

## Education

RTL offers a rich educational environment for graduate and undergraduate students interested in learning about and performing research in railway technology. Our sponsors have the advantage of hiring these already-trained students to better integrate the technologies we have developed into their products.

## Sponsors

Transportation Technologies Center, Inc.



General Electric Transportation Systems



## Mission

The Railway Technology Lab's mission is to explore and help implement technologies that will enable the U.S. railroad companies to become more efficient and competitive in their day-to-day operation.



## RTL Faculty



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# Railway Technology Laboratory

An AAR Affiliated  
Laboratory



## About RTL

The Railway Technologies Lab (RTL) at Virginia Tech was established in 2004 as an Association of American Railroads (AAR) affiliated laboratory. Prior to 2004, rail dynamics activities were performed at Virginia Tech in the Advanced Vehicle Dynamics Laboratory (AVDL). Dr. Mehdi Ahmadian, professor of Mechanical Engineering, became the director of RTL in 2004. RTL is currently part of the Center for Vehicle Systems and Safety (CVeSS) at Virginia Tech.



## Research

Projects at Railway Technologies Laboratory (RTL) include a wide mix of technologies related to different engineering disciplines:

- Rolling stock tangent track and curving dynamics
- Vehicle-rail interface dynamics
- Railway car bogies analysis
- Wayside vehicle and rail health monitoring
- Advanced rail vehicle suspensions

## Current Projects

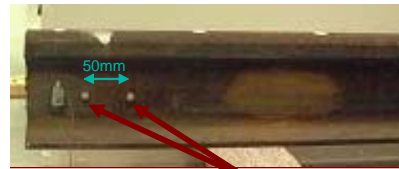
### Innovative design concepts for insulated rail joints

Evaluate the feasibility and effectiveness of designing a “jointless” insulated joint



### Broken rail detection using smart materials and impedance

Provide a self-contained wireless system that will warn operators and maintenance personnel of anomalies in rail tracks (cracks, breaks)



Small Magnets  
(damage)

### Effective methods for detecting crew alertness

Assess non-intrusive systems for detecting physical and/or psychological signs of lowered alertness

### Optical fiber Doppler sensors for measurement of rail friction

Investigating simple optical fiber sensors for monitoring rail friction



### Automated measurement of curve movement

Identify the existing technologies and their constraints for measuring or monitoring curve movement specify the path for prototype development of the most promising technology

## Facility & Equipment

RTL is housed in a modern facility in Blacksburg, minutes away from Virginia Tech's main campus. Existing RTL laboratory equipment allows state-of-the-art research in rail vehicle dynamics.

