



HOWARD STREET TUNNEL PROJECT BRIEF

Integrated Geotechnical & Structural
Monitoring for a Landmark Freight Rail
Modernization Project



OVERVIEW

To support rehabilitation of the historic Howard Street Tunnel, FTG delivered integrated geotechnical and structural monitoring throughout every phase of construction. Modernizing this critical freight rail corridor beneath downtown Baltimore required continuous monitoring of ground and structural performance to support safe construction.

THE CHALLENGE

Historical Tunnel Rehabilitation

Protecting a 130-year-old masonry tunnel while increasing freight rail clearance.

Dense Urban Infrastructure

Safeguarding streets, utilities, transit systems, and surrounding structures throughout construction.

Complex Construction Logistics

Maintaining continuous monitoring across a 1.7-mile tunnel while accommodating active rail operations and advancing construction.

SOLUTION PROVIDED

FTG designed and implemented an integrated monitoring program throughout the 19-month rehabilitation. Providing baseline analysis, continuous monitoring, and real-time engineering oversight, the program utilized:

- First East Coast GeoLidar deployment
- 1,000+ tunnel monitoring points
- 80+ instruments installed including GeoLidar, extensometers, inclinometers, and piezometers
- Automated readings every 30 minutes
- Pre- and post-construction condition surveys

AT A GLANCE

Project Profile

Client: CSX Transportation

Contractor: Skanska and Fay JV

Designers: WRA and Hatch

Stakeholders: MTA and City of Baltimore

Location: Baltimore, Maryland

Duration: 19 months

Project Impact

- 160,000 additional containers annually
- \$1B estimated annual economic impact
- Reduced I-95 congestion and transportation emissions
- Completed East Coast double-stack rail clearance

Results

- ✓ Supported on-time tunnel handover
- ✓ Zero construction-related damage
- ✓ Protected surrounding infrastructure
- ✓ Enabled data-driven decisions
- ✓ Supported safe construction



**Kevin E.
Tehansky, P.E.**
Senior
Geotechnical
Engineer

"Establishing a reliable baseline of 100+ year-old structures allows us to distinguish existing movements from construction-related effects, which is critical for driving schedule demands safely on complex tunnel projects like Howard Street"

**Need real-time monitoring?
Let's talk.**
410-517-0715

19

MONTHS OF
MONITORING

1,000+

TUNNEL
MONITORING
POINTS

2+

MILES CRITICAL
INFRASTRUCTURE
MONITORED

55+

WEEKLY
DATA
REPORTS