

EXHIBIT A



MEMORANDUM

To: Traffic Study Files

From: Lee Austin, P.E.
Area Engineer
Austin Transportation Department



12/22/2021

Date:

Subject: Speed Zone Investigation

Location: East Yager Lane – Tech Ridge Boulevard to Parmer Lane

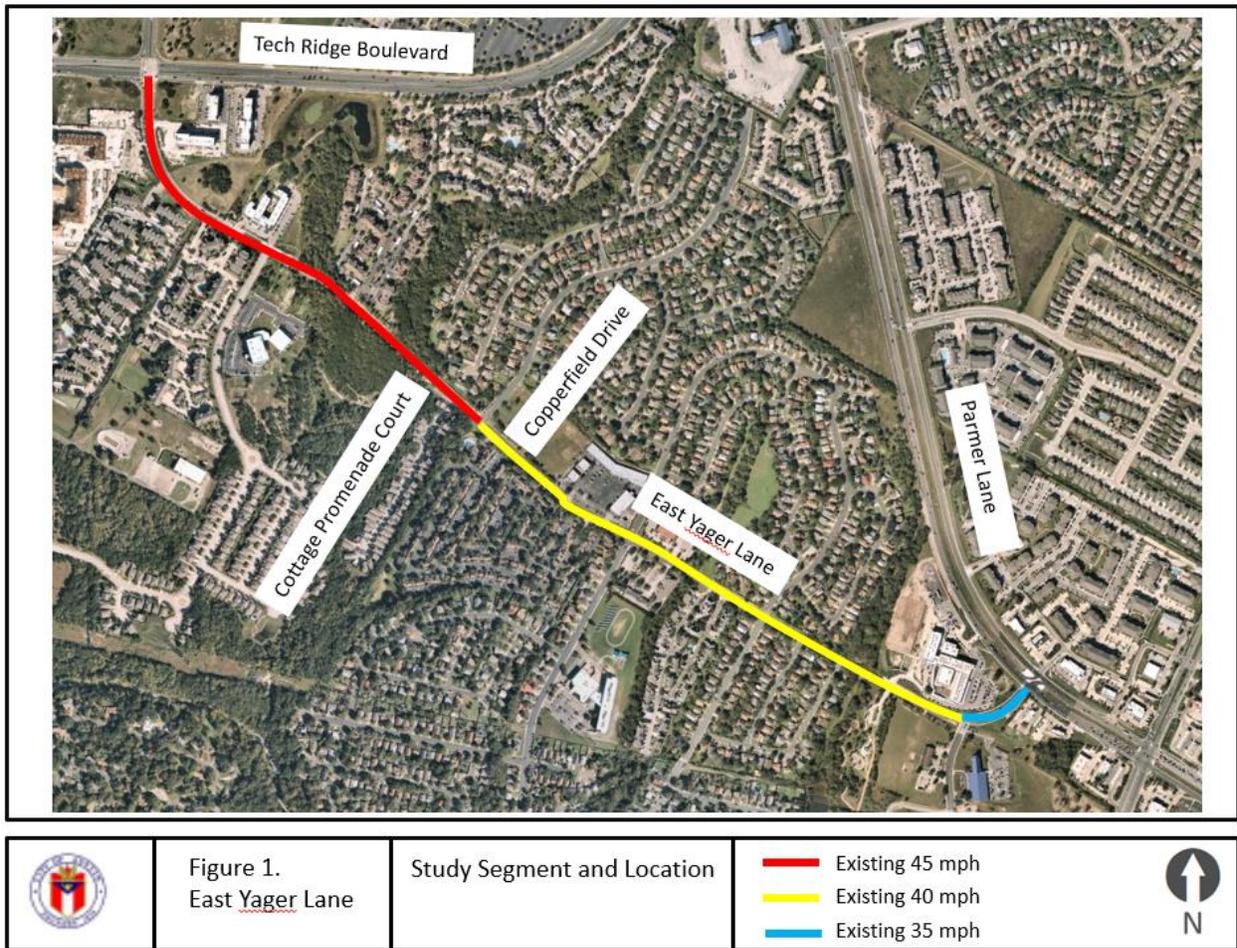
Year(s) of Previous Investigation: 2014

A speed zone investigation has been conducted by the Austin Transportation Department to recommend an appropriate speed limit on East Yager Lane from Tech Ridge Boulevard to Parmer Lane (the study segment). Figure 1 at the end of this document presents a map of the study area with existing and proposed speed limits along the study segment. Staff previously studied this section of East Yager Lane in 2014 but the data collected did not support a recommendation to reduce the speed limit at the time.

Location Conditions

East Yager Lane is a two-lane undivided neighborhood collector road that runs in a general east/west direction for a length of approximately 1.4 miles along the study segment. The majority of the East Yager Lane has a 34-foot-wide cross section with unprotected bicycle lanes in both directions; however, East Yager Lane widens to 72 feet where it intersects with Tech Ridge Boulevard to provide additional turn lanes. Sidewalks are absent for a majority of the study segment except where the roadway widens near Tech Ridge Boulevard. Nine city streets and 16 driveways intersect this segment of East Yager Lane. Adjacent land use along the study segment is mostly residential with a small shopping center in the middle of the study segment and three churches along the study segment. A charter school has recently been built at the intersection with Parmer Lane. A 45 mph speed limit sign had been posted for the eastbound direction near Tech Ridge Boulevard but appears to have been removed with the replacement of a street light. A 40 mph speed limit sign is posted near Copperfield Drive for the eastbound direction where the speed limit changes and, similarly, a 45 mph speed limit sign for the westbound direction is posted to the west of Copperfield Drive. A 40 mph speed limit sign for the westbound direction

near Parmer Lane appears to have been removed since the completion of the charter school construction. Figure 1 presents the study segment and the surrounding street network.



Traffic Data

Speed and volume data were collected during the spring and fall of 2021 to determine the appropriate posted speed limit for the study segment. While data collection occurred during pandemic conditions, the volume data was comparable to data collected in 2014 while the speed data was lower than data collected in 2014.

Block Number	Location	Posted Speed Limit	85 th Percentile Speed		Daily Traffic Volumes
			EB	WB	
600	East of Natures Bend	45	45.1	48.8	12,901
1000	West of Thompkins Drive	40	47.1	42	11,431
1500	East of Branston Drive	40	39.5	40.4	4,530

Crash Data

Austin Police Department's crash database was reviewed to analyze documented crashes along the study segment within the past eighteen months. Fourteen crashes were documented during this period; no discernible pattern from excessive speed is present.

Date / Time	Direction		Weather	Light	Road	Injury	Comments
	At Fault	Other					
11/16/2021 5:10pm	EB	EB	Clear	Daylight	Dry	None	Failed to maintain assured distance – rear end
11/10/2021 8:01am	WB	WB	Clear	Daylight	Dry	Incapacitating	Failed to maintain assured distance – rear end
10/02/2021 4:16pm	WB	SB	Clear	Daylight	Dry	Minor	Ped attempting to cross Yager Ln struck by WB vehicle
7/09/2021 3:26pm	EB	SB	Cloudy	Daylight	Dry	None	Failed to yield right of way making a left turn
03/23/2021 6:15pm	SB	EB	Clear	Daylight	Dry	None	Failed to yield right of way making a left turn
01/22/2021 10:22pm	EB	WB	Clear	Dark, Lighted	Dry	Minor	Continued straight in right turn lane and struck vehicle waiting to exit driveway
12/17/2020 7:43am	SB	SB	Clear	Daylight	Dry	Possible Injury	Changed lane when unsafe
12/8/2020 8:12am	WB	EB	Clear	Daylight	Dry	Possible Injury	Driving on wrong side, DWI
11/15/2020 3:52am	EB	EB	Clear	Dark, Lighted	Dry	None	Failed to maintain assured distance – rear end
11/08/2020 4:24pm	WB	Parked	Clear	Daylight	Dry	None	Evasive action – struck parked vehicle on private property
11/07/2020 1:02am	NB	EB	Clear	Dark	Dry	Possible Injury	Disregard Stop Sign
11/07/2020 2:10pm	NB	WB	Clear	Daylight	Dry	Minor	Failed to yield right of way making a left turn
10/24/2020 2:18pm	WB	EB	Cloudy	Daylight	Dry	Possible Injury	Failed to yield right of way making a left turn
10/21/2020 7:30pm	NB	NB	UNK	UNK	UNK	Possible Injury	Rear end – Left scene

Analysis

The analysis of the speed data indicates that the 85th percentile speed along East Yager Lane is between 39.5 mph and 48.8 mph from Tech Ridge Boulevard to Parmer Lane. Staff followed the procedures specified in the Texas Procedures for Establishing Speed Zones, 2006, which takes into consideration the 85th percentile speed. In this investigation, staff also employed USLIMITS2, a tool provided by the Federal Highway Administration designed to help practitioners set reasonable, safe, and consistent speed limits for specific segments of roads. USLIMITS2 takes into consideration the 85th percentile speed and other factors such as the 50th percentile speed, annual average daily traffic, roadway characteristics and geometric conditions, level of development in the area around the road, crash and injury rates, presence of on-street parking, and extent of ped/bike activity, as well as several others depending on the road type. The study segment was split into two segments for this analysis. A 40 mph speed limit was recommended by the USLIMITS2 tool utilizing data particular to the segment between Tech Ridge Boulevard and Cottage Promenade Court. A 35 mph speed limit was recommended by the USLIMITS2 tool utilizing data particular to the segment between Cottage Promenade Court to Parmer Lane.

Recommendation

Based on the analysis of this information, it is my engineering judgement that the speed limit on East Yager Lane from Tech Ridge Boulevard to 200 feet west of Cottage Promenade Court should be established at **40 mph**. The speed limit on East Yager Lane from 200 feet west of Cottage Promenade Court to Parmer Lane should be established at **35 mph**. Figure 2 presents the recommended speed limits in the study segment.



	<p>Figure 2. East <u>Yager Lane</u></p>	<p>Proposed Speed Limit</p>	<p> Proposed 40 mph Proposed 35 mph</p>	
--	---	-----------------------------	---	--

USLIMITS2 Speed Zoning Report

Project Overview

Project Name: East Yager Lane Btw Tech Ridge and Cottage Promenade Court

Analyst: Ravi

Date: 2021-11-17

Basic Project Information

Route Name: East Yager Lane Btw Tech Ridge and Cottage Promenade Court
From: Tech Ridge
To: Cottage Promenade Court
State: Texas
County: Travis County
City: Austin city
Route Type: Road Section in Developed Area
Route Status: Existing

Crash Data Information

Crash Data Years: 5.00
Crash AADT: 11431 veh/day
Total Number of Crashes: 26
Total Number of Injury Crashes: 5
Section Crash Rate: 215 per 100 MVM
Section Injury Crash Rate: 41 per 100 MVM
Crash Rate Average for Similar Roads: 297
Injury Rate Average for Similar Roads: 86

Roadway Information

Section Length: .58 mile(s)
Statutory Speed Limit: 45 mph
Existing Speed Limit: 45 mph
Adverse Alignment: No
One-Way Street: No
Divided/Undivided: Undivided
Number of Through Lanes: 2
Area Type: Residential-Collector/Arterial
Number of Driveways: 7
Number of Signals: 0

Traffic Information

85th Percentile Speed: 47 mph
50th Percentile Speed: 42 mph
AADT: 11431 veh/day
On Street Parking and Usage: Not High
Pedestrian / Bicyclist Activity: High

Recommended Speed Limit:



Note: The road section is in an area with high pedestrian or bicycle activity. Consider implementing engineering measures to reduce speeds before lowering the recommended speed limit. See [Engineering Countermeasures for Speed Management](#) and [PedSafe](#) for more guidance.

Disclaimer: The U.S. Government assumes no liability for the use of the information contained in this report. This report does not constitute a standard, specification, or regulation.

Equations Used in the Crash Data Calculations

Exposure (M)

$$M = (\text{Section AADT} * 365 * \text{Section Length} * \text{Duration of Crash Data}) / (100000000)$$
$$M = (11431 * 365 * .58 * 5.00) / (100000000)$$
$$M = 0.1210$$

Crash Rate (Rc)

$$Rc = (\text{Section Crash Average} * 100000000) / (\text{Section AADT} * 365 * \text{Section Length})$$
$$Rc = (5.20 * 100000000) / (11431 * 365 * .58)$$
$$Rc = 214.88 \text{ crashes per 100 MVM}$$

Injury Rate (Ri)

$$Ri = (\text{Section Injury Crash Average} * 100000000) / (\text{Section AADT} * 365 * \text{Section Length})$$
$$Ri = (1.00 * 100000000) / (11431 * 365 * .58)$$
$$Ri = 41.32 \text{ injuries per 100 MVM}$$

Critical Crash Rate (Cc)

$$Cc = \text{Crash Average of Similar Sections} + 1.645 * (\text{Crash Average of Similar Sections} / \text{Exposure})^{(1/2)} + (1 / (2 * \text{Exposure}))$$
$$Cc = 297.07 + 1.645 * (297.07 / 0.1210)^{(1/2)} + (1 / (2 * 0.1210))$$

$$Cc = 382.71 \text{ crashes per 100 MVM}$$

Critical Injury Rate (Ic)

$$Ic = \text{Injury Crash Average of Similar Sections} + 1.645 * (\text{Injury Crash Average of Similar Sections} / \text{Exposure})^{(1/2)} + (1 / (2 * \text{Exposure}))$$
$$Ic = 86.34 + 1.645 * (86.34 / 0.1210)^{(1/2)} + (1 / (2 * 0.1210))$$
$$Ic = 134.42 \text{ injuries per 100 MVM}$$

USLIMITS2 Speed Zoning Report

Project Overview

Project Name: East Yager Lane Btw Cottage Promenade Court and Parmer Lane

Analyst: Ravi

Date: 2021-11-18

Basic Project Information

Route Name: East Yager Lane btw Cottage Promenade Court and Parmer Lane
From: Parmer
To: Cottage Promenade Court
State: Texas
County: Travis County
City: Austin city
Route Type: Road Section in Developed Area
Route Status: Existing

Crash Data Information

Crash Data Years: 5.00
Crash AADT: 11431 veh/day
Total Number of Crashes: 80
Total Number of Injury Crashes: 13
Section Crash Rate: 468 per 100 MVM
Section Injury Crash Rate: 76 per 100 MVM
Crash Rate Average for Similar Roads: 297
Injury Rate Average for Similar Roads: 86

Roadway Information

Section Length: .82 mile(s)
Statutory Speed Limit: 40 mph
Existing Speed Limit: 40 mph
Adverse Alignment: No
One-Way Street: No
Divided/Undivided: Undivided
Number of Through Lanes: 2
Area Type: Residential-Collector/Arterial
Number of Driveways: 19
Number of Signals: 1

Traffic Information

85th Percentile Speed: 42 mph
50th Percentile Speed: 37 mph
AADT: 11431 veh/day
On Street Parking and Usage: Not High
Pedestrian / Bicyclist Activity: High

Recommended Speed Limit:



Note: The section crash rate of 468 per 100 MVM is above the critical rate (369). A comprehensive crash study should be undertaken to identify engineering and traffic control deficiencies and appropriate corrective actions. The speed limit should only be reduced as a last measure after all other treatments have either been tried or ruled out.

Note: The road section is in an area with high pedestrian or bicycle activity. Consider implementing engineering measures to reduce speeds before lowering the recommended speed limit. See [Engineering Countermeasures for Speed Management](#) and [PedSafe](#) for more guidance.

Disclaimer: The U.S. Government assumes no liability for the use of the information contained in this report. This report does not constitute a standard, specification, or regulation.

Equations Used in the Crash Data Calculations

Exposure (M)

$M = (\text{Section AADT} * 365 * \text{Section Length} * \text{Duration of Crash Data}) / (100000000)$
 $M = (11431 * 365 * .82 * 5.00) / (100000000)$
 $M = 0.1711$

Crash Rate (Rc)

$Rc = (\text{Section Crash Average} * 100000000) / (\text{Section AADT} * 365 * \text{Section Length})$
 $Rc = (16.00 * 100000000) / (11431 * 365 * .82)$
 $Rc = 467.66 \text{ crashes per 100 MVM}$

Injury Rate (Ri)

$Ri = (\text{Section Injury Crash Average} * 100000000) / (\text{Section AADT} * 365 * \text{Section Length})$
 $Ri = (2.60 * 100000000) / (11431 * 365 * .82)$
 $Ri = 75.99 \text{ injuries per 100 MVM}$

Critical Crash Rate (Cc)

$Cc = \text{Crash Average of Similar Sections} + 1.645 * (\text{Crash Average of Similar Sections} / \text{Exposure}) ^ (1/2) + (1 / (2 * \text{Exposure}))$
 $Cc = 297.07 + 1.645 * (297.07 / 0.1711) ^ (1/2) + (1 / (2 * 0.1711))$
 $Cc = 368.54 \text{ crashes per 100 MVM}$

Critical Injury Rate (Ic)

$Ic = \text{Injury Crash Average of Similar Sections} + 1.645 * (\text{Injury Crash Average of Similar Sections} / \text{Exposure}) ^ (1/2) + (1 / (2 * \text{Exposure}))$
 $Ic = 86.34 + 1.645 * (86.34 / 0.1711) ^ (1/2) + (1 / (2 * 0.1711))$
 $Ic = 126.22 \text{ injuries per 100 MVM}$