



Passing and Climbing Lane Safety Study for Safety on Rural Roads

To align with the goals of the Strategic Highway Safety Plan (SHSP), NDOT initiated a statewide comprehensive study to develop new safety focused criteria for passing and climbing lanes on rural two-lane and multi-lane highways. This created a safety-focused, data-driven process that identifies passing and climbing lane opportunities based on safety needs and current transportation data, to identify the most effective and feasible locations.

Enhance Safety



Reduce Delays Due to Crashes



Study Needs

Crashes are overrepresented on rural roads not only in Nevada but across the country. Nationally, about half of fatal crashes occur on rural roads, even though only 19% of Americans live in rural areas. In Nevada, while less than 10% of the population lives in rural areas, almost one-quarter of fatal crashes occur on rural roads.

Study Purpose

Lane departure and head-on crashes are the most fatal and they occur more frequently on rural roads. The study aims to reduce these crashes by adding passing or climbing lanes.

Passing lanes mitigate congestion and provide opportunities for vehicles to pass without crossing into the oncoming lane. Reducing the distance between passing lanes breaks up long distances with limited passing opportunities.

Climbing lanes target roadway segments where slow-moving vehicles impair the safety and mobility of other vehicles. When faster vehicles are slowed down for a significant amount of time, they may depart the lane unsafely for a passing attempt. Even though multilane highways provide continuous passing opportunities, there are steep grades that reduce the speeds of larger vehicles by greater than 10 mph. The chance of a crash increases when the difference in vehicle speed on the roadway increases.

Fatal Crashes

- » Almost one-quarter of all fatal crashes in Nevada occur on rural roads — though less than 10 percent of the state's population lives in rural areas.
- » Nationally, the fatality risk is 62 percent higher for crashes on rural roadways than the same trip length on an urban road.
- » The two most common fatal crash types on rural roads are roadway departure and head-on collisions. These occur more often on rural roads than on urban roads.

Metrics

An existing conditions assessment was performed to identify relevant GIS data metrics that capture existing roadway and safety information.

Most of the source data used for the prioritization analysis was obtained through national, state, open-sourced, and aerial imagery analysis. The process of identifying existing passing and climbing lanes was a multi-step process that relied upon features such as

- Number of travel lanes
- Shoulder Width
- Lane Width
- Existing Passing lanes
- AADT
- Truck Percentage of AADT
- Passing sight distance percentage
- Crash locations and types
- Speed limits

Identification Methodology

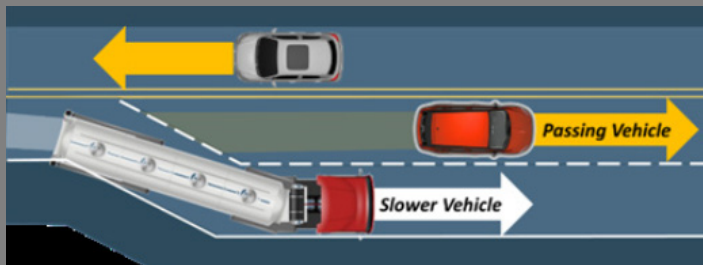
The identification methodology begins by determining which facilities to consider and applying a consistent process to determine which candidate segments provide the highest potential for safety improvement. A data-driven approach ensures the infrastructure investments have the greatest potential to reduce fatalities and serious injuries on Nevada's rural roads. To analyze candidate locations, it is necessary to split the analyzed highways into regular segments. This will provide sufficient criteria for localized variables to reflect the performance and characteristics of each segment.

Passing lanes were divided into 2-mile segments and climbing lanes were divided into 0.25-mile segments. Factors such as roadway volume, percentage of trucks within roadway volume, and existing passing lane proximity were considered for all sections.

A risk-based prioritization scheme was selected as the preferred method to compare candidate segments against each other. This approach considers both risk exposure and severity characteristics to calculate locations that have the highest potential for severe crashes.

Weighting Methodology

Candidate segments across the state were given a weighted score. The higher the score, the greater the potential for risk of a fatal crash and the greater the potential for improved safety benefits by implementing a passing or climbing lane. Based on these scores, candidate segments were grouped into 20-percent "bins" consisting of the highest 20-percent, followed by the next 20-percent and so forth.



Further Information

The passing and climbing lane recommendations are developed for the concept phase. These recommendations will be integrated into NDOT's One Nevada Plan to track project needs throughout the project development process. These recommendations will contribute to identifying state needs and allocating NDOT resources to projects aligned with statewide priorities. As projects advance to the design phase, detailed engineering evaluation will determine the optimal locations for passing and climbing lanes. More information can be found on the Nevada Department of Transportation website.

Learn More

To learn more, visit please contact Lacey Tisler at ltisler@dot.nv.gov or Kimberly Goodwin at kgoodwin@dot.nv.gov in the Traffic Safety Engineering Division.