

June 15, 2009

OP-ED CONTRIBUTOR

A Threat in Every Port

By LAWRENCE M. WEIN

Stanford, Calif.

WHILE President Obama’s future vision of “a world with no nuclear weapons” is certainly laudable, for the present America still needs to do everything it can to prevent a terrorist from detonating such a bomb on our soil.

The Domestic Nuclear Detection Office, part of the Department of Homeland Security, is in charge of developing a worldwide nuclear-detection system that, primarily, would use technology to monitor vehicles and shipping containers along the various transportation networks by which nuclear weapons could be smuggled into America. Yet the Government Accountability Office [found](#) last year that the detection office “lacks an overarching strategic plan,” despite the \$2.8 billion a year spent on the initiative.

How should the detection office proceed? The best way to view the problem strategically is through game theory. In this case, the government plays first and uses its budget to place detection resources — technology, security experts and the like — at the various “nodes” along the transportation network, like seaports, airports and border stations. The terrorists, in turn, can be expected to choose the path that gives them the best chance to carry out an attack.

As the accompanying chart illustrates, there are a dizzying number of paths that terrorists could use to transport a foreign-built weapon to an American target city — 132 variations, in fact, taking into consideration all four likely modes of transport: commercial airplane, cargo airplane, container ship and cruise ship.

So, how do we decide which route the terrorists are most likely to choose and which path we the are most vulnerable to? Game theory implies that we should maintain an equal chance of detecting fissile material along each of the 132 paths because if we harden one path too much, the terrorists will simply choose an easier one. On top of it all, the agency needs to consider cost-effectiveness: if certain sets of nodes along the transportation network are much more cost-effective to reinforce than others, then the best defense may not come from allocating resources equitably across the system.

First, the terrorists’ obtaining nuclear material and transferring it to a foreign airport or seaport are the two steps that are on all 132 paths, and hence represent excellent choke points. The Pentagon and Energy Department agencies that try to detect fissile material at foreign ports are actually quite well financed and efficient, but given the size of the globe, the number of nations producing nuclear material and the political barriers inherent in working in another nation’s territory, we can hardly assume these efforts are a solid defense of our homeland.

Next we must look at the 12 paths that terrorists have to get nuclear material from a foreign nation to an American port. Whether by sea or air, the trip could either be direct to the United States or routed through a port in Canada or in Central or South America.

On the direct-to-America route, game theory tells us to equalize the likelihood of detection for the four methods of transportation. Yet the Domestic Nuclear Detection Office has inexplicably concentrated its efforts on seaborne commerce and commercial flights: every United States-bound shipping container and piece of baggage on international flights is now screened by professionals (cruise lines do their own checking). The agency has dragged its feet on aviation cargo, with a goal of 100 percent inspections by 2014. As it looks to reshape its strategy, speeding up the monitoring of cargo planes would seem an obvious place to start.

Once the terrorists have a weapon in our hemisphere, they have several possible paths into the United States other than bringing it to a secure seaport or airport. One would involve making a covert trip in either a small boat or plane to a discreet coastal dock or landing strip. Or, if the weapon is in either Canada or Mexico, the terrorists could cross into American soil at an official land port of entry like the Ambassador Bridge that connects Windsor, Ontario, with Detroit. Or they could sneak into the country at any unguarded spot along our long northern and southern land borders.

Strategically, we should aim to have identical detection probabilities for each route. But this does not mean pouring equal amounts of money, manpower and technology into each. For example, although the long northern border is more porous (and more costly to harden) than the southern border, it would be far easier to improve security at Canada's seaports than at all those littered along the coasts of Central and South America.

Thus we should put far more effort into increasing security along the Mexican border than along the northern border, but we should work closely with Canada to harden its seaports and airports. Canada now screens all shipping containers, but we must push it — using its obligations under the Security and Prosperity Partnership of North America Program of 2005 — to move quickly toward 100 percent screening of cargo at air terminals.

As for our preventive strategy along the southern border, we need to consider what we now do well and what we are struggling at, particularly the effectiveness of the Coast Guard along the coasts and of Customs and Border Protection agents along the land borders. We now screen for radiation all cargo containers and privately owned vehicles arriving at official ports of entry, but security experts have for some time put the likelihood of detecting anyone crossing at unguarded spots along the United States-Mexico border in the 20 percent to 30 percent range (although carrying a bomb or even tens of pounds of fissile material may make evasion more difficult).

The seaborne route is even more worrisome. The Coast Guard is undertaking a three-year pilot project aimed at securing maritime routes, but faces daunting challenges in both identifying suspect vessels and detecting fissile material amid the background radiation present at sea. This pathway will perhaps be the weakest link in our border defense for the next several years, and should be one of the highest priorities of the Domestic Nuclear Detection Office.

Last, assuming the terrorists aren't planning to detonate the device at the point of entry, they must move it to

the target city. They could do this in several ways: with a truck, a small airplane or, for coastal cities, a small boat. As we have no idea which is most likely, our goal should be to ensure an equal chance of detection no matter which form of transportation is used.

The detection office has a pilot project called the Securing the Cities Initiative, which is testing techniques of detecting fissile material, at land or sea, within 45 miles of New York City. Given the many crowded roads and waterways leading into the city, this is no easy task. It requires creating a detection architecture that cannot be easily bypassed by a vehicle; sensors that can operate amid all manner of background confusion and false signals; and a communications network that can track vehicles amid swarms of cars after the alarm is given.

What about attack by a small plane? Given the impracticality of shooting down a tiny aircraft before it could detonate a bomb from the air, the best approach is to begin screening all domestic departures of small airplanes. This effort should be folded into the Securing the Cities Initiative.

The one thing each of these strategies has in common is the use of technology to detect fissile material. But what sort of nuclear fuel are the terrorists likely to use? While existing equipment detects plutonium much more easily than highly enriched uranium, most experts believe that terrorists are more likely to have uranium weapons, as they are far easier to build. Development aimed at detecting highly enriched uranium needs to be a much higher priority.

The criticism of the accountability office aside, the Domestic Nuclear Detection Office has done a good job since its inception in 2005 at identifying the weak links in our global detection network. But its bigger task is to turn that analysis into action, initially by stepping up the screening of air cargo, better monitoring domestic flights by small planes, and improving the ability to detect highly enriched uranium and fissile material at sea.

Lawrence M. Wein is a professor of management science at the Stanford Graduate School of Business.

132 WAYS TO BRING A BOMB TO AMERICA

FOREIGN ORIGIN

FOREIGN TRANSIT

FOREIGN DEPARTURE
TO U.S. PORT*

FOREIGN DEPARTURE
TO CANADIAN PORT*

FOREIGN DEPARTURE TO CENTRAL/
SOUTH AMERICAN PORT*

CANADIAN PORT

CENTRAL/SOUTH
AMERICAN PORT

U.S. SEAPORT/
AIRPORT

U.S. SEAPORT/
AIRPORT

U.S. VIA LAND BORDER
STATION

U.S. VIA COVERT CROSSING
OF LAND BORDER

U.S. BY COVERT
SMALL PLANE

U.S. BY COVERT
SMALL BOAT

U.S. SEAPORT/
AIRPORT

U.S. VIA MEXICO BY
LAND BORDER STATION

U.S. VIA MEXICO BY COVERT
CROSSING OF LAND BORDER

U.S. BY COVERT
SMALL PLANE

U.S. BY COVERT
SMALL BOAT

U.S. TARGET CITY
BY LAND

U.S. TARGET CITY
BY AIR

U.S. TARGET CITY
BY SEA

*INCLUDES FOUR MODES OF TRANSPORTATION



COMMERCIAL
AIRPLANE



CARGO
AIRPLANE



CONTAINER
SHIP



CRUISE SHIP

SHORT-DISTANCE COVERT LAND, SEA AND AIR ACCESS



SMALL BOAT



SMALL PLANE



MOTOR VEHICLE

NUCLEAR MATERIALS TERRORIST GROUPS MAY TRY TO OBTAIN



URANIUM



PLUTONIUM