UTC Project Information	
Project Title	Developing AI-driven Safe Navigation Tool
University	Texas A&M Transportation Institute
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Start and End Dates	09/01/2021-07/31/2022
Brief Description of Research Project	Traffic crashes are a leading cause of death in the United States. The conventional safety evaluation methods incorporate safety modeling to determine the risk scoring of the roadways and provide these risk maps in non-reproducible format. For roadway users, these risk maps are not usable in their daily roadway trips. On the other hand, popular navigation applications such as Google Maps and Apple Maps provide distance-based or travel time-based alternative routes with no real-time risk scoring. There is a need for a real-time navigation system that can provide the data-driven decision on the safest path or route. Obtaining data from several historical and real-time data sources, the user interface of the tool or application can provide the safest navigation decision by examining several scorings such as safety, distance, travel time, and overall scoring. Conducting safety prediction by using multiple big data sources, AI-driven algorithms perform better than conventional statistical models. This study aims to conduct a unique contribution by developing a robust, AI-driven, safe navigation tool, which can provide an informed decision of the safest route instead of providing several uninformed decisions offered by the current navigation tools.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	**<u>Deliverables</u>** • Database – The final datasets developed for this project. • Final Report – The report will document the work performed, models and results, lessons learned, conclusions, and recommendations. • Safe Navigation Tool– The source codes and instruction manual of the safe navigation tool. • PowerPoint Presentation – The presentation will be used to summarize the work performed, the results of the analysis, and explain how other agencies can repeat similar analyses. **<u>EWD Products</u>** • Onboarding of the students • Master's thesis • Learning modules for the workshop • Online Book Material **<u>T2 Products</u>** • Conference papers at the Transportation Research Board Annual Meeting • Developed Dataset and metadata • Journal article (submitted to a peer-reviewed journal such as TRB's Transportation Research Record or Accident Analysis and Prevention) • Safe Navigation Tool • Conduct webinar to present the project methodology and findings to industry partners and explain how to conduct a similar analysis
Impacts/Benefits of Implementation (actual, not anticipated)	A safe navigation tool will be beneficial for all road users. Other end users that may benefit from these products are research institutes and private entities that provide research and engineering services and technical support to transportation agencies. Civil engineering students may also benefit by learning how to perform data-driven safety analysis, apply AI models using a comprehensive database developed from multiple sources.

Web Links
   • Reports
   • Project website
	https://safed.vtti.vt.edu/projects/developing-ai-driven-safe-navigation-tool/