



Research Notes

Work Order 24-07

January 2, 2026

LINKING OREGON DRIVER RECORDS AND CRASH DATA TO EVALUATE INTERVENTIONS AND DRIVER RISK

Background

From 2019 to 2023, there were an estimated 225,000 reported collisions in the state of Oregon, resulting in 2,790 deaths and 179,516 persons injured. Risky driving behavior is widely recognized as a contributor to fatal collisions, which is why the reduction of risky driver behavior is one of the near-term emphasis areas within the ODOT Transportation Safety Action Plan. To this end, Oregon DMV has implemented programs that identify drivers who display heightened levels of collision risk from the roadway and intervene through mandated programs. These programs often include a blend of license restriction and education requirements; however, the efficacy of these programs is studied infrequently. In the state of Oregon, it has been decades since the intervention programs have been evaluated for effectiveness.

The objective of this research was to build a dataset linking driver information and collision outcomes so that agency staff and leadership have the data necessary to evaluate the efficacy of driver intervention programs and establish profiles of risky drivers that are the most likely to be involved in serious crashes. The goal is that this information can be used by the Oregon DMV and ODOT Transportation Safety Office to evaluate their risky driver interventions programs and improve the safety of roadways by identifying and removing unsafe drivers in a more efficient manner.

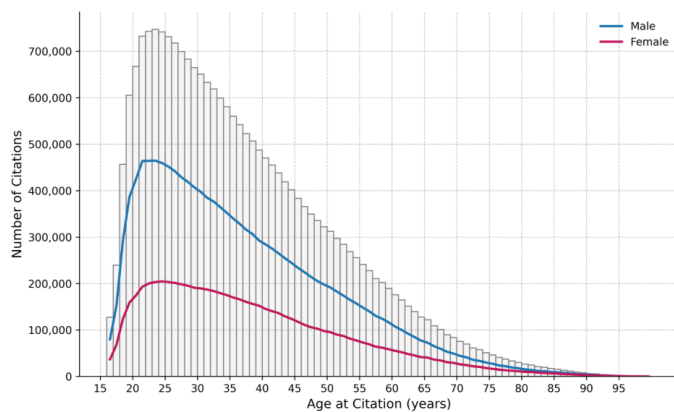
Study Outline

Task 1: Develop Data Archive

The development of the linked database involved a systematic process of cleaning, formatting, and merging four primary datasets: Driver, Verdict, Accident, and Crash Data, to create a unified resource for analyzing traffic safety and driver behavior. Thorough data preparation was carried out and addressed challenges such as duplicate records, inconsistent identifiers, and formatting discrepancies, ensuring the datasets were accurate and compatible. The merging process was conducted sequentially, starting with pairs of datasets and ending in a comprehensive integration using Oregon driver's license numbers and deterministic methods. Despite limitations, such as incomplete fields and reliance on sampling during QA/QC, the final database successfully consolidated millions of records while maintaining data integrity. This linked dataset provides a multidimensional view of driver actions, legal outcomes, and crash events, establishing a robust foundation for further analysis and supporting strategies to mitigate driver risk and improve traffic safety.

Task 2: Document Driver Risk Profiles

Using the demographic data provided by the DMV, driver risk was evaluated through the lens of age and sex. It was found that younger drivers were more likely to receive citations than older drivers, with the peak occurring between 22-24 years of age. The difference between male and female drivers is the most pronounced during younger years. As drivers get older, the difference in the number of citations between the sexes slowly decreases.



- Routine moving violations, such as speeding, had a neutral or negative associations with higher severity crashes.
- Citations relating to violations such as administrative non-compliance and DUII has a much stronger correlation with increased crash rates, so focusing on flagging those types of behaviors as more serious may improve the efficacy of the system

Research Benefits

This research provides insight for the Oregon DMV and Transportation Safety Office when it comes to which driver profiles that are more likely to commit risky driving behaviors and how these risky driving behaviors correlate with crash risk. This knowledge can be used to evaluate the efficacy of current DMV intervention systems to improve the safety of road users.

Task 3: Evaluate Intervention Programs

Three generalized linear models were used to evaluate speed-related crashes and DUII-related crashes. Additionally, a multinomial logit model evaluated the effect of the top ten citation types in the verdict data on the level of crash severity. Results revealed that drivers who received speeding or DUII citations before the occurrence of a crash were very likely to be involved in speeding or DUII related crashes. Considering the odds ratios for speeding-related and DUII-related crashes by age, it was found that younger drivers tend to

engage in speeding but are less likely to be involved in alcohol-related crashes, possibly due to the age limit. Lastly, it was found that citations relating to DUII and administrative noncompliance were the most predictive when it came to serious collision outcomes.

Research Recommendations

This study concluded that:

- Based on demographic analysis, older drivers and male drivers were positively associated with more severe crash outcomes.



Oregon Department of Transportation
Research Section
355 Capitol Street NE
Salem, OR 97302

To read the full research report go to:

<https://www.oregon.gov/odot/Programs/ResearchDocuments/TR-24-24-11-00 Linking Driver and Crash Data.pdf>

For additional information about this research project, contact Josh Roll via email at josh.f.roll@odot.oregon.gov.