AIRPORT SECURITY: TIME FOR A NEW MODEL

By Robert W. Poole, Jr.

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Executive Summary

The legislation that created the Transportation Security Administration (TSA) and the current approach to aviation security, though well-intentioned, was poorly thought out and is fundamentally flawed. It mandated costly changes in some aspects of aviation security, without any analysis of relative risks, costs, or benefits. Consequently, it has wasted passengers' time and absorbed large sums of money that could have done more to improve security if used in other ways. With new leadership at the TSA and its parent agency, the Department of Homeland Security, the time is ripe for rethinking how this country approaches airport security.

There are three basic flaws in the current model. First, the law presumes that all air travelers are equally likely to be a threat, and mandates equal attention (and spending) on each—which is very wasteful of scarce security resources. Second, the TSA operates in a highly centralized manner, which is poorly matched to the wide variation in sizes and types of passenger airports. And third, the law puts the TSA in the conflicting position of being both the airport security policymaker/regulator and the provider of some (but not all) airport security services.

DHS Secretary Michael Chertoff and TSA Administrator Edmund "Kip" Hawley have called for re-orienting security policies along risk-based lines. At the same time, the Government Accountability Office has found that today's very costly airport screening is little better than what existed prior to "federalization" of this function—and that the performance-contracting approach implemented on a pilot-program basis at five airports appears to have worked slightly better than the TSA-provided screening. Both factors set the stage for fundamental reform.

This report calls for three such reforms, to address the three fundamental flaws in the current approach. First, to remove the inherent conflict of interest, the TSA should be phased out of performing airport screening services. Instead, its role should become purely policymaking and regulatory (and better balanced among all transportation modes). Second, the screening functions

should be devolved to each individual airport, under TSA oversight. And third, screening and other airport security functions should be redesigned along risk-based lines, to better target resources on dangerous people rather than dangerous objects.

Devolving screening responsibilities to airports would mean that each airport could decide to meet the requirements either with its own workforce or by hiring a TSA-approved screening contractor. This model has been used successfully in Europe and Israel since the 1980s and has worked very well. Funding would be re-allocated to airports on a monthly (or at least quarterly) basis, rather than annually as at present. This would permit a much better match of screener numbers to actual passenger throughput, in the rapidly changing airline environment.

And with the funding managed at the airport level, airport managers would have strong incentives to finance the upgrading of baggage-screening systems to make them less labor-intensive. At most larger airports, this would mean replacing lobby-based EDS machines with automated, in-line EDS systems. At smaller airports, it would replace labor-intensive ETD installations with EDS machines transferred from larger airports. These changes alone would save over $700 million per year in screener staffing costs nationwide.

A risk-based model would separate passengers into three groups: low-risk, high-risk, and ordinary. Low-risk travelers would be those who qualify for Registered Traveler status. They would get expedited checkpoint processing and their bags could usually bypass EDS screening. This change would cut future EDS acquisition costs by $1 to $2 billion, and would yield another $200 million annual savings in baggage screener costs. High-risk travelers would receive mandatory body scans and explosive-detection inspection of both checked and carry-on baggage.

These changes would free up resources to use for increased security in lobby areas and on the tarmac, as well as improved control of access by non-passengers to secure areas. Overall, this set of risk-based changes would put much greater emphasis on guarding against the threat of explosives (as opposed to just weapons) getting onto planes, as well as the threat of suicide bombers in terminals and on planes.

In addition, by putting all airport security functions under the control of the airport (instead of dividing them between airport and the TSA, as today), and putting all these functions under arms-length TSA regulation, overall airport security would be more integrated and more effective, and the whole program would be more accountable. And freeing up nearly $1 billion a year from screening would provide the resources for reconfiguring passenger checkpoints and beefing up the other aspects of airport security.

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Introduction

Two months after the 9/11 attacks, Congress enacted the Aviation and Transportation Security Act (ATSA) of 2001. This law created the Transportation Security Administration (TSA) initially as part of the Department of Transportation, but later folded into the newly created (in 2002) Department of Homeland Security (DHS). The law is perhaps best known for "federalizing" airport security, by creating a large federal workforce of passenger and baggage screeners to replace the private contract screeners previously employed by airlines to staff passenger screening checkpoints at airport concourses. As part of this federalization, Congress mandated that all checked bags be inspected for explosives by December 31, 2002 (later extended to December 31, 2003). Built into this federalization were two unstated assumptions: that all passengers are equally suspicious and should receive the same scrutiny, and that the principal purpose of airport security is to keep dangerous objects off airplanes.

This paper will argue that, though well-intentioned, much that was legislated in the ATSA was poorly thought-out and ill-advised. The law, as implemented by the TSA, has wasted large sums of taxpayers' money and passengers' time while doing little to increase aviation security. The DHS plans to shift some functions from the TSA to other parts of the DHS. It needs to re-think the TSA's role in airport security as well, beginning with the underlying, unexamined premises about equal risk.

The TSA's Basic Flaws

Broadly speaking, there are three basic flaws with the current approach to airport security, each of which will be discussed here. First is the equal-risk model, which has produced a number of harmful consequences. Second is the TSA's very centralized approach to interpreting its charge under the ATSA, which is at odds with the great variation in size, design, and function of America's more than 400 commercial-service airports. And third, because of its legislated role as the principal provider of airport screening services, the TSA is in the conflicting position of being both the aviation security policymaker/regulator and the provider of some (but not all) airport security services.

A. The Equal-Risk Model

The unstated assumption that every passenger poses the same risk of being a threat to aviation security lies behind the legislated mandate that every checked bag be screened for explosives before being loaded on a plane. The equal-risk assumption was never applied quite as stringently to passenger screening itself, though it did lead to the basic model of everyone, including the flight crew, receiving the same level of passenger screening (removal of shoes and jackets, removal of cameras and laptops, X-ray screening of carry-ons, and magnetometer walk-through of the person). From the outset, however, two subsets of passengers were selected for additional "secondary" screening (wanding, possible pat-downs, examination of carry-ons) in addition to the basics. One subset was randomly selected and another subset was flagged by the pre-9/11 computer system called CAPPS (Computer-Assisted Passenger Pre-Screening). With respect to the latter subset, at least a modest element of estimated risk was taken into account in deciding what resources to apply to a few passengers.

The consequences of these assumptions, especially given the tight implementation deadlines imposed by Congress, were several: a much larger the TSA screening workforce than anyone had anticipated, long checkpoint lines, and a huge investment in baggage-screening equipment.

Long lines resulted from the significantly increased processing time per passenger, due to the new, more stringent checkpoint screening process (shoe and jacket removal, more banned objects for

screeners to look for, greater sensitivity levels of the magnetometers, many more secondary screenings, etc.), combined with limited space in terminals to add checkpoint lanes and (despite a large increase) limitations on the numbers of screeners.

The huge investment in checked-baggage screening equipment ($2.5 billion as of September 2004[1]) stemmed from the low throughput and high error rate of the costly explosive detection system (EDS) machines, which required them to be purchased in much larger numbers than Congress had anticipated. And because of the tight deadlines, only a handful of airports were able to reconfigure their entire baggage-processing systems to permit the EDS machines to be installed in baggage areas and fed by conveyor belts, where throughput rates could be optimized (so-called "in-line" installations). Instead, most airports had to make do with installing these minivan-size machines in their ticket lobbies, to which passengers would have to transport their suitcases for hand-feeding by baggage screeners, an inherently slow and labor-intensive process.

The equal-risk model has produced a number of harmful consequences.

Manual (piecework) loading of EDS machines led to an unexpectedly large number of baggage screeners being hired by the TSA, in addition to the unexpectedly large number of passenger screeners. At one point, the total screening workforce approached 60,000 (compared with a pre-9/11 screener force of under 20,000[2]). Balking at the cost, the House Transportation Appropriations Subcommittee imposed a cap of 45,000 full-time screeners in 2003, which, while holding down budgetary costs, imposed a cost on travelers in terms of slower processing of bags and people.

In addition to creating unexpected consequences, the law's mandates on passenger checkpoints and checked-baggage screening focused most of the TSA's attention on those two areas. But when outside analysts stepped back and assessed the larger screening picture, they pointed out glaring inconsistencies in this model. First, the very costly 100 percent inspection of *checked* bags is not matched by equally rigorous inspection of *carry-on* bags. In Europe, checked bags are screened by various high-speed X-ray systems, but those are rejected by the TSA as not accurate enough for use in this country. Yet those systems are actually more advanced than the X-ray machines used to screen carry-on luggage at U.S. airports. And given the large size of many wheeled carry-on bags these days, it is not credible to defend current practice by claiming that carry-ons are too small to contain enough explosives to cause harm.

The second inconsistency is that the vast majority of passengers are screened solely for metallic objects. Yet a terrorist bent on either blowing up or taking over a plane could wear body-conformal plastique or carry a variety of non-metallic lethal weapons. Yet the equal-risk model does not inspect every passenger's body or clothing for such objects—only for metallic ones.

Complaints about these inconsistencies, especially high-profile speeches and articles by people such as House Aviation Subcommittee Chair John Mica (R, FL), led the TSA to test such devices as walk-though explosive-detection "puffer" booths (in which a blast of air shakes loose any particles of explosive that may be on a person's skin or clothing) and back-scatter X-ray machines (which can see through clothing) at selected airports. But the former take significantly longer to process each passenger than a magnetometer, and the latter pose serious privacy concerns. Hence, despite much testing, no decision to mandate their use for all passengers seems at all likely.
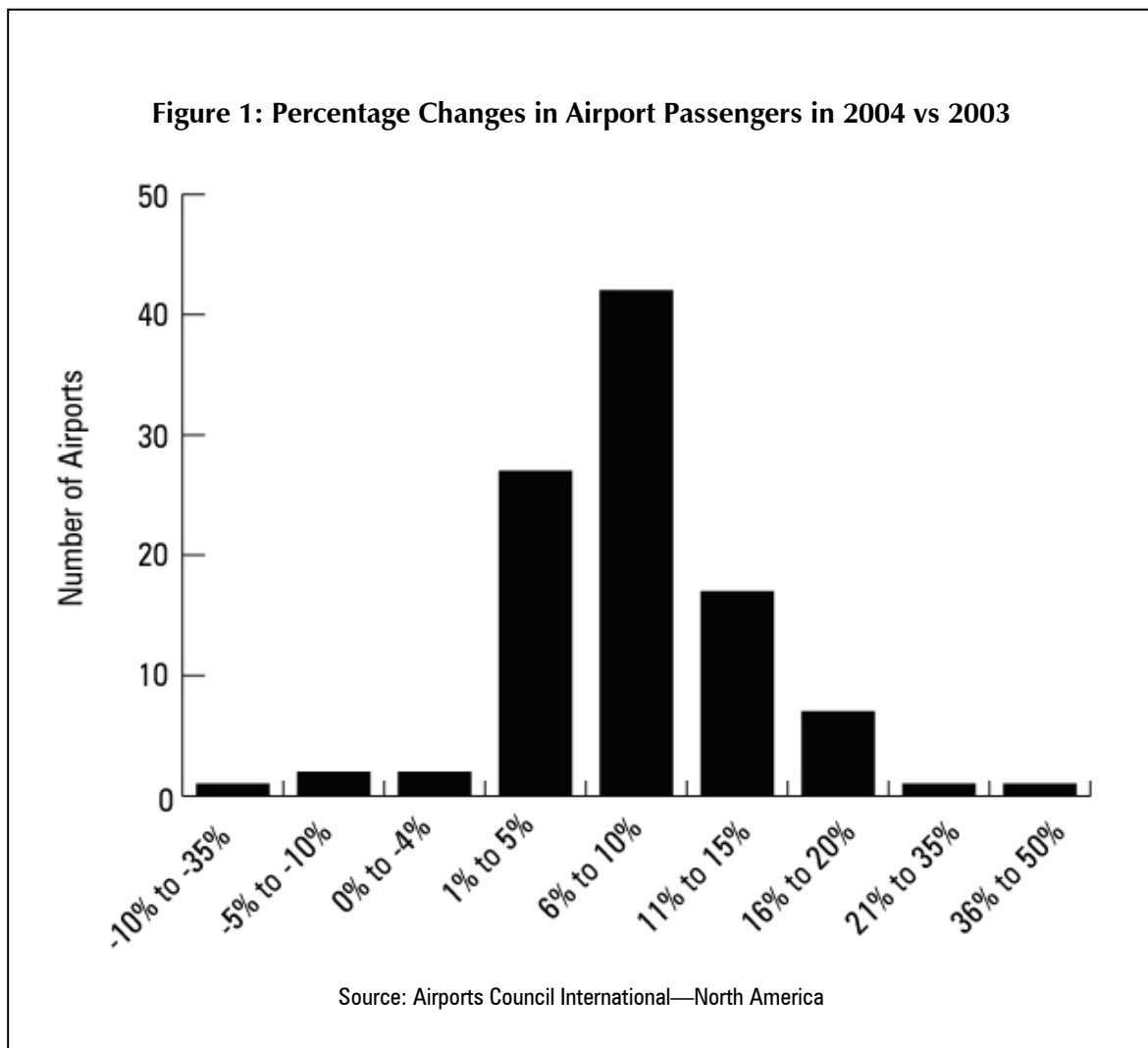
B. Overcentralization

From the outset, the TSA has been plagued by the conflict between centralization and decentralization. Part of the rationale for "federalizing" airport security was to provide a consistently high level of security nationwide, regardless of the myriad differences among airports (which range from huge to tiny, from primarily origin & destination [O&D] to primarily transfer hubs, and from centralized terminals to multiple terminals). These differences crucially affect numerous aspects of both passenger and baggage processing. Early on, TSA officials verbally acknowledged this vast diversity by repeatedly saying, "If you've seen one airport, you've seen one airport." But their highly centralized approach does not fully take this diversity into account.

One example is how the TSA allocates screeners among the 446 airports it is responsible for. Once a year, it reallocates the screening workforce, to take into account changes in airline activity, using a confidential algorithm called REGAL. These allocations may be tweaked occasionally during the course of a year, but airport directors have no idea how the algorithm works and little ability to influence the allocations. Members of Congress sometimes go to bat for an airport in their district where long lines have been a particular problem, and their intervention is believed to have some effect. And the TSA maintains a mobile screener force that can provide temporary relief of some screener shortages (but cannot address surpluses of screeners at airports with reduced traffic).

Commercial aviation is an inherently dynamic industry.

The problem is that commercial aviation is an inherently dynamic industry. As one indication, Figure 1 shows how much variability there is in annual passenger numbers at the 100 largest U.S. airports (comparing 2004 with 2003). As can be seen, 26 of the top 100 airports experienced increases of 11 to 50 percent, while three had declines of from 5 to 35 percent. For smaller airports, the fraction of double-digit percentage changes is even greater, affecting 40 percent of airports ranking 101-150 in size (not shown in the figure). And the relative impact of not getting more screeners can be much greater at a small airport like Peoria (146th in annual passenger count) when it experiences 23 percent passenger growth, or Newburgh, NY (142nd) with 34 percent growth. When a single airline begins serving, or withdraws from serving, such an airport, the change can happen in a matter of a month or two, but it may take the TSA six months or more to catch up with

it (if it is under sufficient pressure to make a change prior to the next annual screener reallocation). During those many months, the airport will operate with too few or too many screeners.

Figure 1: Percentage Changes in Airport Passengers in 2004 vs 2003

Source: Airports Council International—North America

A second example is the highly centralized way in which the TSA has interpreted the provision in the ATSA that allowed five airports to opt out of TSA-provided screening as a pilot program to test TSA-certified security firms as an alternative (see box). What airports expected, and what most people would assume to be the way to implement such a program, would be for the TSA to define criteria for such firms, certify those that met the criteria, define the rules for airports to implement outsourced screening, and then let those airports with acceptable plans issue requests for proposals (RFPs) and select the firm (from those on the TSA's list) submitting the best proposal. The airport would then contract with the firm, under the supervision of the TSA's Federal Security Director who oversees all other security operations at that airport.

The 5-Airport Pilot Program

The 2001 ATSA legislation authorized the TSA to permit five airports—one in each size category—to obtain their passenger and baggage screening from TSA-certified private screening companies. Interested airports applied to the TSA, and the agency selected San Francisco, Kansas City, Rochester, Jackson Hole, and Tupelo as what became known as the PP5 airports. The idea was to test whether outsourcing this function with strong performance standards and federal oversight (both lacking under the pre-9/11 outsourcing of passenger screening by airlines) could produce results as good as or better than directly provided federal (TSA) screening.

Congress asked the GAO to assess the performance of screening at the PP5 airports, and the TSA itself hired the consulting firm BearingPoint to make a similar assessment. Both reports were released in April 2004.[3,4] Both broadly concluded that, within the limitations of a very small sample size and very narrow bounds for deviation from the TSA model, the private screening operations worked as well as or better than TSA-provided screening.

The BearingPoint assessment looked at security effectiveness, cost, and customer/stakeholder impact. On security effectiveness, Kansas City was judged to be outperforming comparable airports while the other four PP5 airports performed at the same level as comparables. This was measured by covert testing, the use of Threat Image Projection (TIP) data, and recertification testing. The costs to the government were not significantly different from the estimated cost of a TSA operation at the same airport (which is not surprising, given how severely ATSA and the TSA constrained the private operations). On overall customer satisfaction, the results were mixed, with no general pattern. On customer complaints, there were no significant differences. And on wait time, San Francisco and Kansas City had significantly shorter wait times for passenger screening; insufficient data were available for the smaller airports.

The GAO study focused more on the limitations of the PP5 design. Not only was the sample size too small (just one airport in each of the five size categories, out of a total of more than 400 airports mandated to have federally imposed screening) but "the TSA provided the screening contractors with little opportunity to demonstrate innovations, achieve efficiencies, and implement initiatives that go beyond the minimum requirements of [ATSA]." In those limited cases where the TSA did provide some operational flexibility, GAO found that "These practices have enabled the private screening contractors to achieve efficiencies that are not currently available at airports with federal screeners." These included such things as hiring "baggage handlers" to move bags from one location to another rather than tying up more highly trained screeners with this task, screening job applicants before they are hired through TSA assessment centers, and selecting screening supervisors from within the screener workforce rather than relying on decisions of the TSA's hiring contractors. Within the limits of the performance data GAO was able to obtain, the agency concluded that "in general, private and federal screeners performed similarly."

That was not how the TSA implemented the pilot program, however. While it did certify a number of firms, it did not allow airports to issue RFPs, select their preferred bidder, or enter into a contract. Rather, after the TSA selected the five airports that would participate as the pilot sites, it assigned one of its certified firms to each airport. The TSA itself entered into a contract with each firm and directly supervised its operation at each airport. Moreover, when the November 2004 date specified by ATSA approached, after which point all airports would be free to opt out of TSA-provided screening in favor of contract operations, TSA defined its Screening Partnership Program along the same highly centralized lines.[5]

Private screening contractors have had little opportunity to demonstrate and achieve efficiencies because the TSA runs the program in such a centralized manner.

And the centralization does not stop there. As the Government Accountability Office (GAO) noted in an April 2004 assessment of the pilot program, because the TSA runs the program in such a centralized manner, "private screening contractors have had little opportunity to demonstrate and achieve efficiencies."[6] Among other things, the GAO report notes that the contractors lack the authority to determine staffing levels and conduct hiring. And actual hiring by the contractors must be coordinated through TSA headquarters. Before new staff can be hired by a contractor, the TSA must authorize this, and it must set up an assessment center in the area, using the TSA's national assessment contractor. According to the GAO, this process typically takes several months. Its report notes a case at one of the pilot program airports where a staff shortage went on for months, waiting for the TSA's process. The inability to hire screeners during this time "contributed to screener performance issues, such as absenteeism or tardiness, and screener complacency, because screeners were aware that they are unlikely to be terminated due to staffing shortages."[7]

The GAO also reported that Federal Security Directors (FSDs) at non-pilot program airports expressed similar frustrations at the TSA's centralization of hiring and training. In a survey of all 155 FSDs, the GAO found that "the overwhelming majority . . . reported that they needed additional [local] authority to a great or very great extent."[8]

C. Conflict of Interest

Congress decided to "federalize" airport screening after concluding that the prior institutional arrangements included both regulatory failure and conflict of interest.[9] Prior to 9/11, the Federal Aviation Administration was in charge of airport security, and its rules required that access to airport concourses be limited to those who cleared a basic screening process at checkpoints. The FAA delegated this screening

responsibility not to the airports (which own the premises) but rather to the airline that had the largest presence on each concourse (generally a "signatory" airline that had signed a long-term use and lease agreement with the airport). The structural failure was that the airlines had no real incentive to make security a priority. Since operating this function was a cost item for airlines, and airlines operate in a very competitive business, their interest was to meet whatever requirements the FAA laid down at minimal cost. Over time, that led to the well-documented situation in which the airline-selected screening companies paid not much more than minimum wage, did only modest amounts of training, and suffered turnover rates sometimes in excess of 100 percent per year.

The regulatory failure was that the FAA essentially set no standards for hiring and training of screeners. Moreover, the FAA was de-facto satisfied with the relatively low level of performance of those screeners, when challenged by "Red Teams" that attempted to get prohibited items past the screeners. The GAO called for implementation of performance standards for screening in 1987,[10] but the agency failed to act. In the 1996 FAA reauthorization act, Congress required the FAA to "certify companies providing security screening and to improve the training and testing of security screeners through development of uniform performance standards."[11] Three years later, in January 2000, the FAA issued a proposed rule, Certification of Screening Companies, which would have held companies to minimum performance standards. When the rule had not been finalized by November 2000, Congress directed the FAA to issue a final rule no later than May 31, 2001.[12] The FAA failed to meet this deadline, so Congress then required it to report twice a year on the status of each missed statutory deadline. That was the situation as of September 11, 2001.

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The structural failure was that the airlines had no real incentive to make security a priority.

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In response, Congress took responsibility for aviation security away from the FAA and gave it to the newly created TSA, an appropriate response to the FAA's regulatory failure. But in response to the structural failure, instead of doing as nearly every other country in the world does—making each airport responsible for securing its operations under national regulatory supervision— Congress instead vested in the TSA not only the *regulatory* responsibility but also the *service provision* duties of airport screening. Note that the TSA was not required to take over access control or perimeter patrols or law enforcement functions at the airports. Those security functions were still the airport's responsibility, under the watchful eye of the TSA's Federal Security Director (FSD) assigned to that airport. But for baggage and passenger screening, the TSA was to be both the regulator and the operator.

This dual role is a potentially serious conflict of interest. As one airport director said to a *Chicago Tribune* reporter in the early days of the TSA, "The problem inherent in the federally controlled screening process is that you end up having a federal agency sitting in the middle of your terminal, essentially answerable to nobody."[13] This point was underscored in BearingPoint's report on the five pilot-program airports. "Because the screeners at a private contractor [pilot program] airport

are not government employees, the FSD is able to take a more objective approach when dealing with screener-related issues raised by stakeholders such as airport management or air carriers."[14]

The classic example of a federal agency with this kind of dual-role conflict was the Atomic Energy Commission, created after World War II to encourage peaceful uses of nuclear power. In carrying out this mission, the AEC became both a promoter of nuclear energy (funding research & development, doing educational/marketing work, etc.) and the regulator of all civilian nuclear reactor operations. Eventually, public criticism of the conflict of interest—that the AEC could not serve as an objective regulator if it was also the chief promoter of nuclear power—led Congress to split those functions. It created a purely regulatory body, the Nuclear Regulatory Commission, for that role. And it shifted the R&D functions into the newly created Department of Energy.

Rethinking the TSA

Early in 2005 separate reports were made to Congress, one by the DHS Inspector General's Office and the other by the GAO. Based on testing of airport screening operations, both concluded that there was no evidence that screening performance today, several years after the TSA took over, is better than it was prior to the TSA putting its own screeners into airports.[15,16] In other words this new agency, with a budget of $5.5 billion per year, more than half of which is devoted to baggage and passenger screening, has not led to demonstrably improved protection of planes from dangerous objects.

This sobering finding ought to lead to a serious reassessment of the premises that underlie the ATSA, and the TSA as it was created and as it has evolved. One of the most important premises is that we should continue spending $2.5 billion per year to keep dangerous objects off of planes. In point of fact, there have been no further attempts to hijack U.S. airliners since 9/11. Many aviation and security experts believe that the policy changes that led to strengthened and always-locked cockpit doors, a greatly expanded sky marshal program, and revised crew protocols for dealing with hijackers have made hijacking essentially impossible, regardless of knives or guns that might somehow get past screening checkpoints. At the very least, this proposition should lead us to question the massive expenditure on keeping such objects off airplanes.

The GAO report also found that the limited covert testing that was done showed that performance of screeners at the five pilot-program airports was slightly better than that of TSA screeners (though the GAO also noted that there was not enough data to draw broad conclusions). Given that TSA provision of screening services entails a conflict of interest, those limited findings serve to strengthen the case for separating such service provision from the TSA's inherently governmental role as security policymaker and regulator in aviation. That would permit the actual provision of airport security to be devolved to each airport, as it is in Europe and most of the rest of the world, under TSA oversight via the FSDs. Airports would be free to provide those services either in-house, with their own workforces, or by contracting with a TSA-certified security company.

Finally, a revamped approach would scrap the equal-risk premise in favor of a risk-based approach to dealing with passengers and their bags. To the extent that passengers can be separated into high-risk, ordinary, and low-risk groups, security resources can be adjusted proportionally, thereby

getting more bang for the buck from whatever level of airport security budgets Congress decides to set. The guiding principle should be to identify dangerous people and keep them off planes, rather than trying to keep all dangerous objects off planes.

Washington Post columnist Anne Applebaum called creation of the TSA a mistaken use of $5.5 billion per year that would have been better spent beefing up intelligence on terrorism.

A. Separating Policymaking and Regulation from Operations

1) The Need for Legislation

The dual-role nature of the TSA stems directly from the ATSA legislation. Thus, this problem can only be corrected by new legislation to overhaul the TSA in the interest of improving its performance, thereby increasing aviation security. Is such a change conceivable in the real world of Washington politics?

Certainly the TSA, as it now exists, is subject to considerable critical commentary. In a widely discussed commentary, *Washington Post* columnist Anne Applebaum cited the evidence that TSA-type screening is little better than what existed before and called creation of the TSA a mistaken use of $5.5 billion per year that would have been better spent beefing up intelligence on terrorism.[17]

The Bush administration's FY2006 budget proposal called for shifting several key programs out of the TSA into a new Screening Coordination and Operations office within the DHS that would include:

- Secure Flight (the successor to CAPPS);
- Registered Traveler;
- Transportation Worker Identity Credential (TWIC).

This change, not yet approved by Congress, would "strip the TSA of its biggest and most high-profile programs and leave it largely as a manager of 45,000 security screeners."[18] A subsequent news report speculated that, with the dismissal of David Stone as the TSA's director, the agency itself was slated for dismantling. "The agency's very existence, in fact, remains an open question, given that the legislation creating the Department of Homeland Security contains a clause permitting the elimination of the TSA as a 'distinct entity' after November, 2004."[19] The same article noted that even the TSA's remaining airport screening role "could diminish as private screening companies increasingly seek a comeback at U.S. airports."

Despite the referenced clause in the DHS legislation, the ATSA still calls for the federal government to provide airport screening services, except for those airports that choose to opt out after November 2004. So it would still appear necessary for Congress to remove the agency from screening operations in order to resolve the conflict of interest issue. But without the above list of programs and without its major current role in operating screening, the remaining policymaking, R&D, and regulatory roles for the TSA would be a tiny fraction of its current responsibilities. It would no longer seem to warrant the designation as an "administration" within the DHS, and would probably best be configured as an "office" comparable to the one proposed for Secure Flight, Registered Traveler, and the other information-centered programs.

2) How Europe Handles Airport Screening

Europe began confronting hijackings and terrorist attacks on airports in the late 1960s. Risk analysis identified the need for a comprehensive approach that included background checks of airport personnel, passenger and baggage screening, and airport access control. The initial approach in most nations was to use national government employees to beef up airport security, either from the transport agency or the justice agency. But beginning in the 1980s, European airports began developing a performance-contracting model, in which government set and enforced high performance standards and airports carried them out—usually by hiring security companies, but occasionally with their own staff. Belgium was the first to adopt this model in 1982, followed by The Netherlands in 1983 and the United Kingdom in 1987, when BAA was privatized. The 1990s saw a new wave of conversions to the public-private partnership model, with Germany switching in 1992, France in 1993, Austria and Denmark in 1994, Ireland and Poland in 1998, and Italy, Portugal, Spain, and Switzerland in 1999.

Table 1 provides a breakdown of outsourced passenger and baggage screening at 33 large European airports as of late 2001. Of these, only the Zurich and Lisbon airports were not using the performance-contracting model, and in both nations, efforts to shift to this model were under way.

Table 1: Outsourced Passenger and Baggage Screening in Europe					
Rank By Total Int'l Pax /1	City (Airport Code)	Passenger & Hand Baggage Screening /2	Private Screeners?	Hold Baggage Screening Y	Private Screeners?
1	LONDON (LHR)	BAA	Y	ADI Initial, SIS (CIVAS)	Y
2	PARIS (CDG)	SIFA/Brinks/ICTS	Y	ICTS/ASA/SIFA	Y
3	FRANKFURT/MAIN (FRA)	FRAPORT	Y	FRAPORT and others /3	Y
4	AMSTERDAM (AMS)	Group 4 Falk	Y	Randon Securicor-ADI & Group 4 Falk	Y
5	LONDON (LGW)	BAA	Y	ICTS; Initial	Y
6	BRUSSELS (BRU)	Securair	Y	Securair	Y
7	ZURICH (ZRH)	State Police		State Police /4	See note 4

Table 1: Outsourced Passenger and Baggage Screening in Europe					
Rank By Total Int'l Pax [1]	City (Airport Code)	Passenger & Hand Baggage Screening [2]	Private Screeners?	Hold Baggage Screening Y	Private Screeners?
					below
8	COPENHAGEN (CPH)	Copenhagen Airport Security	Y	Copenhagen Airport Security	Y
9	MANCHESTER (MAN)	Manchester Airport plc	Y	Securicor/ADI	Y
10	MADRID (MAD)	Vinsa, State Police	Y	State Police	
11	MUNICH (MUC)	SGM (Airport Company)	Y	various private companies [3]	Y
12	ROME (FCO)	Aeroporto di Roma; physical searches handled by police	Y	Aeroporto di Roma	Y
13	DUSSELDORF (DUS)	ADI	Y	ADI	Y
14	MILAN (MXP)	SEA; physical searches handled by police	Y	SEA	Y
15	DUBLIN (DUB)	Aer Rianta (Airport Authority)	Y	Aer Rianta (Airport Authority)	Y
16	STOCKHOLM (ARN)	Group 4 Falk	Y	Group 4 Falk	Y
17	VIENNA (VIE)	VIASS	Y	VIASS and others [3]	Y
18	PARIS (ORY)	ASA, SIFA	Y	ICTS, Brinks	Y
19	BARCELONA (BCN)	Prosegur, State Police	Y	Prosegur, State Police	Y
20	LONDON (STN)	BAA	Y	ADI (Securicor)	Y
21	LISBON (LIS)	State Police [5]	See note 5 below	State Police [5]	See note 5 below
22	OSLO (OSL)	ADECCO, Olsten	Y	ADECCO, Olsten	Y
23	MALAGA (AGP)	80% Securitas/20% State Police	Y	80% Securitas/20% State Police	Y
n/av	GENEVA (GVA)	Airport Authority	Y	ICTS	Y
n/av	ATHENS (ATH)	ICTS/Wackenhut/3D	Y	Hermis/Civas	Y
n/av	NICE (NCE)	ICTS, SGA	Y	ICTS, SGA	Y
n/av	HELSINKI (HEL)	Securitas	Y	Securitas	Y
n/av	BIRMINGHAM (BHX)	ICTS & AAS	Y	ICTS & AAS	Y
n/av	BERLIN (BER)	Securitas	Y	Securitas	Y
n/av	STUTTGART (STR)	FIS	Y	FIS	Y
n/av	COLOGNE (CGN)	ADI	Y	ADI	Y
n/av	HAMBURG (HAM)	FIS	Y	FIS	Y
n/av	HANNOVER (HAJ)	FIS	Y	FIS	Y

[1]   Based on 1999 Int'l Airport Traffic Statistics from ACI.

[2]   As of October 2001.

[3]   These airports do not have centralized baggage screening, but airlines hire private companies to x-ray bags.

[4]   Public/private partnership underway.

[5]   Legislation proposed to permit public/private sector partnership.

Source: Aviation Security Association

The GAO visited five nations in 2001 to examine their security screening practices—Canada and four European nations (Belgium, France, The Netherlands, and the United Kingdom).[20] Its report focused on the superior performance of the European airports, all of which use the performance-contracting model. The GAO reported significant differences between their screening practices and that of then-current U.S. airports in four areas:

- Better overall security system design (allowing only ticketed passengers past screening, stationing law enforcement personnel at or near checkpoints, etc.);

- Higher qualifications and training requirements for screeners (e.g. 60 hours in France vs. 12 hours as then required by the FAA);

- Better pay and benefits, resulting in much lower turnover rates; and,

- Screening responsibility lodged with the airport or national government, not with airlines.

Most of these lessons were incorporated by Congress into the ATSA. What was largely ignored, however, was the fact that under the European conditions of high standards and oversight, performance contracting (hiring private security firms, paying them adequately, and holding them accountable for results) is the model adopted by nearly all European airports over the past two decades. Israel and a number of other nations in the Caribbean and the Far East also use this model.

Companies that do not meet the standards and perform effectively are not simply fined but actually have their contracts cancelled. Since these are typically long-term (e.g., up to six-year) contracts, losing such a contract is a serious loss of business, creating a strong incentive for high performance. Companies often bid on a whole package of security services, not just passenger screening, paid for via a single monthly charge. This avoids undue cost pressures being put on any one element.

Standards are set and enforced by a national government agency, typically either a civil aviation authority or a justice or interior ministry. The performance standards and enforcement process focus on four areas:

- **Certification** of the security companies, in which the government agency reviews the financial fitness of each firm, as well as the backgrounds of its officers and directors;

- **Licensing** of individual employees, initially as a trained security officer and then as a specialized aviation security agent;

- **Standards** for compensation and benefits, to ensure that people of sufficient caliber are recruited, and that they are motivated to remain with the company; and,

- **Training**, both initial and recurring, of both managers and operating personnel. The government develops goals and objectives for the training, and companies devise the curriculum, which the government must approve before it can be used.

Government oversight includes periodic audits of the qualifications and training of managers and staff. It conducts random, unannounced testing at the screening sites. It also conducts audits to be sure that the training has been conducted. Two main sanctions are used instead of fines: termination of specific contracts and revocation of the company's license to provide aviation security services. Individual screeners can have their licenses suspended or terminated for failing to perform properly.

3) Political Feasibility

When Congress debated what became the ATSA legislation, the Senate version passed on October 11, 2001, by 100-0, calling for a complete "federalization" of airport security. There was no fact-finding testimony, just bipartisan speeches attacking the private screening companies and assuring the worried public that a new federal workforce would be replacing them "as soon as practicable."[21] By contrast, the House took more time, and with the support of the GOP leadership, passed a bill allowing airports to choose private screeners under new federal supervision, by a vote of 218-214. But when White House Chief of Staff Andrew Card conceded that the President would sign a bill that federalized all screening, the balance of power in the conference committee went with federalization, and the Senate's approach largely prevailed. As a concession to the House bill, the final version of the ATSA allowed for the five-airport pilot program using private contractors and for all airports to be able to opt out after November 2004.

What has changed since then is the creation of the DHS, the actual and potential removal of a number of functions from the TSA, and a growing number of critical reports about the TSA from

the GAO, the DHS Inspector General, and most recently a scathing audit on TSA spending by the Defense Contract Audit Agency.[22] Thus, as of 2005, the original sanctity of the TSA as originally conceived has certainly worn off. But given how partisan the original House vote on "federalization" was, it's not clear how viable a proposal to shift that function to a new model of private provision would be. Opponents of the current opt-out provision repeatedly characterize such a move (as proposed by Rep. Mica) as "going back" to the pre-9/11 model, even though it is nothing of the sort.

The alternative recommended is not "privatization"—which would be the case if all airports were required to use private contractors. Rather, it is *devolution*.

The alternative recommended here is not "privatization"—which would be the case if all airports were required to use private contractors. Rather, it is *devolution*. The idea would be to remove the TSA's conflict of interest by devolving the actual provision of screening to the airport level, which is where all other aspects of airport security (such as access control and perimeter protection) already reside. Airports would then have the option of complying with federal screening requirements either with their own TSA-approved screening workforce or by hiring a TSA-certified screening contractor. This approach has strong support among airport directors, and is also embraced by the leading congressional champion of TSA reform, Rep. John Mica (R, FL), chairman of the House Aviation Subcommittee. Mica has called for "a decentralized screening program with federal oversight," citing the TSA's conflict of interest as a case of "the regulator regulating itself."[23]

The stage was set for making basic changes in the TSA by DHS Secretary Michael Chertoff's call for reform in mid-July 2005. Contrary to some expectations, the proposed overhaul did not call for abolishing the TSA, and actually gave back to it responsibility for the Federal Air Marshal Service. The TSA will also continue to have responsibility for security for all modes of transportation, not just aviation. Since some of Chertoff's proposed changes will require legislation, there would be an opportunity to revise the ATSA's mandate that the TSA both regulate and operate airport screening. If U.S. airlines via their trade association, the Air Transport Association, and the airport community, via the American Association of Airport Executives and the Airports Council International-North America, coalesced around devolution of airport screening, it could well prove to be a politically viable approach as part of overall reform of the TSA and the DHS.

B. Airport-Centered Security

How would devolution work? This section outlines some of the key features of a devolved, airport-centered approach to security, of which screening would become an integral part. As in Europe, the airport director would be in charge of securing the airport premises, under the supervision of the

TSA Federal Security Director (FSD) assigned to that airport. (Note: large airports have their own FSD, whereas for smaller airports, a single FSD may supervise several within a geographic region.)

1. Make-or-Buy Authority

The most fundamental aspect of devolution is that the responsibility for carrying out the screening of baggage and passengers would be shifted from the TSA to each individual airport. And as with all other airport services, it would be up to the airport to decide how to carry out the screening functions. Like most businesses, airports outsource some services and perform others using their own paid staff. In the case of screening, as with other security functions, the operations would have to comply with all TSA requirements.

But with the TSA no longer being in the business of screening, its requirements would have to be reconfigured for the new circumstances. To gain the flexibility advantages that go along with devolution, the hiring and training of screeners should be devolved rather than being centralized in Washington and carried out by a national TSA contractor. Rather, the TSA would provide training requirements and a core curriculum that could be used by airports, TSA-certified screening contractors, and TSA-certified screener training firms operating on a decentralized basis in various parts of the country.

2. Funding Allocations

Under current law, passenger and baggage screening are paid for by the TSA, whether provided by its own workforce or by TSA-certified contractors. This funding would presumably continue under devolution, but in order to take advantage of the flexibilities provided by devolution, two key changes should be made in how the funding is done. First, the allocations should be made far more frequently than once a year - ideally every month, but at least quarterly. This should be done in accordance with a transparent workload formula arrived at with significant input from the airport organizations (AAAE and ACI-NA) and the air carriers. Second, each airport should receive a lump sum amount which it can use as it sees fit for TSA-approved screening operations. The airport would be subject to reporting and auditing requirements to ensure that the funds are spent solely on airport security purposes.

A screener staffing allocation decided a year in advance is simply not a good fit for this dynamic airline environment.

Why monthly allocations rather than the current more-or-less annual allocation? The idea is to better match resources with workload. Today's dynamic, highly competitive airline industry is characterized by rapid change. USAirways downsizes its hub at Pittsburgh; JetBlue orders 100 new larger-size regional jets to add service to many smaller airports; America West and USAirways

merge, very likely leading to further cutbacks at some airports; and one or more legacy carriers may well liquidate (Chapter 7 bankruptcy), leading to significant changes in service. Tables 2 and 3 are drawn from a database of monthly enplaned passengers at the top 100 airports. For the sample year 2003, the tables illustrate the month-to-month volatility in passenger numbers at these airports, which account for the lion's share of passengers and screeners. A screener staffing allocation decided a year in advance is simply not a good fit for this dynamic airline environment. With funding allocations adjusted every month among the 446 airports with screeners, and the local flexibility to increase and decrease staffing as needed, there will be a much better match of screening workforce to actual workloads.

Table 2: Monthly Changes in Enplaned Passengers, Top 100 U.S. Airports, 2003				
Month	No. airports with +/-10%	No. airports with +/-15%	Airport with greatest change	Amount of change
January	77	54	Pensacola	-26%
February	7	1	San Juan	-19%
March	95	81	Myrtle Beach	76%
April	24	6	Salt Lake City	-18%
May	29	15	Palm Springs	-37%
June	20	7	Anchorage	57%
July	19	10	Islip	26%
August	11	0	Wichita	-15%
September	82	56	San Juan	-38%
October	64	35	Palm Springs	39%
November	23	9	St. Louis	-47%
December	14	3	Myrtle Beach	-22%

Source: U.S. DOT T-100 carrier reports

Table 3: Examples of Monthly Airport Enplanement Volatility, 2003 (percent change)												
Airport	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ft. Myers	7	8	38	-11	-32	-20	3	-8	-23	38	28	6
Seattle	-21	-4	17	1	9	16	11	2	-25	-4	-4	12

Source: U.S. DOT T-100 carrier reports

In addition to keeping funding in pace with passenger flow, the devolved system should leave the funds unencumbered by many of the current requirements. Currently, the TSA screeners are paid on a national wage scale, regardless of local living costs. And TSA-certified screening contractors must, per the ATSA, pay the identical wages and benefits to their screeners. While the intent of these provisions in the ATSA was to prevent a return to minimum-wage screeners with high turnover, that was a brute-force solution to a problem caused by the lack of FAA standards for screener selection, training, and performance. With hiring and operations under the control of each airport, the airport or its contractor should be free to innovate, using whatever mix of job functions

and compensation approaches will best get the job done, while meeting all TSA training and performance standards. Thus, especially at smaller airports, the same employee might do passenger screening during peak morning hours and do access-control or perimeter patrol during the remainder of her shift. Some airports (or their contractors) might develop workable split-shift approaches to cover morning and afternoon peaks without paying for a lot of unproductive time in between. The point is to let airports and their contractors decide on the best use of the screening money, to get the most bang for the buck.

The savings in labor would be very impressive.

3. Incentives for In-Line Baggage Systems

The imposition, in the ATSA, of extremely tight deadlines for implementing 100 percent explosive-detection inspection of all checked baggage also led to brute-force solutions. Large and medium airports mostly installed huge EDS machines in their ticket lobbies or in available spaces in their baggage areas; in either case, they had to be loaded by hand, one bag at a time. (Each EDS machine also requires an electronic trace detection [ETD] machine to be used for resolving alarms, also by hand.) Between the inherently slow processing time and this hand-feeding, processing rates are often as low as 100 bags/hour. Hence, in order to prevent massive delays, large numbers of $1 million apiece EDS machines were required. Smaller airports were equipped mostly with ETD machines as their primary means of compliance with the inspection mandate. In addition, as noted, thousands of ETDs were installed at large and medium airports for secondary screening of bags identified as suspicious by EDS. As of June 2004, some 1,228 EDS and 7,146 ETD machines had been installed at U.S. airports.[24]

These brute-force approaches are very labor-intensive. If EDS machines are integrated into a conveyor-fed baggage processing system (called "in-line systems"), and especially if go/no-go assessments are made at a remote display terminal (called "on-screen resolution"), the bag processing rates go way up and the labor involved goes way down. The latest GAO report on the subject cites TSA findings that when installed in-line, an EDS can process up to 425 bags/hour compared with 180 bags/hour when used in a stand-alone mode. And replacing an ETD operation with stand-alone EDS changes throughput from 36 bags/hour to 180 bags/hour.[25] These changes, if carried out, would mean the number of EDS machines at larger airports could be cut in half, with the excess machines shifted to smaller airports to replace ETD-only systems.

The savings in labor would be very impressive. According to the GAO report, a typical lobby-based EDS installation has one EDS plus three ETDs, requiring a workforce of 19 screeners. This can be replaced by an in-line EDS requiring just 4.25 screeners—a 78 percent reduction. For the nine large airports that have implemented in-line systems, the TSA's retrospective analysis found a reduction in bag screeners and supervisors of 78 percent. Similar GAO calculations analyzed replacing a 3 to 5-unit ETD installation with one stand-alone EDS plus one ETD for alarm

resolution. The former would require between 12.3 and 20.5 screeners, while the latter needs only 6.75. If we take the intermediate case of a 4-unit ETD installation, the reduction in staff from 16.4 to 6.75 is 59 percent.

Because of numbers like these, several airports that have switched from stand-alone, lobby-based EDS to in-line systems with on-screen resolution have reported a payback period of little more than one year. The TSA's analysis of nine airports shifting to in-line systems reached a similar conclusion, the GAO reported. In other words, the one-time investment in in-line EDS quickly pays for itself in reduced payroll costs. (It should be noted that the GAO's review of the TSA's aggregated analysis found that the results held true for eight of the nine airports; modification costs were so high at Seattle's SEA-TAC that there were no net cost savings from the conversion.[26])

In order to estimate overall labor savings from optimal revision of baggage screening systems (from stand-alone EDS to in-line EDS for larger airports, and from all-ETD to EDS+ETD at smaller airports), we need to know how many baggage screeners are involved at each type of airport. Unfortunately, the TSA does not release this information, but we will make a guess that the equivalent of 50 percent of the 45,000 TSA screeners are de-facto dedicated to baggage screening.[27] Using data on baggage flow per year at the top 100 airports from Leigh-Fischer Associates[28], and estimates for airports in the smaller categories, we have the comparative bag processing workloads shown in Table 4. Assuming that baggage screeners are distributed proportionally to workload, we then estimate how the 22,500 baggage screeners are distributed among the five categories of airports. Then, using the TSA/GAO calculation of 78 percent savings for shifting from stand-alone to in-line systems at large airports, we estimate a reduction of 9,477 bag screeners at Cat. X airports. For small, all-ETD airports, we assume that Cat. IV airports do not have enough workload to justify an EDS+ETD solution, so we assume zero reductions there. For Cat. III, we use the GAO estimate of 59 percent. And for the Cat I and II airports, which are intermediate in size, we use the average of 78 and 59 percent, which is 68.5 percent. Altogether, that produces a total reduction in the need for baggage screeners of 16,173.

Table 4: Potential Labor Savings from Optimized Bag Screening Systems							
Airport Category	No. of airports	Average bags per year (M)	Workload (bags x airports)	% of total	No. of screeners	% Reduced	No. reduced
X	21	15	315	54	12,150	78	9,477
I	61	3	183	31	6,975	68.5	4,778
II	50	1	50	9	2,025	68.5	1,387
III	124	0.2	25	4	900	59	531
IV	190	0.05	9	2	450	0	0
Total	446		582	100	22,500		16,173

Source: Reason calculations from TSA data in GAO-05-365.

In point of fact, as the GAO pointed out, there will be a few airports where for specialized, local reasons, these revisions are not cost-effective. So, to be conservative, we assume that one out of nine airports (11 percent) will not change bag-screening systems, thereby reducing the workforce saving from 16,173 to 14,394. Based on FY 2005 TSA budget data reported by the GAO, the screening workforce budget was $2.424 billion. Averaged over 45,000 screeners, that equates to $53,867 apiece. But assuming that 5-6 percent of the budget is management that would not be eliminated by reducing the need for baggage screeners, we can use $50K per screener as the approximate annual payroll savings from optimizing the baggage screening along these lines. Applied to 14,394 positions, that means an annual savings of $720 million.

If TSA screening funds were devolved to airports as proposed above, it would clearly be in an airport's interest to finance the investment in new screening systems so as to achieve these ongoing savings. And once the costs of the equipment and facility modernization were paid off, the savings could (with TSA consent) be used for other security improvements, such as more passenger screening lanes and screeners, if needed. Over time, as overall screening costs came down, smaller annual allocations from the TSA would be needed, thereby producing federal budget savings.

4. Liability

One of the issues that have held back many airports from participating in the post-November 2004 opt-out program (which the TSA calls the Screening Partnership Program) is liability. With the TSA as their provider of screening services, if a terrorist incident having any connection with passenger or baggage screening occurs at the airport, then the TSA is the party most likely to be at risk for lawsuits. But if the airport opts for a TSA-certified contractor, and such an incident occurs, there has been concern that the airport might be at greater risk for not having gone with the standard approach.

This liability issue arose first in connection with EDS machines and other technologies needed in security protection. In response, Congress passed the Support Anti-terrorism by Fostering Effective Technologies Act, better known as the SAFETY Act. It provides a process by which companies providing homeland security technologies or services can become certified by the DHS and win a limit on their liability. FirstLine and Covenant, two of the leading private screening companies, have recently received this designation.

However, if the TSA withdraws from the provision of screening services and this function is devolved to airports, the same liability concern could arise on the part of the airports. Under that new set of alternatives, it would maintain more of a level playing field between in-house and contracted screening services if airports were made eligible to receive the same extent of SAFETY Act protection as designated screening companies. Congress took a step in that direction via language included in the Homeland Security Appropriations Conference Report that passed both

houses and was signed by the president in October 2005. Sec. 547 amends Sec. 44920 of Title 49, USC, by making airport operators not liable for any claims for damages relating to their decision to opt out of TSA-provided screening.

C. A Risk-Based Model

The basic principle suggested here is that the equal-risk assumption embedded in the ATSA be replaced with a risk-based approach to airport security. The new principle would be to allocate security resources in proportion to the risk posed. In fact, this is how most other federal security policy is done—for example, air cargo, truck and rail cargo, and sea cargo do not have anything like 100 percent physical inspection. Instead, various procedures have been devised to identify those containers, trailers, or packages most likely to be dangerous, and those are physically inspected. And for people crossing U.S. borders, a number of programs (including FAST, INSPASS, NEXUS, PAL, and SENTRI) give expedited processing to subsets of travelers who have registered in advance and undergone some kind of background checking, thereby getting designated as lower-risk.[29]

On July 13, 2005, relatively new DHS Secretary Michael Chertoff announced a sweeping reorganization of the agency, shifting priorities in what appeared to be a more risk-based approach to security.[30] The former DHS Inspector General, Clark Kent Ervin, praised the new approach, characterizing it as "a threat-based, risk-based, consequence-based approach."[31] And new TSA Administrator Kip Hawley has said that "The federal government must focus resources on the basis of consequences, threat and vulnerability assessments, and the prioritization of risks."[32]

The discussion below suggests how such an approach could be implemented for airport security.

1. A Three-Tiered Approach for Air Travelers

The basic approach was outlined in this author's 2003 report on risk-based airport security.[33] It is based on the premise that the task of airport security is to identify and isolate dangerous persons, not dangerous objects per se. The challenge is to keep those persons from causing harm, either in the terminal area or to the planes themselves. There are many ways in which terrorists can cause great harm in connection with airports: getting on board with the aim of hijacking, getting on board as a suicide bomber, putting explosives into checked luggage but not getting on board, or targeting large concentrations of passengers in terminals. The TSA's current emphasis seems to devote the lion's share of its airport resources to just one of these threats: preventing would-be hijackers from boarding with weapons. Yet since the completion of the program that installed strengthened, locked cockpit doors (along with changing protocols for how crews deal with hijack threats), most experts consider the hijack threat to be greatly reduced. Far less money and effort is spent on securing airport terminal lobby areas and the ramp area where planes park. Thus, current policy de-facto downplays the threat of suicide bombers targeting crowds at checkpoints and lobby-based

EDS installations, and the threat of bombs being smuggled onto planes from the ramp (as opposed to the terminal).

Our proposed risk-based approach would shift the focus to identifying dangerous people. This could include greater security guard presence in terminal lobby areas and outside the terminal, in ramp areas and around the airport perimeter. And within the terminal, from the checkpoint onwards, it requires separating passengers into at least three TSA-defined groups, based on the quantity and quality of information about each:

- Low-risk passengers, about whom a great deal is known;
- High-risk passengers, based either on no knowledge or on specific, negative information;
- "Ordinary" passengers, mostly infrequent flyers and leisure travelers.

A different approach to both passenger screening and bag screening would be applied to each group.

Our proposed risk-based approach would shift the focus to identifying dangerous people.

Low-risk passengers are defined as those who possess a current federal security clearance or who have been accepted into a Registered Traveler program by passing a background check and being issued a biometric identity card. Passengers in this group would go through express lanes at checkpoints, with something like pre-9/11 protocols (e.g., no shoe or jacket removal, not having to remove laptops or video cameras, etc.). Their checked bags would not have to be EDS-screened. The whole point is to not waste the system's resources or those passengers' time on procedures that add very little value to airport security. As a safeguard against the small probability that a dangerous person might slip into this category, a certain percentage of these people and bags would be randomly selected for "ordinary passenger" screening.

High-risk passengers include those with no paper trail, about whom so little is known that the safest thing to do is to assume the worst and do a thorough screening of both person and bags (both checked and carry-on). Everyone in this group, in other words, would receive a more rigorous version of today's "secondary" screening, to include both explosive-detection screening of their carry-ons and bodies and either see-through scanning to detect non-metallic objects or a thorough pat-down search. The same protocol would apply to those whose names appear on government-maintained watch lists. Some of those in the latter category—those on the No-Fly list—would in most cases be detained rather than being put through a screening process.

Ordinary travelers are those in between the other two risk categories. These people would receive something like today's level of passenger screening (but with a much-reduced list of banned objects such as lighters, nail files, and razors). A fraction of this group would be randomly selected for secondary screening, as described above.

2. Identifying Low-Risk Passengers

Aviation experts Michael Levine and Richard Golaszewski suggested the idea of separating out low-risk travelers and expediting their processing at airports in an article published two months after 9/11.[34] It was first subject to detailed analytical scrutiny by a team of graduate students in operations research at Carnegie Mellon University in 2003.[35] They first created a model of passenger checkpoint processing, based on data from Pittsburgh International Airport (PIT). Next they created a design for a Registered Traveler program called SWIFT and simulated its operations using the model. Based on data from two surveys of airline passengers, they estimated that 40 percent of originating passengers would sign up for and be accepted into the system. Based on their simulation, first-class and elite frequent flyers (who already had a priority line at PIT) would see their average throughput time cut nearly in half, from 2.5 minutes down to 1.35. Coach passengers joining the program would have their average time slashed from 19.5 to 1.35 minutes. But those still using the regular lanes would benefit also. Since 40 percent fewer people would be using the regular lanes, their average processing time would drop from 19.5 to 12.1 minutes. The paper estimates that first-year benefits would exceed first-year costs by $2 million.

In 2004, the TSA launched a five-airport pilot program to test a watered-down version of the Registered Traveler concept. At each airport, enrollment was limited to frequent flyers of a single airline, with a maximum of 10,000 participants nationwide. There was no shortage of volunteers signing up, even though the members still had to endure the identical checkpoint processing (though bypassing the long lines and normally being exempt from secondary screening). Initial expectations were that after testing this model on a limited basis, the TSA would roll it out to a much larger number of airports and airlines. But instead of doing that, in 2005 the agency decided to open the field to private-sector firms (as recommended in Reason's 2003 study[36]).

The first private-sector offering came from Verified Identity Pass, which was selected in spring 2005 by Orlando International Airport over a competing proposal from Unisys to provide a "known traveler" program open to all airlines and intended to be expanded nationwide.[37] Enrollment began June 21, 2005. Verified handles the enrollment process, except for the background check and clearance decision, which is done by the TSA. The company will initially charge members $79.95 per year, and it is working out co-marketing agreements with airline frequent-flyer programs. Because participating airports must make room for express lanes and special kiosks (to verify the members' identity biometrically), Verified shares a percentage of its revenue with each participating airport.

At this point, it is not clear which checkpoint requirements (e.g., shoe and laptop removal) the TSA might be willing to waive for members of the program. But if the TSA approves something like the Carnegie Mellon model, the time-saving benefits for both members and non-members should be significant. There should also be some reduction in checkpoint screening personnel requirements, depending on what proportion of average daily passengers shifts from regular lines to the express

lines requiring less screener interaction with passengers (fewer inexperienced travelers to coach, much less use of secondary screening).

3. Separating Ordinary and High-Risk Passengers

Once low-risk passengers have been self-selected out of the mix, the remaining task is to use all feasible information to separate high-risk passengers from all the rest. One tool for doing this is a government-maintained watch list, continuously updated, against which all airline passenger reservations would be checked by the TSA in real time. Despite significant efforts among a number of federal agencies to create and maintain such a unified list, nearly four years after 9/11 this watch list still leaves a great deal to be desired, as discussed in many recent articles.[38]

A second approach is to assess what is known about each passenger, based on information provided at the time of ticket purchase. This is the function of the pre 9/11 CAPPS, which actually flagged some, but not all, of the 9/11 hijackers. The idea of such risk-screening systems is to use various algorithms to (1) verify the passenger's identity, and (2) look for patterns that might suggest high risk. The TSA's proposed Secure Flight system is intended to do this, replacing CAPPS.

The original CAPPS, still in use because its replacement has been repeatedly delayed, uses rather crude algorithms, some of whose parameters have become well-known (paying cash, buying a one-way ticket, etc.) and can hence be avoided by those seeking to do harm. It apparently does not make use of travel-history data maintained in airline industry databases, linked to the passenger name record (PNR). An exercise carried out in 2003 for Reason Foundation by R. W. Mann & Company tested several different algorithms using only five million travel records (no names) for the two-month period before and after September 11, 2001. One query identified 13 sets of travelers fitting a pattern that closely matched those of the actual 9/11 hijackers; this set of records included all of the actual hijackers.[39]

To supplement the above tools, and to deal with lobby-area persons not holding tickets (and therefore not passing through the screening checkpoints), a technique called "behavioral profiling" is being used at Israeli airports, Boston's Logan Airport, and Las Vegas casinos.[40,41,42] The general idea is to unobtrusively monitor people's behavior, looking for suspicious activities, to be followed up by questioning by security personnel.

4. Redesigning Passenger Checkpoints

Security checkpoints for a risk-based system would be different from those at today's airports. First, there would be two different sets of lanes: one set for Registered Travelers and the other for

all others. The proportion of each would have to be varied over time, depending on the fraction of daily originating passengers who were RT program members. Space would be required on the approach to the RT lanes for kiosks at which members would insert their biometric identity cards to gain admission to the line for these lanes. These kiosks might be combined with common-use boarding-pass kiosks, saving RT members without bags to check from having to stop at two different kiosks.

On the sterile side of the checkpoint, additional space would be required for secondary screening portals to check the bodies and carry-on bags of selectees for explosives and potential weapons. All high-risk passengers (except those on the No Fly list, who would be detained) would automatically go through secondary screening. Boarding passes would be coded electronically, not visibly, so that a selectee would not know whether he/she had been selected by Secure Flight or at random.

It is likely that meeting this set of requirements would need somewhat more square footage than is now allocated for checkpoints, though this remains to be determined. On one hand, added space would be needed for RT kiosks and for expanded secondary screening equipment for selectees. On the other hand, significant RT enrollment should reduce the length of waiting lines (and hence reduce the area needed for that purpose). And a smaller total number of selectees (as the TSA has promised for the more sophisticated Secure Flight, when it replaces CAPPS) would lead to a smaller secondary screening area than if current percentages of passengers continued to be selected.

The risk-based approach should produce significant savings in passenger time, by speeding up baggage screening and passenger screening alike.

5. Redesigning Baggage Screening

The risk-based model would reduce the size and cost of checked baggage screening. The bags of RT members could be screened via high-speed X-ray machines, reducing the load on (and hence number of) EDS machines. RAND Corporation has done a number of studies of the impact that an RT program (which RAND refers to as "positive profiling") could have on the size and cost of EDS installations at large and medium airports. In a 2004 report, one representative result from a simulation modeling exercise used the following parameters: size the system to ensure that bags get to the intended flight 99 percent of the time, assume 90 percent reliability (up-time) of the EDS machines, and assume that 50 percent of all bags are exempted from EDS screening. For this particular set of assumptions, the RAND

team estimated the total cost to the flying public of various levels of EDS deployment, where cost includes both the capital and operating costs (screener payroll) of the EDS machines and the extra time currently wasted by passengers getting to the airport early enough to ensure that their flight is not delayed due to slow bag processing. In the absence of an RT program, the optimal number of EDS machines under these assumptions (nationwide) was found to be 6,000. But with an RT program that exempts 50 percent of all bags from screening (defined as screening all bags of non-members plus one-sixth of the bags of the 60 percent of passengers who are RT members), the optimal number of EDS machines declines to about 2,500.[43] That's an enormous difference in both the space required at airports and also in the capital and operating costs. As a ballpark estimate, we could say that under a reasonable set of assumptions, an RT program could cut costly EDS deployment by up to 50 percent.

As shown in the previous subsection, the risk-based approach would reduce the scale of EDS deployment, potentially by about 50 percent.

6. Cost Implications

The risk-based approach would produce significant cost savings, in both capital and operating costs, while targeting those funds spent on airport security toward the passengers most likely to pose threats to people and property. And those savings, in turn, could be devoted partially to expanded security in other areas and partially to reducing the cost burden on passengers, airlines, airports, and taxpayers.

As shown in the previous subsection, the risk-based approach would reduce the scale of EDS deployment, potentially by about 50 percent. The GAO reports that the TSA has not done a detailed assessment of the cost of adding in-line EDS systems at all the remaining airports where it would make sense, but has provided a broad estimate that the cost would be $3 to 5 billion.[44] A system needing half as many EDS machines would probably not be 50 percent less costly, due to some factors that do not scale downwards as much (facility modifications, conveyor systems, overhead, etc.). So a safer estimate of capital cost savings would be 40 percent. Hence, those one-time savings would be in the range of $1.2 to 2 billion, reducing the cost of the remaining in-line systems to $1.8 to 3 billion.

In a previous section, we saw that optimizing EDS and ETD systems would produce dramatic reductions in the number of baggage screeners needed, eliminating 14,394 of the estimated 22,500 now in place and saving $720 million per year in payroll costs. That 8,106-person workforce could be further reduced by the risk-based re-sizing of EDS systems. Another 50 percent reduction would reduce the bag screening workforce to 4,053, saving another $202,650,000 per year in payroll

costs. Thus, the total payroll savings, from both in-line systems and risk-based re-sizing, would be $923 million.

Some of the capital cost savings could be used for expanding passenger checkpoints and/or for beefing up terminal access control and airport perimeter control. The latter two uses aim at protecting planes on the ramp from unauthorized persons. And some of the payroll cost savings could be used to increase passenger checkpoint screener numbers, to add security personnel in lobby areas, and to add staff for access control and perimeter control, as necessary.

The risk-based approach should produce significant savings in passenger time, by speeding up baggage screening and passenger screening alike. While the modeling necessary to quantify such savings is beyond the scope of this paper, the ultimate impact would be that people would not have to arrive at airports as early as they have learned to do in the post-9/11 era, reclaiming that time for personal or business purposes.

Summing Up: Benefits of Reform

This paper has argued for three basic changes in the model of airport security that has been employed in the United States since the passage of the ATSA legislation in 2001. Those changes are (1) to remove the TSA's conflict of interest by making it the policymaker and regulator, but not the provider, of airport screening; (2) to devolve screening responsibility to the airport level, under the supervision of the TSA's Federal Security Director in each case, and (3) to shift the paradigm from an equal-risk model to a truly risk-based model for airport security.

Those changes would improve airport security in several ways. They would target more of the available resources (of people and equipment) toward those passengers who pose relatively greater risk of harm, thereby getting more bang for the buck. By making all on-airport security functions the responsibility of the airport, this approach would lead to a more integrated approach, with the FSD supervising everything. Removing EDS and ETD installations from ticket lobbies and reducing the extent of lines at passenger checkpoints would reduce large concentrations of people that could be targets for suicide bombers.

The proposed changes in passenger and baggage screening should have the effect of significantly reducing the average passenger waiting time to get through security and also the unpredictable variability of those times. An analysis carried out by *USA Today*, using TSA data from 2004-2005, found that at the 15 busiest airports, although average waits were seldom more than five minutes, the maximum wait could be as long as 133 minutes (Los Angeles), 120 minutes (Atlanta), or 100 minutes (Ft. Lauderdale).[45] This kind of extreme variability forces passengers to arrive at the airport far earlier than is usually necessary, wasting a huge amount of people's time.

Removing the TSA's conflict of interest, and making the airport responsible for all aspects of security (as in Europe) should also increase accountability for results.

Finally, as discussed above, this approach should produce meaningful cost savings, both in one-time capital costs for additional baggage system improvements and in annual payroll costs for screening functions. This will free up scarce airport security resources for other security needs besides screening, as well as creating the possibility of savings for airlines, airports, passengers, and taxpayers. Over time, those savings may permit the TSA and the DHS to spend relatively more on protecting vital non-aviation infrastructure.

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