Capital Planning Considerations for Airport Improvements

Thursday, October 10, 2013
Information on ACRP

- www.TRB.org/ACRP
- Regular news and updates on:
  - Upcoming and ongoing research projects
  - New publications
  - Success stories
  - Announcements
  - Webinars
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Ways to Get Involved in ACRP

- Submit a research idea, also called a Problem Statement
- Prepare a proposal to conduct research
- Volunteer to participate on a project panel; Travel expenses are reimbursed
- Apply to be an ACRP Ambassador or member of the ACRP Speakers Bureau
- Use our research results
Upcoming ACRP Webinars

• November 7th – Airport Emission Inventories and Reduction Strategies

• December 11th – Airport Sustainability Practices and Strategies

You can learn more about these webinars by visiting the www.trb.org/webinars
Today’s Speakers

Moderated by David Cushing, FAA

1) Overview of ACRP Report 68: Evaluating Terminal Renewal Versus Replacement Option
   • Joe Chang and Jeff Schultess, Ricondo & Associates

2) Overview of ACRP Synthesis 25: Strategies for Reuse of Underutilized or Vacant Airport Facilities
   • Lois Kramer, KRAMER aerotek inc.

3) Overview of ACRP Synthesis 13: Effective Practices for Preparing Airport Improvement Program Benefit-Cost Analysis
   • Steve Landau and Glen Weisbrod, Economic Development Research Group, Inc.
Joseph Chang  
Principal Investigator

- Vice President, Ricondo & Associates
- Registered Architect
- Terminal Planning

Jeff Schulthess  
Financial Analyses

- Vice President, Ricondo & Associates
- 20+ Years Experience
- Airport Business/Financial Planning
## ACRP Report 68
### Oversight Panel

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angela Newland</td>
<td>Broward County Aviation Department</td>
</tr>
<tr>
<td></td>
<td>Panel Chairperson</td>
</tr>
<tr>
<td>Roddy Bogus</td>
<td>Parson Brinkerhoff</td>
</tr>
<tr>
<td>Kenneth Bower</td>
<td>American Airlines, Inc.</td>
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<tr>
<td>Jon Cimperman</td>
<td>Port of Oakland</td>
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<tr>
<td>Kiran Merchant</td>
<td>Port Authority of New York &amp; New Jersey</td>
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<tr>
<td>Gregory Wellman</td>
<td>Parson Brinkerhoff</td>
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<tr>
<td>Teresia Schatz</td>
<td>Transportation Research Board,</td>
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<tr>
<td></td>
<td>ACRP, Senior Program Officer</td>
</tr>
<tr>
<td>Elisha Novak</td>
<td>Federal Aviation Administration Liaison</td>
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ACRP Report 68: Guidebook for Evaluating Terminal Renewal Versus Replacement Options

Guidelines for conducting a business-driven evaluation of competing options to renew or replace terminal facilities that is repeatable and scalable to airports of varying sizes.

• Published in 2012

• Discusses the Conditions and Environment for Terminal Redevelopment
  o Common Motivations
  o Contributing Factors and Guiding Principles that Influence the Evaluation Process

• Four Step Evaluation Process
Terminal Building Life Cycle

Common Motivations for Terminal Redevelopment

- Building Age and Physical Condition
- Air Service Changes
- Functional Obsolescence
- Optimize Use of Multiple Terminal Buildings
- Related Airport Development and Airport Master Plan
- Civic Aspirations
- Availability of Funding
Factors That Influence the Evaluation Process

- Governance
- Historic/Current Market Conditions
- Aviation Activity Forecasts
- Strategic Plan
- Financial Capacity
- Revenue Growth and Diversification
- Inventory Conditions
- Functionality
- Capital Improvements Program
- Regulatory Compliance
- Funding
Evaluation of Options in the Context of Overall Planning for Terminal Redevelopment

Evaluating renewal versus replacement options is only a phase of a larger process for redeveloping a terminal.
Airport Roles in the Terminal Planning Process

**EXECUTIVE MANAGEMENT**
- Mission and Vision

**UNDERSTANDING**
- Business Strategy
- Stakeholder Group
- Measures for Success
- Time Frame
- Civic Image

**ANALYZING & PLANNING**
- Define Long Term and Short Term Objectives
  - Facility Requirements
    - Gap Analyses
    - Alternatives Development and Evaluation
    - Options Evaluation
    - Detailed Financial Analysis
      - Rates and Charges
      - Funding
      - Return on Investment (ROI), Net Present Value (NPV), Internal Rate of Return (IRR)
      - Marketing and Leasing
      - Risk Analyses

**ACTING**
- Review
- Approve
- Define and Implement Projects
- Monitor/Fund

**FACILITIES PLANNING & DESIGN, ENGINEERING, MAINTENANCE**
- Terminal Conditions
- Operating Costs
- Space Utilization
- Level of Service
- Energy Systems
- IT Systems
- Inventory
- Capabilities

**BUSINESS AND FINANCE**
- Develop Indicators and Benchmarks
- Financial Capacity Analysis
- Rates and Charges
- Marketing and Leasing
- Debt Capacity
- Funding
Basic Principles for Conducting an Evaluation

• Provide clear unbiased statement of the project objectives.

• Investigate reasonable alternatives that satisfy a given program objective and conforms to the airport’s Strategic Plan.

• Consider alternatives in terms of its life cycle (total) costs, operational and functional benefits.

• Document all assumptions and factors that contribute to decisions.

• Ensure that an appropriate balance is maintained between: an airport’s capital needs; an airport’s ability to pay for capital projects; and affordability to the airlines.
Four Step Evaluation Process

• **Step 1:** Understand the Airport’s Strategic Goals
• **Step 2:** Refine Redevelopment Objectives and Generate Options
• **Step 3:** Evaluate Options
• **Step 4:** Make Recommendation with Clearly Stated Assumptions
Step 1

UNDERSTAND THE AIRPORT'S STRATEGIC PLAN

AIRPORT STRATEGIC PLAN

Process Guidance: ACRP Report 20

FACILITY CONDITIONS: Acceptable
GAP ANALYSIS: Acceptable

Prepare Refined Life Cycle Cost Analyses

FACILITY CONDITIONS: Unacceptable
GAP ANALYSIS: Acceptable

Negative Net Present Value

Add Approximate Projects to Normal CP or O&M

CONDUCT FINANCIAL CAPACITY ANALYSIS

INSUFFICIENT FINANCIAL CAPACITY

SUFFICIENT FINANCIAL CAPACITY

ESTABLISH PROGRAM REQUIREMENTS

GO TO STEP 2

FUNDING AVAILABILITY

PFC CAPACITY

CASH FLOW

BORROWING CAPACITY

TOTAL FUNDS AVAILABLE
Step 2: Refine Redevelopment Objectives and Generate Concept Options
Step 3
EVALUATE OPTIONS

QUALITATIVE EVALUATION
- Strategic Objectives
- Programmatic & User Requirements
- Time Based Total Program Costs
- Summarize Qualitative Evaluation Metrics

DETAILED FINANCIAL ANALYSIS
- Operating Assumptions
- Activity Growth Considerations
- Finalize Financial Model Inputs

KEY FINANCIAL MODEL METRICS
- Debt per Enplanement
- Days of Cash on Hand
- CPE
- Debt Service Coverage Ratio
- Direct Terminal Costs
- Revenue Per Enplanement

PERFORM SENSITIVITY ANALYSES
Step 3

Both Options are Fundable

CAPITAL JUSTIFICATION

Perform Value Analyses
Perform Targeted LOCA/BCAs

Analyze Risk
Select Preferred Options

GO TO STEP 4

One or Both Options Over Budget

Revisit Financial Constraints (Inputs)

Increase Budget

No Budget Increase

Return to Step 2 and Rescope Options
Detailed Financial Analysis / Typical Airport Financial Model

- **Capital Projects**
  - Terminal
  - Airfield
  - Apron
  - Roadway
  - Cargo
  - Parking
  - Repairs
  - Rental Car
  - Other

- **Funding Plan**
  - Federal/State Funds
  - Airport Operator Funds
  - PFC Funds
  - Other/3rd Party Funds
  - Revenue Bond Proceeds

- **Other Fund Deposits**
  - (e.g., operating reserve, R&R)

- **Existing Debt Service & Amortization**

- **Additional Debt Service & Amortization**

- **Annual Debt Service & Amortization**

- **Existing Operating Expenses**

- **Additional Expenses**

- **Annual Operating Expenses**

- **Airline Rates & Charges**
  - Landing Fee
  - Terminal Rentals
  - Other Airline Fees

- **Existing Nonairline Revenues**

- **Additional Nonairline Revenues**

- **Annual Nonairline Revenues**

- **Airport Costs**

- **Airport Revenues**

- **Net Revenues and Debt Service Coverage Ratio**

- **Airline Cost Per Enplaned Passenger**
Airline Cost Per Enplanement
(Current Year Dollars)
For additional information:

ACRP Report 68: Guidebook for Evaluating Terminal Renewal Versus Replacement Options

http://www.trb.org/Main/Blurbs/167299.aspx

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Strategies for Reuse of Underutilized or Vacant Airport Facilities

Lois Kramer
October 10, 2013
The Team

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Senior Program Officer – Gail Staba

Panel
- William Randell Forister, Pittsburgh International
- Christine Gerenchere, TRB
- Brandon Mark, Port of Oakland
- John Walewski, Texas A&M University
- David Cushing, FAA
Lois Kramer
Principal Investigator

- Principal Investigator on ACRP Synthesis 48: How Airports Measure Customer Service Performance
- Principal Investigator on ACRP 01-15: Innovative Revenue Strategies
- CEO of KRAMER aerotek, an aviation consulting firm
What’s in the Synthesis

1. Overview of the root causes and issues surrounding reuse of aeronautical facilities
2. Exploration of short and long-term solutions
3. Case studies of reuse situations
4. Steps airports can take to reduce surprise and risk
As They Lose Traffic, Once Bustling Airports Have Space to Rent

The vacant D concourse at Lambert-St. Louis International Airport
Commercial Airports of All Sizes Have Experienced Capacity Reductions

% Change in Domestic Departures 2007-2012

-8.8% Large Hub
-18.2% Medium Hub
-26.2% Small Hub
-15.4% Non-Hub

Excess terminal space has occurred unevenly throughout the system....
Change in Enplanements, 2000-2012 at U.S. Hubs

- 75% Charlotte
- 52% New York (JFK)
- 40% Denver
- 34% Chicago Midway
- 19% Philadelphia
- 17% Atlanta
- 16% Houston Intercontinental
- 16% Seattle
- 16% Baltimore
- 15% Miami
- 14% Las Vegas
- 12% Washington Dulles
- 9% San Francisco
- 8% Phoenix
- 8% All Primary Airports
- 3% Salt Lake City
- 3% Cincinnati
- 2% Pittsburgh
- 2% St. Louis
- 2% Memphis
- 2% San Jose
- 1% Cleveland
- 1% Kansas City
- 1% Raleigh/Durham
- 1% Port Columbus
- 1% Detroit
- 1% Minneapolis-St. Paul
- 1% Chicago O'Hare
- 1% Los Angeles
- 1% Newark
- 1% Dallas-Ft. Worth

-74%
-61%
-59%
-41%
-34%
-31%
-18%
-14%
-10%
-10%
-6%
-5%
-3%
-1%
-1%
Types of Vacant/Underutilized Facilities

- Terminals and Concourses
- Cargo Facilities
- Maintenance Facilities
- Hangars
- Military Base Closures
- Non-Aeronautical Buildings
Case Studies

- **Terminals**
  - Demolition: Pittsburgh - Old Terminal
  - Reuse: Springfield Branson - Expedia Call Center
  - Historic Preservation: JFK - TWA Flight Center

- **Cargo**
  - Dayton UPS Menlo Facility and Cargo Hub
  - Pittsburgh Jet Bridge Refurbishing

- **Military Base Closures**
  - Phoenix-Mesa Gateway - Commercial Airport
  - Rickenbacker International - Multiple Uses

- **Maintenance Base**
  - Reuse: Tampa - Former US Airways Hangar Converted to MRO
  - Vacant: Duluth Maintenance Center - LEASED
  - Subdivided: Indianapolis Maintenance Center
  - Interim Uses: Oakland Maintenance Center

- **Non-Aeronautical Building**
  - New Bedford Training Center
Synthesis Findings

- Vacant/underutilized facilities at airports are widespread.
- While lease expirations and changes in ownership occur regularly in property management, rejection of leases during bankruptcies can result in sudden and large reductions in airport revenues and instant ownership of facilities (often obsolete).
- Unexpected return of facilities back to the airport will require immediate funds maintenance, reuse, or demolition.
Synthesis Findings (continued)

- Revenue replacement is difficult in the short run.
- Reuse of aeronautical facilities for non-aero purposes is complex and expensive (security, grant assurances, AOA’s, environmental cleanup, stakeholder support) and typically takes years to accomplish.
Synthesis Conclusions

- Take decisive action on reuse or demolition options that include adherence to specific timelines associated with each option.
- Keeping a vacant facility alive preserves options, but it is expensive. Sometimes demolition is the lowest cost option.
- Unanticipated facility ownership requires additional airport operating and capital funds.
- Expect that securing new tenants will take awhile and require an extensive marketing effort.
Additions to Property Management Toolbox

- Risk Analysis for Vacancies
  - Evaluate vacancy risks annually.
  - For highest risks, develop mitigation plans and incorporate reserve funds into budget cycle.

- Lease Protections
  - For new leases, institute provisions that protect the airport in event the lease is suddenly terminated such as letters of credit naming the airport as the sole beneficiary to guarantee funds are available for reuse or demolition of a property. (Continuously enforce.)
Additions to Planning Toolbox

• Understand environmental, safety and security requirements for vacant properties.
• Develop a cost estimator to evaluate options to maintaining, reuse, or demolish a property.
• Plan future airport facilities for flexible use, changes in demand, and new technology.
Thanks for listening. Challenge us with your questions.

Check out ACRP Synthesis 25
Strategies for Reuse of Airport Facilities
http://www.nap.edu/catalog.php?record_id=14592

To discuss facility reuse or airport business planning, please contact:

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ACRP Synthesis 13: Effective Practices for Preparing Airport Improvement Program Benefit-Cost Analysis

Steven Landau and Glen Weisbrod

Economic Development Research Group, Inc.
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Co-Principal Investigator

- Vice President and Aviation Practice Leader of Economic Development Research Group

Glen Weisbrod
Co-Principal Investigator

- President and Founder of Economic Development Research Group
ACRP Synthesis 13 Topic Panel

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Rob Brancheau, Orlando International Airport
Scott J. Bascom, Vermont Agency of Transportation
Jeffrey Cohen, University of Hartford
Mitchell Holmes, PBS&J, Fort Worth, TX
R. Douglas Trezise, Ricondo & Associates, Inc. Chicago
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Alex Zaslov, Simat, Helliesen & Eichner, Inc., Washington, DC
Joseph Hebert, Federal Aviation Administration (Liaison)
Robert Samis, Federal Aviation Administration (Liaison)
Christine Gerencher, Transportation Research Board
Gail Staba, ACRP Senior Program Officer
ACRP Synthesis 13: Effective Practices for Preparing Airport Improvement Program Benefit-Cost Analysis

- Define and describe benefit assessment techniques used by airports as well as other modes
- Highlight best practices and identifies inconsistencies of how benefits are calculated and where there is confusion in the FAA benefit-cost guidance.
- Focus on GA and small commercial airports
- Published 2009
Approach

• Literature review to define benefit – cost analysis
• Examine benefit – cost guidelines for all U.S. modes
• Review of 117 benefit-cost studies submitted to FAA for AIP grants from 1998 through 2008, including in depth review of 24 BCA studies, with FAA evaluations, correspondence with proponents & multiple submissions
• Identify proposed airport improvements and reviews similarities and differences of how benefits and costs are calculated for each type of improvement
• Case studies of funded projects, using documentation and interviews with airport managers, consultants who prepared BCA studies and (current and former) FAA staff
Hubs are 4% of NPIAS Airports and account for 60% of BCAs Submitted

- Large Hub Primary: 26%
- Medium Hub Primary: 18%
- Small Hub Primary: 16%
- General Aviation: 21%
- Non-Hub Primary: 15%
- Non-Primary Commercial Service: 2%
- Reliever: 2%
- General Aviation: 21%
Relievers & GA are 85% of NPIAS Airports and Account for 22% of BCAs Submitted

<table>
<thead>
<tr>
<th>Airport Class</th>
<th>Total NPIAS Airports</th>
<th>BCAs Submitted</th>
<th>BCAs Accepted</th>
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<tr>
<td>Hub</td>
<td>139</td>
<td>71</td>
<td>46</td>
</tr>
<tr>
<td>Other Commercial</td>
<td>360</td>
<td>20</td>
<td>10</td>
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<tr>
<td>Reliever &amp; GA</td>
<td>2,831</td>
<td>26</td>
<td>14</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>3,330</strong></td>
<td><strong>117</strong></td>
<td><strong>70</strong></td>
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Typical FAA Processing of BCA Submissions

APO 200 may point out flaws in BCA to APP 500, which then communicates these flaws to proponent. Iterations of the BCA may.

- Project Proponent (airport & consultant) → Agree on base case → Airports Division (APP-500) → Policy Office (APO 200) for BCA Review → Airports Division for Decision → FAA Regional Office
BCA Studies by Project Type

N = 117
BCA Studies by FAA Disposition

- Pending - Ongoing FAA Review
- Reviewed and Resubmitted
- Not Accepted
- Withdrawn
- Rendered No Objection
- Made Exempt
- Regional Decision
- Partially/Conditionally Accepted
- Accepted

N = 117
Benefit Measures in BCAs Reviewed

Percent of BCA Studies

- Reduced Aircraft Operation Costs
- Reduced Passenger Delays
- Air Time Savings
- Ground Time Savings
- Salvage Value
- Consolidation of Flights
- Increased Air Cargo Revenue
- Land Revenues
- Reduced Operating Cost-Savings
- Increased Non-airline Revenue at Airport
- Increased Airline Ticket Revenue
- Energy Savings
- Reduced Fares
- Less Wear and Tear on Aircraft

N = 24
FAA Disposition of BCA Studies by Airport Class

N = 117
Outcomes of Reviewed Projects

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<th>Disposition</th>
<th>BCAs Reviewed</th>
<th>% of Total Submitted</th>
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<tr>
<td>Accepted</td>
<td>16</td>
<td>67%</td>
</tr>
<tr>
<td>Partially/Conditionally Accepted</td>
<td>2</td>
<td>8%</td>
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<tr>
<td>Regional Decision</td>
<td>2</td>
<td>8%</td>
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<tr>
<td>Withdrawn</td>
<td>2</td>
<td>8%</td>
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<tr>
<td>Not Accepted</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Pending - Ongoing FAA Review</td>
<td>1</td>
<td>4%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
<td><strong>100%</strong></td>
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Case Study Project Examples

- GA runway extension to serve corporate jets. Partially accepted by FAA.
- Proposed new small hub to consolidate commercial service of two airports. Not accepted by FAA.
- Reliever runway extension to better serve a reliever regional airport for corporate jets. Accepted by FAA.
- Small Hub to develop new (replacement) runway to meet rise in forecast aviation demand. Accepted by FAA.
- GA runway extension to allow reliable operation of larger aircraft to improve response to oil spills in the LA Gulf. Accepted by FAA.
- GA runway extension to improve airport ability to facilitate just-in-time deliveries to local manufacturers. Accepted by FAA.
Expanding the Aviation Community

FAA acknowledges that aviation dependent activities may be a valid basis for Benefit – Cost Analysis.

Demonstrated by favorable consideration of the:

1. Economic necessity for just-in-time deliveries to manufacturers off-airport; and
2. Economic benefit of cleaning up oil spills in the Louisiana Gulf.
Discount Rate Set BCA Hurdle

- Example: Sum of Nominal Costs equals $13,900,000 and sum of nominal benefits equals $28,000,000.

<table>
<thead>
<tr>
<th>Discount Rate</th>
<th>PV Benefit*</th>
<th>PV Costs*</th>
<th>NPV*</th>
<th>BC Ratio</th>
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<tbody>
<tr>
<td>10%</td>
<td>$10,925</td>
<td>$7,346</td>
<td>($3,579)</td>
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<tr>
<td>7%</td>
<td>$11,700</td>
<td>$10,549</td>
<td>($1,151)</td>
<td>0.90</td>
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<td>5%</td>
<td>$12,267</td>
<td>$13,368</td>
<td>$1,401</td>
<td>1.11</td>
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<tr>
<td>3%</td>
<td>$12,881</td>
<td>$17,985</td>
<td>$5,104</td>
<td>1.40</td>
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</table>

*All dollars are in thousands
Net Benefit Value Differs from Benefit/Cost Ratio

<table>
<thead>
<tr>
<th>Project</th>
<th>PV of Benefit*</th>
<th>PV of Cost*</th>
<th>Net Present Value (Benefit–Cost)*</th>
<th>B/C Ratio (Benefit/Cost)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>$36</td>
<td>$30</td>
<td>+$6</td>
<td>1.2</td>
</tr>
<tr>
<td>B</td>
<td>$3</td>
<td>$1</td>
<td>+$2</td>
<td>3.0</td>
</tr>
<tr>
<td>C</td>
<td>$8</td>
<td>$10</td>
<td>-$2</td>
<td>0.8</td>
</tr>
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* Figures are in Millions
BCA Guidance Varies by Mode
Values of Passenger Time Vary by Mode

(*) indicates that values increase annually with inflation
Other Differences Across Modes

• **FAA mandates a discount rate 7% rate**
  - Other modes allow lower rates based on more recent conditions

• **FAA guidance explicitly permits consideration of “hard to quantify benefits”**
  - Unlike other modal guidance documents.

• **Safety benefits are handled differently in aviation BCA guidance than in any other modal guidance.**
  - Primarily because aviation crashes are extremely rare; however, when they occur, they can be very costly.

• **Aviation guidance concerning freight delay includes: (1) the value of tied up inventory, (2) spoilage and (3) logistical bottlenecks**
  - Most highway-related guidance documents define freight time savings only in terms of the cost of operator and vehicle time. Logistics costs are recognized as a legitimate element of truck and rail freight in BCA guidance posted by the FHWA Office of Freight.
For additional information:

ACRP Synthesis 13: Effective Practices for Preparing Airport Improvement Program Benefit-Cost Analysis

http://www.trb.org/Publications/Blurbs/161751.aspx

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