Accurate Counting of Aircrafts Operations at Non-Towered Airports

ACRP Staff: Although the title is nearly identical, the scope actually expands upon research conducted for ACRP Synthesis 4, Counting Operations at Non-towered Airports by conducting comprehensive test of video counters at multiple airports.

TRB Aviation Group Committees: Aviation System Planning: Supported by all respondents. The need for this work is well founded particularly in light of the need to provide better measure of general aviation activity. The sampling of specific airports will provide a basis for projections for other airports which is correlated with attributes that are easier to measure. The results should be especially helpful to sponsor with a significant number of un-attended rural airports for which operational data is needed. The scope of the research should be expanded to include more than one technology for gathering data; a review of previous work and the most promising techniques could be selected for comparative tests. The research should review prior studies comparing automated aircraft counts to operations estimates by airport managers and others, including work undertaken by the California Division of Aeronautics.

Review Panel: Recommended – This problem statement has high Value because it will address the ongoing issue of obtaining accurate counts at non-towered airports and explore better technologies and methods. Accurate counts are needed for long-range planning and gauging impacts. Scope should be expanded to include both existing and emerging cost-effective technologies.

Results of broader industry survey evaluation of problem statements.

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<thead>
<tr>
<th></th>
<th>Value</th>
<th>Relevance</th>
<th>Need</th>
<th>Feasibility</th>
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<td>11-03-11 Accurate Counting of Aircraft Operations at Non-Towered Airports.... (n=74)</td>
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N = number of respondents to this particular problem statement.
Accurate Counting of Aircraft Operations at Non-Towered Airports

Research Problem Statement: Annual aircraft operations estimates are used in aviation systems planning, master plans, environmental studies, aviation forecasts, and to determine funding and design criteria for the nation's airports. At airports with air traffic control towers, aircraft operations are tracked and recorded by the air traffic controller. There are over 5,300 Public Use facilities in the United States; of which, only 546 have towers. Most of the towered airports are not manned, so even if an airport has a tower, significant operations can be missed when the tower is closed. Therefore, even though we have towers at just over ten (10%) percent of all public-use airports in the nation, accurate number of operations occurring of most of the public-use airports is unknown.

Objective: Produce accurate counts of aircraft operations/types of operations at all Non-Towered Public-Use airports in the National Plan of Integrated Airport Systems (NPIAS) using the most current technology.

Research Proposed: Given recent advances in aircraft tracking technology, operational data, and the additional hardware and software sophistication now available in aircraft and at airports through FAA’s NexGen program, there are technologies available that allow users to passively monitor aircraft traffic at much greater accuracies than previously possible.

The proposed research will employ field monitoring equipment at public-use NPIAS airports. While this technology review is proposed to span a twelve (12) month period, the research methodology will also investigate the accuracy of extrapolating actual counts for selected periods to develop annual operational counts. The plan recommended is to place the passive monitoring equipment at selected airports using the following strategy:

<table>
<thead>
<tr>
<th>Airports</th>
<th>Devices</th>
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<tr>
<td>5</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
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<tr>
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<td>2</td>
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<tr>
<td>40</td>
<td>20</td>
<td>Total</td>
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</table>

The placement of the field equipment under this plan will allow the development of accuracy tests-comparing the level of accuracy in performing actual operation counts for selected periods and extrapolating the counts for the development of more accurate counts of annual aircraft operations at a non-towered airport.
**System Specifics:** The research equipment should include the following features:

1. Video motion detection;
2. Capture and recording of movements at the field;
3. Easily access recorded and/or live images by date/time format;
4. Ability to use FTP (File Transfer Protocol);
5. Remote secure access using VPN (Virtual Private Networking protocol);
6. Password protected with User login accounts;
7. High level data encryption;

**Estimate of the Problem Funding and Research Period:** The estimate for purchase (or lease) of the necessary field equipment; placement of the equipment at each airport (relocating five (5) of the devices at mid-year and five (5) of the devices at three and two month intervals); monitoring of all equipment to confirm that data is being continually collected; assessment and analysis of the final data; and development of the final report is $750,000.

Assuming one month for placement for the placement of all devices, twelve (12) months of data collection, and three (3) months for analysis of the data and development of the final report, the research period is estimated to be sixteen (16) months.

**Urgency and Payoff Potential:** In 2007, FAA Headquarters, Office of Airport Planning and Programming (APP) initiated an accurate inventory of the Based Aircraft at all Non-Primary airports in the National Plan of Integrated Airport Systems (NPIAS). Prior to the initiation of the based aircraft inventory, the official count at the approximately 2,700 non-primary airports was over 175,000 based aircraft. The results of the detailed inventory has yielded a count of approximated 151,000, based aircraft. Further reducing the based aircraft count is the fact that the inventory confirmed that over 8,000 aircraft were being reported as based at more than one airport. This detailed inventory has resulted in the reduction of based aircraft counts from approximately 175,000 to 144,000 - a reduction of approximately eighteen (18%) percent. It is anticipated that a more accurate counting of aircraft operations will yield a comparable disparity. This data should result in a clearer picture of both operations/types of operations and based aircraft in the NPIAS.

**Related Research:** In 2007, a research project entitled "Counting Aircraft Operations at Non-Towered Airport, A Synthesis of Airport Practice" was completed for the Transportation Research Board. This research was focused on "the different methods used by states, airports, and metropolitan planning agencies, of counting and estimating aircraft operations at non-towered airports with the goal of identifying best practices."
This research, did list common practices; however, it was completed prior to recent advances in technology and did not include analysis of data and recommendations for matrices to be used in the analysis of future data collection efforts. The research proposed in this submittal will build off of the findings of the 2007 reports and add the most current technology and proposes to establish a recommended methodology for use by airports, consultants, and planning agencies in the development of accurate aircraft operation counts and forecasts.

**Person Developing the Problem:** The developer of this Problem Statement is:

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**Process Used to Develop Problem Statement:** Benjamin Mello works for the FAA in the Chicago Airport District Office. In this capacity he review master plans, airport layout plans, and airport system plans in both IL and IN. He is the program manager for several airports in IL and he is also responsible for environmental issues in the lower portions of IL and IN. Prior to his arrival with the FAA he was the Airport Planner at Juneau International Airport (JNU) in Juneau, Alaska. While employed at Juneau, Ben completed environmental reviews, capital improvement programming, passenger facility charge planning, terminal master plans and Part 139 certification. He also developed requests for proposals for planning and construction work. He worked as a consultant for approximately six (6) years shortly after graduating from college. His responsibilities over the course of his consulting career included aviation system planning, airport master planning, and environmental analysis. During this time he conducted statewide system planning and air service assignments in numerous states. This problem statement is the result of Mr. Mello's 12 years of airport planning.

**ORIGINAL SIGNED**  
Submitted By: _________________________  
Benjamin Mello  
October 1, 2009