Innovative Finance and Alternative Sources of Revenue for Airports

DETAILS

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AUTHORS

Cindy Nichol; Transportation Research Board

AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP SYNTHESIS 1

Innovative Finance and Alternative Sources of Revenue for Airports

A Synthesis of Airport Practice

CONSULTANT
CINDY NICHOL
Jacobs Consultancy
Burlingame, California

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AIRPORT COOPERATIVE RESEARCH PROGRAM

Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The Airport Cooperative Research Program (ACRP) serves as one of the principal means by which the airport industry can develop innovative near-term solutions to meet demands placed on it.

The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). The ACRP carries out applied research on problems that are shared by airport operating agencies and are not being adequately addressed by existing federal research programs. It is modeled after the successful National Cooperative Highway Research Program and Transit Cooperative Research Program. The ACRP undertakes research and other technical activities in a variety of airport subject areas, including design, construction, maintenance, operations, safety, security, policy, planning, human resources, and administration. The ACRP provides a forum where airport operators can cooperatively address common operational problems.

The ACRP was authorized in December 2003 as part of the Vision 100-Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International–North America (ACI–NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), and the Air Transport Association (ATA) as vital links to the airport community; (2) the TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academies formally initiating the program.

The ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

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Once selected, each ACRP project is assigned to an expert panel, appointed by the TRB. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, ACRP project panels serve voluntarily without compensation.

Primary emphasis is placed on disseminating ACRP results to the intended end-users of the research: airport operating agencies, service providers, and suppliers. The ACRP produces a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties, and industry associations may arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by airport-industry practitioners.

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FOREWORD

By Staff
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Airport administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to the airport industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire airport community, the Airport Cooperative Research Program authorized the Transportation Research Board to undertake a continuing project. This project, ACRP Project 11-03, "Synthesis of Information Related to Airport Practices," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an ACRP report series, *Synthesis of Airport Practice*.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

PREFACE

This synthesis study is intended to inform airport operators, stakeholders, and policymakers about alternative financing options and revenue sources currently available or that could be available in the future in the United States. The report provides a brief overview of common capital funding sources used by airport operators, a review of capital financing mechanisms used by airports, descriptions of various revenue sources developed by airport operators, and a review of privatization options available to U.S. airport operators.

Information used in this study was acquired through a review of the literature and interviews with airport operators and industry experts.

Cindy Nichol, Jacobs Consultancy, Burlingame, California, collected and synthesized the information and wrote the report. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

CONTENTS

INNOVATIVE FINANCE AND ALTERNATIVE SOURCES OF REVENUE FOR AIRPORTS

SUMMARY

Airport capital needs are estimated to exceed $70 billion for federal fiscal year (FFY) 2005 through FFY 2009, or approximately $14.3 billion per year, according to the Capital Needs Survey conducted by Airports Council International–North America. Although the Airport Improvement Program (AIP) administered by FAA is at historically high levels, it totaled just over $3.5 billion in FFY 2006, leaving a gap of $10.8 billion to be funded with local sources. With costs of construction increasing, airlines filing for bankruptcy, and periodic economic downturns affecting the industry, airport operators find themselves continually looking for additional revenue sources to fund capital projects and sustain operations.

This report presents the results of ACRP Project 11-03, S01-01, and is intended to inform airport operators, stakeholders, and policymakers about alternative financing options and revenue sources that are currently available to airport operators in the United States, or that could be available in the future if certain developments occur to facilitate them. Information used for this study has been gathered through a literature review and selected interviews of airport operators and industry experts.

This report provides: (1) a brief overview of common capital funding sources used by airport operators, (2) a high-level review of capital financing mechanisms used by airports, (3) a description of the various revenue sources developed by airport operators, and (4) a review of privatization options available to airport operators in the United States. Because what is innovative to one airport operator may be common practice to another, a continuum of financing mechanisms and sources of revenue is presented, starting with the most common practices at U.S. airports, and progressing to increasingly innovative practices.

The principal sources of funds for airport capital projects include the following, from largest to smallest:

- Proceeds of bonds and other forms of debt—Bond proceeds are the largest source of funds for airport capital needs. Debt service associated with bonds issued for airport capital needs can be supported by the overall tax base of the issuing entity, general airport revenues, passenger facility charge (PFC) revenues, revenues generated by the facility constructed with the bond proceeds, other revenues, or any combination thereof.
- PFC revenues—A majority of large-, medium-, small-, and non-hub airports impose a PFC of between $1.00 and $4.50 per enplaned passenger to finance eligible airport-related projects. Airport operators must obtain an approval from FAA before they begin the collection and use of such revenues.
- AIP grants from the Airport and Airways Trust Fund and administered by FAA—AIP grants administered by FAA are funded by aviation user taxes and are available to airport operators, subject to certain eligibility limitations and assurances.
- Internally generated capital resulting from retained airport revenues—Certain airport operators are able to retain net operating income from each year to invest in capital improvements.
- Security grants from the general fund and administered by TSA—TSA grants are available on a limited basis to airport operators to make terminal modifications to accommodate explosive detection systems.

- State grants and local financial support—Certain states provide funding for airport and aviation-related projects in the form of outright grants or matching share for federal AIP grants.

Airport operators are major and regular participants in the municipal bond markets. Despite the financial challenges airports have faced since September 11, 2001, airports have maintained investment-grade ratings from credit rating agencies. To finance capital projects, airport operators have:

- Utilized numerous types of bonds—Airport operators have used, among others, general obligation bonds, general airport revenue bonds, bonds backed by PFCs, bonds backed by customer facility charges (CFCs; fees paid by rental car customers), bonds to be paid with future AIP or state grants, and special facility bonds to finance capital projects. Each type of bond has advantages and disadvantages that are dependent on the structure and financial capacity of the airport operator. *For example, the Port of Seattle, operator of the Seattle–Tacoma International Airport, issued subordinate and intermediate lien general airport revenue bonds to finance a $3.4 billion capital improvement program and reduced projected airline payments.*
- Accessed other financial instruments—In addition to bonds, airport operators have used, among others, commercial paper, bond anticipation notes, grant anticipation notes, pooled credit programs, and capital leases. *For example, the city and county of Denver, operator of Denver International Airport, entered into capital equipment leases to provide short-term financing at low interest rates for runway, security, and other equipment.*
- Minimized interest expenses—Airport operators have reduced interest rates on outstanding bonds and manage interest rate risk by entering into interest rate swaps with investment banks. *For example, the city of Chicago has examined the agreements with airlines serving Chicago O'Hare International Airport to reduce the bonds subject to the alternative minimum tax* (*AMT*). *Bonds subject to AMT pay a higher interest rate than bonds not subject to AMT.*

Although a majority of these financing mechanisms have been used by large- or medium-hub airports, greater capital market acceptance can create opportunities for other airports.

Nonairline revenues may be used to reduce airline payments, fund new capital projects, or develop airport equity and reserves. Airports nationwide have developed creative programs to maximize revenue sources such as:

- Airport parking revenues—Parking has long been a revenue source for airport operators and further opportunities exist to enhance parking revenues by offering premium parking services, implementing parking operational enhancements, and collecting off-airport privilege fees.
- Rental car revenues—In addition to privilege fees and rentals, a CFC is collected at some airports by each rental car concessionaire from its customers and used to pay all or a portion of the operating and capital costs of a consolidated rental car area or structured facility, and may include the cost of transportation to the terminals. *For example, Albuquerque International Sunport imposed a CFC to finance the cost of a new consolidated rental car facility at the airport.*
- Terminal concessions—Airport shoppers are recognized as a lucrative market, and airport retailing is evolving to meet that market. Concession sales have increased dramatically as airlines discontinue meal service and passengers arrive earlier. Airport operators have been able to maximize revenues through reinventing their terminal concessions programs by recognizing the customer, creating an inviting shopping experience, providing an accommodating dining opportunity, and branding. *For example, Memphis International Airport's new concession program balances local favorites with major brands and provides guests with a sense of the city.*

- Advertising programs—With longer dwell times, airport customers now take the time to read advertisements. Modern airport advertising programs specialize in the sales and maintenance of advertising sites at airports by using technology, sponsorship opportunities, and nontraditional advertising locations.
- Commercial development and land use—Airport operators have generated revenue from a variety of revenue-producing leases from nonairline operations including manufacturing, warehousing, freight forwarding, and even farming on available airport land. Commercial development and land use has been done through coordinated planning efforts and mindful of FAA restrictions on land development. *For example, Dallas/Fort Worth International Airport is in the process of developing natural gas and oil resources on airport land.*

Most U.S. airports are operated as independent not-for-profit entities with oversight by a politically appointed authority or as a self-sustaining enterprise of a governmental entity such as a county, city, or state government. As it applies in the United States, privatization can refer to a broad range of activities that entail varying levels of private involvement in the operation of an airport including:

- Partial privatization—Airport operators have explored many ways of doing business that involve varying degrees of private-sector involvement in the management, capital investment decision making, financing, and pricing of airport facilities and services. Private involvement at airports nationwide includes airline involvement in capital decision making, contracting of services to private companies, master concessionaire agreements, and private terminal development. *For example, AMR* (*American Airlines' parent company*) *developed, renovated, and financed Terminal 4 at Los Angeles International Airport with special facility bonds issued by AMR and backed by their lease payments.*
- Full privatization—Some airports in the United States have been developed, financed, and operated privately throughout their entire existence, including various general aviation airports around the country. Congress established an airport privatization pilot program to explore privatization as a means of generating access to sources of private capital for airport improvement and development. *Stewart International Airport is the only airport to be privatized to date. Under the 99-year lease agreement, the New York State Department of Transportation received an initial payment of $35 million from National Express Group. The city of Chicago submitted a privatization proposal to FAA for Midway Airport in September 2006 that was still pending as of January 31, 2007.*

CHAPTER ONE

INTRODUCTION

This report presents the results of ACRP Project 11-03, S01-01, *ACRP Synthesis of Airport Practice 1: Innovative Finance and Alternative Sources of Revenue for Airports.* This introductory chapter describes the purpose of the report, presents the methodology used to develop the report, provides general background information, and outlines the organization of the report.

PURPOSE OF REPORT

This synthesis topic was identified by a 10-member panel of industry experts charged with overseeing syntheses of information related to airport problems and was initiated out of concern about challenges to airport operators' ability to finance operations and needed capital improvements in the context of:

- Increasing air traffic volumes nationwide and emerging congestion at certain airports necessitating investment in future capacity and other measures.
- Uncertainty about the financial health of the airline industry and the actual or potential affect airline bankruptcies may have on air service decisions and airport finances.
- Concerns regarding how willing the U.S. Congress will be to appropriate funds to aviation given the wars in Iraq and Afghanistan, the status of the federal budget, and other federal priorities.
- The potential effect that reauthorization of FAA, the Airport and Airway Trust Fund, and TSA may have on various funding sources for airports, including passenger facility charges (PFCs), Airport Improvement Program (AIP) grants from FAA, and grants from TSA.
- Construction inflation owing to post-hurricane rebuilding efforts and the increasing demand for construction materials by growing economies elsewhere in the world, particularly by China and India.

Given these and other financial challenges, the panel believed it would be prudent for airport operators to consider innovative finance mechanisms and alternative sources of revenue. This study is therefore intended to inform airport operators, stakeholders, and policymakers about alternative financing options and revenue sources that are currently available to airport operators in the United States, or that could be available in the future if certain developments occur to facilitate them.

Because what is innovative to one airport operator may be common practice to another, no attempt is made in this report to stipulate where certain "traditional" financing mechanisms or sources of revenue become "innovative." Rather, a continuum is presented, starting with the most common practices at U.S. airports, and progressing to increasingly innovative practices.

STUDY METHODOLOGY

Information used in this study has been acquired through a literature review and selected interviews of airport operators and industry experts.

Literature and Data Search

A comprehensive search of literature and data sources was conducted to document financing trends and innovative ideas explored by airport operators, FAA, TSA, and other transportation agencies. The research had three primary areas of focus: (1) nontraditional revenue sources airport operators could explore, (2) innovative financing mechanisms, and (3) new ways for airports to operate financially.

Interviews

Various interviews have been conducted to gather information on innovative financial alternatives for airports. Although airport operators have the most thorough knowledge of innovative financial alternatives used at their airports, rating agency analysts, investment bankers, and financial advisors have also been valuable resources in identifying those airports implementing innovative structures.

REPORT STRUCTURE

The remainder of this report includes the following:

- Chapter one concludes with a general background section to provide a brief overview of common capital funding sources used by airport operators.
- Chapter two provides a high-level review of capital financing mechanisms used by airports to obtain the most flexibility and/or capital funding from its revenue sources.

- Chapter three describes the various revenue sources airport operators have developed to date and new revenues that some airports are starting to use or that could be realized in the future.
- Chapter four reviews financing options available to airport operators in the United States that would fundamentally change the way they operate. The two main topic areas of this section include (1) privatization of airports and airport assets and (2) third-party development and capitalization.

GENERAL BACKGROUND ON AIRPORT FINANCIAL OPERATIONS

Airport Legal and Financial Structure

This section provides an overview of the legal organization of most U.S. airports, a discussion of the factors governing U.S. airport financial operations, and a discussion of the sources of funding for projects at U.S. airports.

Legal Organization of U.S. Airports

Most U.S. airports are operated as independent, not-for-profit entities with oversight by a politically appointed authority, or as self-sustaining enterprise funds of a governmental entity such as a county, city, or state government. The form of governance for the 100 busiest airports in the United States is as follows (the top 100 airports were determined based on numbers of enplaned passengers in 2005):

- Authority 39%
- City 33%
- Regional 5%
- County 13%
- State 7%
- Other 3%

Airports operated as enterprise funds of governmental entities may be overseen by boards or commissions structured as decision-making entities, operating within the legal and political framework of the sponsoring jurisdiction.

Airport authorities exist in a variety of forms and their specific powers and responsibilities are established by their enabling legislation. Some airport authorities are independent public bodies created by state legislation; others are municipal corporations or agencies created by one or more local jurisdictions under general state statutes governing the establishment of independent authorities. Many airport authorities sponsored by state or local legislation operate relatively independently of their governmental sponsors, while remaining responsive to political concerns and priorities. In other cases, the sponsoring jurisdiction retains some oversight of airport operation, such as approval of operating budgets and bond issues.

Factors Governing Airport Financial Operations

Most of the sources of capital available to finance airport improvements have either direct or indirect external restrictions on their use (i.e., federal or contractual restrictions). This section describes those external restrictions and provides the context for airport access funding from different sources, as will be discussed later.

Figure 1 reflects the typical factors that govern airport financial operations. Those factors include: (1) federal regulations and policies and grant assurances made by airport sponsors, (2) the airport operator's authorizing legislation, (3) the bond indenture for the airport, and (4) the airport's airline use and lease agreement(s). The airport's concession agreement(s) also affects the airport operator's net revenue and financial capacity.

Federal Regulations and Policies

Since 1982, the U.S. Congress has passed various legislation (1) establishing the AIP that provides federal grant funding, (2) creating the authority for airport operators to levy PFCs, and (3) governing how airport revenue is generated and used. U.S.DOT and FAA have established regulations and issued policy guidance to provide specific direction to airport operators regarding the eligibility and use of AIP funds, PFC revenue, and airport revenue. U.S.DOT/FAA regulations and policies regarding airport rates and charges, which relate to how airport revenue is generated, have also been issued.

Authorizing Legislation

Airport operators that are independent entities or enterprise funds of a city, county, or state government typically are governed by authorizing legislation or a local charter that establishes the airport operator's organizational structure, responsibilities, and powers. The authorizing legislation may specify facilities that the airport operator is responsible for developing and/or maintaining, such as airport access roads.

Bond Indenture

The bond indenture (also called a bond resolution or bond ordinance) provides the legal basis for issuing airport revenue bonds and defines the terms under which additional bonds might be issued, including the need for revenue-generating projects. The bond indenture defines what may or may not be included in the definition and computation of airport revenues and expenses. The indenture establishes various funds and accounts for the payment of interest and principal on the bonds from airport revenues, establishes the priority of payments for all of the airport operator's obligations, and sets

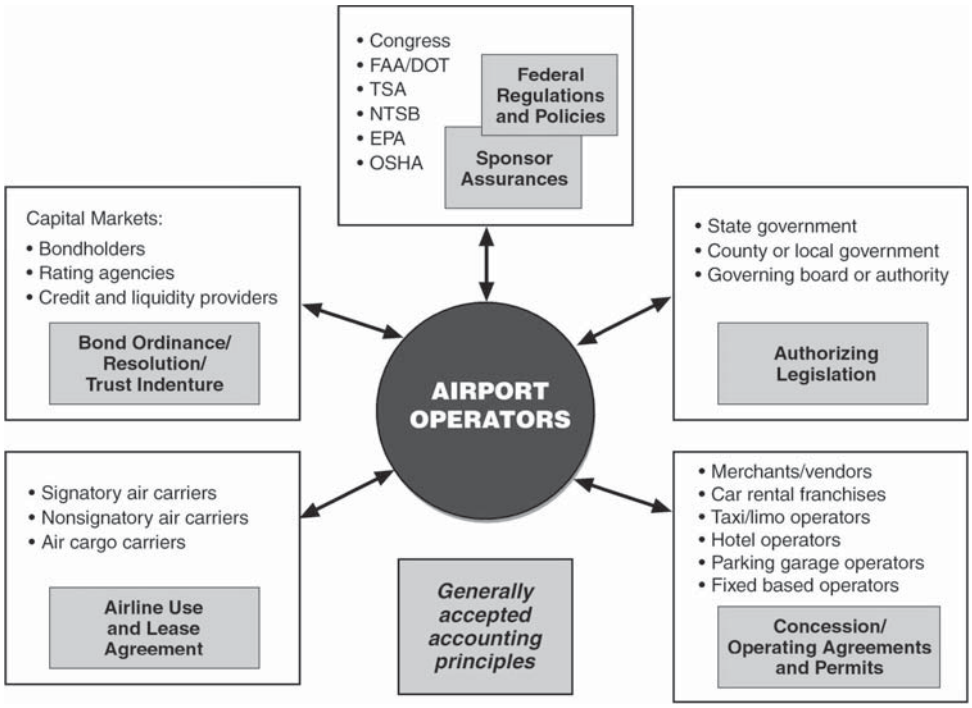

FIGURE 1 Factors governing airport financial services.

forth various covenants between the issuing entity and the bondholders, including a rate covenant requiring the airport operator to set rates and charges to produce specified levels of revenues. Some airport bond indentures may also include principles to guide the establishment of rates and charges for the use of airport facilities.

Airline Agreements

An airport–airline agreement generally stipulates the rights, privileges, and obligations of the airport operator and the airlines serving the airport, and sets forth the manner in which the rentals, fees, and charges paid by the airlines for use of the airport are calculated and adjusted. Parties to a use and lease agreement are called Signatory Airlines.

Many airline agreements contain provisions that require a certain number or percentage of the Signatory Airlines to approve or disapprove certain decisions of the airport operator, most often those involving airport capital expenditures. These provisions are known as Majority-in-Interest provisions and are designed to give the Signatory Airlines some control over long-term financial obligations undertaken by the airport operator.

Some airports, however, are not governed by such agreements, and instead rates are established by ordinance or regulation. In those instances, the airport operator typically adopts a policy setting forth the procedures to be used in calculating user rentals, fees, and charges, and applies those procedures consistently from year to year in enacting the rate ordinance and calculating airport charges. The FAA's "Policy Regarding Airport Rates and Charges" (1996) broadly governs airport rate setting in the absence of an airline agreement and dispute resolution.

Concession Agreements

Many airport operators also enter into various agreements with providers of nonaeronautical services, such as parking garage operators; rental car agencies; and merchants and vendors of food, news items, and gifts on airport premises. These agreements are often the largest source of nonairline revenues at most airports. The agreements do not, however, govern how an airport operator can use those revenues.

Airport Capital Needs

The capital requirements of airports are significant today, and are expected to increase in the future. The capital needs of airports are principally driven by:

- Traffic growth and the need to expand facilities;
- Normal wear and tear of facilities as a result of use and age; and
- Changing technology, particularly aircraft technology that over time can render older facilities obsolete.

According to the Capital Needs Survey, airport capital needs are estimated to exceed $70 billion for the 5-year period from federal fiscal year (FFY) 2005 through FFY 2009 conducted by Airports Council International–North America (ACI–NA). The survey reflected capital investments of approximately $14.3 billion per year, a figure that is to be updated early in 2007.

According to the National Plan of Integrated Airport Systems (NPIAS) for FFY 2007 through FFY 2011, airport operators will have $41.2 billion (or $8.24 billion per year) in capital projects eligible for federal aid as shown in Figure 2. However, even though AIP has been at historic levels, it totaled just over $3.5 billion in FFY 2006 (the FFY 2007 appropriation was pending at this time), leaving a funding gap of just over $4.7 billion annually for airport projects eligible for federal aid. It is important to note that overall capital needs for airports are higher than the NPIAS estimate: projects eligible for federal aid that are paid for by other local sources (including airport bonds and PFCs) are not included in the NPIAS estimate, nor are capital projects ineligible for federal aid (e.g., revenue-producing parts of the terminal or parking garages). According to the most recent ACI–NA *Capital Needs Survey,* once capital projects that are to be funded from sources other than federal grants are included, such as bonds, the total increases significantly.

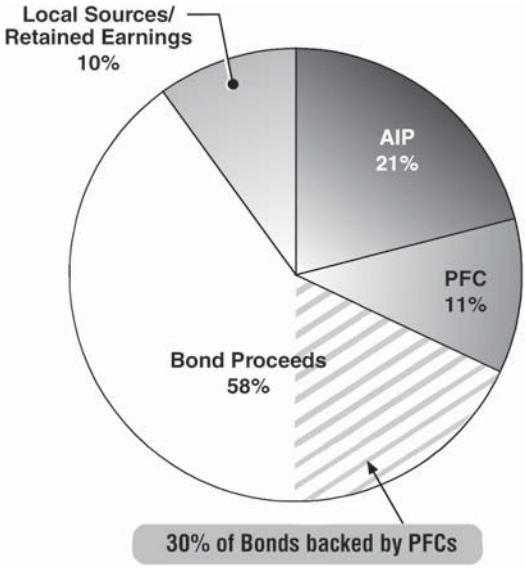

FIGURE 2 Sources of airport capital (2001–2004, average). *Source:* Thomson Financial, FAA, and ACI–NA.

Airport Sources of Funding

As indicated earlier, increasing capital investments will be required for airport operators to provide needed infrastructure. The principal sources of funds for airport capital projects include the following, cited from largest to smallest:

- Proceeds of bonds and other forms of debt
- PFC revenues
- AIP grants from FAA
- Internally generated capital resulting from retained airport revenues
- Security grants from TSA
- State grants and local financial support

The distribution of airport sources of capital is shown in Figure 2.

Proceeds of Bonds and Other Forms of Debt

Four basic types of bonds are issued to fund airport capital improvements, including (1) general obligation bonds supported by the overall tax base of the issuing entity (the airport sponsor); (2) general airport revenue bonds (GARBs) secured by the revenues of the airport and other revenues as may be defined in the bond indenture; (3) bonds backed either solely by PFC revenues or by PFC revenues and airport revenues generated by rentals, fees, and charges; (4) special facility bonds backed solely by revenues from a facility constructed with proceeds of those bonds; and (5) other debt instruments. Bonds and other debt instruments are discussed in greater detail in chapter two.

Passenger Facility Charges

In 1990, Congress enacted legislation to provide airports with an additional source of funding for capital projects, subject to FAA approval, in the form of PFCs. The Aviation Safety and Capacity Expansion Act of 1990 required U.S.DOT to issue regulations under which a public agency may be authorized to impose a PFC of $1.00, $2.00, or $3.00 per enplaned passenger at commercial airports it controls. Under this act, airport-related projects that preserve or enhance safety, capacity, or security of the national air transportation system; reduce noise from an airport that is part of the system; or furnish opportunities for enhanced competition between or among air carriers are eligible.

The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21) included authorization to charge a PFC at the $4.00 and $4.50 levels that meet specific eligibility requirements. One such requirement, which applies only to large- and medium-hub airports, is that a project must make a "significant contribution" to improving air safety and security, increasing competition, reducing congestion, or reducing noise (in comparison with the "adequate justification" requirement for projects at a lower level). For operators of large- and medium-hub airports that are approved to collect a $4.00 or $4.50 PFC, passenger entitlement grants are reduced by 75% (rather than the 50% associated with lower PFC levels). Figure 3 shows:

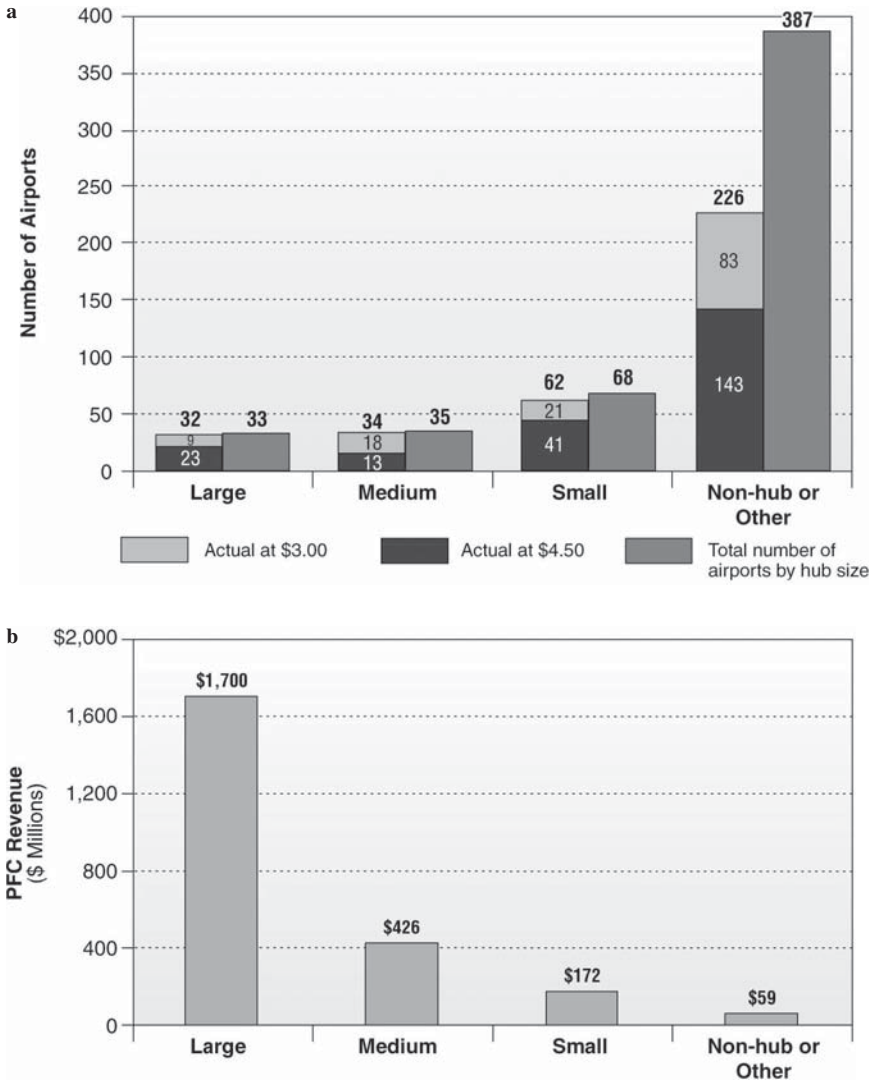

FIGURE 3 (*a*) Passenger facility charge levels by hub size; (*b*) total PFC revenue by hub size. *Source:* FAA, PFC Branch, Feb. 2006.

- The number of airports charging PFCs, and the level being charged by hub size compared with the total number of airports of that hub size. It shows that the number of airports by category and the number charging a PFC increases as one moves from large- to medium-, small- and non-hub airports, although the highest percentage of airports charging PFCs are in the large-, medium- and small-hub categories.
- The amount of PFC revenue collected by airport hub size, which are orders of magnitude larger for large-hub airports than for the other hub sizes.

More than $2.2 billion in PFC revenues are collected by airport operators each year. PFC revenues are: (1) used on a "pay-as-you-go" basis, where PFC collections and interest earnings are spent directly on capital projects, and/or (2) leveraged; that is, used to pay debt service on bonds or to repay other forms of debt. These forms of financing will be discussed in greater detail in chapter two.

AIP Grants from Airport and Airway Trust Fund Administered by FAA

Federal AIP grants administered by FAA are funded by aviation user taxes. AIP grants are made available to airport operators in numerous forms:

- *Entitlement funds,* which are apportioned to primary airports based on levels of passenger traffic and to cargo service airports based on levels of cargo aircraft landed weight, subject to certain minimum and maximum levels.
- *Small airport funds,* which are apportioned to general aviation (including reliever) and non-hub commercial service airports.

- *Set aside funds,* which are dedicated to noise compatibility planning and implementation, the Military Airport Program, and reliever airports.
- *State apportionments,* which are principally apportioned for nonprimary commercial service, general aviation, and reliever airports based on an area/population formula among the 50 states, the District of Columbia, Puerto Rico, and insular areas. In Alaska, Hawaii, and Puerto Rico these amounts may be used at any primary or nonprimary airport in addition to other designated entitlements.
- *Nonprimary apportionments,* which are apportioned based on the needs for a particular nonprimary airport in the most recently published NPIAS, subject to overall caps.
- *Discretionary funds,* which are distributed based on the ranking of the airport's projects in relation to others deemed most important for improving the national airspace system.

There are two important steps in the federal policy making process.

- *An authorization* provides the legal authority for the federal government to undertake a program. The length of an authorization is typically between 3 and 5 years, with Vision 100 running the period between FFY 2004 through FFY 2007. The next authorization bill will run from October 1, 2007, to the end of the authorization period, for which the duration is to be determined.
- *An appropriation* must be separately enacted by Congress each FFY for funding actually to be spent on a program.

Confusion often occurs when Congress authorizes a program at a particular level and then either does not provide any funding or does not appropriate monies to the authorized level. As shown in Figure 3, this has happened frequently, although the differences, if any, have been slight since 2001.

FAA has issued AIP grants as multiyear letters of intent (LOIs) as well as 1-year grants. Airport operators must conduct benefit–cost analyses to obtain discretionary grants for more than $5 million or for multiyear LOIs to fund capacity projects.

Airport operators must give certain assurances to FAA to receive federal grants. More than 30 assurances must be certified by the sponsor as a condition of grant approval depending on the type or scope of the project for which the grant is being sought. Examples of assurances that directly affect the legal and financial structure of airports are:

- Economic nondiscrimination—Ensures that the airport will be operated for public use on fair and reasonable terms, and that those engaged in aeronautical activities at the airport are providing services on a fair, equal, and not unjustly discriminatory basis and charging fair, reasonable, and not unjustly discriminatory prices for those services.
- Nonexclusive right of use—Ensures that the airport operator will not permit exclusive use of its aeronautical facilities by those providing aeronautical services.
- Fee and rental structured to provide airport financial self-sufficiency—Ensures that the airport fee and rental structure will be set so as to make the airport as self-sustaining as possible.
- Nondiversion of airport revenues—Ensures that all revenues generated by the airport and local taxes on aviation fuel will be expended on the operating and capital costs of the airport or other facilities, directly and substantially related to aeronautical activity, owned and operated by the operator of the airport.

Through FFY 2003, AIP grants were used to fund explosives detection system (EDS) infrastructure at airports. Beginning in FFY 2004 through FFY 2006, U.S.DOT's annual appropriation acts have prohibited spending AIP funds for baggage screening infrastructure. This prohibition is expected to continue through FFY 2007 and possibly beyond.

Internally Generated Capital Resulting from Retained Airport Revenues

Airport operators charge and collect rentals, fees, and charges for the lease and use of facilities to passenger and cargo airlines, concessionaires, and other entities providing airport support services. Rentals, fees, and charges collected from airlines cover a portion of the operating expenses and debt service incurred by airport operators. Rentals, fees, and charges collected from tenants of airport facilities are also often the primary source of funds for repayment of principal and interest on bonds. Airport sources of revenue are discussed in detail in chapter three.

Total revenues, less total operating expenses incurred by the airport operator, equal the net operating income generated by the airport operator. Net operating income (1) can be used to fund debt service (along with the portion recovered from airline rentals, fees, and charges), (2) can be invested as cash in capital improvements (this constitutes slow forming equity because it typically takes years to retain significant retained earnings), and/or (3) can be returned to the airlines in the form of revenue-sharing or credits in the calculation of rentals, fees and charges.

Security Grants from the General Fund Administered by TSA

Since FFY 2003, TSA grants have been available to airport operators on a limited basis to make terminal modifications to accommodate EDS. TSA grants have been issued as

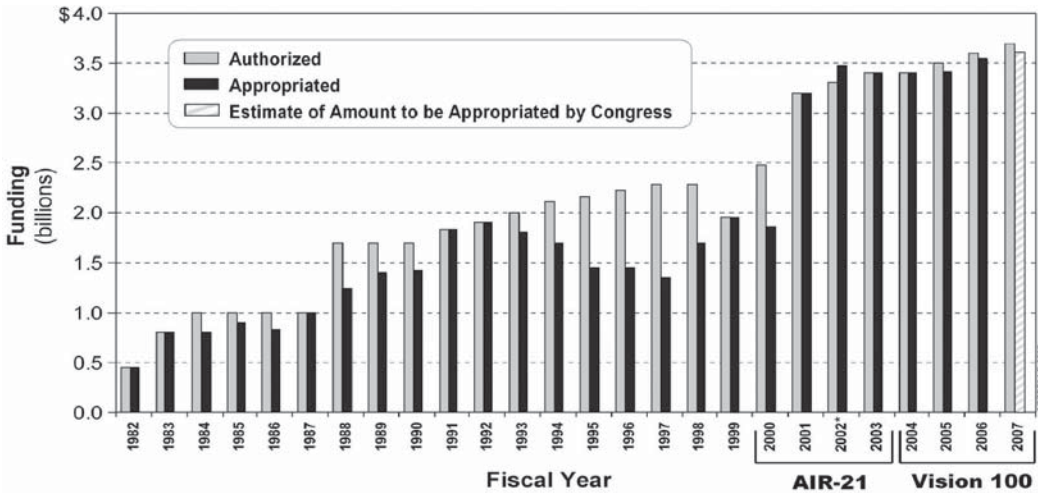

FIGURE 4 AIP funding levels.

multiyear LOIs as well as 1-year grants, called other transaction agreements (OTAs), to fund baggage screening infrastructure. Through FFY 2004, TSA executed eight LOIs to provide grant funding to each of nine airports over a 3- or 4-year period, with the last payments to be made in FFY 2007 providing the funding is appropriated. Figure 4 reflects the budget for EDS installation and integration since FFY 2003.

Owing to concerns about making multiyear commitments without the safeguards of a trust fund or other form of guaranteed future year funding, and because the funding stream has not supported additional long-term grant agreements, TSA has provided only 1-year grants since FFY 2004 through OTAs. To date, approximately 33 OTAs have been issued by TSA (see Figure 5).

State Grants and Local Financial Support

Certain states provide funding for airport and aviation-related projects in the form of outright grants or matching share for federal AIP grants. States fund such grants or local matching funds from a variety of sources—registration and licensing fees and dedicated or special taxes such as fuel taxes. Support from local governments generally takes the form of general

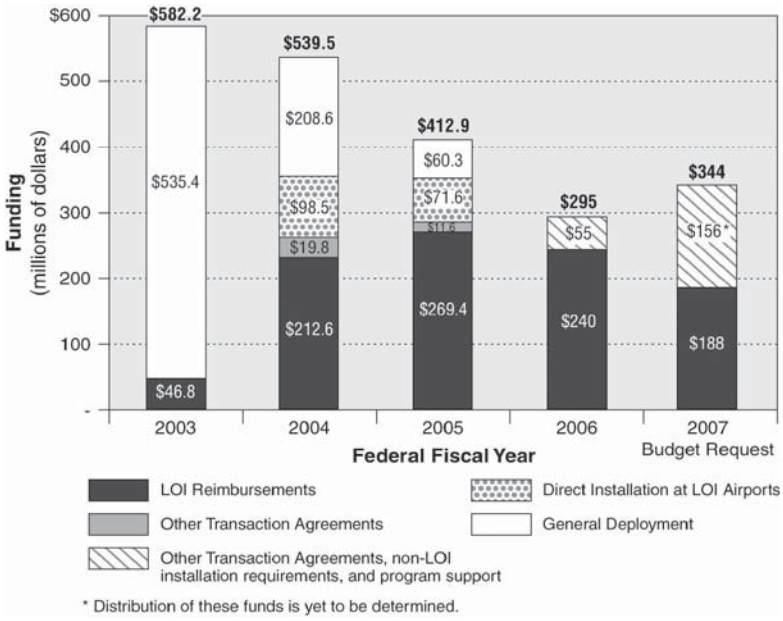

FIGURE 5 Current TSA obligated funding levels. *Source:* TSA Finance and Administration staff, Aug. 2006.

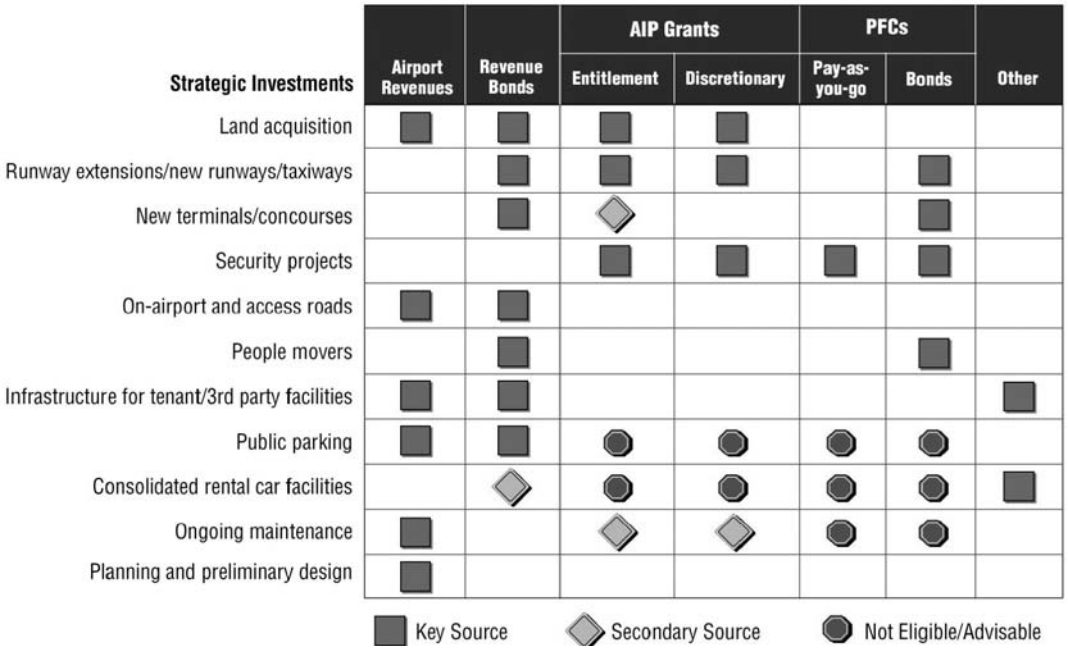

FIGURE 6 Strategic targeting of airport funding sources.

taxes. State or local grants may be provided to fund capital improvements at an airport, such as roadway and access projects. As shown in Appendix A, 30 states levy aviation fuel taxes and 10 states have aircraft sales or use taxes. State grants are used as the local match to AIP funds or as direct grants for various types of projects as shown. Certain states also provide lower or no interest loans.

Using Sources of Funding Strategically

Aligning the sources of capital funds with allowable and optimal uses is essential for airport operators to maximize the impact of each dollar. Certain funding sources such as PFCs and AIP grants have restrictions in how they can be used. In addition, sources such as revenue bonds are more effective when targeted to projects having a direct income stream, especially when airline approvals are required.

After maximizing the use of federal AIP grants and PFC revenues for major capacity-enhancing projects, airport operators can fund capital projects from a combination of debt and equity. Private and/or third-party funding may also make sense for certain types of facilities, such as maintenance facilities, flight kitchens, and cargo facilities. Figure 6 summarizes the strategic use of capital sources among the competing uses to optimize financial capacity.

CHAPTER TWO

FINANCING MECHANISMS—AIRPORT PRACTICES AND INNOVATIONS

This chapter gives a high-level review of capital financing mechanisms used by airport operators. Although certain of these mechanisms may be commonplace at one airport, they may be innovative at another. Specifically, the following are discussed in this chapter:

- Airport access to credit,
- Types of airport bonds, and
- Other forms of airport financing.

AIRPORT ACCESS TO CREDIT

The cost to airport operators to access the capital markets is a function of several key factors that determine airport investment quality:

- Bond ratings,
- Interest costs,
- Insurability, and
- Defaults.

Airport operators are major and regular participants in the municipal bond markets. Figure 7 shows the value of state and local transportation-related financing transactions for 2000 through 2004. In addition to the value of financings transacted by airport operators, it shows the value of transactions by operators of toll roads and highways, mass transit, and other modes of transportation such as seaports, bridges, tunnels, and parking facilities. Airport financings are a significant share of the total, second to transactions carried out by operators of toll roads and highways and, in some years, mass transit operators.

Airport Bond Ratings

Major investor services use rating systems to grade bonds according to investment quality to inform potential investors about the creditworthiness of specific types of bonds at specific airports. Figure 8 shows the distribution of bond credit ratings for airports of all hub sizes as of August 2006, for two types of debt: (1) GARBs and (2) stand-alone PFC bonds. Despite the financial challenges airports have faced since September 11, 2001 (9-11), airports remain financially sound. The three major credit rating agencies—Moody's Investors Service, Fitch Ratings, and Standard & Poor's—have concluded that, on the whole, the airport system has performed well under difficult circumstances.

Interest Costs

The interest paid by airport operators to attract investors relative to what other municipal enterprises pay is a measure of the attractiveness of airport debt in the capital markets. Airport interest costs also reflect whether interest on the bonds is taxable for federal income tax purposes, is subject to the alternative minimum tax (AMT), or is tax-exempt (see Ways of Addressing Alternative Minimum Tax Issues).

Insurability

The affordability of purchasing bond insurance to improve credit ratings and reduce interest costs is a third factor relating to the cost of airports accessing the capital markets. Bond insurance is an important means by which airports can reduce their interest costs. That airport operators of all size categories can afford insurance is a signal of creditworthiness in the capital markets. Although airport operators do not always buy bond insurance, especially those with strong ratings, the overwhelming majority of the bonds issued since 9-11 have been insured.

Defaults

The frequency with which airport operators have defaulted on bond issues is the fourth measure of the competitiveness of airports in the capital markets. By this measure, the competitiveness of airports is particularly strong. The *airport* industry never experienced a single default. There have been several instances of *airline* special facility debt defaults.

TYPES OF AIRPORT BONDS

Airport sponsors and operators issue various forms of bonds to finance generally large-scale capital projects with long-term debt. This section discusses the following types of bonds:

- General obligation (GO) bonds
- GARBS
- Bonds backed by PFCs
- Bonds backed by customer facility charges (CFCs)
- Bonds to be paid with future grants
- Ways of addressing AMT issues
- Potential new tax credit bonds (TCBs) for baggage screening infrastructure.

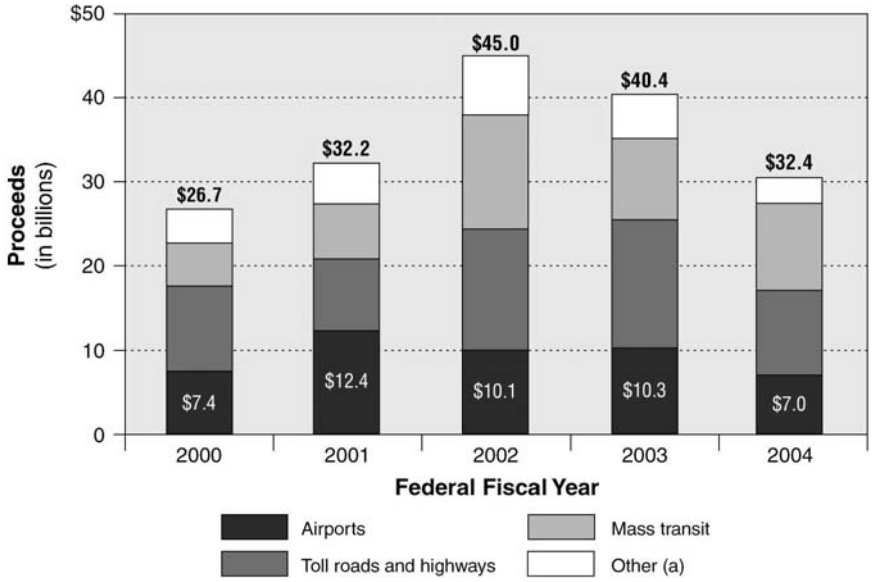

FIGURE 7 State and local transportation—Related financings. [(a) includes seaports, bridges, tunnels, parking facilities, and other transportation.] *Source:* Government Accountability Office, *Federal Tax Policy, Information on Selected Capital Facilities Related to the Essential Governmental Function Test.*

General Obligation Bonds

GO bonds may be issued to finance airport capital improvements, backed by general tax revenues of the city, county, or state that owns and operates the airport. Specifically, local general tax revenues such as sales, income, or property taxes may be pledged as a source of repayment for GO bonds, although the airport operator may actually pay debt service from airport sources, or, in rarer instances, general local taxes may directly pay debt service on proceeds used to fund airport projects.

Some large airports such as Honolulu International Airport pay debt service on outstanding GO bonds issued on their behalf by their airport sponsor (in this case, by the state of Hawaii); however, the bonds were generally issued decades ago and the outstanding balances are relatively small. GO bonds are currently a key financing tool for many small airports for several important reasons:

- Stronger credit with lower interest rates—GO bonds are a stronger credit than GARBs, which are discussed later. GO bonds therefore result in lower interest costs for the airport because the bonds are backed by the full faith and credit of a city, county, or state that (1) has a much larger and diverse tax revenue base than an airport's revenue base, and (2) can typically adjust tax rates often more readily than an airport operator can adjust airport rates and charges. However, in certain states voters must approve tax rate adjustments and/or issuance of bonds, which may make GO debt less attractive than GARBs.
- Lower issuance costs—GO bonds do not have the upfront costs of developing a separate indenture/ordinance, getting bond ratings and insurance, and preparing feasibility studies that GARBs have. These upfront GARB costs do not generally vary significantly with the size of the bonds being issued, and so constitute a larger percentage of the GARB for small airports issuing smaller numbers of bonds. This makes GO bonds more attractive the smaller the bond issue is, and because smaller airports typically have smaller capital needs, GO debt is typically more attractive for them.
- No coverage requirement—Airport operators are typically required to maintain coverage of 1.25x or 1.35x; that is, the ratio of net revenues after paying operating costs to annual debt service must be at least 125% or 135% to give investors comfort that their debt will be repaid. Because of the strength of GO bond credits, coverage is not required, which can also save airport operators money.

General Airport Revenue Bonds

GARBs are traditionally the most commonly issued bonds for airport infrastructure. Their credit rating is based on revenues generated at the airport from airline rates and charges, parking, rental car operations, terminal concessions, other leases, interest, and any other revenues of the airport. Following the economic downturn in 2000 and the terrorist attacks of 9-11, GARB credit ratings for several airports were downgraded, and 19 of the 31 large-hubs carried negative outlooks (*Aviation Infrastructure Innovative Financing* 2002). The financial outlook and accompanying credit ratings for airports have subsequently steadily improved as airport operators have taken many steps to manage their financial results, and as traffic levels have returned to pre-9-11 levels.

The remainder of this chapter discusses other types of bonds that reflect innovations by airport operators and the financial markets. Even within the category of GARBs various innovations can be seen.

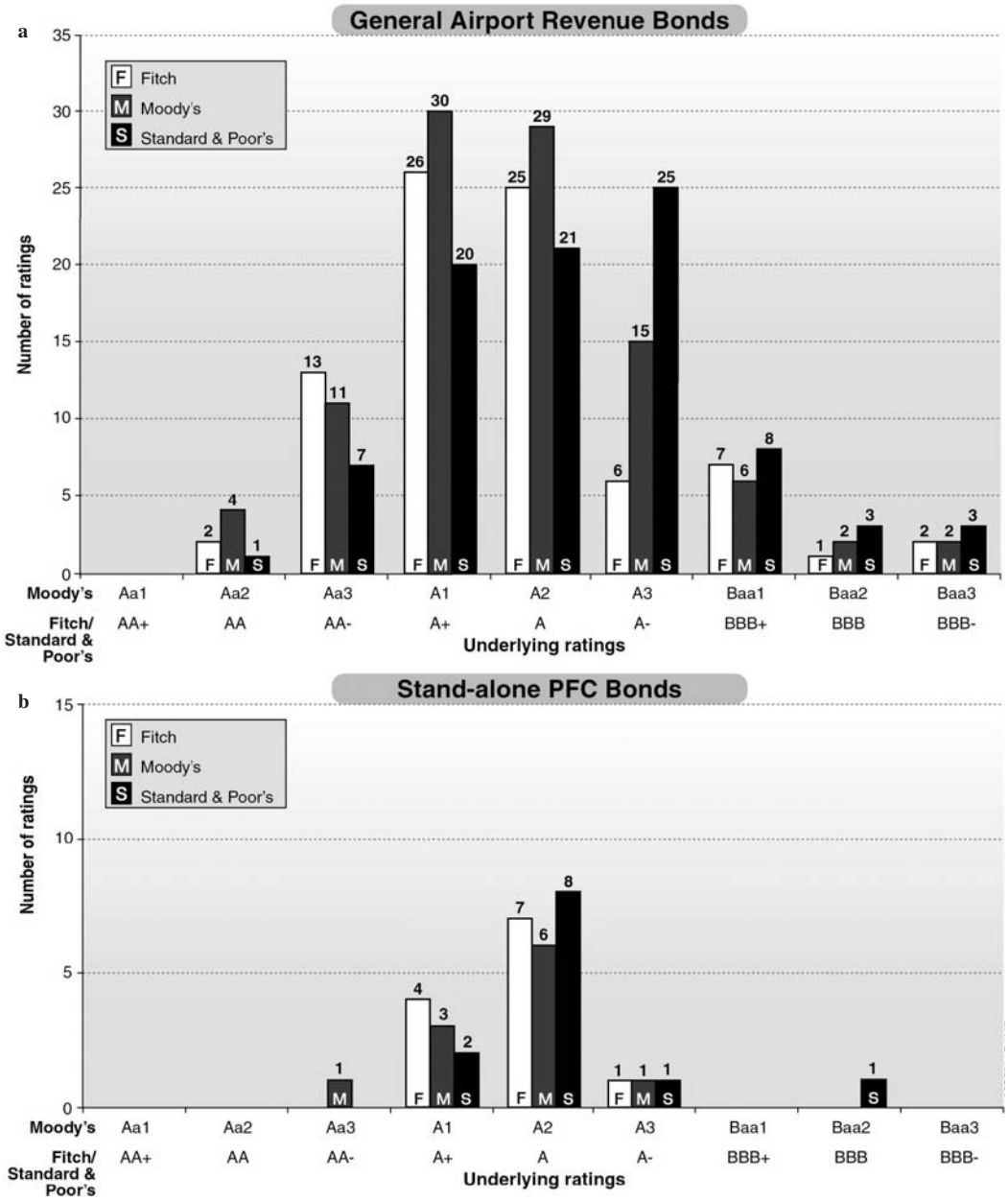

FIGURE 8 Bond credit rating for all hub sizes as of August 2006: (*a*) General airport revenue bonds; (*b*) stand-alone PFC bonds.

- Use of sureties in lieu of funded reserves—Airport operators historically funded required debt service reserves from either available retained earnings (cash) or from bond proceeds. Sureties can be obtained from the financial markets either at the time of, or any time, after bond issuance, to be used in lieu of a funded reserve. Sureties are recognized by the rating agencies, bond insurers, and investors as equivalent security to providing a funded reserve. The airport operator pays a fee at issuance, usually a percentage of the new or outstanding principal, and in the event that it is needed to pay debt service, the surety is drawn on. Use of sureties can reduce the size of a bond issue and therefore annual debt service by eliminating the need to fund a debt service reserve account and/or free cash held in a reserve to be used for any allowable airport purpose (allowable uses may need to be determined by the airport operator's bond counsel, depending on the provisions of its bond indenture or ordinance).
- Use of intermediate and subordinate liens—It is increasingly common for airport operators to issue bonds with a lower pledge of airport revenues than its senior debt. Issuing intermediate and subordinate debt can reduce coverage requirements and annual airline rates and charges. The downside is that such liens typically require new bond indentures or ordinances, which can add time and costs to the issuance process (see, for example, Figure 9).
- Interest rate swaps—Airports increasingly enter into "over-the-counter" contracts with investment banks to

The Port of Seattle developed a structure of multiple liens in its flow of funds as part of its strategy to finance a $3.4 billion capital improvement program (CIP) at Seattle-Tacoma International Airport and its Seaport properties over 6 years. Approximately $2.7 billion of that CIP was earmarked for Airport projects, including completion of a third runway and the implementation of a consolidated rental car facility.

The Port instituted a series of measures to reduce projected airline payments per enplaned passenger from a peak (in 2009) of $24 to less than $15. The Port's first lien rate covenant requires net revenues in each fiscal year to at least equal 135% of scheduled debt service payments on outstanding bonds. The Port plans to close the first lien, and is using a new intermediate lien as the primary lien for new airport debt, thereby reducing the coverage requirement to 125%. A subordinate lien is used for variable rate funding, with an even lower coverage requirement of 100%. As shown on the flow of funds figure, the Port has the ability to use open liens that fall after the first lien and before the intermediate lien currently being used, and to use additional open liens that fall after the intermediate lien but before the subordinate lien in the flow of funds to further manage coverage.

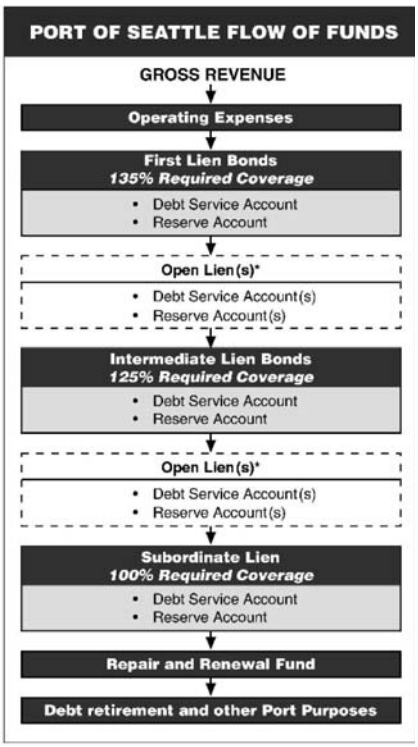

FIGURE 9 Seattle–Tacoma International Airport. Use of subordinate liens to reduce debt service coverage and airline payments.

"swap" or exchange a stream of interest payments for another party's stream. Each swap is a unique contract between the parties and cannot be bought and sold like securities or futures contracts. Interest rate swaps are normally "fixed against floating," where an airport operator exchanges fixed-rate obligations for floating rate obligations, or "floating to fixed," where the reverse happens. The principal amounts are not exchanged, and are referred to as the notional principal (with the exception of basis swaps). Swaps are often used to hedge certain risks, for instance interest rate risk (see, for example, Figure 10).

By swapping interest rates, an airport operator is able to synthetically alter its interest rate exposures and bring them in line with management's appetite for interest rate risk. Forms of interest rate swaps include (Market Update and Interest Rate Swaps Presentation, Oct. 18, 2005):

– Forward current refunding (synthetic fixed)—A fairly common type of swap transacted by operators of airports such as Charlotte/Douglas International, Jacksonville International, Miami–Dade International, Sacramento International, Salt Lake City International, and Wayne County (Detroit).

In 2001, the City of Manchester, New Hampshire, issued general airport revenue bonds to fully refund prior bonds issued in 1992. The prior bonds had a lien on Manchester-Boston Regional Airport revenues that was senior to airport revenue bonds issued subsequently.

An unusual aspect of this financing was that it entailed issuing variable rate bonds and a swap agreement. The City wished to take advantage of the lower interest rates afforded by variable rate bonds, but did not want to take on the increased risk associated with variable rate debt. To achieve both objectives, the City entered into a forward interest rate exchange agreement (swap agreement) with an investment bank in 1998. The City then issued variable rate general airport revenue bonds in 2001 to refund the prior bonds. However, the City does not pay variable interest rates on its 2001 Bonds. Under the swap agreement, beginning in January 2002, the City paid the investment bank a fixed interest rate of 4.83% annually on the par amount of the 2001 Bonds and received interest payments from the investment bank at the variable rate payable on the 2001 Bonds. The average coupon rate for the prior bonds was 6.8%. Because of the lower interest rate, the City was able to reduce its interest expense over the term of the Bonds by nearly $6.4 million.

FIGURE 10 Manchester–Boston Regional Airport. Revenue bonds under a swap agreement.

– Advance refunding (synthetic fixed)—Examples include operators of the airports in Atlanta and Manchester, New Hampshire.
– Swaption for refunding—A swaption is a financial instrument granting the owner an option to enter an interest rate swap pursuant to certain agreed upon terms. Examples include the operators of airports serving Philadelphia, Portland (Oregon), Chicago (Midway), and Albany.
– Forward hedge for new money—Examples include the Indianapolis Airport Authority and the Metropolitan Washington Airports Authority.
– Synthetic variable—Have been used by the operators of airports serving Boston, Las Vegas, and Orlando.
– Basis swap—Also known as "floating to floating" swaps, have been used by the operators of airports in Cleveland, Las Vegas, and New Orleans.

Passenger Facility Charge Bonds

Airport operators have increasingly issued bonds that either include a pledge of PFC revenues and/or are to be repaid in part or in full from PFC revenues. Approaches to leveraging PFC revenues include:

- Combined flow of funds—These bonds are a form of GARB, where the bonds are secured by an underlying pledge of airport revenues. Under this structure, PFC revenues, or certain PFC revenues, are defined as airport revenues in the bond indenture. Combined airport revenues are then used to pay GARB debt service. This bond structure is used by the airports serving Albuquerque, Guam, and Orlando, among others.
  – *Advantages*—it is relatively easy to incorporate into an existing revenue bond indenture, and debt service

coverage requirements can be lower relative to stand-alone PFC bonds (i.e., 1.25x–1.35x instead of 1.5x for stand-alone PFC-backed bonds).
  - *Disadvantages*—bonds issued under this approach reduce the airport sponsor's GARB capacity, and sometimes more importantly, may require airline majority-in-interest approval.
- Direct debt service offset—These bonds are another form of GARB secured by airport revenues. PFC revenues are used to pay all or a part of the GARB debt service, but they do not secure the bonds. Debt service may be included in the airline rate base if projected PFC revenues are not realized under this structure. This bond structure is used by the airports serving Albany, Austin, Cleveland, Denver, El Paso, Grand Rapids, and Providence, among others.
  - *Advantages*—they result in higher demonstrated debt service coverage relative to the combined flow of funds structure, as PFC revenues directly offset debt service (the denominator in the coverage calculation). Also, debt service coverage requirements can be lower relative to stand-alone PFC bonds.
  - *Disadvantages*—(1) they do not preserve GARB capacity, (2) they are not applicable to airports where the definition of airport "Revenues" includes PFC revenues, or that pledges airport revenues elsewhere, and/or (3) they may require airline majority-in-interest approval.
- Back-up pledge of subordinate airport revenues—These bonds are secured by PFC revenues with a back-up pledge of airport revenue that is subordinate to a more senior lien on airport revenue. This bond structure is used by the airports serving Baltimore, Las Vegas, Nashville, and Sacramento, among others.
  - *Advantages*—(1) it enhances the creditworthiness of the bonds versus stand-alone PFC bonds, (2) it keeps the costs out of the airline rate base, (3) debt service coverage requirements can be lower relative to stand-alone PFC bonds (i.e., 1.25x–1.35x), (4) it preserves the senior lien GARB capacity, and (5) it maximizes airport management control over airport financing decisions.
  - *Disadvantages*—they are not applicable to airports where the definition of airport "Revenues" includes PFC revenues or that pledges them elsewhere.
- Stand-alone PFC bonds—Issuance of bonds backed solely by PFC revenues has evolved since they were first issued in 1994. Stand-alone PFC bonds have been issued by the airports serving Boston, Chicago, Fort Lauderdale, Lee County (Fort Myers, Florida), Little Rock, New Orleans, Palm Springs, Portland (Oregon), Richmond, and Seattle.
  - *Advantages*—(1) they preserve GARB capacity, (2) keep costs out of the airline rate base, and (3) maximize airport management control over airport financing decisions because they do not require airline majority-in-interest approval.
  - *Disadvantages*—(1) PFC revenues are completely dependent on passenger volumes; (2) the bonds entail development of a new indenture or ordinance; (3) they require FAA termination protection and approval of the bond indenture; (4) they require more rigorous tests and sensitivity analysis; (5) they have higher required debt service coverage levels, typically 1.5x; and (6) they are not applicable to airports where the definition of airport "Revenues" includes PFC revenues, or that pledges them elsewhere.
- Convertible lien PFC bonds—Another concept is to issue bonds initially secured solely by PFC revenues that subsequently convert to GARBs. To date, the only airport to issue such bonds is Broward County, which operates Fort Lauderdale–Hollywood International Airport (see Figure 11).

Bonds Backed by Customer Facility Charges

As discussed in chapter three, CFCs are collected by rental car companies from their customers at certain airports to pay operating expenses and debt service for consolidated rental car facilities. As with PFC revenues, CFC revenues can be structured in many of the same ways as the various forms of PFC bonds.

- Combined flow of funds—These bonds have the same characteristics, advantages, and disadvantages as PFC bonds structured as a combined flow of funds. Examples include the bonds issued for the consolidated rental car facility at Fort Lauderdale–Hollywood International Airport.
- Direct debt service offset—These bonds have the same characteristics, advantages, and disadvantages as PFC bonds structured with a debt service offset. No specific examples of this type of CFC bond have been identified; however, they could be implemented by interested airports.
- Back-up pledge of subordinate airport revenues—These bonds have the same characteristics, advantages, and disadvantages as PFC bonds structured as CFC bonds with a back-up pledge of subordinate airport revenues. No specific examples of this type of CFC bond have been identified; however, they could be implemented by interested airports.
- Stand-alone CFC bonds—These bonds have the same characteristics, advantages, and disadvantages as stand-alone PFC bonds. Examples include the bonds issued for the consolidated rental car facility at Dallas/Fort Worth International Airport.

Single-Tenant Special Facility Bonds

Special facility bonds issued by a single tenant are used to finance unit passenger terminals or portions of terminals, hangar and maintenance facilities, cargo buildings, and ground equipment support facilities for the exclusive use of an airline.

In 1997, the signatory airlines at Fort Lauderdale-Hollywood International Airport approved a $334 million capital program to accommodate continuing passenger growth. To maintain the low-rate structure at the Airport, PFCs were targeted as a major funding source for the program.

To alleviate the need for airline approvals, the financing plans were structured so that PFCs would be leveraged as standalone debt until 2012, which coincides with expiration of the airline agreement. Upon conversion of the debt to Airport System revenue bonds, debt service will be paid from Airport revenues until maturity of the bonds in 2023.

Broward County issued two series of convertible lien bonds, in 1998 and 2001, and has issued double-barrel bonds to be paid with PFCs through 2012.

In the feasibility studies for the bond sales, airline costs were forecast to be less than $7.10 per enplaned passenger through 2009, which meets the County's goal for maintaining low rates for its airline partners. The financing technique won Broward County the 1999 *Award for Excellence in Government Finance* by the Government Finance Officers Association.

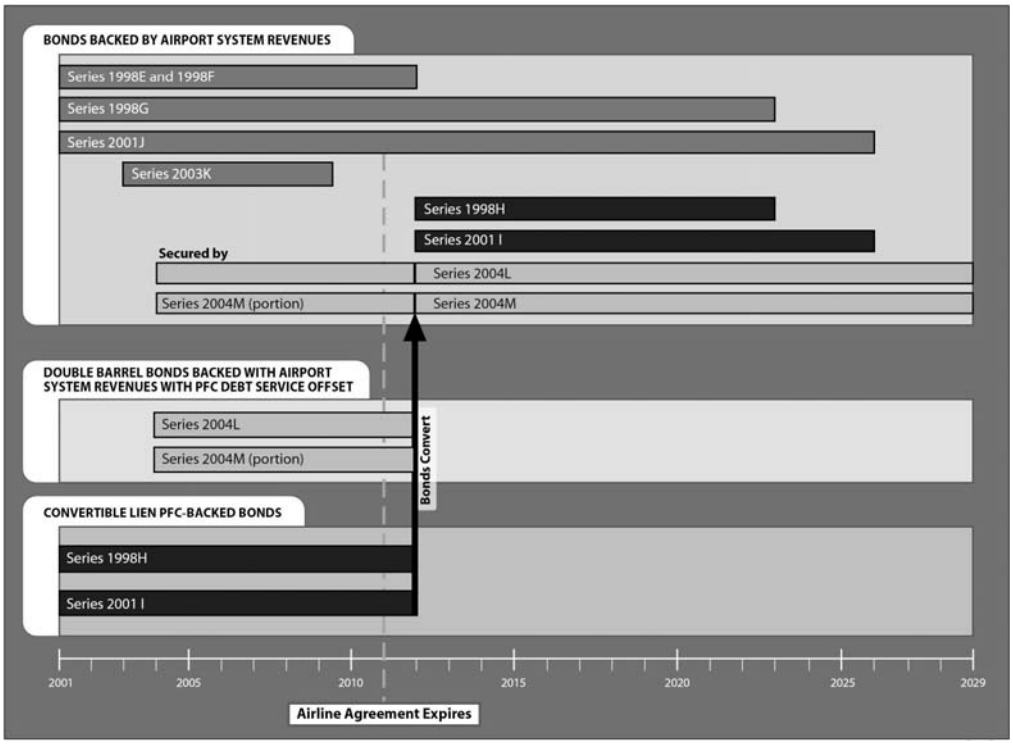

FIGURE 11 Fort Lauderdale–Hollywood International Airport. Passenger facility charge convertible lien bonds for airport expansion.

The bonds are backed solely by an airline corporate pledge to repay the debt. According to a study by the FAA Office of Policy and Plans, however, this form of financing has come under significant scrutiny as a result of recent airline bankruptcies and defaults (*Aviation Infrastructure Innovative Financing* 2002).

For example, one airline rejected payment of its special facility bond obligations and discontinued use of its maintenance facility at an airport. Another airline closed its maintenance facility that had been funded with special facility bonds.

Multi-Tenant Special Facility Bonds

Special facility bonds have been issued to fund multi-tenant terminals, fuel storage and distribution facilities, and consolidated rental car facilities, as discussed in chapter four. These bonds have greater credit strengths than single-tenant special facility bonds because of the more diverse revenue base from multiple tenants and users.

Ways of Addressing Alternative Minimum Tax Issues

Under current tax rules, interest on private-activity bonds, including most airport debt, is subject to the AMT, which was introduced in 1969 to ensure that top income earners paid their share of income taxes. Despite the public nature of most airport facilities and the public benefit derived from their use, more than 60% of airport bonds currently can only be sold as private-activity bonds rather than as tax-exempt governmental purpose bonds. Historically, the interest rate penalty for interest on bonds for which interest earnings are subject to the AMT ranges from 16 basis points (0.16%) to 49 basis points (0.49%), depending on the status of tax reform proposals that would affect the AMT ("Airline Agreement Paves Way for Non-AMT O'Hare Bonds" 2005) (see Figure 12). Another key problem with AMT debt is that under current law, governmental purpose bonds may be advance-refunded once and only once, at any time 10 years after issuance, but airport private-activity bonds are prohibited from being advance refunded. This elim-

In 2005, the signatory airlines operating at O'Hare Airport agreed to share annual bottom line revenues among all 75 airlines at the airport, facilitating issuance of an expected $1.1 billion in new-money GARBs that were exempt from the federal alternative minimum tax. Because of the 16 to 49 basis point (0.16% to 0.49%) interest rate differential between the more common AMT bonds and non-AMT bonds, the change was expected to save the airlines about $100 million over the long term. The financial markets viewed the sale of non-AMT bonds favorably due to the rarity of non-AMT airport debt, the extra yield the bonds offer over AAA-insured credits, including AMT debt, and the practices of some portfolio managers limiting AMT holdings to 20% of their national municipal bond funds.

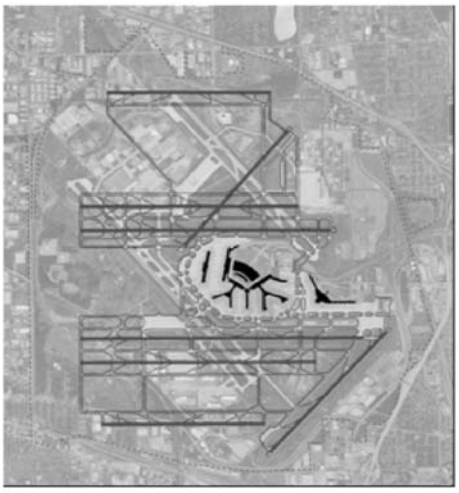

FIGURE 12 Chicago O'Hare International Airport. Interest savings using non-alternative minimum tax bonds.

inates the ability of airport operators to realize interest savings by refunding AMT debt when interest rates are lower.

Two key developments relating to AMT restrictions and associated interest rate penalties are:

- Multi-purpose allocation refundings—Historically, it has been possible for airport operators to issue "non-AMT" (i.e., tax-exempt) debt with lower interest rates for parking facilities (as long as the airport's bond counsel concurs), because such facilities are used by the public and not private companies. A ruling by the Internal Revenue Service a number of years ago clarified that airfield projects could be financed on a non-AMT (tax-exempt) basis, which triggered multipurpose allocations to allocate prior bond proceeds between airfield projects (to be refunded with non-AMT debt with lower interest rates) and terminal projects that are still considered not open to the public and therefore are to remain AMT funded.

  Many airports carried out multipurpose allocations to refund the portions of prior bonds associated with airfield projects that could be changed to non-AMT debt with lower interest rates. Denver International Airport is an example. However, some operators at airports with residual airline agreements were unable to get bond counsel concurrence because net revenues go back to signatory airlines, and the airports have differential rates for signatory and nonsignatory airlines. The city of Chicago addressed this problem by changing its airline agreement, as described in Figure 12.
- Reform of the federal tax treatment of airport bonds—Airport operators have, for some time, discussed the need to reclassify airport private activity bonds that directly benefit the general public as governmental purpose bonds, similar to the way GO debt is treated under the tax code. The change in status would eliminate the AMT penalty that increases interest rates on the bonds and allow advance refundings of airport bonds.

Potential New Tax Credit Bonds for Baggage Screening Infrastructure

A recent Baggage Screening Investment Study conducted on behalf of TSA resulted in the recommendation that Congress adopt new legislation authorizing the use of a federal tax credit bond program for the capital costs of a baggage handling system and related infrastructure.

Tax credit bonds (TCBs) involve the issuance of taxable debt by state and local governments or other non-federal entities for designated capital purposes. As shown on Figure 13, bondholders receive annual tax credits that can be applied against their federal income tax liability instead of cash interest payments. The tax credit itself represents taxable income to the bondholder. Principal is repayable by the issuer from nonfederal sources. The bonds are generally structured as

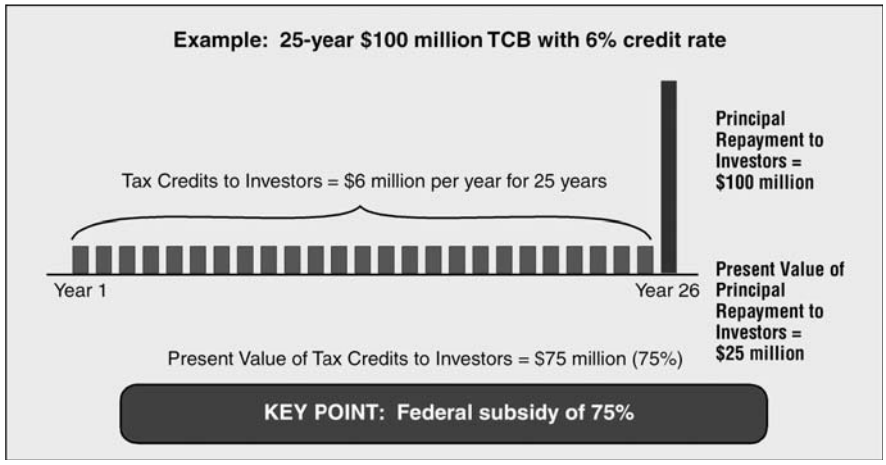

FIGURE 13 Tax credit bond mechanisms—Investor perspective (TSA).

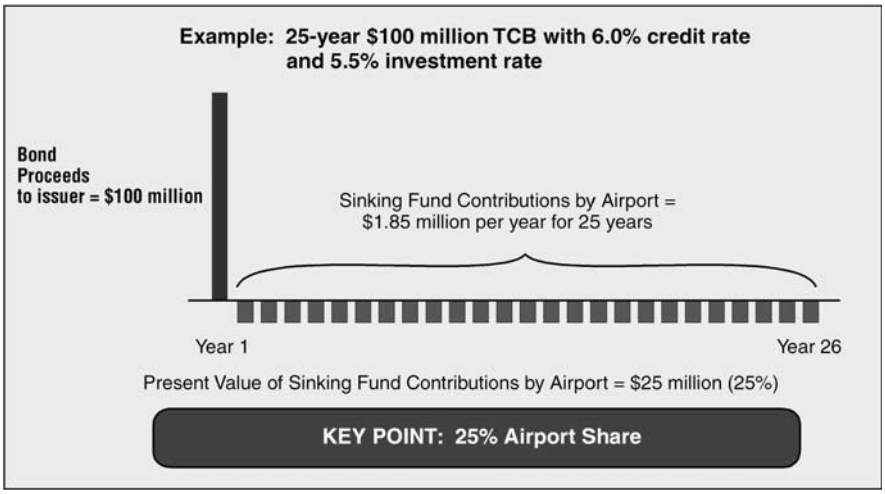

FIGURE 14 Tax credit bond mechanics—Airport issuer perspective (TSA).

"bullet" term bonds, where the principal is repaid in a lump sum at bond maturity. TCBs are generally structured as bullet term bonds to maximize the value of the tax credit, and the issuer makes periodic deposits to a sinking fund to provide for principal retirement at maturity.

Figure 14 shows the issuer perspective. Unlike other federal tax credit programs oriented to equity capital (such as tax credits for investments in low-income housing), TCBs do not require the project sponsor to be the "consumer" of the tax credit. Instead, this form of tax subsidy encourages private investment in desired infrastructure through lower-cost debt capital for the issuer.

As shown on Figure 15, TCBs provide a substantial subsidy to the issuer, as the interest expense can represent 50% to 80% of the effective cost of long-term borrowing. The extent of the subsidy depends on the term (maturity) of the bonds and the interest (credit) rates. The longer the term and the higher the interest rates the greater the subsidy level.

The TCBs could be on parity with an airport's traditional revenue bond indebtedness or issued on a subordinate or stand-alone basis. Possible pledged revenue streams include one or more of the following:

- General airport revenues from airline rents and fees and nonairline sources, as is the case for traditional GARBs.
- PFC revenues, as is the case for stand-alone PFC-backed bonds and double-barrel bonds backed by PFC revenues and general airport revenues.
- General local governmental resources such as sales and property taxes, as is the case for general obligation municipal bonds issued to fund airport projects (more common for small- and non-hub airports than large- and medium-hub airports)

Airport participation in the TCB program would be entirely voluntary. It is anticipated that large- and medium-hub airports, which frequently access the capital markets to raise

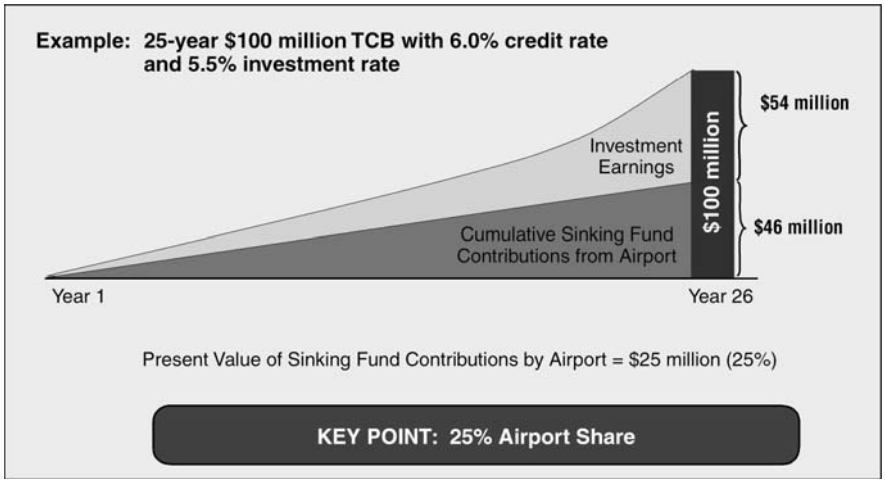

FIGURE 15 Tax credit bond mechanics—Airport sinking fund (TSA).

capital, would be the most likely issuers of TCBs. Although smaller airports would not be excluded, the resource demands on smaller airports for this type of issuance would be relatively high compared with their smaller borrowing needs.

OTHER FORMS OF AIRPORT FINANCING

Airport operators use many other financial instruments to access and use the capital markets, including:

- Commercial paper,
- Bond anticipation notes (BANs),
- Grant anticipation notes (GANs),
- Pooled credit, and
- Capital leases.

Commercial Paper

Commercial paper is a money market security that is generally not used to finance long-term investments, but rather to manage cash flow. It is commonly bought by money funds, and is generally regarded as a very safe investment. As a relatively low-risk option, commercial paper interest rates are low. Commercial paper can only be "out" for 270 days, but can be "taken out" with more commercial paper and ultimately is taken out typically with bond proceeds.

Commercial paper is used on a routine basis at some airports, particularly large airports and airports that operate independently as authorities, but is much more difficult at some airports, particularly those that operate as enterprise funds of a city, county, or state that have centralized financial management. Airport operators that routinely use commercial paper to manage cash flow include the operators of airports in Boston, Seattle, and San Francisco (see Figure 16).

The San Francisco Airport Commission has used commercial paper to provide cashflow at low interest rates since 1997, the year it launched a major capital program to build a new international terminal, people mover, roadways, and other improvements at San Francisco International Airport. The Commission authorized issuance of the lesser of (1) $400 million in Subordinate Commercial Paper Notes or (2) the amount secured by a letter of credit (currently $200 million). The notes are secured by a pledge of airport net revenues that is subordinate to that for senior lien bonds. Interest rates on commercial paper were approximately 3.5% when San Francisco's commercial paper program was initiated, compared to interest of approximately 6.0% on AMT bonds at the time.

FIGURE 16 San Francisco International Airport—Use of commercial paper to provide low-cost cash flow.

Bond Anticipation Notes

BANs are short-term financing mechanisms that provide capital in advance of issuing long-term bonds. Various airports around the country have issued BANs, although commercial paper may be a more cost-effective way of managing cash flow for some airports.

Grant Anticipation Notes

GANs are short-term financing mechanisms that provide capital in advance of receiving expected grants.

Pooled Credit

Pooled credit is attractive for airport operators that have difficulty accessing the credit markets; however, few airport operators are actually in that situation, as most at a minimum can work with the city, county, or state that is the airport sponsor to issue GO debt. There are several examples of pooled credit for airports.

- American Association of Airport Executives (AAAE) Airport Capital Projects Loan Program—In December 2000, AAAE and the Capital Projects Finance Authority issued $300,000,000 of Variable Rate Demand Revenue Bonds to fund the AAAE Airport Capital Projects Bond Loan Program. AAAE established the program to make low-cost, tax-exempt loans to eligible airports to finance improvements and equipment that constitute non-AMT governmental use projects under federal tax law. The program offered airport operators a flexible and low-cost method of financing capital needs (Airport Capital Projects Loan Program 2001).

  No loans were made under the program owing to several factors, including (1) changes in airport priorities away from capital development immediately after 9-11; (2) a limited number of projects that meet the eligibility criteria for tax-exempt financing (as mentioned in chapter four, terminal projects do not qualify and until a few years ago airfield projects did not qualify); and (3) the lack of difficulty that airport operators have in accessing the capital markets. According to AAAE staff, the program was never formally ended, but is not active.
- Virginia Resources Authority's (VRA) Airport Revolving Revenue Fund—The VRA airport revolving fund pool includes 12 borrowers as of January 31, 2007. Approximately 65% of the $70 million in outstanding debt is tied to the Capital Region Airport Commission, which runs the airport in Richmond, Virginia; therefore, Richmond's credit rating drives that of the entire pool. In August 2006, the credit rating for the VRA pool was upgraded by Fitch Ratings, based on Richmond International Airport's improved operating performance and enhanced stability in the overall airport sector since 2001 ("Virginia: VRA Airport Pool Upgraded" 2006).

Capital Leases

Leasing capital equipment or facilities may also facilitate acquisition for airports that do not have adequate funding up front or cannot get the necessary approvals to issue bonds (see Figures 17 and 18).

LEVERAGING FUTURE GRANTS

Airport operators occasionally issue GARBs that are intended to be repaid with future federal grant funds.

Leveraging FAA Letters of Intent

FAA issues multiyear LOIs to provide AIP grant funding to certain airports for airfield projects. Grants scheduled to be received under an LOI are not always received when project costs are incurred. For large-scale capital projects a majority of the expenditures typically occur in the first few years, whereas the duration of an LOI is usually between 5 and 10 years. To address the resulting cash-flow shortage over the initial years, some airport sponsors have leveraged grants scheduled to be received in an LOI to obtain upfront funding. Approaches to leveraging an LOI include:

- Bonds—Airport sponsors have long used LOI grants to pay debt service on outstanding bonds on a double-barrel basis. The investment community has identified credit concerns related to pledging future LOI grants as security for debt, including that an LOI is not a binding obligation of the government and LOIs are dependent on appropriations by Congress, LOI entitlement payments are dependent on enplanements levels, LOI payments are dependent on actual expenditures, and LOI payments may decrease owing to a change in hub status or PFC amount collected. However, a few airport operators have actually pledged the funds as security for the bonds. Two examples are the Airport Authority of Washoe County (Reno, Nevada) in 1993 and the city of St. Louis in 2000.
- Commercial paper—The Minneapolis–St. Paul Metropolitan Airports Commission issued subordinated commercial paper notes in 2000 to be repaid by LOI grants to be received over the next 10 years. The commission considered issuing LOI-secured debt, but decided instead to pledge general airport revenues. If LOI receipts do not materialize, the commercial paper could be repaid from subordinated airport revenues.

The City and County of Denver has entered into four master Installment Purchase Agreements, two with GE Public Finance (for runway equipment, gates, jetways, and information display systems) and two with Siemens Financial Services (for baggage handling and explosives detection systems). The equipment funded by the financing companies is then leased by the City. Under the purchase agreements, the City makes installment purchase payments to the financing companies for 3 to 7 years at loan rates that have been in the 2% - 3% range with no issuance costs, saving the City an estimated 7 to 31 basis points (0.07% to 0.31%). At the end of each agreement, the City will own the equipment.

Under City ordinances, purchase payments to the financing companies do not have a lien on the net revenues of the Airport System or balances in the Capital Fund. Funds to make those payments have come from the Equipment and Capital Outlay Account.

FIGURE 17 Denver International Airport—Capital equipment leases.

The Fort Wayne Airport Authority planned to construct a new runway but was unable to gain voters' support for a bond issue to fund the runway. Instead, a Building Corporation was formed to finance, design and construct airport improvements (runway extension and CAT II ILS) and lease them to the Airport Authority through a 15-year capital financing lease. Semi-annual rent payments covered all development costs associated with the project, with the Authority obtaining legal title to the real estate and improvements after the 15th year. Annual lease payments were made from the Authority's operating funds, requiring no voter approval. The Building Corporation sold Certificates of Participation to raise the capital necessary to construct the project. The certificates qualified as "private activity bonds" under IRS code at that time.

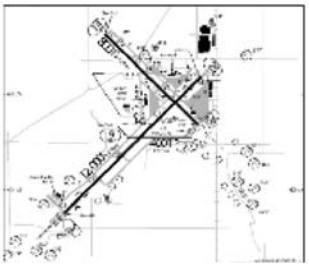

FIGURE 18 Fort Wayne International Airport—Capital lease paid with operating funds.

Leveraging Security Grants from TSA

TSA grants have been available on a limited basis since FFY 2003, funded, in part, by federal user fees. Grants have been issued as multiyear LOIs as well as 1-year grants called Other Transaction Agreements (OTAs) to fund baggage screening infrastructure. Through FFY 2004, TSA executed eight LOIs to provide grant funding to each of nine airports over a 3- or 4-year period. The last payment related to these LOIs is scheduled to be issued in FFY 2007, subject to annual Congressional appropriations. In FFY 2003 and FFY 2004, TSA issued LOIs to the following airport operators, in the order in which they were granted:

- Massachusetts Port Authority (BOS)
- Dallas/Fort Worth International Airport Board (DFW)
- Port of Seattle (SEA)
- City and county of Denver, Department of Aviation (DEN)
- Clark County (Nevada) Department of Aviation (LAS)
- Los Angeles World Airports (LAX and ONT)
- City of Phoenix, Aviation Department (PHX)
- City of Atlanta, Department of Aviation (ATL).

Six of the eight airport operators issued debt to be repaid with annual TSA LOI grant funds and used the bond proceeds to build infrastructure for in-line systems. The bonds were generally issued as short-term variable-rate bonds

expected to be fully repaid once the final LOI payments are received (FFY 2007). The operators of the airports in Los Angeles and Phoenix used the grant funds and did not issue debt.

Owing to concerns about making multiyear commitments without the safeguards of a trust fund or other form of guaranteed future year funding, and because the funding stream has not supported additional long-term grant agreements, TSA has provided only 1-year grants since FFY 2004 through OTAs. To date, approximately 33 OTAs have been issued by TSA.

Federal and State Credit Assistance for Airport Access Projects

Credit assistance to facilitate development of surface transportation projects, and in some cases airport access projects, is available at the federal and state levels.

The Transportation Infrastructure Finance and Innovation Act (TIFIA), created in 1998 as part of the Transportation Equity Act for the 21st Century (TEA-21), allows U.S. DOT to provide direct credit assistance to sponsors of major transportation projects. The TIFIA credit program offers three distinct types of financial assistance—direct loans, loan guarantees, and standby lines of credit—to public and private sponsors of large surface transportation projects that meet certain eligibility criteria:

- The project must be included in a state transportation plan, and before an agreement is made for federal credit assistance, must be in an approved State Transportation Improvement Program.
- The entity undertaking the project must submit a project application.
- A credit rating or preliminary opinion letter from a rating agency indicating that the project's senior debt obligations have the potential of being investment grade is required with the application.
- Eligible project costs must equal and exceed the lesser of $100 million or 50% of the amount of federal-aid highway funds apportioned to the states for the most recently completed fiscal year.
- Project financing must be repayable in part or in whole from tolls, user fees, or other dedicated revenue sources.
- If the project is not undertaken by a state or local government or an agency or instrument of a state or local government, the project must be included in both the state transportation plan and an approved State Transportation Improvement Plan.

TIFIA credit assistance backed by a regional gas tax and rental car fees helped complete the financing for a $1.3 billion Miami Intermodal Center, designed to improve access to and within Miami International Airport (*Innovative Finance Brochure—Credit Assistance* 2006).

Seven credit assistance programs are state-directed programs enabled through federal-aid funding. The best point of contact is the relevant state department of transportation (DOT).

- *State Infrastructure Bank* (*SIB*)—The National Highway System Designation Act of 1995 (NHS Act) enabled states to capitalize transportation credit assistance banks modeled on wastewater State Revolving Loan Funds. The SIB program provides loans, credit enhancement, and other forms of assistance (such as bond banks) to eligible surface transportation projects. Thirty-nine states participated in the NHS pilot. In TEA-21, Congress allowed only four states—California, Florida, Missouri, and Rhode Island—to use new TEA-21 funding for capitalization. Because program implementation and capitalization levels vary from state to state, the best source of information about SIB assistance is the state DOT (see Figure 19).
- *Section 129 loan*—These loans allow states to use regular federal-aid highway apportionments to fund loans to projects with dedicated revenue streams. A state may direct lend federal-aid highway funds to toll and non-toll projects that must have a pledge of a dedicated repayment source to secure the loan. Section 129 loans must be paid beginning 5 years after construction is completed and payment must be completed within 30 years of the date federal funds were authorized for the loan. States have the flexibility to negotiate interest rates and other terms of Section 129 loans.

Broward County entered into an agreement with the State of Florida for a $30.1 million State Infrastructure Bank (SIB) loan in 2001. The SIB loan is an interest-free loan, and was used to fund roadway improvements at the Airport.

The County is repaying the SIB loan over 7 years beginning from a combination of committed State grants and pay-as-you-go PFCs for which approvals were given by the FAA. SIB loan repayments made from PFC Revenues are subordinate to debt service payments on convertible lien (PFC) bonds, but through 2012, will be senior to debt service payments from PFCs for double-barrel GARBs. Airport System Revenues may also be used to make loan payments if necessary and if the County elects to make such payments.

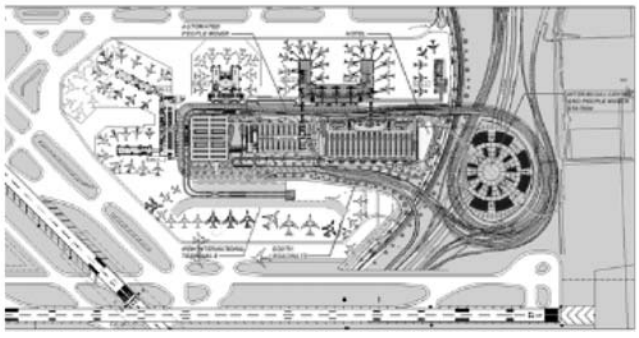

FIGURE 19 Fort Lauderdale–Hollywood International Airport—SIB loans.

CHAPTER THREE

REVENUE SOURCES—AIRPORT PRACTICES AND INNOVATIONS

With costs of construction increasing, airlines filing for bankruptcy, and periodic economic downturns affecting the industry, airport operators find themselves continually looking for additional revenue sources to fund capital projects and sustain operations.

Figure 20 shows the distribution of operating revenues for large-, medium-, and small-hub airports. Because airline revenues are governed by airport-specific conditions that often include an airport–airline lease and use agreement, and airfield-related fees are governed by federal laws and FAA regulations that prohibit revenues from exceeding costs, this report focuses on nonairline revenue services. These revenues may be used to reduce airline payments, fund new capital projects, or develop airport equity and reserves.

The ideas presented are not intended to represent revenue streams available to all airports nationwide. Instead, these summaries should illustrate creative options that are available to airport operators. The decision of undertaking a revenue-enhancement initiative at a particular airport should ultimately be made after careful consideration and evaluation of local needs and financial viability.

For particularly unique nonairline revenue sources case studies are presented documenting the discovery, development, and annual operations of the specific revenue source. Topics discussed in this chapter include:

- Airport parking revenues,
- Rental car revenues,
- Terminal concessions,
- Advertising programs,
- Commercial development and land use, and
- Other innovative revenue enhancement concepts.

AIRPORT PARKING REVENUES

As shown in Figure 20, parking revenues are the most significant source of nonairline revenue at airports. Although parking has long been a revenue source for airport operators, recent innovations provide further opportunity to enhance parking revenues. Some innovative ideas for enhancing parking revenues that are being used in airports around the country today are outlined here.

Premium Parking Services

There are a variety of premium parking services (or products) available to enhance parking revenues, improve customer service, and maintain or enhance an airport's share of the parking market. Although each of these services has been used and proven at several airports, there does not appear to be any airport that has implemented all of the following premium parking services:

- Valet parking—Many airports have offered or currently offer valet parking that allows a customer to drop off their car at the terminal curbside (or other convenient location) and, upon the customer's return, retrieve their car at this same location. Valet services are typically popular among business travelers and can benefit airport operators if vehicles are stored in underutilized portions of a garage or lot. Furthermore, more valet-parked vehicles can be "squeezed" into an area than self-parked vehicles. However, many airport operators have found that valet parking operations do not generate significant additional net revenues because of their labor-intensive nature (compared with self-parking operations), increased liability costs, and other costs. Many airports have found that valet parking operations produce less net revenue than do an equivalent number of standard parking spaces offered at standard rates.
- Monthly or corporate reserved parking—Several airports sell monthly or corporate access cards and guarantee that card holders can always find an empty space in the convenient parking area reserved for their use. Card holders are charged a premium rate—often a monthly fee—to gain access to these reserved spaces. Airports have found that this service is popular with patrons and can generate significant additional revenues compared with standard rates, but do not use spaces every day. Airports where monthly or corporate reserved parking is offered include those serving Atlanta, Houston, Sacramento, San Francisco, and Seattle.
- Discount parking coupons and loyalty programs—Private airport parking companies have offered discount coupons and loyalty (frequent parking) programs for many years. Discount coupons are typically distributed through travel agents, corporate (in-house) travel desks, newspapers, household mailers, or other sources, and now through the Internet. For competitive reasons, private operators may accept coupons issued by other

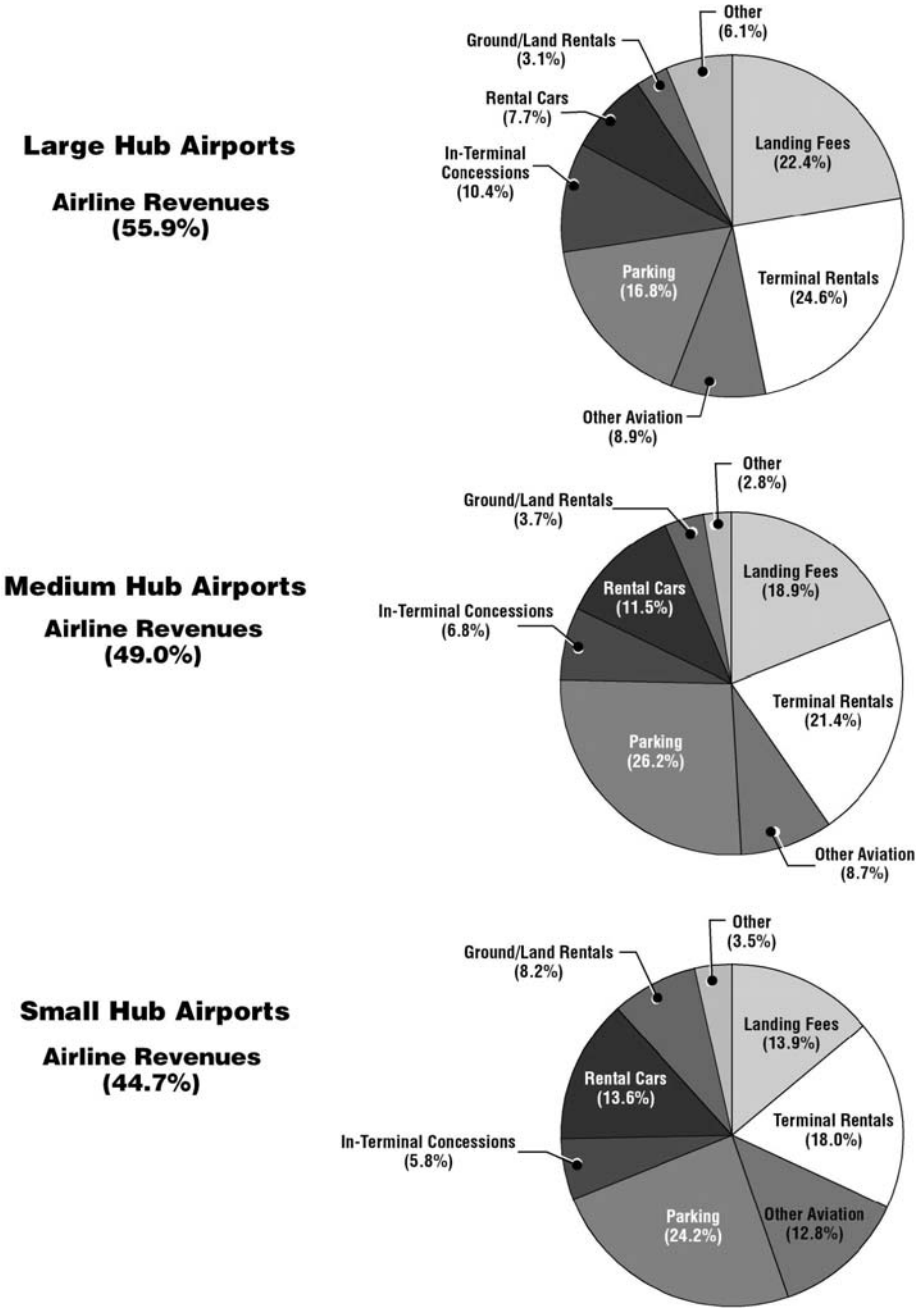

FIGURE 20 Distribution of airport operating revenues. *Source:* FAA, *AAS-400, CATS Report 127,* 2005.

companies (or the airport). In the past, few airports offered discount coupons; however, recently airports such as San Francisco International are using the Internet to offer such coupons. Coupons allow an airport to develop an electronic database of their frequent customers (and long-duration, high-ticket-value customers) and to better compete with off-airport lots.

Parking-based loyalty programs are similar to frequent flyer programs in that they offer repeat patrons reduced rate parking. Alternatively, the frequent parking points can be applied to goods and services available at the airport (e.g., discounts on concessions). Several private airport parking companies allow the frequent parking points to be translated into airline frequent flyer miles.

- Remote lot parking service enhancement—To improve customer service and better compete with off-airport parking companies, several airports offer frequent shuttles that pick up and drop off remote lot customers at or near their car. To complement these shuttle services, some airports clear the snow from parked cars, wash windshields, and offer amenities such as free bottles of water and newspapers. Others have tested pilot programs that allowed a patron's vehicle to be washed, serviced, or repaired. Some airport operators offer shuttle services

that pick up customers at the trunk of their car, but drop them at scheduled stops. Other airports use parking attendants to direct entering vehicles to empty parking bays or floors, rather than allowing customers to randomly circulate through a lot searching for empty spaces. Airports where such services are offered include those serving Atlanta, Dallas, and Houston.

- Internet-based parking reservation—In Europe, airport parking patrons can use the Internet to reserve and pay for parking in advance of their arrival at the airport. In the United States, many private airport parking companies also use the Internet to allow prospective customers to reserve and pre-pay for parking. The benefits of such Internet-based reservations include: (1) advanced receipt of payment for long-duration/high-value transactions, (2) improved marketing and promotional opportunities as Internet sites attract potential customers browsing the web for parking, (3) formation of an electronic customer base for future promotions, and (4) less diversion of potential patrons who, having already paid for parking, are less likely to be attracted to an alternate parking lot or rate that they may see when entering the airport.

Parking Operational Enhancements

Many airports have implemented operational measures that reduce operating costs while enhancing customer service. These measures include:

- Cashier-less parking—Several airports, including Montreal, Portland, Raleigh–Durham, Richmond, Seattle, Vancouver, and Washington, D.C., have implemented "pay-on-foot" parking revenue control systems by means of automatic teller machine-like pay stations. These pay-on-foot systems eliminate the need for patrons to interact with exit cashiers (except for lost tickets and other exception items); eliminate vehicle queues at the parking exits, thereby allowing patrons to exit more quickly and reducing vehicle emissions associated with idling vehicles in long queues; and improve cash handling and reduce revenue "shrinkage." Pay-on-foot systems have proven to be most successful at airports that reward patrons using the systems.
- Ticketless parking—Several airports have eliminated parking tickets (minimizing the use of parking cashiers) through the use of:
  - Credit card in/out control systems—Parking patrons who enter a lot with a credit card in/credit card out control system must insert a credit card to raise the barrier gate and enter the lot (rather than retrieving a parking ticket) and then insert the same credit card in a reader when exiting the lot. The parking system automatically calculates the fee owed, charges the fee to the patrons credit card, and, if requested, prints a receipt. The patron need not sign a credit card slip. Airports with credit card in/credit card out systems include those serving Des Moines, Indianapolis, and Minneapolis–St. Paul.
  - Automatic vehicle identification (AVI) transponders—At several airports AVI tags or toll tags (e.g., FastPass and EZPass) issued by a local toll road, toll bridge authority, or the airport itself are recognized by the parking control system and allow customers to enter and exit parking without using cash or credit cards. The customer's parking fees are automatically debited from their toll tag account. Airports with AVI tag entries and exits include Columbus, Dallas/Fort Worth, Richmond, and the three New York area airports.
- Parking guidance systems—To reduce the time patrons spend searching for an empty space (and thereby improve customer service and reduce vehicle emissions) airports are installing changeable message signs activated by low-cost overhead vehicle detectors that clearly display space availability (OPEN or FULL) for each space and aisle, rather than just at the entrance to each garage (or garage level). These guidance systems result in better utilization of the available spaces as they direct patrons to empty spaces, rather than requiring patrons to conduct random searches across large floors or garages.

Off-Airport Parking Percentage (or Privilege) Fees

More than 24 airports require private off-airport parking companies to pay "privilege fees" that are calculated as a percentage of the company's gross revenues. Additional airports are in the process of establishing such fees. The fees are similar to those charged off-airport rental car agencies in that the fees are charged for the benefits an off-airport company doing business on an airport receives from the presence of the entire airport—not just the roadways used by their courtesy vehicles. Off-airport privilege fees can help an airport operator to:

- Maintain and protect existing parking revenues by helping to preserve the airport's share of the total public parking market.
- Generate additional revenues that exceed $1 million per year at some large airports. The amount of the potential additional revenue varies depending on the extent of the off-airport parking business, the parking rates charged by these businesses, and the amount of the privilege fee established by the airport.

Similar to past court decisions concerning rental car fees, federal and state courts have repeatedly upheld the right of an airport operator to establish off-airport parking privilege fees and require the payment of such fees.

RENTAL CAR REVENUES

As was shown in Figure 20, rental car concession revenues are the next largest source on nonairline revenue for medium- and

small-hub airports after parking revenues, and rank third after parking and terminal concessions at large-hubs airports. Revenues from rental cars companies can include one or more of the following.

Percentage (or Privilege) Fees

Rental car companies located on-airport typically pay privilege fees of up to 10% of gross revenue from airport-related car rentals, or a minimum annual guarantee, whichever is greater. The minimum annual guarantee may be bid for the first year of the agreement and then adjusted by an agreed-upon formula or it may be specified in the bid for every year of the agreement. Off-airport rental car companies typically pay from 0% to 8% of gross revenue from airport-related car rentals.

Terminal Rentals

Rental car companies typically lease ticket counters and sometimes office space in terminals, and pay rent to the airport operator.

Land Leases

Rental car companies also lease land on-airport for fuel, cleaning, vehicle storage, and/or maintenance facilities. This rent may be determined based on the appraised value of the land or by some other method.

Customer Facility Charge or Transportation Fee

At some airports, each rental car concessionaire collects a CFC or transportation fee from its customers at the airport. Transportation fees, such as those charged at San Francisco International Airport, are charged on a per-transaction basis and are intended to recover the operating and capital costs of transportation between a consolidated rental car facility and the airport's terminals (see Figure 21).

CFCs are typically used to pay all or a portion of the operating and capital costs of a consolidated rental car area or structured facility, and may include the cost of transportation to the terminals. CFCs may be assessed on a per-transaction basis (i.e., as a one-time fee for each rental car contract) or on a per-transaction-day basis (i.e., as a fee charged for each day the rental car contract is in effect). CFC revenues may be used on a stand-alone basis to leverage bonds or may be used together with other airport revenues to support double-barrel bonds.

In 2000, Albuquerque International Sunport issued $45 million in variable-rate taxable airport revenue bonds to finance the cost of a new consolidated rental car facility at the airport. The primary security for the bonds was the rental car customer facility charges (CFC), and the bonds received a AAA rating based on the plan of finance and strength of the market.

In fiscal Year 2006, CFC revenues were about $4.3 Million, and CFCs per enplaned passengers were $1.34.

FIGURE 21 Albuquerque International Sunport—Customer facility charge-supported bonds.

As with PFC revenues, revenues from CFCs and rental car transportation fees are local money. Unlike PFC revenues, there is no requirement for any federal oversight or approval of the CFC or transportation fees. CFCs are usually established pursuant to an ordinance that documents the CFC amount, among other things, and the CFC may thereafter be part of the airport's annual rate resolution. Because rental car companies cannot decide among themselves to charge a CFC or transportation fee, the airport operator has a great degree of discretion in setting and charging the fees.

Contingent Rent

In the event that there is an unanticipated shortfall between the airport's cost of providing and operating a consolidated rental car facility and the revenues derived from CFCs and rental payments, a contingent rent may be charged to the rental car companies, subject to the terms of any agreement.

TERMINAL CONCESSIONS

Although airlines are currently struggling with yields, labor issues, and rising fuel costs, passengers are returning in record numbers. Today, airport shoppers are recognized as a lucrative market and airport retailing is evolving to meet that market. Concession sales have increased dramatically as airlines discontinue meal services and changes in airport security require that passengers arrive early, consequently finding themselves with extra time in the airport and being a captive audience to the products and services offered by an airport's concessionaires.

Airport operators have worked diligently over the past several years to satisfy the traveler's desire for a pleasant airport experience. With considerable effort directed toward developing some of the best food, beverage, and retail offers anywhere, concession partnerships are turning airport terminals into places that effectively serve the dining and shopping needs of millions of customers.

With travelers spending 90 minutes, on average, at the airport, airport operators have directed efforts to maximize convenience and "down time" for the traveler, which if successful, can translate into significant sales from the restaurants and shops located in the terminal (see Figure 22).

In 2002, the City of Boise underwent a concession program implementation for its new expanded terminal building at Boise Airport.

The City developed a comprehensive concession plan with detailed space allocations; integration of the existing McDonald's operation into a new food court; development of sales and revenue forecasts; recommendation of business arrangements and lease provisions; review and drafting of concession agreements and competitive proposal documents; review and analyses of food and beverage, retail merchandise, and specialty coffee proposals; and Board presentations.

The City was able to meet its overall goals for the concession program, including development of a new central food court and concessions area to better serve the traveling public, and to obtain financial commitments for a high-quality buildout of new and existing concession areas.

FIGURE 22 Boise Airport—Concession program implementation.

Reinventing Terminal Concessions Programs

Developing a concessions program that goes beyond industry standards requires thoughtful planning, a strong customer orientation, and hard work. Each airport has a unique, distinctive set of passenger markets, all of which use the airport differently, and have varying spending motivations and characteristics.

Today, airport operators are recognizing the need to embrace the latest trends and idea management in the industry. These include understanding the customer, anticipating what they want to buy, creating a shopping environment, motivating shopping behavior, and finally making it easy to buy.

New trends and innovations such as upscale dining, high-technology newsstands, and creative specialty retail offerings are common amenities of the modern airport. Independent passenger surveys have shown that airport retail programs are one of the key determinants of passenger satisfaction with an airport. At the same time, passengers are becoming more discriminating in their choices of food, beverages, and retail offerings at airports.

- Recognizing the consumer—Airport operators are making serious efforts to understand the key passenger market segments in their respective airports. These efforts are informed by statistics such as the ratio of men to women and domestic to international passengers, the percentage of business versus leisure travelers, and even connecting versus origin and destination (O&D) passengers, because departing passengers often have different habits from those returning home.
- Inviting shopping experience—Airport operators are designing new airport facilities around the goal of incorporating substantial amounts of retail space to provide greater exposure to retail opportunities. Innovative design can help motivate potential customers. Successful design and retail plans are creative and innovative to attract upscale, branded merchandise as well as food and beverage outlets in terms of revenues and service. Apart from achieving the objective of maximizing nonaeronautical revenues, airport operators want airports to be user-friendly, provide the highest possible level of passenger convenience and comfort, and promote the culture of the region where the airport is located by:
  - Creating a density of shops and restaurants that visually affects the customers—Clustering or double-loading amenities will often attract potential customers who could otherwise walk straight to the gate. Food courts strategically placed in the center of the airport's retail area stimulates foot traffic into stores (e.g., at Orlando International Airport).
  - Providing accessibility to merchandise—Because of the smaller size of most airport concessions, access is key. The entrance should be open, well-merchandised, uncluttered, and provide enough room for shoppers to enter and begin browsing immediately.
  - Making use of idle space by using kiosks—Using kiosks in key locations offers customer convenience and maximizes concession revenues. The kiosk should look attractive—inviting and friendly—to the individuals who are going to use it, and it should embody a positive expression of the image that the company or institution wishes to project, including its brand identity and service levels.
  - Playing on local concepts and "Sense of Place"—Many airports are looking for concepts that are a point of differentiation, such as regional or local branding that reflects the cultural heritage of the region.
- Providing an accommodating dining opportunity—Certain airport operators provide creative food venues that offer quality carry-out food. Long-haul flights on airlines that provide minimal food service often motivate passengers to purchase food before their flight. Also, one-of-a-kind restaurant concepts that celebrate icons, landmarks, and the cuisine from the surrounding region are a growing trend designed to enhance the travel experience. Minneapolis–St. Paul and Portland International airports are good examples of this.
- Product preferences—Airports also consider concessionaires that best meet the taste of the profile of the airport's passengers and that generate higher sales and commissions. Airports and their retailers have a much better chance of generating a sale if they are selling something that the customer really wants to buy.

  Travelers from different countries have different purchasing profiles, dependent on both the availability of specific brands and styles in their respective homelands, and any price differentials that might exist.
- Branding—Many travelers express a preference for brand name products and services. National companies with branded products can partner with local retailers to provide a complement of brand name and local ownership (see Figure 23).

In 2005, Memphis International Airport unveiled its new restaurants and concessions. The renovations to the airport's concessions cost approximately $25 million and took two years to complete. Airports Council International-North America (ACI-NA) named Memphis International Airport as the Richard A. Griesbach Award of Excellence winner in the 2006 Airport Concessions Contest.

The new concessions were designed to be Memphis-centric and feature local favorites, major brands and Memphis-themed restaurants. "For thousands of people each week, Memphis International Airport is their introduction to Memphis, or even their only experience with the city," said Larry D. Cox, president and CEO of the Memphis-Shelby County Airport Authority. "We wanted that experience to give our guests a real flavor of Memphis. From the food they eat, to the stores they shop, to the artwork on the walls, our goal was to entice them to want more of the one-of-a-kind Memphis experience."

Artwork by a local artist can be seen along the connectors between terminals. The hometown theme is continued with murals throughout the terminals that depict a variety of recognizable Memphis scenes from music, art, tourism, history and industry.

FIGURE 23 Memphis International Airport—Concession program redevelopment.

Terminal Concessionaire Contracts

In addition to shorter airline agreements, airport operators are taking a more competitive look at retail space as contracts begin to expire and retailers aggressively bid for space.

- Revisit percentage fees—Traditionally, airports have charged percentage rents that were payable on a monthly or quarterly basis, with an annual reconciliation when total gross sales for the year are known. As the importance of percentage rent continues to decline, airports (as landlords) are now using other methods to increase value from tenants when renewing or releasing space. Those methods include tying rental increases to the Consumer Price Index, implementing fixed-percentage increases, or aggressively renegotiating leases to raise minimum rents by 10% or more.
- Control minimum annual guarantees—Airports that identified a fixed-income guarantee in concessionaire contracts were able to minimize their losses following the effects of the terrorist attacks of 9-11. Because airport concessions contracts are bid competitively, operators often bid more than what they can afford to get the contract. Therefore, airport operators may want to consider setting a reasonable minimum annual guarantee, using a percentage for the first year and then reevaluating annually based on enplanements.
- Establish point of sale procedures—The drive toward increased cost-effectiveness means maximizing operations integration and information technology consolidation to minimize retail payment challenges.
- Monitor pricing and inventory—Incorporating regular audits into concession contracts allows airports the flexibility to monitor pricing and inventory and ensures compliance of tenant and concessionaire leases and contracts.

ADVERTISING PROGRAMS

Airport advertising can reach an exclusive and upscale audience, and can be an important complement to the standard media mix. With longer dwell times, airport customers can now take the time to read advertisements. Modern airport advertising programs specialize in the sales and maintenance of advertising sites at airports. Table 1 shows the revenues generated by advertising for a cross section of U.S. airports.

The range of media described here are just some innovative and creative approaches to advertising seen at airports today.

Optimize Technologies

Technological innovations also offer opportunities for airport revenue enhancements.

- Touch-screen directories—Touch-screen airport directories provide passengers with a complete directory and way-finding system. Most systems include a directory of area hotels, car rentals, restaurants, and shopping, as well as area maps. Some listings are even linked to a floor plan showing the current location as well as a guide to their desired destination.

  Also available are real-time flight information displays, including arrival and departure status and gate information. Information can be viewed interactively with a touch-screen interface. The touch-screens kiosks require less space and provide tremendous customer services as well as another revenue opportunity.
- WiFi applications—Airports that are providing wireless Internet service for travelers find that short-term contracts allow them to assess their needs as technology and the needs of users evolve. Under some agreements, the airport receives a percentage of the user fees (e.g., Des Moines International Airport). Opportunities also exist to provide wi-fi for free, but also to sell advertising on

TABLE 1
ADVERTISING REVENUE AT SELECTED AIRPORTS

Airport	2005 Advertising Revenue (in $ millions)	Advertising Revenue per Enplaned Passenger ($)
Atlanta—ATL	7.8	0.18
Chicago—ORD	11.1	0.29
Cincinnati—CVG	1.8	0.16
Denver—DEN	4.7	0.22
Detroit—DTW	1.8	0.10
Fort Lauderdale—FLL	1.2	0.11
Houston—IAH	3.0	0.24
Las Vegas—LAS	16.3	0.74
Miami—MIA	4.4	0.29
Minneapolis—MSP	33.3	0.18
New York—LGA	9.6	0.74
Philadelphia—PHL	3.4	0.22

the launch page through the use of a simple "ad bar" at the bottom or top of the screen. However, this needs to be nonintrusive and must avoid pop-ups.

- iFIDS—Internet-based Flight Information Display Systems provide real-time airline information through the use of the Internet, eliminating the need for information technology investment and infrastructure. The cost-effective kiosks can be configured to display multimedia images and text messages offering a tremendous revenue potential.

Sponsorship Opportunities

In the last decade, sponsorship programs have moved to the forefront of advertising programs and emerged as a specific business discipline, capturing the attention of the media and the corporate world as it provides organizations with the ability to cut through the clutter of traditional advertising and exhibition. Effective sponsorship that balances the ties between brand and product marketing and is done well fits ideally with overall marketing objectives. The benefit of sponsorship programs is that they help defray the cost of the terminal while providing a valuable customer amenity. For example, in a sponsorship effort with the airport, a vendor provided flat screen televisions at no cost in the newly constructed Dallas/Fort Worth International Terminal D/Hyatt Hotel. Sponsorships do not replace the airport's identity and may be of short duration or event driven. It is feasible to have multiple sponsors for a single location or have a sponsored meeting point.

Maximize Exposure

Opportunities also exist for nontraditional locations for airport advertising. Advertising with banners, moving walkways and escalators, and even websites are cost-effective ways to generate additional revenue. Banners draped across the sky bridge or on the exterior of the terminal building are raising the bar on nonaeronautical revenues and are quickly becoming the newest form of airport advertising that gives "ownership" to a specific brand name, for example at Miami–Dade International Airport.

Furthermore, advertisements can be used to improve the airport's image and propose modern and creative ideas to travelers. In Johannesburg, South Africa, advertising has been placed on unpaved airfield land to maximize advertising revenues (Figure 24).

FIGURE 24 Advertising on unpaved airport land in Johannesburg, South Africa.

COMMERCIAL DEVELOPMENT AND LAND USE

Given the need to finance future capital expenditure and maximize shareholder value, airport operators are under increasing pressure to optimize revenues they generate from commercial sources. This can be achieved through adopting policies and practices that can unlock the considerable potential that exists within many airports to fully develop and exploit commercial activities to increase revenue. The following sections will explore some conventional and innovative sources to enhance nonairline revenues and help lower airline costs while improving the quality of service and providing a new level of convenience for the passenger. It also includes some key constraints to revenue development as well as opportunities.

Depending on the nature of the airport complex, there can be a variety of other revenue-producing leases from nonairline operations, including manufacturing, warehousing, freight forwarding, and even farming. Revenues from these areas have been categorized in the following way:

- Fixed-base operator leases,
- Ground rentals,
- Cargo-area rentals (freight forwarders, etc.),
- Industrial areas,
- Other buildings,
- Fuel and aircraft servicing, and
- Agriculture.

Although commercial development of the airport's land is another way to help support core aviation businesses by producing nonairline revenues, it also redefines the airport as a center of commerce. To determine its goals and objectives for commercial land development, it is essential for the airport operator to identify the relative importance of the financial, political, and aesthetics/identity considerations.

Commercial Property Development

In most instances, simply providing basic services to airlines and passengers is no longer sufficient to ensure the viability of running an airport. Quality, innovation, and new services and products are the key to ensuring survival in the competitive marketplace. Today, airport operators are compelled to review their roles as mere landlords with a new energy to complement ancillary services. Although most revenue sources are tied to passengers, airports are now finding the need to identify a long-term source of nonairline revenues.

Development and property management planning provides a long-term plan for nonairline revenue generation by helping the airport communicate to all interested parties the long-term goals of the airport and the benefits of cost.

In recent years, legislation relating to environmental and security issues has required airport operators to take a more proactive role as "landlord." Therefore, airport operators are discovering the importance of putting in place land leasing policies for commercial property. Those land leasing policies are being evaluated in a number of respects:

- Existing leases—Airports need to evaluate existing lease agreements and perform physical facility reviews as agreements are expiring and facilities are reverting back to the airport.
- Redevelopment plans—Airports should anticipate the expiration dates of the existing leases and facilitate "highest and best use" standards for aging facilities.
- New development and vacant land—Airports are being more active in identifying near- and long-term uses for currently unused land.

Land Use Plans

Land use planning not only provides a long-term plan for traditional and nontraditional revenue generation but a number of other useful purposes as well:

- Minimize costs—By guiding incompatible land users away from the airport vicinity and encouraging compatible land users to locate around airport facilities, costs for noise studies, capital investment in noise mitigation, and legal fees can be minimized. Aircraft noise has been the primary driver of airport land use compatibility conflicts and proper planning can alleviate noise issues with advance "buy-in" from the surrounding community. This is a valuable tool for the overall strategic business planning for small and large airports alike.
- Define alternatives—To the incumbent first-come-first-served policy, which can result in contracts having negotiated lease terms that are reasonable on a stand-alone basis, but that otherwise may be inconsistent with the long-term use needs of the airport system.
- Determine the highest and best use—Forecast the market demand for property having commercial uses. The demand (land absorption and price) for office, retail, and industrial (which includes warehouse and distribution) property is projected to determine revenue.
- Identify future capital improvements—Determine the major roadway(s) and utilities required to access and service the property for its highest and best use.

The planned improvements are developed by phase based on an analysis of areas that can be absorbed by the market over a reasonable amount of time and serviced with improvements that can be developed in reasonable cost increments. The land use plan results in a cost-benefit analysis of property development. The benefit of revenue generated from office, retail, and industrial land use is calculated by deducting the estimated cost to access and service the property.

Airport planning processes are performed at multiple levels:

- Service plan—establishes the specific strategy for providing the access and utility improvements required for the implementation of the land use plan. Roadways, storm drainage, water, sanitary sewer, and franchise utilities are required for commercial uses of land. Police, fire protection, and maintenance services are required for development.

  The service plan identifies, evaluates, and recommends the most cost-efficient combination of methods to provide access and utility services. Efficiency is derived from the determination of political, initial investment, operating, and administration costs.
- Financing plan—establishes the strategy for funding the infrastructure improvements required for commercial development. The plan identifies public, private, and airport funding methodologies available considering:
  - Ownership of property,
  - Bond ordinances, and
  - FAA grant assurances.

  The financing plan quantifies and evaluates the costs of funds, including initial (start-up) costs, interest, guarantees, and flexibility to change funding methods. The recommended funding method of the financing plan will be compared with the financing strategies and fees charged by neighboring municipalities.
- Marketing plan—establishes the price of property to be set to achieve the airport's goals of quality of development, market share, and absorption rate. The target market of users, disadvantaged business enterprises, and developers should be identified in the plan. A promotion plan is developed using a mix of printed material, the Internet, presentations, mailings, and advertising to reach the target market.
- Development guidelines—direct development to create a coordinated and cohesive appearance linking aviation and nonaviation land uses and an awareness that one is on-airport. They are used to give land for different commercial uses a unified and consistent appearance. The result is a campus-style look that accentuates each individual development:
  - Landscaping;
  - Roadways, gateways, driveways, traffic signals, and lighting;
  - Architectural style, including materials, textures, shapes, and colors;
  - Lotting, including setbacks and parking; and
  - Parks of specific land uses, including office, retail, and commercial/flex.

Large Land Mass

Airports are unique facilities in that they tend to occupy large parcels of land, have unique siting requirements, produce

noise, and generate complex safety concerns, all of which affect neighboring communities.

By promoting nonaviation commercial development, an airport can generate additional revenue without increasing the number of aircraft or the level of operations at the airport. The additional revenue could provide an increased level of reserves and funding for both past and future airport needs. Airport operators should be mindful of long-term compatibility with aviation operations when developing commercial development plans.

A number of airports have developed portions of their airport properties to accommodate nonaviation commercial enterprises. The types of businesses found on airport property include:

- Industrial uses
  - Importing and exporting
  - Manufacturing
  - Warehousing
  - Research and development
  - Cargo facilities
  - Bulk storage
  - Outside storage
  - Petroleum exploration and mineral rights (see Figure 25).
- Commercial uses
  - Restaurants
  - Commercial office space/complexes
  - Hotels and motels
  - Recreational centers
  - Training facilities
  - Small business centers
  - Retail sales
  - Industrial businesses
  - Car rental agencies
  - Automobile dealers
  - Golf courses
  - Movie theaters
  - Retail businesses
  - Agricultural uses (see Figure 26)
  - Recreational and training facilities.

The presence of these types of businesses at the airports surveyed contributes significantly to their revenues and their ability to build up their reserves and invest in improvements to their facilities.

FAA Restrictions on Land Development

There are numerous restrictions on the development of airport-owned land and the use of the revenue from that land that are driven by the grant assurances airports accept as a condition of receiving grants or acquiring federal surplus property. Further restrictions are placed on land development through the airport master plan process and airport revenue diversion regulations. These restrictions do not prohibit airport land development; however, they do put limitations to some aspects of this development.

- Grant assurances for land acquired with federal assistance. Grant Assurances 31a (land acquired for noise compatibility purposes) and 31b (land acquired for development purposes) each state that when the land is no longer needed for the purpose acquired, the sponsor shall dispose of it at fair market value, and the proceeds from this sale that are proportional to the original federal share of projects cost either be returned to the trust fund or reinvested in another approved (AIP or noise program) eligible project. It is important to note that this particular assurance only applies to land specifically acquired with federal assistance and not all airport land.

  However, Grant Assurance 31c states: "Land shall be considered to be needed for airport purposes under this assurance if (1) it may be needed for aeronautical purposes (including runway protection zones) or serve as noise buffer land, and (2) the revenue from interim uses of such land contributes to the financial self-sufficiency of the airport."

  Grant Assurance 31d states: "Disposition of such land under (a) (b) or (c) will be subject to the retention or reservation of any interest or right therein necessary

The Dallas/Fort Worth International Airport (DWF) Board is currently in the process of developing natural gas and oil resources on 18,000 acres of airport land. A similar project developed at nearby Fort Worth Spinks Airport sparked the idea in late 2005.

DFW will lease the land to Chesapeake Energy Corporation which won the lease in early August 2006. The company will pay a one-time bonus and yearly royalties to the airport. The lease is initially for 2 years, to allow the developer time to commence production. After this period, the lease will remain in effect so long as the leasee is drilling and extracting natural gas.

At DFW, oil exploration is projected to produce additional revenues in the order of $180 million over the 2-year lease, and royalty payments of 25% of natural gas revenues.

FIGURE 25 Dallas/Fort Worth International Airport—Natural gas and oil exploration.

DENVER INTERNATIONAL AIRPORT

Farming on Currently Unused Airport Land

DIA partners with farmers to grow and harvest crops such as wheat, sunflowers, millet, and corn on airport property.

Under the lease program, the monies received from the sale of the farm crop have been divided on a ratio of one-third to the airport and two-thirds to the farmers. The farmland lease contracts bring in about $300,000 per year to DIA.

FIGURE 26 Denver International Airport—Farming on currently unused airport land.

to ensure that such land will only be used for purposes which are compatible with noise levels associated with operation of the airport."

There is some recent emphasis concerning this issue, because the Office of Inspector General (OIG) audited 11 airports and found that they were not complying with the intent of the land acquisition assurance in that they should have disposed of the land as soon as possible once the proper deed restrictions were placed on that land (that is, the airport should not hold or lease the land). Prior to the OIG audit, airports had assumed that the land could be developed for compatible uses and the revenue contributed to the self-sufficiency of the airport. The results of this audit have only recently been released and follow-up is still pending.

- Airport layout plan and airport property map issues. The primary issue around the Airport Layout Plan (ALP) as it relates to land development is the requirement that land uses on these documents are approved, and that changing these uses requires approval.

  The Grant Assurances require the airport to maintain an ALP that shows the boundaries of all off-site areas owned or controlled by the airport for airport purposes (Grant Assurance 29a), and requires showing the location of all existing and proposed nonaviation facilities and of all existing improvements thereon.

  There is some flexibility, however, in how the ALP is developed as part of the master planning process, as spelled out in Advisory Circular 150-5070-6B Airport Master Plan. The ALP consists of a number of drawings as listed in that circular; however, not every drawing is required (specific requirements are worked out between FAA and the airport as the master plan is developed). Any drawing that is approved as a part of the master plan's ALP however does drive the need to have subsequent changes to that drawing approved.

If the airport acquired land with federal assistance, a great deal more care must be taken to ensure that the airport property map and the ALP documents are approved to show any changes in development.

Revenue Diversion Issues

The FAA policy on Revenue Diversion ("Policy and Procedure Concerning the Use of Airport Revenue" 1999) specifically states that airport revenue shall only be used for the capital or operating costs of the airport, the local airport system, or other local faculties owned or operated by the airport owner or operator, and directly and substantially related to the air transportation of passengers or property.

The allowable use of revenue to develop airport land is clear for land that serves a direct aviation purpose (use revenue is allowed for the development of this land and revenue generated from this land must be used for airport purposes). The restrictions on the use of airport revenue to develop land not used for direct aviation purposes (developing land set aside for noise buffers) are less clear.

OTHER INNOVATIVE REVENUE ENHANCEMENT CONCEPTS

On-Line Auctions of Airport Equipment

Airports with excess equipment or equipment being replaced or phased out may consider online auctions as a possible way to enhance airport revenue. Auctions allow the seller to generate additional revenues and the buyer to obtain much needed equipment at or below market rate. Conducting those auctions online makes them more readily accessible to a broader range of potential buyers than other forms of auctions (see Figure 27).

Conservation Easements

A conservation easement is a legally binding agreement between a property owner and a land trust or government agency that limits the use of an area of land. Some of the rights of the owner are transferred to the latter to support conservation efforts. Although conservation easements are usually donated, they are sometimes sold. Furthermore, if an easement benefits the public by protecting important resources and meets other tax requirements, it can qualify as a tax-deductible charitable donation.

Most easements run into perpetuity—only perpetual easements can qualify for tax breaks. Airports, being publicly owned, would not benefit from tax breaks, but might be able to sell conservation easements for airport land that will not be developed in the future. The viability of these instruments as revenue generators for airports, however, is unknown. Airports may not want to permanently restrict their ability to develop their unused lands. Given concerns about accommodating future growth, those areas that are already off limits to construction would probably not be purchased by a conservation easement fund to begin with.

DFW is using the internet to auction capital equipment at a lower cost and to a wider set of perspective buyers. DFW has held five online auctions, selling unused items such as Air Train cars (from the former people mover system at DFW), shuttle buses, and dump trucks. Other airport authorities, such as the Port Authority of NY and NJ, also auction surplus equipment, although online auctioning is a new development.

The last auction at DFW netted over $320,000. All-time revenue from surplus equipment at the airport stands at more than $2 million.

FIGURE 27 Dallas/Fort Worth International Airport—Online auction of surplus equipment.

Carbon Sequestration

The Carbon Sequestration—Chicago Climate Exchange (CCX) is a self-regulatory exchange that administers a voluntary, legally binding program for reducing greenhouse gases in North America. Corporations, public entities, and organizations that generate greenhouse gas emissions directly or indirectly can join CCX by pledging to curb their contribution of these gases to a baseline volume that decreases annually according to a predetermined formula.

CCX members trade their carbon credits to comply with their emissions quota at minimum cost. CCX offset providers are organizations or individuals that manage or represent carbon offset projects, such as no-till farming, methane sequestration, and reforestation and conservation. Offset providers can earn Carbon Financial Instruments (CFIs) in the exchange through a third-party certification of their practices. Airports could adopt carbon sequestration projects in their excess lands and apply for CCX Offset Certification. With possible future increases in the value of CFIs from their January 2007 levels of between $3 and $4, innovative sequestration approaches may become viable supplements to conventional forestation projects.

Energy and Utility Services

Airports may have opportunities to generate and sell energy and utility services to tenants, nearby businesses or communities, or regional utilities at a net profit. For example:

- An airport could purchase utilities wholesale from the local utility company and sell the utilities to tenants at the retail utility rates they would have paid the utility company.
- An airport steam plant could be sized to produce a cost-effective steam district to nearby hotels or other large institutions.
- Electricity from solar or wind sources could be generated on airport property to offset airport electricity or costs, or be sold to the local electric utility and/or tenants. As restrictions on emissions increase, local utilities may be willing to subsidize airport investment in alternative energy equipment on airport property.

Shared Services

Airports may also have opportunities to provide services that are of mutual benefit to the airport, airlines, and/or other tenants. For example, ground handling of aircraft is provided by airport operators at a number of European airports. In the United States, ground handling is generally provided by the airlines or ground handling companies. If an airport can provide the services more cost-effectively than its tenants or a third-party contractor, then providing the service represents a potential new revenue source. For example, ground handling is provided by the airports operators of Orlando Sanford International Airport and Bangor (Maine) International Airport.

CHAPTER FOUR

ALTERNATIVE WAYS OF DOING BUSINESS

As discussed in chapter one, most airports in the United States are operated as independent, not-for-profit entities with oversight by a politically appointed authority, or as self-sustaining enterprise funds of a governmental entity such as a city, county, or state government. U.S. airports have been characterized as being among the most privatized in the world (e.g., see de Neufville 1999, pp. 2, 8); although they are operated by local or state governments, the airlines often have a role in capital investment decision making and other private entities are involved in operating and providing services at airports.

The term "privatization" can refer to a broad range of activities that entail varying levels of private involvement. A report by the Government Accountability Office in 1995 stated that "the privatization spectrum can include contracting out, public–private partnerships, vouchers, and franchising, as well as the actual sale—divestiture—of government assets and operations" (*Issues: Privatization/Divestiture Practices in Other Nations* 1995, p. 1). Figure 28 shows the continuum of private involvement at airports.

This chapter addresses the spectrum of privatization, particularly as it applies in the United States, by discussing:

- Partial privatization—ways of doing business that involve varying degrees of private-sector involvement in the management, capital investment decision making, financing, and pricing of airport facilities and services.
- Full privatization—outright sale of airport assets.

PARTIAL PRIVATIZATION

Private involvement in the management and operation of U.S. airports, starting with the most typical practices to the more innovative, includes:

- Airline capital decision-making involvement—Airlines often have a role in capital investment decision making through majority-in-interest provisions of airport–airline agreements.
- Private capital—In the United States, the majority of financing comes from private sources. An estimated 58% of U.S. airport capital investments in 2000 through 2004 were funded by bonds and other forms of debt through the private financial markets, according to ACI–NA, based on information from FAA, U.S. Treasury, and Thompson Financial Data. In the unlikely event that there are discrepancies between airport bond ordinances (in effect, agreements with bondholders) on the one hand and airline agreements on the other, bond ordinances take precedence (see Figure 29).
- Contracting of services—Airport operators routinely contract with private companies to assist with the financial and physical planning of airports, design and construct facilities, provide terminal cleaning or other routine services, operate parking facilities, and perform other functions related to managing and operating airports.
- Private companies operating on-airport—Airport operators typically employ only 10% to 20% of the total number of employees at an airport (de Neufville 1999, p. 9). Airlines, rental car companies, concessionaires, ground transportation companies (taxis, limousine operators, etc.), cleaning companies, etc., constitute the majority of personnel at an airport.
- Master concessionaires—Some airport operators have negotiated master concessionaire agreements with private companies to oversee the development of terminal concessions. Examples include Boston–Logan, Chicago O'Hare, Pittsburgh, Washington National, and New York's LaGuardia airports.
- Private terminal development—Airlines have built and operate(d) terminals at numerous airports around the country, including Terminals A, C, and E at Dallas/Fort Worth International Airport, Terminal A at Boston–Logan International Airport, and Terminal 4 at Los Angeles International Airport. In other cases, third parties have built terminals for use by multiple airlines, including Terminal B at Boston–Logan, and the International Arrivals Building at John F. Kennedy International Airport.
- Private airport operators—The Indianapolis Airport Authority and Susquehanna Area Regional Airport Authority each entered into 10-year agreements with BAA plc (formerly the British Airport Authority) to manage and operate Indianapolis International Airport and Harrisburg International and Capital City airports on a day-to-day basis, and to upgrade and/or develop major new facilities. Ownership of the airports did not change under the agreements, only responsibility for managing and operating the airports. BAA is no longer managing the Harrisburg airports, but is still operating in that capacity at Indianapolis International Airport.

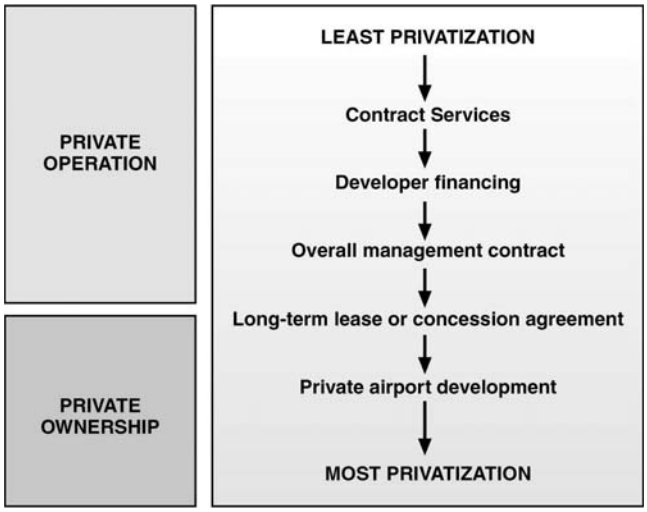

FIGURE 28 Continuum of private involvement at airports.

FULL PRIVATIZATION

Since the 1980s, when the Thatcher government began selling government-owned assets in Britain, privatization of all or some airports has occurred in (see de Neufville 1999 p. 4, augmented with more recent examples): Argentina, Australia, Austria, Bolivia, Canada, Chile, Great Britain, Hungary, Italy, Macao, Mexico, The Netherlands, New Zealand, Philippines, and South Africa.

Some airports in the United States have been developed, financed, and operated privately throughout their entire existence, including Alliance Airport in Dallas, as well as various general aviation airports around the country. However, fully privatized commercial service airports are the exception in this country. Barriers to privatization in the United States include:

- Access to federal grants—Airports in the United States have access to AIP grants from the federal government, unlike airports in many other parts of the world. Airport operators must agree to a series of grant assurances that, among other things, require all airport revenues to be expended for costs of the airport.

In 1984, the AMR Corporation entered into a 40 year lease with LAX for its Terminal 4 facilities. AMR is a commercial aviation holding company for American Airlines and its commuter affiliates.

In 2002, AMR renovated and expanded Teminal 4 at LAX for a total of approximately $284 Million. The Terminal 4 project was funded with Special Facilities Sublease Bonds which were issued by AMR and backed by the lease payments.

The lease agreement included a buyback provision that allows LAX to purchase AMR's interest in the premises upon a notice of 18 months or more.

FIGURE 29 Los Angeles International Airport—Special facility bond terminal financing.

- Revenue diversion prohibition—Federal policy and the grant assurances prohibit airport operators from diverting revenue to nonairport uses. A small number of airport operators are grandfathered from this provision, but the nonairport uses for which they can use airport revenues are generally other governmental or transportation purposes. The prohibition on revenue diversion makes it difficult for a private airport operator to direct any airport profits to the company owners or shareholders.
- Access to tax-exempt and alternative minimum tax debt—Airport operators in the United States, as public entities, also have access to tax-exempt debt and AMT debt for eligible airport facilities, as discussed in chapter two. Private operators cannot access tax-exempt or AMT debt and must rely on taxable debt or sources of private equity, and therefore have higher costs of capital than airport operators that are part of a governmental entity.

Overview of the U.S. Airport Privatization Pilot Program

Full privatization of U.S. airports; that is, the transfer of ownership from a local government to a private entity, has been possible for a limited number of airports for 10 years. As part of the Reauthorization Act of 1996, as codified under 49 USC Section 47134, Congress established an airport privatization pilot program to explore privatization as a means of generating access to sources of private capital for airport improvement and development. The act authorized U.S.DOT to grant exemptions from certain federal statutory and regulatory requirements, thereby allowing private companies to own, manage, and develop up to five public airports. Under the pilot program:

- At least one of the airports must be a general aviation airport, and no more than one large-hub airport may participate.
- The secretary of U.S.DOT may exempt the airport sponsor (i.e., seller) from the requirement:
  - To use airport revenues for airport-related purposes, particularly proceeds of the sale or transfer;
  - To repay all or a portion of federal grants upon transfer of the airport ownership; and
  - To return airport property deeded by the federal government upon transfer of airport ownership.
- The private operator assumes the responsibility of upholding AIP grant assurances and may continue to receive AIP grants, although at a reduced share PFCs may continue to be collected for the airport.
- A minimum of 65% of the airlines at the airport representing 65% of total landed weight at the airport in the preceding year must approve the deal. This requirement has, in the past, created a major challenge for airport sponsors interested in privatizing their airports.
- FAA reserves the right to ensure that the private operator is earning no more than a reasonable rate of return.

Stewart International Airport in Newburgh, N.Y.—which was owned and operated by the New York State Department of Transportation (NYDOT)—is the only airport to be privatized to date under the FAA's Airport Privatization Pilot Program. Privatization was expected to improve the airport's financial performance through increased airline revenue with the introduction of low-fare service, increased parking and concession revenues from increased passenger levels, lower improvement costs through an enhanced phasing program, and lower operating expenses through the use of third-party contracts and outsourcing.

A competitive process resulted in the selection of National Express Group (NEG), a United Kingdom-based private operator in 2000, and execution of a 99-year lease of the facility. NEG made an initial payment of $35 million, and is to pay 5% of gross income on the earlier of the lease's 10th anniversary or when traffic exceeds 1.38 million passengers. Under the lease agreement, NYDOT recouped $25 million it had invested in the airport, and the remainder of the proceeds have been used for airport purposes.

FIGURE 30 Stewart International Airport—Airport privatization.

- Any collective bargaining agreement that covers airport employees will remain intact after the transfer of airport ownership.
- The private operator must submit a 5-year Capital Improvement Program to FAA with its application.

Status of Applications Under the Pilot Program

FAA has received applications from six airports under the pilot program; however, three were withdrawn for various reasons.

Stewart Airport, Newburgh, New York—The only airport that has received approval to date is Stewart Airport (see Figure 30).

New Orleans Lakefront Airport, New Orleans, Louisiana—A final application filed in April 2002 by the Orleans Levee District, which operates the airport, to privatize New Orleans Lakefront Airport was still pending as of January 31, 2007. American Airports Lakefront LLC would operate the airport under a 50-year lease and pay the Orleans Levee District $300,000 in annual rental payments for the first 3 years. In the fourth year, American Airports Lakefront would pay $300,000 in rental payments or 11% of the airport's gross income, not to exceed $3 million, plus 30% of the airport's gross income over $3 million (Carvlin 2006).

Midway Airport, Chicago, Illinois—The city of Chicago is the first airport sponsor to submit a privatization proposal for a large-hub airport. Background and status are as follows:

- Chicago Skyway toll bridge precedent—The city's interest stems in part from the successful privatization of the Chicago Skyway toll bridge in January 2005, in which Macquarie Infrastructure Group and Cintra signed a 99-year agreement to operate the Skyway and paid the city $1.83 billion.
- State enabling legislation—The Illinois legislature passed a bill in the spring of 2006 that preserves the property tax exemption for the airport in the event that it is privately operated. The legislation requires the city to spend the majority of sale proceeds on infrastructure projects or to strengthen its pension funds, which have an average funding level of 61%.
- The city's objectives—The city's initiative to privatize Midway Airport is seen as a way to (*Privatization of Chicago Midway International Airport* 2006):
  - Generate a new rate-setting methodology that can give certainty and stability to the airlines;
  - Increase operating efficiencies;
  - Improve customer amenities and satisfaction;
  - Create economic benefits for the city;
  - Ensure adequate upkeep of capital equipment and investment in capital improvements; and
  - Continue to provide a service to the public by maintaining strict guidelines for noise and environmental mitigation, safety and security requirements, and employee protection.
- Bond defeasance—Approximately $1.3 billion of Midway Airport revenue bonds would have to be defeased as part of the privatization deal.
- Status—The city has assembled a team to provide financial advisory services throughout the process, and submitted its proposal to FAA in September 2006. As of January 31, 2007, the application was pending.

REFERENCES

"Airline Agreement Paves Way for Non-AMT O'Hare Bonds," *The Bond Buyer: The Daily Newspaper of Public Finance,* Nov. 18, 2005.

Airport Capital Projects Loan Program, American Association of Airport Executives, Alexandria, Va., Mar. 2001.

Aviation Infrastructure Innovative Financing, Office of Aviation Policy and Plans, Federal Aviation Administration, Washington, D.C., Sep. 25, 2002.

Carvlin, E., "Airport Privatization for Chicago" [Online]. Available: www.bondbuyer.com [accessed Sep. 18, 2006].

de Neufville, R., *Airport Privatization: Issues for the United States,* Massachusetts Institute of Technology, Cambridge, Mass., 1999.

Innovative Finance Brochure—Credit Assistance, Federal Highway Administration, Washington, D.C., Nov. 2006.

Issues: Privatization/Divestiture Practices in Other Nations, Government Accountability Office, Washington, D.C., 1995.

Market Update and Interest Rate Swaps Presentation, Bear Stearns, New York, N.Y., Oct. 18, 2005.

"Policy and Procedures Concerning the Use of Airport Revenue," Federal Aviation Administration, Washington, D.C., 1999.

"Policy Regarding Airport Rates and Changes," *Federal Register,* Vol. 61, No. 121, June 21, 1996, pp. 31994–32022.

Privatization of Chicago Midway International Airport, Preliminary Application Under 49 USC 47134, City of Chicago, Ill., Sep. 12, 2006.

"Virginia: VRA Pool Upgraded," *The Bond Buyer: The Daily Newspaper of Public Finance,* Aug. 11, 2006.

BIBLIOGRAPHY

2005 Medians for the Airport Sector, Moody's Investors Service Research, New York, N.Y., Dec. 2005.

AIP Handbook, Federal Aviation Administration, Washington, D.C., June 28, 2005 [Online]. Available: http://www.faa.gov/airports_airtraffic/airports/aip/aip_handbook/.

Airport Business Opportunities, APT, July 11, 2006.

Airport Privatization Pilot Program, Federal Aviation Administration, Washington, D.C. [Online]. Available: http://www.faa.gov/airports_airtraffic/airports/airport_obligations/privatization/ and http://dms.dot.gov/search/searchFormSimple.cfm (for updates).

Airport Project Finance and Special Facilities Debt—Very Different Credits, FitchRatings, New York, N.Y., Nov. 6, 2003.

Airport Security: Checked Bag Screening—The Challenge for Airport Operators, Burlingame, Calif., Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), May 2002.

"All in a Brand," *Airport World,* Aug.–Sep. 2005, p. 71.

An Assessment of Innovative Financing Options for the Airport Improvement Program, Federal Aviation Administration, Washington, D.C., Mar. 1996.

Andrews, T., "You Ain't Seen Nothing Yet," *Airport World,* Aug.–Sep. 2005, pp. 18–19.

Austin, J., "Latin Sprit," *Airport World,* Aug.–Sep. 2005, p. 12.

Aviation Infrastructure Innovative Financing, Office of Aviation Policy and Plans, Federal Aviation Administration, Washington, D.C., Sep. 25, 2002.

Bates, J., "Buying Frenzy," *Airport World,* Aug.–Sep. 2005, p. 61.

"Blagojevich Signs Bill Allowing Midway Airport to Privatize," *Associated Press,* May 9, 2006.

California Public Utilities' Self-Generation Incentive Program, 2006 [Online]. Available: http://www.cpuc.ca.gov/static/energy/electric/051005_sgip.htm.

"Chicago Wants to Privatize Midway Under FAA Program," *Aviation Daily,* Sep. 19, 2006, p. 3.

Conservation Options for Landowners, Land Trust Alliance, Washington, D.C., 2006 [Online]. Available: http://www.lta.org/conserve/options.htm.

"Daley Looks at Leasing Airport," *Chicago Tribune,* Mar. 4, 2006.

DFW Airport Approves Barnett Shale Drilling Lease with Chesapeake Energy Corporation, Dallas/Ft. Worth International Airport, Dallas, Tex., Aug. 3, 2006 [Online]. Available: http://www.dfwairport.com/naturalgas/pdf/OBA-2006-05-172.pdf.

"DFW Cashes in with Multimillion Dollar Gas Deal," *Aviation Daily,* Aug. 7, 2006.

"DFW's Fifth Online Auctions Net Over $320,000," Dallas/Ft. Worth International Airport, Dallas, Tex., May 8, 2006 [Online]. Available: www.dfwairport.com/mediasite/pdf/06/05/060508-online.pdf.

"DFW's Ground May Fuel Airport Revenues," *DFW Opportunities,* Winter 2006, pp. 4–5 [Online]. Available: http://www.dfwairport.com/seb/pdf/sebwi06.pdf.

"DFW, Trammel Crow to Develop 2 Million Feet at Airport," *Dallas Business Journal,* Apr. 6, 2006 [Online]. Available: http://dallas.bizjournals.com/dallas/stories/2006/04/03/daily38.html.

DIA Announces Additional Gas and Oil Resource Development on Airport Property, Denver International Airport, Denver, Colo., Apr. 24, 2006 [Online]. Available: www.denverpost.com/search/ci_4067817.

"DIA Announces Successful Bidder on Pena Project," Denver International Airport, Denver, Colo., Apr. 6, 2006 [Online]. Available: www.flydenver.com/pr/DIAPR_060424.pdf.

"Energy Efficiency and Sustainable Programs at Dallas/Fort Worth International Airport," Power Point Presentation, Nov. 7–10, 2005, DFW and Energy Systems Laboratory [Online]. Available: http://airquality2005.tamu.edu/presentations/Air%20Quality%202005%20DFW.pdf#search=%22DFW%20Bear%20Creek%20EE%22.

"Exhibitor News: AeroClinics to Open in 2007," *Centerlines ACI–NA 15th Annual Conference Event Guide,* Fall 2006, p. 50.

"Exhibitor News: Hudson Group, CNN Sign Co-Branding Agreement," *Centerlines ACI–NA 15th Annual Conference Event Guide,* Fall 2006, p. 40.

"Exhibitor News: Parking Locator Services SFO Passengers," *Centerlines ACI–NA 15th Annual Conference Event Guide,* Fall 2006, p. 42.

"Exhibitor News: Sit Back & Relax Debuts Massage Chairs," *Centerlines ACI–NA 15th Annual Conference Event Guide,* Fall 2006, p. 56.

"Exhibitor News: WiFi Buyout Unites Boingo, Concourse," *Centerlines ACI–NA 15th Annual Conference Event Guide,* Fall 2006, p. 50.

Facts and Information: The Port Authority of New York and New Jersey, 2006 [Online]. Available: www.panynj.gov.

Falconer, R., "Ottawa Enters 'Simpler' Second Phase of Expansion," *Centerlines,* Fall 2006, pp. 37–38.

"Farming the Airport," *On Approach: Newsletter of the Victoria Airport Authority,* Victoria Airport Authority, Victoria, BC, Canada, Spring 2004 [Online]. Available: http://victoriaairport.com/resources/On%20Approach%20Spring%2004.pdf?PHPSESSID=62630342f74a1fbac81f5c13f4baa31d#search=%22farming%20on%20airport%20land%22.

Federal Funding for Airport Security: Who's Picking Up the Tab? Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., May 2003.

Federal Funding for Voluntary Airport Low Emission Projects (*VALE*), Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., July 2005.

Federal Funding Update: Vision 100 Authorization and 2004 Appropriations, Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., Mar. 2004.

"Foreign Bidders to Dominate Sale of US Airport," *The Financial Times,* July 11, 2006.

Forsgren, K., "US Report Card," *Airport World,* Aug.–Sep. 2005, pp. 28–29.

Generally Positive Impact of Low Cost Carriers on Airport Finances, Operations and Capital Planning; but Some Risks Exist, Moody's Investors Research, New York, N.Y., June 2006.

Guidance on Airport Emission Reduction Credits for Early Measures Through Voluntary Airport Low Emission Programs, Environmental Protection Agency, Office of Air and Radiation, Triangle Park, N.C., Sep. 2005 [Online]. Available: http://www.faa.gov/airports_airtraffic/airports/resources/publications/reports/environmental/media/AERC_093004.pdf.

"Is Plan to Privatize Midway Ready for Take-Off?" *Chicago Sun-Times,* Mar. 5, 2006.

Issues for Airports in the 2007 FAA Reauthorization, Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., Dec. 2006.

Letter of Intent Program: A Key Funding Source for Airfield Projects, Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., Jan. 2002.

Limited Offering Memorandum—$250 Million: The Port Authority of New York and New Jersey. Special Projects Bond, Series 4, KAIC Partners Project, Goldman, Sachs & Co., New York, N.Y., May 31, 1996.

M/WBE Investment Guidelines, Dallas/Ft. Worth International Airport Commercial Development Department Dallas, Tex., Jan. 5, 2006 [Online]. Available: http://www.dfwairport.com/naturalgas/pdf/MWBE-Investment-Guidelines_2006-01-28.pdf.

"News in Brief: Milwaukee's General Mitchell International Airport . . . ," *Airport World,* Aug.–Sep. 2005, p. 11.

Official Board Action—Request to Bid Oil & Gas Lease, Dallas/Ft. Worth International Airport Commercial Development Department, Dallas, Tex., May 4, 2006 [Online]. Available: http://www.dfwairport.com/naturalgas/pdf/OBA-2006-05-172.pdf.

Overbeck, A., "Drought Concerns Linger into Winter," *Golf Course News,* Dec. 2002 [Online]. Available: http://www.findarticles.com/p/articles/mi_qa4031/is_200212/ai_n9157563.

Pacific Gas & Electric Company Self-Generation Incentive Program, 2006 [Online]. Available: http://www.pge.com/docs/pdfs/suppliers_purchasing/new_generator/incentive/2006_sgip_handbook.pdf.

PFC Financings: Why Are Airport Sponsors Leveraging PFC Revenues? Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., Jan. 2000.

PFC Program: Navigating Through Changes Resulting from AIR-21, Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., Mar. 2001.

PFC Program Update: Increased Flexibility to Use PFC Revenues for Security-Related Projects, Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., Oct. 2002.

PFC Program Update: PFC Program Changes Effective May 2005, Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., May 2005.

Potential Bidder Contact Information—M/WBE Outreach Conference, Dallas/Ft. Worth International Airport Commercial Development Department, Dallas, Tex., Mar. 29, 2006 [Online]. Available: http://www.dfwairport.com/naturalgas/pdf/potential_bidders.pdf.

Sandler, L. and D. Umhoefer, "Airport on Auction Block?" *Milwaukee Journal Sentinel,* May 11, 2006 [Online]. Available: http://www.jsonline.com/story/index.aspx?id=423125.

Shields, Y., "Chicago Selects Team for Potential Midway Sale" [Online]. Available: www.bondbuyer.com [June 16, 2006].

Shields, Y., "Midway Flight Crew Gearing Up" [Online]. Available: www.bondbuyer.com [June 19, 2006].

"Simplifying the Business Worldwide," *Centerlines,* Fall 2006, pp. 34–36.

Swartz, T., F. Spielman, and D. McKinney, "Plan for Midway Could Be Boon for City Officers," *Chicago Sun-Times,* Apr. 13, 2006.

Texas Emissions Reduction Plan (*TERP*), Texas Commission on Environmental Quality, Austin, Tex., May 2004 [Online]. Available: http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/rg/rg-388_202442.pdf.

The Transportation Security Administration's Screening Partnership (*OPT-OUT*) *Program,* Leigh Fisher Associates (a division of Jacobs Consultancy Inc.), Burlingame, Calif., Dec. 2004.

Undisguised: Impact of UAL Bankruptcy on Airport Special Facility Debt, FitchRatings, New York, N.Y., Apr. 27, 2004.

US Airport Select Median Ratios Cast a Favorable Light on Large Hubs, Standard & Poor's, New York, N.Y., Mar. 2, 2006.

"User Fee Face Off," *Centerlines,* Fall 2006, pp. 23–24.

VALE Technical Report, Federal Aviation Administration, Washington, D.C. [Online]. Available: www.faa.gov/airports_airtraffic/airports/environmental/vale/media/vale (sight no longer exists).

Von Paumgartten, P. and B. Haig, "Green Days," *Airport World,* Aug.–Sep. 2005, pp. 38–39.

Yamanouchi, K., "Diversifying Lifts DIA," *Denver Post,* July 19, 2006 [Online]. Available: http://www.denverpost.com/search/ci_4067817.

Working Group Report: Baggage Screening Investment Study, Leigh Fisher Associates (a division of Jacobs Consultancy Inc), Burlingame, Calif., Aug. 9, 2006.

ACRONYMS

AAAE	American Association of Airport Executives
ACI–NA	Airports Council International–North America
AIP	Airport Improvement Program (FAA's grant program)
ALP	Airport Layout Plan
AMT	Alternative minimum tax
AVI	Automatic vehicle identification
BAA	Formerly the British Airport Authority
BAN	Bond anticipation note(s)
CCX	Chicago Climate Exchange
CFC	Customer facility charge
CFI	Carbon Financial Instrument(s)
EDS	Explosives detection system
FFY	Federal fiscal years
GAN	Grant anticipation note(s)
GARB	General airport revenue bond(s)
GO	General obligation [bond(s)]
iFIDS	Internet-based Flight Information Display Systems
LOI	Letter of intent
MII	Majority-In-Interest (of airlines)
NHS Act	National Highway System Designation Act of 1995
Non-AMT	Not subject to AMT; that is, these bonds are tax exempt
NPIAS	National Plan of Integrated Airport Systems
O&D	Origin and destination
OIG	Office of the Inspector General
OTA	Other transaction agreement(s); 1-year TSA grants
PFC	Passenger facility charge
SIB	State Infrastructure Bank
TCB	Tax credit bond(s)
TEA-21	Transportation Equity Act for the 21st Century
TIFIA	Transportation Infrastructure Finance and Innovation Act
VRA	Virginia Resources Authority

APPENDIX A

State Grants and Loans for Aviation

	Sources of Funding				Grant Purposes				Loans
	General Fund	Aviation Fuel Taxes	Aircraft Sales and Use Taxes	Other	Federal Match	Nav Aids	Airfield Projects	Hangar Construction	Loans
Alabama		X		X	X	X	X	No	
Alaska				X	X	No	X	No	
Arizona					X	X	X	X	
Arkansas		X	X		X	X	X	X	
California		X		X	X	X	X	X	X
Colorado		X			X	X	X	No	X
Connecticut	X					Unavailable			
Delaware	X				X	No	No	No	
Florida		X		X	X	X	X	X	
Georgia	X				X	X	X	No	
Hawaii	X	X		X	No	X	X	No	
Idaho		X		X	X	X	X	No	
Illinois	Unavailable				Unavailable				
Indiana	X				X	X	X	X	
Iowa				X	No	X	X	X	
Kansas	X				No	X	X	No	
Kentucky		X			X	X	X	X	X
Louisiana		X		X	X	X	X	No	
Maine				X	X	No	No	No	
Maryland		X		X	X	X	X	X	
Massachusetts				X	X	X	X	No	
Michigan		X		X	X	X	X	X	X
Minnesota		X	X	X	No	X	X	X	X
Mississippi		X		X	X	X	X	No	
Missouri		X		X	No	X	X	X	X
Montana		X		X	X	X	X	X	
Nebraska		X		X	X	X	X	X	X
Nevada					No	No	No	No	
New Hampshire	X				X	X	X	No	
New Jersey				X	No	X	X	No	
New Mexico	X	X	X	X	X	X	X	X	
New York				X	X	X	X	X	
North Carolina	X				X	X	X	No	
North Dakota	X	X	X	X	X	X	X	No	
Ohio	X				X	No	X	No	
Oklahoma		X	X	X	No	X	X	No	
Oregon 2002 Data		X	X		X	Data Not Available			
Pennsylvania	X	X			X	X	X	X	X
Rhode Island	X			X	X	No	No	No	
South Carolina	X	X			X	X	X	No	
South Dakota		X	X		X	X	X	X	
Tennessee	X	X			X	X	X	X	
Texas				X	No	X	X	X	
Utah		X	X		X	X	X	X	
Vermont	X				X	X	X	X	
Virginia	X	X	X	X	X	X	X	No	
Washington		X	X	X	X	X	X	No	
West Virginia	X	X			X	No	No	X	
Wisconsin		X		X	X	X	X	No	
Wyoming	X	X			X	X	X	X	
	19	30	10	27	39	39	42	23	8

Sources: *State Aviation Funding and Organizational Data Annual Report, Fiscal Years 2002 and 2003* Prepared for the National Association of State Aviation Officials.
Note: As of 2003.

Abbreviations used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation