

## Data Supporting the Impact of Regulatory Compliance Costs on Small Airports, Volume 2: Technical Appendixes to ACRP Report 90

### DETAILS

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## TECHNICAL APPENDIX 1. RESEARCH METHODOLOGY

This technical appendix describes the research methodology used to complete the ACRP research report on regulatory compliance cost and the impact on small airports.

### A. Overview

The research focused on three issues:

1. Identification and description of regulatory and compliance requirements adopted during the study period (January 1, 2000 to December 31, 2010)
2. Determination of the initial and on-going costs of compliance with these requirements
3. Identification of potential funding sources to pay for compliance costs

Agency websites were a primary source of information for FAA/DOT, EPA and OSHA requirements. Copies of available compliance documents were downloaded and reviewed. Agency personnel also assisted in providing copies of compliance or regulatory documents that could not be readily obtained from the websites. The research team compiled information on each individual regulatory or compliance action in **Tables A-1, A-2, A-4** and **Table A-5** in **Appendix A** of the research report.

The research team relied on two main sources for information on compliance costs: published sources and an airport survey. The research team identified cost information available from published sources (published cost information) – primarily regulatory documents. In addition to proposed and final rule documents, the research team reviewed regulatory impact assessments and economic evaluations of relevant regulatory actions. The U.S. government consolidated regulatory information website ([www.regulations.gov](http://www.regulations.gov)) was one source of this information. Published cost information is included in the tables listed above. Section C below provides a more detailed description of the research process for published costs.

Cost information was also obtained through an outreach effort to small and non-hub airports, described in Section D. The major element of the outreach effort was a survey, conducted in two phases. Phase 1 focused on identifying the compliance and regulatory actions that had an impact on survey participants. Phase 2 focused on identifying the cost of compliance experienced by individual airports. The Phase 2 survey efforts were supplemented by telephone interviews with 13 airports. **Technical Appendix 2** through **Technical Appendix 6** and **Appendix B** of the research report present the survey findings for each of the four regulatory/compliance areas.

Five airport case studies, described in Section E, provided additional information on cost impacts.

Potential funding sources were identified for many requirements. Phase 2 of the survey included questions on airport use of alternative funding sources for specific compliance requirements.

## **B. Research Approach to Document Regulatory/Compliance Requirements**

The research team identified a total of 291 regulatory, guidance and other documents for the four subject areas. As detailed below, environmental requirements and OSHA requirements are introduced primarily through regulatory actions. FAA requirements take a variety of forms, including agency orders, Advisory Circulars (ACs) and cert alerts. Security requirements take the form of published regulations, emergency amendments, security directives and Airport Security Program amendments.

Many regulations, advisory circulars or other requirements were modified, or even repealed, during the study period. Appendix A lists and summarizes each version of the requirements. Certain regulatory actions reduced or eliminated requirements on airports. These actions are also included in **Appendix A** of the research report to provide a comprehensive report on the federal regulatory actions affecting airports.

The approaches adopted by the research team for documenting regulatory requirements under each of the four subject areas are described below.

### ***B.1 FAA/DOT Requirements***

Within the broad area of FAA/DOT requirements different research methodologies were used to document FAA and DOT requirements. The FAA/DOT requirements that address environmental issues are described in the environmental section.

#### FAA Requirements

The primary source of information was the FAA Office of Airports website, [www.faa.gov/airports](http://www.faa.gov/airports), and links available at that site. The main web page contains links to pages for each of the major programs administered by the Office of Airports, e.g. Airport Improvement Program, Airport Safety and Engineering, Design and Construction. These program pages contain additional links to regulations, Federal Register notices and guidance documents such as FAA Orders and ACs. The FAA search function provided direct links to most relevant documents.

Many FAA documents underwent multiple revisions during the study period. The links from the Airports program web pages and the FAA search function were often limited to the current version of the document and occasionally the immediately preceding version. For prior versions of these documents, a search using the Google search engine in most cases provided a link to a location on the FAA's website where the document resides.

Websites reviewed and employed to search for FAA regulatory and compliance documents included the following:

- General information on FAA requirements for airports  
[www.faa.gov/airports](http://www.faa.gov/airports)
- Requirements associated with the Airport Safety  
[www.faa.gov/airports/airport\\_safety](http://www.faa.gov/airports/airport_safety)
- Airport runway safety requirements  
[www.faa.gov/airports/runway\\_safety](http://www.faa.gov/airports/runway_safety)  
[www.faa.gov/airports/engineering](http://www.faa.gov/airports/engineering)
- Requirements associated with the Airport Improvement Program (AIP)  
[www.faa.gov/airports/aip](http://www.faa.gov/airports/aip)
- Airport grant assurances  
[www.faa.gov/airports/airport\\_compliance](http://www.faa.gov/airports/airport_compliance)
- Requirements associated with the passenger facility charge (PFC) program  
[www.faa.gov/airports/pfc](http://www.faa.gov/airports/pfc)
- Requirements associated with the airport noise compatibility program  
[www.faa.gov/airports/environmental/airport\\_noise](http://www.faa.gov/airports/environmental/airport_noise)

FAA staff members provided listings of new AC publications, AC revisions and other documents issued during the study period, and provided copies of documents that could not be readily located through web searches. They also provided suggestions for conducting web searches.

The tables in **Appendix A** of the research report include a summary of the compliance documents. Summaries of regulations were obtained from the respective Federal Register publication. Introductory paragraphs from the respective FAA Orders and ACs and other guidance documents were the basis for the remaining summaries. Because of the number and highly technical nature of changes to requirements contained in many FAA documents, it was not feasible to prepare a highly detailed description of every document. Documents that are inapplicable to small airports were not included in **Table A-1**.

### DOT Requirements

Subtitle A, *Title 49 of the Code of Federal Regulations (CFR)*, Parts 1-99, was the primary source for DOT regulations and requirements, because the DOT establishes requirements on airports primarily through regulations. The current CFR volume was reviewed to identify new regulations or amendments adopted during the study period. The Government Printing Office (GPO) Federal Register website, [www.gpoaccess.gov/fr/advanced.html](http://www.gpoaccess.gov/fr/advanced.html), was the source for

information on rulemaking documents adopting these regulatory actions. The descriptions of DOT requirements applicable to small airports included in **Table A-1** were developed in the same manner as employed for FAA requirements.

### ***B.2 Environmental Requirements***

The environmental compliance research built on the findings of ACRP Report No. 43, *Guidebook of Practices for Improving Environmental Performance at Small Airports* (2011) (*Environmental Guidebook*). The *Environmental Guidebook* included a comprehensive description of federal rules and regulations, Executive Orders and FAA Orders and ACs applicable to small airports. Additional research was performed to collect information pertaining to potential new regulations and amendments finalized during the study period. The environmental requirements reviewed included only those categories typically applicable to small airport operations (e.g. air quality, hazardous waste, emergency response, water, etc.).

In addition, potentially applicable FAA environmental documents (e.g. Orders, ACs) and Executive Orders were reviewed using the following websites:

- FAA Airport Environmental Program – [www.faa.gov/airports/environmental/](http://www.faa.gov/airports/environmental/)
- National Archives – [www.archives.gov/federal-register/executive-orders/disposition.html](http://www.archives.gov/federal-register/executive-orders/disposition.html)

The list of environmental compliance documents (**Table A-2** of the research report) incorporates a summary of each document. Summaries for the regulations were obtained from the respective Federal Register publication. Introductory paragraphs from the respective FAA Order and AC were used to generate summaries for those documents. Documents determined to be inapplicable to small airports were not included in the table.

### ***B.3 Security Requirements***

The research to document security requirements was the primary responsibility of a research team member who previously served as a senior manager for the Transportation Security Administration (TSA) and FAA Office of Civil Aviation Security. Former and current TSA staff members and the two major airport associations – the American Association of Airport Executives (AAAE) and the Airport Council International-North America Chapter (ACI-NA) were also contacted. None of them had a complete, sequential listing of the emergency amendments and security directives issued during the study period. ACI-NA provided a listing maintained by an airport's Public Safety and Operations Director containing most of the required information. Current and former airport security managers were also contacted. Most had some data, but none had a comprehensive compilation of all of the necessary information.

Based on the data obtained and the researcher's knowledge of the current and prior Airport Security Program (ASP) requirements, the research team developed an initial listing of the requirements still in effect.

The following websites for were also researched for relevant and historical information:

- [www.tsa.gov](http://www.tsa.gov)
- [www.dhs.gov](http://www.dhs.gov)
- [www.faa.gov](http://www.faa.gov)
- [www.gpoaccess.gov](http://www.gpoaccess.gov)
- [www.gao.gov](http://www.gao.gov)

#### ***B.4 Occupational Safety and Health Requirements***

The occupational safety and health research focused on actions by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) posted on the OSHA News Releases – Standards and Guidance website for the study period. Each release was reviewed for new or amended standards and a compilation of requirements applicable to small airports was developed.

Additionally, OSHA has a reference page for airline industries at [www.osha.gov/SLTC/airline\\_industry/index.html](http://www.osha.gov/SLTC/airline_industry/index.html). The majority of these references are applicable to employees of airlines such as baggage handlers or employees of other entities operating at the airport, rather than airport employees themselves. The reference page was developed as a product of OSHA's former Alliance with the Airline Industry, National Safety Council (NSC) and the International Air Transport Association.

To provide information on web links to the listed standards, the research team cross referenced other government sources, primarily the Federal Register website ([www.gpoaccess.gov/fr/advanced.html](http://www.gpoaccess.gov/fr/advanced.html)) and the regulations.gov website ([www.regulations.gov](http://www.regulations.gov)).

#### **C. Research Approach to Document Published Cost Estimates**

The research team took a similar approach to document published cost estimates for each regulatory/compliance area.

Under Executive Order 12866, *Regulatory Planning and Review*, federal agencies are required to evaluate potential costs and benefits of proposed regulatory actions, including evaluating whether the action creates unacceptable or unreasonable costs to society. When a significant regulatory action is identified, federal agencies conduct an economic analysis to

estimate the costs of the rule. Economic analysis reports are publicly available in regulatory docket folders.

A significant regulatory action is defined as one that is likely to:

- Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal requirements, the President's priorities, or the principles set forth in the Executive Order.

Economic analyses include both quantifiable and qualitative measures and allow for comparison of costs of various alternative regulatory approaches, including not regulating. The information is used by the agency to help select the alternative that maximizes net benefits (including potential economic, environmental, public health and safety, etc.). The content of each economic report varies depending on the proposed rule and its potential related costs. However, the typical report includes the following components:

- Baseline analysis – projection of regulated behavior in the absence of the new regulatory provisions that allows for measurement of changes in regulated behavior either caused directly or indirectly from a proposed regulation;
- Alternatives analysis – discussion and comparison of the potentially feasible options available for implementing a proposed rule;
- Analysis of costs and benefits – evaluation of the potential capital and operating costs (including associated assumptions) and discussion regarding potential benefits (*e.g.* public health, water quality, air quality, etc.) associated with implementing the rule. Cost-benefit analyses also typically evaluated potential impacts or benefits to small businesses as required by the Regulatory Flexibility Act (RFA); and
- Overall economic impact analysis and conclusions – discussion of cumulative national costs, annualized costs, and net impacts or benefits resulting from the proposed rule.

The RFA requires federal agencies to certify whether regulatory actions have a significant economic impact on a substantial number of small entities. The Small Business Administration (SBA) advises that agencies should consider both adverse and beneficial impacts and identify opportunities to minimize adverse impacts, in determining whether a rule has a significant economic impact.



Small entities are defined as:

- A small business as defined in the SBA regulations (13 CFR 121.201);
- A small governmental jurisdiction, i.e., a city, county, town, school district or special district with a population of less than 50,000; and
- A small organization that is a not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

If an agency cannot certify a regulation will not have a significant economic impact on a substantial number of small entities, a regulatory flexibility analysis must be prepared. Similar to economic analyses required under EO 12866, regulatory flexibility analyses evaluate alternatives that may reduce adverse economic effects on small entities. Information pertaining to regulatory flexibility analyses is typically incorporated as a chapter in economic analysis reports required under EO 12866.

For those compliance requirements established by regulation, the procedures above may have been followed. Where cost or economic impacts were evaluated and reports published, this information is included in the tables in **Appendix A** of the research report. Many regulatory actions did not meet the criteria for significance in EO 12866, and therefore did not have detailed analyses. Most FAA compliance actions did not take the form of regulations. The research team reviewed the non-regulatory FAA documents and found no assessments of costs or economic impact.

## **D. Airport Outreach**

The outreach efforts consisted of surveys and telephone interviews. The implementation details are described below.

### ***D.1 Airport Surveys***

The survey targeted small hub and non-hub primary airports. A primary airport has scheduled air carrier service and at least 10,000 passenger boardings (enplanements) per year. A small hub airport is a primary airport with at least 0.05% of national passenger boardings, but less than 0.025%. A non-hub airport is a primary airport with less than 0.05% of national passenger boardings. The survey was conducted in two phases.

The objective of the Phase 1 survey was to identify those compliance and regulatory actions that had an impact on small airports. The universe consisted of all 310 small-hub and non-hub primary airports, based on CY 2009 passenger boardings. The survey instrument was a self-administered questionnaire made available on the Internet through the SurveyMonkey service. Invitations were e-mailed to airports to complete the survey online. Several reminder e-mails were sent, and the deadline for response was extended multiple times to increase

participation rates. A total of 79 airports responded to the Phase 1 survey. Fifty-six airports responded before September 19, 2011 (first round), and 23 responded by November 14, 2011 (second round). Not all respondents answered every question.

The objective of the Phase 2 survey was to obtain data on the costs of compliance with specific requirements or standards for each of the four regulatory areas. The questionnaire was more detailed and lengthy. The survey instrument was a self-administered excel spreadsheet questionnaire distributed to airports via e-mail. Initially the distribution was limited to the 56 airports that responded to the first round of the Phase 1 survey.

To increase the response rate for the Phase 2 survey, multiple reminders were sent following initial distribution of the survey. ACI-NA provided assistance by sending a message to its Small Airport Committee members urging participation in the survey. An additional request for participation was made at the Small Airport Committee Meeting at the ACI-NA Annual Conference and Exhibition (October 16, 2011, San Diego, CA).

Despite these efforts, response rates to the Phase 2 survey were initially low, with only 11 airports responding. Therefore, the research team implemented an enhanced follow-up effort, beginning with a second round of e-mail and regular mail distribution of the Phase 2 survey. In this second round, the sampling frame was expanded, as follows:

- The full questionnaire was sent to the 23 airport respondents to the second round of Phase 1 survey. The transmittal included an offer of telephone assistance to complete the survey.
- Abbreviated versions of the Phase 2 questionnaire were sent to the 45 non-respondent airports out of the 56 that initially received the Phase 2 surveys. Each version consisted of a different subset of the original full set of FAA/DOT questions plus questions for only one of the three remaining regulatory areas, environmental, security, or OSHA. A roughly equal number of airports received each subset of questions.
- Abbreviated versions of the questionnaire were also sent to 235 airports that did not respond to the Phase 1 survey. The versions sent to this group included appropriate Phase 1 questions.

The research team followed up by telephone and sent multiple reminders by e-mail. As a result of the enhanced follow-up effort, 68 additional airports submitted responses to the Phase 2 survey. As was the case with Phase 1 surveys, respondents did not answer every question in either the full or abbreviated questionnaire they received.

## ***D.2 Telephone Interviews***

The research team conducted telephone interviews with 13 airports to obtain additional cost estimates and resolve discrepancies in survey responses. Interviewees also offered their

opinions on the nature and scope of the costs resulting from federal compliance actions and regulations

## **E. Case Studies**

Five case studies were conducted with the following airports:

- Golden Triangle Regional Airport (GTR) – Columbus, MS
- Yakima Air Terminal/ McAllister Field (YKM) – Yakima, WA
- Stewart International Airport (SWF) – Newburg, NY
- Santa Barbara International Airport (SBA) – Santa Barbara, CA
- Huntsville International Airport (HSV) – Huntsville, AL

The FAA classifies the first three airports as non-hub airports. The FAA classifies the last two airports as small hubs.

The airports were selected to provide a mix of non-hub and small hub airports and to provide geographic diversity. The quality and scope of Phase 2 survey responses and willingness to participate were also considered.

Interviews were conducted by telephone for GTR, YKM and SWF. Interviews for SBA and HSV were conducted on-site. Each participant was provided a list of questions in advance to enable them to gather necessary data. Each participant was also provided a draft of the case study report to review for accuracy.

## TECHNICAL APPENDIX 2. ANALYSIS OF FAA/DOT REQUIREMENTS

### A. Overview of Requirements

The research identified 150 compliance or regulatory actions affecting small airports originating with the Federal Aviation Administration (FAA) or Department of Transportation (DOT). The FAA issued 150 requirements and the DOT issued ten.

#### A.1 FAA Requirements

FAA regulatory and compliance requirements arise from the following sources. **Table A-1** in **Appendix A** of the research report summarizes each requirement.

The broadest source of compliance requirements is the Airport Safety Program, which addresses general aviation airport safety, runway safety, airports certificated under 14 CFR Part 139, and safety management systems (SMS) in the following areas:

- Aircraft Rescue and Fire Fighting (ARFF)
- Air shows
- Opening or Closing an Airport or Runway
- Part 139 Certification
- Reducing Runway Incursions
- Runway Safety Program
- SMS
- Signs and Marking
- Wildlife Hazard Mitigation

The primary source of the compliance requirements for the safety program is 14 CFR Part 139, a mandatory regulation. Additional requirements are introduced through Advisory Circulars (ACs). For example, the FAA has developed and published airport design standards in ACs. The ACs are not themselves binding, nor are they regulatory documents. However, some ACs are identified as one means of compliance with Part 139. To avoid controversy over compliance with Part 139, many airports elect to follow the standards in the ACs. In addition, many of the ACs are identified as required for projects funded with Airport Improvement Program (AIP) grants or passenger facility charge (PFC) revenue. The ACs become binding on airports through incorporation by reference into AIP grant agreements and through PFC assurances.

Most of the ACs identified and discussed in the research report originate with the FAA Airport Engineering, Design and Construction Program. The ACs are considered safety-related because one objective of the design and construction standards is objective the safety of aircraft operations in the airport environment.

Another source of guidance is the Part 139 Cert. Alerts. The Cert. Alerts are also advisory in nature. They provide clarification or updated information on safety issues and FAA policy.

The next two sources of requirements are the airport financial assistance programs administered by the FAA— the AIP and the PFC program. The AIP provides grant funds for airport planning, capital projects and environmental initiatives. The PFC program permits individual airports to collect PFCs of up to \$4.50 per enplaned passenger to finance airport planning, capital projects and environmental initiatives. Imposition of the PFC is subject to FAA approval, which is granted on a project-by-project basis.

The primary source of guidance for the AIP is the *AIP Handbook*, Order 5100.38C (June 28, 2005). Other orders address specific issues, such as development of the national airports capital improvement plan (ACIP) (*Airports Capital Improvement Plan*, Order 5100.39A (August 22, 2000)), and designation of airports in the National Plan of Integrated Airport Systems (NPIAS) (*Field Formulation of the National Plan of Integrated Airport Systems*, Order 5090.3C (December 4, 2000)).

Other sources of guidance for the AIP include ACs, Program Guidance Letters (PGLs) and Program Information Memos (PIMs). The standards in many design and construction ACs are incorporated by reference into grant agreements and become requirements for implementation of projects. PGLs are issued to supplement the AIP Handbook to address new developments or statutory changes. A PGL is issued with the expectation that its substance will be incorporated into the next update of the AIP Handbook. A PIM is similar to a PGL, but is not necessarily intended to be incorporated in the AIP Handbook.

The orders, PGLs and PIMs are intended as internal documents providing guidance and direction to FAA staff in carrying out the AIP. However, the documents direct the determinations of FAA staff on whether and when to provide AIP funds for specific projects, and under what conditions. Therefore, the FAA publishes the documents and airports follow the guidance in preparing AIP funding requests and carrying out projects.

The PFC program is governed by a regulation, 14 CFR Part 158. Additional guidance is provided by the *PFC Order*, Order 5500.1 (August 9, 2001) and by PFC program updates (PFC updates). The order and PFC updates are intended to provide guidance and direction to FAA staff. However, airports follow this guidance in preparing PFC applications and carrying out projects because the guidance instructs FAA staff on whether to approve a project for PFC funding and on administration of PFCs.

The final source of compliance requirements is the FAA Airport Compliance Program. The compliance program is based on statutory grant assurances contained in 49 USC §47107 and other sections of the statute governing AIP (49 USC §47101 *et seq.*). The assurances govern implementation of AIP-funded projects, certain aspects of airport operations and certain aspects of the airport's business relationship with aeronautical users. The statutory assurances are incorporated in the standard AIP grant agreement and become binding on the airport upon execution of the agreement.

Guidance on grant assurances is provided in the *Airport Compliance Manual*, Order 5190.6B (September 2009). The order provides general guidance and direction to FAA staff in administering the Airport Compliance Program. However, interpretation of the grant assurances and direction to airports is usually accomplished on a case-by-case basis following a compliance investigation or review. FAA compliance inquiries are generally initiated in response to formal or informal complaints by airport users. However, FAA occasionally begins a compliance review on its own initiative. Some of the ACs address airport compliance issues. The FAA also issued one guidebook relating to grant assurances during the study period. It discusses requirements for air carrier incentive programs.

The 140 FAA compliance and regulatory documents issued are distributed among the various categories of documents as follows:

- Regulations – 6
- Orders – 8
- ACs – 86
- Cert Alerts – 20
- PGLs – 10
- PFC Updates – 7
- Other – 3

**Table A-1** in **Appendix A** of the research report summarizes the FAA requirements. The table includes the title of the document, a brief description of the type of document, (*e.g.*, new AC, change to AC, an amendment to regulations), a summary of the document and the document issuance date. For documents published in the Federal Register, the issue date is the Federal Register publication date. For other documents, the issue date is the date listed in the document.

Documents are listed in chronological order, with one exception. Some ACs and regulations were modified or reissued multiple times during the study period. For these documents, all revisions, amendments, reissuances, etc. are listed sequentially to facilitate the tracking of changes to the requirements over time.

## **A.2 DOT Requirements**

**Table A-1** in **Appendix A** of the research report also summarizes the DOT regulatory and compliance requirements adopted during the study period. The DOT requirements are listed following the FAA requirements. The requirements are listed in chronological order, subject to the same exception noted above for multiple versions of the same document.

Nine of the 10 DOT requirements were regulatory documents (regulations or amendments to regulations). One document was a policy statement published in the Federal Register. Eight of the regulations apply to airports as recipients of federal assistance. Three apply only to programs administered by DOT elements, *e.g.*, 49 CFR Part 26, *Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs*. Five regulations are DOT versions of government-wide regulations (*e.g.*, 49 CFR Part 29 *Government-wide Debarment and Suspension (Nonprocurement)*). Two of the regulations and the policy statement apply specifically to airports (*e.g.* 49 CFR Part 23, *Participation of Disadvantaged Business Enterprises in Airport Concessions*).

## **B. Published Cost Information**

**Table A-1** of the research report presents available published cost information. Where specific cost data are published, the source, other discussion of cost by the agencies, and brief comments are included.

### **B.1 FAA Requirements**

With few exceptions, the FAA did not publish cost information when issuing the documents included in the table. Only two out of the six regulatory documents included specific cost projections. The remainder did not meet the criteria discussed in **Technical Appendix 1** for a full economic analysis.

A number of the FAA and DOT documents were intended to reduce compliance costs or to defer implementation of new requirements. **Table A-1** of the research report notes the beneficial impact of these actions on the costs facing airports.

One of the regulatory documents with a specific cost projection was an amendment to the PFC Regulation (14 CFR Part 158). This amendment implemented administrative streamlining for non-hub airports. The rulemaking document projected an average cost reduction of \$9,500 (**Table A-1**, Item 4). The only FAA regulation that quantified an increase in costs to small airports was the 2004 amendment to the Airport Certification Regulation (14 CFR Part 139). This amendment implemented the new airport certification requirement for airports receiving scheduled service from small aircraft (**Table A-1**, Item 25), and modified requirements for existing certificate holders. As reflected in the table, the FAA projected that existing certificate

holders as well as new certificate holders would incur increased costs. The added costs for new certificate holders (Category III airports) were projected at approximately \$98,000 in initial costs and approximately \$119,000 in recurring costs. These projections were substantially higher than the incremental costs projected for current certificate holders.

Other actions included explicit statements that costs would be negligible or minimal. **Table A-1** includes a zero dollar cost entry for these documents. Under federal requirements for issuance of rules, if a regulation is not deemed significant or likely to have a substantial impact on small entities, it is not necessary to conduct a benefit-cost analysis or develop a quantitative estimate of costs.

## ***B.2 DOT Requirements***

None of 10 DOT regulatory and compliance documents included specific cost projections. Four included explicit statements that costs would be negligible or minimal. **Table A-1** shows a zero dollar cost entry for these documents.

## **C. Analysis of Requirements**

The FAA adopted 140 separate regulatory and compliance actions during the study period and the DOT adopted 10. Many of the requirements, particularly in the area of design standards were minor technical modifications or corrections. The revisions are described in **Table A-1**. The analysis focuses on the requirements in the following subject areas:

- Airfield Design, Standards and Operations
- Part 139 Certification Requirements
- Vehicles in Aircraft Operating Areas
- Passenger Facility Charge Requirements
- Disadvantaged Business Enterprise Requirements
- Miscellaneous Administrative Requirements

### ***C.1 Airfield Design, Standards and Operations***

Airfield design, standards and operations include a range of issues from the composition of airfield pavement to lighting and marking to standards for imaginary surfaces above or adjacent to the airfield. Approximately 43 individual regulatory and compliance actions fall into this category.

#### **Background and Change in Requirements**

The primary document establishing airfield design standards is AC 150/5300-13, *Airport Design Standards*, which provides general guidance on airport design. During the study period, this AC was revised seven times. While some of the changes were simple clarifications or



adjustment of written standards to match current practices, others were potentially costly. For example, Change 11 to the AC prohibits automobile parking in the central portion of the runway protection zone (RPZ) and introduces requirements for automobile parking in other areas of the RPZ.

Other ACs address specific design, construction or equipment issues. For example, AC 150/5340-1, *Standards for Airport Markings*, addresses airfield markings. There were four revisions to this AC during the study period. The revisions addressed a variety of issues. For example AC 150/5340-1K included 29 “principal changes”. A separate AC addresses runway and taxiway signs. This AC, 150/5345-44, *Specification for Runway and Taxiway Signs*, was revised three times during the study period. One of the revisions, AC 150/5345-44J listed 42 “principal changes”.

A major safety initiative during the study period has been upgrading runway safety areas (RSAs) at Part 139-certificated airports to meet FAA standards, to the extent practicable. Under the 2006 DOT appropriation legislation, Pub. L. 109-115 (November 30, 2006), RSAs at certificated airports must meet FAA standards by December 31, 2015. During the study period, the FAA has addressed RSA standards through multiple compliance actions, as follows:

- AC 150/5370-2E, *Operational Safety on Airports During Construction* (January 17, 2003), addressing operational safety on airports during construction, including construction in RSAs
- Cert Alert #03-07, *Personnel and Equipment in the Runway Safety Area*, (November 12, 2003), addressing the presence of personnel and equipment in RSAs
- Order 5200.9 *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems* (March 15, 2004), addressing the maximum feasible costs for RSA improvements and methods for comparing the use of engineered material arresting systems (EMAS) with other options for RSA compliance.
- AC 150/5220-22A, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns* (September 30, 2005), updating standards for design, installation and testing of EMAS based on testing and experience with aircraft overruns at locations with EMAS.

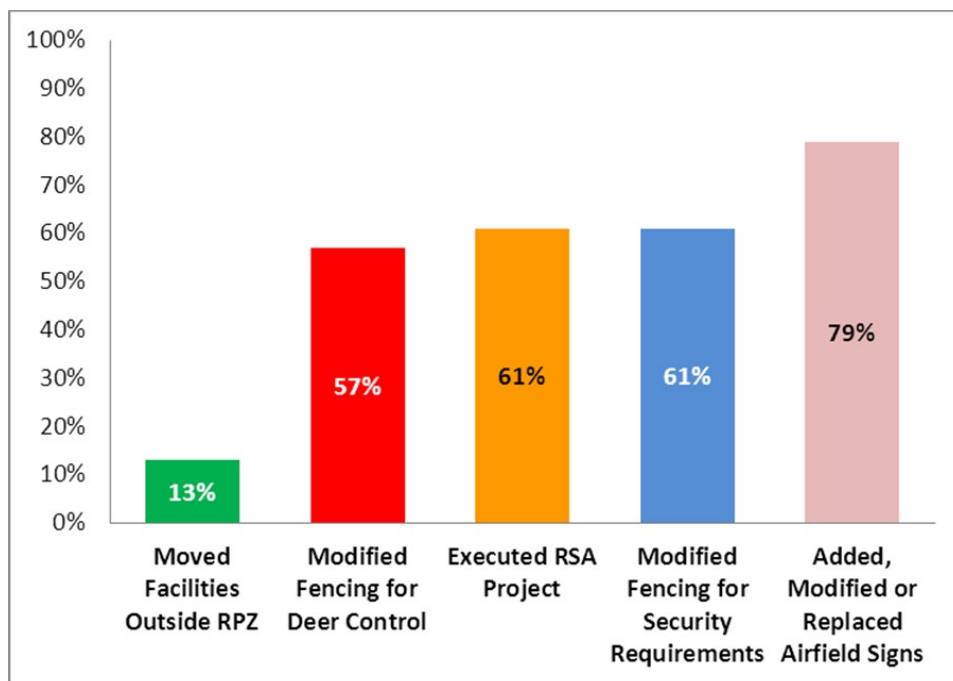
Another potentially costly issue of airfield design is fencing. Fencing requirements are included in Part 139, and in TSA regulations. In addition, the FAA issued Cert. Alert #04-16, *Deer Hazard to Aircraft and Deer Fencing* (December 14, 2004), providing updated standards on deer fencing specifications and installation techniques.

FAA has also adopted requirements for operations. For example, AC 150/5200-18C, *Airport Safety Self-Inspection* (April 23, 2004) updated standards for Airport Safety Self-Inspections conducted by Part 139 airports. AC 150/5380-6A, *Guidelines and Procedures for*

*Maintenance of Airport Pavements* (July 14, 2003) revised procedures for maintaining airfield pavement.

### Phase 1 Survey Results and Evaluation, Airports Affected by Requirements

**Table B-1** in **Appendix B** of the research report presents data on the number of airports affected by each of the requirements for airfield, design, standards and operations based on the Phase 1 survey responses. **Figure TA-1** shows the percentage of Phase 1 respondent airports that were affected by some of the more significant requirements. Unless otherwise noted, the percentages in the figure represent the percentage of airports that responded affirmatively to the particular question. As shown, 13% of airports reported undertaking projects to comply with new requirements for RPZs. Sixty-one percent reported RSA projects. The RSA covers a larger area than the RPZ. A much higher percentage of airports, 79%, reported signage projects. The survey included separate questions on deer hazard fencing and on fencing to meet security requirements. Fifty-seven percent of airports reported modifying fencing to meet new deer hazard standards, and 61% reported modifications to comply with new security requirements.



**Figure TA-1. Airports Affected by Changes to FAA Requirements for Airport Design, Standards and Operations**  
(Sample: 41-90 airports)

### Phase 2 Survey Results and Evaluation, Reported Costs

**Table TA-1** summarizes the initial costs of compliance with the FAA initiatives discussed above. **Table TA-2** summarizes the recurring costs of compliance. **Table TA-1** is repeated for

the other FAA/DOT requirements discussed in this document. **Table B-2** in **Appendix B** of the research report summarizes the responses to the remaining Phase 2 survey questions not discussed in this **Technical Appendix**.

The sample cost data are described in terms of the following statistics:

- Minimum and maximum – The minimum and maximum indicate the full range of reported cost incurred by respondent airports in complying with a particular regulatory requirement.
- 25<sup>th</sup> and 75<sup>th</sup> percentile – Since the minimum and maximum represent extreme values (*outliers*) in most cases, the 25<sup>th</sup> percentile (first quartile) and the 75<sup>th</sup> percentile (third quartile) values are presented, giving the *interquartile range* to indicate a more typical range of costs.
- 50<sup>th</sup> percentile or median – The 50<sup>th</sup> percentile or the median is the middle value in an array of observations. It is a better indicator of the most typical case, especially when there are outliers.
- Arithmetic mean - The arithmetic mean is the simple average of all the reported costs for each regulatory item. The mean is very sensitive to the presence of outliers, and may not indicate the typical case. For example, the mean cost for RSA compliance projects is nearly three times the median cost. The mean cost for signage requirements is more than four times the median cost. The arithmetic mean cost is sometimes referred to as the “average cost”.
- Interquartile mean - We also calculate the interquartile mean – the arithmetic mean calculated over the interquartile range – as a better measure of the sample average to use in deriving industry cost estimates. A big difference between the arithmetic mean and interquartile mean also indicates that the arithmetic mean is unduly influenced by outliers.
- Cost per thousand enplanements and cost per thousand commercial operations – The above statistics measure cost per airport. The tables also show unit costs per thousand enplanements and per thousand commercial aircraft operations. When costs are similar across airports regardless of activity levels, unit costs expressed this way can better represent the costs to an airport, especially when comparing cost to airports with different activity levels. For example, an airport with relatively moderate costs, but low levels of activity could have higher unit costs than a busier airport with more robust total compliance costs.
- Sample size – The sample size represents the number of responses (or observations) obtained for each item. In cases where the sample size is very small (for example, less than three), the descriptive statistics do not have meaningful interpretation. The interquartile mean does not

exist; the value of the arithmetic mean is substituted in these cases mainly for consistency in presentation. Readers should take note that because of the small number of airports responding, results may not apply to all airports.

Where it makes sense, an estimate of the arithmetic mean and interquartile mean “total” cost for like items – runway protection (RPZ and RSA standards combined) and fencing (deer fencing and security fencing) is presented. The ability to aggregate data for individual items to develop estimates of “total” cost for a particular grouping of regulatory items is limited because of the different composition and number of observations in the sample for each regulatory item. In particular, valid estimates of the minimum, maximum, and percentile values for the combined costs cannot be provided.

**Table TA-1. Airfield Design, Standards and Operations Requirements, Initial Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
36. Since March 28, 2007, how much did it cost your airport to move an automobile parking, a roadway, or other facility improvement outside a runway protection zone (RPZ) as a result of an advisory circular (AC) issued by the FAA on that date (AC 150/5300-13, Change 11)?	5	\$200,000	\$298,383	\$1,139,199	\$3,040,086	\$5,000,000	\$1,935,534	\$1,492,556
Average Cost per thousand Enplanements	5	\$666	\$1,385	\$18,311	\$21,541	\$56,474	\$19,675	\$19,926
Average Cost per thousand Operations	5	\$18,532	\$21,249	\$61,803	\$265,336	\$420,075	\$157,399	\$116,130
73. How much has your airport spend on projects in the last 10 years to comply with new or updated regulations related to the Runway Safety Area?	17	\$627,000	\$1,200,000	\$3,516,747	\$10,500,000	\$34,000,000	\$8,191,706	\$3,676,184
Average Cost per thousand Enplanements	17	\$472	\$7,165	\$28,356	\$70,966	\$186,509	\$47,325	\$2,133
Average Cost per thousand Operations	17	\$13,141	\$70,344	\$282,697	\$527,874	\$1,164,982	\$375,868	\$18,468
Total Runway Protection Costs (RPZ and RSA)	19						\$10,127,240	\$5,168,740
Average Cost per thousand Enplanements	19						\$67,001	\$22,059
Average Cost per thousand Operations	19						\$533,267	\$134,597
18. Since the beginning of CY 2000, how much did it cost your airport to modify its perimeter fencing in response to FAA guidance on minimizing deer hazards?	17	\$100,000	\$450,000	\$800,000	\$1,300,000	\$3,000,000	\$988,797	\$782,660
Average Cost per thousand Enplanements	17	\$135	\$1,942	\$4,179	\$8,886	\$136,184	\$16,438	\$5,387
Average Cost per thousand Operations	17	\$3,229	\$23,458	\$53,124	\$107,373	\$316,957	\$81,058	\$65,089
74. How much has your airport spend on projects in the last 10 years to comply with new or updated regulations or requirements related to security fencing surrounding the AOA?	23	\$15,000	\$461,792	\$800,000	\$1,193,712	\$3,189,200	\$961,793	\$777,269
Average Cost per thousand Enplanements	23	\$302	\$1,220	\$2,588	\$8,287	\$61,146	\$7,270	\$3,233
Average Cost per thousand Operations	23	\$3,579	\$20,644	\$41,847	\$97,113	\$438,837	\$77,529	\$71,307
Total Fencing Costs	26						\$1,950,590	\$1,559,929
Average Cost per thousand Enplanements	26						\$23,708	\$8,620
Average Cost per thousand Operations	26						\$158,587	\$136,397
43. Since January 1, 2000, how much has it cost your airport to add, modify or replace airfield signs as a result of new or modified requirements or guidance adopted by the FAA?	16	\$1,050	\$22,500	\$58,925	\$247,126	\$1,800,000	\$228,821	\$90,003
Average Cost per thousand Enplanements	16	\$7	\$82	\$528	\$2,014	\$28,981	\$3,002	\$679
Average Cost per thousand Operations	16	\$121	\$1,273	\$7,564	\$15,498	\$216,685	\$23,656	\$8,629

Based on both the arithmetic mean and interquartile mean, initial compliance with RSA requirements (Question #73) is the single most expensive compliance requirement in this category, with average cost of \$8.2 million and interquartile mean cost of \$3.75 million. The cost of this single item is more than four times higher than the average cost of the combined fencing requirements and more than twice the interquartile mean cost. The average cost of the combined runway protection requirements (Questions #36, #73) is \$10.1 million, and interquartile mean cost is \$5.1 million. Average cost per thousand enplanements is \$67,000, with an interquartile mean cost of \$22,100. Average cost per thousand operations is \$533,000, with an interquartile mean cost of \$135,000. Factors that could affect costs include the dimensions of the existing RSA and RPZ, and the nature of the work needed to meet standards.

A simple project to remove vegetation would be less costly than a project requiring grading or fill work. Land acquisition could also increase compliance costs. Factors specific to RPZs could include existing conditions in the RPZ site, the surface area of incompatible use, and the nature of corrective actions required. For example, construction of a replacement parking lot may be less costly than relocating a road.

**Table TA-2. Airfield Design, Standards and Operations Requirements, Recurring Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
36. Since March 28, 2007, how much did it cost your airport to move an automobile parking, a roadway, or other facility improvement outside a runway protection zone (RPZ) as a result of an advisory circular (AC) issued by the FAA on that date (AC 150/5300-13, Change 11)?	1	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Average Cost per thousand Enplanements	1	\$5	\$5	\$5	\$5	\$5	\$5	\$5
Average Cost per thousand Operations	1	\$80	\$80	\$80	\$80	\$80	\$80	\$80
43. Since January 1, 2000, how much has it cost your airport to add, modify or replace airfield signs as a result of new or modified requirements or guidance adopted by the FAA?	6	\$1,000	\$4,600	\$10,000	\$10,000	\$25,000	\$9,800	\$10,000
Average Cost per thousand Enplanements		\$13	\$27	\$31	\$40	\$459	\$101	\$31
Average Cost per thousand Operations		\$100	\$322	\$363	\$483	\$874	\$422	\$457
18. Since the beginning of CY 2000, how much did it cost your airport to modify its perimeter fencing in response to FAA guidance on minimizing deer hazards?	8	\$1,000	\$5,000	\$5,500	\$14,000	\$650,000	\$88,000	\$6,600
Average Cost per thousand Enplanements		\$18	\$26	\$30	\$32	\$28,865	\$3,632	\$29
Average Cost per thousand Operations		\$293	\$315	\$434	\$567	\$155,094	\$19,753	\$466

The survey did not include a question about recurring costs of RSA compliance, and only one airport reported recurring costs for RPZ compliance. Reported costs are \$1,500, which translated into a cost per thousand enplanements of \$5 and a cost per thousand operations of \$37.

The survey included separate questions about the cost of compliance with requirements for deer fencing to (Question #18) and the cost of security fencing (Question #74). Combined initial average cost of the fencing requirements is \$2.0 million, and the interquartile mean cost is \$1.6 million. Average cost per thousand enplanements is \$23,700, and interquartile mean cost is \$8,600. Average cost per thousand operations is \$159,000, and interquartile mean cost is \$136,000. Costs of compliance could be affected by the length of fencing to be installed, the height of the fencing and required installation techniques. The number of entrances and sophistication of access control systems to meet security requirements could also affect costs.

The survey included a question on recurring costs of meeting new requirements for deer fencing (Question #18), but not a question on recurring costs of security fencing requirements. Recurring costs for deer fencing range from \$1,000 to \$650,000. Average cost is \$88,000 and the interquartile mean cost is \$6,600. Average cost per thousand enplanements is \$3,600, but interquartile mean cost is only \$29. Average cost per thousand operations is \$20,000, and

interquartile mean cost is \$466. The discrepancies between average and interquartile mean costs suggest that interquartile mean cost may be the more reliable indicator of typical unit costs. This conclusion is supported by the difference between the maximum cost, \$650,000 and the cost reported for the 75<sup>th</sup> percentile, \$14,000.

Initial costs of meeting new requirements for signage (Question #43) range from \$1,000 to \$1.8 million. Average cost is \$229,000, while interquartile mean cost is \$90,000. The large difference between the two measures suggests that the average costs may be skewed by high maximum costs. Average cost per thousand enplanements is approximately \$3,000, and the interquartile mean cost is approximately \$700. Average cost per thousand operations is approximately \$23,700, and the interquartile mean cost is approximately \$8,600. Important factors affecting compliance costs are the dimensions and geometry of the airfield pavement. The length of runways and taxiways, the number of runways or taxiways and number of intersections all affect the number of signs required by the FAA and hence the cost of compliance.

Reported recurring costs of compliance (Question #43) range from \$1,000 to \$25,000, with an average cost of \$9,800 and an interquartile mean cost of \$10,000. Average cost per thousand enplanements is approximately \$100, and interquartile mean cost is \$31. Average cost per thousand operations is \$422, and interquartile mean cost is \$466.

## ***C.2 Part 139 Certification Requirements***

federal law (49 USC §44706) requires specified airports receiving commercial passenger service to obtain airport operating certificates. The FAA implements this requirement through Part 139 of the Federal Aviation Regulations, 14 CFR Part 139.

### **Background and Change in Requirements**

Before 2004, airport operating certificates were required only if an airport received passenger service with aircraft having a capacity of more than 30 passenger seats (large aircraft). Airports receiving scheduled service with qualifying aircraft held “full certificates”. Airports with only non-scheduled service (charter service) held “limited certificates”. In 2004, the FAA amended Part 139 to expand the requirement for an airport operating certificate, in response to a change in the law. The amended rule requires airports receiving scheduled passenger service with aircraft with more than nine seats to hold a certificate. The 30-seat threshold continues to apply for non-scheduled passenger service.

The amended rule modified the classification system for certificates. Four classes of certificates now exist:

- Class I airports have scheduled and charter service with large aircraft. Class I airports previously held full operating certificates.
- Class II airports have charter service with large aircraft and scheduled service with aircraft with 10-30 seats (small aircraft). Class II airports previously held limited operating certificates.
- Class III airports have scheduled service with small aircraft, but no large aircraft service. They were previously non-certificated.
- Class IV airports have only unscheduled operations with large aircraft. They previously held limited operating certificates.

When it adopted the rule, FAA estimated that 37 airports would need to become certificated for the first time to retain their scheduled passenger service with small aircraft. *Final Regulatory Evaluation, Regulatory Flexibility Determination, International Trade Impact Assessment and Unfunded Mandates Assessment, Final Rule Title 14 CFR Parts 121,139 (November 21, 2001) (Part 139 Regulatory Evaluation)*, page 14. Newly certificated airports were subject to minimum ARFF standards for the first time, and had to prepare a new airport certification manual (ACM). The explanatory statement (69 Fed. Reg. 6380, 6421 (February 10, 2004)) identified changes in following areas:

- Risk reduction, consisting of ARFF and the Airport Emergency Plan (AEP)
- Mitigation, which included the following:
  - ◆ Marking, signs and lighting
  - ◆ Snow and ice control
  - ◆ Self-inspection program
  - ◆ Control of access to movement and runway safety areas
  - ◆ Wildlife hazard mitigation

In addition, newly certificated airports faced the initial cost of preparing the ACM and certificate application. Existing certificate holders faced the cost of modifying their ACM.

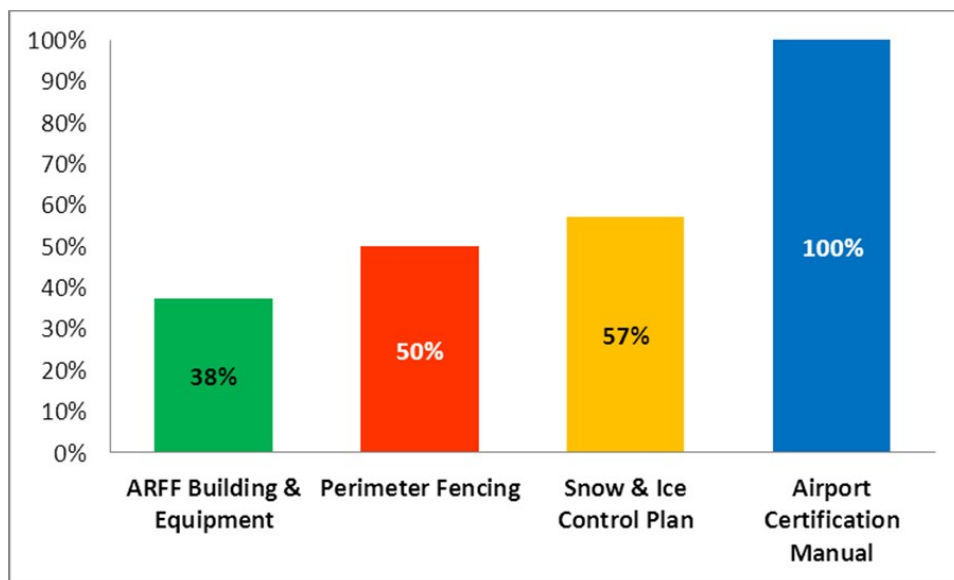
### Phase 1 Survey Results and Evaluation, Airports Affected by Requirements

Sixteen airports answered that they were required to obtain a Part 139 certificate as a result of the rule change. However, based on the Phase 2 survey results, it appears that some airports may have misunderstood the question. The survey responses were inconsistent with the FAA's census of airports included in the regulatory evaluation for the rule. Most of the newly-certificated airports identified by the FAA (Class III airports under the 2004 amendment) were non-primary commercial service airports (airports with less than 10,000 annual enplanements) that are outside the scope of this research. Many of the airports that reported being newly-certificated in the survey were identified by the FAA as certificate holders. The survey results were adjusted to reflect the certification status reported by the FAA in 2004, with one exception.



Limited certificate holders (Class II airports under the new certification system) were exempt from many of the requirements applicable to full certificate holders. The 2004 amendment eliminated this distinction and applied equivalent requirements on all certificate holders. The costs of the 2004 amendment incurred by a Class II airport are more likely to be comparable to those incurred by a newly certificated airport than to an airport that was a full certificate holder. Therefore, for purposes of this research, the analysis categorizes Class II certificate holders as newly-certificated airports.

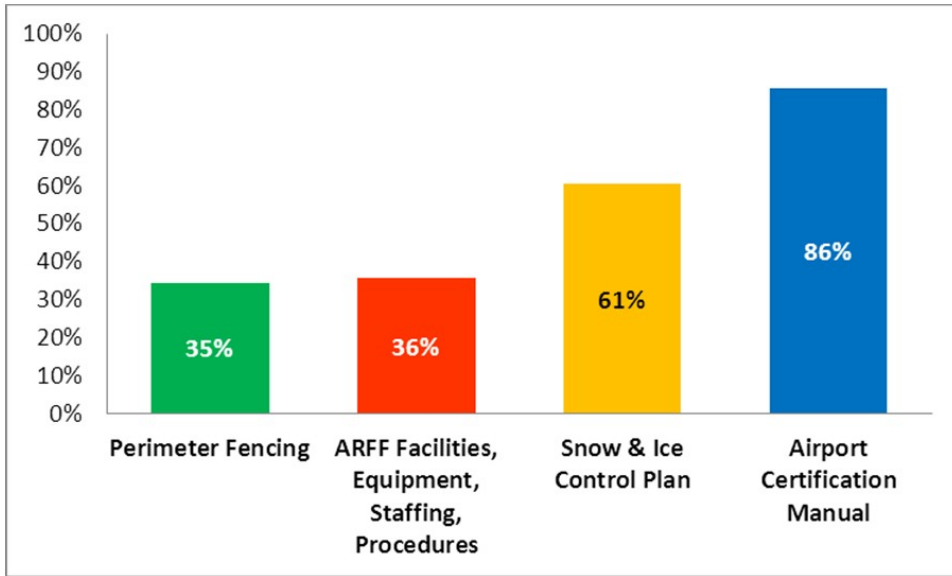
Of the newly certificated airports completing the survey (as defined above), 38% were required to construct aircraft rescue and firefighting (ARFF) stations and acquire ARFF equipment. Fifty percent of the airports reported they were also required to modify their perimeter fencing. Sixty-five percent of the newly certificated airports were required to develop a snow and ice control plan. In addition, all 17 of the airports would have been required to develop an airport certification manual, although a specific question on this subject was not included in the survey. **Figure TA-2** summarizes the impact of the Part 139 amendment on newly certificated airports.



**Figure TA-2. Newly Certificated Airports Affected by Part 139 Amendments**  
(Sample: 5-8 airports)

Airports already holding Part 139 certificates in 2004 were also affected by the amendment. Some airports reporting they were not required to obtain a certificate in 2004 were defined as Class II airports. For purposes of analyzing the effect of the 2004 amendments, the Class II airports were excluded from the group of existing certificate holders. After making this adjustment, 36% of existing certificate holders reported that they modified their ARFF building and equipment; 35% modified their perimeter fencing; 61% modified their snow and ice control plan; and 86% reported modifying their airport certification manual. **Figure TA-3** summarizes

the reported impact of the Part 139 Amendment on existing certificate holders. The reported result for the airport certification manual is inconsistent with the terms of the rule, which required all certificate holders to update their airport certification manual.



**Figure TA-3. Existing Certificate Holders Affected by Part 139 Amendments**  
(Sample: 76-84 airports)

### Phase 2 Survey Results and Evaluation, Reported Costs

The *Part 139 Regulatory Evaluation* projected initial compliance costs for new certificate holders (Class III airports) at approximately \$98,000 and projected recurring costs at approximately \$119,000.

**Table TA-3** summarizes the initial costs of compliance with the Part 139 amendments for newly certificated airports. **Table TA-4** summarizes the recurring costs of compliance. Because of the small sample size (one airport for each specific requirement), reported results may not be reliable. Nevertheless, reported initial costs are substantially higher than FAA's projection. For example, initial costs of ARFF compliance alone were reported as \$1.5 million, more than 15 times higher than the total compliance costs projected by the FAA. Interquartile mean costs could not be calculated because there were only two valid responses. Reported recurring costs are almost five times higher than FAA's projection, but the sample size is again very small.

**Table TA-3. Impact of Part 139 Amendments on Newly Certificated Airports, Initial Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
11. What capital expenditures were required for compliance with the								
b. ARFF vehicles, clothing and ARFF personnel equipment	0							
Initial Costs	1	\$1,462,733	\$1,462,733	\$1,462,733	\$1,462,733	\$1,462,733	\$1,462,733	\$1,462,733
Total Initial Costs	1	\$1,462,733	\$1,462,733	\$1,462,733	\$1,462,733	\$1,462,733	\$1,462,733	\$1,462,733
Average Cost per thousand Enplanements								
b. ARFF vehicles, clothing and ARFF personnel equipment	0							
Initial Costs	1	\$404,517	\$404,517	\$404,517	\$404,517	\$404,517	\$404,517	\$404,517
Total Initial Costs	1	\$404,517	\$404,517	\$404,517	\$404,517	\$404,517	\$404,517	\$404,517
Average Cost per thousand Operations								
b. ARFF vehicles, clothing and ARFF personnel equipment	0							
Initial Costs	1	\$2,616,697	\$2,616,697	\$2,616,697	\$2,616,697	\$2,616,697	\$2,616,697	\$2,616,697
Total Initial Costs	1	\$2,616,697	\$2,616,697	\$2,616,697	\$2,616,697	\$2,616,697	\$2,616,697	\$2,616,697
12. How much did it cost your airport to modify its perimeter fencing in order to comply with Part 139?	1	\$784,390	\$784,390	\$784,390	\$784,390	\$784,390	\$784,390	\$784,390
Average Cost per thousand Enplanements	1	\$216,922	\$216,922	\$216,922	\$216,922	\$216,922	\$216,922	\$216,922
Average Cost per Operations	1	\$1,403,203	\$1,403,203	\$1,403,203	\$1,403,203	\$1,403,203	\$1,403,203	\$1,403,203
13. How much did it cost your airport use to develop its airport certification manual?	1	\$1,516	\$1,516	\$1,516	\$1,516	\$1,516	\$1,516	\$1,516
Average Cost per thousand Enplanements	1	\$106	\$106	\$106	\$106	\$106	\$106	\$106
Average Cost per thousand Operations	1	\$588	\$588	\$588	\$588	\$588	\$588	\$588
15. How much did it cost your airport to develop a snow and ice control plan?	0							
Average Cost per thousand Enplanements	0							
Average Cost per thousand Operations	0							
16. How much did it cost did your airport to develop its certificate application?	0							
Average Cost per thousand Enplanements	0							
Average Cost per thousand Operations	0							
Total Part 139 Compliance Costs	2						\$2,248,640	\$2,248,640
Average Cost per thousand Enplanements	2						\$621,545	\$621,545
Average Cost per thousand Operations	2						\$4,020,488	\$4,020,488

The Interquartile mean cannot be calculated for items with less than three responses. The mean value is used as a proxy.

ARFF compliance was the single most costly requirement (\$1.5 million), with perimeter fencing the second most expensive (\$784,000). No airports reported costs for developing a snow and ice control plan or a certificate application. Total costs were reported as \$2.2 million. Average cost per thousand enplanements is \$622,000 and average cost per thousand commercial operations \$4.0 million.

**Table TA-4. Impact of Part 139 Amendments on Newly Certificated Airports, Recurring Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
11. What capital expenditures were required for compliance with the Part 139 ARFF requirements?	2	\$150,000	\$362,500	\$575,000	\$787,500	\$1,000,000	\$575,000	\$575,000
Average Cost per thousand Enplanements	2	\$2,393	\$12,165	\$21,938	\$31,710	\$41,482	\$21,938	\$21,938
Average Cost per thousand Operations	2	\$68,766	\$118,659	\$168,551	\$218,444	\$268,336	\$168,551	\$168,551
12. How much did it cost your airport to modify its perimeter fencing in order to comply with Part 139?	1	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Average Cost per thousand Enplanements	1	\$2,765	\$2,765	\$2,765	\$2,765	\$2,765	\$2,765	\$2,765
Average Cost per thousand Operations	1	\$17,889	\$17,889	\$17,889	\$17,889	\$17,889	\$17,889	\$17,889
13. How much did it cost your airport use to develop its airport certification manual?	0							
Average Cost per thousand Enplanements	0							
Average Cost per thousand Operations	0							
15. How much did it cost your airport to develop a snow and ice control plan?	0							
Average Cost per thousand Enplanements	0							
Average Cost per thousand Operations	0							
<b>Total Part 139 Compliance Costs</b>	2	\$150,000	\$362,500	\$575,000	\$787,500	\$1,000,000	\$585,000	\$585,000
Average Cost per thousand Enplanements	2						\$24,703	\$24,703
Average Cost per Thousand Operations	2						\$186,440	\$186,440

The Interquartile mean cannot be calculated for items with less than three responses. The mean value is used as a proxy.

The small number of responses in **Table TA-4** also raises questions about the representativeness of the data. Based on the limited data, ARFF requirements are the single largest recurring Part 139 certification cost for newly certificated airports (\$575,000 average cost), based on the specific survey questions. The next most expensive recurring cost item is perimeter fencing at a cost of only \$10,000. Total average recurring costs are \$585,000. Cost per thousand enplanements is \$25,000 Cost per thousand commercial operations is \$186,000.

The *Part 139 Economic Analysis* projected different initial costs for each class of certificated airport as follows:

- Class I airports – \$1,360
- Class II airports – \$8,370
- Class IV Airports – \$1,791

Recurring costs were projected as follows:

- Class I Airports – \$8,479
- Class II Airports – \$15,509
- Class IV Airports – \$911

For existing certificate holders, the survey questionnaire focused on the cost of complying with modified ARFF requirements, modifications to standards for perimeter fencing,

revisions to certification manuals, and revisions to snow and ice control plans. **Table TA-5** summarizes initial compliance costs, and **Table TA-6** summarizes recurring compliance costs. The reported initial costs of compliance are substantially higher than the FAA’s projections – with average costs of \$2.6 million and interquartile mean costs of \$1.3 million. It appears that a significant portion of the difference is based on the low amount assigned by the FAA for incremental costs of ARFF compliance as compared with the results of the Phase 2 survey. The reported recurring costs of compliance are likewise substantially higher than the FAA projections.

**Table TA-5. Impact of Part 139 Amendments on Existing Certificated Airports, Initial Costs**

Question(s)	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
17. For airports holding an Airport Operating certificate in 2004, when the FAA amended Part 139, was there a cost to the airport to modify any of the following:								
<b>Cost per Airport</b>								
a. ARFF facilities, vehicles, equipment, staffing or procedures?	9	\$4,500	\$500,000	\$850,000	\$1,625,100	\$7,000,000	\$1,828,922	\$998,360
b. Modify perimeter fencing?	13	\$40,000	\$180,000	\$428,049	\$1,100,000	\$2,421,054	\$731,516	\$257,706
c. Modify the airport certification manual?	19	\$600	\$1,250	\$2,000	\$5,000	\$75,000	\$9,689	\$3,136
d. Modify the snow and ice control plan?	12	\$150	\$882	\$1,800	\$2,500	\$5,000	\$1,832	\$1,871
<b>Total Initial Costs</b>							<b>\$2,571,958</b>	<b>\$1,261,074</b>
<b>Average Cost per Thousand Enplanements:</b>								
a. ARFF facilities, vehicles, equipment, staffing or procedures?	9	\$85	\$8,347	\$36,190	\$71,648	\$160,030	\$57,323	\$42,939
b. Modify perimeter fencing?	13	\$54	\$1,680	\$4,955	\$9,996	\$28,981	\$9,284	\$4,414
c. Modify the airport certification manual?	19	\$1	\$7	\$28	\$49	\$403	\$71	\$24
d. Modify the snow and ice control plan?	12	\$0	\$6	\$13	\$49	\$136	\$32	\$19
<b>Total Average Initial Costs per Thousand Enplanements</b>							<b>\$66,709</b>	<b>\$47,395</b>
<b>Average Cost per Thousand Operations:</b>								
a. ARFF facilities, vehicles, equipment, staffing or procedures?	9	\$415	\$85,299	\$123,426	\$535,693	\$893,883	\$295,804	\$268,190
b. Modify perimeter fencing?	13	\$1,292	\$33,039	\$59,147	\$147,580	\$216,685	\$82,701	\$59,421
c. Modify the airport certification manual?	19	\$15	\$92	\$305	\$624	\$3,213	\$697	\$292
d. Modify the snow and ice control plan?	12	\$6	\$80	\$136	\$585	\$878	\$287	\$227
<b>Total Average Initial Costs per Thousand Operations</b>							<b>\$379,489</b>	<b>\$328,130</b>

The range of initial compliance costs for individual requirements is substantial. ARFF compliance is the most expensive single item on average at \$1.9 million (\$998,000 interquartile mean). Perimeter fencing is the second most expensive on average at \$732,000 (\$258,000 interquartile mean). The remaining cost items are substantially lower by orders of magnitude of 80 times to 500 times. Average total cost is \$2.6 million, and interquartile mean cost is \$1.3 million. Average cost per thousand enplanements is \$67,000 and interquartile mean cost is \$47,000. Average cost per thousand commercial operations is \$379,000 and interquartile mean cost is \$328,000.

**Table TA-6. Impact of Part 139 Amendments on Existing Certificated Airports, Recurring Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
17. For airports holding an Airport Operating certificate in 2004, when the FAA amended Part 139, was there a cost to the airport to modify any of the following:								
a. ARFF facilities, vehicles, equipment, staffing or procedures?	9	\$1,000	\$2,500	\$10,000	\$75,000	\$514,458	\$84,440	\$24,083
b. Modify perimeter fencing?	5	\$1,000	\$1,000	\$5,000	\$5,000	\$50,000	\$12,400	\$5,000
c. Modify the snow and ice control plan?	8	\$150	\$238	\$500	\$1,250	\$20,000	\$3,075	\$563
<b>Total Recurring Costs</b>							<b>\$99,915</b>	<b>\$29,646</b>
<b>Average Cost per thousand Enplanements:</b>								
a. ARFF facilities, vehicles, equipment, staffing or procedures?	9	\$3	\$51	\$147	\$1,208	\$9,351	\$1,459	\$371
b. Modify perimeter fencing?	5	\$3	\$18	\$28	\$81	\$4,676	\$961	\$54
c. Modify the snow and ice control plan?	8	\$1	\$1	\$11	\$22,081	\$33	\$13	\$11
<b>Total Average Recurring Costs per thousand Enplanements:</b>							<b>\$2,433</b>	<b>\$437</b>
<b>Average Cost per thousand Operations:</b>								
a. ARFF facilities, vehicles, equipment, staffing or procedures?	9	\$55	\$383	\$2,416	\$9,029	\$40,000	\$9,957	\$4,392
b. Modify perimeter fencing?	5	\$51	\$305	\$337	\$958	\$20,000	\$4,330	\$647
c. Modify the snow and ice control plan?	8	\$10	\$15	\$75	\$208	\$611	\$156	\$114
<b>Total Average Recurring Costs per thousand Operations:</b>							<b>\$14,444</b>	<b>\$5,154</b>

ARFF compliance represented the largest category of recurring compliance costs on average (\$84,000 with interquartile mean cost of \$24,000). Perimeter fencing is the second most expensive recurring requirement. Total average recurring cost is \$100,000 and interquartile mean cost is \$30,000. These figures are substantially higher than the FAA's projections. Average cost per thousand enplanements is \$2,400 and interquartile mean cost is \$437. Average cost per thousand commercial operations is \$14,000 and interquartile mean cost is \$5,200.

### ***C.3 Vehicles in Aircraft Operations Areas***

#### **Background and Change in Requirements**

The FAA has an ongoing program to reduce vehicle and pedestrian incursions onto active runways or taxiways (vehicle pedestrian deviations or VPDs). In support of this policy, FAA issued a new AC with guidance on actions to reduce VPDs addressing vehicle access, vehicle marking and inspection, driver training, emergency operations and enforcement and control. AC 150/5210-20, *Ground Vehicle Operations on Airports* (June 21, 2002).

The AC addresses the circumstances in which vehicles may be permitted and the types of operations. It specifies that contracts involving construction on the airport should address vehicle operation during construction and provides a sample training curriculum and a sample training record. Vehicle operation should be kept to a minimum, and vehicles should be marked for visibility and, if operating at night, lighted. Properly marked vehicles should accompany unmarked vehicles. Two-way radio communication is required between the vehicle and airport traffic control tower (ATCT) at airports with ATCTs and between the vehicle and fixed base operators or other airport users at other airports. Vehicle inspection procedures are also discussed. In 2008, the FAA issued Change 1 to the AC to clarify training requirements

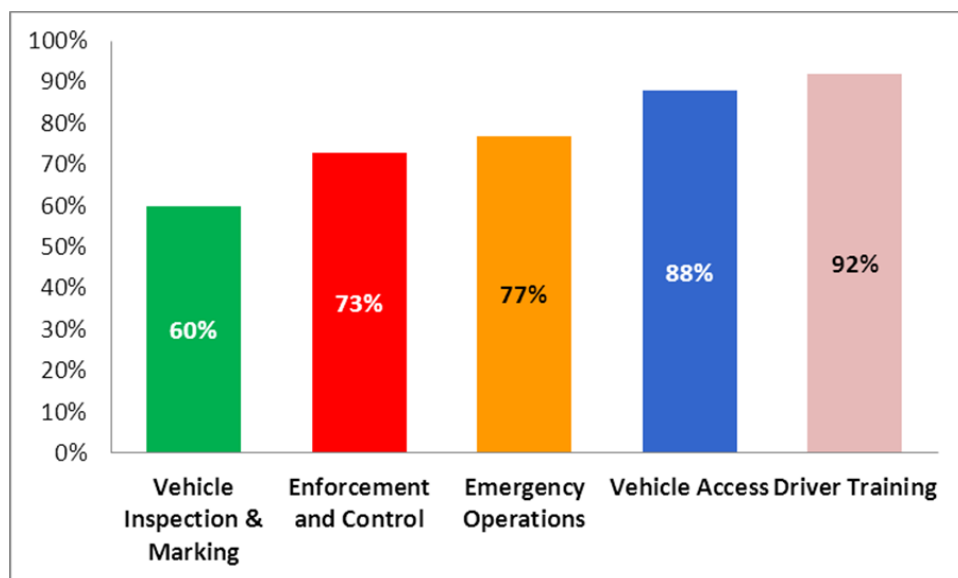
for vehicle operators. Initial and recurrent training is required for airport employees. Initial training is required for other vehicle operators and recurrent training is recommended.

### Phase 1 Survey Results and Evaluation, Airports Affected by Requirements

The survey requested airports to indicate if they were affected by five elements of the AC and Change 1:

- Driver training
- Vehicle permitting
- Vehicle access
- Emergency operations
- Enforcement and control

A high percentage of the responding airports reported modifying their policies in each of the areas, as reflected in **Figure TA-4**. The highest percentage of airports modified their driver training programs (92%), followed by modification of vehicle access policies (88%).



**Figure TA-4. Airports Affected by Modifications to Policies on Vehicle Operations in Aircraft Operation Areas**

*(Sample: 90-92 airports)*

### Phase 2 Survey Results and Evaluation, Reported Costs

**Table TA-7** summarizes the initial cost of compliance reported in the Phase 2 survey, and **Table TA-8** summarizes the recurring costs of compliance.

**Table TA-7. Modifications to Policies on Vehicle Operations in Aircraft Operations Area, Initial Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
5. Since the beginning of CY 2000, how much did it cost your airport to modify any policies or procedures related to vehicle operation in the Aircraft Operations Area as it relates to any of the following?								
a. Vehicle Access	20	\$500	\$1,000	\$15,150	\$85,250	\$2,108,578	\$207,509	\$22,227
b. Vehicle inspection and marking	13	\$100	\$2,000	\$5,000	\$57,000	\$225,000	\$36,877	\$12,014
c. Driver training curriculum	22	\$100	\$2,000	\$4,300	\$36,611	\$215,363	\$31,980	\$6,459
d. Emergency operations	14	\$500	\$2,125	\$12,000	\$257,500	\$1,589,298	\$231,990	\$26,933
e. Enforcement and control	12	\$200	\$95,500	\$125,000	\$2,125,000	\$3,000,000	\$932,340	\$450,000
<b>Total Initial Costs</b>							<b>\$1,440,695</b>	<b>\$517,634</b>
<b>Average Cost per thousand Enplanements</b>								
a. Vehicle Access	20	\$2	\$27	\$74	\$382	\$7,739	\$894	\$119
b. Vehicle inspection and marking	13	\$0	\$3	\$8	\$94	\$615	\$78	\$23
c. Driver training curriculum	22	\$3	\$10	\$33	\$111	\$5,037	\$311	\$31
d. Emergency operations	14	\$2	\$21	\$123	\$822	\$33,290	\$3,347	\$270
e. Enforcement and control	12	\$1	\$239	\$621	\$5,497	\$136,184	\$17,723	\$1,250
<b>Average Initial Costs per thousand Enplanements</b>							<b>\$22,353</b>	<b>\$1,693</b>
<b>Average Cost per thousand Operations</b>								
a. Vehicle Access	20	\$26	\$171	\$902	\$4,933	\$128,533	\$12,581	\$2,293
b. Vehicle inspection and marking	13	\$5	\$58	\$111	\$1,742	\$6,038	\$1,214	\$853
c. Driver training curriculum	22	\$24	\$124	\$342	\$2,953	\$25,484	\$2,434	\$582
d. Emergency operations	14	\$26	\$181	\$1,784	\$13,952	\$133,241	\$20,609	\$3,819
e. Enforcement and control	12	\$10	\$3,322	\$6,729	\$92,074	\$316,957	\$65,852	\$58,746
<b>Average Initial Costs per thousand Operations</b>							<b>\$102,690</b>	<b>\$66,292</b>

There is a wide range between the minimum and maximum initial cost of compliance with the individual requirements. For example, costs of enforcement and control ranged from \$200 to \$3 million.

Because of the variation in the individual responses among airports, only average and interquartile mean costs are calculated for total costs. Average cost is \$1.4 million and interquartile mean cost is \$518,000. Average cost per thousand enplanements is \$22,400 and interquartile mean cost is \$1,700. Average cost per thousand commercial operations is \$103,000 and interquartile mean cost is \$66,000.



**Table TA-8. Modifications to Policies on Vehicle Operations in Aircraft Operations Area, Recurring Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
5. Since the beginning of CY 2000, how much did it cost your airport to modify any policies or procedures related to vehicle operation in the Aircraft Operations Area as it relates to any of the following?								
a. Vehicle Access	17	\$100	\$4,000	\$10,000	\$20,000	\$100,000	\$24,653	\$11,144
b. Vehicle inspection and marking	6	\$1,000	\$9,130	\$16,200	\$82,850	\$225,000	\$61,707	\$16,200
c. Driver training curriculum	18	\$100	\$1,000	\$4,300	\$8,750	\$120,000	\$10,733	\$3,040
d. Emergency operations	9	\$450	\$3,000	\$5,000	\$225,000	\$395,000	\$106,956	\$51,230
e. Enforcement and control	12	\$600	\$35,868	\$91,000	\$283,000	\$500,000	\$164,114	\$128,992
<b>Total Recurring Costs</b>							<b>\$368,163</b>	<b>\$210,606</b>
<b>Average Cost per thousand Enplanements</b>								
a. Vehicle Access	17	\$3	\$27	\$64	\$145	\$496	\$134	\$64
b. Vehicle inspection and marking	6	\$3	\$32	\$57	\$119	\$615	\$149	\$57
c. Driver training curriculum	18	\$2	\$6	\$21	\$39	\$194	\$37	\$21
d. Emergency operations	9	\$2	\$30	\$43	\$551	\$8,274	\$1,224	\$176
e. Enforcement and control	12	\$26	\$124	\$634	\$891	\$6,116	\$1,136	\$540
<b>Total Average Recurring Costs per thousand Enplanements</b>							<b>\$2,680</b>	<b>\$858</b>
<b>Average Cost per thousand Operations</b>								
a. Vehicle Access	17	\$34	\$275	\$611	\$2,099	\$8,039	\$1,593	\$1,021
b. Vehicle inspection and marking	6	\$55	\$456	\$864	\$3,042	\$6,038	\$1,985	\$2,424
c. Driver training curriculum	18	\$29	\$60	\$181	\$422	\$2,299	\$425	\$314
d. Emergency operations	9	\$24	\$183	\$985	\$10,559	\$33,115	\$7,190	\$3,278
e. Enforcement and control	12	\$60	\$1,952	\$4,281	\$16,812	\$25,306	\$9,460	\$8,728
<b>Total Recurring Costs per thousand Operations</b>							<b>\$20,653</b>	<b>\$15,765</b>

The range of recurring cost for individual requirements is narrower than for initial costs. Minimum recurring cost for enforcement and control is \$600 and maximum cost is \$500,000. Average total recurring cost is \$368,000 and interquartile mean cost is \$211,000. Average cost per thousand enplanements is \$2,700 and interquartile mean cost is \$860. Average cost per thousand commercial operations is \$21,000 and interquartile mean cost is \$16,000.

#### ***C.4 PFC Requirements***

PFCs are local airport charges on departing passengers authorized by 49 USC §40117. Section 40117 defines eligible uses of PFCs, specifies other conditions for imposition and requires approval by the DOT before an airport can begin collection. The FAA administers the PFC program under delegated authority. Section 40117 requires carriers to collect the PFC on behalf of airports and authorizes carriers to retain a handling and processing fee at a level established by the FAA.

#### **Background and Change in Requirements**

The primary source of requirements for the PFC program is a regulation, 14 CFR Part 158. Additional guidance is provided by the *PFC Order*, Order 5500.1 (August 9, 2001) and by PFC updates.

During the study period, the FAA issued 11 compliance documents related to PFCs: four amendments to Part 158; the current version of Order 5500.1; and six PFC updates. Three of the

four Part 158 amendments implemented changes in Section 40117. The fourth amendment, increased the rate of carrier compensation for PFC collection and handling and was undertaken at FAA's initiative. Order 5500.1 reflects Part 158, at the time of issuance and policies and procedures developed by FAA on a case-by-case basis. It did not contain new policies or practices. Two of the PFC updates were administrative, announcing OMB approval of a new application form and announcing the availability of the carrier PFC module in the FAA's System of Airport Reporting (SOAR) data-base for AIP grants and PFCs. Two of the PFC updates provided guidance on amendments to Part 158. One of the updates modified a prior update to reverse a PFC eligibility determination.

The survey focused on four changes to PFC requirements adopted during the study period.

In 2004, the FAA amended Part 158 to increase carrier compensation from eight cents per PFC remitted to 11 cents per PFC collected. 69 Fed. Reg. 12940 (March 18, 2004). Because the FAA approves the amount of PFCs to be collected on a net basis, this amendment did not reduce the amount of PFCs airports are able to collect. It does, however, extend the time it takes an airport to collect a given amount of approved PFC revenue.

In 2005, the FAA amended Part 158 to implement a pilot program on PFC applications for non-hub airports. 70 Fed. Reg. 14928. This pilot program is authorized by an amendment to Section 40117. It is intended to simplify the application process for non-hub airports and thereby reduce the cost and administrative requirements of the PFC program for these airports.

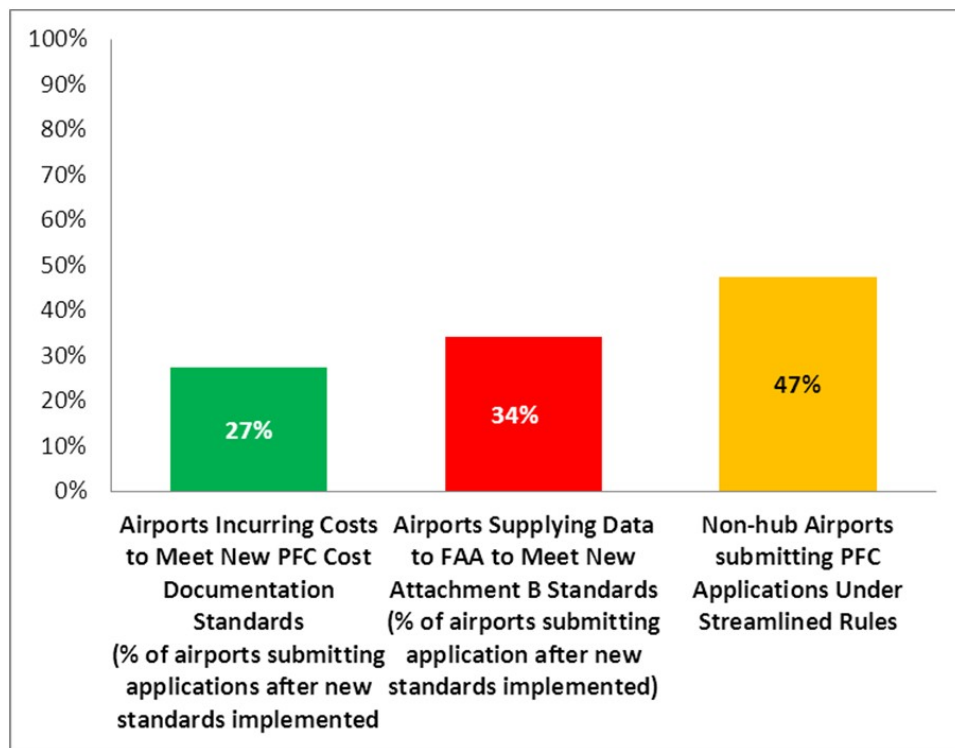
PFC Update 50-06, Detailed Basis of Cost Information (September 8, 2006) modified the standards for documentation of costs for PFC projects with a value of \$10 million or more. The FAA developed the update in response to an adverse court decision holding that the FAA's administrative record did not support a finding that a projected cost of over \$100 million for an EIS was reasonable.

PFC Update 59-09, Completion of "For FAA Use" Portions of Attachment Bs (July 30, 2009) establishes new requirements for FAA staff to document their analysis of individual PFC projects. The focus of the survey was on the cost to airport operators of providing additional information or analysis to enable FAA staff to meet the new requirements.

### Phase 1 Survey Results and Evaluation, Airports Affected by Requirements

**Figure TA-5** summarizes the results of the Phase 1 survey. Eighty-eight percent of airports responding reported imposing a PFC. However, according to FAA records 84% of small and non-hub airports collect a PFC. Any airport imposing a PFC is affected by the change in the carrier compensation rate in 2004, and the survey did not include a question on this subject. Of the non-hub airports imposing a PFC, 47% reported submitting a PFC application after the FAA

implemented the non-hub pilot program. Of the airports that submitted a PFC application after issuance of PFC Update 50-06, 27% reported incurring increased costs to supply additional cost information as specified in the update. Thirty-four percent of airports submitting a PFC application after issuance of PFC Update 59-09 reported that FAA requested additional information to meet the new Attachment B requirements.



**Figure TA-5. Airports Affected by Changes to PFC Requirements**  
(Sample: 72 non-hub airports; 81-83 airports)

### Phase 2 Survey Results and Evaluation, Reported Costs

**Table TA-9** summarizes the cost impacts of the PFC requirements as reported in the Phase 2 survey. The total cost figure in the table does not include any cost savings from the non-hub pilot program, because this program did not apply to small hub airports. It also treats as a cost the annual reduction in net PFC revenue from the increase in mandatory carrier compensation implemented in 2004. The survey did not specifically ask questions about initial and recurring costs.

**Table TA-9. Costs Incurred by Airports Affected by Changes to PFC Requirements**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
24. What was the annual reduction in net PFC revenue due to the FAA's increase in carrier compensation?	16	\$100	\$1,900	\$6,269	\$16,250	\$88,195	\$14,072	\$7,067
Average Cost per thousand Enplanements	16	\$25	\$31	\$38	\$62	\$128	\$54	\$39
Average Cost per thousand Operations	16	\$179	\$277	\$497	\$812	\$2,305	\$657	\$590
35. How much in additional costs your airport incur to prepare the application or amendment to comply with new FAA requirements on documentation of costs issued on that date (PFC Update 50-06)?	5	\$5,000	\$7,000	\$18,500	\$26,000	\$38,154	\$18,931	\$17,167
Average Cost per thousand Enplanements	5	\$16	\$51	\$103	\$351	\$477	\$199	\$168
Average Cost per thousand Operations	5	\$397	\$638	\$1,109	\$1,705	\$1,837	\$1,137	\$1,151
48. Has your airport experienced any costs due to FAA staff requesting the airport or the airport's PFC consultant to provide any additional data, documentation or analysis to assist them in meeting the requirements of PFC Update 59-09?	5	\$500	\$2,000	\$7,000	\$10,000	\$15,000	\$6,900	\$6,333
Average Cost per thousand Enplanements	5	\$6	\$14	\$37	\$153	\$477	\$137	\$68
Average Cost per thousand Operations	5	\$102	\$168	\$610	\$1,109	\$1,915	\$781	\$629
Total Cost of Requirements Applicable to All Airports	22						\$39,903	\$30,567
Total Average Cost Per Thousand Enplanements	22						\$390	\$275
Total Average Cost Per Thousand Operations	22						\$2,575	\$2,370
27. What are the airport's cost savings per PFC application or amendment request as a result of the new filing procedures? (Non-hub airports)	5	\$500	\$500	\$500	\$5,000	\$5,000	\$2,300	\$2,300
Average Cost per thousand Enplanements	5	\$2	\$14	\$18	\$21	\$30	\$17	\$18
Average Cost per thousand Operations	5	\$26	\$50	\$265	\$275	\$353	\$194	\$270

Average cost of the three requirements included in the survey applicable to all PFC airports is \$40,000 and interquartile mean cost is \$31,000. Average cost per thousand enplanements is \$390 and interquartile mean cost is \$275. Average cost per thousand commercial operations is \$2,600, and interquartile mean cost is \$2,400.

The non-hub pilot program generated sample and interquartile mean cost savings of \$2,300. Average cost savings per thousand enplanements is \$17, and interquartile mean cost saving is \$18. Average cost savings per thousand commercial operations is \$194, and interquartile mean cost savings is \$270. These results are substantially lower than the cost savings projected in the rulemaking document implementing the non-hub pilot program. The rulemaking document projected an average cost savings of \$9,500 (**Table A-1**, Item 4).

### ***C.5 DBE Requirements***

DBE requirements provide opportunities for disadvantaged businesses, as defined in the AIP statute, to participate in AIP-funded projects (49 USC §47113) and in airport concessions (49 USC §47107(e)). Other DOT-funded infrastructure programs have similar DBE requirements for federally-funded projects. The concession participation requirements are unique to airports. Because DBE participation requirements apply to DOT programs in addition

to the AIP, DOT, through the Office of the Secretary of Transportation, has promulgated DBE requirements.

### Background and Change in Requirements

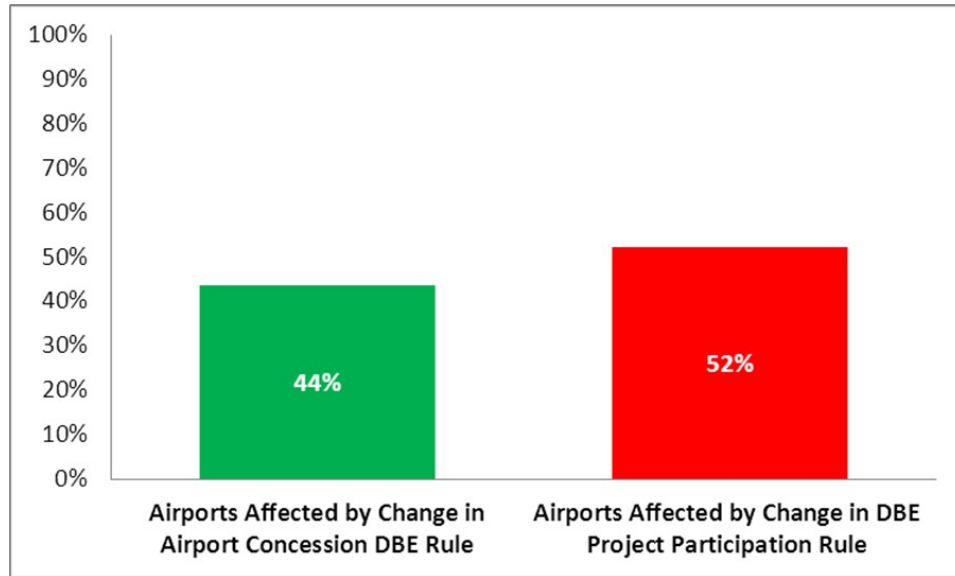
The DOT maintains separate rules for participation of DBEs in airport concessions (49 CFR Part 23) and in federally-funded projects (49 CFR Part 26). Part 23 applies only to airports. Part 26 applies to airports and other DOT-funded entities.

The DOT amended Part 23 once during the study period (70 Fed. Reg. 14508 (March 22, 2005)) (**Table A-1**, Item 149). The amendment aligned Part 23 with Part 26 and established new standards for goal setting, for personal net worth and business size and for DBE participation by rental car companies.

The DOT amended Part 26 twice during the study period (**Table A-1**, Items 141 and 142). The first amendment (65 Fed. Reg. 68951 (November 15, 2000)) increased the grant value threshold for mandatory goal setting to \$250,000 annually; clarified requirements for use of bidders lists; clarified the requirement of grant recipients to monitor actual DBE participation and clarified the information to be used by recipients in goal setting. The second amendment (68 Fed. Reg. 35553 (June 16, 2003)) established new uniform application and reporting forms; set new standards for maximum personal net worth, DBE size, ethnicity and proof of disadvantage; revised standards for participation of Alaska Native Corporations in DBE programs; and revised standards for goal setting in multi-year projects.

### Phase 1 Evaluation and Results, Airports Affected by Requirements

As shown in **Figure TA-6**, 44% of airports responding were affected by the revisions to the Airport Concession DBE Rule. 52% of responding airports were affected by the revision to the rule on DBE participation in federally-assisted projects.



**Figure TA-6. Airports Affected by DBE Rule Changes**  
(Sample: 86-87 airports)

### Phase 2 Survey Results and Evaluation, Reported Costs

The regulatory documents for these amendments did not include any estimates of cost impacts.

**Table TA-10** summarizes the initial DBE compliance costs reported in the Phase 2 survey, and **Table TA-11** summarizes the reported recurring cost.

The range of initial compliance costs for the project participation DBE rule change are much lower than the range for the airport concession DBE rule. Total average cost of compliance for both rules combined is \$24,000 and interquartile mean cost is \$19,000. Average cost per thousand enplanements is \$59, and interquartile mean cost is \$57. Average cost per thousand commercial operations is \$996, and interquartile mean cost is \$723.

**Table TA-10. Airports Affected by DBE Rule Changes, Initial Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
20. Was there a cost to your airport as a result of the DOT's issuance of modified regulations for the Airport Concession DBE Program in 2005?	9	\$500	\$2,100	\$7,000	\$18,000	\$50,000	\$12,470	\$7,620
Average Cost per thousand Enplanements	9	\$2	\$14	\$36	\$55	\$67	\$34	\$41
Average Cost per thousand Operations	9	\$26	\$208	\$518	\$673	\$1,615	\$563	\$583
21. Was there a cost to your airport resulting from the DOT's issuance in 2003 of modified regulations for DBE participation in federally funded projects?	4	\$1,000	\$6,250	\$11,000	\$15,907	\$21,628	\$11,157	\$11,000
Average Cost per thousand Enplanements	4	\$3	\$8	\$22	\$40	\$52	\$25	\$16
Average Cost per thousand Operations	4	\$51	\$185	\$445	\$693	\$791	\$433	\$140
<b>Total DBE Compliance Costs</b>							<b>\$23,627</b>	<b>\$18,620</b>
Total Average Cost per thousand Enplanements							\$59	\$57
Total Average Cost per thousand Operations							\$996	\$723

Recurring compliance costs are relatively modest. Total average cost is \$13,000, and interquartile mean cost is \$14,000. The higher interquartile mean cost suggests the arithmetic mean is disproportionately affected by extreme low values. Average cost per thousand enplanements is \$68, and interquartile mean cost is \$49. Average cost per thousand commercial operations is \$954, and interquartile mean cost is \$855.

**Table TA-11. Airports Affected by DBE Rule Changes, Recurring Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
20. Was there a cost to your airport as a result of the DOT's issuance of modified regulations for the Airport Concession DBE Program in 2005?	8	\$250	\$1,750	\$2,800	\$4,750	\$7,210	\$3,382	\$2,900
Average Cost per thousand Enplanements	8	\$1	\$10	\$13	\$14	\$55	\$16	\$10
Average Cost per thousand Operations	8	\$15	\$157	\$200	\$230	\$673	\$232	\$210
21. Was there a cost to your airport resulting from the DOT's issuance in 2003 of modified regulations for DBE participation in federally funded projects?	4	\$2,000	\$6,500	\$11,000	\$14,576	\$16,305	\$10,076	\$11,000
Average Cost per thousand Enplanements	4	\$9	\$22	\$39	\$69	\$119	\$52	\$39
Average Cost per thousand Operations	4	\$230	\$431	\$644	\$946	\$1,411	\$732	\$644
<b>Total DBE Compliance Costs</b>							<b>\$13,459</b>	<b>\$13,900</b>
Total Average Cost per thousand Enplanements							\$68	\$49
Total Average Cost per thousand Operations							\$964	\$855

## ***C.6 AIP Administrative Requirements***

During the study period, the FAA modified a number of administrative requirements for the AIP program and operation of AIP-obligated airports. Actions in this broad category included changes to requirements for procurement of services for grant-funded projects, internal guidance to FAA staff on administering the AIP and identifying projects for potential discretionary funding, and standards for applying AIP grant assurances. Twenty-eight of the requirements listed in **Table A-1** of the research report are classified as administrative requirements.

### **Background and Change in Requirements**

Two of the requirements in this category are updates to FAA Orders governing AIP – the *AIP Handbook* (Order 5100.38) and the *ACIP Order* (Order 5100.39A). PGL 07-03 adopted new guidance for preparing and processing letter of intent requests under the AIP. Separate PGLs addressed selection of architects, engineers and other technical consultants for AIP-funded projects and the selection of experts to conduct wildlife hazard assessments. A third PGL addressed the Buy America Requirements for AIP-funded projects. Two DOT regulations addressed debarment of businesses from participating in grant-funded projects. Eight FAA actions related to compliance with AIP grant assurances governing the following:

- Financial reporting
- The reasonable access requirement
- The requirement for reasonable and non-discriminatory rates and charges
- The requirements for the use of airport revenue

In addition, the FAA issued four ACs or AC revisions related to the use of Geospatial Information System (GIS) data to support airport surveys.

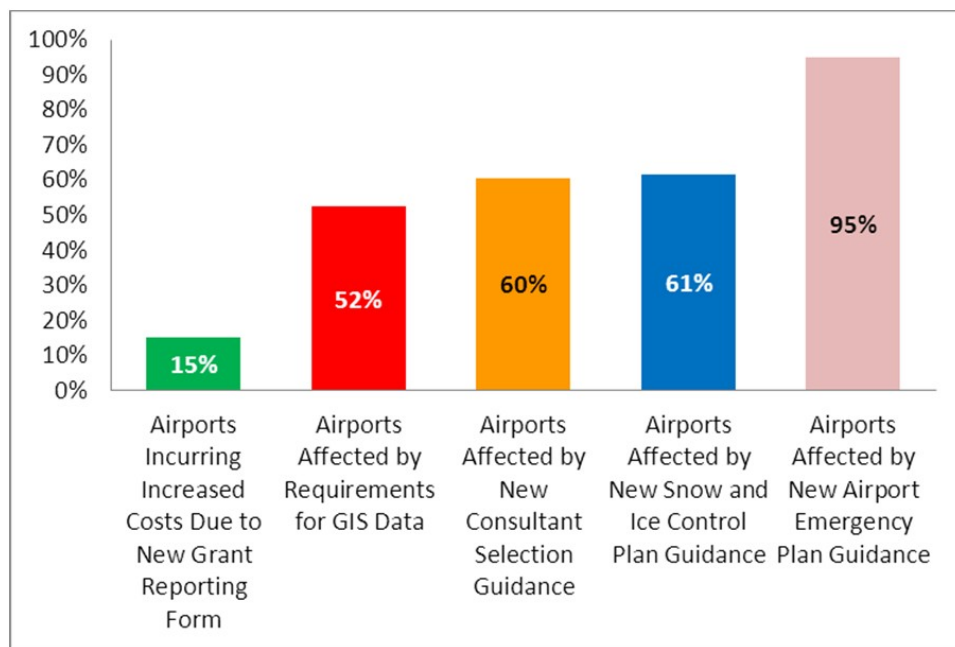
### **Phase 1 Survey Results and Evaluation, Airports Affected by Requirements**

The survey focused on requirements considered to have wide applicability or to be potentially costly for affected airports. The requirements for consultant selection in AIP-funded projects were modified in 2005 (**Table A-1**, Item #71). All responding airports reported selecting a consultant after the new requirements were adopted. Sixty percent of the airports reported that they were affected by the new requirements.

In 2009, FAA adopted a new government-wide financial reporting form for AIP (**Table A-1**, Item 127). Fifteen percent of airports reported that they were impacted by the new form, and all of these airports stated the cost of reporting went up. Fifty-two percent of airports reported that they were affected by FAA's requirements for the use of GIS data (**Table A-1**, Items 92-94, 109). Sixty-one percent reported preparing or revising their snow and ice control



plans in response to new FAA guidance issued in 2008 (**Table A-1**, Item 113). Ninety-five percent of airports reported preparing or revising an Airport Emergency Plan in response to new FAA guidance issued in 2010 (**Table A-1**, Item 132). **Figure TA-7** summarizes these results.



**Figure TA-7. Airports Impacted by Various FAA Administrative Requirements**  
(Sample: 66-87 airports)

### Phase 2 Survey Results and Evaluation, Reported Costs

**Table TA-12** summarizes the initial cost for four of the requirements included in **Figure TA-7**, as reported in the Phase 2 survey. **Table TA-13** summarizes the recurring costs. Costs of compliance with the new financial reporting form are not included because of the low rate of airports reporting cost impacts and the low value of costs reported. The highest reported cost is \$11,000. Because the requirements included in this category are so disparate, total compliance costs were not calculated.

**Table TA-12. Miscellaneous FAA Administrative Requirements, Initial Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
32. How much did it cost your airport to comply with the new guidance issued on September 30, 2005, by the FAA on the subject of consultant selection (AC 150/5100-14D)?	6	\$1,000	\$4,875	\$157,500	\$450,000	\$1,000,000	\$302,917	\$157,500
Average Cost per thousand Enplanements	6	\$25	\$37	\$207	\$2,131	\$5,971	\$1,527	\$207
Average Cost per thousand Operations	6	\$337	\$383	\$4,190	\$35	\$58,620	\$18,569	\$2,913
40. Has much has it costs your airport to conduct or engage consultants to conduct survey, mapping or charting work using Geospatial Information System (GIS) techniques or methodology in response to FAA guidance or requirements on this subject?	14	\$1,000	\$62,496	\$157,500	\$507,212	\$657,854	\$256,278	\$176,000
Average Cost per thousand Enplanements	14	\$22	\$350	\$616	\$961	\$5,107	\$971	\$632
Average Cost per thousand Operations	14	\$100	\$4,824	\$10,666	\$18,129	\$45,238	\$14,834	\$11,858
45. How much did it cost your airport to prepare a revised snow and ice control plan in response to a new AC issued by the FAA on December 8, 2008 (AC 150/5200-30C)?	12	\$100	\$225	\$643	\$1,050	\$1,600,000	\$133,953	\$639
Average Cost per thousand Enplanements	12	\$0.09	\$2	\$5	\$14	\$16,294	\$1,367	\$7
Average Cost per thousand Operations	12	\$2.13	\$15	\$61	\$136	\$204,316	\$17,102	\$96
54. How much did it cost your airport to prepare or update an Airport Emergency Plan in response to guidance issued by the FAA on May 21, 2010 (AC 150/5200-31C)?	27	\$500	\$2,350	\$3,200	\$9,500	\$27,600	\$7,317	\$4,490
Average Cost per thousand Enplanements	27	\$1	\$10	\$51	\$132	\$889	\$120	\$49
Average Cost per thousand Operations	27	\$27	\$229	\$533	\$1,124	\$10,586	\$1,124	\$660

Based on average compliance costs, compliance with consultant selection standards is the most expensive requirement (\$303,000). Compliance with GIS standards is the second most expensive (\$256,000). Considering interquartile mean costs, the positions are reversed (\$176,000 for GIS standards and \$158,000 for consultant selection). Meeting the revised standards for airport emergency plans is the least expensive using either measure, considering average costs (\$7,400). Compliance with requirements for AEPs is the least expensive based on average costs, but compliance with the new requirements for snow and ice control plans is the least expensive (\$639) based on interquartile mean costs. For snow and ice control plans, the interquartile mean is a more reliable measure. The maximum cost reported for snow and ice control plans is \$1.6 million, which is more than 1,000 times higher than the cost reported for the 75<sup>th</sup> percentile. The pattern of results for unit costs follows the pattern for per airport costs.

**Table TA-13. Miscellaneous FAA Administrative Requirements, Recurring Costs**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
40. How much has it cost your airport to conduct or engage consultants to conduct survey, mapping or charting work using Geospatial Information System (GIS) techniques or methodology in response to FAA guidance or requirements on this subject?	4	\$150	\$7,538	\$35,000	\$71,500	\$106,000	\$44,038	\$35,000
Average Cost per thousand Enplanements	4	\$6	\$46	\$77	\$114	\$175	\$84	\$77
Average Cost per thousand Operations	4	\$15	\$443	\$1,164	\$2,116	\$3,240	\$1,396	\$1,856
45. How much did it cost your airport to prepare a revised snow and ice control plan in response to a new AC issued by the FAA on December 8, 2008 (AC 150/5200-30C)?	3	\$100	\$125	\$150	\$5,075	\$10,000	\$3,417	\$150
Average Cost per thousand Enplanements	3	\$0.37	\$3	\$6	\$54	\$102	\$36	\$6
Average Cost per thousand Operations	3	\$6	\$11	\$15	\$646	\$1,277	\$433	\$15
54. How much did it cost your airport to prepare or update an Airport Emergency Plan in response to guidance issued by the FAA on May 21, 2010 (AC 150/5200-31C)?	9	\$100	\$500	\$1,000	\$1,200	\$2,000	\$1,033	\$867
Average Cost per thousand Enplanements	9	\$0.37	\$14	\$20	\$59	\$109	\$35	\$26
Average Cost per thousand Operations	9	\$6	\$96	\$168	\$255	\$706	\$236	\$254

The survey did not include a question about the recurring costs of the revised consultant selection requirement. For the other requirements included in **Table TA-13**, compliance with the GIS standards is most expensive based on both the arithmetic mean (\$44,000) and interquartile mean (\$35,000). Compliance with AEP requirements is the least costly on average (\$1,000), but the compliance with the new requirements for snow and ice control plans is the least costly based on interquartile mean costs (\$150). Also, in the follow-up interviews for the Phase 2 survey, a number of airports commented that the AEP requirement results in continuing costs due to the requirement for regular updates. A number of airports also expressed concern about the potential cost of future requirements for safety management systems (SMSs).

#### D. Funding Sources

The research identified outside funding sources potentially available to airports for the categories of requirements described in this report. These funding sources can reduce the out-of-pocket costs to airports only if they are actually used. The Phase 2 survey included questions about funding sources for some of the requirements addressed in the survey. This section discusses the outside funding sources (primarily grants) potentially available to airports to help meet the requirements and the actual utilization of outside funding reported in the surveys. Two financial assistance programs administered by the FAA are an important source of funding for some of the requirements in each of the categories.

### ***D.1 Overview of Potential Funding Sources***

The AIP is a significant source of funding for airport capital development, planning and environmental mitigation. AIP funds cannot be used for operations and maintenance (O&M) costs of the airport. For small airports, the federal share of project costs was 95% during most of the study period, with the airport responsible for a five percent local matching share. Before 2003, the federal share was 90%, and the local matching share was 10%. Under the FAA Modernization and Reform Act, Pub. L. 112-95 (February 14, 2012) (FMRA), the local matching share for most small airports returned to the 10% level, effective in FY 2012. The local matching share may come from any non-federal source.

PFCs are considered another form of federal assistance because of the FAA's role in approving their collection and use. Currently the maximum PFC is \$4.50 per enplaned passenger. In general, PFCs may be used for any costs that are eligible for AIP grants, with broader eligibility in the area of terminal projects and noise mitigation. Currently 188 out of 237 non-hub airports collect a PFC, and 72 out of 73 small hub airports do so. PFC funding can be applied to pay the full amount of any incremental costs that are eligible for AIP funding or to pay for the local matching share of a project receiving grant funds. PFC project administrative costs, including costs of preparing applications, are also eligible. Like AIP funds, PFCs cannot be used for airport O&M expenses.

Some states maintain their own airport assistance programs. State funds may be provided to assist airports in paying the local share of AIP-funded projects or may be provided to fund projects that do not receive AIP grants. When state funds are used for the local match, 50% of the local matching requirement is typically provided from state airport assistance programs. ACRP Synthesis 24, *Strategies and Financing Opportunities for Airport Environmental Programs* (2011) (ACRP Synthesis 24), Table 2 of the Synthesis includes a listing of all state airport assistance programs. Eligibility for state airport assistance programs generally follows federal standards, although some states may fund projects that are ineligible for AIP.

### ***D.2 Potential Funding Sources for FAA and DOT Requirements***

The capital costs of many of the FAA compliance requirements listed in **Table A-1** of the research report may be eligible in part for AIP or fully eligible for PFC funding. Potential eligibility is discussed in the "Notes" column of the table.

#### **AIP Funding**

During most of the study period, the federal share for AIP-funded projects at small airports was 95%. Beginning in FY 2012, the federal share for most small airports is 90%.

In the context of the FAA requirements listed in **Table A-1**, incremental costs associated with the design or construction standards listed in ACs, Orders and Cert Alerts are eligible for AIP funding, to the extent they apply to AIP-eligible construction. Capital costs associated with the Part 139 requirements are eligible, as well. Development of plans or manuals may be eligible, if the exercise qualifies as airport planning under the AIP statute. However, ongoing staffing costs and any operating costs of facilities or equipment required by Part 139 are not eligible. Thus, although recurring costs of FAA compliance are generally lower than initial costs, airports cannot look to federal funding to help pay the costs.

Any incremental costs associated with preparing or submitting AIP applications as a result of modification of FAA requirements would be eligible for reimbursement as a project formulation cost. Incremental project administration costs resulting from FAA requirements would also be reimbursable.

One exception to the general rule that operational and administrative costs cannot be funded with AIP is the DOT DBE requirements. The FAA may consider these costs to be project administration costs that are eligible for reimbursement. As discussed in the next section, however, only a small number of airports have received federal assistance for DBE compliance.

### PFC Funding

PFCs can be used to fund any incremental costs associated with the FAA requirements included in **Table A-1** that are eligible for AIP funding. PFCs can be used to pay the full cost (if the associated project was funded entirely with PFCs) or pay the local matching share of the incremental costs (if the associated project received AIP funds), or any other amounts provided that the project is approved. Finally, any incremental costs associated with changes to PFC application or administrative requirements are can be funded with PFCs.

### State Funding Programs

Depending on the location, state or local economic development funds may be available to projects that are subject to the design and construction standards listed in **Table A-1** of the research report. Where available, these funds could also be used to defray the incremental costs associated with any of the standards. The research team did not attempt to catalog state or local economic development funding opportunities.

In states with airport assistance programs, state airport funds could be used for incremental costs resulting from the FAA requirements listed in **Table A-1** of the research report that are applicable to eligible capital development projects. In most cases, state participation would be limited to one-half of the local matching requirement.

### Limitations on the Benefits of Federal Assistance

Although the use of AIP or PFC funds may reduce the amount of funding airports must generate from other sources, e.g. rates and charges, bond proceeds, discretionary reserves, to comply with federal requirements, there is an opportunity cost associated with this use. AIP and PFC funds applied to comply with federal requirements cannot be used for the physical completion of projects that benefit airport users and generate a financial return to the airport.

In addition, AIP and PFC funding has not kept pace with the growth in federal requirements. As shown in the preceding section, the cost impact of just the FAA and DOT requirements adopted during the study period totals \$1,458 million. However, AIP funding remained flat at approximately \$3.5 billion from 2008 through 2011 and actually declined by \$165 million in 2012. The \$4.50 PFC cap was implemented in June of 2000, close to the beginning of the study period.

### ***D.3 Use of Financial Assistance***

The Phase 2 Survey for FAA and DOT requirements included questions about the sources of funding to pay for compliance. The survey included AIP and PFC funds, other airport funds and other funding sources. The figures and discussion below summarize the survey results. The focus is on the use of AIP and PFC funds. Generally speaking, other airport revenue was used to cover costs that were not financed by AIP or PFC funds. A limited number of airports reported using other funding sources.

For AIP funds, the figures show the number of airports that used no AIP funds; the number that used some AIP funds, but less than the full federal share; and the number that used the full federal share. For PFC funds, the figures show the number of airports that used no PFC funds; the number that used PFC funds for the full amount of the local matching share; the number that used PFCs for less than the matching share; and the number that used PFCs for more than the local matching share. The results in many cases include airports that reported using both AIP and PFC funds. The data is presented separately for initial and recurring costs, because the patterns of use are significantly different.

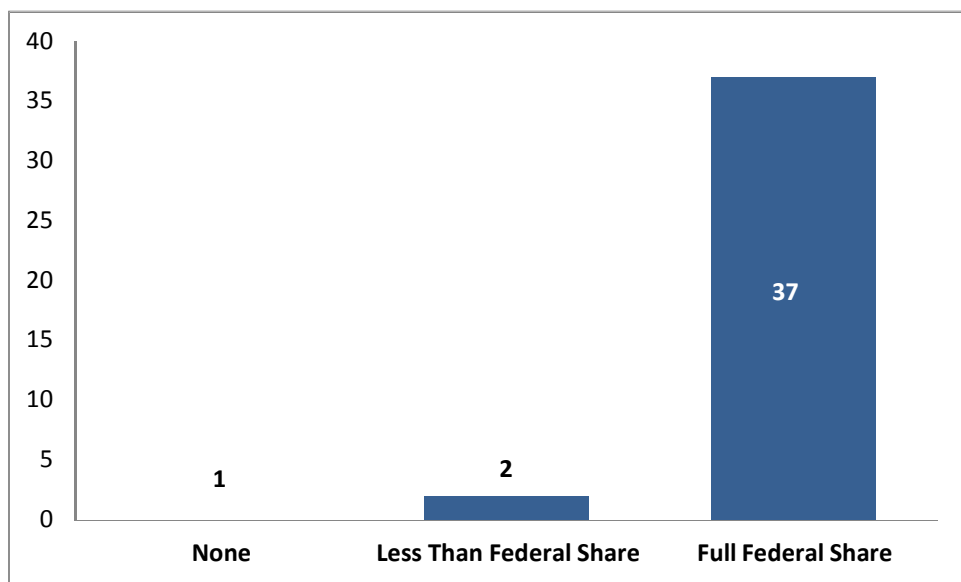
### Initial Compliance Costs

**Figure TA-8** through **Figure TA-19** provide summary data on the use of AIP and PFC funds for initial costs of the FAA requirements. The data is presented for the individual categories (and sometimes individual requirements) because of variations in the pattern of usage of AIP funds that are masked by aggregation of data. PFC usage was more consistent, but unexpected. In most cases a majority of airports did not use PFC funds, even to finance all or part of the local matching requirement for an AIP grant.

### *Airfield Design, Standards and Operations*

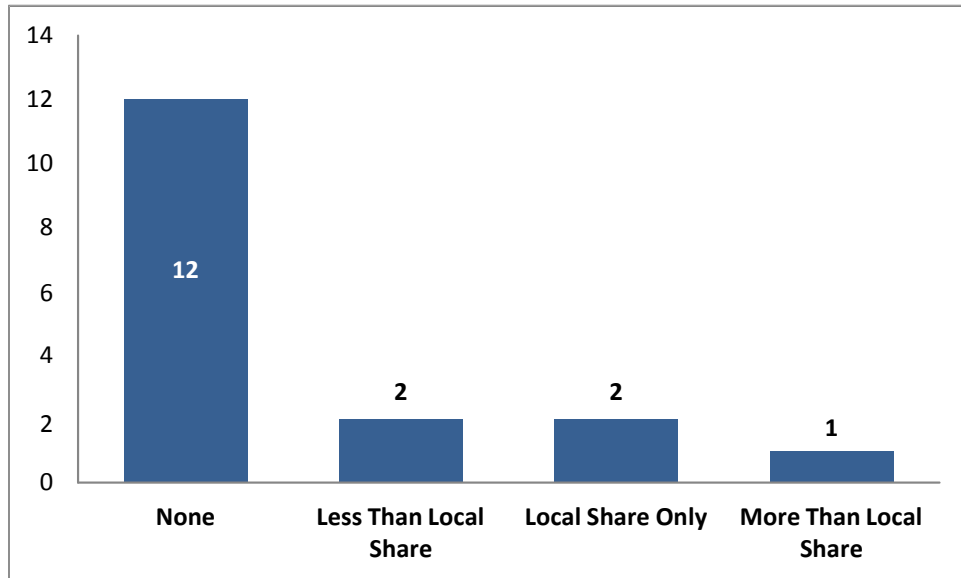
The funding sources for airfield design, standards and operation requirements are summarized in **Figure TA-8** through **Figure TA-13**. A substantial number of airports were able to obtain AIP funding for the full federal share of project costs for these compliance requirements. This outcome is to be expected, because many design and standards requirements involve capital development and address safety and security issues. More noteworthy is the limited use of PFCs, even to fund the local matching share of projects. At some airports, this may reflect the use of state grant funds, but many airports reported the use of no PFCs at all.

Data on the use of AIP funding for fencing requirements (wildlife and security) is presented in **Figure TA-8**, and data the use of PFCs for wildlife fencing is presented in **Figure TA-9**. The survey did not include a specific question on the use of PFCs for security fencing.



**Figure TA-8. AIP Funding Levels for Initial Costs of Perimeter Fencing Requirements**

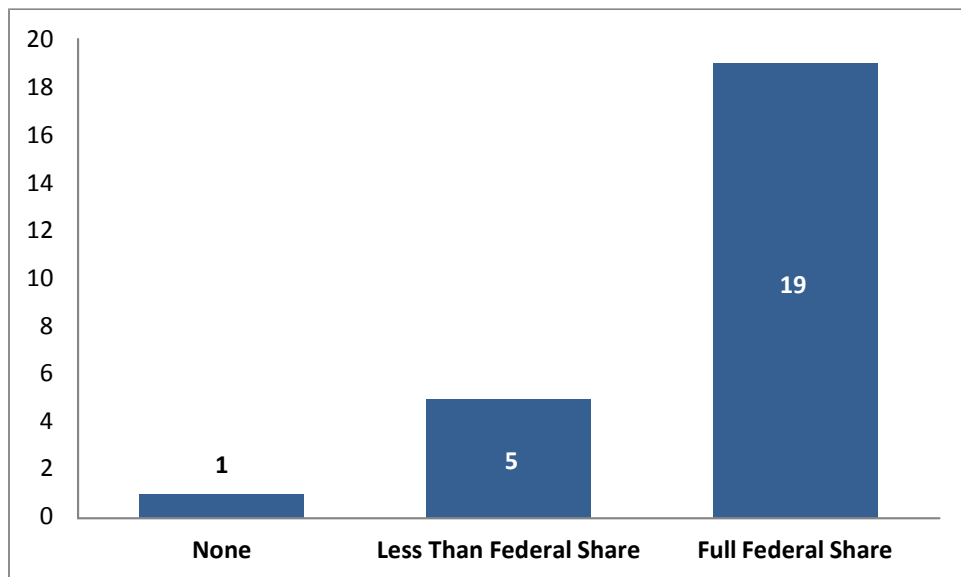
As shown, 37 out of 40 responding airports reported receiving the full federal share to comply with perimeter fencing requirements. Only one airport did not receive any federal funds.



**Figure TA-9. PFC Funding Levels for Initial Costs of Fencing Requirements**

In contrast, 12 out of 17 airports reported using no PFC funds to comply with wildlife fencing requirements. Only two relied on PFCs to finance the full local matching share of their projects.

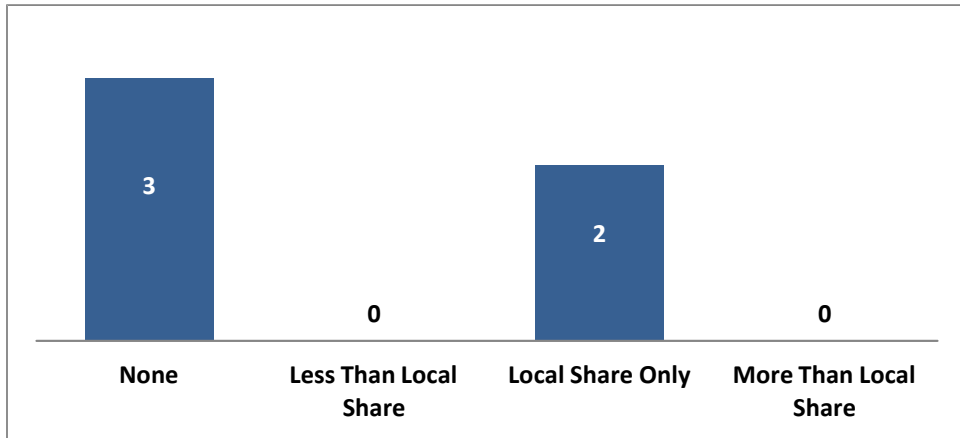
Data on the use of AIP funding for runway protection requirements (RPZs and RSAs) is presented in **Figure TA-10**, and data on use of PFCs for RPZ requirements is presented in **Figure TA-11**. The survey did not include a specific question on the use of PFCs for RSAs.



**Figure TA-10. AIP Funding Levels for Initial Costs of Runway Protection (RPZ and RSA) Requirements**



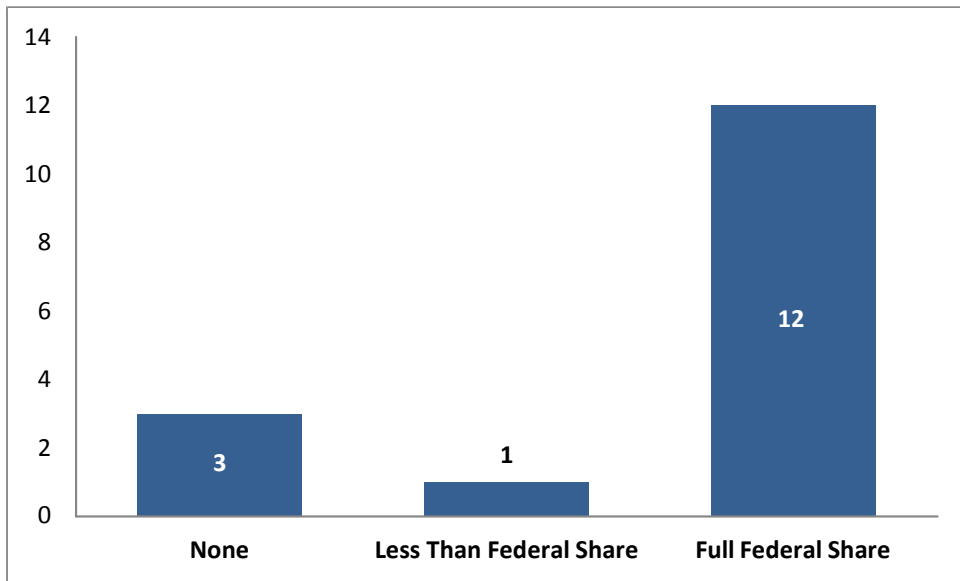
Nineteen out of 25 airports received AIP funds for the full federal share of their runway protection projects, and only one airport received no federal funding.



**Figure TA-11. PFC Funding Levels for Initial Costs of RPZ Requirements**

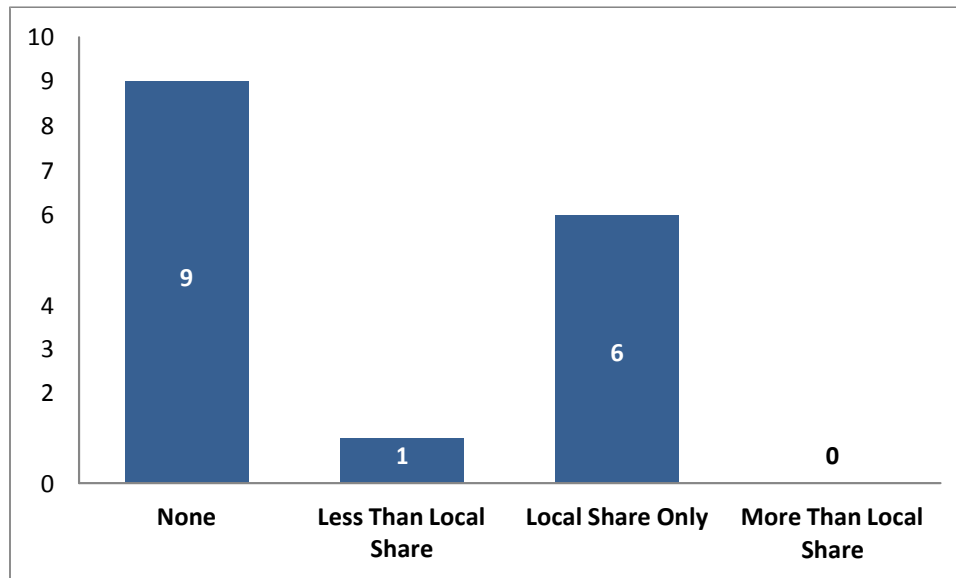
As shown, a majority of airports (three out of five) did not use PFCs to finance their RPZ projects.

**Figure TA-12** and **Figure TA-13** show the use of AIP and PFC funds, respectively, to finance the costs of compliance with new airfield signage requirements.



**Figure TA-12. AIP Funding Levels for Initial Costs of Airfield Signage Requirements**

Twelve out of 16 airports reported receiving AIP grants for the full federal share of their signage projects, but three airports did not receive any AIP grants.



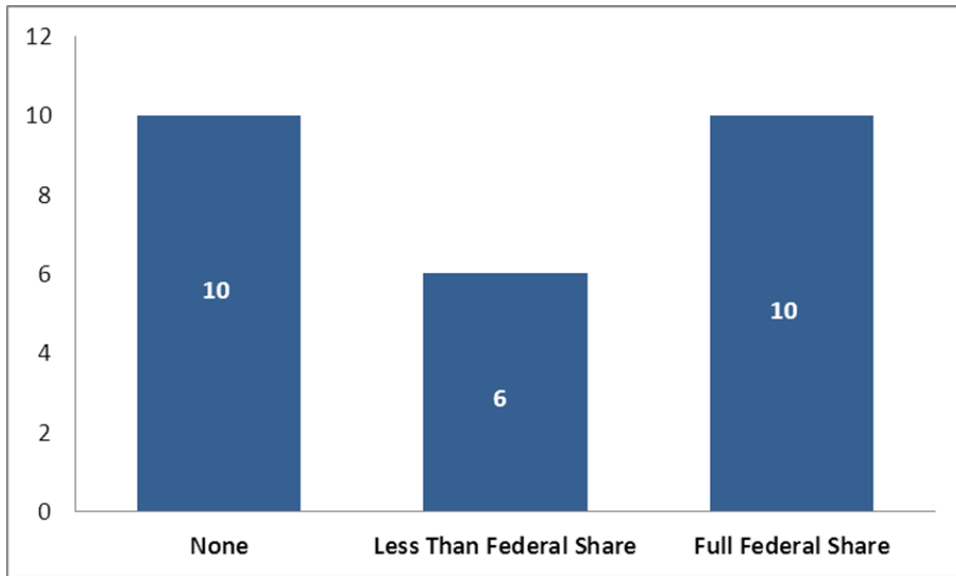
**Figure TA-13. PFC Funding Levels for Initial Costs of Airfield Signage Requirements**

Consistent with the other requirements, a majority of airports (nine out of 16) did not use any PFCs to meet airfield signage requirements. However a substantial number (six) did finance their local matching share with PFCs.

#### *Part 139 Certification Requirements*

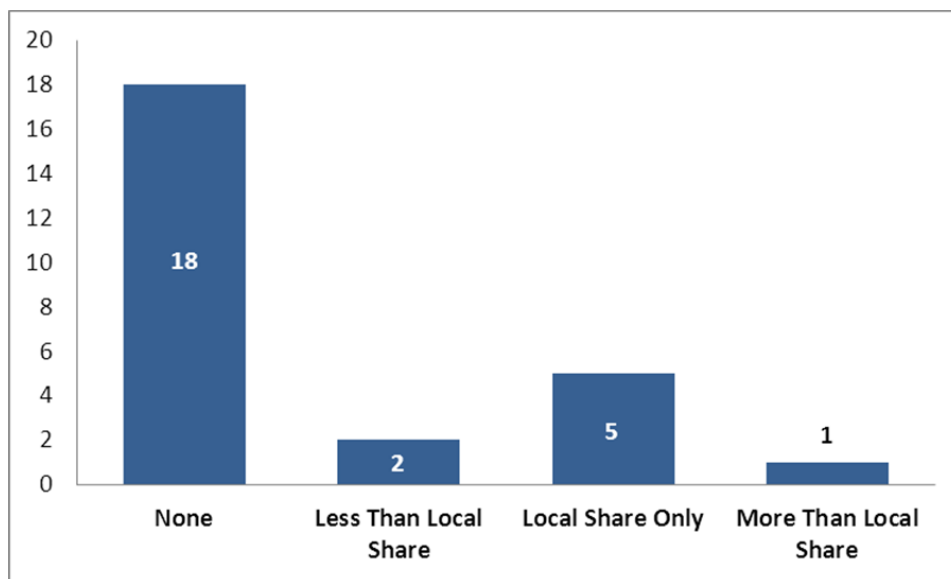
No newly certificated airport reported the use of either AIP or PFC funds to finance their compliance requirements. Airport funds or funding from other sources financed the compliance costs.

**Figure TA-14** and **Figure TA-15** show the use of AIP funds and PFCs, respectively, to finance initial Part 139 compliance costs for existing certificated airports. The figures show the funding for all requirements combined, and they include multiple responses from individual airports, *i.e.*, the same airport may have incurred costs for compliance with ARFF requirements and perimeter fencing requirements.



**Figure TA-14. AIP Funding Levels for Initial Costs of Part 139 Requirements, Existing Part 139 Airports**

There was more diversity in the use of AIP funds for Part 139 requirements than the previous requirements. An equal number of airports (10 each) received no AIP funds and received the full federal share for their Part 139 compliance projects. This pattern may reflect the status of some Part 139 requirements as administrative or operational.

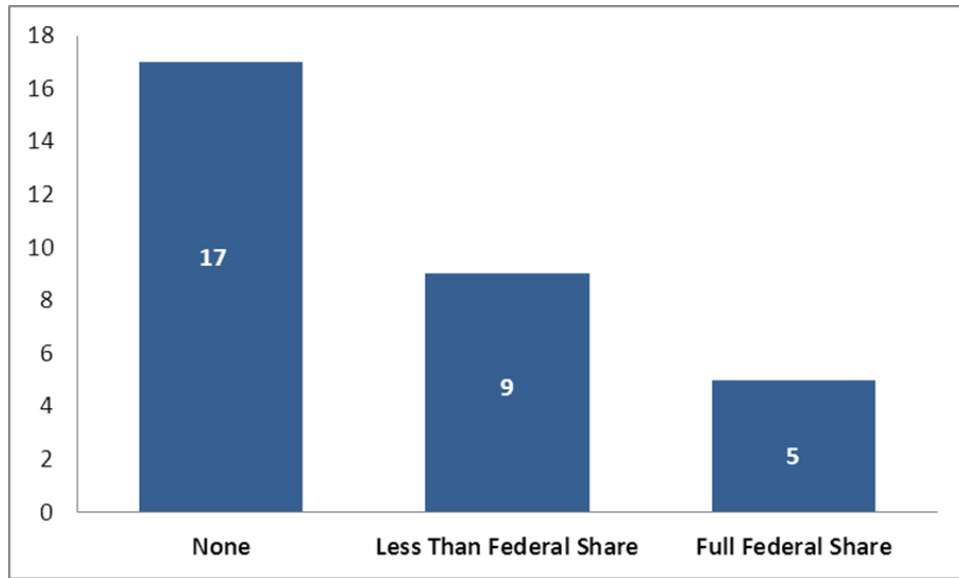


**Figure TA-15. PFC Funding Levels for Initial Costs of Part 139 Requirements, Existing Part 139 Airports**

Consistent with the previous requirements an 18 out of 26 airports used no PFC funds to finance their Part 139 compliance projects.

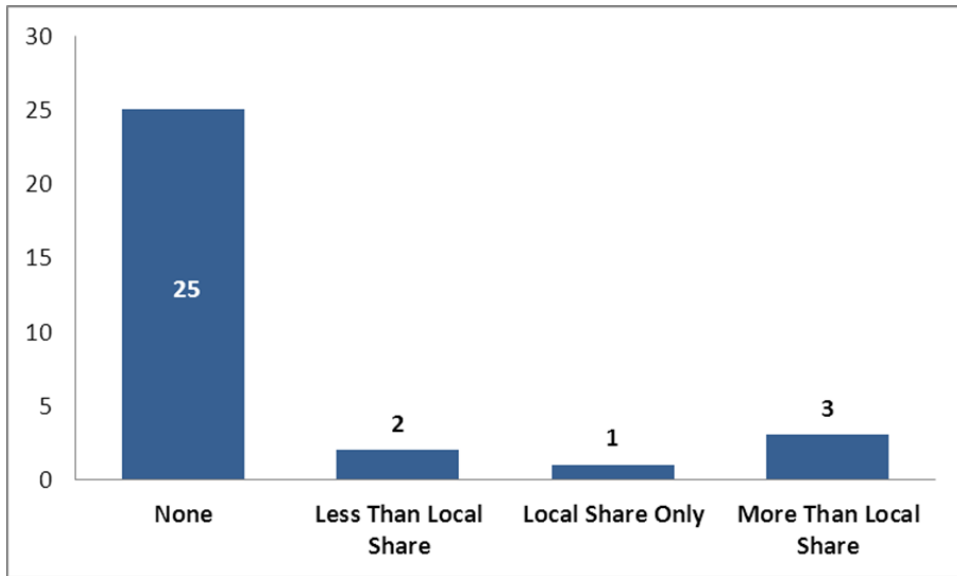
### Requirements for Vehicle Operations on the Airport

**Figure TA-16** and **Figure TA-17** show the use of AIP funds and PFCs, respectively, for financing compliance with requirements for vehicle operations on the airfield. The figures show the funding for all requirements combined, and they include multiple responses from individual airport, *i.e.*, the same airport may have incurred costs for compliance with enforcement and control requirements and requirements for emergency vehicle operations.



**Figure TA-16. AIP Funding Levels for Initial Cost of Requirements for Vehicle Access**

A majority of airports (17 out of 33) received no AIP funding for compliance with these requirements. Only 5 airports reported receiving the full federal share. This pattern of funding may reflect the status of some of the requirements as administrative or operational.



**Figure TA-17. PFC Funding Levels for Initial Cost of Compliance With Requirements for Vehicle Operations**

A substantial majority of airports (25 out of 31) did not use any PFC funds to comply with these requirements. The pattern is consistent with PFC usage for previous requirements.

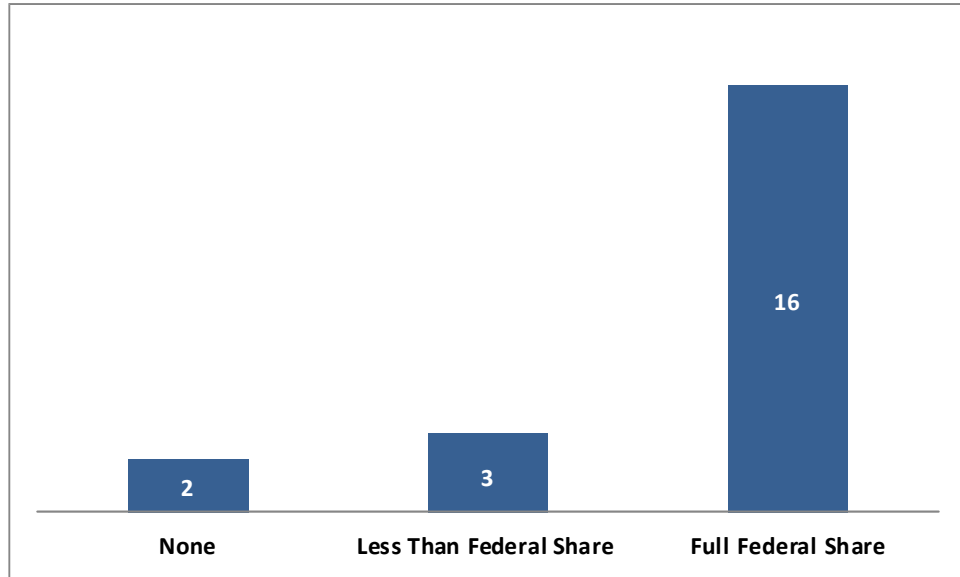
#### *PFC Program Requirements*

Three of the changes to PFC program requirements affect the preparation of PFC applications. The cost of preparing a PFC application is PFC-eligible, and the cost is typically financed with PFCs. The fourth requirement was the change in the required carrier compensation rate. This requirement did not require out-of-pocket expenditures by airports, but reduced monthly net PFC revenue received. Therefore, the survey did not include questions about funding sources for PFC program requirements.

#### *Miscellaneous FAA Administrative Requirements*

The miscellaneous administrative requirements addressed in the survey fall into distinct subcategories. Two requirements – consultant selection and use of GIS – are directly related to AIP-eligible projects; the funding sources for these requirements are presented together. The other two requirements – modifications to snow and ice control plans and modifications to airport emergency plans – are administrative or operational in nature, and are generally not AIP eligible. The funding sources for these two requirements are presented together. The pattern of funding reflects the differences in AIP (and hence PFC) eligibility.

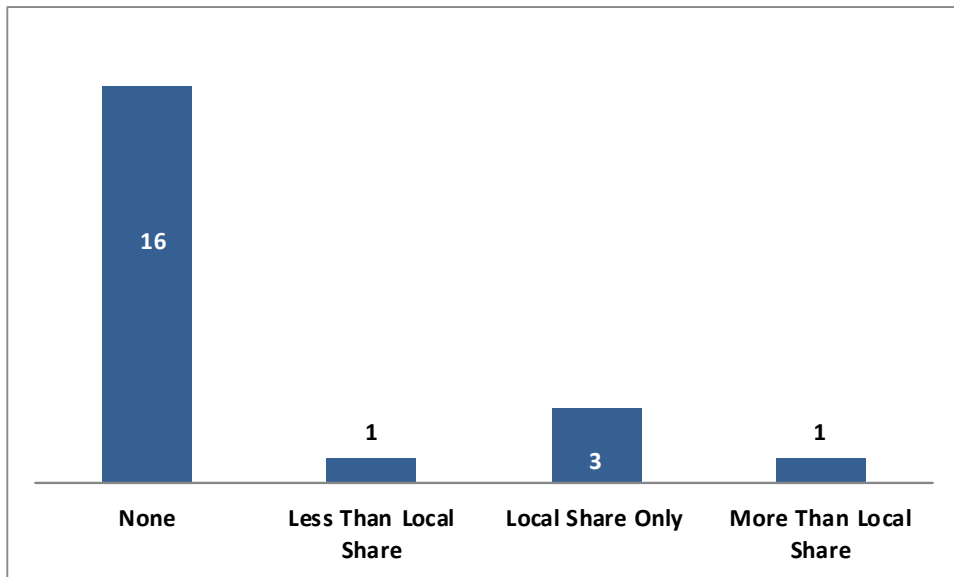
**Figure TA-18** and **Figure TA-19** show the use of AIP and PFC funds, respectively, to finance the costs of consultant selection requirements and the requirements for the use of GIS techniques and data. They include multiple responses from individual airport, *i.e.*, the same airport may have incurred costs for compliance with both requirements.



<sup>1</sup> Total count may include multiple responses for individual airports

**Figure TA-18. AIP Funding Levels for Initial Costs of Consultant Selection and GIS Requirements<sup>1</sup>**

A substantial majority of airports (16 out of 21) received the full federal share of AIP grants for their compliance projects, and only two airports received no AIP funding.



<sup>1</sup> Total count may include multiple responses for individual airports

**Figure TA-19. PFC Funding Levels for Initial Costs of Consultant Selection and GIS Reporting Requirements<sup>1</sup>**

A majority of airports (16 out of 21) reported using no PFCs to fund the costs of the consultant selection and GIS requirements.

Thirteen out of 14 airports reported using only airport funds (other than PFCs) to finance the initial costs of compliance with the requirements for snow and ice control plans. One airport received an AIP grant for the full federal share and used PFCs to finance its local matching share. Twenty-six airports reported incurring costs to meet new requirements for airport emergency plans, and all 26 used airport funds to finance the full initial costs of compliance.

These results are consistent with the classification the costs of these plans as operational or administrative activities ineligible for AIP and PFC funding.

### *DOT DBE Requirements*

Eight airports incurred initial costs for compliance with the new airport concession DBE requirements. Seven relied entirely on airport funds to pay these costs. One airport received an AIP grant for 75% of compliance costs and used PFCs to pay for the balance. All four airports that incurred initial costs for compliance with the DBE project participation requirements relied entirely on airport funds to pay these costs.

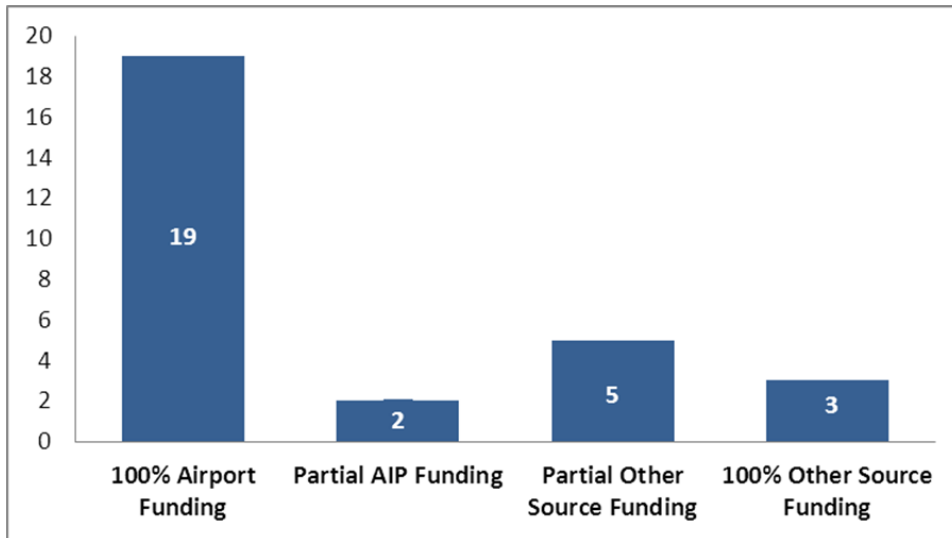
One airport reported that FAA considers DBE compliance to be a project administrative cost that can be reimbursed with AIP funds (and hence PFCs). The results above suggest that this interpretation of eligibility is not being widely followed in the small airport community.

### Recurring Costs

#### *FAA Requirements*

With one exception – vehicle operations – AIP grants and PFCs were not used to finance the recurring costs of FAA requirements. Airports relied in most cases entirely on airport funds. A small number of airports (five in total) relied on third-party funding to cover recurring compliance costs. One airport (out of 14 total) reported receiving an AIP grant to pay a portion of its recurring Part 139 compliance costs.

**Figure TA-20** summarizes the sources of funding used by small airports to pay the recurring costs of the FAA requirements on vehicle operations.



**Figure TA-20. Funding Sources for Recurring Costs of Requirements for Vehicle Operations**

While the majority (19 out of 29) of airports used airport funds to pay the full cost of vehicle operations compliance, 10 airports were able to obtain funding from other sources, including two that received partial AIP funding.

The prevalence of airport funds to finance recurring costs is consistent with the typical status of recurring costs as operational or administrative.

#### *DOT DBE Requirements*

Seven out of eight airports used airport funds (other than PFCs) to finance the full recurring costs of airport concession DBE compliance. The eighth airport used a combination of AIP (75%) and PFC (25%) funds.

Three out of four airports used airport funds (other than PFCs) to finance the full recurring costs of project DBE requirements. The fourth airport used a combination of AIP (95%), PFC (2.5%) and other (2.5%) funds.



## TECHNICAL APPENDIX 3. ANALYSIS OF ENVIRONMENTAL REQUIREMENTS

### A. Overview of Requirements

The 39 environmental actions identified for the study period encompass a variety of regulatory topics and programs. The specific environmental regulatory and compliance actions are summarized in **Table A-2** in **Appendix A** of the research report and generally fall into one of the following regulatory topics:

- Air Quality
  - ◆ General Conformity
  - ◆ Hazardous Air Pollutants
- Planning and Development
  - ◆ Emergency Planning and Response
  - ◆ All Appropriate Inquiries
- ◆ Waste Management
  - ◆ Hazardous Waste
  - ◆ Recordkeeping
- Water Resources
  - ◆ Drinking Water
  - ◆ Spill Prevention, Control and Countermeasure (SPCC)
  - ◆ Pesticide Applicator Permits
  - ◆ Construction Storm Water

Most federal environmental regulatory requirements identified through the research are found in Title 40 of the CFR, administered under the authority of the EPA. However, federal environmental regulations are not always implemented and enforced at the federal level. The EPA has delegated the responsibility to implement and enforce many environmental regulations to its state counterparts that have adopted the federal regulations or promulgated regulations that are at least, if not more, stringent. To a limited extent, environmental regulations were also identified under Title 10 (Energy, administered by the Department of Energy), and Title 49 (Transportation, administered by the DOT).

Each topic may include regulations covered under separate regulatory programs or under the authority of different federal agencies. For example, actions identified as part of Waste Management include amendments to the hazardous waste, universal waste, and used oil regulations. **Table A-3** in **Appendix A** provides a summary of the typical environmental topics applicable to small airports and associated regulatory programs. The table also incorporates potential airport activities related to each requirement. The table includes requirements that were not adopted or revised during the study period. Those topics addressed as part of this study are

indicated by check marks. The table is included to provide an indication of the full range of environmental requirements to which small airports may be subject. Detailed descriptions of each regulatory program are presented in ACRP Report 43, *Guidebook for Improving Environmental Performance at Small Airports* (2011).

Small airports are also subject to environmental requirements administered by the FAA. During the study period, the FAA issued updates to FAA Orders and various ACs under series 150 addressing environmental issues, summarized in **Table A-2** of the research report. Subjects included management of hazardous waste, management of wildlife hazards, and minimizing pollution from earthwork during airport construction. The FAA also updated environmental requirements through the issuance of Program Guidance Letters (PGLs), described in more detail in **Technical Appendix 2**. PGLs related to environmental requirements issued during the study period are summarized in **Table A-1** in **Appendix A** of the research report. The FAA environmental requirements identified during the study are as follows:

- National Environmental Policy Act (NEPA) Requirements
- Sensitive Areas and Wildlife
- Noise Compatibility
- Other FAA and DOT Environmental Requirements

Finally, one Executive Order, EO 13158, *Marine Protected Areas*, was issued during the study period. EO 13158 is intended to protect significant natural and cultural resources within the marine environment.

## **B. Published Cost Information**

Fourteen of the 39 items listed include specific cost projections. The remaining regulatory environmental actions either did not have a significant economic impact necessitating the need for an economic analysis or cost-related publications were not prepared or could not be obtained.

For some of these 14 regulatory actions, the specific cost impact to each affected entity could be determined. Affected entities were not limited to airports. For other regulatory actions, only annual national costs or annualized costs over a period of years could be presented. Eleven of the regulatory actions with cost data also had multiple cost components with costs projected separately for each component. Five of these had a combination of components with increased costs and decreased costs. For the 11 actions, a “rolled up” annual cost could not be calculated.

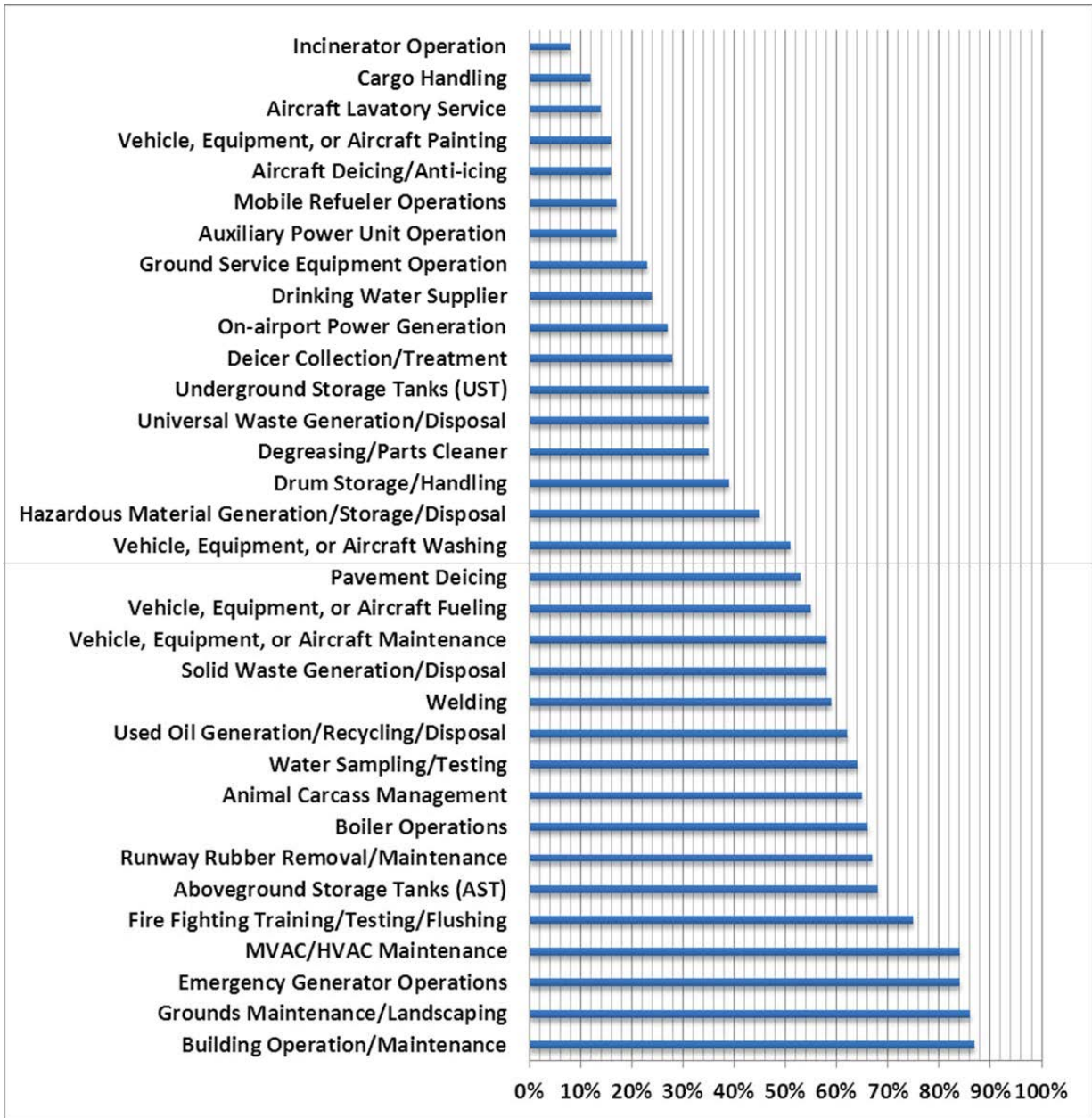
Eleven regulatory actions had projections of minimal costs. For these actions a zero value was assigned in the cost column of **Table A-2**. There were no published cost estimates for fourteen regulatory actions (six regulatory actions, seven FAA Orders/ACs, and EO 13158). These actions are indicated by a dash in the cost column.

### **C. Analysis of General Environmental Requirements**

The environmental actions identified for the study period encompass a variety of regulatory topics and programs. Additionally, environmental compliance and associated costs are not straightforward. For example, while some requirements are met by installing certain types of equipment or controls, preparing a plan/report, or applying for a permit, most requirements are implemented on an airport-specific basis using strategies tailored to that airport's needs and circumstances. The level of up front planning and coordination also varies from airport to airport and from compliance initiative to compliance initiative. A greater level of effort tends to generate higher costs. As a result, the Phase 1 survey questions for most environmental requirements did not focus exclusively on the requirements adopted during the study period. Rather, the questions were related to typical activities; plans or documents; and permits, certifications, or registrations related to the actions identified for the study period.

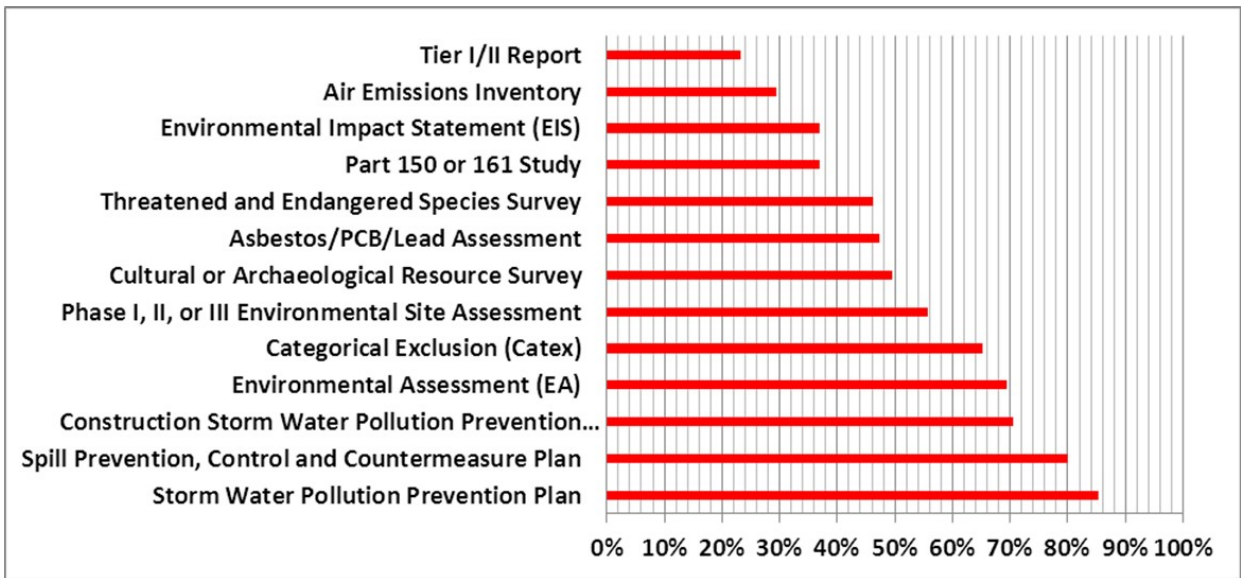
#### ***C.1 Summary of Phase 1 Results***

**Figure TA-21** summarizes responses to the question on the airport operator's role in conducting activities subject to environmental regulation. Thirty-three specific activities that trigger federal environmental requirements were identified. Airport participation rates ranged from eight percent for incinerator operation to 87% for building operation/maintenance.



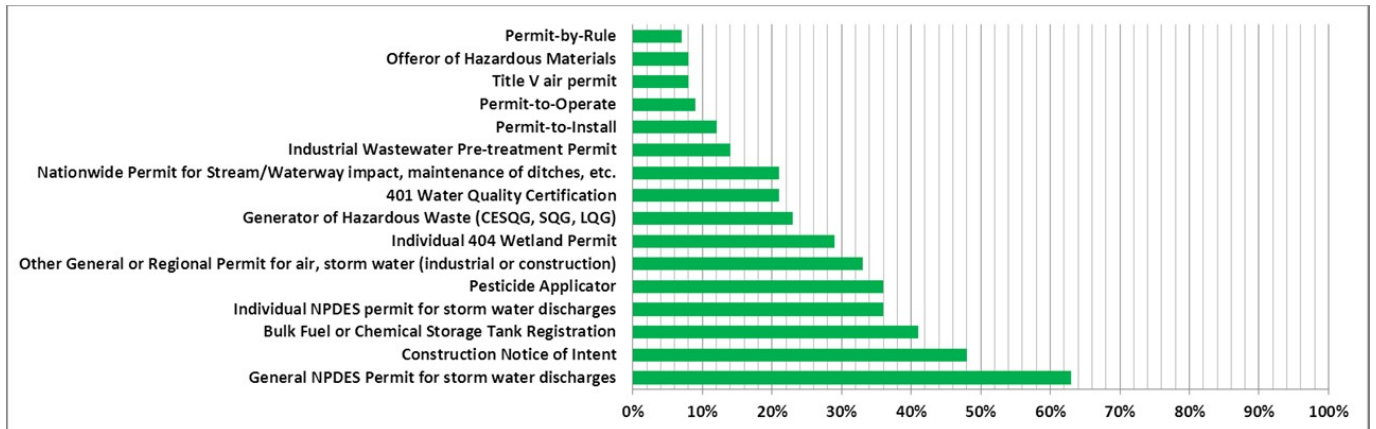
**Figure TA-21. Airport Operator Participation in Environmentally-Regulated Airport Activities**  
*(Sample: 95 airports)*

**Figure TA-22** summarizes the results for environmental plans or documents prepared to meet regulatory requirements. Airport participation ranged from 23% for Tier I/Tier II Reports to 85% for Storm Water Pollution Prevention Plans.



**Figure TA-22. Airport Participation in Preparing Environmental Plans and Documents**  
(Sample: 95 airports)

**Figure TA-23** summarizes the percentage of airports applying for or holding typical permits, certifications, or registrations to meet regulatory requirements. The survey results range from two percent of airports holding or applying for a Title V Air Permit to 67% holding or applying for the General NPDES Storm Water Discharge Permit.



**Figure TA-23. Airports Applying For or Holding Environmental Permits, Certifications or Registrations**  
(Sample: 95 airports)

Questions for the Phase 2 survey built upon the Phase 1 information by focusing on initial/capital and ongoing operating costs associated with implementing an activity or plan/document/permit. The Phase 2 questions focused on overall cost of compliance, not necessarily the cost of implementing the specific requirements adopted during the study period. Therefore, the results presented may not be fully comparable to those for the other broad categories of regulation.

Tables and figures associated with Phase 2 responses are provided in their appropriate section. The survey results are grouped according to regulatory topic and program.

As with the other Technical Appendixes, the tables presented in this chapter include minimum and maximum values, quartile data, arithmetic mean and interquartile mean values per airport. Cost per thousand enplanements and per thousand commercial operations are also presented. Technical Appendix 3 provides explanations of these measures.

## ***C.2 Air Quality – General Conformity Requirements***

### **Background and Change in Requirements**

The General Conformity rule of the Clean Air Act applies to federal actions located within designated air quality non-attainment or maintenance areas and dictates that all reasonably foreseeable emissions from an action conform to the applicable State Implementation Plan (SIP). In 2006, fine particulate matter (PM<sub>2.5</sub>) was added to the list of pollutants covered under the General Conformity regulations, with a *de minimis* threshold of 100 tons/year. For airports in a nonattainment or maintenance area, major airport development actions such as construction of a new runway or major extension or a terminal expansion may require General Conformity determinations, if an airport is in a nonattainment or maintenance area, or the total direct and indirect emissions from the project exceed 10% of an area's emissions inventory (considered a "regionally significant action").

General Conformity determinations are based on an air emissions inventory to evaluate total emissions resulting from a proposed project's construction and operation compared to the total emissions associated with a no action/no build alternative. The total net emissions from the proposed action are then compared to *de minimis* thresholds to determine whether the FAA needs to issue a General Conformity Determination (FAA Airport Desk Reference (1997)).

### **Phase 1 Survey Results and Evaluation**

Promulgation of the PM<sub>2.5</sub> *de minimis* threshold resulted in airports being required to evaluate emissions of PM<sub>2.5</sub> and its precursors for certain proposed actions as part of the General Conformity determination. Twenty-nine percent of airports responding to the Phase 1 survey reported conducting an air emissions inventory (**Figure TA-22**). The primary PM<sub>2.5</sub> emission sources at a small airport are emergency generators, incinerators, power turbines, and oil-fired boilers. Airport responses to the Phase 1 survey for activities related to these sources were as follows: 84% for emergency generators, 66% for oil-fired boilers, 17% for power turbines (auxiliary power units), and eight percent for incinerators (**Figure TA-21**).

If an airport's General Conformity determination of existing and proposed PM<sub>2.5</sub> sources exceeds *de minimis* thresholds, the airport may need to purchase new equipment or retrofit

existing sources with controls to offset PM<sub>2.5</sub> emissions. Examples of PM<sub>2.5</sub> controls include particle traps or oxidation catalysts.

### Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

**Table TA-14** summarizes the reported costs for preparation of an air emissions inventory. Reported costs for an inventory are on average \$17,000, but range from \$5,000 to \$50,000, and are primarily conducted by consultants. Interquartile mean costs were \$5,800. The average cost per thousand enplanements and per thousand operations is \$62 and \$1,112, respectively. Interquartile mean cost is \$60 and \$344, respectively.

Since emissions inventories typically evaluate all six criteria air pollutants (i.e., carbon monoxide, volatile organic carbons, nitrogen oxides, sulfur oxides, PM<sub>10</sub>, and PM<sub>2.5</sub>), only a percentage of the total cost reported for an emissions inventory should be attributed to the rule change. It is assumed the new PM<sub>2.5</sub> standard does not itself trigger an emissions inventory. Assuming the cost for evaluating PM<sub>2.5</sub> is 1/6<sup>th</sup> of the cost for an emissions inventory, the average cost impact is \$2,800 and interquartile mean cost impact is \$972. Average and interquartile mean cost per thousand enplanements is \$10. Average cost per thousand commercial operations is \$185 and interquartile mean cost is \$60.

One airport reported costs of \$1,000 for controls, equipment, or mitigation needed to offset potential impacts to air quality identified from the emissions inventory. Mitigation controls for PM<sub>2.5</sub> may include operational or policy changes. For example, implementing controls during construction activities, changing from Jet A or diesel fuel to propane or other cleaner burning fuels for use during firefighter training activities, or providing ultra-low or reduced-sulfur diesel can minimize emissions. The need, type, and cost of control(s) vary depending on the project, estimated emissions, and potential acceptable mitigation alternatives to offset air quality impacts. Refer to ACRP Report 9, *Summarizing and Interpreting Aircraft Gaseous and Particulate Emissions Data*, for additional information on this topic. In addition, one airport reported costs of \$1,000 for specialized training.

**Table TA-14. Reported Costs for Air Emissions Inventories**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey							Share of Costs Attributable to PM <sub>2.5</sub>	
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean	Mean	Interquartile Mean
		56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information: <b>Air Emissions Inventory</b> a. Initial cost to prepare plan, document or report b. Installation/construction for control(s)/equipment/mitigation/remediation c. Specialized training <b>Total Costs</b> d. Amount received from 3rd party funding/grant  <b>Average Cost per thousand Enplanements</b> a. Initial cost to prepare plan, document, or report b. Installation/construction for control(s)/equipment/mitigation/remediation c. Specialized training <b>Total Costs</b>  <b>Average Cost per thousand Operations</b> a. Initial cost to prepare plan, document, or report b. Installation/construction for control(s)/equipment/mitigation/remediation c. Specialized training <b>Total Costs</b>	4 1 1  1  4 1 1  4 1 1  1 1 1  1 1 1	\$5,000 \$1,000 \$1,000  \$7,500  \$6 \$2 \$2  \$131 \$69 \$69  \$69 \$69 \$69	\$5,000 \$1,000 \$1,000  \$7,500  \$11 \$2 \$2  \$291 \$69 \$69  \$291 \$69 \$69	\$6,250 \$1,000 \$1,000  \$7,500  \$60 \$2 \$2  \$890 \$69 \$69  \$890 \$69 \$69	\$18,125 \$1,000 \$1,000  \$7,500  \$112 \$2 \$2  \$1,712 \$69 \$69  \$1,712 \$69 \$69	\$50,000 \$1,000 \$1,000  \$7,500  \$121 \$2 \$2  \$2,537 \$69 \$69  \$2,537 \$69 \$69	\$16,875 \$1,000 \$1,000  \$7,500  \$62 \$2 \$2  \$1,112 \$69 \$69  \$1,112 \$69 \$69	\$5,833 \$1,000 \$1,000  \$7,500  \$60 \$2 \$2  \$344 \$69 \$69  \$344 \$69 \$69

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

### ***C.3 Air Quality – Hazardous Air Pollutant Requirements***

#### **Background and Change in Requirements**

In 2008, EPA revised the requirements for gasoline dispensing facilities with a monthly throughput greater than 10,000 gallons or for newly constructed facilities. Specifically, the rule change revised the air pollution control requirements for vapor balance systems to control emissions from gasoline storage tanks. The rule is commonly referred to as the “Stage 1” vapor recovery rule.

Many small airports with on-site vehicle and equipment fueling operations became subject to these requirements. The requirements include implementing practices to check for and minimize evaporation of gasoline and submerged filling of tanks. Facilities with a monthly throughput of 100,000 gallons or more are required to use vapor balancing when tanks are filled. Loading aviation gasoline into storage tanks at airports is excluded from the regulation.

Potential cost-generating actions required by this rule include installing submerged fill pipes and/or vapor recovery adaptors on gasoline storage tanks, and performing periodic tests and monitoring.

#### **Phase 1 Survey Results and Evaluation**

Sixty-eight percent of airports reported operating aboveground storage tanks, and 35% operate underground storage tanks (**Figure TA-21**). Based on typical airport activities, a portion of the reported operations are likely attributed to gasoline dispensing for vehicles and equipment used onsite.



## Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

The economic analysis conducted for the rule change identified an annual cost savings of \$383 for facilities implementing submerged fill technologies, and an annual cost of \$948 for facilities with vapor balance systems. The reported costs in the analysis include annualized capital costs for equipment and operation, maintenance, monitoring, reporting, and recordkeeping costs.

No airports reported costs for installation of controls or equipment associated with underground storage tanks, and most airport authorities reported they are not responsible for activities associated with underground storage tanks. Three airports reported contractor or consultant costs for underground storage tanks, but did not specify the kind of work performed.

A majority of the airports responding to the survey are responsible for operations associated with aboveground storage tanks. Installation costs were reported as indicated in **Table TA-15**. Reported costs range from \$1,000 to \$1,000,000, with an average cost of approximately \$238,000. Interquartile mean cost is \$63,000. The average cost per thousand enplanements is \$15,000 with an interquartile mean of \$1,000. The average cost per thousand commercial operations is approximately \$184,000 with an interquartile mean of approximately \$12,500.

Since many newer tanks are already equipped with submerged fill pipes as part of construction, the reported costs in **Table TA-15** are most likely associated with the tank purchase and installation or construction/installation of controls related to spill containment rather than retrofit costs to meet the Stage 1 rule. Airports that acquire old tanks from tenants (e.g., rental car facilities, FBOs) may be required to install controls in the event the tank(s) will be used in the future. Fuel cost savings indicated by the economic analysis are negligible compared to the overall airport-reported costs associated with aboveground storage tanks. The survey questionnaire did not specifically exclude information related to aviation gasoline storage tanks. Therefore the number of instances in which costs are reported in **Table TA-15** may include information for tanks not subject to the requirement. However, during the telephone interviews, most airports that reported owning fuel tanks stated that the tanks were used for fueling vehicles and equipment, rather than aircraft.

**Table TA-15. Reported Costs for ASTs and USTs**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information:								
<b>Aboveground Storage Tanks (AST)</b>								
a. Contractor/consultants	5	\$500	\$1,000	\$1,500	\$2,500	\$5,000	\$2,100	\$1,667
b. Installation/construction for control(s)/equipment	4	\$1,000	\$35,000	\$75,000	\$80,000	\$1,000,000	\$238,200	\$63,333
c. Material/equipment replacement	3	\$2,500	\$6,250	\$10,000	\$42,500	\$75,000	\$29,167	\$10,000
d. Specialized training	2	\$2,000	\$2,375	\$2,750	\$3,125	\$3,500	\$2,750	\$2,750
<b>Total Costs</b>							<b>\$272,217</b>	<b>\$77,750</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	5	\$1	\$2	\$14	\$16	\$148	\$36	\$10
b. Installation/construction for control(s)/equipment	4	\$318	\$652	\$1,028	\$15,788	\$59,273	\$15,412	\$1,028
c. Material/equipment replacement	4	\$2	\$122	\$204	\$376	\$764	\$293	\$246
d. Specialized training	2	\$57	\$72	\$88	\$103	\$119	\$88	\$88
<b>Total Costs</b>							<b>\$15,829</b>	<b>\$1,372</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	5	\$21	\$30	\$219	\$255	\$1,764	\$458	\$168
b. Installation/construction for control(s)/equipment	4	\$5,101	\$8,458	\$12,453	\$187,926	\$705,716	\$183,931	\$12,453
c. Material/equipment replacement	4	\$31	\$371	\$1,200	\$3,831	\$9,577	\$3,002	\$1,916
d. Specialized training	2	\$671	\$856	\$1,041	\$1,226	\$1,411	\$1,041	\$1,041
<b>Total Costs</b>							<b>\$188,432</b>	<b>\$15,578</b>
<b>Underground Storage Tanks (UST)</b>								
a. Contractor/consultants	3	\$500	\$750	\$1,000	\$2,000	\$3,000	\$1,500	\$1,000
b. Installation/construction for control(s)/equipment		-	-	-	-	-	-	-
c. Material/equipment replacement		-	-	-	-	-	-	-
d. Specialized training		-	-	-	-	-	-	-
<b>Total Costs</b>							<b>\$1,500</b>	<b>\$1,000</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	3	\$2	\$2	\$2	\$2	\$3	\$2	\$2
<b>Total Costs</b>							<b>\$2</b>	<b>\$2</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	3	\$30	\$41	\$51	\$57	\$64	\$48	\$51
<b>Total Costs</b>							<b>\$48</b>	<b>\$51</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

Vapor control equipment (e.g., pressure/vacuum vent valves) is readily available and relatively easy to install. Costs are related to the equipment itself and contractor installation fees. Fuel tank professionals identify the total cost for equipment is approximately \$2,000 plus installation, which only takes a few hours to complete.

Tests on vapor control equipment are needed once every three years. Costs on tests, monitoring, reporting and recordkeeping were not provided by airports responding to the Phase 2 survey, but the results do indicate the overall effort associated with tank activities ranges from “as-needed” to “part-time”.

***C-3 Planning and Development – Emergency Planning and Response Requirements***

**Background and Change in Requirements**

Airports storing hazardous substances and/or extremely hazardous substances may be required to prepare and submit information to local emergency response agencies under the

Emergency Planning and Community Right-to-Know Act (EPCRA), if defined thresholds are exceeded. In 2008, EPA amended EPCRA requirements to clarify (1) reporting requirements for mixtures containing hazardous chemicals; and (2) emergency response notification criteria. The clarifications specified EPA's policy for determining thresholds in mixtures and incorporated instructions for calculating thresholds in the regulations. The amendments to the emergency response notification procedures also incorporated defined time periods for notifications to emergency response agencies (i.e., within 30 days of a change at the facility, within 24 hours of a release of a reportable quantity).

Examples of hazardous substances that may be present in mixtures at airports include tetraethyl lead and toluene in gasoline or avgas and ethylene glycol in deicing fluids. As a result, airport operators may be required to report the total quantity of a hazardous chemical in mixtures stored at their facility using Tier I or Tier II forms. Additionally, airports must understand the reporting procedures in the event of a release or emergency involved with these substances.

### Phase 1 Survey Results and Evaluation

Twenty-three percent of airports responding to the survey reported preparing Tier I/II reports (**Figure TA-22**). Commenters responding to the rule change reported the approach may result in double counting reportable materials and increase the burden on facilities. EPA agreed that the cost of reporting may be greater, but deemed the requirement appropriate to protect emergency responders.

### Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

Although the rule change is intended to clarify the EPCRA reporting criteria for mixtures, staff at small airports may have found the modified requirements to be complicated, as noted by the commenter's response to the draft rule. However, once airport staff understand the reporting criteria, annual Tier I/II report preparation is generally straightforward.

A summary of reported costs is provided in **Table TA-16**. Reported costs ranged from a low as \$500 to a maximum of \$5,000. Total reported cost for Tier I/II related work is on average approximately \$3,200. Interquartile mean costs are \$2,000. The average cost per thousand enplanements and per thousand commercial operations are \$6 and \$149, respectively. Reporting is conducted annually, requiring one part-time staff (one response) or one full-time staff (two responses). Training costs were not provided. (Several companies online provide free webinars for Tier I/II reporting). Since overall costs associated with report preparation and staffing is relatively low, the overall impact to airports for the change in EPCRA reporting criteria is likely to be low, as well.

**Table TA-16. Reported Costs for Tier I/Tier II Reports**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:								
56. Tier I/II Report								
a. Initial cost to prepare plan, document, or report	3	\$500	\$750	\$1,000	\$3,000	\$5,000	\$2,167	\$1,000
b. Installation/construction for control(s)/equipment/mitigation/remediation	1	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
c. Specialized training	0	-	-	-	-	-	-	-
Total Costs							\$3,167	\$2,000
d. Amount received from 3rd party funding/grant	0	-	-	-	-	-	-	-
<b>Average Cost per thousand Enplanements</b>								
a. Initial cost to prepare plan, document, or report	3	\$2	\$2	\$2	\$4	\$6	\$4	\$2
b. Installation/construction for control(s)/equipment/mitigation/remediation	1	\$2	\$2	\$2	\$2	\$2	\$2	\$2
Total Costs							\$6	\$5
<b>Average Cost per thousand Operations</b>								
a. Initial cost to prepare plan, document, or report	3	\$40	\$54	\$69	\$100	\$131	\$80	\$69
b. Installation/construction for control(s)/equipment/mitigation/remediation	1	\$69	\$69	\$69	\$69	\$69	\$69	\$69
Total Costs							\$149	\$138

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

## ***C.4 Planning and Development – All Appropriate Inquiries Requirements***

### **Background and Change in Requirements**

40 CFR Part 312 establishes procedures to protect potential property purchasers from buying property that may have existing environmental contamination under the Comprehensive Environmental Response, Compensation and Liability Act. The rule includes criteria for innocent landowner defense through conduct of “All Appropriate Inquiries” (AAI) into the previous ownership and uses of the property.

EPA published a rule in 2003 to clarify AAI interim standards by specifying that persons who purchase property on or after May 31, 1997 could use either the procedures provided in American Society for Testing Materials (ASTM) E1527–2000 or ASTM E1527–97, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. In 2005, the 2003 interim standards were amended and finalized. A third amendment was made in 2008 to clarify the use of ASTM E2247-08, *Standard Practice for Forestland or Rural Property*, as an allowable resource to use when performing AAI.

Airports must provide a Certificate of Environmental Site Assessment (ESA) to FAA after conducting a Phase 1 ESA when purchasing properties using AIP funds. Performing ESAs when purchasing other properties will also help prevent airports encumbering liabilities of previous owner’s activities.

## Phase 1 Survey Results and Evaluation

Fifty-six percent of airports responded that an ESA has been prepared (**Figure TA-22**).

## Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

The EPA prepared an economic assessment to evaluate the cost of the proposed AAI regulations compared to current practices. Estimated costs for the rule increased the cost of a Phase I ESA by \$52-58 (resulting in estimated total cost per Phase I ESA of \$2,185-\$2,190). Industry experience for Phase I ESAs for airport and related properties are usually between \$5,000 and \$9,000. Question #56 in the Phase 2 survey requested airport costs to prepare either a Phase I, Phase II, or Phase III ESA. Therefore, only a portion of the reported costs presented in **Table TA-17** should be attributed to completion of a Phase I ESA.

**Table TA-17. Reported Costs for Documents Related to the All Appropriate Inquiries Amendments (Environmental Site Assessments)**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:								
56. Phase I, II, or III Environmental Site Assessment								
a. Initial cost to prepare plan, document, or report	11	\$500	\$10,000	\$15,000	\$37,000	\$380,000	\$58,727	\$16,750
b. Installation/construction for control(s)/equipment/mitigation/remediation	3	\$15,000	\$17,500	\$20,000	\$30,000	\$40,000	\$25,000	\$20,000
c. Specialized training	1	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
<b>Total Costs</b>							<b>\$85,727</b>	<b>\$38,750</b>
d. Amount received from 3rd party funding/grant	3	\$9,500	\$14,750	\$20,000	\$67,000	\$114,000	\$47,833	\$20,000
<b>Average Cost per thousand Enplanements</b>								
a. Initial cost to prepare plan, document, or report	11	\$12	\$28	\$92	\$687	\$965	\$342	\$366
b. Installation/construction for control(s)/equipment/mitigation/remediation	3	\$33	\$34	\$36	\$117	\$198	\$89	\$36
c. Specialized training	1	\$5	\$5	\$5	\$5	\$5	\$5	\$5
<b>Total Costs</b>							<b>\$436</b>	<b>\$406</b>
<b>Average Cost per thousand Operations</b>								
a. Initial cost to prepare plan, document, or report	11	\$97	\$348	\$1,637	\$8,660	\$19,284	\$5,197	\$4,736
b. Installation/construction for control(s)/equipment/mitigation/remediation	3	\$611	\$821	\$1,031	\$2,123	\$3,215	\$1,619	\$1,031
c. Specialized training	1	\$138	\$138	\$138	\$138	\$138	\$138	\$138
<b>Total Costs</b>							<b>\$6,954</b>	<b>\$5,905</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

Factors that influence the cost of a Phase I ESA include:

- Property type (e.g., industrial, commercial, agricultural, developed, undeveloped, etc.)
- Existing environmental issues in the area (e.g., leaking underground storage tank, sites listed on the National Priorities List, remedial efforts, etc.)
- Record availability/access
- Number of interviews performed

The average cost for a Phase I, II, or III review is approximately \$59,000, with a range of \$500 to \$380,000. Interquartile mean cost was \$17,000. Six airports reported costs between \$500 and \$15,000. The total average cost per thousand enplanements is \$436 with an interquartile mean of \$406. The total average cost per thousand commercial operations is \$7,000 with an interquartile mean cost of \$5,900. Three airports reported costs for installation of control systems, equipment or mitigation measures related to the ESA, with an interquartile mean cost of \$20,000, and one airport reported specialized training, with a cost of \$2,000.

### ***C.5 Waste Management – Hazardous Waste Requirements***

#### **Background and Change in Regulations**

Several regulatory changes took place during the study period that affected requirements pertaining to hazardous waste management. The changes included adding exclusions from Resource Conservation and Recovery Act of 1976 (RCRA) regulations for certain types of wastes.

In 2001, RCRA was amended to exclude certain mixtures/derivatives of wastes that no longer exhibit a characteristic of a hazardous waste (i.e., ignitability, corrosivity, and/or reactivity). “RCRA mixtures” are mixtures of solid waste mixed with listed hazardous waste; “RCRA derivatives” are solid wastes generated from the treatment, storage, or disposal of a listed hazardous waste. The EPA identified the exemption applies to 29 waste-codes. Therefore, if a waste mixture or derivative falls under one of the 29 waste-codes and does not itself exhibit a characteristic of a hazardous waste, the waste does not need to be managed as a hazardous waste. For example, some types of solvents used during airport maintenance activities may be listed for ignitability under waste-code F003. If a shop rag is used to wipe ignitable spent solvent and the rag itself is not ignitable and does not contain free liquids, the rag does not need to be treated as hazardous waste. Excluded wastes may still be subject to other restrictions or state regulations.

In 2003, the RCRA regulations for used oil management were clarified to specify that mixtures of Conditionally Exempt Small Quantity Generator (CESQG) waste and used oil to be recycled were subject to the used oil management regulations, as opposed to the hazardous waste regulations. The exemption was intended to allow generators to mix small quantities of hazardous waste with used oil. The rule did not intend for wastes to be mixed with used oil in order to avoid the hazardous waste regulations. State regulations may prohibit mixing certain types of waste (e.g., waste diesel or gasoline) with used oil.

The majority of small airports conducting hazardous waste activities are likely to be either CESQGs or small quantity generators (SQGs) and generate used oil during vehicle or equipment maintenance activities. Small airports either contract with companies to pick up and

recycle used oil or reuse used oil onsite (i.e., waste oil heaters). Screening used oil for halogens may be necessary if spent solvents are mixed with used oil.

Before 2005, regulated universal wastes included lamps, batteries, pesticides, and thermostats. In 2005, RCRA was amended to add “mercury-containing equipment” to the universal waste rule. Examples of mercury-containing equipment include metal switches, pilot light sensors, capacitors, water treatment pressure gauges, and flow meters. If mercury-containing equipment is not managed as a universal waste, it must be managed as a hazardous waste. At airports, the amount of mercury-containing equipment waste is generally low and typically generated from building maintenance activities, such as from replacing mercury thermostats or boiler pilot sensors. The majority of universal wastes generated at airports include lamps and batteries.

### Phase 1 Survey Results and Evaluation

Fifteen percent of airports reported being a generator of hazardous waste (i.e., CESQG, SQG, or large quantity generator (LQG)). Sixty-two percent reported conducting used oil generation/recycling/disposal activities. Of the airport activities that typically generate used oil, approximately one-half of the respondents are involved with fueling and maintenance activities, and 35% reported being involved in universal waste generation and disposal activities. Eighty-seven percent reported they are responsible for airport building and maintenance activities. (Refer to **Figure TA-21**)

### Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

**Table TA-18** summarizes the reported costs for waste management activities. Small airports contracting with companies to pick up and dispose hazardous waste generally report costs of less than \$5,000, which is represented the 75<sup>th</sup> percentile. One airport reported costs of \$75,000, which affected the average cost calculation (\$16,700). Interquartile mean cost was only \$2,733. The total average cost per thousand enplanements is \$29 with an interquartile mean of \$19. Total average cost per thousand commercial operations is \$652 with an interquartile mean of \$403.

Universal waste contractor interquartile mean costs are approximately \$2,300, with average costs of \$6,400. The total average cost per thousand enplanements and per thousand operations is similar compared to the hazardous material generation and disposal data. Total average cost per thousand enplanements is \$29 with an interquartile mean of \$19. Total average cost per thousand commercial operations is \$637 with an interquartile mean of \$511.

Used oil contractor costs are slightly less than hazardous and universal waste contractor costs, as airports report costs between \$500 and \$7,400. The average contractor cost for used oil recycling/disposal is approximately \$2,800, and the interquartile mean cost is \$2,200. Total

average cost per thousand commercial operations is \$716 with an interquartile mean of \$673. Costs are dependent on the quantity of waste or used oil generated and picked up/disposed. However, as the price of oil is getting increasingly greater, some vendors actually pay to collect and recycle used oil (usually \$0.30-\$0.40 per gallon). Most airports reported wastes and used oil are generated and recycled/disposed on an “as needed” basis.

For each of these requirements, contractor costs were the primary expense item. Combined costs for the three requirements (hazardous waste, universal waste and used oil) averaged approximately \$30,000, with interquartile mean cost of \$11,500. Combined average costs per thousand enplanements and per thousand operations are \$94 and \$2,005, respectively. Combined interquartile mean costs per thousand enplanements and per thousand operations are \$68 and \$1,600, respectively. The costs reported in this table represent total compliance costs, not incremental costs (or cost savings).

Airports affected by these rule changes include those that previously managed CESQG waste and used oil separately (i.e., did not mix waste with used oil) and those that managed mercury-containing equipment as hazardous waste. Exclusions from hazardous waste regulations are intended to minimize or lessen the requirements associated with management of wastes for generators, thus resulting in a net cost savings to generators. This is confirmed from the economic analysis conducted for the universal waste rule. The economic analysis identified the estimated cost for shipping mercury-containing equipment as a universal waste is \$106/ton (\$.05/lb), compared to \$159/ton (\$0.08/lb) for shipping as a hazardous waste. Nevertheless, although the rules demonstrate a net costs savings, airports do not regularly generate tons of hazardous waste or mercury-containing equipment. Additionally, overall material/equipment installation and replacement costs are low (less than \$1,000) and staffing needs associated with these activities are reported primarily on a part-time basis. Therefore, the net cost savings for these requirements are expected to be negligible.



**Table TA-18. Reported Costs for Activities and Documents Related to Waste Management**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
Of those activities the airport authority is responsible for, please enter the requested follow-up information:								
<b>55. Hazardous Material Generation/Storage/Disposal</b>								
a. Contractor/consultants	5	\$500	\$1,200	\$2,000	\$5,000	\$75,000	\$16,740	\$2,733
b. Installation/construction for control(s)/equipment	1	\$500	\$500	\$500	\$500	\$500	\$500	\$500
c. Material/equipment replacement	0	-	-	-	-	-	-	-
d. Specialized training	0	-	-	-	-	-	-	-
<b>Total Costs</b>							<b>\$17,240</b>	<b>\$3,233</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	5	\$1	\$6	\$10	\$11	\$69	\$19	\$9
b. Installation/construction for control(s)/equipment	1	\$10	\$10	\$10	\$10	\$10	\$10	\$10
<b>Total Costs</b>							<b>\$29</b>	<b>\$19</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	5	\$25	\$102	\$214	\$254	\$1,600	\$439	\$190
b. Installation/construction for control(s)/equipment	1	\$214	\$214	\$214	\$214	\$214	\$214	\$214
<b>Total Costs</b>							<b>\$652</b>	<b>\$403</b>
<b>Universal Waste Generation/Disposal</b>								
a. Contractor/consultants	5	\$100	\$500	\$1,500	\$5,000	\$25,000	\$6,420	\$2,333
b. Installation/construction for control(s)/equipment	1	\$400	\$400	\$400	\$400	\$400	\$400	\$400
c. Material/equipment replacement	2	\$500	\$1,625	\$2,750	\$3,875	\$5,000	\$2,750	\$2,750
d. Specialized training	0	-	-	-	-	-	-	-
<b>Total Costs</b>							<b>\$9,570</b>	<b>\$5,483</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	5	\$0	\$2	\$10	\$11	\$79	\$20	\$10
b. Installation/construction for control(s)/equipment	1	\$1	\$1	\$1	\$1	\$1	\$1	\$1
c. Material/equipment replacement	2	\$1	\$5	\$8	\$11	\$15	\$8	\$8
<b>Total Costs</b>							<b>\$29</b>	<b>\$19</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	5	\$7	\$51	\$214	\$254	\$1,276	\$360	\$234
b. Installation/construction for control(s)/equipment	1	\$28	\$28	\$28	\$28	\$28	\$28	\$28
c. Material/equipment replacement	2	\$34	\$142	\$250	\$357	\$465	\$250	\$250
<b>Total Costs</b>							<b>\$637</b>	<b>\$511</b>
<b>Used Oil Generation/Recycling/Disposal</b>								
a. Contractor/consultants	8	\$500	\$875	\$1,850	\$4,250	\$7,400	\$2,763	\$2,175
b. Installation/construction for control(s)/equipment	0	-	-	-	-	-	-	-
c. Material/equipment replacement	2	\$200	\$400	\$600	\$800	\$1,000	\$600	\$600
d. Specialized training	0	-	-	-	-	-	-	-
<b>Total Costs</b>							<b>\$3,363</b>	<b>\$2,775</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	8	\$2	\$4	\$8	\$14	\$51	\$13	\$8
c. Material/equipment replacement	2	\$0	\$11	\$22	\$32	\$43	\$22	\$22
<b>Total Costs</b>							<b>\$35</b>	<b>\$30</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	8	\$30	\$77	\$151	\$206	\$638	\$191	\$148
c. Material/equipment replacement	2	\$14	\$269	\$525	\$781	\$1,036	\$525	\$525
<b>Total Costs</b>							<b>\$716</b>	<b>\$673</b>
<b>Combined Cost of Waste Management Requirements</b>							\$30,173	\$11,492
<b>Combined Cost of Waste Management Requirements per thousand Enplanements</b>							\$94	\$68
<b>Combined Cost of Waste Management Requirements per thousand Operations</b>							\$2,005	\$1,587
Of those permits, certifications, or registrations the airport is subject to, or has applied for, please enter the requested follow-up information:								
<b>57. Offeror of Hazardous Materials</b>								
a. Application/ certification/ registration (initial application and/or annual fee)	0	-	-	-	-	-	-	-
b. Contractor/consultants	0	-	-	-	-	-	-	-
c. Installation/construction for control(s)/ equipment	0	-	-	-	-	-	-	-
d. Material/equipment replacement	0	-	-	-	-	-	-	-
e. Specialized training	1	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<b>Total Costs</b>							<b>\$1,000</b>	<b>\$1,000</b>
<b>Average Cost per thousand Enplanements</b>								
e. Specialized training	1	\$2	\$2	\$2	\$2	\$2	\$2	\$2
<b>Total Costs</b>							<b>\$2</b>	<b>\$2</b>
<b>Average Cost per thousand Operations</b>								
e. Specialized training	1	\$34	\$34	\$34	\$34	\$34	\$34	\$34
<b>Total Costs</b>							<b>\$34</b>	<b>\$34</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

## ***C.6 Waste Management – Recordkeeping Requirements***

### **Background and Change in Requirements**

In 2005, the content of the Uniform Hazardous Waste Manifest Forms (8700-22 and 22a) was revised to include procedures for tracking certain types of waste shipments. Many small airports are shippers of hazardous materials (also known as “offerors”) and use contractors to pick up materials from their facilities for appropriate disposal.

### **Phase 1 Survey Results and Evaluation**

Only four percent of airports reported being an offeror of hazardous materials (**Figure TA-23**). This response rate was expected to be higher since most small airports “offer” hazardous materials to contractors for disposal and the response rate for hazardous waste generator activities was 15% (**Figure TA-21**).

### **Phase 2 Survey Results and Evaluation, Reported Costs of Compliance**

The economic analysis for RCRA documentation changes identified an overall cost savings of \$7 per manifest for SQGs using the updated Uniform Hazardous Waste Manifest form. The cost savings is primarily based on the time savings associated with filling out the revised form. CESQGs were not evaluated as part of the economic analysis. The analysis also identified training would be required for the new manifest form. The published cost for training was \$64/year.

The majority of certified hazardous waste contractors utilized by airports already have manifests completed and ready for signature as part of their services. Additionally, copies of the manifests are provided to airport staff for appropriate recordkeeping. Therefore, due to the reported frequency of hazardous waste pickup at small airports and available contractor services, cost savings associated with hazardous waste manifest preparation is either negligible or not realized by airport staff. One airport, however, did report specialized training was conducted in the amount of \$1,000 (**Table TA-18**).

## ***C.7 Water Resources – Drinking Water Requirements***

### **Background and Change in Requirements**

The majority of small airports that treat and distribute drinking water use ground water as the source of drinking water, and they are considered either transient non-community water systems (TNCWS) or non-transient non-community water systems (NTNCWS). A TNCWS is a public water system that provides water in areas where people do not remain for long periods of time. A

NTNCWS is a public water system that regularly supplies water to at least 25 of the same people at least six months per year, but not year-round. The actions affecting these types of treatment and distribution systems during the study period include the Ground Water Rule, Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 Rule), and Lead and Copper Rule.

In 2006, the Ground Water Rule was promulgated by the EPA. Requirements of the rule include conducting periodic sanitary surveys and additional water quality monitoring. Other requirements include supplementary sampling and testing after triggering events and implementation of corrective actions, if necessary.

The Stage 2 Rule was also issued by the EPA in 2006. Requirements of this rule applied to systems that treat source water with disinfectants other than ultraviolet light. An example of a system that would qualify under the Stage 2 Rule includes those that utilize chlorine gas or hypochlorite to disinfect drinking water prior to distribution. The cost-related requirements for this rule include additional compliance monitoring for the disinfection byproducts trihalomethanes and haloacetic acids.

The Lead and Copper Rule was promulgated in 2007 and required NTNCWSs to perform additional routine monitoring for lead and copper. Other requirements include delivery of public education materials or supply line replacement after monitoring results demonstrate excess lead or copper levels.

### Phase 1 Survey Results and Evaluation

Most of airport-related water quality sampling and testing is conducted to meet industrial storm water permit requirements. A total of 64% of airports reported water sampling and testing was performed for the airport (**Figure TA-21**). Nevertheless, 24% of airports reported the airport authority is a drinking water supplier (**Figure TA-21**).

### Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

Costs of compliance for each rule were documented in published economic analyses. The detailed breakdown of costs associated with each rulemaking are presented in **Table A-2**. Costs presented are for systems that serve less than 10,000 people.

Under the Ground Water Rule, the principal published costs were attributed to periodic source water monitoring. Depending on the type of system, published costs ranged from \$2,470 to \$4,645. Other costs were reported for staff to read and understand the rule; prepare corrective action plans after a triggering event; perform state notifications; and conduct periodic surveys (\$161 to \$229). The published annual cost for routine monitoring and operational evaluations for the Stage 2 rule was \$25,473. Other costs (i.e., reading and understanding the rule and preparation of associated implementation plans) ranged from \$7,807 to \$69,136. Published costs

for the Lead and Copper Rule were presented cumulatively for all systems nationally. Costs associated with implementation of the Lead and Copper Rule for individual systems could not be determined.

If all of the published costs associated with implementation of the Ground Water Rule and Stage 2 Disinfectants and Disinfection Byproducts Rule are totaled, the range of costs (\$36,000 to \$99,000) is consistent with the reported costs for contractors or consultants used for drinking water supplier activities, presented in **Table TA-19** (\$50,000). However, the data is from a single response. Alternatively, airports reporting the use staff to meet drinking water treatment and distribution requirements use full-time staff for this purpose. Although not specifically addressed in **Table TA-19**, in most cases, one airport staff person is responsible for drinking water treatment and monitoring activities, which include tasks such as periodic testing, reporting, and maintenance activities. The annual estimated salary for this type of individual is approximately \$56,000 (assumptions: \$27/hour for airport maintenance/operations personnel (2012, Bureau of Labor Statistics NAICS 48100) and 2,080 annual work hours).

**Table TA-19. Reported Costs for Drinking Water Suppliers**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information:								
<b>Drinking Water Supplier</b>								
a. Contractor/consultants	1	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
b. Installation/construction for control(s)/equipment	0	-	-	-	-	-	-	-
c. Material/equipment replacement	1	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
d. Specialized training	1	\$6,350	\$6,350	\$6,350	\$6,350	\$6,350	\$6,350	\$6,350
<b>Total Costs</b>							<b>\$58,350</b>	<b>\$58,350</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	1	\$158	\$158	\$158	\$158	\$158	\$158	\$158
c. Material/equipment replacement	1	\$6	\$6	\$6	\$6	\$6	\$6	\$6
d. Specialized training	1	\$10	\$10	\$10	\$10	\$10	\$10	\$10
<b>Total Costs</b>							<b>\$174</b>	<b>\$174</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	1	\$2,552	\$2,552	\$2,552	\$2,552	\$2,552	\$2,552	\$2,552
c. Material/equipment replacement	1	\$186	\$186	\$186	\$186	\$186	\$186	\$186
d. Specialized training	1	\$217	\$217	\$217	\$217	\$217	\$217	\$217
<b>Total Costs</b>							<b>\$2,954</b>	<b>\$2,954</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

In addition to general staffing costs, one airport (different than the one reporting contractor costs) reported a cost of \$6,350 for specialized training. A third airport reported a cost of \$2,000 for replacement of consumable materials/equipment. The response identified the reported costs as related to potable water supply for aircraft. At most airports, air carriers operate drinking water watering points, which include water cabinets, carts, trucks, and hoses.

## ***C.8 Water Resources – Above-Ground Oil Storage and the SPCC Rule Changes***

### **Background and Change in SPCC Rule**

The SPCC rule was amended a number of times in the 1990's to clarify the rule, incorporate technical changes, and reduce the impact of information collection requirements for regulated entities. During the study period, the SPCC rule was further amended in 2002, 2006, 2008, and 2009 to provide increased clarity, tailor requirements to particular industry sectors, and streamline certain requirements for facility owners or operators. All of the amendments potentially applicable to small airports made during the study period are extensive. An overview of the principal potential cost-related rule changes are listed below:

- Exemptions
  - ◆ Completely buried tanks subject to all the technical requirements of the federal or state-approved UST program (Some USTs (e.g., emergency generator or heating oil USTs) may still be subject to the rule) (2002)
  - ◆ Facilities whose aggregate aboveground storage capacity is 1,320 gallons or less; and containers with oil storage capacities less than 55 gallons (2002)
  - ◆ “Motive power” containers (i.e., onboard bulk storage container used primarily to power the movement of a motor vehicle, or ancillary onboard oil-filled operational equipment) (2006)
  - ◆ Hot-mix asphalt containers (2008)
  - ◆ Requirements for secondary containment for mobile refuelers and non-transportation-related tank trucks (2006, 2008)
- Administrative Requirements
  - ◆ Changing the threshold for submitting information following certain discharges and reducing the amount of information that must be submitted after discharges (2002)
- Plan Certification
  - ◆ Changing the plan review period from three to five years and requiring documentation of plan reviews and evaluations. A professional engineer certification is required for technical plan amendments. (2002)
  - ◆ Streamlining certification requirements for qualified facilities that store 10,000 gallons or less of oil and meet other qualifying criteria (2006)
  - ◆ Allowing owners or operators of Tier I qualified facilities to complete an SPCC plan template in lieu of a full SPCC plan and self-certify the plan (2009)
- Records and Testing
  - ◆ Providing flexibility in complying with bulk storage container integrity testing requirements (2008)

Due to the amount of fuel/oil managed and handled at an airport, the overall cost for an airport's SPCC implementation program can be substantial when compared to all of the applicable environmental regulatory.

### Phase 1 Survey Results and Evaluation

A total of 80% of airports reported an SPCC plan was prepared for their operations (**Figure TA-22**). Airports reporting operations or activities related to the airport's SPCC program (**Figure TA-21**) include:

- Aboveground Storage Tanks – 68%
- Underground Storage Tanks – 35%
- Mobile Refuelers – 17%
- Drum Storage and Handling – 39%

In addition to the federal SPCC regulations, state or local agencies may require bulk fuel or oil storage tanks to be registered with the agency. A total of 43% of airports reported they were responsible for registering bulk storage tanks. The response includes both fuel and chemical storage tanks. Therefore, only a portion of the response should be attributed to fuel and/or oil storage. Additionally, not all USTs are subject to the SPCC requirements (as noted by the exemptions). Therefore, it is also likely that only a portion of reported UST operations are related to SPCC compliance.

### Phase 2 Survey Results and Evaluation, Reported Costs

Published cost estimates for the 2002 rule change identified the cost to prepare an SPCC plan for new and existing facilities was between \$3,020 and \$13,000. Published cost analyses also provided separate costs for facility staff to read and understand the updated rule, develop facility diagram updates, adding cross references to the SPCC plan, etc.

Airport-reported costs associated with the SPCC rule are provided in **Table TA-20**. The average cost for an airport SPCC plan is approximately \$19,000 with a range of between \$1,000 and \$150,000. The interquartile mean cost was \$7,800. The total average cost per thousand enplanements and per thousand commercial operations is \$227 and \$1,926, respectively. Interquartile mean costs are \$77 and \$1,007, respectively. Five airports reported costs greater than \$20,000. Potential explanations for the higher reported costs may be preparation of multiple plan updates during the study period, regulatory coordination, or significant plan revisions due to major changes in regulations.

Minor plan updates, such as adding or removing tanks from the plan, incorporating new procedures, etc., typically cost between \$2,000 and \$5,000. The economic analysis identified similar costs for a 5-year plan update was between \$981 and \$4,210.

Ongoing operational activities associated with SPCC plan implementation include recordkeeping and periodic inspections and tests. The majority of airports report these activities are performed on a part-time basis. The frequency of inspections, monitoring, and testing vary and are conducted daily, weekly, monthly, seasonally, or annually depending on the airport's operations. Annual training is also required and was reported by six airports to range from \$200 to \$9,000, with an average cost of approximately \$3,000. Interquartile mean cost was approximately \$1,900. Published training costs range from \$1,930 to \$3,650 per year.

Several SPCC amendments specified particular controls or equipment necessary to avoid or minimize oil discharges from a facility. The economic analyses provided capital and operational costs associated with controls including costs for security upgrades, secondary containment, installation of drainage measures, response equipment, and liquid level sensing devices. Eight airports reported costs for controls or equipment to meet the SPCC regulations. The reported cost range between \$200 and \$150,000. Average cost is approximately \$30,000, and interquartile mean cost is approximately \$5,800. The average cost per thousand enplanements and per thousand commercial operations is \$847 and \$5,869, respectively. Interquartile costs are \$28 and \$389, respectively.

**Table TA-20. Reported Costs for Activities and Documents Related to SPCC Amendments**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information:								
<b>Aboveground Storage Tanks (AST)</b>								
a. Contractor/consultants	5	\$500	\$1,000	\$1,500	\$2,500	\$5,000	\$2,100	\$1,667
b. Installation/construction for control(s)/equipment	5	\$1,000	\$35,000	\$75,000	\$80,000	\$1,000,000	\$238,200	\$63,333
c. Material/equipment replacement	3	\$2,500	\$6,250	\$10,000	\$42,500	\$75,000	\$29,167	\$10,000
d. Specialized training	2	\$2,000	\$2,375	\$2,750	\$3,125	\$3,500	\$2,750	\$2,750
<b>Total Costs</b>							<b>\$272,217</b>	<b>\$77,750</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	5	\$1	\$2	\$14	\$16	\$148	\$36	\$10
b. Installation/construction for control(s)/equipment	4	\$318	\$652	\$1,028	\$15,788	\$59,273	\$15,412	\$1,028
c. Material/equipment replacement	4	\$2	\$122	\$204	\$376	\$764	\$293	\$246
d. Specialized training	2	\$57	\$72	\$88	\$103	\$119	\$88	\$88
<b>Total Costs</b>							<b>\$15,829</b>	<b>\$1,372</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	5	\$21	\$30	\$219	\$255	\$1,764	\$458	\$168
b. Installation/construction for control(s)/equipment	4	\$5,101	\$8,458	\$12,453	\$187,926	\$705,716	\$183,931	\$12,453
c. Material/equipment replacement	4	\$31	\$371	\$1,200	\$3,831	\$9,577	\$3,002	\$1,916
d. Specialized training	2	\$671	\$856	\$1,041	\$1,226	\$1,411	\$1,041	\$1,041
<b>Total Costs</b>							<b>\$188,432</b>	<b>\$15,578</b>
<b>Mobile Refueler Operations</b>								
a. Contractor/consultants	2	\$600	\$4,200	\$7,800	\$11,400	\$15,000	\$7,800	\$7,800
b. Installation/construction for control(s)/equipment	3	\$1,200	\$25,600	\$50,000	\$129,743	\$209,485	\$86,895	\$50,000
c. Material/equipment replacement	1	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
d. Specialized training	2	\$1,400	\$7,300	\$13,200	\$19,100	\$25,000	\$13,200	\$13,200
<b>Total Costs</b>							<b>\$157,895</b>	<b>\$121,000</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	2	\$36	\$40	\$45	\$50	\$55	\$45	\$45
b. Installation/construction for control(s)/equipment	3	\$71	\$208	\$346	\$577	\$808	\$408	\$346
c. Material/equipment replacement	1	\$808	\$808	\$808	\$808	\$808	\$808	\$808
d. Specialized training	2	\$98	\$174	\$251	\$327	\$404	\$251	\$251
<b>Total Costs</b>							<b>\$1,512</b>	<b>\$1,449</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	2	\$423	\$546	\$669	\$792	\$914	\$669	\$669
b. Installation/construction for control(s)/equipment	3	\$847	\$3,625	\$6,403	\$7,992	\$9,580	\$5,610	\$6,403
c. Material/equipment replacement	1	\$9,580	\$9,580	\$9,580	\$9,580	\$9,580	\$9,580	\$9,580
d. Specialized training	2	\$543	\$1,605	\$2,667	\$3,728	\$4,790	\$2,667	\$2,667
<b>Total Costs</b>							<b>\$18,526</b>	<b>\$19,319</b>
<b>Drum Storage/Handling</b>								
a. Contractor/consultants	1	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
b. Installation/construction for control(s)/equipment	1	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
c. Material/equipment replacement	1	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
d. Cost for specialized training	0	-	-	-	-	-	-	-
<b>Total Costs</b>							<b>\$4,500</b>	<b>\$4,500</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	1	\$15	\$15	\$15	\$15	\$15	\$15	\$15
b. Installation/construction for control(s)/equipment	1	\$15	\$15	\$15	\$15	\$15	\$15	\$15
c. Material/equipment replacement	1	\$15	\$15	\$15	\$15	\$15	\$15	\$15
<b>Total Costs</b>							<b>\$46</b>	<b>\$46</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	1	\$192	\$192	\$192	\$192	\$192	\$192	\$192
b. Installation/construction for control(s)/equipment	1	\$192	\$192	\$192	\$192	\$192	\$192	\$192
c. Material/equipment replacement	1	\$192	\$192	\$192	\$192	\$192	\$192	\$192
<b>Total Costs</b>							<b>\$575</b>	<b>\$575</b>
56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:								
<b>Spill Prevention, Control and Countermeasure Plan</b>								
a. Initial cost to prepare plan, document, or report	22	\$1,000	\$4,000	\$4,850	\$20,000	\$150,000	\$19,097	\$7,800
b. Installation/construction for control(s)/equipment/mitigation/remediation	8	\$200	\$475	\$3,750	\$27,500	\$150,000	\$29,825	\$5,750
c. Specialized training	7	\$200	\$853	\$2,000	\$4,250	\$9,000	\$3,058	\$1,902
<b>Total Costs</b>							<b>\$51,980</b>	<b>\$15,452</b>
d. Amount received from 3rd party funding/grant	2	17,300	28,413	39,525	50,638	61,750	39,525	39,525
<b>Average Cost per thousand Enplanements</b>								
a. Initial cost to prepare plan, document, or report	22	\$3	\$21	\$75	\$212	\$1,969	\$227	\$77
b. Installation/construction for control(s)/equipment/mitigation/remediation	8	\$6	\$8	\$38	\$419	\$5,098	\$847	\$28
c. Specialized training	6	\$1	\$4	\$7	\$16	\$40	\$13	\$6
<b>Total Costs</b>							<b>\$1,086</b>	<b>\$110</b>
<b>Average Cost per thousand Operations</b>								
a. Initial cost to prepare plan, document, or report	22	\$55	\$290	\$1,335	\$3,105	\$6,394	\$1,926	\$1,007
b. Installation/construction for control(s)/equipment/mitigation/remediation	8	\$55	\$122	\$343	\$5,562	\$25,794	\$5,869	\$389
c. Specialized training	6	\$27	\$78	\$172	\$411	\$2,558	\$578	\$98
<b>Total Costs</b>							<b>\$8,372</b>	<b>\$1,493</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy



Costs for installation or construction of controls or equipment were also reported for aboveground storage tanks (\$1,000-\$1,000,000), mobile refuelers (\$1,200-\$209,485) and drum storage (\$1,500, single response). Average cost is \$238,000 for above ground storage tanks, and interquartile mean cost is approximately \$63,000. Average cost for mobile refuelers is \$87,000, and interquartile mean cost is approximately \$50,000. Figures represent the total cost for installation or construction of controls or equipment. Only a portion of these costs may be attributed to meeting SPCC regulatory changes, which varies depending on the airport's existing infrastructure.

## ***C.9 Water Resources – Pesticide Applicator Permit Requirements***

### **Background and Change in Requirements**

In 2006, the EPA revised point source discharge regulations to clarify that application of a pesticide in compliance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) does not require a National Pollutant Discharge Elimination System (NPDES) permit under two conditions.

After the rule was published, petitions for review were filed in eleven circuit courts. On January 7, 2009, the Sixth Circuit vacated the rule, and on April 9, 2009, the Department of Justice filed a motion to stay issuance of the Court's mandate for two years. In addition, industry petitioners filed a motion to seek a rehearing of the court's decision. Both the Sixth Circuit Court and Supreme Court denied the petitions. Therefore, the EPA and states authorized to implement the NPDES program were required to issue an NPDES permit to point source dischargers for pesticide. As a result, the EPA and authorized states began to issue Pesticide General Permits (PGP).

Requirements of the federal PGP include implementing technology-based effluent limitations to minimize discharges, submission of a Notice of Intent (NOI) to become covered under the permit, and performing ongoing monitoring and record-keeping. State PGPs may have slightly different notification requirements or more stringent monitoring and record-keeping criteria.

### **Phase 1 Survey Results and Evaluation**

The amount of pesticides applied at small airports may rival larger airports due to the relatively large grassy areas. Small airports typically apply pesticides for weed, algae, and/or animal pest control. Thirty-nine percent of responding airports reported they are responsible for applying pesticides. (**Figure TA-21**).

## Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

The economic analysis conducted for the rulemaking estimated the required surveys to identify and evaluate problem areas, issues, and aquatic conditions to cost \$100/acre. Assuming the area for pesticide application at a small airport encompasses 100 acres, the cost for a survey alone may be up to \$10,000. The analysis also estimated costs of pest management implementation at approximately \$50 to \$500/acre and pesticide usage at \$100/acre. Using the same 100-acre scenario, pest management implementation may range from \$5,000 to \$50,000. Pesticide usage could be as much as \$10,000. Consultant costs to develop a pesticide discharge management plan (required by the PGP for some states) are typically between \$5,000 and \$15,000. The economic analysis also identified recordkeeping and administrative costs as \$350 to \$890/year and submittal of an NOI to obtain coverage under the PGP as a one-time fee of \$30. These amounts appear to be higher, overall, than the costs reported by airports in the Phase 2 survey.

**Table TA-21** presents the airport-reported costs associated with pesticide application activities including applicator certification fees and specialized training. The reported certification fees from two airports are \$200 and \$500. Training costs are also reported from the same two airports as \$200 and \$500. Pesticide application is conducted seasonally or on an as-needed basis and materials and equipment utilized for pest removal may periodically need to be replaced. One airport reported the cost for material usage/equipment replacement is \$10,000. In some cases airports contract out pesticide application needs. Contractor costs are reported from two airports and range from \$3,200 to \$7,000.

**Table TA-21. Reported Costs for Documents Related to Pesticide General Permit**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
Of those permits, certifications, or registrations the airport is subject to, or has applied for, please enter the requested follow-up information:								
<b>57. Pesticide Applicator</b>								
a. Application/certification/ registration (initial application/annual fee)	2	\$200	\$275	\$350	\$425	\$500	\$350	\$350
b. Contractor/consultants	2	\$3,200	\$4,150	\$5,100	\$6,050	\$7,000	\$5,100	\$5,100
c. Installation/construction for control(s)/ equipment	0	-	-	-	-	-	-	-
d. Material/equipment replacement	1	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
e. Specialized training	2	\$200	\$275	\$350	\$425	\$500	\$350	\$350
<b>Total Costs</b>							<b>\$15,800</b>	<b>\$15,800</b>
<b>Average Cost per thousand Enplanements</b>								
a. Application/certification/ registration (initial application/annual fee)	2	\$1	\$1	\$1	\$1	\$1	\$1	\$1
b. Contractor/consultants	2	\$13	\$24	\$36	\$48	\$59	\$36	\$36
d. Material/equipment replacement	1	\$20	\$20	\$20	\$20	\$20	\$20	\$20
e. Specialized training	2	\$1	\$1	\$1	\$1	\$1	\$1	\$1
<b>Total Costs</b>							<b>\$58</b>	<b>\$58</b>
<b>Average Cost per thousand Operations</b>								
a. Application/certification/ registration (initial application/annual fee)	2	\$10	\$14	\$18	\$22	\$25	\$18	\$18
b. Contractor/consultants	2	\$221	\$276	\$331	\$387	\$442	\$331	\$331
d. Material/equipment replacement	1	\$508	\$508	\$508	\$508	\$508	\$508	\$508
e. Specialized training	2	\$10	\$14	\$18	\$22	\$25	\$18	\$18
<b>Total Costs</b>							<b>\$875</b>	<b>\$875</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

Because some airports perform pesticide applications on or near waters, streams, etc. the new PGP may apply. To avoid needing coverage under the PGP, airports may consider utilizing pest resistant landscape materials and native species or alternative materials to minimize or eliminate the need for regulated pesticides over, on, or near waters. However, in the event PGP coverage is needed, additional costs associated with coverage will be necessary. Consultant costs to review applicability and prepare the notice of intent for permit coverage are normally between \$3,000 and \$10,000, which is generally consistent with reported costs in the survey. Overall average costs for pesticide applicator activities per thousand enplanements and per thousand operations is \$58 and \$875, respectively.

### ***C.10 Water Resources – Construction Storm Water Requirements***

#### **Background and Change in Requirements**

EPA and/or state environmental/natural resource agencies require notification prior to commencement of development activities through submittal of a notice of intent (NOI) for coverage of storm water runoff from construction sites. As part of authorization under the NOI, most state agencies also require preparation and implementation of a construction storm water pollution prevention plan (CSWPP Plan) to minimize impacts on storm water discharges from construction sites. Prior to 2009, numeric effluent limitation guidelines (ELGs) were not established for storm water discharges.

On December 1, 2009, EPA established a new ELG of 280 Nephelometric Turbidity Units (NTU) for storm water discharges from construction sites. Under Phase 1 of the regulations, sites that disturb more than 20 acres of land must comply with the new ELG (effective August 2011). The limitation was also planned to be extended in 2014 for construction sites that disturb more than 10 acres of land. On January 4, 2011, EPA stayed the numeric limitation and is in the process of proposing a revised limit in a future rulemaking. In general, the ELG rulemaking primarily affects the construction industry, and although the numeric limitation was stayed, a revised effluent limitation may be adopted in the future.

FAA AC 150-5370-10, *Specifying Construction of Airports*, was issued during the study period and primarily incorporates information related to airport safety, design, and construction standards. The AC also incorporates information related to controls to implement during earthwork activities to help minimize storm water pollution. Use of the AC is mandatory for AIP or PFC-funded projects.

#### **Phase 1 Survey Results and Evaluation**

Construction activities at an airport, including small airports, are almost inevitable. This is reflected by the 63% of airports responding to the Phase 1 survey as preparing a construction

NOI (**Figure TA-23**). Seventy-one percent of airports also identified preparation of a construction SWPPP (**Figure TA-22**).

### Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

Based on the survey responses, preparation and submittal of a construction NOI usually is performed by the airport authority and requires low to moderate regulatory coordination. Airport staffing is required during the project planning phase as construction projects arise.

Two airports reported the cost incurred from NOI applications were \$60 and \$100,000, respectively, as reflected in **Table TA-22**. Two different airports reported using consultants to assist with the NOI. Reported consultant costs ranged from \$2,500 to \$20,000. The total average cost per thousand enplanements and per thousand operations is \$143 and \$2,995, respectively.

**Table TA-22. Reported Costs for Documents Related to Construction Storm Water Amendments**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:								
<b>56. Construction Storm Water Pollution Prevention Plan</b>								
a. Initial cost to prepare plan, document, or report	10	\$500	\$2,500	\$4,000	\$12,500	\$65,000	\$12,930	\$3,417
b. Installation/construction of control(s)/equipment/mitigation/remediation	1	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
c. Specialized training	2	\$3,000	\$3,500	\$4,000	\$4,500	\$5,000	\$4,000	\$5,000
<b>Total Costs</b>							<b>\$18,930</b>	<b>\$10,417</b>
d. Amount received from 3rd party funding/grant	2	\$2,438	\$5,391	\$8,344	\$11,297	\$14,250	\$8,344	\$8,344
<b>Average Cost per thousand Enplanements</b>								
a. Initial cost to prepare plan, document, or report	10	\$2	\$14	\$36	\$67	\$5,258	\$667	\$35
b. Installation/construction of control(s)/equipment/mitigation/remediation	1	\$197	\$197	\$197	\$197	\$197	\$197	\$197
c. Specialized training	2	\$4	\$104	\$204	\$304	\$404	\$204	\$204
<b>Total Costs</b>							<b>\$1,068</b>	<b>\$436</b>
<b>Average Cost per thousand Operations</b>								
a. Initial cost to prepare plan, document, or report	10	\$53	\$148	\$312	\$981	\$8,591	\$1,760	\$448
b. Installation/construction of control(s)/equipment/mitigation/remediation	1	\$387	\$387	\$387	\$387	\$387	\$387	\$387
c. Specialized training	2	\$78	\$224	\$370	\$515	\$661	\$370	\$370
<b>Total Costs</b>							<b>\$2,517</b>	<b>\$1,205</b>
<b>Construction Notice of Intent</b>								
a. Application/certification/registration (initial cost and/or annual fee)	2	\$60	\$25,045	\$50,030	\$75,015	\$100,000	\$50,030	\$50,030
b. Contractor/consultants	2	\$2,500	\$6,875	\$11,250	\$15,625	\$20,000	\$11,250	\$11,250
c. Installation/construction of control(s)/equipment/mitigation/etc.	1	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
d. Cost for material/equipment replacement	0	-	-	-	-	-	-	-
e. Specialized training	0	-	-	-	-	-	-	-
<b>Total Costs</b>							<b>\$81,280</b>	<b>\$81,280</b>
<b>Average Cost per thousand Enplanements</b>								
a. Application/certification/registration (initial cost and/or annual fee)	2	\$6	\$36	\$66	\$95	\$125	\$66	\$66
b. Contractor/consultants	2	\$25	\$30	\$34	\$39	\$43	\$34	\$34
c. Installation/construction of control(s)/equipment/mitigation/etc.	1	\$43	\$43	\$43	\$43	\$43	\$43	\$43
<b>Total Costs</b>							<b>\$143</b>	<b>\$143</b>
<b>Average Cost per thousand Operations</b>								
a. Application/certification/registration (initial cost and/or annual fee)	2	\$12	\$662	\$1,313	\$1,963	\$2,613	\$1,313	\$1,313
b. Contractor/consultants	2	\$319	\$493	\$667	\$841	\$1,015	\$667	\$667
c. Installation/construction of control(s)/equipment/mitigation/etc.	1	\$1,015	\$1,015	\$1,015	\$1,015	\$1,015	\$1,015	\$1,015
<b>Total Costs</b>							<b>\$2,995</b>	<b>\$2,995</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy.

Airport experience outside the survey process suggests that fees associated with NOI submittals are usually low and are typically less than \$500. The \$100,000 figure in the survey result seems to be exceptional. In the case where consultants are used, the reported fee most likely incorporates application fees associated with NOI submittals.

Ten airports reported costs for preparation of a construction SWPPP. Average cost to prepare a SWPPP was reported as approximately \$13,000. Interquartile mean cost was approximately \$3,400. Three airports reported SWPPP preparation costs were greater than \$10,000; two of these airports also reported a high level of regulatory coordination. The total average cost per thousand enplanements and per thousand commercial operations is \$1,100 and \$2,500, respectively. Interquartile costs were \$436 and \$1,200, respectively.

Implementation of a construction SWPPP includes controls to minimize impacts to storm water discharges. In many cases these controls meet the criteria required under FAA AC 150-

5370-10. One airport reported the cost for construction controls was \$2,000 and two airports reported costs for participation in specialized training as \$3,000 and \$5,000. Airports also report inspections associated SWPPP implementation was performed on a daily, weekly, and monthly basis. The cost of physical controls, training, and/or frequency of implementation of operational controls may increase as a result of compliance with future construction storm water ELGs.

#### **D. Analysis of FAA Environmental Requirements**

Small airports are also subject to environmental requirements administered by the FAA, including regulations under Title 14 (Aeronautics and Space) and administrative directives such as orders or ACs which provide guidance and direction on implementing the agency's environmental programs and policies. The FAA Airport Environmental Program helps airports implement the provisions of NEPA, noise compatibility planning (14 CFR 150), noise and access restrictions (14 CFR 161), and property transfers. Specifically, the FAA issued administrative directives during the project study period, including FAA Orders 1050.1 and 5050.4 and various ACs under series 150, which are summarized in **Table A-2**. The FAA also issued PGLs addressing noise compatibility during the study period, which are summarized in **Table A-1**.

The discussion of the survey results and related financial impacts for FAA related environmental requirements are as indicated below:

- NEPA Requirements
- Sensitive Areas and Wildlife
- Noise Compatibility (Including Land Acquisition)
- Other FAA and DOT Environmental Requirements

##### ***D.1 NEPA Requirements***

###### Background and Change in Requirements

Two guidance documents for FAA's NEPA implementation were issued prior to the study period, Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts* (1983) and Order 5050.4A, *Airport Environmental Handbook* (1985). Due to modifications in environmental evaluations and reviews occurring since 1985, changes in regulations, and adjustments to FAA policy, Order 1050.1 was re-evaluated and updated in 2004 and 2006 (**Table A-2**, Items #24 and #25). Order 5050.4 was updated in 2006 (**Table A-2**, Item #26). In general, the updates incorporated the most current information related to the overall review and approval procedures associated with FAA NEPA-related actions.

Order 1050.1E, *Environmental Impacts: Policies and Procedures*, sets the agency-wide protocol for implementing NEPA. In 2004 and 2006, updates to the Order included:

- Changes to format and organization
- New and modified categorical exclusions (CATEX)
- New procedures for preparing documents for review
- Inclusion of FAA's policy on the environmental stewardship and streamlining provisions of the "Vision 100—Century of Aviation Reauthorization Act," Pub. L. 108-176 (December 12, 2003)

Order 5050.4B, *NEPA Implementing Instructions for Airport Actions* (2006), supplements 1050.1E and is part of FAA's effort to ensure FAA Office of Airports personnel have clear instructions to address potential environmental effects resulting from major airport actions. Key changes related to the 5050.4 update included:

- Clarification of text (e.g., examples, discussion, details) to improve NEPA implementation, reviews, and approvals
- Emphasis on coordination, planning, and quality of data necessary for approvals
- New categorical exclusions and information on extraordinary circumstances
- Discussion of FAA's role associated with projects using State Block Grants
- Expanded list of actions normally requiring an environmental assessment (EA) or environmental impact statement (EIS)
- Clarification on agency, consultant, and airport roles during NEPA process

Issuance of these Orders provided airports and their consultants with updated details related to the information needs, relevant environmental documents, agency coordination, etc. necessary for a prompt NEPA review. Since airport actions and associated NEPA approvals are dependent on many factors such as the type of action, available background information, proposed project location, affected environmental resources, etc., detailed costs were not developed as part of the Order updates. However, it is well-known that NEPA approvals can be quite costly to small airports.

### Phase 1 Survey Results and Evaluation

Questions regarding the impact of the changes to the FAA's NEPA guidance document were included in the group of questions regarding general environmental requirements.

The analyses to support NEPA are tailored to the type of project and necessary documents that demonstrate the FAA has appropriately evaluated the environmental impacts of a proposed action and its reasonable alternatives. Specifically, a CATEX applies to actions that do not individually or cumulatively have a significant effect on the environment. The updated Orders added to the prior lists of actions that are normally categorically excluded. For these projects, the FAA requests information to determine if any extraordinary circumstances exist (i.e., if the proposed action has the potential to have a significant effect on a particular resource).

Order 5050.4B also provides detailed information related to the thresholds triggering extraordinary circumstances.

If the proposed action does not meet the criteria for a CATEX, preparation of an EA begins. If no significant impacts are identified from the EA, the FAA will issue a “finding of no significant impacts” (FONSI), and the airport is able to undertake the action. If significant impacts are identified or likely based on the type of action, an EIS may be required. Projects such as major runway extensions trigger an EIS.

The survey results associated with airports participating in the NEPA review process (**Figure TA-22**) are listed below:

- CATEX – 65%
- EA – 69%
- EIS – 37%

As expected, a higher percentage of small airports report completing a CATEX and EA compared to an EIS. Proposed projects qualifying for an EIS are generally limited at small airports primarily based on the level of operations and need for new or updated facilities. The higher percentage of airports participating in EAs than participating in CATEX’s is not consistent with the overwhelmingly high percentage of FAA airport actions qualifying for a CATEX. The most likely explanation is that in many cases, the FAA can make the CATEX determination without the airport’s participation.

### Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

Airports responding to the Phase 2 survey reported categorical exclusions and EAs as primarily prepared by the airport. Although most of the EIS documents are not prepared by airports, five airports reported they were responsible for an EIS. It is likely these responses are associated with the airport’s work related to data collection and information gathering activities to support the EIS.

The overall range and average cost associated with preparation of each type of NEPA document is provided in **Table TA-23**. The survey did not request airports to identify the incremental cost of complying with the modifications to the FAA Orders, because it was not expected that airports would be able to isolate these incremental costs.



**Table TA-23. Reported Costs for NEPA Related Documents**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:								
<b>Categorical Exclusion (CateX)</b>								
a. Initial cost to prepare plan, document, or report	6	\$1,000	\$1,125	\$1,650	\$2,325	\$5,000	\$2,133	\$1,650
b. Installation/construction of control(s)/equipment/mitigation/remediation	0	-	-	-	-	-	-	-
c. Specialized training	1	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<b>Total Costs</b>							<b>\$3,133</b>	<b>\$2,650</b>
d. Amount received from 3rd party funding/grant	2	\$1,462	\$2,284	\$3,106	\$3,928	\$4,750	\$3,106	\$3,106
<b>Average Cost per thousand Enplanements</b>								
a. Initial cost to prepare plan, document, or report	6	\$1	\$3	\$10	\$23	\$213	\$44	\$7
c. Specialized training	1	\$2	\$2	\$2	\$2	\$2	\$2	\$2
<b>Total Costs</b>							<b>\$46</b>	<b>\$10</b>
<b>Average Cost per thousand Operations</b>								
a. Initial cost to prepare plan, document, or report	6	\$32	\$63	\$166	\$305	\$5,181	\$987	\$166
c. Specialized training	1	\$69	\$69	\$69	\$69	\$69	\$69	\$69
<b>Total Costs</b>							<b>\$1,056</b>	<b>\$234</b>
<b>Environmental Assessment (EA)</b>								
a. Initial cost to prepare plan, document, or report	14	\$5,000	\$40,000	\$58,606	\$159,588	\$530,000	\$123,925	\$59,602
b. Installation/construction of control(s)/equipment/mitigation/remediation	4	\$1,000	\$4,000	\$92,500	\$260,000	\$500,000	\$171,500	\$92,500
c. Specialized training	0	-	-	-	-	-	-	-
<b>Total Costs</b>							<b>\$295,425</b>	<b>\$152,102</b>
d. Amount received from 3rd party funding/grant	7	\$4,876	\$42,750	\$95,000	\$210,331	\$855,000	\$208,720	\$107,317
<b>Average Cost per thousand Enplanements</b>								
a. Initial cost to prepare plan, document, or report	13	\$5	\$104	\$521	\$2,899	\$4,258	\$1,465	\$666
b. Installation/construction of control(s)/equipment/mitigation/remediation	3	\$2	\$8	\$13	\$320	\$626	\$214	\$13
<b>Total Costs</b>							<b>\$1,679</b>	<b>\$678</b>
<b>Average Cost per thousand Operations</b>								
a. Initial cost to prepare plan, document, or report	13	\$107	\$1,371	\$9,309	\$19,841	\$103,627	\$18,218	\$6,495
b. Installation/construction of control(s)/equipment/mitigation/remediation	3	\$69	\$163	\$257	\$6,662	\$13,067	\$4,464	\$257
<b>Total Costs</b>							<b>\$22,682</b>	<b>\$6,752</b>
<b>Environmental Impact Statement (EIS)</b>								
a. Initial cost to prepare plan, document, or report	7	\$2,000	\$10,000	\$50,000	\$125,000	\$600,000	\$131,714	\$42,500
b. Installation/construction of control(s)/equipment/mitigation/remediation	3	\$1,000	\$3,000	\$5,000	\$252,500	\$500,000	\$168,667	\$5,000
c. Specialized training	1	\$500	\$500	\$500	\$500	\$500	\$500	\$500
<b>Total Costs</b>							<b>\$300,881</b>	<b>\$48,000</b>
d. Amount received from 3rd party funding/grant	5	\$9,500	\$48,750	\$75,000	\$142,500	\$1,045,000	\$264,150	\$88,750
<b>Average Cost per thousand Enplanements</b>								
a. Initial cost to prepare plan, document, or report	7	\$37	\$121	\$239	\$572	\$784	\$350	\$276
b. Installation/construction of control(s)/equipment/mitigation/remediation	3	\$2	\$8	\$13	\$320	\$626	\$214	\$13
c. Specialized training	1	\$1	\$1	\$1	\$1	\$1	\$1	\$1
<b>Total Costs</b>							<b>\$565</b>	<b>\$290</b>
<b>Average Cost per thousand Operations</b>								
a. Initial cost to prepare plan, document, or report	7	\$387	\$838	\$3,968	\$6,008	\$15,681	\$4,818	\$3,391
b. Installation/construction of control(s)/equipment/mitigation/remediation	3	\$69	\$163	\$257	\$6,662	\$13,067	\$4,464	\$257
c. Specialized training	1	\$34	\$34	\$34	\$34	\$34	\$34	\$34
<b>Total Costs</b>							<b>\$9,317</b>	<b>\$3,683</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

As expected with the distribution of responses obtained from the Phase 1 survey, the results show the average cost associated with preparation of a CATEX is lower than the cost of an EA and EIS. Inclusion of additional categorical exclusions and triggering thresholds in the updated FAA Orders likely saved many airports money that would have been needed for an EA or EIS.

As presented in **Table TA-23**, the reported average cost and range of costs for an EA compared to an EIS are similar. The average cost is approximately \$124,000 and \$132,000, respectively. Interestingly, the interquartile mean cost of an EA is approximately \$60,000, somewhat higher than the interquartile mean costs of an EIS at approximately \$42,500. The range of costs is \$5,000-\$530,000 and \$2,000-\$600,000, respectively. The total average costs per thousand enplanements and per thousand operations are greater for an EA compared to an EIS. Specifically, cost per thousand enplanements and commercial operations for an EA is \$1,700 and \$23,000, respectively, and \$565 and \$9,300 for an EIS. The same pattern exists for interquartile mean costs.

The wide range of costs is likely attributed to many factors such as the level of analyses needed, agency coordination, number of environmental impacts from the proposed action, mitigation needs, and differing procedures between FAA Airport District Offices. The updated FAA Orders therefore focused content on upfront planning and coordination to avoid unanticipated costs or schedule delays. As a result, prior to starting the NEPA process, airports typically engage in master planning activities to help identify future airport capital needs.

Airports reported low to moderate regulatory and public coordination for a CATEX and an EA. Airport responses for staffing needs varied depending on the type of document. One airport however, provided a general synopsis of staffing needs necessary to develop NEPA-related documents for a proposed action, as summarized below:

- CATEX – 24 hours
- EA – 80 hours
- EIS – 160 hours

## ***D.2 Sensitive Areas and Wildlife***

### **Background and Change in Requirements**

FAA AC 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports* (June 28, 2006) describes the qualifications for wildlife biologists who conduct Wildlife Hazard Assessment (WHA)s for Part 139-certified airports (**Table A-2**, Item 39). In particular, the AC addresses the minimum wildlife hazard management training curriculum for airport personnel involved in implementing an FAA-approved wildlife hazard management plan (WHMP).

Typically airports hire a qualified wildlife biologist to perform a WHA as part of WHMP development. Small airports are able to utilize AIP funding to perform WHAs. Once the WHA is in place, initial and ongoing training must be conducted to ensure staff have the knowledge,

skills, and abilities to safely and accurately implement the plan. To be acceptable to the FAA, the AC states that initial and recurrent training must be at least 8 hours in length.

Phase 1 Survey Results and Evaluation

The survey did not include specific questions related to WHAs or WHMPs. However, most small airports are involved in some aspect of managing wildlife, which is reflected by the 65% of airports responding to the Phase 1 survey as performing animal carcass management (**Figure TA-21**). A portion of these activities may be associated with implementation of a WHMP.

Phase 2 Survey Results and Evaluation, Reported Costs of Compliance

Projected 8-hour training costs associated with WHMP implementation are estimated at \$500 to \$700, which assumes a rate of \$27/hour for airport maintenance/operations personnel, training materials, and expenses (2012, Bureau of Labor Statistics NAICS 48100). Costs for specialized training reported as part of the responses to animal carcass management are generally consistent with projected costs. Three airports responded that training costs were between \$500 and \$2,500, as shown in **Table TA-24**. Training costs per thousand enplanements and per thousand commercial operations are \$61 and \$668, respectively. Interquartile mean training costs are \$35 and \$194, respectively.

**Table TA-24. Reported Costs for Wildlife Related Activities**

	Valid Responses (# of airports in the sample)	Estimated Cost of Compliance for Individual Airports based on Phase 2 Survey						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information:								
<b>Animal Carcass Management</b>								
a. Contractor/consultants	3	\$25	\$513	\$1,000	\$1,125	\$1,250	\$758	\$1,000
b. Installation/construction for control(s)/equipment	0	-	-	-	-	-	-	-
c. Material/equipment replacement	1	\$500	\$500	\$500	\$500	\$500	\$500	\$500
d. Specialized training	3	\$500	\$500	\$500	\$1,500	\$2,500	\$1,167	\$500
<b>Total Costs</b>							<b>\$2,425</b>	<b>\$2,000</b>
<b>Average Cost per thousand Enplanements</b>								
a. Contractor/consultants	3	\$0	\$2	\$4	\$17	\$30	\$11	\$4
c. Material/equipment replacement	1	\$49	\$49	\$49	\$49	\$49	\$49	\$49
d. Specialized training	3	\$1	\$18	\$35	\$92	\$148	\$61	\$35
<b>Total Costs</b>							<b>\$122</b>	<b>\$88</b>
<b>Average Cost per thousand Operations</b>								
a. Contractor/consultants	3	\$2	\$31	\$61	\$236	\$411	\$158	\$61
c. Material/equipment replacement	1	\$97	\$97	\$97	\$97	\$97	\$97	\$97
d. Specialized training	3	\$46	\$120	\$194	\$979	\$1,764	\$668	\$194
<b>Total Costs</b>							<b>\$923</b>	<b>\$352</b>

Interquartile mean value cannot be determined for items with less than 3 responses. Mean value is used as a proxy

### ***D.3 Noise Compatibility Requirements (Including Land Acquisition)***

#### **Background and Change in Requirements**

*Airport Noise Compatibility Planning*, 14 CFR Part 150, governs voluntary airport noise compatibility planning programs. AIP funds are available to develop noise exposure maps (NEMs) that identify noise impacted incompatible land-uses; develop plans to reduce or mitigate noise impacts; and to carry out mitigation measures. During the study period, the FAA did not amend Part 150. However, the FAA issued two PGLs related to Part 150 – PGL 03-2 (November 12, 2003), requiring periodic updates or revalidation of NEMs (**Table A-1**, Item #23) and PGL 08-02 (February 1, 2008), requiring development of noise land reuse plans for land acquired for noise compatibility with AIP funds (**Table A-1**, Item #101). Another regulation, 14 CFR Part 161, contains requirements for airports seeking to restrict aircraft access for noise mitigation or other purposes. The FAA did not amend Part 161 during the study period.

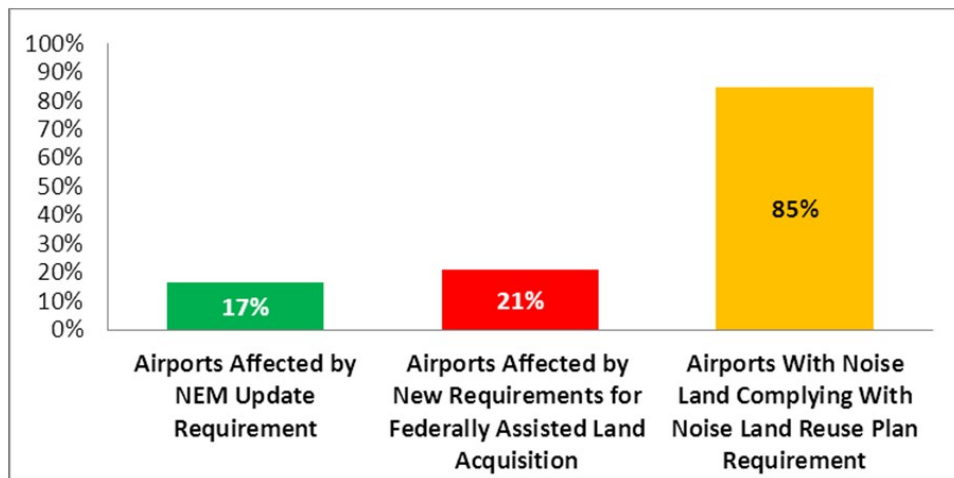
49 CFR Part 24 implements the Uniform Relocation Assistance and Real Property Acquisition Policies Act (URARPPA), which establishes requirements for acquisition of real property with federal assistance. A substantial portion of real property acquisition funded with the AIP is carried out to implement noise compatibility measures under Part 150. The rule is included as an environmental requirement for this reason. The DOT amended Part 24 during the study period (70 Fed. Reg. 611 (January 4, 2005)), and the FAA's Airport Planning and Environmental Division revised its implementing guidance to incorporate the rule changes (Order 5100.37B, *Land Acquisition and Relocation Assistance for Airport Projects* (August 1, 2005)) (**Table A-1**, Items #148 and #69, respectively). The amendments to the regulation were intended to bring Part 24 up to date, improve service to property owners and reduce the cost of government regulation.

#### **Phase 1 Survey Results and Evaluation**

For these environmental requirements, the approach of the survey was similar to that taken for other FAA/DOT requirements. Questions focused on the specific requirements adopted during the study period.

**Figure TA-24** summarizes the results of the Phase 1 survey. Seventeen percent of responding airports reported revising their NEM's in response to the new guidance on this subject. Sixteen percent of responding airports reported having acquired noise land with AIP funds. Eighty-five percent of these airports had completed the noise land reuse plan. This figure may understate the true impact of the requirement. Under the terms of PGL: 08-02, all airports with AIP-funded noise land were required to develop an inventory and reuse plan. Forty percent of responding airports reported acquiring real property with AIP funds for any purpose. Of these airports, 21% reported being impacted by the revisions to the regulations and guidance on

federally-assisted land acquisition. Thirty-seven percent of airports responding to the environmental Phase 1 Survey identified that a noise study (i.e., includes both Part 150 and 161 studies) was conducted (**Figure 22**).



**Figure TA-24. Airports Affected by Changes to Noise Compatibility Requirements**  
(Sample: 13-70 airports)

### Phase 2 Survey Results and Evaluation, Compliance Costs

The Phase 2 survey did not include separate questions on initial and recurring costs for this regulatory area. **Table TA-25** shows the reported costs of complying with each of the requirements for noise compatibility program and combined total average and interquartile mean costs. Average cost was \$224,000 and interquartile mean cost was \$78,000. Average cost per thousand enplanements was \$3100, and interquartile mean cost was \$300. Average cost per thousand operations was \$5,500 and interquartile mean cost was \$1,200. Only one airport reported on costs of compliance with the modified requirements for federally-funded land acquisition. Upon further review, it appears that the costs reported were the total land acquisition costs of the project, not the incremental cost of the new requirements. Therefore, this data is not included in the table.

**Table TA-25. Reported Costs of Noise Compatibility Requirements**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						Interquartile Mean
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	
7. Since the beginning of CY 2000, how much did FAA requirements cost your airport to update airport Noise Exposure Maps (NEMs) to justify issuing AIP grants for your noise compatibility program or to provide documentation of the validity of your existing NEM?	8	\$10,000	\$25,250	\$75,000	\$150,025	\$1,000,000	\$195,963	\$74,175
Average Cost per thousand Enplanements	8	\$22	\$99	\$311	\$2,977	\$16,101	\$3,498	\$288
Average Cost per thousand Operations	8	\$531	\$1,499	\$3,994	\$11,481	\$120,380	\$20,462	\$8,327
39. How much did it cost your airport to develop the noise land inventory and reuse plan as required by FAA Program Guidance Letter (PGL) 08-02 (February 1, 2008)?	4	\$500	\$2,375	\$3,600	\$29,051	\$103,604	\$27,826	\$3,600
Average Cost per thousand Enplanements	4	\$2	\$9	\$12	\$29	\$75	\$25	\$12
Average Cost per thousand Operations	4	\$26	\$140	\$179	\$593	\$1,833	\$554	\$179
<b>Total Part 150 Compliance Costs</b>							<b>\$223,789</b>	<b>\$77,775</b>
Total Average Cost per thousand Enplanements							\$3,524	\$300
Total Average Cost per thousand Operations							\$21,016	\$8,506

### ***Other FAA and DOT Environmental Requirements***

#### Background and Changes in Requirements

FAA 150-5370-10E, *Specifying Construction of Airports* (September 30, 2009), primarily incorporates information related to airport safety, design, and construction standards. However, the AC also includes practices to help minimize pollution when performing earthwork activities, such as installing temporary controls for air and water pollution, soil erosion, and siltation. This AC was revised four times during the study period (**Table A-2**, Item #37). The AC is discussed in more detail in section C of this technical appendix, and will not be addressed further.

AC 150-5320-15A, *Airport Industrial Waste* (June 18, 2004), includes basic information on characteristics, management, and regulations related to industrial wastes generated at airports (**Table A-1**, Item 36, **Table A-2**, Item 6). The AC also provides guidance for development of Storm Water Pollution Prevention Plans that apply best management practices to eliminate, prevent, or reduce pollutants in storm water runoff associated with particular airport industrial activities.

Twenty-two out of 81 responding airports (27%) reported modifying their procedures for disposing of industrial waste in response to the FAA guidance.

#### Phase 1 Survey Results and Evaluation

Twenty-seven percent of responding airports reported modifying their procedures for disposing of industrial waste in response to the FAA guidance.

## Phase 2 Survey Results and Evaluation, Compliance Costs

**Table TA-26** summarizes the reported initial and recurring costs. Only one airport reported initial costs and two airports reported recurring costs. For consistency of presentation, the same format is used as for the other cost tables.

**Table TA-26. Reported Cost of Compliance With FAA Industrial Waste Handling Requirements**

Question(s)	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
41. How much has it cost your airport to modify its policies, practices or procedures for disposing of industrial waste, including deicing fluid, as a result of FAA guidance issued on September 8, 2008 (AC 150/5320-15A)? (Initial Costs)	1	\$306,881	\$306,881	\$306,881	\$306,881	\$306,881	\$306,881	\$306,881
Average Cost per thousand Enplanements	1	\$1,126	\$1,126	\$1,126	\$1,126	\$1,126	\$1,126	\$1,126
Average Cost per thousand Operations	1	\$18,707	\$18,707	\$18,707	\$18,707	\$18,707	\$18,707	\$18,707
<b>Recurring Costs</b>	2	\$6,000	\$7,000	\$8,000	\$9,000	\$10,000	\$8,000	\$8,000
Average Cost per thousand Enplanements	2	\$16	\$21	\$26	\$31	\$37	\$26	\$26
Average Cost per thousand Operations	2	\$242	\$334	\$426	\$518	\$610	\$426	\$426

Interquartile mean cannot be determined for items with less than three responses. Mean value is used as a proxy

Initial compliance cost was reported as \$306,000. Average recurring cost was \$8,000.

## E. Funding Sources

### E.1 Potential Funding Sources

A variety of funding sources are potentially available to help airports finance environmental compliance costs. The AIP and the PFC program administered by the FAA are sources of funding for certain requirements. Other federal agencies may also provide funding, either directly or through state programs. State funding sources may also be available. A comprehensive discussion of federal and state funding sources for environmental initiatives is contained in ACRP Synthesis 24.

### AIP Funding

Projects for compliance with the Clean Water Act and the Federal Water Pollution Control Act are eligible for AIP funding. Systems for collection of aircraft deicing fluid are also eligible. In addition, funds from the “Noise Set-Aside” established by 49 USC § 47117 may be used for defined projects to comply with the Clean Air Act and, since 2012, the Clean Water Act. The primary use of the Noise Set-Aside is to fund development of NEMs and development and implementation of NCPs under 14 CFR Part 150. The Noise Set-Aside was potentially available to defray a portion of any increased costs associated with the modifications to Part 150 program requirements, subject to certain conditions.

If a development project is eligible for AIP funding, preparation of the EA or EIS is also eligible for AIP funding, and required mitigation measures may also be eligible.

The AIP share of environmental projects at small airports was 95% during most of the study period. In FY 2012 the AIP share for most small airports was reduced to 90%.

### PFC Funding

PFC eligibility for environmental requirements is comparable to AIP eligibility. PFCs can be used to pay the local matching share of AIP-funded projects or can be used to pay the full costs of projects. One difference is that AIP funds (with limited exceptions) can be used to fund Part 150 noise compatibility projects only if the project is included in an FAA-approved noise compatibility program. PFCs can be used for a project that is eligible for approval under Part 150, even if it is not in an approved plan.

### Other Federal Funding Sources

ACRP Synthesis 24, Table 1 summarizes federal funding opportunities for environmental initiatives. Eight other federal agencies provide environmental funding. For some of the federal agencies or programs, funds are provided only for voluntary actions, not for mandatory compliance actions. There are exceptions to this general policy, as discussed in section E.2 below.

### State Funding Sources

State funds are also available for many environmental initiatives. ACRP Synthesis 24, Table 2 summarizes state funding opportunities. Funding opportunities are listed by state and category of initiative. Many of the state program funds are available only for voluntary actions.

State airport grant programs may also be available to fund environmental initiatives. These programs are also summarized in ACRP Synthesis 24, Table 2.

## ***E.2 Use of Financial Assistance***

The Phase 2 survey requested information on cost of compliance with environmental requirements and the amounts funded by or received from third parties. Several airports reported receiving funds from third parties for various environmental requirements, but they did not specify the sources of third-party funding.

### Air Emissions Inventory

One airport reported receiving third-party funding related to an air emissions inventory in the amount of \$7,500. Although this amount is similar to the average cost of conducting an air



emissions inventory, these funds may have otherwise been used to install equipment or devices to control air emissions from the airport.

### Drinking Water Supplier Requirements

Grants and funding were made available to drinking water supply utilities through Drinking Water State Revolving Funds to meet costs associated with compliance or implementation of necessary upgrades. States must annually provide a minimum of 15% of drinking water loans to systems serving fewer than 10,000 people, which are typical of systems serving small airports. No airports responding to the Phase 2 survey reported obtaining grants or other funding from third parties to offset compliance costs.

### All Appropriate Inquiries (Land Acquisition)

Airports must provide a Certificate of Environmental Site Assessment (ESA) to FAA after conducting a Phase 1 ESA when purchasing properties using AIP funds. Three airports reported funding was provided by a third party for work related to Phase I/II/III ESAs. For two of the airports the third party payment was 95% of the total costs to prepare the ESA – a figure consistent with AIP funding. The third airport received 50% of the reported costs to perform the ESA. It is possible that this percentage represented the share of AIP funding provided by the FAA for the underlying land acquisition project, but this possibility cannot be determined with certainty.

### Bulk Oil Storage Operations and SPCC

Two airports reported receiving third-party funds in the amounts of \$17,300 and \$61,750 to implement the airport's SPCC program. In the first case, the amount was exactly equal to reported cost of preparing the SPCC plan and was 87% of the combined cost of the plan and equipment purchases or facility retrofits. In the second case, the amount was 95% of the reported cost of equipment purchase or retrofits. This percentage is consistent with receipt of an AIP grant for the capital costs associated with compliance.

### Construction Storm Water Requirements

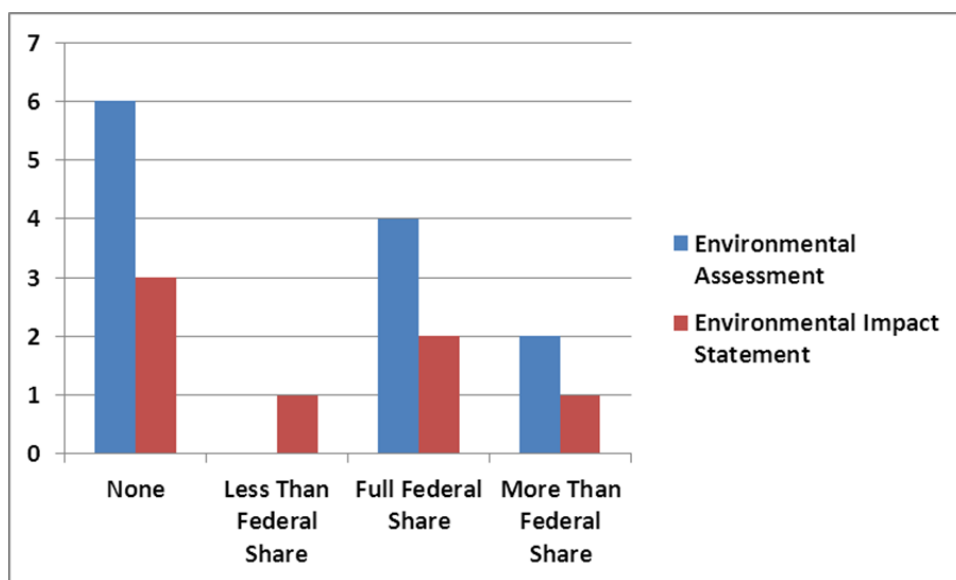
In many cases storm water controls implemented as part of an airport's construction SWPPP also meet the pollution prevention criteria for earthwork activities required under FAA AC 150-5370-10, *Specifying Construction of Airports*. Use of the AC is also mandatory for AIP or PFC-funded projects. Two airports reported receiving funds associated with the CSWPP Plan from third-parties in the amounts of \$2,438 and \$14,250. These funding amounts represented 97.5% and 95% of the cost of preparing the Construction SWPP, respectively. These percentages are consistent with the receipt of an AIP grant by a small airport, with the former airport receiving additional assistance to cover one-half of the matching share requirement. If

the projects triggering the CSWPP plan were funded with AIP grants, the costs of developing the plan would have been eligible for AIP funding.

### NEPA Requirements

Two out of six airports reporting costs for a CATEX also reported receiving third-party funding. One airport received 95% of the cost; the other received 97.5%. These percentages are consistent with the receipt of an AIP grant by a small airport, with the latter airport receiving additional assistance to cover one-half of the matching-share requirement.

**Figure TA-25** depicts the number of airports reporting third-party funding for EAs and EISs. Because many projects triggering EAs or EISs are eligible for AIP funding, figure presents the data in terms of the federal share of the costs of the EA or EIS. The airports reporting receipt of more than the federal share from third-parties probably received additional assistance to pay for the local matching requirement.



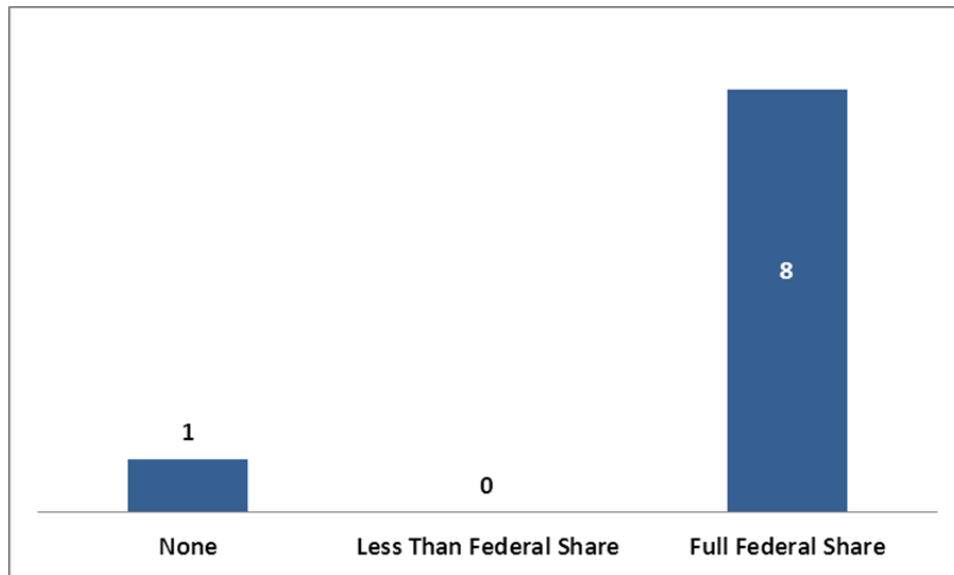
**Figure TA-25. Third Party Funding of NEPA Documents**

An equal number of airports that conducted EAs received no third-party funding as received at least the full federal AIP share (six each). Three airports performing EISs received no third party assistance, and three received at least the full federal share. The seventh airport that received third-party assistance received less than the full federal AIP share.

### FAA Noise Compatibility Program Requirements

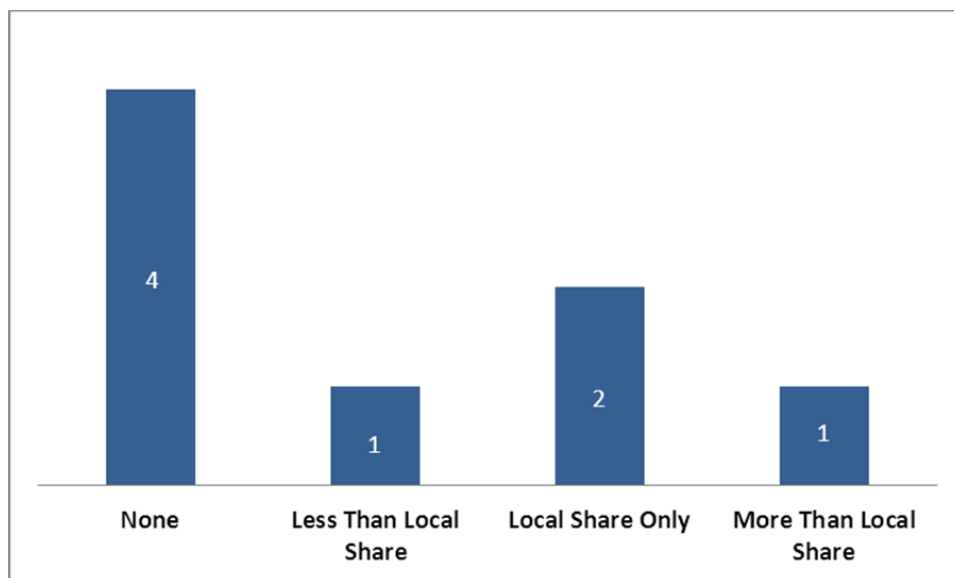
Airports reported using only airport funds (other than PFCs) to fund development of noise land inventory and reuse plans.

The analysis of funding for NCP requirements focuses on the use AIP and PFC funds, similar to the analysis of other FAA requirements in **Technical Appendix 2**. **Figure TA-26** summarizes the use of AIP funds. Seven out of eight airports received the full federal share of funds for their NEM updates. One airport did not receive any AIP funding.



**Figure TA-26. AIP Funding Levels for Noise Compatibility Requirements**

**Figure TA-27** summarizes the use of PFCs to fund compliance with the noise compatibility requirements. The same number of airports used no PFCs (four) as used some PFCs. The single airport that used PFCs for more than the local match funded its project entirely with PFCs.



**Figure TA-27. PFC Funding Levels for Noise Compatibility Requirements**

## TECHNICAL APPENDIX 4. ANALYSIS OF SECURITY REQUIREMENTS

### A. Transition from FAA to Transportation Security Administration Responsibility

In January 2000 (the beginning of the study period), the FAA was responsible for civil aviation security under Title 49 of the United States Code. The FAA issued and administered Federal Aviation Regulations (FARs) for aviation security, which were codified in 14 CFR, Parts 91, 107, 108, 109, 121, 129, 135, 139 and 191. Part 107 contained the rules governing airport security.

Under FAR Part 107, airports regularly serving scheduled passenger operations of an air carrier required to have a security program by Part 108, or a foreign air carrier required to have a security program by Part 129, were required to adopt and carry out an airport security program (ASP). The ASP describes how the airport would comply with and carry out the federal regulations and requirements. The ASP must be comprehensive, written, signed by the airport operator or their designee and be approved by the FAA. Prior approval was required for all changes or amendments to the ASP. The key elements and requirements of the ASP were:

- A description of each Aircraft Operations Area (AOA), exclusive area, and other adjacent areas including dimensions, boundaries, and pertinent features
- Access control of persons and vehicles in the AOA
- Descriptions of the procedures, facilities and equipment used to control, detect and monitor access of persons and vehicles
- Law enforcement functions and support
- Airport identification media including control, use and display of airport-approved identification or access media
- Aviation security measures for:
  - ◆ Access and movement of people and vehicles
  - ◆ Contingency plans
  - ◆ Airport emergency plan
- Records maintenance system
- Airport Security Coordinator (ASC)

ASPs usually included numerous appendixes that addressed other areas or issues and may have required more detailed or more frequent updates such as:

- Organizational diagrams

- Scale map of the airport and peripheral area
- Detailed map showing landside, airside and security restricted areas and access control points
- Airline operator's contact information
- Private organizations/businesses/tenants operating at the airport

In 2000, the FAA's Office of Intelligence regularly analyzed and evaluated threat information from the intelligence community and determined if there was a threat to aviation. If there was, the Office of Policy and Plans, in coordination with the Office of Security Operations, designed countermeasures to combat the threat and issued an Emergency Amendment (EA) to Airport Security Programs. This was done through an emergency rulemaking process that allowed for immediate implementation, if necessary, without a notice and comment period. On June 8, 2000, the Associate Administrator for Civil Aviation Security issued an EA to all U.S. airports covered by 14 CFR Part 107 that required additional security procedures. These emergency procedures were primarily an increase in the required frequency of existing measures such as police patrols of the perimeter and additional restrictions on access points.

The Airport Security Improvement Act of 2000 (Pub. L. 106-528, (November 22, 2000)) amended aviation law in a number of ways that included:

- Directing the FAA Administrator to expand a pilot program for electronic fingerprint transmission supporting criminal history record checks into an aviation industry-wide program;
- Requiring a criminal history record check (fingerprint check) be done for any individual applying for a position as a security screener, a screener supervisor, or other position that will allow unescorted access to an aircraft or a secured area of an airport;
- Listing additional crimes in the past ten years preceding an employment investigation for which an individual will be barred from employment in a position as a security screener or a position that will allow unescorted access;
- Directing the Administrator to issue a final rule on the certification of screening companies;
- Establishing new minimum standards for the training of security screeners; and
- Directing the issuance of an amendment to air carrier security programs to require a manual process to increase the number of checked bags that are selected for screening by explosive detection systems.

The FAA had been working on revisions to FAR Part 107 for several years and had incorporated some of these requirements into a draft rulemaking document in the summer of 2001. The revisions had not been published prior to September 11, 2001.

Following the events of September 11, 2001 (9/11 events), Congress enacted the Aviation and Transportation Security Act (ATSA) of 2001 (Pub. L. 107-71 (November 19, 2001)). ATSA required enormous changes in airport and airline security. ATSA established the TSA under the Secretary of Transportation and transferred authority for all civil aviation security functions from FAA to the TSA. On December 28, 2001, the DOT published in the Federal Register (66 Fed. Reg. 67117) a final rule that implemented ATSA, by amending the DOT's Organizational Regulation, 49 CFR Part 1, to recognize the establishment of the TSA and outline TSA's general responsibilities which include:

1. Security relating to civil aviation and all other modes of transportation within the Department of Transportation, including at transportation facilities;
2. Federal security screening operations for passenger air transportation and intrastate air transportation;
3. Managing and carrying out program and regulatory activities, including administering laws and promulgating and enforcing security-related regulations and requirements in all modes of transportation, including at transportation facilities;
4. Receiving, assessing, coordinating and distributing intelligence information related to transportation security;
5. Developing, coordinating and carrying out plans to discover, prevent and deal with threats to transportation security;
6. Identifying and undertaking research and development activities related to enhancing transportation security; and
7. Coordinating domestic transportation, including aviation, rail, and other surface transportation, and maritime transportation (including port security) and overseeing all transportation-related security responsibilities of the federal government, other than the Department of Defense and the military departments, during a national emergency.

During 2001, the TSA issued five emergency rulemakings (four emergency amendments and one security directive) affecting airports. Once ATSA was enacted, TSA decided to change the name of the airport emergency amendments (EAs) to Security Directives (SDs) similar to those issued to air carriers. Previously, the FAA designated emergency rulemakings for air carriers under Part 108 as SD's. Emergency amendments for airports under Part 107 were called EAs. Consequently, when an "SD" was issued, industry participants understood that it related to air carriers. If an "EA" was issued, it applied to airport(s). Under ATSA, TSA elected to use the single designation of SD to apply to requirements established for airports and air carriers.

TSA and FAA issued a final rule published in the Federal Register (67 FR 8340) on February 22, 2002 that transferred all rules governing civil aviation security from FAA to TSA. The rulemaking also amended those rules to enhance security as required by ATSA. The final rule was adopted without notice and comment. This transfer required complete ASP updates by all airports that were subject to Part 107 to change the verbiage and incorporate new changes in security requirements.

The TSA is now responsible for issuing and administering Transportation Security Regulations (TSRs), which are codified in 49 CFR Parts 1500 through 1699. Transportation Security is assigned Part 1500 and Airport Security 1542.

## **B. Overview of Requirements**

**Table A-4** in **Appendix A** of the research report summarizes the security requirements adopted during the study period. Twenty-one requirements were adopted by the FAA; 58 were adopted by the TSA and one was adopted jointly by FAA and TSA. One was adopted by Customs and Border Protection (CBP).

Of the 81 total, two were regulations or amendments to regulations published in the Federal Register. Seventy-seven were EAs or SDs. One document was an amendment to Airport Security Program Requirements (AP). The CBP document was a guidance document on airport technical design standards.

As noted in the table, the SDs and EAs and AP include security sensitive information (SSI). Disclosure of SSI is prohibited except on a need to know basis to individuals with appropriate security clearances. SSI may not be included in reports available to the general public. Consequently, summaries of these documents could not be included in the table. The summaries of the regulatory documents are based on published rulemaking documents, and the CBP guidance document was also available publicly.

Some EAs and SDs went through multiple revisions during the study period. All versions adopted during the study period are listed in **Table A-4**, because each version may have had cost impacts for airports.

The regulatory and compliance documents are listed in chronological order, with the same exception as noted in prior discussions. For the documents that were subject to revisions, amendments, reissuances etc., all versions are listed sequentially to facilitate the tracking of changes to the requirements over time.

### C. Published Cost Information

Only one security rulemaking document – an FAA amendment to Parts 107 and 108 to eliminate exceptions to the criminal history check requirement (**Table A-4**, Item #21) – included a projection of costs. The rulemaking document projected total annual costs to all entities at \$2.8 million. Another rulemaking document – transferring security requirements from FAA to TSA (**Table A-4**, Item #27) – noted that the rule would add costs to *aircraft operators* and stated that an assessment would be conducted in the future. None of the other compliance and regulatory documents included in **Table A-4** incorporated estimates of costs. An assessment of the likely cost impacts of the SDs and EAs would have required a discussion of the nature of these documents. Such a discussion could have resulted in the disclosure of SSI, which is prohibited.

### D. Analysis of Survey Results

Because the specific security requirements adopted during the study period for the most part involve SSI, the security questions in the Phase 1 and Phase 2 surveys did not inquire about specific requirements. Instead, the questions asked whether airports had installed or modified equipment or systems to comply with new security requirements during the study period.

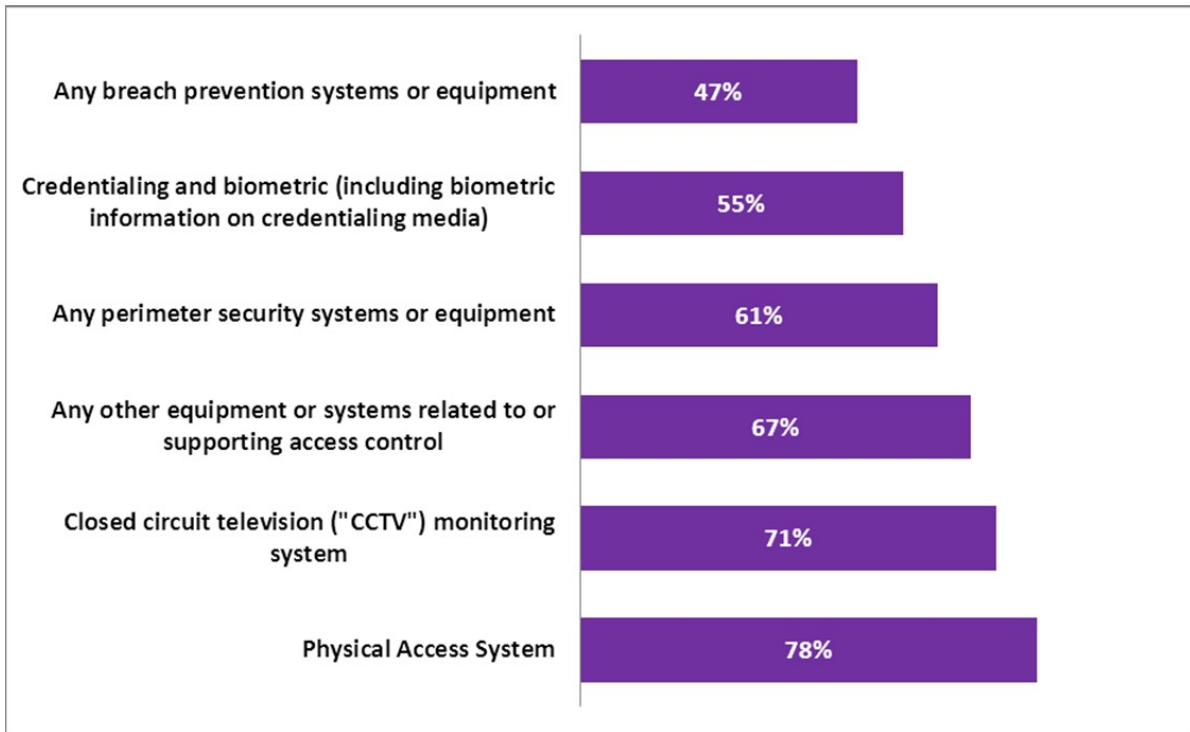
#### ***D.1 Security Equipment and Access Control Systems***

The survey identified six security systems used for access control or security, as shown in **Figure TA-28**.

##### Phase 1 Results and Evaluation

As summarized in **Figure TA-28**, the percentage of airports that reported installing or modifying security and access control equipment ranged from 49% (breach prevention system or equipment) to 78% (physical access system).





**Figure TA-28. Airports Installing Security Equipment or Access Control Systems**  
*(Sample: 72-83 airports)*

*Phase 2 Results and Evaluation, Compliance Costs*

**Table TA-27** summarizes the costs reported in the Phase 2 survey responses for security equipment or access control systems.

**Table TA-27. Reported Costs For Installing Security Equipment or Access Control Systems**

Questions	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
<b>69</b> How much has it cost your airport to install or modify any of the following between January 1, 2000, and December 31, 2010, as a result of a new Transportation Security Administration ("TSA") regulation, security directive or other TSA or Department of Homeland Security ("DHS") requirement?								
Physical Access System	23	\$12,000	\$176,531	\$325,000	\$1,576,162	\$4,300,000	\$935,888	\$538,137
Closed Circuit Television ("CCTV") Monitoring System	18	\$20,000	\$39,009	\$135,220	\$500,000	\$4,793,493	\$796,979	\$234,617
Credentiaing and biometric (including biometric info on credentiaing media)	10	\$3,600	\$13,750	\$50,000	\$128,750	\$500,000	\$100,660	\$46,750
Any breach prevention systems or equipment	2	\$50,000	\$56,250	\$62,500	\$68,750	\$75,000	\$62,500	\$62,500
Any perimeter security systems or equipment	6	\$50,000	\$57,500	\$90,000	\$100,000	\$2,421,054	\$466,842	\$93,333
Any other equipment or systems related to access control	2	\$20,000	\$640,000	\$1,260,000	\$1,880,000	\$2,500,000	\$1,260,000	\$1,260,000
<b>Total Initial Cost</b>							\$3,622,869	\$2,235,337
<b>Average Cost per thousand Enplanements</b>								
Physical Access System	23	\$175	\$997	\$2,726	\$6,160	\$136,184	\$10,535	\$2,880
Closed Circuit Television ("CCTV") Monitoring System	18	\$61	\$319	\$1,202	\$2,927	\$13,369	\$2,357	\$1,276
Credentiaing and biometric (including biometric info on credentiaing media)	10	\$28	\$114	\$159	\$354	\$1,307	\$343	\$164
Any breach prevention systems or equipment	2	\$112	\$125	\$138	\$151	\$164	\$138	\$138
Any perimeter security systems or equipment	6	\$252	\$288	\$1,025	\$2,027	\$8,886	\$2,265	\$1,025
Any other equipment or systems related to supporting access control	2	\$49	\$2,032	\$4,014	\$5,997	\$7,979	\$4,014	\$4,014
<b>Total Average Initial Cost per thousand Enplanements</b>							\$19,653	\$9,496
<b>Average Cost per thousand Operations</b>								
Physical Access System	23	\$1,341	\$14,005	\$41,034	\$88,701	\$316,957	\$61,691	\$35,437
Closed Circuit Television ("CCTV") Monitoring System	18	\$857	\$4,555	\$17,546	\$41,359	\$128,533	\$30,434	\$16,963
Credentiaing and biometric (including biometric info on credentiaing media)	10	\$531	\$1,448	\$2,347	\$6,948	\$20,530	\$4,942	\$2,337
Any breach prevention systems or equipment	2	\$671	\$1,426	\$2,182	\$2,937	\$3,693	\$2,182	\$2,182
Any perimeter security systems or equipment	6	\$1,341	\$4,316	\$5,258	\$21,945	\$147,580	\$31,825	\$5,258
Any other equipment or systems related to supporting access control	2	\$939	\$27,475	\$54,012	\$80,548	\$107,085	\$54,012	\$54,012
<b>Total Average Initial Cost per thousand Operations</b>							\$185,085	\$116,188

Interquartile mean cannot be determined for items with less than three responses. Mean value is used as a proxy

The highest mean expenditure was for "any other equipment" at \$1.3 million, followed by physical access systems at \$936,000. Based on interquartile mean costs, physical access systems were also the second most costly item at \$538,000. The least costly item was breach prevention equipment (average cost of \$62,000). Average total cost was \$3.5 million. Average total cost per thousand enplanements was \$20,000, and average total cost per thousand commercial operations was \$185,000. Interquartile mean cost was \$2.2 million. Interquartile mean cost per thousand enplanements was \$9,500, and interquartile mean cost per thousand commercial operations was \$115,000.

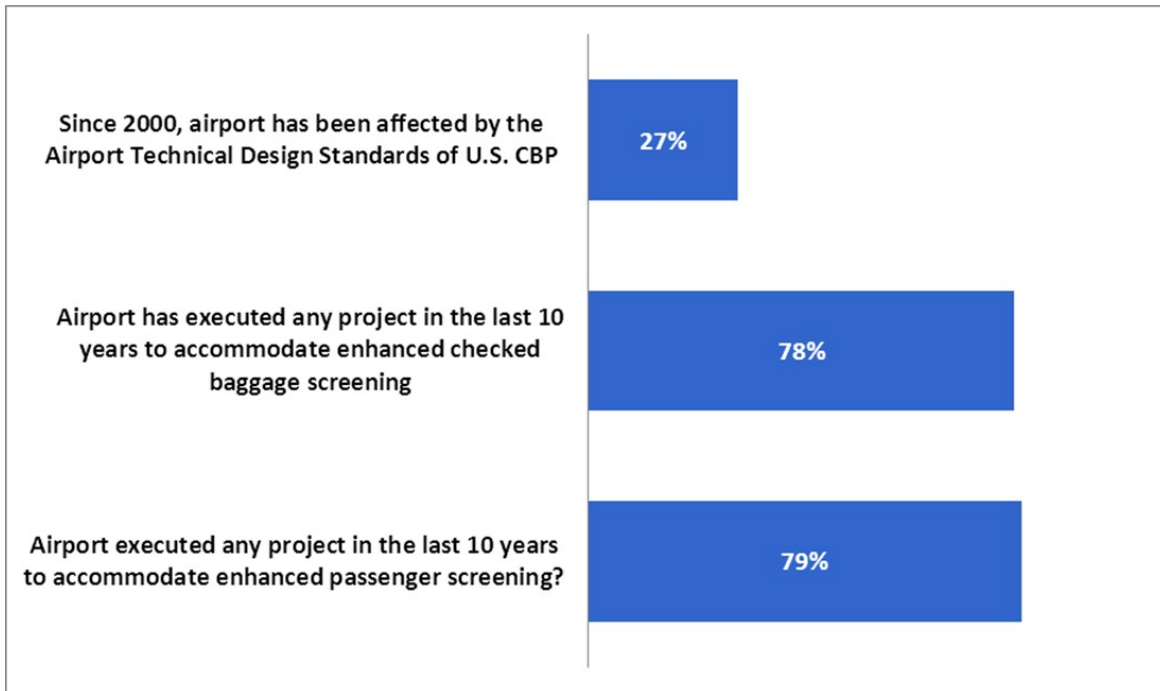
## D.2 Screening Requirements

Following the 9/11 events passenger and checked baggage screening requirements were enhanced. At many airports, screening facilities or equipment were modified. In addition, in 2006, the U.S. Customs and Border protection issued new guidance on design and construction for CBP inspection facilities (Table A-4, Item 77).

### Phase 1 Survey Results and Evaluation

As shown in Figure TA-29, 79% of responding airports reported executing a project for passenger screening, and 78% reported executing a project for checked baggage screening. Only

27% of airports reported being affected by the CBP design standards. This lower percentage probably reflects the lack of CBP activities at many small airports.



**Figure TA-29. Airports Executing Passenger or Baggage Screening and CBP Projects**  
(Sample: 22-85 airports)

### Phase 2 Survey Results and Evaluation, Compliance Costs

**Table TA-28** summarizes the costs of screening projects reported in the Phase 2 survey.

**Table TA-28. Reported Costs for Screening and Inspection Projects**

Questions	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
70 How much has it cost your airport to execute any project in the last 10 years to accommodate enhanced checked baggage screening?								
Total Project Costs	24	\$10,000	\$121,695	\$400,000	\$2,500,000	\$26,700,000	\$3,161,519	\$768,055
Average Cost per thousand Enplanements	24	\$7	\$968	\$2,692	\$7,214	\$59,706	\$7,623	\$3,499
Average Cost per thousand Operations	24	\$158	\$12,022	\$31,476	\$107,065	\$586,201	\$114,293	\$36,670
71 How much has it cost your airport to execute any projects in the last 10 years to accommodate enhanced passenger screening?								
Total Project Costs	23	\$4,500	\$55,000	\$224,049	\$2,330,000	\$23,126,750	\$2,076,711	\$637,377
Average Cost per thousand Enplanements	23	\$7	\$138	\$3,193	\$6,931	\$48,302	\$7,541	\$3,011
Average Cost per thousand Operations	23	\$158	\$2,395	\$17,501	\$117,339	\$706,894	\$90,343	\$34,250
Total Security Screening Costs							\$5,238,231	\$1,405,432
Cost per Thousand Enplanements							\$15,164	\$6,510
Cost per Thousand Operations							\$204,636	\$70,920
73 Since the beginning of Calendar Year (CY) 2000, how much has the adoption or modification of Airport Technical Design Standards by U.S. Customs and Border Protection (CBP), or its predecessor cost your airport?								
i. Total initial cost:	5	\$72,000	\$275,000	\$400,000	\$450,000	\$4,780,000	\$1,195,400	\$375,000
Average Cost per thousand Enplanements	5	\$0	\$1	\$1	\$2,231	\$12,491	\$3,413	\$1,143
Average Cost per thousand Operations	5	\$1	\$15	\$22	\$36,174	\$196,264	\$53,998	\$18,432

The range of cost for checked baggage screening (from \$10,000 to \$26.7 million) was the widest of the three categories of screening projects. Checked baggage projects were also the most expensive, on average (\$3.2 million). Average cost for passenger and baggage security screening combined was \$5.2 million, with average cost per thousand passengers of \$15,000 and average cost per thousand commercial operations of \$205,000. Interquartile mean cost was \$1.4 million, with interquartile mean cost of \$6,500 per thousand passengers and \$71,000 per thousand operations.

Average cost for CBP facility requirements was \$1.2 million per airport, \$3,400 per thousand enplanements, and \$54,000 per thousand commercial operations. Interquartile mean cost was \$375,000 per airport, \$1,100 per thousand passengers, and \$18,000 per thousand commercial operations.

Two other categories of costs were not included in the survey, but were discussed in the case studies. First, airports are required to provide law enforcement officer presence or availability for passenger screening checkpoints. Second, airports are required to provide screening space to TSA on a rent-free basis. Airports are entitled to reimbursement for utility costs and certain maintenance costs, but not all airports seek reimbursement.

The case study airports noted the law enforcement officer (LEO) expense, but only one airport, Huntsville could estimate the additional cost. Four out of the five case study airports were able to estimate the annual lost rental income resulting from the rent-free space requirement. **Figure TA-30** summarizes the lost revenue reported by these airports. For airports with TSA space funded by AIP grants, the grant assurances preclude charging TSA rent in any

event, however. Also, some airports may include the cost of TSA space in calculating terminal rental rates for airlines.

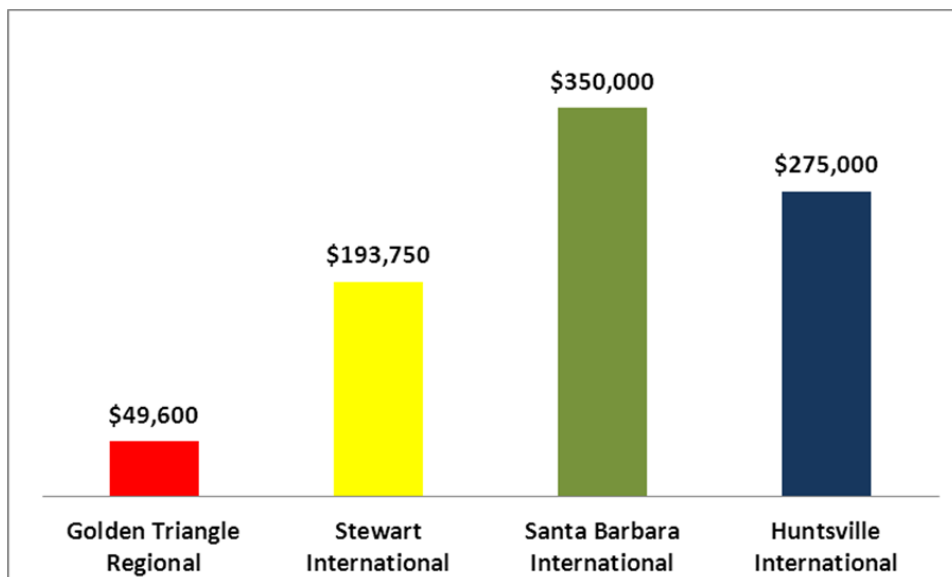


Figure TA-30. Lost Revenue From TSA Screening Space

## E. Funding Sources

Enhanced screening of passengers and baggage after the 9/11 events has led many airports of all sizes to incur substantial capital costs. In particular, passenger screening checkpoints have been expanded and reconfigured. Baggage handling systems and the facilities housing them have been reconfigured as well to accommodate automated in-line screening of checked baggage. Even where in-line systems were not installed, airports may have incurred expenses to modify ticketing areas to accommodate free-standing Bulk Explosive Detection System (EDS) installations. TSA is responsible for the costs of acquiring and installing the screening equipment itself. Modification of facilities and baggage handling equipment is the responsibility of the airport – as are any incremental operation and maintenance (O&M) costs (primarily electric utilities and additional law enforcement personnel). Since the passage of ATSA, both FAA and TSA have administered financial assistance programs for the capital costs associated with passenger and baggage screening.

In addition, airports have incurred costs to upgrade various security systems for access control, perimeter security and monitoring functions. Also, in 2006, the U.S. CBP issued revised standards and guidance for design and implementation of CBP facilities in airports.

Finally airports have incurred added personnel costs to provide enhanced security staffing and patrols and to provide for law enforcement officer presence at screening checkpoints.

## ***E.1 Potential Funding Sources for Security Requirements***

### **AIP and PFC Funding**

ATSA made capital development to comply with TSA security requirements eligible for AIP passenger entitlement and discretionary funds. In FY 2002 and FY 2003, AIP funding for security projects increased substantially to support reconfiguration of passenger screening checkpoints and checked baggage handling equipment and facilities. In FY 2002, the federal share of security projects was temporarily increased to 100%. Security projects eligible for AIP funds were also eligible for PFCs. The airport's local matching share or the entire amount of project costs was eligible for PFC funding.

In 2003, Congress limited AIP eligibility for checked baggage screening to AIP passenger entitlement funds. However, in the same fiscal year and the years since, annual FAA appropriation legislation has prohibited use of any AIP funds for these purposes. The projects continue to be eligible for PFC funding.

Facilities to accommodate CBP functions are considered terminal development and are eligible for AIP funding. At small hub airports, only passenger entitlement funds may be used for terminal development. At non-hub airports, discretionary funds may be used as well. However, terminal development is considered to be low priority by the FAA. Only limited amounts of AIP discretionary funds are made available for terminal development each year. The federal share for AIP grants for terminal development at small airports was 95% for most of the study period. Effective in FY 2012, the federal share is 90%.

As terminal development, CBP facilities may be funded with PFCs. PFCs can be used as the local match for AIP funds or the sole funding source.

### **TSA Funding**

Since the enactment of ATSA, TSA has provided funds directly to airports to support the installation of automated in-line checked baggage EDSs. The legal document supporting the transfer of funds is called an Other Transaction Agreement (OTA). Unlike the AIP, there is no statutorily defined federal share for TSA funded projects. Generally, the TSA determines federal share based on an airport's security classification. For Category III and IV airports, which are usually smaller airports, the typical federal share is 95%.

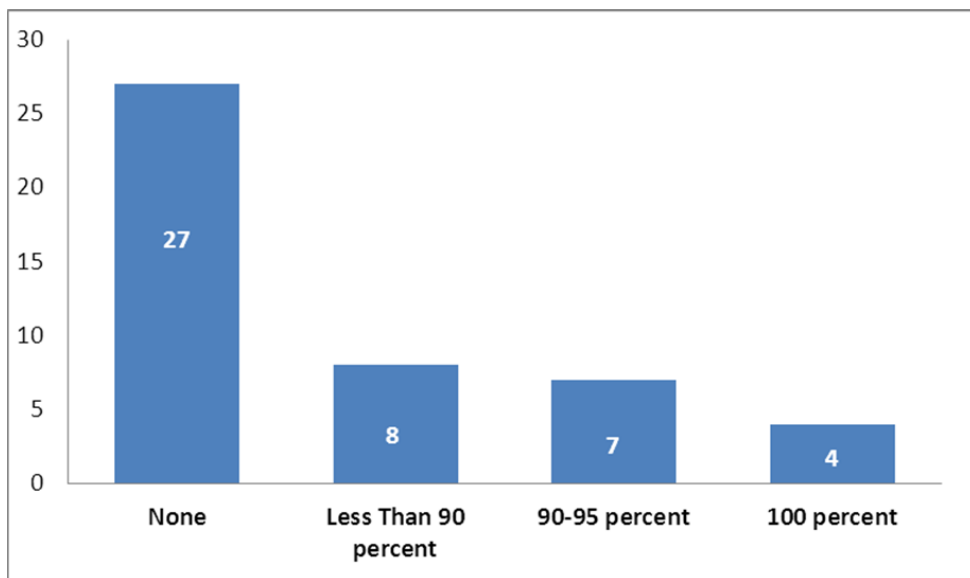
The TSA LEO support program reimburses participating airports for the cost of providing LEOs at screening checkpoints. The amount of reimbursement is based in part on the funds appropriated each year for this purpose, the number of airports participating and each airport's LEO costs.

## E.2 Use of Financial Assistance

The Phase 2 survey requested information on funding sources for passenger and checked baggage screening systems and for compliance with CBP requirements. The survey did not include questions about funding sources for security and access control equipment and facilities.

### Passenger and Baggage Screening

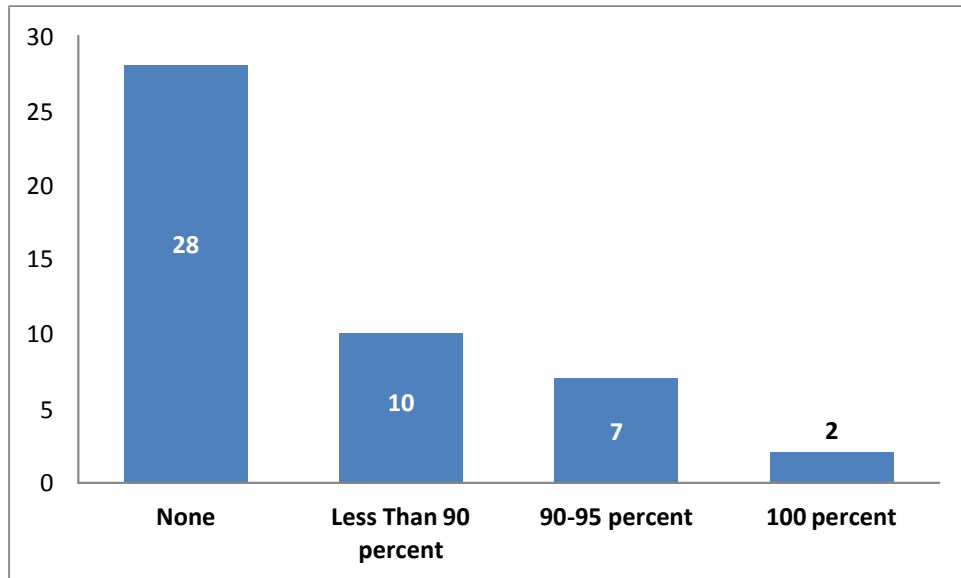
For passenger and baggage screening the survey included questions on funding provided by the airport, funding provided by TSA and funding provided by other sources. Other sources could include AIP funding, PFC funding or state funding. **Figure TA-31** summarizes the scope of TSA funding for screening projects during the study period. The counts for passenger and baggage screening are combined. The 90-95 percent bar reflects TSA funding at a share comparable to FAA funding, which is typical of the percentage received by smaller airports. **Figure TA-32** summarizes the scope of funding from other sources. Because other funding sources could have included AIP funds until 2003, the same funding levels are used. The 90-95 percent bar reflects the federal AIP share during the study period.



<sup>1</sup>Counts include airports completing both baggage and passenger screening projects

**Figure TA-31. TSA Funding Levels for Baggage and Passenger Screening Projects<sup>1</sup>**

A substantial majority of airports (27 out of 46) received no TSA funding. Four airports reported receiving 100% funding from TSA.



<sup>1</sup>Counts include airports completing both baggage and passenger screening projects

**Figure TA-32. “Other Source” Funding Sources for Baggage and Passenger Screening Projects<sup>1</sup>**

As shown in **Figure TA-32**, a similarly large majority (28 out of 46 projects) did not receive funding from “other sources” beside TSA. Airports that did not receive either TSA or “other” funding, would have used their own resources to finance the projects.

The survey did not include questions about the costs of providing LEO support for screening, including the extent of reimbursement. The case study airports reported that TSA participation is declining while the costs of providing LEO support are rising.

### CBP Facility Requirements

Five airports reported initial costs of complying with CBP facility requirements. One airport used PFCs to finance the entire costs of compliance. Two airports used other airport resources to fund the full costs of compliance. Two airports relied entirely on other funding sources.

The survey included a question about recurring costs of compliance with CBP facility requirements. Three airports responded. Two reported funding compliance entirely from airport resources. One airport reported CBP funded the full costs of compliance.



## **TECHNICAL APPENDIX 5. ANALYSIS OF OCCUPATIONAL SAFETY AND HEALTH REQUIREMENTS**

### **A. Background**

The applicability of the Occupational Safety and Health Administration (OSHA) regulations and requirements to an individual airport depends on the structure and ownership of the airport. OSHA generally does not enforce the health and safety regulations if another federal agency has responsibility for the health and safety of the Agency employees. Additionally, the Williams-Steiger Occupational Safety and Health Act of 1970 (OSH Act) Pub. Law 91-596 (December 29, 1970) is not applicable to public employees. The following background information provides a discussion of the FAA's role, as a federal agency, regarding health and safety and a discussion of what constitutes a public employee.

#### ***A.1 Federal Occupational Safety and Health Jurisdiction***

Section 4(b)(1) of the OSH Act provides that nothing in the OSH Act, "shall apply to working conditions of employees with respect to which other federal agencies...exercise statutory authority to prescribe or enforce standards or regulations affecting occupational safety or health." Thus, OSHA is preempted from exercising its authority under the OSH Act if another federal agency has been granted statutory authority to regulate the relevant working conditions, and the other federal agency has exercised its authority in a manner such as to exempt the cited working conditions from OSHA's jurisdiction.

29 CFR §1975.5(a) indicates that the term 'employer' as used in the OSH Act excludes the United States and States and political subdivisions of the State (such as cities and counties). As such, these entities are not covered as employers under the Act.

29 CFR §1975.5(b) states that any entity which has been created directly by the State, so as to constitute a department or administrative arm of the government, or administered by individuals who are controlled by public officials and responsible to such officials or to the general electorate, shall be deemed to be a "State or political subdivision thereof" under section 3(5) of the OSH Act and, therefore, not within the definition of employer, and, consequently, not subject to the Act as an employer.

29 CFR §1975.5(e)(2) explains that depending on the facts in the particular situation, the following types of entities would probably be excluded as employers under section 3(5) of the OSH Act: harbor districts, irrigation districts, port authorities, bi-State authorities over bridges, highways, rivers, harbors, etc.; municipal transit entities; and State, county, and local hospitals and related institutions. Based on this listing, most entities operating airports would probably be excluded as well.

### FAA and Occupational Safety

In 2000, the FAA and OSHA entered into a memorandum of understanding (MOU) regarding the health and safety of employees on operating aircraft. The MOU outlines safety regulations for employees on aircraft in operation (other than flight deck crew). The MOU in turn referred to guidance information published by the FAA in the Federal Register on July 10, 1975. This FAA guidance expressed the view that FAA had the sole responsibility for air carrier employee safety based on its jurisdiction over civil aviation safety under Chapter 447 of Title 49 of the US Code (49 USC § 44701 et seq.).

FAA has issued regulations and guidance on aircraft cabin safety specifically to protect crewmembers. Given FAA's stated exercise of its legislative authority, OSHA historically has not attempted to enforce the provisions of the OSH Act with respect to employees on aircraft in operation.

Notwithstanding its efforts to make the aircraft cabin safer for crewmembers, FAA acknowledges that it has not promulgated enforceable regulations to address all employee safety and health issues associated with working conditions in and around the aircraft. Where FAA has not preempted OSHA from enforcing its standards and regulations, OSHA generally has exercised its authority with respect to the working conditions of aviation employees.

In 2009, OSHA began to inspect FAA airport traffic control towers (ATCT), specifically for emergency action plans, fire prevention plans and egress. Directive FAP 01-00-005 indicates that the FAA shall ensure compliance with the exit route requirements in FAA-owned and operated airport traffic control towers. There are two alternatives to provide adequate exit routes depending upon the date of construction of the tower and the occupancy of the tower. The cited directive and actions are not new regulations; they simply increased the frequency of FAA ATCT inspection visits by OSHA compliance officers.

Neither FAA's regulation of occupational health and safety aboard aircraft nor OSHA's inspection of FAA ATCTs directly affects airport operators. The discussion in this technical appendix is intended to provide a complete picture of federal control of occupational health and safety issues in the airport environment.

## ***A.2 State and Local Agency Jurisdiction***

As discussed above, and according to the OSHA web site “OSHA Coverage of state and Local Government Workers”, State and local government workers are excluded from federal coverage under the OSH Act. However, states operating their own state workplace safety and health programs under plans approved by the U.S. Department of Labor cover most private sector workers. These states are also required to extend the coverage of their state programs to public sector (state and local government) workers in the state. Section 2(11) of the OSH Act encourages states to develop and operate their own state OSH programs.

OSHA regulations (29 CFR Part 1956) also permit states without approved plans to develop plans that cover only public sector workers. In these states, private sector employment remains under federal OSHA jurisdiction. Twenty-two states and territories operate plans covering both the public and private sectors. Four states – Connecticut, Illinois, New Jersey, and New York – plus the Virgin Islands operate public employee only plans.

States without OSHA-approved state job safety and health plans may voluntarily provide safety and health protection to their governmental workers. Many states without approved safety and health programs provide coverage to public employees, to varying degrees, through programs that do not receive federal funding and are not subject to federal OSHA oversight. States with approved plans cover most private sector employees as well as State and local government workers in the State. federal OSHA continues to cover federal and U.S. Postal Service employees and certain other employees specifically excluded by a State plan – for example, maritime operations or employees working on Indian reservations and military bases.

State plans are beyond the scope of this research and were not reviewed.

## ***A.3 OSHA Requirements and the Application to Airports***

The applicability of the OSHA standards depends upon the roles, tasks and responsibilities of airport staff, whether airport employees are public or private employees and if there is a State OSHA-approved job safety and health plan. Therefore, applicability of OSHA requirements may vary considerably from airport to airport.

As reflected in **Table A-5** in **Appendix A** of the research report, 21 OSHA regulatory or compliance actions with potential impacts on airports were adopted during the study period. Fourteen of the actions were regulatory. One of the actions was a compliance directive (**Table A-5**, Item #20). Two actions were revisions to voluntary programs and the remaining actions were guidance documents. Most airport employees would be considered public employees, however. Therefore, the OSHA requirements would apply to these employees only through the application of state or voluntary programs.

There were limited new regulations adopted from 2000 through 2010 that could have a significant direct impact on airports. The revisions to the personal protective equipment, respirator fit testing protocols, and recordkeeping forms were not significant and should not involve major costs. If airport workers are welding on stainless steel or other hexavalent chromium containing products, there is a requirement for conducting an initial assessment of exposure. Depending upon the exposure concentration, engineering controls, training and medical surveillance may be required. The extent to which airports would be directly impacted by this requirement is unclear. On the one hand, 98% of responding airports stated that they rely on contractors to perform construction and renovation work. On the other hand, 26% of the airports reported that employees also perform construction work and 22% reported that employees also perform renovation work. Also, 59% of responding airports reported in the environmental portion of the survey being responsible for welding (**Figure TA-8 in Technical Appendix 3**).

Six of the OSHA standards listed in the table primarily affect the construction industry. Almost all (98%) of responding airports contract out construction work. Where an airport relies on contractors, the cost of complying with the construction regulations, such as those governing high visibility, cranes, signs and barricades and steel erection, would be borne by the construction company, not by the airport directly. Since the construction companies would have other customers beside the airport, it is not anticipated that significant compliance costs would be directly passed along to the airports.

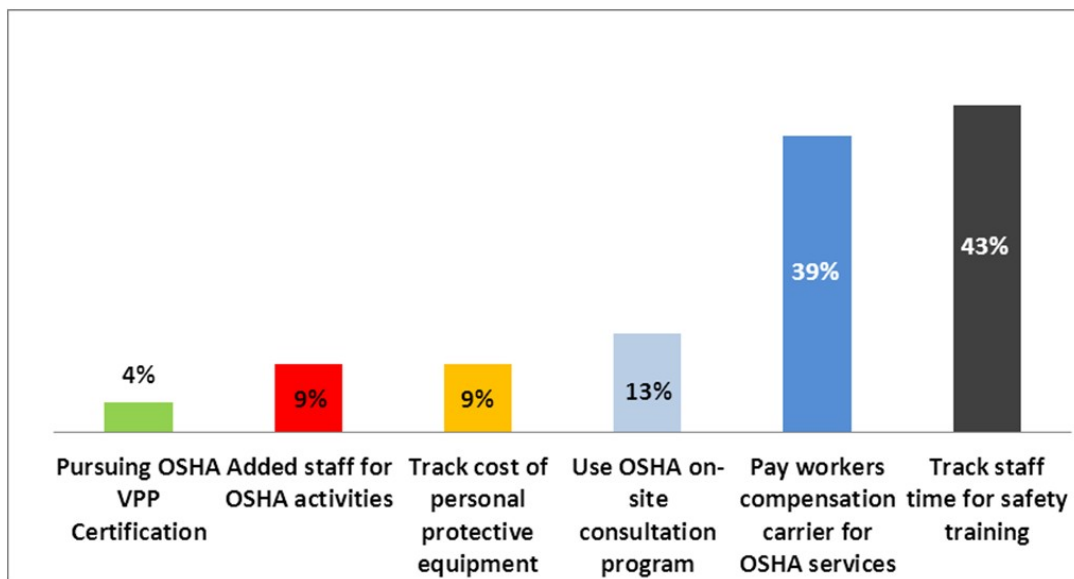
## **B. Published Cost Information**

Thirteen of the regulatory and compliance requirements listed in **Table A-5** have associated OSHA estimates of compliance costs. For 11 of the items, OSHA published an estimate of annual cost per impacted firm. For these eleven items, the highest cost per impacted firm was \$557. This figure suggests a modest impact. One item (**Table A-5**, Item #11) rescinded a requirement, representing total projected savings of \$29.5 million for the industry sector through avoided compliance costs.

## **C. Phase 1 Survey Results and Evaluation**

The questions on this subject focused on two areas. The first area was whether the respondents had implemented various policies or programs that could generate additional compliance costs for occupational safety and health. The second area focused on the types of work or activities airport employees perform. Many of the OSHA requirements adopted during the study period involve construction or construction-related activities. To the extent that airports use contractors for construction, airports would not be directly responsible for OSHA compliance. Rather compliance costs would fall on airport contractors, who would allocate the costs among all of their contracts.

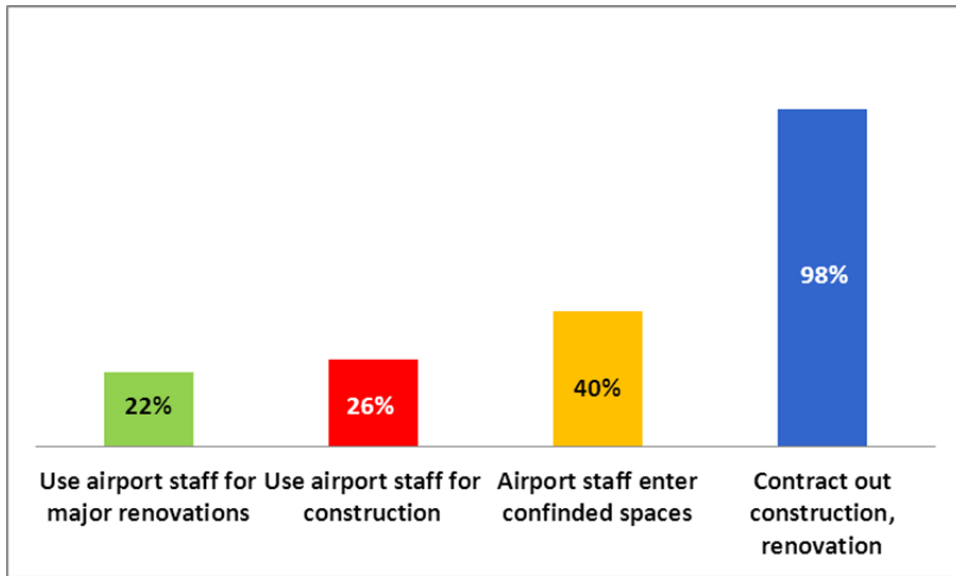
As shown in **Figure TA-33**, only nine percent of responding airports reported adding staff to comply with occupational safety and health requirements. Four percent are pursuing OSHA's Voluntary Protective Program (VPP) certification, and 13% use OSHA's On-Site Consultation Program. Thirty-nine percent reported paying their workers compensation carrier for occupational safety and health services. Forty-three percent reported tracking staff time for safety training.



**Figure TA-33. Airports Reporting Programs Generating OSHA Costs**  
(Sample: 68-82 airports)

In addition, 43% of responding airports reported they track staff hours spent in health and safety training, and 50% reported they tracked expenditures for employee protective equipment. Costs reported by airports in these groups are discussed in the next section

The survey included four questions on the use of airport employees and use of contractors. As shown in **Figure TA-34**, 98% of responding airports reported using contractors for construction and renovation. However, 26% reported also using airport employees for new construction and 22% reported using airport employees for building renovation. Forty percent of airports reported their maintenance staff entered confined spaces. This situation could trigger the requirement to provide personal protective equipment to the maintenance staff.



**Figure TA-34. Use of Airport Staff and Contractors for OSHA Regulated Activities**  
*(Sample: 66-83 airports)*

#### D. Phase 2 Survey Results and Evaluation, Compliance Costs

**Table TA-29** summarizes costs reported by airports related to general programs that may generate OSHA costs. Because of the disparate nature of the requirements, the costs of the individual items were not totaled.

**Table TA-29. Airports Reporting Programs Generating OSHA Costs**

Questions	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
58	1	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Average Cost per thousand Enplanements	1	\$114	\$114	\$114	\$114	\$114	\$114	\$114
Average Cost per thousand Operations	1	\$814	\$814	\$814	\$814	\$814	\$814	\$814
61	1	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000
Average Cost per thousand Enplanements	1	\$328	\$328	\$328	\$328	\$328	\$328	\$328
Average Cost per thousand Operations	1	\$5,033	\$5,033	\$5,033	\$5,033	\$5,033	\$5,033	\$5,033
63	11	12	78	156	375	728	261	179
How many hours are spent annually?	11	0.1	0.4	1.7	2.4	11.7	2.2	1.2
Average Hours per thousand Enplanements	11	1.0	5.9	10.3	32.7	87.6	21.8	14.1
Average Hours per thousand Operations	11							
What is the cost of staff time in health and safety training?	8	\$1,250	\$4,900	\$10,050	\$11,438	\$20,000	\$9,225	\$9,138
Average Cost per thousand Enplanements	8	\$5	\$23	\$59	\$68	\$170	\$60	\$52
Average Cost per thousand Operations	8	\$76	\$346	\$826	\$952	\$1,021	\$655	\$751
64	13	\$200	\$1,000	\$6,000	\$12,000	\$35,592	\$9,298	\$6,267
How much is the annual cost of personal protective equipment used by your staff?	13	\$8	\$16	\$26	\$56	\$2,222	\$204	\$36
Average Cost per thousand Enplanements	13	\$20	\$197	\$403	\$729	\$2,256	\$564	\$333
Average Cost per thousand Operations	13							

Interquartile mean value cannot be determined for items with less than three responses. Mean value is used as a proxy

Only one airport reported the amount of payments to workers compensation insurance carriers for occupational safety and health support – at \$125,000. Many airports participating in the survey reported that the cost of health and safety support was included in the carrier’s overall premium. Similarly only one airport reported a cost for additional airport staff to handle OSHA related activities – at \$25,000. Average cost of the staff time spent in occupational health and safety training was \$9,200, with average unit costs of \$60 per thousand enplanements and \$655 per thousand commercial operations. Interquartile mean cost was \$9,100, with unit costs of \$52 per thousand enplanements and \$751 per thousand commercial operations. The average cost of personal protective equipment was \$9,300, with average unit costs of \$204 per thousand enplanements and \$564 per thousand commercial operations. Interquartile mean cost was \$6,300 with unit costs of \$36 per thousand enplanements and \$333 per thousand operations.

**Table TA-30** summarizes the occupational safety and health compliance costs associated with construction and with the use of employees in confined spaces. Because the three specific costs elements are related, a total cost was calculated. Interquartile mean costs were not calculated because of the limited number of airports reporting cost data. Therefore, the arithmetic mean value is also presented as the interquartile cost.

**Table TA-30. Reported Costs for Use of Airport Staff and Contractors for OSHA Regulated Activities**

Questions	Valid Responses (# of airports)	Estimated Cost of Compliance (\$)						
		Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum	Mean	Interquartile Mean
65 What is the cost of complying with health and safety requirements related to airport maintenance staff entering confined spaces?	2	\$3,750	\$3,813	\$3,875	\$3,938	\$4,000	\$3,875	\$3,875
Average Cost per thousand Enplanements	2	\$9	\$10	\$11	\$12	\$13	\$11	\$11
Average Cost per thousand Operations	2	\$204	\$218	\$231	\$244	\$258	\$231	\$231
66 How much has it cost your airport to comply with health and safety requirements related to new construction completed by airport staff?	2	\$1,000	\$1,250	\$1,500	\$1,750	\$2,000	\$1,500	\$1,500
Average Cost per thousand Enplanements	2	\$2	\$3	\$4	\$5	\$6	\$4	\$4
Average Cost per thousand Operations	2	\$69	\$77	\$85	\$94	\$102	\$85	\$85
67 How much has it cost your airport to comply with health and safety requirements related to major building renovations completed by airport staff?	3	\$500	\$750	\$1,000	\$1,500	\$2,000	\$1,167	\$1,000
Average Cost per thousand Enplanements	3	\$2	\$4	\$6	\$23	\$39	\$16	\$23
Average Cost per thousand Operations	3	\$69	\$85	\$102	\$150	\$198	\$123	\$102
Total Cost for Health/Safety Requirements for Construction and Work in Confined Spaces							\$6,542	\$6,375
Average Cost per thousand Enplanements							\$31	\$38
Average Cost per thousand Operations							\$440	\$418

Interquartile mean value cannot be determined for items with less than three responses. Mean value is used as a proxy.

On average the occupational health and safety requirements related to employees entering confined spaces were costlier (\$3,900) than the health and safety requirements associated with either new construction (\$1,500) or renovation completed by airport staff (\$1,200). However, the highest cost per thousand enplanements was associated with compliance for building renovations. This anomaly is probably a function of the difference in enplanements recorded for the airports reporting cost in response to each question. Average total cost for compliance with the requirements in the three areas combined was \$6,500 with average unit costs of \$31 per thousand enplanements and \$440 per thousand operations.

## E. Funding Sources

### E.1 Potential Funding Sources For OSHA Requirements

No sources of financial assistance to airports specifically linked to OSHA compliance were identified. A few states have grant programs administered through their state-run workers compensation programs. These programs provide funding for implementation of controls to reduce injuries resulting in workers' compensation claims, not necessarily OSHA compliance.



If OSHA compliance increases the costs of construction projects funded with AIP grants or PFCs, these funds could be used to pay for the incremental costs.

### ***E.2 Use of Financial Assistance***

Because significant outside funding sources were not identified for OSHA compliance, the Phase 2 survey questionnaire did not include questions on funding sources.

## TECHNICAL APPENDIX 6. ESTIMATES OF INDUSTRY COSTS

**Technical Appendix 2** through **Technical Appendix 5** present estimates of average compliance costs per airport and per thousand units of activity, enplanements and commercial operations. Further analysis, however, shows that compliance costs do not increase with activity levels, and estimates of national costs should be derived from the average cost per airport.

This technical appendix presents estimates of industry cost impacts for each of the four regulatory subject areas based on the average costs per airport calculated from the survey data.

### A. Methodology

The primary estimates of industry cost impacts are based on the average cost per airport presented in **Technical Appendix 2** through **Technical Appendix 5**. The estimation process followed three steps:

1. The total number of potentially affected airports (airport population) was determined. In many cases, the airport population consisted of all small airports. In other cases, such as the certification requirements, and PFC requirements, only a subset of small airports was potentially affected, and the appropriate airport population was determined using FAA records.
2. The number of airports actually affected by the requirement was determined. Unless the terms of a requirement or other information indicated otherwise, this number was calculated by multiplying the airport population subject to the requirement (Step 1) by the percentage of airports reporting an impact from the requirement in the Phase 1 survey. If the terms of the requirement or other information clearly indicated the survey results were inaccurate, the percentage was adjusted to conform to the percentage indicated by the terms of the requirement or other percentage. For example embedded in the total costs of Part 139 requirements is the cost of preparing a new airport certification manual. This requirement applied to 100% of certificated airports by the terms of the regulation; therefore, the percentage of airports was adjusted to 100%.
3. The average cost per airport of the requirement was multiplied by the number of affected airports.

When available, the interquartile mean, instead of the arithmetic mean, was used to avoid skewing results by extreme high or low values.

The industry cost estimates presented in the succeeding sections represent the best possible estimate obtainable from the Phase 2 survey results. For many reported costs, few airports responded (in some cases, a single airport). The length of the survey and the level of detail of the questions made it difficult for many small airports to respond. Much like the

compliance requirements that are the subject of this research, the survey was an additional workload item for the limited staff resources that typically perform multiple operational and administrative functions.

For consistency of presentation, the estimates of industry cost impacts are organized in the same way as the data on individual airport costs presented in **Technical Appendix 2** through **Technical Appendix 5**. Where applicable, initial and recurring costs are presented in a single table.

## **B. Industry Cost Impacts of FAA/DOT Requirements**

Total initial costs of compliance with FAA/DOT requirements are \$1.392 billion. Almost half of this total is attributable to a single requirement – the modification of RSAs to meet FAA standards. Total recurring industry costs are \$67.5 million. These figures include initial and recurring costs of \$1.0 million and \$656,000, respectively, for compliance requirements documented in **Appendix B**, which are not otherwise discussed.

### ***B.1 Airfield Design, Standards and Operations Requirements***

**Table TA-32** presents the estimate of the industry costs of the airfield design, standards and operations requirements. Total industry initial costs are \$1.063 billion, and total recurring costs are \$3.9 million. Based on initial costs, the single most expensive requirement for the industry is the RSA requirement at \$695 million. The RSA requirement is also the most expensive on a per airport basis. The high cost may reflect the fact that RSA projects can involve grading, filling, relocation of roads, navigational aids and other costly civil construction. The requirement for airfield signs is the most expensive on a recurring cost basis at cost of \$2.4 million and was also the most costly on a per airport basis.

**Table TA-31. Industry Costs, Airfield Design, Standards and Operations Requirements**

Question(s)	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
<b>Initial Costs</b>				
36. Since March 28, 2007, how much did it cost your airport to move an automobile parking, a roadway, or other facility improvement outside a runway protection zone (RPZ) as a result of an advisory circular (AC) issued by the FAA on that date (AC 150/5300-13, Change 11)?	\$1,492,556	310	13%	\$60,150,000
73. How much has your airport spend on projects in the last 10 years to comply with new or updated regulations related to the Runway Safety Area?	\$3,676,184	\$310	61%	\$695,166,000
Total Runway Protection Costs (RPZ and RSA)	\$5,168,740			\$755,316,000
18. Since the beginning of CY 2000, how much did it cost your airport to modify its perimeter fencing in response to FAA guidance on minimizing deer hazards?	\$782,660	\$310	57%	\$138,296,000
74. How much has your airport spend on projects in the last 10 years to comply with new or updated regulations or requirements related to security fencing surrounding the AOA?	\$777,269	\$310	61%	\$146,982,000
Total Fencing Costs	\$1,559,929			\$285,278,000
43. Since January 1, 2000, how much has it cost your airport to add, modify or replace airfield signs as a result of new or modified requirements or guidance adopted by the FAA?	\$90,003	\$310	79%	\$22,042,000
Total Initial Costs, Airfield Design, Standards & Operations				\$1,062,636,000
<b>Recurring Costs</b>				
36. Since March 28, 2007, how much did it cost your airport to move an automobile parking, a roadway, or other facility improvement outside a runway protection zone (RPZ) as a result of an advisory circular (AC) issued by the FAA on that date (AC 150/5300-13, Change 11)? <sup>3</sup>	\$1,500	\$310	57%	\$265,000
43. Since January 1, 2000, how much has it cost your airport to add, modify or replace airfield signs as a result of new or modified requirements or guidance adopted by the FAA?	\$10,000	\$310	79%	\$2,449,000
18. Since the beginning of CY 2000, how much did it cost your airport to modify its perimeter fencing in response to FAA guidance on minimizing deer hazards?	\$6,600	\$310	57%	\$1,166,000
Total Recurring Costs				\$3,880,000

<sup>1</sup> Interquartile mean cost, unless otherwise indicated

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

## B.2 Part 139 Certification Requirements

Table TA-32 presents the estimated industry cost of compliance with the amendments to Part 139 requirements for newly certificated airports. As discussed in **Technical Appendix 2**, Class II airports, which held limited certificates in 2004 are included in the category.

**Table TA-32. Industry Costs of Part 139 Amendments for Newly Certificated Airports<sup>1</sup>**

Question(s)	Average Cost (\$) <sup>2</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance (\$)	
			Percentage of Airports Impacted by Requirements <sup>3</sup>	Industry Cost (\$)
<b>Initial Costs</b>				
11. What capital expenditures were required for compliance with the Part 139 ARFF requirements? <sup>4</sup> b. ARFF vehicles, clothing and ARFF personnel equipment				
Initial Costs	\$1,462,733	15	38%	\$8,338,000
Total Initial Costs	\$1,462,733			\$8,338,000
12. How much did it cost your airport to modify its perimeter fencing in order to comply with Part 139? <sup>4</sup>	\$784,390	15	50%	\$5,883,000
13. How much did it cost your airport use to develop its airport certification manual? <sup>4</sup>	\$1,516	15	100%	\$23,000
15. How much did it cost your airport to develop a snow and ice control plan?		15	65%	
16. How much did it cost did your airport to develop its certificate application?		15	100%	
Total Initial Costs	\$2,248,640	15		\$14,244,000
<b>Recurring Costs</b>				
11. What capital expenditures were required for compliance with the Part 139 ARFF requirements? <sup>5</sup>	\$575,000	15	38%	\$3,278,000
12. How much did it cost your airport to modify its perimeter fencing in order to comply with Part 139? <sup>4</sup>	\$10,000	15	50%	\$75,000
13. How much did it cost your airport use to develop its airport certification manual?		15	100%	\$0
15. How much did it cost your airport to develop a snow and ice control plan?		15	65%	\$0
Total Recurring Costs	\$585,000	15		\$3,353,000

<sup>1</sup> Airports holding limited certificates in 2004 are classified as newly certificated airports

<sup>2</sup> Interquartile mean cost, unless otherwise indicated

<sup>3</sup> Unless otherwise indicated, percentage of airports is based on Phase 1 survey results

<sup>4</sup> Single airport response. Value of response used.

<sup>5</sup> Interquartile mean cannot be calculated for items with less than three responses. Arithmetic mean value used

The estimates are based on small samples – one or two airports, and therefore may have limited reliability. For two requirements, no newly-certificated airport reported costs. However, based on the results from existing certificate holders, the costs of these requirements is likely modest. Also, the potentially affected population of small hub and non-hub airports is only 15 airports. Total initial costs are \$14.2 million and total recurring costs are \$3.4 million. The requirement

with the highest initial costs is the ARFF requirement at \$8.3 million. This requirement also had the highest recurring cost at \$3.3 million. The ARFF requirement also had the highest initial and recurring cost per airport. The high initial costs probably reflect acquisition of additional equipment and construction of new ARFF facilities. The high recurring costs may reflect additional staff costs to meet new requirements for response time or to staff new or expanded ARFF fleets.

**Table TA-33** presents the estimated industry cost of compliance with the Part 139 amendments for existing certificate holders. Total initial costs are \$133.9 million, and recurring costs are \$3.2 million. Compliance with new ARFF requirements is the most costly at \$106 million in initial costs and \$2.6 million in recurring costs. The ARFF requirements also have the highest per airport costs. As with newly-certificated airports, the high initial costs probably reflect acquisition of additional equipment and construction of new ARFF facilities. The high recurring costs may reflect additional staff costs to meet new requirements for response time, or to staff expanded ARFF fleets.

**Table TA-33. Industry Costs of Compliance with Part 139 Amendments for Existing Certificate Holders<sup>1</sup>**

Question(s)	Average Cost (\$) <sup>2</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance (\$)	
			Percentage of Airports Impacted by Requirements <sup>3</sup>	Industry Cost (\$)
<b>Initial Costs</b>				
17. For airports holding an Airport Operating certificate in 2004, when the FAA amended Part 139, was there a cost to the airport to modify any of the following: Cost per Airport				
a. ARFF facilities, vehicles, equipment, staffing or procedures?	\$998,360	295	36%	\$106,026,000
b. Modify perimeter fencing?	\$257,706	295	35%	\$26,608,000
c. Modify the airport certification manual? <sup>4</sup>	\$3,136	295	100%	\$925,000
d. Modify the snow and ice control plan?	\$1,871	295	61%	\$337,000
Total Initial Costs	\$1,261,074			\$133,896,000
<b>Recurring Costs</b>				
For airports holding an Airport Operating certificate in 2004, when the FAA amended Part 139, was there a cost to the airport to modify any of the following:				
17. a. ARFF facilities, vehicles, equipment, staffing or procedures?	\$24,083	295	36%	\$2,558,000
b. Modify perimeter fencing?	\$5,000	295	35%	\$516,000
c. Modify the snow and ice control plan?	\$563	295	61%	\$101,000
Total Recurring Costs	\$29,646			\$3,175,000

<sup>1</sup> Airports holding limited certificates in 2004 are classified as newly certificated airports

<sup>2</sup> Interquartile mean cost, unless otherwise indicated

<sup>3</sup> Unless otherwise indicated, percentage of airports is based on Phase 1 survey results

<sup>4</sup> Under terms of regulation, 100 percent of airports were required to develop new certification manuals

### ***B.3 Vehicles in Aircraft Operations Areas***

**Table TA-34** presents the estimated industry costs of compliance with new requirements for vehicle operation in the aircraft operations area. Total initial costs are \$118.4 million, and total recurring costs are \$48.3 million. Compliance with enforcement and control requirements has both the highest initial industry cost (\$101.8 million) and highest recurring industry cost (\$29.2 million). These requirements has the highest per airport costs in this category as well.

The high initial costs likely represent upgrades to facilities and equipment to support better control over vehicle access. The high recurring costs likely represent operational costs of ongoing security patrols and staffing of vehicle checkpoints.

**Table TA-34. Industry Costs of Modifications to Requirements for Vehicle Operation in Aircraft Operations Area**

Question(s)	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
<b>Initial Costs</b>				
Since the beginning of CY 2000, how much did it cost your airport to modify any policies or procedures related to vehicle operation in the Aircraft Operations Area as it relates to any of the following?				
5.				
a. Vehicle Access	\$22,227	310	88%	\$6,064,000
b. Vehicle inspection and marking	\$12,014	310	60%	\$2,235,000
c. Driver training curriculum	\$6,459	310	92%	\$1,842,000
d. Emergency operations	\$26,933	310	77%	\$6,429,000
e. Enforcement and control	\$450,000	310	73%	\$101,835,000
<b>Total Initial Costs</b>	<b>\$517,634</b>			<b>\$118,405,000</b>
<b>Recurring Costs</b>				
Since the beginning of CY 2000, how much did it cost your airport to modify any policies or procedures related to vehicle operation in the Aircraft Operations Area as it relates to any of the following?				
5.				
a. Vehicle Access	\$11,144	310	88%	\$3,040,000
b. Vehicle inspection and marking	\$16,200	310	60%	\$3,013,000
c. Driver training curriculum	\$3,040	310	92%	\$867,000
d. Emergency operations	\$51,230	310	77%	\$12,229,000
e. Enforcement and control	\$128,992	310	73%	\$29,191,000
<b>Total Recurring Costs</b>	<b>\$210,606</b>			<b>\$48,340,000</b>

<sup>1</sup> Interquartile mean cost, unless otherwise indicated

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise indicated

### B.4 PFC Requirements

Table TA-35 presents the estimated industry costs of compliance with selected PFC requirements adopted during the study period.

**Table TA-35. Industry Cost of Changes to PFC Requirements**

Question(s)	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
24. What was the annual reduction in net PFC revenue due to the FAA's increase in carrier compensation? <sup>3</sup>	\$7,067	260	100%	\$1,837,000
35. How much in additional costs your airport incur to prepare the application or amendment to comply with new FAA requirements on documentation of costs issued on that date (PFC Update 50-06)?	\$17,167	260	18%	\$807,000
48. Has your airport experienced any costs due to FAA staff requesting the airport or the airport's PFC consultant to provide any additional data, documentation or analysis to assist them in meeting the requirements of PFC Update 59-09?	\$6,333	260	19%	\$314,000
Total Cost of Requirements Applicable to All Airports	\$30,567			\$1,121,000
27. What are the airport's cost savings per PFC application or amendment request as a result of the new filing procedures? (Non-hub airports)	\$2,300	188	19%	\$82,000
Net Costs				\$1,039,000

<sup>1</sup> Interquartile mean cost, unless otherwise indicated

<sup>2</sup> Unless otherwise indicated, percentage of airports is based on Phase 1 survey results

<sup>3</sup> Under terms of regulation, 100 percent of airports were required to pay the new rate of carrier compensation.

The change in required carrier compensation had the highest dollar impact to the industry at \$1.8 million. However, this figure represents an annual reduction in net PFC revenue received by airports. The requirement increases the time it takes for an airport to accumulate a specified amount of PFC revenue, but does not reduce the total amount of PFCs an airport can collect. For the two program changes that increased airport expenditures on the PFC program, total industry costs are \$1,121,000. Non-hub airports are saving \$82,000 from the non-hub pilot program. Net industry costs are thus \$1,039,000.

### ***B.5 DBE Requirements***

**Table TA-36** presents the estimated industry costs of changes to the DOT's DBE requirements during the study period. Total initial costs are \$2.8 million and total recurring costs are \$2.2 million. The recurring costs of modification to the DBE project participation rule are equal to the initial costs. The reason for this is unclear.



**Table TA-36. Industry Costs of DBE Rule Changes**

Question(s)	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
<b>Initial Costs</b>				
20. Was there a cost to your airport as a result of the DOT's issuance of modified regulations for the Airport Concession DBE Program in 2005?	\$7,620	310	44%	\$1,039,000
21. Was there a cost to your airport resulting from the DOT's issuance in 2003 of modified regulations for DBE participation in federally funded projects?	\$11,000	310	52%	\$1,773,000
Total Initial Costs	\$18,620			\$2,812,000
<b>Recurring Costs</b>				
20. Was there a cost to your airport as a result of the DOT's issuance of modified regulations for the Airport Concession DBE Program in 2005?	\$2,900	310	44%	\$396,000
21. Was there a cost to your airport resulting from the DOT's issuance in 2003 of modified regulations for DBE participation in federally funded projects?	\$11,000	310	52%	\$1,773,000
Total Recurring Costs	\$13,900	310		\$2,169,000

<sup>1</sup> Interquartile mean cost, unless otherwise indicated

<sup>2</sup> Unless otherwise indicated, percentage of airports is based on Phase 1 survey results

### ***B.6 Miscellaneous FAA Administrative Requirements***

**Table TA-37** presents the estimate of industry cost of miscellaneous AIP administrative requirements. Total initial costs are \$57.8 million, and total recurring costs are \$5.9 million. Changes to consultant selection requirements have the highest initial industry costs at \$29.3 million. GIS requirements are almost as costly with industry costs of \$28.4 million. GIS requirements generate the highest recurring cost (\$5.6 million) and have the highest per airport initial and recurring costs. Total costs for consultant selection are higher because a higher number of airports reported being affected.

**Table TA-37. Industry Costs of Miscellaneous AIP Administrative Requirements**

Question(s)	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
<b>Initial Costs</b>				
32. How much did it cost your airport to comply with the new guidance issued on September 30, 2005, by the FAA on the subject of consultant selection (AC 150/5100-14D)?	\$157,500	310	60%	\$29,295,000
40. Has much has it costs your airport to conduct or engage consultants to conduct survey, mapping or charting work using Geospatial Information System (GIS) techniques or methodology in response to FAA guidance or requirements on this subject?	\$176,000	310	52%	\$28,371,000
45. How much did it cost your airport to prepare a revised snow and ice control plan in response to a new AC issued by the FAA on December 8, 2008 (AC 150/5200-30C)?	\$639	310	61%	\$121,000
54. How much did it cost your airport to prepare or update an Airport Emergency Plan in response to guidance issued by the FAA on May 21, 2010 (AC 150/5200-31C)?	\$4,490	310	95%	\$1,322,000
Total Initial Costs				\$57,787,481
<b>Recurring Costs</b>				
40. How much has it cost your airport to conduct or engage consultants to conduct survey, mapping or charting work using Geospatial Information System (GIS) techniques or methodology in response to FAA guidance or requirements on this subject?	\$35,000	310	52%	\$5,642,000
45. How much did it cost your airport to prepare a revised snow and ice control plan in response to a new AC issued by the FAA on December 8, 2008 (AC 150/5200-30C)?	\$150	310	61%	\$28,000
54. How much did it cost your airport to prepare or update an Airport Emergency Plan in response to guidance issued by the FAA on May 21, 2010 (AC 150/5200-31C)?	\$867	310	95%	\$255,000
Total Recurring Costs				\$5,925,000

<sup>1</sup> Interquartile mean cost, unless otherwise indicated

<sup>2</sup> Unless otherwise indicated, percentage of airports is based on Phase 1 survey results

## C. Industry Cost Impacts of General Environmental Requirements

Industry costs for the general environmental requirements are based on the data reported in the Phase 2 survey, and not specifically the incremental cost for the requirements adopted during the study period. Total costs of compliance with general environmental requirements are \$57.4 million. The most expensive requirements relate to above-ground storage tanks (ASTs) with a cost of \$16.4 million. Operation of ASTs are subject to various regulatory programs. The costs are reported in two separate tables in the following sections, but were counted only once as part of the total industry cost.

### C.1 Air Quality – General Conformity Amendments

**Table TA-38** presents the estimated industry costs for air emission inventories and the effects on costs from modifications to general conformity requirements. Total industry cost of air emission inventories is \$704,000. The share of industry costs attributable to the general

conformity requirements is \$117,000, as discussed in **Technical Appendix 3**. The most expensive component was attributed to completing the inventory itself at total industry cost of \$524,000. The share of this cost attributable to the general conformity requirements is \$87,000.

**Table TA-38. Industry Costs for Air Emission Inventories**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance			Share of Costs Attributable to PM <sub>2.5</sub>	
		Airports Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)	Average Share of Cost	Industry Share of Cost
56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information: <b>Air Emissions Inventory</b>						
a. Initial cost to prepare plan, document, or report	\$5,833	310	29%	\$524,000	\$972	\$87,000
b. Installation/construction for control(s)/equipment/mitigation/remediation <sup>3</sup>	\$1,000	310	29%	\$90,000	\$167	\$15,000
c. Specialized training <sup>3</sup>	\$1,000	310	29%	\$90,000	\$167	\$15,000
<b>Total Costs</b>	<b>\$7,833</b>	<b>310</b>	<b>29%</b>	<b>\$704,000</b>	<b>\$1,306</b>	<b>\$117,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

## C.2 Air Quality – Hazardous Air Pollution Requirements

**Table TA-39** presents the estimated industry costs for ASTs and underground storage tanks (USTs) and the cost impacts from modifications to hazardous air pollution requirements. Total costs for AST requirements are \$16.4 million. The cost for installation of controls, equipment is \$13.4 million or 82% of the total. Industry cost for UST requirements is only \$109,000, which is fully attributable to the cost of consultants or contractors.

**Table TA-39. Industry Costs for ASTs and USTs**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information: <b>Aboveground Storage Tanks (AST)</b>				
a. Contractor/consultants	\$1,667	310	68%	\$351,000
b. Installation/construction for control(s)/equipment	\$63,333	310	68%	\$13,351,000
c. Material/equipment replacement	\$10,000	310	68%	\$2,108,000
d. Specialized training <sup>3</sup>	\$2,750	310	68%	\$580,000
<b>Total Costs</b>	<b>\$77,750</b>	<b>310</b>	<b>68%</b>	<b>\$16,390,000</b>
<b>Underground Storage Tanks (UST)</b>				
a. Contractor/consultants	\$1,000	310	35%	\$109,000
b. Installation/construction for control(s)/equipment	-	-	-	-
c. Material/equipment replacement	-	-	-	-
d. Specialized training	-	-	-	-
<b>Total Costs</b>	<b>\$1,000</b>	<b>310</b>	<b>35%</b>	<b>\$109,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Interquartile mean value cannot be determined for items with less than 3 responses. Arithmetic mean value is used

### C.3 Planning and Development – Emergency Planning and Response Requirements

**Table TA-40** presents estimated industry costs for preparation of Tier I/II reports under the EPCRA. Total compliance cost is \$143,000, which is divided equally between initial document preparation cost and cost for controls, equipment, mitigation or remediation. Only one airport reported costs in the latter category, and therefore the results may not represent a reliable estimate of industry costs.

**Table TA-40. Industry Costs for Tier I/Tier II Reports**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:				
Tier I/II Report				
a. Initial cost to prepare plan, document, or report	\$1,000	310	23%	\$71,000
b. Installation/construction for control(s)/equipment/mitigation/remediation <sup>3</sup>	\$1,000	310	23%	\$71,000
c. Specialized training	-	-	-	-
<b>Total Costs</b>	<b>\$2,000</b>	<b>310</b>	<b>23%</b>	<b>\$143,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

### C.4 Planning and Development – All Appropriate Inquiries (ESA) Requirements

**Table TA-41** presents estimated industry costs for environmental site assessments (ESAs). Total cost is \$6.7 million. Of this amount, \$2.9 million is attributed to the cost of preparing the assessments and \$3.5 million to the cost of controls/equipment/mitigation/remediation. The remaining amount is attributed to specialized training, but is based on a single response.

**Table TA-41. Industry Costs for Documents Related to All Appropriate Inquiries (Environmental Site Assessments)**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:				
Phase I, II, or III Environmental Site Assessment				
a. Initial cost to prepare plan, document, or report	\$16,750	310	56%	\$2,908,000
b. Installation/construction for control(s)/equipment/mitigation/remediation	\$20,000	310	56%	\$3,472,000
c. Specialized training <sup>3</sup>	\$2,000	310	56%	\$347,000
<b>Total Costs</b>	<b>\$38,750</b>	<b>310</b>	<b>56%</b>	<b>\$6,727,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

### C.5 Waste Management – Hazardous Waste Requirements

**Table TA-42** presents estimated industry costs for compliance with waste management requirements. Combined costs of hazardous waste, universal waste and used oil requirements are \$1.6 million. Universal waste requirements are the most costly with industry costs of \$595,000. The cost savings associated with changes to record-keeping requirements for “offerors of hazardous materials” are negligible, as reported in **Technical Appendix 3**.

**Table TA-42. Industry Costs for Activities and Documents Related to Waste Management**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information: <b>Hazardous Material Generation/Storage/Disposal</b>				
a. Contractor/consultants	\$2,733	310	45%	\$381,000
b. Installation/construction for control(s)/equipment <sup>3</sup>	\$500	310	45%	\$69,750
c. Material/equipment replacement	-	-	-	-
d. Specialized training	-	-	-	-
<b>Total Costs</b>	<b>\$3,233</b>	<b>310</b>	<b>45%</b>	<b>\$451,000</b>
<b>Universal Waste Generation/Disposal</b>				
a. Contractor/consultants	\$2,333	310	35%	\$253,000
b. Installation/construction for control(s)/equipment <sup>3</sup>	\$400	310	35%	\$43,000
c. Material/equipment replacement <sup>4</sup>	\$2,750	310	35%	\$298,000
d. Specialized training	-	-	-	-
<b>Total Costs</b>	<b>\$5,483</b>	<b>310</b>	<b>35%</b>	<b>\$595,000</b>
<b>Used Oil Generation/Recycling/Disposal</b>				
a. Contractor/consultants	\$2,175	310	62%	\$418,000
b. Installation/construction for control(s)/equipment	-	-	-	-
c. Material/equipment replacement <sup>4</sup>	\$600	310	62%	\$115,000
d. Specialized training	-	-	-	-
<b>Total Costs</b>	<b>\$2,775</b>	<b>310</b>	<b>62%</b>	<b>\$533,000</b>
<b>Combined Cost of Waste Management Requirements</b>	<b>\$11,492</b>	<b>310</b>	<b>62%</b>	<b>\$1,579,000</b>
57. Of those permits, certifications, or registrations the airport is subject to, or has applied for, please enter the requested follow-up information: <b>Offeror of Hazardous Materials</b>				
a. Application/ certification/ registration (initial application and/or annual fee)	-	-	-	-
b. Contractor/consultants	-	-	-	-
c. Installation/construction for control(s)/ equipment	-	-	-	-
d. Material/equipment replacement	-	-	-	-
e. Specialized training <sup>3</sup>	\$1,000	310	8%	\$25,000
<b>Total Costs</b>	<b>\$1,000</b>	<b>310</b>	<b>8%</b>	<b>\$25,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

<sup>4</sup> Interquartile mean value cannot be determined for items with less than 3 responses. Arithmetic mean value is used

Based on a single response, the small airport industry also spends \$25,000 for specialized training required for entities considered “offerors of hazardous materials”.

### C.6 Water Resources – Drinking Water Requirements

**Table TA-43** presents the estimated industry cost for compliance with drinking water supplier requirements. Total costs are \$4.3 million, with \$3.7 million spent for contractors and consultants. The estimates are based on a single response.

**Table TA-43. Industry Costs for Drinking Water Suppliers**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information:				
<b>Drinking Water Supplier</b>				
a. Contractor/consultants <sup>3</sup>	\$50,000	310	24%	\$3,720,000
b. Installation/construction for control(s)/equipment	-	-	-	-
c. Material/equipment replacement <sup>3</sup>	\$2,000	310	24%	\$149,000
d. Specialized training <sup>3</sup>	\$6,350	310	24%	\$472,000
<b>Total Costs</b>	<b>\$58,350</b>	<b>310</b>	<b>24%</b>	<b>\$4,341,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

### C.7 Water Resources –SPCC Rules

**Table TA-44** presents estimated industry costs for complying with the spill prevention control and countermeasures (SPCC) rule. Specific cost categories include ASTs, mobile refuelers, drum storage and handling, and preparation of SPCC plans. Compliance with AST requirements is the most costly at \$16.4 million, with \$13.4 million attributable to construction/installation of controls/equipment.

**Table TA-44. Industry Costs for Activities and Documents Related to SPCC Amendments**

	Average Cost (\$)¹	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements²	Industry Cost (\$)
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information:				
<b>Aboveground Storage Tanks (AST)</b>				
a. Contractor/consultants	\$1,667	310	68%	\$351,000
b. Installation/construction for control(s)/equipment	\$63,333	310	68%	\$13,351,000
c. Material/equipment replacement	\$10,000	310	68%	\$2,108,000
d. Specialized training³	\$2,750	310	68%	\$580,000
<b>Total Costs</b>	<b>\$77,750</b>	<b>310</b>	<b>68%</b>	<b>\$16,390,000</b>
<b>Mobile Refueler Operations</b>				
a. Contractor/consultants³	\$7,800	310	17%	\$411,000
b. Installation/construction for control(s)/equipment	\$50,000	310	17%	\$2,635,000
c. Material/equipment replacement⁴	\$50,000	310	17%	\$2,635,000
d. Specialized training³	\$13,200	310	17%	\$696,000
<b>Total Costs</b>	<b>\$121,000</b>	<b>310</b>	<b>17%</b>	<b>\$6,377,000</b>
<b>Drum Storage/Handling</b>				
a. Contractor/consultants⁴	\$1,500	310	39%	\$181,000
b. Installation/construction for control(s)/equipment⁴	\$1,500	310	39%	\$181,000
c. Material/equipment replacement	\$1,500	310	39%	\$181,000
d. Cost for specialized training	-	-	-	-
<b>Total Costs</b>	<b>\$4,500</b>	<b>310</b>	<b>39%</b>	<b>\$544,000</b>
56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:				
<b>Spill Prevention, Control and Countermeasure Plan</b>				
a. Initial cost to prepare plan, document, or report	\$7,800	310	80%	\$1,934,000
b. Installation/construction for control(s)/equipment/mitigation/remediation	\$5,750	310	80%	\$1,426,000
c. Specialized training	\$1,902	310	80%	\$472,000
<b>Total Costs</b>	<b>\$15,452</b>	<b>310</b>	<b>80%</b>	<b>\$3,832,000</b>

¹ Interquartile mean value unless otherwise noted

² Percentage based on Phase 1 survey results unless otherwise noted

³ Interquartile mean value cannot be determined for items with less than 3 responses. Arithmetic mean value is used

⁴ Single airport response. Value of response used.

### ***C.8 Water Resources – Pesticide Applicator Permit Requirements***

**Table TA-45** presents estimated industry costs for pesticide application requirements. Total costs are 1.8 million, with \$1.1 million attributed to material and equipment replacement. The latter figure is based on a single response and likely represents the cost associated with purchasing pesticides for use at the airport.

**Table TA-45. Industry Costs for Activities and Documents Related to Pesticide General Permits**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
57. Of those permits, certifications, or registrations the airport is subject to, or has applied for, please enter the requested follow-up information: <b>Pesticide Applicator</b>				
a. Application/certification/ registration (initial application/annual fee) <sup>3</sup>	\$350	310	36%	\$39,000
b. Contractor/consultants <sup>3</sup>	\$5,100	310	36%	\$569,000
c. Installation/construction for control(s)/ equipment	-	-	-	-
d. Material/equipment replacement <sup>4</sup>	\$10,000	310	36%	\$1,116,000
e. Specialized training <sup>3</sup>	\$350	310	36%	\$39,000
<b>Total Costs</b>	<b>\$15,800</b>	<b>310</b>	<b>36%</b>	<b>\$1,763,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Interquartile mean value cannot be determined for items with less than 3 responses. Arithmetic mean value is used

<sup>4</sup> Single airport response. Value of response used.

### ***C.9 Water Resources – Construction Storm Water Requirements***

**Table TA-46** presents estimated industry costs for compliance with construction storm water permitting requirements and standards. Costs for developing a construction storm water pollution prevention plan (CSWPP plan) and construction notice of intent (NOI) were reported separately. Total costs for construction NOIs at \$12.1 million are more than five times higher than costs of preparing the CSWPP plan (\$2.3 million). The costs for construction NOI compliance are based on samples of only one or two airports. Specialized training (\$1.1 million) accounts for almost half of costs associated with CSWPP plans.



**Table TA-46. Industry Costs for Activities and Documents Related to Construction Storm Water Requirements**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:				
<b>Construction Storm Water Pollution Prevention Plan</b>				
a. Initial cost to prepare plan, document, or report	\$3,417	310	71%	\$752,000
b. Installation/construction of control(s)/equipment/mitigation/remediation <sup>3</sup>	\$2,000	310	71%	\$440,000
c. Specialized training <sup>4</sup>	\$5,000	310	71%	\$1,101,000
<b>Total Costs</b>	<b>\$10,417</b>	<b>310</b>	<b>71%</b>	<b>\$2,293,000</b>
<b>Construction Notice of Intent</b>				
a. Application/certification/registration (initial cost and/or annual fee) <sup>4</sup>	\$50,030	310	48%	\$7,444,000
b. Contractor/consultants <sup>4</sup>	\$11,250	310	48%	\$1,674,000
c. Installation/construction of control(s)/equipment/mitigation/etc. <sup>3</sup>	\$20,000	310	48%	\$2,976,000
d. Cost for material/equipment replacement	-	-	-	-
e. Specialized training	-	-	-	-
<b>Total Costs</b>	<b>\$81,280</b>	<b>310</b>	<b>48%</b>	<b>\$12,094,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted<sup>3</sup> Single airport response. Value of response used.<sup>4</sup> Interquartile mean value cannot be determined for items with less than 3 responses. Arithmetic mean value is used

## D. Industry Cost Impacts of FAA/DOT Environmental Requirements

Total costs of compliance are \$67.1 million. Fifty-seven percent of the total cost is for NEPA compliance.

### D.1 NEPA Requirements

**Table TA-47**<sup>4</sup> presents industry cost estimates for compliance with NEPA requirements. As with general environmental requirements, costs are the total costs for NEPA compliance reported in the Phase 2 survey, not incremental costs of requirements adopted during the study period.

**Table TA-47. Industry Costs for NEPA Related Documents**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
56. Of those plans/documents that have been prepared for activities/operations at the airport, please enter the requested follow-up information:				
Categorical Exclusion (CATEX)				
a. Initial cost to prepare plan, document, or report	\$1,650	310	65%	\$332,000
b. Installation/construction of control(s)/equipment/mitigation/remediation	-	-	-	-
c. Specialized training <sup>3</sup>	\$1,000	310	65%	\$202,000
Total Costs	\$2,650	310	65%	\$534,000
Environmental Assessment (EA)				
a. Initial cost to prepare plan, document, or report	\$59,602	310	69%	\$12,749,000
b. Installation/construction of control(s)/equipment/mitigation/remediation	\$92,500	310	69%	\$19,786,000
c. Specialized training	-	-	-	-
Total Costs	\$152,102	310	69%	\$32,535,000
Environmental Impact Statement (EIS)				
a. Initial cost to prepare plan, document, or report	\$42,500	310	37%	\$4,875,000
b. Installation/construction of control(s)/equipment/mitigation/remediation	\$5,000	310	37%	\$574,000
c. Specialized training <sup>3</sup>	\$500	310	37%	\$57,000
Total Costs	\$48,000	310	37%	\$5,506,000

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

Costs for CATEXs are the lowest, at \$534,000. This outcome is to be expected because of the very low reported average cost per airport (\$2,600). Total industry cost for EAs are the highest at \$32.6 million, which reflects the high average cost per airport and the high percentage of airports incurring costs (69%). \$19.8 million of the total is attributable to the cost of mitigation and remediation measures.

## ***D.2 Sensitive Areas and Wildlife***

The survey questions did not specifically address the costs of recent FAA requirements for wildlife hazard planning, management and training. Rather, the survey included questions on handling of animal carcasses, which results from airport wildlife management activities. **Table TA-48** provides the estimated industry costs. Total costs are \$403,000, with more than half (\$202,000) spent for contractors and consultants.

**Table TA-48. Industry Costs for Wildlife-Related Activities**

	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports/Activity Subject to Requirement	Percentage of Airports Impacted by Requirements <sup>2</sup>	Industry Cost (\$)
55. Of those activities the airport authority is responsible for, please enter the requested follow-up information:				
<b>Animal Carcass Management</b>				
a. Contractor/consultants	\$1,000	310	65%	\$202,000
b. Installation/construction for control(s)/equipment	-	-	-	-
c. Material/equipment replacement <sup>3</sup>	\$500	310	65%	\$101,000
d. Specialized training	\$500	310	65%	\$101,000
<b>Total Costs</b>	<b>\$2,000</b>	<b>310</b>	<b>65%</b>	<b>\$403,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

### D.3 Noise Compatibility Requirements

**Table TA-49** presents estimated industry costs for the two requirements related to AIP-funded noise compatibility programs adopted during the study period. As noted in **Technical Appendix 2**, costs for compliance with changes in requirements for AIP-funded land acquisition are not presented because the data is unreliable. Total costs are \$1.8 million, with \$1.6 million attributed to the cost of updating noise exposure maps.

**Table TA-49. Industry Costs for Noise Compatibility Program Requirements**

Question(s)	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
7. Since the beginning of CY 2000, how much did FAA requirements cost your airport to update airport Noise Exposure Maps (NEMs) to justify issuing AIP grants for your noise compatibility program or to provide documentation of the validity of your existing NEM?	\$74,175	129	17%	\$1,627,000
39. How much did it cost your airport to develop the noise land inventory and reuse plan as required by FAA Program Guidance Letter (PGL) 08-02 (February 1, 2008)? <sup>3</sup>	\$3,600	52	100%	\$187,000
<b>Total Part 150 Compliance Costs</b>	<b>\$77,775</b>			<b>\$1,814,000</b>

<sup>1</sup> Interquartile mean cost, unless otherwise indicated

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Under terms of PGL, 100 percent of airports were required to develop noise land inventory & reuse plan certification manuals

### D.4 Industrial Waste Handling Requirements

**Table TA-50** presents estimated industry costs for complying with new FAA requirements for handling industrial waste adopted during the study period. Initial industry costs of \$25.7 million are based on a single survey response. Recurring industry costs of \$670,000 are based on a limited sample of two responses.

**Table TA-50. Industry Compliance Costs for FAA Industrial Waste Requirements**

Question(s)	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
<b>Initial Costs</b>				
How much has it cost your airport to modify its policies, practices or procedures for disposing of industrial waste, including deicing fluid, as a result of FAA guidance issued on September 8, 2008 (AC 150/5320-15A)? <sup>3</sup>	\$306,881	310	27%	\$25,686,000
<b>Recurring Costs</b>				
How much has it cost your airport to modify its policies, practices or procedures for disposing of industrial waste, including deicing fluid, as a result of FAA guidance issued on September 8, 2008 (AC 150/5320-15A)? <sup>4</sup>	\$8,000	310	27%	\$670,000

<sup>1</sup> Interquartile mean cost, unless otherwise indicated

<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted

<sup>3</sup> Single airport response. Value of response used.

<sup>4</sup> Interquartile mean cannot be calculated for items with less than three responses. Arithmetic mean value used

## E. Industry Cost Impacts for Security Requirements

Total costs of compliance with security requirements are \$610.8 million. Seventy-nine percent of the total is for costs of physical access systems and other security equipment.

### E.1 Access Control and Security Equipment

**Table TA-51** presents estimated industry cost of compliance with requirements for access control and related security equipment. Total costs are \$481.8 million. The largest single expense item is “other equipment or systems”, at \$265.6 million, but this estimate is based on responses from only two airports.

**Table TA-51. Industry Cost for Installing Security Equipment or Systems**

Questions	Average Cost (\$) <sup>1</sup>	Estimated Industry Cost of Compliance		
		Airports Subject to Requirement	Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
69 How much has it cost your airport to install or modify any of the following between January 1, 2000, and December 31, 2010, as a result of a new Transportation Security Administration (“TSA”) regulation, security directive or other TSA or Department of Homeland Security (“DHS”) requirement?				
Physical Access System	\$538,137	310	78%	\$130,122,000
Closed Circuit Television (“CCTV”) Monitoring System	\$234,617	310	71%	\$51,639,000
Credentialing and biometric (including biometric info on credentialing media)	\$46,750	310	56%	\$8,116,000
Any breach prevention systems or equipment <sup>3</sup>	\$62,500	310	49%	\$9,494,000
Any perimeter security systems or equipment	\$93,333	310	58%	\$16,781,000
Any other equipment or systems related to access control <sup>3</sup>	\$1,260,000	310	68%	\$265,608,000
<b>Total Initial Cost</b>	<b>\$2,235,337</b>			<b>\$481,760,000</b>

<sup>1</sup> Interquartile mean cost unless otherwise indicated

<sup>2</sup> Percentage based on Phase 1 survey results, unless otherwise noted

<sup>3</sup> Interquartile mean cannot be determined for items with less than three responses. Arithmetic mean value is used.

## E.2 Screening Facilities and Equipment

**Table TA-52** presents estimated industry costs for screening requirements, including Customs and Border Protection (CBP). Total costs for passenger and baggage screening are \$122.1 million. Cost of CBP facility requirements is \$6.9 million. The lower cost is based on both a low reported cost per airport and low percentage of airports affected.

**Table TA-52. Industry Costs for Screening and Inspection Projects**

Questions	Average Cost (\$)¹	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact²	Industry Cost (\$)
70 How much has it cost your airport to execute any project in the last 10 years to accommodate enhanced checked baggage screening? Total Project Costs	\$768,055		29%	\$68,028,000
71 How much has it cost your airport to execute any projects in the last 10 years to accommodate enhanced passenger screening? Total Project Costs	\$637,377		27%	\$54,101,000
Total Security Screening Costs	\$1,405,432			\$122,129,000
73 Since the beginning of Calendar Year (CY) 2000, how much has the adoption or modification of Airport Technical Design Standards by U.S. Customs and Border Protection (CBP), or its predecessor cost your airport? i. Total initial cost:	\$375,000		6%	\$6,920,000

¹ Interquartile mean cost unless otherwise indicated

² percentage based on Phase 1 survey results, unless otherwise noted

## F. Industry Cost Impacts of OSHA Requirements

As noted in **Technical Appendix 5**, airports are not under the direct jurisdiction of OSHA. Rather, they may be subject to state regulation or voluntary programs. Some states maintain their own airport assistance programs. Total costs of compliance with OSHA requirements are \$12.3 million.

### F.1 Typical Programs Generating OSHA Costs

**Table TA-53** presents the estimated industry cost for typical programs that generate OSHA costs. Total cost is \$11.7 million. Payment to workers' compensation insurance carriers is the largest single item with an industry cost of \$8.8 million, but this estimate is based on a single airport response.

**Table TA-53. Industry Costs of Typical Programs for OSHA Compliance**

Questions	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
58 How much has it cost your airport to add staff since 2000 to handle Occupational Safety and Health Administration (OSHA) related activities? <sup>3</sup>	\$25,000	310	9%	\$698,000
61 How much has it cost your airport to utilize your workers compensation insurance carrier for health and safety support? <sup>3</sup>	\$125,000	310	23%	\$8,765,000
63 How much has it cost your airport to track the amount of hours staff spends in health and safety training? What is the cost of staff time in health and safety training?	\$9,138	310	43%	\$1,218,000
64 How much is the annual cost of personal protective equipment used by your staff?	\$6,267	310	50%	\$971,000
<b>Total Costs</b>				<b>\$11,652,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted<sup>3</sup> Single airport response. Value of response used**F.2 Use of Staff and Contractors for OSHA Related Activities**

**Table TA-54** presents industry cost estimates for OSHA compliance associated with construction activity and work in confined spaces. Total costs are \$670,000. Requirements for protection of workers entering confined spaces are the most costly (\$481,000), but the estimate is based on only two responses.

**Table TA-54. Industry Costs for Use of Staff and Contractors for OSHA-Regulated Activities**

Questions	Average Cost(\$) <sup>1</sup>	Airports Subject to Requirement	Estimated Industry Cost of Compliance	
			Percentage of Airports Reporting Impact <sup>2</sup>	Industry Cost (\$)
65 What is the cost of complying with health and safety requirements related to airport maintenance staff entering confined spaces? <sup>3</sup>	\$3,875	310	40%	\$481,000
66 How much has it cost your airport to comply with health and safety requirements related to new construction completed by airport staff? <sup>3</sup>	\$1,500	310	26%	\$121,000
67 How much has it cost your airport to comply with health and safety requirements related to major building renovations completed by airport staff?	\$1,000	310	22%	\$68,000
<b>Total Costs</b>	<b>\$6,375</b>	<b>310</b>		<b>\$670,000</b>

<sup>1</sup> Interquartile mean value unless otherwise noted<sup>2</sup> Percentage based on Phase 1 survey results unless otherwise noted<sup>3</sup> Interquartile mean value cannot be determined for items with less than three responses. Arithmetic mean value is used