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Benefit-Cost Analysis of a Replacement Airport

by

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Principal





Outline

- Unison Consulting, Inc.
- Background / legal basis
- U.S. FAA guidelines on airport BCA
- BCA steps
- Benefits & costs
- The case of a replacement airport for St. George Municipal Airport in Utah

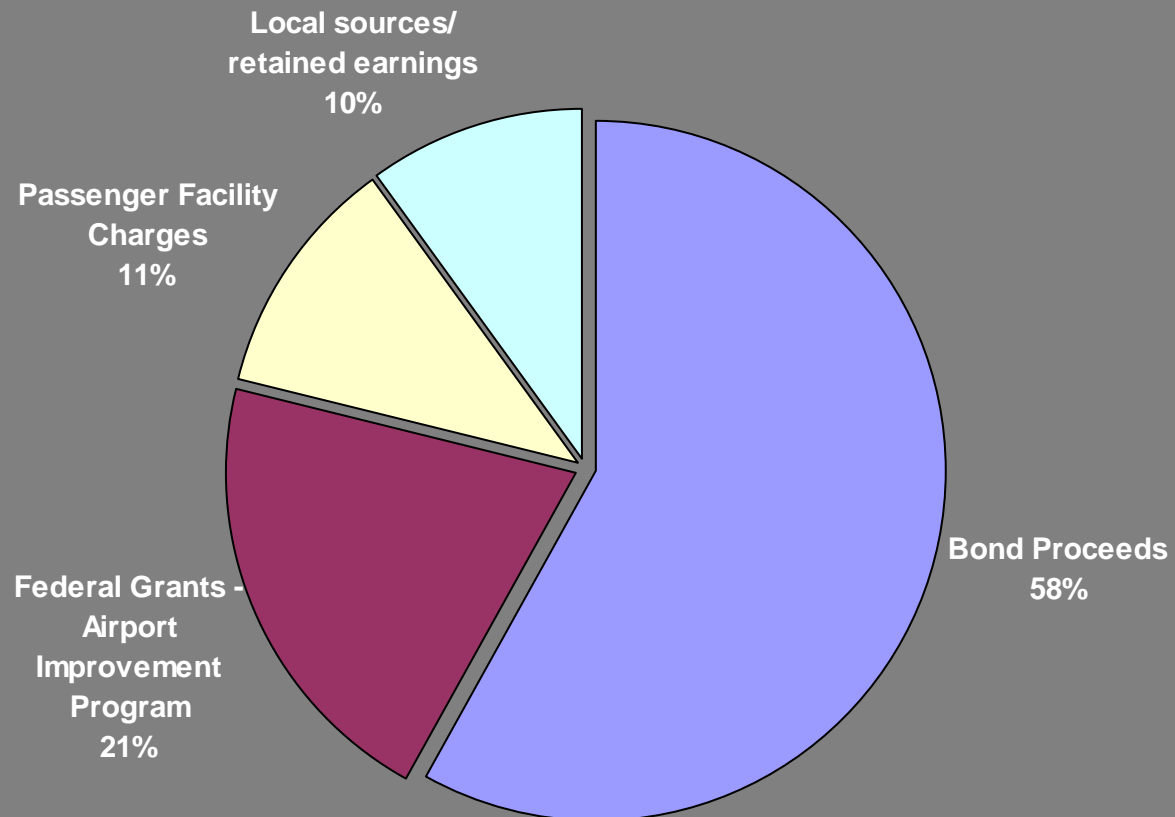
Corporate Overview

Who We Are?

- UCG Associates, Inc. dba Unison Consulting, Inc. is an Airport Consulting Firm providing services in:
 - Airport Finance & Economics
 - Airport Retail Planning & Management
 - Program Management
 - Information Systems
- Office Locations – United States
 - Chicago, Illinois
 - St. Louis, Missouri
 - Orange County, California
 - San Antonio, Texas
- 44 employees

Background: U.S. airport funding sources

21% comes from the Federal Airport Improvement Program (AIP) grants



Background: FAA BCA requirement

- Capacity projects requiring \$5 million or more in AIP discretionary grants
- All capacity projects requesting AIP multi-year grant commitments under a Letter of Intent (LOI)
- Airport capacity projects are those that:
 - Preserve an infrastructure
 - Improve upon an existing infrastructure
 - Create new infrastructure



Background: FAA BCA exemptions

- Reconstruction of critical airfield structures at large and medium hub airports
- Reconstruction of primary runways and associated taxiways and aprons at small airports
- Airport projects undertaken solely for:
 - Safety
 - Security
 - Conformance with FAA standards
 - Environmental mitigation



FAA guidelines on airport BCA

- Objective - to allow FAA to determine if:
 - There is adequate information to show project need and consequences
 - Benefits justify costs
 - Proposed project maximizes net benefits to society
 - The BCA uses best available data



FAA guidelines on airport BCA

- Focus: costs and benefits – monetary and non-monetary – to aviation system users (i.e. airport sponsor, airlines, passengers and shippers)
- Rationale: AIP funds are paid from the Airport and Airway Trust Fund, funded by aviation user taxes
- Excluded: regional economic impacts, especially multiplier effects



FAA guidelines on airport BCA

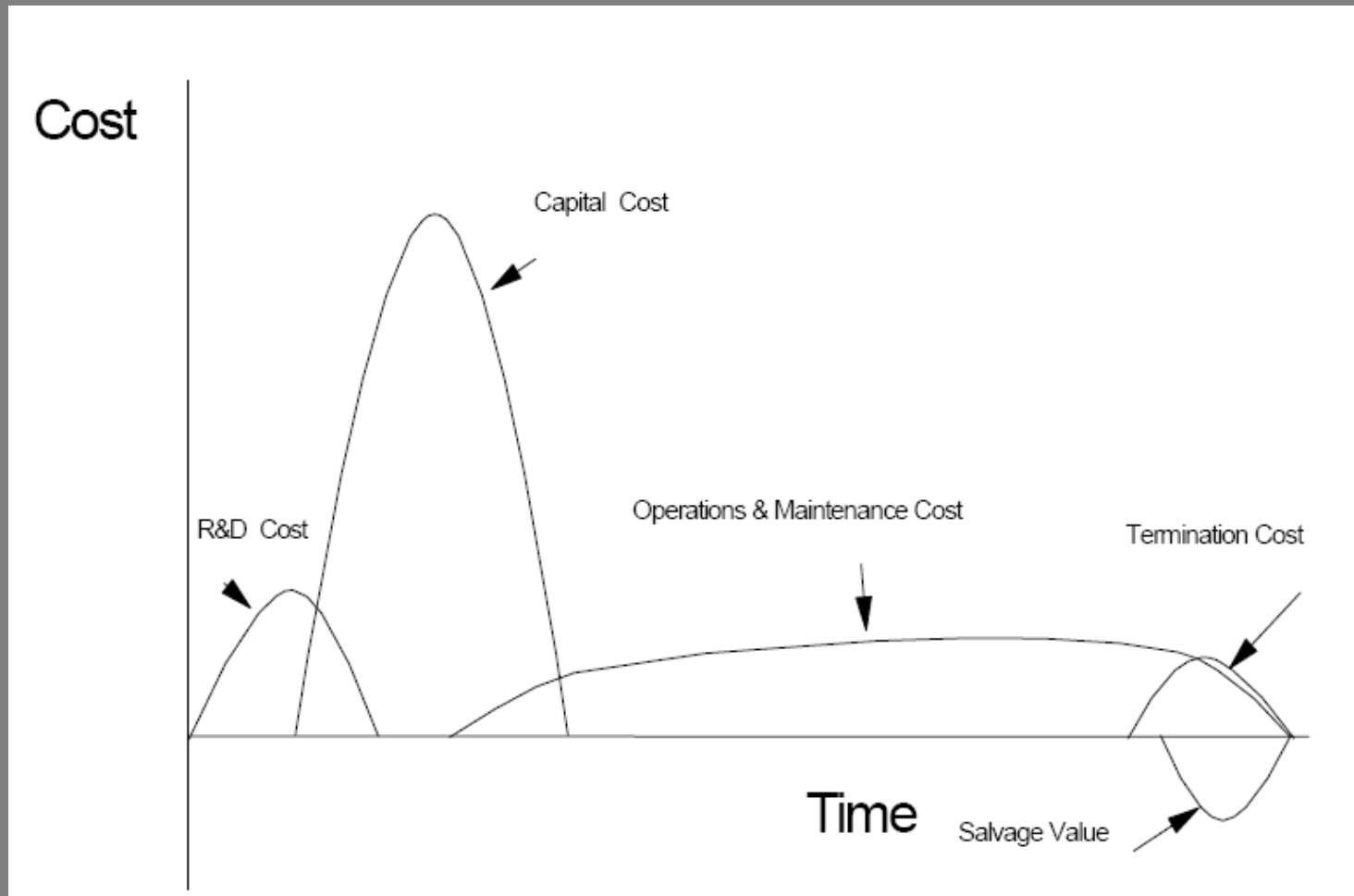
- Follows basic BCA steps:
 - Define project objectives
 - Specify assumptions
 - Identify base case (no investment)
 - Identify and screen all reasonable alternatives
 - Determine appropriate evaluation period
 - Establish reasonable level of effort
 - Identify, quantify and evaluate incremental benefits and costs
 - Compare benefits and costs: NPV, B/C ratio, IRR
 - Perform sensitivity analysis
 - Make recommendations



FAA guidelines on airport BCA

- Follows basic BCA principles:
 - Life-cycle benefits and costs
 - Constant dollar valuation to control for inflation
 - Discounting to account for opportunity cost of capital
 - Discount rate: 7% for airport projects funded with Federal grants

Life-Cycle Costs



Source: FAA Airport Benefit-Cost Analysis Guidance, December 1999



Measurement of Benefits

- Cost savings to airport users associated with reduced time spent in the airport system:
 - Reduced delay
 - More efficient processing
 - Reduced idle time
 - Improved predictability of landing and take-off schedules
 - Ability to accommodate more efficient aircraft
 - Other: environmental, safety, security, design standards



Typical benefits of airfield capacity projects

- New or extended runway, taxiway, apron, or hold pad:
 - Reduced aircraft, passenger and cargo delay during normal airport operations
 - Reduced aircraft, passenger and cargo delay during reconstruction of other airport facilities
 - Improved schedule predictability:
 - Airlines can make more efficient use of equipment and crew
 - Passengers can take later flight and get to destination on time
 - Improved traffic flows reducing vectoring and taxiing distances
 - Reduced airline operating costs and passenger travel time from ability to accommodate more efficient aircraft
 - Other: environmental, safety, security, design standards



Typical benefits of airfield capacity projects

- Reconstruction of runway, taxiway, apron or hold pad:
 - Lower facility maintenance costs
 - Avoided loss of capacity benefits associated with facility failure
- Acquisition of airside equipment (e.g. navigational aids, snow removal and maintenance equipment):
 - Reduced aircraft, passenger and cargo delay during normal airport operations
 - Greater schedule flexibility
 - Lower facility maintenance costs



Proposed Replacement Airport for St. George Municipal Airport, Utah

- Location:
 - The City of St. George is located in the southwestern corner of Utah, approximately 303 miles southwest of Salt Lake City and 112 miles northeast of Las Vegas
- Air service area:
 - A growing population
 - A growing workforce
 - Growing tourism
- Objective:
 - To develop an airport that can safely and efficiently accommodate the anticipated increase in aviation activity



Proposed Replacement Airport for St. George Municipal Airport, Utah

- Base case
 - Existing airport sits atop a mesa with no room to expand
 - Runway and taxiway can accommodate only small turboprop aircraft with 30 seats
 - Does not adequately handle existing demand for air service in the area – leakage to Las Vegas
 - Cannot handle the projected increase in aviation demand that would necessitate the use of larger and faster aircraft



Proposed Replacement Airport for St. George Municipal Airport, Utah

- Alternative: construct replacement airport
- Benefit: enable airport to accommodate larger aircraft and enable airlines to expand air service in St. George
- Investment components:
 - Land acquisition and site work
 - New runway, taxiways and associated facilities
 - New terminal building and aprons
 - General aviation, cargo and support facilities
 - Access roadways

Forecast of Aviation Activity for St. George Municipal Airport, Utah

	1998	2008	2013	2018
Enplanements				
Constrained	32,910	52,000	65,700	84,000
Unconstrained		52,000	107,150	191,900
Annual Operations				
Constrained	4,242	5,840	7,200	9,490
Unconstrained		4,490	10,220	10,220
Aircraft Fleet Mix				
Constrained				
EMB-120 (30 seats)	100%	100%	100%	100%
Unconstrained				
EMB-120 (30 seats)	100%	40%	40%	30%
CRJ (50 seats)		60%	60%	58%
B737 (130+ seats)				12%



Proposed Replacement Airport for St. George Municipal Airport, Utah

- BCA technical parameters
 - Evaluation period: 27 years (7 years of land acquisition and construction plus 20 years of economic life upon completion)
 - Constant dollar valuation
 - Discount rate: 7 percent for base analysis



Assessment of Costs - Proposed Replacement Airport

- Capital costs (three phases)
- Net operating revenues (incremental revenue minus incremental costs)



Assessment of Benefits - Proposed Replacement Airport

- Reduced passenger air travel time – existing passengers (30% of potential demand)
 - Access to larger & faster aircraft
 - For 14.4%, access to direct flights to destinations eliminating layover at Salt Lake City
 - 74 minutes mean layover time at SLC
- Reduced passenger airport ground access time - passengers going to Las Vegas (70% of potential demand)
 - Half of them will use the replacement airport saving 2 ½ hours in airport ground access each way
- Values for passenger travel time



Assessment of Benefits - Proposed Replacement Airport

- Airline operating cost savings
 - Variable and fixed costs
 - Larger aircraft cost more to operate per flight
 - However, fewer flights will be needed to serve the same level of enplanements
 - Result: net savings in total aircraft operating costs

Cost-Benefit Comparison - Proposed Replacement Airport

- Cost-benefit comparison:
 - NPV of \$12.0 million
 - B/C ratio of 1.23
 - IRR of 8.6%
- Sensitivity analyses
 - Discount rate: 7%, 4%, 10%
 - Value of time: recommended, low and high
 - Enplanements: 100% of forecast, 90%, 80%
 - Project with and without GA component
 - Development phasing
 - NPV > 0 in 106 out of 162 scenarios



Other Benefits - Proposed Replacement Airport

- Improvement in safety from the acquisition of airside navigational aids
- Improvement in passenger comfort and convenience from the use of larger aircraft
- Improvement in passenger flows and passenger comfort from larger and more modern terminal
- Improvement in traffic safety from new airport access road
- Regional economic impact from expansion in air service



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