

# DRISI

CALTRANS DIVISION OF RESEARCH,  
INNOVATION AND SYSTEM INFORMATION

# Research Notes

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Project Title:  
Strategies for Improving Safety and  
Efficiency of Interaction Between  
Surface Traffic and Trunkline Transit

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## Strategies for Improving Safety and Efficiency of Interaction Between Surface Traffic and Trunkline Transit

This research will focus on understanding the safety and efficiency issues involving interaction between transit and surface traffic; and study ways to apply ITS technologies to manage hazards while optimizing operation.

### WHAT IS THE NEED?

The interaction between surface traffic and trunk line transit systems has presented significant challenges. To improve transit efficiency, signal priority, and signal preemption have been implemented for certain light rail applications. While the signal priority is designed to reduce transit delays, it has led to an increased number of collisions between automobiles and transit vehicles, particularly when the buses operate on dedicated right-of-way.

One notable example is the LACMTA BRT Orange line (G-Line), which has encountered a high crash rate at intersections, resulting in injuries, property damage, substantial network delays, and significant public attention. These hazardous situations often involve cars running red lights or driving parallel to the BRT line and making turns at intersections without being aware of approaching transit vehicles.

California's light rail systems also face similar safety challenges, especially when vehicles travel alongside rail transit vehicles and attempt left turns. Another type of conflict arises on dedicated BRT lanes that run parallel to conventional traffic lanes, like the AC Transit International Blvd BRT, where adjacent vehicles abruptly intrude into the BRT lane, resulting in collisions between BRT vehicles and surface traffic. Appendix A synthesizes the safety issues encountered by LACMTA, AC Transit, and VTA.

### WHAT ARE WE DOING?

To tackle the safety concerns at intersections while minimizing the impact on BRT service, potential solutions will be evaluated. While physical barriers and adjacent conventional traffic lanes (traditional measures) can be effective, their operation significantly affects the flow of surface traffic and may result in



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reduced BRT capacity.

ITS has made significant advancements in traffic management, and their use as a solution will be explored.

There are several challenges that current ITS technologies must address to mitigate the safety hazards, including:

- a) The absence of performance measures and management strategies capable of thoroughly assessing and addressing safety hazards.
- b) The lack of methods for detecting and mitigating safety hazards, as well as for facilitating efficient coordination and management between transit vehicles and surface traffic. This coordination is essential to ensure safe operations without unduly compromising the efficiency of both transit and traffic systems.

These innovations may replace or complement traditional safety technologies, such as grade crossing controls, to provide effective solutions that enhance transit system safety while maintaining overall traffic efficiency.

## WHAT IS OUR GOAL?

To investigate methods for assessing the safety hazards involving trunkline transit and surface traffic and to develop innovative approaches to detect and mitigate hazards and facilitate efficient management or coordination between transit vehicles and surface traffic.

To achieve these goals, the research aims to (1) collect and analyze traffic and transit data to understand safety issues involving interaction between transit and surface traffic, (2) study ways to apply advanced ITS technologies to measure, detect, and mitigate safety hazards while optimizing the operation of all modes, the treatments to be studied range from traditional grade crossings applied for transit trunklines to advance ITS technologies.

## WHAT IS THE BENEFIT?

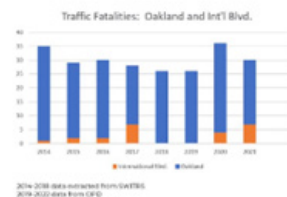
As regions in California continue to expand their trunk line transit services, with a particular interest on dedicated Bus Rapid Transit (BRT) systems, it is crucial to address the safety and efficiency challenges associated with the interaction between trunkline transit and surface traffic systems. The insights obtained from this study will have widespread benefits for regions that currently operate or have plans for dedicated BRT and light rail systems, contributing to the development of a transportation system that is safe, sustainable, integrated, and efficient. Furthermore, the findings of this study will be valuable to BRT agencies across the country, providing them with valuable insights and recommendations for improving the overall efficiency, safety, and functionality of these systems, leading to more effective integration and enhanced performance.

## WHAT IS THE PROGRESS TO DATE?

The research contract is currently being reviewed by the Department of Procurement and Contracts (DPAC) and has not been executed.

## IMAGES

### Traffic Deaths are Increasing Citywide and on International Blvd.



**Oakland Traffic Deaths: Recent high of 36 in 2020; 22 deaths at the end of June 2022.**

**International Traffic Deaths: comprise ~25% of Oakland traffic deaths in 2021 (7 deaths) + 2022 ( 7 deaths Jan. - June.)**

**Nationally, traffic deaths reached a 16 year high in 2021 – speeding, DUI**

WYSA, Nov 2022. <https://caltransdot.ca.gov/Releases/2022/11/222204>

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