A New Passenger Checkpoint Screening Strategy for the 21st Century

Today's terrorists are smart; they have proven their ability to study and work around our security measures, with explosives and bomb components that are more diverse and difficult to find, especially if they use teams to smuggle them on board where they can be assembled. We have new screening technologies, but our underlying strategy at the checkpoint resembles early 20th century manufacturing; we still screen on a bag-by-bag and passenger-by-passenger basis, with little or no attempt to integrate or send the information we collect from each step on to the next step in the process or look across different bags and passengers. This item-by-item inspection process fails if threat components are distributed or carried by multiple terrorists, on their bodies or in bags and assembled on-board.

The checkpoint is much more challenging than checked bag screening. It has to contend with and separately screen carry-on baggage, shoes, and coats, as well as items on the passenger's body and body language. Terrorists can distribute disassembled bombs, as well as disassembled firearms among these items, with no single passenger having to carry more than a few parts of either. Implementing improved on-board protection, not to mention passengers' awareness and willingness to confront potential terrorist activity, has dramatically reduced the threat from knives and other non-projectile weapons and the current approach is effective at finding firearms.

However, little has been done to effectively counter the wide range of IED components and concealment methods that are available to terrorists. Merely adding another piece of technology to an outdated screening methodology will not address this underlying fault. Another problem is that much of our checkpoint process is still visible, making it straightforward for terrorists to study, test and defeat it.

An updated screening strategy along with an intelligent combination of different devices and new procedures is urgently needed at the very least for watch-list and selectee passengers. As terrorists' primary aim has traditionally been to destroy an aircraft, a new strategy to counter such attacks is essential to address today's threat and it must include a flight-based screening component in addition to item-by-item screening used today.

Flight-based screening can work in the following manner. Step One occurs within the reservation system. If there are two or more selectees on one flight, those selectees could be flagged for more stringent screening in the high security lane. Also, software can analyze the passenger records to assess any connections between/among selectee passengers on the same flight who have something in common with each other, such as address, credit card, nationality, driver licenses issued on dates near to one another. Any such connections would allow them to be considered as matched pairs, trios, or quartets as they enter the checkpoint. It is unlikely that an IED team would have more than two members, as the risk of exposure would likely exceed any benefit.

As each selectee passenger passes through the checkpoint process, all screening data on the traveler and bags are stored and organized by flight number. As other passengers go through a

high security lane, their information is sorted by flight. Software can inspect the results from each component of the High Security Lane for those selectees on the same flight to assess if there is anything indicative of an IED distributed among these passengers and their bags, regardless of whether each passenger and his/her carry-on has been cleared individually. If the software suspects any items, such as a possible explosive mass and a potential detonator in different locations, the system then alarms that a possible team attempt may be underway. A flight inspector, or possibly an IED expert located remotely can be used to validate the decision or clear the passenger. There should be sufficient time after the passenger has passed through the checkpoint but before boarding the aircraft for this process to occur. If there is a potential problem, it could be resolved by sending a security team to the gate armed with the data and decisions that the flight inspector has already made. The passengers can be searched at the gate, taken to an appropriately equipped search room in the terminal or potentially returned to the high security lane for final resolution.

As the process becomes more refined, it could be expanded to other non-selectee lanes. Another advantage of flight-based screening is that it occurs out of sight, making it much harder for terrorists to understand and defeat it.

There are five critical elements that are necessary precursors for flight-based screening to be a reality:

- Criteria for pre-screening and segregation of passengers into high threat and normal lanes under normal and elevated threat conditions
- A high threat lane that includes technologies that compensate for each other's weaknesses
- Data integration of pre-screening, scanning technology data and operator decisions
- A method for reviewing stored information after passengers have passed through security
- A procedure for preventing such passengers from boarding the aircraft until the issues have been resolved, either at the gate, at a dedicated search room in each terminal or back at the high security lane

Several historical developments can be leveraged to implement such a strategy:

Prescreening: Other AIASP papers have addressed how to segregate passengers, using TIDE databases, Computer Assisted Passenger Prescreening (CAPPS), and behavior detection. CAPPS was developed and deployed in the 1990s and used to select hold baggage for high-security screening using CTX technology; the process was deployed and used for several years until 100% hold baggage screening was implemented. It is effective and non-controversial with the public. For the checkpoint, a passenger threat grading system could be derived from several of the above methods and each passenger's final grade printed on the bar code of the boarding card. While the underlying methodology should be classified, the grade for each passenger would be sufficient to take action. On arriving at the checkpoint, a higher risk passenger would be identified from the grade and sent through a high security lane, while other passengers would go through conventional lanes (and possibly a registered traveler subset would go through a minimal screening lane).

High Security Lane: After 911, several companies joined forces to implement and test a "system of systems" that was known as the Advanced Technology Screening Checkpoint or ATSC. The ATSC consisted of an array of orthogonal technologies for both passengers and bags that were each capable of detecting part of the threat. The ATSC combined them into a passenger-friendly, operator-usable system that compensated for each device's weaknesses. The private industry team also addressed other critical aspects of the inspection process, such as inspection protocols, operator training, and motivation. To ensure high detection, a single inspector was shown the information obtained from all devices - including operator decisions - for every passenger and their bags prior to making a final CLEAR or REJECT decision. The National Safe Skies Alliance operationally trialed the ATSC at Orlando airport for six months and then tested it in California using live explosives and other weapons alongside a typical 2002-era TSA checkpoint lane. The threats included explosive quantities similar in mass to that used by Abdul Muttallab in Dec 2009. The ATSC yielded several times better detection than the TSA checkpoint. Since then, new technologies and improvements have become available that could further improve detection, even with a broader threat.

Data integration: Data integration has been funded and prototype systems exist that can collect the data images and operator decisions from the different scanners and correlate them with real passenger and bag images. From this, it is straightforward and cheap to assemble a passenger security screening record that digitally links the bag image, operator threat decision and bag photo to the passenger and stores it in a database. To implement Flight-Based screening a boarding card reader would be added and a remote screening area configured for the flight inspectors.

Reviewing Flight-based Information. Once each higher risk passenger passes through the checkpoint, the system would automatically sort the collected data and distribute it by flight number. A combination of software and flight inspectors would then scrutinize each image and data set to identify and tag specific passengers and items of concern.

Resolving Suspicious Items. Any items or passengers that remain a concern after the flight-based inspection process could be handled in a number of ways. Either the software or an inspector would notify a roving security intercept team that could intercept the passengers before boarding and perform final verification either at the gate, at a dedicated search room in the terminal or by escorting them back to the high security lane for additional scrutiny. This team could receive all the data collected and decisions made to date via wireless PDAs or tablet computers.

In summary, many of the pieces are in place and there are no apparent technical barriers to Flight Based screening. The communications hardware is widespread and low cost and the process would supplement today's checkpoint methods to become another layer in a security system that is capable of combating the very real 21st Century challenge from distributed threat components and terrorist teams. Without such an approach, team based attacks using distributed components are virtually unstoppable with today's item-by-item screening strategy.