



Volpe, The National Transportation Systems Center

# Infrastructure Systems and Engineering

Our Center for Infrastructure Systems and Engineering applies in-depth technical knowledge of surface, ground-based aviation, and marine transportation systems to enhance safety, operational efficiency, and sustainability.

We perform engineering and safety analyses of rail and transit systems; system and subsystem elements, including freight and passenger vehicles, track structures, and vehicle and guideway interactions; and waterways, ports, and related facilities.

Our team addresses a wide variety of transportation challenges related to design, construction, operation, maintenance, inspection, and overall safety assurance of transportation systems.



U.S. Department of Transportation  
Volpe, The National Transportation Systems Center

## What We Do

### Infrastructure Engineering and Deployment

Volpe's Infrastructure Engineering and Deployment Division advances transportation innovation by being leaders in infrastructure technology and operational enhancements, including vehicles and vessels, railways, waterways and ports, aviation structures and facilities, and systems.

Our team provides analysis, engineering, and project management to implement operational enhancements and improve infrastructure safety and security.

### Structures and Dynamics

Volpe's Structures and Dynamics Division improves the performance and safety of the rail transportation system by applying engineering expertise in the areas of vehicle-track interaction, mechanics of wear, fatigue and fracture, soil mechanics, and vehicle impact energy management.

We conduct research and testing related to the crashworthiness of rail cars, and develop and test new methods for inspecting tracks.

### Systems Safety and Engineering

Volpe's Systems Safety and Engineering Division conducts engineering, research, and analysis to improve transportation safety, capacity, and resiliency.

Our team examines engineering, education, and enforcement methods that can reduce injuries and fatalities at railroad and transit grade crossings.

We provide program management, monitoring, and technical assistance services for federal multi-billion-dollar grant programs throughout the United States.

## Our Capabilities

- Analysis of data from accident and incident reports, inspections, tests, and other sources to identify causes and propose solutions that will prevent or mitigate hazards
- Application of materials engineering principles to understand and improve rail component performance
- Assessment of the dynamic performance of ground transportation vehicles
- Implementation of infrastructure and systems modernization to improve safety and security
- Interpretation of analytic and experimental investigations
- Risk assessment and analysis
- System development, deployment, and sustainment
- Technical, analytical, and project management in the planning, development, operation, and evaluation of railroad and transit systems and technologies
- Technical, analytical, architectural, engineering, and project management support for improvements to transportation infrastructure, equipment, facilities, vehicles, and vessels and their systems
- Technical assistance and training on regulatory compliance and safety assurance
- Transportation safety regulations and standards development and implementation support

- Transportation system lifecycle support, including systems requirement development, performance evaluation, operational test implementation, and change management

## Our Sponsors

- Federal Aviation Administration
- Federal Railroad Administration
- Federal Transit Administration
- Maritime Administration
- Pipeline and Hazardous Materials Safety Administration
- U.S. Air Force
- U.S. Army
- U.S. Coast Guard
- U.S. Navy

## Contact Us

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