seconds to 160 seconds.

The **Loop 323** intersection has protected-only left turns from all approaches with dual left turn lanes provided for all approaches. All approaches to this intersection have VIVDS camera stop-bar detection.

The **Rice Road** intersection has protected/permitted left turns with flashing yellow arrows for the north and south approach. The east and west approach are split phase with protected-only left. This works well because the eastbound approach is a small residential drive without much traffic. The westbound approach has a left turn lane and a shared thru/left lane. All approaches to this intersection have VIVDS camera stop-bar detection.

The **Grande Boulevard** intersection has protected/permitted lefts on the north and south approaches with flashing yellow arrows. The east and west approaches are split phased with protected-only lefts. The east and west approaches have a left turn lane and a shared thru/left lane. All approaches to this intersection have VIVDS camera stop-bar detection.

The **Three Lakes Parkway** intersection has protected/permitted lefts with flashing yellow arrows for the north and south approaches. The east and west approaches are split phased with protected-only lefts. All approaches to this intersection have radar based stop-bar detection. This intersection was recently added to a school zone along Old Jacksonville.

The **Cumberland Road** intersection has a traffic signal installed, but it is not scheduled to be activated until the summer of 2016.

The **FM 2813** intersection has protected/permitted left turns on all approaches with permissive yield on green ball. All approaches to this intersection have VIVDS camera stop-bar detection.

Unsignalized Intersections

The **Toll 49** intersection is a diamond interchange, where the east-west frontage roads of Toll 49 are stop controlled and the north-south approached on Old Jacksonville Highway are unsignalized.

The **County Road 140** intersection has a flashing yellow light on Old Jacksonville and a flashing red light on CR 140.

The **FM 346** intersection in Flint is an all-way stop controlled intersection with flashing red beacons on the stop signs.

The **FM 344** intersection in Bullard is an all-way stop controlled intersection with flashing red beacons on the stop signs. This intersection has a right turn lane on the southbound approach.

The **US 69** is a tee intersection with Old Jacksonville Highway ending at the intersection with US 69. Old Jacksonville Highway becomes two channelized turn lanes for making a stop controlled left turn onto northbound US 69 and another for a stop controlled right turn onto southbound US 69.

Railroad Facilities

There are currently no railroad facilities crossing the study corridor. There is a TxDOT owned abandoned railroad right-of-way (ROW) that parallels FM 2493 on the west side along most of the corridor. The

railroad ROW separates from FM 2493 between Three Lakes Pkwy and rejoins FM 2493 again just north of CR 140. The railroad ROW then separates again at Craft Ln and rejoins alongside FM 2493 at CR 172.

Transit Operations

Tyler Transit currently runs Route 3 – Yellow Line throughout the southern portion of the City of Tyler. It runs south from the Grande Blvd. intersection to Three Lakes Parkway, where it turns around the Fresh Grocery store and heads back north to Loop 323. There are five scheduled stops along the study corridor at Three Lakes Parkway, Grande Blvd (SB), Grande Blvd (NB), Rice Road and at Capital Drive. There are no bus turnouts and only a few of the stops have a permanent hard surface for the bus riders to wait.

Access

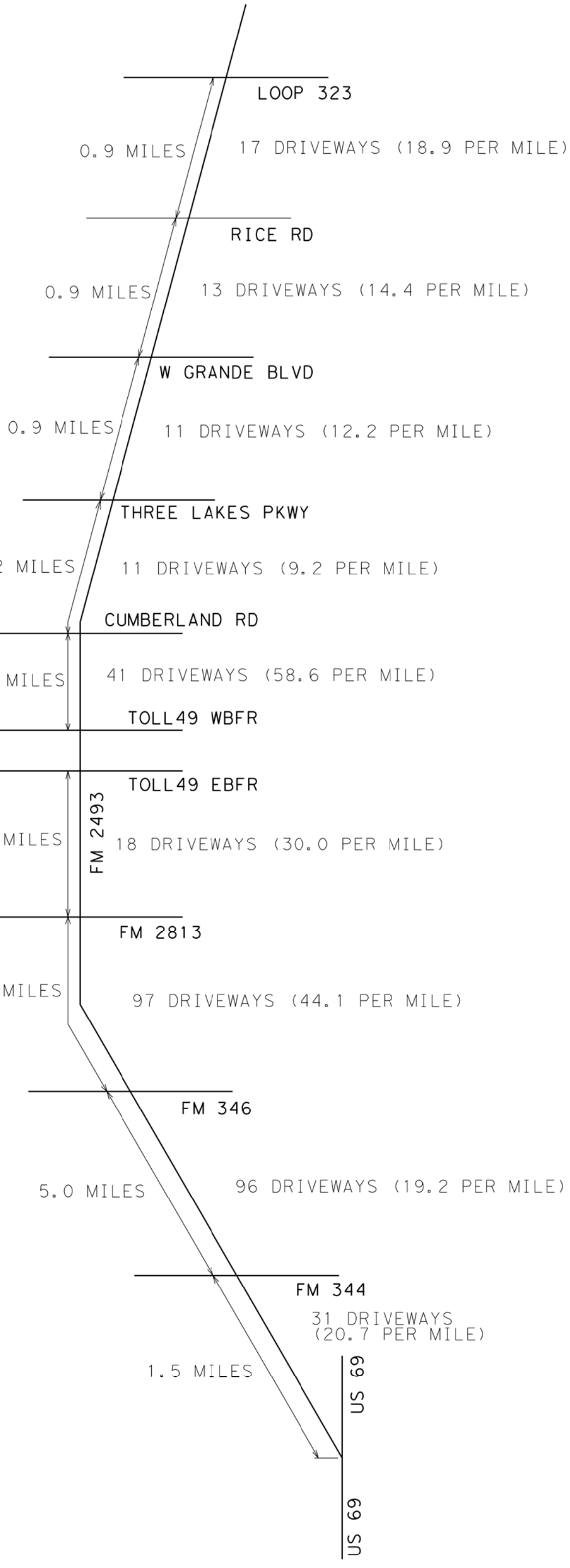
One of the issues facing Old Jacksonville Highway is access management that is not ideal. There is a high density of residential and commercial driveways along the whole corridor. This creates many different areas where traffic makes left turns from the two-way-left-turn-lane (TWLTL) as well as traffic leaving driveways to join through traffic on Old Jacksonville Highway. These left turns reduce the effectiveness of future coordination between signals, lowers intersection and corridor level of service, and creates a potential safety issue for increased head-on collisions in the TWLTL. The driveway density of each segment of the corridor is shown in **Figure 8**. South of Toll 49 becomes much denser because of residential single family driveways along Old Jacksonville Highway. North of Toll 49 is all commercial, industrial, or neighborhood collector roads.

Pedestrian and Bicycle Infrastructure

There are currently no bicycle lanes along the study corridor. Sidewalks are currently installed in areas north of Toll 49, especially the west side from Toll 49 until Oakhill Blvd and on the eastside from Three Lakes Pkwy to Grande Blvd. The intersections at Loop 323, Rice Road and Grande Blvd do not have pedestrian signals or crosswalks. The intersections at Three Lakes Pkwy and at FM 2813 have crosswalks and pedestrian signals. The all-way stop intersections at FM 346 in Flint and FM 344 in Bullard do not have crosswalks. There are TxDOT plans for a bike lane to be constructed with the upcoming widening from FM 2813 in Gresham to FM 346 in Flint. There are also plans to install a 10’ wide hike & bike trail called Legacy Trail along the study corridor from Three Lakes Pkwy to Gresham. The abandoned railroad ROW along the west side of FM 2493 is in the rails-to-trails program.

Land Use and Zoning

Much of the land use along the north portion of the study corridor is commercial with some light industrial and some subdivisions particularly between Toll 49 and Grande Blvd. Numerous churches and small restaurants line the northern half of the corridor. At Loop 323 there is a warehouse district located on the southwest corner and a large grocery distribution center located on the southeast corner. The southern end of the corridor is much more rural south of Gresham with farm land and single family homes making up the majority of the land use. Two large schools are located along this portion of the corridor in Bullard, the Bullard High School and the Brook Hill private school with 2 large campuses just north of Bullard.



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DRIVEWAY DENSITY DATA
OLD JACKSONVILLE HIGHWAY

DATE:		
1/2016	N. T. S.	FIG. 8

4.3 Current Corridor Conditions

Intersection Level of Service / Delay

The effectiveness of the proposed timing plan for each intersection was determined by comparing the existing levels of service (LOS) to the estimated LOS that would be provided by the proposed timings. LOS is a value that represents the operating conditions that may occur at an intersection when accommodating various levels of traffic volumes. It is a qualitative measure responsive to the effects of a number of operational factors, such as roadway geometry, traffic signal control parameters, traffic volume fluctuations, and others.

LOS values range from A, which is characterized by unencumbered free-flow conditions with little or no delay, to F, which is characterized by stop-and-go conditions or extreme congestion in which the roadway has exceeded its capacity. The intermediate levels of service reflect the spectrum of conditions that exist between LOS A and F. LOS B represents a condition with short delays to traffic. LOS C (average traffic delay) is considered desirable for peak or design traffic flow. In urban areas LOS D (more significant delays than LOS C) is generally considered acceptable during peak hour conditions. LOS E indicates that the limit of acceptable delay has been reached and the roadway is near capacity.

The LOS values are a function of vehicle delay as defined in Transportation Research Board's *Highway Capacity Manual* (*HCM*) and outlined in **Table 4**.

Table 4 - Signalized Intersection Level of Service Criteria (2010 *HCM*)

Control Delay *(sec/veh)*	LOS
≤10	A
>10 and ≤20	B
>20 and ≤35	C
>35 and ≤55	D
>55 and ≤80	E
>80	F

The intersection LOS was determined for each major intersection along Old Jacksonville Highway using *Synchro 9* software. **Table 5** gives an overview of the LOS for each overall intersection as well as the delay in seconds for AM and PM periods for existing conditions and optimized existing conditions. For a more detailed look at the LOS and delay for each signalized approach as well as the overall intersection under existing optimized timings, see **Appendix D**.

The existing intersections are struggling to keep up with the traffic volumes as Tyler expands south, most intersections are LOS C or LOS during the peak hours. The intersections at Grande and Loop 323 have the worst LOS of the existing intersections. This is caused by the high volume of left turn movements as well as oversaturated north and south through movements. If traffic signals were optimized and coordinated along FM 2493, then the delay and LOS would improve for current traffic volumes, especially at the most congested intersections.

Table 5 - Existing Signalized Intersection Level of Service

		Existing Volumes Existing Timings		Existing Volumes Optimized Timings	
		LOS	Delay *(sec)*	LOS	Delay *(sec)*
Loop 323	AM	D	46.9	C	33.4
	PM	D	47.3	D	36.0
Rice Road	AM	B	16.2	B	11.4
	PM	B	20.0	B	17.5
Grande Blvd	AM	E	64.2	D	40.4
	PM	F	93.2	E	55.1
Three Lakes Pkwy	AM	C	25.2	C	23.3
	PM	C	24.8	C	23.6
FM 2813	AM	C	23.4	B	19.6
	PM	C	22.9	C	21.4

Corridor Level of Service

The effectiveness of the corridor between each intersection was determined with HCS in accordance with the Highway Capacity Manual 2010. This analysis uses lane geometry, posted speed limit, peak hour traffic volumes, and the number and density of access points along the corridor. The level of service of each segment for the existing traffic volumes are shown in **Table 6**. The detailed HCS analysis for existing conditions can be found in **Appendix G**.

Table 6 - Existing Corridor Level of Service between Intersections

	Existing LOS		
Segment	North	South	
Loop 323 - Rice	B	C	4 Lanes
Rice - Grande	C	C	
Grande - Three Lakes	C	C	
Three Lakes - Cumberland	C	C	
Cumberland - Toll 49	B	B	
Toll 49 - FM 2813	B	B	
FM 2813 - FM 346	E	E	2 Lanes
FM 346 - FM 344	D	C	
FM 344 - US 69	D	D	

The existing corridor north of FM 2813 currently shows acceptable levels of service, however the number of access points along the existing corridor lowers the average LOS to a C. The corridor south of FM 2813 reduces to a 2 lane road with no shoulder, this causes a failing level of service in most segments.

4.4 Conclusions

Although the crash experience is under the state average, a large number of crashes can be attributed to the TWLTL and high number of access points. A reduction in the number of driveways along the corridor would greatly benefit safety. There are portions of the study corridor where the speed seems to be too high based on citizen input and our field visits and analysis of the roadway geometry and adjacent land uses.

The intersection and link LOS can be improved by making some intersection modifications and by improving the signal system timing and phase sequences. The non-coordination of the traffic signals make it such that there is no platooning of vehicles which can also help create gaps for cross streets and driveways to utilize during peak periods of the day. The pedestrian and bicycle facilities can also be improved by filling in some of the missing pedestrian/bike facilities and encouraging a policy that requires these facilities to be constructed. Finally, transit service in the corridor will need to be examined for service expansion and improvements at the existing transit bus stops.

Chapter 5: Improvement Options

5.1 Introduction

Improvement options for this corridor plan have several dimensions. For instance, there is short- term and long-term, safety and operational improvement and finally other improvements such as pedestrian and bicycle and policy recommendations. To organize these improvements this report has four separate categories of improvements:

- Safety
- Operational
- Policy
- Other Improvements

The following sections will detail the available improvements within each option.

Figure 9 - Example of a Raised Median in Tyler

5.2 Safety

Safety in the corridor is an important issue. With 40 reported crashes in the previous three years some type of safety improvement should be considered. Safety improvements are largely concepts derived from access management techniques. Below are two techniques that can be used for this study.

- Median Installation
- Driveway Consolidation

Raised Median Installation

This technique involves adding a raised median barrier (See **Figure 9**) to restrict the movement of traffic and thereby reduce the number of conflicts in the corridor. **Figure 10** illustrates that at any full access location there are 32 potential conflict points. With the introduction of a raised median barrier to restrict the left out maneuver the conflict points are reduced by 50%.

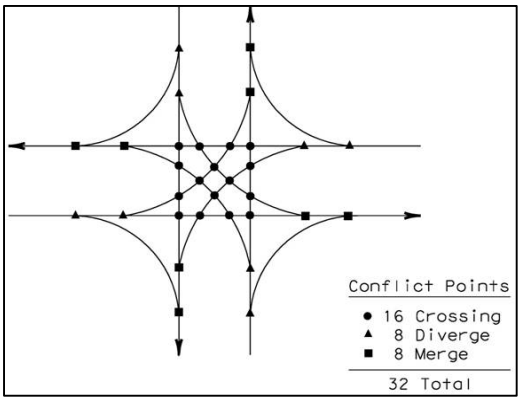


Figure 10 - Conflict Points

Roadways with non-traversable medians are safer at higher speeds and at higher traffic volumes than undivided roadways or those with continuous TWLTL. Numerous studies from across the nation have been conducted relating to undivided, TWLTL, and divided roadways

with a non-traversable median. Based on studies, it can be concluded that roadways with a non-traversable median have an average crash rate about 30% less than roadways with a TWLTL.

Additionally, where ADT exceeds 20,000 vehicles per day and the demand for mid-block turns is high, a raised median should be considered. With raised medians additional safety benefits are found for pedestrian and bicycle activity, in terms of having a refuge area when crossing a thoroughfare. With the addition of a raised median, consideration of the median opening and opening type will need to occur. The placement of the median opening must first consider the thoroughfare system. Priority should be given to those thoroughfares providing mobility and access throughout the community. Then, the opening can consider other traffic generators along the corridor. The median treatment can take on many different forms. **Figure 11** illustrates five variations available for a median opening.

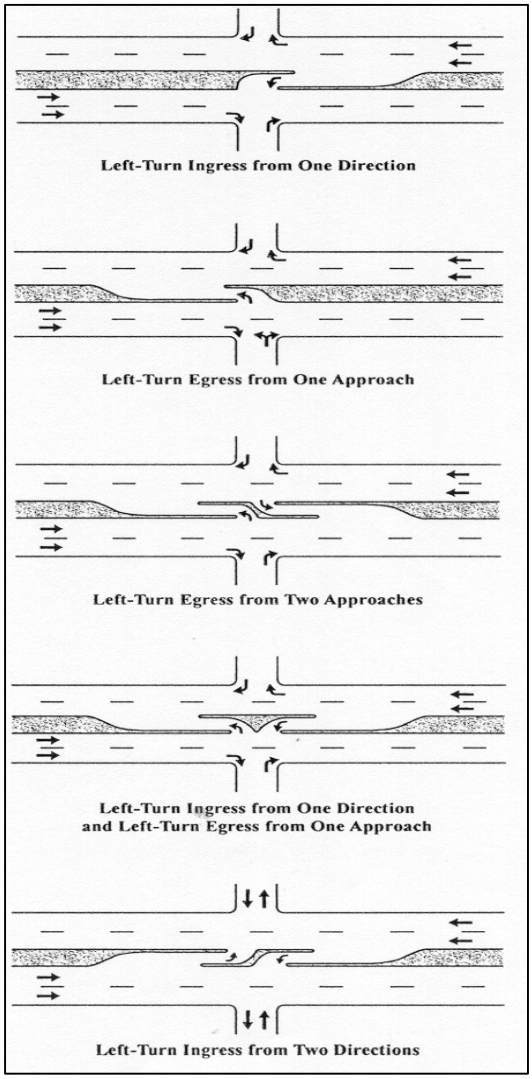


Figure 11 - Median Treatments

Driveway Consolidation

This technique involves removing or relocating existing access connections (driveways) for the sole purpose of improving safety. Research has shown that driveways that are closely spaced can have direct impact on safety along a roadway. Moreover, research has found that a nexus exists between access connection density and crash rates, as indicated in **Figure 12**. As you can see as the density of access connections increase the crash rates increase.

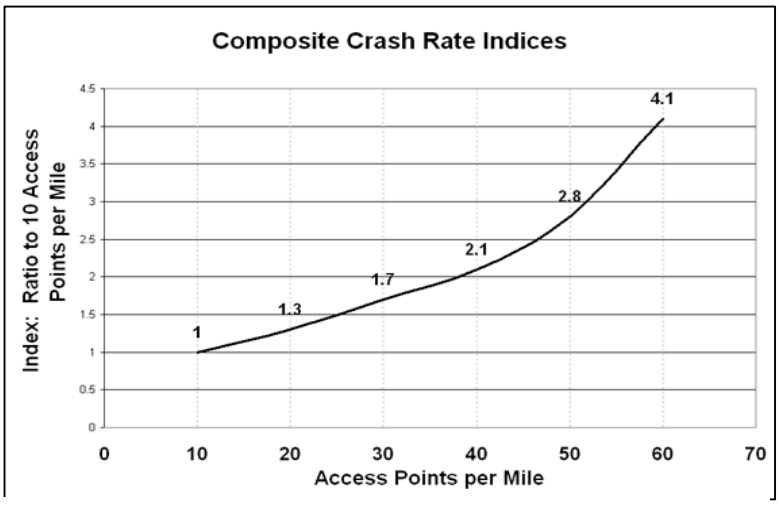


Figure 12 - Composite Crash Rate Indices

Driveway consolidation is only possible through a cooperative agreement between the property owner and the agency attempting to consolidate the driveway. Application of this technique will be focused on the greatest need. Each situation is unique and a great deal of negotiation will need to occur between all parties involves.

5.3 Operational

In addition to safety, the operations in the corridor are another vital goal of this overall corridor study. The operational improvements for this corridor can be broken down into several distinct pieces.

- Right-Turn Lane
- Left-Turn Lane
- Signal Timing

Right-Turn Lane

The addition of acceleration and deceleration lanes can provide operational benefits throughout the corridor by allowing turning vehicles to exit the roadway without effecting the through movement of traffic. This allows for a more efficient flow of traffic in the corridor and allows vehicles to form platoons at the signalized intersections, thereby maximizing the flows that the signal can handle.

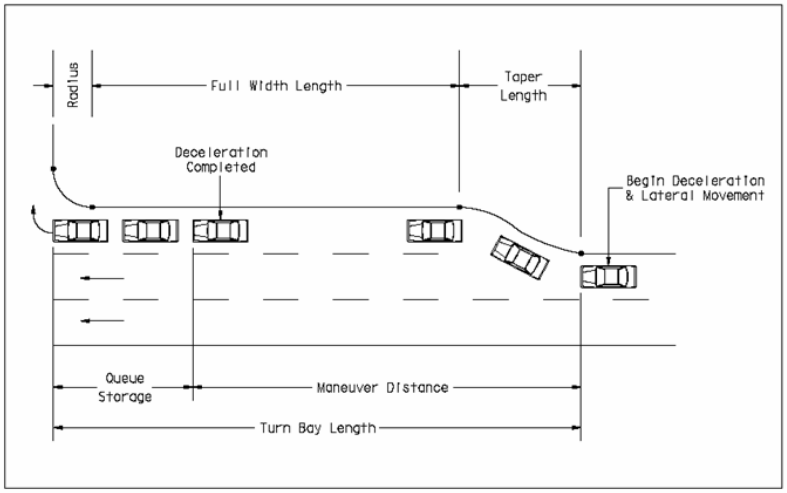


Figure 13 - Right-Turn Lane

Lengths of auxiliary lanes are a function of posted speed, but queue lengths are normally established on a case by case basis. The *Highway Capacity Manual and TxDOT's Operations and Procedures Manual* provide guidance on this matter. **Figure 13** illustrates the general layout and design for a right-turn lane. These improvements are not one size fits all. Consideration must be given for posted speed, traffic volume, and development type.

Left-Turn Lane

Much like right-turn lanes, left-turn lanes also allow the turning vehicles to exit the through lanes without affecting the through traffic. However, these lanes generally provide for more queue storage for left turning vehicles for both signalized and un-signalized intersections. **Figure 14** illustrates the general design elements for a left-turn lane. The length of deceleration should consider the posted speed and the amount of speed differential acceptable for the thoroughfare.

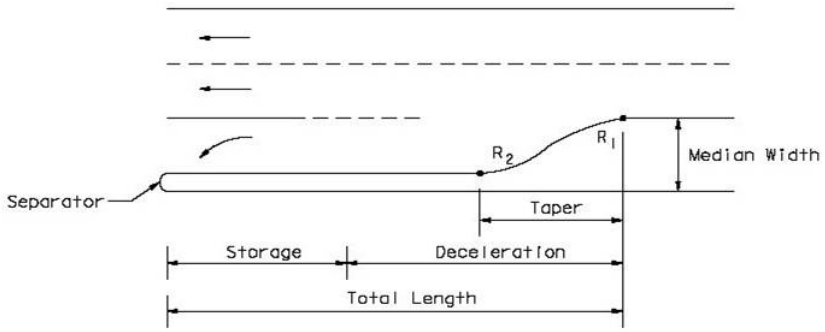


Figure 14 - Left-Turn Lane

Signal Timing

Signal timing is a critical technique to improve the overall traffic flow throughout the corridor. The timing of signals often involves coordinating an entire signal system. For the FM 2493 corridor, the signals are not part of a coordinated signal system. Once these signals are coordinated any recommendation related to future signal timing should consider the ramifications of the system as a whole rather than an isolated signal.

5.4 Policy

Authority and Purpose

This document will ultimately serve as an overlay for land use and design related issues throughout the corridor. The access policy direction must be established in terms of:

- Coordination with TxDOT
- Shared and Cross Access Provisions
- Thoroughfare Planning
- Design Guidelines

Coordination with TxDOT

On July 1, 2011, TxDOT released the latest access management manual. The manual includes general policy implications and minimum driveway spacing criteria along state highways. There is a provision in the manual for local agencies to develop corridor access plan in cooperation with TxDOT which could become a corridor overlay.

This corridor overlay would then supersede any criteria established by the local agency and / or TxDOT. The benefit of this approach is to allow for a more coordinated effort among all agencies involved. Moreover, it provides an interactive mechanism for developers and landowner to understand the vision for the corridor and gain general confidence of future access decisions in the corridor. If agreed to, all the

agencies involved can enter into an inter-local agreement to activate this corridor access plan and provide for a clear delineation of access authority in the corridor.

Shared and Cross Access Provisions

Access management is much more than just spacing of driveways and providing raised medians. In order to fully realize the benefits of access management, certain land use provisions should be provided in the local municipalities subdivision code and zoning ordinance.

Subdivision ordinances can require property owners to dedicate land on their common property lines or develop joint access easements. A parking lot cross access provision assures that a single driveway can serve both properties. The result is greater internal circulation between neighboring properties, which allows vehicles to circulate between businesses without having to re-enter the major roadway and overall fewer driveways (see **Figure 15**).

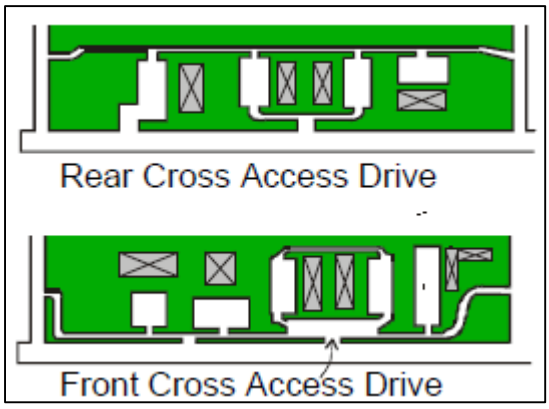


Figure 15 - Cross Access

The result of this effort may take on two separate forms. The first, is one which the team identifies in the aerial photos and project list specific locations that would benefit from sharing access. The second, involves providing changes to the local agencies guidelines to initiate a shared access provision.

Thoroughfare Planning

The local government code provides the authority for local agencies to adopt and implement thoroughfare plans. These plans generally describe the alignment and ROW requirements for major thoroughfares through a community. This policy goes a step further and investigates the potential for the use of collector roads and backage roads to serve local developments without adding more turning traffic onto the major thoroughfares. These roads will generally be localized and dependent on site development and property boundaries. **Figure 16** demonstrates these concepts.

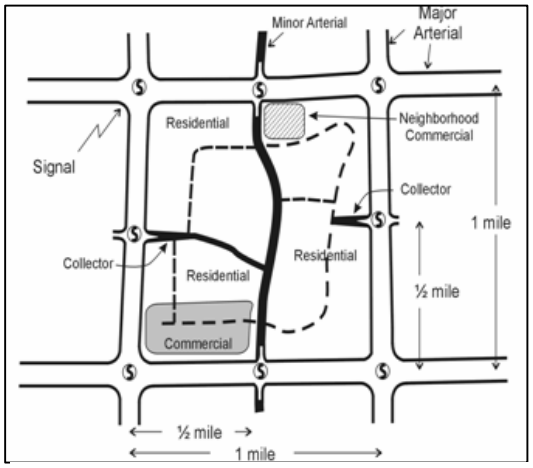


Figure 16 - Thoroughfare Planning

Design Guidelines

These guidelines shall form the basis for technical guidance with regard to access decisions along FM 2493. Specific guidelines have been developed for access connection (driveway) spacing and median opening spacing.

Access Connections

The access connection distances in the following sections are intended for passenger cars on a level grade. These distances may be increased for downgrades, truck traffic, or where otherwise indicated for the specific circumstances of the site and the roadway. In other cases, shorter distances may be appropriate to provide reasonable access, and such decisions should be based on safety and operational factors supported by an engineering study.

The distance between access connections, measured along the edge of the traveled way from the closest edge of pavement of the first access connection to the closest edge of pavement of the second access connection. **Table 7** provides minimum connection spacing criteria for TxDOT facilities according to the City of Tyler Unified Development Code.

Minimum Connection Spacing	
Posted Speed (MPH)	Distance (FT)
≤ 30	200
35	250
40	305
45	360
≥ 50	425

Table 7 - Minimum Connection Spacing

A lesser connection spacing than set forth in this document may be allowed in the following situations:

- To keep from land-locking a property.
- Replacement or re-establishment of access to the highway under a reconstruction / rehabilitation projects.

Median Installation

Openings should only be provided for street intersections or at intervals for major developed areas. Spacing between median openings must be adequate to allow for introduction of left-turn with proper deceleration and storage lengths. Refer to *TxDOT Design Guidelines* for proper deceleration and storage lengths.

Deceleration Lane Tolerances

When a raised median is present and a left-turn deceleration lane shall be provided for every opening. Right-turn deceleration lanes should be required when the peak hour turning movement is greater than 60 vehicles.

5.5 Other Improvements

Raised medians, driveway consolidations, signal timing, shared access and cross access, access spacing, and thoroughfare planning all translate into benefits for pedestrians, bicycles, and the operations of transit buses. Several additional techniques that exist to expand the multi-model flavor of this corridor might be the addition of pedestrian amenities, bicycle lanes, and transit service.

Transit Service

Developing a set of viable transportation alternative will be centered on building ridership for future high capacity transit service. This not only includes making better use of the existing roadway capacity, but also includes managing the demand for travel in the corridor. Transportation Demand Management (TDM) is a set of strategies designed to make the best use of existing transportation facilities as well as enhancing transportation improvements. Using strategies that promote alternative modes, increase vehicle occupancy, reduce travel distances, and ease peak-hour congestion, TDM increases the efficiency and effectiveness of the transportation system.

Approaches include:

- Strategies to promote alternative modes of travel, such as carpooling, vanpooling, transit, biking, and walking.
- Projects designed to maximize the efficient use of parking resources.
- Efforts to shift travel demand to “nonpeak” periods, by promoting flexible work schedules and variable work hours.
- Attempts to eliminate the demand for some trips through teleworking, teleconferencing, etc.
- Augmentation and coordination of existing demand response transit provisions.

Pedestrian Amenities

One improvement technique involves the possible addition of sidewalks and curb ramps along the corridor where they are missing. As identified in the existing conditions report many areas throughout the corridor do not have sidewalks, therefore opportunities to fill in the missing pieces are presented.

Bicycle Lanes

The need and feasibility of adding on-road bicycle facilities should be planned with any future improvement projects. Coordination should occur to connect off-road bicycle facilities with any on-road bike lanes.

Chapter 6: Short-Term Corridor Improvements

6.1 Introduction

One of our primary goals for the FM 2493 corridor study is to identify short-term transportation solutions. Safety and traffic flow are large concerns on this corridor. The following sections detail the study team's methodology and provide recommendations safety improvements

6.2 Methodology

Operational Improvements

Traffic conditions modeling is one of the primary tools that transportation planners and engineers use to evaluate current and future corridor conditions. Using current intersection traffic counts and Synchro software, the study team evaluated every signalized intersection. As seen in **Chapter 4**, four out of the five signalized intersections are currently running a LOS C or worse. Existing corridor level of service between intersections drops below average from FM 2813 to US 69. Based on current traffic counts, field observation, and public involvement the study team tested various intersection improvement options with the use of our Synchro model in an attempt to optimize both the intersections and the overall corridor mobility. This process included optimizing the intersection phasing, timing, and offsets.

Safety Improvements

Providing for raised medians can greatly improve the overall safety in the corridor. As described in **Chapter 4**, nine of the 40 crashes in the three years analyzed may have been avoided with dedicated left turn bays instead of the shared left turn lane. Raised medians minimize the conflict points along a roadway and provide for safe pedestrian refuge. The location of full-access median openings was given first to public street connections and then to major private developments. It is not recommend to have median openings that would be so close to major intersections that they would influence the functional intersection area. **Figure 17** provides an example of how this technique was applied. In addition to raised medians, it is recommended that a future schematic looks for opportunities to consolidate driveways that are too close to major intersections and eliminate driveways that were in close proximity to other driveways.

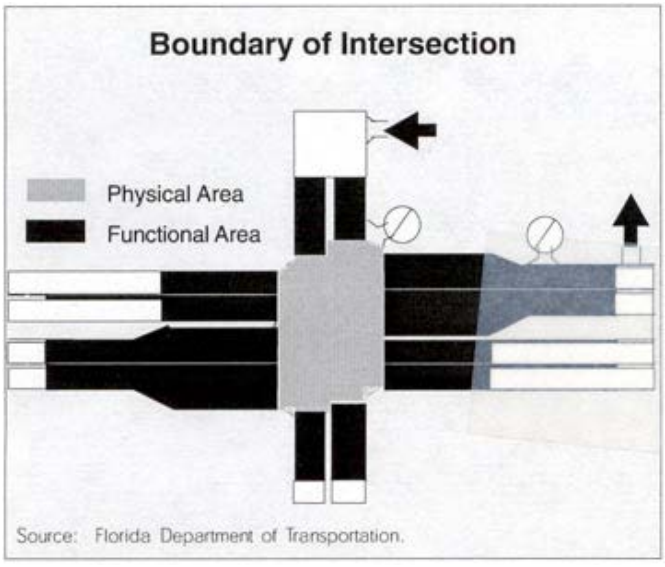


Figure 17 - Functional Intersection Area

6.3 Operational Improvements

The following recommendations provide Tyler Area MPO, TxDOT, City of Tyler and the City of Bullard with a list of operational improvement to improve the overall corridor level of service.

Traffic Signal Improvements

Signal timing can greatly reduce the overall corridor delay. In order to capitalize on these improvements the signal system as a whole needs to be evaluated. Currently the corridor is not synchronized, therefore no platoons are able to form. Optimizing the signal timings brings all signals at or above average level of service, except for the intersection at Grande Blvd. It is recommended that a communication system be installed to link all the existing signals along this corridor. It is also recommended that a full signal timing study be performed to optimize the traffic signals and to provide maximum coordination between the traffic signals.

The addition of dual lefts and right turn bays at signalized intersections will also improve operations at the signalized intersections. Consolidating driveways where possible and adding deceleration lanes would provide further operational improvements along the corridor.

Numerous unsignalized intersections currently meet warrants for traffic signals.

- Brookshire's Distribution Center Driveway – Warrants 2 (Four Hour) & 3 (Peak Hour)
- Capital Drive – Warrants 2 (Four Hour) & 3 (Peak Hour)
- FM 344 – Warrants 2 (Four Hour) & 3 (Peak Hour)
- FM 346 – Warrant 3 (Peak Hour)
- US 69 – Warrants 2 (Four Hour) & 3 (Peak Hour)

Toll 49 diamond intersection does not currently meet signal warrants, but it is a safe assumption it will in the near future. Most all other diamond intersections along Toll 49 are already signalized. Conversely, the US 69 intersection currently meets warrants for a traffic signal, but a majority of the traffic from FM 2493 turns right at this intersection. It is recommended that this right turning traffic be provided an acceleration lane onto US 69 which would remove the need to place a signal at this intersection. This acceleration lane would give refuge to the FM 2493 southbound turning traffic and allow them to accelerate before entering the flow of traffic on US 69. It is recommended that the FM 344 and FM 346 unsignalized intersections be examined for signalization as the future roadway widening projects in those areas are constructed and funding becomes available.

The intersection at Brookshire's Distribution Center Driveway is recommended to have a traffic signal installed. Brookshire Grocery has expressed a willingness to fund this traffic signal due to the heavy amount of trucks that utilizing this driveway as well as the long queuing that occurs for the workers during their shift changes. This signal will need to be coordinated and synched with the Loop 323 traffic signal that is located 1,600 feet to the north to avoid any unnecessary delay to the Loop 323 traffic signal. If it is determined that TxDOT or the City of Tyler does not agree to a signal being located at this intersection, then a traffic signal should be installed at Capitol Drive which is 800 feet further south. This signal would

most likely produce adequate gaps in traffic for the Brookshire's Distribution Center driveway. In addition, there is a large amount of undeveloped land west of where Capitol Drive currently terminates which would generate higher volumes at the intersection.

Roadway Widening Improvements

TxDOT has is finalizing plans to widen FM 2493 from south of FM 2813 to FM 346 in Flint. This should greatly increase safety and operations on this section of the corridor. It is recommended that this widening be continued through Bullard to US 69. In the short term, this planning can start and programming of funds should begin.

6.4 Safety Improvements

Four short-term options were developed and focused on the area between Grande Blvd and Three Lakes Pkwy. Three of these options were presented to the public during the second public meeting. These concepts presented in each option can be applied to other portions of the study corridor as needed. Many citizens stressed the need to lower speeds in this section of the corridor and eliminate the potential for head on crashes in the TWLTL. They also stressed that it is important to correct any driveways and streets that have a bad offset which creates a conflict for two left turning vehicles traveling in opposite direction. **Figure 18** displays a location along the corridor with this bad offset at the Chicken Express driveway near Ashmore Lane. A fourth option was created in response to comments from the TAC's review of this draft report.

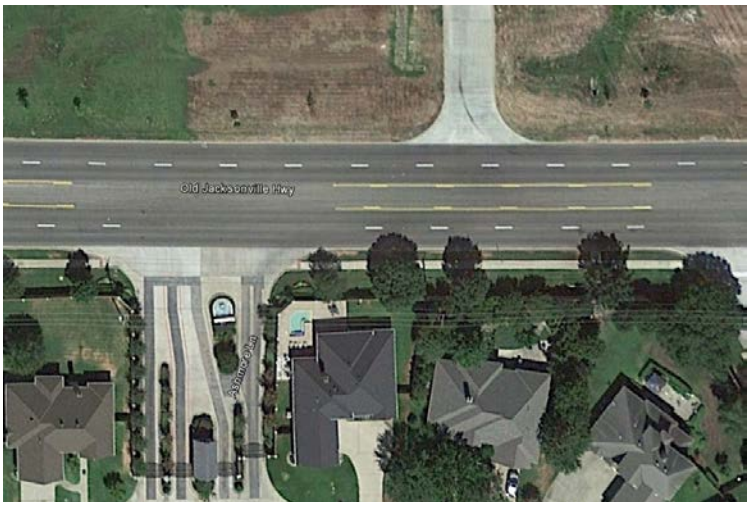


Figure 18 - Incorrect Driveway-Street Offset

The following discussion will detail the safety components of each option. All options proposed have cross access agreements with the developments where possible.

Option A

This option features medians with left turn lanes that have 675 feet of storage and a taper length of 100 feet. This corresponds with lengths of a median turn lane multilane rural highways from the TxDOT Roadway Design Manual. At 50 mph the total length of the median turn lane is 775 feet. In order to place these median turn lanes of this length, many of the drvieways and streets would become right in/right out. Right turn lanes were shown at many locations to facilitate u-turns at the median openings. This option is shown in **Figure 19**.


FUTURE DEVELOPMENT RECOMMENDATION
KENNEBUNK LANE
ACCELERATION LANE
RIGHT TURN BAY
675 FT TURN LANE
675 FT TURN LANE
TYLER MPO
SHORT TERM RECOMMENDATIONS
OPTION A
SEPTEMBER 24, 2015

This option was not viewed very favorably by the citizens due to the removal of a number of left turning movements into and out of many of the developments. This option did eliminate the bad offset at Ashmore Lane with the driveway mentioned above. This option increases mobility and safety, but greatly reduces access.

Option B

This option features medians similar to Option A, but there were assumptions made in order to give dedicated left turn lanes where appropriate. Those assumptions included a lower speed limit and greater deceleration assumptions for left turning vehicles which is allowed per the TxDOT Roadway Design Manual. Acceleration lanes are provided to allow for u-turns where needed. The Chicken Express driveway was relocated in this option in order to remove the bad offset. Safety and mobility is increased from existing condition, but access is reduced from the existing condition, although greatly improved from Option A. This option is shown in **Figure 20**.

Option C

This option features travel lane that are narrowed from 12' to 10.5'in order to split the two-way left-turn lane into two continuous left-turn lanes. This would be accomplished by with an asphalt overlay to eliminate any old lane markings. Portions of the continuous left turn bays are hatched off in order discourage drivers from using this lane to drive down the entire corridor. Rumble strips, raised pavement markers or flexible object markers can be utilized in these areas to further restrict movements that are not desired. As with option B, the Chicken Express driveway was relocated to remove the bad offset. Mobility is decreased in this option due to the narrower lanes, especially as it relates to trucks and larger vehicles. Access will be similar to existing conditions, but any safety benefits gained from removing the TWLTL may be negated due to the narrower lanes. This option is shown in **Figure 21**.

Option D

As stated previously, a fourth option was created in response to comments from the TAC's review of this report. This option is a no build scenario with minor adjustments to the shared center left turn lane. This option would be to implement delineators in the shared center left turn lane at specific locations to deter motorists from using it as an acceleration/deceleration lane. This cost effective option will not only reduce the chances of a head-on accident in this shared lane, but it could also expedite movement toward the implementation of one of the long term solutions discussed in the next chapter.

Conclusion

Although the public preferred Option C for a short-term recommendation due to the lack of medians and access restrictions, it is recommended to implement Option B which provides raised medians with shorter turn bay lengths. This option will require acceleration lanes or truck loons at median opening to provide space for u-turning vehicles where needed due to any driveways not served by median openings. An example of a truck loon is provided in **Figure 22**.

Extensive discussion and planning will be needed during the schematic phase to ensure these median openings are placed at the most optimal and logical locations. Although this option did show a midblock median break, this break could be removed since it could be confusing to drivers. It has been noted that u-turn volumes would increase at median openings and at intersections. If the future median breaks are strategically placed and driveways are relocated, consolidated and, if necessary, removed in conjunction with cross development access, these u-turns will be negligible.

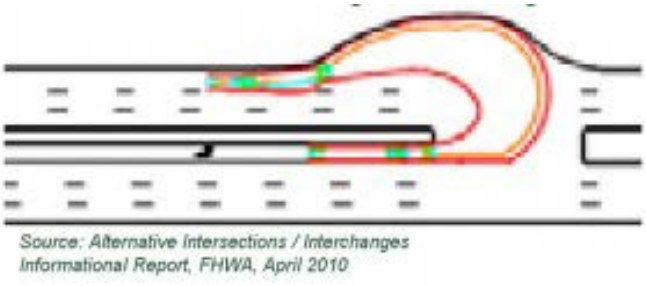


Figure 22 – Truck Loon

Option A seems to be too restrictive in terms of removing access to adjacent developments and was met with much opposition during the second public meeting. This option would greatly increase the number of u-turning vehicles at median openings and intersections which in turn would cause the need for longer storage bays.

Option C, while very cost effective and easier to implement, would present a challenge due to these narrower lanes, especially as it relates to larger vehicles and trucks. Assuming a lowering of the posted speed to 45 mph due to the narrower lanes and increased future traffic volumes, a design exception would be needed since the TxDOT Roadway Design manual states for urban facilities the minimum recommended lane width is 11' and the outside lane should be 14' to accommodate bicycles. This 14' outer lane is from the lane stripe to the gutter joint. Each gutter is 1'-6" wide which leaves a usable cross section width of 63'. Without actually widening the cross section, this option is not feasible.

The low cost Option D is a viable option that should be considered as well.

Other short-term recommendations include the following:

- Install communication system for coordination of signals along corridor
- Conduct a signal timing study to optimize signal timings and coordination
- Encourage cross access easements with developers to reduce the number of driveways
- FM 2493 be reclassified as a major arterial in the Tyler Master Street Plan
- Relocate, remove or consolidate driveways to utilize proposed median openings
- Install a traffic signal at Brookshire's Distribution Center driveway or at Capitol Drive
- Monitor other intersections for installation of future signals
- Provide dual lefts and right-turn bays as needed at intersections
- Begin to plan and program for widening of FM 2493 south of Flint
- Provide pedestrian signals, curb ramps and crosswalks at traffic signals
- Install sidewalks to fill in areas where sidewalks currently do not exist
- Improve parallel corridors to better distribute the north-south traffic in this area
- Improve current bus stops to increase usage
- Study if increased bus service (frequency and number of stops) will be beneficial and utilized

BGE

TYLER MPO

SHORT TERM RECOMMENDATIONS

OPTION B

SEPTEMBER 24, 2015


FUTURE DEVELOPMENT RECOMMENDATION
OLD JACKSONVILLE HWY
TYLER MPO
SHORT TERM RECOMMENDATIONS
OPTION C
SEPTEMBER 24, 2015

Chapter 7: Long-Term Improvements

7.1 Introduction

The existing traffic volumes were grown at a rate of 2.65% over 20 years to get the year 2035 projected traffic volumes. This growth rate was used by TxDOT for the 20 year projected growth period for the upcoming widening of Old Jacksonville north of Flint. This growth rate appears consistent with recent growth rates in the Tyler area, especially along this high growth corridor. With the increased traffic volumes, many intersections and segments of the study corridor would have a LOS D or worse. In order to accommodate the future traffic and help plan for a safer corridor, the chapter contains recommendations on roadway geometry and signal improvements.

7.2 Intersection Recommendations

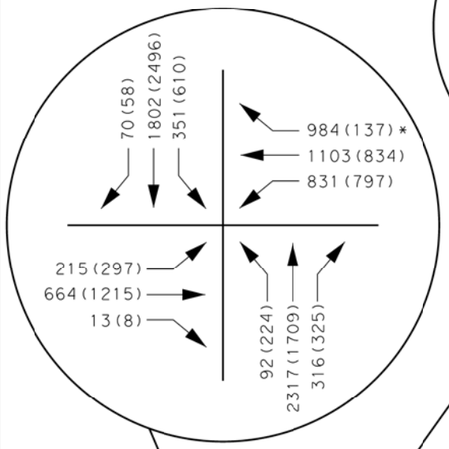
As traffic demand grows with the population over the next 20 years, the current intersections and future planned intersections will struggle to maintain a passing level of service, most will be LOS E or LOS F. **Table 8** shows the level of service and delay of signalized intersections with future volumes if no improvements were made. For a more detailed look at the LOS and delay for each signalized approach as well as the overall intersection for the future traffic conditions with the current lane configurations see **Appendix E**.

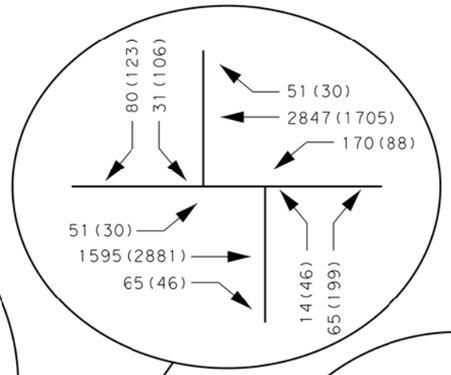
Figure 23 shows a summary of the projected 2035 turning movement counts for the AM and PM peak hours as well as the 24-hour tube count volumes and locations.

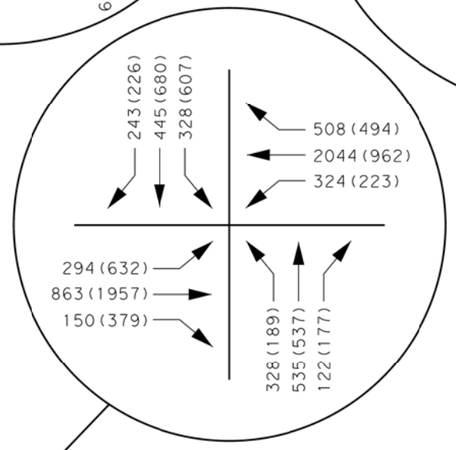
Table 8 - Future Signalized Intersection Level of Service and Delay

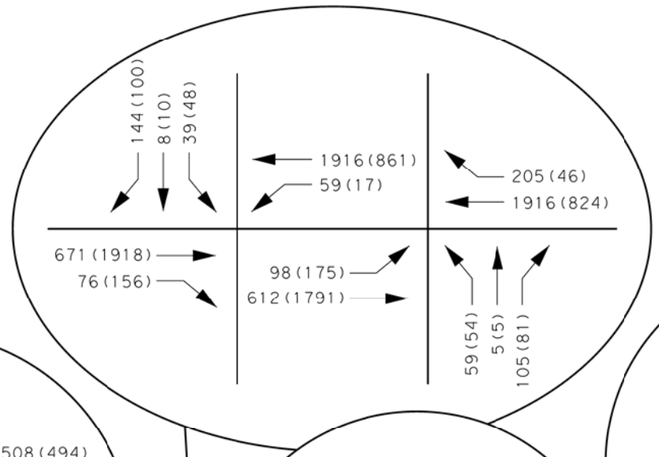
	AM Peak		PM Peak	
	LOS	Delay *(sec)*	LOS	Delay *(sec)*
SH 323	F	96.0	F	170.5
Brookshire's Distribution Center	A	5.2	B	14.3
Rice Road	C	24.5	E	65.0
Grande Blvd	F	91.3	F	234.6
Three Lakes Pkwy	C	33.3	F	103.9
Cumberland Road	C	26.1	B	19.1
Toll 49 WBFR	A	7.3	A	6.5
Toll 49 EBFR	B	13.4	A	4.6
FM 2813	E	60.0	D	44.1
FM 346	C	25.8	D	52.2
FM 344	D	40.9	E	58.6
US 69	A	8.4	A	8.7

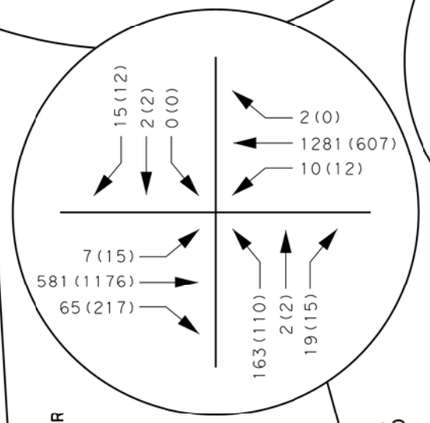
* FREE RIGHT TURNS ESTIMATED

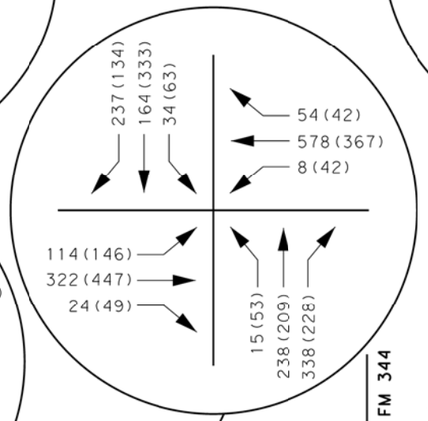


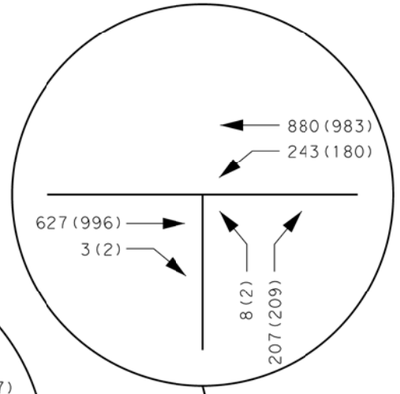


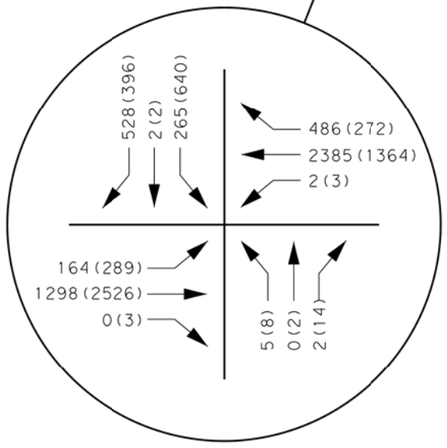


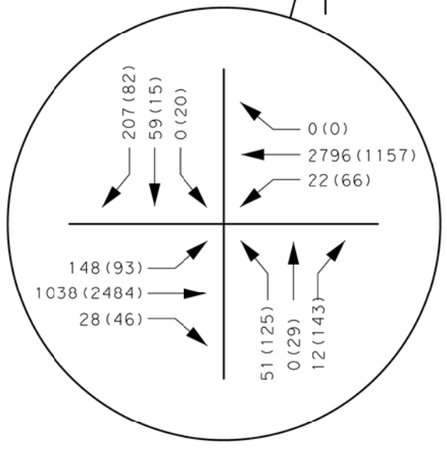


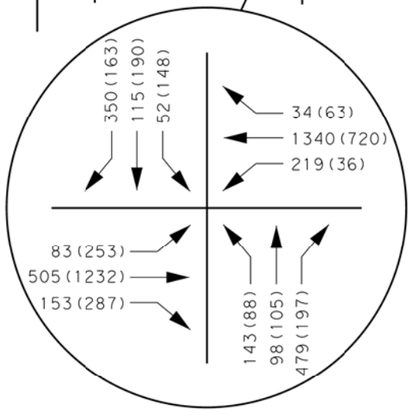


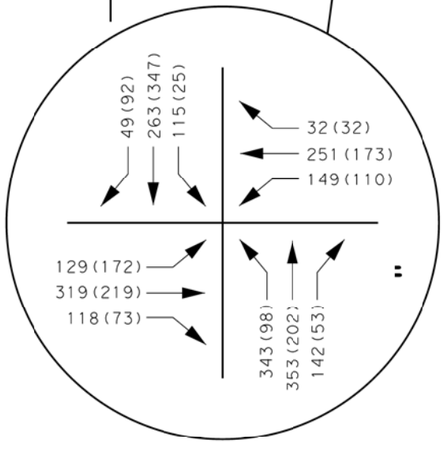












US 69 US 69

FM 344

2856

2781

5248

5045

23734

23600

22000

23165

18048

18501

15025

14538

11746

11741

LOOP 323

BROOKSHIRES

RICE RD

CAPITAL DR

W GRANDE BLVD

THREE LAKES PKWY

CUMBERLAND RD

TOLL49 WBFR

TOLL49 EBFR

FM 2493

FM 2813

CR 140

FM 346

N. T. S.

LEGEND

AM (PM) THROUGH VOLUME

AM (PM) TURNING VOLUME

24 HOUR TUBE COUNT LOCATION

NOTE:
TRAFFIC PROJECTED BASED ON 2.65% GROWTH RATE OVER 20 YEARS

Brown & Gay Engineers, Inc.
2595 Dallas Parkway, Suite 204, Frisco, TX 75034
Tel: 972-464-4800 • www.browngay.com
TBPE Registration No. F-1046

2035 PROJECTED TRAFFIC VOLUMES OLD JACKSONVILLE HIGHWAY

DATE:		
12/2015	N. T. S.	FIG. 22

Geometric changes at key intersections were accessed to increase the capacity for turning and through movements. The following are long-term geometric recommendations for major intersections along the study corridor:

Loop 323 at FM 2493

An additional lane on FM 2493 from Loop 323 to Toll 49 is discussed later in this chapter. North of Loop 323 FM 2493 drops back down into a 4-lane undivided roadway. See **Figure 24**.

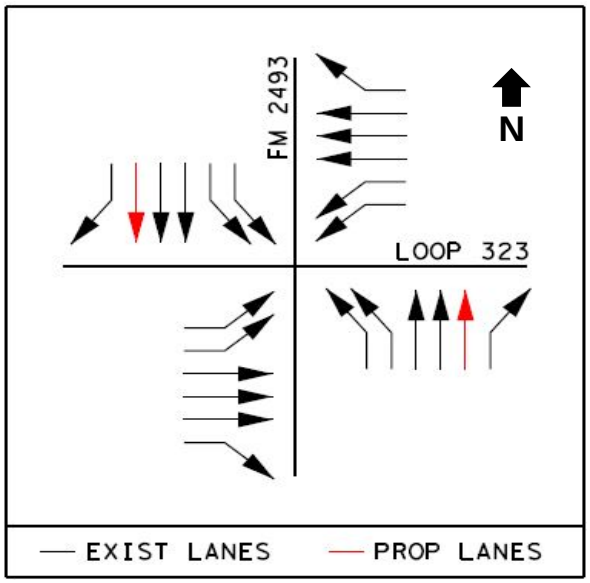


Figure 24 - Loop 323 at FM 2493

Brookshire's Distribution Center at FM 2493

As mentioned in Chapter 6, a signal at this location is recommended due to the volume of trucks and employee vehicles during shift changes. Also, a right turn bay is proposed to allow employees to have a deceleration lane when turning into the distribution center. See **Figure 25.**

As stated early, if a signal cannot be installed at this intersection, then one is recommended for Capitol Drive.

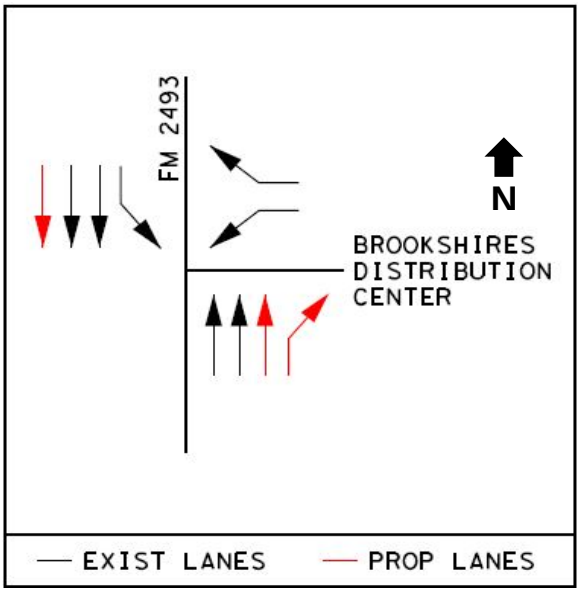


Figure 25 - Brookshire's Distribution Center at FM 2493

Rice Road at FM 2493

The west side of FM 2493 currently has a few single family homes and a driveway for Thedford Construction Co., Inc. A small commercial development was recently added on the west side also. With this addition and the possibly of future development on the west side of the intersection, traffic volumes will most likely increase. Storage for eastbound traffic on Rice Road is limited due to Steel Road being about 110 feet from FM 2493, therefore dedicated turn bays are needed. Realignment of Rice Road to be perpendicular to FM 2493 will allow left turning movements to run concurrently and the split phasing can be removed. See **Figure 2.**

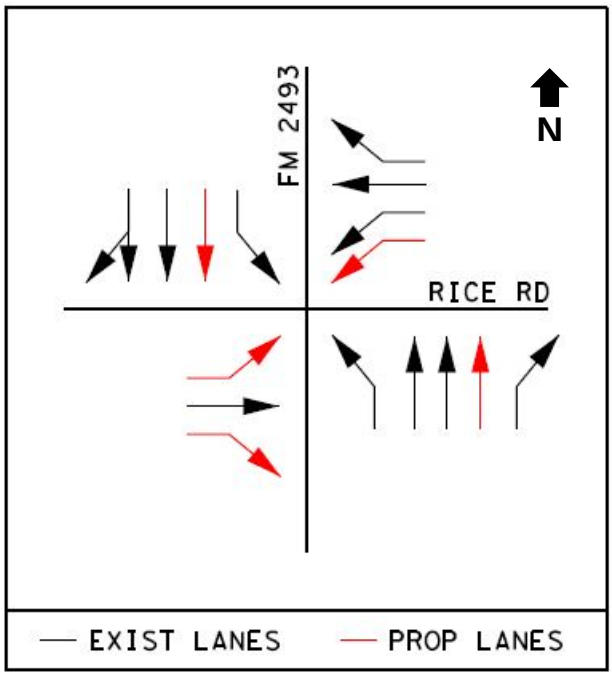


Figure 26 - Rice Road at FM 2493

Grande Boulevard at FM 2493

Additional turning lanes are needed at this very busy intersection. A new Walmart is planned just north of this intersection which will increase traffic at this intersection.

Turning movements are heavy, therefore having dual left turns and right turn bays for each approach will be warranted and will help decrease delays. This will still function at a LOS D even with these geometric improvements. An alternative configuration with an overpass is accessed later in this chapter. See **Figure 27.**

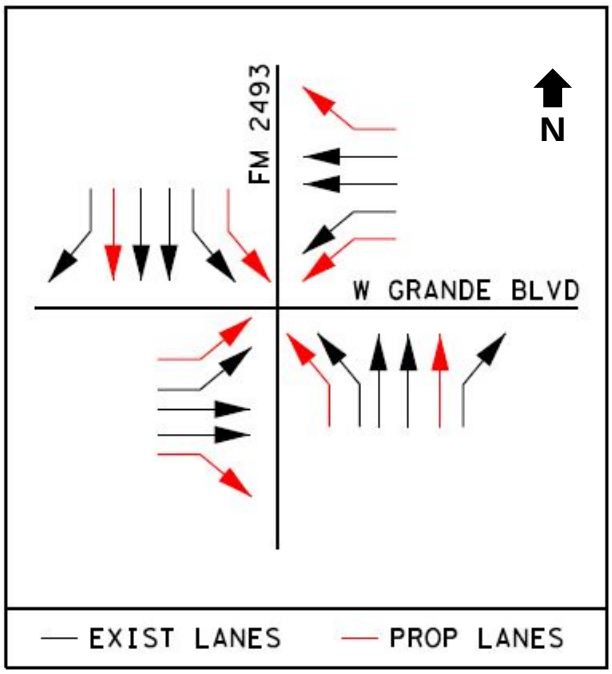


Figure 27 - Grande Boulevard at FM 2493

Three Lakes Parkway at FM 2493

Recently a middle school was built on Three Lake Parkway west of FM 2493. Dedicated turn bays are recommended on the eastbound approach of Three Lake Parkway. See **Figure 28.**

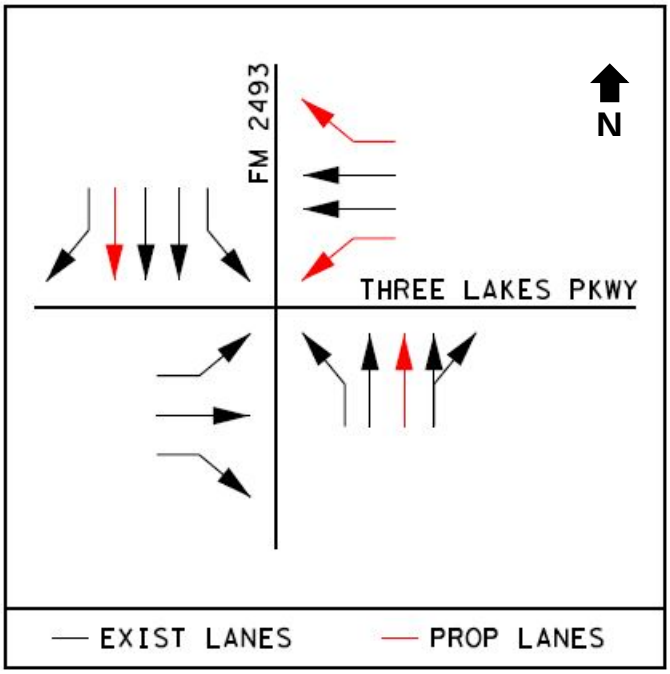


Figure 28 - Three Lakes Parkway at FM 2493

Cumberland Road at FM 2493

Cumberland Road is under construction. Currently the plans show that the westbound approach to have a through movement with the right most lane becoming a right only as well a left turn bay on this approach. A through right movement is recommended for the right most lane. Capacity for the through movement on FM 2493 is recommended with the addition of right turn bays to allow motorists to decelerate out of the traveled lanes. See **Figure 29.**

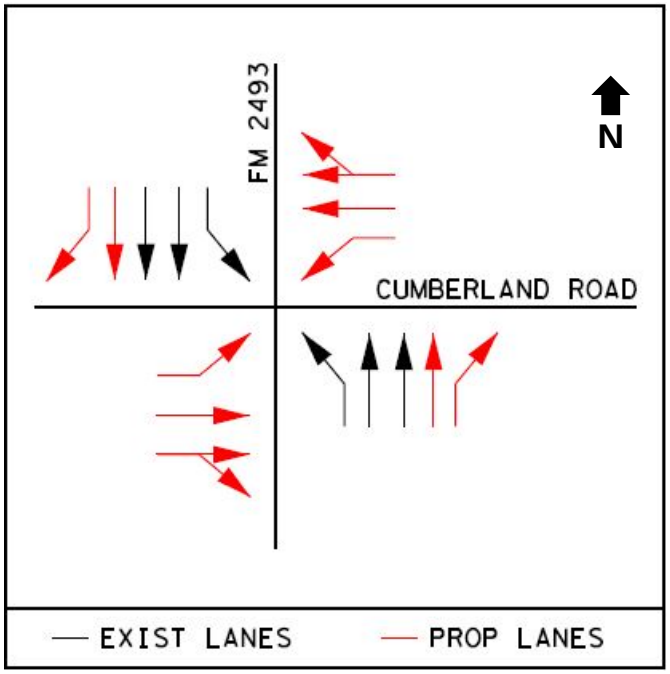


Figure 29 - Cumberland Road at FM 2493

Toll 49 at FM 2493

Right turn bays on every approach are recommended to allow motorists to decelerate out of the traveled lanes. See **Figure 30.**

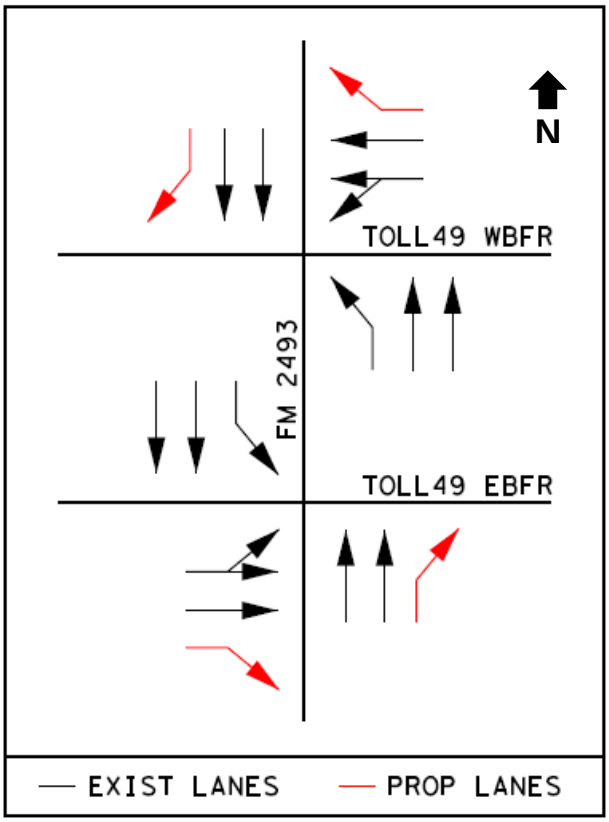


Figure 30 - Toll 49 at FM 2493

FM 2813 at FM 2493

Right turn bays are recommended on FM 2493 at FM 2813 in Gresham. See **Figure 31.**

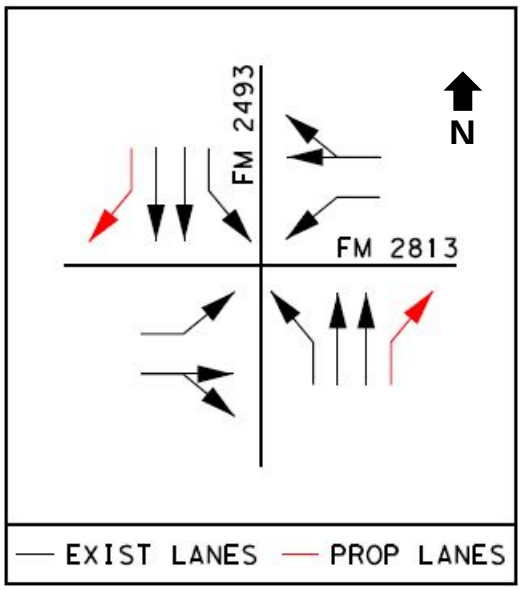


Figure 31 - FM 2813 at FM 2493

FM 346 at FM 2493

This intersection will definitely need to be signalized in the future. Turning movement storage is needed on all approaches. Recommend left and right turn bays on FM 346. FM 2493 will need a left turn bay on both approaches. See **Figure 32.**

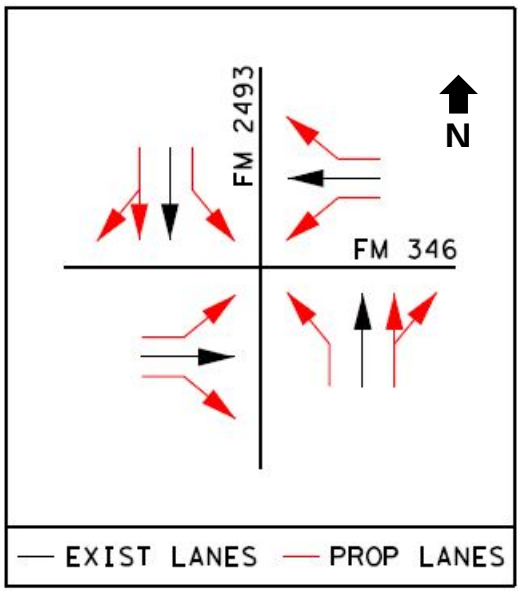


Figure 32 - FM 346 at FM 2493

FM 344 at FM 2493

This intersection will definitely need to be signalized in the future. Turning movement storage is needed on all approaches. Recommend left and right turn bays on FM 344. FM 2493 will need a left turn bay on both approaches. See **Figure 333.**

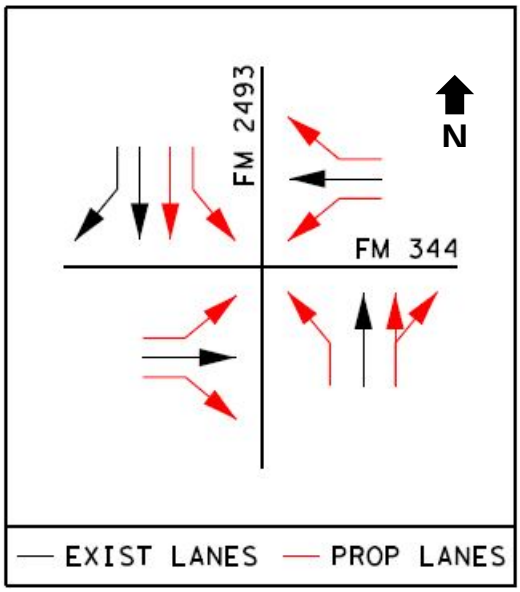


Figure 33 - FM 344 at FM 2493

US 69 at FM 2493

The recommendations for this intersection are a southbound right turn lane onto FM 2493 and a dedicated right turn acceleration lane onto southbound US 69 from FM 2493. See **Figure 34.**

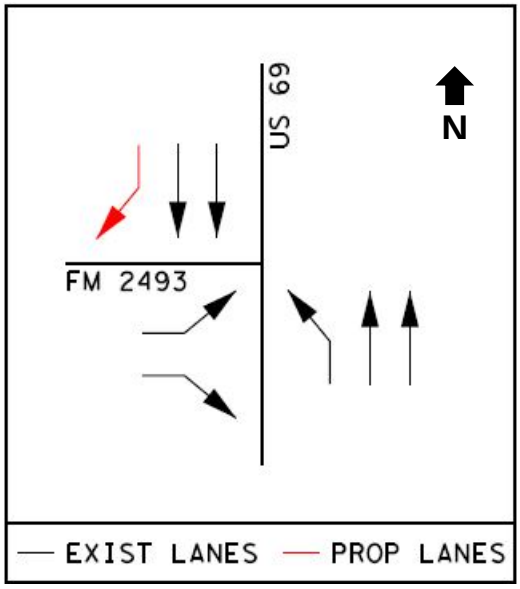


Figure 34 - US 69 at FM 2493

Table 9 gives an overview of the LOS for each overall intersection as well as the delay in seconds for AM and PM periods for future build and no build conditions. For a more detailed look at the LOS and delay for each signalized approach as well as the overall intersection for the future traffic volumes with intersection improvements, see **Appendix F**.

Table 9 - Future Intersection Level of Service and Delay with Recommended Intersection Improvements

	AM Peak		PM Peak	
	LOS	**Delay *(sec)***	**LOS**	**Delay *(sec)***
Loop 323	**F**	**81.5**	**F**	**130.7**
Brookshire's Grocery Distribution Center	**A**	**4.2**	**A**	**7.4**
Rice Road	**C**	**30.6**	**C**	**32.6**
Grande Blvd	**C**	**32.1**	**C**	**27.3**
Three Lakes Pkwy	**C**	**20.5**	**C**	**30.7**
Cumberland Road	**C**	**24.0**	**B**	**16.2**
Toll 49 WBFR	**B**	**10.1**	**A**	**9.9**
Toll 49 EBFR	**B**	**16.2**	**A**	**6.1**
FM 2813	**D**	**51.7**	**D**	**41.0**
FM 346	**B**	**14.7**	**B**	**19.1**
FM 344	**C**	**30.0**	**C**	**28.6**
US 69	**A**	**7.7**	**A**	**8.7**

Another geometric improvement analyzed is a grade separation along FM 2493. The two intersections that would benefit most from a grade separation are Loop 323 and Grande Blvd. Loop 323 would most likely be a difficult location to build a grade separation, but not impossible. There appears to be enough right-of-way on Loop 323, but the numerous commercial developments near this intersection may have an issue with a bridge that affects their direct access. A grade separation at Grande may be more suitable since there is less development in this area. The grade separated road would most likely have to be Grande Blvd since nearby large power distribution lines just south of the intersection would not allow FM 2493 to get under these power lines quick enough after going over Grande Blvd. This concept would allow more signal green time to be dedicated to the FM 2493 movements since the thru movements on Grande are practically eliminated. Grande Blvd. would have to be split phased though with dual left turn lanes. **Figure 35** shows this overpass concept.

7.3 Signalization

Signalization of traffic signals at warranted intersections will also help to relieve some of this congestion and delay. The list of future potential traffic signals include the following:

- Brookshire Grocery Distribution Center Driveway or Capitol Drive
- Toll 49 (diamond intersection)
- FM 346
- FM 344
- Panther Crossing/Sanders Street

Some of these intersections currently meet warrants as mentioned early in this report. It is recommended that these intersections continue to be observed and evaluated for future signalization as volumes and delays increase, and as funding becomes available. During some of the public meetings, citizens inquired about the possibility of installing a traffic signal at locations such as at Elkton Trail or Oakhill Blvd. Signals with spacing less than one-half mile spacing do not provide an opportunity for coordinated signal progression at a reasonable speed (40-45 mph) while keeping through traffic moving within a platoon.

7.4 Corridor Recommendations

The current number of lanes will result in high levels of congestion and higher delays when considering the future traffic volumes from **Figure 22**. A majority of the corridor averages a failing level of service in the future without any geometric improvements. **Table 10** shows the corridor level of service with no geometric improvements. An additional lane would help alleviate this future congestion and facilitate traffic flow along the corridor. Based on future projected volumes, it is recommended that the segment of FM 2493 from Loop 323 to Toll 49 be widened to six lanes. This segment will have over 30,000 vehicles per day (vpd) and will also meet TxDOT's illumination warrant for continuous lighting in the future. The segment of FM 2493 south of Toll 49 is recommended to have 4 lanes all the way to US 69. This section should have safety lighting at major intersections given the volumes that are projected to be less than 30,000 vpd. The detailed HCS analysis for future conditions with no geometric improvements can be found in **Appendix H**.

$DATE$ $TIME$

$FILE$

LEGEND

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PAVEMENT REMOVAL
- PROPOSED MEDIAN
- PROPOSED SIDEWALK
- PROPOSED SHARED ACCESS
- PROPOSED UTURN LANE
- BRIDGE COLUMNS

HORIZONTAL

160 0 80 160

SCALE IN FEET

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LONG TERM RECOMMENDATIONS

OLD JACKSONVILLE HWY AT GRANDE BLVD

OVERPASS ALTERNATIVE

SCALE: 1" = 80'

Table 10 - Future Corridor Level of Service with no Widening

Segment	Future LOS		
	North	South	
Loop 323 – Rice Road	D	E	4 Lanes
Rice Road – Grande Blvd	E	E	
Grande Blvd – Three Lakes Pkwy	E	D	
Three Lakes Pkwy – Cumberland Road	E	D	
Cumberland Road – Toll 49	D	D	
Toll 49 – FM 2813	D	C	
FM 2813 – FM 346	F	E	2 Lanes
FM 346 – FM 344	E	D	
FM 344 – US 69	E	D	

Widening of FM 2493 to the west will incorporate the use of existing TxDOT right-of-way. Given the available abandoned railroad corridor adjacent to the existing FM 2493 right-of-way, allows for ample room to widen FM 2493 and still have room for a significant hike and bike trail.

As mentioned in Chapter 6, it is important to consolidate and reduce driveways to reduce the number of access points. For the section from Toll 49 to Cumberland Road there are close to 60 driveways per mile. From the composite crash rate indices (**Figure 12**), there is a about a 40% increase in crashes compared to having just 10 driveways per mile.

Similar to the short term recommendations, three options were presented to the public that focused on the study corridor from Grande Blvd to Three Lakes Parkway. As stated before all option assume some sort of cross access within parking lots where ever possible. The three options presented are as follows:

Option A

This option features a widening to 6 lanes with a raised median. Assumptions were made in order to give dedicated left turn lanes where appropriate. Those assumptions included a slower speed limit and greater deceleration assumptions for left turning vehicles per the TxDOT Roadway Design Manual. Right turn lanes were provided were it is assumed right turn volumes warrant their construction. The Chicken Express driveway bad offset has been mitigated in this option since there is a raised median to remove the head-on collision potential. Safety and mobility is greatly increased from existing condition, but access is reduced slightly from the existing condition. This option is shown in **Figure** 20**36**.

Option B

This option features a widening to 6 lanes but without a raised median. The center shared left turn lane is still used in this option. Right turn lanes were provided were it is assumed right turn volumes warrant their construction. The Chicken Express driveway bad offset has been mitigated in this option with the

LEGEND

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PAVEMENT REMOVAL
- PROPOSED MEDIAN
- FUTURE TRAIL
- SHARED ACCESS

HORIZONTAL

50 0 50 100

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LONG TERM RECOMMENDATIONS

OPTION A CORRIDOR EXAMPLE

SCALE: 1" = 50'

relocation of this driveway. Mobility is greatly increased from the existing condition, but safety most likely would be reduced from the existing condition. This option is shown in **Figure 207**.

Option C

This option does not feature a roadway widening to 6 lanes, but instead provides backage roads similar to frontage roads in order to reduce the number of access points on the main lanes of FM 2493. This option does not have a raised center median and still uses the center shared left turn lane. Instead, a median is provided on the outside to separate much of the turning traffic from the main through lanes. This creates entry and exit points along the corridor similar to on- and off-ramps of a freeway. These backage roads and entry/exit points would have to be designed to maintain emergency vehicle and small delivery truck access. These backage roads would not cross any cross streets since that would lead to driver confusion with two very closely spaced intersections on the cross street. This geometric configuration is not common and could lead to driver confusion. Numerous destination signs may be needed to alert drivers to turn into an exit point earlier that they may expect to. Mobility would most likely not be changed, access would be reduced, but safety most likely would be improved from the existing condition. This option is shown in **Figure 38**.

7.5 Bullard Segment Recommendations

FM 344, the major east west connecting street for the FM 2493 corridor in the heart of the downtown area of the rural community of Bullard is located on a rural section the study corridor. Both corridors, FM 2493 and FM 344, through the heart of Bullard are described in Bullard's 2030 Comprehensive Plan as 'Primary Image' corridors. The comprehensive plan describes image corridors as providing 'aesthetic improvements in the highway right-of-way' with 'close coordination with TxDOT in order to provide enhancements that create distinctive eye pleasing infrastructure and streetscapes. Given the distinctive suburban character of the FM 2493 corridor through the City of Bullard it is appropriate to provide FM 2493 corridor and intersections that fit the character and land use along the stretch. This study recommends a long range plan of providing a four lane urban curb and gutter TxDOT design facility with a 50 mph design speed and a minimum of a 21' wide raised median. A 21' raised median provides space for left turn lanes at intersections to include 15' turn lanes and the minimum 5' refuge island for pedestrian movements across the intersection.

Recommendations for FM 2493 for Bullard include a curb and gutter section that begin near the north city limits of Bullard in the vicinity of County Road 155. Left turn bays will be necessary at several locations including Brook Hill School, Courtney and Lynch Drives, at FM 344, Tyler Street and Panther Crossing. Additional openings necessary will include at the Bullard High School, and CR 3801 as well as several other mid-block openings to be determined later during schematic development.

The intersection of FM 2493 and FM 344 should be a signalized intersection with north/south movements having two through lanes and dedicated left turn lanes. The southbound movement will have a dedicated right turn lane headed westbound along FM 344. The intersections east/west bound movements along FM 344 will have single lanes through with dedicated left turn and right lanes in each direction for a total of a three lane approach in each direction.

LEGEND

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PAVEMENT REMOVAL
- PROPOSED MEDIAN
- FUTURE TRAIL
- SHARED ACCESS

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LONG TERM RECOMMENDATIONS

OPTION B CORRIDOR EXAMPLE

SCALE: 1" = 50'


OLD JACKSONVILLE HWY
FRESH
CENTRAL TITLE
MERRILL LYNCH
CHICKEN EXPRESS
STATE FARM
HOLLYHILL SHOPPING
CAVALRY BAPTIST CHURCH
STATE BAPTIST CHURCH
CHURCH
SHARED ACCESS
LEGEND
EXISTING PAVEMENT
PROPOSED PAVEMENT
PAVEMENT REMOVAL
PROPOSED MEDIAN
FUTURE TRAIL
SHARED ACCESS
LONG TERM RECOMMENDATIONS
OPTION C
CORRIDOR EXAMPLE
SCALE: 1" = 50'

The intersection of FM 2493 and Tyler Street should be a non-signalized intersection with stop controls along Tyler Street and dedicated left turn lanes along FM 2493. Tyler Street cross-section to include single through and left turn combined lanes with dedicated right turns in each direction. Tyler Street is a north/south corridor in Bullard that provides parallel access with FM 344 and also provides direct access to US 69. The FM 344 and Tyler Street recommendations are shown in **Figure 39**.

The existing unsignalized intersection of FM 2493 and Panther Crossing/Sanders Street is a major intersection of north/south traffic accessing all of the Bullard School District campuses and athletic facilities. Morning and afternoon school peak hour traffic volumes may warrant a traffic signal at this location in the future. Sanders Street to the north also provides the most direct access for traffic south of Tyler Street to access US 69. Most traffic northbound on FM 2493 intending to access US 69 will turn right and proceed northeast along Sanders Street. School district growth along with widening of FM 2493 will support this intersection being signalized. Currently, Sanders Street to the north intersects FM 2493 slightly to the north of Panther Crossing. Additionally, the Sanders Street approach to FM 2493 is at a severe angle. The long term solution for this intersection will require the re-alignment of Sanders Street to the South slightly and to provide for a near 90 degree approach to FM 2493. Similarly, slight re-aligning of Panther Crossing to then align with Sanders will create an effective solution to this congested intersection. Lane assignments along the proposed FM 2493 at this intersection will include dedicated left and right turn lanes with the two through lanes in each direction.

Raised median openings will be provided each of the entrance/exits for the Bullard High School. The North entrance to the High School median opening will allow for both left and right turns into the campus. The south entrance being an exit only drive will have a median opening providing for only left turn movements exiting the campus to the north in either single or dual left turn movements. The recommendations for Panther Crossing and the Bullard High School driveways is shown in **Figure 40**.

Continuing the raised median cross-section approach throughout the remaining section of FM 2493 from the Bullard High School to the intersection of FM 2493 and US 69 provides for continuity and safety along the urban corridor. Locations of median openings can be identified at schematic level with interim development and planning conducted consistent with the knowledge of the future raised median corridor.

7.5 Conclusion

Due to safety concerns the widening and raised medians shown in Option A are recommended due to the growing development on the northern segment. The roadway design manual states that roadways with a non-traversable median have an average crash rate about 30 percent less that roadways with a two-way-left-turn-lane. Driveways would need to be consolidated and aligned to prevent improper offsets.

The road widening and other proposed improvements improve the level of service for the FM 2493 corridor. The corridor LOS for future conditions with widening and other improvements are shown in **Table 11**. The detailed HCS analysis for future conditions with geometric improvements can be found in **Appendix I**.

$FILES$

$DATE$ $TIME$

LEGEND

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PAVEMENT REMOVAL
- PROPOSED MEDIAN
- PROPOSED SIDEWALK

HORIZONTAL
80 0 80 160
SCALE IN FEET

ENGINEERING

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LONG TERM RECOMMENDATIONS

OLD JACKSONVILLE HWY AT FM 344 & TYLER ST

SCALE: 1" = 80'

$FILES$

$FILES$

$DATE$ $TIME$

LEGEND

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PAVEMENT REMOVAL
- PROPOSED MEDIAN
- PROPOSED SIDEWALK

HORIZONTAL
80 0 80 160
SCALE IN FEET

CW ENGINEERING

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LONG TERM RECOMMENDATIONS

OLD JACKSONVILLE HWY AT BULLARD HIGH SCHOOL

SCALE: 1" = 80'

$FILES$

Table 11 - Future Corridor Level of Service with Widened Corridor

Segment	Future widened LOS		
	North	South	
Loop 323 - Rice Road	B	C	6 Lanes
Rice Road – Grande Blvd	C	C	
Grande Blvd - Three Lakes Pkwy	C	C	
Three Lakes Pkwy - Cumberland Road	C	C	
Cumberland Road - Toll 49	C	C	
Toll 49 - FM 2813	D	C	
FM 2813 - FM 346	C	A	4 Lanes
FM 346 - FM 344	A	A	
FM 344 - US 69	A	A	

Other long term recommendations include the following:

- Widen FM 2493 to 6 lanes north of Toll 49, widen to 4 lanes south of Toll 49
- Install raised medians
- Coordinate median openings with developers to maximize access along the corridor
- Add turn bays and other lanes at intersections as recommended
- Continue to encourage cross access easements with developers to reduce the number of driveways
- Continue to relocate, remove or consolidate driveways to utilize median openings
- Continue to periodically conduct a signal timing study to optimize signal timings and coordination
- Continue to monitor intersections for installation of future signals
- Provide pedestrian signals, curb ramps and crosswalks at future traffic signals
- Continue to install sidewalks as areas are widened and developed
- Continue to improve parallel corridors to better distribute the north-south traffic in this area

Appendix A: Turning Movement Counts

Appendix B: 24-Hour Traffic Counts

Appendix C: Travel Time Data

Appendix D: Existing (Optimized) Synchro Analysis

Appendix E: Future Synchro Analysis

Appendix F: Future (Widened) Synchro Analysis

Appendix G: Existing Corridor HCS Analysis

Appendix H: Future Corridor Analysis

Appendix I: Future (Widened) Corridor Analysis