TUNING UP MUSIC HIGHWAY CHECKPOINT 1

Music Highway, the stretch of I-40 between Nashville and Memphis, is widely recognized as the most dangerous highway in Tennessee. Our goal is to develop a cost-effective, data-driven strategy to improve safety along this vital corridor. Our primary approach will involve geospatial modeling using publicly available data from the Tennessee Department of Safety and Homeland Security.

The main dataset we will analyze contains serious injury and fatality crash data from 2023–2025. We will augment this dataset by manually annotating sections of the highway with key geospatial features known to influence crash risk, including:

(1) presence of guardrails
(2) cable barriers
(3) rumble strips
(4) nighttime lighting and visibility
(5) pavement condition
(6) proximity to highway entrances and exits
(7) urban vs. rural environment
(8) surrounding natural features
(9) other relevant factors

Preliminary analysis has revealed an unusually high concentration of crashes in Madison and Henderson Counties. We will therefore focus our efforts on this section of I-40. Using data on crash locations and severity, we will identify hotspots and model how modifications to the geospatial features listed above could reduce the likelihood and severity of future crashes.

In addition, we will assess the projected cost and feasibility of implementing these safety interventions. Our final deliverable will include a prioritized list of improvements, along with a proposed budget and implementation timeline. Where possible, we will incorporate research-based estimates of effectiveness to evaluate interventions using an impact-versus-cost framework.

Our primary stakeholders are the Tennessee Department of Safety and Homeland Security and the Tennessee Department of Transportation. Tennessee travelers, residents, and taxpayers are also key stakeholders, as this project aims to improve safety while maximizing public value. Our key performance indicators are:

(1) reduction in predicted crash severity based on our model
(2) reduction in predicted crash frequency
(3) cost-effectiveness and feasibility of proposed improvements

Ultimately, we believe that tuning up Music Highway will make the road safer—and let travelers sing without fear.