

Request for Information - TTC

Request for Information (RFI)

for

Operation, Maintenance, and Long-term Sustainability of the

Federal Railroad Administration's (FRA) Transportation Technology Center (TTC)

Pueblo, Colorado

Disclaimer: Request for Information (RFI) Only. This RFI is issued solely for information and planning purposes – it does not constitute a Request for Proposals (RFP) or a promise to issue an RFP in the future. This RFI does not commit the Government to contract for any supply or service whatsoever. Further, the Government is not at this time seeking proposals and will not accept unsolicited proposals. The RFI respondees are advised that the Government will not pay for any information or administrative costs incurred in response to this RFI; all costs associated with responding to this RFI will be solely at the interested party's expense. Not responding to this RFI does not preclude participation in any future RFP, if any is issued. If a solicitation is released, it will be synopsisized on the Federal Business Opportunities (FedBizOpps) website: <https://www.fbo.gov>.

Purpose: This RFI seeks market research information to inform defining future requirements definition and acquisition planning for the operation, maintenance, and long-term sustainability of TTC.

FRA is seeking ideas to maximize the utilization of the site to achieve FRA's objectives in research and training while increasing the investment in the physical plant. Ideas should include one or more of the following:

- 1) Managing, maintaining and operating a research, development and training facility;
- 2) Maintaining real and personal property (including the rehabilitation, renewal, and long-term sustainability of TTC's physical plant);
- 3) Providing technical services supporting training, research, and development.

Background: FRA owns buildings, laboratories, test tracks, and equipment at TTC, which is located on a 52-square mile site near Pueblo, Colorado (see Figure 1). TTC is currently managed and operated by a private company under contract with FRA.

FRA's current mission statement for TTC is "To provide innovative world class research, development, testing, training, and facilities to ensure safe, secure, reliable, and efficient rail transportation for the Nation, now and forever."

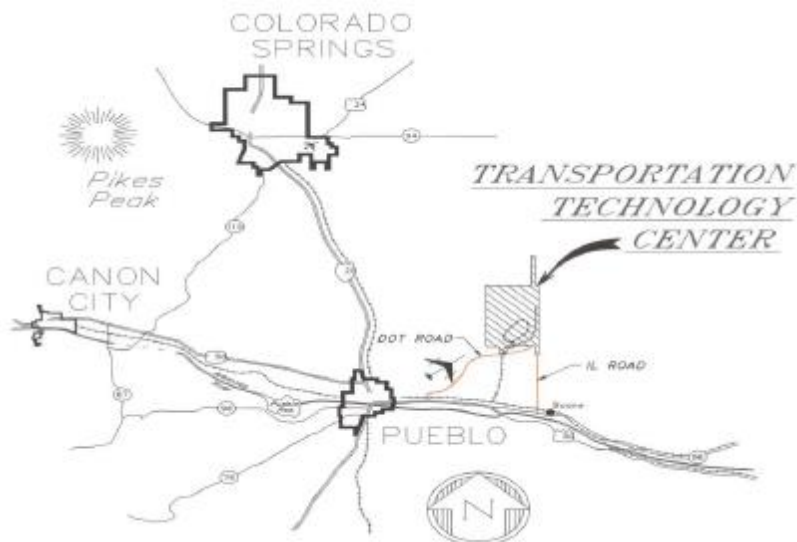


Figure 1. Location Map for the Transportation Technology Center

Development of the test facility was authorized by The High-Speed Ground Transportation Act, Public Law 90-423, in 1968. Construction of the facility began in 1970 on land leased from the State of Colorado. Since its dedication in 1971, it has played an important part in research, development, and testing of rail infrastructure and equipment, including Amtrak's Acela train prior to its beginning revenue service in 2000. The lease agreement currently extends until August 22, 2070, with an option to renew for an additional 50-year period. The FRA lease is for surface use of the land.

TTC has approximately 50 miles of test rail track, including: (1) a short High Tonnage Loop used primarily to test track components under heavy axle load freight cars; (2) a 13.5-mile long Railroad Test Track used for high-speed testing up to 165 mph; (3) a shorter Transit Test Track equipped with third rail electrification and a maximum speed of 90 mph; and (4) various other test tracks used to evaluate vehicle performance over a range of extreme track conditions.

Major buildings at TTC include offices, workshops, test halls, and laboratories. Test equipment includes servo-hydraulic stands on which entire rail cars can be mounted. There is a crash wall used for impact testing of passenger cars and tank cars. Please visit <https://www.fra.dot.gov/Elib/Document/15675> for more detail about the facilities.

TTC is currently managed under a contract with a private company, including responsibility for maintenance and upkeep of the physical plant and surrounding grounds. The current contract provides that the contractor may use TTC for its own commercial purposes. In recent years, FRA has not received an appropriation for the maintenance and operation of the facility. However, FRA has received appropriations for research and development projects, as well as training that take place at TTC.

The site also supports government and commercial emergency response training. The Transportation Security Administration (TSA) created the Surface Technology Security Training

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Center located at TTC, providing training to Department of Homeland Security inspectors and other federal, state, and local security partners. TSA's presence is one of several cases of other Federal agencies using TTC. The Federal Transit Administration and the Department of Defense have utilized the site from time to time. Other government agencies are encouraged to use the facility.

FRA Expectations of the Site: FRA has four priorities for the future of TTC: (1) continued and expanded technically superior, advanced research on railroad safety challenges and development of advanced technologies to support safe rail operations and oversight; (2) continued and broadened technical training facilities and activities related to railroad safety oversight; (3) opportunities for additional professional activities that leverage and complement existing programs; and (4) integrated facilities management practices that support maintenance, rehabilitation, and renewal over a 20-year time frame.

Research

FRA's expectation is that the site will facilitate research and development that supports public safety. Equipment and facilities must be kept in a state that allows research contractors to conduct track, rolling stock, human factors, and train control research for freight and passenger rail. The site must be capable of supporting multiple contractors and multiple research contracts concurrently.

The research conducted at the site will consist of laboratory research, engineering studies, technology development, and also full-scale testing for passenger, freight, and transit vehicles and associated infrastructure. This includes: track structure components; rolling stock equipment and components; train control systems, signal, and safety devices; and human factor-related research. In addition to full scale testing, capabilities in computer modelling and simulations to predict vehicle, track, and train control performance are required. The results of this research will be a better understanding of the sciences of railroading, the development and application of new technologies, the ability to conduct complex problem solving in the railroad environment, and the development of railroad safety data analytics and component life cycle reliability prediction.

Types of research currently conducted on site include:

- Track, Bridges, and Components including:
 - Assessing performance and safety aspects of new track and bridge components and materials, including turnouts and alternative track designs.
 - Developing and assessing non-destructive methods to evaluate track and bridge condition, strength, and performance.
 - Developing models to predict track deterioration rates and performance under load.
 - Developing technologies for improving track safety inspection and detection including geometry, strength, and internal defects.
- Track-Train Interaction including:
 - Developing analytical tools and test procedures to better predict conditions for adverse track-train performance.

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- Evaluations of wheel-rail and track-train interaction, including potential derailment modes.
- Evaluation of advanced and alternate lubrication systems and technologies.
- Equipment including:
 - Performance and safety evaluations of conventional and unconventional railroad equipment (locomotives, passenger and freight cars, high speed trainsets, and their components) including: crashworthiness, passenger and employee survivability, and equipment failure modes.
 - Developing non-destructive evaluation techniques for railroad equipment components.
 - Developing environmental mitigation practices for noise, vibration, EMF exposure, etc.
- Operating Practices and Human Factors including:
 - Policies and practices to increase safety of railroad operations.
 - Human factors and ergonomic aspects of railroad operations and maintenance, including: stress, fatigue, and alertness issues.
- Hazardous Materials (Hazmat) including:
 - Developing non-destructive evaluation techniques for freight cars and containers designed to carry Hazmat.
 - Evaluation of existing and new tank car and component designs and materials.
 - Emergency response guidelines for minimizing adverse human and environmental effects from Hazmat releases and accidents involving rail cars containing Hazmat.
 - Providing training to government and state personnel on emergency response to Hazmat releases and accidents.
- Train Control including:
 - Development of next generation train control and PTC technologies.
 - Development and evaluation of safety and integration standards for advanced train control systems.
 - Development and evaluation of standards for integrating Intelligent Transportation Systems (ITS), Global Positioning Systems (GPS), and weather data with train control systems.
- Grade Crossings including:
 - Evaluating performance and safety aspects of various components and systems for train and highway vehicle warning and presence detection at grade crossings.
 - Human factors and risk assessments of crossing systems and safety enforcement strategies.
- Predictive Analytics including:
 - Practical knowledge and expertise in the application of analytical techniques for large data sets, including: development and application of mathematical and statistical models for asset life predictions and forecasting.
 - Experts in advancing and implementing automation, including up-and-coming artificial intelligence (AI) technologies and techniques that lend themselves to augmenting manual processes and tasks related to railway track inspection.

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- Data scientists, with practical knowledge of railway engineering principles, who are capable of appropriately and efficiently cleaning and processing large data sets in preparation for analytical applications.

To support research activities, the contractor shall maintain the capability to provide the government with technical services, such as the following:

- Data collection and analysis support.
- Electronics support.
- Photographic and video support.
- Instrumental maintenance, calibration, and operation.
- Laboratory test and evaluation support.
- Test report preparation.
- Operation of full-sized railroad test equipment.

Training

The rapid adoption of new technologies and innovation in the rail industry is driving changes in FRA's railroad safety oversight model. For FRA's workforce to keep pace with new technologies, such as machine vision, automated testing, unmanned aerial vehicles, and AI, FRA requires a nimble training environment within a realistic railroad environment. TTC has the capacity to add to the world class research already conducted with a state of the art training facility that will prepare FRA's workforce for future railroad safety oversight challenges.

FRA envisions a cost-effective and flexible training environment that includes: modern classrooms, advanced learning and presentation technology, distance learning, office space, and flexible meeting rooms. Hands-on training aids will include: hazardous materials equipment benches, grade crossing sites, railroad equipment, rolling stock, track structures, and human performance laboratories with simulators. A capability to re-construct or simulate railroad accidents for learning root causes and developing new safety practices or equipment improvements is also necessary.

Opportunities to partner with universities and academic institutions, other government entities, and safety organizations to enhance and promote training that advances public safety are desired.

Opportunities for New Activities

TTC's location and available space provide an opportunity to expand the capability of the facilities to host multi-modal research, testing, and training. TTC encompasses 52 square miles of flat land, with sizable portions undeveloped. The available land could accommodate a variety of structures and test track or roadways to support emerging technologies such as autonomous vehicles and innovative highway grade crossing improvements. Other Federal agencies might find the site useful for their purposes, either independently or in partnership with FRA. Similarly, state or other public agencies, universities, or commercial enterprises could be interested in TTC.

Facility Management

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TTC is a secure and isolated campus and includes over 50 miles of railway tracks and 12 major buildings that house advanced laboratories, facilities, and equipment dedicated to surface transportation testing and training. TTC has various classes and types of track and structures to perform high-speed passenger, light rail, freight, accelerated wear, vehicle performance, and energy management testing. Existing buildings and equipment are aging and many require investment to replace or repair. Current investment in operations and maintenance has remained flat for many years, resulting in a backlog of maintenance and repair projects.

Companies providing information and ideas related to the management of the site and facilities should assume the facilities operations management functions at TTC include:

- security
- emergency medical response
- fire protection
- animal control
- electrical
- environmental
- carpentry
- real property management
- personal property management
- plumbing
- heating and air conditioning systems
- railroad track and road maintenance work

These services include a wide range of technical disciplines, including civil, mechanical, electrical, and industrial/systems engineering; engineering economics; and environmental science to perform preventive maintenance, repairs, troubleshooting and/or replacement of components on buildings, facilities, and equipment.

The site requires on-site equipment monitoring and maintenance services 24 hours a day, seven days a week, including weekends and holidays. Inspections of major building equipment mandated by any acts, codes or regulations, or any state or local requirements at set frequencies is required. All work must be accomplished in conformance with approved and accepted standards of the industry; equipment manufacturers; all applicable activity, local, state, and federal standards; and all applicable building and safety codes.

FRA requires advanced facility management practices, including tracking all building and equipment conditions and executing preventive maintenance and rehabilitation schedules and renewal needs. Detailed records of each maintenance, repair, replacement, and modification action for input into overall facility management must be maintained. The responsible party will recommend, facilitate, and oversee implementation of physical plant replacements, upgrades, and new construction.

Requested: Interested parties are requested to provide white paper responses outlining possible technical solutions and capabilities related to the above-mentioned categories. Also, the white paper responses may include all or some of the following scenarios below.

- Site and facility management.
 - Bring to a state of good repair.
 - Long-term maintenance and replacement of obsolete facilities.
 - New construction to accommodate existing and potential uses.

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- Research, development, and testing (railroad and/or multi-modal).
- Training (railroad and/or multi-modal).
- Expanded commercial and government use of the facility.

Respondents should include potential options that rely on commercial fee-based services, a private-public partnership, or limited federal investment.

Respondents should provide innovative approaches to maximize the use and investment in the facility.

Responses: The response shall include a cover page with the company name, DUNS number, address, point of contact (including phone number and email address), as well as the small business status of the responding company. In addition, FRA also welcomes you to submit a capability statement, which should be limited to five pages. The white paper response is **limited to ten pages** excluding appendices and submitted **via e-mail only** to the Government Point of Contract: Devona Jackson, devona.jackson@dot.gov. The submission shall be in PDF format and **due Friday, 5 April 2019 at 1:00pm EST. PROPRIETARY INFORMATION MUST BE CLEARLY MARKED.**

Vendors are encouraged to direct any questions by e-mail to the Government Point of Contract: Devona Jackson. Questions regarding this RFI shall be submitted to the email address above no later than **Wednesday, 13 March 2019 at 1:00 PM EST**. No telephone inquiries will be accepted.

Meetings and Discussions Government representatives may or may not choose to meet with submitters to the RFI. Such meetings and discussions would only be intended to get further clarification of submissions.