

# MPC-628

July 9, 2020 (updated August 1, 2021)

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## **Project Title**

Impaired Driving Safety Program Strategies Pilot and Dashboard: Improving Prevention Outcomes Based on Subpopulation Risk Factors and Individualized Risk Assessment

## **University**

North Dakota State University

## **Principal Investigators**

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## **Research Needs**

Alcohol-impaired driving is an endemic public safety issue in the United States. In 2015, approximately 1.1 million drivers were arrested for driving-under-the-influence (DUI). DUI was a contributing factor in about one-third of motor vehicle (MV) related fatalities during 2015. Figure 1 shows North Dakota consistently records high rates of alcohol involvement MV fatalities in the nation (ND Department of Transportation 2018). About 40 percent of MV deaths annually include drivers with BAC above the 0.08 legal limit (Figure 1). Recidivism is a critical issue in these crashes since about 40 percent of drivers in the ND DUI are repeat offenders. This share is above the national rate of 35 percent (NHTSA, 2012 and 2016; Schell, Chan, & Morral 2006). Therefore, the potential to strengthen tools used in prevention programs and policy decision-making is critical.

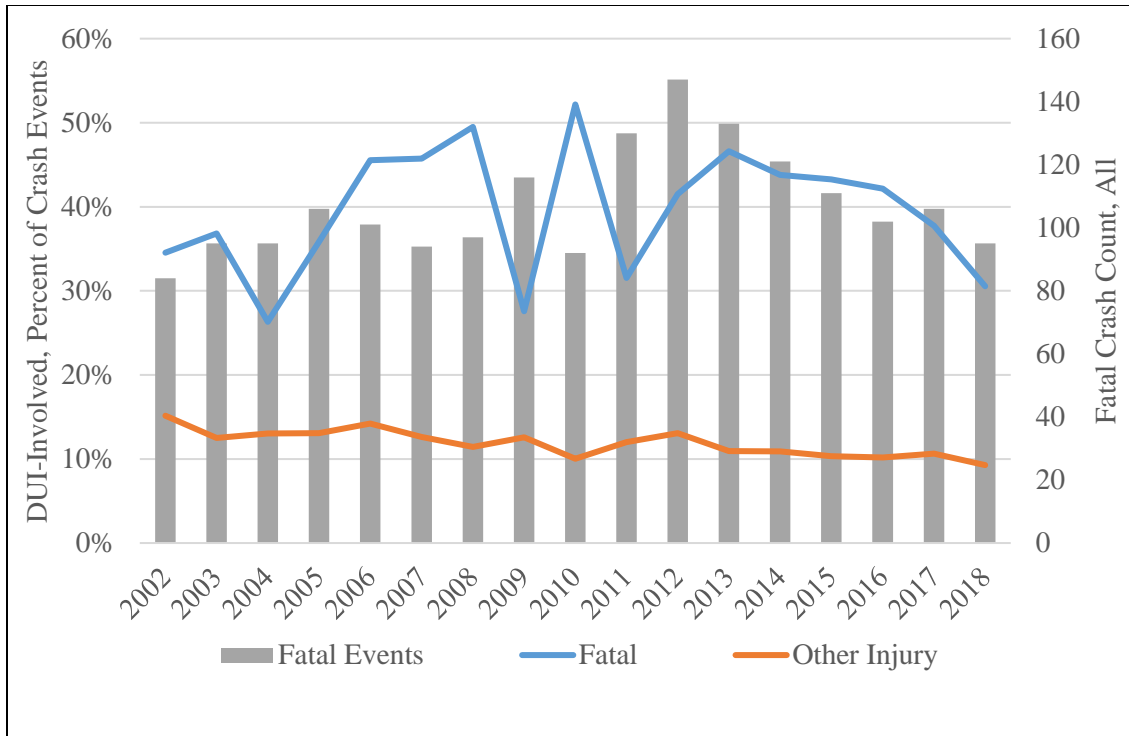


Figure 1. Drivers Under-the-Influence of Alcohol in North Dakota Crashes

DUI recidivism will be investigated in the driver license history studies and work with a new database to be formed from a NDDOT/NDHP collaboration in a county DUI record linkages pilot project. Current practices and demonstration of technology-based enhancement for smarter practices in impaired driving prevention will be studied. Historically, most states have recidivism prevention centered in driver education and court adjudication. North Dakota has evolved its practices to include a well-supported DWI Court network and was an early adopter of the 24/7 Sobriety Program. Both have proven effective tools in DUI recidivism.

Stakeholder engagement is key in continued improvement with systematic assessment and evidence-based path recommendations for driver improvement aimed to prevent DUI reoffense. Understanding subpopulation risk factors is critical in appropriately selecting and directing strategies to prevent alcohol-impaired driving. Furthermore, considering individualized assessment and improvement paths for higher-risk impaired drivers, those with multiple offenses, is intriguing as research has shown 45% of repeat drunk drivers have a major mental disorder.

This project engages stakeholders in high-risk subpopulation study discussions and in a systematic study that aligns with the NDDOT/NDHP county pilot project. Multiple perspectives, with SMEs from arrest to rehabilitation, will be considered in this DUI prevention program research aimed to better understand high-risk subpopulations and individualized DUI-based risk assessments tools/practices/prospects. For instance, recognizing mental health risk related to a DUI offense may result in more effective resource allocation resulting from a holistic approach to recidivism prevention decisions. Findings may be especially beneficial in underserved populations, such as highly rural and tribal areas, where DWI Courts and 24/7 Sobriety Program

SCRAM options are not always available.

## **Research Objectives**

The goal of this project is to conduct a pilot project to determine an appropriate implementation practice and assess early efficacy.

- Objective 1: Improve record transparency and create linkages to support individualized program delivery based on NDDOT-supported DUI administrative record linkages county-level pilot,
- Objective 2: Improve understanding of ND drivers' DUI risk assessment, recidivism proclivity and prevention strategies considering education, enforcement, judicial, and post-adjudication (parole/probation) perspectives related to driving after drinking alcohol,
- Objective 3: Investigate high-risk and/or high-benefit driver cohorts and DUI recidivism intervention strategies based on driver records, other administrative records and subject matter experts, and
- Objective 4: Identify potential administration and/or policy changes that may be required to facilitate efforts to reduce alcohol-impaired driving aimed at improved public safety.
- Objective 5: prevent crashes and reduce crash severity for driver alcohol-impaired crashes by transforming historical and real-time data into knowledge streams to improve law enforcement and driver understanding of hazardous corridors, roadways, and hotspots.

## **Research Methods**

Statistical and qualitative methods will be used to explore subpopulation and individualized driver improvement interventions aimed at preventing DUI re-offense. Empirical studies and data processing will be conducted in a systematic study of pilot county records to evaluate traffic safety outcomes among DUI offenders considering data linked in an event series from arrest to post-adjudication; a measure for traffic safety outcomes continuing after rehabilitation will be considered. In addition, state agency participant focus groups and/or interviews may be conducted to gather consensus regarding research findings and potential application by stakeholder groups.

## **Expected Outcomes**

This research will contribute to an ongoing effort to improved public safety by preventing impaired driving crashes. Results will add to the local understanding of efficacy for interventions with high-risk subpopulations and at the individual driver level. Findings from this research will be used by policymakers and program administrators to refine programs for impaired driver interventions. The knowledge may also be useful when shared with other states where alcohol impaired driving is a public safety concern.

## **Relevance to Strategic Goals**

Safety: Improving public health and safety is a top priority for the US Department of Transportation (USDOT 2013). Among states, progress is possible by understanding and addressing crash risk by identifying priorities based on risk and using high-quality data to optimize policy decisions and strategic countermeasure investment. Impaired driver crashes are an emphasis area for the NDDOT – this pilot will provide valuable information for future policy and program investment aimed at preventing impaired driver crashes.

## **Educational Benefits**

Professional development in stakeholder education related to research findings.

## **Technology Transfer**

Journal articles and presentations to academic and practitioner audiences will be used to disseminate research findings.

## **Work Plan**

- 1) Collect and investigate ND driver records to determine the project scope based on driving under the influence (DUI) citations and convictions.
- 2) Administer NDDOT driver survey related to alcohol-impaired driving and electronically enhanced ride alternatives to driving such as ridesourcing. (The NDDOT will fund data processing and analysis, Month 6)
- 3) Research to understand alcohol-impaired driving in the state and assess DUI recidivism risk factors among first-time and repeat offenders.
  - a) Develop code and summarize findings to stakeholders in descriptive statistics.
  - b) Conduct research to establish cohorts to confirm intervention strategy, e.g. first-time offenders, high-risk offenders, and possible control group(s) for empirical program assessment.
  - c) Conduct impaired driver risk research using nonparametric techniques, such as machine learning investigations, along with other parametric regression techniques.
  - d) Identify pilot project county/county cluster-based willingness of key stakeholders and collaboration opportunities per the program path.
- 4) Conduct SME focus groups, interviews and/or administrative record studies to determine current assessment practices and driver improvement strategy, along with knowledge of promising assessment tools and strategies that could be considered for recommended improvement to support the state's Vision Zero initiative.
- 5) Contribute empirical perspectives/expertise in a joint NDDOT/NDHP county data-linkages pilot project to expand and improve DUI driver administrative record data for impaired driving prevention work in North Dakota. (NDDOT funding county pilot planned for FY22)
- 6) Complete NDSU IRB process for human subject research.
- 7) Draft research report and submit to stakeholder for review.
- 8) Finalize research report.

- 9) Submit/Present findings at practitioner and research conferences.
- 10) Design and Implement Alcohol Impaired Driving Decision Tool Dashboard
  - a) Identify and develop a list of subject matter experts (SMEs) for project consultation group.
  - b) Develop the database to include law enforcement records, crash records, roadway characteristics/features, and other pertinent information.
    - i) Inventory primary alcohol-impaired record sources based on IDRIS work and discussions with SME.
    - ii) Determine record compatibility with spatial platform.
    - iii) Database record accessibility and collection intervals.
    - iv) Collect and integrate sample records.
  - c) Develop the GIS mapping and Hot Spot Analysis tool as alcohol impaired driving stakeholder tool.
  - d) Environmental scan of crash prediction modeling related to DUI crash prediction.
  - e) Develop the Dashboard for user interaction.
  - f) Test user experience in beta dashboard exercise.
  - g) Ongoing dashboard refinement based on user feedback and evolving dashboard capabilities/technologies.
  - h) Analyze key metrics and outcomes.

### **Project Cost**

Total Project Costs:	\$248,756
MPC Funds Requested:	\$124,378
Matching Funds:	\$124,378
Source of Matching Funds:	Kimberly Vachal/Other Salary, \$77,992 NDSU Uncollected Indirect Costs, \$26,386 NDDOT In-Kind Contribution, \$20,000

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