

Tunnel Detection: Going Underground to Enhance Security

Hundreds of tunnels remain undiscovered

Tunnels are a serious and growing security threat that allow smuggling of contraband and illegal immigrants along the U.S.–Mexico border. The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) is developing tools for Border Patrol agents to detect and locate clandestine tunnels before they become conduits for drug smuggling and other illegal activity.



A sophisticated tunnel with lighting, ventilation and full standing headroom.

Although many technical approaches to tunnel detection have been proposed and tested in the past, DHS has been made many efforts to enhance tunnel detection. Most existing capabilities are based on equipment originally designed to detect land mines or identify natural gas and oil deposits; therefore, they are not necessarily suited to Border Patrol agents' operational needs.



Clandestine tunnels often connect buildings in Mexico to buildings across the border in the United States.

All geophysics is local

Effective tunnel detection depends on the geophysical characteristics of local soil, which vary tremendously along the southwestern border of the United States. S&T's first step is to create a database of existing, derived and new geological and geophysical survey data along the 50 miles of the southwestern border where tunneling is most probable. Using a complete and detailed database of the border areas, S&T will use computer models to assess which sensor systems can be used for tunnel detection.

Helping border patrol agents select the right widget

Following evaluation of the available sensor technologies, S&T will deliver a decision tool to Border Patrol agents that help them choose the most effective tunnel detection technology.



A rudimentary tunnel under the southwest U.S. border.

Long-term goal: finding the magic bullet(s)

S&T will use the results of the system performance predictions to invest in specific system and subsystem components and software to construct developmental prototypes. Intense experimentation will follow to develop and refine algorithms and improve performance. Border Patrol agents will gather feedback about performance before transitioning the technology for operational use.

