Pacific Northwest NATIONAL LABORATORY

# BUILDING A SCIENCE & TECHNOLOGY LEGACY IN HOMELAND SECURITY

The tragic events of September 11, 2001, sparked major changes in how the U.S. government viewed and ultimately countered terrorism. The newly formed U.S. Department of Homeland Security (DHS) called upon Pacific Northwest National Laboratory (PNNL) and other U.S. Department of Energy national laboratories to help. Twenty years later, PNNL continues to play a critical role in nearly every layer of the country's national security, advancing solutions and partnerships that address the evolving threat environment and help the first responders protecting the nation.

***Looking to the Future:*** *PNNL is setting the stage to address the evolving threat environment with 5G partnerships and programs designed to transform cybersecurity, grid protection, and first responder technology.*

## 2001

**After the 9/11 attacks, country priorities led PNNL to hone focus on threats to aviation, radiation, biological and chemical detection, and public safety.**

## 2002

DHS launches with critical mission "to secure the nation from the many threats we face."

PNNL powers on first radiation detector designed to scan international cargo for radiation sources at U.S. borders.

## 2003

The whole-body scanner, first patented in 1995, is licensed for security applications and introduced to DHS for passage screening at airports.

Portable Acoustic Inspection Device receives Federal Laboratory Consortium (FLC) award. The technology examines and inspects containers non-invasively.

## 2004

Radiation portal monitors are installed at ports of entry to scan for illicit nuclear and radiological materials. PNNL has since installed more than 1,300 radiation portal monitor systems along the nation's borders.

## 2005

Millimeter Wave Holographic Body Scanner receives FLC award, adding to its R&D 100 Award and R&D Magazine's Editor's Choice Award as the "Most Promising New Technology."

## 2006

Senate approves critical funding for Washington State, including $2 million for PNNL to use in critical security detection work at the Hanford Nuclear Reservation. PNNL awards contracts to four universities for homeland security work.

PNNL begins coordinating preventative radiological/nuclear detection drills for Puget Sound maritime environments, training first responders in proper response and use of detection equipment.

## 2007

PNNL launches the Explosives Detection Initiative to advance transformational science and technology in explosives detection, specifically for aviation security.

## 2008

PNNL develops the Risk Reduction and Resource Assessment Model to counter the threat of vehicle-borne improvised explosives.

PNNL stands up the Northwest Regional Technology Center to address homeland security challenges.

## 2009

After the underwear bomber attack, PNNL plays a key role in the working group that developed initial protocols put into operation by the Transportation Security Administration (TSA).

## 2010

PNNL joins the U.S. Defense Threat Reduction Agency and DHS in the Seattle Urban Area Security Initiative to conduct the Interagency Biological Restoration Demonstration Program, culminating in a first-of-its-kind regional recovery framework for a biological incident.

As part of a PNNL-managed project, Lincoln Laboratory's immersive imaging system is piloted at Logan International Airport, providing unprecedented, high-resolution, 360-degree camera coverage.

## 2011

Whole-body scanning security systems are deployed at airports nationwide. Today, more than 1,300 systems are in place in 250 airports across the country and around the world.

## 2012

News of PNNL's vapor phase explosives detection research creates buzz in *Smithsonian* magazine, *Popular Science*, and the *New York Times*.

PNNL participates in a partnership with DHS and the State of Colorado, producing the Denver Urban Area Security Initiative Regional Recovery Framework and laying a foundation for a regional and collaborative recovery approach.

## 2013

PNNL transitions focus to trace vapor detection research and advanced imaging technology development and begins support of detection standards for radiological, nuclear, chemical, and biological threat detection equipment.

## 2014

PNNL completes laboratory prototype of High-Definition Advanced Imaging Technology and adds active shooter component to Risk Reduction and Resource Assessment Model.

## 2015

PNNL becomes major contributor to the DHS Science & Technology Directorate's Apex Screening at Speed program in aviation security.

PNNL leads the Responder Technology Alliance, partnering with first responders nationwide to envision future technology.

PNNL begins participating in the DHS System Assessment and Validation for Emergency Responders program to aid procurement decisions.

PNNL named supporting laboratory for the National Infrastructure Security Analysis Center, providing modeling and analysis for natural disasters.

## 2016

PNNL begins development of the Airport Risk Assessment Model with DHS, TSA, and Seattle Tacoma International Airport.

FLC award-winning Physical and Cyber Risk Analysis Tool technology is licensed to RhinoCorps for integration into a tool to examine cyber and physical security postures.

## 2017

SerialTap receives R&D 100 Award. The palm-sized device is an inexpensive, nonintrusive add-on that can monitor and verify the activity in older serial communication systems.

The PNNL-developed BioFeeds debuts a scalable, flexible, open-source data collection, analysis, and dissemination tool to support biosurveillance operations by DHS and its federal interagency partners.

## 2018

PNNL pilots the immersive imaging system at a large-scale event venue and the Federal Law Enforcement Training Center.

PNNL designs VitalTag, a stick-on sensor that measures and tracks a patient's vital signs to help first responders quickly triage, treat, and transport the injured.

StreamWorks receives an R&D 100 Award. The software cuts cyberbreach detection time significantly—to near real time—by detecting emerging patterns of sophisticated cyberattacks in massive data streams.

## 2019

Acoustic Gunshot Detection technology, licensed to Security-USA Services, LLC, receives FLC award. The technology instantaneously detects a gunshot indoors with a high degree of accuracy.

## 2020

VaporID Detection Technology wins GeekWire Innovation of the Year Award in addition to a 2019 R&D 100 Award. The technology can quickly detect explosive vapors, deadly chemicals, and illicit drugs with unparalleled accuracy.

PNNL joins fight against COVID-19 on an array of research fronts, applying biological, computational, and materials expertise and training and capturing lessons learned with first responders and regional partners.

## 2021

The shoe scanner, also a 2020 R&D 100 Award winner, is licensed to Liberty Defense Holdings, a concealed weapons detection company.

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