MEMORANDUM

To: Traffic Study Files

From: Alison Mills, P.E., South Area Transportation Engineer
Transportation Engineering Division
Austin Transportation Department

Date: December 27, 2021

Subject: SPEED ZONE INVESTIGATION

Location: Convict Hill Road – Brodie Lane to US Highway 290

Date(s) of Previous Investigation: None

A traffic engineering investigation has been conducted by the Transportation Engineering Division (TED) to determine the appropriate speed limit on Convict Hill Road from Brodie Lane to US Highway 290. Currently the speed limit from Brodie Lane to Woodcreek Road is 35 MPH, 40 MPH from Woodcreek Road to Escarpment Boulevard, and 35 MPH from Escarpment Boulevard and US Highway 290. Figure 1 represents a map of the study area.

Location Conditions

Convict Hill Road from Brodie Lane to US Highway 290 is an undivided, two-way, two-lane, collector roadway. For the purposes of this study, Convict Hill Road was divided into three segments. Convict Hill Road from Brodie Lane to Woodcreek Rd is 35 MPH with very few front facing homes. There is a church and a library in this segment. Woodcreek Road to Escarpment Boulevard is 40 MPH with bike lanes on both sides of the roadway. Escarpment Boulevard to US Highway 290 is 35 MPH with parking on the north side of street and bike lanes on both sides of the street in this segment.

Table 1 presents more information of each street segment studied, while Figures 2, 3, and 4 present maps of the street segments studied.
Table 1: Location Information

<table>
<thead>
<tr>
<th>Street Segment</th>
<th>Segment Length (Miles)</th>
<th>Number of Unsignalized Access Points</th>
<th>Number of Signalized Intersections</th>
<th>Width (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brodie Ln to Woodcreek Rd</td>
<td>1.5</td>
<td>38</td>
<td>-1</td>
<td>22</td>
</tr>
<tr>
<td>Woodcreek Rd to Escarpment Blvd</td>
<td>1</td>
<td>18</td>
<td>1</td>
<td>44</td>
</tr>
<tr>
<td>Escarpment Blvd to US 290</td>
<td>.75</td>
<td>32</td>
<td>2</td>
<td>44</td>
</tr>
</tbody>
</table>

Figure 1: Study Area Aerial View
Figure 2: Street Segment Brodie Ln to Woodcreek Rd
Figure 3: Street Segment Woodcreek Rd to Escarpment Blvd
Figure 4: Street Segment Escarpment Blvd to US 290
Investigation Data

TED’s investigation was conducted in accordance with the TxDOT’s “Procedures for Establishing Speed Zones,” which focuses on a traditional methodology of 85th percentile speeds.

This investigation also utilized FHWA’s USLIMITS2 tool to evaluate speed limits from a safe systems approach, which includes the following inputs to consider in setting reasonable, safe, and consistent speed limits based on the context and operating characteristics on the study segments.

- 85th percentile speed
- 50th percentile speed
- Statutory speed limit
- Section length
- Road alignment
- Median treatment
- Number of through lanes
- Adjacent land use
- Driveway density
- Traffic control devices
- Bicycle, pedestrian, and parking activity
- Daily vehicular volume
- Crash rate

Speed and volume data were collected in August 2021 to determine the appropriate posted speed limit for Convict Hill Road.

Table 2 summarizes the 85th percentile speed, 50th percentile speed, and daily traffic volumes collected on Convict Hill Road at various points.

<table>
<thead>
<tr>
<th>Street Segment</th>
<th>Existing Speed Limit (mph)</th>
<th>85% Speed (mph)</th>
<th>50% Speed (mph)</th>
<th>Traffic Volumes (ADT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brodie Ln to Brush Country Rd</td>
<td>35</td>
<td>41</td>
<td>41</td>
<td>36 37</td>
</tr>
<tr>
<td>Brush Country Rd to Woodcreek Rd</td>
<td>35</td>
<td>43</td>
<td>38</td>
<td>38 34</td>
</tr>
<tr>
<td>Beckett Rd to Abilene Tr</td>
<td>40</td>
<td>44</td>
<td>38</td>
<td>39 34</td>
</tr>
<tr>
<td>Escarpment Blvd to US 290</td>
<td>35</td>
<td>45</td>
<td>38</td>
<td>41 34</td>
</tr>
</tbody>
</table>

Crash data was obtained from the City of Austin’s Vision Zero database. This database obtains crash data from the Texas Department of Transportation (TxDOT) Crash Record Information...
System (CRIS) database. Total number of crashes and total number of fatal or injury crashes from July 9th, 2016 to July 9th, 2021 were obtained for the extents of this project limits. A crash was determined to be within the study area if the primary address was between 3500 Convict Hill Road and 8000 Convict Hill Road.

<table>
<thead>
<tr>
<th>Street Segment</th>
<th>Crashes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Injury/Fatal</td>
</tr>
<tr>
<td>From Brodie Ln to Woodcreek Rd</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>From Woodcreek Rd to Escarpment Blvd</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>From Escarpment Blvd to US 290</td>
<td>16</td>
<td>3</td>
</tr>
</tbody>
</table>

A USLIMITS2 study was run in both directions for all identified street segments on Convict Hill Road. In accordance with the “Texas Procedures for Establishing Speed Zones,” the same speed limit shall be maintained in both directions of travel on undivided roadways. Therefore, the recommended speed limit is to be 35 MPH along all identified street segments. In addition, on Convict Hill Road, the land use and functional classification is maintained for the length of the segment. Speed recommendations at each point were considered to select one consistent speed limit for the length of the segment. The results of the USLIMITS2 Speed Zoning Report are summarized in Table 4 below.

<table>
<thead>
<tr>
<th>Street Segment</th>
<th>Existing Speed Limit (EB &amp; WB) (mph)</th>
<th>USLIMITS2 Recommended Speed Limit (mph)</th>
<th>Recommended Speed Limit (EB &amp; WB) (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eastbound</td>
<td>Westbound</td>
<td>Eastbound</td>
</tr>
<tr>
<td>From Brodie Ln to Woodcreek Rd</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>From Woodcreek Rd to Escarp Blvd</td>
<td>40</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>From Escarp Blvd to US 290</td>
<td>35</td>
<td>40</td>
<td>35</td>
</tr>
</tbody>
</table>

Figure 5 presents a map of the study area and the proposed speed limit based on the collected data and analysis.
Recommendation

TED has determined a speed limit of 35 mph is appropriate for the study segments, based on the two methodologies used for setting speed limits and taking into account that the crash rate and injury crash rates for the study segments both exceed average crash rates for similar roads.
Appendix

USLIMITS2 Speed Zoning Report

Project Overview

Project Name: ConvictHill1

Analyst: Gavin Jones

Date: 2021-11-30

Basic Project Information

Route Name: Convict Hill Road
From: Brodie Lane
To: Woodcreek Road
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: 4629 veh/day
Total Number of Crashes: 27
Total Number of Injury Crashes: 8
Section Crash Rate: 213 per 100 MVM
Section Injury Crash Rate: 63 per 100 MVM
Crash Rate Average for Similar Roads: 217
Injury Rate Average for Similar Roads: 66

Roadway Information

Section Length: 1.5 mile(s)
Statutory Speed Limit: None
Existing Speed Limit: 35 mph
Adverse Alignment: Yes
One-Way Street: No
Divided/Undivided: Undivided
Number of Through Lanes: 2
Area Type: Residential-Collector/Arterial
Number of Driveways: 38
Number of Signals: 1

Traffic Information

85th Percentile Speed: 43 mph
50th Percentile Speed: 36 mph
AADT: 4629 veh/day
On Street Parking and Usage: Not High
Pedestrian / Bicyclist Activity: High

Recommended Speed Limit: 35

Note: Sections with adverse alignments may need specific 'advisory speed warnings' which may be different from the general speed limit for the section. See Procedures for Setting Advisory Speeds on Curves, Publication No. FHWA-SA-11-22, June 2011, for more guidance.

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.

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How the Recommended Speed Limit was Determined

The questions and responses below, and the referenced page numbers, correspond to the flowcharts found in the Decision Rules Flowchart document.

Terms Used in the Recommendation

- **Closest 85th**: This is the 5 mph increment that is closest to the 85th percentile speed (e.g., if the 85th percentile speed is 63 mph, the Closest 85th will be 65 mph).
- **Rounded-down 85th**: This is the 5 mph increment obtained by rounding down the 85th percentile to the nearest 5 mph increment (e.g., if the 85th percentile speed is 63 mph, the Rounded-down 85th will be 60 mph).
- **Closest 50th**: This is the 5 mph increment that is closest to the 50th percentile speed (e.g., if the 50th percentile speed is 58 mph, the Closest 50th will be 60 mph).
- **SL_1**: Speed limit determined using site characteristics (e.g., AADT, interchange spacing, roadside hazard rating, ped/bike activity, number of traffic signals, etc.).
- **SL_2**: Speed limit determined using crash data from the crash module.
- **SL**: Recommended Speed Limit.

The Recommended Speed Limit (SL) is the lower of the speed limit determined without crash data (SL_1) and the speed limit determined with crash data (SL_2).

**Determine SL_1 Using Site Characteristics (pg. K-23)**

**Note**: The number of signals per mile is being calculated as 0.67 signals per mile.

**Note**: The number of driveways per mile is being calculated as 25.33 driveways per mile.

**Question 1**: Are any of the following true: there are more than four signals per mile, pedestrian or bicyclist activity is high, parking activity is high, or there are more than 60 driveways per mile?

**Results**: Yes. There are 0.67 signals per mile, 25.33 driveways per mile, high pedestrian/bicyclist activity, and not high parking activity. The **SL_1 is set to the closest 50th percentile speed (35 mph)**.

**Question 2**: Are crash data available?

**Results**: Yes, so use these data to determine SL_2.

**Determine SL_2 Using Crash Data (pg. K-24)**

**Question 3**: Is more than one year of crash data available?

**Results**: Yes, at least one year of crash data is available.

**Note**: The crash rate is calculated to be 213 crashes per 100M VMT, and the injury rate is calculated to be 63 crashes per 100M VMT.

**Note**: The critical crash rate is calculated as 289 crashes per 100M VMT.

**Question 4**: Is the crash rate (213 per 100M VMT) greater than the critical crash rate (289 crashes per 100M VMT)?
Results: No, so the crash level is classified as low.

**Question 5**: Is the injury crash rate (63 per 100M VMT) greater than the critical injury rate (107 crashes per 100M VMT)?

Results: No, so the injury crash level is classified as low.

**Question 6**: Are either of the crash level (low) or injury crash level (low) classified as medium or high?

Results: No, so the total crash level is classified low.

**Question 7**: Is the total crash level (low) classified as medium or high?

Results: No, so the total crash level is classified low.

**Question 8**: Is the SL less than 20 mph or greater than 50 mph?

Results: The SL (35 mph) is between 20 mph and 50 mph. The SL remains the same.

**Final Recommendation**: The recommended speed limit is 35 mph.

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**Equations Used in the Crash Data Calculations**

**Exposure (M)**
\[ M = \frac{\text{Section AADT} \times 365 \times \text{Section Length} \times \text{Duration of Crash Data}}{100000000} \]
\[ M = \frac{4629 \times 365 \times 1.5 \times 5.00}{100000000} \]
\[ M = 0.1267 \]

**Crash Rate (Rc)**
\[ Rc = \frac{\text{Section Crash Average} \times 100000000}{\text{Section AADT} \times 365 \times \text{Section Length}} \]
\[ Rc = \frac{5.40 \times 100000000}{4629 \times 365 \times 1.5} \]
\[ Rc = 213.07 \text{ crashes per 100 MVM} \]

**Injury Rate (Ri)**
\[ Ri = \frac{\text{Section Injury Crash Average} \times 100000000}{\text{Section AADT} \times 365 \times \text{Section Length}} \]
\[ Ri = \frac{1.60 \times 100000000}{4629 \times 365 \times 1.5} \]
\[ Ri = 63.13 \text{ injuries per 100 MVM} \]

**Critical Crash Rate (Cc)**
\[ Cc = \text{Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Crash Average of Similar Sections}}{\text{Exposure}} \right)^{1/2} + \frac{1}{2 \times \text{Exposure}} \]
\[ Cc = 217.36 + 1.645 \times \left( \frac{217.36}{0.1267} \right)^{1/2} + \frac{1}{2 \times 0.1267} \]
\[ Cc = 289.43 \text{ crashes per 100 MVM} \]

**Critical Injury Rate (Ic)**
\[ Ic = \text{Injury Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Injury Crash Average of Similar Sections}}{\text{Exposure}} \right)^{1/2} + \frac{1}{2 \times \text{Exposure}} \]
Ic = 65.57 + 1.645 \times \frac{65.57}{0.1267}^{(1/2)} + \frac{1}{2 \times 0.1267})

Ic = 106.94 \text{ injuries per 100 MVM}
USLIMITS2 Speed Zoning Report

Project Overview
Project Name: ConvictHill2

Analyst: Gavin Jones
Date: 2021-11-30

Basic Project Information
Route Name: Convict Hill Road WB
From: Brodie Lane
To: Woodcreek Road
State: Texas
County: Travis County
City: Austin city
Route Type: Road Section in Developed Area
Route Status: Existing

Roadway Information
Section Length: 1.5 mile(s)
Statutory Speed Limit: None
Existing Speed Limit: 35 mph
Adverse Alignment: Yes
One-Way Street: No
Divided/Undivided: Undivided
Number of Through Lanes: 2
Area Type: Residential-Collector/Arterial
Number of Driveways: 38
Number of Signals: 1

Crash Data Information
Crash Data Years: 5.00
Crash AADT: 4629 veh/day
Total Number of Crashes: 27
Total Number of Injury Crashes: 8
Section Crash Rate: 213 per 100 MVM
Section Injury Crash Rate: 63 per 100 MVM
Crash Rate Average for Similar Roads: 217
Injury Rate Average for Similar Roads: 66

Traffic Information
85th Percentile Speed: 41 mph
50th Percentile Speed: 37 mph
AADT: 4629 veh/day
On Street Parking and Usage: Not High
Pedestrian / Bicyclist Activity: High

Recommended Speed Limit: 35

Note: Sections with adverse alignments may need specific 'advisory speed warnings' which may be different from the general speed limit for the section. See Procedures for Setting Advisory Speeds on Curves, Publication No. FHWA-SA-11-22, June 2011, for more guidance.

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.

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Equations Used in the Crash Data Calculations

Exposure \( (M) \)
\[ M = \frac{(\text{Section AADT} \times 365 \times \text{Section Length} \times \text{Duration of Crash Data})}{(100000000)} \]
\[ M = \frac{(4629 \times 365 \times 1.5 \times 5.00)}{(100000000)} \]  
\[ M = 0.1267 \]

**Crash Rate (Rc)**  
\[ Rc = \frac{(\text{Section Crash Average} \times 100000000)}{(\text{Section AADT} \times 365 \times \text{Section Length})} \]  
\[ Rc = \frac{(5.40 \times 100000000)}{(4629 \times 365 \times 1.5)} \]  
\[ Rc = 213.07 \text{ crashes per 100 MVM} \]

**Injury Rate (Ri)**  
\[ Ri = \frac{(\text{Section Injury Crash Average} \times 100000000)}{(\text{Section AADT} \times 365 \times \text{Section Length})} \]  
\[ Ri = \frac{(1.60 \times 100000000)}{(4629 \times 365 \times 1.5)} \]  
\[ Ri = 63.13 \text{ injuries per 100 MVM} \]

**Critical Crash Rate (Cc)**  
\[ Cc = \text{Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Crash Average of Similar Sections}}{\text{Exposure}} \right)^{1/2} + \frac{1}{2 \times \text{Exposure}} \]  
\[ Cc = 217.36 + 1.645 \times \left( \frac{217.36}{0.1267} \right)^{1/2} + \frac{1}{2 \times 0.1267} \]  
\[ Cc = 289.43 \text{ crashes per 100 MVM} \]

**Critical Injury Rate (Ic)**  
\[ Ic = \text{Injury Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Injury Crash Average of Similar Sections}}{\text{Exposure}} \right)^{1/2} + \frac{1}{2 \times \text{Exposure}} \]  
\[ Ic = 65.57 + 1.645 \times \left( \frac{65.57}{0.1267} \right)^{1/2} + \frac{1}{2 \times 0.1267} \]  
\[ Ic = 106.94 \text{ injuries per 100 MVM} \]
USLIMITS2 Speed Zoning Report

Project Overview

Project Name: ConvictHill3

Analyst: Gavin Jones

Basic Project Information
Route Name: Convict Hill Road EB
From: Woodcreek Rd
To: Escarpment Blvd
State: Texas
County: Travis County
City: Austin city
Route Type: Road Section in Developed Area
Route Status: Existing

Date: 2021-12-02

Crash Data Information
Crash Data Years: 5.00
Crash AADT: 4496 veh/day
Total Number of Crashes: 14
Total Number of Injury Crashes: 3
Section Crash Rate: 171 per 100 MVM
Section Injury Crash Rate: 37 per 100 MVM
Crash Rate Average for Similar Roads: 232
Injury Rate Average for Similar Roads: 66

Roadway Information
Section Length: 1 mile(s)
Statutory Speed Limit: None
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: 18
Number of Signals: 1

Traffic Information
85th Percentile Speed: 44 mph
50th Percentile Speed: 38 mph
AADT: 4496 veh/day
On Street Parking and Usage: Not High
Pedestrian / Bicyclist Activity: High

Recommended Speed Limit: 40

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.

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Equations Used in the Crash Data Calculations

Exposure (M)
\[ M = \frac{\text{Section AADT} \times 365 \times \text{Section Length} \times \text{Duration of Crash Data}}{100000000} \]
\[ M = \frac{4496 \times 365 \times 1 \times 5.00}{100000000} \]
\[ M = 0.0821 \]

Crash Rate (Rc)
\[ Rc = \frac{\text{Section Crash Average} \times 100000000}{\text{Section AADT} \times 365 \times \text{Section Length}} \]
\[ R_c = \frac{(2.80 \times 100000000)}{(4496 \times 365 \times 1)} \]
\[ R_c = 170.62 \text{ crashes per 100 MVM} \]

**Injury Rate (Ri)**
\[ R_i = \frac{(\text{Section Injury Crash Average} \times 100000000)}{(\text{Section AADT} \times 365 \times \text{Section Length})} \]
\[ R_i = \frac{(0.60 \times 100000000)}{(4496 \times 365 \times 1)} \]
\[ R_i = 36.56 \text{ injuries per 100 MVM} \]

**Critical Crash Rate (Cc)**
\[ C_c = \text{Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Crash Average of Similar Sections}}{\text{Exposure}} \right)^{\frac{1}{2}} + \frac{1}{2 \times \text{Exposure}} \]
\[ C_c = 231.80 + 1.645 \times \left( \frac{231.80}{0.0821} \right)^{\frac{1}{2}} + \frac{1}{2 \times 0.0821} \]
\[ C_c = 325.33 \text{ crashes per 100 MVM} \]

**Critical Injury Rate (Ic)**
\[ I_c = \text{Injury Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Injury Crash Average of Similar Sections}}{\text{Exposure}} \right)^{\frac{1}{2}} + \frac{1}{2 \times \text{Exposure}} \]
\[ I_c = 66.27 + 1.645 \times \left( \frac{66.27}{0.0821} \right)^{\frac{1}{2}} + \frac{1}{2 \times 0.0821} \]
\[ I_c = 119.12 \text{ injuries per 100 MVM} \]
USLIMITS2 Speed Zoning Report

Project Overview
Project Name: ConvictHill4

**Analyst:** Gavin Jones

**Date:** 2021-12-02

**Basic Project Information**
Route Name: Convict Hill Road WB
From: Woodcreek Rd
To: Escarpment Blvd
State: Texas
County: Williamson County
City: Austin city
Route Type: Road Section in Developed Area
Route Status: Existing

**Roadway Information**
Section Length: 1 mile(s)
Statutory Speed Limit: None
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: 18
Number of Signals: 1

Crash Data Information
Crash Data Years: 5.00
Crash AADT: 4496 veh/day
Total Number of Crashes: 14
Total Number of Injury Crashes: 3
Section Crash Rate: 171 per 100 MVM
Section Injury Crash Rate: 37 per 100 MVM
Crash Rate Average for Similar Roads: 232
Injury Rate Average for Similar Roads: 66

**Traffic Information**
85th Percentile Speed: 38 mph
50th Percentile Speed: 34 mph
AADT: 4496 veh/day
On Street Parking and Usage: Not High
Pedestrian / Bicyclist Activity: High

**Recommended Speed Limit:** 35

**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.

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**Equations Used in the Crash Data Calculations**

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**Exposure (M)**

\[ M = \frac{(\text{Section AADT} \times 365 \times \text{Section Length} \times \text{Duration of Crash Data})}{(100000000)} \]

\[ M = \frac{(4496 \times 365 \times 1 \times 5.00)}{(100000000)} \]

\[ M = 0.0821 \]

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**Crash Rate (Rc)**

\[ Rc = \frac{(\text{Section Crash Average} \times 100000000)}{(\text{Section AADT} \times 365 \times \text{Section Length})} \]
\[ Rc = \frac{(2.80 \times 100000000)}{(4496 \times 365 \times 1)} \]
\[ Rc = 170.62 \text{ crashes per 100 MVM} \]

**Injury Rate (Ri)**
\[ Ri = \frac{(\text{Section Injury Crash Average} \times 100000000)}{(\text{Section AADT} \times 365 \times \text{Section Length})} \]
\[ Ri = \frac{(0.60 \times 100000000)}{(4496 \times 365 \times 1)} \]
\[ Ri = 36.56 \text{ injuries per 100 MVM} \]

**Critical Crash Rate (Cc)**
\[ Cc = \text{Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Crash Average of Similar Sections}}{\text{Exposure}} \right)^{1/2} + \left( \frac{1}{2 \times \text{Exposure}} \right) \]
\[ Cc = 231.80 + 1.645 \times \left( \frac{231.80}{0.0821} \right)^{1/2} + \left( \frac{1}{2 \times 0.0821} \right) \]
\[ Cc = 325.33 \text{ crashes per 100 MVM} \]

**Critical Injury Rate (Ic)**
\[ Ic = \text{Injury Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Injury Crash Average of Similar Sections}}{\text{Exposure}} \right)^{1/2} + \left( \frac{1}{2 \times \text{Exposure}} \right) \]
\[ Ic = 66.27 + 1.645 \times \left( \frac{66.27}{0.0821} \right)^{1/2} + \left( \frac{1}{2 \times 0.0821} \right) \]
\[ Ic = 119.12 \text{ injuries per 100 MVM} \]
Project Overview

Project Name: ConvictHill5

Analyst: Gavin Jones

Date: 2021-11-30

Basic Project Information
Route Name: Convict Hill Road EB
From: Escarpment Blvd
To: US 290
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: 8933 veh/day
Total Number of Crashes: 16
Total Number of Injury Crashes: 3
Section Crash Rate: 131 per 100 MVM
Section Injury Crash Rate: 25 per 100 MVM
Crash Rate Average for Similar Roads: 235
Injury Rate Average for Similar Roads: 70

Roadway Information
Section Length: .75 mile(s)
Statutory Speed Limit: None
Existing Speed Limit: mph
Adverse Alignment: No
One-Way Street: No
Divided/Undivided: Undivided
Number of Through Lanes: 2
Area Type: Residential-Collector/Arterial
Number of Driveways: 32
Number of Signals: 2

Traffic Information
85th Percentile Speed: 45 mph
50th Percentile Speed: 39 mph
AADT: 8933 veh/day
On Street Parking and Usage: High
Pedestrian / Bicyclist Activity: High

Recommended Speed Limit: 40

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.

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Equations Used in the Crash Data Calculations

Exposure (M)
\[ M = \frac{(\text{Section AADT} \times 365 \times \text{Section Length} \times \text{Duration of Crash Data})}{100000000} \]
\[ M = \frac{(8933 \times 365 \times .75 \times 5.00)}{100000000} \]
\[ M = 0.1223 \]

Crash Rate (Rc)
\[ Rc = \frac{(\text{Section Crash Average} \times 100000000)}{(\text{Section AADT} \times 365 \times \text{Section Length})} \]
\[ R_c = \frac{(3.20 \times 10^8)}{(8933 \times 365 \times 0.75)} \]
\[ R_c = 130.86 \text{ crashes per 100 MVM} \]

**Injury Rate (R_i)**
\[ R_i = \frac{(\text{Section Injury Crash Average} \times 10^8)}{(\text{Section AADT} \times 365 \times \text{Section Length})} \]
\[ R_i = \frac{(0.60 \times 10^8)}{(8933 \times 365 \times 0.75)} \]
\[ R_i = 24.54 \text{ injuries per 100 MVM} \]

**Critical Crash Rate (C_c)**
\[ C_c = \text{Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Crash Average of Similar Sections}}{\text{Exposure}} \right)^{0.5} + \frac{1}{2 \times \text{Exposure}} \]
\[ C_c = 234.74 + 1.645 \times (234.74 / 0.1223)^{0.5} + (1 / (2 \times 0.1223)) \]
\[ C_c = 310.91 \text{ crashes per 100 MVM} \]

**Critical Injury Rate (I_c)**
\[ I_c = \text{Injury Crash Average of Similar Sections} + 1.645 \times \left( \frac{\text{Injury Crash Average of Similar Sections}}{\text{Exposure}} \right)^{0.5} + \frac{1}{2 \times \text{Exposure}} \]
\[ I_c = 69.91 + 1.645 \times (69.91 / 0.1223)^{0.5} + (1 / (2 \times 0.1223)) \]
\[ I_c = 113.33 \text{ injuries per 100 MVM} \]
**Project Overview**

**Project Name:** ConvictHill6

**Analyst:** Gavin Jones

**Date:** 2021-11-30

**Basic Project Information**

- **Route Name:** Convict Hill Road WB
- **From:** Escarpment Blvd
- **To:** US 290
- **State:** Texas
- **County:** Travis County
- **City:** Austin city
- **Route Type:** Road Section in Developed Area
- **Route Status:** Existing

**Roadway Information**

- **Section Length:** .75 mile(s)
- **Statutory Speed Limit:** None
- **Existing Speed Limit:** 35 mph
- **Adverse Alignment:** No
- **One-Way Street:** No
- **Divided/Undivided:** Undivided
- **Number of Through Lanes:** 2
- **Area Type:** Residential-Collector/Arterial
- **Number of Driveways:** 32
- **Number of Signals:** 2

**Crash Data Information**

- **Crash Data Years:** 5.00
- **Crash AADT:** 8933 veh/day
- **Total Number of Crashes:** 16
- **Total Number of Injury Crashes:** 3
- **Section Crash Rate:** 131 per 100 MVM
- **Section Injury Crash Rate:** 25 per 100 MVM
- **Crash Rate Average for Similar Roads:** 235
- **Injury Rate Average for Similar Roads:** 70

**Traffic Information**

- **85th Percentile Speed:** 38 mph
- **50th Percentile Speed:** 34 mph
- **AADT:** 8933 veh/day
- **On Street Parking and Usage:** High
- **Pedestrian / Bicyclist Activity:** High

**Recommended Speed Limit:** **35**

**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)**

\[
M = \frac{(\text{Section AADT} \times 365 \times \text{Section Length} \times \text{Duration of Crash Data})}{(100000000)}
\]

\[
M = \frac{(8933 \times 365 \times .75 \times 5.00)}{(100000000)}
\]

\[
M = 0.1223
\]

**Crash Rate (Rc)**

\[
Rc = \frac{(\text{Section Crash Average} \times 100000000)}{(\text{Section AADT} \times 365 \times \text{Section Length})}
\]
Rc = \((3.20 \times 100000000) / (8933 \times 365 \times .75)\)
Rc = 130.86 crashes per 100 MVM

*Injury Rate (Ri)*
\(Ri = \text{(Section Injury Crash Average} \times 100000000) / (\text{Section AADT} \times 365 \times \text{Section Length})\)
\(Ri = (0.60 \times 100000000) / (8933 \times 365 \times .75)\)
Ri = 24.54 injuries per 100 MVM

*Critical Crash Rate (Cc)*
\(Cc = \text{Crash Average of Similar Sections} + 1.645 \times \left(\frac{\text{Crash Average of Similar Sections}}{\text{Exposure}}\right)^{1/2} + \frac{1}{2 \times \text{Exposure}}\)
\(Cc = 234.74 + 1.645 \times \left(\frac{234.74}{0.1223}\right)^{1/2} + \frac{1}{2 \times 0.1223}\)
Cc = 310.91 crashes per 100 MVM

*Critical Injury Rate (Ic)*
\(Ic = \text{Injury Crash Average of Similar Sections} + 1.645 \times \left(\frac{\text{Injury Crash Average of Similar Sections}}{\text{Exposure}}\right)^{1/2} + \frac{1}{2 \times \text{Exposure}}\)
\(Ic = 69.91 + 1.645 \times \left(\frac{69.91}{0.1223}\right)^{1/2} + \frac{1}{2 \times 0.1223}\)
Ic = 113.33 injuries per 100 MVM