

VTI MONITOR™

Vehicle/Track Interaction Monitor™ remotely manages rolling stock and pinpoints track problems in real time with Internet data access and email event notification

Detect Problems Early

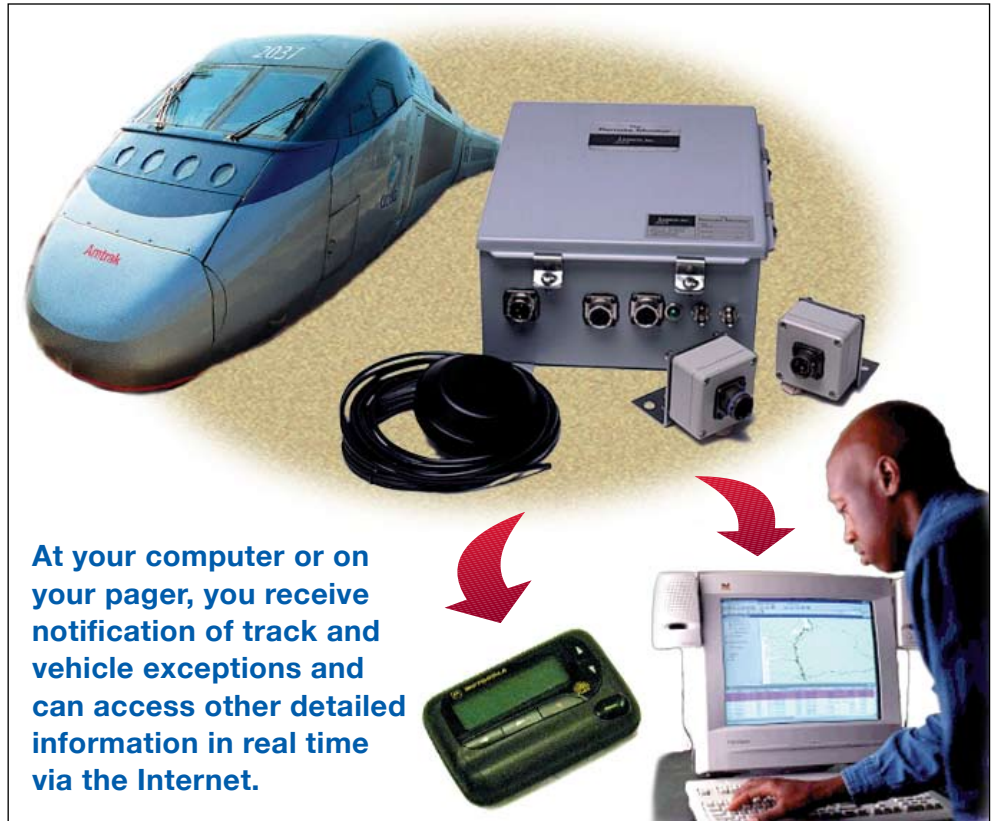
Installed on rail vehicles, ENSCO's Vehicle/Track Interaction (VTI) Monitor™ proactively detects and pinpoints the locations of potential track and vehicle problems. It monitors numerous conditions such as track anomalies, joint impact and vehicle suspension issues. It detects problems early, reducing the potential of serious equipment failures. All information is transmitted by wireless communication from the vehicle and is available in real time on your computer. The VTI Monitor is based on research sponsored by the Federal Railroad Administration (FRA) and ENSCO'S internal research and development.

Now, VTI Monitor Supports Track/IT™, ENSCO's Webbased Data Management System

Both applications work through the same ENSCO system, giving the VTI Monitor all Track/IT functionalities. New ways of presenting data, including track charts, maps, tables and graphical channel views, are cross-referenced to move easily from one format to another. Like all Track/IT applications, the VTI Monitor data is fully Web-based, so you need only a browser to use it— no special requirements.

Saves Time and Money

- Provides early warning of track and vehicle problems
- Reduces cost of track and vehicle inspection and maintenance
- Decreases equipment degradation through early and continuous assessment
- Minimizes labor costs through efficient maintenance planning and scheduling



At your computer or on your pager, you receive notification of track and vehicle exceptions and can access other detailed information in real time via the Internet.

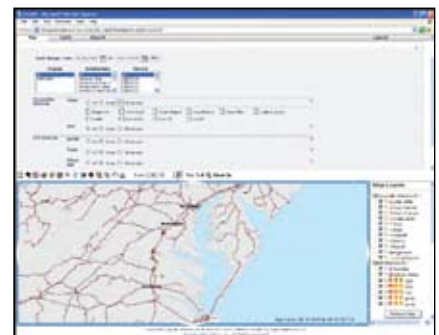
- Streamlines asset management: accurately monitors train location, speed, track, and vehicle condition

System Operation

- Remotely assesses joint impact and vehicle track interaction through continuous and autonomous monitoring of sensors
- Posts an alert or alarm message with location, time, date and exception description when a track or vehicle parameter is out of range
- Displays periodic status reports including snapshots of all measured data, vehicle speed and location, time, and date
- Provides customized summaries and

comparisons

- Displays real-time vehicle location and data on the Web, overlaid on a GIS map
- Auto reset and remote reprogramming Capability



Sample Track/IT application screen.

(continued on reverse side)
05.0054



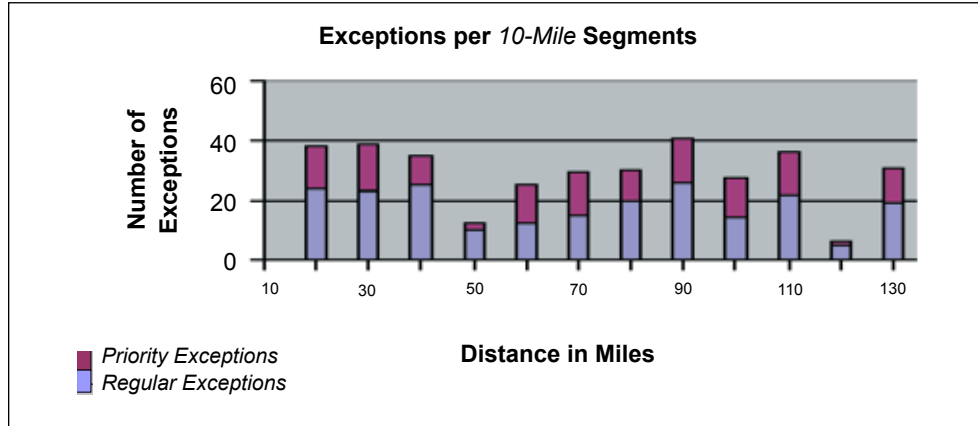
Innovation Starts Here

A Product of FRA Research Federal Railroad Administration,
Office of Research and Development

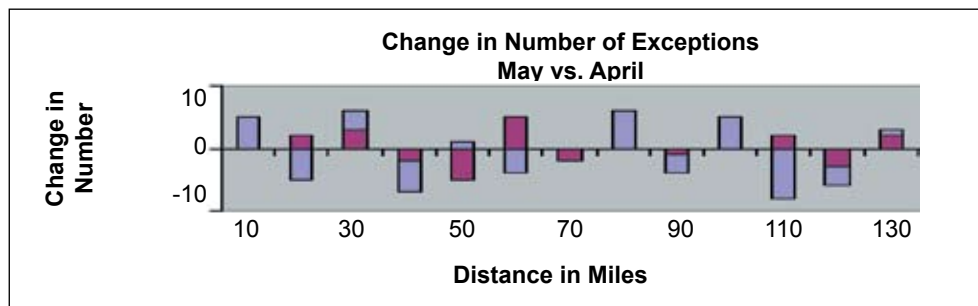
5400 Port Royal Road
Springfield, VA 22151
703-321-9000 • 800-ENSCO-VA
info@ensco.com • www.ensco.com

Trend Reports

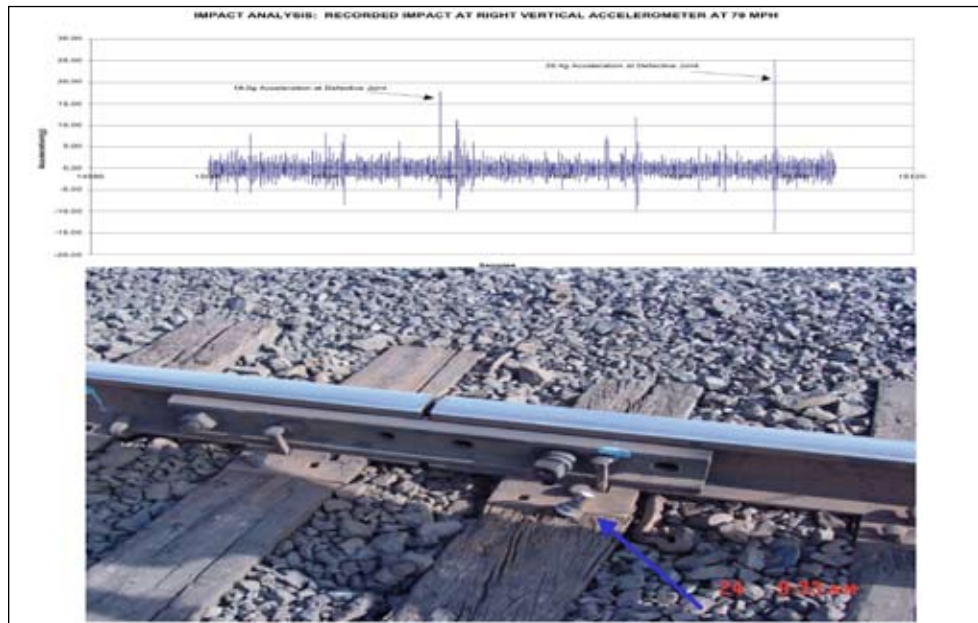
Weekly and monthly trend reports summarize the collected data in a variety of ways for multiple trend analyses.



For example, this chart shows the number of exceptions along each ten-mile segment of track for a specific car.



This chart indicates changes in track over time for each portion of track due to activities such as track maintenance.



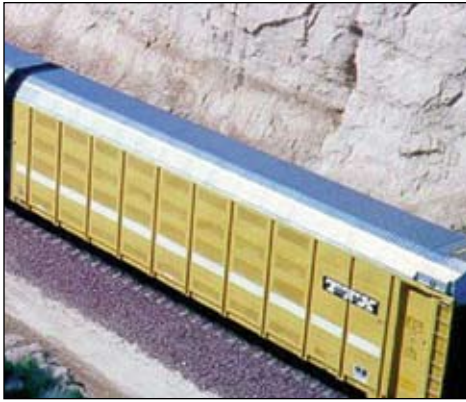
Additional Features

- Users can remotely request additional data or change exception thresholds
- Reports its own status at predetermined time and distance intervals
- Functions in harsh environments
- Includes various sensor options: carbody acceleration, truck acceleration, wheel impact and roll sensors
- Uses satellite and/or commercial or proprietary wireless networks
- Includes various sensor options: motion, vibration, engine monitoring, and car monitoring
- Contains multiple reporting capabilities
- Complies with the FRA high-speed track safety standard for car body and truck acceleration (49 CFR 213.333)
- Integrates with Work Order Management Systems to automatically create, manage and monitor follow-up actions
- Detects profile alignment anomalies, battered and broken joints and damaged frogs
- Locates problems that might cause equipment or lading damage

“With the VTI Monitor™, we can be more proactive about conditions that we have not previously had the accurate information necessary to become constructively involved in.”

*Branch Chief, Railroad Technology
California Department of Transportation
(Caltrans)
- Ken Galt*

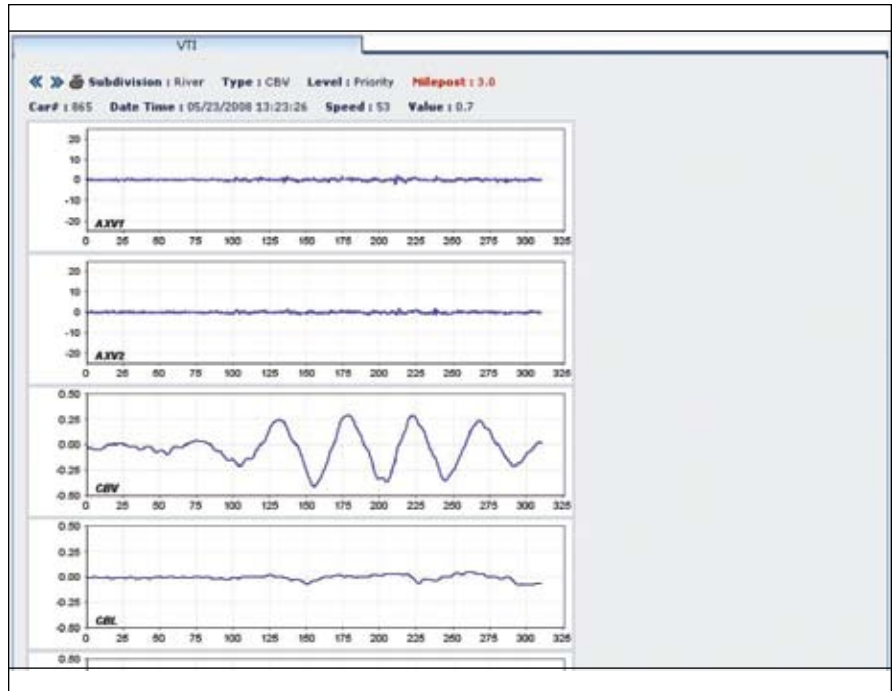




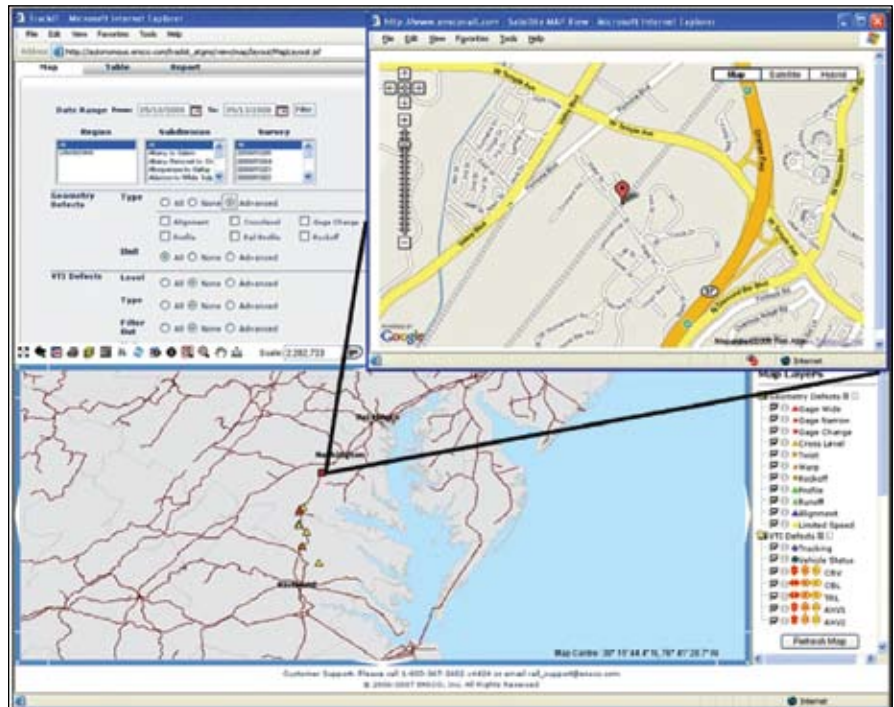
The VTI Monitor helps reinforce the safe shipment of valuable cargo. *Photo courtesy of Tim Harris*

Systems in Action

- There are currently over 200 VTI monitoring system Operating throughout North America
- Over 120 VTI Monitors in use by Class 1 Railroads including BNSF, CP, CSX, NS and UP
- Amtrak operates 18 VTI Monitors on the Northeast corridor highspeed line, in accordance with the FRA Track Safety Standards mandating track inspections for high-speed rail.
- Amtrak operates six VTI Monitor on InterCity routes to assess passenger quality and locate rough riding track locations.
- MARC has deployed 28 systems for compliance with FRA highspeed requirements and as part of a safety enhancement effort.
- Metrolink currently uses 5 VTI Monitors to supplement their track inspection process



Operators can view and analyze waveforms associated with detected exceptions and can watch for trends and data approaching exception thresholds.



By clicking on icons showing map location of exceptions, the operator can display information about the potential problem, as well as vehicle speed and location.

