Regulatory Assessment

&

Final Regulatory Flexibility Act Analysis

for the final rule

Passenger Manifests for Commercial Aircraft Arriving in and Departing from the United States; Passenger and Crew Manifests for Commercial Vessels Departing from the United States

Elena Ryan, Regulatory Economist
Office of Regulations and Rulings
US Customs and Border Protection
Department of Homeland Security

July 2007

Acronyms

APIS	Advance Passenger Information System
AQQ	APIS Quick Query
CBP	US Customs and Border Protection
EO	Executive Order
FBI	Federal Bureau of Investigation
FR	Federal Register
IATA	International Air Transport Association
ICE	US Immigration and Customs Enforcement
OMB	Office of Management and Budget
PV	Present Value
TSA	Transportation Security Administration
VSL	Value of a Statistical Life

Contents

Appendices

Tables

Executive Summary

The primary purpose of this final rule is to prevent passengers that have been identified as high-risk on government watchlists from boarding aircraft bound for or departing from the United States and to prevent passengers and crew so identified from departing on vessels leaving the Unites States. On April 7, 2005, US Customs and Border Protection (CBP) published requirements for the transmission of passenger and crew manifests for aircraft and vessels arriving from foreign destinations or departing to foreign destinations (70 FR 17820). Implementation of the "2005 APIS Rule" (named for the Advance Passenger Information System, the CBP electronic system used to obtain electronic manifest information from carriers) required that information on passengers and crew to be transmitted: no later than 15 minutes after departure for arriving aircraft passengers; no later than 15 minutes prior to departure for departing aircraft passengers; at least 60 minutes prior to departure for arriving and departing aircraft crew; at least 24 hours and as much as 96 hours prior to a vessel's entry at a US port for arriving passengers and crew, depending on the length of the voyage; and 15 minutes prior to departure for departing vessel passengers and crew.

The Intelligence Reform and Terrorism Prevention Act of 2004 (Public Law 108–458) required that a notice of proposed rulemaking be issued to allow for pre-departure vetting for aircraft passengers and cruise vessel passengers and crew. That proposed rule, published July 14, 2006, (71 FR 40035) intended to modify the requirements for arriving and departing aircraft passengers and passengers and crew on board departing vessels such that that information was transmitted at least *60 minutes prior to departure*. Alternatively, air carriers could adopt, in conjunction with CBP, *APIS Quick Query* (AQQ)—a system that would allow carriers to vet passengers individually during the check-in process. Carriers using AQQ would have had to transmit passenger data no later than 15 minutes prior to departure.[1] These changes were to enhance the ability of CBP and other law enforcement agencies to plan and coordinate a more effective response to intercept high-risk individuals before boarding aircraft and before vessels depart.

This final rule will also enhance CBP's ability to intercept high-risk individuals before boarding aircraft and before vessels depart. This rule, however, has been significantly modified in response to public comments received on the proposed rule. Under the final rule, air carriers may, at their discretion, separate their APIS batch transmissions into two parts. The first transmission, at a minimum, will contain primary data elements necessary to conduct complete watchlist screening.[2] This transmission must occur no later than 30 minutes prior to the securing of the aircraft doors. The second transmission will contain the full APIS manifest necessary for compliance with the 2005 APIS Rule.[3] The second message containing the remaining data must be transmitted to

[1] Where departure would have been defined as "push back from the gate."

[2] Primary data needed to screen a passenger against a watchlist includes full name, date of birth, redress number when available, gender, citizenship, status on board the aircraft, travel document type, passport number (if available), and passport country of issuance.

[3] In addition to the primary data: passport expiration date, residency, address (if required), second document type, second document number, Passenger Name Record locator (if available).

CBP no later than 30 minutes after the aircraft doors have been secured. The flight closeout message, indicating all passengers boarded, must be transmitted no later than 30 minutes after departure of the aircraft.[4] Alternatively, air carriers may adopt AQQ and transmit the data any time prior to boarding or prior to the issuance of a passenger's boarding pass. Finally, the definition of departure is remaining "wheels up" as it is under the 2005 APIS Rule. These modifications to the proposed rule should greatly lessen the impacts of the final rule on air carriers and their international passengers, while fully maintaining the security benefits of this rule.

We estimate that the final rule will affect only air carriers, and primarily large air carriers (those that employ over 1,500 employees). We expect certain connecting passengers will be adversely affected: those coming from a foreign airport and changing planes in the US and those coming from one foreign airport, changing planes at another foreign airport, then continuing on to the US. We do not expect originating passengers to be adversely affected, with the possible exception of some Canadian flights. Costs are thus driven by the percentage of air travelers that are expected to miss connecting flights, require rerouting, and experience delay as a result. Additionally, if carriers adopt AQQ, they will incur implementation and transaction costs of AQQ.

We estimate a range of costs in this analysis. For the high end of the range, we assume that passengers will provide APIS data upon check-in for their flights and that all carriers will transmit that data, as an entire passenger and crew manifest, to CBP at least 30 minutes prior to the securing of the aircraft doors. We estimate that this will result in 1 percent of passengers on large carriers and 0 percent of passengers on small carriers missing connecting flights and needing to be rerouted, with an average delay of 4 hours.[5] We also estimate that 5 percent of originating passengers will need to arrive 15 minutes earlier than usual in order to make their flights. For the low end of the range, we assume that all large air carriers will implement AQQ to transmit information on individual passengers as each checks in. We estimate that this will drive down the percentage of passengers requiring rerouting on large carriers, attributable to this rulemaking, to 0.5 percent. The percentage on small carriers remains 0 percent because we assume that small carriers will not implement AQQ; rather, they will continue to submit manifests at least 30 minutes prior to securing the aircraft doors through eAPIS, CBP's web-based application for small carriers. Thus, costs for small air carriers are the same regardless of the regulatory option considered.

The endpoints of our range are presented below. As shown, the present value (PV) costs of the rule are estimated to range from $827 million to $1.2 billion over the 10 years of the analysis (2006–2016, 2005 dollars, 7 percent discount rate).

[4] Where departure is defined as "wheels up."

[5] The 30-minute option was an alternative presented in the Regulatory Assessment for the proposed rule (The Pre-Departure APIS Rule alternative) and was available for review during the public comment period.

Costs of the Final Rule ($Millions, 2006–2016, 2005 dollars)

	High Estimate (30-Minute Option)			Low Estimate (APIS Quick Query Option)		
	Large Carriers	Small Carriers	Total	Large Carriers	Small Carriers	Total
First-Year Costs (2006)	$116	$1	**$117**	$184	$1	**$185**
Average Recurring Costs	$150	$2	**$152**	$92	$2	**$94**
10-Year PV Costs (7%)	$1,168	$14	**$1,182**	$813	$14	**$827**
10-Year PV Costs (3%)	$1,413	$17	**$1,430**	$959	$17	**$976**

We quantify four categories of benefits, or costs that could be avoided, under the final rule: costs for conducting interviews with identified high-risk individuals, costs for deporting a percentage of these individuals, costs of delaying a high-risk aircraft at an airport (either at the origination or destination airport), and costs of rerouting aircraft if high-risk individuals are identified after takeoff. The average recurring benefits of the rule are an estimated $14 million per year. Over the 10-year period of analysis, PV benefits are an estimated $105 million at a 7 percent discount rate ($128 million at a 3 percent discount rate).

The primary impetus of this rule, however, is the security benefit afforded by a more timely submission of APIS information. Ideally, the quantification and monetization of the beneficial security effects of this regulation would involve two steps. First, we would estimate the reduction in the probability of a successful terrorist attack resulting from implementation of the regulation and the consequences of the avoided event (collectively, the risk associated with a potential terrorist attack). Then we would identify individuals' willingness to pay for this incremental risk reduction and multiply it by the population experiencing the benefit. Both of these steps, however, rely on key data that are not available for this rule.

In light of these limitations, we conduct a "breakeven" analysis to determine what change in the reduction of risk would be necessary in order for the benefits of the rule to exceed the costs. Because the types of attack that would be prevented by this regulation are not entirely understood, we present a range of potential losses that are driven by casualty estimates and asset destruction. We use two estimates of a Value of a Statistical Life (VSL) to represent an individual's willingness to pay to avoid a fatality onboard an aircraft, based on economic studies of the value individuals place on small changes in risk: $3 million per VSL and $6 million per VSL. Additionally, we present three attack scenarios. Scenario 1 explores a situation where only individuals are lost (no destruction of physical property). Scenario 2 explores a situation where individuals

are lost and the aircraft is destroyed. Scenario 3 explores a situation where individuals are lost and substantial destruction of physical capital is incurred.

We subtract the annualized benefits of the rule (7 percent discount rate over 10 years) from the annualized costs (high and low estimates) and divide these net costs by the value of casualty and property losses avoided to calculate an annual risk reduction range that would be required for the benefits of the rule to at least equal the costs.

The annual risk reductions required for the rule to breakeven are presented below for the three attack scenarios, the two estimates of VSL, and a range of casualties. As shown, depending on the attack scenario, the VSL, and the casualty level, risk would have to be reduced 0.2 (Scenario 3, 3,000 casualties avoided) to 44.2 percent (Scenario 1, 100 casualties avoided) in order for the rule to "breakeven."

Annual Risk Reduction Required (%) for Net Costs to Equal Benefits (annualized at 7 percent over 10 years)

Casualties Avoided	Scenario 1: Loss of Life Only	Scenario 2: Loss of Life and Aircraft	Scenario 3: Loss of Life and Catastrophic Loss of Property
$3M VSL			
100	30.4–44.2	29.2–42.5	0.4–0.6
250	12.2–17.7	12.0–17.4	0.4–0.6
500	6.1-8.8	6.0–8.8	0.4–0.6
1,000	3.0–4.4	3.0–4.4	0.4–0.5
3,000	1.0-1.5	1.0–1.5	0.3–0.4
$6M VSL			
100	15.2–22.1	14.9–21.7	0.4–0.6
250	6.1–8.8	6.0–8.8	0.4–0.6
500	3.0–4.4	3.0–4.4	0.4–0.5
1,000	1.5–2.2	1.5–2.2	0.3–0.5
3,000	0.5–0.7	0.5–0.7	0.2–0.3

Finally, we also consider the economic impacts of two regulatory alternatives: a requirement for data transmission 60 minutes prior to departure (the rule as proposed without the AQQ option) and a requirement for data transmission 120 minutes prior to departure. In the proposed rule, the chosen alternative was not the least-cost alternative. CBP is now finalizing the more cost-effective regulatory option by allowing data transmission 30-minutes prior to securing the aircraft doors.

In our analysis of impacts to small entities, we certify that the rule will not have a significant economic impact on a substantial number of small entities.

The key assumptions that drive the cost and benefit analyses are found throughout this document and are summarized in the appendices.

1. Introduction

On April 7, 2005, US Customs and Border Protection (CBP) published requirements for the transmission of passenger and crew manifests for aircraft and vessels arriving from foreign destinations or departing to foreign destinations (70 FR 17820). Implementation of the "2005 APIS Rule" (named for the Advance Passenger Information System, the CBP electronic system used to obtain electronic manifest information from carriers) required that information on passengers and crew to be transmitted: no later than 15 minutes after departure for arriving aircraft passengers; no later than 15 minutes prior to departure for departing aircraft passengers; at least 60 minutes prior to departure for arriving and departing aircraft crew; at least 24 hours and as much as 96 hours prior to a vessel's entry at a US port for arriving passengers and crew, depending on the length of the voyage; and 15 minutes prior to departure for departing vessel passengers and crew.[6]

Under the final rule, air carriers may, at their discretion, separate their APIS batch transmissions into two parts. The first transmission, at a minimum, will contain primary data elements necessary to conduct complete watchlist screening.[7] This transmission must occur no later than 30 minutes prior to the securing of the aircraft doors. The second transmission will contain the full APIS manifest necessary for compliance with the 2005 APIS Rule.[8] The second message containing the remaining data must be transmitted to CBP no later than 30 minutes after the aircraft doors have been secured. The flight closeout message, indicating all passengers boarded, must be transmitted no later than 30 minutes after departure of the aircraft.[9] Alternatively, air carriers may adopt APIS Quick Query (AQQ) and transmit the data any time prior to boarding or prior to the issuance of a passenger's boarding pass.

These changes will enhance the ability of CBP and other law enforcement agencies to plan and coordinate a more effective response to intercept high-risk individuals before boarding aircraft. This Regulatory Assessment examines the costs and benefits of these requirements, includes changes to the analysis we are making to address public comments received to the proposed rule, two regulatory alternatives, and the economic impacts to small businesses that will be affected.

This rule is a significant regulatory action under Executive Order (EO) 12866 because it may impose costs of at least $100 million in any one year. CBP is thus required to conduct an in-depth assessment that considers the costs and benefits of the regulatory

[6] "Departure" for aircraft means the point at which the wheels are up on the aircraft and the aircraft is en route directly to its destination. "Departure" for vessels is the point at which the vessel departs the berth.

[7] Primary data needed to screen a passenger against a watchlist includes full name, date of birth, redress number when available, gender, citizenship, travel document type, passport number (if available), passport country of issuance, and status on board the aircraft. With the exception of the status on board the aircraft, this information is contained in the machine-readable zone of a passport.

[8] In addition to the primary data: passport expiration date, residency, address (if required), second document type, second document number, Passenger Name Record locator (if available).

[9] Where departure is defined as "wheels up."

action as well as alternatives. The Office of Management and Budget (OMB) has reviewed this analysis under this EO.

Purpose and Need

This final rule would further enhance the government's capability to counter terrorist threats to the United States, the carrier industry, and the international traveling public as required by section 115 of the Aviation Transportation Security Act, the Enhanced Border Security and Visa Entry Reform Act of 2002, and the Intelligence Reform and Terrorism Prevention Act of 2004. Further background on the purpose and need may be found in the preamble to this final rule.

Currently, under the 2005 APIS Rule, carriers are required to submit passenger manifests no later than 15 minutes after departure for flights en route to the US and no later than 15 minutes prior to departure for flights departing the US. If an individual is identified, the carrier must coordinate a response with CBP to either divert the aircraft to another airport or meet the aircraft at the scheduled airport with a response team. CBP is unable, given the current time of data transmission, to intercept high-risk individuals prior to boarding an aircraft. For flights to the United States, individuals and their baggage are aboard the aircraft, have taken off, and are en route to the United States by the time CBP is able to review the data. For flights departing the United States, CBP cannot complete the screening process before departure and a high-risk individual boards an aircraft.

Thus, the key outcome sought in finalizing this rule is to place CBP in a better position to fully screen traveler information with sufficient time to effectively secure an aircraft or vessel, to effectively identify high-risk travelers and contact domestic and foreign carriers and government personnel to prevent such travelers from boarding aircraft bound for or departing from the US, and to effectively identify high-risk travelers and make appropriate contacts to prevent the departure of vessels from the United States with a high-risk traveler onboard.

CBP believes that for large air carriers the AQQ process provides the most security while imposing the least disruption to the traveling public—high-risk passengers are prevented from boarding an aircraft, baggage associated with those passengers is not laden on the aircraft, and other passengers are not delayed or inconvenienced. CBP recognizes, however, that not all international air carriers will find AQQ feasible at this time. For these carriers, CBP is establishing a "30-minute" regulatory option, where carriers may submit primary passenger data, in batch form, to CBP at least 30 minutes prior securing the aircraft doors. Entire manifests containing all fields of APIS data must be transmitted no later than 30 minutes after departure. Thirty minutes was determined to provide an adequate amount of time to prepare a law enforcement response prior to the beginning of the boarding process while minimizing the cost impacts to industry. Some passengers would be delayed from making their flights under the 30-minute option.

Although this Regulatory Assessment attempts to mirror the terms and wording of the final rule, no attempt is made to precisely replicate the regulatory language and

readers are cautioned that the actual regulatory text, not the text of this assessment, is binding.

Comments to the Proposed Rule

Responses to public comments on this analysis are summarized in the preamble to the final rule. We note throughout this analysis where we have changed assumptions or calculations in response to data provided in the public comments received.

Organization of This Document

Chapter 2 will present an industry profile and regulatory baseline as well as the cost analysis of the rule. Chapter 3 will present the benefits analysis. Chapter 4 will compare the costs and benefits of the final rule plus two regulatory alternatives, and Chapter 5 will present an analysis of the impacts to small entities as required under the Regulatory Flexibility Act.

2. Baseline and Cost Analysis

This chapter details the regulatory baseline and current state of the affected industry, the assumptions used to estimate costs, and the low and high ends of the range of costs we expect industry and the traveling public to incur as a result of the rule, based on two scenarios. The period of analysis is 2006 to 2016. We assume that costs will be incurred beginning in 2006; benefits will be accrued beginning in 2007. Costs are discounted at 7 and 3 percent to their present value (PV) in 2005 dollars. The costs for other regulatory alternatives considered are presented in Chapter 4.

The baseline for the rule is the 2005 APIS Rule published April 7, 2005 (70 FR 17820). The 2005 APIS Rule affected aircraft and vessels arriving from or departing to foreign destinations. This rule covers the same population.

Affected Population

According to CBP databases, there are an estimated 1,280 foreign and domestic air carriers that will be affected by the rule. Of these, 92 are large air carriers (11 US carriers and 81 foreign) and 1,188 are small air carriers (773 US carriers and 415 foreign).[10] According to US Coast Guard and CBP databases, there are 16 cruise-ship companies that own approximately 150 vessels. There are also 12,835 foreign and domestic cargo vessel carriers. An estimated 585 are US-flag vessels certified to operate internationally, while approximately 12,250 are foreign-flag vessels that make ports of call in the United States.

We believe that vessel carriers will not have to make major modifications to their operations because the rule is intended to prevent vessels with identified high-risk individuals from *departing*, not *boarding*. If all individuals aboard vessels had to be vetted prior to boarding, this could require substantial adjustments to cargo operations and boarding procedures, since boarding for vessels begins 3 to 6 hours prior to departure (unlike aircraft where boarding begins 30 to 45 minutes prior to departure). Also, the threat posed by a high-risk passenger or crewmember once onboard a vessel, although serious, is not the same as that posed by a high-risk passenger onboard an aircraft; a hijacked vessel's movements over the water and its range of available targets could be more readily contained. In short, we do not believe that vessel owners and operators will be affected by the rule and will not incur costs as a result of the provisions of this rule; thus, air carriers and their passengers are the affected population considered in this analysis.

Table 1 (next page) presents the number of passengers carried by the affected entities over the period 2006–2016. Based on data from the Department of Commerce, we estimate that international passenger loads are increasing 5 percent annually.[11] CBP also estimates that 95 percent of these passengers travel on large carriers. Of these 95

[10] Large carriers are defined as those that employ over 1,500 employees, per the Small Business Administration.

[11] Department of Commerce, Office of Travel and Tourism Industries (OTTI). OTTI estimates an increase in US and non-US citizen air arrivals of approximately 5 percent annually for the years 2005–2007. In the Regulatory Assessment for the proposed rule, we used an increase of 2 percent annually.

percent, 47 percent travel on US carriers and 53 percent travel on foreign carriers. Of the 5 percent of passengers traveling on small carriers, 65 percent travel on US carriers and 35 percent travel on foreign carriers.

Table 1.
Predicted Passenger Counts for Air Carriers over the 10-Year Period of Analysis

	Large US Carriers (11)	Large Foreign Carriers (81)	Small US Carriers (773)	Small Foreign Carriers (415)	Total Passengers
2006	35,372,971	39,888,669	2,574,740	1,386,399	79,222,779
2007	37,141,619	41,883,103	2,703,477	1,455,719	83,183,918
2008	38,998,700	43,977,258	2,838,651	1,528,504	87,343,114
2009	40,948,635	46,176,121	2,980,584	1,604,930	91,710,270
2010	42,996,067	48,484,927	3,129,613	1,685,176	96,295,783
2011	45,145,871	50,909,173	3,286,094	1,769,435	101,110,572
2012	47,403,164	53,454,632	3,450,398	1,857,907	106,166,101
2013	49,773,322	56,127,363	3,622,918	1,950,802	111,474,406
2014	52,261,988	58,933,732	3,804,064	2,048,342	117,048,126
2015	54,875,088	61,880,418	3,994,267	2,150,759	122,900,533
2016	57,618,842	64,974,439	4,193,981	2,258,297	129,045,559

It is important to remember that US carriers carry non-US citizens and foreign carriers carry US citizens. We do not currently have the data to determine how many of each type of international passenger travels on domestic and foreign carriers, respectively. In this analysis, we consider the impacts to both domestic and foreign carriers because US citizens on both types of carriers could be affected by this rule. If we considered the impacts only to passengers on US carriers, we would be ignoring the US citizens that travel using foreign carriers, which violates the spirit of the type of analysis required under EO 12866.

The 30-Minute Transmission Option and AQQ

Under the 2005 APIS Rule, carriers are required to submit passenger manifests no later than 15 minutes after departure for flights en route to the US and no later than 15 minutes prior to departure for flights departing the US. Additionally, carriers housed and administered the various watchlists used to identify high-risk individuals; under the final rule that information is now housed at CBP. If an individual is identified, the carrier must coordinate a response with CBP to either divert the aircraft to another airport or meet the aircraft at the scheduled airport with a response team. CBP is unable, given the current time of data transmission, to intercept high-risk individuals prior to boarding an aircraft. For flights to the United States, individuals and their baggage are aboard the aircraft and have taken off by the time CBP is able to review the data. For flights departing the United States, CBP cannot complete the screening process before departure and a high-risk individual boards an aircraft.

CBP has determined that changing the transmission requirement either using APIS Quick Query (AQQ, where an individual's data are submitted and the passenger is given a "cleared" message during check-in) or 30 minutes prior to securing the aircraft doors (where an entire manifest is submitted and screened prior to boarding) would allow CBP and other law enforcement officials the opportunity and time necessary to intercept high-risk individuals before the boarding process begins. Under the final rule, carriers using either the AQQ or the 30-minute option may not issue a boarding pass to a passenger who has not received a "cleared" message from CBP.

From a security perspective, AQQ would be CBP's preferred method for receiving a traveler's information. Passengers would provide their APIS information during check-in, as they do now. The data would be transmitted to CBP and a response to allow boarding would be sent in a matter of seconds. The remainder of the check-in process would proceed during APIS transmission and screening, and the passenger would not likely be aware of AQQ occurring. If CBP issued a "not-cleared" notification for a passenger, that passenger would be denied a boarding pass, and his bags would not be put on the aircraft. The passenger would thus not go through security checkpoints or be on airport concourses.

For carriers not able to implement AQQ, CBP is proposing an alternative regulatory option that would require carriers to transmit, at the carrier's discretion, the entire passenger manifest or just those primary data required for watchlist screening at least 30 minutes prior to securing the aircraft doors. If a passenger is in a US airport for a departure to a foreign destination, the carrier may not give the passenger access (i.e., may not issue a boarding pass) to the "sterile area" behind the security checkpoint until the carrier receives a "cleared" message from CBP. If a passenger is in a foreign airport bound for the United States, the carrier may still, in some instances, issue a boarding pass for the passenger but the passenger cannot board the aircraft until a "cleared" message has been received. In these circumstances, CBP requires time to prepare and coordinate a response to a high-risk passenger that has checked in, checked his bags, has likely gone through security checkpoints, and may now be on the airport concourse preparing to board. CBP has determined that 30 minutes is the minimum time possible to intercept a high-risk passenger prior to boarding. A delay of the aircraft may still occur if a high-risk individual has baggage that must be located and removed.

Large air carriers (those with over 1,500 employees) will incur the greatest percentage of the regulatory burden of the rule due to the number of international travelers these entities carry and their method of transmitting APIS data. We believe this rule could affect both originating and connecting passengers. Passengers conducting foreign travel, either coming to or leaving the US, are instructed to check in for international flights well in advance, usually 2 to 3 hours, of departure. Some percentage of originating passengers does not, however, habitually arrive at the airport 30 minutes prior to departure and will now need to arrive earlier. Connecting passengers may not have a full 2 hours between flights. Partnering airlines may share APIS information for an entire trip, but non-partner airlines may not. We believe, therefore, that under a 30-minute option a number of originating passengers will have to arrive at the airport earlier than customary and a number of connecting passengers may not make their flights, will be delayed, and will have to be rerouted. If large carriers implement AQQ,

there should be fewer delays to connecting travelers and originating passengers will not need to modify their arrival times at the airport, as data can be transmitted up to the point where the aircraft doors are secured. Carriers will, however, need to develop and implement their systems to support AQQ.

Under the final rule, small carriers may still use "eAPIS," a web-based application implemented for the 2005 APIS Rule and designed to electronically transmit manifests between small carriers and CBP. We do not believe that small carriers will develop and implement AQQ because they will not find it cost effective given their operations and their current utilization of eAPIS. Thus, we assume that small carriers will exercise the 30-minute option exclusively. While large carriers have connecting flights where affected passengers could face short layover times, small air carriers operate predominantly on charter schedules and make point-to-point trips without connecting flights. As originating passengers, we expect some of them to need to modify their behavior to arrive at their airport earlier than they customarily do.

Analyzing the Costs of Providing APIS Data under the Final Rule

Currently, passengers provide APIS data during the check-in process. The rule does not change that process, but it does not preclude carriers from submitting data earlier, up to 72 hours in advance of departure. Additionally, the final rule provides the carriers the option of submitting only primary data required for watchlist screening (generally, the data obtained from the machine-readable zone of a passport), so long as the carrier submits complete APIS data no later than 30 minutes after departure.[12]

We believe that collecting data in advance of check-in would likely speed up the process because carriers would be verifying data rather than initiating the data collection process. Some carriers may not believe, largely because of issues of liability, that they can accept data in advance from parties such as travel agents and online reservation systems. Some international carriers are prohibited from collecting data in advance due to privacy regulations in other countries. Other carriers may believe that collecting APIS data in advance of check-in is worthwhile and could lead to efficiency gains and better customer service. For this analysis, we assume that carriers will continue to collect data during the check-in process.

We do not know which carriers will implement AQQ versus maintaining the current transmission method and altering the timing of the transmission.[13] There is also likely to be a period of time where carriers will need to comply with the 30-minute regulatory option while they coordinate with CBP to develop and implement AQQ. We thus present two endpoints of the likely range of costs. For our "high cost estimate," we assume that all carriers will use their current transmission methods but will

[12] Where departure is defined as "wheels up."

[13] CBP estimates that as many as 10 carriers could implement AQQ. For the purposes of estimating the potential low endpoint of the range of costs, we have assumed that all carriers implement AQQ. While CBP believes that 10 carriers converting to AQQ is a realistic expectation, for this analysis we cannot determine which carriers these are, how quickly they will implement AQQ, where they fly, or how many passengers they carry; thus, the endpoints of the range of likely costs are estimated.

transmit the entire manifest at least 30 minutes prior to securing the aircraft doors (rather than 15 minutes after departure as they do now) for the entire 10-year period of analysis. For the purposes of this estimate we assume that the carriers will submit their complete APIS manifests no later than 30 minutes prior to securing the aircraft doors and will not transmit the primary data separately from the complete manifest. For our "low cost estimate," we assume that all carriers will convert their transmissions to the AQQ system immediately and will use AQQ throughout the 10-year period of analysis.

The true cost of the rule will most likely lie between these two endpoints, as some carriers will implement AQQ immediately, some in the more distant future, and others not at all. We also assume that in both the high and low cost estimates, small carriers will continue to use eAPIS to transmit data and will comply with the 30-minute regulatory option. The system is relatively simple, is web-based, and does not require any further investments on the part of small carriers. As previously stated, we do not think small carriers will find developing AQQ cost-effective, but this rule does not preclude them from implementing AQQ if they so choose.

The 30-Minute Option—High Cost Scenario Assumptions and Costs

In this scenario, we assume that carriers will continue to submit the manifest in its entirety using their existing computer systems but will now submit it at least 30 minutes prior to securing the aircraft doors. As previously stated, we expect some originating passengers to be affected by a 30-minute requirement because most, but not all, passengers are checked in well in advance of 30 minutes prior to departure. Additionally, a small percentage of connecting passengers may be delayed and rerouted. The 30-minute option was an alternative presented in the Regulatory Assessment for the proposed rule and was available for review during the public comment period. The 60-minute option originally proposed has been retained as a regulatory alternative (see Chapter 4).

Associations representing the air carrier industry could not precisely estimate the percentage of passengers that could potentially be delayed as a result of this rule. We received comments to the proposed rule with specific estimates of passenger delays for carriers testing AQQ. Per the International Air Transport Association (IATA), the vast majority of passengers traveling to the United States make connecting flights once arriving at their first US destination.[14] These passengers must have data transmitted for the inbound flight, but not for the connecting domestic flight. Only a small percentage of passengers arrives from a foreign airport, changes planes, and then continues on to a foreign destination. For example, it is unusual for a passenger to fly from London to Miami, then switch planes and fly to Mexico City; the passenger is more likely to take a direct flight from London to Mexico City. A larger percentage begins a journey in a foreign airport, travels to another foreign airport, then changes planes to connect to a carrier coming to the United States; for example, a passenger begins his journey from New Delhi, then changes planes in Rome to come to New York City. Flights to and from Canada may operate more like domestic US flights than international flights, and travelers may not be advised to arrive 2 hours prior to

[14] IATA response to CPB One-Hour Rule Questionnaire. August 2004.

departure for Canadian flights and travelers may treat Canadian flights more like domestic ones. Thus, passengers to and from Canada may be occasionally delayed as a result of this rule if international carriers servicing Canada and the US do not implement AQQ. Finally, while passengers are advised to arrive 2 to 3 hours prior to their international departures, some passengers may need to arrive earlier than they customarily do to ensure they make their flights.

The total percentage most likely affected was not available from IATA, air carriers we contacted, public comments, or CBP data. IATA did provide an estimate that 80 to 90 percent of international passengers arrive more than 60 minutes prior to departure and that over 95 percent of international passengers arrive more than 30 minutes prior to departure.[15] We did not receive any additional estimates during the public comment period, though many air carriers and their associations stated that a 30-minute timeframe would be a more "workable option" for their operations. For this scenario, we assume that 5 percent of passengers on both large and small carriers will arrive at their *originatin*g airport 15 minutes earlier than usual, and 1 percent of passengers traveling on large carriers and 0 percent of passengers traveling on small carriers will not make *connecting* flights.[16]

Costs of arriving early are accrued by the passenger. We estimate that 5 percent of originating passengers will arrive an average of 15 minutes earlier than customary. Each hour of traveler time is worth an estimated $28.60.[17] Arriving 15 minutes early would thus cost $7.15. Costs of missing connecting flights are imposed on both the traveler and the carrier that must reroute the traveler on another flight. We estimate that a missed flight will typically result in a 4-hour delay for the passenger and would thus cost a traveler $114.40. The hourly wage for a ticket agent is $14.07.[18] The "loaded" labor rate for this agent (which includes fringe benefits) is $18.29 using a load factor of 1.3.[19] We estimate that it takes 15 minutes to reroute the passenger, for

[15] IATA response to CPB One-Hour Rule Questionnaire. August 2004.

[16] As originally proposed with a 60-minute option, 15 percent of passengers on both large and small carriers would arrive at their originating airport 15 minutes earlier than usual, 2 percent of passengers traveling on large carriers, and 0.25 percent of passengers traveling on small carriers would not make connecting flights. These assumptions have been maintained in the analysis of alternatives presented in Chapter 4.

[17] FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004. The estimate is the reported average of personal and business travel and is expressed in 2000 dollars. To be consistent with Department of Transportation policy, we are not modifying this estimate to account for inflation. Because this is based on American wage rates it may overvalue the value of time for foreign travelers who have lower wages. Because this value is weighted heavily by domestic air travelers, however, it may also understate the value of time of most international travelers, who tend to have higher wages both domestically and abroad. CBP believes this is a reasonable approximation of the average value of a traveler's time.

[18] Bureau of Labor Statistics data for transportation ticket and reservation agents. Value is expressed in 2003 dollars and is not modified to account for inflation.

[19] FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004.

a cost of $4.57. The total cost for one passenger being delayed and rerouted is thus $118.97.[20]

Large Carriers

In 2006, the first year that costs will be incurred, there will be an estimated 75,261,640 international passengers traveling on large carriers (35,372,971 on US carriers; 39,888,669 on foreign carriers).[21] If 5 percent of these passengers must arrive at the originating airport early, this will result in an estimated cost of $27 million (75,261,640 passengers × 5 percent × $7.15 ≈ $27 million). If 1 percent of these passengers are delayed and rerouted, this will result in an estimated cost of $90 million (75,261,640 passengers × 1 percent × $118.97 ≈ $90 million). These costs are expected to increase over the period of analysis as passenger loads increase. Average recurring costs over the 10-year period of analysis are an estimated $150 million per year (undiscounted).

The 10-year costs for large carriers are summarized in Table 2. Present value (PV) costs are presented at 7 and 3 percent discount rates.

Table 2.
PV Costs for Large Carriers and Passengers under the 30-Minute Option

	US	Foreign	Total	PV at 7% Discount Rate	PV at 3% Discount Rate
2006	$54,730,033	$61,716,846	$116,446,879	$116,446,879	$116,446,879
2007	57,466,535	64,802,688	122,269,223	114,270,302	118,707,984
2008	60,339,862	68,042,823	128,382,684	112,134,409	121,012,993
2009	63,356,855	71,444,964	134,801,819	110,038,438	123,362,760
2010	66,524,698	75,017,212	141,541,910	107,981,645	125,758,153
2011	69,850,932	78,768,073	148,619,005	105,963,297	128,200,059
2012	73,343,479	82,706,476	156,049,955	103,982,674	130,689,381
2013	77,010,653	86,841,800	163,852,453	102,039,073	133,227,039
2014	80,861,186	91,183,890	172,045,076	100,131,800	135,813,972
2015	84,904,245	95,743,085	180,647,330	98,260,178	138,451,136
2016	89,149,457	100,530,239	189,679,696	96,423,539	141,139,508
Total				**$1,167,672,235**	**$1,412,809,864**

Complete detail of these costs can be found in Appendix A-1.

[20] Commenters to the proposed rule stated that the estimated 4-hour delay and 15 minutes of ticket agent time were too low. While we continue believe that these estimates are reasonable for the average traveler delayed, we present two sensitivity analyses in Appendix A where we relax these assumptions. We present costs for an 8-hour and 24-hour delay for the passenger and 1 hour of time needed for the ticket agent (or a combination of agents) to reroute the passenger and secure accommodations. These estimates should be considered "worst-case."

[21] See Table 1.

As shown, under the scenario where all large carriers transmit the entire manifest at least 30 minutes prior to securing the aircraft doors, the PV 10-year costs are expected to reach approximately $1.2 billion at a 7 percent discount rate. Approximately 3 percent will be incurred by the carriers; the remaining 98 percent will be incurred by the passengers that travel on the large carriers in the form of opportunity costs.

Small Carriers

In this scenario, we estimate that 0 percent of passengers on these carriers will be delayed. Thus, the cost for passengers aboard small carriers is arriving at the airport earlier than is customary. In 2006, the first year that costs will be incurred, there will be an estimated 3,961,139 international passengers traveling on small carriers (2,574,740 on US carriers; 1,386,399 on foreign carriers).[22] If 5 percent must arrive 15 minutes early at the airport, this will result in an estimated cost of $1 million (3,961,139 passengers × 5 percent × $7.15 ≈ $1.4 million). Average recurring costs over the 10-year period of analysis are an estimated $2 million per year.

The 10-year costs for small carriers are summarized in Table 3. PV costs are presented at 7 and 3 percent discount rates.

Table 3.
PV Costs for Small Carriers and Passengers under the 30-Minute Option

	US	Foreign	Total	PV at 7% Discount Rate	PV at 3% Discount Rate
2006	$920,470	$495,638	$1,416,107	$1,416,107	$1,416,107
2007	966,493	520,419	1,486,913	1,389,638	1,443,604
2008	1,014,818	546,440	1,561,258	1,363,663	1,471,636
2009	1,065,559	573,762	1,639,321	1,338,174	1,500,211
2010	1,118,837	602,450	1,721,287	1,313,162	1,529,341
2011	1,174,778	632,573	1,807,351	1,288,617	1,559,037
2012	1,233,517	664,202	1,897,719	1,264,530	1,589,310
2013	1,295,193	697,412	1,992,605	1,240,894	1,620,170
2014	1,359,953	732,282	2,092,235	1,217,700	1,651,630
2015	1,427,951	768,896	2,196,847	1,194,939	1,683,700
2016	1,499,348	807,341	2,306,689	1,172,604	1,716,394
Total				**$14,200,029**	**$17,181,140**

Complete detail of these costs can be found in Appendix A-2.

As shown, the PV 10-year costs are expected to reach approximately $14 million at a 7 percent discount rate. Based on the assumption that no passengers on small carriers will be delayed, the estimated costs are entirely opportunity costs.

[22] See Table 1.

Total Costs for the 30-Minute Option

A summary of the total costs of the 30-minute regulatory option is presented in Table 4. Under this high cost scenario, 10-year PV costs are an estimated $1.2 billion (7 percent discount rate).

Table 4.
Summary of Total Costs of the 30-Minute Option

	Large Carriers*		Small Carriers*		
	US	**Foreign**	**US**	**Foreign**	**Total**
First-Year Costs (2006)	$54,730,033	$61,716,846	$920,470	$495,638	**$117,862,986**
Average Recurring Costs	$70,685,267	$79,708,918	$1,188,811	$640,129	**$152,223,124**
10-Year PV Costs (7%)	$1,167,672,235		$14,200,029		**$1,181,872,264**
10-Year PV Costs (3%)	$1,412,809,864		$17,181,140		**$1,429,991,004**
Average Cost per Passenger	$1.55		$0.36		

* Including costs for passengers traveling on these air carriers.

The AQQ Option—Low Cost Scenario Assumptions and Costs

In this scenario, we assume that large carriers will use AQQ to transmit APIS data for each passenger during check in. We assume that small carriers will comply with the 30-minute option and will not implement AQQ.

Large Carriers

Large air carriers will transmit passenger data to CBP in real time, as individual passengers check in, up to the point that the carrier secures the aircraft doors. The carrier will be able to transmit data as soon as passengers begin checking in for their flight, up to 72 hours in advance. CBP will send a "cleared" or "not-cleared" message within seconds of the carrier's transmission, and carriers will not issue a boarding pass to any passenger who has not been cleared for boarding. The carrier will confirm by electronic receipt a "not-cleared" instruction. The carrier may then provide information to CBP about the questionable passenger to pursue clearance to board. CBP may resume the query and will reply to the carrier as soon as possible with either a confirmation or a correction. When there is not enough time for CBP to do so, however, the carrier will be bound by the "not-cleared" instruction and may not issue a boarding pass for that passenger. The carrier may, at its discretion, delay the flight

until CBP can confirm the "not-cleared" instruction or depart without the passenger in question.

Unlike the 30-minute option where CBP requires a substantial response window, a carrier transmitting individual passenger information as late as securing the aircraft doors provides sufficient time, in most instances, for CBP to perform an effective screening of the passengers. For international flights, most passengers check in hours before departure of the aircraft (with the possible exception of flights to and from Canada), leaving plenty of time for the screening process. Late arrivals are likely to be few, and we do not estimate that any passengers will need to arrive at their originating airports earlier than they customarily do. In addition, this procedure may prevent high-risk passengers from gaining access to the airport's sterile areas because they will not be obtaining boarding passes. High-risk passengers' baggage will not be laden on the aircraft and, therefore, will not have to be located and removed from the aircraft upon a "no board" instruction.

Under this option, we assume that only 0.5 percent of passengers will be delayed or rerouted because the information will be transmitted and processed while the passenger is completing other portions of the check-in process.[23] There may be instances where APIS information is not transmitted from the originating flight and the information then must be transmitted prior to the connecting flight. Passengers will likely, but not always, have sufficient layovers to complete the transmissions. This rerouting may occur when carriers do not share APIS information with one another or with carriers that receive connecting passengers from other carriers that do not operate in the United States. Using our previous example, an Indian airline may not fly to New York City, but flies to Rome, where passengers then connect with their flights to the United States. The Indian carrier may not collect all APIS information because it is not required to do so and may not have the means to collect or store it. The APIS information must then be collected when a passenger makes his connection in Rome. We believe that the vast majority will be able to make their connections given the speed and reliability of AQQ, but there will be a small percentage that do not.[24]

[23] In a comment to the proposed rule, one commenter noted that the percentage of passengers that would be delayed under the AQQ option would be 2 percent, based on tests conducted by the commenter and the assumption that APIS data could be transmitted no later than 15 minutes prior to departure. Because the 15-minute transmission requirement for AQQ has been removed from this final rule, we have retained the assumption that 0.5 percent of connecting passengers may be delayed or rerouted. As described in more detail in Chapter 3, the number of passengers considered "high risk" is less than one-tenth of 1 percent of the estimated number of international passengers in 2004; in light of this statistic, we believe that our estimate of the number of passengers potentially delayed under the final rule is reasonable. Additionally, numerous commenters to the proposed rule stated that connecting passengers would be negatively affected by the rule because as proposed, AQQ could only be conducted upon check in. CBP acknowledges that the regulatory text as proposed restricts transmission of APIS data to the check-in process only. Accordingly, CBP has amended §§ 122.49a (b)(1)(iii) and 122.75a (b)(1)(iii) to reflect the possibility that a carrier may transmit APIS data from the gate of departure.

[24] Several commenters to the proposed rule asked why any passengers would be delayed if the carrier were using AQQ. CBP notes that while an AQQ response will be provided within seconds, the resolution of a "not-cleared" passenger may require coordination among CBP, various other government agencies, and the carrier. CBP notes that under the "legacy" screening process, the carrier, on behalf of the passenger, completed this coordination. Under the final rule, the government will assume this responsibility. The coordination process could possibly lead to a delay that may result in the need to reroute a passenger.

In addition to rerouting costs, there are costs for large carriers to develop, test, and implement AQQ in conjunction with CBP and transaction costs for transmitting data following implementation. Based on information gathered from the CBP program office in conversations with both US and foreign carriers, we assume that the large carriers will each spend $2 million in the first year to develop and test a system that can conduct real-time queries as individual passengers check in for their flights.[25] Performing individual queries following implementation will cost an estimated $0.33 per passenger ($0.10 to send to CBP, $0.10 to send back to the carrier, plus $0.05 for ticket agent time and $0.08 for passenger time).[26]

For this analysis we assume that implementation costs for AQQ will be incurred in 2006. Following the implementation phase, we assume that individual query and rerouting costs will be incurred the remainder of the period of analysis (2007–2015). Implementation costs are an estimated $184 million if all 92 large carriers convert to AQQ (92 carriers $\times$ $2 million = $184 million). In 2007, transaction costs are an estimated $26 million (79,024,722 passengers $\times$ $0.33 $\approx$ $26 million). If 0.5 percent of these passengers are delayed and rerouted, this will result in an estimated cost of $47 million (79,024,722 passengers × 0.5 percent × $118.97 $\approx$ $47 million) in 2007. Average recurring costs are an estimated $92 million.

The 10-year costs for all large carriers to convert to AQQ are summarized in Table 5 (next page). PV costs are presented at 7 and 3 percent discount rates. As shown, the PV 10-year costs are expected to reach approximately $813 million at a 7 percent discount rate. Carriers will incur approximately 45 percent; the remaining 55 percent will be incurred by the passengers that travel on the large carriers in the form of opportunity costs.

[25] One commenter to the proposed rule stated that the costs to develop AQQ would be "much higher" but did not provide any additional data on which to base a more-informed assumption.

[26] The $0.10 charge is the transaction fee that is charged to carriers for accessing the SITA system, which is currently used by Australian carriers to obtain "electronic travel authority" for their passengers. When CBP launches AQQ, it may be able to query passengers for less than the $0.10 charge; in order to not underestimate costs in this analysis, we use this figure to calculate the annual transaction costs for this alternative. The $0.05 for ticket agent time is based on our estimate that it will require 10 seconds of time to submit the data multiplied by a ticket agent cost of $18.29 per hour. The $0.08 for passenger time is based on 10 seconds of time to submit the data multiplied by the value of a passenger's time at a cost of $28.60 per hour.

Table 5.
PV Costs for Large Carriers and Passengers under the AQQ Option

	US	Foreign	Total	PV at 7% Discount Rate	PV at 3% Discount Rate
2006	$22,000,000	$162,000,000	$184,000,000	$184,000,000	$184,000,000
2007	34,360,326	38,746,751	73,107,077	68,324,371	70,977,744
2008	36,078,342	40,684,088	76,762,430	67,047,280	72,355,953
2009	37,882,259	42,718,293	80,600,552	65,794,059	73,760,923
2010	39,776,372	44,854,207	84,630,579	64,564,264	75,193,174
2011	41,765,191	47,096,917	88,862,108	63,357,455	76,653,235
2012	43,853,451	49,451,763	93,305,214	62,173,204	78,141,648
2013	46,046,123	51,924,352	97,970,475	61,011,088	79,658,961
2014	48,348,429	54,520,569	102,868,998	59,870,694	81,205,737
2015	50,765,851	57,246,598	108,012,448	58,751,615	82,782,548
2016	53,304,143	60,108,927	113,413,071	57,653,454	84,389,976
Total				**$812,547,483**	**$959,119,899**

Complete detail of these costs can be found in Appendix A-3.

Small Carriers

Small carriers will incur the same costs as under the 30-minute option because we assume small carriers will not convert to AQQ and will continue using eAPIS. As previously estimated, the PV 10-year costs for small carriers are approximately $14 million at the 7 percent discount rate.[27]

Total Costs for the AQQ Option

A summary of the total costs of the AQQ regulatory option is presented in Table 6 (next page). Under this low cost scenario, 10-year PV costs are an estimated $827 million (7 percent discount rate). Table 7 (next page) presents a side-by-side comparison of the high and low cost scenarios.

[27] See Table 3.

Table 6.
Summary of Total Costs of the AQQ Option

	Large Carriers*		Small Carriers*		Total
	US	Foreign	US	Foreign	
First-Year Costs (2006)	$22,000,000	$162,000,000	$920,470	$495,638	**$185,416,107**
Average Recurring Costs	$43,218,049	$48,735,246	$1,188,811	$640,129	**$93,782,235**
10-Year PV Costs (7%)	$812,547,483		$14,200,029		**$826,747,512**
10-Year PV Costs (3%)	$959,119,899		$17,181,140		**$976,301,039**
Average Cost per Passenger	$1.03		$0.36		

* Including costs for passengers traveling on air carriers.

Table 7.
Comparison of Costs for the 30-Minute and AQQ Options
(in millions except average cost per passenger)*

	High (30-Minute Option)			Low (AQQ Option)		
	Large Carriers	Small Carriers**	Total	Large Carriers	Small Carriers**	Total
First-Year Costs (2006)	$116.4	$1.4	**$117.8**	$184.0	$1.4	**$185.4**
Average Recurring Costs	$150.4	$1.8	**$152.2**	$92.0	$1.8	**$93.8**
10-Year PV Costs (7%)	$1,167.7	$14.2	**$1,181.9**	$812.5	$14.2	**$826.7**
10-Year PV Costs (3%)	$1,412.8	$17.2	**$1,430.0**	$959.1	$17.2	**$976.3**
Average Cost per Passenger	$1.55	$0.36		$1.03	$0.36	

* Including costs for passengers traveling on air carriers.

** In both scenarios, small carriers are assumed to continue using eAPIS for manifest submission, not AQQ. For small carriers, the manifest will be transmitted at least 30 minutes prior to securing the aircraft doors under both cost scenarios.

Sensitivity Analyses

As noted previously, in response to public comments on the proposed rule we conducted several sensitivity analyses to relax our assumptions regarding passenger delays and rerouting costs for ticket agents. In the first sensitivity analysis, we calculate an average delay for passengers on large carriers of 8 hours and an average time for the carrier to reroute the passenger of 1 hour.[28] In the second sensitivity analysis, we calculate an average delay for passengers on large carriers of 24 hours and an average time for the carrier to reroute the passenger of 1 hour. The detailed calculations for these sensitivity analyses are presented in Appendix A. A summary of the 10-year PV costs (7 percent discount rate) of these analyses is presented in Table 8.

Table 8.
Comparison of 10-Year PV Costs for Sensitivity Analyses of the 30-Minute and AQQ Options (in millions, 7 percent discount rate)

	High (30-Minute Option)			Low (AQQ Option)		
	Large Carriers	**Small Carriers**	**Total**	**Large Carriers**	**Small Carriers**	**Total**
Primary Analysis	$1,167.7	$14.2	**$1,181.9**	$812.5	$14.2	**$826.7**
Sensitivity Analysis 1	$2,134.6	$14.2	**$2,148.8**	$1,247.8	$14.2	**$1,262.0**
Sensitivity Analysis 2	$9,361.4	$14.2	**$9,375.6**	$4,500.9	$14.2	**$4,515.1**

Complete detail of these costs can be found in Appendix A-3.

As shown from these results, the estimated costs of the rule are clearly sensitive to the number of hours passengers are delayed and how quickly they can be rerouted. We asked specifically for comments on the time delays and received several comments indicating they were too low in the analysis for the proposed rule. We continue to believe that all delayed passengers experiencing a 24-hour delay is an extreme worst case; however, the carriers' concerns regarding potential delays to passengers are a primary reason for amending the final rule to include a 30-minute requirement and to remove a time limit for those carriers using AQQ.

Other Costs

CBP does not anticipate incurring new operational or administrative costs for the 30-minute regulatory option. The AQQ portion of the rule is anticipated to cost CBP an estimated $12 million initially to work with air carriers and to modify its existing

[28] Recall that we do not estimate delays for passengers on small carriers.

capabilities and infrastructure.[29] This estimate is for the purposes of this Regulatory Assessment only.

One commenter to the proposed rule stated that the Regulatory Assessment did not account for investments that airports would have to make to cope with earlier arrivals and extended checking delays.

This comment is accurate. We note, however, that it is virtually impossible to quantify or monetize the changes that would occur in airports throughout the world as a result of this final rule. This is because we do not know how many airports, if any, may reconfigure ticketing and waiting areas, the number of carriers that will use the batch APIS transmission method versus the AQQ transmission method (which should result in fewer delays to passengers), the number of international passengers that would be affected in each airport, and daily peaks in passenger volume that may affect possible "crowding" in the ticketing area and other areas of the airport.

Even so, we have estimated that the AQQ method adopted in the final rule will not add appreciably to check-in time; AQQ, therefore, should not have a significant impact on "crowding." Entering APIS information at check-in, which consists primarily of swiping a passenger's passport through a reader, will constitute a very small part of the international check-in process.

[29] CBP bases this estimate on only 10 large carriers implementing AQQ, not the entire 92 carriers.

3. Benefits Analysis

The primary benefits of the rule are to enhance security and prevent dangerous individuals with nefarious intentions from successfully carrying out attacks against the United States. Monetizing these benefits has proven difficult because the damages caused by terrorism are a function of where the attack takes place, the nature of the attack, the number of people affected, the casualty rates, and the psychological impacts of the attack.

We are able, through assessments of previous natural disasters, economic shocks, and terrorist attacks, to glean an understanding of the consequences of disaster. While variance and uncertainty abound, we can estimate monetary damages within an order of magnitude and with large margins of error. The psychological impacts are less apparent but are still tractable. We are currently unable, however, to measure risk and commensurate risk reduction with any degree of clarity or certainty. Through intelligence gathering we can get a sense of what terrorists are thinking and planning, but we rarely have information that can accurately ascertain the probability that an attack will take place at a particular time, at a particular location, using a particular means, requiring a particular response. Later in this chapter, we conduct a "breakeven" analysis to determine what those risk reductions would have to be for the benefits of this rule to at least equal the costs estimated in Chapter 2.

In the face of this uncertainty, government agencies must still act to ensure continuity and shield the citizens they are committed to protect. It is important to acknowledge the risk trade-offs involved in determining the proper level of regulation to impose. Government agencies are constantly assessing and addressing and re-examining the effects of security measures they impose, the willingness and financial ability of industry to bear the associated costs, and the willingness of the public to pay higher costs.

CBP believes that the final rule reduces risk while imposing acceptable costs to the private sector and without causing economic harm to industry or the traveling public. The rule is a profound improvement upon the status quo, the 2005 APIS Rule. While the 2005 APIS Rule yielded improvements, such as removing the uneven administration of watchlists from the carriers, high-risk individuals are still able to board international aircraft. At a minimum, CBP and other law enforcement officials must detain and interview these people upon arrival into this country, and some will face deportation. Planes have been held on runways, flights have been delayed and cancelled, and aircraft have been diverted—all at great inconvenience and expense to travelers, air carriers, airports, and response agencies. These detentions, delays, and diversions can be monetized with some degree of confidence and should be an important segment of the benefits "picture" assessed by decision makers and the public.

As stated in Chapter 2, we do not believe that vessel carriers will be affected by the rule due to the nature of their operations. Thus, vessel carriers will not experience increased benefits as a result of the rule.

Security Incidents and the 2005 APIS Rule

While there are numerous security incidents throughout the air transportation system on an annual basis, the overwhelming majority of travelers and crew pose no threat to air safety and security. According to CBP and the Transportation Security Administration (TSA) there were approximately 22,000 "hits" on the security watchlists in 2004. If this is compared to the estimated number of international passengers in 2004, less than one-tenth of 1 percent of these passengers are considered high-risk individuals.

Nevertheless, these individuals require lengthy processing once they reach this country, and some must be deported. Based on CBP data, an estimated 11,000 individuals boarded aircraft and were subsequently found to be on watchlists from May to November 2004. If this figure were extrapolated to the entire year, that would result in an estimated 22,000 selectees. In this analysis, we estimate that this number will increase 1 percent annually over the period of analysis as both passenger counts increase and more individuals are added to government watchlists. By 2016, an estimated 24,800 hits would occur.

Under the 2005 APIS Rule, high-risk individuals may still board aircraft in foreign airports and fly to the United States because the information required to intercept these passengers is transmitted 15 minutes after departure. These passengers are then intercepted and interviewed upon arriving in the US. CBP estimates that each interview requires 2 hours of time for their agents to conduct. Some of the entry issues may be resolved, and the individuals may be sent on their way. Based on data for 2004, CBP estimates that 25 percent must be deported back to their countries of origination.

Quantified Benefits of the Rule

Under the final rule, fewer high-risk individuals would board planes and come to the United States because they would be identified and intercepted prior to the boarding process. Even under the best circumstances, however, not every individual will be intercepted prior to boarding. We assume an "effectiveness factor" of the rule of 0.9, or 90 percent of the identified high-risk passengers will be prevented from boarding the aircraft and leaving the foreign airport. The remaining 10 percent are "unaffected" by this rule either because the 2005 APIS Rule may have caught them and because it is nearly impossible to implement a regulation that captures 100 percent of the high-risk individuals that fly.[30] Table 9 presents the estimated number of annual hits over the period of analysis and the individuals prevented from boarding aircraft assuming a 90 percent effectiveness factor.

[30] The analysis for the 2005 APIS Rule did not estimate an effectiveness factor for the 15-minutes after departure requirement. Because this rule did not prevent high-risk individuals from boarding planes, we assume that this rule did not greatly reduce the risk of these individuals entering this country. The actual risk reduction is unknowable, but we estimate it is probably between 0 to 10 percent effective, as reflected in the 90 percent effectiveness factor for this rule.

Table 9.
Predicted Watchlist Hits for Air Carriers over the 10-Year Period of Analysis

	Annual Hits	Individuals Prevented from Boarding Aircraft	Residual Individuals Entering US
2006	22,442	20,198	2,244
2007	22,667	20,400	2,267
2008	22,893	20,604	2,289
2009	23,122	20,810	2,312
2010	23,353	21,018	2,335
2011	23,587	21,228	2,359
2012	23,823	21,441	2,382
2013	24,061	21,655	2,406
2014	24,302	21,872	2,430
2015	24,545	22,090	2,454
2016	24,790	22,311	2,479

We estimate four categories of costs that could be avoided under the rule: costs for conducting interviews with identified individuals, costs for deporting a percentage of these individuals, costs of delaying a high-risk aircraft at an airport (either at the origination or destination airport), and costs of rerouting aircraft if high-risk individuals are identified after takeoff.

These benefits are the same under both the high and low cost scenarios presented in Chapter 2 as both the 30-minute option and the APIS Quick Query (AQQ) option primarily prevent the boarding of high-risk individuals. AQQ yields slightly higher benefits than the 30-minute option because under AQQ, a high-risk individual is not permitted to enter the "sterile area" of the airport and his bags have not been checked. The additional benefits of AQQ are not quantified.

Interview Costs Avoided

CBP estimates that an interview requires 2 hours of time and requires 1 government official (or a combination of officials that equal one person's time) to conduct the interview. The hourly cost of a government agent is $27.59 per hour, and the cost per interview would then be $55 (1 agent × $27.59 per hour × 2 hours ≈ $55).[31] Under the rule, we estimate that in 2007 approximately 20,400 individuals would be prevented from entering the United States and would thus not need to be interviewed.[32] The

[31] We assume that CBP, ICE, and FBI officials conducting interviews are GS-11/1 employees with an annual base salary of $44,136. We apply a load factor of 1.3 to account for fringe benefits and locality pay and divide this by 2,080 hours to calculate the hourly cost of these officials.

[32] See Table 9.

costs avoided would be an estimated $1.1 million per year ($55 per interview × 20,400 interviews avoided ≈ $1.1 million).

Deportation Costs Avoided

As previously mentioned, of the 22,000 high-risk individuals entering this country in 2004, an estimated 25 percent were deported due to improper documentation and further information gathered during interviews. Deportation imposes costs to the government to process the paperwork and make necessary arrangements as well as to the air carriers who must pay to fly deportees back to their country of origin and provide accommodations prior to deportation. CBP estimates that their processing cost to deport a high-risk individual is $1,507. The estimated cost to the air carrier of the flight and a hotel stay is an estimated $1,000, for a total cost of $2,507 per deportation.

Under the rule, we estimate that in 2007, 20,400 individuals would be prevented from entering the United States, and 5,100 of these individuals would not need to subsequently be deported. The costs avoided would be an estimated $13 million per year ($2,507 per deportation × 5,100 deportations ≈ $13 million).

Delay Costs Avoided

On New Year's Eve 2003, a flight from London to Washington, DC, was delayed for hours on the Dulles tarmac when passenger manifest queries produced numerous hits on terrorist watchlists. Passengers and crew were forced to sit on the runway for more than 2 hours while law enforcement officials organized a response and interviewed passengers and crew. This incident prompted a flurry of additional cancellations for in-bound planes from London, Paris, and Mexico City over the next several weeks as specific intelligence continued to reveal an elevated threat.

Costs for the 2003 holiday incident are not available. We estimate one scenario here: if a plane were held on the tarmac for 4 hours, this would cost the carrier an estimated $15,000 for each hour delayed, for a total cost of $60,000.[33] A large aircraft making international flights holds an estimated average of 250 passengers.[34] If the value of one hour of passenger time is $28.60, then the cost to the passengers of the delay would be $28,600 (250 passengers × $28.60 per hour × 4 hours = $28,600). Finally, officials must organize and coordinate a response to the security incident. The estimated hourly cost of government agents is $27.59 and, per CBP, 12 officials would likely be involved in the response. The government cost would be $1,320 (12 agents × $27.59 per hour × 4 hours ≈ $1,320). The total cost would be an estimated $90,000

[33] In the Regulatory Assessment for the proposed rule, we used an estimate of $3,372 for each hour of delay based on a study from the Massachusetts Institute of Technology. Several commenters to the proposed rule stated that this was much too low and offered estimates ranging from $10,000 per hour to $17,000 per hour. We use an estimate of $15,000 here.

[34] The FAA report used elsewhere in this analysis ("Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004) estimates that large aircraft hold an average of 157 passengers. This average is weighted heavily by domestic aircraft; generally international aircraft are larger, holding between 200 and 300 people. We use 250 passengers in this analysis.

($60,000 + $28,600 + $1,320 ≈ $90,000). For this analysis, we assume one such security incident would occur annually that could be avoided with the rule.

Diversion Costs Avoided

In September 2004, a high-risk individual was identified en route from London to Washington, DC, after the plane had departed Heathrow. This aircraft was diverted to Bangor, Maine, where Federal officials met the plane and questioned this individual extensively. The passengers were held aboard the plane during the interrogation and then continued on to Dulles without incident. The delay was nearly 7 hours.

In November 2004, a high-risk individual and his traveling companion were identified en route from Paris to Washington, DC. This aircraft was also diverted to Bangor. After the two suspects were detained, the flight continued on to Dulles, arriving more than 2 hours late.

In early May 2005, an individual with the same name as someone on the government's No Fly List boarded a plane in Paris bound for Boston. The flight was diverted to Bangor and was later allowed to continue to Boston without incident. A week later, an individual on the No Fly List boarded a plane in Milan bound for Boston. The plane was diverted to Bangor. The man and his baggage were removed from the plane, and the plane was allowed to continue on to Boston. Also in May 2005, a father and son on the No Fly List were identified en route from Seoul to San Francisco. The plane was diverted to Japan. The plane was delayed while the two were questioned. The son was later allowed to re-board the aircraft as it continued on to San Francisco.

Again, costs for these diversions are not available.[35] We estimate one scenario here: if a plane were diverted, causing delay for 8 hours, this would cost the carrier an estimated $120,000 ($15,000 per hour × 8 hours). The cost to the passengers of the delay would be $57,200 (250 passengers × $28.60 per hour × 8 hours = $57,200). The estimated hourly cost of a CBP agent is $27.59 and 12 officials would likely be involved in the response. The cost for government response would be $2,650 (12 agents × $27.59 per hour × 8 hours ≈ $2,650). The total cost would be an estimated $180,000 ($120,000 + $57,200 + $2,650 ≈ $180,000). For this analysis, we assume two such security incidents occur annually that could be avoided with the rule.

Total Quantified Benefits of the Rule

Table 10 (next page) presents the total quantified benefits (costs avoided) of the rule over the period of analysis. As shown, the 10-year PV benefits are an estimated $105 million at a 7 percent discount rate.

[35] The air carriers involved indicated that these security incidents were very expensive, on the order of millions of dollars. When CBP asked for further detail and justification for these estimates, we were told those details were not available. These estimates may understate the costs of these types of incidents, but absent more complete information, we have used estimates derived from published sources and information received during the public comment period for the proposed rule.

Table 10.
PV Benefits of the Final Rule

	Interview Costs Avoided	Deportation Costs Avoided	Delay Costs Avoided	Diversion Costs Avoided	Total	PV at 7% Discount Rate	PV at 3% Discount Rate
2006	$0	$0	$0	$0	$0	$0	$0
2007	1,125,466	12,785,675	89,924	359,696	14,360,761	13,421,272	13,942,486
2008	1,136,720	12,913,532	89,924	359,696	14,499,872	12,664,750	13,667,520
2009	1,148,088	13,042,667	89,924	359,696	14,640,375	11,950,907	13,398,017
2010	1,159,569	13,173,094	89,924	359,696	14,782,282	11,277,333	13,133,867
2011	1,171,164	13,304,824	89,924	359,696	14,925,609	10,641,753	12,874,962
2012	1,182,876	13,437,873	89,924	359,696	15,070,369	10,042,023	12,621,197
2013	1,194,705	13,572,251	89,924	359,696	15,216,576	9,476,119	12,372,469
2014	1,206,652	13,707,974	89,924	359,696	15,364,246	8,942,131	12,128,678
2015	1,218,718	13,845,054	89,924	359,696	15,513,392	8,438,258	11,889,723
2016	1,230,905	13,983,504	89,924	359,696	15,664,030	7,962,799	11,655,509
Total						**$104,817,344**	**$127,684,428**

Complete detail of these costs avoided can be found in Appendix B-1.

It is important to note that these benefits are most likely a transfer of avoided costs from US officials to foreign-government officials. For example, FBI agents may avoid interview costs if a high-risk individual is prevented from boarding an aircraft, but a foreign law-enforcement official would now likely be tasked with conducting the interview and determining what actions, if any, would have to be taken against the high-risk individual. Additionally, while FBI agents in the field may avoid interview costs, other FBI officials would still be part of the international coordination effort with the foreign government. Thus the benefits presented in Table 10 should be viewed with those issues in mind.

Breakeven Analysis of the Rule

Ideally, the quantification and monetization of the beneficial security effects of this regulation would involve two steps. First, we would estimate the reduction in the probability of a successful terrorist attack resulting from implementation of the regulation and the consequences of the avoided event (collectively, the risk associated with a potential terrorist attack). Then we would identify individuals' willingness to pay for this incremental risk reduction and multiply it by the population experiencing the benefit. Both of these steps, however, rely on key data that are not available for this rule.

Typically, reductions in the probability of a terrorist attack resulting from a regulation are measured against the baseline probability of occurrence (the current likelihood that a terrorist attack will be attempted and be successful) and combined with information about the consequences of the attack. The difference between the baseline probability of occurrence and the probability of occurrence after the

regulation is implemented would represent the incremental probability reduction attributable to the rule.

We cannot use historical data on the frequency of terrorist attacks to estimate the current baseline probability of attack within the United States for several reasons. The data on international events occurring within the United States in the last decade are limited, and little information is available describing the consequences of most of these events. Additionally, use of these data to project future probability of attack requires an understanding of the socioeconomic and political conditions motivating and facilitating these events historically and foresight with regard to how these factors may change in the future. Therefore, for this benefits analysis, we do not use these data to estimate the baseline probability of a terrorist attack in the United States resulting from earlier submission of APIS data. As a result, and in the absence of more detailed data, we are unable to quantitatively estimate the incremental reduction in the probability of terrorist attack that will result from this rule.

We have conducted reviews of the economic literature to identify existing studies of individuals' willingness to pay to reduce the risk of a terrorist attack. Several articles discuss characteristics of terrorist attacks that might influence willingness to pay to reduce these risks.[36] Given publicly available data, however, we are unable to identify specific estimates of willingness to pay to reduce the risk of terrorist attack in the United States. Although we are unable to identify estimates of willingness to pay for the risk reductions potentially achieved by this regulation, academic literature provides information about how the public's perception of terrorist risks might influence their desire for policy action, and ultimately, their willingness to pay for such regulation. A substantial body of psychometric literature attempts to measure how the perception of risk affects attitudes towards risk reduction.

For example, the work of Slovic et al., clarifies dimensions of risk that influence individual rankings of the importance of reducing these risks.[37] The authors find that the most important determinant of how the public ranks risk is the degree of "dread" associated with the risk. The authors define dreaded risks as a "perceived lack of control…catastrophic potential, fatal consequences, and the inequitable distribution of risks and benefits."[38] In other words, the public is less willing to tolerate risks related to incidents they dread, such as nuclear accidents or terrorist attacks, than

---

[36] See Sunstein, Cass. 2003. "Terrorism and Probability Neglect." *Journal of Risk and Uncertainty*. Volume 26, Numbers 2-3. 2003. Pages 121–136, and

Fischhoff, Baruch, Roxana M. Gonzalez, Deborah A. Small, and Jennifer S. Lerner. 2003. "Judged Terror Risk and Proximity to the World Trade Center." *Journal of Risk and Uncertainty*. Volume 26, Numbers 2-3. 2003, Pages 137–151.

[37] Slovic, Paul, Baruch Fischhoff, and Sarah Lichtenstein. 1981. "Perceived Risk: Psychological Factors and Social Implications." *Proceedings of the Royal Society of London. Series A: Mathematical and Physical Sciences*. Volume 430, Number 1878. Pages 17–34, and

Slovic, Paul. 1987. "Perception of Risk." *Science*. Volume 236, April 1987. Pages 280–285.

[38] Slovic, Paul. 1987. "Perception of Risk." *Science*. Volume 236, April 1987. Page 283.

incidents that are not dreaded but that pose similar or higher risks, such as riding a motorcycle. Slovic et al., state that the more dreaded an activity, "(a) the higher its perceived risk, (b) the more people want its risk reduced, and (c) the more they want to see strict regulation employed to achieve the desired reduction in risk."[39] Based on existing risk perception literature, it is reasonable to hypothesize that people would be willing to pay more to reduce risks associated with a terrorist attack than similar risks associated with hazards that are familiar, controllable, and that do not have catastrophic consequences.

When it is not possible to obtain a single value estimate that comprises the bundle of benefits derived from the regulation in question, analysts estimate separately the value of individual effects resulting from the regulation and sum them to estimate total benefits. Certain effects are more easily measured than others. Substantial literature exists estimating the value of changes in fatal and nonfatal risks. In addition, the value of lost property and opportunity costs associated with supply chain effects can be determined from market data. Other effects may be more difficult to quantify or monetize—a regulatory action may result in citizens feeling safer or having less fear. Several researchers argue that reductions in fear result in a social good that should be quantified, though "the problem of quantifying and monetizing fear and its consequences…has yet to be seriously engaged in the relevant literature."[40] In addition, people's willingness to pay to protect national historic treasures or sites of cultural importance may exceed the costs of simply repairing or rebuilding these sites. Effects that are not easily monetized using readily available information may be discussed qualitatively. However, lacking information about the incremental decrease in the probability of a successful terrorist attack or reliable information about the consequences of such an attack, we are unable to quantify individual categories of benefits. Without quantifying these benefits, we cannot estimate their value.

In light of these limitations, we conduct a "breakeven" analysis to determine what change in the reduction of risk would be necessary in order for the benefits of the rule to exceed the costs. OMB recommends a threshold or breakeven analysis when non-quantified benefits are important to evaluating the benefits of a regulation.[41]

The potential economic impacts of a terrorist attack that are prevented by the regulation represent the costs savings, or benefits, of the regulation. For the costs and benefits of the rule to be equal, the net costs of the rule we are able to monetize in the analysis must equal the reduction in the probability that a successful terrorist attack will occur multiplied by the costs of such an attack, as illustrated in the following formula—

[39] Slovic, Paul, Baruch Fischhoff, and Sarah Lichtenstein. 1981. "Perceived Risk: Psychological Factors and Social Implications." *Proceedings of the Royal Society of London. Series A: Mathematical and Physical Sciences*. Volume 430, Number 1878. Page 29.

[40] See Sunstein, Cass. 2003. "Terrorism and Probability Neglect." *Journal of Risk and Uncertainty*. Volume 26, Numbers 2-3. 2003. Pages 132 and 133.

[41] US Office of Management and Budget. Circular A-4, September 17, 2003.

Net costs = Δp(successful terrorist attack) × consequences of an attack

We solve for the change in probability (Δp), and the result is the smallest reduction in the probability of a successful terrorist attack resulting from the regulation that would result in the benefits of the rule equaling the costs. We believe that in the absence of a credible estimate of the probability of a terrorist attack, this "breakeven" probability can still be of much use to decisionmakers and the general public. For example, if decisionmakers believe that the incremental change in probability of a successful attack achievable with the rule is greater than the change calculated in our analysis, this may lead them to recommend adopting the regulation on the grounds that a reasonable estimate of the benefits of the rule is likely to exceed a reasonable estimate of the costs. Conversely, if decisionmakers believe the incremental change in probability is likely to be less than the change calculated in this analysis, this may lead them to recommend rejecting the regulation on the grounds that the costs of the rule are likely to exceed the benefits. An important caveat is that this analysis is only useful if the attack scenarios appropriately reflect the types of attacks prevented by this regulation.

Because the types of attack that would be prevented by this regulation are not entirely understood, we present a range of potential losses that are driven by casualty estimates and asset destruction. We use two estimates of a Value of a Statistical Life (VSL) to represent an individual's willingness to pay to avoid a fatality onboard an aircraft, based on economic studies of the value individuals place on small changes in risk: $3 million per VSL and $6 million per VSL.[42] Additionally, we present three attack scenarios. The first explores a situation where only individuals are lost (no destruction of physical property). The second explores a situation where individuals are lost and the aircraft is destroyed. The third explores a situation where individuals are lost and substantial destruction of physical capital is incurred.

Because the discount rate applied (3 percent versus 7 percent) has an effect of less than one-tenth of 1 percent on the risk probably estimate, we present annualized net costs at the 7 percent discount rate in this analysis.[43] We compare annualized costs to the consequences of each attack scenario, as we assume that the rule results in a constant probability reduction that occurs in every year following implementation. In other words, we assume that the risk reduction resulting from this regulation is constant each year. In addition, we present the reduction in the probability of experiencing a single event in a given year.

Scenario 1: Human Casualty Losses Only

In this scenario, we estimate the losses if an attack resulted in 100 to 3,000 casualties but no loss of physical capital. We acknowledge that this scenario is not necessarily

[42] The estimate of $3 million per VSL is from the FAA guidance used throughout this analysis: FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004. Other government agencies, for example the Environmental Protection Agency, use a VSL approaching $6 million.

[43] Estimates at a 3 percent discount rate are presented in Appendix B-2.

realistic because an attack that would result in 3,000 casualties would almost certainly also result in loss of physical assets; however, this scenario provides a useful high end for the risk reduction probabilities required for the rule to break even.

First, we subtract the annualized quantified benefits above from the annualized costs presented in Chapter 2. The annualized high cost estimate is $147.5 million (7 percent discount rate over 10 years), and the annualized quantified benefit is $14.9 million, for net annualized costs of $132.6 million. If an attack resulted in 500 casualties, each with a VSL of $3 million, these deaths averted would be an estimated $1.5 billion. With an annualized net cost of $132.6 million and an annual benefit of $1.5 billion, the risk reduction required for the rule to break even would be 8.8 percent ($132.6 million ÷ $1.5 billion = 8.8 percent).

The annualized net low cost estimate is $91.2 million ($106.1 million - $14.9 million = $92.1 million). With this net cost, the risk reduction required to break even would be 6.1 percent ($92.1 million ÷ $1.5 billion = 6.1 percent). Thus, the rule would have to reduce the annual risk by 6.1 to 8.8 percent for the benefits to equal the costs given this attack scenario and casualty level. The risk reduction estimates for other casualty levels and the $6 million VSL are presented in Table 11.

Table 11.
Annual Risk Reduction Required for Net Costs to Equal Benefits for Scenario 1
(7 percent discount rate, in millions)

Casualties Avoided	Value of Casualties Avoided	Annualized Net Cost, High	Annualized Net Cost, Low	Risk Reduction Range Required (%)
$3M VSL				
100	$300	$132.6	$91.2	30.4–44.2
250	750	132.6	91.2	12.2–17.7
500	1,500	132.6	91.2	6.1-8.8
1,000	3,000	132.6	91.2	3.0–4.4
3,000	9,000	132.6	91.2	1.0-1.5
$6M VSL				
100	$600	$132.6	$91.2	15.2–22.1
250	1,500	132.6	91.2	6.1–8.8
500	3,000	132.6	91.2	3.0–4.4
1,000	6,000	132.6	91.2	1.5–2.2
3,000	18,000	132.6	91.2	0.5–0.7

Complete detail of these costs avoided can be found in Appendix B-2.

Scenario 2: Human Casualty Losses and Loss of Aircraft

In this scenario we again estimate individual lives lost as well as the loss of the aircraft. This presents a more realistic attack scenario, as terrorists have successfully

destroyed an aircraft in mid-flight, resulting in total loss of life aboard the aircraft but with little significant damage done to assets on the ground (the explosion of Pan Am Flight 103 over Lockerbie, Scotland, in 1988 is an example of such an event).

Casualties are estimated as before using the two VSL estimates. To value the loss of the aircraft, we use FAA's estimate of $11.5 million for the hull loss. Additionally, we value the cost of an investigation at $0.4 million.[44] The risk reduction estimates for this scenario are presented in Table 12.

Table 12.
Annual Risk Reduction Required for Net Costs to Equal Benefits for Scenario 2
(7 percent discount rate, in millions)

Casualties Avoided	Value of Casualties Avoided + Loss of Aircraft	Annualized Net Cost, High	Annualized Net Cost, Low	Risk Reduction Range Required (%)
$3M VSL				
100	$312	$132.6	$91.2	29.2–42.5
250	762	132.6	91.2	12.0–17.4
500	1,512	132.6	91.2	6.0–8.8
1,000	3,012	132.6	91.2	3.0–4.4
3,000	9,012	132.6	91.2	1.0–1.5
$6M VSL				
100	$612	$132.6	$91.2	14.9–21.7
250	1,512	132.6	91.2	6.0–8.8
500	3,012	132.6	91.2	3.0–4.4
1,000	6,012	132.6	91.2	1.5–2.2
3,000	18,012	132.6	91.2	0.5–0.7

Complete detail of these costs avoided can be found in Appendix B-2.

Scenario 3: Human Casualty Losses and Catastrophic Loss of Physical Capital

In this scenario we again estimate individual lives lost but now consider a massive loss of physical capital (the 9/11 attack is an example of such an event).

Casualties are again estimated as before using the two VSL estimates. To value the loss of capital assets, we use a report from the Comptroller of the City of New York that estimated $21.8 billion in physical capital destruction as a result of the 9/11

[44] FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004. The value of an aircraft loss and the investigation is in 2002 dollars. To be consistent with Department of Transportation policy, we are not modifying these estimates to account for inflation.

attacks on the World Trade Center.[45] This report also estimates the "ripple effects" of the attack—the air traffic shutdown, lost tourism in New York City, long-term economic impacts; however, we do not compare these secondary impacts to the direct costs of the rule estimated in Chapter 2 because we do not know the extent to which these losses are transfers versus real economic losses. In this analysis we compare direct costs to direct benefits to estimate the risk reduction required for the rule to break even.

The risk reduction estimates for this scenario are presented in Table 13.

Table 13.
Annual Risk Reduction Required for Net Costs to Equal Benefits for Scenario 3
(7 percent discount rate, in millions)

Casualties Avoided	Value of Casualties Avoided + Catastrophic Loss of Physical Capital	Annualized Net Cost, High	Annualized Net Cost, Low	Risk Reduction Range Required (%)
$3M VSL				
100	$22,300	$132.6	$91.2	0.4–0.6
250	22,750	132.6	91.2	0.4–0.6
500	23,500	132.6	91.2	0.4–0.6
1,000	25,000	132.6	91.2	0.4–0.5
3,000	31,000	132.6	91.2	0.3–0.4
$6M VSL				
100	$22,600	$132.6	$91.2	0.4–0.6
250	23,500	132.6	91.2	0.4–0.6
500	25,000	132.6	91.2	0.4–0.5
1,000	28,000	132.6	91.2	0.3–0.5
3,000	40,000	132.6	91.2	0.2–0.3

Complete detail of these costs avoided can be found in Appendix B-2.

Limitations of Breakeven Analysis

In this analysis we have considered the net costs of the rule and compared them to potential benefits of the rule in the form of terrorist attacks prevented. The resulting risk reduction required for the benefits to at least equal the costs should be approached with caution. There are numerous reasons why we may have overstated or understated risk reduction required.

First, we selected the consequence scenarios applied in the breakeven analysis based on available estimates valuing the loss of human life, hull loss, and one estimate of

[45] Thompson, Jr., William C. Comptroller, City of New York. "One Year Later: The Fiscal Impact of 9/11 on New York City." September 4, 2002.

catastrophic property destruction. These scenarios may not capture the full range of attack modes or targets affected by the rule. As noted above, the first scenario is probably not likely because high casualties will likely be accompanied by losses in capital assets. Additionally, if the consequences of avoided events are larger than estimated in this analysis, then we have overstated the required probability reduction.

Second, we rely on the cost estimates provided in the available studies from FAA and the Comptroller of New York City for our consequence estimates for scenarios 2 and 3. The researchers of these reports did not estimate certain elements of cost, such as the value of losing a historically significant or iconic landmark. If the total cost of the consequence is underestimated, then the breakeven analysis likely overstates the probability reduction required for the benefits of the regulation to equal the costs of the regulation.

Third, we have not considered the simultaneous consequences of multiple attacks—a realistic scenario to consider, given the multiple-event nature of 9/11 and other terrorist attacks (the attacks on the London and Madrid transit systems, for example). We have compared the consequences of a single attack to the annualized net costs of the rule, which only identifies the breakeven probability reduction in the risk of one type of attack. In reality, the rule likely affects the risk of multiple types of attacks simultaneously, which we have tried to capture by calculating breakeven probabilities for multiple scenarios. It is difficult to predict the direction of bias of the results of our breakeven analysis without knowing more about the specific types of attack scenarios affected and whether the terrorists will shift their focus from one type of attack to another.

Finally, the baseline probability of an attack is unknown. Our approach does not provide the decisionmaker with any information about the baseline probability that these types of attacks will occur. As a result, the decisionmaker is expected to use judgment to determine whether the required risk reductions are feasible, as well as whether they are reasonable. For example, if the baseline probability of scenario 3 is only 0.1 percent, then achieving the required risk reductions of 0.2 percent to 0.3 percent is not possible.

4. Comparison of Costs and Benefits of Regulatory Alternatives

Under EO 12866, CBP is required to consider and analyze alternatives to the rule to ensure that the most cost-effective rule that still meets agency objectives and legal mandates is promulgated. This chapter considers the following possible regulatory actions, in order of stringency relative to the No Action alternative—

1) Do not promulgate any further manifest transmission requirements (No Action)—the baseline case where carriers would continue to submit APIS manifests 15 minutes after departure. There are no additional costs or benefits associated with this alternative. High-risk passengers would continue to board aircraft. Because this alternative is the status quo and is used as the regulatory baseline, it has no additional costs or benefits.

2) A 30-minute transmission requirement for batch manifests and option for APIS Quick Query—this is the final rule, discussed in previous chapters, which generally requires carriers to submit manifests 30 minutes prior to securing the aircraft doors or allows them to implement APIS Quick Query (AQQ). If flying on a carrier using AQQ, individuals would be queried while they checked in and would be prevented from continuing to check in or having their bags checked. High-risk individuals would thus not enter passenger screening or the departure gate area.

3) A 60-minute transmission requirement for batch manifests (60-Minute APIS Rule)—this was the proposed rule, without the option for AQQ. While this would have prevented high-risk passengers from boarding aircraft and allowed a good deal of time for CBP to coordinate a response, the proposed rule was ultimately considered too burdensome for the carriers and the traveling public.

4) A 120-minute transmission requirement (120-Minute APIS Rule)—this rule would require carriers to submit manifests 120 minutes prior to departure. The costs would be higher than under the 30- and 60-minute transmission requirements because originating passengers, not just connecting passengers, would now be affected. High-risk passengers would be prevented from boarding aircraft. CBP would be able to easily coordinate and plan a response to a hit on the watchlists well before the boarding process began.

For each of these alternatives, we base our estimates of cost largely on the methods described in Chapter 2. Key assumptions that we alter to account for the unique characteristics of each alternative are: the percent of passengers that do not make their flights and the length of the delay. In all but the Chosen Alternative, we assume carriers will not implement AQQ. Complete details of the computations for the regulatory alternatives are presented in Appendix C.

Additionally, we provide a qualitative description of whether the benefits estimate is likely to be higher or lower than the No Action alternative and the final rule as well as the monetized benefits (where applicable) as calculated in Chapter 3.

The 30-Minute Transmission Requirement and AQQ (Chosen Alternative)

Under the final rule, air carriers may, at their discretion, separate their APIS batch transmissions into two parts. The first transmission, at a minimum, will contain primary data elements necessary to conduct complete watchlist screening.[46] This transmission must occur no later than 30 minutes prior to the securing of the aircraft doors. The second transmission will contain the full APIS manifest necessary for compliance with the 2005 APIS Rule.[47] The second message containing the remaining data must be transmitted to CBP no later than 30 minutes after the aircraft doors have been secured. The flight closeout message, indicating all passengers boarded, must be transmitted no later than 30 minutes after departure of the aircraft.[48] Alternatively, air carriers may adopt APIS Quick Query (AQQ) and transmit the data any time prior to boarding or prior to the issuance of a passenger's boarding pass.

Under this scenario, we assume that 1 percent of passengers on large carriers will be delayed and 0 percent of passengers on small carriers will be delayed. We assume that 5 percent of passengers will need to arrive at the airport 15 minutes earlier than customary. Alternatively, large carriers could use AQQ to submit passenger information on an individual basis (small carriers would not likely opt for AQQ). This would result in only 0.5 percent of passengers on large carriers requiring rerouting, but carriers would invest in implementing AQQ. Passengers would not need to arrive any earlier at the airport than they do now. We present the two cost endpoints in this analysis—all carriers opt for the 30-minute option and all carriers implement AQQ—to capture the likely range of costs. Benefits will include interview costs avoided, deportation costs avoided, delay costs avoided, and diversion costs avoided, as well as the non-quantified security benefits that are the impetus for this rule.

For international flights that originate in the United States, carriers using the 30-minute option may issue a boarding pass to a passenger only if a "cleared" message has been received for that passenger. Thus, "not-cleared" passengers may not enter a security checkpoint or be in a sterile area. For international flights that originate in another country, the US government cannot mandate that carriers not issue boarding passes to "not-cleared" passengers. While carriers may be able to issue a provisional boarding pass to a "not-cleared" passenger, the carrier may not board the passenger until a "cleared" message has been received. Carriers using the AQQ transmission option cannot issue a boarding pass unless a "cleared" message has been received.

[46] Primary data needed to screen a passenger against a watchlist includes full name, date of birth, redress number when available, gender, citizenship, travel document type, passport number (if available), passport country of issuance, and status on board the aircraft. With the exception of the status on board the aircraft, this information is contained in the machine-readable zone of a passport.

[47] In addition to the primary data: passport expiration date, residency, address (if required), second document type, second document number, Passenger Name Record locator (if available).

[48] Where departure is defined as "wheels up."

The 30-Minute Transmission Requirements and AQQ

Percent of passengers arriving early	5% on all carriers, 15 minutes
Percent of passengers delayed	1% on large carriers, 0% on small carriers
Length of delay	4 hours
First-year costs	$118–185 million
Average recurring costs	$94–152 million
Government cost	$12 million during initial implementation of AQQ
10-year PV costs (7%)	$827 million–1.2 billion
10-year PV costs (3%)	$976 million–1.4 billion

Under either regulatory option (30-minute requirement or AQQ), benefits are higher than the No Action alternative because the high-risk individual will be identified prior to boarding. In addition to this security benefit, there is an estimated $14 million in costs avoided annually. The AQQ regulatory option may yield slightly higher benefits than the 30-minute option because a high-risk passenger's baggage may not reach the aircraft and the passenger may not enter the sterile area of the airport.

The 60-Minute APIS Rule

This is the rule as proposed, without the AQQ option. Carriers would submit their manifests in their entirety at least 60 minutes prior to departure. We assume that 2 percent of passengers on large carriers and 0.25 percent of passengers on small carriers will be delayed an average of 4 hours and will need to be rerouted. In the absence of any specific data from the air carriers or IATA, we also assume that 15 percent of passengers would need to arrive at their originating airport an average of 15 minutes earlier than normal to make their flights.[49] Benefits will include interview costs avoided, deportation costs avoided, delay costs avoided, and diversion costs avoided, as well as the non-quantified security benefits that are the impetus for this rule.

60-Minute APIS Rule

Percent of passengers arriving early	15% on all carriers, 15 minutes
Percent of passengers delayed	2% on large carriers, 0.25% on small carriers
Length of delay	4 hours
First-year costs	$265 million
Average recurring costs	$343 million
10-year PV costs (7%)	$2.7 billion
10-year PV costs (3%)	$3.2 billion

[49] Although IATA provided an estimate that 80 to 90 percent of international passengers arrive more than 60 minutes prior to departure and that over 95 percent of international passengers arrive more than 30 minutes prior to departure, they did not provide an estimate of the time delays that would be incurred by those passengers not already arriving within the required or alternative time periods.

Under the 60-minute requirement benefits are higher than the No Action alternative because the high-risk individual will be identified prior to boarding. In addition to this security benefit, there is an estimated $14 million in costs avoided annually.

The 120-Minute APIS Rule

Under this alternative, carriers would submit their manifests in their entirety at least 120 minutes prior to departure. This alternative would be quite disruptive because even though passengers and carriers would have the predictability of a pre-determined transmission time, passenger check-in at the original departure airport would be affected. Instead of passengers checking in 2 hours prior to departure, carriers would have to advise passengers to arrive even earlier to assure timely manifest transmission. We assume that 20 percent of passengers on large carriers and 5 percent of passengers on small carriers will be delayed an average of 6 hours and will need to be rerouted. We also assume that 30 percent of passengers would need to arrive at the originating airport an average of 1 hour earlier than customary to make their flights. Benefits would be essentially the same as those under the other regulatory alternatives.

120-Minute APIS Rule

Percent of passengers arriving early	30% on all carriers, 1 hour
Percent of passengers delayed	20% on large carriers, 5% on small carriers
Length of delay	6 hours
First-year costs	$3.4 billion
Average recurring costs	$4.3 billion
10-year PV costs (7%)	$33.8 billion
10-year PV costs (3%)	$40.8 billion

Benefits are higher than the No Action alternative because a high-risk individual will be identified prior to boarding. Benefits are likely the same as under the proposed and final rules because the ability to intercept high-risk passengers prior to boarding does not change appreciably given the extra time.

Comparison of Regulatory Alternatives

Table 10 presents a comparison of the costs and benefits of the rule and the regulatory alternatives.

Table 14.
Comparison of Costs and Benefits of the Final Rule and Regulatory Alternatives

	Final Rule			
	30-Minute Option	**AQQ Option**	**60-Minute APIS**	**120-Minute APIS**
First-year costs	$118 million	$185 million	$265 million	$3.4 billion
Average recurring costs	$152 million	$94 million	$343 million	$4.3 billion
10-year PV costs (7%)	$1.2 billion	$827 million	$2.7 billion	$33.8 billion
10-year PV costs (3%)	$1.4 billion	$976 million	$3.2 billion	$40.8 billion
Average cost per passenger	$0.36–$1.55	$0.36–$1.03	$1.37–$3.45	$17.39–$43.81
Benefits comparison to No Action	Higher (risk identified prior to boarding)	Higher (risk identified prior to boarding)	Higher (risk identified prior to boarding)	Higher (risk identified prior to boarding)
Benefits comparison to Final Rule			Comparable (security benefits + $14 million in costs avoided annually)	Comparable (security benefits + $14 million in costs avoided annually)

5. Impacts to Small Entities

We have prepared this chapter to examine the impacts of the final rule on small entities as required by the Regulatory Flexibility Act. A small entity may be a small business (defined as any independently owned and operated business not dominant in its field that qualifies as a small business per the Small Business Act); a small not-for-profit organization; or a small governmental jurisdiction (locality with fewer than 50,000 people).

In this rulemaking, small air carriers are defined as those that employ fewer than 1,500 employees. CBP estimates that there are 773 small US air carriers that may be affected by the rule. There are no small vessel carriers that are anticipated to be affected by the rule.

This chapter addresses the following.

- The reason the agency is considering this action
- The objectives of and legal basis for the rule
- The number and types of small entities to which the rule will apply
- Projected reporting, recordkeeping, and other compliance requirements of the rule, including the classes of small entities that will be subject to the requirements and the type of professional skills necessary for the preparation of the reports and records
- Other relevant Federal rules that may duplicate, overlap, or conflict with the rule
- Significant alternatives to the component under consideration that accomplish the stated objectives of applicable statutes and may minimize any significant economic impact of the rule on small entities
- Comments received to the proposed rule that addressed impacts to small entities

Reason for Agency Action

CBP would be in a better position to screen passengers and crewmembers against law enforcement databases and terrorist watch lists and to take necessary and effective action prior to an identified risk becoming a threat to the passengers, the aircraft, or the vessel. The primary purpose of this rule is to prevent a known or potential terrorist from boarding an aircraft before departure and from departing on a vessel, thus minimizing disruption to other passengers and limiting delays, costly diversions, or emergency response that could have been prevented if the passenger or crewmember had not been allowed to board. More information on the purpose and need for this regulation can be found in the preamble to this rule.

Objectives of and Legal Basis for the Rule

These final rule would further enhance the Government's capability under the regulations to counter the terrorist threat to the United States, the carrier industry, and the international traveling public by increasing that capability to a level necessary to meet more fully the statutory requirements of section 115 of the Aviation Transportation Security Act, the Enhanced Border Security and Visa Entry Reform Act of 2002, and the Intelligence Reform and Terrorism Prevention Act of 2004. More information on the objectives of and legal basis for this regulation can be found in the preamble to this rule.

Number and Types of Small Entities to which the Rule Will Apply

CBP has identified 773 US-based small air passenger and cargo carriers. For this analysis, we compared the estimated annual cost of the rule to annual revenue data for the small businesses affected. To determine annual company revenue data, we used the *Reference USA* database available online.[50]

We do not expect these carriers to experience great economic impacts as a result of the rule. Small carriers do not need to modify their reservation systems, their transmission methods, nor do they have many connecting passengers that may miss their flights and require rerouting. We estimate that at most 5 percent of passengers on small carriers will be affected by this rule annually. In the 2005 APIS Rule, we estimated that small carriers transport an average of 300 passengers annually. As calculated in Chapter 2, the total cost of delay per passenger is $118.97, and only $4.57 of this is incurred by the air carrier. Initial analysis for the proposed rule estimated the impacts of a 60-minute prior to departure transmission requirement. Now that the transmission requirement has changed for this final rule to 30-minutes prior to the securing of the aircraft doors, we estimate there will be no direct impacts to small carriers.[51] The costs of arriving earlier than customary are incurred only by the passenger.

We certify, therefore, that this rule will not have a significant economic impact on a substantial number of small entities.

Reporting and Recordkeeping

This rule imposes no new reporting or recordkeeping requirements from the 2005 APIS Rule; it simply changes the time that manifest information is reported. Small carriers may continue to use eAPIS to submit their manifests.

Other Federal Rules

This final rule does not duplicate, overlap, or conflict with other Federal regulations.

---

[50] www.referenceusa.com. Accessed September 2004.

[51] The 30-minute option was an alternative presented in the Regulatory Assessment and Initial Regulatory Flexibility Act analysis for the proposed rule (The Pre-Departure APIS Rule alternative) and was available for review during the public comment period.

Regulatory Alternatives

As discussed previously, we examined two regulatory alternatives to the rule. Complete details are provided in Chapter 4. The alternatives were ultimately rejected because they impose an unacceptable burden on air carriers and the traveling public.

Comments to the Proposed Rule

We received one comment to the proposed rule on our Initial Regulatory Flexibility Act analysis that stated that the analysis erroneously omitted costs to passengers.

We disagree with this comment. Individuals of the traveling public are not considered small entities under Small Business Administration guidance.

Conclusion

Based on our analysis and comments received during the public comment period, we certify that this final rule will not have a significant economic impact on a substantial number of small entities.

Appendix A

Costs of the Final Rule

Appendix A-1
Cost Calculations
30-Minute Requirement, Large Carriers
No modification to transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs (carriers)	Rerouting costs, 4-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ -	$ 26,906,036	$ 3,441,527	$ 86,099,316	$ 116,446,879	$ 116,446,879	$ 116,446,879	$ 54,730,033	$ 61,716,846
2007	1	-	28,251,338	3,613,603	90,404,282	122,269,223	114,270,302	118,707,984	57,466,535	64,802,688
2008	2	-	29,663,905	3,794,283	94,924,496	128,382,684	112,134,409	121,012,993	60,339,862	68,042,823
2009	3	-	31,147,100	3,983,997	99,670,721	134,801,819	110,038,438	123,362,760	63,356,855	71,444,964
2010	4	-	32,704,455	4,183,197	104,654,257	141,541,910	107,981,645	125,758,153	66,524,698	75,017,212
2011	5	-	34,339,678	4,392,357	109,886,970	148,619,005	105,963,297	128,200,059	69,850,932	78,768,073
2012	6	-	36,056,662	4,611,975	115,381,318	156,049,955	103,982,674	130,689,381	73,343,479	82,706,476
2013	7	-	37,859,495	4,842,574	121,150,384	163,852,453	102,039,073	133,227,039	77,010,653	86,841,800
2014	8	-	39,752,470	5,084,702	127,207,904	172,045,076	100,131,800	135,813,972	80,861,186	91,183,890
2015	9	-	41,740,093	5,338,937	133,568,299	180,647,330	98,260,178	138,451,136	84,904,245	95,743,085
2016	10		43,827,098	5,605,884	140,246,714	189,679,696	96,423,539	141,139,508	89,149,457	100,530,239
							$ 1,167,672,235	**$ 1,412,809,864**		
					Annual recurring cost	$ 150,394,185			$ 70,685,267	$ 79,708,918

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	35,372,971	39,888,669	75,261,640
2007	37,141,619	41,883,103	79,024,722
2008	38,998,700	43,977,258	82,975,958
2009	40,948,635	46,176,121	87,124,756
2010	42,996,067	48,484,927	91,480,994
2011	45,145,871	50,909,173	96,055,044
2012	47,403,164	53,454,632	100,857,796
2013	49,773,322	56,127,363	105,900,686
2014	52,261,988	58,933,732	111,195,720
2015	54,875,088	61,880,418	116,755,506
2016	57,618,842	64,974,439	122,593,281

[l] **$ 1.55** Average cost per passenger

[a] No programming and transaction costs
[b] [l] * 5% passengers arriving earlier * $28.60/hour passenger time * 15 minutes
[c] [l] * 1% passengers delayed * $4.57 cost of carrier ticket agent
[d] [l] * 1% passengers delayed * $28.60/hour passenger time * 4 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 1% passengers delayed * $118.97 cost of passenger delayed + [j] * 5% passengers arriving early * $7.15 cost of passenger
[i] [k] * 1% passengers delayed * $118.97 cost of passenger delayed + [j] * 5% passengers arriving early * $7.15 cost of passenger
[j] Estimated annual passengers on large US carriers, 5% annual growth rate
[k] Estimated annual passengers on large foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l]

Appendix A-2
Cost Calculations
30-Minute Requirement, Small Carriers
No modification to transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs (carriers)	Rerouting costs, 4-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ -	$ 1,416,107	$ -	$ -	$ 1,416,107	$ 1,416,107	$ 1,416,107	$ 920,470	$ 495,638
2007	1	-	1,486,913	-	-	1,486,913	1,389,638	1,443,604	966,493	520,419
2008	2	-	1,561,258	-	-	1,561,258	1,363,663	1,471,636	1,014,818	546,440
2009	3	-	1,639,321	-	-	1,639,321	1,338,174	1,500,211	1,065,559	573,762
2010	4	-	1,721,287	-	-	1,721,287	1,313,162	1,529,341	1,118,837	602,450
2011	5	-	1,807,351	-	-	1,807,351	1,288,617	1,559,037	1,174,778	632,573
2012	6	-	1,897,719	-	-	1,897,719	1,264,530	1,589,310	1,233,517	664,202
2013	7	-	1,992,605	-	-	1,992,605	1,240,894	1,620,170	1,295,193	697,412
2014	8	-	2,092,235	-	-	2,092,235	1,217,700	1,651,630	1,359,953	732,282
2015	9	-	2,196,847	-	-	2,196,847	1,194,939	1,683,700	1,427,951	768,896
2016	10	-	2,306,689	-	-	2,306,689	1,172,604	1,716,394	1,499,348	807,341
							$ 14,200,029	**$ 17,181,140**		
					Annual recurring cost	$ 1,828,939			$ 1,188,811	$ 640,129

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	2,574,740	1,386,399	3,961,139
2007	2,703,477	1,455,719	4,159,196
2008	2,838,651	1,528,504	4,367,156
2009	2,980,584	1,604,930	4,585,513
2010	3,129,613	1,685,176	4,814,789
2011	3,286,094	1,769,435	5,055,529
2012	3,450,398	1,857,907	5,308,305
2013	3,622,918	1,950,802	5,573,720
2014	3,804,064	2,048,342	5,852,406
2015	3,994,267	2,150,759	6,145,027
2016	4,193,981	2,258,297	6,452,278

[m] **$ 0.36** Average cost per passenger

[a] No programming and transaction costs
[b] [l] * 5% passengers arriving earlier * $28.60/hour passenger time * 15 minutes
[c] No passengers delayed
[d] No passengers delayed
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] No passengers delayed but [j] * 5% passengers arriving earlier * $7.15
[i] No passengers delayed but [k] * 5% passengers arriving earlier * $7.15
[j] Estimated annual passengers on small US carriers, 5% annual growth rate
[k] Estimated annual passengers on small foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l]

Appendix A-3
Cost Calculations
AQQ, Large Carriers
Modifications to transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs (carriers)	Rerouting costs, 4-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ 184,000,000	$ -	$ -	$ -	$ 184,000,000	$ 184,000,000	$ 184,000,000	$ 22,000,000	$ 162,000,000
2007	1	26,098,134	-	1,806,801	45,202,141	73,107,077	68,324,371	70,977,744	34,360,326	38,746,751
2008	2	27,403,041	-	1,897,142	47,462,248	76,762,430	67,047,280	72,355,953	36,078,342	40,684,088
2009	3	28,773,193	-	1,991,999	49,835,361	80,600,552	65,794,059	73,760,923	37,882,259	42,718,293
2010	4	30,211,852	-	2,091,599	52,327,129	84,630,579	64,564,264	75,193,174	39,776,372	44,854,207
2011	5	31,722,445	-	2,196,179	54,943,485	88,862,108	63,357,455	76,653,235	41,765,191	47,096,917
2012	6	33,308,567	-	2,305,987	57,690,659	93,305,214	62,173,204	78,141,648	43,853,451	49,451,763
2013	7	34,973,996	-	2,421,287	60,575,192	97,970,475	61,011,088	79,658,961	46,046,123	51,924,352
2014	8	36,722,695	-	2,542,351	63,603,952	102,868,998	59,870,694	81,205,737	48,348,429	54,520,569
2015	9	38,558,830	-	2,669,469	66,784,149	108,012,448	58,751,615	82,782,548	50,765,851	57,246,598
2016	10	40,486,772	-	2,802,942	70,123,357	113,413,071	57,653,454	84,389,976	53,304,143	60,108,927
							$ 812,547,483	**$ 959,119,899**		
					Annual recurring cost	$ 91,953,295			$ 43,218,049	$ 48,735,246

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	35,372,971	39,888,669	75,261,640
2007	37,141,619	41,883,103	79,024,722
2008	38,998,700	43,977,258	82,975,958
2009	40,948,635	46,176,121	87,124,756
2010	42,996,067	48,484,927	91,480,994
2011	45,145,871	50,909,173	96,055,044
2012	47,403,164	53,454,632	100,857,796
2013	49,773,322	56,127,363	105,900,686
2014	52,261,988	58,933,732	111,195,720
2015	54,875,088	61,880,418	116,755,506
2016	57,618,842	64,974,439	122,593,281

[m] **$ 1.03** Average cost per passenger

[a] $2 million * 92 large carriers in 2006; $0.33 * [l] in subsequent years
[b] No costs for arriving at the originating airport earlier
[c] [l] * 0.5% passengers delayed * $4.57 cost of carrier ticket agent
[d] [l] * 0.5% passengers delayed * $28.60/hour passenger time * 4 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 0.5% passengers delayed * $118.97 cost of passenger delayed + [j] * $0.33
[i] [k] * 0.5% passengers delayed * $118.97 cost of passenger delayed + [k] * $0.33
[j] Estimated annual passengers on large US carriers, 5% annual growth rate
[k] Estimated annual passengers on large foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l] (sum of 2007-2016 estimates only)

Appendix A-4
Cost Calculations, Sensitivity Analysis 1
Carriers spend 1 hour rerouting passenger, average passenger delay of 8 hours
30-Minute Requirement, Large Carriers
No modification to transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs, 1 hour (carriers)	Rerouting costs, 8-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ -	$ 26,906,036	$ 13,766,107	$ 172,198,633	$ 212,870,776	$ 212,870,776	$ 212,870,776	$ 100,049,265	$ 112,821,511
2007	1	-	28,251,338	14,454,412	180,808,564	223,514,314	208,891,883	217,004,189	105,051,728	118,462,587
2008	2	-	29,663,905	15,177,133	189,848,992	234,690,030	204,987,361	221,217,862	110,304,314	124,385,716
2009	3	-	31,147,100	15,935,989	199,341,442	246,424,532	201,155,822	225,513,355	115,819,530	130,605,002
2010	4	-	32,704,455	16,732,789	209,308,514	258,745,758	197,395,900	229,892,255	121,610,506	137,135,252
2011	5	-	34,339,678	17,569,428	219,773,940	271,683,046	193,706,257	234,356,182	127,691,032	143,992,014
2012	6	-	36,056,662	18,447,899	230,762,637	285,267,198	190,085,579	238,906,788	134,075,583	151,191,615
2013	7	-	37,859,495	19,370,294	242,300,769	299,530,558	186,532,578	243,545,754	140,779,362	158,751,196
2014	8	-	39,752,470	20,338,809	254,415,807	314,507,086	183,045,988	248,274,798	147,818,331	166,688,756
2015	9	-	41,740,093	21,355,750	267,136,598	330,232,441	179,624,567	253,095,668	155,209,247	175,023,193
2016	10		43,827,098	22,423,537	280,493,427	346,744,063	176,267,099	258,010,147	162,969,709	183,774,353
							$ 2,134,563,809	**$ 2,582,687,773**		
					Annual recurring cost	$ 274,928,164			$ 129,216,237	$ 145,711,927

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	35,372,971	39,888,669	75,261,640
2007	37,141,619	41,883,103	79,024,722
2008	38,998,700	43,977,258	82,975,958
2009	40,948,635	46,176,121	87,124,756
2010	42,996,067	48,484,927	91,480,994
2011	45,145,871	50,909,173	96,055,044
2012	47,403,164	53,454,632	100,857,796
2013	49,773,322	56,127,363	105,900,686
2014	52,261,988	58,933,732	111,195,720
2015	54,875,088	61,880,418	116,755,506
2016	57,618,842	64,974,439	122,593,281

[l] **$ 2.83** Average cost per passenger

[a] No programming and transaction costs
[b] [l] * 5% passengers arriving earlier * $28.60/hour passenger time * 15 minutes
[c] [l] * 1% passengers delayed * $18.29 cost of carrier ticket agent
[d] [l] * 1% passengers delayed * $28.60/hour passenger time * 8 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 1% passengers delayed * $247.09 cost of passenger delayed + [j] * 5% passengers arriving early * $7.15 cost of passenger
[i] [k] * 1% passengers delayed * $247.09 cost of passenger delayed + [j] * 5% passengers arriving early * $7.15 cost of passenger
[j] Estimated annual passengers on large US carriers, 5% annual growth rate
[k] Estimated annual passengers on large foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l]

Appendix A-5
Cost Calculations, Sensitivity Analysis 2
Carriers spend 1 hour rerouting passenger, provide accomodations, average passenger delay of 24 hours
Pre-Departure APIS Rule, 30-Minute Requirement, Large Carriers
No modification to transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs, 1 hour, accomodations (carriers)	Rerouting costs, 24-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ -	$ 26,906,036	$ 390,074,307	$ 516,595,898	$ 933,576,242	$ 933,576,242	$ 933,576,242	$ 438,780,834	$ 494,795,408
2007	1	-	28,251,338	409,578,023	542,425,693	980,255,054	916,126,218	951,703,936	460,719,875	519,535,178
2008	2	-	29,663,905	430,056,924	569,546,977	1,029,267,806	899,002,364	970,183,624	483,755,869	545,511,937
2009	3	-	31,147,100	451,559,770	598,024,326	1,080,731,197	882,198,581	989,022,141	507,943,662	572,787,534
2010	4	-	32,704,455	474,137,758	627,925,543	1,134,767,756	865,708,888	1,008,226,454	533,340,846	601,426,911
2011	5	-	34,339,678	497,844,646	659,321,820	1,191,506,144	849,527,414	1,027,803,667	560,007,888	631,498,256
2012	6	-	36,056,662	522,736,879	692,287,911	1,251,081,451	833,648,397	1,047,761,019	588,008,282	663,073,169
2013	7	-	37,859,495	548,873,723	726,902,306	1,313,635,524	818,066,184	1,068,105,894	617,408,696	696,226,828
2014	8	-	39,752,470	576,317,409	763,247,422	1,379,317,300	802,775,227	1,088,845,814	648,279,131	731,038,169
2015	9	-	41,740,093	605,133,279	801,409,793	1,448,283,165	787,770,082	1,109,988,451	680,693,088	767,590,078
2016	10		43,827,098	635,389,943	841,480,282	1,520,697,323	773,045,408	1,131,541,625	714,727,742	805,969,581
							$ 9,361,445,004	**$ 11,326,758,864**		
					Annual recurring cost	$ 1,205,738,088			$ 566,696,901	$ 639,041,186

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	35,372,971	39,888,669	75,261,640
2007	37,141,619	41,883,103	79,024,722
2008	38,998,700	43,977,258	82,975,958
2009	40,948,635	46,176,121	87,124,756
2010	42,996,067	48,484,927	91,480,994
2011	45,145,871	50,909,173	96,055,044
2012	47,403,164	53,454,632	100,857,796
2013	49,773,322	56,127,363	105,900,686
2014	52,261,988	58,933,732	111,195,720
2015	54,875,088	61,880,418	116,755,506
2016	57,618,842	64,974,439	122,593,281

[l] **$ 12.40** Average cost per passenger

[a] No programming and transaction costs
[b] [l] * 5% passengers arriving earlier * $28.60/hour passenger time * 15 minutes
[c] [l] * 1% passengers delayed * $18.29 cost of carrier ticket agent
[d] [l] * 1% passengers delayed * $28.60/hour passenger time * 8 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 1% passengers delayed * $1,204.69 cost of passenger delayed + [j] * 5% passengers arriving early * $7.15 cost of passenger
[i] [k] * 1% passengers delayed * $1,204.69 cost of passenger delayed + [j] * 5% passengers arriving early * $7.15 cost of passenger
[j] Estimated annual passengers on large US carriers, 5% annual growth rate
[k] Estimated annual passengers on large foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l]

Appendix A-6
Cost Calculations, Sensitivity Analysis 1
Carriers spend 1 hour rerouting passenger, average passenger delay of 8 hours
AQQ, Large Carriers

Modifications to transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs, 1 hour (carriers)	Rerouting costs, 8-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ 184,000,000	$ -	$ -	$ -	$ 184,000,000	$ 184,000,000	$ 184,000,000	$ 22,000,000	$ 162,000,000
2007	1	26,098,134	-	7,227,206	90,404,282	123,729,622	115,635,161	120,125,847	58,152,922	65,576,700
2008	2	27,403,041	-	7,588,566	94,924,496	129,916,103	113,473,756	122,458,387	61,060,569	68,855,535
2009	3	28,773,193	-	7,967,995	99,670,721	136,411,908	111,352,751	124,836,220	64,113,597	72,298,311
2010	4	30,211,852	-	8,366,394	104,654,257	143,232,504	109,271,391	127,260,224	67,319,277	75,913,227
2011	5	31,722,445	-	8,784,714	109,886,970	150,394,129	107,228,935	129,731,297	70,685,241	79,708,888
2012	6	33,308,567	-	9,223,950	115,381,318	157,913,835	105,224,656	132,250,351	74,219,503	83,694,333
2013	7	34,973,996	-	9,685,147	121,150,384	165,809,527	103,257,840	134,818,319	77,930,478	87,879,049
2014	8	36,722,695	-	10,169,405	127,207,904	174,100,004	101,327,787	137,436,150	81,827,002	92,273,002
2015	9	38,558,830	-	10,677,875	133,568,299	182,805,004	99,433,810	140,104,814	85,918,352	96,886,652
2016	10	40,486,772	-	11,211,769	140,246,714	191,945,254	97,575,234	142,825,295	90,214,269	101,730,985
							$ 1,247,781,322	**$ 1,495,846,905**		
					Annual recurring cost	$ 155,625,789			$ 73,144,121	$ 82,481,668

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	35,372,971	39,888,669	75,261,640
2007	37,141,619	41,883,103	79,024,722
2008	38,998,700	43,977,258	82,975,958
2009	40,948,635	46,176,121	87,124,756
2010	42,996,067	48,484,927	91,480,994
2011	45,145,871	50,909,173	96,055,044
2012	47,403,164	53,454,632	100,857,796
2013	49,773,322	56,127,363	105,900,686
2014	52,261,988	58,933,732	111,195,720
2015	54,875,088	61,880,418	116,755,506
2016	57,618,842	64,974,439	122,593,281

[m] **$ 1.63** Average cost per passenger

[a] $2 million * 92 large carriers in 2006; $0.33 * [l] in subsequent years
[b] No costs for arriving at the originating airport earlier
[c] [l] * 0.5% passengers delayed * $18.29 cost of carrier ticket agent
[d] [l] * 0.5% passengers delayed * $28.60/hour passenger time * 8 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 0.5% passengers delayed * $247.09 cost of passenger delayed + [j] * $0.33
[i] [k] * 0.5% passengers delayed * $247.09 cost of passenger delayed + [k] * $0.33
[j] Estimated annual passengers on large US carriers, 5% annual growth rate
[k] Estimated annual passengers on large foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l] (sum of 2007-2016 estimates only)

Appendix A-7
Cost Calculations, Sensitivity Analysis 2
Carriers spend 1 hour rerouting passenger, provide accomodations, average passenger delay of 24 hours
AQQ, Large Carriers
Modifications to transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs, 1 hour, accomodations (carriers)	Rerouting costs, 24-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ 184,000,000	$ -	$ -	$ -	$ 184,000,000	$ 184,000,000	$ 184,000,000	$ 22,000,000	$ 162,000,000
2007	1	26,098,134	-	204,789,011	271,212,846	502,099,992	469,252,329	487,475,720	235,986,996	266,112,996
2008	2	27,403,041	-	215,028,462	284,773,489	527,204,991	460,481,257	496,941,268	247,786,346	279,418,645
2009	3	28,773,193	-	225,779,885	299,012,163	553,565,241	451,874,131	506,590,613	260,175,663	293,389,578
2010	4	30,211,852	-	237,068,879	313,962,771	581,243,503	443,427,885	516,427,324	273,184,446	308,059,057
2011	5	31,722,445	-	248,922,323	329,660,910	610,305,678	435,139,514	526,455,039	286,843,669	323,462,009
2012	6	33,308,567	-	261,368,439	346,143,955	640,820,962	427,006,065	536,677,467	301,185,852	339,635,110
2013	7	34,973,996	-	274,436,861	363,451,153	672,862,010	419,024,643	547,098,389	316,245,145	356,616,865
2014	8	36,722,695	-	288,158,704	381,623,711	706,505,111	411,192,407	557,721,658	332,057,402	374,447,709
2015	9	38,558,830	-	302,566,640	400,704,896	741,830,366	403,506,567	568,551,205	348,660,272	393,170,094
2016	10	40,486,772	-	317,694,972	420,740,141	778,921,884	395,964,389	579,591,034	366,093,286	412,828,599
							$ 4,500,869,186	**$ 5,507,529,718**		
					Annual recurring cost	$ 631,535,974			$ 296,821,908	$ 334,714,066

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	35,372,971	39,888,669	75,261,640
2007	37,141,619	41,883,103	79,024,722
2008	38,998,700	43,977,258	82,975,958
2009	40,948,635	46,176,121	87,124,756
2010	42,996,067	48,484,927	91,480,994
2011	45,145,871	50,909,173	96,055,044
2012	47,403,164	53,454,632	100,857,796
2013	49,773,322	56,127,363	105,900,686
2014	52,261,988	58,933,732	111,195,720
2015	54,875,088	61,880,418	116,755,506
2016	57,618,842	64,974,439	122,593,281

[m] **$ 6.08** Average cost per passenger

[a] $2 million * 92 large carriers in 2006; $0.33 * [l] in subsequent years
[b] No costs for arriving at the originating airport earlier
[c] [l] * 0.5% passengers delayed * $18.29 cost of carrier ticket agent + [l] * 0.5% passengers delayed * $500 cost to carrier for passenger accommodations
[d] [l] * 0.5% passengers delayed * $28.60/hour passenger time * 24 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 0.5% passengers delayed * $1,204.69 cost of passenger delayed + [j] * $0.33
[i] [k] * 0.5% passengers delayed * $1,204.69 cost of passenger delayed + [k] * $0.33
[j] Estimated annual passengers on large US carriers, 5% annual growth rate
[k] Estimated annual passengers on large foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l] (sum of 2007-2016 estimates only)

Appendix B

Benefits of the Final Rule

Appendix B-1
Benefits Calculations
High and low cost scenarios

		Interview costs avoided (CBP and law enforcement)	Deportation costs avoided (CBP and carriers)	Delay costs avoided (passengers, carriers, CBP)	Diversion costs avoided (passengers, carriers, CBP)	Grand total	Total discounted (7%)	Total discounted (3%)
		[a]	[b]	[c]	[d]	[e]	[f]	[g]
2006	0	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2007	1	1,125,466	12,785,675	89,924	359,696	14,360,761	13,421,272	13,942,486
2008	2	1,136,720	12,913,532	89,924	359,696	14,499,872	12,664,750	13,667,520
2009	3	1,148,088	13,042,667	89,924	359,696	14,640,375	11,950,907	13,398,017
2010	4	1,159,569	13,173,094	89,924	359,696	14,782,282	11,277,333	13,133,867
2011	5	1,171,164	13,304,824	89,924	359,696	14,925,609	10,641,753	12,874,962
2012	6	1,182,876	13,437,873	89,924	359,696	15,070,369	10,042,023	12,621,197
2013	7	1,194,705	13,572,251	89,924	359,696	15,216,576	9,476,119	12,372,469
2014	8	1,206,652	13,707,974	89,924	359,696	15,364,246	8,942,131	12,128,678
2015	9	1,218,718	13,845,054	89,924	359,696	15,513,392	8,438,258	11,889,723
2016	10	1,230,905	13,983,504	89,924	359,696	15,664,030	7,962,799	11,655,509
							$ 104,817,344	**$ 127,684,428**

Average recurring benefit $ 13,639,774
[h]

Improper boardings

	Annual hits	Hits prevented from boarding	Residual
	[i]	[j]	[k]
2004	22,000		
2005	22,220	19,998	2,222
2006	22,442	20,198	2,244
2007	22,667	20,400	2,267
2008	22,893	20,604	2,289
2009	23,122	20,810	2,312
2010	23,353	21,018	2,335
2011	23,587	21,228	2,359
2012	23,823	21,441	2,382
2013	24,061	21,655	2,406
2014	24,302	21,872	2,430
2015	24,545	22,090	2,454
2016	24,790	22,311	2,479

[a] [j] * $29.70/hour cost per agent * 2 hour interview
[b] [j] * 25% of hits deported * ($1,507 CBP processing costs + $1,000 carrier costs)
[c] [($3,372/hour carrier cost * 4 hours) + ($28.60/hour passenger time * 250 passengers * 4 hours) + ($500/passenger compensation * 250 passengers) + (29.70/hour per agent * 12 agents * 4 hours)] * 1 delay annually
[d] [($3,372/hour carrier cost * 8 hours) + ($28.60/hour passenger time * 250 passengers * 8 hours) + (29.70/hour per agent * 12 agents * 8 hours)] * 2 diversions annually
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] Average of [e]
[i] Estimated annual hits, 1% annual growth rate
[j] [i] * 0.9 effectiveness factor
[k] [i] - [j]

Appendix B-2
Breakeven Analysis
High and low cost scenarios

Scenario 1: Human casuality losses only
$3M VSL
7% discount rate

Casualties	Value of casualties prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 300	$ 132.57	$ 91.15	44.2%	30.4%
250	750	132.57	91.15	17.7%	12.2%
500	1,500	132.57	91.15	8.8%	6.1%
1,000	3,000	132.57	91.15	4.4%	3.0%
3,000	9,000	132.57	91.15	1.5%	1.0%

3% discount rate

Casualties	Value of casualties prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 300	$ 133.18	$ 89.40	44.4%	29.8%
250	750	133.18	89.40	17.8%	11.9%
500	1,500	133.18	89.40	8.9%	6.0%
1,000	3,000	133.18	89.40	4.4%	3.0%
3,000	9,000	133.18	89.40	1.5%	1.0%

$6M VSL
7% discount rate

Casualties	Value of casualties prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 600	$ 132.57	$ 91.15	22.1%	15.2%
250	1,500	132.57	91.15	8.8%	6.1%
500	3,000	132.57	91.15	4.4%	3.0%
1,000	6,000	132.57	91.15	2.2%	1.5%
3,000	18,000	132.57	91.15	0.7%	0.5%

3% discount rate

Casualties	Value of casualties prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 600	$ 133.18	$ 89.40	22.2%	14.9%
250	1,500	133.18	89.40	8.9%	6.0%
500	3,000	133.18	89.40	4.4%	3.0%
1,000	6,000	133.18	89.40	2.2%	1.5%
3,000	18,000	133.18	89.40	0.7%	0.5%

Scenario 2: Human casuality losses and loss of aircraft

$3M VSL

7% discount rate

Casualties	Value of losses prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 312	$ 132.57	$ 91.15	42.5%	29.2%
250	762	132.57	91.15	17.4%	12.0%
500	1,512	132.57	91.15	8.8%	6.0%
1,000	3,012	132.57	91.15	4.4%	3.0%
3,000	9,012	132.57	91.15	1.5%	1.0%

3% discount rate

Casualties	Value of casualties prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 312	$ 133.18	$ 89.40	42.7%	28.7%
250	762	133.18	89.40	17.5%	11.7%
500	1,512	133.18	89.40	8.8%	5.9%
1,000	3,012	133.18	89.40	4.4%	3.0%
3,000	9,012	133.18	89.40	1.5%	1.0%

$6M VSL

7% discount rate

Casualties	Value of losses prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 612	$ 132.57	$ 91.15	21.7%	14.9%
250	1,512	132.57	91.15	8.8%	6.0%
500	3,012	132.57	91.15	4.4%	3.0%
1,000	6,012	132.57	91.15	2.2%	1.5%
3,000	18,012	132.57	91.15	0.7%	0.5%

3% discount rate

Casualties	Value of casualties prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 612	$ 133.18	$ 89.40	21.8%	14.6%
250	1,512	133.18	89.40	8.8%	5.9%
500	3,012	133.18	89.40	4.4%	3.0%
1,000	6,012	133.18	89.40	2.2%	1.5%
3,000	18,012	133.18	89.40	0.7%	0.5%

Scenario 3: Human casuality losses and catastrophic loss of physical capital

$3M VSL

7% discount rate

Casualties	Value of losses prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 22,300	$ 132.57	$ 91.15	0.6%	0.4%
250	22,750	132.57	91.15	0.6%	0.4%
500	23,500	132.57	91.15	0.6%	0.4%
1,000	25,000	132.57	91.15	0.5%	0.4%
3,000	31,000	132.57	91.15	0.4%	0.3%

3% discount rate

Casualties	Value of casualties prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 22,300	$ 133.18	$ 89.40	0.6%	0.4%
250	22,750	133.18	89.40	0.6%	0.4%
500	23,500	133.18	89.40	0.6%	0.4%
1,000	25,000	133.18	89.40	0.5%	0.4%
3,000	31,000	133.18	89.40	0.4%	0.3%

$6M VSL

7% discount rate

Casualties	Value of losses prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 22,600	$ 132.57	$ 91.15	0.6%	0.4%
250	23,500	132.57	91.15	0.6%	0.4%
500	25,000	132.57	91.15	0.5%	0.4%
1,000	28,000	132.57	91.15	0.5%	0.3%
3,000	40,000	132.57	91.15	0.3%	0.2%

3% discount rate

Casualties	Value of casualties prevented	Annualized cost high	Annualized cost low	Risk reduction required high	Risk reduction required low
100	$ 22,600	$ 133.18	$ 89.40	0.6%	0.4%
250	23,500	133.18	89.40	0.6%	0.4%
500	25,000	133.18	89.40	0.5%	0.4%
1,000	28,000	133.18	89.40	0.5%	0.3%
3,000	40,000	133.18	89.40	0.3%	0.2%

Appendix C

Costs of Regulatory Alternatives

Appendix C-1
Cost Calculations
60-Minute APIS Rule, Large Carriers
No modifications to transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs (carriers)	Rerouting costs, 4-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ -	$ 80,718,109	$ 6,883,053	$ 172,198,633	$ 259,799,795	$ 259,799,795	$ 259,799,795	$ 122,105,904	$ 137,693,891
2007	1	-	84,754,014	7,227,206	180,808,564	272,789,785	254,943,724	264,844,451	128,211,199	144,578,586
2008	2	-	88,991,715	7,588,566	189,848,992	286,429,274	250,178,421	269,987,062	134,621,759	151,807,515
2009	3	-	93,441,301	7,967,995	199,341,442	300,750,738	245,502,189	275,229,529	141,352,847	159,397,891
2010	4	-	98,113,366	8,366,394	209,308,514	315,788,275	240,913,363	280,573,792	148,420,489	167,367,786
2011	5	-	103,019,034	8,784,714	219,773,940	331,577,688	236,410,309	286,021,827	155,841,513	175,736,175
2012	6	-	108,169,986	9,223,950	230,762,637	348,156,573	231,991,425	291,575,648	163,633,589	184,522,984
2013	7	-	113,578,485	9,685,147	242,300,769	365,564,401	227,655,137	297,237,312	171,815,269	193,749,133
2014	8	-	119,257,410	10,169,405	254,415,807	383,842,621	223,399,900	303,008,910	180,406,032	203,436,589
2015	9	-	125,220,280	10,677,875	267,136,598	403,034,752	219,224,201	308,892,578	189,426,334	213,608,419
2016	10	-	131,481,294	11,211,769	280,493,427	423,186,490	215,126,553	314,890,492	198,897,650	224,288,840
							$ 2,605,145,016	**$ 3,152,061,396**		
					Annual recurring cost	$ 335,538,217			$ 157,702,962	$ 177,835,255

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	35,372,971	39,888,669	75,261,640
2007	37,141,619	41,883,103	79,024,722
2008	38,998,700	43,977,258	82,975,958
2009	40,948,635	46,176,121	87,124,756
2010	42,996,067	48,484,927	91,480,994
2011	45,145,871	50,909,173	96,055,044
2012	47,403,164	53,454,632	100,857,796
2013	49,773,322	56,127,363	105,900,686
2014	52,261,988	58,933,732	111,195,720
2015	54,875,088	61,880,418	116,755,506
2016	57,618,842	64,974,439	122,593,281

[m] **$ 3.45** Average cost per passenger

[a] No programming and transaction costs
[b] [l] * 15% passengers arriving earlier * $28.60/hour passenger time * 15 minutes
[c] [l] * 2% passengers delayed * $4.57 cost of carrier ticket agent
[d] [l] * 2% passengers delayed * $28.60/hour passenger time * 4 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 2% passengers delayed * $118.97 cost of passenger delayed + [j] * 15% passengers arriving early * $7.15 cost of passenger
[i] [k] * 2% passengers delayed * $118.97 cost of passenger delayed + [j] * 15% passengers arriving early * $7.15 cost of passenger
[j] Estimated annual passengers on large US carriers, 5% annual growth rate
[k] Estimated annual passengers on large foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l]

Appendix C-2
Cost Calculations
60-Minute APIS Rule, Small Carriers
No modifications of transmission methods

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs (carriers)	Rerouting costs, 4-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ -	$ 4,248,322	$ 45,283	$ 1,132,886	$ 5,426,491	$ 5,426,491	$ 5,426,491	$ 3,527,219	$ 1,899,272
2007	1	-	4,460,738	47,547	1,189,530	5,697,815	5,325,061	5,531,859	3,703,580	1,994,235
2008	2	-	4,683,774	49,925	1,249,007	5,982,706	5,225,527	5,639,274	3,888,759	2,093,947
2009	3	-	4,917,963	52,421	1,311,457	6,281,841	5,127,854	5,748,774	4,083,197	2,198,644
2010	4	-	5,163,861	55,042	1,377,030	6,595,933	5,032,006	5,860,401	4,287,357	2,308,577
2011	5	-	5,422,054	57,794	1,445,881	6,925,730	4,937,950	5,974,195	4,501,724	2,424,005
2012	6	-	5,693,157	60,684	1,518,175	7,272,016	4,845,652	6,090,199	4,726,811	2,545,206
2013	7	-	5,977,815	63,718	1,594,084	7,635,617	4,755,079	6,208,455	4,963,151	2,672,466
2014	8	-	6,276,706	66,904	1,673,788	8,017,398	4,666,199	6,329,008	5,211,309	2,806,089
2015	9	-	6,590,541	70,249	1,757,478	8,418,268	4,578,980	6,451,901	5,471,874	2,946,394
2016	10	-	6,920,068	73,762	1,845,351	8,839,181	4,493,392	6,577,181	5,745,468	3,093,713
							$ 54,414,187	**$ 65,837,740**		
					Annual recurring cost	$ 7,008,454			$ 4,555,495	$ 2,452,959

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	2,574,740	1,386,399	3,961,139
2007	2,703,477	1,455,719	4,159,196
2008	2,838,651	1,528,504	4,367,156
2009	2,980,584	1,604,930	4,585,513
2010	3,129,613	1,685,176	4,814,789
2011	3,286,094	1,769,435	5,055,529
2012	3,450,398	1,857,907	5,308,305
2013	3,622,918	1,950,802	5,573,720
2014	3,804,064	2,048,342	5,852,406
2015	3,994,267	2,150,759	6,145,027
2016	4,193,981	2,258,297	6,452,278

[m] **$ 1.37** Average cost per passenger

[a] No programming and transaction costs
[b] [l] * 15% passengers arriving earlier * $28.60/hour passenger time * 15 minutes
[c] [l] * 0.25% passengers delayed * $4.57 cost of carrier ticket agent
[d] [l] * 0.25% passengers delayed * $28.60/hour passenger time * 4 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 0.25% passengers delayed * $118.97 cost of passenger delayed + [j] * 15% passengers arriving early * $7.15 cost of passenger
[i] [k] * 0.25% passengers delayed * $118.97 cost of passenger delayed + [k] * 15% passengers arriving early * $7.15 cost of passenger
[j] Estimated annual passengers on small US carriers, 5% annual growth rate
[k] Estimated annual passengers on small foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l]

Appendix C-3
Cost Calculations
120-Minute APIS Rule, Large Carriers

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs (carriers)	Rerouting costs, 6-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ -	$ 645,744,872	$ 68,830,533	$ 2,582,979,489	$ 3,297,554,895	$ 3,297,554,895	$ 3,297,554,895	$ 1,549,850,801	$ 1,747,704,094
2007	1	-	678,032,116	72,272,060	2,712,128,464	3,462,432,640	3,235,918,355	3,361,585,087	1,627,343,341	1,835,089,299
2008	2	-	711,933,722	75,885,663	2,847,734,887	3,635,554,272	3,175,433,899	3,426,858,584	1,708,710,508	1,926,843,764
2009	3	-	747,530,408	79,679,946	2,990,121,631	3,817,331,985	3,116,079,995	3,493,399,527	1,794,146,033	2,023,185,952
2010	4	-	784,906,928	83,663,943	3,139,627,713	4,008,198,584	3,057,835,509	3,561,232,528	1,883,853,335	2,124,345,250
2011	5	-	824,152,275	87,847,140	3,296,609,099	4,208,608,514	3,000,679,705	3,630,382,674	1,978,046,001	2,230,562,512
2012	6	-	865,359,888	92,239,497	3,461,439,554	4,419,038,939	2,944,592,234	3,700,875,541	2,076,948,301	2,342,090,638
2013	7	-	908,627,883	96,851,472	3,634,511,531	4,639,990,886	2,889,553,127	3,772,737,202	2,180,795,717	2,459,195,170
2014	8	-	954,059,277	101,694,046	3,816,237,108	4,871,990,431	2,835,542,788	3,845,994,235	2,289,835,502	2,582,154,928
2015	9	-	1,001,762,241	106,778,748	4,007,048,963	5,115,589,952	2,782,541,988	3,920,673,735	2,404,327,277	2,711,262,675
2016	10	-	1,051,850,353	112,117,685	4,207,401,411	5,371,369,450	2,730,531,858	3,996,803,322	2,524,543,641	2,846,825,808
							$33,066,264,352	**$40,008,097,330**		
					Annual recurring cost	$ 4,258,878,231			$ 2,001,672,769	$ 2,257,205,463

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	35,372,971	39,888,669	75,261,640
2007	37,141,619	41,883,103	79,024,722
2008	38,998,700	43,977,258	82,975,958
2009	40,948,635	46,176,121	87,124,756
2010	42,996,067	48,484,927	91,480,994
2011	45,145,871	50,909,173	96,055,044
2012	47,403,164	53,454,632	100,857,796
2013	49,773,322	56,127,363	105,900,686
2014	52,261,988	58,933,732	111,195,720
2015	54,875,088	61,880,418	116,755,506
2016	57,618,842	64,974,439	122,593,281

[m] **$ 43.81** Average cost per passenger

[a] No programming and transaction costs
[b] [l] * 30% passengers arriving earlier * $28.60/hour passenger time * 1 hour
[c] [l] * 20% passengers delayed * $4.57 cost of carrier ticket agent
[d] [l] * 20% passengers delayed * $28.60/hour passenger time * 6 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 20% passengers delayed * $118.97 cost of passenger delayed + [j] * 30% passengers arriving early * $28.60 cost of passenger
[i] [k] * 20% passengers delayed * $118.97 cost of passenger delayed + [j] * 30% passengers arriving early * $28.60 cost of passenger
[j] Estimated annual passengers on large US carriers, 5% annual growth rate
[k] Estimated annual passengers on large foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l]

Appendix C-4
Cost Calculations
120-Minute APIS Rule, Small Carriers

		Programming and transaction costs (carriers)	Costs for arriving earlier (passengers)	Rerouting costs (carriers)	Rerouting costs, 6-hour delay (passengers)	Total	Total discounted (7%)	Total discounted (3%)	US total	Foreign total
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]
2006	0	$ -	$ 33,986,572	$ 905,665	$ 33,986,572	$ 68,878,809	$ 68,878,809	$ 68,878,809	$ 44,771,226	$ 24,107,583
2007	1	-	35,685,901	950,948	35,685,901	72,322,750	67,591,355	70,216,262	47,009,787	25,312,962
2008	2	-	37,470,196	998,496	37,470,196	75,938,887	66,327,965	71,579,685	49,360,277	26,578,611
2009	3	-	39,343,706	1,048,420	39,343,706	79,735,832	65,088,190	72,969,581	51,828,291	27,907,541
2010	4	-	41,310,891	1,100,841	41,310,891	83,722,623	63,871,588	74,386,466	54,419,705	29,302,918
2011	5	-	43,376,436	1,155,883	43,376,436	87,908,754	62,677,727	75,830,864	57,140,690	30,768,064
2012	6	-	45,545,257	1,213,678	45,545,257	92,304,192	61,506,181	77,303,308	59,997,725	32,306,467
2013	7	-	47,822,520	1,274,361	47,822,520	96,919,402	60,356,532	78,804,343	62,997,611	33,921,791
2014	8	-	50,213,646	1,338,080	50,213,646	101,765,372	59,228,373	80,334,524	66,147,492	35,617,880
2015	9	-	52,724,328	1,404,984	52,724,328	106,853,640	58,121,301	58,121,301	69,454,866	37,398,774
2016	10	-	55,360,545	1,475,233	55,360,545	112,196,322	57,034,921	57,034,921	72,927,610	39,268,713
							$ 690,682,943	**$ 785,460,064**		
					Annual recurring cost	$ 88,958,780			$ 57,823,207	$ 31,135,573

Passenger counts

	US	Foreign	Total
	[j]	[k]	[l]
2006	2,574,740	1,386,399	3,961,139
2007	2,703,477	1,455,719	4,159,196
2008	2,838,651	1,528,504	4,367,156
2009	2,980,584	1,604,930	4,585,513
2010	3,129,613	1,685,176	4,814,789
2011	3,286,094	1,769,435	5,055,529
2012	3,450,398	1,857,907	5,308,305
2013	3,622,918	1,950,802	5,573,720
2014	3,804,064	2,048,342	5,852,406
2015	3,994,267	2,150,759	6,145,027
2016	4,193,981	2,258,297	6,452,278

[m] **$ 17.39** Average cost per passenger

[a] No programming and transaction costs
[b] [l] * 30% passengers arriving earlier * $28.60/hour passenger time * 1 hour
[c] [l] * 5% passengers delayed * $4.57 cost of carrier ticket agent
[d] [l] * 5% passengers delayed * $28.60/hour passenger time * 6 hours delay
[e] [a] + [b] + [c] + [d]
[f] [e] discounted at 7%
[g] [e] discounted at 3%
[h] [j] * 5% passengers delayed * $118.97 cost of passenger delayed + [j] * 30% passengers arriving early * $28.60 cost of passenger
[i] [k] * 5% passengers delayed * $118.97 cost of passenger delayed + [j] * 30% passengers arriving early * $28.60 cost of passenger
[j] Estimated annual passengers on small US carriers, 5% annual growth rate
[k] Estimated annual passengers on small foreign carriers, 5% annual growth rate
[l] [j] + [k]
[m] Sum of [e] / sum of [l]

Appendix C-5
Summary of Costs for Regulatory Alternatives

	Final Rule		60-minute requirement	120-minute requirement
	30-minute option	AQQ option*		
Large US carrier year 1 cost	$ 54,730,033	$ 22,000,000	$ 122,105,904	$ 1,549,850,801
Small US carrier year 1 cost	920,470	920,470	3,527,219	44,771,226
Total	$ 55,650,503	$ 22,920,470	$ 125,633,122	$ 1,594,622,027
Large foreign carrier year 1 cost	$ 61,716,846	$ 162,000,000	$ 137,693,891	$ 1,747,704,094
Small foreign carrier year 1 cost	495,638	495,638	1,899,272	24,107,583
Total	$ 62,212,484	$ 162,495,638	$ 139,593,163	$ 1,771,811,678
Large carrier year 1 cost	$ 116,446,879	$ 184,000,000	$ 259,799,795	$ 3,297,554,895
Small carrier year 1 cost	1,416,107	1,416,107	5,426,491	68,878,809
Total	$ 117,862,986	$ 185,416,107	$ 265,226,285	$ 3,366,433,704
Large US carrier average recurring cost	$ 70,685,267	$ 43,218,049	$ 157,702,962	$ 2,001,672,769
Small US carrier average recurring cost	1,188,811	1,188,811	4,555,495	57,823,207
Total	$ 71,874,077	$ 44,406,859	$ 162,258,457	$ 2,059,495,976
Large foreign carrier average recurring cost	$ 79,708,918	$ 48,735,246	$ 177,835,255	$ 2,257,205,463
Small foreign carrier average recurring cost	640,129	640,129	2,452,959	31,135,573
Total	$ 80,349,047	$ 49,375,375	$ 180,288,214	$ 2,288,341,036
Large carrier average recurring cost	$ 150,394,185	$ 91,953,295	$ 335,538,217	$ 4,258,878,231
Small carrier average recurring cost	1,828,939	1,828,939	7,008,454	88,958,780
Total	$ 152,223,124	$ 93,782,235	$ 342,546,672	$ 4,347,837,012
Large carrier 10-year cost (7%)	$ 1,167,672,235	$ 812,547,483	$ 2,605,145,016	$ 33,066,264,352
Small carrier 10-year cost (7%)	14,200,029	14,200,029	54,414,187	690,682,943
Total	$ 1,181,872,264	$ 826,747,512	$ 2,659,559,203	$ 33,756,947,295
Large carrier 10-year cost (3%)	$ 1,412,809,864	$ 959,119,899	$ 3,152,061,396	$ 40,008,097,330
Small carrier 10-year cost (3%)	17,181,140	17,181,140	65,837,740	785,460,064
Total	$ 1,429,991,004	$ 976,301,039	$ 3,217,899,135	$ 40,793,557,394

* Costs for small carriers are the same as those for the 30-minute option because small carriers will continue to use eAPIS.

Appendix D

Summary of Key Assumptions Used in the Analysis

Appendix D-1			
Key Assumptions for the Cost Analysis and Alternatives			
Variable	**Estimate**		**Source**
Number of carriers			
Number of large US carriers	11		CBP
Number of small US carriers	773		CBP
Number of large foreign carriers	81		CBP
Number of small foreign carriers	415		CBP
Percentages of passengers on carriers			
Percent of passengers on large carriers	95%		Estimate from CBP data
Percent of passengers on US carriers	47%		Estimate from CBP data
Percent of passengers on foreign carriers	53%		Estimate from CBP data
Percent of passengers on small carriers	5%		Estimate from CBP data
Percent of passengers on US carriers	65%		Estimate from CBP data
Percent of passengers on foreign carriers	35%		Estimate from CBP data
Modifications to implement AQQ			
Air carrier cost of developing system that will conduct individual passenger queries	$ 2,000,000		Estimate
Communications cost per transaction	$ 0.20		Estimate based on cost of Austrialians using SITA
Time per transaction (seconds)	10		Estimate from CBP
Ticket agent cost per transaction	$ 0.05		Above multiplied by loaded labor rate for ticket agent
Passenger cost per transaction	$ 0.08		Above multiplied by value of passenger time
Total AQQ cost per transaction	$ 0.33		Communications cost plus ticket agent cost
Value of passenger time			
Average value ($/hour) of passenger time (all passengers, value in 2000)	$ 28.60		FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004.
Average value ($/minute) of passenger time (all passengers, value in 2000)	$ 0.48		Above value of passenger time divided by 60 minutes
Average value ($/hour) of ticket agent time (value in 2003)	$ 14.07		Bureau of Labor Statistics data for transportation ticket and reservation agents
Loaded labor rate for ticket agent	$ 18.29		Above multiplied by 1.3. Labor load rate per FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004.
Average value ($/minute) of ticket agent time (value in 2003)	$ 0.30		Above value of agent time divided by 60 minutes

Variable	Estimate		Source
Cost to passenger of arriving 15 minutes early (all alternatives but 120-Minute APIS Rule)	$ 7.15		Above value of passenger time multiplied by 0.25 hours
Cost to passenger of arriving 1 hour earlier (120-Minute APIS Rule)	$ 28.60		Above value of passenger time multiplied by 1 hour
Cost to passenger of 4-hour delay	$ 114.40		Above value of passenger time multiplied by 4 hours
Cost to passenger of 6-hour delay	$ 171.60		Above value of passenger time multiplied by 6 hours
Cost to passenger of 8-hour delay	$ 228.80		Above value of passenger time multiplied by 8 hours
Cost to passenger of 24-hour delay	$ 686.40		Above value of passenger time multiplied by 24 hours
Cost to carrier of rerouting one passenger (15 minutes)	$ 4.57		Reservation agent value multiplied by 15 minutes to reroute passenger
Cost to carrier of rerouting one passenger (1 hour)	$ 18.29		Reservation agent value multiplied by 60 minutes to reroute passenger
Cost to carrier of 24-hour passenger delay	$ 500.00		Estimate to accommodate passenger lodging, meals, and incidental expenses
Percentage of passengers delayed and rerouted			
Chosen Alternative			
30-minute regulatory option			
Percent of passengers on large carriers delayed	1.00%		Estimate
Percent of passengers on small carriers delayed	0.00%		Estimate
Percent of passengers on large carriers who need to arrive at originating airport earlier	5.00%		Estimate
Percent of passengers on small carriers who need to arrive at originating airport earlier	5.00%		Estimate
AQQ regulatory option			
Percent of passengers on large carriers delayed	0.50%		Estimate
Percent of passengers on small carriers delayed (no AQQ)	0.00%		Estimate
60-Minute APIS Rule			
Percent of passengers on large carriers delayed	2.00%		Estimate
Percent of passengers on small carriers delayed	0.25%		Estimate
Percent of passengers on large carriers who need to arrive at originating airport earlier	15.00%		Estimate
Percent of passengers on small carriers who need to arrive at originating airport earlier	15.00%		Estimate
Pre-Boarding APIS Rule at Elevated Alert, assume a 60-minute requirement			
Percent of passengers on large carriers delayed	10.00%		Estimate
Percent of passengers on small carriers delayed	2.50%		Estimate
Percent of passengers on large carriers who need to arrive at originating airport earlier	15.00%		Estimate
Percent of passengers on small carriers who need to arrive at originating airport earlier	15.00%		Estimate

Variable	Estimate		Source
120-Minute APIS Rule			
Percent of passengers on large carriers delayed	20.00%		Estimate
Percent of passengers on small carriers delayed	5.00%		Estimate
Percent of passengers on large carriers who need to arrive at originating airport earlier	30.00%		Estimate
Percent of passengers on small carriers who need to arrive at originating airport earlier	30.00%		Estimate

Appendix D-2			
Key Assumptions for the Benefits Analysis			
Variable	**Estimate**		**Source**
Watchlist hits			
Hits over 6-month period in 2004	11,000		CBP, TSA
Estimated hits over 1 year	22,000		Above multiplied by 2
Annual increase in hits	1.00%		Estimate
Percent effectiveness of 60-Minute APIS Rule	0.9		Estimate
Value of passenger and carrier time			
Average value ($/hour) of passenger time (all passengers, value in 2000)	$ 28.60		FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004.
Cost to carrier for hour of delay	$ 15,000.00		Average estimate based on data received from carriers during the public comment period to the proposed rule.
Annual salary of CBP/other law enforcement agent	$ 44,136		US Office of Personnel Management. GS-11/1 Salary, 2004, no locality pay
Loaded labor rate for CBP/law enforcement agent	$ 57,377		Above multiplied by 1.3 labor load rate to account for fringe benefits and locality pay
Average value ($/hour) of CBP/law enforcement agent time	$ 27.59		Above divided by 2080, the number of hours in a full-time equivalent
Times for various scenarios			
Length of time (in hours) for CBP/law enforcement interview	2		CBP
Length of time for delayed aircraft (in hours)	4		Estimate based on CBP incident reports
Length of time for diverted aircraft (in hours)	8		Estimate based on CBP incident reports
Misc information			
Number of passengers onboard international aircraft	250		The FAA report ("Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004) estimates that large aircraft hold an average of 157 passengers. This average is weighted heavily by domestic aircraft; generally international aircraft are larger, holding between 200 and 300 people. We use 250 passengers in this analysis.
Number of CBP/law enforcement agents required during security incident response	12		CBP
Percent of watchlist hits deported	25%		CBP

Variable	Estimate		Source
Response costs			
Cost of CBP/law enforcement interview	$ 55.17		Average value of CBP/law enforcement agent time multiplied by 2 hours
Cost to CBP to process passenger deported	$ 1,507.00		CBP
Cost to air carrier to transport and accommodate passenger deported	$ 1,000.00		Estimate
Total cost of 4 hour delay			Assumes 250 passengers onboard international aircraft and 12 CBP agents responding to incident
Passenger time costs	$ 28,600.00		Average value passenger time multiplied by 4 hours multiplied by 250 passengers
Carrier operational costs	$ 60,000.00		Cost of hour of delay for air carrier multiplied by 4 hours
Law enforcement costs	$ 1,324.08		Average value of CBP/law enforcement agent time multiplied by 12 agents multiplied by 4 hours
Total	$ 89,924.08		
Total cost of 8 hour delay			Assumes 250 passengers onboard international aircraft and 12 CBP agents responding to incident
Passenger time costs	$ 57,200.00		Average value passenger time multiplied by 4 hours multiplied by 250 passengers
Carrier operational costs	$ 120,000.00		Cost of hour of delay for air carrier multiplied by 4 hours
Law enforcement costs	$ 2,648.16		Average value of CBP/law enforcement agent time multiplied by 12 agents multiplied by 4 hours
Total	$ 179,848.16		
Values used in breakeven analysis			
Value of a fatality avoided (1)	$ 3,000,000		FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004.
Value of a fatality avoided (2)	$ 6,000,000		
Value of an aircraft loss avoided	$ 11,460,000		FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004.
Value of an investigation avoided	$ 449,000		FAA Office of Aviation Policy and Plans. "Economic Values for FAA Investment and Regulatory Decisions, a Guide." May 28, 2004.