

ITS for Transit Safety

Americans depend on public transit daily for work, school, and more, with 3.61 billion bus trips taken in 2024 alone. Yet bus-related fatalities per 100 million Vehicle Revenue Miles (VRM) increased 12% from 2014–2024 [1]. ITS technologies can help to keep transit passengers and operators safe from collisions, assault, and other transit hazards.



12%



Bus related fatalities per 100 million vehicle revenue miles (2014-2024)

The featured benefits, costs, and lessons learned are based on ITS project evaluations from the ITS Databases at: <https://www.itskrs.its.dot.gov>. **Click on each example to learn more.**

KEY BENEFITS

Operator and Passenger Security



- **Video surveillance** improved security on public transportation by 4% according to an international survey conducted between 2015 and 2018. ([2023-B01790](#)).
- The installation of new **security cameras, fencing, and gates** at rail stations in St. Louis, as a part of the city's Secure Platform Plan, led to a 42% reduction in law enforcement incidents ([2025-B02007](#)).



Vehicle Systems Safety

- A **pedestrian crossing warning system** in Cleveland improved bus driver reaction time to pedestrian conflicts by 19% ([2022-B01675](#)).
- A **Collision Avoidance Warning System (CAWS)** in Virginia reduced vehicle events by as much as 67.4% ([2022-B01663](#)).
- A driver simulation study showed that **V2X warnings** reduced crash rates by 56-97% in unpredictable pedestrian or distraction cases. ([2022-B01622](#)).

Transit System Maintenance



- A **machine learning based predictive maintenance process** to screen railway transit signals for repair was able to identify 35% of failures a month in advance ([2022-B01708](#)).
- A **predictive maintenance system** which monitored and communicated engine data reduced the rate of transit bus breakdowns by 8%. ([2022-B01703](#)).



Emerging Technologies

- An **automated shuttle pilot** in North Carolina felt “safe” or “very safe” for 87% of survey respondents ([2022-B01700](#)).
- A **computer vision model** trained to detect passenger slip and fall events in transit stations correctly identified whether a video contained a fall event 82.2% of the time ([2025-B02008](#)).