

# VAISALA

## How Airports can Increase Competitive Advantage and Profitability



**Vaisala White Paper**

## Remaining Competitive in a Crowded Market

The total number of airports in the United States is 19,983 and rising each year.<sup>1</sup> As the number of airports continues to increase, so does the need for airports to improve their competitiveness.

To do this, airports must increase their availability. Without real-time weather information this is not possible. For example, Part 135 operators may not even depart for a destination unless the forecast weather there will allow an instrument approach and landing.

In addition, providing real-time weather information enables better pre-flight planning and in-flight updates—enabling pilots to plan accordingly and determine if they can safely take-off or land at an airport.

The need for real-time weather information is highlighted by the following example taken from the General Aviation Pilots Guide to Preflight Weather Planning: “At typical general aviation aircraft speeds, making a 200-mile trip can leave a two to three hour weather information gap between the preflight briefing and the actual flight. In-flight updates are vital...”<sup>2</sup>

By installing an Automated Weather Observing System (AWOS), an airport can increase its availability, safety and ultimately its bottom line. This white paper explores the features and benefits of an AWOS, how to secure funding and what to look for in an AWOS partner.

# The Solution: Automated Weather Observing System (AWOS)

An AWOS is ideal for both small and large airports and heliports. It collects and verifies weather data and then processes and disseminates that data through a variety of channels. A message is then generated and is available 24 hours a day over a dedicated phone line and an assigned VHF frequency.

Airports can also be equipped with displays for pre-flight planning. For dissemination beyond the local area, AWOS messages can be sent through the FAA's weather network and the National Airspace Data Interchange Network (NADIN). This allows real-time weather information to be accessed via flight service stations, pilot briefing systems and commercial weather vendors from anywhere in the country.

## The Benefits of an AWOS

An AWOS offers key benefits such as increased safety, efficiency, traffic and availability. Automation of weather observation functions via an AWOS offers multiple benefits. Timely, accurate weather information not only increases operational safety but also lowers costs and can dramatically impact the economic situation of both the airport and community in terms of increased flight traffic and tax revenue.

### Safety

Information on wind speed and direction, ceiling, visibility and altimeter settings is crucial for flight plan preparation. Adequate weather data allows pilots to make informed decisions regarding fuel management, diversions and alternate planning.<sup>3</sup> It allows them to determine which approach can be used, and even in some cases whether an approach should be attempted. With an AWOS in place, real-time, approved altimeter and METAR readings are guaranteed. Pilots receive the necessary information when they need it.

### *Increased Efficiency Equals Lower Costs*

An AWOS can increase the efficiency of airport operations by providing:

- Automated observations 24 hours a day, freeing employees to focus on other tasks
- Up-to-date data on runway conditions, helping the Air Traffic Controllers to optimize traffic flow
- Advance information, making it easier for runway operators to minimize disruption due to bad weather
- Use of the lowest published minimum descent altitude during instrument approaches

### *Additional Availability Equals Increased Revenue*

One of the greatest benefits of an AWOS is that it provides an approved source of weather to FAR Part 91, 121 and 135 operators. When visibility is low and pilots are operating under Instrument Flight Rules (IFR), the data provided by an AWOS makes it possible for planes to conduct an instrument approach to landing, where otherwise they might not.<sup>4</sup>

In Frederick, Maryland, for example, “Prior to the commissioning of the AWOS, the local FBO staff would provide the altimeter setting (most of the time) on the Unicom frequency up until 9 p.m., after which you were obliged to use the Washington-Dulles altimeter setting. Having the local altimeter setting provided by AWOS, lowers the landing minimums by 120 feet. This feature alone has saved numerous diversions to Baltimore or Dulles.”<sup>5</sup>

Since AWOS facilitates lower minimums on instrument approaches, more planes are able to land in IFR conditions. Part 135 operators may not even depart for a destination unless the forecast weather there will allow an instrument approach and landing.<sup>6</sup> Lower minimums mean more planes may depart from the airport.

By connecting to the FAA’s Weather Network, AWOS observations are available for pre-flight briefing from anywhere in the nation—virtually putting an airport on the official national weather map.

A case study done on the impact of an AWOS at T.P. McCampbell Airport near Ingleside, Texas, highlights the economic benefits. Not only has the airport seen growth, so has the local economy. Corporate flyers and passengers who use the airport stay at local hotels, rent cars, buy fuel and dine at area restaurants.

In fact, in 2005 McCampbell Airport’s economic impact on the Ingleside area was just under \$550,000, as calculated by a Texas Department of Transportation study. Airport Manager George Alvarado estimates the impact has risen to more than \$1 million after installing an AWOS, simply because of increased availability and traffic.<sup>7</sup>

## Selecting an AWOS

There are many different options when choosing an AWOS, with choices ranging from the very basic to the more complex. The best systems have the flexibility to be customized with the combination of sensors that most adequately suit the airport's needs.

TYPE	FEATURES
AWOS A	Current altimeter setting
AWOS I	Altimeter setting, temperature, dew point, wind speed and direction
AWOS II	All AWOS-I features plus visibility
AWOS III	Features of AWOS-II plus cloud height and sky condition
AWOS IIIP	AWOS-III features plus present weather
AWOS IIIP/T	All features of the AWOS-III plus present weather and thunderstorm detection
AWOS IV	Features of AWOS-III plus all of the following: <ul style="list-style-type: none"> <li data-bbox="810 936 1350 1032">– Present weather: reports drizzle, rain, snow, precipitation intensity, fog and haze.</li> <li data-bbox="810 1034 1337 1131">– Thunderstorm sensor: reports thunderstorm activity within a 30-mile radius of the airport.</li> <li data-bbox="810 1133 1294 1196">– Freezing Rain Sensor: reports the occurrence of freezing rain.</li> <li data-bbox="810 1198 1350 1299">– Runway Surface Condition Sensor: reports runway conditions such as dry, wet, snow, frost and ice.</li> </ul>

AWOS prices range as much as their offerings, from \$20,000 to \$100,000 depending on the level of reporting. For approximately 75 percent of airports, an AWOS III is the most appropriate choice. It provides the minimum weather reporting requirements for most commercial operators. One important note, the FAA now requires airports wanting to install an AWOS, to conduct a cost-benefit analysis to justify purchasing a fully FAA-certified AWOS III system or higher.

## Steps to Secure Funding for an AWOS

Once it is determined that an AWOS would be a positive addition to an airport, the next step is to procure financing.

There are a variety of ways to secure financing for an AWOS project including federal and state funding, bonds, or private capital investments. In many cases it will be a combination of one or more of the above factors. For many general aviation airports in Wisconsin, for example, the airport owner's share was 20 percent, 60 percent was federally-funded and 20 percent was supported by the state.<sup>8</sup>

Because funding is often a joint venture, airport improvement projects cannot be easily achieved without a good deal of teamwork between the airport owner, the state department of transportation and the FAA.

### Federal Funding

#### The Airport Improvement Program

Public use airports are able to receive Federal money for eligible projects through a federal grant-in-aid program known as the Airport Improvement Program (AIP). The AIP is a major source of funding for airport development and planning. Large and medium primary hub airports receive 75 percent of eligible expenses while smaller airports currently receive 90 percent of eligible costs.<sup>9</sup> Although AWOS are in line with the FAA and state goals of increasing safety and economic prosperity and are eligible for funds, it is important to note that the funds are not guaranteed. Demand for AIP funding exceeds supply. Grant requests are evaluated and prioritized, "with highest priority given to safety, security, reconstruction and capacity standards."<sup>10</sup>

While AIP is a federally-funded program, it is noted in the FAA AIP Handbook that "the diversity among the regions of program needs, available resources, and Airports Division organizational structures dictate, that flexibility must be given to Airports Division Managers for efficient grant program administration. At the same time, however, the AIP must be perceived by the aviation community as an even-handed program administered uniformly in every state."<sup>11</sup> In other words, the steps required to obtain AIP funding may differ slightly from state to state, but in basic principle they will stay the same.

Specific questions about AIP eligibility should be directed to the appropriate Regional Airports Office. Contact information for all FAA Regional Divisions and Airport District Offices can be found at:

[www.faa.gov/about/office\\_org/headquarters\\_offices/arp/regional\\_offices/](http://www.faa.gov/about/office_org/headquarters_offices/arp/regional_offices/).

#### Criteria

Regardless of region, all AIP-funded projects must meet the following criteria as presented in the FAA Airport Improvement Program Handbook<sup>12</sup>:

- (1) The project sponsorship requirements have been met;
- (2) The project is reasonably consistent with the plans of planning agencies for the development of the area in which the airport is located;

- (3) Sufficient funds are available for that portion of the project not paid for by the United States;
- (4) The project will be completed without undue delay;
- (5) The airport location is included in the current version of the NPIAS; and
- (6) The project involves more than \$25,000 in AIP funds unless, in the judgment of the responsible Airports office, it would be in the best interest of the Government to award a grant of a lesser amount.

### ***Application Process***

The FAA establishes the application deadline each year and publishes it as a Federal Register Notice. The notice is typically posted in February or March, with the application deadline usually around the first of May.<sup>13</sup>

The appropriate FAA office is responsible for furnishing guidance about the proper completion of the form and the required supplemental supporting documentation, sponsor assurances, and certification.<sup>14</sup>

A sample step-by-step guide to submitting an AIP application is included in appendix A.

### **Other Federal Assistance**

When airports need Federal financial assistance other than the AIP, regions might refer the airport to the Catalog of Federal Domestic Assistance at <http://www.cfda.gov>. This Web site provides information on individual Federal funding programs.<sup>15</sup>

### **State Funding**

As discussed in the previous section, even when AIP or other Federal funds are awarded, they do not cover the entire cost involved in an airport development project. The balance of funds can be covered with a combination of “local match” and state funding.

States spend about \$400 million annually on airport development with roughly 20 percent of the budget going to match Federal grants and 80 percent to state-only grants and loans.<sup>16</sup> Since each state operates differently it is best to contact an aviation representative at the state department of transportation for specifics.

An example of the percentages of costs that a state may cover is a grant program offered by the Florida Department of Transportation Aviation office. This program is funded through the State Transportation Trust Fund, which covers Airport Planning, Airport Improvement, Land Acquisition and Airport Economic Development. Funding for AWOS would fall under the Airport Improvement umbrella. As with federal aid, state aid is based on availability of funds with highest priority projects receiving funds first.

Several states have taken innovative approaches to funding airport improvements to help streamline the process.

## **State Sponsorships**

Title 49 U.S.C., Section 47105(a) (1) (B) allows state sponsorship of development projects. The primary benefit of state sponsorships is that it reduces the FAA/state sponsor workload by combining many grants into one. It also allows for economies-of-scale from a purchasing standpoint. Equipment can be acquired in bulk at potentially lower costs.<sup>17</sup> With state sponsorships, funds are still dispersed by the FAA.

## **Block Grants**

State block grants are an alternative to state sponsorship of airport projects.<sup>18</sup> A block grant is a large sum of money granted by the national government. It comes with general provisions as to how it is to be spent. Currently, there are nine states which receive federal block grants for aviation funding. Block grants are awarded annually and then dispersed as needed by the state transportation bureau. States assess project justification based on local, regional and statewide conditions and can adapt state, federal and local funds to meet the immediate and future needs of the state's aviation system.<sup>19</sup> States currently receiving block grants are: Wisconsin, Tennessee, Illinois, Missouri, North Carolina, Michigan, New Jersey, Pennsylvania and Texas.<sup>20</sup>

## **Other State Initiatives**

Other states have come up with initiatives to try to help airport sponsors streamline costs. Alabama, for example, came up with a time saving and cost saving way to simplify the bid process necessary to procure funding. In order to take advantage of supplier cost savings, the state Aeronautics Bureau solicited bids for AWOS equipment and included it on the state bid list, thus eliminating the expense of preparing specs and bid documents for each individual site.<sup>21</sup>

## **Local Support & Private Capital Funding**

Another option to explore after exhausting federal and state funding opportunities is available local resources. This includes airport revenues, direct funding from a county or municipality and issuing of bonds to support airport improvements.

There are two types of bonds to consider when securing funding for an AWOS—general obligation bonds and limited obligation bonds (also referred to as self-liquidating bonds).

A general obligation bond is typically issued on voter approval. It often involves a pledge to levy a property tax to meet the obligations of the debt. They are considered the most secure type of municipal bond and generally issued at lower interest rates and costs of issuance.

Limited obligation bonds, or self-liquidating bonds, are secured by revenues from a local source. The interest and principal is fully paid off (serviced) from the revenue generated by the project financed by the bond issue.

Another source of funding is tapping into the private sector. This type of funding can include either securing a loan from a local financial institution or the backing of local investors and corporations.



# What to Look for in an AWOS Partner

This paper has taken a closer look at the need for an AWOS system, the positive impact it can bring to an airport in terms of safety and increased economic benefits and various means of funding. It is also important to discuss what to look for in an AWOS partner. Not all AWOS systems are created equally and not all companies back up their product in the same way.

## FAA-certified Systems

- First and foremost make sure you are working with a provider who will offer you a system that is fully FAA-certified.

## Industry Experience

- Look at industry experience, credentials and referrals. A provider with extensive experience is invaluable in helping you determine which system and features best suit your needs and budget.

## Flexibility

- Airports change over time. Your AWOS should be scalable and able to grow with your airport.

## Level of Service

- Support at the planning stage is essential. A good AWOS representative or project manager has been through the process before and can help you each step of the way, walking you through the funding process, aiding with site selection, assisting with the completion of requisite forms, coordinating UHF and VHF licensing and more.
- Service should not end with installation. Your AWOS provider should be able to provide you with proper training and ongoing operational support.
- A fully staffed, full-time support center with remote maintenance capabilities is a must.

## Maintenance

The FAA requires that each AWOS be covered under a maintenance contract with all maintenance carried out by certified technicians. Look for a partner that offers:

- Factory-trained technicians that are FAA, FCC & VSAT certified;
- A maintenance contract that includes preventative and corrective maintenance;
- Proactive remote monitoring;
- Spare and replacement parts on demand.

## Summary

Weather data is, has been, and will continue to be critical to aviation safety. Automating airport weather observations with an AWOS provides the real-time, accurate weather information required to increase operational safety. Other benefits include lower costs, increased air traffic and revenue.

The AIP was set up to support the nation's airport system by providing funds to, among other things, enhance safety and security. As such, an AWOS is on the list of projects eligible for AIP funding. AIP will not cover the full amount of the project. The balance can be made up with a combination of state funding and local match.

Because funding is often a joint venture, airport improvement projects cannot be easily achieved without a good deal of teamwork between the airport owner, the state department of transportation, FAA and local resources. A good AWOS partner can serve as a valuable resource throughout this process.

# About Vaisala

## Quality

- Vaisala provides a complete line of fully certified AWOS systems. All systems are scalable with an open system architecture providing for easy upgrades and expansion

## Service

At Vaisala, service is always at the forefront of our operations. It is our job to provide you with a quality system, training, support and maintenance before, during and after installation. We are not merely vendors for our customers, but partners, creating value by identifying and solving their operational challenges.

- We will help you through each step of the purchase and installation including installation support, equipment hookup, FAA commissioning assistance and more.
- Optimal performance requires training. We offer certified training courses on operation, maintenance and safety at our Vaisala training centers, select public training events or at your facility.
- Our proactive maintenance program is second to none and provides Vaisala with an unmatched ability to monitor the status of every AWOS we maintain in real-time.
- Vaisala offers spare and replacement parts on demand, as well as a factory service and repair center to minimize system downtime and expenses.

## Expertise

- Expertise comes with experience; Vaisala project managers and technicians have installed more than 750 AWOS systems across North America – including the first FAA-certified AWOS in 1979.
- Technicians are manufacturer-certified as well as FAA-approved and FCC VSAT licensed.
- Project managers are AWOS certified
- ISO 9001:2000 certified

# Appendix A

## Sample AIP Application Process

The following is an example of the steps it takes to procure AIP funding in the Central Region:

In order to be considered for AIP funding, you must:

1. Submit an application (for entitlement funds to be used that fiscal year), complete with:
  - a. Accurate bid information
  - b. Dun & Bradstreet DUNS number
  - c. Certificate of Title
  - d. "Exhibit A" Property map

The FAA establishes the application deadline date each year and publishes it as a Federal Register Notice. The notice is typically posted in February or March, with the application deadline usually around the first of May.<sup>22</sup>

A complete "Checklist for Typical AIP Development Project" can be found on the FAA website:  
[http://www.faa.gov/airports\\_airtraffic/airports/regional\\_guidance/central/aip/sponsor\\_guide/](http://www.faa.gov/airports_airtraffic/airports/regional_guidance/central/aip/sponsor_guide/).

The checklist will walk you through the ins and outs of Project Formulation, Project Programming, "Early Start" Phase, Airport Property Rights, Design Phase, Bid Phase and Grant Application as well as steps taken after funds are awarded.

Project Programming begins with submitting an Airport Capital Improvement Plan (ACIP) project data sheet. The timing of the submittal is critical to when funds will be made available. Typically your ACIP data sheet should be submitted in February in order to be considered for the following fiscal year. After submittal it is necessary to stay in touch with the appropriate FAA planner to verify when funding may be available.<sup>23</sup>

2. "Early Start" phase
  - a. You will receive notice from the FAA of "favorable potential for receiving Federal funding".
  - b. This is not a commitment nor a guarantee of funds but simply a "heads up" notice that funding for the project is favorable and that the sponsor should initiate actions that require long lead times.<sup>24</sup>
3. With a "go letter" in hand, it is time to begin the process of fully defining your project perimeters then entering the design phase of the project:
  - a. Hire and meet with engineering consultant & FAA representative to define scope of approved AIP eligible work;
  - b. Verify status of DBE program;
  - c. Verify DUNS number;
  - d. Verify Airport Property Rights.

Your consultant should assemble an Engineers Report which should include a preliminary estimate of probable costs. Also needed is a Preliminary Plans & Specifications (P&S) Submittal, which must adhere to FAA standards. This is then reviewed by the FAA, revised as necessary and submitted in final form.

4. The bid phase begins with:
  - a. FAA approval to solicit bids;
  - b. The sponsor publicly advertises for bids;
  - c. Once all bids are received there is a “public opening” of bids;
  - d. Once lowest bidder is determined, the sponsor is required to submit a written recommendation of award of contract to the FAA, which includes information on the contractor's proposed DBE participation.

Once the FAA has approved your “award of contract” you have reached the point where you are able to submit your grant application as described above.

Should your project be given the green light to proceed, you will receive a Grant Offer in the form of a Congressional Release of funds.<sup>25</sup>

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