ACRP Problem Statement No. 14-01-07

Recommended Allocation: --

Enterprise Data Warehouse and Reporting Solutions for Airports

ACRP Staff Comments: No staff comments.

TRB Aviation Group Committees Comments: AVIATION ECONOMICS AND FORECASTING: This problem statement is conditionally supported by the committee. The problem statement as currently written functions more as advocacy of enterprise data warehouse systems than as a response to airport needs that such systems may address. The problem statement would be greatly improved through specification of airport data management problems that would be eased by these methods.

Review Panel Comments: Not recommended.—Private sector marketing should take care of this need.
1. **Problem Statement Title**
Enterprise Data Warehouse and Reporting Solutions for Airports

2. **Background**
Consistent, comprehensive, and easily accessible data are key to the functionality of any facility. Airports keep and use records for various aspects of airport operations, including airport safety, environmental management, inspection and regulatory compliance, financial management, and operations and maintenance. However, these data are not always catalogued and stored in a consistent, centralized, and shared manner. The concept of enterprise data warehouse storage, which creates a centralized repository for a variety of otherwise disconnected data streams may help streamline data collection, analysis, reporting, and ultimately decision-making to inform airport management. The concepts of integrated data management and performance management are conceptually linked. It is stated in *ACRP 19: Developing an Airport Performance-Measurement System* that “Performance measurement is not just about identifying and tracking some numbers; it is ultimately about managing to achieve results.” This concept should be considered within the context of integrated data management – adequate data systems are a prerequisite to performance management and therefore enable management to achieve results. In addition to improvements in decision-making as a result of centralized data management, enterprise data warehouse solutions may reduce duplicative data systems in place at airports and thus result in direct cost-savings.

Beyond the direct benefits of improved access to a variety of data sources by airport managers, the implementation of data warehouse solutions may have additional management benefits realized over time. Data warehouse solutions enable the consistent reporting of data over time, improving the ability of airport managers to assess the efficacy of airport initiatives across all aspects of airport operations. Further, such systems may enable airport managers to identify critical cross-linkages between different aspects of airport operations that may go unnoticed without integrated data management. Additionally, enterprise data warehouse solutions for airports may enable improved asset management to improve investment decisions, increase airport flexibility in the context of future changes to regulatory structures, and reduce costs through integrated and preventive maintenance.

3. **Objective**
The objective of this research is to identify and evaluate enterprise data warehouse systems that may be applied to airport operations to improve data management, analysis, reporting and decision making.

4. **Proposed Tasks**
The research plan should include the following tasks:

- Review of current practices related to enterprise data warehousing across business departments
• Develop a rating system to assess existing enterprise data warehousing solutions relative to operational needs at airports
• Assess the applicability of identified enterprise data warehousing solutions in other industries for application in airport operations
• Identify preferred solutions for three airport classifications: 1) large; 2) medium; and 3) small
• Prepare implementation guides for each preferred solution (i.e., separate implementation guide for each airport size and operation)
• Provide data integration strategies including open architecture, data security, data modeling, data storage, and data reporting tools

5. **Estimated Funding**
This project is expected to require $300,000 to complete the stated research objective.

6. **Estimated Research Duration**
This research project is expected to require 18 months to complete the stated research objective.

7. **Related Research**
A number of existing research efforts provide valuable context regarding the potential role of information technology (IT) in airports. *ACRP Report 59: Information Technology Systems at Airports—A Primer* provides a broad perspective on the role of IT in airport management and offers insights and advice into the implementation of IT systems at airports. The report does not specifically address the potential role of enterprise data warehousing solutions in airport operations, however. From an operational perspective, *ACRP Report 19: Developing an Airport Performance-Measurement System* presents an overview of performance management at airports, a concept which would be fundamental to the implementation of integrated and centralized data systems at airports. This report also stresses the need for adequate data systems in successful performance management of airports. The use of integrated systems at airports is discussed in *ACRP Report 74: Application of Enterprise Risk Management at Airports*. While this publication focuses specifically on risk management, the concepts explored may help define the systems-level approach needed to integrate various airport data sources into an enterprise data warehouse.

8. **Process Used to Develop the Problem Statement**
This problem statement was developed from a focus group webinar session held on February 13th, 2013. Participants in the focus group session included members of the American Association of Airport Executives (AAAE). The session was hosted by the Institute for Transportation Research and Education (ITRE).

9. **Person Submitting Problem Statement and Date**
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