Challenges Facing Small Airports: Effective Practices for Preparing Airport Improvement Program Benefit-Cost Analyses

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Findings from ACRP Synthesis 13 Effective Practices for AIP Benefit-Cost Analysis

Overview Case Studies





BCA Studies Are Submitted Primarily From Hub Airports





Common Benefits in BCAs

Used by Hub Airports. Robust volume of commercial operations and enplanements drive benefit calculations.

- Reduced Aircraft Operation Costs
- Reduced Passenger Delays
- Reduced Aircraft Delays
- Air Time Savings
- Ground Time Savings
- Salvage Value
- Consolidation of Flights



Why Do Small Airports Have Trouble Reaching "1.0"?

1. Volume of Activity

- A lot of benefits are based on savings/returns realized from operations and/or passengers
- 2. Congestion is rarely an issue
- 3. Similar facilities nearby minimize costs for diversion
 - e.g., nearby GA airport with ILS or a 5,000 foot runway



Small airports rely on singular and contextual benefits, while also making the most of frequency measures.

Use of Difficult-to-Measure & Non-Quantified Benefits in a BCA Study

- Small airports might not be held to a 1.0 BCA for project approval if there significant non-quantified benefits
- Demonstrating strong non-quantified benefits can lead to FAA support for AIP funds
 - Examples include:
 - Noise reduction
 - Potential cargo benefits
 - Environmental benefit
- Base case & safety issues
 - Regulatory Compliance

These can also be quantified & monetized



Capacity Enhancements at Small Airports

Enable new types of aircraft and air services at the airport, such as new corporate aviation uses or air cargo that benefit local economy

Are user benefits & externalities separated by a <u>fine line</u> or <u>barrier</u>?

User Benefits



Externalities

Four Case Studies

- Jimmy Stewart Airport PA
- Concord Regional Airport NC
- Houma-Terrebonne Airport LA
- Rock County Southern WI Regional Airport - WI



Jimmy Stewart Airport Indiana Country PA

The second second second	Overview	
	Airport Type	GA
	Proposed Project	Lengthen runway from 4,000 to 5,500 ft; add ILS
	B/C Ratio	0.65 combined
		1.21 for ILS, only
I design to a		0.38 for runway extension, only
The second secon	Outcome	Partial FAA funding provided



Quantified Benefits	Unquantified Benefits
 Ability to land with lower cloud or visibility 	•Operational Safety: full RSA & elimination of nonstandard OFA
 Induced operational demand resulting from additional runway length (supported by survey of area business users) Avoidance of operational restrictions or impacts during construction activities Reduced passenger travel time resulting from commuter travel to other airports 	•Environmental Benefits: decreased vehicle emissions due to reduced ground travel time to airport & reduced emissions from less aircraft circling and fewer missed approaches
	•Airport revenues by meeting demand for aviation storage, fuel, and other factors
	 Expeditious transportation of critical trauma patients
	 Community economic Impacts



Issues Guiding FAA Review

- Accepted BCA methodology
- Project approved w/partial funding due to need for safety improvements



Concord Regional Airport Concord, North Carolina

	Overview	
all the ter	Airport Type	Reliever
	Proposed Project	Extend runway from 5,500 ft. to 7,000 ft.; add section of parallel taxiway; associated drainage, erosion control and lighting
	B/C Ratio	1.35; all sensitivity tests returned BCA > 1.0
Sto VER PRESS	Outcome	BCA Accepted



Quantified Benefits	Unquantified Benefits
•Reduction of aircraft delays for users of Charlotte Douglass International Airport	•None required
•Time saved by passengers of Concord Regional Airport (certain critical aircraft departures will not have to stop for refueling)	



Issues Guiding FAA Review

- Accepted BCA methodology
- Indicated that benefits may have been underestimated
 - Although the BCA counted air carrier delay avoidance cost savings for operations occurring at Concord, it omitted associated air carrier passenger delay avoidance cost savings



Houma-Terrebonne Airport Houma, Louisiana





Overview		
Airport Type	General Aviation	
Proposed Project	Strengthen primary runway to allow the reliable operation of larger, heavier aircraft.	
	Strengthen aircraft parking apron	
	Improve the east-side automobile access road and expand the aircraft parking apron to provide additional public-use aircraft parking	
B/C Ratio	.2 – 4.0	
Outcome	BCA Accepted	

BCA driven entirely by environmental benefits. Other factors did not alter the BCA ratio

Environmental Benefits – Avoidance of damage due to untreated oil spills

- Total cost avoided is a function of: "number of spills and the distance off shore"
 - The more events that occur and the farther off-shore they occur, the greater the cost avoided

•BCA evaluated scenarios with combinations of number and distance from:

- 2 7 events/year
- Between 50 and 600 miles off-shore



Issues Guiding FAA Review

- Concerned that project appeared to support only one user. FAA requested:
 - Additional information regarding who the benefits would accrue to (aviation users or aeronautical purposes)
 - Additional years of historical data regarding past clean-up activities (number of events, locations)
 - Needed to determine likely future activity
 - Hard commitment to purchase heavier aircraft
 - Information if other airports had been given the opportunity to house cleanup activities



FAA Review (continued)

The issues were addressed through subsequent correspondence between the applicant and the FAA

- Although the concerns were not entirely resolved, the FAA ultimately was satisfied that the project would generate a B/C ratio greater than 1.0
- BCA was approved. Project was completed in 2005, allowing airport to be key staging area for Hurricanes Katrina and Rita cleanups.



Rock County Southern WI Regional Airport Janesville, Wisconsin

and the second		Overview
	Airport Type	General Aviation
	Proposed	Extend & strengthen
	Project	6,700 ft. to 7,300 ft.
		Install ILS
	B/C Ratio	0.28 -0.46
		3.23 – 5.27
	Outcome	BCA Accepted



Quantified Benefits. Direct costs to operators represent only a small portion of the total economic cost of inadequate runway conditions at Rock County Airport

Cost savings associated with air & ground transportation	Cargo efficiencies realized with extended runway
• <u>Aircraft substitution benefits</u> - operators will be able to use 1 large plane in place of 2 small ones	 Logistics savings Avoiding indirect costs, such as production line slowdowns and
• <u>Refueling reduction benefits</u> - larger planes will not need to stop en route to refuel	shutdowns
• <u>Airport substitution benefits</u> – operators use more distant airports because larger and heavier aircraft could accommodate "just-in-time" deliveries at Rock County	



Issues Guiding FAA Review

- BCA is justified in including external plant which is directly impacted by airport's cargo capacity
 - Plant is direct consumer of aviation services
 - "Just-in-time" aviation deliveries are part of daily operations.
 - Plant is effectively part of the aviation community
- BCA documents results of not being able to land air carrier size cargo flights
 - Annual productivity loss at was estimated at \$4.4 mil/year
- B/C is greater than 1.0 if only \$1.5\$2 million per year is actually realized in these cost savings



Summary

Core BCA metrics are a large airport's game. To Push the Envelope for Small Airports: Itemize & discuss hard to quantify benefits Take advantage of unique circumstances Sometimes this includes externalities and expanding the aviation community ✓ Address multi-modal efficiencies



THANK YOU

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