

Homeland Security Institute

Underlying Reasons for Success and Failure of Terrorist Attacks: Selected Case Studies

4 June 2007



2900 South Quincy Street • Suite 800 • Arlington, VA 22206-2233

Report Documentation Page

*Form Approved
OMB No. 0704-0188*

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1. REPORT DATE 04 JUN 2007	2. REPORT TYPE	3. DATES COVERED 00-00-2007 to 00-00-2007			
4. TITLE AND SUBTITLE Underlying Reasons for Success and Failure of Terrorist Attacks: Selected Case Studies		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Homeland Security Institute, Arlington, VA		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 176	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

HOMELAND SECURITY INSTITUTE

The Homeland Security Institute (HSI) is a federally funded research and development center (FFRDC) established by the Secretary of Homeland Security under Section 312 of the Homeland Security Act of 2002. Analytic Services Inc. operates HSI under contract number W81XWH-04-D-0011.

HSI's mission is to assist the Secretary of Homeland Security, the Under Secretary for Science and Technology, and the Department of Homeland Security (DHS) operating elements in addressing national policy and security issues where scientific, technical, and analytical expertise is required. HSI also consults with other government agencies, nongovernmental organizations, institutions of higher education, and nonprofit organizations.

HSI delivers independent and objective analyses and advice to support policy development, decision making, alternative approaches, and new ideas on significant issues.

HSI's research is undertaken by mutual consent with DHS and is organized by Tasks in the annual HSI Research Plan. This report presents the results of research and analysis conducted under

Task 06-TT-29, Underlying Reasons for Success or Failure in Terrorist Attacks (Phase II)

of HSI's Fiscal Year 2006 Research plan. The purpose of Task 06-TT-29 is to continue the work completed in Phase I by expanding the study set to include attacks not involving U.S. interests and by providing increased granularity for assessing the underlying reasons for the success and failure of these attacks.

The information presented in this report does not necessarily reflect official DHS opinion or policy.



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UNDERLYING REASONS FOR SUCCESS AND FAILURE OF TERRORIST ATTACKS: SELECTED CASE STUDIES

Final Report

4 June 2007

**Prepared for Department of Homeland Security
Science and Technology Directorate**

ACKNOWLEDGEMENTS

This report benefited from the advice and expertise of many dedicated professionals in the private and public sectors, as well as representatives of countries with whom we share the struggle against terrorism. The authors would like to acknowledge specifically two of these experts who reviewed our report for accuracy and completeness: Mr. William Baron, of the Department of Transportation's Volpe National Transportation Systems Center, and Ms. Elizabeth Smiley, with the Transportation Security Administration. Mr. Baron served as our external reviewer for the passenger rail sector, while Ms. Smiley reviewed the report as our commercial aviation threat expert.

Finally, we would like to thank the project sponsor, Mr. Robert Ross, Director of the Comparative Studies Program in the Risk Sciences Branch, Special Programs Division, Department of Homeland Security/Office of Science and Technology. Mr. Ross provided invaluable insight that helped us frame our approach and create a product that we believe will be useful to many throughout the homeland security community.

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HSI Publication Number: RP06-TT-29-02

TABLE OF CONTENTS

Executive Summary	1
Findings	1
Policy Implications	2
Section I—Background	5
Introduction.....	5
Who Should Read This Study.....	5
Methodology.....	6
Passenger Rail.....	7
Commercial Aviation.....	8
Section II—Passenger Rail.....	11
Specific Vulnerabilities of Passenger Rail Systems	11
Limited Screening Capability and Open Architecture of Rail Systems	11
Design of Train Stations and Rail Cars.....	12
Operational Predictability	12
Summary.....	12
Chemical Weapons Attack on the Tokyo Subway System—March 1995.....	17
Overview	17
Significance of the Incident	17
Description of the Group or Individuals Involved	17
Motivation	18
Planning.....	19
Attack.....	20
Consequences	21
Factors Associated With Success or Failure.....	22
Findings	24
New York City Subway Bomb Plot—July 1997	25
Overview	25
Significance of the Incident	25
Description of the Group or Individuals Involved	25
Motivation	27
Planning.....	28
Attack.....	29
Consequences	29
Factors Associated With Success or Failure.....	30
Findings	31
London Transit Bombings—July 7, 2005.....	32
Overview	32
Significance of the Incident	32
Description of the Group or Individuals Involved	32
Motivation	34
Planning.....	35
Attack.....	36

Consequences	37
Factors Associated With Success or Failure	39
Findings	41
Attempted London Transit Bombings—July 21, 2005	42
Overview	42
Significance of the Incident	42
Description of the Group or Individuals Involved	42
Motivation	43
Planning	43
Attack	44
Consequences	46
Factors Associated With Success or Failure	46
Findings	47
Section III—Commercial Aviation.....	49
Specific Vulnerabilities of Commercial Aviation.....	49
Various Means of Attacking Aircraft	49
Chemical and Biological Attack	50
Insider Threat	50
Standoff Attack	51
Summary	51
The Hijacking of Air France Flight 8969—December 1994	55
Overview	55
Significance of the Incident	55
Description of the Group or Individuals Involved	56
Motivation	56
Planning	57
Attack	57
Consequences	58
Factors Associated With Success or Failure	58
Findings	59
Operation Bojinka—December 1994-January 1995	61
Overview	61
Significance of the Incident	61
Description of the Group or Individuals Involved	62
Motivation	62
Planning	63
Attack	63
Consequences	64
Factors Associated With Success or Failure	64
Findings	65
The Attacks on the World Trade Center and the Pentagon—September 11, 2001	66
Overview	66
Significance of the Incident	66
Description of the Group or Individuals Involved	66

Motivation	67
Planning	68
Attack.....	70
Consequences	71
Factors Associated With Success or Failure.....	73
Findings	76
The Liquid Explosives Airline Plot in the United Kingdom—August 2006.....	77
Overview	77
Significance of the Incident	77
Description of the Group or Individuals Involved	78
Motivation	79
Planning.....	79
Attack.....	80
Consequences	82
Factors Associated With Success or Failure.....	82
Findings	84
Section IV—Findings.....	85
Influence of Factors	85
Accessibility	85
Training	85
Operational Proficiency and Technical Sophistication	86
Terrorist Profile Indicators.....	87
Law Enforcement or Intelligence Knowledge	88
Security Environment	88
Observant Public and Vigilant Security Services	88
Effective Information Sharing	89
Technical Difficulties	89
International Cooperation	89
Terrorist Operational Security (OPSEC)	90
Innovation.....	90
Policy Implications	92
Observant Public.....	92
Aware and Responsive Law Enforcement and Security Forces	92
Community Policing.....	93
Information Sharing.....	93
Appendix A—Expanded Methodology	95
Data Sources	96
Evaluation of Data	96
Description of Matrices	97
Bibliography	101
Endnotes.....	145

LIST OF TABLES

Table 2-1: Passenger Rail Sector—Indicators of Success	15
Table 2-2: Passenger Rail Sector—Factors	16
Table 2-3: Passenger Rail Sector—Case Study Descriptions	16
Table 3-1: Commercial Aviation Sector—Indicators of Success	53
Table 3-2: Commercial Aviation Sector—Factors	54
Table 3-3: Commercial Aviation Sector—Case Study Descriptions	54

EXECUTIVE SUMMARY

Terrorist organizations are not static entities. They learn, change their structure, adapt to countermeasures, and continuously look for means to advance their campaign. Sometimes the terrorists' efforts result in successful operations; sometimes they lead to failure.

The purpose of this study is to identify particular factors which influence the success or failure of terrorist plots. This is the second of a two phased effort: Phase I focused on assessing the underlying reasons for the success and failure of terrorist attacks against targets within the United States and against U.S. interests abroad.

Phase II, this study, focuses on attacks since the mid-1990s against targets in the United States and abroad, whether or not directly targeting the United States. We look at two target categories that we believe are particularly vulnerable: passenger rail and commercial aviation. Using a case study analysis, we identified eight particular terrorist attacks to analyze. These are:

Passenger Rail:

- The Aum Shinrikyo attack on Japanese subway trains, March 20, 1995
- The suicide bombing plot involving the New York City subway system, July 1997
- The attacks on the London transit system, July 7, 2005
- The plan to attack the London transit system, July 21, 2005

Commercial Aviation

- The hijacking of Air France Flight 8969, December 24-26, 1994
- The Bojinka plot in the Philippines, December 1994 - January 1995
- The attacks of September 11, 2001
- The plot to destroy U.S. airliners with liquid explosives, August 2006

We analyzed these cases based on an expansion of the set of factors used in Phase I (see Appendix A for a detailed description of factors and methodology). The results were then examined as a group to discern trends and commonalities.

Findings

The analytic results indicated that the most influential factors determining the success or failure of a terrorist attack are those that occur in the pre-execution phases. While safeguards and controls at airports and rail stations are critical, they are most effective when coupled with factors that can be leveraged to detect the plot in the planning stages. These factors include:

- *Poor terrorist operational security (OPSEC).* The case studies indicate that even plots that are otherwise well-planned and operationally sound will fail if there is a lack of attention to OPSEC. *Security services cannot "cause" poor OPSEC, but they can create the proper conditions to capitalize on it when it occurs.*
- *Observant public and vigilant security services.* OPSEC breaches are a significant factor only if they are noticed. In cases where the public was sensitive to suspicious behavior,

lapses in OPSEC were brought to the attention of authorities by ordinary citizens. However, the authorities must likewise be vigilant and recognize the value of unexpected information that may seem unimportant, but actually provides the opening to interdict a planned attack.

- *Terrorist profile indicators.* Awareness of and sensitivity to behavioral indicators, certain activities, or past involvement with extremist elements can help alert an observant public and help a vigilant security apparatus recognize a potential cell of terrorist plotters.
- *Law enforcement or intelligence information sharing.* Naturally, if security services are aware of an impending attack they will be better able to interdict it. The key, as stated above, is to recognize the value of information that may seem unimportant but warrants further investigation. Security services may not recognize the context into which a certain piece of information fits, but by sharing with other organizations more parts of the puzzle can be pieced together. Information should be shared laterally, with counterpart organizations; downward, with local law enforcement, who can serve as collectors of information; and with higher elements capable of conducting detailed analysis. Intelligence collection and analysis are relatively new functions for law enforcement. Training is a key element in their ability to recognize and respond to indicators.
- *International cooperation.* Nearly all terrorist plots, including most of those studied for this project, have an international connection. This could include overseas support elements, training camps, or movement of funds. The sharing of information among allies appears from our analysis to have a positive impact on interdicting attack plans as well as apprehending members of larger networks.

Policy Implications

One phenomenon stands out: terrorists are rarely caught in the act during the execution phase of an operation, other than instances in which their equipment or weapons fail. Rather, plots are most often foiled during the pre-execution phases. The importance of detecting and interdicting terrorist plans early leads to several implications for policy.

We found that there must be an observant and sensitive public that recognizes potential indicators of terrorist planning. Therefore, *public awareness programs* aimed at the general populace, combined with *outreach activities* focused on at-risk populations, are key to creating an environment which can detect and report OPSEC lapses. This effectively creates a wider surveillance net for reporting potential attack planning. Additionally, the security apparatus should be knowledgeable and sensitive to reports and other indicators that may be signs of terrorist planning. This involves *training* of officers at the lowest echelons and *sufficient resources* to allow all pertinent leads to be investigated.

Community policing has the potential of increasing both the sensitivity of the public and the awareness of law enforcement personnel. Police who are embedded within communities know—and are known by—the residents. Observant citizens are more likely to approach such police officers with information regarding suspicious activity.

Information must be shared both horizontally and vertically. Police and security services need to have open conduits of information exchange with their foreign counterparts due to the mobility and globalization of the terrorist threat. Further, they must be able to share information upward,

where disparate pieces of information can be woven together, and downward, where information can be used to inform enforcers of threats of which they should be aware.

The important lesson learned is that it is highly effective to concentrate on the pre-execution phases of attempted terrorist attacks. Last-line fail-safe measures are critical to thwart undetected plots, as well as induce uncertainty into the terrorist planning process. However, the best way to influence the success or failure of an attack—at the tactical, operational, or strategic level—is to interdict the plot before the terrorists deploy to execute their plan.

SECTION I—BACKGROUND

INTRODUCTION

The Department of Homeland Security (DHS), and more generally the homeland security community, faces the daunting challenge of anticipating and preventing attacks by innovative, adaptive enemies. These adversaries may have a track record of success but they may also have suffered failures for a variety of reasons.

It is not always clear what leads to the failure of terrorist groups to carry out their attacks. In some instances, it seems to be bad luck, rather than positive action by security authorities; at other times, credit clearly goes to intelligence, law enforcement, and protective services.

Identifying the factors underlying the success or failure of terrorist plans will greatly facilitate the ability of DHS to formulate strategy and allocate resources in a way that maximizes its ability to prevent attacks from occurring or to mitigate the consequences. The purpose of this study is to assist DHS, and others involved in preventing terrorist attacks, by identifying such factors and relating the findings to possible policy implications. We have done so by applying case study analytical methods to a number of successful and unsuccessful terrorist plots, which were selected based on how well they demonstrate key aspects of planning and executing terrorist attacks.

Who Should Read This Study

Several communities could benefit from the information presented in this report. These include:

- Policymakers in the Department of Homeland Security and its components
- Officials involved with security of transit and aviation systems at the federal, state and local levels
- Law enforcement personnel
- Decisionmakers responsible for allocation of resources in the homeland security, intelligence, and law enforcement communities
- Intelligence analysts
- Scholars interested in the historical antecedents to current and future terrorist attacks

It is our hope that the analysis presented in this report is useful to these communities and others interested in protecting the U.S. and its allies from terrorist attack. We further hope that our research leads to discussion among the many stakeholders in this important area and serves as a catalyst for continued research.

METHODOLOGY

This Homeland Security Institute project represents Phase II of *Underlying Reasons for Successful & Unsuccessful Terrorist Attacks Against the U.S. Homeland & Selected U.S. Interests Abroad*. Phase I, completed in September 2005, sought to create a historical record of terrorist incidents directed against the United States or its interests, as well as to determine what accounts for the success or failure of an attack.

For this phase, we expanded upon Phase I of this project by including attacks or attempted attacks against both U.S. and non-U.S. targets. For that reason, the words “Against the U.S. Homeland and Selected U.S. Interests” were removed from the title. In addition, Phase II attempts to discern various aspects and factors of success or failure from both the U.S./Western and the adversarial perspectives.

Phase I focused on factors called terrorist objectives, operational measures (such as training, technical proficiency, deception, or operational security), and environmental measures (such as target accessibility, countermeasures, or permissive environment). In the current phase, we expanded upon these factors using a matrix adapted from an attack path risk model (described below).

Phase I identified underlying reasons for success and failure. Reasons for success included accessibility of the target, execution, technical proficiency or technology factors, personnel, and planning. Reasons for failure included personnel, technical proficiency or technology factors, and intelligence.

The methodology of Phase I centered on the compilation of a large database of cases, from which statistical inferences were drawn. Phase II narrows the focus to a smaller set of informative, representative cases and uses case study methodology to elicit executable information.

In this phase, Phase II, we examine “success” and “failure” from the adversary’s perspective at tactical, operational, and strategic levels. For the purpose of this study, those levels are defined as follows:

- Tactical: Immediate damage from a weapon or other method of attack -- for example, casualties and material damage due to the effects of the weapon
- Operational: Systemic disruption, widespread media attention, or other effects lasting weeks or months
- Strategic: Lasting effects enabling terrorists to achieve long-term goals, such as changes in foreign or domestic policy that aid their cause or long-term economic or psychological damage

The consequences of the attacks of September 11, 2001 provide a useful illustration of the tactical, operational, and strategic levels. The nearly 3000 deaths and physical destruction of the aircraft, Twin Towers and Pentagon can be considered tactical level effects. The extensive media coverage and systemic disruption of air traffic control over the next few days and weeks are operational level effects. Continuing economic and psychological effects on the American population are considered strategic effects.

For data evaluation purposes, we created three matrices to evaluate each case systematically so that possible trends and patterns could be identified. The first (Attack Path Matrix) breaks down

the event into the steps required to plan and execute the attack (see Appendix A, p. 102). The second (Success Indicator Matrix) analyzes indicators of success or failure at the tactical, operational, and strategic levels, and is divided into pre-execution and execution phase factors (see Appendix A, p. 103). These indicators determine the degree to which an attack or attempt was successful at each of the three levels. *It is possible for an attack to have the attributes of success at some levels and attributes of failure at others.* The final matrix (Factors Matrix) examines factors that our analysis indicates have an impact on the success or failure of an operation; in other words, the first matrix shows the “how,” the second matrix shows the “what,” and the third depicts the “why” (see Appendix A, p. 95).

We focused our efforts on two target types: passenger rail and commercial aviation. While there are other target categories (e.g., maritime, fixed target, or industrial infrastructure), these two stood out because of:

- Demonstrated terrorist intent to attack these targets
- Demonstrated terrorist capability to conduct such attacks
- Potential for mass casualties
- Particular aspects inherent in the design of these targets which could impact the success or failure of attempted attacks

We established criteria for selecting cases used in this study to determine which are most informative for future policy and strategy. The criteria are described in detail in Appendix A. These criteria are:

- Is there evidence of clear ties to a terrorist plan?
- Does the incident demonstrate terrorist learning, either as precedent or refinement of prior tactics?
- Does the incident demonstrate some aspect (e.g., tactic, group characteristic, target) that is believed to be a significant threat in the future?
- Does the incident demonstrate any particularly informative counterterrorism approaches?
- Does the incident demonstrate a significant shift in terrorist trends?

We selected eight cases for in-depth study to gain a more complete understanding of the components of the incident and factors that led to success or failure at multiple levels—tactical, operational, and strategic. We chose terrorist events that met one or more of the criteria and which demonstrated important aspects of planning and executing terrorist attacks. These cases are described briefly below and in detail later in the main body of the report.

Passenger Rail

1. **Aum Shinrikyo attack on Japanese subway trains, March 20, 1995.** Although this event occurred over a decade ago, it remains highly informative. This incident demonstrates one of the only terrorist attacks to use chemical weapons with a modicum of success. This event is also one of the first terrorist attacks on trains or subways; as such, it illustrates possible terrorist organizational learning for future attack planning.

2. **Suicide bombing plot, New York City subway system, July 1997.** While this plot never reached the execution phase, trains—especially high-volume urban subway systems—are particularly vulnerable and attractive targets to terrorists. While there have been other similar attempts (many successful) overseas, this case is of interest because it involved a system in the United States.
3. **Attacks on the London transit system, July 7, 2005.** This successful series of attacks suggests that attacks on rail systems pose a significant future threat. This case is instructive due to significant similarities between London mass transit and mass transit systems across the United States. It also demonstrates potential terrorist organizational learning, building upon similar events in Madrid and elsewhere. Furthermore, the case displays a shift in terrorist trends toward the use of attackers who were born and raised in the target country.
4. **Plan to attack the London transit system, July 21, 2005.** This unsuccessful attempt occurred only two weeks after the successful attack and against the same target system. It is useful to contrast this case with the successful attacks of July 7, 2005. The case demonstrates potential terrorist organizational learning, although in this case, perhaps a failure to do so.

Commercial Aviation

1. **Air France Flight 8969, December 1994.** In this case, terrorists from the Armed Islamic Group successfully entered the execution phase by hijacking an airliner and forcing it to fly to France. The case exhibits a precedent for terrorist organizational learning. It was the first planned attempt to use a commercial aircraft as a weapon in and of itself, and subsequent efforts, such as the attacks of September 11, may have been informed by mistakes made by the terrorists that prevented them from ultimately reaching their target. The case also demonstrates successful counterterrorism methods: although the terrorists succeeded in entering the execution phase, counterterrorist forces were able to free all hostages.
2. **The Bojinka Plot, December 1994-January 1995.** This plot had several elements: an attempt to kill Pope John Paul II in Manila, a plan to crash an aircraft into the headquarters of the Central Intelligence Agency, and an effort to simultaneously destroy 11 or 12 U.S.-flag airliners in flight over the Pacific Ocean.¹ None of these components reached the execution phase. This case illustrates potential terrorist organizational learning as a precedent. It was the first attempt to destroy multiple airliners simultaneously in flight, it was the first significant attempt to use liquid explosives to circumvent existing screening technology, and (like the Air France plot) it was an early attempt to use an aircraft as a weapon by crashing it into a target.
3. **The attacks of September 11, 2001.** Al Qaeda succeeded in entering the execution phase of this plan, using four commandeered airliners to destroy targets of significant symbolic and material value and kill nearly 3,000 Americans. This case exhibits organizational terrorist learning, with commercial aircraft being used as weapons successfully for the first time. It also demonstrates a significant shift in terrorist and counterterrorist trends: not only was it the largest, most complex terrorist attack on U.S. soil to date, but it led to major changes in security measures.

4. **The plot to destroy U.S. airliners with liquid explosives, August 2006.** British authorities successfully prevented a group of approximately 20 terrorists from destroying multiple U.S.-flag airliners en route from the United Kingdom to the United States. The case illustrates terrorist organizational learning: like the Bojinka plot, this plan called for the use of liquid explosives. The method for smuggling the explosives on board was more sophisticated than in the Bojinka plot. The use of liquid explosives also exhibits a significant shift in terrorist trends, in that it has forced a major adjustment to screening procedures for commercial aircraft. Finally, the effective international and interagency information sharing that disrupted this plan is a useful “lessons learned.”

A Note on Cases Not Selected for This Study

In choosing cases for analysis, we avoided incidents that were redundant. For example, the bombings in Madrid were significant in that they affected an election. We reviewed this incident for inclusion in the study, but in its technical execution we found it to be similar to the London bombings of July 7, 2005. Between the two, we decided to study the London incident because:

- It provided a useful vehicle for contrast against the unsuccessful plot of July 21, 2005, and
- The London Underground system is more analogous to U.S. urban subway systems than Madrid’s commuter rail, which is more typical of the large-scale passenger networks on the European continent

For similar reasons, we did not include the attacks by Islamic terrorists in Mumbai in July 2006 or by Chechen terrorists in Moscow in February 2004. However, where appropriate, we refer to these incidents to expand upon information presented in our other case studies.

A more detailed description of the methodology used in this study is found in Appendix A.

SECTION II—PASSENGER RAIL

SPECIFIC VULNERABILITIES OF PASSENGER RAIL SYSTEMS

Before examining specific case studies on attacks or attempted attacks on the passenger rail sector, it is useful to identify aspects of these systems that affect the ability of terrorists to conduct successful attacks on passenger trains and subways.

Limited Screening Capability and Open Architecture of Rail Systems

Compared to other categories of targets, such as those in the aviation sector, passenger rail presents unique challenges to security screening. This difficulty may provide greater opportunity for terrorists to attack targets within this sector.

One of the reasons that screening rail passengers is difficult relates to the open architecture of the system.² By design, rail systems are accessible and are therefore more challenging to protect. In many cases, trains and subways must move large volumes of passengers who are in a hurry to arrive at their destinations. Rail passenger facilities rely on the rapid, easy movement of customers on and off of trains and in and out of stations.³

Any type of thorough screening would add time to passengers' commutes, and this could make rail an inconvenient option for many commuters. If strict screening measures were instituted system-wide, the cost of the security likely would be reflected in higher fares for customers, which also might result in decreased ridership.

Members of Aum Shinrikyo relied upon the open architecture and limited screening practices of the Tokyo subway system when planning their March 1995 sarin gas attack. The openness of the system facilitated their entry to and exit from the target, and they knew that the sarin gas would not be detected prior to its release onboard the subway cars.

Further, passenger rail systems transit diverse geographical areas, moving through crowded urban areas, broad swaths of suburbs, and relatively unpopulated rural areas.⁴ Each region presents its own challenges to rail security. Large cities tend to have high concentrations of stations, meaning that terrorists would have multiple opportunities to attack and have several points of exit, should they choose to escape the train or subway rather than conduct a suicide attack.

In less populated areas, long segments of track pass through areas that are difficult to patrol regularly—this offers opportunities for terrorists who might try to lay explosives on the track or on bridges. Were an improvised explosive device to be detonated along a bridge or section of track on which a train was traveling at high speed, the force of the explosion could cause the train to derail, resulting in a high number of casualties and significant structural damage, both to the train and the tracks beneath it.⁵

The limited screening capability and open architecture that characterize the rail system have been contributing factors to the success of terrorist attacks against targets in this sector, including the coordinated explosions that occurred on trains in Madrid, Spain, on March 11, 2004. In this

operation, Moroccan men, affiliated with or inspired by al Qaeda, nearly simultaneously detonated explosives on 10 commuter rail cars during morning rush hour.⁶ The explosives were hidden inside backpacks and left on board trains and then detonated with mobile phones, killing 191 commuters and wounding 1,500 others.⁷ One reason this attack is notable is that it appears to have had significant effect at the strategic level. The attack occurred just three days before Spain's general elections and seems to have shifted the expected results. The Socialist candidate, who was not favored in polls taken in the days just before the attacks, won a surprising majority of the votes; it had appeared prior to the train bombings that the sitting prime minister, José Maria Aznar, of the right-centrist Popular Party, would claim victory.⁸

Design of Train Stations and Rail Cars

The enclosed structure of some rail stations and of train cars may make them appealing targets to terrorists. Train stations are often very crowded, especially at rush hour, and the high concentration of people would likely result in substantial casualties should a terrorist detonate an explosive inside the station.⁹ Many passenger rail stations are located below ground, concentrating the effects of any blast and complicating the arrival of first responders and the exit of passengers after an attack.¹⁰ This is exactly what occurred in the Kings's Cross Station bombing during the attacks of July 7, 2005, in London, leading to a large number of injuries and deaths.

Operational Predictability

Passenger rail is among the most predictable target categories. Because many trains are patronized by commuters and other passengers on tight schedules, the trains must depart and arrive at specific stations at specific times. This aids terrorists in executing their plan, particularly if that plan calls for multiple, coordinated attacks. Further, trains by nature cannot deviate in their physical location to a great degree—their only option is to be at some location on the track. This adds to the predictability of the system; compare this, for example, to the maritime domain where ships in open water can deviate to a significant extent, complicating a terrorist's efforts to locate and attack the target.

In planning its operation against the Tokyo subway system, Aum Shinrikyo relied upon the predictable schedule of subway travel to select specific targets for its attack. The group chose subway trains that would be traveling during morning rush hour, ensuring a high volume of passengers. Further, operatives selected trains that would be simultaneously converging upon a centrally located and symbolic area.

Summary

All of these issues—the limited screening capability that exists in the passenger rail sector, the open architecture of the passenger rail system, the design of rail stations and passenger cars, the economic vulnerabilities, and the operational predictability—should be taken into account when considering the vulnerabilities of this sector. Each of these factors played a role in the incidents described in the following case studies. In all four cases, the terrorists exploited the limited screening capability and open architecture of rail systems. For the majority of cases, they also took advantage of the vulnerabilities inherent in the design of stations and trains as well as the operational predictability of the system. In contrast, not all of the cases demonstrated exploitation

of the economic vulnerabilities of the rail sector. The tables on the following pages deconstruct the four cases and display the results for purposes of comparison.

As the following case studies demonstrate, the accessibility and importance of the passenger rail system have made it a desirable target for terrorists and may continue to do so in the future.

Table 2-1: Passenger Rail Sector—Indicators of Success

Tactical Level Indicators of Success

Case Study	Was the attackers' security plan maintained pre-execution?	Was the attack initiated?	Did the weapon(s) function as designed?	What was the level of lethality?	What was the level of injuries sustained?	What was the level of material damage?	Did the cell members avoid capture/death?
Sarin Gas Attack	Yes	Partial	Partial	Moderate	Moderate	None	No
NYC Subway Plot	No	No	N/A	N/A	N/A	N/A	No
7/7 London Bombings	Yes	Yes	Yes	High	High	High	Yes (suicide)
7/21 London Bombings	Yes	Yes	No	None	None	Light	No

Operational Level Indicators of Success

Case Study	Was the broader security network maintained?	What was the level of system disruption?	What was the level of media coverage?	Did the plot's target have symbolic value?	Did the network members avoid capture/death?
Sarin Gas Attack	No	Minor	High	No	No
NYC Subway Plot	N/A	None	Moderate	No	N/A
7/7 London Bombings	Yes	Moderate	High	No	Yes
7/21 London Bombings	Yes	Low	High	No	Yes

Strategic Level Indicators of Success

Case Study	What was the level of psychological impact?	What was the level of economic impact?	What was the level of policy change?	What was the level of impact on the supporting population?
Sarin Gas Attack	High	Low	Moderate	Severe
NYC Subway Plot	Low	None	None	Unknown
7/7 London Bombings	High	Moderate	Moderate	Severe
7/21 London Bombings	High	Moderate	Moderate	Severe

Table 2-2: Passenger Rail Sector—Factors

Passenger Rail Success Factors—Adversary-Related

Case Study	Factors						
	What was the level of the terrorists' training?	What was the level of the terrorists' technical sophistication?	What was the level of the terrorists' operational proficiency?	Were there terrorist profile indicators?	What was the level of terrorist OPSEC?	What was the level of innovation?	Did the terrorists experience any technical difficulties?
Sarin Gas Attack	High	Moderate	Moderate	Low	High	High	Low
NYC Subway Plot	Moderate	High	Unknown	Moderate	Low	Moderate	None
7/7 London Bombings	High	High	High	Moderate	High	Moderate	None
7/21 London Bombings	Low	Low	High	High	High	None	Significant

Passenger Rail Success Factors—Security-Related

Case Study	Factors					
	Was access to the target site restricted?	What was the level of law enforcement knowledge of the plot?	Was the security environment restrictive?	What was the level of information sharing?	What was the level of international cooperation?	What was the level of vigilance of the public and security services?
Sarin Gas Attack	No Barriers	Moderate	Permissive	Low	Low	Moderate
NYC Subway Plot	No Barriers	High	Moderate	Moderate	None	High
7/7 London Bombings	No Barriers	None	Moderate	Ineffective	None	Low
7/21 London Bombings	No Barriers	None	Moderate	None	Moderate	Low

Table 2-3: Passenger Rail Sector—Case Study Descriptions

	PLANNING						EXECUTION		
	Target Selection (Note: Target, Method, and Personnel Selection can occur in any order)	Method Selection	Personnel Selection	Intelligence Gathering & Surveillance	Logistics, Resources, Materiel, Support Network	Training (Including Rehearsals & Dry Runs)	Weapon Assembly	Stage for Attack	Execute
Aum Shinrikyo March 1995	Tokyo Subway during rush hour Minimal barriers to access	Sarin gas Innovative	Most likely selected by Asahara or other senior leader	None observed	Assets >\$1B; some training through Russian groups; possible support through co-opted Japanese authorities	Previous incident at Matsumoto served as proof of concept	One day prior to attack	Five attackers deployed to three subway lines; five others deployed as lookouts/drivers	Five devices activated
New York City Subway July 1997	Subway station in Brooklyn traveled by Jewish civilians Minimal barriers to access	Two backpack bombs Probable suicide Unusual, but not unprecedented	Unknown - most likely self-selection of radical acquaintances	Probably at least one surveillance run - caught jumping turnstile at station connected by tunnel to the target.	Unknown. Probably acquired materials during residence in North Carolina. May have been self-financed.	No known dry runs or weapons tests.	Two working weapons completely assembled; FBI confirmed that bombs would have worked as designed.	Plot interdicted prior to this stage.	Plot interdicted prior to this stage.
London July 7, 2005	Three Underground trains and one bus (unknown if bus was intended target or last minute change) Minimal barriers to access	Backpack bombs/suicide Unusual, but not unprecedented	Older, charismatic leader recruited younger radicalized Moslems	At least one recon - Jun 28, by Khan, Tanweer and Lindsay; tickets found at the "bomb factory" flat also suggest possible info gathering in London in mid-March	Apparently self-financed (total cost less than 8K pounds; possibly AQ directed, inspired, or unaffiliated)	Jun 28 may have been a dry run	Four weapons fully assembled (date unknown)	Khan, Tanweer and Hussain left in one car from Leeds, and met Lindsay at Luton; then took train to King's Cross, from which they transferred to Tube and split up	3 bombs nearly simultaneously detonated at rush hour 4th on bus 57 minutes later
London July 21, 2005	Three Underground trains and one bus; one unidentified target Minimal barriers to access	Backpack bombs/suicide Predictable following July 7 attack	Appear to be radical acquaintances, all or most from Horn of Africa	None identified; however, it is unlikely they were able to deploy successfully without a dry run beforehand	Adel Yahya apparently part of support cell; calls/text messages to Saudi Arabia for hawala	Unknown; but since the weapons did not operate due to an apparent flaw in their manufacture, it is unlikely they did a test fire	Five weapons fully assembled (date unknown)	All staged successfully to target locations	Four of five attempted to detonate weapons; in those four cases, the detonators worked but main charge failed due to improper concentration of H2O2

CHEMICAL WEAPONS ATTACK ON THE TOKYO SUBWAY SYSTEM—MARCH 1995

Overview

During the peak of morning rush hour on March 20, 1995, five members of the Japanese religious cult Aum Shinrikyo launched a sarin gas attack on multiple lines of the Tokyo subway system.

Within minutes, more than 5,000 commuters and station workers were suffering the ill effects of the deadly nerve agent, and 12 people were killed. Eventually, several members of the organization were arrested for their role in this attack.

Type of Attack: Sarin gas attack aboard five trains in the Tokyo subway system

Date: March 20, 1995, during the height of morning rush hour

Group: Aum Shinrikyo, a Japanese cult founded by Shoko Asahara in 1984

Significance of the Incident

Aum's attack on the Tokyo subway is the most serious terrorist incident in Japan in modern history and is one of the few instances in which terrorists have used chemical weapons.¹¹ As more recent violence in Madrid, London, and Mumbai indicates, terrorists remain interested in attacking the rail sector and have the ability to do so. The open architecture and high ridership that characterize trains and subways make them desirable targets for terrorist activity.

This particular incident is noteworthy because it shows that some terrorist groups have the capability to manufacture and use chemical weapons. Although rail attacks within the past few years have relied on improvised explosive devices rather than sarin or other chemical agents, there is no doubt that the possibility of biological or chemical weapons attacks on the U.S. transportation infrastructure should be a concern. Therefore, an examination of the 1995 Aum Shinrikyo case is useful for providing information about the threat that may be posed to the U.S. homeland by the possibility of similar attacks.

Description of the Group or Individuals Involved

Founding of the Group and Its Early Years

In 1984, Shoko Asahara founded Aum Shinrikyo, which initially consisted of just 10 to 15 members who focused their activities on nothing more than yoga and mysticism. However, within just a few years, the organization saw its membership increase dramatically. Aum Shinrikyo, whose name means "Supreme Truth," tapped into the Japanese "fascination with mystical, obscure religious sects that combine the spiritual with the supernatural," and Asahara's group grew rapidly.¹⁵ In August 1989,

Shoko Asahara

Shoko Asahara, the founder of Aum Shinrikyo, was a yoga instructor born in 1955 in Yatsushiro, located on the southern Japanese island of Kyushu. Described by some as a "magnetic misfit," he was the sixth of seven children and was raised in a poor family.¹² He had weak vision due to infantile glaucoma and attended a school for the blind, where he emerged as a leader, because he had better vision than his classmates.¹³

After his admission to Tokyo University was rejected, Asahara became involved in yoga, meditation, and selling Chinese medicine at a pharmacy. He was arrested (but not imprisoned) in 1982 on suspicion of violating Japanese pharmaceutical laws by selling unregulated medicines, and his pharmacy subsequently went out of business.¹⁴

Aum was granted status as a religious sect and, because the Japanese government did not want to be perceived as stifling religious freedom, the group was granted massive tax breaks and immunity from any type of oversight, as were all of Japan's 183,000 religious organizations.¹⁶ Eventually, Aum Shinrikyo had 10,000 members in Japan, more than 25,000 adherents in Russia, and approximately 15,000 followers in six other countries, with offices in Sri Lanka, Australia, Germany, and the United States.¹⁷

In February 1990, Asahara and two dozen of his followers ran in an election for the Japanese Diet, or Parliament, under the banner of the Shinrito Party. Confident that they would win a resounding victory, Asahara and his fellow Aum candidates were shocked to receive not even the endorsement of all of Aum's members. According to a U.S. Senate report written after the March 1995 attack, this electoral defeat is almost "universally held" as the point of no return for Aum Shinrikyo; afterwards, members of Aum "gave up on all legal pretensions and turned away from normal interactions with the larger Japanese society."¹⁸

From this point forward, Shoko Asahara placed additional emphasis on his purported belief that Armageddon was coming and that only those who received enlightenment through his group would survive the Earth's end.¹⁹ In addition, he suggested that the end of the world would come in the form of a war between Japan and the United States, using weapons of mass destruction. He decided that Aum should develop chemical and biological weapons, either to prepare for this expected war or to launch preemptive strikes against Japanese and Western enemies.²⁰ With vast resources and targeted recruitment of bright university graduates, Aum Shinrikyo was well poised to go down the path that would eventually result in the sarin gas attacks of March 1995.

Acquisition of Resources

Aum Shinrikyo had large quantities of money to fund its activities—funds that were not subject to official oversight from the Japanese government or other entities, given the group's protected status as a religious sect. Estimates indicate that Asahara and his group had cash reserves in excess of one billion dollars, from donations, sales of religious materials, criminal activities, and businesses.²¹ These cash reserves meant that Aum was able to pay contractors to supplement the group's knowledge and skills. Members of elite Russian security organizations and other special operations forces provided training in martial arts, escape and evasion techniques, and the use of small arms to Aum Shinrikyo's members.²²

Aum also may have relied upon Russian expertise for acquiring knowledge about sarin production. Several sources reveal that Aum Shinrikyo obtained a formula for synthesizing sarin, likely either from a Russian scientist who visited Aum's facility in Japan or from a written formula, although the timing of this event is not known. Perhaps most indicative of a transfer of information from Russian experts to those in Aum Shinrikyo is the fact that the sarin produced by Aum "was synthesized in a fashion that is unique to the Soviet arsenal of chemical agents."²³ In today's environment, groups may not need to rely on face-to-face contact with outside experts. Such information may be available on the Internet or through other sources.

Motivation

Initially, those investigating the case believed that Asahara ordered the sarin attack on the subway system as a means of bringing about the apocalypse, the arrival of which was a central facet of Aum's belief system. According to this belief, the sarin gas attack was intended to topple the Japanese government "in an elaborate scheme to hasten Armageddon."²⁴

However, after conducting interviews with Aum members arrested for their role in the sarin gas attack, investigators realized that the group's actions had been prompted by Asahara's fears that police were about to conduct a raid on Aum's compound near Mount Fuji. One day before the attack, the police had entered the sect's Osaka headquarters and arrested three members of the group. Apparently, Asahara and the organization's top leadership either suspected or had inside knowledge that the Japanese police were planning to search Aum Shinrikyo's main facilities near Mount Fuji and decided to launch the subway attack to divert the authorities' attention.²⁵

Planning

Aum Shinrikyo's Earlier Operations

While little is known about the specific planning for this attack, Aum's earlier attacks and its chemical and biological weapons research are well chronicled, and some of these activities may have provided the training needed to prepare for the attacks of March 20, 1995. Aum tried to launch its first biological weapons attack in April 1990, when group members attempted to spray an aerosolized form of botulinum toxin over a wide area of downtown Tokyo, including the building housing the Japanese Diet. However, this attack failed because Aum members had not properly extracted the botulinum from the soil that contained it (Aum members had gathered the soil from a river basin in Hokkaido, Japan and extracted the botulinum from it in their laboratory), and the toxin was not lethal.²⁶

Over the next few years, Aum Shinrikyo attempted to carry out attacks with botulinum toxin, anthrax, and sarin, but all of these attempts failed, often because the agents were unusable or because the spraying devices used to disseminate the agents were clogged.²⁷ In June 1994, group members launched a sarin attack against an apartment building in Matsumoto, Japan, in an effort to kill three judges who were presiding over a civil suit brought against Aum Shinrikyo. Aum operatives drove a van into the residential Kaichi Heights neighborhood, vaporized the sarin by heating it, and then blew the gas out of the van with a fan. The poisonous agent seeped into the windows of the apartment building, eventually killing seven people and injuring more than 500, including the three targeted judges.²⁸ Following the incident, the authorities believed that a chemical salesman who lived nearby had accidentally released the agent; however, investigation later revealed that none of the compounds in his house could have resulted in the toxic effect this incident had, and prior to the March 1995 attacks, traces of sarin were found at the site of the Matsumoto attack. Evidence that surfaced after the arrest of Aum members following the March 1995 attack clearly implicated the group in the attack at Matsumoto.²⁹

In the nine months between the Matsumoto attack and the subway attack of March 1995, Aum continued to test its skills with chemical and biological weapons, launching operations in and around Tokyo and meeting with more success than it had with any earlier attempts (other than the Matsumoto incident). In September 1994, Aum operatives sprayed phosgene gas through the mail slot of a journalist who had accused the group of kidnapping a man. The journalist survived but had difficulty talking and breathing after the attack.³⁰ Three months later, the group launched an attack against Tadahiro Hamaguchi, a man who had been assisting dissident members of the group. Members of Aum sprayed VX nerve gas on the man as he walked on a street near his home, and he died 10 days after the attack.³¹ In a similar incident, Aum attacked Hiroyuki Nagaoka, the head of the Association of the Victims of Aum Shinrikyo, with VX gas, and although he survived, he was in a coma for several weeks.³² Just five days before the sarin gas attack, three members of Aum Shinrikyo placed briefcases, equipped to spray a liquid form of

anthrax, at the turnstiles of the Kasumigaseki station (this is the same station that would be targeted on March 20). However, one of the Aum members replaced the toxin with water, and the attack was not carried out as planned.³³

Preparation for the Attack

Having shown a clear interest in launching attacks using chemical and biological weapons, Asahara decided to conduct an operation against trains converging upon the Kasumigaseki station using sarin gas. Exploiting the operational predictability of the passenger rail sector, Aum selected five trains as targets, all scheduled to arrive at Kasumigaseki station within four minutes of each other at the height of morning rush hour, shortly after 8:00 AM. Located at a point where several major Tokyo subway lines meet, Kasumigaseki station is situated in the heart of the city's government district and is within walking distance of the Ministries of Health & Welfare, Foreign Affairs, Finance, and Taxation, as well as the Tokyo Police Headquarters. Many of those who rode the subways to the station would have been employees of these agencies, and this may have played a role in Asahara's target selection.³⁴

With regard to weapons selection and preparation, the attack at Matsumoto had proven to Aum Shinrikyo that it had the capability to carry out operations using sarin gas. According to testimony from group members, sarin was appealing to Aum Shinrikyo because its precursors were readily available and it was fairly easy to produce.³⁵ One day before the attack in a secret laboratory at Aum's compound near Mount Fuji, senior members of the group, under the direction of Tsuchiya, manufactured the sarin, pouring it into the polyester bags that would be taken onto the subway cars during rush hour the next morning.³⁶ Aum members were aware of the limited screening capability associated with the rail sector and likely felt confident that they would be able to bring their weapons onboard the subway cars without being detected.

The preparation for this attack may reflect examples of terrorist learning. Aum Shinrikyo relied upon information gathered from those outside the group as well as from the group's earlier activities and an extensive collection of books and manuals.³⁷ Aum scientists appear to have obtained information from Russian experts that provided the capability necessary to manufacture sarin gas. Group members also seem to have learned from their own previous operations. Instead of using botulinum toxin, which had not worked well for the group in the past, Aum operatives selected sarin as their weapon of choice, perhaps because its use in the Matsumoto attack had resulted in the death of seven people.

Attack

Shortly before 8:00 AM, in the midst of morning rush hour on Monday, March 20, 1995, five Aum Shinrikyo operatives placed bags containing sarin on three lines of the Tokyo subway system. Two young physics graduate students brought the sarin aboard trains running on opposite ends of the Hibiya Line, a physicist and an engineer placed their bags of poison on trains at either end of the Maruouchi Line, and a former cardiovascular surgeon targeted a car on the Chiyoda Line. Each train was scheduled to arrive at the Kasumigaseki Station within minutes of one another. As the trains approached the designated station, the five men punctured 8 of the 11 bags of sarin with sharpened umbrella tips to release the gas, then promptly exited their trains, which moved on along the tracks. They were immediately picked up by five other members of Aum Shinrikyo, who had been pre-positioned with get-away cars, and went to a hideout where they received injections of sarin antidote.³⁸

Within minutes of the release of the sarin gas, passengers and train staff were suffering the ill effects of the poison. As the trains stopped, passengers fell out, bleeding, coughing, vomiting, and experiencing spasms—according to witnesses, the station entrances seemed like “battlefields, as injured commuters lay gasping on the ground with blood gushing from their noses or mouths.”³⁹ Some were unable to escape the trains and lay on the floors of the cars in pain. Those who were able ran up to street level to escape the noxious fumes and to breathe in the fresh air.⁴⁰

Consequences

The impact of this attack was significant in a number of ways. Twelve people died from the effects of the sarin gas—10 shortly after the attack and two later.⁴¹ More than 5,500 people went to the hospital, some by ambulance and the rest on foot, by taxi, or in private vehicles.⁴² Of those, 17 were considered critically ill (12 of these died), 37 severely ill, and 98 moderately ill; the remaining victims were categorized as being in psychological rather than physical distress.⁴³

That said, many more people might have died if the weapons had functioned as Aum intended. Three of the bags brought onto the trains by the operatives were not punctured, meaning that not all of the sarin gas was released. In addition, according to chemical weapons experts, the sarin was impure and the system used to disseminate it was inferior.⁴⁴ The number of those killed and injured may have been further reduced by the fact that the following day was a national holiday celebrating the first day of spring—at least one of the trains was less crowded than it would have been during a typical Monday morning rush hour.⁴⁵ Eventually, 20 members of Aum were arrested for their role in the attack, and a number of them, including Shoko Asahara, are on death row in Japan.⁴⁶

Disruption to the Tokyo subway system was minor—15 stations and three separate train lines were impacted—but there was extensive media coverage of the event.⁴⁷ Both of these likely would have been viewed as successful outcomes by Aum Shinrikyo. However, there was also a negative impact on the group at the operational level. Following the attack, Aum lost its status as a Japanese religious cult, renamed itself Aleph (knowing that any identification with those who had carried out the attack would be detrimental), and became subject to government surveillance.⁴⁸ As such, the operation certainly did not have the effect that Asahara had intended—averting a police raid on the organization.

Aum achieved both positive and negative results from this attack. The long-term psychological impact on the target population can be characterized as high. The influence of this incident went beyond those riding the trains that day. There is little doubt that commuters in other parts of Japan and around the world were shocked by this attack, given that it marked the first time a weapon of mass destruction had been used in this environment. Further, the psychological effects of this event were long-term: more than six years after the attack, a survey by the Japanese National Police Agency revealed that 20% of the victims still suffered post-traumatic stress disorder.⁴⁹ The survey also indicated that 43% of the victims continued to have flashbacks to the attack.⁵⁰

Nonetheless, while the terrorists may have intended for the attack to cause great economic disruption, there was little actual economic impact from this attack—the greatest loss likely came from missed time at work by those who were suffering the effects of the sarin gas. There were no changes in Japanese foreign policy and only minor changes to security procedures following the attack, although, as noted earlier, Aum Shinrikyo did lose its status as a religious organization. Further, in 1996, Japan’s Religious Corporation Law was amended to mandate greater disclosure

of financial assets by religious organizations and to provide the government with greater oversight authority for such groups.⁵¹

Four months after the attack, the Japanese transport minister requested that security cameras be installed throughout the Tokyo subway system as a deterrent to terrorism.⁵² The law enforcement learning from Aum's activities was widespread: following the March 1995 operation, the Washington Metropolitan Area Transit Authority took the lead in developing a chemical sensing system for subway systems in the United States.⁵³ The changes in policy toward Aum Shinrikyo and the consideration of new security measures are reflections of the law enforcement and government learning that occurred as a result of the sarin gas incident.

Factors Associated With Success or Failure

The mixed "success" of this attack may be attributed to a number of factors:

Training: Aum's many attempted and actual attacks prior to the incident on the subway can be considered training for this operation. In addition, Asahara's strategy of recruiting individuals with scientific backgrounds may have meant that less training was required for specific attacks as these members had the desired skill sets. At the same time, Aum Shinrikyo had never carried out a chemical weapons attack on a subway until the day of the attack.

Technical sophistication: Prior to this incident, members of Aum Shinrikyo had experienced difficulty with the technical aspects of chemical and biological weaponry, and the same was true on March 20, 1995. The sarin used in the attack was impure; Japanese experts speculated that the sarin had been diluted so that it would not kill the terrorists, and American experts suggested that it had not been purified properly when it was manufactured or that it had been stored for too long.⁵⁴ Some evidence indicates that the attack occurred sooner than Asahara had originally planned, given his fears of a police raid on Aum's compound. After their arrests, Aum scientists testified that their preparations had been rushed, and although they had asked for more time to prepare the sarin properly before the attack, these requests were denied.⁵⁵ Impure sarin has a distinct odor that the undiluted form of the gas does not; this smell made those riding the subways realize that something was wrong and may have prompted some of them to escape sooner than they would have otherwise.⁵⁶ Regardless of the reasons why the sarin was not pure, there were additional technical sophistication issues with the dispersal mechanisms used by Aum on the day of the attack. The bags into which the sarin was placed were described as "primitive," and this form of dispersal did not allow the sarin to distribute effectively into the air.⁵⁷

Operational Proficiency: The terrorists who executed the attack were moderately proficient. While they successfully pierced eight of the bags containing sarin, they failed to do so on the remaining three.

Terrorist profile indicators: The members of Aum Shinrikyo came from a variety of backgrounds and, as mentioned, included scientists, graduate students, doctors, and businessmen, as well as military and law enforcement personnel. There is little evidence to suggest that any of Aum's members should have stood out to the authorities.

Terrorist OPSEC: It appears that Aum Shinrikyo practiced good operational security while preparing this attack, assembling the weapons in a secret laboratory on the premises of the Mount Fuji area compound. After the attack, Japanese police and local and foreign observers reported

that the attack had taken them by complete surprise, indicating that Aum had given little indication that the operation was forthcoming.

Innovation: This attack may be considered highly innovative, as its occurrence marked the first time that terrorists had targeted the passenger rail sector with chemical weapons. Further, members of Aum, relying upon information from the Russians, manufactured a known chemical weapons agent.

Observant public and/or vigilant security services: In July 1994, one month after the attack in Matsumoto, a family that lived near Aum's compound reported that leaves on the nearby trees were turning brown, as if something in the air was causing them to die. Furthermore, everyone in the family noticed a horrible smell in the air and began suffering from burning eyes and nausea. When a family member reported the situation to environmental agencies and local police, cult members received a warning from the authorities, but no further action was taken toward Aum members.⁵⁸ Those in the surrounding village were angered and horrified, especially after an article in a local newspaper revealed that police had discovered potential residues of sarin in the soil surrounding Aum's compound, following reports from the family that lived nearby.⁵⁹

Perhaps the local police were hindered by the same concerns as the Japanese government and did not want to investigate the cult due to concern of treading on religious freedom.⁶⁰ Or perhaps, as some have said, the Japanese police were just "clumsy" and bungled any operations aimed at curtailing Aum's activities prior to the attack in March 1995.⁶¹ In any event, while the Japanese public may be characterized as relatively observant, it appears that the security forces were not vigilant with regard to Aum Shinrikyo's attack preparations.

Law enforcement or intelligence knowledge: Given Aum's activities prior to the March 1995 operation, there is little doubt that both law enforcement and intelligence entities knew about the group and its penchant for biological and chemical warfare, although the actual attack seems to have come as a surprise. Following the events of March 20, the law enforcement personnel were "derided . . . for failing to halt Aum's murderous rampage."⁶² Whether the minimal investigation of Aum's activities prior to the sarin attacks was due to ignorance or unwillingness to investigate potential leads on the part of law enforcement, it seems that the group did not receive the attention it deserved. According to some reports, Aum Shinrikyo had informants within the National Police Agency, and this may have had a bearing on the level of scrutiny given to the group.⁶³ In addition, there is some evidence to suggest that Aum may have paid bribes to certain members of Japan's Liberal Democratic Party, and this too could have influenced the level of investigation to which Asahara and his group were subject.⁶⁴

Security environment: At the time of the attack, the environment in Japan could be characterized as permissive toward Aum Shinrikyo, because the group was considered a religious organization under Japanese law. Aum exploited this status and was subject to far less scrutiny than it might have been otherwise. Religious organizations in Japan were given large tax breaks and were immune from official oversight, and Asahara used this to his advantage. While, in practice, religious organizations such as Aum Shinrikyo could be investigated for criminal activity, in actuality, the chances of this occurring were negligible, because the Japanese government was reluctant to investigate any type of religious group, for fear of being seen as intruding upon citizens' freedom of religion.⁶⁵

Effective information sharing: There was little effective information sharing prior to the sarin gas attacks. Domestically, there was little to no exchange of information among Japanese entities about Aum Shinrikyo and its activities.⁶⁶

International cooperation: Internationally, while Japan and the United States discussed the group, the CIA, others within the American government, and officials in Japan and Russia did not take the group seriously until after the March 1995 operation.

Findings

While several factors mentioned above aided Aum Shinrikyo in its attack on March 20, 1995, the low number of casualties meant that the operation was less successful than the group intended.

The group was highly innovative in its use of chemical weapons and exploited the vulnerabilities of the rail sector. Using the open architecture and limited screening practices of the Tokyo subway system to their advantage, Aum Shinrikyo members knew that the sarin gas would not be discovered until they released it during morning rush hour.

Japan's favorable laws toward religious organizations, such as Aum Shinrikyo, certainly enhanced the group's ability to gather resources and plan operations without intervention from government officials or law enforcement personnel. Free from oversight, Asahara and his followers were able to build up considerable financial resources, conduct research, and develop chemical and biological agents in their laboratory. Although authorities were aware of some of Aum's prior attacks, this particular operation caught them by surprise.

Once the attack was carried out, it had a worldwide impact, as news of the incident was disseminated by international media outlets. The operation led to stepped up countermeasures as far away as Washington, DC, where the local transit authority led efforts to develop a chemical weapons detection system.

At the same time, conducting a chemical weapons attack is not an easy operation, and it seems that the attack was not as lethal as Aum Shinrikyo likely had intended. According to testimony from those arrested after the attack, preparations were rushed, due to an impending police raid. If group members had not been denied their request for more time to prepare the sarin, it might have been purer and resulted in far more than 12 deaths. Thus, internal group dynamics played a role in an outcome that was less successful than intended. While this attack resulted in some success for the group, the negative impacts eliminated any possibility that Aum could survive or be a political factor in Japan or elsewhere.

NEW YORK CITY SUBWAY BOMB PLOT—JULY 1997

Overview

In July 1997, two Palestinian natives of the West Bank planned to attack Brooklyn’s Atlantic Avenue subway station using improvised explosive devices (IEDs). The plot was discovered when a roommate, to whom they had shown one of the assembled devices, notified police.

Believing the attack was imminent—possibly planned to occur as soon as the next day—the New

Type of Attack: Planned attack on New York City subway system using improvised explosive devices

Date: July 1997

Individuals Involved: Gazi Ibrahim Abu Mezer and Lafi Khalil

York City police department raided the suspects’ apartment, arrested the suspects, and seized two IEDs.

Significance of the Incident

As demonstrated by the successful attacks on subway and commuter rail systems in Tokyo, London, Madrid, and

Mumbai, some terrorist groups have identified the rail sector as a relatively high payoff target for a simple, inexpensive attack.

The 1997 plot is significant because it targeted a major U.S. metropolitan subway system and came very close to the execution phase. As such, it is an informative case for examining the threat to the U.S. homeland posed by such attacks and serves as a vehicle for applying information to the U.S. context gleaned from overseas attacks.

Description of the Group or Individuals Involved

Two men were involved in this plot: Gazi Ibrahim Abu Mezer and Lafi Khalil. There is no known connection between these individuals and any terrorist organization; however, Mezer claimed in an application for asylum that he had been arrested by Israeli authorities for being associated with Hamas.⁶⁷ He claimed that the accusation was baseless.

Gazi Ibrahim Abu Mezer was born in 1973,⁶⁸ into a well-educated, middle-class family and raised in a modest home in the West Bank town of Hebron.⁶⁹ Lying approximately 20 miles south of Jerusalem, Hebron has been a focal point of Israeli-Palestinian conflict in the West Bank since its occupation in the 1967 War.⁷⁰ Mezer supported the Palestinian Front for the Liberation of Palestine as a teenager⁷¹ and, like many of his age at that time, participated in the First Intifada. He was detained twice by Israeli authorities during this period, but never arrested.⁷² His political activity seemed to be limited to general support of the Liberation Front and stone throwing during the Intifada, but there were events that could have contributed to later radicalization: for example, the Israeli authorities destroyed his uncle’s auto parts store and his brother was briefly deported for political activities.⁷³ His attitude also may have been hardened by a massacre of Palestinians which took place in Hebron five months after his departure from the city: in February 1994, Baruch Goldstein killed 29 Arab worshippers at the Cave of the Patriarchs. Ironically, Goldstein was an immigrant to Israel, originally from New York City.⁷⁴

In May 1993, Mezer applied for a student visa from Canada; in July of that year, he received the required travel document from Israel permitting him to go to any country that granted him a visa and allowing his readmission to Israel provided he returned by July 5, 1994. On September 10,

1993, Mezer was granted a Canadian student visa, which would allow him to remain in Canada as long as he was enrolled in an educational program.⁷⁵ Shortly after his arrival in Canada, he applied for asylum;⁷⁶ under Canadian law, an asylum seeker is permitted to remain in the country while the application is being adjudicated.⁷⁷ During this period, Mezer was twice arrested: once for assault and once for using a stolen credit card. In both cases, he was sentenced to one year of unsupervised probation but was not forced to leave Canada.⁷⁸

Mezer's ultimate goal was to enter the United States. Initially, he tried to enter legally by applying for a non-immigrant visa nine days after arriving in Canada. He received a "routine refusal;" the precise reasons were not recorded, but typically a routine refusal is issued if the applicant cannot show evidence that he will not overstay the visa. Such a decision often is based on factors such as age, lack of financial resources, or lack of family ties that would motivate an applicant to return to his country of origin.⁷⁹

Mezer then made three unsuccessful attempts to enter the United States illegally. The first two attempts were made less than a week apart in June 1996, in Ross Lake and Blaine, Washington. In both cases, he was caught by U.S. Border Patrol agents and returned to Canada. In the third attempt, in January 1997, Mezer crossed the border successfully but was arrested by an alert Border Patrol agent at a bus station in Bellingham, Washington, who believed Mezer and two others were behaving suspiciously.⁸⁰ After this third attempt, the Canadian authorities refused to allow him back in their country, citing his previous arrests and attempts to cross the border illegally.⁸¹ Now facing deportation back to the West Bank, Mezer petitioned for asylum in the United States. He posted bond and was released from detention; his case was still being adjudicated at the time of his arrest in the subway bomb plot.⁸²

Lafi Khalil was born and raised a short distance away from Mezer's home, but under much different circumstances. He was from Ajoul, an affluent suburb of Ramallah. This area was home to some of the wealthiest and most influential Palestinian families, and due to its affluence, the Ramallah suburbs did not provide a great deal of support to the Intifada.⁸³ Khalil had no record of arrest, detention, or other interest on the part of Israeli authorities.

Khalil, a Palestinian like Mezer, held a Jordanian passport. His plan to enter the United States involved two steps. First, he paid an acquaintance to fraudulently obtain a valid visa stamp for Ecuador.⁸⁴ Once he had this, he sought a U.S. C-1 (Transit) visa, which allows the bearer to remain in the U.S. for up to 29 days on his way to a destination country.⁸⁵ According to an investigation by the Department of Justice's Inspector General, during the interview at the U.S. consulate,

Khalil stated that he was a Jordanian national, born in 1974 in Ajoul, Ramallah, West Bank, that he lived in that region with his family, and that he owned part of a farm. Khalil was not asked for and did not provide any documentary proof for these assertions. His application did not contain responses to questions regarding his address in Israel, his home or business telephone numbers, the names of any individuals with whom he would be traveling or would be visiting in Ecuador, or how he would support himself when in the United States or in Ecuador.⁸⁶

The consular officer did not ask to see an airline ticket to Ecuador or other proof of such arrangements; the officer stated that, in fact, the consulate discouraged travelers from purchasing their tickets prior to obtaining a visa. Consulate officers were concerned that the traveler would waste the cost of the ticket should the visa be denied or not approved in time for use.⁸⁷

Khalil arrived in the United States on the evening of December 7, 1996. Although granted the 29-day C-1 Transit visa by the U.S. Consulate in Jerusalem, the Immigration Inspector at John F. Kennedy International Airport mistakenly stamped his passport with a B-2 (tourist) visa stamp; this gave Khalil permission to remain in the United States for six months, expiring on June 6, 1997.⁸⁸

Mezer and Khalil met in New York, where they shared an apartment with other Arab immigrants in Brooklyn.⁸⁹ They traveled together to North Carolina in July 1997, where they shared a trailer and worked briefly at an IGA supermarket.⁹⁰ After a short period, they returned to the apartment in New York, where they remained until their arrest.

Acquaintances of the two characterize them as being interested only in women and making money, and not particularly religious.⁹¹ However, evidence found in the apartment after their arrest indicated a radical orientation. Investigators found a note expounding radical politics which they believe may have been a suicide note; there was also anti-Israel political literature and a portrait of “Blind Sheikh” Omar Abdul Rahman, then serving a life sentence for his role in the plot to attack the World Trade Center in 1993.⁹² Mezer and Khalil are also known to have attended the radical al Farooq mosque while living in New York.⁹³

Motivation

The evidence gathered in the apartment and from post-arrest interviews indicates that Mezer and Khalil were motivated by a hatred of Jews engendered by events in the Palestinian territories and a desire to punish the United States for its support of Israel. Mezer told investigators he had picked the Atlantic Avenue station as a target because it served the B Train, which runs through the predominantly Orthodox Jewish neighborhood of Brooklyn Park, and he desired to kill as many Jews as possible.⁹⁴ During his trial, Mezer testified “[I have] come to the United States because I feel that the United States is supporting the Jewish state and the United States should be punished for supporting Israel.”⁹⁵

The manifesto found in their apartment specifically demanded the release of several accused terrorists imprisoned at that time. Besides Sheikh Omar Abdul Rahman, these were Sheikh Ahmed Yassin, the spiritual leader of Hamas (who was imprisoned in Israel at that time) and Ramzi Yousef, tied not only to the 1993 plot against the World Trade Center but also the Bojinka plot in 1994-1995.⁹⁶

At his trial, Mezer declared that he “had always wanted to be a martyr” and that the United States was waging war on Islam; he wanted to be “part of that war.”⁹⁷ The two also took great interest in the suicide bombing by Hamas in Jerusalem on July 29, 1997. The attack claimed the lives of 13, plus the two suicide bombers. “They were heroes,” stated Mezer, “and we wished to join them.”⁹⁸ This was corroborated by the statement given by the man who reported their plan to the police: “My roommates are going to follow up on Jerusalem.”⁹⁹

These statements indicate a radical mindset that turned to violence to avenge perceived abuse and persecution; however, the actual event or events that triggered this transformation have not been identified.

Planning

Little is known about the actual planning of the attack—specifically when the planning began or whether this was directed by a larger terrorist group. Nevertheless, one can assume that two aspects of the attack required careful attention: target selection and the design of the weapon.

Target selection would have centered on the goal “to kill as many Jews as possible”¹⁰⁸ and would have been fairly straightforward, since the ethnic composition of neighborhoods in New York is

Hamas

Authorities have never come to a definitive conclusion as to whether Hamas was behind the planned attack. At trial, Mezer claimed to be “with Hamas.”¹⁰⁰ On his U.S. application for asylum, he said that he had been held by Israeli authorities for connection with Hamas, but at that time, he alleged that this was a false accusation.¹⁰¹ In addition, Khalil possessed an address book containing the address of a “known member of a terrorist organization” (not further identified).¹⁰²

One media report cited unspecified sources as stating that the two suspects may have phoned members of Hamas from pay phones near their apartment.¹⁰³ However, after authorities sifted through the phone records and other evidence, they were unable to find any link between the two and Hamas.¹⁰⁴ Furthermore, an attack against a U.S. subway would have been a significant strategic departure for Hamas, which raises considerable funds in the United States and had never attacked a target there.¹⁰⁵

According to Bruce Hoffman, then with the University of Saint Andrew, “It would very much be out of character [for Hamas] to operate abroad.”¹⁰⁶ Hoffman cautioned, however, that it would be a mistake to dismiss any Hamas connection to the plot on that basis alone.¹⁰⁷

easily identified. The subway would have been an obvious target, since it offered the terrorists not only a means to reach the Jewish neighborhood, but also a high concentration of potential victims. In fact, Mezer told a federal agent that he specifically targeted the B Train “because there are a lot of Jews that ride that train.”¹⁰⁹ According to one source, the B Train “was a popular line for the Orthodox Jews in Brooklyn Park commuting to their jobs in the Diamond District on Forty-Seventh Street in Midtown.”¹¹⁰

The two may have conducted pre-operational surveillance of their target; in fact, shortly before their arrest, they were cited for “turnstile jumping” at a station joined by a tunnel to the Atlantic Avenue station.¹¹¹

Perhaps the most difficult aspect of planning the attack was to design and construct the weapons. The design and method of employment are similar to

weapons used in the West Bank, and Mezer and Khalil may have received assistance from acquaintances back home.

Mezer constructed two IEDs consisting of five pipe bombs,¹¹² four of which were joined for a combined device and one which was separate.¹¹³ The larger device, according to an FBI bomb expert, consisted of four pipes, filled with high-velocity gunpowder, which Mezer and Khalil purchased at a gun shop during their stay in North Carolina,¹¹⁴ with 85 construction nails attached to increase lethality. They were connected by wires to batteries and four switches; all four would need to be activated to detonate the device.¹¹⁵ The weapons were to be brought on board the subway in backpacks; this would exploit the vulnerability of limited screening on passenger rail systems. The method of employment was to imitate a favorite tactic of Hamas, the “double tap;” a device is set off, and when police and other first responders arrive, a second, larger device is set off to inflict more casualties and spread panic.¹¹⁶ Whether the terrorists were directly supported by Hamas or merely inspired by its actions, they were technically proficient; an FBI expert reconstructed a similar weapon for testing, and it functioned properly.¹¹⁷

The design of the weapons and concept of employment could reflect terrorist learning. This is certainly true if the attack was directed by Hamas—in that case, methods shown to be effective in the West Bank were adapted to and employed in the environment in the United States. But if the terrorists were autonomous, and the methods and designs they used were common knowledge at home, this would demonstrate *indirect* terrorist learning. It is possible for tactics to be spread through diffusion of knowledge in a community. Such informal dissemination of information could present an even greater challenge to security services, since it cannot be stopped by apprehending a few key trainers.

Attack

Mezer and Khalil appear to have accomplished all tasks required to conduct a successful terrorist attack; they formed a small team with required proficiency; they selected an accessible target with sufficient payoff; they chose a viable method of attack suitable for the target; they gathered sufficient information on the target to select the Atlantic Avenue station and performed pre-attack reconnaissance; they acquired the necessary materials to carry out the attack; and they constructed a viable weapon.¹¹⁸ The one step likely not conducted was to carry out a dry run; this may have occurred, but investigators found no evidence of this. Nevertheless, the terrorists could have conducted their attack successfully based on the steps they did carry out.

The plan to attack was interrupted, however, because on the evening before the planned attack, Mezer showed the devices to one of the other Arab immigrants residing in the apartment and told him of the plan to detonate the devices on the train the next day. That man, an Egyptian immigrant named Abdelrahman Mossabeh, did not support the plan and was concerned that, as their roommate, he would be implicated and arrested. Mossabeh left the apartment and notified police.¹¹⁹ Mossabeh gave the police a key to the apartment, diagrammed its layout, and accompanied them to the location.¹²⁰ The police entered the dark apartment, and a struggle ensued during which both Mezer and Khalil were wounded; police later indicated that the pair attempted to detonate the devices during the raid.¹²¹

Consequences

From the perspective of the two would-be terrorists, the impact of this activity was negligible. The attack was not initiated, and hence the weapon never caused casualties or material damage.

There was no system disruption. There was moderate national media coverage that ran for days after the incident and during the trial. The plot was not aimed at a symbolic target.

It is not clear that the plan had a strategic objective. Taking that into account, the psychological impact can be characterized as low. No survey data are available to indicate the reaction of New Yorkers to this threat to the subway system, but it most likely had some shock value as the plot nearly entered the execution phase. However, the psychological impact was not so severe that it kept New Yorkers from continuing to use the train system. There was no economic impact, since no businesses or business sectors suffered from the event. There were no changes in U.S. foreign policy or security procedures as a result of the plot. Finally, there are no survey data regarding the impact of the plot on supporting population, but anecdotal evidence indicates that it was neutral at best. There were no immediate follow-on plots that appeared to be inspired by this attempt, and in fact, the person who reported the plot to police would be considered a member of the population to whom Mezer and Khalil would look for support.

Factors Associated With Success or Failure

The outcome of this plot is associated with a number of factors.

Training: This was a relatively simple operation and as such required little specialized training or mastery of complex skills. One exception might be the design and assembly of the weapon, which is covered separately in the next category. Both Mezer and Khalil seemed proficient in the roles they were to carry out, specifically deploying to the station undetected and initiating the detonation of the explosives.

Technical sophistication: The FBI explosives experts confirmed that the bombs were viable and capable of killing any person within a 25-foot radius in an enclosed space.¹²² Therefore, it can be said that Mezer and Khalil had a high level of technical sophistication.

Operational proficiency: Since the attack was never executed, the level of operational proficiency of Mezer and Khalil is unknown.

Terrorist profile indicators: Mezer clearly had a background warranting interest from authorities: he was a West Bank Palestinian who, by his own statements, indicated a tie to a terrorist organization; he had committed crimes while in Canada, and he had attempted to enter the United States illegally three times. Khalil, on the other hand, would not have raised suspicions. Although the Ecuadorian visa upon which his U.S. visa was predicated was fraudulently obtained, he nonetheless held an authentic entry stamp for the United States. Furthermore, despite Mezer's background, both he and Khalil gave the impression to acquaintances that they were not devout. Therefore the record in this category is mixed, with one of the members warranting suspicion and the other not.

Terrorist OPSEC: Of all factors, operational security is the one that contributed the most to the failure of the operation at all three levels. Mezer's decision to boast of his plan to a non-vetted acquaintance initiated the chain of events that prevented the operation from entering the execution phase; had it done so, it is likely that the operation would have been successful on at least the tactical and operational levels. The failure of the operation due to this single factor indicates that success or failure is highly sensitive to operational security.

Innovation: A moderate degree of innovation was present in this plot. While pipe bombs had been used extensively against public transport, this would have been their first use against such targets on U.S. soil.

Technical difficulties: The terrorist team experienced no technical difficulties, as evidenced by the fact that their bombs were assembled and capable of working as designed.

Law enforcement or intelligence knowledge: Up until the informant notified police of the plot, the authorities had no knowledge of the plan. As in many cases, events played into the hands of the authorities when Mossabeh provided the threat information. Good police training, reflected in the officers' recognition of the veracity and importance of that information, played a crucial role in capitalizing on that lead. That said, the fact that either got into the country highlights serious weaknesses in U.S. entry control procedures at that time.

Security environment: The environment in the United States in 1997 could be characterized as between moderately restrictive; law enforcement and intelligence agencies were cognizant of the threat of terrorist attacks in the United States (after the World Trade Center bombing, the destruction of the Murrah building, and other incidents). However, there were few specific anti-

terror laws, programs, or practices in place at that time as compared to the post-2001 environment.

Effective information sharing: This attempted attack might have been defeated even earlier had the plotters been denied entry to the United States or deported for illegal entry. Both men's cases highlight a lack of communication and understanding of roles in the immigration and asylum processes. The immigration court considering Mezer's asylum application believed that the State Department had checked for information on potential ties to terrorist organizations, while the State Department believed that the Immigration and Naturalization Service had enough information in its database to make its own determination.¹²³ In Khalil's case, neither the Consular Officer in Jerusalem nor the immigration officer at the airport considered it his responsibility to ask to see a ticket to Ecuador; furthermore, neither considered it his responsibility to limit time permitted in the United States to less than the maximum 29 days, even though Khalil stated he would be in the United States only long enough to transfer to a connecting flight.¹²⁴ Had standard operating procedures made roles and responsibilities clear, and information shared appropriately, it is less likely that either man would have gained entry to the United States.

There was effective information sharing, however, at the tactical level. The officers approached by Mossabeh were with the Transit Police; they recognized the importance of passing the information outside their organization and transported Mossabeh to the New York Police Department's 88th Precinct, and eventually the special tactics unit was given control.¹²⁵

International cooperation: International cooperation was lacking. The State Department and the Immigration and Naturalization Service did not seek information from Canada or Israel regarding terrorist ties, nor did they confirm through Ecuadorian authorities Khalil's intent to travel there.

Findings

As with many terrorist attempts, the New York City subway plot exhibits a mix of factors that could be associated with a successful operation and those that could lead to failure. What is revealing, however, is that in this case, the overwhelming majority of factors were working in favor of the terrorists, and yet the single factor impacting failure—poor operational security—had more influence on the outcome of the plan than all of the other factors. Had Mezer not boasted of the plot and shown an assembled weapon to an unvetted acquaintance, and had the police not acted upon the tip received from the acquaintance, in all likelihood, the many factors associated with success would have led to execution of the plan. This suggests that terrorist plans are very sensitive to this particular factor.

Poor OPSEC, in and of itself, will not necessarily lead to the failure of a plot. Security authorities must be able to capitalize on opportunities that poor OPSEC provides. Mossabeh provided his information to two inexperienced police officers who had difficulty understanding him due to language difficulties.¹²⁶ However, they took this information seriously and ensured that it was passed to other authorities who could act upon it.

LONDON TRANSIT BOMBINGS—JULY 7, 2005

Overview

During the morning rush hour in downtown London, four terrorists detonated homemade bombs on the Underground subway system and on a commuter bus. In addition to the bombers, 52 people were killed and over 700 were injured.¹²⁷ Although the British had experienced bombings for an extended period by the Irish Republican Army, this was the first terrorist incident in the U.K. since the September 11, 2001 attack in the United States and the first connected to radical Islam. The entire Underground system was shut down for hours, creating moderate disruption for commuters after the attacks. At that time of day, the Tube is typically carrying over 200,000 passengers on 500 trains.¹²⁸ Those 200,000 passengers, along with 2,500 staff, were evacuated in under an hour.¹²⁹

Type of Attack: Detonation of homemade bombs aboard London Underground system
Date: July 7, 2005, during morning rush hour
Group Involved: Four young Muslim men who were British citizens

Within days, British authorities had identified the four terrorists, three of whom were native Britons and one an immigrant from Jamaica who had converted to Islam.¹³⁰ In May 2007, evidence emerged that possibly tied this plot to a senior al Qaeda planner named Abdul Hadi al-Iraqi. This was revealed at the end of the trial of six other Britons accused of plotting to conduct a bombing campaign using explosives made from fertilizer. Those court records indicate both plots may have been directed by al Iraqi.¹³¹

Significance of the Incident

This attack marked an important shift in the model of terrorist attacks in the West. Until this point, terrorist attacks were almost exclusively conducted by outsiders—either immigrants residing in a target country or terrorists who arrived specifically to conduct an attack. After this event, Western security services began to consider homegrown terrorists a threat and to evaluate the degree to which locally raised members of ethnic or religious minorities were integrated into or alienated from the society in which they live.

Significantly, this incident was the first in the U.K. involving a suicide attack; most previous attacks had been conducted by the Irish Republican Army, using remotely detonated or time-detonated bombs and mortars.

Finally, along with attacks in Moscow, Madrid, and Mumbai, the attack demonstrates the intent and capability of terrorists to strike passenger rail and subway systems. In fact, the London operation may represent a case of terrorist learning from observations. The high number of casualties inflicted in the attacks in Spain and Russia may have demonstrated to those planning these bombings the vulnerability of the transit system to catastrophic attack. Likewise, the attack in Mumbai in 2006 could have been inspired by the strategic impact of the bombings in London and elsewhere.

Description of the Group or Individuals Involved

Background of the Bombers

The attack cell was composed of four individuals from the West Yorkshire area. The oldest, and apparent leader, was 30-year-old *Mohammed Sidique Khan*.¹³³ The youngest of six children, Khan was born in the U.K. to Pakistani immigrants.¹³⁴ He was considered quiet and studious in his early years. He studied business at Leeds Metropolitan University and was married to a British Muslim of Indian heritage.¹³⁵ Considered “highly Westernized” by acquaintances,¹³⁶ he worked at a local school with special-needs children and those with behavioral issues. He was considered a role model,¹³⁷ but after a long period of sick leave—considered excessive by school administrators—he was fired from that position.¹³⁸ While still employed at the school, he was openly religious, praying at work and attending mosque regularly.¹³⁹ However, he did not espouse violence or radicalism, and spoke out against the 9/11 attacks.¹⁴⁰ In hindsight, some acquaintances from that period report a subtle change in his character around 2002, when his behavior became less tolerant and he seemed more introverted.¹⁴¹ It is known that Khan traveled to Karachi, Pakistan, in 2004 (with one of the other conspirators, *Shehzad Tanweer*),¹⁴² and he may have received some training at al Qaeda camps in Afghanistan at some point as well.¹⁴³ In fact, testimony from the trial of the Britons accused of plotting to make fertilizer bombs indicates Khan trained with at least one of those conspirators at an al Qaeda camp in late 2004.¹⁴⁴

The Support Cell

Twenty months after the attack, British authorities arrested three men believed to have been connected to the July 7 bombings. Two were living in the Beeston area of Leeds at the time of the arrests. These were thirty-year-old Mohammed Shakil and Sadeer Saleem, age 26. The third, Waheed Ali, had lived most of his life in Beeston but had moved to east London; he was also known as Shipon Ullah. As of mid-May 2007, their exact role in the bombing was unknown. British authorities stated that further arrests were expected.¹³²

Like Khan, 22-year-old *Shehzad Tanweer* was born in the U.K. and was the son of Pakistani immigrants.¹⁴⁵ He also attended Leeds Metropolitan University, in his case to study sports science,¹⁴⁶ but left before earning a degree.¹⁴⁷ After he left the university, he worked at his father’s fish and chips shop.¹⁴⁸ He had been very religious since his late teens, but never exhibited extremism in his statements or behavior.¹⁴⁹ His religion, moreover, did not interfere with his British identity; in addition to working in the fish and chips shop, he was an avid cricket and football player and was described by acquaintances as “more British than anything else.”¹⁵⁰ As mentioned above, he traveled to Pakistan with Khan and may have attended training camps in Afghanistan.¹⁵¹

The other native Briton and youngest of the group was 18-year-old *Hasib Hussain*. The youngest of four children, he, like Tanweer and Khan, was born in the U.K. to Pakistani parents.¹⁵² In 2002, he participated in the *hajj* with his family; this seems to have been a turning point for him, as after his return he began to wear traditional clothing and a prayer cap, and on Fridays he would wear white.¹⁵³ Unlike the others, he began to espouse support for extremism, including writing the phrase “Al Qaeda No Limits” on a school notebook and referring to the 9/11 bombers as martyrs.¹⁵⁴ He did, however, switch back to Western clothing in late 2004; although the reason for this change is not known, there is speculation that he was trying to become less conspicuous.¹⁵⁵

Jermaine Lindsay was the only conspirator not native to the U.K. The 19-year-old was born in Jamaica and had little contact with his birth father. Less than a year after his birth, he moved with his mother and another man to the U.K.¹⁵⁶ In 2000, when he was 14, his mother converted to Islam. Lindsay himself converted shortly thereafter. He had always been a good student, and the ease with which he learned Arabic and memorized passages from the Koran impressed his

acquaintances.¹⁵⁷ However, he did begin to espouse extremist philosophy and was disciplined in school for handing out leaflets in support of al Qaeda. He was a follower of a particularly radical cleric named Abdallah al Faisal, also a Jamaican, who was eventually jailed for inciting murder and racist violence.¹⁵⁸ In 2002, at age 17, Lindsay was traumatized by his mother's move to the United States, leaving him alone back in the U.K. However, he settled down and married a white British convert whom he met on the Internet and later met in person at a "Stop the War" protest against the planned invasion of Iraq. Their first child was born in April 2004.¹⁵⁹ In contrast to the others, whose behavior generally did not arouse suspicion before the bombings, Lindsay exhibited erratic behavior beginning in November 2004. According to the "Report of the Official Account" into the bombings commissioned by the House of Commons, he was sometimes violent, became flirtatious (having previously been very conservative in contacts with women), shaved his beard, and reverted to Western clothing. He is known to have had at least one mistress, perhaps more. When his wife discovered incriminating text messages on his cellular phone, she forced him to leave their house.¹⁶⁰

Formation of the Cell

It appears that Khan was the ringleader of this group and that the others were drawn to him through his charismatic personality while working at youth centers or at the local gym. Whether or not they were previously disposed toward violence, Khan appears to be the leader around whom the others rallied.¹⁶¹ The conspirators also took an interest in outdoor activities, such as whitewater rafting, which provided further opportunities for bonding and indoctrination away from the public eye.¹⁶² Although no connection has been proven, it is interesting that some of the participants in the failed plot on July 21, 2005 may have also attended that whitewater rafting camp.¹⁶³

The most telling commonality among the four is that they were all native to Britain or immigrated in their early childhood and generally speaking did not exhibit any behaviors that would have brought them to the attention of authorities. At the time, most Western intelligence and law enforcement agencies were concentrating on radicals who had migrated to Western countries; this was the type of terrorist who had attempted most previous attacks, including (among others) the World Trade Center attack in 1993, the Bojinka plot, the September 11 attacks, and the train bombings in Madrid. These homegrown terrorists, therefore, were able to operate with greater latitude than others who met the standard profile in use at that time.

Motivation

The four conspirators seemed to be fairly well integrated into British society and, with few minor exceptions, did not seem interested in terrorism. However, each of them reached a turning point that altered their identity and sense of justice.

There is little concrete information regarding the terrorists' motivation. The primary sources are martyrdom videos made by Khan and Tanweer, along with Khan's last will and testament. Khan's September 2005 video gives perhaps the greatest insight into his specific motivation toward violent action. He cites perceived injustices inflicted on Muslims around the world by the West. He views civilians in democratic countries that perpetuate these perceived atrocities as valid targets, since they lend legitimacy to their governments, and he views himself as "directly responsible for protecting and avenging [his] Muslim brothers and sisters."¹⁶⁸ His will emphasizes the religious aspect of his act and the role of martyrdom as the supreme act of commitment. He seems to borrow heavily from the will of a British national killed in Afghanistan, whom he regarded as a role model.¹⁶⁹

Tanweer's video, released a year after the bombings, is more specific: he cites British and American operations in Afghanistan and Iraq as his motivation, claiming that bombings would continue until British forces are withdrawn from those countries. He also specifies British financial and military support to Israel and the United States as justifications for his actions.¹⁷⁰

Planning

There is no information indicating the specific genesis of the plan or whether it was initially conceived by the four suicide bombers or from an outside entity such as al Qaeda. Regardless, available evidence indicates that the operation was sophisticated and well planned.

The first evidence of the plan is the initial purchase of materials for the bombs on March 31, 2005.¹⁷¹ In May 2005, the conspirators rented an

apartment next to the Leeds Grand Mosque to use as a bomb factory, away from their normal residences. The apartment was located in the Hyde Park area of Leeds, which was inhabited mostly by students. This aided their operational security, since they would not be recognized and would not stand out in this neighborhood of young, transient men.¹⁷²

The planning also included at least one reconnaissance trip or dry run on June 28, 2005. Khan, Tanweer, and Lindsay (but not Hussain) were seen on closed-circuit TV (CCTV) making the trip that they would make again nine days later, taking a train from Luton to the King's Cross Station in London, from which they transferred to the Underground system. The timing of the connections was approximately a half hour later in the day than the timing for the actual attack.¹⁷³ In addition, tickets were found at the bomb factory apartment suggesting trips to London in mid-

The Role of al Qaeda

At first, there was no clear connection between al Qaeda and the attacks of July 7, 2005. Authorities knew Khan and Tanweer had traveled to Pakistan; however, that is quite common among the large minority of Britons of Pakistani background (estimated at approximately 750,000 in April 2001).¹⁶⁴

It wasn't until May 2007 that more concrete evidence of a connection was publicly revealed. A separate investigation, known as Operation Crevice, resulted in the arrest of six Britons for plotting to attack targets in the U.K. using bombs fabricated from fertilizer. Testimony that was kept secret until after the trial connected those plotters to the reputed No. 3 leader in al Qaeda, Abdul al Iraqi. According to the testimony, Khan trained with one of the Crevice plotters – Omar Khyam – at an al Qaeda camp directed by al-Iraqi.¹⁶⁵ It should also be noted that al Qaeda itself claimed responsibility for the attacks.

A video made by Khan was broadcast on al Jazeera in September 2005, accompanied by a statement from al Qaeda's second-in-command, Ayman al Zawahiri, asserting, "London's blessed raid is one of the raids which Jama'at Qa'idat al-Jihad [al Qaeda of Jihad Group] was honored to launch."¹⁶⁶ A second video was released on the anniversary of the attack in 2006; this was Tanweer's "martyrdom" video, edited by al Qaeda and once again including a statement by Zawahiri.¹⁶⁷ These tapes suggest, but do not conclusively prove, some level of coordination or support from al Qaeda to the bombers.

March; such trips could have been intended to gather information or to practice routes and timing.¹⁷⁴

There is no information to confirm or refute whether the terrorists conducted a test detonation to validate their weapon design.

Attack

The Weapon

Forensic analysis indicated that the bombers each carried a homemade peroxide-based explosive. Such explosives require care to manufacture, owing to their instability; however, they are not especially difficult to assemble and can be created with readily available ingredients.¹⁷⁵ Each weapon contained two to five kilograms of explosives.¹⁷⁶ While the bombers could have found instructions for creating these weapons in open sources, British authorities believe it is likely that they also received some assistance from a skilled bomb maker, owing to the volatility of the mixture.¹⁷⁷ The chemicals used were also very strong, requiring the use of masks and shower caps; in fact, the fumes killed portions of plants just outside the windows where the mixing took place.¹⁷⁸

Deployment

There is considerable documentation, through CCTV footage, of the deployment phase of this attack.

Deployment began early in the morning on July 7, when three of the bombers—Khan, Tanweer, and Hussain—were seen leaving the bomb factory in Leeds at 3:58 AM in a rental car.¹⁷⁹ At 5:07 AM, Lindsay, alone at this point, arrived at the Luton train station and waited in the parking lot for the others for a little over an hour and a half.¹⁸⁰ When the others arrived, at 6:47 AM, the four donned the backpacks containing the weapons and entered the train station. They waited at the platform for approximately 20 minutes, then at 7:40 AM caught the train to London's King's Cross Station. Their casual clothes and backpacks did not stand out, since this occurred during a period of heavy tourist travel and the train serviced the Luton airport. The train arrived at King's Cross just before 8:30 AM, and the four transferred from the rail system to the Underground. From there the four split up and deployed onto the trains that were their intended targets.¹⁸¹

Execution

The execution phase began approximately twenty minutes after the four men transferred to the Underground. The first three weapons were detonated at 8:50 AM, within 50 seconds of each other,¹⁸² attesting to a high degree of training, coordination and discipline by the bombers. The fourth bomb was detonated nearly an hour later on a commuter bus; it is not known if this was according to the plan or a fallback option after meeting operational or technical difficulties.¹⁸³

- According to CCTV images, Tanweer was onboard the eastbound Circle Line train and detonated the device as it approached Aldgate from the Liverpool Street station. He was likely in the second car of the train, toward the back with the backpack on the floor next to him.¹⁸⁴
- Khan was in the second car from the front on the westbound Circle Line train near the Edgware Road station. He was standing near the first set of doors, also with the bomb on the floor next to him.¹⁸⁵

- Lindsay’s target was the Piccadilly Line; he was in the first car of the train as it headed south from King’s Cross to Russell Square. He was most likely standing in the crowded car, which held 127 passengers at that moment. Forensics indicate again that the weapon was detonated at or near floor level between the second and third rows of seats.¹⁸⁶
- For unknown reasons, Hussain did not detonate his weapon simultaneously with the others. Instead, at 8:55 AM, he was observed leaving the King’s Cross Underground Station onto Euston Road. After several unsuccessful attempts to contact the others by cell phone, he re-entered the station and purchased a 9-volt battery at a bookstore. This might indicate a technical difficulty with the weapon, and if so, it indicates good training and discipline to assess and correct the cause of the malfunction.¹⁸⁷ Hussain then took a bus to Euston Station and transferred to a second bus; by this time, the Underground had been shut down so buses were crowded. When the bus was at Tavistock Square, he detonated the device. Like the others, it was on the floor, either between his feet or in the aisle next to him.¹⁸⁸
- As stated above, there is no conclusive evidence as to why this weapon was detonated on a bus and nearly an hour after the others. It may have been planned that way to continue the sense of panic; it could have been a technical malfunction, necessitating the purchase of the battery; or, as one government report posited, he may have intended to go north on the Northern Line (the others had gone east, west and south from King’s Cross), but been frustrated by delays on that line.¹⁸⁹

Consequences

The impact of this event was significant. The total number of people killed, not including the bombers, was 52, with over 700 injured. The casualties by location are as follows:¹⁹⁰

Target (Bomber)	Killed	Injured
Aldgate (Tanweer)	7	171
Edgware (Khan)	6	163
Russell Square (Lindsay)	26	340
Tavistock (Bus) (Hussain)	13	110

In addition to destroying at least four Underground cars and a bus, the explosion also nearly buckled the deep tunnel near Russell Square,¹⁹¹ which is 70 feet below ground.¹⁹²

There was moderate disruption to the Underground system. The system was completely shut down on July 7, but was running at 80% capacity within 24 hours. On July 25, the Aldgate Station was back in operation, and Edgware Road was operational four days later. Finally, Russell Square was reopened on August 4.¹⁹³

The terrorists did draw attention to their “cause;” media coverage was extensive, with immediate breaking news coverage worldwide and continuing for several months. This event was also marked by widespread inclusion of user-generated content with photos from cell phones and other information from the many sources made ubiquitous by today’s personal technology.¹⁹⁴ This democratization helped make the events seem more personal to news consumers.

Although the Underground might be considered iconic by some, it is not a symbolic target in the way that the Tower of London, Buckingham Palace, or other symbols of British identity are; therefore, we do not consider this an attack on a symbolic target.

There was no compromise of a larger terrorist network; either no such network existed or it has not been detected.

The near term psychological impact of this event for transit users can be characterized as high. According to a paper published in the *British Medical Journal* in August 2005, 31% of respondents indicated significant stress (the highest category) due to the July 7 attack. Thirty percent responded that they would decrease use of the Underground, and 46% stated that they felt unsafe on the Underground system.¹⁹⁵ By mid-September ridership on the Underground was back at 2004 levels.¹⁹⁶ The psychological impact that this attack has in the long-term remains to be seen, but it is likely that the adverse effects will continue.

Economic impact was moderate; pedestrian traffic in the West End went down 20% to 30% in the two weeks following the attacks; in addition, a survey of more than 50 British business owners indicated that 21% of respondents said they would change plans to visit London after the attack.¹⁹⁷ On the other hand, the London Chamber of Commerce reported that all member businesses were back to full operations in two days at most.¹⁹⁸ The Royal Mail, for example, experienced disruptions during the day—and with at least 25% of British mail transiting London, this had nationwide impact. However, according to the Royal Mail's response to queries by the London Chamber of Commerce, it was “very quickly able to recover” and “in many cases services were being resumed during the afternoon and evening of 7 July and deliveries were made as usual the following morning.”¹⁹⁹

The strategic impact on the government was reflected directly in changes to antiterrorist legal legislation. Proposals introduced in the month after the bombing created new offenses related to planning terrorist attacks and proposed a controversial national identification card.²⁰⁰ Many Britons felt this to be an over-reaction that played into the hands of the terrorists by limiting civil rights; Human Rights Watch, in particular, objected to the proposal to extend the period of detention without charge, from 14 days to 90, stating that it “seriously undermines the right to a fair trial, the presumption of innocence, and the right of an arrested person to be informed promptly of any charge against him.”²⁰¹

The attacks had a generally negative impact on the terrorists' support population. In a Populus poll conducted for the *London Times* one year after the attack, 56% of the 1,131 British Muslims surveyed—higher than the 49% indicated by the general population—felt their government had not done enough to combat terrorism. Furthermore, 49% of British Muslims felt that the government should be allowed to monitor events in mosques to anticipate and thwart extremist violence. However, the same poll found that over 10% of the Muslims surveyed considered the bombers to be martyrs, and 16% (“equivalent to more than 150,000” Muslims) felt that the attacks were wrong, but that the cause was just.²⁰²

Significantly, the tip that started the investigation into the August 2006 plot to destroy U.S. airliners came shortly after the July 7 bombings. The informant, in the wake of the London attacks, raised concerns about an acquaintance to police.²⁰³

Just as terrorist organizations learn, so do security services. For example, after London suffered a series of IRA bomb attacks in the 1980s and 1990s, British authorities emplaced closed-circuit

television (CCTV) cameras throughout the city. These did not prevent the 2005 bombings, but they were instrumental in identifying the bombers and tracking their movements before the attack. In the future, they could be used to identify suspicious behavior.²⁰⁴ After the 2005 bombings, London, New York, and other cities began random bag searches as a means of deterring the use of backpack bombs.²⁰⁵ As another example, the Washington Metropolitan Area Transit Authority (WMATA) implemented a series of measures in direct response to the London transit bombings. These include the use of Explosives Detection Canine Teams, increased joint patrols by area police authorities, increased tunnel inspections, and training for transit employees and law enforcement officers in spotting suspicious behavior or indications of impending attack.²⁰⁶ These measures can add a degree of uncertainty to terrorist planning and possibly deter an attack, but it is difficult to determine the exact extent of their effectiveness.

Factors Associated With Success or Failure

The following factors are associated with the outcome of this incident:

Training: The terrorists clearly were well trained. They executed a simultaneous attack, with one possible flaw (the fourth bomb). Hasib Hussain was able to detonate the fourth bomb at a later time and complete the attack objective.

Technical sophistication: The bombers possessed the level of technical sophistication required to prepare for this attack. The first three bombs functioned as designed, and the fourth eventually detonated as well.

Operational proficiency: Khan, Tanweer, and Lindsay were all able to deploy to their targets and detonate the bombs near simultaneously. It is not clear whether the delay in use of the fourth device was due to a technical flaw; but even if it was, the ability to identify and repair the fault indicates a high level of operational proficiency.

Terrorist profile indicators: Generally speaking, none of the four bombers had anything in his background that would make him a priority target for law enforcement. The exception is the association of Tanweer and Khan with suspects in the previously mentioned fertilizer bomb plot; however, they were assumed to be petty criminals not involved in terrorism and were never investigated or identified by name until after the July bombings.

Terrorist OPSEC: Terrorist OPSEC was good. The Parliamentary Report specifically stated that “the group showed good security awareness and planning discipline.”²⁰⁷

Innovation: The attack was unusual, but not unprecedented; while there had been high-profile rail attacks in the past (notably Madrid), this was the first suicide attack in Western Europe in recent years, and the use of homegrown terrorists was an innovation that increased the likelihood of success.

Technical difficulties: The bombers experienced few, if any, technical difficulties. It is unclear whether there was a problem with the fourth device; but if there was a problem, it was quickly overcome.

Law enforcement or intelligence knowledge: Law enforcement and security officials had no knowledge of the plan until it was executed.

Security environment: The security environment in the U.K. at the time could be characterized as a complex mix of permissive and restrictive attributes. On the one hand, Britain’s experience with

the Irish Republican Army had resulted in a more restrictive environment than most democracies; on the other hand, the U.K. was regarded by many other countries as overly permissive toward extremist ideologues among its Muslim community.²⁰⁸

Effective information sharing: Information sharing among British authorities was ineffective; MI5 failed to follow up on reports tying Khan and Tanweer to known terrorists. However, this could be attributed as much to a lack of resources as to failure to share information.

International cooperation: International cooperation was lacking. There was no known exchange of information between Pakistani and British security services regarding Tanweer and Khan's presence in Pakistan.

Observant public and/or vigilant security services: There is only one, unconfirmed, report regarding a tip from a member of the public. A computer expert named Martin Gilbertson claimed to have notified police in 2003 that Khan and Tanweer had asked him to create an email encryption program and firewall, presumably to mask their activities from authorities. West Yorkshire Police state that they have no record of this incident. If it did occur, this would be an informative case of a lucky break falling into the hands of security services, upon which they failed to act, possibly missing an opportunity to halt the attack.

Other factors: Other factors can be identified that impacted the outcome of this plot:

Location of attack: The damage inflicted in the deepest tunnel, near Russell Square, was far greater than in the shallower tunnels and therefore had greater impact at the tactical level. All three train bombs, however, caused great damage due to the enclosed design of the rail cars.

Method of attack: This attack combined two tactics that increased the likelihood of success. First, the terrorists attacked a major subway system at rush hour. This is extremely difficult to defend against, due to the previously mentioned vulnerability of limited screening and open system architecture. Second, and unlike the Madrid operation, this was a suicide attack; no exit strategy was required for the attackers, and command detonation enabled the bombers to ensure that the devices were not moved or discovered prior to detonation. In the words of RAND's Bruce Hoffman, "there is no other type of attack that is more effective than suicide terrorism."²⁰⁹ As the Chief Operating Officer of the London Underground, Michael Brown, stated, "the phenomenon of the suicide bomber means any traditional measures of detection and interception are therefore likely to be ineffective."²¹⁰

Simplicity: Although the execution of the plan was relatively complex, the planning and actions prior to execution were relatively simple. A small number of individuals were directly involved, making OPSEC easier to maintain. The materials used were commonly available and inexpensive; therefore the logistics and financing did not rise to a level to cause suspicion or create operational difficulties.

Lack of resources by security services: Khan and Tanweer had been identified as possibly involved in terrorist activity, but MI5 specifically stated that a lack of resources prevented them from following through on leads that did not present an immediate threat. At the time of the attack, funding had been authorized to increase the MI5 staff by 1,000, but the results had not yet been realized.²¹¹

Failure to capitalize on fortuitous information: Many terrorist plots are thwarted when a piece of important information unexpectedly comes to the attention of authorities. The Bojinka plot, the planned attack on the subway in Brooklyn, and the liquid explosives plot were all uncovered when security and law enforcement forces recognized the value of such information and investigated. If Martin Gilbertson's claim to have tipped off police in 2003 is true, this would illustrate the converse—that lack of attention to unexpected information will likely lead to a missed opportunity to thwart an attempted terror attack.

Findings

Many factors led to the tactical, operational, and, to a certain extent, strategic success of this attack.

First, the plotters did not fit the profile of the presumed terrorist. They were all born in the U.K. or lived there for most of their lives and were viewed by those who knew them as well-integrated into British society. They did not arouse suspicion when they boarded the trains, as their clothing, accents, and manner marked them all as natives. Furthermore, suicide attacks were not anticipated as none had occurred in the past.

Surprise was also aided by good operational security. The size of the group and simplicity of the pre-execution activity certainly enhanced OPSEC, but the bombers also practiced discipline in carrying out their activities away from those who would ask questions and in not confiding their plans to anyone outside the attack cell. There were some breaches in OPSEC, notably the identification of Khan and Tanweer by MI5 and the alleged contact with Gilbertson, but security authorities were unable to capitalize on these fortuitous opportunities.

ATTEMPTED LONDON TRANSIT BOMBINGS— JULY 21, 2005

Overview

Exactly two weeks after the first suicide attack on the London Underground, a similar attack was attempted by another small cell of radical Islamists. This attempt, resulted in no casualties because the main charge of the weapons failed to detonate. Three stations of the London

Type of Attack: Planned detonation of homemade bombs aboard London Underground system

Date: July 21, 2005, around lunchtime

Group Involved: Six young Muslim men who had resided in the U.K. for many years

Underground and one bus were targeted, similar to the July 7 attack. A fifth bomb was found abandoned, apparently because the terrorist assigned to use that weapon lost his nerve, and the intended target for that weapon is unknown.

After an initial sweep arrested over 40 persons believed connected to the plot,²¹² British authorities eventually charged six suspects: five who were to be bombers and one person in a support role.²¹³

Significance of the Incident

Together, the two July attacks marked the initial use of suicide bombs in the U.K., as well as the targeting of the vulnerable transit system.

Two other aspects of this plot make it useful to study. First, because this attack failed, it is useful to contrast it with the more successful attack two weeks earlier to determine whether there are any variations in the plot to which the divergent outcomes could be attributed. Second, notwithstanding the failure of the bombs to detonate, the terrorists were able to deploy successfully to their targets despite the increased awareness of the threat and heightened security.

Description of the Group or Individuals Involved

Unlike the bombers in the earlier attack, the men involved in this plot were not native to the U.K.; most were immigrants from the Horn of Africa, although they had been residents of Great Britain for years and in some cases held British citizenship.

The apparent ringleader was *Muktar Said Ibrahim*. Ibrahim, 27 at the time of the attempted attack,²¹⁴ had lived in the U.K. for 15 years. His family had emigrated as refugees from Eritrea.²¹⁵ He left home at age 16 and apparently was not close to his family. He was, however, very religious, according to reports from acquaintances.²¹⁶ In contrast with the July 7 bombers, Ibrahim had exhibited antisocial behavior as early as high school²¹⁷ and had a significant criminal past—in 1996, he was sentenced to five years in prison for participating in gang-related robberies (he was granted early release in 1998). Apparently, Ibrahim became devout while in prison.²¹⁸ He became a British citizen in September 2004, only 10 months before the attempted attack.²¹⁹

Yassin Hassan Omar was 24 at the time of the plot.²²⁰ Omar was a Somali, but like Ibrahim, he came to the U.K. in his pre-teens as a child refugee and lived in state housing.²²¹ Eight years later, at age 19, he was given permission to remain indefinitely.²²² At one point, Omar and Ibrahim shared an apartment in north London. This apartment, at 58 Curtis House, New Southgate, later served as the bomb factory for this plot.²²³

Little is known about the third plotter, *Ramzi Mohammed*. He was 23 and lived in west London.²²⁴ In his suicide note, found at another plotter's apartment, he addresses a wife and two sons; the note emphasizes his religious beliefs and perceived spiritual rewards for martyrdom.²²⁵ He was also a Somali who came to the U.K. in the 1990s.²²⁶

The fourth suspect claimed to be a Somali refugee named *Osman Hussain*, and most reports use this name for him. However, it has since emerged that he is in fact an Ethiopian named Hamdi Adus Isaac; he had lived under his true identity in Italy, from 1991 until he came to the U.K. in 1996.²²⁷ He changed his name when he entered the U.K. and claimed Somali nationality because he believed this would better enable him to achieve refugee status.²²⁸ Other reports indicate that he was part of a group of radicals who attempted to take control of the mosque in Stockwell, where he resided, following the closure of the extremist-oriented Finsbury Park Mosque.²²⁹ He had a wife and three children.²³⁰

Little information is known regarding *Manfo Asiedu*, the fifth suspect, other than his age at the time of the attacks: 33. His country of birth is unknown, although he arrived in the U.K. bearing a Ghanaian passport in the name of George Nanak Marquaye. Authorities believe his true name may be Sumaila Abubakari.²³¹

Adel Yahya, the sixth suspect, is believed to have been part of a support cell and did not deploy with the others to execute the plot. He was born in Ethiopia in September 1979 and may have lived in Yemen at one point.²³² He is known to have attended London Metropolitan University, where he studied computer technology.²³³

Motivation

The men responsible for the July 7 bombings, generally speaking, were able to keep their extremist ideology hidden from family and acquaintances. However, those behind the July 21 plot were known by neighbors and acquaintances to harbor radical agendas. Ibrahim and Omar frequented the Finsbury Park mosque²³⁴—known as a focal point for violent jihadism—prior to its closure.²³⁵ Ibrahim also traveled to Sudan in 2003 for “jihadi training” and made a similar trip to Pakistan in December 2004.²³⁶ Material found at their apartments—including extremist Islamic literature, videos of beheadings, and material glorifying the 9/11 attacks—also indicates that the plotters were driven by a deep-seated dedication to violent jihad.

Planning

Planning for this operation began no later than April 2005, when Asiedu, Yahya, and Ibrahim are known to have made purchases for the bomb components.²³⁷ There is no specific information regarding rehearsals or dry runs; however, the fact that the attackers were able to deploy with the

bombs undetected and to attempt to detonate their weapons near simultaneously suggests that some sort of dry run may have occurred.

The failure of the weapons from a flaw in manufacturing suggests that no test firing was conducted. Had such a test occurred, the terrorists may have realized there was a problem with their mixture and not attempted the attack until it was corrected.

It is difficult to determine if these plotters incorporated any lessons from the attacks two weeks earlier. While the targets and tactics were very similar, this does not necessarily mean that the latter plot was inspired by the former. At a minimum, however, the earlier attack proved the viability of the concept and in that regard could have confirmed in the minds of the July 21 bombers that their plan was sound.

Attack

The Weapon

There is detailed information regarding the weapons, because all five were recovered either intact or nearly intact.

The main charge was a mixture of hydrogen peroxide and chapatti flour (used for a bread popular in South Asia) in a ratio of 70 to 30. The flour provided the fuel for the explosion while the hydrogen peroxide acted as the oxidant. The charge was to be placed in a 6.25-liter plastic container with a lid. A hole was made in the bottom of each container, through which a homemade detonator was inserted. The detonator contained triacetone triperoxide (TATP), made by mixing hydrogen peroxide, acetone, and hydrochloric acid—all easily obtainable. The TATP was contained inside a tube, at the bottom of which was mounted a small bulb. The bulb contained more TATP and was connected to two wires.²³⁹

The devices were hidden inside backpacks, and the wires were fed through slits in the back of the packs and concealed inside the bombers' clothing. The bombers were to connect the wires to a 9-volt battery they were carrying; this would complete the circuit, sending a charge to the bulb. The TATP inside the bulb would detonate, setting off the remainder of the TATP in the detonator tube and consequently the main charge. To maximize lethality, the bombs were covered with screws, nuts, tacks, and other hardware that would act as shrapnel.²⁴⁰

The London Attacks: Copycat, Independent, or Related?

The similarity of the attacks on July 7 and July 21, 2005, raises the question of how—or whether—the attacks were related. There are three possibilities: that the latter plot was a copycat attack conducted by a group inspired by the former's success; that the two attacks were totally independent and any similarities were a coincidence; or that they were related plots, part of a larger campaign.

It is unlikely that the latter attempt was a hastily planned copycat effort. This theory is refuted by evidence, presented at trial, that the July 21 conspirators began acquiring materials for their bombs in April 2005, nearly three months prior to the July 7 attack. If the accused terrorists are to be believed, they conceived of the attack in September 2004, out of frustration with the ineffectiveness of peaceful protests against the Iraq War.

It is less clear whether the attacks were independent or related. However, it is difficult to imagine that two completely independent plans would both target three Underground trains and a bus, using suicide tactics, and employing peroxide-based backpack bombs. There is other circumstantial evidence that may point to some sort of tie: the fact that members of both cells may have attended the same whitewater camp and the contemporaneous presence of Khan and Tanweer (July 7 plotters) and Ibrahim (July 21 plotter) in Pakistan in late 2004. Based on this circumstantial evidence, and the unlikelihood of the similarities being coincidental, the most plausible explanation is that the two plots were somehow related, perhaps as autonomous attacks directed from a central command authority.²³⁸

Deployment

While the July 7 attacks occurred during the morning rush hour, this attack was to commence during the lunch hour. Just before noon on July 21, the bombers deployed for their attacks from two locations.

Yassin Omar, Muktar Ibrahim, and Ramzi Mohammed all started at the Stockwell station in the south-central portion of the Underground. Omar headed due north on the Victoria Line, with his target the Warren Street Station (not far from King's Cross, Tavistock Square, and Russell Square, which all figured prominently in the July 7 attacks). Ibrahim took the Northern Line, going as far as the Bank Station before leaving the Underground and transferring to the Number 26 bus, which heads due east. Mohammed's target was the next stop up on the Northern Line, the Oval Station in the southern portion of the Underground. He let the others go ahead of him so they could all be in location for near simultaneous attacks.²⁴¹

Meanwhile Osman Hussain (also known as Hamdi Isaac) and Manfo Asiedu began their deployment from Westbourne Park Station. At noon, Hussain received a call from Ramzi Mohammad at Stockwell Station, most likely to initiate the deployment. He then boarded a train on the Hammersmith and City Line, headed for his target at the Shepherd's Bush Station, in the western portion of the system. Asiedu, however, apparently decided against carrying out his attack. Instead, he left the Underground and headed to a nearby park called Little Wormwood Scrubs and abandoned his weapon.²⁴²

Execution

Hussain was the first to attempt to detonate his device. At approximately 12:25 PM, approaching Shepherd's Bush, he attached the wires to the 9-volt battery, setting off the detonator; however, the main charge failed. The explosion, though not large enough to cause any damage or casualties, caused significant panic on board the train. When it reached the platform, he lowered himself through a window and down a wall, disappearing into a nearby neighborhood.²⁴³

Mohammad attempted to set off his device five minutes later, with identical results. He also fled the train, and three passengers unsuccessfully attempted to catch him.²⁴⁴

Fifteen minutes later, Omar initiated his attack, and once again, only the detonator functioned. As with the others, he fled the scene amid the panic caused by the sound of the detonator exploding.²⁴⁵

Ibrahim attempted to detonate his device on board the Number 26 bus just after 1:00 PM. Like the bus bomber on July 7, he positioned himself on the upper deck; however, there were few passengers on that level and only 12 total on the bus. Again, the main charge failed to detonate and Ibrahim was forced to flee.²⁴⁶

Police bomb experts were later able to conclude why the bombs failed. Hydrogen peroxide is available commercially only in diluted form (18% concentration at most). Therefore, the bombers needed to purchase large quantities of the chemical and boil it down in order to achieve the required concentration.²⁴⁷ Forensic analysis of the remains of the bombs indicated that the concentration was too low.²⁴⁸

Consequences

Consequences of the attempts were negligible. Because the devices did not function as designed, there were no casualties inflicted; the only material damage was to the Number 26 bus, which had several windows blown out by the force of the detonator's explosion.²⁴⁹ There was very little disruption of the London transit system. Three stations were evacuated (Shepherd's Bush, Oval, and Warren), and the area around the Number 26 Bus was cordoned off;²⁵⁰ the entire system was shut down temporarily but was reopened in time for the evening rush hour.²⁵¹ Media coverage was extensive and worldwide and continued for weeks; with the commencement of the trial in January 2007, there was another surge of media coverage. News reports and commentary called attention to the similarity to the July 7 bombings and alleged implications for wider conspiracy. This plot did not focus on a symbolic target, and no operational-level network was penetrated or compromised.

Surveys and economic data tend to aggregate the effects of both July bomb attacks. One could consider the July 21 attacks a second and amplifying event that exacerbated the psychological impact of the July 7 attack; in that case, one could view the *British Medical Journal* survey results described on page 38 as descriptive of the impact of this attack as well. Likewise, the moderate economic impact described in the London Chamber of Commerce survey (page 38) should be considered a reflection of the July 21 attacks as well as the previous incident. The same is true of resulting counterterrorism legislation and the adverse impact on the attitudes of British Muslims. At the same time, the terrorists achieved some psychological advantage in demonstrating that they could strike at the same target twice in a matter of two weeks, despite heightened security.

Factors Associated With Success or Failure

A number of factors are associated with this attempted attack:

Training: The terrorists exhibited a high degree of training and discipline in certain areas: they were able to maintain operational security, they acquired the necessary components for the weapons, and they were able to deploy to their targets and initiate the execution phase nearly simultaneously. However, their training was insufficient regarding the proper method for creating the main charge of their weapons, resulting in net failure.

Technical sophistication: The terrorists did not possess the technical sophistication required to fabricate the hydrogen peroxide and chapatti flour explosives. While the fact that the detonators functioned as designed shows a certain degree of proficiency, ultimately the plot failed because of mistakes in achieving the correct concentration of hydrogen peroxide.

Operational proficiency: The attackers were proficient in deploying to their intended targets and initiating their attacks. The failure of the charges was not due to a lack of operational proficiency, but rather to their lack of sophistication in preparing the main charge.

Terrorist profile indicators: Those involved in this plot were known by acquaintances to hold extremist views, and one (Ibrahim) had a violent criminal record.

Terrorist OPSEC: Terrorist OPSEC was good. The men maintained a small organization, did not involve unnecessary or unvetted support personnel, and were able to deploy and initiate the

execution phase unhindered. They had one unreliable member who contributed to the failure of the operation.

Innovation: The attack was not innovative; it was nearly identical to the plot executed two weeks earlier. From the perspective of those planning this plot, there would be advantages and disadvantages to using an identical attack plan. Since the July 7 attack had been successful in many regards, it verified the validity of attacking in this way. On the other hand, the plotters might have anticipated that both the authorities and the public at large would be sensitive to indications of a similar attack in the immediate aftermath of the first series of bombings. They discounted that as a reason to change process.

Technical difficulties: The bombers experienced a significant technical difficulty when the main charge of the bombs failed to detonate. A simpler device might have been within their level of technical competence—for example, they could have used TATP, which they mixed correctly for the detonators, as the main charge.

Law enforcement or intelligence knowledge: Law enforcement and security officials had no knowledge of the plan until it was executed.

Security environment: As was the case with the July 7 plot, the security environment in the United Kingdom at the time could be characterized as restrictive regarding anti-terror laws enacted since the IRA bombing campaigns, while permissive in terms of the latitude given to radical clerics to inspire British Muslims to acts of violence.

Effective information sharing: There is no indication of any information exchanged among security authorities relating to this event. However, it should be noted that little information had been developed regarding this plot or the actors involved.

International cooperation: There is evidence of some international cooperation prior to the event, but no information was developed that could have thwarted the attempt. After the attempt, Osman Hussain fled to Italy, where his brother lived. Cooperation between British and Italian authorities resulted in Hussain's capture and eventual extradition to the U.K. for trial.²⁵²

Observant public and/or vigilant security services: While there are no survey data from that period to depict a level of increased awareness, one could logically surmise that Londoners using rail or bus transportation were more perceptive of suspicious behavior on the transit system or in their neighborhoods, given the events of July 7. However, this did not result in any alarms being raised before the execution phase was initiated.

Findings

The failure of this plot may be attributed to a single factor—the terrorists attempted to create a weapon beyond their technical capability. Had they succeeded in concentrating the hydrogen peroxide to a sufficient level, the weapons would have functioned as designed and likely caused results similar to the July 7 attacks. Since the failure of the weapons to function cannot be attributed to any act on the part of security services, there is no executable lesson to be gleaned—other than the necessity of interdicting terrorist operations prior to the deployment stage and to exploit any gaps in operational security presented by terrorist cells.

SECTION III—COMMERCIAL AVIATION

SPECIFIC VULNERABILITIES OF COMMERCIAL AVIATION

Before examining specific case studies, it is useful to identify aspects of commercial aviation that affect—negatively or positively—the ability of terrorists to attack this sector successfully.

Various Means of Attacking Aircraft

Compared to other categories of targets, there are many more attack paths that can lead to the destruction of an airliner or its possible use as a weapon. This complicates security efforts by creating more requirements to counter the multiple threats and creates a vulnerability that can be exploited by innovative terrorist planning.

One method of attack is to introduce an explosive into the cargo hold of an airliner, either in checked baggage or as air freight. One well-known example of this method is the bombing of Pan Am Flight 103. Libyan intelligence agents placed a bomb (consisting of plastic explosives hidden in a portable radio) inside luggage on a flight from Malta to Frankfurt, Germany; it was tagged for transfer to London’s Heathrow Airport and then put on Pan Am 103 to John F. Kennedy Airport in New York. The device was detonated by an electronic timer, and the aircraft was destroyed over Lockerbie, Scotland. All 259 passengers and crew were killed, as well as 11 people on the ground.²⁵³

Besides checked baggage, airliners fly with freight in their cargo holds that is not subject to the same scrutiny as personal baggage. In fact, companies can apply to be designated as “known shippers;” after undergoing a security vetting process, cargo sent by known shippers is not inspected unless a parcel appears suspicious.²⁵⁴ While this program balances security against the needs of commerce, it still presents gaps that may be exploited. As one industry source put it,

“There are approx 1.5 million known shippers in the U.S. There are thousands of freight forwarders. Anywhere down the line packages can be intercepted at these organizations. Even reliable respectable organizations, you really don't know who is in the warehouse, who is tampering with packages, putting parcels together.”²⁵⁵

Another way of introducing an explosive onboard an aircraft in flight is to place it in the cabin, either to be detonated by timer or by suicide bomber. This method offers the advantage of positive control regarding the placement of the device and, in the case of suicide bombings, its detonation. However, since all passengers must pass through individual screening, it is more difficult to bring a device on board in this way. Three of our case studies demonstrate innovative methods used by terrorists to circumvent screening and place explosives inside the cabin of the aircraft. In both the Bojinka plot and the plan to destroy U.S. airliner flying from the U.K., the components of the bombs were disguised and hidden in items commonly found in carry-on baggage. Further, the terrorists planned to use liquid explosives, which would not have been easy to detect by the safeguards in place at that time. The hijackers of Air France 8969 took a different approach: they disguised themselves, rather than the weapon, to place explosives in the cabin.

They were able to gain free access to the aircraft, and once they had taken control, they were able to position the explosives.

Whether in the cargo hold or the cabin, the amount of explosive required to destroy an aircraft is considerably less than that needed to inflict casualties on a train or to destroy a building. Because of this, it is easier to covertly introduce a weapon to an aircraft than other classes of targets. For example, the small amount of explosive planned for the Bojinka plot could be hidden in a contact lens solution bottle. Sports drink bottles were to be used in the 2006 airline plot in the United Kingdom.

Chemical and Biological Attack

Explosives are not the only means to cause casualties on a commercial aircraft. Because of the closed conditions in the cabin, a chemical or biological weapon could be released with no possibility for the passengers and crew to escape the lethal agent. However, there are difficulties with weaponizing agents and other issues which would make an attack difficult to execute. While there have been no known cases in which such an attack was planned, this is nevertheless a vulnerability that could be exploited in the future.

Insider Threat

Insiders—including the air crew itself—could cause the destruction of the aircraft as well. Although there has never been a known case of a crew member participating in a terrorist plot, one event in particular underscores this vulnerability. In October 1999, Egypt Air Flight 990 crashed into the Atlantic Ocean killing all aboard. The National Transportation Safety Board concluded that “the probable cause of the Egypt Air Flight 990 accident is the airplane’s departure from normal cruise flight and subsequent impact with the Atlantic Ocean as a result of the relief first officer’s flight control inputs. The reason for the relief first officer’s actions was not determined.”²⁵⁶ Although suspicions that the relief first officer, Gamil al-Batouti, destroyed the aircraft as part of a terrorist plot were eventually dismissed by both U.S. and Egyptian investigators, this event highlights the vulnerability of an airliner to destruction by a flight crew member whose intentions are not detected.

The attacks on September 11, 2001, were an innovative variation on this event; in fact, CIA director George Tenet later stated he believed that the Egypt Air 990 attack convinced Osama bin Laden that the U.S. airline system was vulnerable to a catastrophic attack.²⁵⁷ In addition, there is evidence that al Qaeda had considered a crew member suicide attack in late 1994: while the Bojinka plot centered on the midair destruction of airliners over the Pacific Ocean, there was also discussion of crashing an airliner into the headquarters of the Central Intelligence Agency in Langley, VA.²⁵⁸ The plot was uncovered prior to its execution, so it is not known whether this aspect of the operation was seriously considered.

Besides flight and cabin crew, others have frequent access to airliners on the ground. This would include maintenance personnel, who could sabotage critical components of the aircraft, or service crews who clean the aircraft or load in-flight meals. While such personnel are vetted to a degree, they are not subject to the same scrutiny as a passenger. Illustrating this vulnerability, 29 cargo handlers at Miami International Airport were arrested in April 2007; they had been using their access to facilitate the smuggling of cocaine and heroine on international flights.²⁵⁹ A co-opted ground crew member could place a device on board the aircraft or pre-position weapons or bomb

components for others. No such action has been detected in the past, although Amin Asmin Tariq, arrested in connection with the liquid explosives plot in August 2006, was employed as a security guard at Heathrow Airport and would have had special access to secure areas.²⁶⁰

Standoff Attack

Further complicating security measures, aircraft can be destroyed by standoff threats as well. For example, airliners could be attacked with man-portable air defense systems (MANPADS), which fire small surface-to-air missiles. Many of these systems are simple to use, readily available on the black market and relatively inexpensive. Insurgent forces in Iraq and Afghanistan have used MANPADS and are knowledgeable in their use, and they could train potential terrorists for their deployment in Western countries. Such a missile, homing on the infrared signature of the aircraft's engines, could possibly cause catastrophic failure during takeoff or landing. It should be noted, though, that according to the Congressional Research Service there have been only six attacks on large turbojet airliners with MANPADS since 1980, and only two of these resulted in loss of the aircraft.²⁶¹ Less-sophisticated means, including high-caliber rifles and rocket-propelled grenades, could also be used against aircraft. Although none of the case studies involved a standoff attack, terrorists may turn to this method as security measures make other means increasingly difficult to execute.

Summary

Taken together, these possibilities create challenges for the aviation security community and opportunities for terrorists. Our case studies demonstrate a constant theme: terrorists are aware of the vulnerabilities of commercial aviation and attempt to find innovative methods to overcome security measures and execute their attacks. Because it is difficult to create countermeasures against the wide variety of innovative and unexpected methods of attack, it is important that terrorist plots be detected and interrupted before they reach the execution stage. Security services must do more than react to the most recent plot—they must recognize vulnerabilities and weaknesses, realize that terrorists are aware of these as well, and act to prevent exploitation of the vulnerabilities in future attacks.

The tables on the following pages deconstruct the four cases and display the results for purposes of comparison.

Table 3-1: Commercial Aviation Sector—Indicators of Success

Tactical Level Indicators of Success

Case Study	Was the attackers' security plan maintained pre-execution?	Was the attack initiated?	Did the weapon(s) function as designed?	What was the level of lethality?	What was the level of injuries sustained?	What was the level of material damage?	Did the cell members avoid capture/death?
Air France Hijacking	Yes	Partially	N/A	Low	None	None	No
Operation Bojinka	No	No	Some (Dry Run)	Low (Dry Run)	Low (Dry Run)	Minor (Dry Run)	No
9/11	Yes	Yes	Yes	High	High	High	Moderate
Liquid Explosives Plot	No	No	N/A	N/A	N/A	N/A	No

Operational Level Indicators of Success

Case Study	Was the broader network security maintained?	What was the level of system disruption?	What was the level of media coverage?	Did the plot's target have symbolic value?	Did the network members avoid capture/death?
Air France Hijacking	Yes	None	Moderate	Moderate	Yes
Operation Bojinka	No	None	Moderate	No	No
9/11	Yes	Severe	High	Yes	Moderate
Liquid Explosives Plot	No	Minor	High	No	No

Strategic Level Indicators of Success

Case Study	What was the level of psychological impact?	What was the level of economic impact?	What was the level of policy change?	What was the level of impact on the supporting population?
Air France Hijacking	Low	Low	Moderate	N/A
Operation Bojinka	None	None	None	N/A
9/11	High	High	High	High
Liquid Explosives Plot	Moderate	Moderate	Moderate	N/A

Table 3-2: Commercial Aviation Sector—Factors
Commercial Aviation Success Factors—Adversary-Related

Case Study	Factors						
	What was the level of the terrorists' training?	What was the level of the terrorists' technical sophistication?	What was the level of the terrorists' operational proficiency?	Were there terrorist profile indicators?	What was the level of terrorist OPSEC?	What was the level of innovation?	Did the terrorists experience any technical difficulties?
Air France Hijacking	Moderate	Low	Low	High	Low	Moderate	Moderate
Operation Bojinka	High	Moderate	High	High	Low	High	High
9/11	High	Low	High	Moderate	High	High	Low
Liquid Explosives Plot	Moderate	Unknown	Unknown	Low	Low	Moderate	Unknown

Commercial Aviation Success Factors – Security-Related

Case Study	Factors					
	Was access to the target site restricted?	What was the level of law enforcement knowledge of the plot?	Was the security environment restrictive?	What was the level of information sharing?	What was the level of international cooperation?	What was the level of vigilance of the public and security services?
Air France Hijacking	Moderate restriction	None	Moderately restrictive	Low	Low	Low
Operation Bojinka	Moderate restriction	High	Not restrictive	High	High	High
9/11	Moderate restriction	Low	Moderately restrictive	Very Low	Low	Low
Liquid Explosives Plot	Moderate restriction	High	Moderately restrictive	High	High	High

Table 3-3: Commercial Aviation Sector—Case Study Descriptions

	PLANNING							EXECUTION	
	Target Selection (Note: Target, Method and Personnel Selection can occur in any order)	Method Selection	Personnel Selection	Intelligence Gathering & Surveillance	Logistics, Resources, Materiel, Support Network	Training (Including Rehearsals & Dry Runs)	Weapon Assembly	Stage for Attack	Execute
Air France 8969 December 1994	Eiffel Tower or Paris at large (unknown if this was the original intent or selected after hijacking) Moderate security barriers in place	Hijacked airliner as weapon Innovative	Most likely selected by senior leaders in GIA	Unknown, but likely (attackers had knowledge of uniforms/credentials to use to circumvent security)	Unknown, but acquisition of uniforms/credentials suggests strong support network	Unknown	Dynamite set for detonation during hijacking	Hijackers bypassed security and boarded aircraft successfully	Hijacking executed successfully; CT forces interdicted before Paris attack could be executed
Operation Bojinka December 1994-January 1995	11-12 US trans-Pacific airliners; CIA HQ Significant security barriers in place	Time-detonated liquid explosives in cabin of airliners; crash airliner into CIA HQ Innovative	Selected by KSM and/or Ramzi Yousef; operatives were experienced terrorists	Detailed flight information gathered by Yousef	Funds from unknown source funneled through support network in Indonesia	Bomb tested at Greenbelt Theatre; bomb and concept of employment tested on PAL flight	Plot uncovered because of fire resulting from errors in mixing chemicals, possibly for final weapons	Plot interdicted prior to this stage.	Plot interdicted prior to this stage.
WTC/Pentagon Sep 11, 2001	Key economic/governmental facilities Significant security barriers in place	Aircraft as weapons Unusual, but not unprecedented	Formal selection by AQ leaders	Terrorists likely gathered information on security during dry runs; also gathered flight schedule data to select target aircraft	Support and resources provided through AQ Central; total cost ca. \$400-500K	Pilot terrorists conducted dry runs May-Jul 2001	None required	All hijackers bypassed security and staged on target flights	Attacks on WTC and Pentagon executed as planned; fourth aircraft destroyed during struggle prior to reaching target
Liquid Explosives August 2006	U.S. airliners departing from U.K. Significant security barriers in place	Suicide-detonated liquid explosives on unknown number of aircraft Unusual, but not unprecedented	Unknown - most likely self-selection of radical acquaintances	Unknown	Most likely self-financed	Unknown, but U.K. authorities believe no dry runs conducted prior to arrests	Weapons not assembled prior to arrests	Plot interdicted prior to this stage.	Plot interdicted prior to this stage.

THE HIJACKING OF AIR FRANCE FLIGHT 8969—DECEMBER 1994

Overview

On December 24, 1994, shortly before noon, four Algerian terrorists walked across the tarmac of the Houari Boumediene Airport in Algiers²⁶² and boarded Air France Flight 8969, which was bound for Paris. The men entered the A300 Airbus dressed in Air Algerie uniforms²⁶³ and, claiming to be security agents, began to check the passengers' passports.²⁶⁴ Soon thereafter, one hijacker shouted, "Allah is great"; three of the terrorists entered the cockpit, while the fourth held the people in the cabin hostage with a Kalashnikov.²⁶⁵ An Algerian policeman was identified and shot in the head. Shortly afterwards the terrorists killed a second passenger, a Vietnamese diplomat.²⁶⁶

Type of Attack: Hijacking with intent to detonate explosives mid-flight above Paris, or crash the airliner into the Eiffel Tower

Date: December 24-25, 1994

Group: GIA—Groupe Islamique Armé (Armed Islamic Group)

The hijackers were members of the Algerian Islamic terrorist organization Groupe Islamique Armé (Armed Islamic Group) or GIA. Initially, they demanded the release of two leaders of a banned Islamic organization, the Islamic Salvation Front.²⁶⁷ A standoff ensued, and the terrorists eventually agreed to release women and children. The hijackers dropped the demand for the release of prisoners and instead insisted that they be allowed to take off and depart Algeria. When Algerian security forces failed to allow their departure, the hijackers killed a third passenger—a cook at the French Embassy. The French government was at odds with its Algerian counterpart; the French wanted the aircraft to be allowed to fly to France, while the Algerians insisted that it stay in place. The Algerians allowed the aircraft to depart after the French citizen was killed.²⁶⁸ The hijackers had wanted to fly to Paris but were convinced by authorities that they did not have enough fuel and would have to stop in Marseille to refuel.²⁶⁹

In Marseille, the terrorists demanded 27 tons of fuel to fly to Paris.²⁷⁰ That was nearly three times the amount required for that route,²⁷¹ according to one source, officials feared that "they would head for a friendly Islamic country—perhaps Iran, or Sudan, or Yemen."²⁷² More ominously, released passengers informed French authorities that the hijackers intended to crash the fuel-laden aircraft into the Eiffel Tower or explode it over the city of Paris.²⁷³

To prevent the aircraft from carrying out such an attack, the French government deployed its specialized counterterrorist police unit, the Groupe d'Intervention de la Gendarmerie Nationale (GIGN), to the airport. The GIGN was able to practice its rescue maneuvers on an identical Airbus.²⁷⁴ While the airliner was on the tarmac, the GIGN team boarded the airliner and freed all 173 hostages, killing all four terrorists.²⁷⁵ Twenty sticks of dynamite were found aboard the aircraft.²⁷⁶

Significance of the Incident

This incident represents the first known plan to use a commercial aircraft as a weapon; as such, it may have served as a learning tool for the September 11, 2001 attacks. This case also illustrates the use of disguises to overcome barriers to access, problems arising from the lack of international cooperation, and successful anti-terrorist techniques.

Description of the Group or Individuals Involved

According to passengers on the hijacked flight, the terrorists, who all seemed to be in their 20s, clean shaven, and short haired, were polite yet had a determined air about them.²⁷⁷ Another witness stated, "...they told us that they would give a lesson to the French and to the world, that they would show what they were capable of."²⁷⁸

The GIA was arguably one of the most violent Islamic fundamentalist groups.²⁷⁹ It aimed to replace the secular government in Algeria with an Islamic state and targeted government workers, civilians, and foreigners. In some cases, the GIA would destroy entire villages; according to one estimate, over 70,000 civilians were killed from 1993 to 1998.²⁸⁰

In the 16 months prior to the hijacking, the GIA had killed 80 foreigners,²⁸¹ including 24 French citizens.²⁸² Additionally, the GIA had entered the guarded residence of a French diplomat, killing three French gendarmes and two other officials.²⁸³ Because of this attack, France planned to adopt new security measures to protect French officials in Algiers.²⁸⁴ This provides an interesting illustration of the dynamic between terrorist learning and security service learning. First, the terrorists conducted a successful attack. The French responded by increasing protection of their government workers in Algeria; and in response to that, the GIA changed tactics to targeting a civilian airliner and possibly the French capital itself.

According to the State Department, the GIA's goal was to overthrow the government in Algeria and create a fundamentalist Islamic state.²⁸⁵ The GIA supported the Islamic Salvation Front and began its violent activity in 1992 to protest the cancellation of elections in which the victory of the Islamic Salvation Front was predicted.²⁸⁶ The GIA attacks ranged from attacks against government workers to massacres of civilian Algerians as well as expatriates from Europe.²⁸⁷

One of the hijackers identified by police was *Abdul Abdullah Yahia*, a.k.a. "the Emir." He was described as a petty thief and member of the GIA. He had allegedly taken part in earlier attacks and was considered extremely devout,²⁸⁸ as were the others involved in the hijacking.²⁸⁹ Yahia was described by one source as having taken part in previous "attacks of rare violence and savagery."²⁹⁰

Motivation

As members of GIA, the overarching motivation for the terrorists was the destabilization of the secular government in Algiers and its replacement with an Islamic state.²⁹¹ In furtherance of that goal, one source stated that the terrorists were "trying to rid Muslim Algeria of Western influence, specifically from France."²⁹²

As one report put it, the attack achieved two goals: "to embarrass the embattled Algerian government and to remind France of the perils of involving itself in the Algerian civil war."²⁹³ Another source noted that the group released a statement claiming that the hijacking was conducted in order to force France to end its "unconditional political, military and economic aid" to the Algerian government.²⁹⁴ France had further drawn the ire of the GIA by clamping down on extremists in the large Algerian community residing in the former colonial power.²⁹⁵

Planning

Very little is known of the planning behind this attack. However, certain conclusions can be drawn from the events that transpired.

First, the use of Air Algerie uniforms and identification—whether authentic or counterfeit—suggests a high degree of planning, sufficient resources, and perhaps insider access, one of the specific vulnerabilities of commercial aviation which can be exploited by terrorists.

Second, the generally flawless execution of the hijacking indicates a high degree of planning and perhaps rehearsals or dry runs. The terrorists were able to board the aircraft, conduct themselves as airline security guards without appearing nervous or out of place, and swiftly transition into the execution mode without providing an opportunity for passengers, crew, or security forces to intervene.

However, their tactical objectives do not appear to have been well-planned in advance. After the hijackers had control of the aircraft, their demands shifted over time: from release of prisoners, to French reparations for colonial rule and support of the ruling regime,²⁹⁶ to removal of obstacles to their departure.

Attack

Because of the successful intervention of the GIGN, who freed the remaining hostages and killed all four hijackers, the main portion of the attack—detonating explosives in midair or crashing the airliner into the Eiffel Tower—was not carried out.

The Weapons

While the GIA was a very well-resourced group, it tended to use simple weapons (for example, its signature method of assassination was slitting the throat).²⁹⁷ The weapons used in this attack reflect that simple approach: the hijackers were armed with Kalashnikov rifles, Uzi submachine guns, homemade grenades, and dynamite.²⁹⁸

While one could draw inferences from this lack of technological sophistication, this simple approach may have been a deliberate attempt to reduce chances of technical failure. Furthermore, the lack of security at the airport allowed the use of small arms and dynamite, which might have been unfeasible in a more secure environment.

Deployment

There is no information available regarding how the terrorists staged for this operation. However, they were successful in gaining unhindered access to the aircraft with their weapons.

Execution

This event should be examined as two separate attacks: the hijacking of the airliner and the intended destruction of the aircraft over Paris or the Eiffel Tower. The hijacking was well executed; the terrorists were able to gain unimpeded access to the aircraft with their weapons, inspect passports, and transition to taking control without interference. They remained in control of the aircraft from that time until the GIGN team assaulted the aircraft.

The execution of the attack on Paris, however, was thwarted prior to its initiation. An error on the part of the hijackers was to land the aircraft at an intermediate location—Marseille—to unload

fuel. The distance from the airport in Algiers to Paris is 851 nautical miles;²⁹⁹ the average range of a fully fueled A300 (not accounting for altitude, weather, or load) is 4,160 nautical miles.³⁰⁰ Had the hijackers demanded a full fuel load in Algiers, they could have flown directly to Paris and destroyed the aircraft with a great deal of fuel still onboard, rather than present an opportunity for France to deploy its well-trained counterterrorist force in Marseille to thwart the operation.

Consequences

The GIA terrorists had minimal to moderate success, depending on which aspects of the incident are examined. They were able initiate part of their attack—the hijacking—but were unable to coerce the pilots and air traffic controllers into making the airliner take off toward Paris. While they were proficient in the use of small arms (killing three people and injuring others), it is not known whether they had similar expertise with explosives, since they did not have the opportunity to detonate them.³⁰¹

The larger GIA network was not disrupted by this failed operation. The target the terrorists aimed to ultimately hit was symbolic if it was the Eiffel Tower, but if their plan was to detonate the explosives mid-flight, the target would not be considered symbolic. Regardless, there was some media coverage of this hijacking, and although there was short-term system disruption, there were no long-lasting effects on the aviation system.

The psychological impact of the event overall could be considered low, as could the economic effect. The French did call for security measures to be increased in Algeria before commercial transportation between France and Algeria would be resumed.³⁰²

Factors Associated With Success or Failure

While less is known about this plot than other cases, we still can draw certain conclusions.

Training: It is unclear how the terrorists were trained and if they were, how extensive the training was. What is known is that they were members of the GIA which had participated in other violent attacks.

Technical sophistication: This attack did not require a great deal of technical sophistication. The terrorists' weapons consisted of standard small arms and dynamite, which require little specialized technical knowledge to use.

Operational proficiency: The early stages of this attack demonstrate a high degree of operational proficiency. They were able to board the aircraft with their weapons and seized control quickly. However, their lack of knowledge regarding the capabilities of the aircraft (particularly its range) indicate a lack of proficiency.

Terrorist profile indicators: All hijackers were members of the GIA which has a history of violent attacks. At least two of them had been identified as having taken part in previous terrorist activities.

Terrorist OPSEC: It appears that the terrorists' OPSEC was initially good; they were able to procure Air Algérie uniforms and badges, enter the airplane without arousing suspicion, and get the explosives on board. However, once they hijacked the airliner, their OPSEC deteriorated—in discussing the Paris phase of the plan within earshot of hostages who were later released, they

allowed important information to come to the attention of authorities, who then put the plan in motion to avert that attack.

Innovation: This plot can be considered unusual but not unprecedented. While hijackings had become relatively commonplace and in a few instances, terrorists had detonated explosives on airliners while in mid-air, this plan marked the first time that terrorists considered crashing an aircraft into a target of national significance.

Technical difficulties: The terrorists did not experience technical difficulties with the weapons they carried onboard. Additionally, the explosives found on board, if detonated, would have been able to destroy the airliner. However, it appears that the terrorists did not know how to fly the airliner themselves and thus had to rely on the Air France pilots. Their plot might have turned out differently had they known how to pilot the aircraft themselves.

Access: Access to the target aircraft was nominally hindered by security guards and other measures, but these barriers to access were easily circumvented by the use of disguise and false documentation.

Law enforcement or intelligence knowledge: According to the open sources, law enforcement and intelligence officials did not have any knowledge of this event before it occurred.

Security environment: The security environment in Algiers could be considered highly restrictive—the country had been under military control since 1992, and the government had jailed thousands of terrorists and insurgents.³⁰³ However, the apparent ease with which the terrorists were able to circumvent security indicates that certain aspects of the security environment were lax.

Effective information sharing: It appears that both the Algerians and the French wanted jurisdiction over the incident, delaying the terrorist-requested journey from Algeria to France. However, cooperation eventually was achieved, and the GIGN was able to practice on an identical airliner before the actual rescue mission.

International cooperation: Cooperation between the French and Algerian governments was poor, as evidenced by the disagreement over jurisdiction and whether the aircraft should be allowed to take off.

Other factors: All four terrorists were dressed in Air Algerie uniforms and had identification badges, therefore not causing suspicion on the part of airport and airline personnel or passengers.³⁰⁴ This can be considered a use of deception that worked in favor of the terrorists and allowed them to successfully board and hijack the Air France flight.

The French GIGN commandos were highly proficient in hostage rescue. Training for a new member of the force typically takes three years to complete, testifying to the level of proficiency expected of GIGN members.³⁰⁵ Because the French had this resource available to them, they were able to free all of the hostages and prevent the execution of the Paris phase of the plot. The availability of this force should be considered a factor that led to the failure of that phase of the attack at the tactical, operational, and strategic levels.

Findings

The GIA terrorists exhibited a high degree of innovation, both in the use of disguises to overcome accessibility issues and in the plan to use the aircraft itself as a weapon. However, they also

exhibited major lapses in planning and execution—for example, lack of familiarity with the fuel load and range of the aircraft and failure to maintain OPSEC in front of their hostages. These lapses created opportunities seized upon by French security authorities. However, the idea of using an aircraft in this manner would be seen in subsequent years, in better-planned operations, and with greater success at all three levels.

OPERATION BOJINKA—DECEMBER 1994- JANUARY 1995

Overview

Today the idea of destroying a commercial aircraft in flight or using an airliner as a weapon does not seem particularly innovative. That was not the case in early 1995, when a plot was uncovered that aimed to use liquid nitroglycerin bombs to destroy as many as 12 airliners simultaneously.³⁰⁶

The plot was the creation of Ramzi Yousef, who was a veteran terrorist and the mastermind of the 1993 plot to destroy the World Trade Center.³⁰⁷ In his plan, nitroglycerin-based bombs would be smuggled on board the airliners in innocuous-appearing components: a contact lens solution bottle, a Casio watch, and a detonator hidden in the heel of a shoe.³⁰⁸ The terrorist would assemble and arm the weapon, then leave the aircraft at an intermediate stop. The timers were set to detonate the explosives while the aircraft were flying on subsequent legs of their journeys, and the aircraft would be destroyed within hours of each other.³⁰⁹

Type of Attack: Planned detonation of liquid explosives aboard multiple airliners while in flight
Date: December 1994-January 1995
Individuals Involved: Experienced Islamic terrorists

Another aspect of the Bojinka plot was the possible hijacking of a plane in the United States. Similar to the Air France incident, the plan was to use the aircraft as a weapon and crash it into the headquarters of the Central Intelligence Agency, but in this plot, the hijacker himself would take control of the aircraft and guide it to its target.³¹⁰

The Bojinka plot progressed a great deal toward the execution phase. Yousef had constructed test bombs and carried out dry runs, even detonating a bomb on a Philippines Airlines flight to test the validity of the plan. However, the plotters made a mistake while mixing a batch of explosives, starting a fire that drew the attention of Philippines authorities. The Filipinos pursued the case and forced the plotters to abandon their plan, and the plotters fled the country. They were later apprehended and brought to the United States to stand trial.³¹¹

Significance of the Incident

The Bojinka plot involved the innovative use of liquid explosives to circumvent screening procedures and destroy several airliners simultaneously. A nearly identical attempt was thwarted over a decade later, when British authorities arrested approximately 20 men believed to be preparing to destroy U.S. airliners headed from the United Kingdom to the United States. The secondary plot to destroy CIA headquarters similarly foreshadows the September 11, 2001 attacks. It is noteworthy that the later plot targeted, among other landmarks, the World Trade Center, which Yousef failed to destroy in 1993.

These innovations are significant in and of themselves, but they also demonstrate a tendency of terrorist groups (al Qaeda in particular) to learn from their previous actions and those of others. They resurrect tactics and refine them, and they often revisit targets that escaped destruction in earlier incidents.

Description of the Group or Individuals Involved

Ramzi Yousef was the central figure in this plot. His nationality is unclear—there is speculation that his father was from the Baluchistan region of Pakistan, but Yousef (whose actual name may be Abdul Basit Karim) was raised in Kuwait. His father was a guest worker there, and so the members of the family were probably treated as second-class citizens.³¹² Nevertheless, Yousef was educated at the university level in the U.K., where he studied electrical engineering.³¹³ He came to the United States in 1992 with a forged Iraqi passport; his traveling companion was arrested when his passport was determined to be fake and bomb-making plans were found in his luggage. Yousef, however, was able to enter the United States. He became a follower of the radical cleric Omar Abdel Rahman and eventually conceived the plot to detonate a van of explosives under the World Trade Center. After that plot failed to achieve its desired results, he fled the United States and moved to Pakistan, where he lived in safe houses financed by Osama bin Laden.³¹⁴

Yousef's uncle was *Khalid Sheikh Mohammed*, who was born in Kuwait. He was educated in the United States, studying mechanical engineering first at a small Baptist college and then transferring to North Carolina Agricultural and Technical University.³¹⁵ After graduation in 1986, he went to Afghanistan to join the resistance against the Soviet occupation. Mohammed had a peripheral role supporting his nephew's plot against the World Trade Center, and this may have provided the impetus for his own transformation into terrorist planner. Following the Bojinka plot, he went on to become the principal force behind the September 11 attacks, as well as the Richard Reid shoe bomb plot, the killing of reporter Daniel Pearl, and the attacks in Bali.³¹⁶

Abdul Hakim Murad,³¹⁷ also known as Saeed Akman, was born in Kuwait on January 4, 1968, and grew up in a Palestinian enclave there, where his hatred of both the United States and Israel developed. He was childhood friends with Ramzi Yousef.³¹⁸ Murad moved to the United States in November 1991 and took flying lessons, leading to a commercial pilot rating.³¹⁹ Murad, like Yousef, had been involved in earlier terrorist planning; in fact, Murad chose the World Trade Center as the target for Yousef's 1993 attack.³²⁰

Wali Khan Amin Shah is variously thought to have Turkmen, Saudi, or Russian nationality.³²¹ He was born on April 2, 1966. His principal role was as financier, although he reportedly planted a bomb used in a dry run at a theater in Manila.³²²

Motivation

According to FBI sources, the plotters wanted “to make the American people and the American government suffer for their support of Israel.”³²³ Yousef claimed that America's support of Israel gave Lebanese and Palestinians the right to attack American targets.³²⁴ A letter found on Yousef's computer stated that the Bojinka plot was “in response to the financial, political and military assistance given to the Jewish State in the occupied land of Palestine by the American Government.”³²⁵ “All people who support the U.S. government are our targets in our future plans and that is because all those people are responsible for their government's actions and they support the U.S. foreign policy and are satisfied with it,” the document continued.³²⁶

Planning

Operation Bojinka was well planned by these experienced terrorists. Yousef had thoroughly researched trans-Pacific flight schedules for U.S. air carriers, selecting targets that would be in the air at approximately the same time for nearly simultaneous destruction.³²⁷ Yousef's planning also included design of a weapon that would best be able to pass undetected through airport screening. He selected nitroglycerine as the main component of the explosive because screening techniques at that time would not have detected its presence.³²⁸ The components also were selected because contact lens solution and sports watches were commonplace items carried on board airliners and would not be scrutinized.³²⁹ Planning was supported by extensive training; Murad told authorities after his arrest that he had spent 18 days in Pakistan training in the use of explosives.³³⁰

Finally, the terrorists conducted several tests of their weapons and dry runs of the attack: these included placing a bomb in the Greenbelt Theater in Manila on December 1, 1994,³³¹ and detonating a small version of the bomb on a Philippines Airlines flight later that month, killing one passenger.³³² The details of that test run indicate the sophistication of Yousef's planning. He boarded the Philippines Airlines 747 and once in flight assembled the bomb components in the lavatory. He returned and planted the bomb under his seat in the life jacket. Yousef disembarked in the Philippine city of Cebu, and the flight took off again on its way to Tokyo, with a new passenger in Yousef's seat. Two hours into the second flight, the bomb exploded and killed the Japanese businessman in that seat. The bomb breeched the skin of the aircraft, but the pilot managed to jettison fuel and make an emergency landing, avoiding further casualties.³³³

According to an FBI source, Murad told him that Philippines Airlines Flight 434 was used as "a test to make sure the timing devices worked properly."³³⁴ Furthermore, Yousef learned from this dry run that more explosive would be required to destroy the aircraft; this demonstrates another instance of terrorist learning.³³⁵

Attack

The attack did not reach the execution phase owing to an incident that occurred as Yousef and Murad were preparing a batch of nitroglycerin. A fire broke out, and their apartment building was evacuated. Although they had both fled, Yousef insisted that Murad return to the apartment to retrieve a laptop; this seemed suspicious to authorities, who detained Murad. When questioned, he gave the name Ahmed Saeed (he was actually Murad) and said he was a commercial pilot. The authorities searched the apartment and found various explosive ingredients including pure glycerin, acetone and various acids, thermometers, beakers, timers, circuit breakers, hotplates, cotton soaking in liquid, plastic containers, multicolored electrical wiring, and chemistry reference manuals. As they searched the apartment another man was standing outside on a cell phone. It was later determined that it was Yousef, but he escaped in the small firefight that ensued as Saeed (Murad) attempted to flee.³³⁶

Authorities also found a laptop (the one for which Murad had returned to the apartment) with encrypted files they were able to access. These files contained great detail about the airline plot, including flight schedules and an outline of the attack plan. The computer also included information linking the plotters to Mohammed and Khan and to the plot to crash an airliner into CIA headquarters. A third aspect of Bojinka—a plot to assassinate Pope John Paul II during his impending visit to Manila—was also detailed in documents on the computer.³³⁷

Consequences

This plot was not a success; the terrorists were not able to detonate their explosives on board multiple airliners as they had intended. It is estimated that 4,000 people could have died if the plot had been carried out as the terrorists planned.³³⁸ However, because authorities capitalized on the windfall of information and averted the execution of the plot, the only casualty was the Japanese businessman killed during the dry run and the 10 who were injured by that bomb.³³⁹

There was only minor impact, primarily in the form of media attention (which surfaced again after the September 11 attacks and the liquid explosives plot in August 2006). However, a significant indicator of operational-level failure is the dismantling of the terror network which followed the investigation into the plot.

There is no evidence that the Western public was psychologically traumatized or that the airline or tourist industries suffered due to this attempt. Likewise, there is no information indicating a positive or negative impact on potential supporting populations, and no changes in foreign policy or security measures resulted from the plot.

Security services learned from the Bojinka plot that terrorists were aware that existing measures to detect explosives were not effective. According to one source, the Federal Aviation Administration began installing “sniffer” machines at major U.S. airports shortly after the plot was uncovered.³⁴⁰ However, the terrorists had learned a different lesson, according to a senior Philippines official: explosives were unstable, expensive, and difficult to handle. They would seek other methods to destroy aircraft that did not have these disadvantages.³⁴¹

Factors Associated With Success or Failure

A number of factors contributed to the outcome of this operation.

Training: The terrorists attended flight-training schools, had the know-how to create bomb components, conducted successful test runs, and possibly had the financial backing of a larger terrorist organization. They appeared to be well-disciplined planners.

Technical sophistication: Although Yousef demonstrated technical sophistication when his test bombs detonated as designed, the mishandling of chemicals in the apartment began the chain of events which led to the disruption of the plot.

Operational proficiency: Ramzi Yousef’s successful test run on the Philippines Airlines flight indicates he was highly proficient at covertly transporting the explosive elements onto the aircraft, assembling the weapon, setting the timer, and placing the bomb where it would not be detected before detonating.

Terrorist profile indicators: Yousef, Murad, and Mohammed all were known to be involved in the 1993 World Trade Center attacks. This operational history would be considered a strong indicator highlighting them for attention by security services.

Terrorist OPSEC: The failure of this otherwise well-planned plot at all three levels can be directly attributed to lapses in OPSEC. First, Murad exhibited suspicious behavior by attempting to return to the apartment before being given the all-clear. Second, and more important, the extensive documentation of the plot on the computer—although encrypted—enabled authorities to disrupt the plot prior to its execution.

There were other lapses in OPSEC as well. When Murad and Yousef checked into the apartment, they initially filled out the registration cards in their true names, then asked for the cards back and filled out new ones. They also refused to allow a security guard into the apartment when smoke first appeared and had not permitted hotel cleaning staff to access their room during their stay.³⁴²

Innovation: This plot was highly innovative in several aspects. The use of a liquid explosive was a new means of attack, and Yousef's success in bypassing security on the test run may have been used as a learning point by the plotters in the liquid explosives plot in 2006. The simultaneous destruction of airliners was likewise unique and possibly a learning point. Finally, the use of an aircraft to destroy a building, along with the nearly contemporaneous Air France plot, was an innovation that was later employed by Khalid Sheikh Mohammed when he planned the September 11 attacks.

Technical difficulties: Yousef and Murad mishandled chemicals in the apartment, leading to the fire and the discovery of the plot. Although this appears to be the only technical difficulty encountered, it had significant impact on the outcome of the plot.

Law enforcement or intelligence knowledge: The Philippine security services capitalized on their fortuitous acquisition of incriminating information. By recognizing the importance of this windfall, they were able to pursue leads discovered at the apartment and disrupt the Bojinka plot.

Security environment: The security environment can be considered permissive. As stated in a report by the Council on Foreign Relations, "Philippine antiterrorist efforts have been undermined by weak and sometimes corrupt law enforcement."³⁴³ Thus, the diligence of the authorities in this case was an exception to the norm.

Effective information sharing: Information sharing was effective. The local police passed information to the national authorities, who had the technical means and intelligence capability to capitalize on the details.³⁴⁴

International cooperation: International cooperation was generally good. The Philippine National Police contacted the CIA station chief and FBI legal attaché, seeking their assistance.³⁴⁵

Findings

The outcome of this plot demonstrates the sensitivity of terrorist attacks to the OPSEC factor. This was a very well-planned and well-rehearsed operation that likely would have been executed successfully. Only two factors worked against the adversary: improper fabrication of the explosive and poor OPSEC, which allowed authorities to discover details of the plan while investigating the subsequent fire.

This case also demonstrates that this factor has impact only when combined with other factors, in this case the alertness of the local police and the ability to realize the importance of unexpected windfalls of information. Poor OPSEC would not, on its own, have led to the interruption of the plot; it was only when combined with the reaction of the security forces that conditions were set that led to failure.

THE ATTACKS ON THE WORLD TRADE CENTER AND THE PENTAGON—SEPTEMBER 11, 2001

Overview

On the morning of September 11, 2001, 19 young men affiliated with al Qaeda hijacked four commercial American airliners. Two of the airliners crashed into the World Trade Center buildings in New York City, one flew into the side of the Pentagon in Arlington, Virginia, and a fourth was flown into the ground in Shanksville, Pennsylvania, presumably after passengers overpowered the hijackers. Nearly 3,000 people were killed as a result and many more were injured. This series of coordinated attacks was the worst terrorist event in the history of the United States.

Type of Attack: Hijacked airliners flown into the World Trade Center, the Pentagon, and a field in Shanksville, PA

Date: September 11, 2001

Group Type: al Qaeda affiliated individuals

Significance of the Incident

More people were killed in the attacks of September 11, 2001, than in any single terrorist attack that had occurred previously against U.S. targets—this is one of the reasons that this event is significant. In addition, unlike al Qaeda’s attacks against American targets in East Africa and the Saudi Arabian peninsula, this event occurred at home, marking a new chapter in al Qaeda’s war against the West. This operation also stands out for its innovation—this was the first time that a terrorist group had successfully used commandeered airlines to kill people and destroy buildings. As the more recent plot to destroy U.S. airliners using liquid explosives indicates, terrorists remain interested in attacking the aviation sector and likely have the ability to do so.

Description of the Group or Individuals Involved

The attack cell responsible for carrying out the hijackings on September 11 consisted of 19 men, all of whom spent time in the United States prior to the attacks. Fifteen of the terrorists had Saudi Arabian citizenship and the other four hailed from Egypt, the United Arab Emirates, or Lebanon.³⁴⁶

One of the oldest of the 19 hijackers and considered the tactical leader of the plot, *Mohammed Atta* was born in Egypt in 1968 to a middle-class family and later, in July 1992, moved to Hamburg, Germany, to complete his master’s degree, having graduated from Cairo University with a degree in architectural engineering.³⁴⁷ During his time in Germany, Atta was a serious student and became increasingly religious, trying to organize a Muslim association at his school, the Technical University of Hamburg-Harburg. Over the years he studied in Hamburg, Atta became “abrasive and increasingly dogmatic,” and his friends from those days recall him as an intelligent and charismatic decision-maker who did not tolerate dissent.³⁴⁸ Fellow students remember that he was intensely anti-American and anti-Semitic, and within his circle of acquaintances, Atta “advocated violent jihad.”³⁴⁹

While living in Germany, Atta met and became friends with some of those who would later join him in carrying out the attacks of September 11. In April 1996, *Marwan al Shehhi*, a citizen of the United Arab Emirates, arrived in Germany, to study in a program funded by a military scholarship. Unlike Atta, al Shehhi was not a dedicated student, but he and Atta did share a

similar devotion to the Muslim faith. Al Shehhi moved to Hamburg in 1998, and Atta moved into his apartment shortly thereafter, but the location and timing of their first meeting is uncertain. From this point forward, al Shehhi became more dedicated to a fundamentalist strain of Islam, living frugally and telling people that “he was living the way the Prophet had lived.”³⁵⁰

Ziad Jarrah, who would later pilot United Airlines Flight 93, also met Atta during his time in Hamburg. Jarrah, who was born in Lebanon to an affluent family, may have become acquainted with Atta through Ramzi Binalshibh, who supposedly was to have been part of the team that conducted the September 11 attacks.³⁵¹ Like Atta and al Shehhi, Jarrah came to Germany for academic reasons and enrolled in a college in Griefswald, where he met a Turkish woman who would later become his wife. The following year, in 1997, Jarrah moved to Hamburg, where he enrolled in the Technical University of Hamburg-Harburg and began taking aircraft engineering classes. At some point during his time in Hamburg, Jarrah made Atta’s acquaintance, although the timing and circumstances of this meeting are uncertain. Those who knew Jarrah in Hamburg remembered that he became increasingly devoted to religion in the years he spent there, and he spent more and more time praying. Reportedly, in 1999, he told his girlfriend that he was “planning to wage a jihad because there was no greater honor than to die for Allah.”³⁵²

These three men—Mohammed Atta, Marwan al Shehhi, and Ziad Jarrah—formed something of a core around which the other hijackers would eventually coalesce, and all three would serve as pilots on the ill-fated flights of September 11, 2001. In 1999, they traveled to Afghanistan, where they pledged loyalty to Osama bin Laden and were subsequently told that they would be taking part in a secret mission. Atta was chosen by bin Laden to be the leader of the operation, and by the time the three men left Afghanistan, they had plans to enroll in flight training classes.³⁵³ (See the “Planning” section for more information on events that occurred prior to the attacks on September 11, 2001.)

Others involved in the hijackings likely either grew up together or near one another or met while training in Afghanistan. Four of the hijackers—*Ahmed al Ghamdi*, *Hamza al Ghamdi*, *Saeed al Ghamdi*, and *Ahmad al Haznawi*—came from three small towns located in proximity to each other in an isolated part of Saudi Arabia, and five others came from the Asir Province, also in Saudi Arabia.³⁵⁴ All of these men, the so-called “muscle hijackers,” developed connections to extremists two or three years prior to the 2001 attacks.³⁵⁵ Unlike Atta, al Shehhi, and Jarrah, acquaintances did not recall that these men had become increasingly devout or fanatic in the months before the attacks. Some of them were religious, but not unusually so, and others were more likely to violate Islamic laws by drinking alcohol.³⁵⁶

Regardless of these differences, by early 2000, the future hijackers began displaying similar behavior—family members revealed that the men began seeing less of their families and started taking trips to undisclosed locations during this period. In retrospect, it is clear that these absences allowed the terrorists the opportunity to begin planning and training, in earnest, for the events of September 11, 2001.³⁵⁷

Motivation

The attacks were ordered by Osama bin Laden, and the motivation for this operation appears to have come directly from bin Laden and his associate, Khalid Sheikh Mohammed (KSM).³⁵⁸ KSM was violently opposed to what he saw as American favoritism toward Israel, and according to information provided during his interrogations, this was what drove him to consider the

possibility of attacks against the United States.³⁵⁹ Further, he was well-aware of the impact of the first World Trade Center attack in 1993, because his nephew, Ramzi Yousef, had been the mastermind of that operation, and KSM wanted to carry out an attack of even greater magnitude. In fact, according to KSM, had it not been for Yousef's involvement in the 1993 attack and KSM's relation to him, bin Laden would have been less willing to meet with KSM to discuss future operations. Bin Laden was impressed with Yousef, and it appears that this proved beneficial to his uncle—bin Laden agreed to meet with KSM, and it was at this meeting that KSM presented his proposal for crashing airliners into buildings in the United States, a plan which would take advantage of the various means of attacking aircraft that can be used against the commercial aviation sector, as mentioned earlier.³⁶⁰

Khalid Sheikh Mohammed believed that an attack such as this—with its potential to damage the American economy—would be the most effective means of influencing U.S. foreign policy.³⁶¹ He saw New York City as the economic center of the United States and likely viewed Washington, D.C., including the nearby Pentagon, as the heart of the country's governmental power. For the same reasons that the World Trade Center was an attractive target to Yousef in 1993, it remained a compelling objective for al Qaeda eight years later. The sheer size of the World Trade Center complex and the Pentagon made them appealing to al Qaeda. Buildings such as these would contain thousands of people, and attacks on them would likely result in a high number of casualties. In addition, an attack of such magnitude would be expected to provoke a response from the United States. Bin Laden and KSM anticipated that such a reaction could be portrayed as an attack against all of Islam and might result in a backlash against the United States that could benefit al Qaeda.³⁶²

Planning

After his arrest, Khalid Sheikh Mohammed revealed that following al Qaeda's attacks on the U.S. embassies in Nairobi and Dar es Salaam in 1998, he recognized bin Laden was serious about attacking the United States. Although KSM had entertained the idea of a September 11-type attack for years, possibly learning from and refining the plan for the failed Operation Bojinka, it was this realization that prompted him to approach bin Laden about backing the operation. In the first few months of 1999, bin Laden, KSM, and Mohammed Atef, a senior al Qaeda military commander, met to discuss the plot and to develop an initial target list. These included the White House, the U.S. Capitol, the Pentagon, and the World Trade Center.³⁶³

Having received bin Laden's endorsement and guidance on target selection, KSM moved forward with the plot, and it seems that planning began in earnest in early 2000, after Atta, al Shehhi, and Jarrah returned from their trip to Afghanistan.³⁶⁴ After returning to Germany, the three men tried not to arouse suspicion, and they distanced themselves from known extremists and stopped spending time at radical mosques.³⁶⁵

One of the key aspects of planning the attack—learning how to fly airliners—occupied the attention of the hijackers during this time. All three men considered attending flight schools in Europe, but after being informed that flight instruction in the United States was less expensive and could be accomplished more quickly than at schools in Germany or elsewhere in Europe, Atta, al Shehhi, and Jarrah decided that they would travel to the United States for instruction.³⁶⁶ Atta contacted more than 30 American flight schools, and between January and May 2000, all three men obtained visas to travel to the United States.³⁶⁷

Available evidence suggests that the hijackers' airline tickets to the United States, their living expenses once they arrived, and the fees associated with flight training were funded by al Qaeda.³⁶⁸ The money was provided in cash by Khalid Sheikh Mohammed and through wire transfers. Ali Abdul Aziz, a nephew of KSM, wired funds from Dubai to the hijackers; much of this money was used to pay for flight training for the four men who would pilot the planes on September 11. Aziz was not required to present identification when he wired the money, and all of his transactions were small and "were essentially invisible amid the billions of dollars flowing daily across the globe."³⁶⁹ Ramzi Binalshibh, a close associate of the hijackers, also provided funding to them, wiring money to a Sun Trust Bank account in Florida.³⁷⁰ Several of the "muscle hijackers" brought money with them when they came to the United States, and at least seven of them purchased approximately \$50,000 in travelers' checks.³⁷¹

After arriving in the United States, those who would be piloting the airliners on September 11, 2001, focused on their flight training. In order to complete the attacks as planned, at least four of the hijackers would need to be able to fly a commercial airliner, navigate it to the desired location, and direct the plane into the designated target.³⁷² By November 2000, Mohammed Atta, who would pilot American Airlines Flight 11, and Marwan al Shehhi, who would take over the controls of United Airlines Flight 175, had completed their flight training and had received their instrument certificates from the Federal Aviation Administration. The following month, they passed the commercial pilot's test and received their licenses. Around the same time, Ziad Jarrah, who would later fly United Airlines Flight 93 into a field in Shanksville, Pennsylvania, began training on a flight simulator, giving him practice in piloting large jets; Atta and al Shehhi did the same.³⁷³ Hani Hanjour, who would later fly American Airlines Flight 77, had received his pilot credentials earlier than the other three, having been granted a commercial multi-engine pilot certificate in March 1999. Hanjour also had taken flight simulator training, and he may have been "the most experienced and highly trained pilot" among the hijackers.³⁷⁴

Meanwhile, the "muscle hijackers" traveled to Afghanistan, where they received training from Abu Turab al Jordani, "one of only a handful of al Qaeda operatives who . . . was aware of the full details of the planned planes operation."³⁷⁵ The men learned how to conduct hijackings and disarm air marshals. Al Jordani also taught them how to kill people with knives and provided them with a few useful phrases in English. Interestingly, the hijackers were also taught about other types of attack techniques, including truck bombings, "so that they would not be able to disclose the exact nature of the operation if they were caught."³⁷⁶ It was not until these men arrived in the United States that they were told that the planned attack involved flying airliners into buildings.³⁷⁷

When most, if not all, of the hijackers had arrived in the United States, during the summer of 2001, they began their final planning for the operation. Three of the pilots—Atta, Jarrah, and al Shehhi—conducted surveillance trips in early summer, each traveling in first class (probably to better observe the crew) on United Airlines flights. Atta flew from Boston to San Francisco and then on to Las Vegas; Jarrah traveled from Baltimore to Los Angeles and then on to Las Vegas; and al Shehhi went from New York to San Francisco and then to Las Vegas. Each of the three flew on the same type of plane he would pilot on September 11.³⁷⁸ In addition, all of the men continued to train at local gyms, as they had in previous months, and the pilots took many practice flights on small airplanes.³⁷⁹ At some point in July, Hani Hanjour rented a plane in New Jersey and flew it to Gaithersburg, Maryland—this route likely would have brought him in proximity to Washington, D.C.³⁸⁰

At some point, the lead operatives selected the specific flights that would be hijacked. The men were careful to choose large Boeing 757 and 767 aircraft scheduled to make cross-country flights—the amount of fuel on these planes would maximize the incendiary effect when the pilots flew into the designated targets. The men also strategically selected their seats on the various flights, based upon the configuration of the specific aircraft in question. The arrangement of the passenger seats on Flights 11 and 175 provided more maneuverability for the hijackers, so on those two flights, they purchased tickets in both first class and business class. On the two other flights, which were both on Boeing 757 aircraft, the single-rowed seats provided less flexibility, and all of the hijackers purchased first-class tickets, ensuring ready access to the cockpit on the morning of September 11.³⁸¹

Attack

In the early morning hours of Tuesday, September 11, 2001, Mohammed Atta and fellow hijacker Abdul Aziz al Omari flew from Portland, Maine, to Boston, Massachusetts, arriving at Logan Airport at approximately 6:45 AM, where they met their co-conspirators, Satam al Suqami, Wail al Shehri, and Waleed al Shehri. All five men would soon board American Airlines Flight 11, en route to Los Angeles International Airport. Meanwhile, in another part of Logan Airport, at Newark Airport in New Jersey, and at Dulles Airport in Virginia, the other hijackers were meeting, clearing security, and boarding their flights.³⁸²

After boarding Flight 11, the five men took their seats—the al Shehri brothers in first class and Atta, al Omari, and al Suqami in business class. There were 81 passengers (including the hijackers) and 11 crew members on board the Boeing 767 aircraft. Shortly after 8:00 AM, the five men took over the flight, which had departed Logan Airport at 7:59 AM that morning. After stabbing at least two of the nine flight attendants and using mace to force the first-class passengers toward the back of the plane, the five men commandeered the aircraft. At 8:13 AM, the flight was diverted from its course, after the controls were taken over by Mohammed Atta, who was the only one of the five men who knew how to pilot the plane. He flew the plane toward New York City, and less than an hour after the plane had left Boston, it slammed into the North Tower of the World Trade Center, at 8:46 AM, cutting through floors 93 to 99. All on board the aircraft were killed instantly, as were several people inside the building. Less than two hours later, at 10:28 AM, the North Tower collapsed, killing all of those who had survived the impact on the upper floors and killing several first responders.³⁸³

At 8:14 AM., United Airlines Flight 175, a Boeing 767 carrying 56 passengers (including five hijackers) and nine crew members, departed Logan Airport, also bound for Los Angeles. Between 8:42 AM and 8:46 AM, five men—Ahmed Alghamdi, Hamza Alghamdi, Mohand Alshehri, Fayez Ahmed Banihammad, and Marwan al Shehhi—commandeered the aircraft in a manner similar to the hijackers on Flight 11. They used mace and knives and killed both pilots in the cockpit, which allowed al Shehhi, who had received flight training, to take the controls of the airliner. He flew the plane toward New York City, and at 9:03 AM, the plane flew into the South Tower of the World Trade Center, crashing through floors 78 through 84 of the building. The aircraft exploded into a fireball and instantly killed all on board, as well as several people within the tower. At 9:58 AM, the South Tower collapsed in just 10 seconds, likely killing all of those who remained inside as well as first responders and civilians on the building's concourse and at the nearby Marriott Hotel.³⁸⁴

Just a few minutes after Flight 175 took off from Logan Airport, American Airlines Flight 77 departed Dulles International Airport in Herndon, Virginia, at 8:20 AM, en route to Los Angeles. This airliner, a Boeing 757 aircraft, had 58 passengers and six crew members on board. Among the passengers were five hijackers—Hani Hanjour, Nawaf al Hazmi, Salem al Hazmi, Khalid al Mihdar, and Majed Moqed—who subdued the passengers, using knives and box cutters, between 8:51 AM and 8:54 AM. It is believed that Hani Hanjour, who had received flight training, took over controls of the aircraft. At 8:55 AM, the Boeing 757 began an unauthorized turn to the southeast, toward Washington, D.C. At 9:37 AM, Flight 77 crashed into the newly renovated west side of the Pentagon, destroying four of the building's five rings on that side, instantly killing all those on board the aircraft, and killing 125 inside the building and seriously injuring 106 people.³⁸⁵

At 8:42 AM, United Airlines Flight 93, a Boeing 757 aircraft, departed Newark International Airport in New Jersey, en route to San Francisco. Among the 37 passengers and seven crew members on board were four hijackers—Saeed Alghamdi, Ahmed Alnami, Ahmad Ibrahim al Haznawi, and Ziad Samir Jarrah. By 9:15 AM, the aircraft reached its cruising altitude of 35,000 feet, and the automatic pilot was engaged. Jarrah, the only one of the four terrorists who had received flight training, took over controls of the aircraft, after at least one passenger and possibly a flight attendant, the captain, and first officer had been stabbed to death. Just before 9:30 AM, a manual override was executed, and the aircraft gained an additional 5,000 feet in altitude, turning from its westerly direction to the southeast. Then the aircraft descended, and passengers were herded to the rear of the plane, where several of them made phone calls to their family members, friends, and colleagues. In the course of these calls, information was exchanged about the attacks on the World Trade Center, and at least five passengers on Flight 93 made reference to their intent to revolt against the hijackers in an attempt to take over the plane. At 9:57 AM, the passengers began their assault, and in response, Jarrah began rolling it from right to left and back again, in a clear attempt to cause the passengers to lose their footing. The offensive continued, and at 10:02 AM, having judged that “the passengers were only seconds from overcoming them,” the hijackers decided to crash the aircraft.³⁸⁶ Only 20 minutes (by air) away from Washington, D.C., Flight 93 hurtled at 580 miles per hour into a field in Shanksville, Pennsylvania, instantly killing all those aboard the aircraft.³⁸⁷

Consequences

Approximately 2,970 people were killed in the coordinated attacks, and more than 2,000 were injured.³⁸⁸ Structural damage was considerable. When American Airlines Flight 11 slammed into the North Tower of the World Trade Center, the aircraft cut through floors 93 to 99, likely making all three of the building's stairwells impassable. On impact, the airliner exploded, and a fireball traveled down an elevator shaft, causing subsequent explosions on several floors of the North Tower, including those below ground level. Both the North and South Towers were engulfed in thick black smoke, fed by burning jet fuel from Flight 11. At 10:28 AM the North Tower collapsed, having been severely weakened by the impact of the aircraft and subsequent fire.³⁸⁹

When United Airlines Flight 175 flew into the South Tower of the World Trade Center at 9:03 AM, it hit floors 78 through 84. However, the plane banked as it approached the building, meaning that some portions of the impacted floors were not damaged and at least one of the stairwells remained passable from the 91st to ground level. The initial impact damaged the South

Tower extensively. Just 45 minutes after Flight 175 slammed into the building, it collapsed upon itself, creating a huge windstorm and rocking the still standing North Tower, knocking several people inside the building to the floor.³⁹⁰

In a report published four years after the September 11 attacks, the National Institute of Standards & Technology concluded that a number of factors led to the collapse of the North and South Towers of the World Trade Center. These included: damage to the structures of the buildings from the initial aircraft impact; jet fuel sprayed into the buildings that ignited fires on several floors; dislodging of fireproofing insulation from the steel structure of both buildings, enabling unprotected steel to heat rapidly; weakened core columns that increased the weight on external columns; and bowed perimeter columns that had less ability to carry loads than they would have under normal circumstances.³⁹¹

When American Airlines Flight 77 crashed into the west side of the Pentagon, four of the building's five rings were heavily damaged on that side. The Pentagon was just five days away from completing renovation of this part of the building—the first phase of a \$250 million project to bring the building up to current standards.³⁹² Pentagon officials commented that lives may have been saved because the plane impacted this renovated area rather than parts of the building that had not yet been refurbished. Some of the offices in this part of the building were not yet occupied on September 11, and those that were recently occupied had been fitted with blast-resistant windows, which may have lessened the impact of the explosion.³⁹³

There was short-term system disruption following the attacks on the World Trade Center and Pentagon. All non-emergency civilian aircraft in the United States were grounded, and thousands of passengers across the country and in Canada were stranded. These airliners remained on the ground for three days. There was extensive media coverage of the event, both domestically and internationally, in newspapers and magazines and on radio stations and television channels. The targets of this attack were symbolic: the World Trade Center represented the financial and economic power of the United States, while the Pentagon represented the strength of both the government and the military.³⁹⁴

The attack caused high stress and other psychological symptoms in those who were at the target sites and those who witnessed the events on television and through other media. In addition to long-term emotional health issues, the attacks of September 11 have had a lasting effect on the physical health of those who were at the World Trade Center on the day of the attack and on the workers who combed through the wreckage of the buildings in the weeks after the events of that day. The cloud of smoke and dust that covered Lower Manhattan as the North and South Towers collapsed contained contaminants, including asbestos, benzene, mercury, and lead. These substances, some of which are carcinogenic, also can cause respiratory, heart, liver, kidney, and nervous system damage. A study conducted by Mount Sinai Hospital, the results of which were released in September 2006, revealed that 70% of 10,000 “Ground Zero” workers have experienced new or worsened respiratory problems since September 11, 2001.³⁹⁵

The economic impact of these attacks can also be considered high, especially compared to the relatively small amount of money—\$400,000 to \$500,000—that al Qaeda used to finance the attacks.³⁹⁶ Estimates vary depending on the parameters used, but the costs of the 9/11 attacks were in the billions of dollars. The Government Accountability Office prepared a report that summarized the findings of several government and private studies, and found that estimates of direct and indirect costs of the World Trade Center attack alone ranged between \$83 billion and

\$105 billion.³⁹⁷ Direct costs included destruction of life and property and the financial burden of clean-up efforts. Indirect costs to the economy included loss of income from business closings as well as the resultant unemployment. In addition, the United States has had to bear the brunt of increased security costs, such as expenses associated with new screening technologies at airports.³⁹⁸

The September 11 attacks influenced U.S. policy, resulting both in the creation of a new government agency, the Department of Homeland Security, and in the commencement of military operations against the Taliban and al Qaeda strongholds in Afghanistan. In addition, the consequences of the attack reveal examples of security service learning, as demonstrated by changed security screening procedures at airports and the strengthening of cockpit doors aboard aircraft.

Factors Associated With Success or Failure

An examination of this incident reveals that several factors influenced its outcome.

Training: Prior to the attack, some of the terrorists had received training at al Qaeda camps in Afghanistan, and at least four of the hijackers had learned how to pilot commercial aircraft and had FAA certificates as qualified pilots.³⁹⁹ Information suggests that Khalid Sheikh Mohammed may have provided some of the hijackers with lessons on Western culture and travel.⁴⁰⁰ However, a few of the terrorists—notably Nawaf al Hazmi and Khalid al Mihdhar—were not prepared for life in the United States. Neither man spoke much, if any, English, and they were unfamiliar with Western culture.⁴⁰¹ At the same time, both were able successfully to play their roles in the attacks on September 11. Furthermore, they were experienced fighters—both had fought in Bosnia in 1995 and had visited Afghanistan many times for instruction.⁴⁰² The training of the 19 hijackers was sufficient for this operation.

Technical sophistication: This plan did not require the fabrication of weapons or other technologically advanced techniques. It was a complex plot that required a great deal of planning and coordination, but the weapons and means to be used were relatively simple.

Operational proficiency: To use the aircraft as weapons, four of the terrorists were required to complete training and be licensed to fly commercial airliners. On the day of the attack, the hijacker pilots had to precisely guide the aircraft to the designated targets, requiring a high level of operational proficiency. The muscle hijackers were proficient in their role of subduing the passengers and crew; only on Flight 93 did the muscle hijackers fail in their task of preventing interference with the terrorist pilots.

Terrorist profile indicators: Although some of the hijackers were known for their extremist views in the mid-1990s, after they became involved in the planning for the September 11 operation, they made more of an effort to blend into their surroundings. As mentioned earlier, once Mohammed Atta, Marwan al Shehhi, and Ziad Jarrah returned to Germany after their training in Afghanistan, they distanced themselves from known extremists, shaved their beards, and dressed in Western-style clothing. Atta, considered the ringleader of the plot, was “a near perfect person” to carry out the operation, having no record of terrorist activities and speaking fluent English.⁴⁰³ In contrast, at least two of the hijackers, Khalid al Mihdhar and Nawaf al Hazmi, had come to the attention of the National Security Agency (NSA) before September 11, 2001. By early 1999, the NSA had identified al Hazmi as an al Qaeda associate, and a year later, al Hazmi and al Mihdhar were “in the sights” of NSA personnel; while this information was shared with the U.S.

intelligence community, it does not appear to have been shared with those at U.S. consulates or at the U.S. border.⁴⁰⁴

Terrorist OPSEC: The operational security for this incident can be considered good. According to Khalid Sheikh Mohammed, “only a handful of al Qaeda operatives” knew all of the details of the plot.⁴⁰⁵ Further, once inside the United States, the terrorists made no contact with al Qaeda sympathizers within the country, so as not to disclose their presence.⁴⁰⁶ They used pre-paid calling cards and publicly accessible Internet connections so that their communications would not be intercepted by the U.S. intelligence community or law enforcement personnel. According to a former FBI official, the 19 men “operated flawlessly in their planning [and] communications” in preparation for the attacks.⁴⁰⁷

Innovation: The method of this attack was highly innovative. While it was not the first time that terrorists had considered flying planes into buildings—in both the Air France hijacking by the Armed Islamic Group in 1994 and Operation Bojinka in 1995, those involved considered using airplanes as weapons—the attacks of September 11 mark the first time that terrorists were successful at executing the entire scheme to crash airliners into buildings in simultaneous operations. In addition, using aircraft themselves as weapons helped to ensure that the cost of the entire operation was relatively small. The majority of expenses associated with the plot came from living expenses, travel by the hijackers in the months prior to September 2001, and fees associated with flight training. Since the terrorists had no need to transfer large sums of money, “nothing they did would have led the banks to suspect criminal behavior, let alone a terrorist plot to commit mass murder.”⁴⁰⁸ The innovative nature of the attack thus contributed to the operational security of the plot, allowing the terrorists to move forward with their plans and remain undetected.

Law enforcement or intelligence knowledge: In the months leading up to the attack, U.S. law enforcement and intelligence agencies were aware of al Qaeda’s desire to attack American targets, given its history of previous operations, such as the bombing of the U.S. embassies in Kenya and Tanzania in August 1998 and the suicide attack on the *USS Cole* in October 2000. By late July 2001, U.S. intelligence agencies were receiving the “greatest volume of threat reporting since the Millennium plot,” although the reports hinted at “multiple, possibly catastrophic terrorist attacks being planned against American interests overseas,” rather than at home.⁴⁰⁹ Much of the intelligence reporting about al Qaeda at that time was related to earlier terrorist attacks by the group rather than to the future threat of an event such as the September 11 attacks.⁴¹⁰

Law enforcement and intelligence entities were hindered by the nature of al Qaeda. The threat posed by the group was quite different from the earlier danger of the Cold War-era Soviet Union, and “the large, unwieldy U.S. government tended to underestimate [the threat of al Qaeda] that grew ever larger.”⁴¹¹ Aviation security experts and intelligence personnel appeared to have a difficult time imagining or believing that terrorists would fly airplanes into buildings, although some within the Federal Aviation Administration and other government agencies had considered the possibility of terrorist suicide hijackings or traditional hijackings in the late 1990s.⁴¹² Some of the attacks preceding those of September 11—notably the first attack on the World Trade Center, the bombing at the Alfred P. Murrah Building in Oklahoma City, and the nearly simultaneous bomb blasts at the U.S. embassies in Kenya and Tanzania—had used explosives packed in vehicles, and this may have influenced thinking about future threats.⁴¹³

In early 2001, the Director of Central Intelligence, George Tenet, appointed a senior manager to develop strategic assessments on al Qaeda and its capabilities. To this end, the Counterterrorist Center at the CIA created a strategic assessments division during the summer of 2001. The head of this new branch arrived on the job on September 10, 2001.⁴¹⁴

Now that the innovative, transnational nature of the threat is apparent, Western security services should pay attention to the types of indicators that were present before this attack. For example, Atta, al Shehhi and Jarrah were all studying in Germany, yet traveled to Afghanistan and eventually the U.S. While overseas travel is not by itself a suspicious act, travel to countries known to harbor terrorist training or command elements is worthy of attention, particularly if there is no obvious reason for such travel (family, business) and the travelers move on to potential target countries. Wire transfers are also common, but if small transfers accumulate into large sums, this could indicate the bankrolling of a major operation. In the case of the 9/11 plotters, the purchase of \$50,000 in travelers' checks could have been viewed as an indicator of criminal activity at the very least; authorities should be vigilant for such activity in the future. Another potential indicator is unusual interest in specialized training. Security services must keep in mind that terrorist groups are adaptive and innovative, and such activity may foreshadow a new tactic that will be employed.

Security environment: While there were certainly security measures in place in the United States during the preparation for and execution of the attacks, the hijackers were able to exploit loopholes in the system to their advantage, and their plans were not negatively impacted by the security environment in the United States. None of the hijackers tried to bypass legal entry procedures to enter the United States, but they did take advantage of these procedures.⁴¹⁵ The majority of the hijackers arrived in the U.S. with Saudi passports, and at this time, Saudi citizens rarely overstayed their visas. Based on this information, consular officials felt they had little reason to fear granting visas to the future hijackers.⁴¹⁶

One component of the security system in place on the day of the attack was known as the Computer-Assisted Passenger Prescreening System (CAPPS). This program was designed to identify passengers who would be most likely to require additional security screening prior to boarding an aircraft. FAA rules required that the checked baggage of CAPPS-designated passengers be screened for explosives. Seven of the 19 hijackers were identified for additional security screening as a result of this prescreening program. However, there were no consequences of this selection—four of the hijackers had no checked baggage with them, and although the bags of the other three were screened, they were carrying no explosives. All of the men were cleared to board their flights, having “defeated all of the pre-boarding defense layers the U.S. civil aviation security system mounted on September 11, 2001.”⁴¹⁷

Effective information sharing and international cooperation: There was a lack of effective information sharing and international cooperation in relation to the threat posed by al Qaeda prior to the attacks of September 11, 2001. Members of the 9/11 Commission, after extensive investigation, found that “information was not shared, sometimes inadvertently or because of legal misunderstandings,” and often, the analysis generated from this information was not pooled.⁴¹⁸ Former Central Intelligence Agency Director George Tenet admitted that throughout the U.S. government, there had been no capability to “integrate foreign and domestic knowledge, data operations, and analysis.”⁴¹⁹ Even if there had been sufficient warning prior to the attack, there was no effective dissemination mechanism to “put [the warnings] into action.” Had such a

mechanism existed, this might have provided the means for interdicting the plot in its planning phases. However, many factors, including the innovative nature of the operation (See *Innovation*), complicated the possibility of preventing the terrorists' plans from going forward.

Observant public and/or vigilant security services: Although a few of the men acted in ways that made neighbors suspect their intentions, most of the future hijackers blended in enough to the surrounding population that they did not make the public or local police suspicious. More recent events, such as the failed plot to bring down U.S. airliners with liquid explosives in August 2006, have been foiled because of public sensitivity to suspicious behavior. However, during the summer of 2001, the idea of a major terrorist operation on U.S. soil seemed highly unlikely, and there was less likelihood that citizens would consider any sort of behavior to be indicative of terrorism.

Finally, the *initiative* of the passengers on Flight 93 should be taken into account when examining the factors underlying this attack. The flight departed Newark International Airport 40 minutes late, due to heavy air traffic that morning.⁴²⁰ Consequently, by the time the flight was hijacked, or shortly thereafter, at least some of the passengers were aware of the attacks on the World Trade Center and the Pentagon. Surmising that their aircraft also might be used as a weapon, some of the passengers resolved to overtake the hijackers, and in so doing, prevented the plane from targeting either the White House or the U.S. Capitol Building.

Findings

Many factors led to the success of this plot. While no single factor seems to stand out as having been the most important contributor to the success of this plot, one aspect that appears critical was the innovative method of the attack. Although terrorists, including those affiliated with al Qaeda, had considered this type of operation, it had never been used in practice. Further, al Qaeda's earlier attacks, while often directed against American targets, had all occurred abroad. The September 11 attacks were thus something of a departure from al Qaeda's earlier behavior and caught Americans by surprise.

The good operational security that characterized this plot also was crucial to its success. Very few people knew the full details of the operation, and those who were aware of the specifics did not share the information. Further, the terrorists were careful with their financial transactions, ensuring that they would not come to the attention of bank authorities. The men were also cautious with their communications, using phones and Internet connections that would be difficult to trace back to them or their affiliates.

The planning and training for this plot were thorough, and this also contributed to success. Once the operatives were selected, those who would fly the planes went through hours of flight training to ensure that they would be able to get the planes to the desired targets on the day of the attack. The men who would be responsible for subduing the passengers trained at the gym regularly and were educated in the techniques required for hijacking an aircraft.

All of these factors were critical in the terrorists' success, and the impact of this success is still felt today. The attacks led to heightened security measures at airports, led to the creation of the Department of Homeland Security, increased intelligence spending, and continue to play a role in the psyche of Americans.

THE LIQUID EXPLOSIVES AIRLINE PLOT IN THE UNITED KINGDOM—AUGUST 2006

Overview

In August 2006, British authorities announced that they had arrested more than 20 men who were planning to launch an attack on American airliners traveling from the United Kingdom to the

Type of Attack: Planned detonation of liquid explosives aboard multiple airliners while in flight

Date: As early as August 2006

Group Type: Radicalized British citizens with ties to Pakistan

United States. In close cooperation with international partners, notably those in the United States and Pakistan, British officials had tracked the members of this cell for several months. In the early hours of a Thursday morning in August, they launched a raid, taking the men into custody and averting a potentially catastrophic terrorist attack that might have resulted in the deaths of thousands of innocent people.

Significance of the Incident

As demonstrated by the Air France hijacking in 1994, the Bojinka plot of 1995, and the events of September 11, 2001, terrorist groups have the desire and ability to attack the aviation sector. When violent incidents against airliners succeed, the groups involved generally experience great benefit at low cost.

This plot is significant because it targeted the U.S. airline system and appeared to be well developed and possibly near the execution phase. Further, this incident once again shows the potential capability of homegrown terrorists, such as those who perpetrated the London subway attacks of July 2005, to wreak havoc within Western countries. This thwarted operation may also show the ability of today's terrorists to learn from those who have carried out attacks in the past.

This incident does not mark the first time that attackers intended to use liquid explosives, and it is possible that the men involved in this plot learned from these earlier incidents. Over the past 10 years, triacetone triperoxide (TATP) and other peroxide-based explosives have been used in a number of actual (and attempted) terrorist operations. TATP became popular as the weapon of choice for Palestinian suicide bombers.

In at least two cases, attackers attempted to use liquid explosives in operations that did not go according to plan. Ahmed Ressam, who intended to detonate a bomb at the Los Angeles airport as part of a series of Millennium attacks, was arrested after an observant security guard found liquid explosives in the trunk of his car. Two years later, the so-called "shoe bomber," Richard Reid, tried to detonate an explosive using TATP as the initiator, but was unsuccessful. More recently, the bombers who successfully carried out simultaneous attacks on the London subway system in July 2005 used peroxide-based explosives concealed in their backpacks.⁴²¹ (See the case study on this attack in the previous section.)

Nor does this plot mark the first time that attackers planned to detonate explosives simultaneously on multiple American airplanes while in mid-flight. (See the case study in this section for a detailed explanation of Operation Bojinka.) Similarities between Operation Bojinka and this plot are the use of liquid-based explosives concealed in seemingly innocuous containers and the fact that both plots failed. However, while Yousef planned to use timed explosives, it appears that the

British plot involved the use of suicide bombers. In addition, the liquid explosives in this plot might have required mixing once the attackers were on board the planes, whereas the explosives to be used in Operation Bojinka did not. The Bojinka plot heightened the sensitivity of security services to liquid explosives, but over time, this sensitivity decreased as other tactics emerged. It was not until August 2006, when a group of young men in England were arrested on suspicion of plotting this terrorist attack, that the threat associated with liquid explosives once again grabbed the attention of both the authorities and the general public.⁴²²

Description of the Group or Individuals Involved

The suspects ranged in age from 17 to 35. All but one of the suspects lived in England, either in Birmingham, located in the Midlands; High Wycombe, to the west of London; or within walking distance of one another in or near the Walthamstow district of East London. Rashid Rauf, the only plotter who lived outside the United Kingdom, made his home in Bahawalpur, a town in southern Pakistan, having moved there from Birmingham in 2002.⁴²³

Other than their British citizenship, there were few unifying features among the plotters. While all of the men were Muslim, a few were recent converts to the religion, whereas others were lifelong adherents to the Islamic faith. Some of the men were husbands with small children, while others were university students living with their parents. Many were employed in seemingly ordinary work—among those arrested were a bakery deliveryman, a hospital administrator, and a toy-store clerk. One of the apprehended men was a Heathrow Airport security guard, who may have exploited his insider access, which is one of the vulnerabilities of the commercial aviation sector.⁴²⁴

In many cases, the families and neighbors of those arrested on August 10 had noticed nothing unusual in the behavior of the suspects and were shocked when the men were arrested. According to the father of brothers Mehran, Nabeel, and Umair Hussain—all three of whom were taken into custody—the young men were nothing more than innocent students.⁴²⁵ Like Umair Hussain, suspect Waheed Zaman, 22 years old, was enrolled at London Metropolitan University and was described by a friend as a “nice fellow” who would “never hurt a fly.”⁴²⁶ His sister called him a “very normal boy,” and classmates said that he had called for peace and Muslim integration with Westerners.⁴²⁷ Similarly, Abdul Waheed (formerly known as Don Stewart-Whyte) appeared rather unremarkable to those around him—a local imam called this convert to Islam “harmless,” saying that he would never hurt anyone.⁴²⁸

However, while those who knew the plotters best may have seen little reason to guess that they were in the midst of planning for a terrorist attack, after the arrests, some neighbors commented on changes they had noticed in the men in recent months. In the weeks leading up to August 2006, Tayib Rauf, a brother of the suspect arrested in Pakistan, had taken time away from his work as a bakery deliveryman to attend an intense Islamic course in Bury, Lancashire, located approximately 100 miles from his home.⁴²⁹ A former classmate of Nabeel Hussain indicated that he had recently become stricter in his religious practices, had started attending anti-war rallies in Birmingham and Manchester, and had been barred from using the Internet at school because administrators had discovered that he had been visiting a terrorist website.⁴³⁰ According to a neighbor, another plotter, Tanvir Hussain, had become increasingly angry over British policies toward Israel, Afghanistan, and Iraq and recently had been traveling from London to High Wycombe to visit some new friends there.⁴³¹ Osman Adam Khatib, who lived in Walthamstow,

had become more devoted to Islam within the past year. He, like Hussain, had started spending time with a new set of friends, and because his parents would not allow this group of acquaintances inside the family home, Khatib visited with them outside.⁴³²

Motivation

On August 9, two of the plotters met at a second-floor apartment on Forest Road in Walthamstow. They set up a video camera, pressed “record,” delivered their indictments of the United Kingdom and the United States, and explained why they were determined to die to bring destruction to both countries. The information gleaned from the recordings provides ideas about the plotters’ motivations for their planned attack.⁴³³

According to these men, their planned suicide operation was aimed at taking revenge against the United States and its “accomplices,” namely the United Kingdom and Israel. As one of the young men said, presumably speaking to the United States and its allies, “as you bomb, you will be bombed [and] as you kill, you will be killed.”⁴³⁴ Reciting from the Koran as he sat in front of the video camera, he then encouraged others to join jihad. He rationalized killing American civilians and their allies by saying that they supported war against Muslims “through their tax dollars” and were “too busy enjoying their Western lifestyles” to speak out against American foreign policy.⁴³⁵

At least one other suspect also saw U.S. policy as a justification for action, saying that the ongoing fighting against Muslims in Afghanistan and Iraq had motivated him to act. This sentiment was likely shared by others involved in the plot.⁴³⁶

While the group of British men may have received ideological inspiration from al Qaeda, any deeper connection between al Qaeda and the plotters remains uncertain. One of the men who recorded the August 9 video is said to have taken his “as you kill, you will be killed” statement directly from a November 2002 fatwa released by bin Laden.⁴³⁷

Planning

Using a peroxide-based solution disguised in sports drink bottles packed in hand baggage, the suspects supposedly planned to board transatlantic American flights and detonate bombs once the planes were over the ocean, or, according to some accounts, over major U.S. cities. Their hope was that this type of explosive would escape the scrutiny of airport security screeners and would enable the men to capitalize on the various means of attacking aircraft available to terrorists planning operations against commercial airliners.⁴³⁸ The attackers, thought to be at least eight of those arrested, intended to leave the top of each sports drink bottle sealed and filled with Lucozade (similar to Gatorade), but add a false bottom, packed with a liquid or gel explosive dyed red, to match the color of the sports drink. If the suspects were confronted, they would be able to drink from the top part of the bottle without any ill effects. Initially, authorities suggested that the suspects planned to bomb as many as 10 planes, either simultaneously or over a few hours, bombing three or four each hour. However, British authorities subsequently said that these early accounts were exaggerated and speculative, indicating that the number of planes the suspects intended to attack was lower than the initial reports indicated.⁴³⁹

When the news of the plot was first reported, some U.S. authorities hinted that a dry run of the attack was to occur within two days, followed by the actual operation a few days after that. Evidence collected by the authorities indicates that some of those arrested had been visiting the websites of various American carriers to obtain schedules for travel from the United Kingdom to

the United States on flights that departed at similar times. Possible targets included American Airlines, Continental Airlines, and United Airlines flights originating at Gatwick and Heathrow airports in London and traveling to airports in New York, Chicago, Los Angeles, San Francisco, Miami, and Washington, D.C.—from the heart of England to the centers of American economic, cultural, and political power.⁴⁴⁰

However, subsequent reporting revealed that the plotters had not yet decided which flights to attack. In fact, the men had not yet purchased airline tickets, and at least two of the suspects had yet to obtain passports. While they had requested accelerated approval for their passport applications, they would not have been able to travel to the United States at the time they were taken into custody. Furthermore, while initial reports suggested that the suspects had prepared the explosives for the attack, more recent information indicates that this was not the case. Although the men had obtained some of the materials necessary for creating the explosives, they had not yet prepared, mixed, or tested those materials.⁴⁴¹

Attack

Authorities first became aware of the activities of the alleged plotters shortly after the London transit bombings in July 2005. At that time, some of the residents of Walthamstow—where nine of the suspects would later be arrested—alerted police officers about the intentions of a “small group of angry young Muslim men.”⁴⁴²

By December 2005, several suspects in Walthamstow and Birmingham were under surveillance as part of a counterterrorism investigation called Operation Overt. The domestic British intelligence agency, MI5, tapped the phones, monitored the bank accounts, tracked the email, watched the travel patterns, and bugged the apartments of several young men in Walthamstow.⁴⁴³

Also in December 2005, British officials informed their Pakistani and American counterparts of their activities. Authorities from Pakistan began assisting with the investigation, suspicious that many of the men in Birmingham and Walthamstow had ties to Pakistan, given their Pakistani ancestry. By the end of the year, according to U.S. and European counterterrorism officials, the probe into the activities of the young men involved hundreds of investigators in the United Kingdom, the United States, and Pakistan.⁴⁴⁴

Initially, the inquiry was focused mainly on whether these people had any ties to the men who had carried out the attacks of July 7, 2005, or to terrorist cells in Pakistan. However, in June 2006, one of those under surveillance purchased an apartment in a house on Forest Road in Walthamstow, paying the equivalent of \$260,000, in cash for the second-floor flat, where the martyrdom videos were later recorded. This struck the authorities as worrisome, and their concerns were heightened as they watched the same six young men visit the apartment on multiple occasions. After installing recording equipment in the flat, MI5 agents realized that the men were meeting there to discuss a terrorist attack and to conduct chemical experiments with a sports drink called Lucozade.⁴⁴⁵

During the month preceding the arrests, authorities concluded that the plot was quite advanced, and the suspects’ activities received the undivided attention of security and intelligence personnel from that time onward. In late July or early August, it became clear that the plotters intended to target U.S. airlines. While MI5 and Scotland Yard continued to track the men’s activities on the ground in England, U.S. intelligence officials provided British authorities with intercepts of the group’s communications, according to an American official.⁴⁴⁶

Prime Minister Blair informed President Bush of the unfolding details about the plot during the first weekend of August, telling him that British surveillance indicated that there was a specific threat to U.S. airlines. Blair requested complete secrecy on any details he provided, fearing that premature leaks would compromise the monitoring of the suspects. In the following days, British and American authorities continued to watch the group, keeping all but the most necessary officials out of the loop, so that there was less chance of jeopardizing this critical phase of the investigation. By the second week of August, officials in the United Kingdom were finalizing plans to arrest the suspects.⁴⁴⁷

On August 9, the pace of the investigation accelerated in Pakistan, perhaps at a speed unexpected by the British and American authorities.⁴⁴⁸ On that day (or a few days earlier, according to some accounts) Rashid Rauf, the dual British-Pakistani citizen who had been living in Bahawalpur, was taken into custody by Pakistani authorities. Some have suggested that the arrest was also startling to officials in the United States and United Kingdom who were working on the case. In fact, it may have been Rauf's arrest in Pakistan that prompted the events of the following day thousands of miles away, when several British citizens were taken into custody.⁴⁴⁹

After Rauf was arrested, the British and American investigators were concerned that others suspected of being involved in the plot might go into hiding. Within hours of Rauf's arrest, intelligence sources alerted British officials that someone affiliated with Rauf in Pakistan had tried to contact some of those under surveillance in East London. Investigators worried that the message might be some sort of signal to accelerate the plot and move forward with the attack, although the communication from Pakistan does not appear to have been as explicit as the "go now" directive that was first reported by the European Union's security commissioner.⁴⁵⁰

Regardless of the precise content of the message from Rauf's associate, having conducted intense surveillance for so many months, officials were not inclined to let these suspects slip away. So in the early morning hours of August 10, the police surrounded several homes in East London, High Wycombe, and Birmingham and took more than 20 individuals into custody, after alerting a handful of U.S. officials that arrests were imminent.⁴⁵¹

Following the arrests, British authorities raided a number of locations over the next several days and found chemicals, electrical components, and documents. At the second-floor flat on Forest Road in Walthamstow that had been purchased by one of the suspects in June, the police discovered nearly a dozen empty sports drink bottles, batteries, a bin filled with some sort of liquid, rubber gloves, and a digital camera leaking fluid.⁴⁵²

In addition, in the pocket of one of the suspects, police found a computer memory stick that contained information suggesting that he had looked at the airline schedules for flights from London to various American cities. The same suspect had a list written on a piece of paper that referred to sports drink bottles, batteries, and a reminder to "select a date." Police interpreted this information as a "step-by-step plan for attack."⁴⁵³ By August 21, investigators had conducted 69 searches in Walthamstow, High Wycombe, Birmingham, and other locations and had found more than 400 computers, 200 cellular telephones, and more than 8,000 memory sticks, DVDs, and CDs of information.⁴⁵⁴

Also on August 21, Paul Clarke, Scotland Yard's chief antiterrorist official, announced that several of those taken into custody 11 days earlier had been charged with various crimes, including "Conspiracy to Murder and Preparing Acts of Terrorism," under the British Terrorism

Act of 2006. The majority of those arrested in August 2006 remain in custody in the United Kingdom, where a trial for the suspects is unlikely to begin until sometime in 2008.⁴⁵⁵

Consequences

Because the plot was discovered, no attack occurred. There was short-term system disruption within the United Kingdom, as Heathrow Airport was temporarily closed to most flights from Europe, and several flights from England to cities in the United States were cancelled. Over on the other side of the Atlantic, the Transportation Security Administration immediately implemented changes in screening practices, and those departing from airports in the United States found that they could no longer bring liquids or gels in their carry-on luggage, nor could they bring beverages purchased within the security perimeter onto the plane.⁴⁵⁶ In addition, there was extensive international media coverage of this plot during the first few weeks after it was uncovered.

The psychological impact associated with the public's awareness of this plot can be characterized as moderate. Although there are no data available to indicate the reaction of Britons, Americans, and others to news of the planned attack, it seems likely that they would have been alarmed to hear about it. This would have been especially true in the first few days after the arrests were made, when it seemed as if the attack had been averted at the last minute. At the same time, the psychological impact of this event was not great enough to cause people not to fly. Although this event also had moderate economic impact, the results were not lasting, mainly limited to the extra costs associated with higher levels of security in the United Kingdom and the United States. The British Airports Authority (the owner and operator of London's Heathrow and Gatwick Airports) estimated that it spent the equivalent of \$24.3 million on additional security measures following the arrests of August 10, 2006.⁴⁵⁷

With regard to policy, the threat of liquid explosives exposed by this plot prompted lasting changes in security procedures at airports in the United Kingdom and the United States. Passengers are required to limit the amount of liquids and gels in their carry-on luggage and must carry all items in clear plastic bags, so that they can be easily examined by screeners at security checkpoints. This is evidence of the law enforcement learning that emerges from this plot.⁴⁵⁸

Finally, there is no evidence to suggest that the plot had either a positive or negative impact on the population that would have provided support to the suspects.

Factors Associated With Success or Failure

Although the plot was unsuccessful at the tactical, operational, and strategic levels, there were factors involved that could have contributed to success, had this operation gone forward as planned, as well as factors that ultimately resulted in its failure.

Training: Although the planned operation was described as “sophisticated” by some officials, this characterization may have referred more to the advanced stages of planning rather than to the tactic involved.⁴⁵⁹ This appears to have been a fairly simple operation and required little specialized instruction. The one exception to this may have been mixing the liquid explosives and detonating them once the plotters were on board the airliners. Whether those involved had sufficient training to do this is unknown.

Technical sophistication: Somewhat related to training, there are also uncertainties with regard to the technical sophistication of the plotters. Had the plot gone operational, did the suspects have the know-how to properly manufacture liquid explosives? Would these bombs have been able to destroy the planes? According to a chemist involved in the plot investigation, hexamethylene triperoxide diamine (HMTD), one of the peroxide-based explosives that the suspects may have considered in their plan, is dangerous, in theory. However, the chemist also indicated that whether the alleged plotters had “the brights to pull it off” is not yet known.⁴⁶⁰ Even if they had the skills necessary to mix the explosives properly and were able to smuggle them onto airplanes, at least one U.S. official said he did not know whether those particular explosives would have succeeded in bringing down the planes.⁴⁶¹

Operational proficiency: Since the plot was foiled prior to execution, and there were no known dry runs, there is no information to indicate whether the plotters would have been proficient in assembling the bombs on board the aircraft and detonating the explosives.

Terrorist profile indicators: All of those involved in this plot were British citizens, and with the possible exception of Rashid Rauf, the suspect arrested in Pakistan, the men would have had little reason to draw the attention of the authorities, had it not been for their observant neighbors. (See *Observant public or vigilant security services.*) Described as just “normal guys,” it seems mostly in hindsight that the some of the plotters’ behavior seemed odd to their acquaintances.⁴⁶²

Further, while the suspects would have needed passports to board flights to the United States, as British citizens, they would not have required visas. The U.K. is just one of 27 visa-waiver countries—the visa-waiver program is a reciprocal program that encourages travel between the United States and some of its closest allies. Citizens of visa-waiver countries, such as those who plotted this operation, can board flights to the United States with nothing more than a machine-readable passport, thereby avoiding any scrutiny from American officials prior to arriving in the United States.⁴⁶³

Terrorist OPSEC: The activities of the suspects were under observation from the plot’s early stages, due to the neighbors’ report of their angry behavior sometime after the subway bombings of July 2005. Even if the plotters had practiced good operational security while preparing the attack, it is likely that their plans would have been uncovered before the operation could have been carried out due to existing surveillance by British authorities.

Innovation: Although the planned tactic for this plot was unusual, it was certainly not unprecedented, as the earlier description of the Bojinka plot reveals. As mentioned earlier, the suspects chose liquid explosives because of their belief that the weapons would be able to circumvent the security practices in place in August 2006.

Law enforcement or intelligence knowledge: This factor was also key to the failure of this plot, and once the men were noticed by their neighbors and their behavior was reported to the local law enforcement, the plotters were put under an “unprecedented level” of surveillance that was ongoing for several months before the arrests were made.⁴⁶⁴

Security environment: Although law enforcement personnel, government officials, and the general public were highly cognizant of the possibility of terrorist attacks, given the events of September 11, 2001, and the subway bombings in July 2005, security measures in place in August 2006 might not have prevented the attack, had it entered the operational phase. The suspects chose to use liquid explosives knowing that this tactic would likely pass through existing

security practices without being detected. American aviation experts have indicated that airport screening devices have a difficult time sensing the types of chemicals that the plotters were planning to use in their attack. In addition, British security officials suggested that the same technique might have been used again repeatedly, because detecting the types of materials used to destroy the airliners would have been nearly impossible after the attack.⁴⁶⁵

Effective information sharing and international cooperation: In a plot with international scope, as this one had, effective information sharing domestically and internationally is critical, and both contributed to the failure of this planned operation. Within the United States, government officials said that the plot investigation relied on intelligence agencies and law enforcement entities working together in a seamless, coordinated way.⁴⁶⁶ Internationally, there were frequent communications between British and American personnel investigating the plot, as observation of the suspects continued. Those involved in the law enforcement and intelligence activities in the United Kingdom and United States were described as “joined at the hip,” and this close cooperation was a key factor in the failure of the plot.⁴⁶⁷

Observant public and/or vigilant security services: Of all factors, these two contributed the most to failure of this plot. One of the clearest reasons that this attack did not go forward as the terrorists had planned was an informed and motivated public. According to a senior European intelligence official, British authorities opened their investigation into the plot after receiving the report about the angry young Muslims from worried residents of Walthamstow, who were Muslims themselves.⁴⁶⁸ If these citizens had not called the authorities, this plot might have developed as the suspects had intended. If the residents of that East London neighborhood had not lived through the July 7, 2005, bombings, would they have been concerned about their neighbors? The unraveling of this plot was also a result of effective community policing. Had the residents in Walthamstow been unaware of their local police or uncomfortable sharing information with them, there is a chance that the citizens might not have shared with the local law enforcement concerns about their neighbors. If, having received the report, the police had ignored the information, this might have provided another opportunity for the suspects to continue their activities without surveillance.

Findings

To a great extent, the discovery of the plot was based on the observations of concerned citizens who saw their neighbors acting suspiciously and called the authorities. Those who received the calls were well-trained and recognized that the citizens’ concerns were valid and passed the reports through appropriate channels. As the investigation evolved, existing information-sharing practices facilitated communication both within the United Kingdom and with allies abroad, especially with those in the United States, and the plot was broken up before it could be executed.

Had the observant citizens not noticed their neighbors’ behavior, not thought it worth reporting to the authorities, or been reluctant to report it, or had the authorities done nothing with the information once they received it, the operation might have gone forward as the plotters had intended. Questions remain about whether the men would have been able to manufacture their explosives successfully and whether those weapons would have brought down the airliners. However, given the state of airport screening technology, the terrorists likely would have been able to smuggle the explosives components aboard the planes without detection, bringing them one step closer to their plot to bring down American airliners over the Atlantic.

SECTION IV—FINDINGS

INFLUENCE OF FACTORS

Based on the cases outlined in this study, some conclusions can be drawn regarding the influence of certain factors on the success or failure of attempted terrorist attacks at the tactical, operational, and strategic levels.

Accessibility

While Phase I of this study considered accessibility to be a contributing factor for successful attacks, our findings are mixed. Phase II found that in the cases examined, rail targets are easily accessible. The Aum Shinrikyo attackers, the July 7 bombers, and the July 21 bombers all were able to access multiple targets without hindrance, and there is no reason to believe that the New York City plotters could not have done the same.

However, the more restrictive access for airliners does not appear to have had an impact on the success or failure of those attacks; rather, the level of access merely presented obstacles that were overcome with planning and ingenuity. The Air France hijackers circumvented security by use of disguise and false identification; this is a significant point because it demonstrates the vulnerability of the commercial aviation sector to “insider” attack, whether by those legitimately employed as ground personnel or by those who can provide uniforms and documentation to co-conspirators. And because terrorists have demonstrated a tendency to revive tactics used in the past, it is conceivable that future attempts would also involve such deceptive tactics. In the case of the Bojinka plot, Ramzi Yousef was able to bypass barriers to bringing weapons onboard the Philippines Airlines aircraft in his dry run; there is a good chance he would have been able to do so for the main attack as well. The 9/11 hijackers likewise circumvented such barriers, in their case not once, but on four separate aircraft. And while the liquid explosives plot never reached the execution phase, the plotters had devoted significant time and effort to devise a means to bypass security screening and deploy the weapons on board the aircraft.

Based on the lessons gained from these case studies, it can be concluded that accessibility is not necessarily a significant factor contributing to the success or failure of an attack, but may merely provide an obstacle to be overcome.

Training

The degree to which a terrorist team is ready for execution can influence (but not always determine) the outcome of the initial stages of the attack and its consequences. Two of the most successful operations—9/11 and the July 7 attack—were carried out by well-trained, disciplined teams. Conversely, the July 21 bombers seemed to have all other factors working in their favor, but lack of proper training in the preparation of the main charge resulted in failure of the attack to be carried out as the terrorists had planned. Aum Shinrikyo had the benefit of a cadre of scientists and engineers who had successfully employed chemical weapons in the past; however, despite this high degree of training, the weapons functioned only partially when initiated.

Operational Proficiency and Technical Sophistication

The operational proficiency of a terrorist or group of terrorists refers to their skills, abilities, expertise and aptitude at carrying out their plan and using their weapon(s) effectively. This is not to be confused with technical sophistication, although the two can be correlated. Technical sophistication refers to how complex the plan or weapon(s) are. It does not necessarily follow that a terrorist is more proficient because their plan or weapon(s) are more sophisticated or complex; A terrorist can be proficient at using a simple, non-sophisticated weapon, as well as be proficient at the use of a more complex weapon. Similarly, a terrorist can lack proficiency for using a simple or complex weapon.

Our findings show that the level of sophistication of an attack may or may not correlate with the terrorists' proficiency or more indicators of success or failure. For example, the 9/11 attack required a high degree of technical sophistication by the planners, necessitating acquisition of specialized flight training as well as coordination on the timing of the attacks. The terrorists who executed the attack were operationally proficient because they were able to carry out their attack successfully. The Air France hijacking and plot to destroy the aircraft over Paris, on the other hand, required less sophistication as it was a more traditional hostile airplane takeover. The GIA terrorists needed only to commandeer the aircraft and compel the aircrew to fly to their target, at which time the hijackers only had to detonate the dynamite on board the aircraft, however, they were not proficient enough to carry out their plan in its entirety.

In the Aum Shinrikyo attack, the terrorists created a fairly complex weapon of lethal sarin gas and had a coordinated plan for carrying out their attacks. And while they were able to carry out part of their plan and have operational and strategic effects, they did not have full technical sophistication because the impurity of the sarin they made decreased its lethality and provided a warning indicator—an unusual odor—to potential victims. Nevertheless, the sophistication of Aum's weapon makers was sufficient to create a weapon with lethal effects, thus creating an impact at the strategic level.

One way that terrorists can become more proficient is to conduct dry runs or rehearsals. This type of behavior could be detected by alert security services who perhaps could intervene before an attack occurred. Each rehearsal carries the risk that authorities or an observant public will detect their activity. For complex attacks, the groups may also need training in certain areas that require travel or contact with persons already under surveillance by security services. Even training that is acquired through legitimate means, for example commercial flight training, could raise a group's profile and subject it to scrutiny.

Security measures can increase the level of sophistication and/or proficiency required to carry out an attack successfully. For example, more comprehensive airline screening techniques may have forced terrorists to turn to complicated homemade explosives that require considerable technical proficiency to create, test, covertly deploy, assemble, and detonate. By raising the level of technical sophistication required by terrorists, and increasing the knowledge and training it takes to be operationally proficient, such measures may force groups to increase rehearsals and conduct training that increases the probability that they will be detected before executing the attack. Alternatively, this may redirect the terrorists to other, more easily attacked targets.

Terrorist Profile Indicators

Defending against attack would be much simpler if there were certain indicators that were always present in the background of terrorists. Our analysis, however, finds that this is not the case. There are several factors that *could* be indicators, particularly if present in combination; however, terrorist groups have become adept at recruiting members with no obvious indicators of their intent.

In some instances, terrorists will have participated in earlier attacks. For example, the members of Aum Shinrikyo had conducted several operations, albeit on a smaller scale, prior to their sarin attack. The hijackers of Air France 8969 had also participated in earlier terrorist attacks, and were known members of the GIA. Two of the plotters behind the Bojinka plan—Ramzi Yousef and Abdul Murad—were directly involved in the attack on the World Trade Center in 1993. Gazi Ibrahim Abu Mezer, leader of the plot on the Brooklyn subway, had been suspected of ties to Hamas.

Participation in criminal activity can also be an indicator. Aum Shinrikyo supported its terrorist agenda through money earned in both legitimate and illegal enterprises. Mezer had been arrested twice while living in Canada, and had been involved in several illegal border crossing incidents. One of the July 21 plotters, Muktar Said Ibrahim, spent several years in prison for gang-related robberies.

Severing ties with one's social support structure could indicate involvement in a group that espouses violence. The members of Aum Shinrikyo left their families and adopted the group as their new identity, giving supreme allegiance to Asahara. However, some terrorists do not make such a clean break. Those behind the plots against the London transit system and the planned liquid explosives attack maintained their social and familial ties, while creating new connections with radical extremists. For example, Shehzad Tanweer and Mohammed Sidique Khan were known by MI5 to be in contact with individuals involved in another plot, and possibly with the July 21 plotters. And while some of their families later said they noticed changes in Tanweer and Khan's behavior, they also stated they were shocked when they were connected to the July 7 attacks.

Of note, several terrorists mentioned in this study attended mosques known to authorities for their espousal of violence. London's Finsbury Park Mosque was frequented by three of the July 21 plotters; the terrorists planning to attack the Brooklyn subway attended the radical Al Farooq mosque; Ramzi Yousef also attended Al Farooq prior to the World Trade Center attack in 1993. Security authorities should continue to pay particular attention to suspicious activities that are associated with such venues.

Sometimes terrorists must travel to receive operational instructions or training for their attacks. Pakistan was visited by at least one person involved in Bojinka, the liquid explosives plot, and both plans to attack the London transit system. However, like other indicators, this is not sufficient evidence in itself—thousands of people, particularly those with family ties there, travel to Pakistan every year.

While the presence of such indicators can aid in identifying potential terrorists, they are not a foolproof means of finding such individuals. As the shift to homegrown terrorists exemplifies, terrorist organizations learn our techniques and shift their recruiting strategy to avoid creating a typical profile that can be exploited by security services.

Law Enforcement or Intelligence Knowledge

This factor appears to have a great deal of influence on the success or failure of an operation. Cases in which law enforcement and/or intelligence services were alerted to and/or acted upon suspicious behaviors demonstrated the greatest number of failure indicators. Although the Bojinka plot had progressed through several successful dry runs, the attacks on the airliners did not occur because Philippine authorities were able to discover the details of the plot early enough to interrupt it prior to the execution phase. The New York City subway bomb plot was thwarted because police worked swiftly with the windfall of information they gained and discovered enough details to interdict the plot before the bombers deployed. Probably the best example, though, is the liquid explosives plot. Early intelligence, taken seriously by MI5 and shared with key partners, allowed the authorities to shut down the plot before its execution.

The case studies also indicate the importance of a knowledgeable and sensitized security service that recognizes the importance of early warning and indicators and acts on the information, however incomplete. The Japanese security services had reason to suspect that Aum would continue to conduct violent acts and indeed to escalate the level of violence. However, they did not act against the organization. If Martin Gilbertson's claim is true, that he notified authorities of the suspicious activities of the future July 7 bombers, then this represents another missed opportunity that could have led to failure of that plot on the tactical, operational, and strategic levels. On the other hand, the ability of police and security authorities to recognize the importance of information in the Bojinka, New York City subway plot, and liquid explosives plots reflects the impact that can be gained by leveraging this factor. This requires analytic training of police and intelligence officers, as well as expedited dissemination of current threat information.

Security Environment

There does not appear to be a strong relationship between the security environment and the success or failure of an operation. Restrictive or somewhat restrictive environments did not prevent successes in either the London case, the Air France hijacking, or 9/11; however, restrictive environments may have contributed to failure in the liquid explosives plot, in which the conspirators were under heavy surveillance by authorities. The Aum case transpired in a permissive security environment, yet its successes were mixed.

One could make the argument that the increased security at airports has impacted operational planning by forcing terrorists to shift to other target sets or even other countries. However, there is no specific evidence to support a clear cause and effect relationship.

In some cases, however, restrictive environments can work in the favor of the attackers. First, an attack that occurs despite stringent laws and great latitude for authorities can have a larger psychological and economic impact on both target and friendly populations. Second, attacks that result in a more secure environment—at the perceived cost of certain civil liberties—can lead to a strategic gain for terrorists.

Observant Public and Vigilant Security Services

The case studies indicate that this is one of the most significant factors for causing failure. The clearest example is the failure of the liquid explosives plot. That conspiracy was identified early

because an alert member of the public, sensitized after the July 2005 bombings, turned important information over to security authorities. Since the security services recognized the significance of the information, that plot was likely to fail from that point on. The New York City case was also thwarted because of the tandem factors of an observant public and a well-trained police force.

Other recent examples indicate the value of observant citizens passing information to vigilant security services. Operation Crevice, the investigation of the Britons who intended to create fertilizer bombs, was initiated after an employee of a self-storage facility reported to MI5 that several men were storing suspicious amounts of fertilizer in one of their lockers.⁴⁶⁹ In the U.S., a store clerk reported to authorities that he had been asked to dub a video of men shooting weapons and making jihadist statements.⁴⁷⁰

Effective Information Sharing

This is another factor that the case studies indicate has a significant impact on success or failure. Had information been shared effectively among the Japanese national police, prefecture police, and security service, the threat presented by Aum might have been taken more seriously and the attack thwarted. Conversely, the Long Island Railroad police officers who received the initial report in the 1997 plot shared the information with the New York Police Department, which passed the information to the special operations section that planned and executed the arrest of the plotters. In a similar manner, Philippine security services effectively shared vital information, transforming what would have been a minor incident into a robust counterterrorist investigation that interdicted a major international terrorist plot. As a result, mechanisms that enable local law enforcement to share information with appropriate intelligence nodes should be encouraged. This could include the exchange of liaison officers; creation of incident databases which are accessible by all concerned agencies; and creation of joint task forces with regional or threat-specific focus.

Technical Difficulties

Technical difficulties can be the result of factors within the control of terrorists or of outside influences. For example, the technical difficulties in the July 21 plot were due to the lack of technical sophistication on the part of the bomb maker or makers. However, the sarin released by the Aum attackers may have been rendered less effective by an external factor, namely, the weather conditions. In either case, the success or failure of the operation may hinge on the ability of the attack cell to identify and overcome such difficulties—as Hasib Hussain may have done on July 7 by replacing the power source on his weapon. This is dependent, to a great extent, on the terrorists' level of operational proficiency as well as robust planning which accounts for such possibilities.

International Cooperation

As terrorist plots become more globalized, it is increasingly important that states share information regarding suspects and plots. Even homegrown terrorists, such as those behind the July 7 attacks, often have traveled to other countries, received support from overseas, or in other ways had ties beyond the immediate target country. More robust cooperation between the U.K. and Pakistan might have led to information identifying the conspirators and their plan; one year later, such cooperation, along with information shared with the United States, helped uncover the liquid explosives plot. The details of such cooperation are rarely publicly available, but they often involve bilateral or multilateral agreements to exchange information between the security services

of affected countries. There are issues regarding how much information will be released, particularly regarding sources and methods. However, it is in the best interest of the parties involved to exchange as much information as they can with other states that may have a piece of the puzzle.

In creating such networks of international cooperation, Western states may have to shift from the Cold War mindset. While ties with the U.K., Australia, Japan, and NATO countries remain vital, we must also create relationships with countries we would not have deemed fruitful or trustworthy in the past. Terrorists operate support networks, training, and safe houses throughout South Asia, the Middle East, Africa, Asia, and Latin America. Creating networks of cooperation in these regions would help deny sanctuary from which plans against Western targets are developed.

Terrorist Operational Security (OPSEC)

The case studies indicate that the degree to which OPSEC influences success or failure depends on whether other factors are present: specifically, an observant public, vigilant security services, and information sharing. Lapses in OPSEC can be effectively exploited if any or all of these other factors are present.

The New York City subway plot is a good example of this. The plotters assembled weapons that would have worked as designed, chose a vulnerable target with easy access, and conducted pre-operational surveillance. The plot's failure was due to one instance of poor OPSEC—when one of the terrorists discussed the plot and showed the weapons to a person not involved in the plot who was not vetted. However, had that person not taken the boast seriously, the plan would have gone forward to the execution phase. Likewise, had the informant's report not been taken seriously by law enforcement, the attack would have occurred, most likely the following day.

The liquid explosives plot demonstrates that information sharing is crucial for taking advantage of OPSEC lapses. A member of the community, observant of radical activity in his area, knew to report the activity to authorities. The authorities knew to follow up on this information and were able to avert a catastrophic attack.

Once again, community policing can be an important catalyst. Police officers who are embedded within strategic communities are more likely to be trusted and therefore receive reports indicating potential violence. At the same time, they are more likely to recognize incidents that are out of the ordinary that merit further investigation.

Innovation

Innovation appears to provide an element of surprise important for successfully executing an attack, particularly where there are stringent security measures. The innovation of hijacking an aircraft with box cutters and knives and of using aircraft as weapons provided the tactical surprise necessary for successful execution of the 9/11 attacks. In fact, the only aircraft not to reach its target was also the only one where the element of surprise had been lost. The passengers on that flight knew that aircraft were being crashed into buildings, and they reacted by attempting to wrest control back from the hijackers. The use of home grown terrorists in the July 7 plot achieved tactical surprise because most previous terrorist attacks were executed by non-natives; furthermore, their use of suicide tactics was innovative for Western Europe. Aum achieved a

degree of success because the use of chemical weapons on a subway train was innovative and something for which Japanese authorities were not prepared.

Innovation can also have an impact in the form of media coverage—such attacks tend to garner more publicity than the repeated use of a standard tactic. Media coverage of the liquid explosives plot seemed driven not just by the magnitude of the potential damage, but also by the innovative means devised by the terrorists for bringing the explosives on board.

Innovation also can result in psychological impact by adding a new dimension of vulnerability to the target population's psyche. The 9/11 attacks left a greater feeling of vulnerability for the flying public, generating severe economic impacts for the airline industry and others dependent on this mode of travel.

POLICY IMPLICATIONS

One point stands out from the incidents examined in this study: terrorists are rarely caught in the act during the execution phase of an operation. We know of no instance of a modern terrorist attack in the United States that was averted because a terrorist's weapon was found during screening or because the attacker was identified and apprehended while attempting to execute the attack. In fact, the only cases where terrorist attacks have failed during the execution phase have occurred when there has been a technical failure, such as Richard Reid's shoe bomb or the July 21 bombing attempt—and such failures are not the result of any measure taken by security services.

This is not to say that it is not vital to employ screening equipment, air marshals, and other measures as a last line of defense against attack. Not only are these activities necessary to thwart plots that have not been detected, but they also induce uncertainty and create obstacles that necessitate additional reconnaissance, dry runs, and other actions which could be observed in the pre-execution phase.

However, history shows that security services are most effective in interdicting terrorist plots prior to the execution phase, that is, before the attackers have deployed to their targets to commence the attack. This is reflected in the importance of law enforcement and intelligence knowledge of a plot's details; that factor, in turn is dependent on other factors. Poor OPSEC on the part of the terrorists can have a tremendous impact on success or failure, but only when other conditions are in place. *Security services can not "cause" poor OPSEC, but they can create the conditions to capitalize on these mistakes when they occur.*

Observant Public

There must be an observant and sensitive public that recognizes potential indicators of terrorist planning. This effectively creates a wider surveillance net for reporting potential attack planning. The British have been effective in creating an atmosphere in which the citizenry note and report activity they regard as suspicious, creating a more difficult operational environment for terrorist planners.

Aware and Responsive Law Enforcement and Security Forces

The security apparatus should be knowledgeable and sensitive to reports that may indicate potential terrorist planning—in other words, they should be trained to know when a report merits further investigation or when what appears to be a simple criminal enterprise may be part of a larger terrorist conspiracy.

For example, law enforcement should give special attention to reports from within the Muslim community or other enclaves of potential radicalization. Members of such communities are sensitive to unusual activity, and may receive information in confidence from acquaintances that have knowledge of potential attacks. Such information led to the disruption of the plan to bomb the New York subway and the liquid explosives plot.

Security services should also pay close attention to reports of unusual spikes in specialized training. If the reports of Arab males enrolling in commercial aviation classes had been pursued, the 9/11 plot may have been disrupted. Other examples could include martial arts, scuba, and computer security. Authorities should also pursue reports of unusual requests—for example, if

only certain portions of a training syllabus are requested, if payment is in cash, or unrealistic training timelines are demanded.

Likewise, authorities should be sensitive to reports of the acquisition of large quantities of certain materials, such as hydrogen peroxide, cell phones, or electronic watches. Smaller quantities of items in combination could be suspicious as well: for example, hydrogen peroxide, acetone and drain cleaner. Other sensitive items may be stolen or acquired surreptitiously, as was the case with airport uniforms and credentials used in the Air France hijacking.

Immigration violations should be scrutinized. While some terrorists can find legal means of entering the U.S., and homegrown terrorists are already present, past history indicates that some terrorists could have been stopped before entering the U.S. The two men behind the plot to bomb the New York subway benefited from lax procedures regarding immigration: Mezer had been apprehended three times and was free on bail, while Khalil was never asked to prove that he was in transit through the U.S. on his way to Ecuador. Also, prior to the 1993 attack on the World Trade Center, Ramzi Yousef's travel companion was denied entry; his own passport was not detected as a forgery.

The police also should continue to be trained to observe indicators of suspicious behavior. It is much more likely that police will spot a person's behavioral indicators than an actual weapon; in fact, terrorist methods of attack change frequently, yet patterns of behavior generally do not. Such training could also aid in the detection of terrorists during dry runs and reconnaissance; this further assists in detecting attacks in the pre-execution phase. One specific example would be recognition of suspicious behaviors, body language, or facial expressions. Such training could lead to the detection of terrorists conducting pre-operational surveillance, a dry run, or execution of an attack.

Sufficient resources also should be allocated to investigative agencies. Past incidents have indicated that some terrorists have been known by security services, but lack of resources prevented full investigation of their activities.

Community Policing

Community policing has the potential to increase both the sensitivity of the public and the awareness of security forces. Police who are embedded in communities know—and are known by—the residents. Observant citizens are more likely to approach such police officers with information regarding suspicious activity. Those officers familiar with the daily activity, demographics, and other contextual information are more likely to recognize information that merits investigation.

Information Sharing

Finally, information must be shared both horizontally and vertically. Police and security services need to have open conduits of information exchange with their counterparts due to the mobility and globalization of the terrorist threat and they must be able to share information upward, where separate threads of information can be woven together, and downward, where information can be used to sensitize frontline enforcers to threats they should be watching for. That information sharing also needs to cross international boundaries; nearly every terrorist plot since 9/11 has had some international dimension, whether it involves movement of resources, training, recruiting, or safe haven.

APPENDIX A—EXPANDED METHODOLOGY

We established criteria for selecting the incidents used in this study in order to determine which cases are most informative for future policy and strategy. The cases needed to meet the first criterion and at least one of the other criteria.

- *Is there evidence of clear ties to a terrorist plan?* The incident could not be an accident or conducted by a disgruntled or mentally ill individual. Rather, they must conform to the definition of terrorism used in Phase I: “The unlawful, calculated, premeditated use of violence or the threat of violence, directed against noncombatant persons or property, both tangible and symbolic, to coerce or intimidate a civilian population or government, in the pursuit of goals that are generally religious, political, social, or ideological.”
- *Does the incident demonstrate terrorist learning, either as precedent or refinement of prior tactics?* This criterion was meant to capture whether the adversary has learned from past incidents, or whether more recent attacks refined techniques or used lessons learned from the previous incident. One of the most significant trends that research has identified is that terrorist individuals and groups apply lessons from both successes and failures of past attacks in order to plan new attacks. As one study stated, “a terrorist group skilled in learning can find solutions to many problems, modify tactics and behaviors, systematically fulfill its needs, and advance its strategic agenda by design.”⁴⁷¹
- *Does the case demonstrate some aspect (for example, tactic, group characteristic, target) that is believed to be a significant threat in the future?* Some cases raise issues that are a cause of concern for the future, due to their gravity or difficulty in countering. For example, attacks with chemical, biological, or radiological weapons have been rare but are nevertheless a cause of great concern to security services around the world. Therefore, those cases that indicate a well-developed capability or mature plan to conduct an attack with such a weapon (or similarly severe weapon or tactic) warranted analysis.
- *Does the case demonstrate any particularly informative counterterrorism approaches?* Because the ultimate intent of this study is to draw executable policy implications and inform decision makers regarding measures that could frustrate future attacks on U.S. interests, incidents demonstrating countermeasures that have been successful in the past provided valuable information. For example, an analysis of the points in an attack path which may be vulnerable to disruption or to countermeasures could be useful for current and future counterterrorism efforts.
- *Does the incident demonstrate a significant shift in terrorist trends?* Terrorist tactics, targets, and location of attack vary over time; however, some of the changes which occur may result in a major shift in the threat environment. For example, the attacks of 9/11 caused the aviation sector to increase various security measures, and the attacks on the London Underground in 2005 marked an awareness of the emergence of a new “homegrown” terrorist threat.

Data Sources

The data sources used to collect information included interviews with subject matter experts, such as federal security officials, police, foreign diplomats, and members of the aviation and rail communities;⁴⁷² Government documents; Congressional testimony; commission reports; academic journal articles; and media reports. In addition, we consulted classified intelligence reports to guide our analysis. The research team had access to databases up to the Top Secret/Sensitive Compartmented Information level. While this information was very useful in framing our conclusions, no classified data were included in the report.

Evaluation of Data

In Phase II, we continued to refine the approach to the defining the success or failure of an operation. This is a difficult analytical problem, since ultimately this is a subjective and somewhat arbitrary determination. Furthermore, attacks can be successful at some levels and failures at others.

As in Phase I, the terms “success” and “failure” are from the terrorists’ perspective: a successful attack is one in which the terrorists are able to inflict casualties or damage or otherwise harm the interests of the target nation. Conversely, a failed operation is one that is not initiated, either due to technical difficulties with the weapons or because authorities uncover the plot before the attack can be carried out as the terrorists had planned.

In Phase II, we decided to examine “success” and “failure” at tactical, operational, and strategic levels. For the purpose of this study, those levels are defined as follows:

- **Tactical:** Immediate damage from a weapon or other method of attack—for example, the infliction of casualties and material damage due to the effects of the weapon.
- **Operational:** Systemic disruption or other effects lasting weeks or months, such as widespread media attention.
- **Strategic:** Lasting effects enabling terrorists to achieve long-term goals, such as changes in foreign or domestic policy or long-term economic or psychological damage.

For data evaluation purposes, we created three matrices to evaluate each case systematically, and so that possible trends and patterns could be identified. The first (Attack Path Matrix) breaks down the event into the steps required to plan and execute the attack. The second (Success Indicator Matrix) analyzes indicators of success or failure at the tactical, operational, and strategic levels, and is divided into pre-execution and execution phase factors. These indicators determine the degree to which an attack or attempt was successful at each of the three levels. *It is possible for an attack to have the attributes of success at some levels and attributes of failure at others.* The final matrix (Factors Matrix) examines factors that our analysis indicates have an impact on the success or failure of an operation; in other words, the first matrix shows the “how,” the second matrix shows the “what,” and the third depicts the “why.”

The information from the matrices was then analyzed to allow us to determine whether any patterns or similarities exist between the cases.

Each case study is then presented in a narrative format to portray the facts and issues involved. The information gleaned from the three matrices is detailed in the narrative, and conclusions are drawn from that data.

Description of Matrices

The **Attack Path Matrix** divides the plot into the steps required to conduct an attack. The matrix includes the following categories into which we either entered information or chose from a list of response options:

- Planning Phase
 - *Target Selection*: What target did the terrorists select, and what (if anything) do we know about why they picked that target?
 - *Method Selection*: What method did the plotters use or plan to use? What (if anything) do we know about why they chose that method?
 - *Personnel selection*: Was this a centralized and formal process—for example, did al Qaeda dictate that certain skill sets were needed, or that it would vet all participants for suitability? Or was this an informal group of people who knew one another?
 - *Intelligence Gathering and Surveillance*: Did the terrorists surveil the target area? Did they take photos and test responses? Did they gather information about schedules and security measures?
 - *Logistics, Resources, Materiel, and Support Network*: How did those involved arrange for materials, money, logistics (such as cars and apartments), and passports or visas? Were they self-supporting, or did they have a separate support cell, or an outside benefactor such as al Qaeda?
 - *Training (including rehearsals and dry runs)*: Did the terrorists test their weapon design? Did they conduct any dry runs? Did they undertake any special training (for example, flight school or martial arts)?
 - *Weapon Assembly*: At any point did the plotters assemble a working weapon for the attack (not for testing the design)?
- Attack Phase
 - *Stage for attack*: Were those involved able to get everyone with all necessary materials to the right place at the right time for the attack?
 - *Execute Attack*: Were the terrorists able to initiate the attack successfully? Did the weapon work?

The **Success Indicators Matrix** includes the following indicators of success or failure, divided by phase and level of operation:

- Pre-Execution Phase
 - Tactical: Was the cell penetrated or compromised?
 - Operational: Was a larger network penetrated or compromised?
 - Strategic: There are no indicators at the strategic level in the pre-execution phase.

- Execution Phase
 - Tactical:
 - Was the attack initiated?
 - Did the weapon(s) function as intended?
 - How many were killed?
 - How many were injured?
 - What material damage resulted from the effects of the weapon?
 - Were any cell members arrested or killed?
 - Operational:
 - To what degree was the system (for example, subway or air travel network) disrupted?
 - Was there extensive media coverage of the event?
 - Was the attack against a symbolic target?
 - Was a larger network penetrated or compromised?⁴⁷³
 - Strategic:
 - What is the extent of psychological impact?
 - What is the extent of economic impact?
 - Did the plot result in any foreign or domestic policy changes?
 - What was the impact of the plot on supporting populations?

The **Factors Matrix** illustrates factors that could contribute to the results of the Success Indicators Matrix. Those factors could be attributes of the adversary or of security services:

- Adversary:
 - *Terrorist Training*: Were the plotters trained well enough to execute the plan successfully?
 - *Technical Sophistication*: Did they possess skills commensurate with the plan—such as assembling a complex weapon?
 - *Operational Proficiency*: Did those charged with actually executing the attack possess the ability to perform their roles and to react to unforeseen circumstances?
 - *Terrorist Profile Indicators*: Were the plotters on watch lists, did they have known terrorist connections, or did they exhibit any other characteristics that would normally lead to interest from security services?
 - *Terrorist OPSEC*: How well were the plotters able to hide their intentions from outsiders?
 - *Innovation*: Did the terrorists use a new and innovative technique?

- *Technical Difficulties*: Did the plotters encounter technical difficulties with their equipment or other aspects of their plan?
- Security Services:
 - *Access*: Was access to the target restricted?
 - *Law Enforcement or Intelligence Knowledge*: How much did security authorities know about the plot?
 - *Security Environment*: Were the legal and security structures in the target country permissive or restrictive for those planning terrorist acts?
 - *Effective Information Sharing (horizontally and vertically)*: Was information passed to different levels and across jurisdictions?
 - *International Cooperation*: Was information effectively shared between countries?
 - *Observant Public and/or Vigilant Security Service*: Were the public reporting suspicious activity? Do security or law enforcement services take reports seriously and act upon them?

These factors interact and influence each other. For example, a high number of terrorist profile indicators would make it difficult for the terrorists to maintain OPSEC, while increasing the likelihood that an observant public and vigilant security services would take note of suspicious activities. After each case was examined using the three matrices, the research team determined the “lessons learned” that stood out from the analysis. After all case studies were analyzed, the team looked across the cases for trends and commonalities; these informed the final conclusions and policy recommendations.

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ENDNOTES

Overview of Methodology

¹ Strictly speaking, the term Operation Bojinka refers only to the plot to destroy the airliners over the Pacific Ocean. The tentative plans to attack CIA headquarters and to assassinate the Pope were associated with that effort; therefore, for the sake of brevity, Operation Bojinka will refer to all three efforts in this report.

Specific Vulnerabilities of Passenger Rail Systems

² Interview with DOT Official on January 8, 2007; Interview with TSA Official on February 2, 2007; “Backgrounder—Targets for Terrorism: Ground Transportation,” *Council on Foreign Relations*, July 13, 2006, accessed from http://www.cfr.org/publication/10198/targets_for_terrorism.html on January 10, 2007.

³ Jack Riley, “Testimony: Terrorism and Rail Security,” presented to the Senate Commerce, Science, and Transportation Committee, March 23, 2004, p. 4, accessed from RAND Corporation website at http://www.rand.org/pubs/testimonies/2005/RAND_CT224.pdf on February 28, 2007.

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Findings

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Expanded Methodology

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