# Safety of Road Users in Light-Rail Transit Environment

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Tran-SET

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**Total Project Cost:**

$130,000

*Reevaluating current knowledge of vulnerable road users and creating a guide for future rail safety courses*

Light-rail transit (LRT), which includes modern streetcars, trolleys, and heritage trolleys, is one of the fastest growing modes of public transportation in the US. Urban and suburban areas across America are turning to light-rail to solve traffic congestion and air quality issues, improve mobility, and spur economic growth. The rise of LRT systems has been aided in part by the Federal Transit Administration's (FTA) fixed guideway capital investment program known as "New Starts". A major reason behind the demand of LRT systems is the ease of working them into existing urban and suburban corridors where they can operate in shared rights-of-way or semi-exclusive rights-of-way. To lower their cost and complexity, most LRT systems have their tracks placed on city streets, in medians, or in separate at-grade rights-of-way with at-grade crossings. Operating light-rail vehicles (LRVs) along these alignments introduces new problems and increases collision risk with vulnerable road users (pedestrians, cyclists, and electric scooter users). Although LRT systems have an outstanding overall safety record compared to other methods of surface transportation, collisions involving LRVs and vulnerable road users (VRUs) occur resulting in death and/or major injuries. These accidents negatively impact the image of the safety of LRT systems and the reputation of transit agencies.

## Problem Statement

Reducing VRU collisions has been identified by the Federal Transit Administration (FTA) as the second item of the "Top Ten Safety Action Items" in improving rail transit safety. A crucial step in the development and selection of safety treatments is to have a fundamental knowledge of pedestrians, bicyclists, and electric scooter rider's behavior along LRT alignments and the safety issues that arise. The goal of this study is to provide transit agencies, state DOTs and local governments with a resource guide detailing the best practices applicable to improve the safety of VRUs in LRT environments.

## Objectives

This research project has two goals:

1) to survey and evaluate existing knowledge and the state of practice regarding VRUs safety in LRT environments.

2) to utilize this information and publish the results into a "Best Practices Resource Guide" and a companion "PowerPoint Training Materials" that can be used in existing rail safety courses and used in making presentations at schools and public events. The proposed resource guide and training material should also provide important information for new LRT projects in engineering and design stages and support the activities of existing LRT agencies to improve VRUs safety.

## Intended Implementation of Research

**Workforce Development and Outreach:** This project will aid the research and education infrastructure at OSU. The developed learning resources will be designed to advance the professional capacity development and skills of the U.S. transit industry workforce. Webinar presentation will be made at the conclusion of the technical part of the project. Furthermore, the technical results will be published in archival journals and presented at conferences attended by representatives of industry and academia.

**Education:** The data collected in this project will be integrated into courses offered by the School of Civil & Environmental Engineering at OSU to both undergraduate and graduate students. This material will also be available to other universities in the region. The PowerPoint presentation developed in this study will be used to explain the best practices and emerging ITS technologies for reducing crashes involving VRUs in LRT systems, LRT agency employees, the public, and

elementary, middle, and high school students. The PI plans to participate in the OSU's Annual National Lab Day for hands-on demonstration to high school students.

## Anticipated Impacts/Benefits of Implementation

If successful, the results of this study will aid LRT systems operators, planners and designers in Region-6 improve the safety. Accordingly, the research team will leverage this Trans-SET funding to target additional federal, state, and private sector funds.

The main deliverables from this study are: (1) identifying the most effective engineering treatments, devices, public education techniques, and technologies that reduce conflicts and crashes involving LRVs and VRUs; (2) a final report documenting the entire technical phase as well as findings and conclusions (3 presentations to be given at national conferences attended by industry and academic figures.

Figure 1: A light-rail embedded into a city road

## Web links

- Tran-SET's website https://transet.lsu.edu/research-in-progress/

## Tran-SET

Tran-SET is Region 6's University Transportation Center. It is a collaborative partnership between 11 institutions (see below) across 5 states (AR, LA, NM, OK, and TX). Tran-SET is led by Louisiana State University. It was established in late November 2016 "to address the accelerated deterioration of transportation infrastructure through the development, evaluation, and implementation of cutting-edge technologies, novel materials, and innovative construction management processes".

## Learn More

For more information about Tran-SET, please visit our website, LinkedIn, Twitter, Facebook, and YouTube pages. Also, please feel free to contact Dr. Momen Mousa (Tran-SET Program Manager) directly at transet@lsu.edu.