

Pedestrian and Bicyclist Safety at Highway-Rail Grade Crossings (HRGCs)

Deliverables and Reporting Requirements for UTC Grants Awarded in 2023 (June 2023)

Exhibit D

Research Project Requirement Template

Recipient/Grant (Contract) Number: University of Texas Rio Grande Valley (UTRGV), University of Nebraska Lincoln (UNL)/Grant No. 69A3552348340

Center Name: University Transportation Center for Railway Safety (UTCRS)

Research Priority: Promoting Safety

Principal Investigator(s): Aemal Khattak (PI), M. Naveed Aman (Co-PI), and M. Umer Farooq (Co-PI)

Project Partners: University of California Riverside (UCR), University of South Carolina (UofSC), University of Texas Rio Grande Valley (UTRGV).

Research Project Funding: \$150,000 (Federal), \$75,000 (Non-Federal Cost Share)

Project Start and End Date: 06/01/2023 to 08/31/2024

Project Description: Train crashes involving non-motorized pedestrians and bicyclists often receive little attention; nevertheless, they contribute significantly to the overall fatalities and injuries in incidents connected to railways. According to preliminary FRA statistics, 1,197 pedestrian-rail trespass casualties (fatalities and injuries) were recorded in 2022.

Currently, there is a lack of exposure data on pedestrians and bicyclists at Highway-Rail Grade Crossings (HRGCs), which prevents us from understanding the factors associated with high or low exposure of pedestrians and bicyclists at HRGCs. These exposure data are crucial because incorporating pedestrian and bicyclist related dynamic components into predictive modeling can enhance the precision of HRGCs crash frequency and severity prediction models. Ultimately, this improvement can lead to better decision-making on resource allocation and safety of HRGCs.

This study aims to develop a methodology for collecting pedestrian and bicyclist exposure data at urban and suburban HRGCs using video-based data collection devices to capture pedestrian and bicyclist volumes. Based on this data, we aim to create volume-prediction models that can predict pedestrian and bicyclist crash exposure at HRGCs.

US DOT Priorities: This project aligns with the following USDOT strategic goals, as established in the USDOT Strategic Plan for FY2022-FY2026: **(a) Safety:** The proposed research is directly related to the USDOT strategic goal of making the transportation system safer for all people and to advance a future without transportation-related serious injuries and fatalities. **(b) Economic Strength:** The project contributes to economic strength by reducing crashes at highway-rail crossings, which contribute to delays on both the rail and highway networks resulting in lost productivity. **(c) Sustainability:** This research will result in a more sustainable transportation network by making the rail and highway networks more resilient.

Outputs: The research team will produce new volume-prediction models for pedestrians and bicyclists at HRGCs. The research will provide guidance on improving the safety of pedestrians and bicyclists across the US. Specific products will include:

- a. database on exposure of pedestrians and bicyclists,
- b. statistical models on prediction of pedestrian and bicyclist volumes,
- c. future research recommendations, and
- d. the project final report.

Outcomes/Impacts: The proposed research is transformational in nature and its broader impacts include the potential for development of new models on prediction of pedestrian and bicyclist crash exposure at HRGCs. This will help enhance understanding of the safety hazards linked with HRGCs. Such an examination takes into account not just various traffic and train dynamic elements, but also the vulnerability of pedestrians and bicyclists. Ultimately, the research findings will empower transportation agencies to adopt proactive safety measures and reduce the occurrence of crashes, promoting the well-being of non-motorists at HRGCs.

Final Research Report: Upon completion of the project, a URL link to the final report will be provided.