Strategies for Reuse of Underutilized or Vacant Airport Facilities

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AUTHORS

Lois S Kramer; Alicia Seltz; Transportation Research Board

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AIRPORT COOPERATIVE RESEARCH PROGRAM

Strategies for Reuse of Underutilized or Vacant Airport Facilities

Sponsored by the Federal Aviation Administration

A Synthesis of Airport Practice

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A Synthesis of Airport Practice

CONSULTANTS
LOIS S. KRAMER
AND
ALICIA SELTZ
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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 principle 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.

Research problem statements for the ACRP are solicited periodically but may be submitted to the TRB by anyone at any time. It is the responsibility of the AOC to formulate the research program by identifying the highest priority projects and defining funding levels and expected products.

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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The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, or the Federal Aviation Administration of the U.S. Department of Transportation.

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Cover figure: Reuse of former terminal at Springfield–Branson National Airport (*courtesy:* Springfield–Branson National Airport).

FOREWORD

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

By Gail R. Staba
Senior Program Officer
Transportation
Research Board

As the airline industry continues to consolidate, airports are responding to an environment where demand (and revenue) for facilities is not only less predictable, but often reduced, sometimes at short notice. This synthesis study presents an overview of the issues surrounding the reuse of aeronautical facilities.

Information used for this synthesis was gathered through a series of case studies and interviews with airport directors, property managers, and community economic development agencies. Panel members for this project requested a broad examination of reuse situations that address interim and long-term solutions to reuse, the decision process to maintain or demolish a structure, environmental and regulatory issues, success stories, and obstacles to effective reuse.

Lois S. Kramer and Alicia Seltz, KRAMER aerotek, inc., Boulder, Colorado, 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.

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STRATEGIES FOR REUSE OF UNDERUTILIZED OR VACANT AIRPORT FACILITIES

SUMMARY

As the airline industry continues to consolidate and strives to achieve greater efficiencies and lower costs, airports are responding to an environment in which demand (and rent) for facilities is not only less predictable, but often reduced, sometimes at short notice. Bankruptcies, mergers, and capacity cuts have resulted in reduced occupancy of terminals and concourses and in terminated leases on a variety of buildings, including maintenance and cargo facilities, hangars, catering kitchens, and other support centers.

This report presents an overview of the issues surrounding reuse of aeronautical facilities. Information used for this synthesis was gathered through a series of case studies and interviews with airport directors, property managers, and community economic development agencies. The report includes a broad examination of reuse situations that address interim and long-term solutions to reuse, the decision process to maintain or demolish a structure, environmental and regulatory issues, success stories, and obstacles to effective reuse.

The following is an overview of synthesis findings:

- The occurrence of airport building vacancies and obsolescence is widespread but is reported primarily at the individual airport level. This synthesis is one of the first compilations of how airports of different sizes and missions have addressed vacant and underutilized properties.
- Although expiration of leases or changes in ownership of tenant companies are common with any property management, vacancies that arise out of airline bankruptcies often result in sudden and relatively large reductions in airport revenue. Unexpected vacancies also cause urgent efforts by airport sponsors to find replacement tenants. In addition, bankruptcy proceedings can delay resolution of ownership and disposition of financial obligations on a property. Airport sponsors may find themselves assuming the cost and responsibility for maintaining a facility until these issues are resolved.
- Reuse of specialized aeronautical facilities is complex because of issues of airfield security, FAA grant obligations, airline operating agreements, environmental cleanup, stakeholder support, and market conditions.
- Expenses associated with upkeep, environmental mitigation, and rehabilitation of old facilities can make demolition the lowest-cost option.
- Unless there is already a demolition plan and budget in place, many airport sponsors will bear the cost of maintaining a building for what can be several years. Airports have rolled the cost of demolishing a property into a new construction project on the site, but during the recent recession, many capital projects have been postponed and as a consequence, vacant buildings slated for demolition remain on the airport.
- Vacancies may create opportunities for airport entrepreneurial ventures; however, based on the case studies reviewed for this synthesis, revenue replication is often difficult to achieve.
- Reuse typically takes years to accomplish. Initial ideas may turn out to be interim solutions.

- The experience of vacancies and underutilized facilities has led airport sponsors to consider a number of changes to design standards that will incorporate the flexibility to expand or contract a building footprint or allow for subdivision of properties.
- Some airports are also integrating review of vacancy risk and response plans into their Enterprise Risk Management (ERM) programs. (ACRP 01-18 is an active project that examines the application of ERM at airports.)
- Airports are also considering requiring a tenant to offer a security deposit such as a letter of credit that designates the airport as a third-party beneficiary. This letter of credit would not be subject to bankruptcy proceedings and could be available to maintain or demolish a building in the event of tenant bankruptcy. As a matter of practice, letters of credit for airport leases are currently rare.
- The synthesis contains several useful examples of reuse of military bases, a former terminal, a cargo facility, a training facility, and property redevelopment. The unifying features of these case studies are inspired leadership, a vision and comprehensive plan, willingness to cut losses and identify the best reuse prospects, effective use of grants and local resources, active marketing, and patience.

CHAPTER ONE

INTRODUCTION

PURPOSE OF THE SYNTHESIS

Each year, TRB sponsors a series of synthesis reports on current knowledge and practice in the airport industry. The intention of the synthesis is to develop a compendium of best available knowledge on addressing or resolving specific airport problems. Often, if the topic warrants further investigation, a full-scale research effort follows a synthesis project.

This synthesis was initiated because the recent economic downturn reduced demand for air service, general aviation, and cargo at U.S. airports and led many air carriers and service providers to postpone capital projects, consolidate operations, and in some cases, abandon airport facilities or lease less airport space than in previous years.

The challenges associated with vacant aeronautical properties can be vexing. When an airline or other service provider vacates a property, particularly during a bankruptcy, an airport may unexpectedly become responsible for closing the facility, remediating hazardous conditions left by the tenant, providing additional security resources to the property, and implementing a reuse strategy. Usually these tasks are unbudgeted expenses for the airport. The loss of revenue from the property can also have a significant impact.

The incidence of aeronautical vacancy is not widely reported beyond individual airports. The purpose of this report is to compile and examine case studies of how airports have addressed the reuse of vacant or underutilized airport facilities given the costs of physical conversion as well as regulatory requirements on airport operators. Aeronautical facilities under consideration were

- Terminals,
- Maintenance buildings,
- Cargo and United States Postal Service buildings,
- Military base reuse,
- Training facilities,
- Hangars,
- Control towers, and
- Pavement.

Reuse strategies for these types of facilities elicit a broad spectrum of airport responses. If bankruptcy is involved, it will often take time to resolve ownership and financial obligations for a property. Properties can stay vacant for years. Airports may pursue a strategy to find replacement tenants, renovate a facility for an alternative use, or demolish a facility for redevelopment.

STUDY METHODOLOGY

Case studies are a valid methodology when a holistic, in-depth investigation is needed to further understand a particular topic and when there has been little previous organized reporting (Yin 1994). Information used in this synthesis was collected primarily through interviews with airport operators and property managers. Examples of reuse were selected using the following criteria:

- Geographic distribution;
- A sample of different types of aeronautical facilities; and
- Range of reuse outcomes including nothing done, replacement tenant, new use through rehabilitation, historic preservation, and complete redevelopment.

The synthesis team developed background information on each case study by reviewing primary planning documents, airport statistics, websites, and articles. A case study questionnaire was developed to explore various aspects of the situation, including (1) a description of the property and its current status, (2) a history of the property and circumstances leading up to a vacancy, (3) how reuse options were developed and prioritized, (4) what steps were taken to prepare the property for reuse, (5) tenant recruitment, and (6) how the airport viewed the reuse experience. Appendix A shows the case study questionnaire.

REPORT STRUCTURE

This synthesis is organized into four parts (see Figure 1). Chapters one and two provide an overview of how an evolving aviation industry has transformed the ways that airport facilities are used. Also discussed is the concept of adaptive reuse and the complex factors that impact a reuse decision. Chapters three through thirteen present case studies that delve into how airports have addressed reuse of specialized facilities and the following issues of concern:

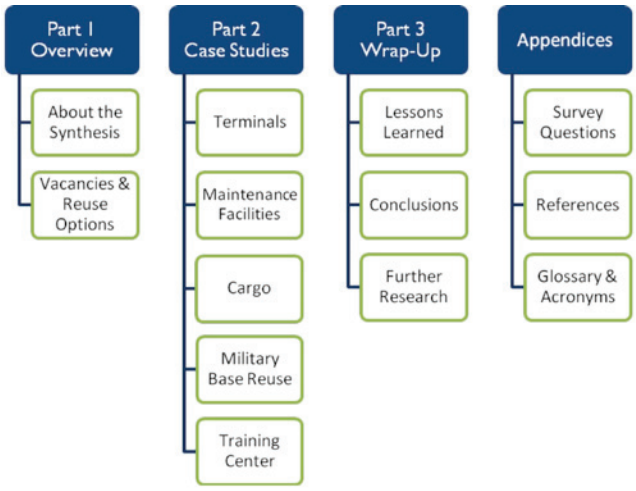

FIGURE 1 Report structure.

- Terminals (Pittsburgh and Springfield–Branson),
- Maintenance facilities (Oakland and Duluth),
- Training facilities (New Bedford),
- Military base reuse (Rickenbacker and Phoenix–Mesa Gateway),
- Cargo facilities (Dayton and Pittsburgh), and
- Historic preservation (John F. Kennedy International).

Chapter fourteen summarizes lessons learned from the case studies, conclusions, and recommendations for best reuse practices.

OTHER ACRP RESOURCES

ACRP has published a number of studies and syntheses that complement this report. Table 1 lists relevant studies and syntheses.

TABLE 1
ACRP PROJECTS THAT COMPLEMENT THIS REPORT

ACRP Number	Project Title
Legal Research Digest 6	The Impact of Airline Bankruptcies on Airports
Project 01-08	Guidebook on Best Management Practices for Leasing and Developing Airport Property
Project 01-16	Asset and Infrastructure Management at Airports
Project 01-18	Application of Enterprise Risk Management at Airports
Report 16	Guidebook for Managing Small Airports
Report 19	Guidebook for Developing an Airport Performance-Measurement System
Report 19A	Airport Performance Indicators
Report 20	Guidebook for Strategic Planning in the Airport Industry
Report 24	Marketing Techniques for Small Airports
Report 27	Enhancing Airport Land Use Compatibility, Volumes 1 and 2
Report 36	Airport/Airline Agreements and Rate Methodologies—Practices and Characteristics
Synthesis 1	Innovative Finance and Alternative Sources of Revenue for Airports
Synthesis 7	Airport Economic Impact Methods and Models
Synthesis 19	Airport Revenue Diversification

CHAPTER TWO

VACANT AND UNDERUTILIZED AIRPORT FACILITIES

ROADMAP FOR REUSE

Vacant facilities occur at airports for a variety of reasons. This chapter provides an overview of the circumstances that have led to vacancies and underutilized airport facilities. Figure 2 graphically describes the root causes and precipitating events that can result in vacancies and the complexities that arise when the responsibility of upkeep and ownership falls unexpectedly on the airport sponsor.

The left side of Figure 2 describes the conditions that often precede facility vacancies. The first is functional obsolescence that occurs because of a facility's age or size or because new technology or regulatory requirements are expensive to retrofit. Functional obsolescence of a facility is usually anticipated, and the owner of the facility has a plan for expansion, modernization, or demolition. The second root cause of vacancy arises from tenant bankruptcies, mergers, and restructurings. Reuse of these types of facilities presents the greatest challenges to airport sponsors because ownership responsibilities for these facilities are not anticipated. When a lease is rejected and the facility reverts to the airport, buildings are often in poor condition, costly to maintain, and new tenants are difficult to find. The right side of Figure 2 describes four reuse strategies that airports typically pursue. These are (1) find a replacement tenant, (2) adapt for reuse, (3) demolish, or (4) do nothing.

Each of the components of Figure 2 is described in the following sections.

FUNCTIONAL OBSOLESCENCE

A scan of any 20-year period since jet aircraft became prevalent in the 1960s would demonstrate the extent of functional changes at airports. Passenger terminals are among the most transformed structures, reflecting advances in the scale of operations, aircraft, technology, and security. Terminals have expanded to accommodate mass air travel, connecting traffic, food and beverage services, retail, entertainment, wireless communication, passenger and baggage screening, and very large aircraft. Technological changes and environmental regulations have altered building materials used, and the ADA set new standards for safety and access in public buildings. Each new advance or requirement set additional specifications for the next remodel, expansion, or update of terminals. After a while, it is hard for original architecture to keep pace with this rate of transformation. The story is similar for air cargo. It was not until the late 1950s that containers came into wide use and knitted together the trucking industry, air cargo, and ocean shipping to serve expanding global trade. The interface of surface, rail, and air transport of cargo came even later. FedEx began operations in 1973 and expanded internationally in the 1980s. Since that time, sorting facilities and cargo hubs have undergone tremendous technological and modal change.

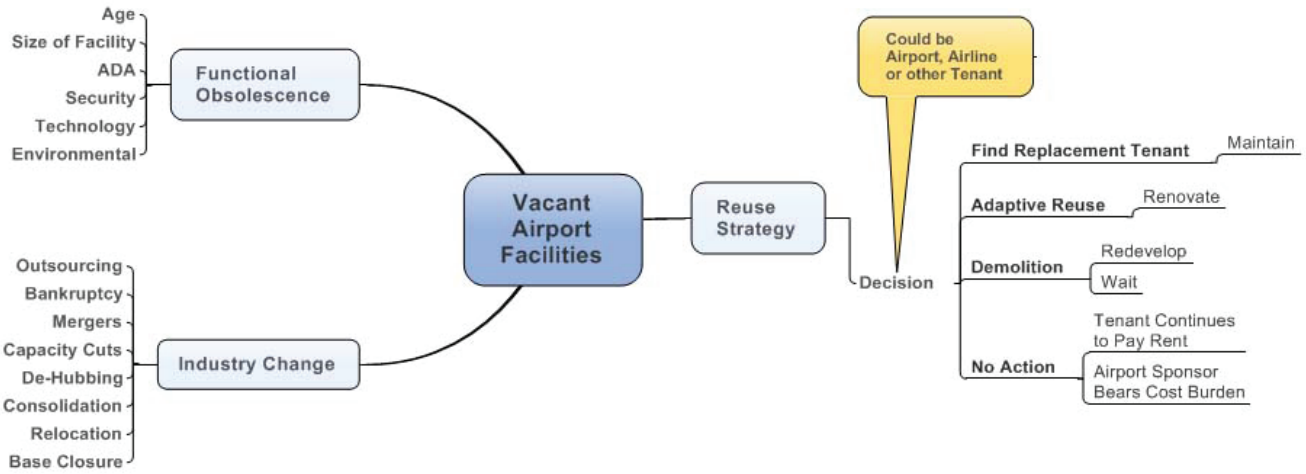

FIGURE 2 Vacant facilities roadmap. (*Source:* KRAMER aerotek, inc., 2010.)

It is in this context that functional obsolescence outpaces typical depreciation schedules or master plans that address future needs in 20 to 30 years. At some point, both airlines and airports face the difficult decision about what to do with outdated facilities that no longer can operate efficiently in today's environment. In several instances around the country, the decision to demolish passenger terminals can be complicated by public interest to preserve iconic architecture. Passenger terminals such as Eero Saarinen's TWA Flight Center and the original Pan Am Worldport (Figure 3) seem oddly out of scale and function for today's expanded travel market. The Port Authority of New York and New Jersey (PANYNJ) is working hard to integrate the TWA Flight Center into the passenger flow of JetBlue's Terminal 5. But not all terminals with strong architectural elements will be preserved at John F. Kennedy International Airport (JFK). Delta Airlines announced in August 2010 that it would demolish the Worldport in 2013 to make room for an expanded Terminal 4 and build a connector to its existing Terminal 2. Renowned architect I.M. Pei's Terminal 6 at JFK is also slated for demolition.

FIGURE 3 Original Pan Am Worldport at JFK (1960). (*Source:* Port Authority of New York and New Jersey.)

Airports in other parts of the United States also have addressed the functional obsolescence of their older terminals. Pittsburgh International built a new midfield terminal in 1992 to accommodate the US Airway's hub and the new air mall. Southwest Florida International Airport also built a new midfield terminal complex, which opened in 2005. Both airports decided to demolish their former terminals. Indianapolis International completed its new terminal in 2008; the airport authority has hired a consultant to recommend ways to recycle the former terminal and maximize revenues.

INDUSTRY CHANGE

Airlines, as the principal tenants of commercial service airports, have greatly influenced the build-out of airport properties. During the late 1980s and early 1990s, network carriers sought to control markets and market share through extensive development of hub and spoke networks that crisscrossed the country. Some airports were dominated by a single carrier. At many airports, Majority in Interest (MII) clauses gave signatory airlines rights to approve or disapprove airport capital projects in exchange for airlines backing debt.

However, starting in 1989, bankruptcies of major carriers resulted in (1) rejected leases on aircraft and buildings, (2) altered airport/airline operating agreements, (3) reduced networks, and (4) discontinued connecting hubs. Table 2 shows the extent of airline bankruptcies. During this period, United Airlines closed major maintenance centers in Indianapolis and Oakland, and Northwest Airlines (NWA) did the same in Duluth and Atlanta. Eastern Airlines, Pan Am, Braniff International, and Trans World Airlines (TWA) ceased to exist. US Airways changed the status of Pittsburgh from a major connecting hub to a focus city. American Airlines shut down its San Jose, Nashville, and Raleigh–Durham hubs. It acquired the assets of TWA and dismantled the TWA hub at St. Louis. Delta has reduced flights at Cincinnati and Memphis. US Airways merged with America West; Northwest and Delta merged, and most recently, United Airlines and Continental merged. The challenges of vacated property through mergers and bankruptcies have also extended to general aviation airports. For instance, the Chapter 7 bankruptcy (liquidation) of Adam Aircraft resulted in vacant hangars and research facilities at three general aviation airports.

Airport revenues are highly dependent on both airlines and passengers. Figure 4 shows how important airline- and passenger-dependent activity (such as concessions, parking, and rental cars) contributes to the operating revenues at airports of all sizes.

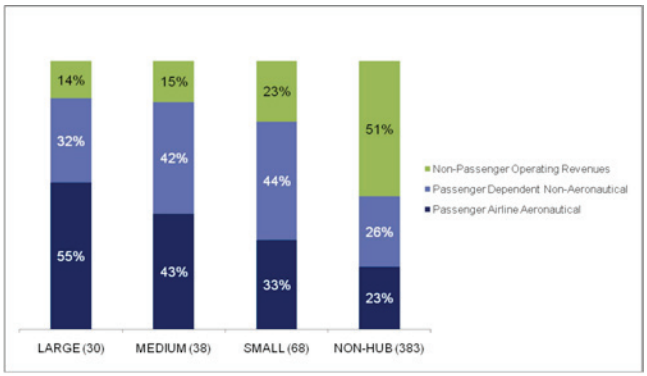

FIGURE 4 Operating revenues at U.S. airports. *(Source:* FAA CATS 127 Reports, 2009.)

The dislocations that have occurred by changes in the routing of connecting passengers have had a profound effect on airport enplanements, both positive and negative. Table 3 tracks enplanements at U.S. connecting hub airports from 2000 to 2009. For all primary airports during this period, enplanements declined by 12.5 million (1.8%). Given the 2008–2009 recession, a modest absolute decrease in enplaned passengers is actually surprising. However, total change in enplanements

TABLE 2
NETWORK AND REGIONAL CARRIERS IN BANKRUPTCY AND OUTCOMES, 1989–2010

Date	Regional Carrier	Date	Regional Carrier
Mar-89	Eastern Air Lines (re-emerged)	Jan-02	Sun Country Airlines (re-emerged)
Sep-89	Braniff International (ceased operations)	Jul-02	Vanguard Airlines (ceased operations)
Oct-89	Presidential Airways (ceased operations)	Aug-02	US Airways (re-emerged)
Dec-90	Continental Airlines (re-emerged)	Dec-02	United Airlines (re-emerged)
Jan-91	Pan Am World Airways (re-emerged)	Mar-03	Hawaiian Airlines (re-emerged)
Jan-91	Eastern Air Lines (ceased operations)	Oct-03	Midway Airlines (ceased operations)
Mar-91	Midway Airlines (re-emerged)	Sep-04	US Airways (re-emerged)
Jun-91	America West Airlines (merged with US Airways)	Oct-04	ATA Airlines (re-emerged)
Nov-91	Midway Airlines (ceased operations)	Dec-04	Aloha Airlines (re-emerged)
Jan-92	Trans World Airlines (re-emerged)	Sep-05	Delta Air Lines (re-emerged)
Jun-92	Markair (re-emerged)	Sep-05	Comair (acquired by Delta Air Lines)
Sep-93	Hawaiian Airlines (re-emerged)	Sep-05	Northwest Airlines (merged with Delta Air Lines)
Apr-95	Markair (ceased operations)	Oct-05	Mesaba Airlines (re-emerged)
Jun-95	Trans World Airlines (re-emerged)	Nov-05	Atlantic Coast Airlines (ceased operations)
Aug-97	Air South (ceased operations)	Jan-06	Independence Air (ceased operations)
Oct-97	Western Pacific Airlines (ceased operations)	Mar-08	Aloha Airlines (ceased operations)
Feb-98	Pan Am World Airways (ceased operations/name sold)	Apr-08	ATA Airlines (acquired by Southwest Airlines)
Mar-99	Kiwi International Airlines (ceased operations)	Apr-08	Skybus Airlines (ceased operations)
Jun-99	Sunjet Int'l/Myrtle Beach Jet Express (ceased operations)	Apr-08	Frontier Airlines (acquired by Republic Airlines)
Dec-00	National Airlines (acquired by Delta Air Lines)	May-08	Air Midwest (ceased operations)
Dec-00	Allegiant Air (re-emerged)	Oct-08	Sun Country (re-emerged)
Jan-01	Trans World Airlines (acquired by American Airlines)	Jan-10	Mesa Air (in bankruptcy)
Aug-01	Midway Airlines (re-emerged)	Nov-10	Gulfstream International (in bankruptcy)

Source: KRAMER aerotek, inc. (2010).

does not begin to describe how passenger flow in the United States has dramatically changed. Table 3 sorts connecting hub airports in the United States starting with airports that have experienced the largest absolute gain in enplaned passengers. New York's JFK, Charlotte, and Denver are among the fastest growing airports in the country, each growing in excess of 5.6 million enplanements (approximately 11 million total passengers) from 2000 to 2009. However, at the other end of the spectrum, St. Louis lost 9.2 million enplanements, Cincinnati lost 6.0 million, and Pittsburgh lost 5.9 million. In these instances, the loss of more than 50% of enplaned passengers has had an enormous impact on individual airport revenues and the demand for services and aeronautical facilities. In response, each of these airports has consolidated gates, closed off whole or parts of concourses, and taken on responsibilities for baggage handling and other systems.

REUSE STRATEGIES

Airports faced with vacant aeronautical facilities typically either solicit proposals for reuse or undertake reuse studies to assess the physical condition of a building and existing systems (mechanical, electrical, plumbing, security, and fire suppression), environmental considerations, reuse options, and the cost for each option. If the tenant has vacated a property but is still paying rent, reuse assessments may be done as a joint venture if the tenant is willing. Reuse decisions typically fall into the following categories:

- Replacement tenant,
- Adaptive reuse,
- Demolition, and
- Do nothing.

Replacement Tenant

For specialized buildings such as hangars, maintenance, or cargo facilities, airports often take a hard look at the possibilities of leasing some or all of the space to a tenant that would use the property for a similar purpose. This approach was taken at the former United Indianapolis Maintenance Center (IMC), a 217-acre campus with 1.7 million square feet of space. AAR Aircraft Services Inc. leased 750,000 ft^2 of the IMC, including 10 of the 12 hangar bays. Most of the remaining space was subdivided and leased to other tenants.

TABLE 3
ENPLANEMENTS AT U.S. CONNECTING HUBS

Hub Airports	CY 2000	CY 2009	Actual Gain/Loss of Enplanements	2000–2009 Change (%)
New York (JFK)	16,155,437	22,710,272	6,554,835	40.6
Charlotte	11,469,282	17,165,376	5,696,094	49.7
Denver	18,382,940	24,013,669	5,630,729	30.6
Atlanta	39,277,901	42,280,868	3,002,967	7.6
Houston Intercontinental	16,358,035	19,290,239	2,932,204	17.9
Philadelphia	12,294,051	15,002,961	2,708,910	22.0
Las Vegas	17,424,214	19,445,952	2,021,738	11.6
Washington Dulles	9,643,275	11,132,098	1,488,823	15.4
Seattle	13,875,942	15,273,092	1,397,150	10.1
Chicago Midway	7,059,520	8,253,620	1,194,100	16.9
Baltimore	9,675,681	10,338,950	663,269	6.9
Phoenix	18,094,251	18,559,647	465,396	2.6
Salt Lake City	9,522,344	9,903,821	381,477	4.0
Houston Hobby	4,354,609	4,087,524	(267,085)	–6.1
Miami	16,489,341	16,187,768	(301,573)	–1.8
Newark	17,212,226	16,659,441	(552,785)	–3.2
Memphis	5,684,619	5,054,191	(630,428)	–11.1%
Kansas City	5,903,296	4,894,349	(1,008,947)	–17.1
San Francisco	19,556,795	18,467,908	(1,088,887)	–5.6
Minneapolis–St. Paul	16,959,014	15,551,206	(1,407,808)	–8.3
Cleveland	6,269,516	4,704,329	(1,565,187)	–25.0
Dallas–Ft. Worth	28,274,512	26,663,984	(1,610,528)	–5.7
Detroit	17,326,775	15,211,402	(2,115,373)	–12.2
Chicago O'Hare	33,845,895	31,135,732	(2,710,163)	–8.0
Los Angeles	32,167,896	27,439,897	(4,727,999)	–14.7
Pittsburgh	9,871,995	3,956,842	(5,915,153)	–59.9
Cincinnati	11,223,966	5,194,214	(6,029,752)	–53.7
St. Louis	15,288,493	6,084,070	(9,204,423)	–60.2
Total Primary Airports	708,638,875	696,141,535	(12,497,340)	–1.8

Source: FAA DOT/TSC CY 2000 and 2009, Air Carrier Activity Information System Database.

Hillsborough County Airport Authority (HCAA) in Tampa also found a replacement tenant for a US Airways hangar vacated in November 2002. HCAA had to invest $400,000 into the property to repair the fire suppression system and meet safety codes. In 2008, PEMCO World Air Services leased the facility for large jet aircraft maintenance, repair, and overhaul (MRO). In August 2010, PEMCO doubled its space at Tampa by leasing another 161,500-ft^2 hangar, a former Delta facility. This hangar is the size of three football fields and is situated on 16.3 acres (see Figure 5). PEMCO wanted flexible parking arrangements within the hangar. As part of the lease terms, HCAA agreed to upgrade the hangar's fire protection system, alarm system, and life safety. In addition, HCAA improved the mechanical, electrical, and plumbing systems before PEMCO's occupancy.

FIGURE 5 Arrival of first major carrier aircraft at the new Tampa facility; traditional water cannon salute. (*Source:* PEMCO.)

Airports that pursue a replacement tenant strategy often have to maintain the vacated property until a tenant is

found. The cost to maintain and secure a property can be considerable.

Adaptive Reuse

Adaptive reuse (AR) is conventionally defined as the process of adapting old structures for new purposes. The following quotation describes AR in a more historical context:

> To prolong the period from cradle-to-grave for a building by retaining all or most of the structural system and as much as possible of other elements, such as cladding, glass, and interior partitions. ... The desire to preserve historical buildings and neighborhoods emerged in many Western countries out of various romanticist, nationalistic, and historicist streams. Today, the imperative to extend the life cycle of a structure is related to various sustainability goals: sprawl minimization, preservation of virgin materials, and energy conservation. Also, many Western cities are changing dramatically as industrial operations more often than not move to the South and the East leaving massive, sturdy buildings vacant. Institutional nature is also changing with many old hospitals, sanatoriums, military buildings, and even office blocks becoming redundant. AR becomes a means to revitalize urban life and declining neighborhoods (MIT Greening East Campus).

Although adaptive reuse of facilities has its roots in urban redevelopment, its application at airports began largely as historic preservation projects to integrate significant architectural elements into terminal modernization programs. PANYNJ is undertaking an adaptive reuse of Eero Saarinen's TWA Flight Center and integrating it into JetBlue's new Terminal 5 (see Figure 6).

Adaptive reuse has been accomplished at other airports. Springfield–Branson National Airport has converted its former passenger terminal into office space and a call center for Expedia Inc. and for the Missouri Army National Guard. Pittsburgh International Airport renovated a US Airways cargo facility into a jet bridge rehabilitation center. There are also many examples of adaptive reuse accomplished when closed military bases are reopened for public use. These examples are further described as case studies.

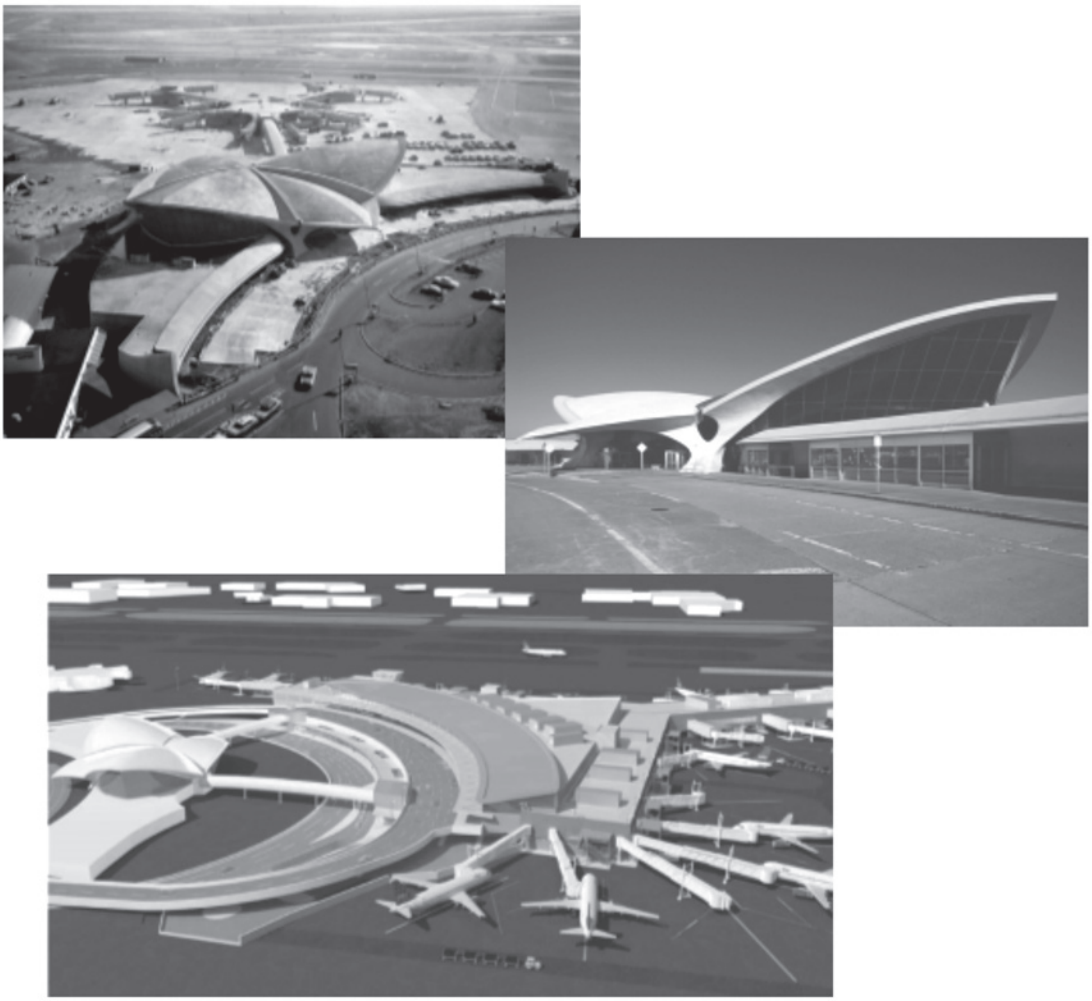

FIGURE 6 TWA Flight Center and JetBlue Terminal 5 pans at JFK. (*Sources:* Port Authority of New York and New Jersey and OBIT, Nov. 17, 2009.)

Demolition and Redevelopment

Airports may decide to demolish a facility as the best approach to ready a property for redevelopment. A decision to demolish is made because—

- The cost to maintain a facility is high,
- The parcel is needed for another use,
- Existing systems are highly specialized and/or outdated,
- Access to the airfield needs to be limited and secured,
- Environmental mitigation to remodel is extensive,
- A low likelihood of reuse points to partial or full demolition,
- The airport does not have the immediate capital to renovate and demolition is the least costly option.

In anticipation of opening its new terminal in 2005, Lee County Port Authority undertook an extensive terminal disposition evaluation at Southwest Florida International Airport (RSW) that included its main existing terminal, Concourses A and B, Concourse B extension, and the International Arrival Building (IAB). The evaluation involved inspection of all accessible building areas; mechanical, plumbing, and electrical systems; underground utilities; hydrant pumping systems; safety and fire issues; and environmental hazards. Four options were considered:

- Reuse of the entire facility;
- Removal of the main terminal and Concourses A and B, reuse of the newer Concourse B Extension and the IAB;
- Retention of the IAB, removal of everything else;
- Demolition of all structures.

For each option, the costs for demolition, construction, and renovation; modifications to mechanical, electrical, and plumbing systems; ongoing maintenance; and roof repairs were estimated. Because the cost of system modifications was so high for reuse of the existing facilities, Lee County Port Authority decided to demolish all structures and prepare a ready and flexible site for a secure airside reuse (see Figure 7).

FIGURE 7 Debris from the old Southwest Florida International Airport terminal. (*Source:* Michel Fortier, *Naples Daily News.*)

Nothing Done

Some vacancies occur and because the tenant continues to pay rent, nothing is done. In these instances, airport sponsors typically work with the tenant and the FAA to plan for reuse in the future. The city of Dayton and Dayton International Airport (DAY) faced this situation when United Parcel Service (UPS) closed its Menlo Facility and cargo hub. UPS owns the building and has a ground lease on 166 acres that will expire in 2020. DAY considered purchasing the building but opted to receive rent for the ground lease and market the property to one or several tenants. Ultimately, prospective tenants would negotiate with UPS and seek FAA approval for any nonaviation use because the property has access to the airfield.

COMPLEXITIES OF REUSE OF AERONAUTICAL PROPERTY

Reuse of aeronautical buildings comes with special challenges to airport operators. The principal issues that influence reuse are—

- Security;
- FAA grant and obligation issues;
- Airport/airline operating agreements;
- Environmental regulations;
- Technology changes;
- Cost to maintain a building, cost to demolish, and cost to renovate (and who pays);
- Market prospects for replacement tenants and alternative uses;
- Stakeholder support; and
- Competition with off-airport sites.

These issues are discussed briefly in the next sections.

Security

Most aeronautical facilities are located next to the airfield. In this context, potential reuse options must consider and address security issues, in particular, general access to all airside areas of the airport. Reuse that requires access to the airfield is the easiest from a security standpoint as a facility that is totally directed at the landside would require closing off access to the airfield and potentially a commitment of security resources to ensure that the property is an independent landside component of the airport.

FAA Grant and Obligation Issues

If an airport sponsor has accepted federal Airport Improvement Program (AIP) grants, it agrees that its prime obligation is to operate the airport for the use and benefit of the public. Furthermore, the FAA also views the airport's prime

mission as aeronautics; therefore, an airport's first obligation is to manage its assets in the civil aviation interests of the public. It is important that all nonaeronautical uses of land contribute to, or financially support, the aeronautical mission of the airport. With regard to this overall mission, Grant Assurances 19 and 29 direct an airport sponsor to retain and operate aeronautical properties for aeronautical uses. A sponsor may consider using aeronautical property for nonaeronautical uses, after review and approval of the FAA, including a period for public comment. Grant Assurance 24 requires an airport sponsor to maintain a fee and rental structure that will make the airport as self-sustaining as possible. Grant Assurances 24, 25, and federal law require that airport sponsors that lease airport property for nonaeronautical use receive no less than fair market value rents.

With regard to specific FAA grant-funded improvements or equipment, a sponsor must operate and maintain the project or equipment for its full useful life. Grant-funded construction or renovation projects are deemed to have a useful life not to exceed 20 years. Grant-funded equipment is deemed to have a useful life not to exceed 10 years. Land purchased with FAA grants is to be operated for airport purposes in perpetuity or until the sponsor receives specific release of its obligations from the FAA. In the case of a grant-funded building, the airport sponsor would need FAA approval for an alternative nonaviation use or for demolition. The FAA may impose conditions for the reuse or demolition of the building, including repayment to the FAA of its share of the undepreciated value of the building or the reinvestment of that value as the federal share of a new AIP-eligible airport improvement. Such repayment or reinvestment would not be necessary if the specific project had exceeded its useful life or if the reuse was for another AIP-eligible purpose.

Because of FAA grant assurances and obligations, airport sponsors should consult with the FAA throughout the reuse process so that the FAA Airport District Office can follow an airport's best efforts to secure a new aeronautical tenant before considering a mixed use or nonaeronautical use.

Many airports consider interim uses (less than 5 years) for a vacated facility to continue a revenue stream and/or solidify a long-term plan.

Airport/Airline Operating Agreements

Numerous airports have signed agreements with "signatory" airlines that include MII clauses. These clauses typically result in the airport losing the right to make fully autonomous decisions about capital expenditure programs by giving the signatory airlines a say on projects exceeding a certain dollar amount. Thus, where an MII clause exists, the disposition of older terminal buildings or other facilities may be influenced by the signatory airlines. In the cases of both Pittsburgh (PIT) and Southwest Florida International (RSW), signatory airlines did not want to share in the maintenance costs of both a new and vacant old terminal. However, at PIT, modified airline/airport operating agreements allowed for the airport's demolition of the former terminal, and at RSW, an MII of the signatory airlines voted to approve a terminal project that included both construction of the new terminal and demolition of the old.

Environmental Regulations

Reuse of aeronautical property requires compliance with current environmental regulations that may include removal of asbestos, lead paint, and hydrocarbon contamination. It is not uncommon for terminal areas to have fuel lines and other utility corridors buried adjacent to an aeronautical property. Fire suppression systems for maintenance facilities, although appropriate for aircraft, would be dangerous if they remained in place for an adaptive reuse to, for example, office space.

Technology Changes

Increased use of information technology systems, advanced fueling systems, alternative fuels, passenger tracking, self-tagging and check-in, wireless communications, common-use baggage systems, and passenger transit are examples of technologies that can be expensive to retrofit into older buildings.

Who Bears the Cost

When airport building leases are rejected by tenants during bankruptcy, ownership usually reverts to the airport sponsor, which becomes responsible for maintenance and repairs. The costs to maintain a building without tenants can be considerable. Direct costs include maintenance and security personnel, materials and supplies, contracted services, utilities, and other repair and maintenance. There may also be indirect costs for taxes and insurance.

In addition to upkeep costs, airport sponsors may incur the costs to remove environmental hazards and meet other building code requirements for an adaptive reuse. This might include modifications to plumbing, electrical, mechanical, and fire safety systems, as well as ADA access requirements. The costs associated with these modifications can make the economics of adaptive reuse unattractive from a cost–benefit standpoint.

Competition from Off-Airport Sites for Nonaeronautical Tenants

Nonaeronautical reuse on an airport does not always stack up well against comparable property off an airport. Warehouses, multimodal logistics centers, and other transport-related activities that do not necessarily need airside access

have a much wider selection of properties off-airport that can be purchased outright (fee simple) or leased at a lower rental rate than aeronautical property.

Despite the many challenges of reuse, the case studies presented in the next chapter demonstrate some excellent examples of facilities that have been modified and placed back in service.

CHAPTER THREE

CASE STUDY APPROACH

How airports redeploy physical assets is an important and timely issue for airport executives and property managers. Although each situation holds its special circumstances, a case study approach provides a useful framework from which to synthesize and draw conclusions about how airports have evaluated their situation and addressed facility reuse. The key components of each case study are (1) description of the situation, (2) discussion of reuse options, (3) analysis of special issues and outcomes, and (4) reflection on lessons learned from successful (and unsuccessful) instances of adaptive reuse.

Ten case studies were developed. Figure 8 shows the location of each. Pittsburgh offered two case studies of reuse that are substantially different. Each of the other airports represents one case study.

In addition to geographic distribution, the case studies were also selected to reflect different types of aviation facilities and different outcomes. This synthesis looked at reuse of terminals, cargo facilities, military base reuse, maintenance facilities, and training centers.

Figure 9 shows examples of airports that have addressed a variety of reuse situations. Table 4 provides a summary of each case study discussed in this synthesis.

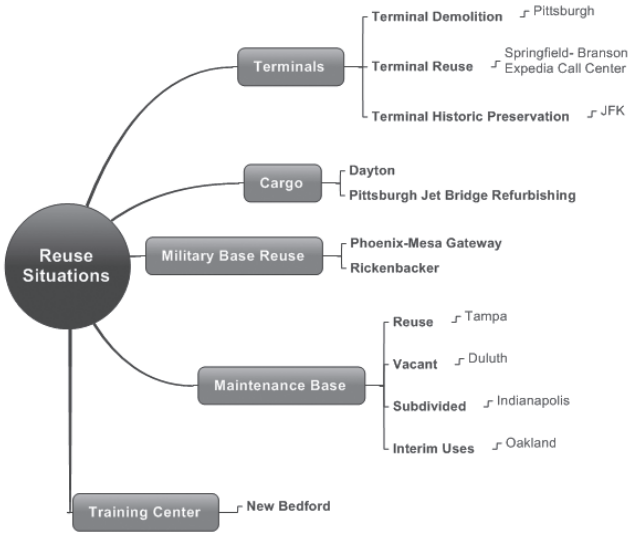

FIGURE 9 Different examples of reuse. (*Source:* KRAMER aerotek, inc., 2010.)

FIGURE 8 Location of case studies. (*Source:* KRAMER aerotek, inc., 2010.)

TABLE 4
SUMMARY OF CASE STUDIES

Airport	Code	Hub Size	Previous Use	Reuse	CY 2009 Enplanements	FY 2009 Operating Revenues
John F. Kennedy International	JFK	Large	TWA terminal	Options under consideration	22,710,272	$971,966,169
Oakland International	OAK	Medium	UA maintenance	Options under consideration	4,612,631	$146,425,773
Pittsburgh International	PIT	Medium	Passenger terminal	Airside business park	3,956,842	$133,333,120
Pittsburgh International	PIT	Medium	US Airways cargo facility	Jet bridge rehabilitation	3,956,842	$133,333,120
Dayton International	DAY	Small	UPS cargo hub	Proposed multiuse	1,240,848	$28,152,124
Springfield–Branson National	SGF	Small	Passenger terminal	Expedia call center/ National Guard offices	398,025	$10,707,070
Rickenbacker International	LCK	CS Nonprimary	Air force base	Multiple reuses	6,415	$5,832,152
Duluth International	DLH	Nonhub	NW maintenance	Options under consideration	125,451	$2,774,925
New Bedford Regional	EWB	Nonhub	Pilot recruitment facility	Bridgewater State University pilot training	11,680	$662,554
Phoenix–Mesa Gateway	IWA	Reliever	Training facility	Passenger terminal	289,770	N/A

Sources: FAA DOT/TSC CY 2009, Air Carrier Activity Information System Database and FAA Compliance Activity Tracking System 127 Reports, 2009. Compiled by KRAMER aerotek, inc. (2010). N/A = not available.

CHAPTER FOUR

DAYTON INTERNATIONAL AIRPORT—UPS MENLO FACILITY AND CARGO HUB

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	Dayton International Airport (DAY)
City, State	Dayton, Ohio
Airport Sponsor	City of Dayton
Person Interviewed	Regina M. Holman, Airport Business Development Manager

THE SITUATION

The UPS Menlo Facility at DAY sits on 166 acres on the northwest side of the airfield (see Figure 10). The property was originally developed in 1981 by Emery Airfreight as its North American sorting center. At that time, Emery processed 900,000 lb of heavy freight per day and employed 350 people. In 1989, Emery was acquired by C.F. Inc., which renamed the company Emery Worldwide and the following year moved its headquarters to DAY. Emery continued to expand its cargo hub at DAY through the early 1990s. The property was designed as a 1.1-million-square-foot sorting facility with office space on the second floor. On one side of the building are 56 truck loading docks, container staging, reloading positions, and a fuel farm consisting of four 1 million-gallon fuel tanks. On the other side of the building are 125 acres of apron, aircraft parking spaces for 70-plus aircraft, deicing pads, and direct access to Runway 6L-24R (see Figure 11). At its peak in 1998, operations included 6 mi of conveyor belts; 80 flights moved 3.5 million pounds of cargo per day. The facility employed more than 4,200 personnel. Total payroll was $160 million.

In December 2001, Emery Worldwide ceased operations after an aircraft accident. Emery's successor company Menlo Worldwide Forwarding was acquired by UPS in December 2004.

UPS operated the facility for a year and a half, but closed it in June 2006 to consolidate Menlo Worldwide and UPS operations and reduce redundancies. At the time, UPS had 1,400 employees at the facility. UPS was leasing space for heavy freight on other airlines to transport it to DAY. The consolidation of operations enabled UPS to carry heavy freight on its own aircraft and use existing UPS hubs.

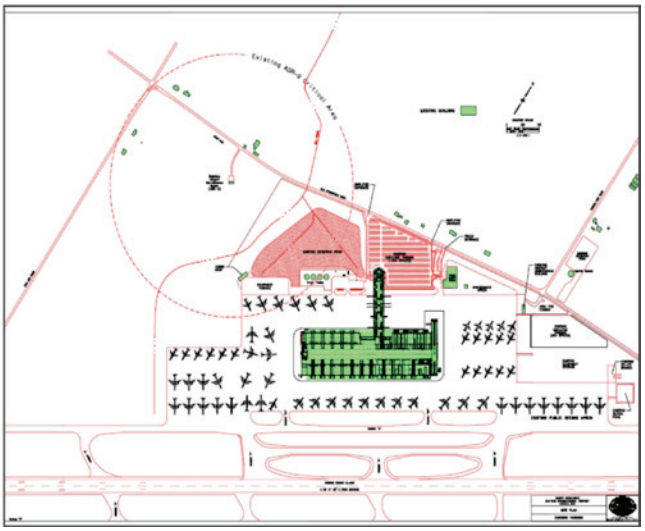

FIGURE 10 UPS cargo facility, Dayton International Airport.

FIGURE 11 Aerial view of Dayton International Airport.

UPS continues to own and maintain the building at DAY and holds a ground lease for the land that will expire in January 2020. Annual rent for the ground lease is $643,149. Initially, UPS was not anxious to be released from its ground

lease and kept the facility for overflow in the event that its Louisville hub was either at capacity or not available. However, the Menlo Facility has not been used even once since UPS terminated operations and has been vacant for 4 years.

REUSE OPTIONS

Because UPS continues to own the building and to pay its ground lease, the city of Dayton has had time to find a good reuse for the property and develop community support along the way. Even before UPS officially closed the facility, the airport hired MergeGlobal, Inc., to consider redevelopment options and prepare a cost–benefit analysis (Figure 12).

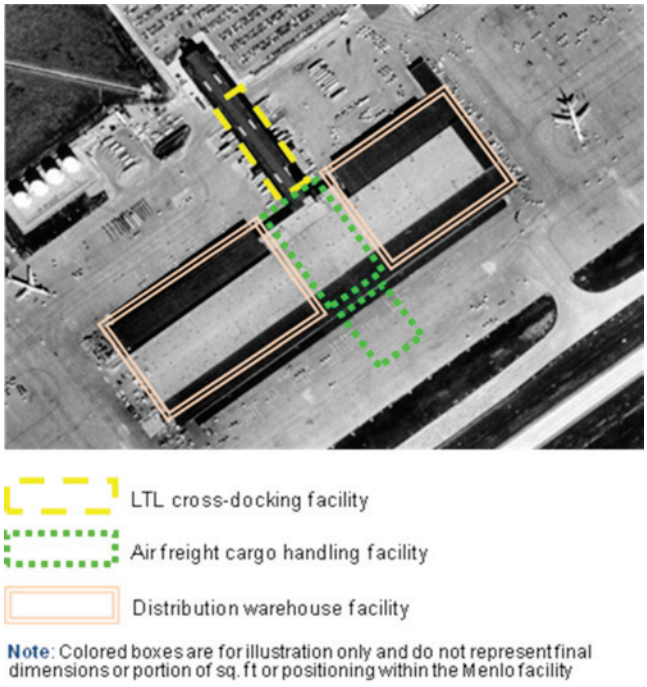

FIGURE 12 MergeGlobal alternatives for the Dayton UPS Menlo Facility 2005.

The consultants recommended that DAY pursue a multipurpose approach by developing an international air freight gateway, a less-than-truckload (LTL) cross-dock facility, and distribution center facilities, preferably in cooperation with UPS. The rationale was that the facility was big enough to support both an international air freight gateway and warehouse operation. Pursuing multiple tenants reduced financial risk and also allowed the city of Dayton to recruit different tenants simultaneously. The multipurpose approach also addressed the possibility that UPS might want to keep control of the facility or use part of it. An LTL cross-dock with warehouses was not as expensive as a conversion of the building to a heavy maintenance facility, so a maintenance option was not recommended. MergeGlobal also considered reuse of the facility as another domestic air freight operation as a low probability; however, MergeGlobal thought that integrated carriers such as FedEx might be interested in additional ramp space.

Redevelopment or reuse of the UPS facility turned out to be a complex undertaking because of a number of factors:

- UPS still owns the facility and is not likely to sell or lease it to a direct competitor.
- The property is very large, specialized, expensive (with respect to its ground lease rate), and has access to a primary runway.
- FAA would prefer that the property remain as an aeronautical facility.
- Negotiations on the property will involve multiple parties including the prospect, UPS, the airport, the city, and the FAA. Buy-in by the community is also important.

RISK MANAGEMENT

As part of the initiative to reuse the property, the city of Dayton and MergeGlobal identified the major risks and key mitigants. This approach allowed the city to head off problems before they happened. Table 5 summarizes potential risks and solutions observed in 2005. They are still relevant.

TABLE 5
KEY RISKS AND POTENTIAL SOLUTIONS, DAYTON MENLO FACILITY

	Key Risks	Potential Solutions
1	UPS does not cooperate with reuse initiatives	Work closely with UPS to achieve a good reuse that is also acceptable to them
2	Recruiting and signing on several nonexclusive tenants is complex	Clearly communicate and quantify the Dayton cost advantage and growth potential
3	Competitive offers from other area airports	Seek long-term competitive commitments from new tenants to ensure initiative's longevity
4	Airside facilities will be underutilized	Launch a marketing effort to recruit more air carriers and freight forwarders to the airport

Source: MergeGlobal, Inc. and city of Dayton, Ohio.

As DAY pursued various options to reuse the facility, airport staff kept stakeholders informed of progress. Although the FAA would have preferred that the property remain in use as an aeronautical facility, it was aware that the city of Dayton has not been able to secure a 100% aeronautical tenant. (Other DAY cargo facilities and hangars, privately owned, were challenged to keep occupancy up during the recent recession.) Although the city of Dayton annexed the airport, it is actually surrounded by the city of Vandalia. At one time, many of the employees of the Menlo Facility

lived in Vandalia. The facility contributed to the local tax base. Since UPS shut down the hub, numerous houses have been built near the airport. DAY has maintained an active dialogue with the community as various reuse options were pursued. The community has indicated a preference for a tenant that will bring more jobs rather than a tenant that will just use the land and building for storage or warehousing.

PROSPECTIVE REUSE

After a 4-year search, a potential tenant is negotiating with all of the parties. Industrial Realty Group LLC signed a letter of intent with the city of Dayton in March 2010 that proposes a mix of aeronautical and nonaeronautical uses for the facility. The project would include 200,000 ft^2 for a maintenance hangar so that access to the airfield would be preserved for an aeronautical use.

LESSONS LEARNED

As the city of Dayton has developed its marketing program for reuse of the UPS Menlo Facility, several principles organized the effort:

- Work with all of the parties to make a good agreement.
- Keep in touch with the community so that it is informed and that the airport understands community preferences.
- Work with the FAA throughout the reuse process, especially if the new tenants are engaged in nonaeronautical activity.
- Go to many trade shows and virtual trade shows to recruit tenants. The market for tenants may be broader than the airport perceives; therefore, good exposure may bring surprising results.
- Treat prospects extremely well and respond quickly to their requests. Encourage prospects to consider the airport as a local agent that can help them. Typically, prospects are from another location. An airport can build important relationships through good deeds and assistance. The Dayton Property Development Team often will meet with a prospect's contractors and estimators to help advance the feasibility and due diligence on a property.

DAY considered the advantages of owning outright the Menlo Facility and finding a new tenant versus actively marketing the facility with the understanding that building negotiations would ultimately take place between UPS and the prospective tenant. Given how long it has taken to find a new tenant, the airport is pleased to have the ground lease cash flow and no additional costs for facility maintenance.

CHAPTER FIVE

DULUTH INTERNATIONAL AIRPORT—DULUTH AIRPORT MAINTENANCE FACILITY

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	Duluth International Airport (DLH)
City, State	Duluth, Minnesota
Airport Sponsor	Duluth Airport Authority (DAA)
Facility Owner	Duluth Economic Development Authority (DEDA)
Persons Interviewed	Brian Hanson, Executive Director, DEDA Brian Ryks, Executive Airport Director

THE SITUATION

The Duluth Airport Maintenance Facility was built in 1996 by Northwest Airlines for maintenance, repair, and overhaul of its fleet of A319 and A320 aircraft (see Figure 13). The facility is 189,000 ft², including three hangar bays and six support shops (100,000 ft²) and more than 300 adjacent acres available for expansion or development. The building has also accommodated DC-9 and Boeing 757 aircraft, and with a few modifications, could handle wide-body aircraft. To further enhance all weather operations, the DAA installed a CAT II instrument landing system (ILS) on the primary runway in 2001. No other airport in the state of Minnesota has a comparable system with the exception of Minneapolis–St. Paul International Airport.

The maintenance facility is located on the north side of the airfield, a relatively undeveloped part of the airport. The Aircraft Rescue Fire Fighting facility is next door, and an airport access road connects the north side of the airport to the terminal area. Site development for the North Business Development Area to the west of the maintenance facility was just completed and includes road access, a new taxiway, and apron and utilities.

NWA operated the maintenance facility from 1996 until 2005. Shortly before declaring Chapter 11 bankruptcy in September 2005, NWA stopped maintaining Airbus aircraft

FIGURE 13 MRO facility, Duluth International Airport: Airport sponsor and interview participants.

there and closed the facility. However, the company retained control of the facility until emerging from Chapter 11 reorganization. Outstanding bonds of $40 million issued by the state of Minnesota (to build the facility) were paid from proceeds from the state selling its equity position in NWA. Ownership of the facility was transferred debt-free to the DEDA in May 2007.

In 2008, Cirrus Aircraft, headquartered at DLA, signed a long-term lease for the maintenance facility to use the space for research and development of light jet aircraft (see Figure 14). However, Cirrus vacated the facility in September 2009 during the recession.

FIGURE 14 A Cirrus aircraft. (*Courtesy:* Cirrus Design Corporation.)

DEDA is actively marketing the facility. One full-time contract maintenance person inspects and manages the property and maintains the fire suppression system and specialized mechanical systems. The building shell is in excellent condition. DEDA estimates that annual maintenance costs for the facility, including utilities and repairs, were approximately $90,000 in 2009.

REUSE PREPARATIONS

The facility is currently lease-ready for a new MRO tenant. There are several reasons why the facility might be attractive to an airline or independent MRO:

- The facility is less than 15 years old.
- The three hangar bays and six shops make it a one-stop facility for maintenance, repairs, and aircraft inspections. The shops can accommodate machining, sheet metal fabrication, welding, composites, plating, and metrology.
- The facility has supported two fulltime lines, nondestructive testing capabilities (x-ray, ultrasonic, borescopic, fluorescent penetrant, magnetic particle, and eddy current), and engineering support in avionics, systems, liaison, and interiors.
- The Air National Guard on the field is responsible for fire-fighting support. A pond located outside provides an additional fire suppression resource.
- Because of the former NWA maintenance facility, a portion of the local workforce is highly skilled in aircraft MRO.
- The property has easy access to the ramp and runways.
- The CAT II ILS on the primary runway maximizes landing and takeoff opportunities in all weather conditions.

Other nearby development augments the reuse prospects for the property. The DAA obtained a U.S. Economic Development Administration (EDA) grant to prepare a site west of the maintenance facility, referred to as the North Business Development Area. The EDA grant paid for extension of the access road and provided new taxiway access and apron area, general parking, and utility infrastructure extensions to this 12.4-acre site. Infrastructure improvements were completed in September 2010. Monaco Air Duluth, the airport's fixed-base operator (FBO), is prepared to construct and lease buildings on the site. Two proposals under consideration include a classroom training facility and aircraft maintenance and parts-manufacturing facility.

TENANT RECRUITMENT

DEDA's immediate tenant recruitment effort is directed at securing either an independent MRO or an airline that would lease the maintenance facility. Other options for the building will be considered later if an MRO tenant is not found.

DEDA and the airport also have researched the terms recently offered to MROs at other U.S. airports and are prepared to offer competitive rates, attractive lease terms, and other incentives to attract a tenant.

INTERIM USE

In the meantime, the building currently has an interim tenant that leases 1,500 ft^2 for storage. ISL Aeronautical Systems is an airship/dirigible manufacturer from Brownsboro, Alabama. ISL rents a 30-ft × 50-ft pad for storing its blimp (see Figure 15). Initially, it was through a relationship with Cirrus that ISL first contacted DEDA for storage use. If ISL decides to go into dirigible production, it holds an option to rent 15,000 ft^2 of space at a higher rate. DEDA has right of first refusal with ISL if it desires to lease the space to another tenant.

FIGURE 15 ISL blimp in Duluth Maintenance Facility, Duluth International Airport.

LESSONS LEARNED

The Duluth Airport Maintenance Facility experience brings into focus many of the challenges that an airport faces when a lease is rejected through bankruptcy for a specialized facility.

The Duluth Airport Maintenance Facility has remained vacant since 2005 and under DEDA ownership since May 2007. Airport properties that are subject to Chapter 11 bankruptcy proceedings can fall into ownership limbo when an airline vacates the facility, such as NWA did. In this instance, payments to bondholders lapsed and regular maintenance on the building ceased. The city of Duluth, the airport, and private businesses recognized the value and importance of the facility to the local economy and covered the financial obligations and upkeep until ownership of the improvements was resolved. Finding a long-term tenant and building out the aviation cluster on the north side of the airport has been a large undertaking during difficult economic times. In the meantime, the Duluth Airport Maintenance Facility has had two interim tenants: Cirrus Design and ISL Aeronautical Systems. A long-term tenant has not yet been secured, but this long lead time is not atypical for airports that seek to lease specialized aviation facilities.

Expansion of existing airport tenants is an obvious first prospect for reuse of a facility. Suppliers of airport tenants are another source of tenant prospects. DEDA in cooperation with DAA and the Area Partnership for Economic Expansion looked first to Cirrus Design, the airport's largest tenant, as the logical tenant to consider expansion. In a better economy, Cirrus may have remained in the facility. That said, further inquiries to existing businesses in the region make sense before conducting a national or international search.

Industry trends are important. The MRO business is concentrated and small within the United States. A realistic view of these prospects will inform the reuse strategy. MROs are operated by airlines, independent organizations, and original equipment manufacturers. The businesses come in all sizes. However, according to a 2009 survey of the MRO industry (Spafford et al. 2009), outsourcing of MRO activities by airlines has leveled off, particularly because North American carriers have reduced capacity and sidelined an unprecedented number of aircraft, particularly older aircraft. Line maintenance is the area that may experience a sizeable increase in activity. The slow growth of the MRO industry and its relative concentration will help focus and target DEDA's prospects.

DEDA recognizes that it may take time to secure its next long-term tenant. Its strategy has been to (1) create an excellent marketing and information package to attract a new tenant for the facility's original use and market the property nationally, (2) build out of the North Business Development Area to create a cluster of aviation support activity, (3) market the facility to a national audience, and (4) seek alternative uses of the facility if an MRO tenant is not found.

CHAPTER SIX

JOHN F. KENNEDY INTERNATIONAL AIRPORT—TWA FLIGHT CENTER ADAPTIVE REUSE

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	John F. Kennedy International Airport (JFK)
City, State	Jamaica, New York
Airport Sponsor	Port Authority of New York and New Jersey (PANYNJ)
Person Interviewed	Don Rivas, Manager, Lease Operations, Properties & Commercial Development

THE SITUATION

This case study describes the challenges airports face when buildings, especially iconic architectural structures, become obsolete. In 1955, PANYNJ adopted a master plan that called for multiple airline terminals at the airport, each with its own design. The terminals constructed in the 1960s and 1970s had some of the most exciting architectural elements in the world, celebrating both the age of jets and the eloquence of structural engineering. Most of these terminals remained buildings of great architectural integrity, but they did not adequately address the requirements of a rapidly changing industry brought about by—

- Huge increases in the number of passengers flying,
- Use of larger aircraft to serve the increased demand,
- Airline bankruptcies and mergers that resulted in abandoned leases and sometimes less than optimal use of stand-alone terminals, and
- Post-9/11 (September 11, 2001) security requirements that constrain access to the airfield and gates.

PANYNJ, wrestling with limited land, made difficult decisions about which terminals to keep and which to tear down. The Eero Saarinen-designed terminal, originally known as the TWA Flight Center, became a historic landmark in 1994 and was kept and refurbished. However, as of 2010, it remains closed, pending a decision about its reuse.

BACKGROUND

Airport

John F. Kennedy International Airport is the busiest international gateway in the United States and the 12th busiest in the world. In 2009, 45,915,069 passengers used the airport. More than 90 airlines operate out of JFK. It is JetBlue's base of operations as well as an international hub for Delta Air Lines and American Airlines. JFK was also a hub airport for the following former airlines: Eastern Air Lines, National Airlines, Pan American World Airways, and TWA.

Terminal Design

The unique architectural design of terminals at JFK dates back to the 1960s and to one of the first larger airports to accommodate jet airplanes. In 1960, American Airlines opened its Terminal 8, which became famous for its 317- × 23-ft translucent wall assembled from 30,000 red, sapphire, and white glass tiles. It was (until 1979) the largest stained glass installation in the world. That same year, Pan American World Airways opened the Worldport (Terminal 3), a large elliptical roof suspended by 32 sets of radial posts and cables. The roof extended beyond the footprint of the building to cover the passenger loading area. It was also one of the first terminals in the world to use jet bridges to board aircraft. TWA opened the TWA Flight Center in 1962 (Terminal 5). Designed by Eero Saarinen, the distinctive winged-bird shape created an architectural metaphor for flight and used a shell of reinforced concrete and large panels of glass to allow passengers to view aircraft arriving and departing from many places within the terminal (Figure 16). In 1970, National Airlines opened the Sundrome (now Terminal 6), designed by I.M. Pei. It was unique for its use of all-glass mullions. Using glass as a primary building material was a first in U.S. airport construction. The open architecture of Terminal 6 proved important immediately as the terminal required modifications to accommodate the newly introduced 747 jumbo jets.

Of these four terminals, only the TWA Flight Center will remain as part of the JFK airport complex. The glass wall of Terminal 8 was taken down in 2007 and the terminal

demolished. Both the Worldport and the I.M. Pei Terminal 6 are scheduled for demolition. Figure 17 pays tribute to these three structures.

FIGURE 16 TWA Flight Center, JFK International Airport.

TWA Flight Center

The TWA Flight Center was designed by Eero Saarinen and completed in 1962. Seven years later, a new departure and arrival concourse and a lounge were added. The interior and exteriors of the terminal became an official landmark in 1994, voted on by the city of New York Landmarks Preservation Commission. In 2005, the National Park Service listed the TWA Flight Center on the National Register of Historic Places. These designations solidified the legacy of the building as a permanent structure at JFK.

Despite designation from the Landmark Preservation Commission, the flight center suffered as TWA's fortunes dwindled. TWA declared bankruptcy three times, first in 1992, then 1995, and fatally in 2001. American Airlines acquired the assets of TWA and took over the Saarinen building in 2001. However, American Airlines closed the operation in early 2002 because of 9/11. In the years leading up to 2001, the building was poorly maintained. No other airlines stepped forward to occupy the building.

In October 2003, JetBlue entered into an agreement with PANYNJ to expand at JFK. Initially, JetBlue considered the full integration of the TWA Flight Center into its terminal design; however, the cost to retrofit the building exceeded the cost of a new building. JetBlue commissioned Gensler to design a building adjacent to the flight center that connected the two structures and left open the possibility of its integra-

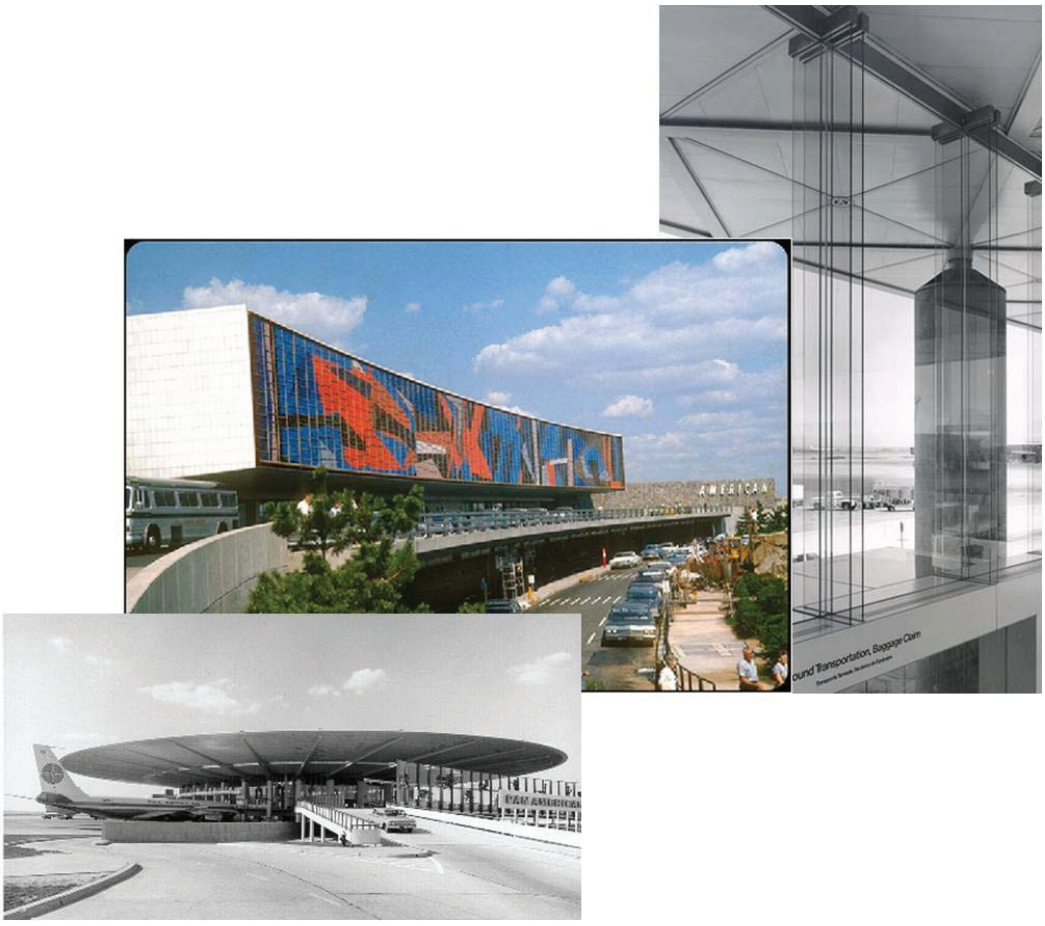

FIGURE 17 Pan American Worldport (lower left), American Airlines Terminal (center), and I.M. Pei Terminal 6 (right).

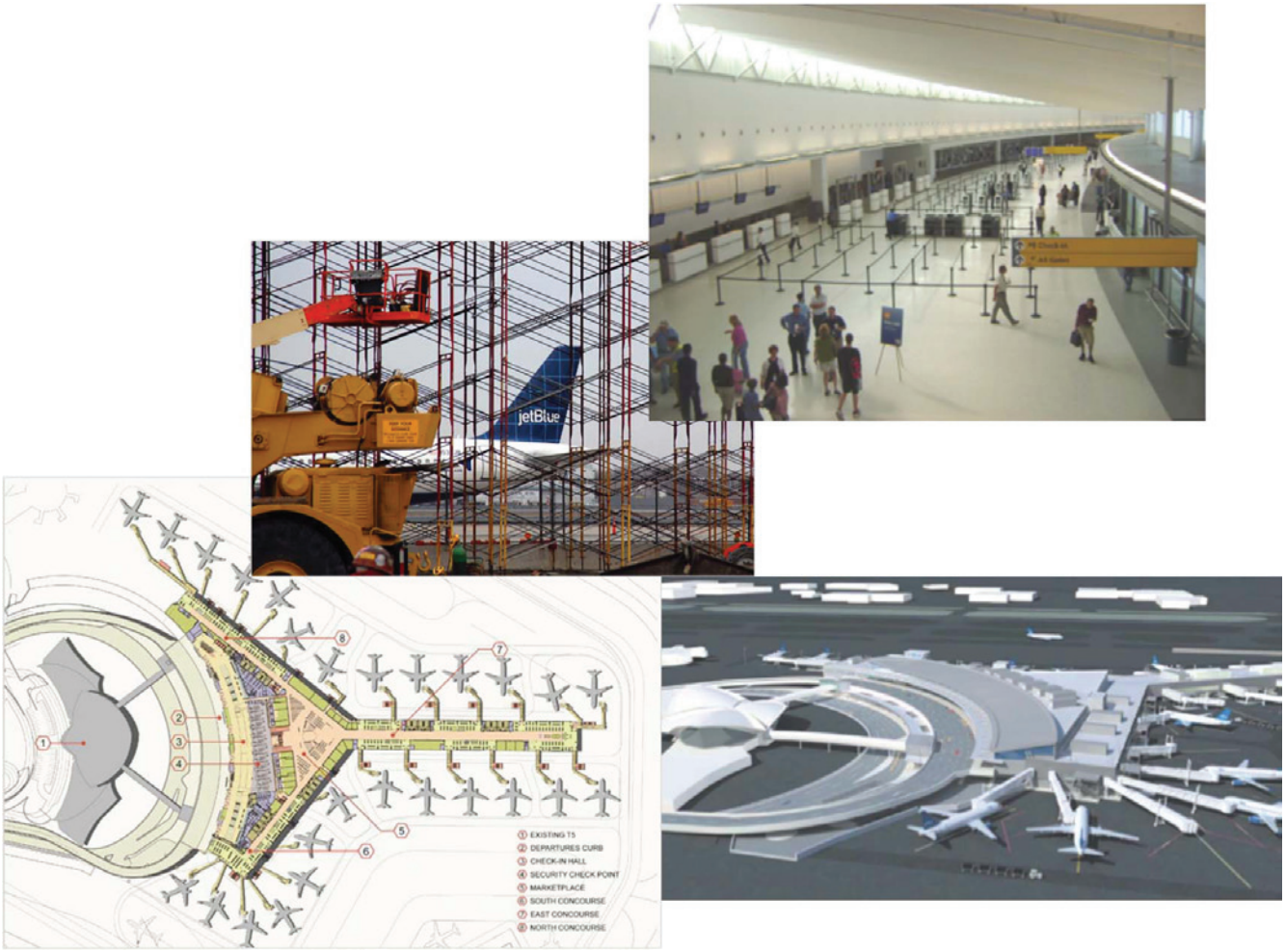

FIGURE 18 JFK Terminal 5 plans, model, construction, and interior.

tion at a future time. The design of the new Terminal 5 was low profile and wraps around the back of the flight center. The two buildings are connected through Saarinen's original departure and arrival passenger tubes (Figure 18).

PANYNJ invested $30 million for restoration of the TWA Flight Center. The structure was restored to its original design. Asbestos was removed and the floor tile was replaced. The restoration was completed in 2010.

PANYNJ intends to solicit proposals for reuse.

LESSONS LEARNED

Unlike urban areas where adaptive reuse can lead to a variety of single- or mixed-use solutions, the reuse of the TWA Flight Center was initially challenged by three important factors:

- The high cost of restoration,
- A tight construction schedule for the JetBlue terminal, and
- Somewhat limited options for aeronautical use.

PANYNJ is one of the first airports in the country to invest in the preservation of a historic landmark terminal. It has completed the initial restoration of the building and mitigation of environmental hazards. To fully integrate the flight center into the JetBlue Terminal would require additional redesign of passenger processing. Today, the flight center sits in close proximity but off the critical path of passenger arrivals either by car or by the JFK AirTrain. The flight center is also away from passenger check-in areas and located before security.

Redesign of the space for alternative uses offers additional possibilities for nonaeronautical revenues. PANYNJ already has received many ideas for reuse including a museum, conference center, restaurant, first class lounge, or hotel. It will pursue these and other options through a solicitation of proposals.

CHAPTER SEVEN

NEW BEDFORD REGIONAL AIRPORT—BRIDGEWATER STATE UNIVERSITY AVIATION TRAINING CENTER

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	New Bedford Regional Airport (EWB)
City, State	New Bedford, Massachusetts
Airport Sponsor	City of New Bedford
Person Interviewed	Ed DeWitt, Former Airport Manager

THE SITUATION

The New Bedford Regional Airport was completed in 1942 as a commercial airport. It was used in World War II by the U.S. Army Air Corps and returned to civilian control after the war, at which time the city of New Bedford resumed its responsibilities as the sponsor and operator of the airport. Over the years, EWB has been served by a number of regional airlines, notably Northeast Airlines (acquired in 2008 by Delta Air Lines), Air New England, Providence–Boston Airlines, and currently by Cape Air, which flies to Nantucket and Martha's Vineyard. EWB handles approximately 24,000 passengers annually, but it also serves as a general aviation and training facility.

Development of the Aviation Training Center at EWB has a long and interesting history of incremental reuse (see Figure 19). The building was first constructed on vacant land by the local Plumbers Union as a training facility. The property had airside access. The structure was a cinder block, one-story facility. There were pipefitting, soldering, and welding classrooms; therefore, the facility had a lot of ductwork and an extensive fire suppression system. As local unions merged, training became increasingly regionalized, and use of the New Bedford facility declined. By 2000, the facility was completely abandoned and fell into disrepair. There were legal issues about who owned the building, its access to the airfield, and use as a nonaeronautical facility.

The city of New Bedford ultimately was able to resolve these issues with the Plumbers Union and the FAA. In 2001, Bridgewater State University and a Delta Air Lines Inc. subsidiary began operating a flight-training program at the airport, using other existing facilities and some trailers on the airport. With financing from a Redevelopment Authority loan of about $300,000, the Plumbers Union building was converted into classroom space for the flight-training program. An AIP grant was obtained in 2002 to construct a ramp for aircraft.

Delta and Bridgewater State were not, however, a perfect match. Delta saw the program as an "advance or get out" pilot-training program for its regional airlines. Bridgewater State desired a college-level program with diverse options for its students. When Delta emerged from Chapter 11 bank-

FIGURE 19 Bridgewater State University Aviation Training Center at New Bedford Regional Airport.

FIGURE 20 New Bedford Regional Airport.

ruptcy, it decided to end the program and, with virtually no warning, closed the facility. The original lease had almost 1 year remaining. When Delta abandoned the facility, it simultaneously stopped paying the utility bills, and the building went without heat for an extended period. Luckily, this was discovered just before a severe cold front, and the building was saved from extensive damage.

Following Delta's closure of the facility, the mayor of New Bedford, the president of Bridgewater State University, and the airport worked together to redefine the university's aviation program. The building was upgraded into a first-rate flight school that met the university's standards and requirements. This included bringing the building into compliance with ADA regulations. Many volunteers worked to remodel the facility.

In June 2008, Bridgewater State University signed a 5-year lease and took control of the facility. The Aviation Training Center received FAA certification in December 2008 and opened for students in January 2009.

OWNERSHIP AND COMPLIANCE ISSUES

The ownership and control of the facility have a blurry history. Initially, the Plumbers Union built and owned the facility and held a ground lease from the city. After the union left the facility in the late 1990s, the building remained vacant for 5 years. Besides the question of ownership, the building's nonaviation use was not an authorized use of airport property. During conversion of the building to a flight-training center, EWB needed FAA approval to re-establish access to the airfield and to apply for AIP funds.

To expedite the conversion, secure AIP funds, and bring the facility into FAA compliance, the city compensated the Plumbers Union for the building and ownership was transferred to the New Bedford Redevelopment Authority in 2003.

The New Bedford Redevelopment Authority subsequently leased the facility to Delta Air Lines. However, the authority was eager to close the deal, and several issues about responsibility for building and outside maintenance were not specified in the lease. The lack of clarity on maintenance responsibilities persisted through the duration of the lease. In the end, the airport was left with many unanticipated maintenance responsibilities for the facility.

Before Bridgewater State University became a tenant, ownership of the facility transferred from the Redevelopment Authority to EWB (see Figure 20). When the airport received the property, it was in fair condition. There was common wear and tear as well as some neglect of the building's mechanical systems during Delta's occupancy. The heating system had had no preventive maintenance during that time. Although none of the systems required replacement, there was a lot of tuning and tweaking. This included repairs to heating, air conditioning, fire detection, fire suppression, and plumbing systems.

TENANT RECRUITMENT

It was fortuitous that the airport had in close proximity a long-term, aeronautical prospect. Initial recruitment of Bridgewater State University started with a series of informal meetings between the New Bedford Regional Airport Commission, New Bedford's mayor, and the university. The mayor and the president of the university built a strong understanding of the importance of the project and its potential contribution to the community.

To establish a fair-market value for the property, the city of New Bedford turned to the Massachusetts Department of Capital Asset Management (DCAM). The DCAM Office of Real Estate offers an appraisal valuation service to client agencies, municipalities, and private sector buyers involved in the acquisition, transfer, sale, or lease of surplus state-owned property.

EWB negotiated a lease with Bridgewater State University that allowed the rent to adjust over the first 2 years of the university's 5-year lease to offset improvements made by university and startup costs. (The 5-year term lease is the maximum allowed for state entities in the Commonwealth of Massachusetts.)

JOINT EFFORT TO UPDATE BUILDING

The preparations for reuse were a joint effort between the city, the airport, and the university. Together, these stakeholders were mutually invested in a positive outcome.

Cosmetic changes such as painting, carpeting, furnishing, updating restrooms, and landscaping were necessary to make the property lease-ready. The building was not ADA compliant and required subsequent modification for Bridgewater State University's occupancy. This work was done through a combination of outside help and in-house sweat equity. It was financed from operating funds from both EWB and the university.

Owing to the prevailing wage clause that applied to City of New Bedford employees, the cost of hiring EWB employees for the upgrades was three times greater than hiring outsiders; therefore, independent contractors were hired to help with maintenance, repair, and ADA modifications. A local real estate office was used to oversee the management of the property.

LESSONS LEARNED

The conversion of the Plumbers Union Training Center into a pilot-training facility offers several key insights that have general applicability to other airports.

Sometimes fully developed reuses take a long time to evolve, with several interim uses that help to redefine the use of a facility. The Plumbers Union facility reuse can be evaluated as two phases—the Delta phase and the Bridgewater phase. The Delta phase offered the impetus for the initial transformation of a nonaeronautical facility into an FAA-compliant pilot-training center. It was unfortunate that the maintenance of the facility experienced a decline during Delta's tenancy and that an abrupt abandonment of the lease caused much turmoil for the city of New Bedford.

The reuse phase with Bridgewater could be considered a win-win situation. EWB gained a major operational tenant and the university obtained a professional facility with all of the aviation attributes it desired (i.e., a tower, ILS, a choice of maintenance providers for its aircraft, and fueling facilities). The facility has room for expansion of the pilot-training program. It can accommodate a full-motion simulator, which would be an ideal technological advancement for the pilot-training program.

Overall, the facility was improved with each new tenant. Improvements since Delta vacated came out of collaboration and mutual effort from the university and the airport. EWB acquired the building at no cost from the New Bedford Redevelopment Authority. All subsequent revenue from the building and ground lease now goes to airport operations.

It is important to get concurrence with the FAA when aeronautical property is to be used for nonaeronautical purposes. The initial use of aeronautical property for nonaeronautical purposes was done without FAA approval and compromised EWB's ability to reuse the property and obtain AIP funding for airport improvements. On any permanent reuse of aeronautical property, it is good practice to work closely with the FAA and keep it informed about reuse plans.

Selection of how an airport property will be valued and who will do the valuation needs to be done in the earliest possible stages of reuse. Although the city of New Bedford was not required to use DCAM's appraisal services, an obstacle to lease negotiations was the length of time needed to complete the DCAM appraisal. DCAM's process was very thorough. However, to not delay action on a property, getting the valuation completed early would have provided a more expedited negotiation.

Eagerness to lock in a tenant can result in unfavorable lease provisions for an airport. The lease with Delta Air Lines was completed quickly for fear that the New Bedford Redevelopment Authority and the airport might lose an excellent tenant. The rush to completion resulted in several overlooked provisions in the lease that ultimately added maintenance responsibilities and additional costs for the airport.

Community volunteers participated in remodeling the facility and lowered conversion costs. Many stakeholders contributed time and effort to ready the training facility for Bridgewater State University students. The team approach built a lot of goodwill and lowered remodeling costs.

ADA compliance added costs to the project. The change of building use triggered additional ADA compliance requirements that improved safety and access to the buildings, but added to the cost of conversion.

Reuse economically benefits the community. Aviation flight schools and programs run by local colleges offer multiple benefits to both the airport and the community. The Bridgewater State University Aviation Training Center added at least 11 direct jobs, including an associate dean, flight instructors, dispatchers, and support staff. Several airport tenants and suppliers also benefited from new fuel and maintenance contracts and other building incidentals.

CHAPTER EIGHT

OAKLAND INTERNATIONAL AIRPORT—OAKLAND MAINTENANCE CENTER

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	Oakland International Airport (OAK)
City, State	Oakland, California
Airport Sponsor	Port of Oakland
Person Interviewed	Brandon J. Mark, Property Manager

THE SITUATION

In 1988, United Airlines, Inc., leased from the Port of Oakland the Oakland Maintenance Center (OMC), a 304,000-ft^2 maintenance facility that was constructed in 1972 and located on 37.6 acres at Oakland International Airport (Figure 21). The OMC includes four large aircraft bays, each capable of accommodating a Boeing 747 or 777 gauge aircraft, as well as office and shop space with ample parking and excellent road access to Airport Drive and Air Cargo Road (Figure 22). United leased the OMC for $3.4 million per year, a substantial contribution to OAK operating revenue. The lease was set to expire in 2013 with options to extend. However, at the end of May 2003, United rejected the lease in the course of its bankruptcy proceedings and consolidated most of its domestic maintenance operations at San Francisco International Airport (SFO). The Port of Oakland regained possession of the OMC but without a tenant; the immediate impacts included lost revenue and new obligations to maintain the facility and keep it safe and secure.

FIGURE 21 Building M-110, originally occupied by World Airways—Oakland International Airport.

FIGURE 22 Aerial view of the OMC and access to the runway.

The OMC has access to the airfield and is designated for aeronautical use. The Port of Oakland moved quickly to investigate alternative uses for the OMC, both aviation and nonaviation. Options under consideration for the OMC were (1) finding another tenant to provide aircraft maintenance, (2) conversion or demolition for a new passenger terminal, (3) modification or demolition to accommodate cargo operations, (4) use of the apron for additional automobile parking, (5) use of the facility for airport support (maintenance/vehicle storage), or (6) a mixed-use combination.

The context for consideration of a wide array of options was informed by robust growth at OAK over the past 20 years. Figure 23 shows how passenger volumes steadily increased from 1989 through 2007. In 2003, OAK experienced the highest passenger levels ever in the history of the airport, and that trend persisted for the subsequent 4 years. To support this passenger growth, OAK began renovations to its existing two terminals by adding five gates and a new baggage claim area to Terminal 2. Roadways, curbsides, and parking lots were renovated and expanded. The master plan for the airport also reserved the OMC area as a potential reuse site in connection with a future third passenger terminal. In this environment of growth, there seemed to be several viable alternatives for the vacated OMC.

HISTORY AND DISPOSITION OF THE PROPERTY

The OMC is an older structure first constructed in 1972 on behalf of World Airways, Inc. under the terms of a long-term lease. World Airways used the facility to maintain its own aircraft and provided maintenance for third-party aircraft. In 1986, World Airways terminated its lease. Shortly thereafter, in 1988, the Port of Oakland and United negotiated a 25-year lease for United to use the OMC as its systemwide base for wide-body (B747, B767, and B777) aircraft. United spent approximately $50 million in facility upgrades.

United filed for bankruptcy protection in December 2001 and thereafter, United continued to operate at the OMC and was responsible for post-petition rental payments, which remained current until the lease was rejected in May 2003 (United was also current on its prepetition rental obligations). The balance of future rental obligations was dismissed through bankruptcy. Any required environmental

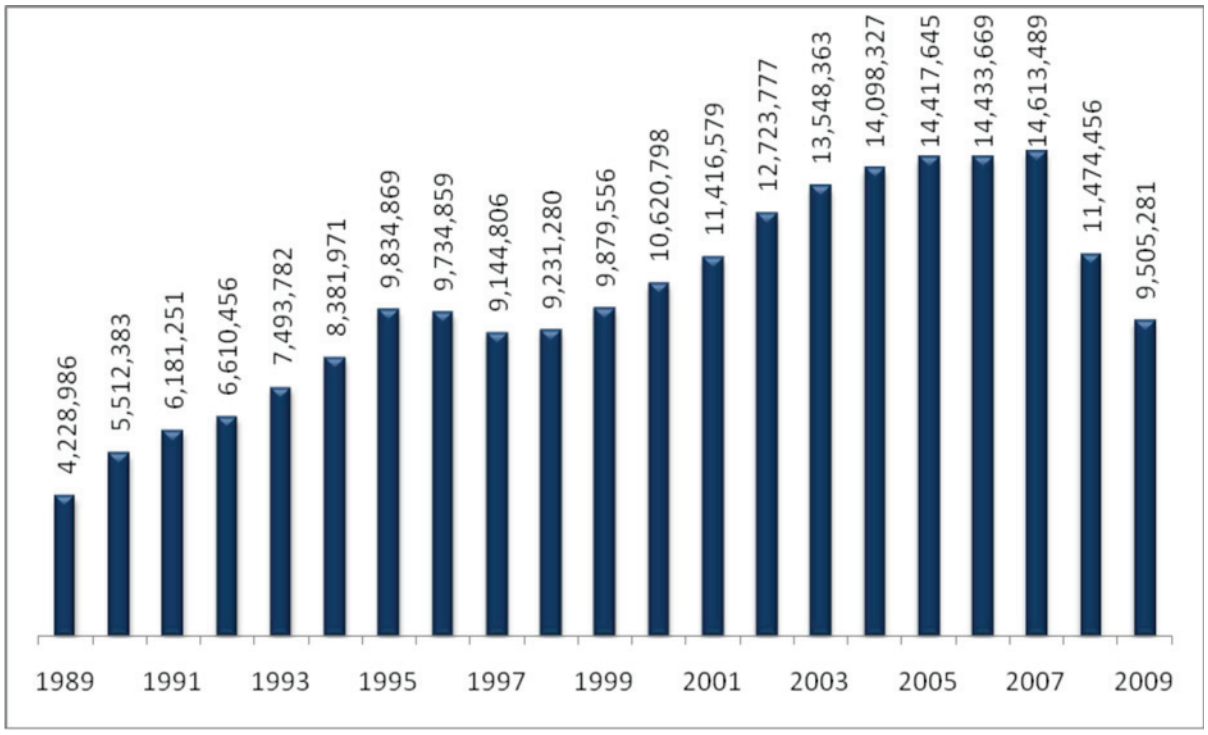

FIGURE 23 Oakland International Airport passengers, 1989–2009. (*Source:* Oakland International Airport.)

contamination remediation was not eliminated through bankruptcy, and United completed such remediation after vacating the OMC to the satisfaction of the Port of Oakland and other governmental jurisdictions.

REUSE DECISION

Immediately on receiving lease rejection from United, the Port of Oakland's Airport Properties Department actively solicited other airlines for their interest in using the OMC for aircraft maintenance and at the same time hired Ricondo & Associates to undertake a "site reuse study" (Ricondo & Associates 2003). Because of changes in the industry and efforts to reduce costs, many airlines had begun outsourcing maintenance to other airlines or third parties in either the United States or foreign countries. The Airport Properties Department could find no airlines or service providers interested in using the OMC for aircraft maintenance.

The conclusions of the reuse study ranked alternative uses in the following order:

- Demolish and replace with cargo facility to accommodate development of a third terminal complex (now no longer an option based on economic conditions),
- Reuse/redevelop as an interim passenger terminal, or
- Reuse/redevelop as a cargo facility.

However, reuse for other purposes proved uneconomical because of the age of the OMC and the specialized nature of the facility. The 100 ± foot ceilings are not conducive for many alternative uses. Centralized utility services (electric substation, water, and gas meters) also make subdividing the facility difficult and expensive. In addition, the hangar is protected by two fire suppression systems: (1) a deluge system (1.8 million-gallon reservoir connected to five massive pumps capable of flooding the hangar with water within 20 min) and (2) an underwing foam (organic chemical compound) system. These fire suppression systems limited replacement uses of the OMC unless the systems were dismantled or decommissioned. (Deluge water flow would be dangerous to any occupants, automobiles, or equipment that might be on the hangar floor if the system activated, and removal of the underwing suppression system would have been expensive and would have required environmental mitigation procedures.)

Given the age of the OMC and its infrastructure, the lack of replacement aircraft maintenance tenants, and the difficulties of reuse, demolition became the preferred option. However, to cover the anticipated minimum $4 million cost of demolition as a capital project, the Port of Oakland needed to initiate design and construction of the third passenger terminal complex. Unfortunately, the extended planning process for the third terminal lasted until 2008, when the economic downturn resulted in the near simultaneous bankruptcy of three airlines (Aloha, ATA, and Skybus) serving OAK, the departure of three other airlines (American, Continental, and TACA), and a decline in OAK passengers by more than 30%. As a consequence, the third terminal project was shelved and demolition of the OMC was not required for this capital project.

By default, nothing was done. The Port of Oakland continues to maintain the OMC as there is not a current capital project that requires use of the site to justify the $4 million needed to demolish the facility.

CURRENT USES

The OMC office space is currently used by Port of Oakland staff and contractors. The maintenance bays store construction material and vehicles. Because of the high visibility of the building from the airport's access roadway, CBS Outdoor located multiple billboards on the faces of the OMC, which have generated approximately $250,000 per year in advertising revenue (Figure 24). Short-term office occupancy, construction materials and vehicle storage, and advertising are interim uses and did not require FAA approval.

FIGURE 24 Billboards on the Oakland OMC.

LESSONS LEARNED

The Port of Oakland has applied a number of ingenious strategies to make the most of the OMC office and storage space and generate advertising revenues from its highly visible location. That said, the age of the facility, the cost of demolition, and difficulties finding a replacement tenant make this case study particularly illustrative of the challenges an airport can face when a specialized facility reverts to the airport sponsor through a tenant bankruptcy.

The cost of keeping a building maintained may exceed the cost of demolition. The OMC has been vacant for more than 7 years and the Port of Oakland has expended in excess of $7 million in maintenance, repair, utilities, insurance, and other building-related costs. Conversely, the Port of Oakland has offset some of these expenses by using the office space for staff and consultants, using the hangar bays for storage, and using the facades for outdoor (mega-billboard) advertising.

In retrospect, it appears that it would have been more cost effective to have demolished the OMC soon after its abandonment by United. Therefore, failure to adopt a reuse strategy—including a demolition option—has resulted in significant upkeep expenses. Exercising the demolition option would have provided a "green field" for future development of aviation-related facilities with direct airside access.

Clear and immediate direction about reuse is important. Inaction is expensive. The biggest obstacles and challenges to implementation of reuse were the lack of clear direction in the immediate aftermath of United's rejection of its OMC lease. Because the airport had experienced robust growth during 2003–2007, the Port of Oakland had expectations that the airport would continue to grow and need space for expansion. The economic crisis that began in 2008 severely impacted the Port of Oakland's finances and the airport's need to develop a third terminal complex.

Options are influenced by the economic outlook. Termination of the United lease took place at a time of rapid growth at OAK. The future of the OMC became bundled with a long-term expansion plan for construction of new cargo facilities to accommodate development of a third terminal. Had the Port of Oakland recovered the OMC from United in 2008 (vs. United's 2003 lease rejection), it may have considered a different set of options, including immediate demolition or funding thereof in connection with the bankruptcy settlement (if possible).

Industry trends are important to consider when making reuse decisions. Airlines jettison outdated facilities during bankruptcy. Because United consolidated its maintenance operations at SFO it may have been a signal to the Port of Oakland that the OMC was no longer viable for aircraft maintenance for United or other domestic airlines.

It is prudent for other airports undertaking reuse of older facilities to take the shortest time necessary to develop a reuse (including demolition) plan and then execute the plan. Inaction can be very expensive.

CHAPTER NINE

PHOENIX–MESA GATEWAY AIRPORT—PASSENGER TERMINAL–MILITARY BASE REUSE OF BUILDING 15

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	Phoenix–Mesa Gateway Airport (AZA)
City, State	Mesa, Arizona
Airport Sponsor	Williams Gateway Airport Authority
Person Interviewed	David Valenzuela, Marketing and Economic Development Manager

THE SITUATION

The Phoenix–Mesa Gateway Airport is located in the East Valley of the Phoenix Metropolitan Area (see Figure 25). The airport was part of the Williams Air Force Base (AFB). In 1991, the Base Realignment and Closure Commission recommended closing the base; however, it remained open for 2 more years. The city of Mesa had previously annexed the AFB to increase its tax base. When the facility closed, the city assumed principal responsibility to coordinate redevelopment of the airport. It took about 5 years to convert the base to a functioning public airport. Many buildings were in disrepair, and the runways needed substantial maintenance and rehabilitation. During the initial years of operation, the airport served as a general aviation reliever for Phoenix Sky Harbor International and then in October 2007, it became a commercial service airport and a focus city for Allegiant Air.

With considerable regional cooperation and much dedicated effort, AZA has made the transition from an AFB to a commercial airport. This case study examines the history of this transition and focuses on the successful redevelopment of Building 15 as a passenger terminal to support Allegiant Air's commercial air service.

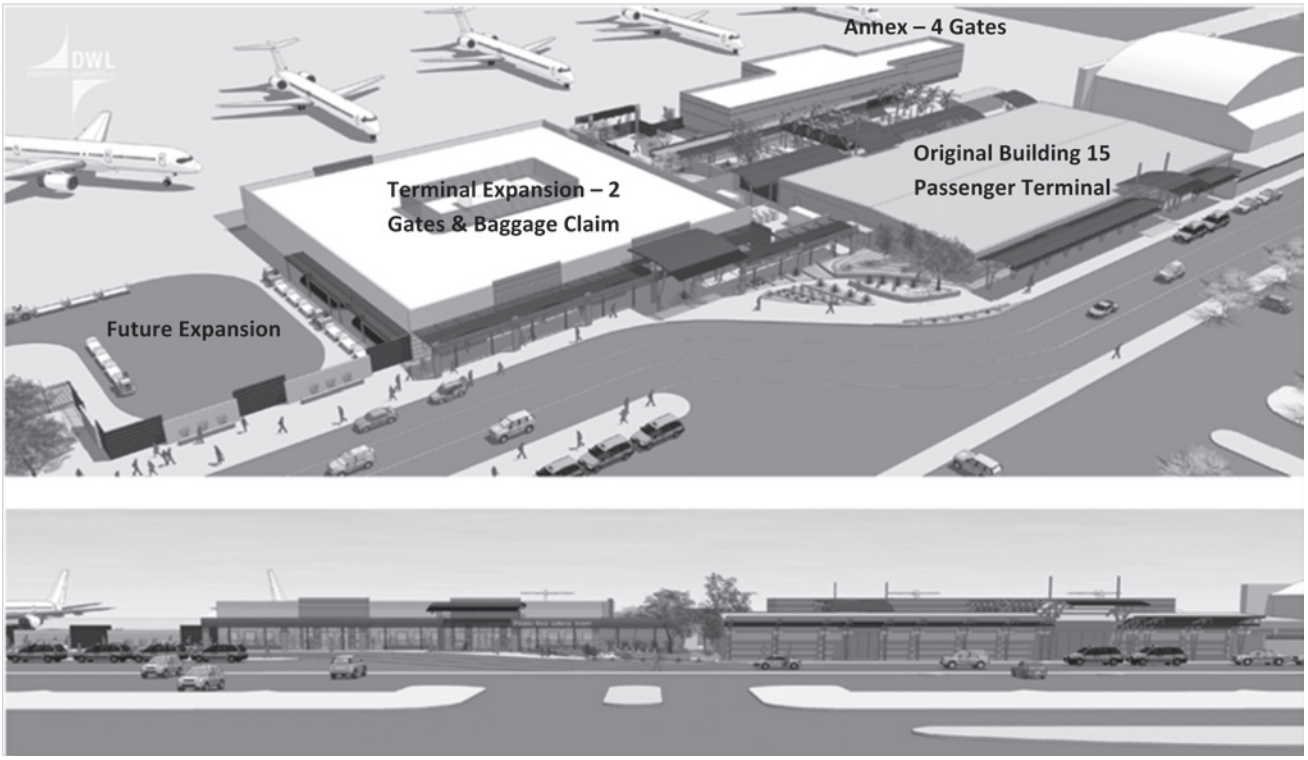

FIGURE 25 Phoenix–Mesa Gateway Airport West Terminal expansion plan.

BACKGROUND

In 1993, the Williams AFB was closed and subdivided into three parcels. One went to Arizona State University, another went to Chandler Gilbert Community College, and the largest parcel was set aside for redevelopment of the property into a public airport. A Joint Powers Airport Authority Agreement was signed in 1994 between the cities of Mesa, Gilbert, and Queen Creek, providing for the formation of the Airport Authority. This agreement was amended twice, once in December 1995 to include the Gila River Indian Community and again in 2006 to add the city of Phoenix.

Today, two major educational institutions are operating programs on the airport. A 600-acre parcel of the property was deeded to Arizona State University for a new eastern campus. There was a large potential synergy between the university and the airport. Eventually, this campus was renamed the Polytechnic Campus, and several applied science programs are based at this location, including nursing, agribusiness, a branch of the W.P. Carey School of Business, and an alternative fuels center that is investigating the use of different strains of algae for jet fuel.

Following the base closure, Chandler Gilbert Community College received a large warehouse on the property and moved its aviation curriculum to the airfield. The college offers FAA-certified programs in airframe and powertrain maintenance and flight training. Technical specialties include aircraft maintenance, electronics/avionics, and aircraft construction. The school has also partnered with the University of North Dakota and Arizona State University East to provide upper division coursework in pilot training at the Williams Campus.

The Airport Authority received 3,020 acres, which included three long runways and many buildings. To begin operations, Runway 12L/30R was completely rebuilt and the other two runways were resurfaced. Many small outbuildings were demolished. Most of the initial conversion costs were paid for with federal grants. Because of the location of the Arizona State campus, the airport also had to relocate the main entrance to the facility. Activity at the airport is centralized on the western side; however, an ultimate build-out of the eastern side is anticipated if passenger traffic continues to increase.

It took 5 years to ready the airport for public use. In the meantime, the Airport Authority invited Boeing to bring in several test flights for the 777. This created positive publicity for the airport.

REUSE OF BUILDING 45

In 2004, the Airport Authority remodeled Building 45 into a general aviation (GA) terminal. Previously, a private FBO provided GA services on the airport. Concerns about quality of service prompted the airport to replace the FBO and to offer GA services and sell fuel directly. Thus began Gateway Aviation Services, the Authority-owned FBO. Gateway Aviation Services supports a Department of Defense fuel contract, which keeps fuel volumes high. In addition, the FBO fuels aircraft operated by the Department of Justice, U.S. Citizenship and Immigration Services, and more recently Allegiant Air. Building 45 houses a full-service restaurant, U.S. Customs and Border Protection, and several offices that are rented. Another FBO, Worldwide Flight Services, also operates on the airfield, providing above and below the wing services.

REUSE OF BUILDING 15

The long-range plan for AZA anticipated that it would function as an air service satellite to Phoenix Sky Harbor International. In accordance with this objective, the Airport Authority recruited Allegiant Air to develop a focus city at AZA. In July 2007, Allegiant Air announced that it would serve eight cities with two aircraft from AZA. (Today, Allegiant provides service to 27 cities.) Building 15 had already served as a charter terminal. Site selection ultimately was determined on the basis of two important factors: (1) a property that could be expanded and (2) a location that was adjacent to the strongest existing pavement (see Figure 26).

Building 15 was originally used by the U.S. Air Force as a classroom. When the Airport Authority selected it for a passenger terminal, it considered the facility as an interim terminal and that, long term, a permanent passenger facility would be constructed as an airport city from a green field site on the northeastern side of the airport. The terminal opened in 2001, 8 years after the base was closed. Building 15 was usable and in reasonable structural and mechanical condition; however, it did require extensive modification of the interior and exterior. Initial reuse required reconstruction of interior walls, offices, floors, ceiling, electrical systems, heating, ventilation, and air conditioning (HVAC), telecommunications, bathrooms, and a parking lot. These initial improvements were funded by the Airport Authority member governments, an FAA grant, and a state transportation grant.

Since the first remodel of Building 15, the facility has already had two expansions. In 2008, Allegiant Air loaned the Airport Authority $3 million (plus $1 million in interest) to fund a 10,000-ft^2 terminal expansion that doubled the number of gates to four. The loan has already been repaid through a $4.50 passenger facility charge. In 2010, the airport added a 25,000-ft^2 building paid for in part through a $1.3 million FAA grant. A third 30,000-ft^2 terminal project expansion is expected to launch in the summer of 2011.

In January 2010, 2 years after scheduled service began, AZA had served more than 1 million passengers (Figure 27).

FIGURE 26 Building 15 reuse as the Phoenix–Mesa Gateway passenger terminal.

FIGURE 27 Phoenix–Mesa Gateway Airport salutes the aircraft carrying the 1 millionth passenger.

LESSONS LEARNED

The AZA is an excellent example of base reuse. Several important factors contributed to its success.

- A strong probusiness and entrepreneurial Airport Authority was willing to both market and invest in the facility.
- There was a long-term plan and vision for the airport.
- There was an understanding that a facility reuse plan needs a specific and measurable goal. An existing facility can only be remodeled and modified to a certain point and cost where the return on investment makes sense.

- The Airport Authority remained flexible and adaptable because conditions in the industry could quickly create or kill opportunities.
- There was an understanding about competition from other local airports.
- Financial and institutional support came from communities in the region.
- There were expanding East Valley population and demand for low-cost service.
- There was successful recruitment of Allegiant Air and its reuse of Building 15 for commercial service.

All of these factors supported a positive outcome for the airport and literally put AZA on the map in less than 20 years.

CHAPTER TEN

PITTSBURGH INTERNATIONAL AIRPORT—REUSE OF THE 1952 PITTSBURGH TERMINAL BUILDING–AIRSIDE BUSINESS PARK

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	Pittsburgh International Airport (PIT)
City, State	Pittsburgh, Pennsylvania
Airport Sponsor	Allegheny County Airport Authority (ACAA)
Persons Interviewed	Wm. Randell Forister, Senior Director of Development Richard C. Belotti, Director of Planning and Environmental Affairs

SITUATION

In 1988, construction began for the new Pittsburgh Midfield Terminal Complex (Figure 28). This project and reuse of the former terminal predates the Allegheny County Airport Authority, which was formed in November 1999. At the time, the Department of Aviation was part of the Allegheny County government and as such, airport planning was integrated with the Department of Development.

Not surprisingly, the new terminal garnered a lot of attention. No reuse plan for the former terminal was considered until it was vacated in 1992. An Air Cargo Special Study, completed in 1991 and revised in 1993, identified the former terminal building as the site that maximized the full potential of an already existing ramp and could support a large build out of air cargo activity. The question remained, however, about what to do with the terminal facility, particularly the large rotunda that had architectural merit and historic significance (see Figure 29).

REUSE OPTIONS

One of the first plans advanced for the former terminal building was development of a satellite facility for the Smithson-

FIGURE 28 Airside Business Park, Pittsburgh International Airport.

FIGURE 29 Former Pittsburgh passenger terminal complex built in 1952.

ian Air and Space Museum. The proposed museum attracted a lot of community interest; however, by the spring 1993, the Smithsonian decided to expand within the Washington, D.C., area. The proposal continued to have local support, and sponsorship was taken up by the Pittsburgh Airport Museum, a not-for-profit group. However, it was not possible to raise all of the estimated $50 million for renovations and exhibits, so the museum initiative failed.

Partly as a consequence of the publicity around the museum proposal, the County Board of Commissioners and the Departments of Aviation and Economic Development received many proposals for reuse of the former terminal building from private developers, companies, agencies, and individuals (see Figure 30). In addition, the County Board of Commissioners awarded a contract to the National Development Corporation to identify and attract potential developers. National Development Corporation was not able to find prospects. One problem with keeping the former terminal building in place was the estimated cost of $15 million needed to remove asbestos and fuel contamination to ready it for development. This cost of cleanup made most proposed reuses financially infeasible. The county decided that its top priority was to develop the property for aeronautical uses compatible with the airport. Under consideration were—

- An FBO,
- A laser-based paint coating removal plant for aircraft paint,
- A new airline,
- Air Force/Air National Guard facility,
- Regional support command army training facility, and
- Air cargo facility.

REUSE OPTIONS LIMITED BY BUILDING ABANDONMENT

Approximately 1 year after the relocation to the Midfield Terminal Complex, Allegheny County received requests from the airlines to terminate utility service to the former terminal building, which was estimated at nearly $1 million per year. The county subsequently stopped general maintenance and upkeep and terminated all utilities except limited electricity for emergencies. The building was secured by an 8-ft perimeter fence. This action was consistent with a memorandum of agreement between Allegheny County and US Airways that stated that if a viable reuse of the former terminal building was not identified by October 1994, the building would be demolished in its entirety and the demolition would be funded by the airlines. This agreement forced an early reuse decision and resulted in few resources dedicated to keeping the former terminal building alive.

However, for a variety of reasons, the building remained standing and vacant for 7 more years. It became weathered and interior elements of the rotunda were damaged by vandalism. The lack of heating and ventilation resulted in mold and mildew. A building condition evaluation report estimated that the cost for demolition was $2.5 million.

A benefit–cost analysis was completed on four alternatives: no action; partial reuse of the former terminal building and cargo development; retention of the former terminal building, a business aviation center, and cargo development; and full demolition of the former terminal building and full development of the Airside Business Park. The last alternative was selected.

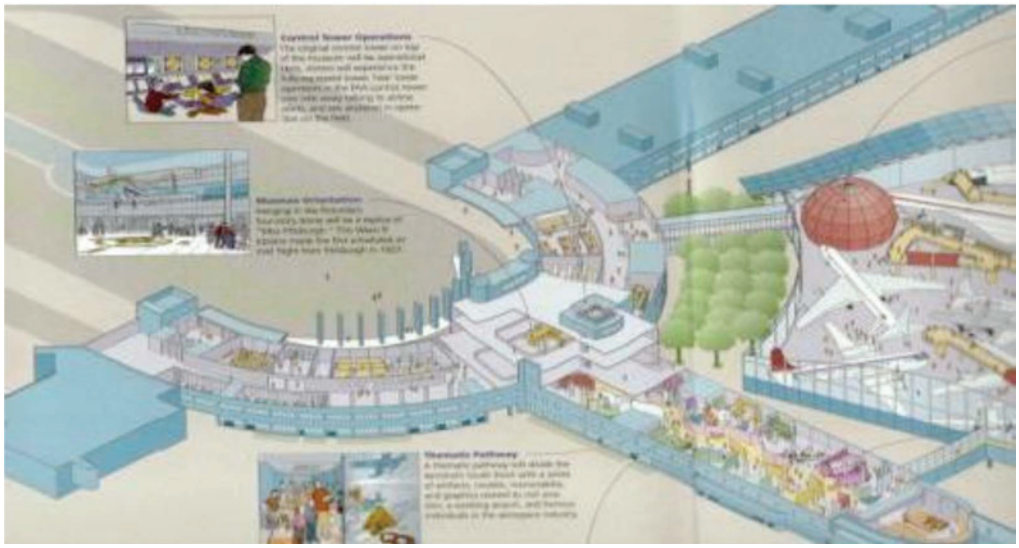

FIGURE 30 Proposed Pittsburgh Air and Space Museum.

DEVELOPMENT OF THE AIRSIDE BUSINESS PARK

In 1995–1996, the Airside Business Park was planned. The goal was to provide an effective reuse of the former terminal building area to increase operations at the airport, to stimulate commerce within the region, and to provide employment and business opportunities for Allegheny County. The Airside Business Park was designed to incorporate the following types of development:

- Flex-offices/warehouses,
- Office and commercial buildings,
- Business aviation center, and
- Air cargo ramp.

In 1997, the Allegheny County Redevelopment Authority and the Departments of Economic Development and Aviation completed a design standards and controls handbook for the business park that described the development strategy, design standards, review procedures, and construction requirements. In 1998, a salvage company came in to demolish the structure. However, the FAA halted the demolition because the presence of asbestos, lead paint, and hydrocarbon contaminants required an environmental assessment. The project was halted for a year to complete the environmental assessment. The former terminal building was finally torn down in 1999 and 2000 (8 years after it was vacated).

The Elmhurst Group, a Pittsburgh development company, signed a master lease to construct five buildings. The first two were built on speculation in 2003. Michael Baker Corporation leased one of these buildings for its headquarters. A third single-story building was also completed that year. For the fourth building, Elmhurst received a 1-year extension to construct because of a weak real estate market, but it was constructed in 2005 and is now occupied. In late 2008, Elmhurst built a fifth multistory building.

In addition to these five buildings, Atlantic Aviation operates an FBO on 11 acres and Aviation Facilities Company owns and leases one cargo building in the Airside Business Park (Figure 31). There is also one new corporate hangar.

FIGURE 31 Atlantic Aviation FBO, Pittsburgh International Airport.

LESSONS LEARNED

Reuse of Pittsburgh's former passenger terminal demonstrates many of the challenges inherent in the renovation and cleanup required to reuse a specialized airport facility.

First ideas do not always prevail. Reuse of the former terminal building stimulated many good proposals for reuse. However, the first ideas did not prevail. In this instance, attention to the new Midfield Terminal Complex eclipsed serious consideration of reuse options for the former terminal building until it was vacant and no longer maintained. That US Airways had agreed to pay for demolition raised the possibility for redevelopment of the site for a new use

without the additional costs of environmental cleanup and mitigation of the building itself. Ultimately, the Airside Business Park was carefully developed to achieve a high-quality, cohesive development.

It is important to plan for reuse and understand both the environmental and regulatory requirements for redevelopment of an airport property. In many respects, reuse of airport facilities is a lot like urban renewal: messy and complicated. The former terminal building had both architectural and historic importance, but it also had environmental hazards such as asbestos and lead paint. There were also instances of fuel contamination outside the building. Stormwater sewers, fuel lines, and power lines were buried under the concrete, which complicated demolition and construction activity. As it turned out, salvage operations began prior to an environmental assessment of the property. As a consequence, demolition of the facility was halted for a year to complete an environmental assessment that should have been done previously.

The economics of reuse are impacted by cleanup costs. The costs associated with cleanup of the former terminal site made the economics of reusing the property infeasible. In this instance, US Airways was already on tap to pay for demolition of the former terminal building, but environmental cleanup of the property, estimated at $15 million, would have been a cost borne by the group redeveloping the property. In the end, demolition was the least costly option and contributed to the decision to redevelop rather than reuse.

Stakeholder agreement is critical. The former terminal building was located in Moon Township. When terminal operations relocated, the airport's "front door" was in Findlay Township. Moon Township lost jobs and tax dollars with the vacancy. Community buy-in on the reuse possibilities was critical to advancing the Airside Business Park and offset the adverse impacts of relocating the terminal in another county.

Keeping a building alive extends the options for reuse, but at a cost. To keep reuse of a building as an option, a minimum level of HVAC is required. Once the former terminal building was closed and not maintained at all, reuse became a more complicated and expensive option. It is also true that to reduce overall airport operating costs, airlines can favor abandonment of older structures to remove the cost of maintenance as a shared airport expense.

CHAPTER ELEVEN

PITTSBURGH INTERNATIONAL AIRPORT—PITTSBURGH JETWAY REHABILITATION FACILITY

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	Pittsburgh International Airport (PIT)
City, State	Pittsburgh, Pennsylvania
Airport Sponsor	Allegheny County Airport Authority (ACAA)
Persons Interviewed	Stephanie L. Saracco, A.A.E., Chief Operating Officer Paul L. Hoback, Jr., Manager, Maintenance Administration and Planning

THE SITUATION

US Airways went bankrupt twice, once in August 2002 and again in September 2004. During bankruptcy proceedings, US Airways discontinued hub operations at PIT, released many skilled airline management and technical personnel, and turned over to ACAA the maintenance responsibility for its passenger boarding bridges (PBBs) and automated baggage system. This case study describes how the ACAA leveraged the capabilities of local aviation personnel and converted an abandoned US Airways cargo building into a jetway rehabilitation facility (see Figure 32).

The Pittsburgh Midfield Terminal, which opened in 1992, was designed to function as a large connecting hub airport. At the time, US Airways provided the majority of connecting passengers. US Airways operated the hub for 10 years. But after the first bankruptcy, it reduced hubbing operations at PIT; after 3 years, the airport was completely dehubbed. Figure 33 shows the change in passenger levels. Between a peak in 2001 and 2009, Pittsburgh lost half of its total passengers, half of its domestic flights, and two-thirds of its international flights.

The US Airways dehubbing of PIT had a significant impact on airport revenues and facilities, and ACAA began a multiyear assessment of what airside and landside facilities were needed and would be maintained. (This effort culminated in the "Comprehensive Facility Requirements Study" prepared by Ricondo & Associates, Inc. et al. 2010.)

However, the idea to create a PBB rehabilitation shop did not happen overnight but grew out of an earlier long-term plan to maintain and refurbish the 76 PBBs that were installed during construction of the Midfield Terminal. In 2000, ACAA knew that all of the PBBs had reached half of their life expectancies (20 years). The ACAA did not want

FIGURE 32 Jetway rehabilitation facility, Pittsburgh International Airport.

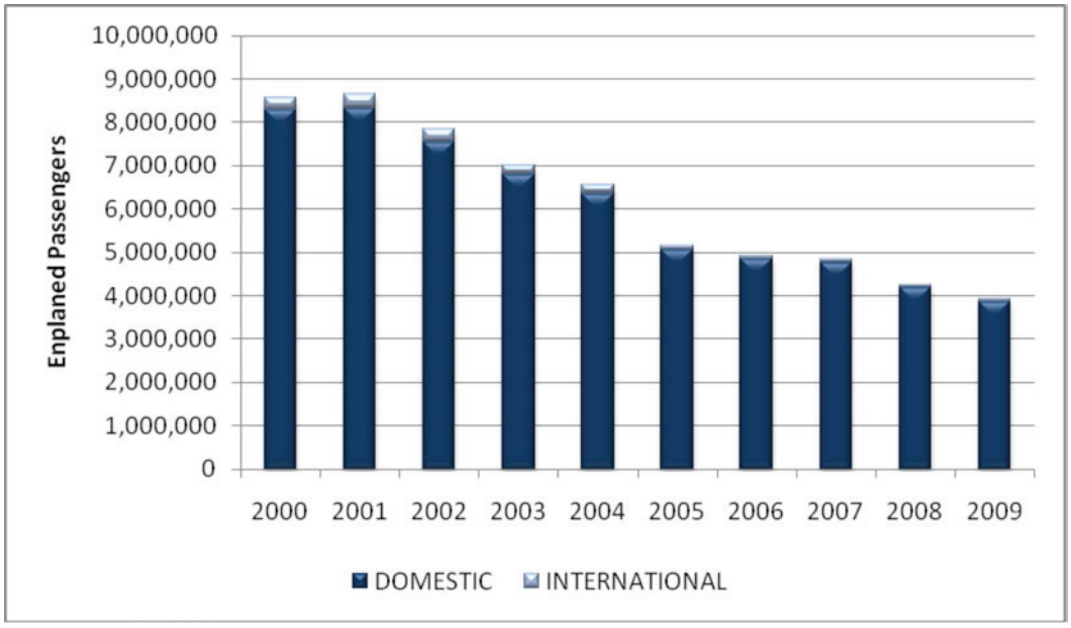

FIGURE 33 Pittsburgh International Airport enplaned passengers, 2000–2009. (*Source:* Bureau of Transportation Statistics T-100 Market Data.)

to face major overhauls or replacements simultaneously. The goal was to phase the work and capital required over time. ACAA began with an assessment of the condition of each PBB. The expectation was that maintaining the PBBs would require outside contractors and expertise. Inspections began in May 2001 and ACAA received a detailed report in February 2002. PBB conditions were prioritized with repairs and costs divided into three types: an immediate repair, a standard repair, and an upgrade to the PBB.

In the midst of the PBB inspection program came the September 11 attacks, followed by US Airways' first bankruptcy 11 months later. For Pittsburgh, it was a period of great uncertainty, and ACAA elected to delay any major repairs, overhauls, and replacements until the status of the US Airways hub operation at PIT was known. In the meantime, ACAA transmitted the inspection reports to each airline because it was the airlines' responsibility under existing operating agreements to maintain PBBs at their respective gates. Airlines were given the option to complete repairs themselves (or to subcontract the work) or to provide funding to the ACAA, which in turn would package all the repairs and seek a better price on a larger scale project. However, because of the 9/11 turmoil, only the most immediate repairs were addressed.

After US Airways filed its second bankruptcy in late 2004, it abandoned maintenance responsibilities for its PBBs and automated baggage system at PIT. ACAA mobilized an outside contractor to assume these duties. However, ACAA realized that it was paying a premium for this work and developed a plan to bring these maintenance functions in-house. To achieve economies of scale, ACAA formed a new Airline Service Maintenance (ALS) Department and took over the maintenance of all airline baggage systems and PBBs. ALS recruited many former US Airways employees to work in the department and by May 2005, all regular maintenance activities for baggage systems and PBBs were handled in-house.

Four years had passed since the initial inspections of the PBBs. The ALS Department began work on immediate repair items, with the highest priority going to safety. Efficiency was the second priority. Any work order that shortened the time of reduced availability of a PBB was given a higher priority. The crews also began to upgrade PBBs with newer technology. However, at the time, there was huge pressure to operate more efficiently. The ALS Department reduced utility costs and evaluated staffing levels to size the department.

DEVELOPMENT OF THE BUSINESS

Now that the ALS Department was up and running, the next step was to address major PBB overhauls and the purchase of new PBBs to spread out future end-of-life cycles. The original plan called for outsourcing major overhauls and the purchase of two to three bridges per year over the next 5 years. ALS staff first tackled the overhaul specifications and to do this, staff visited various PBB manufacturing facilities, including ThyssenKrupp Airport Services and JBT (formerly known as FMC Technologies). Following these visits, ALS began to consider the possibility of doing all Pittsburgh PBB overhauls in-house with a goal of extending the life expectancy of PBBs at least another 20 years (zero-timed).

The ALS Department pursued two simultaneous paths: plans to outsource major overhauls and a detailed analysis of

what was required to internalize this function. Labor, materials needed, equipment, and cost estimates to rehabilitate passenger bridges were all considered. The analysis showed that even accounting for ALS labor rates, rehabilitation would save the ACAA 38% of the cost of a new PBB. The executive team of the ACAA approved the plan and stopped the procurement process for new PBBs until the overhaul plan was tested and proven.

REUSE DECISION, BUILDING MODIFICATIONS, AND STAFFING

Two years had passed. To move forward, the ALS Department needed a facility to work on jetways because major overhauls could not be done while a bridge was in place next to the terminal. In 2007, US Airways terminated the lease on its cargo building and the space reverted back to ACAA. This was the perfect facility for the PBB overhauls (see Figure 34). A few minor modifications were required:

- Removal of older equipment used by US Airways,
- Reorganization of the space,
- Installation of 480-V electrical drops and compressed air drops,
- Modification of the overhead door to a 16-ft opening,
- Addition of an improved exhaust and ventilation system to address air-quality issues,
- Upgrade of the furnace, and
- New restrooms.

The facility also needed additional tooling and equipment, so the ALS Department worked closely with a local fabricator to design and construct support stands and a PBB lifting mechanism. Also needed was equipment to move the PBB around the facility. ALS considered an overhead crane, but the cost to modify the building and install the crane was too large. Thinking creatively, ALS shopped around for a crane that was used to lift boats from the water and found a used Tami-Lift mobile gantry crane that had been used at a marina in Boston Harbor (Figure 35). This proved to be an excellent way to move PBBs around the facility.

FIGURE 35 Tami-Lift mobile gantry crane.

The other aspect of setting up the shop was to figure out the optimum crew size and specify the makeup of trades that would be required to complete individual tasks in the overhaul process. Based on site visits to other facilities, ALS estimated an initial crew that included a lead mechanic to oversee the work, another mechanic, an electrician, a painter, and two laborers. Other trades were drawn from different

FIGURE 34 US Airways cargo building, Pittsburgh International Airport.

ACAA maintenance departments as needed. After completing the first overhaul, a carpenter was added to the team. The crew of seven could complete an overhaul in 5 weeks, assuming five 8-hour days per week.

INNOVATIONS TO PBBS AND PARTNERSHIP WITH JBT AEROTECH

The PBB rehab crew members took great pride in their craftsmanship and began to work closely with the original manufacturer, JBT Aerotech, on safety and operational improvements to the PBBs. These included improved energy-efficient lighting, a new radius strip in the PBB rotunda that eliminates a tripping hazard, and changes in the mounting position of cameras to improve visibility of apron-level activity for operators. The crew also worked with JBT to develop kits and modifications that make bridge maintenance easier and reduce downtime. Many materials and fixtures were purchased from local vendors to decrease shipping costs and support the local economy.

The ongoing working relationship with JBT continued to develop. After the first eight PBBs were overhauled, JBT was impressed with the quality of work. JBT and ACAA began discussing a partnership whereby JBT would pursue jetway rehabilitation work at other airports and deliver the PBBs to Pittsburgh; ACAA then would offload the PBB into the facility, complete the overhaul, and place the PBB back on a truck for delivery. JBT would supply all the parts, using stock and materials from regional vendors.

A formal agreement between ACAA and JBT was signed in 2010. JBT will deliver bridges east of the Mississippi to the Pittsburgh Jetway Rehabilitation Facility for overhaul. ACAA is optimistic about this unique venture and opportunity for a new revenue source for the airport. The venture makes it possible to use in-house staff and expertise to help other airports extend the lifetime of their passenger bridges. For PIT, the saving on PBB overhauls is considerable.

OPERATIONS TODAY

ACAA is now responsible for the maintenance of all PBBs at the airport. The ALS Department coordinates with the airlines and adjusts its schedule based on their needs. Regular maintenance activities can take place while the bridge is hung and in place on the Airside Terminal (see Figure 36). There is no need to take it to the overhaul facility. The overhauls are planned a year in advance and coordinated with the airlines. ALS determines the schedule based on the PBB condition and discusses this with the airlines. To date, no airline has turned down ALS for overhauling one of its PBBs. When an overhaul is required, it typically impacts the airline gate for only 1 to 2 weeks because the overhaul process begins with a nonexclusive gate. Within 2 weeks, ALS replaces the airline PBB with the previous overhaul; therefore, the downtime to the gate is the time required to remove the old bridge and install a new bridge—the previously overhauled bridge (not the time to overhaul). In other words, a particular PBB does not go back to the same jetway, but a similarly overhauled PBB in the "zero-timed" condition is installed.

FIGURE 36 Truck delivery of a passenger boarding bridge for overhaul.

As of fall 2010, the first two bridges from other airports had arrived. If the schedule increases sufficiently, the overhaul facility is large enough to accommodate a second track. The second track would be operational during the day shift so that managing staff can oversee both tracks.

LESSONS LEARNED

The Pittsburgh Jetway Rehabilitation Facility is an excellent example of ingenuity, careful planning, and reuse. There are several important takeaways from this case study.

Pittsburgh's experience demonstrates that out of a major shift in the airport's operating paradigm came innovation and entrepreneurial opportunities. The Jetway Rehabilitation Facility is a business that grew out of a Pittsburgh airport initiative to reduce costs. The ACAA had the foresight to have a passenger bridge inspection and overhaul program in place prior to when US Airways discontinued hubbing operations at the airport. A willingness to explore options, to analyze and make a business plan, to employ a skilled (and available) workforce, and to continue excellent relationships with contractors made it possible for ACAA to take on maintenance of the airport's jet bridges and automated baggage system. What started as a cost-reduction program led to an entrepreneurial effort that continues to develop. As the Jetway Rehabilitation Facility developed a track record, delivered a quality product, and the capacity to handle steady

demand, ACAA entered into a public–private partnership with JBT.

Use of available technical expertise, skilled workforce, and local suppliers can provide both key personnel and community economic benefit. The Jetway Rehabilitation Facility is an excellent instance of a difficult situation turned around. The expansion of the US Airways hub at PIT resulted in a highly skilled and experienced aviation workforce that was eliminated during US Airway's two bankruptcies and dehubbing. The PBB rehabilitation project re-engaged some of this workforce and provided an important platform to support local vendors through the purchase of needed materials and products.

The transition of functions from private capacity to government capacity required time and patience. The evolution of the Pittsburgh Jetway Rehabilitation Facility took more than 5 years. During that time, ACAA enhanced its relationships with suppliers, contractors, and vendors and was not afraid to ask questions about how to overhaul PBBs and to explore component and process improvements. The Jetway Rehabilitation Facility was a start-up venture that began as an in-house cost-reduction program. Overhaul of its own PBBs made it possible to calibrate the staff and resources needed for each rehabilitation project and to better understand the economics of the business. It was this detailed experience and a good relationship with JBT that made it possible for ACAA to market this service to other airports.

The commitment of the management team and staff is a key ingredient for success. The ALS Department with the support of ACAA pursued innovation, quality workmanship, lower cost, creative equipment solutions, and determination to make the venture work. That no airport had ever taken on PBB overhauls seemed to inspire and allow the team to analyze carefully, ask good questions, continually improve processes, and motivate each other.

CHAPTER TWELVE

RICKENBACKER INTERNATIONAL AIRPORT—MILITARY BASE REUSE

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	Rickenbacker International Airport (LCK)
City, State	Columbus, Ohio
Airport Sponsor	Columbus Regional Airport Authority (CRAA)
Persons Interviewed	Rod Borden, Senior Vice President and Chief Operating Officer John Byrum, Vice President and Chief Financial Officer

THE SITUATION

Rickenbacker Air Force Base, originally the Lockbourne Army Air Base, is considered to be one of the best conversion efforts in the United States of a military air base to a public airport. Today, the airport serves as a dedicated cargo airport, a multimodal logistics hub, a charter passenger terminal, and a U.S. foreign-trade zone (FTZ; see Figure 37). In addition, the airport remains host to the Rickenbacker Air National Guard. The Guard base and several other military units remain in a "cantonment area" on the airport where the U.S. Department of Defense has retained ownership.

FIGURE 37 FedEx aircraft on Rickenbacker apron.

CRAA has taken an active role in developing nonaeronautical land within the airport property and has acquired land in the area for development or resale. The Rickenbacker area has numerous industrial parks, several individual commercial property owners, more than 150 companies, and more than 39 million square feet of development. As of 2010, the airport was generating enough revenue to break even operationally; however, there is a need to develop a long-term revenue surplus for capital projects.

This case study examines the historical context for reuse of this military air base. The discussion is divided into three time periods: base closure and transfer, transition period, and current business model and activity.

Base Closure and Transfer

In 1978, the Air Force announced Rickenbacker was to be closed and that the Strategic Air Command functions would be transferred. At the time, the base consisted of approximately 5,000 acres, including an estimated 265 buildings with approximately 3.7 million square feet of floor space. In April 1980, Rickenbacker Air Force Base closed, and the facility was turned over to the Ohio Air National Guard and renamed Rickenbacker Air National Guard Base.

At the height of the Vietnam War in 1967, the population on the base peaked at 18,000 service people. The Franklin County Commissioners recognized that closure of the base would have a "significant impact on the central Ohio area, and ... early reuse of the base would be in the best interest of these communities." As a result, the commissioners formed a steering committee in late 1978 to propose alternative ways of using the military property. In March 1979, the committee proposed that the county commissioners create a port authority to receive and redevelop the property released by the military. The following month, the Franklin County Board of Commissioners voted to establish the Rickenbacker Port Authority (RPA). The mission of RPA, as defined in the resolution, was to receive and redevelop any land released for civilian use and to enter into a joint-use agreement with the Air Force to maintain the operation of the airfield. The commissioners envisioned that the property would be a good site for an industrial park.

The full transfer of the base to the RPA took several years. In 1982, the RPA and the federal government entered into a joint-use agreement to permit civil aircraft to use the airfield. The RPA agreed to assume responsibility for airfield operation and maintenance by January 1987. Under this agreement, the Air Force was to be airfield manager and RPA a tenant until the transition to RPA control, when these roles would be reversed. The government agreed to coordinate the operation of any military aircraft with scheduled civil operations, except in the event of the need for prompt military aircraft movements. The military was to provide fire protection for both military and civil operations, but only as long as such services were needed for military activity. As reimbursement for the government's costs, RPA agreed to pay a joint-use fee of $150,000 per year plus any expenses incurred for fire fighting and other services. In October 1990, the Department of the Air Force transferred full control of the airport to RPA. However, as early as 1984, the RPA had already begun to prepare the base for rehabilitation, reuse, and development (http://www.rickenbacker.org/about/history.asp).

Transition to Full Public Control

It took approximately 5 years to transfer the land management to RPA. In that time, little preventive maintenance was done to runways, buildings, or other facilities. In 1984, the RPA was able to begin redeveloping LCK. Many buildings were in poor condition. Some had serious environmental hazards. For example, the cost of demolishing the base hospital, which contained asbestos and polychlorinated biphenyls, was estimated to be $1 million.

The RPA faced some hard decisions to determine which buildings would remain and which would be torn down. It prepared an initial master plan. Ultimately, more than 50 buildings were demolished to ready the property for development. Because the RPA had received the property as a transfer of surplus government property, the deed stipulated that even with a master plan in place, it had to go through the release process with the FAA. Because the size of the property was large, 5,000 acres of land at Rickenbacker, the release process of a small portion of the acreage for demolition of buildings proved noncontroversial for the FAA.

To initiate development of the property, Franklin County solicited for a master contract to develop LCK. In 1985, it entered into a long-term lease with Turner Construction that gave exclusive rights to develop the entire airport for 75 years. In 1986, a public–private partnership was negotiated between the RPA, Turner, and Flying Tigers to build an all-cargo hub and bulk-freight sorting facility. The county raised $22 million in special purpose bonds to construct a ramp, and Flying Tigers was offered free landing fees for 10 years. However, in 1989, Flying Tigers was sold to FedEx, which closed the cargo hub and consolidated operations at its other locations. Because of the way the partnership was structured, taxpayers had to pay for the remaining balance due on the ramp bonds.

Several other milestones occurred during this transition period:

- In 1987, LCK established FTZ No. 138, which was particularly effective as long as personal property taxes were exempt within the FTZ. (This exemption no longer exists.)
- After 1991, much of the rehabilitation of the base was paid for through federal conversion grants under the Military Airports Program.
- Ten years into the Turner Construction lease, the RPA bought out the remaining portion of the lease for $2 million (four $500,000 annual payments) and took control of base redevelopment.
- To assist with development at Rickenbacker, the Franklin County Commissioners and RPA created the Franklin Community Improvement Corporation in 1994 as a private, nonprofit corporation.

Current Business Model and Activity

During the early years of reuse, LCK ran at a loss up to $4 million annually. Today, LCK breaks even operationally. Nevertheless, the RPA realizes that not only does the airport have to break even, but also a goal of $3–$5 million surplus is needed per year to take care of ongoing capital replacement and maintenance needs. Without a revenue stream from passenger service, Rickenbacker strives to (1) leverage its assets; (2) redefine itself through a comprehensive, long-term plan; and (3) find alternative means for generating additional revenues.

In 2002, the city of Columbus, Franklin County, and the Columbus Municipal Airport Authority approved the merger of RPA and the Columbus Municipal Airport Authority, forming the new CRAA, which became effective January 1, 2003. Under the new authority, LCK has engaged in a number of land development initiatives to

- Acquire additional land adjacent to the airport for development and/or resale, and
- Engage in public–private partnerships where CRAA can provide raw land, improved land, or actually construct a building and sell or lease it.

Within the CRAA system of airports, LCK has become the de facto cargo and charter passenger airport. The authority is improving land to build out the Rickenbacker Global Logistics Park. In 2008, the CRAA collaborated with Norfolk Southern Corporation to build and open the Rickenbacker Intermodal Terminal adjacent to LCK (Figure 38). The intermodal terminal is based on an "inland port concept" where rail, air,

and highway come together. Both Rickenbacker and Norfolk Southern contributed land to the deal. A $30 million earmark assisted in construction of the facility, and CRAA gets additional fees from the railroad. There is not much crossover between rail and air, but the rail activity has spurred peripheral development in the area, including a logistics center.

LESSONS LEARNED

The LCK reuse is a work-in-progress even after 25 years. Many lessons have been learned in the process:

- Reuse of a large property requires a comprehensive plan that includes a land use component, a governance plan, feasibility analysis, financial plan, a business strategy, and marketing action plan.
- If the base is not used for passenger service, the more diversified the portfolio of nonaeronautical activities, the better the chances of developing alternative revenue streams.
- It is important to make early decisions about what buildings and functional areas will be kept and what will be demolished. Be selective and stay consistent with the comprehensive plan. It is easy to spend money in nonproductive areas.
- As capital is raised, maintain the discipline to reinvest in other revenue-producing activities or assets.
- Work with the communities in the region to promote an understanding of the economic benefits of the airport so that direct and indirect benefits are appreciated even if the airport is operating at a loss.
- It is important that base reuse plans consider whether the base becomes the community's main airport. In the case of Austin–Bergstrom International, it ultimately made more sense to redevelop Bergstrom AFB than to construct a new and expanded green field airport. However, in this instance, the discussion of whether Rickenbacker should become the main airport was not part of the formal reuse planning effort. It was, however, discussed at length by community leadership multiple times during the 1980s and early 1990s. At that time, it was determined that Port Columbus was viable with respect to both its capacity and the functional and economic life cycle of its facilities. As a result, discarding the substantial investment in Port Columbus' facilities and making an additional substantial investment to replicate those facilities at Rickenbacker could not be justified.
- The reuse and redevelopment of LCK took longer than anyone expected to break even and develop a positive return.

FIGURE 38 Intermodal terminal adjacent to Rickenbacker.

CHAPTER THIRTEEN

SPRINGFIELD–BRANSON NATIONAL AIRPORT—ADAPTIVE REUSE OF FORMER TERMINAL

AIRPORT SPONSOR AND INTERVIEW PARTICIPANTS

Airport Name	Springfield–Branson National Airport (SGF)
City, State	Springfield, Missouri
Airport Sponsor	City of Springfield
Person Interviewed	Shawn Schroeder, A.A.E., Assistant Director of Aviation—Operations

THE SITUATION

In May 2009, Springfield–Branson National Airport moved into its new Midfield Terminal. This left the former terminal vacant (Figure 39). The airport worked with the economic development staff of the Chamber of Commerce to develop tenant leads and with the FAA to keep them posted on progress and to obtain concurrence for nonaeronautical uses. The former terminal was leased relatively quickly to Expedia Inc. and to the Missouri Army National Guard, and both tenants moved in within 15 months after the terminal became vacant. This case study is one of the few successful reuses of a passenger terminal that did not involve extensive modification of the exterior envelope of the facility. The focus here is on lease terms and upgrades that were needed to reuse the terminal.

BACKGROUND

SGF is a small hub airport on 3,500 acres located in southwestern Missouri. It has two runways that are 7,003 ft and 8,000 ft. Four airlines (American, Allegiant, Delta, and United) serve the airport to 11 destinations. In 2009, the airport enplaned 398,025 passengers. Over the past 15 years, passengers have grown by approximately 4% per year. The airport serves as a gateway to the Missouri Ozarks and a tourist destination to Branson, Missouri, which attracts more than 7 million visitors annually. The steady increase

FIGURE 39 Springfield–Branson National Airport former terminal.

in passengers resulted in design and construction of the new Midfield Terminal. The airport broke ground for the new terminal in May 2006 and moved in 3 years later.

TENANT RECRUITMENT AND LEASE NEGOTIATION ISSUES

Both new tenants for the former terminal had existing operations in the area. Expedia Inc. had an off-airport location and the Missouri Army National Guard was already based at the airport. Expedia liked the concept of occupying an air terminal and elected to keep much of the terminal décor (e.g., signs, gates, and basic spaces). The company leased approximately 59,000 ft^2 of the terminal. However, a large factor in the company's decision to relocate at the airport was the space available for vehicle parking. The Missouri Army National Guard leased approximately 25,000 ft^2 of the former terminal for administrative offices that supported the armory that is currently located in Springfield. (This use of the former terminal was considered an extension of existing aeronautical activity for the Army National Guard at the airport.)

Expedia Lease

To establish a market rate for Expedia (nonaeronautical use), the airport contracted with three appraisal companies to establish a value for rent. The airport divided the terminal space into functional categories as shown in Figure 40.

Values for each type of space were established. The airport took the median per square foot rent for each category based on the three appraisals. The FAA approved the lease rates before executing the lease. The terms of the lease were the same for Expedia and the Missouri Army National Guard, but the square footage rates were lower for the National Guard because it was an aeronautical use and the Guard's presence provided additional security for the former airport terminal, which now has a significantly lower law enforcement officer presence than when it was operated as a terminal.

In addition, the airport established a common area maintenance (CAM) charge that included proration of real estate taxes, building insurance, maintenance of building systems (escalators, elevators, and HVAC), window washing, snow and trash removal, utility charges, landscaping, and security costs. CAM rates were $3.64 per square foot per year (as of 2010). The airport hired an additional employee to maintain the facility, and that position is paid through the CAM charge. Below is a summary of the major lease terms:

- A total of 59,000 ft^2 was leased to Expedia Inc. for nonaeronautical purposes; 25,000 ft^2 were leased to the Missouri Army National Guard for aeronautical use (see Figure 41).
- CAM charges are assessed annually to both tenants based on projected expenditures. Increases are capped at 3% per year.
- The lease term for Expedia is 5 years with five 3-year options for renewal at $4 per square foot base rent.
- The lease term for the Army National Guard is 1 year with five 1-year options for renewal at $3 per square foot for aeronautical use and a $3.34 CAM discount because the Guard is not responsible for elevator maintenance.
- The airport board reserves the right upon 30 months' written notice to terminate the lease.
- Each lease contains a war or natural emergency clause that is similar to a preemption clause.

One of the biggest surprises for the airport was the imposition of new ADA requirements. These were triggered because of a change in use of the 1964 terminal facility. Key areas of noncompliance included—

- Accessibility to parking and a clear passageway to all entrances: New ramps with accessible routes were required for entrance doors, all public areas in the building, accessible restrooms, identification signage with proper symbols and Braille, elevator controls, and cab size.

FIGURE 40 Categories of terminal spaces for reuse and market value.

FIGURE 41 Remodel of former terminal for office space.

- Life safety systems: fire sprinkler protection, alarms and strobes, proper signage, and visibility from occupied areas.
- Egress components: exit stair handrails, guards, treads and risers, exit arrangements for remoteness.

ADA compliance was not originally budgeted by SGF to ready the facility. New bathrooms turned out to be a major additional cost that was paid for by the airport.

Despite unexpected additional upfront costs, the city of Springfield experienced significant benefits from Expedia's use of the former terminal. Expedia relocated 500 jobs to Springfield, adding approximately $17.5 million in new payroll.

Missouri Army National Guard Expansion

Springfield–Branson National Airport has an existing lease with the Missouri Army National Guard. This lease consists of approximately 122 acres at the airport for repair of Army National Guard helicopters and avionics. A key element of the reuse of the former terminal was to establish a larger presence of the Guard on the airfield. Because the two tenants occupied the former terminal, a secure separation of the tenants was vital to both of their operations.

LESSONS LEARNED

The reuse experience of the former passenger terminal at SGF demonstrates a few important principals for reuse:

- Coordination with the local economic development agencies and Chamber of Commerce is beneficial as these groups are regularly contacted by companies considering relocation and they can help potential tenants obtain available tax credits and other economic development incentives.
- Work with the FAA throughout a reuse project so that the agency can review plans for nonaeronautical tenants and proposed market lease rates.
- Consider hiring an expert in code compliance to perform an assessment of the property. In this way, additional costs for ADA upgrades, security, and other safety issues can be anticipated and budgeted.

CHAPTER FOURTEEN

CONCLUSIONS

This synthesis developed a series of case studies of vacant or underutilized aeronautical property at U.S. airports. Although not an exhaustive analysis, the investigation of vacancies suggests that the problem appears widespread. Vacancies originate for a variety of reasons, including

- Functional obsolescence of a building,
- Changes in passenger demand (up or down),
- Consolidated or merged airline operations,
- Loss of connecting hub status,
- Outsourcing of services and functions, and
- Tenant bankruptcy.

Each of these reasons influences the timing and likelihood of the vacancy and the subsequent role of the airport sponsor. Given the history of rapid growth of air travel, airports are more accustomed to addressing obsolescence in the context of expansion rather than in the context of no growth or decline in airport activity. As shown earlier, some connecting airports in the United States, such as John F. Kennedy International Airport, Charlotte, and Denver, continue to experience strong passenger growth, whereas others, such as Pittsburgh, Cincinnati, and St. Louis, have experienced the opposite.

The most challenging vacancies for an airport arise when an airline dehubs or when an airline or other major tenant rejects a lease in bankruptcy. In these instances, the property is often highly specialized or in poor condition and the bankrupt entity does not need it anymore. These properties usually revert to and become the responsibility of the airport sponsor. As documented through the case studies, rarely does an airport sponsor receive a property that is in both high demand and excellent shape. Most reversion situations require (and inspire) airports to institute a review of options that range from a decision to maintain a facility for future reuse, find a replacement tenant, or tear down the building.

The case studies offer a few valuable principles for consideration that are summarized in the following sections.

DECISIVE ACTION ON REUSE OR DEMOLITION

Most airports have master plans and/or airport layout plans that identify existing and future aeronautical land use. When a large property goes vacant, it is common to conduct a market or reuse assessment. However, under market conditions present from 2008 to 2011, finding a replacement tenant may take several years to accomplish, even for facilities in good condition. Costs for long-term maintenance and repair will accumulate as the property sits vacant. Sponsors need to plan for vacancies. Airports that have specific timelines associated with each option can move decisively from one option to the next.

KEEPING A FACILITY ALIVE PRESERVES OPTIONS (AT A COST)

The synthesis presented case studies such as the former Pittsburgh passenger terminal where a decision to turn off the heating and cooling systems and other utilities resulted in remarkably fast degradation of the terminal's interior and systems. Mildew and mold as well as vandalism transitioned the property from a possible reuse candidate to a building hazard within 1 year.

Other airports spend millions to keep a building alive. The Port of Oakland might have demolished the Oakland Maintenance Center (OMC) when United Airlines vacated, but it had planned to expense the demolition as part of future capital projects on or near the site. Those projects have not yet been needed and the Port has spent a lot of money to maintain the vacated maintenance facility. These expenses have been somewhat offset by advertising revenues from billboards and interim storage and use of office space at the OMC.

Keeping a building alive promotes safety, prevents future expenses for costly repairs, and creates a positive environment on airport property, which will attract future tenants. At a minimum, upkeep includes heating and ventilation of the interior and regular inspections of the building's mechanical systems and fire safety. Airports secure vacated properties so as not to be a further cost liability or safety hazard.

Vacated buildings can become a "storage facility." In these instances, accumulation of junk, trash, debris, boxes, lumber, scrap metal, or any other materials may produce health, fire, or safety hazards or become harborage for rodents or other animals. Maintenance of plumbing and completely draining or heating all pipes for water to resist

being frozen during cold months are critical. It is important to check and maintain fire suppression systems so that they are operable.

VACATED PROPERTIES REQUIRE ADDITIONAL SOURCES OF OPERATING AND CAPITAL FUNDS

Typically for airport-owned aeronautical facilities, capital budgets that replace obsolete structures such as passenger terminals include a budget for demolition of the older structures.

Facilities that unexpectedly revert to the airport sponsor require unplanned expenditures for maintenance, renovation, marketing, and/or demolition. Potential sources for operating and capital budgets include

- General operating funds,
- Security deposits,
- Letters of credit designating the airport sponsor as beneficiary,
- Temporary rentals,
- Airport Improvement Program (AIP),
- Economic Development Administration grants,
- Amortization through a capital project.

Vacant property ownership is often unplanned and unbudgeted, and the lowest cost option can be demolition. Unless airports can find ways to finance adaptive reuse, many vacant properties will continue to be either demolished or used for a succession of interim uses.

MARKETING A VACANT BUILDING

Airports that have found replacement tenants reported that facilities took a long time to lease. Tenants often came from other locations on the airport or in the region, but sometimes they arrived unexpectedly from their own internal search for property. Some airports have business development managers that engage in extensive trade show presence and Internet promotions. Once there are active prospects, these managers may also serve as liaison with the prospect to facilitate inspections and remodel estimates. In most of the case studies where replacement tenants were found, the airport also renovated the property to meet current building codes and mitigate any safety or environmental hazards.

Keeping the FAA Airport District Office informed throughout the marketing process is an effective way to demonstrate best efforts toward attracting an aeronautical replacement tenant or mixed-use solution before seeking a conversion to nonaviation use.

PLANNING FOR FLEXIBLE USE

From an airport planning perspective, vacancies within terminals and other aeronautical properties mean that future airport facilities could better incorporate the risk of capacity reduction or expansion and new technology into facility design. For example, many of the iconic passenger terminals designed at JFK International Airport were demolished because rehabilitation was either too expensive or difficult to address larger passenger volumes, bigger aircraft, new security requirements, and infrastructure needed to install information technology requirements. Flexible design includes a few important principles that incorporate the possibilities for expansion, appropriate contraction, or reuse:

- Consider aviation trends when planning for a new facility or setting design standards for development.
- Design spaces for resizing.
- Design systems for both expansion and subdivision.
- Encourage common-use solutions in terminals versus customized propriety space.
- Engage stakeholders and tenants in the design process.
- Evaluate the impacts of resizing on airport cost centers.

RISK ANALYSIS FOR VACANCIES

A reasonable response to turbulent economic conditions is implementation of a structured, consistent, and continuous risk management process that is applied to airport property management. The process would include—

- Development of an exit strategy for each leased property on the airport.
- Anticipation of the risk of vacancy during lease negotiations and addition some kind of financial protection in the event of lease rejection through bankruptcy.
- Identification, assessment, and prioritization of tenants and properties at risk annually.
- For the highest risks, formulation of a plan to raise awareness of the risk, develop mitigation plans, and incorporate into the budget cycle.

Figure 42 describes a sample vacancy-risk graph that visually portrays the likelihood and impact to airport revenues, operations, and jobs of various events that could lead to vacancies. For example, a corporate hangar vacancy (F) is likely but would have a relative low impact overall. On the other hand, bankruptcy of a signatory carrier might be less likely but would have a large impact. These are general estimates only. In each case, unique factors such as the tenant's financial strength, the size of the space, rent, remaining lease term, and suitability for reuse will affect both the likelihood and the impact of vacancy.

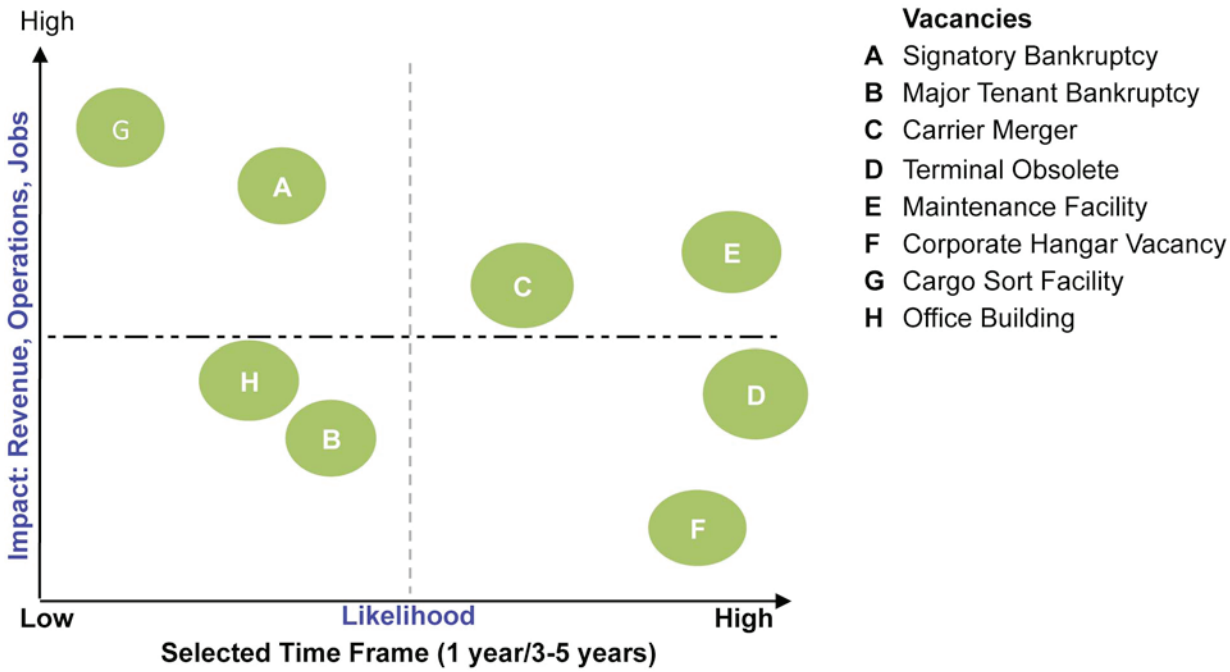

FIGURE 42 Sample vacancy-risk graph.

FINANCING ADAPTIVE REUSE

The financing of adaptive reuse (or demolition) of aeronautical property is an area of uncharted public policy. The FAA grant programs address demolition and reuse primarily in conjunction with new capital projects. In the instance of a mature or contracting industry, there appear to be fewer options for the financing of reuse or demolition except as an operating cost. The model for who pays does not lend itself to reuse, and it is important that the cost of demolition be tied to redevelopment of the site if it is to be funded by AIP. This leaves instances where redevelopment is not needed currently and airports need to shoulder the operating costs to maintain a building and keep it safe.

FURTHER RESEARCH

With consolidation of airlines, air cargo carriers, and air service routes, the trend suggests that some airports will continue to experience a surplus of aeronautical land and require funding to dispose of vacant or obsolete buildings and to secure the airfield. This synthesis scratched the surface of a very large topic not widely reported beyond the individual airport level. Further research is needed to calibrate the extent of the problem and to develop a risk management strategy that would help airports identify properties at risk and pursue an exit plan to reuse or dispose of the property. This research would include development of a toolbox of strategies for airport property managers that addresses the following issues:

- Lease provisions that protect the airport in the event of tenant bankruptcies or sudden termination of lease,
- Letters of credit naming the airport as sole beneficiary (and enforcement of provisions over time) to guarantee that funds are available for reuse or demolition of a property,
- Analysis of the tradeoffs (pros and cons) between higher rent and end of lease security provisions,
- Risk assessment methods for airport properties and/or tenants,
- Exit strategies,
- Worksheets to evaluate the cost of maintaining a vacant or underutilized property over time versus demolition,
- Environmental and safety considerations for vacant and underutilized properties, and
- Financing sources for demolition in the event that airport operating funds (and AIP) are unavailable.

GLOSSARY

Aeronautical use: Aviation activity that takes place on the airfield or at the terminal gates.

Aeronautical revenue: Operating revenue that an airport collects from—

- Terminal rents – Based on the amount of space an airline uses inside the terminal;
- Landing fees – A per plane charge, usually based on the weight of the aircraft;
- Other charges – Specific fees for extra airport services (i.e., use of a jet bridge).

An airline does not have to have a signed contract to use an airport. However, an airline with a contract, called a signatory airline, enjoys special benefits, such as lower rates, than those airlines that do not sign a contract.

Compensatory agreements: The airport operator assumes the major financial risk of running the airport and sets rates and charges to recover the costs of the facilities and services that airlines use.

Connecting passengers: Passengers who disembark one aircraft and connect to another aircraft at the same airport.

Enplanements: Passengers boarding an aircraft.

Hub and spoke systems: One model airlines use to organize their network of service. Airlines operate hubs in a few cities where most of their flights originate, and service goes out to spoke cities. Hub and spoke systems give passengers from smaller cities much greater access to a variety of destinations as passengers connect at the hub on flights to their destination. In the United States, United Airlines, American Airlines, Frontier Airlines, Alaska Airlines, Delta Airlines, Continental Airlines, and US Airways operate hub and spoke systems. Other carriers operate point-to-point service, although carriers such as Southwest Airlines and AirTran operate in focus cities where it is possible to make connections.

Large, medium, small, and nonhub airports: The FAA defines large hubs as having 1% or more of total national annual passenger boardings. A medium hub has 0.25% to 1% of boardings. A small hub has at least 0.05%, but less than 0.25%. A nonhub airport has more than 10,000 boardings but less than 0.05%. There are 30 large hub airports, 38 medium hubs, 68 small hubs, and 385 nonhub airports.

Majority-in-interest clause: Provisions in an airport's general use agreement with an airline that typically give those airlines performing a majority of the operations at the airport veto power over airport expansion when those airlines would be responsible for paying the cost of that expansion.

Nonaeronautical revenue: Nonaeronautical, or landside revenue, is generated from the following types of activities:

- Concessions – Rents paid by gift shops, restaurants, or newsstands. Most concession contracts also require a concession to pay a percentage of its profits to the airport.
- Parking – Fees for all airport-owned parking lots.
- Advertising – Ads placed on airport walls, billboards, and buses are a source of airport income.
- Land rent – Excess airport land may be rented for golf courses, office buildings, hotels, or farming.
- Permits – Fees paid by off-airport companies to access the airport and pick up passengers (e.g., taxis or shuttle buses).

Primary airports: As defined by the FAA, a commercial service airport with more than 10,000 passengers boarding each year.

Residual cost agreements: A type of contract with an airport owner where airlines collectively agree to pay any costs of running the airport that are not allocated to other users or covered by nonairline revenue.

Signatory airlines: Any airline that has a valid and effective airport use and lease agreement with an airport sponsor.

ACRONYMS

ACAA	Allegheny County Airport Authority
ADA	Americans with Disabilities Act
AFB	Air Force Base
AIP	Airport Improvement Program
ALS	Airline Services Maintenance Department
AR	Adaptive Reuse
AZA	Phoenix–Mesa Gateway Airport
CAM	common area maintenance
CRAA	Columbus Regional Airport Authority
DAA	Duluth Airport Authority
DAY	Dayton International Airport
DCAM	Massachusetts Department of Capital Asset Management
DEDA	Duluth Economic Development Authority
DLH	Duluth International Airport
EDA	Economic Development Administration
ERM	Enterprise Risk Management
EWB	New Bedford Regional Airport
FBO	fixed-base operator
FTZ	foreign-trade zone
HCAA	Hillsborough County Airport Authority
HVAC	heating, ventilation, and air conditioning
IAB	International Arrival Building
ILS	instrument landing system
IMC	Indianapolis Maintenance Center
JFK	John F. Kennedy International Airport
LCK	Rickenbacker International Airport

LTL	less than truckload
MII	majority-in-interest
MRO	maintenance, repair, and overhaul
NWA	Northwest Airlines
OAK	Oakland International Airport
OMC	Oakland Maintenance Center
PANYNJ	Port Authority of New York and New Jersey
PBB	passenger boarding bridges
PIT	Pittsburgh International Airport
RPA	Rickenbacker Port Authority
RSW	Southwest Florida International Airport
SGF	Springfield–Branson National Airport
SFO	San Francisco International Airport
TWA	Trans World Airlines

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APPENDIX A

Case Study Questionnaire

Airport Name	
City	
State	
Airport Sponsor	
Facility Owner	
Person Interviewed	
Title	
Organization	
E-mail	
Phone	

Description of Previous Use of Property

Name of the Facility	
Facility Location (check one that applies):	
Access to the airfield	
Within airport boundary but no airfield access	
Off airport	
Original Purpose of Facility	
Aeronautical Use (yes/no)	
Previous Tenant	
Reason Facility was Vacated	
Month/Year Vacated	

Current Status (Check all that apply)

Vacant		Reuse	
Demolished		New Development	

If property is reused or redeveloped:

Current Principal Tenant	
Current Use	
Is Use Interim or Permanent?	
Did New Use Require FAA Approval?	

History of Property

1. Who previously occupied the facility?

2. What if any bonds or loans existed on the building at the time it became vacant?

Type	**Amount**
e.g., Special Facility Bond	$10 million

3. Who controlled the facility after it went vacant?

4. How were financial obligations addressed?

5. How long after the property went vacant did the airport get control?

6. Do any of the financial obligations remain on the property from the previous occupant?

7. Is the property subject to FAA Grant Obligations and Assurances?

8. What was the condition of the property when the airport got control?

The next questions address how the airport considered reuse options.

Reuse Decision

Who was responsible for determining how to reuse the property? (Check all that apply.)

Stakeholders		Role
Airport Sponsor		
Airport Board		
Airport Director		
Property Manager		
Local Government		
Economic Development Group		
Committee (specify)		
Consultant		

How were options for reuse identified? (Check all that apply.)

Decision Process	
Informal Discussions	
Reuse Study	
Market Study	
SWOT Analysis	
Broker Suggestions	
Other:	

Please identify reuse options in order of priority.

Rank	Reuse Options
1	
2	
3	

If nothing was done, please describe how and why the decision was made to let the facility remain vacant.

If reuse was pursued:

Reuse Preparations

1. Please outline the steps taken to obtain FAA approval for reuse:

	FAA Approval Steps
1	
2	
3	
4	
5	
6	
7	

2. About how long did it take to get FAA approval?

3. What improvements were needed to make the property lease-ready?

4. How were these improvements financed?

Property Redevelopment (If the property was redeveloped)

Please identify the parties involved in the property redevelopment? (Check all that apply.)

Stakeholder		Role
Airport Sponsor		
City		
State		
County		
Developer		
Bank		
Economic Development Group		
FAA		
Other		

If responsibility for property redevelopment was shared, please identify below participating groups and funding sources:

Project Component	Group Responsible	Funding Sources
Road Access		
Parking Lot		
Site Preparation		
Foundation and Building Pad		
Building Structure		
Water and Sewer		
Electricity		
Tenant Recruitment		

Were incentives used to attract redevelopment? (Check all that apply.)

Incentive		Describe
Bonds		
Grants		
Loans		
Property Tax Abatements		
Sales Tax Abatements		
Fast Track Permits		
Permit Fee Reductions		
Utility Rebates		
Other		

Tenant Recruitment

Who was responsible for tenant recruitment? (Check all that apply.)

Tenant Recruitment	
Airport Director	
Airport Property Manager	
Developer	
Broker	
Other	

How did you establish a fair market value for the property?

What incentives were used to attract tenants? (Check all that apply.)

Incentive		Describe
Rent Adjustments		
Building or Parking Improvements		
Tenant Ownership of Improvements		
Lease Term Extensions		
Options on Other Land		
Property Tax Abatements		
Sales, Payroll, or Income Tax Credits		
Other		

Please Describe the Primary Tenant Lease Terms

Lease Conditions	Describe
Tenant	
Leased Premises	
Allowed Uses	
Term of the Lease	
Rents and Fees	
Security Deposit	
Tenant Planned Improvements	
Other	

Just a few more general questions....

Evaluation and Lessons Learned

1. How does the airport measure the success of this reuse?

2. Were there unexpected benefits of the reuse?

3. What were the biggest obstacles and challenges to implementation of reuse?

4. What advice would you give other airports undertaking reuse?

5. Do you have any documents that we could review on this reuse?

Documents

Project Summary

Reuse Study

Market Evaluation

Marketing Material

Lease Summary

Thank you so much for your time and information. If you have additional thoughts or questions, please contact:

KRAMER aerotek inc.

580 Utica Avenue

Boulder, CO 80304-0775

303.247.1762

info@krameraerotek.com

Abbreviations used without definition 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
SAFETY-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

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500 Fifth Street, N.W.
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