



Highlights of [GAO-10-898](#), a report to congressional committees

## Why GAO Did This Study

Passenger rail systems are vital to the nation's transportation infrastructure, providing approximately 14 million passenger trips each weekday. Recent terrorist attacks on these systems around the world—such as in Moscow, Russia in 2010—highlight the vulnerability of these systems. The Department of Homeland Security's (DHS) Transportation Security Administration (TSA) is the primary federal entity responsible for securing passenger rail systems.

In response to the Legislative Branch Appropriations Act for fiscal year 2008, GAO conducted a technology assessment that reviews 1) the availability of explosives detection technologies and their ability to help secure the passenger rail environment, and 2) key operational and policy factors that impact the role of explosives detection technologies in the passenger rail environment. GAO analyzed test reports on various explosives detection technologies and convened a panel of experts comprised of a broad mix of federal, technology, and passenger rail industry officials. GAO also interviewed officials from DHS and the Departments of Defense, Energy, Transportation, and Justice to discuss the effectiveness of these technologies and their applicability to passenger rail. GAO provided a draft of this report these departments for comment. Four departments provided technical comments, which we incorporated as appropriate.

[View GAO-10-898](#) or [key components](#). For more information, contact Nabajyoti Barkakati at (202) 512-4499 or [BarkakatiN@gao.gov](mailto:BarkakatiN@gao.gov) or David Maurer at (202) 512-9627 or [MaurerD@gao.gov](mailto:MaurerD@gao.gov).

## TECHNOLOGY ASSESSMENT

### Explosives Detection Technologies to Protect Passenger Rail

#### What GAO Found

A variety of explosives detection technologies are available or in development that could help secure passenger rail systems. While these technologies show promise in certain environments, their potential limitations in the rail environment need to be considered and their use tailored to individual rail systems. The established technologies, such as handheld, desktop, and kit-based trace detection systems, and x-ray imaging systems, as well as canines, have demonstrated good detection capability with many conventional explosive threats and some are in use in passenger rail today. Newer technologies, such as explosive trace portals, advanced imaging technology, and standoff detection systems, while available, are in various stages of maturity and more operational experience would be required to determine their likely performance if deployed in passenger rail. When deploying any of these technologies to secure passenger rail, it is important to take into account the inherent limitations of the underlying technologies as well as other considerations such as screening throughput, mobility, and durability, and physical space limitations in stations.

GAO is not making recommendations, but is raising various policy considerations. For example, in addition to how well technologies detect explosives, GAO's work, in consultation with rail and technology experts, identified several key operational and policy considerations impacting the role that these technologies can play in securing the passenger rail environment. Specifically, while there is a shared responsibility for securing the passenger rail environment, the federal government, including TSA, and passenger rail operators have differing roles, which could complicate decisions to fund and implement explosives detection technologies. For example, TSA provides guidance and some funding for passenger rail security, but rail operators themselves provide day-to-day security of their systems. In addition, risk management principles could be used to guide decision-making related to technology and other security measures and target limited resources to those areas at greatest risk. Moreover, securing passenger rail involves multiple security measures, with explosives detection technologies just one of several components that policymakers can consider as part of the overall security environment. Furthermore, developing a concept of operations for using these technologies and responding to threats that they may identify would help balance security with the need to maintain the efficient and free flowing movement of people. A concept of operations could include a response plan for how rail employees should react to an alarm when a particular technology detects an explosive. Lastly, in determining whether and how to implement these technologies, federal agencies and rail operators will likely be confronted with challenges related to the costs and potential privacy and legal implications of using explosives detection technologies.