

USLIMITS2 Speed Zoning Report

Project Overview

Project Name: WY 22- Spring Gulch to Emilys Pond

Analyst: Darin Kaufman

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Basic Project Information

Project Number: Winter 2021 - Site 3

Route Name: WY 22

From: 0.55

To: 3.35

State: Wyoming

County: Teton County

City: Rural

Route Type: Road Section in Undeveloped Area

Route Status: Existing

Crash Data Information

Crash Data Years: 1.67

Crash AADT: 17000 veh/day

Total Number of Crashes: 34

Total Number of Injury Crashes: 6

Section Crash Rate: 117 per 100 MVM

Section Injury Crash Rate: 21 per 100 MVM

Crash Rate Average for Similar Roads: 98

Injury Rate Average for Similar Roads: 36

Roadway Information

Section Length: 2.8 mile(s)

Statutory Speed Limit: 70 mph

Existing Speed Limit: 45 mph

Adverse Alignment: No

Divided/Undivided: Undivided

Number of Lanes: 2

Roadside Hazard Rating: 2

Transition Zone: No

Traffic Information

85th Percentile Speed: 50 mph

50th Percentile Speed: 46 mph

AADT: 17000 veh/day

Project Description: Request to lower to 45mph

Recommended Speed Limit: 50

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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-14)

Question 1: What is the roadside hazard rating (RHR)?

Results: Because the RHR (2) is less than 4, **the SL_1 is the closest 85th speed (50 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-15)

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 117 crashes per 100M VMT, and the injury rate is calculated to be 21 crashes per 100M VMT.

Note: The critical crash rate is calculated as 130 crashes per 100M VMT.

Question 4: Is the crash rate (117 per 100M VMT) greater than the critical crash rate (130 crashes per 100M VMT)?

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

Question 5: Is the injury crash rate (21 per 100M VMT) greater than the critical injury rate (56 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 SL_2 is set as the closest 85th speed (50 mph).**

Determine SL (pg. K-12)

Note: SL is set as the lower of SL_1 (50 mph) and SL_2 (50 mph). **The SL is set to 50 mph.**

Determine the Final Recommended Speed Limit (pg. K-19)

Question 8: Is the SL less than 25 mph or greater than 65 mph?

Results: The SL (50 mph) is between 25 mph and 65 mph. **The SL remains the same.**

Final Recommendation: The recommended speed limit is 50 mph.

Equations Used in the Crash Data Calculations

Exposure (M)

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

$$M = (17000 * 365 * 2.8 * 1.67) / (100000000)$$

$$M = 0.2896$$

Crash Rate (Rc)

$$Rc = (\text{Section Crash Average} * 100000000) / (\text{Section AADT} * 365 * \text{Section Length})$$

$$Rc = (20.40 * 100000000) / (17000 * 365 * 2.8)$$

$$Rc = 117.42 \text{ crashes per 100 MVM}$$

Injury Rate (Ri)

$$Ri = (\text{Section Injury Crash Average} * 100000000) / (\text{Section AADT} * 365 * \text{Section Length})$$

$$Ri = (3.60 * 100000000) / (17000 * 365 * 2.8)$$

$$Ri = 20.72 \text{ injuries per 100 MVM}$$

Critical Crash Rate (Cc)

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

$$Cc = 97.91 + 1.645 * (97.91 / 0.2896) ^{(1/2)} + (1 / (2 * 0.2896))$$

$$Cc = 129.88 \text{ crashes per 100 MVM}$$

Critical Injury Rate (Ic)

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

$$Ic = 35.64 + 1.645 * (35.64 / 0.2896) ^{(1/2)} + (1 / (2 * 0.2896))$$

$$Ic = 55.61 \text{ injuries per 100 MVM}$$