



# MEETING THE BORDER CHALLENGE

## Issue

The figures underscore the magnitude of the border challenge: every year, nearly 500 million people, 5.7 million cargo containers, 2.5 million rail cars, 125 million vehicles, and 16 million trucks cross thousands of miles of U.S. maritime, air, and land borders.

Ideally, security measures would foster this immense flow of legitimate traffic and commerce while preventing illegal entry of people and materials. Further, the border protection system would be designed to defend hundreds of official air, sea, and land ports of entry (POE), thousands of miles of unprotected border (non-POE), and even locations far beyond our borders where threats may originate.

## Solution

Sandia National Laboratories is proud to be among the numerous organizations working to secure our vast and diverse system of borders. Long responsible for helping ensure the security of the nuclear stockpile, Sandia applies more than 50 years of relevant engineering and analysis experience to help elucidate the complexities of the border challenge and develop efficient and effective solutions. We've contributed at every point in the border system, as highlighted by the examples below.

### Protecting Our Borders Outward

Ensuring that materials never approach our borders is a key element of border security. To this end, Sandia has been active in cooperative threat reduction programs, such as the Materials Protection, Control, and Accounting Program of the National Nuclear Security Administration (NNSA) to improve the security of Russian Federation fissile material and nuclear warheads. We're also involved in the Department of Energy/NNSA Second Line of Defense program to prevent nuclear smuggling across the borders of more than 15 participating countries. In addition, Sandia played a key role in Megaports, a federal program that evaluates the vulnerability of foreign seaports to illegal nuclear material shipments and deploys detection equipment to screen U.S.-bound cargo.

Further, Sandia helps build understanding of the international border system. For example, at the request of the Domestic Nuclear Detection Office (DNDO), Sandia developed a high-level architecture for detecting radiological and nuclear material in land, sea, and air cargo—throughout the entire transportation supply chain.

## Securing U.S. Ports of Entry

Sandia's numerous contributions to protect our nation's system of POE is typified by our involvement in Operation Safe Commerce—a federal program that explored business processes and technology solutions for protecting commercial shipments from terrorism, illegal immigration, and contraband. Managing the program for the Ports of Long Beach and Los Angeles, Sandia analyzed specific trade lanes for vulnerabilities, identified security improvements throughout the supply chain, and tested and recommended potential solutions.



Sandia was selected to manage all three phases of Operation Safe Commerce for the Ports of Los Angeles and Long Beach.

Sandia also headed the maritime work of the Countermeasures Test Bed (CMBT) program, run by the Department of Homeland Security to test and evaluate radiation detectors, including Sandia's SMART detection system. Tests were performed in real traffic at working shipping facilities to understand how systems would operate in the real world, as well as in controlled test beds, to evaluate performance in all kinds of weather. Ongoing work is testing advanced spectroscopic portals developed by commercial companies.

Sandia also dedicated three years of internally funded research to create a suite of simulation tools for evaluating different security options at land, sea, and air POE. Findings help border officials evaluate technical and economic tradeoffs when selecting and implementing security measures.



Sandia was instrumental in the Countermeasure Test Bed program to evaluate radiation portals in real traffic at operating shipping facilities.

### Hands-on Assistance at the Southern and Northern Borders

Sandia works hand-in-hand with U.S. border personnel to test solutions at the borders—and ensure they perform as expected. Activities at the southern border have included evaluating several commercial sensors for the New Mexico National Guard, as well as helping the Arizona Border Control Initiative (ACBI) evaluate and select commercial border-monitoring sensors. At the Northern border, we've supported the Integrated Border Enforcement Teams—a joint effort between the United States and Canada—in their search for enhanced sensor systems.

Sandia also provides technical assistance to federal, state, and local border security teams through the Border Research and Technology Center, operated with the National Institute of Justice. And through the Border Technology Development Center, Sandia and New Mexico State University test and deploy technologies for a land border crossing.

This and other hands-on work draws extensively on our work at the Outdoor Test Facility, run by Sandia to evaluate border security technologies—such as sensors, communication links, display technologies, and integrated systems—in the field. Our field work also builds on our deep experience developing technologies for border protection and physical security, including the following:

- An innovative chemical preconcentrator used in sensors—including a Sandia-developed walk-through portal being used in airports—to sniff out trace amounts of explosives and drugs.

- Sandia's SMART<sup>®</sup> radiation detection system, which incorporates our proprietary software for isotope identification.
- Near-surface geophysical characterization, which has been applied for tunnel detection.
- Miniaturized, extremely rapid systems for detecting chemical and biological agents.
- A 3D sensor and facial recognition technology based on a scannerless laser radar.



Sandia assists in numerous field tests, including this test of fiber optic sensors.

### Conclusion

Sandia has made major contributions to border security issues at numerous levels and locations. Incorporating our systems analysis legacy, thorough understanding of weapon and countermeasure technologies, and track record in creating physical security systems for high-risk sites and assets, Sandia will continue to present security solutions that address the unique complexities of the border challenge.

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<http://homelandsecurity.sandia.gov>