

Guidebook and Model for Demonstrating Return on Investment for BIM at Airports

ACRP Staff Comments

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TRB Aviation Committee Comments

AIRPORT TERMINALS AND GROUND ACCESS: Support. BIM has become an increasingly important tool in airport asset management and capital development. Suggested combining all proposed BIM Problem Statements at the upper level of funding and duration (17-01-01, 17-01-02, 17-09-01, and 17-09-02).

Review Panel Recommendation and Comments

Recommended. ROI is clear for construction and design, yet less so when it comes to facility management, as that requires a lot of assumptions--making things not happen. Second-tier airports would benefit from guidance. Recommend adding the elements from 17-01-02 pertaining to developing contracting guidance. The budget should be sufficient for this additional effort.

AOC Disposition

This problem statement received an average rating of 3.2 points out of a possible 5 points among voting AOC members. This is an important issue. The research efforts for 17-01-01 and 17-09-01 were combined, approved, and funded at \$750,000 as ACRP Project 09-15.

ACRP Problem Statement

1. **Problem Statement Title:** Guidebook and Model for Demonstrating Return on Investment for BIM at Airports
2. **Background:** Building information modeling (BIM) offers tools that allow airport decision makers to understand all components of a facility, their location and attributes, graphically and systematically, to minimize the total cost of owning and operating an airport facility. It can be shared by planners, designers, constructors, operators and maintainers to provide reliable information for decision making throughout the facility's life cycle. BIM is an emerging technology that is only recently being implemented in airports in North America.

An organization's BIM effort often begins with consideration of the business case. Both the calculated and perceived *return on investment* (ROI) associated with BIM is believed to be significant. However, there is currently no guidance for airports related to determining appropriate *key performance indicators* (KPI) and calculating ROI for BIM. Quantifying BIM-

associated costs is generally straightforward, as costs are often discrete and trackable. This is not the case with BIM-associated benefits, the value of which are often accrued long term and across the entire organization in terms of increased efficiency of operations and enhanced building (asset) management and performance.

Further research is needed in this topic area to support an airport's ability to implement BIM and operationalize the identified benefit of reduced costs through metrics that provide the information needed for calculating ROI. This will support an airport's organizational goals of managing assets in ways that maximize facility life cycle value and minimize the true cost of ownership.

3. **Objective:** Develop guidance for demonstrating return on investment (ROI) for building information modeling (BIM) at airports
4. **Proposed Tasks:** Tasks to support the development of a guidebook and model for airports that provide guidance in considering organizational needs and enables users to develop meaningful KPIs and calculate ROI on BIM. The guidebook addresses the complexity and uniqueness of an airport facility in terms of its existing conditions and lack of available data about initial costs and life cycle costs, which is a barrier to development of BIM KPIs and ROI.

SUBMITTERS

(ACRP 11-03/S09-07 Panel)

- *Luciana Burdi*, Massport
- *Brendan Dillon*, DEN
- *Douglas Eberhard*, Autodesk
- *Mark Hughes*, AECOM
- *John McWilliams*, SEA
- *David Wilson*, SEA
- *Michael Riseborough*, GTAA
- *Alberto Villalba*, SAN
- *Tamera McCuen*, Univ. of OK
- *Dominique Pittenger*, (scribe)

Tasks also include items such as information gathering (e.g. literature review, survey, site visits), data collection and analysis.

5. **Estimated Funding:** \$500,000
6. **Estimated Research Duration:** 24 months
7. **Related Research:** Information on other research that is closely related to the proposed problem:
 - ACRP Synthesis (2016): *Building Information Modeling for Airports* (In press)
 - ACRP Report 69 (2012): *Asset and Infrastructure Management for Airports*
 - US NBIMS (2015): *US National Building Information Modeling Standard: Version 3*, National Institute of Building Sciences
 - Computer Integrated Construction Research Program (2013): *BIM Planning Guide for Facility Owners, Version 2*, The Pennsylvania State University
 - AACE (2006): *Total Cost Management Framework: An Integrated Approach to Portfolio, Program, and Project Management*
8. **Process Used to Develop Problem Statement:** This problem statement is the product of identifying future research topics from the collaborative effort of airport survey/interview/panel participants in the *ACRP Synthesis Project, Topic S09-07 BIM for Airports* (McCuen and Pittenger, 2016). Lack of guidance on calculating and demonstrating return on investment regarding BIM was identified by airport synthesis participants as being a current and especially challenging problem needing resolution.
9. **Person Submitting Problem Statement and Date:** ACRP 11-03/S09-07 Panel (p.1 text box); March 10, 2016

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