



Transportation Technology Center, Inc.

On January 1, 1998, the Transportation Technology Center, Inc. (TTCI) was formed as a wholly-owned, subsidiary of the Association of American Railroads (AAR). Headquartered at the U.S. Federal Railroad Administration's (FRA) Transportation Technology Center (TTC) near Pueblo, Colorado, its mission is "accelerating the use of clean, safe and efficient technologies by railways worldwide."

Professional Services

TTCI's engineering team is available to help provide solutions to problems related to track issues, rail vehicles and components, vehicle track interaction, and railroad operations. Through the use of current engineering principles and practical experience, TTCI's engineering team is known worldwide for solving railway and transit problems in a variety of areas. Specialties include simulation of track, vehicle, train and component behavior, as well as engineering economics, communications and train control, project management, and general problem-solving. One of TTCI's greatest strengths is its ability to accurately model the behavior of rail vehicles, components, structures, and systems. Data collected during full-scale testing has been used to build and refine computer models utilized to predict behavior under a variety of conditions. TTCI models include:

- **NUCARS®**
- Wheel/Rail Tolerance, **WRTOL™**
- Train Operations and Energy Simulation, **TOES™**
- Simulation of Train Action to Reduce Cost Operations, **STARCO™**
- Train Energy Model, **TEM™**
- Railway Track Life-cycle Mode, **RTL™**

Products

TTCI has developed a number of products as outgrowths of cooperative industry research programs. These products are specifically designed to provide valuable information to customers faced with the need to make important decisions regarding safety, customer service, and economics. Products include Instrumented Wheelsets, the Trackside Acoustic Detection System (TADS®), the Fully Automated Car Train Inspection System (FactIS™), and InteRRIS® - TTCI's performance monitoring data collection and analysis system.

Training

TTCI offers technical training in freight and passenger vehicle dynamics, derailment analysis, wheel-rail interaction theory, vehicle suspensions, nondestructive testing, heavy axle loads, and vehicle/train modeling. TTCI's Emergency Response Training Center (ERTC) provides training for private and public emergency response and security organizations that must respond to incidents involving hazardous materials. Over 38,000 responders have been trained at TTCI's comprehensive training center which includes live exercises at a simulated derailment.

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Specialized Laboratory Testing

TTCI has several specialized laboratory test facilities allowing testing of vehicles and components. Facilities include:

- Vibration Test Unit, Simuloder, and Mini-Shaker Unit, used to evaluate structural integrity and suspension characteristics of rail vehicles and trucks
- Dynamometer, used to measure braking forces and thermal and mechanical loads on railroad wheels and brake shoes
- Train Air Brake Research Laboratory, simulates a 150-car train braking system including all piping and valve components
- Roller Bearing Test Facility, Center Plate Tester, and a fully equipped Metallurgical Laboratory are also located at TTC.

TTCI's remoteness and isolation offers maximum security protection ideally suited for rail security testing and exercises.



Full-Scale Vehicle On-Track Testing

TTCI is home to more than 50 miles (81km) of specialized test track. Extensive track facilities for electric and dual mode high-speed passenger, transit, commuter, and freight testing are available. Test tracks are used daily for track structure and vehicle performance testing, specification compliance, track and service worthiness, life-cycle and component reliability, and ride comfort evaluation. Testing of vehicles at operating speeds up to 165 mph (267kph) is possible on TTCI's Railroad Test Track, and TTCI can accumulate over 1 million gross ton-miles per day on its High Tonnage Loop.

Other Capabilities

TTCI supports the AAR and its members through cooperative research in improved suspension systems, top-of-rail lubrication, improved wheel and rail profiles, performance-based track geometry systems, center plate lubrication, effects of heavy axle loads, track-integrity monitoring systems, and improved ride quality. TTCI develops and maintains industry standards for freight cars and locomotives, under the direction of AAR. TTCI's Technical Standards group provides technical expertise, coordinates the development of new standards, manages the industry's certification and quality assurance programs, and publishes AAR's Interchange Rules and *Manual of Standards and Recommended Practices*.

contact:
TRANSPORTATION
Technology Center, Inc.

55500 DOT Road
Pueblo, Colorado 81001
Phone: +1-719-584-0750
Fax: +1-719-584-0711
Toll free: +1-888-588-7246
Website: www.tci.aar.com
Email: marketing@tci.aar.com