

Final Report

Aviation Search and Rescue Study



Joint Transportation Committee

Washington State Legislature

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Prepared by:

Joint Transportation Committee

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<http://www.leg.wa.gov/JTC/Pages/AviationSearchRescue.aspx>

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Aviation Search and Rescue Study

Joint Transportation Committee

The search and rescue mission is to locate, access, stabilize and transport missing persons as quickly as possible to save life and limb and prevent undue suffering. The aviation search and rescue (ASAR) mission involves locating aircraft that are missing, overdue, or in distress. It can involve searching for a lost aircraft, finding the cause for an aircraft being overdue, or following up on a signal of an aircraft in distress, including tracking down signals of emergency beacons, even if they are inadvertently activated.

The Study

The Legislature directed the Joint Transportation Committee to evaluate the most appropriate organization for the aviation search and rescue (ASAR) program, currently operating from the Washington State Department of Transportation (WSDOT). As directed in ESHB 2190, Sec. 204(5), the study was to address the following issues:

1. Where the aviation search and rescue operations should be located to provide the maximum benefit for these searches;
2. How the duplication of services and training should be addressed;
3. Whether the current structure is the best use of state and federal funding; and
4. If aviation search and rescue is relocated, what should be the source of funding?

Study Work Group

ESHB 2190, Sec. 204(5) directed JTC to convene a Work Group of aviation stakeholder agencies and organizations to assist in the evaluation. Each organization identified in the proviso was invited to participate by appointing a representative. A list of the Work Group members follows on the next page.

Study Process

Working with the agencies and organizations involved in ASAR, staff prepared an overview of the aviation search and rescue process in Washington, including profiles of each agency and organization. Staff conducted one-on-one interviews with each Work Group member, and solicited their observations of the aviation search and rescue process, both in Washington and in other states.

The Work Group held a half-day meeting in Olympia on July 31, 2012. The principal focus of the meeting was a discussion of the strengths and weaknesses of the Washington process, and the advantages and disadvantages of moving the program to other agencies. Members also discussed ASAR training, funding and other states' approaches to ASAR. A summary of the meeting discussion follows on page 11.

Summary of Recommendations

ASAR should remain in WSDOT, where it functions well. WSDOT could improve the program by additional cross-training of staff to lead air searches, and by making the program more transparent to its volunteer community. WSDOT and CAP should coordinate their training and make an effort to conduct training in Eastern Washington. All general aviation agencies and organizations can contribute to general aviation safety by encouraging pilots to file flight plans and use emergency locator beacons. The complete list of *Observations and Recommendations* starts on page 13.

| ASAR Study Work Group Members | | |
|---|--|--|
| | Agency or Organization | Participating Representative |
| 1. | Aircraft Owners and Pilots Association* | Les Smith, AOPA member, Washington |
| 2. | Washington Wing of the Civil Air Patrol* | Col. David Lehman, Commander, Washington Wing |
| 3. | Civil Air Patrol, United States Air Force* | Jim Nakauchi, State Director |
| 4. | Federal Aviation Administration^ | Gary Mayer, Operations Lead, NW MTN Regional Operations Center, Renton |
| 5. | United States Air Force Rescue Coordination Center^ | Danny R. Conley, AFRCC Chief, Tyndall AFB, Florida |
| 6. | Washington Air Search and Rescue* | Matt Towers, President |
| 7. | Emergency Management Division, Washington Military Department* | Major General Gary Magonigle, Commander Washington Air National Guard |
| 8. | Washington Pilots Association* | Tom Jensen, Airports Director, WPA |
| 9. | WSDOT Aviation Division*, Emergency and Security Operations Division | Tristan Atkins, Aviation Director and John Himmel, Emergency and Security Operations Manager |
| 10. | Washington State Patrol* | Captain Rob Huss, WSP |
| Others participating in the July 31, 2012 meeting | | |
| <ul style="list-style-type: none"> • Senator Jim Honeyford; Rep. Brad Klippert • Tom Peterson, WSDOT Aviation Emergency Services Coordinator • Lt. Jim Nobach, WSP Aviation Section • Kurk Hardin, Chris Long and Dan Swisher, Washington Military Department • Colonel Tom Green, CAP • Gene Baxstrom, Mary Fleckenstein, Jerry Long, Hayley Gamble, Laura Zanzig, legislative staff • Alyson Cummings, OFM staff | | |
| * Agency or organization identified in legislation calling for the study | | |
| ^ Invited to participate | | |

The following agencies and organizations participated in the ASAR Study Work Group. A fuller description of these agencies and organizations and their role in ASAR is in the Appendix.

Aircraft Owners and Pilots Association is a national organization that establishes and articulates positions to promote the safety, utility and popularity of general aviation flight.

Civil Air Patrol is a federally-supported non-profit corporation serving as the civilian auxiliary of the United States Air Force. CAP is a volunteer organization that performs three missions: emergency services, which includes air and ground rescue; aerospace education; and a cadet program. The Washington Wing of the CAP trains members in SAR and ASAR, and in Washington, has 11 search aircraft and other search equipment, about 45 search mission qualified pilots and nearly 100 observers.

Civil Air Patrol—United States Air Force is responsible for insuring state CAP organizations are adequately trained and equipped for Air Force missions, providing oversight in eight geographic regions in the United States. A CAP-USAF Pacific Region representative is located at Joint Base Lewis-McChord.

Federal Aviation Administration is the national aviation authority in the United States, regulating and overseeing all aspects of civil aviation. The FAA maintains an alerting system and rescue satellite-aided tracking information for the Air Force Rescue Coordination Center. FAA has an office in Renton.

US Air Force Rescue Coordination Center (AFRCC) is the single agency responsible for coordinating federal ASAR activities in the 48 contiguous states. It operates 24/7 using FAA's alerting system and processes about 20 incidents per day consisting of beacon alerts and other search taskings. AFRCC has established agreements with the Washington Military Department's Emergency Management Division and WSDOT's ASAR program for processing emergency notifications.

Washington Air Search and Rescue (WASAR) was formed in 1993 as an offshoot of the Washington Pilots Association to support ASAR and disaster relief activities directed by the WSDOT ASAR program. Trained WASAR members are available 24/7 to assist ASAR searches as well emergency airlifts for other state and county needs. In 2007, there were 29 aircraft and 101 qualified crews in WASAR. Today there are five aircraft, six qualified pilots, and eight scanner/observers in WASAR.

Washington Military Department's (WMD) role is to minimize the impact of emergencies and disasters on Washington. WMD's **Emergency Management Division (EMD)** maintains a capability to respond to disasters and emergencies, and coordinates emergency responses with state and local agencies. It coordinates those resources (other than ASAR) requested by local governments which have responsibility for land search and rescue operations and helps to ensure multi-jurisdiction land search and rescue operations are well coordinated. It maintains a statewide E911 system and receives initial electronic distress alerts from the AFRCC and FAA, and forwards appropriate notice to WSDOT's Aviation Emergency Coordinator.

Washington Pilots Association (WPA) is an organization of pilots and others focused on serving pilots and promoting general aviation in Washington. Members of this organization are served by aviation search and rescue services. Some WPA members also are members of WASAR and/or CAP.

Washington State Department of Transportation's (WSDOT) Air Search and Rescue (ASAR) program is responsible by statute for coordinating and managing all aerial search and rescue efforts within the state.

Washington State Patrol (WSP) serves Washington through traffic enforcement and other services. The WSP aviation section provides aviation traffic enforcement and other public safety missions including

some search and rescue missions. Two of the Patrol's five Cessna aircraft have forward looking infrared (FLIR) cameras with full communication capabilities, which can be called upon when search needs dictate.

Aviation Search and Rescue in Washington (WSDOT)

The WSDOT Aviation Division is responsible by statute (RCW 47.68.380) for the coordination and management of all aerial search and rescue within the state. This includes coordinating all aircraft used in search and rescue operations requested through the aviation division. The aviation division is also responsible for search and rescue activities involving electronic signaling devices such as emergency locator transmitters, emergency position indicating radio beacons and personal locator beacons associated with aeronautical use. The division responsibilities also include following up on reports of overdue aircraft and reported sightings of distressed aircraft and coordination of aviation resources for disaster response.

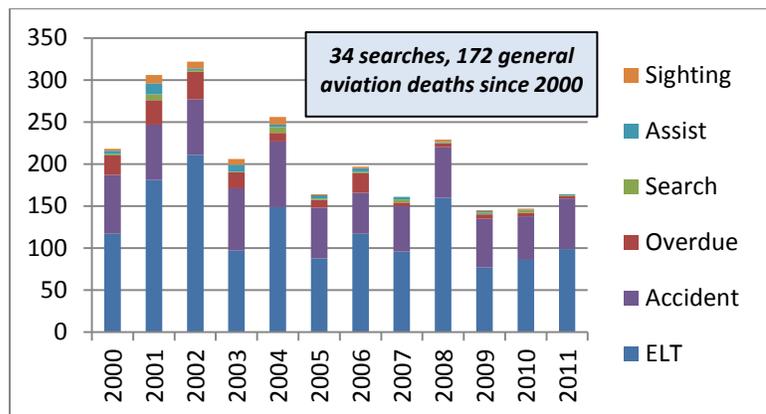
In 2011, WSDOT transferred the ASAR Program from the Aviation Division to the Office of Emergency Management in the WSDOT Maintenance Program, centralizing emergency services.

This coordination and management of all aviation SAR does not include SAR operations conducted by the chief law enforcement officer of each political subdivision (RCW 38.52.400). When a downed aircraft is located, the incident responsibility becomes a land search and rescue operation under the direction and control of the chief law enforcement officer in whose jurisdiction the incident is located (typically the county sheriff).

The ASAR program relies heavily on volunteers and other agencies to conduct search and rescue operations. WSDOT's aviation emergency coordinator may call on resources from the CAP, WASAR and other federal, state, and local organizations in the event of a search.

Since 1996, WSDOT has registered and coordinated air search and rescue volunteers in accordance with WAC 468-200.

The types and number of incidents
WSDOT's ASAR program has been involved with since 2000



The coordinator works with other agencies and organizations to develop and train volunteers to maintain their flight and volunteer certification status. WSDOT Aviation Emergency Services (AES) conducts about ten training sessions each year. A more extensive description of the WSDOT program is in the Appendix.

ASAR is funded from the Aeronautics Account at approximately \$400,000 per biennium. The program is funded for one FTE, rescue training, operation of a search and rescue plane and mobile command center, and limited volunteer reimbursements. When the ASAR Program was first implemented in 1967, it was funded through a \$1 annual pilot's registration fee. In 2005, the pilot registration fee (then \$15) was repealed, and the aviation fuel tax was increased from 10 cents per gallon to 11 cents per gallon with the additional revenues deposited into the Aeronautics Account.

Responding to an Aviation Search and Rescue Incident

Just prior to the July 31, 2012 Work Group meeting, a single-engine plane went missing. This real-life incident showed how a search occurs.

The pilot took off from the Tonasket airport headed to Sequim, but never arrived. He had not filed a flight plan. WSDOT activated a search which lasted for one week. Each day, approximately eight aircraft and fifty people participated in the search, including volunteers from CAP and WASAR. Aircraft flew 106 sorties of approximately 3-4 hours each, for a total of 310 hours in the air. The search area covered about 20,000 square miles. Helicopters from the Department of Natural Resources and Snohomish County Sheriff's Office searched the mountain passes. The aircraft was not found.

Search and Rescue Process

WSDOT has entered into a number of MOUs that outline the process for identifying and conducting aviation searches and rescues.

As shown in the following graphic, an aviation search and rescue may be triggered by a number of different events, including an overdue aircraft report, someone sighting an aircraft in distress, or the activation of an emergency locator beacon (either by some sort of impact or an inadvertent activation). A newer 406 MHz beacon transmits a signal to a satellite, which sends an alert to the Air Force Rescue Coordination Center (AFRCC) at Tyndall Air Force Base in Florida. The AFRCC receives the signal and then forwards it to the Washington Emergency Management Division (EMD), Alert and Warning Center who then contacts the WSDOT ASAR coordinator.

The coordinator uses several different approaches to determine whether the alert is real or false. For example, if an emergency signal is thought to emanate from an airport, the coordinator may have the airport personnel investigate, or another person nearby. If it turns out to be a false alarm, then the event will be logged and no further action is required.

When there is a real aviation search and rescue, the State Emergency Operations Center assigns a mission number. WSDOT's aviation emergency coordinator then decides the type and amount of resources needed, and makes the required notifications. Volunteers may include WSDOT volunteers, members of CAP or WASAR, the WSP Aviation Section, and/or county air support units. The coordinator may also request federal resources.

The aviation emergency coordinator operates as an Incident Commander during searches, usually from WSDOT's command and communications trailer which is relocated proximal to the search area. The search team will gather information and data from family, friends, and any other persons and entities regarding the missing aircraft to assist in pinpointing the area in which the aircraft may be located. The search teams will fly sorties in established patterns to ensure efficient coverage of the search area.

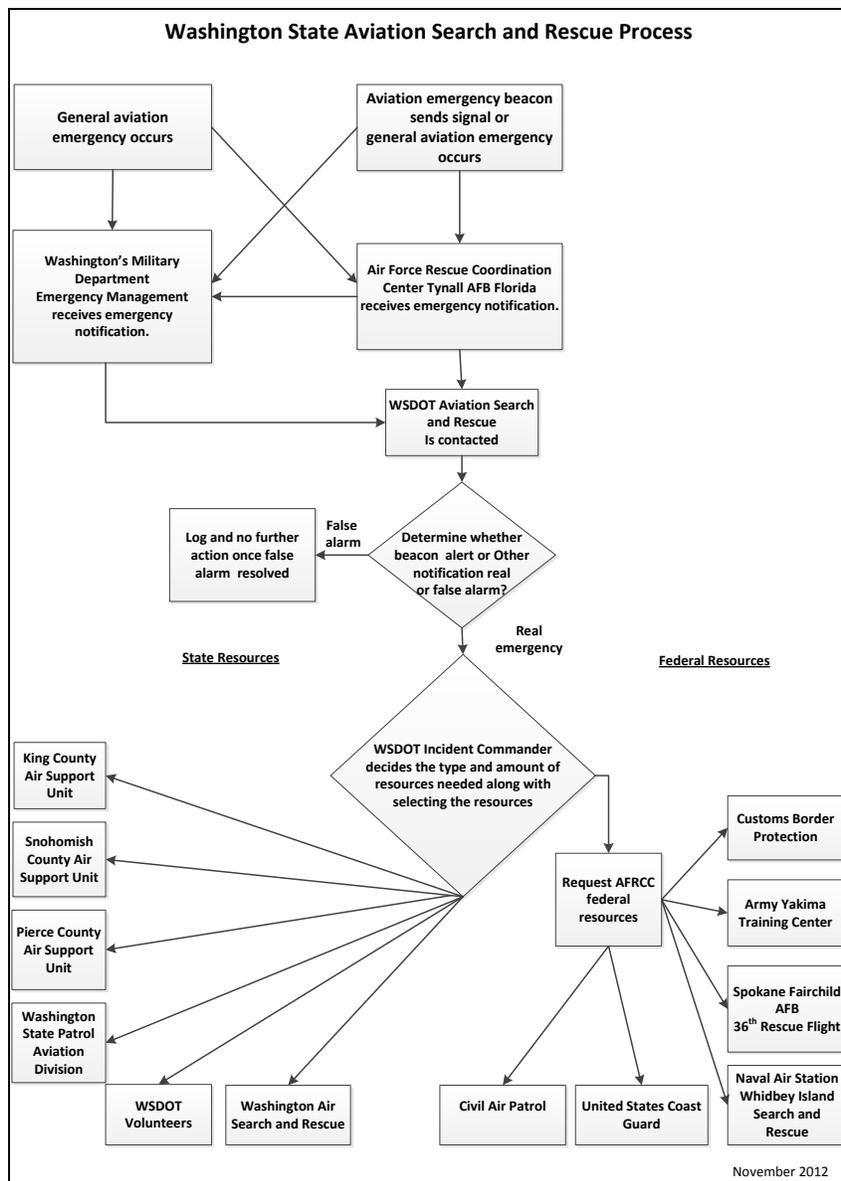
The Incident Commander is also responsible for deciding if or when to conclude or suspend the search for the missing aircraft.

The WSDOT ASAR program provides some reimbursement to volunteers for the fuel and oil for used in search aircraft and land vehicles. In some searches, food and lodging also is provided. Once the plane is located, the rescue becomes a recovery operation and the primary responsibility for the incident

becomes the chief law enforcement officer's in the area in which the airplane is located (usually the county sheriff).

When not managing searches, the WSDOT aviation emergency coordinator is responsible for the certification of air search and rescue volunteers. This includes the pilots and observers in aircraft, and ground-based volunteers that support the rescue operation.

In addition, the ASAR coordinator is the Emergency Support Function lead for aviation-related plans and resources as well as a Co-Sponsor of the Washington Rescue Coordination Center at Camp Murray. The ASAR coordinator also participates in regional, statewide and national level emergency planning and drills to exercise and coordinate the aviation resources that would respond in the state. For example, the Howard Hanson Dam Air Rescue Plan, as directed by the Governor's Directive, specifically tasked the ASAR Coordinator to develop the air rescue plan and coordinate with federal, state, and local partners to implement it.



July 31, 2012 ASAR Work Group Meeting and Follow-Up

The ASAR Work Group held a half-day meeting in Olympia on July 31, 2012. Representatives of all ten agencies and organizations appointed to the Work Group were in attendance, as well as six other individuals involved in SAR or ASAR and two legislators. (See Appendix for meeting materials.)

Following the meeting, staff conducted follow-up interviews with Work Group members and others to clarify and explore issues identified at the July meeting. In October, the Draft Observations and Recommendations were circulated to the Work Group members for comment. Staff presented the revised draft to the JTC on November 14, 2012. In November, a draft report was circulated to the Work Group for comment. The final draft report will be presented to the JTC on December 5, 2012.

Below are the key observations from the July 31, 2012 Work Group meeting.

ASAR in Washington and in the United States

The State Emergency Operations Center issues mission numbers for about 880 search and rescue missions a year (aviation, land and other SAR); most are resolved within 12 hours.

There was general agreement that **Washington's current ASAR process works well**. Statements about Washington's process included "*nobody does it better than Washington,*" and "*don't fix what's not broken.*" A Work Group member said changing the agency responsible for ASAR wouldn't improve it.

The AFRCC representative said the **ASAR process varies considerably from state to state**, but that since 1989, Washington is one of the states that others look to for guidance. A summary of how other states administer ASAR was presented and discussed. (See Appendix.)

Moving ASAR to another agency was also discussed. A statement was made that in states where aircraft frequently go missing, ASAR is typically located in an Aeronautics Division. In states without many missing aircraft, ASAR is often part of an Emergency Management Division. It's a question of a specialist vs. a generalist leading ASAR efforts.

- The CAP stated they were not interested in taking the lead, because ASAR is a government function and CAP is a volunteer agency, with SAR as just one of multiple missions. They said the key is to have a good relationship with WSDOT, and that it has improved in recent years; today their relationship with WSDOT is as good as it's ever been.
- The State Military Department stated their Emergency Management Division was not an appropriate place to locate ASAR. They have just 73 state employees, and they leverage all the other state agencies to complete their missions. Unlike at WSDOT, there would not be a single person dedicated to ASAR at the Military Department. Their State Emergency Operations Center said they weren't the right venue to house ASAR because unlike WSDOT, they are not a response agency. Rather, the SEOC coordinates responses and resources.
- The Washington State Patrol didn't feel they would be the appropriate agency for ASAR, because their primary mission is aviation law enforcement, and taking on ASAR would be a big undertaking requiring additional funding and FTEs, without any real benefit from the move.

WSDOT's ASAR Program

Training and coordination of ASAR volunteers was discussed at the July meeting.

- WSDOT said in its early days, SAR was a community activity but now it's more scientific, and that calling too many volunteers to help can be problematic, and may increase risks to volunteers.
- When designing training classes, WSDOT's objective is to make class requirements objective and performance-based.
- WSDOT spent \$30,000 last year training pilots and crew members. Trainees are reimbursed for fuel expenses incurred during training exercises. WSDOT said it's important to make sure the right volunteers get the right kind of training, so as to not waste scarce training resources.
- The Civil Air Patrol also conducts training classes for CAP members, who receive CAP reimbursement for fuel costs.
- WASAR depends on WSDOT to train its volunteers. WASAR raised concerns about not having a memorandum of understanding (MOU) with WSDOT to outline their ASAR roles and responsibilities, despite repeated attempts to agree to one.

Two concerns were expressed about the training. First, there is not enough training offered in Eastern Washington, and the resulting time, travel and cost issues make it difficult for the limited number of Eastern Washington volunteers to get the training they need to stay current. Second, WSDOT and CAP could better coordinate their training. WSDOT doesn't accept all of CAP's courses as meeting WSDOT's requirements (which are stated in WAC 468.200). CAP acknowledged they sometimes miss required deadlines to submit CAP courses for WSDOT approval.

Concerns were raised about having a single individual in WSDOT to coordinate all ASAR events. If that person should go on a vacation or is for whatever reason unavailable when an aircraft goes missing, there could be a leadership void. WSDOT acknowledged the problem, and said they're working on cross-training but could use another full-time FTE to provide back-up.

General Aviation Safety

A variety of emergency locator beacons are available to identify the location of missing aircraft. Modern beacons contain data specific to the airplane and the pilot, and can help pinpoint the downed aircraft. However, pilots are not required to install them. They are expensive and that raises concerns at the Federal Aviation Administration about requiring them, fearful that pilots would defer maintenance if required to install beacons. Apparently no states require pilots to install beacons.

Work Group members also discussed flight plans – a useful tool that helps speed up searches of missing aircraft. But again, pilots are not required to file them. Nationally, only 17% of general aviation pilots file them.

Observations and Recommendations

Observations

General Observations

- O-1. Due to a relatively large and active general aviation (GA) community in Washington, and challenging flight conditions in the state, it is important to have an effective aviation search and rescue (ASAR) program.**

During the period from 2000 through 2011, there were nearly 750 GA accidents in Washington, resulting in 162 fatalities. The yearly accident rate was relatively constant during the period. During this same period, the WSDOT ASAR office managed thirty-four lost aircraft searches; more searches occurred in the first half of the period than in recent years.

National trends show a general decline in GA accidents, falling from 1,467 in 2000 to 1,116 in 2011, a 24 percent drop. Seventy-three percent of non-fatal accidents and 77 percent of fatal accidents involved personal flights, as opposed to instructional or business flights.

- O-2. Across the country, the ASAR function is primarily assigned to state departments of Emergency Management, the State Police and Transportation.**

A survey of the 50 states and the District of Columbia conducted as a part of this study found that the ASAR function is located principally in three different state agencies: Emergency Management (24); State Patrol (11); and Transportation (8). Among the eight other jurisdictions, the Civil Air Patrol had prime responsibility in five, and other agencies in three instances.

A state's level of effort on ASAR is affected by the scale of general aviation and topography of the state. At the July 31, 2012 Work Group meeting, Dan Conley of the United States Air Force Rescue Coordination Center (USAFRCC) and Chris Long of the Washington State Emergency Operations Center (Military Department) said they believe that those states with the best ASAR organizations, and which have relatively high numbers of missing aircraft incidents, house ASAR in an aviation department or division, and have dedicated personnel to address those incidents. States with fewer missing aircraft incidents assign ASAR to emergency management.

- O-3. Washington's ASAR program is acknowledged by many in the local and national general aviation community to be effective, and was cited by some as one of the better ASAR programs in the country.**

Work Group members and others interviewed for this study concurred that public agency personnel and private volunteers involved in ASAR in Washington are, for the most part, well-trained and capable of effectively carrying out their mission tasks. WSDOT has a dedicated ASAR budget, and is able to call on volunteers and resources from federal, state and local agencies to fulfill search missions. Stakeholders expressed a common sentiment that if you are going to be lost in a downed aircraft, Washington is a good state to have it happen in. Another Work Group member stated, "Don't fix what's not broken."

O-4. In Washington State, public agencies and other organizations generally contribute whatever equipment and personnel are needed for a search.

The ASAR process utilizes various public agencies and private organizations. These include WSDOT's aviation emergency coordinator, the Military Department, local law enforcement and the State Patrol, the U.S. Air Force Rescue Coordination Center (USAFRCC), the Civil Air Patrol, and Washington Air Search and Rescue (WASAR) and other volunteers not affiliated with a particular group. Those entities often donate both equipment and staff or volunteer time.

Observations about WSDOT Aviation Search and Rescue Operations

O-5. There appears to be little support among stakeholders involved in the Washington ASAR process for transferring the ASAR functions from WSDOT to another agency.

The issue of moving the ASAR function out of WSDOT to another agency was one of the primary questions to be addressed by this study. ASAR stakeholders generally indicated support for WSDOT retaining responsibility for the program. At the July 31, 2012 Work Group meeting, agencies expressed the following concerns about moving ASAR out of WSDOT:

- Military Department representatives expressed concern over locating the ASAR program within their agency, explaining that their Emergency Management Division (EMD) is not a response agency, but an agency which coordinates responses and resources.
- The WSP Aviation Section expressed concern over assuming the ASAR function because their primary mission is aerial law enforcement.
- The CAP argued that the activity should remain with a state agency and not CAP, since CAP is largely a volunteer organization with a diversity of duties.

O-6. WSDOT's ASAR program is involved in much more than lost aircraft searches. Since 2000, they have led between one and seven lost aircraft searches annually. During that same time period, they were involved in between 149 and 322 ASAR incidents annually. They also participated in other activities.

Besides coordinating and conducting lost aircraft searches, the WSDOT's ASAR program investigates ASAR incidents such as emergency aircraft locator transmitter alerts, other emergency beacon alerts, overdue aircraft reports, and aircraft accidents. They also provide assistance to county sheriffs for missing persons on the ground, airborne damage assessment after a disaster, and transportation of critical supplies and personnel during disasters. WSDOT also conducts emergency planning and is a co-sponsor of the Rescue Coordination Center at Camp Murray.

O-7. WSDOT's ASAR program is located in WSDOT's Office of Emergency Management in Olympia, and has one full-time employee.

The ASAR program at WSDOT is staffed by one person, the aviation emergency coordinator, whose duties include program coordination, aviation searches, response to emergency locator transmitter alerts, ASAR training classes, and other program activities. The coordinator is housed in the Office of Emergency Management at WSDOT's headquarters in Olympia, rather than the Aviation Division, located in Arlington. WSDOT says locating this person in the Office of Emergency Management in Olympia is beneficial for at least two reasons: it's closer to the State's Emergency Management Center

at Camp Murray, and it allows the individual to better coordinate with other emergency-related transportation activities within WSDOT.

O-8. Concerns were raised about the lack of back-up for the aviation emergency coordinator. Other WSDOT staff has only minimal ASAR-related training.

A single individual is primarily responsible for ASAR activities at WSDOT. While this person does not function alone, reporting to a supervisor who has some ASAR-related knowledge, no one else at WSDOT is trained to manage ASAR missions. Having a single individual doing the job provides a consistent approach to aviation search operations, but it leaves aviation emergencies susceptible to that person's absence.

During the conduct of this study, WSDOT has begun more cross-training of other agency staff to carry out ASAR functions. This includes more extensive documentation of emergency procedures, training of others in ASAR procedures, and qualifying others to operate emergency operations equipment.

O-9. Good communication between WSDOT and others involved in ASAR is vital to ensuring an effective search capability and maintaining a strong volunteer base. Some stakeholders expressed concerns about communications in the early stages of the study, but noted improvements as the study progressed.

The ASAR program is heavily dependent on involvement from many agencies and the volunteer community.

During this study, numerous suggestions were made concerning the need to improve communication among participating agencies and organizations, and their need to better understand their role in ASAR. Many procedures in the communication and search protocol are well defined, and carried out with precision. Others are not as well understood, nor well defined.

Recent efforts among these organizations appear to have improved communication within the past year.

O-10. Some general aviation stakeholders have said WSDOT's ASAR administration and mission search processes are not as transparent as they should be.

Some stakeholders expressed concerns about a lack of transparency in WSDOT's ASAR procedures. For example, while WSDOT has a MOU with CAP outlining CAP's role in ASAR, there is no similar MOU with WASAR despite repeated WASAR attempts to develop one. (In September, 2012, WSDOT did provide a draft MOU to WASAR, and WASAR is currently reviewing that document.) WSDOT and WASAR are discussing improving procedures for WSDOT contact of WASAR during ASAR emergencies, including WASAR developing an "on call" roster so volunteers are able to identify periods they can plan to be available.

O-11. The biennial budget for ASAR activities at WSDOT is approximately \$400,000, funded from the State Aeronautics Account.

The ASAR budget funds the aviation emergency coordinator, maintenance of an aircraft, a mobile command and communication center, ASAR training classes, and limited volunteer expense reimbursement.

Limited data from the 50-state ASAR survey conducted as part of this study, as well as information from WSDOT's aviation emergency coordinator, suggests that Washington's ASAR funding level may be the highest in the lower 48 states. However, it is difficult to confirm ASAR program expenses among the states because they don't always separate ASAR budget activities from other related activities. For example, Montana estimates its ASAR budget at \$15,000; however they have eight staff involved in ASAR, among other duties, and other division expenses contribute to the ASAR effort.

Observations concerning Search-Related Issues

O-12. Technological developments are enabling searchers to more quickly locate downed aircraft, but are also creating additional work load for emergency responders. Many aircraft do not have the most effective equipment.

Federal law requires all aircraft with more than one seat to have Emergency Locator Transmitters (ELTs), to aid in lost aircraft searches. However, not all such aircraft meet this requirement, and even when they do, the ELTs don't always work well. In many cases, ELTs are not turned on, not operable, or fail as a result of a crash. Older ELTs have a crash activation rate of less than 25 percent. In addition, ELTs are sometimes activated unintentionally, but those unintentional alerts require follow up.

Newer ELTs such as the 406 beacon are more dependable and provide personal contact information and GPS coordinates related to that specific aircraft. The \$1,000 - \$1,500 cost of equipping aircraft with those devices is often cited as the reason only about 10 percent of GA aircraft have them. Some pilots use Personal Locator Beacons (PLBs), similar to those used by hikers, along with the required minimal (non-406) ELT. Pilots often carry cellular phones which provide information for the last cellular tower they were within range of, but they may contribute to a false sense of security with accompanying less preparation for survival preparation.

O-13. Nationally, eighty-three percent of general aviation pilots do not file flight plans.

While filing a flight plan is simple and can make lost aircraft searches much easier, only 17 percent of general aviation pilots file them. Flight plans can be prepared in just a few minutes and can be filed at the airport on departure, or by computer with minimal effort. Most importantly, filing flight plans can ensure a more immediate response to the emergency of a search. Reasons for not filing flight plans are primarily personal choice issues including personal freedom and no perceived need, such as for very short trips.

O-14. WSDOT prescribes the classroom and flight training volunteers must have to participate in a search. WSDOT and the Civil Air Patrol offer some similar training classes, but they are often not coordinated regarding scheduling nor content. Also, WSDOT doesn't always accept CAP courses as meeting WSDOT training requirements.

Training is vital to preparing for ASAR missions, both from the aerial search perspective as well as for ground support. WSDOT offers 18 different ASAR courses; 6 - 12 classes are offered each year. In 2011,

WSDOT's training included 387 course registrations involving 311 different persons. Six of the courses involved flight training.

WSDOT training costs to-date in the 2011-13 biennium total \$37,500; this amount does not include staff time. It does include reimbursement for the trainee's gas and oil expenses during training and en route to the training if flight is an integral part of the training. It does not cover other aircraft costs the trainee may incur while training. Most of WSDOT's training class participants are CAP members, while others are WASAR members and other agency personnel.

WAC 468-200-110 prescribes the requirements organizations must meet for their courses to meet WSDOT's ASAR training requirements. These include prior approval of course instructor qualifications, content, and training materials.

While CAP accepts WSDOT training courses for CAP course requirements, WSDOT does not always accept CAP courses. CAP leadership has stated that, on some occasions, they have failed to meet the requirements of WAC 468-200-110, and therefore share some responsibility for some of their courses not meeting WSDOT requirements.

O-15. ASAR training is conducted in Western Washington.

Of the 34 training classes held by WSDOT between 2008 and 2011, all were held in Western Washington. WSDOT said this is because most general aviation pilots live in Western Washington, and that's where most aircraft are lost. Members of the aviation community in Eastern Washington have asked that some of the instruction be held in Eastern Washington, to maintain a trained volunteer presence throughout the state.

O-16. The number of qualified mission pilots, other volunteers, and aircraft available for ASAR is declining, due in part to the rising cost of flying, the recession, a drop in the number of downed aircraft searches, and a perceived lack by some in the aviation community, of training opportunities and subsequent utilization in mission assignments.

Several organizations such as CAP and WASAR provide the qualified pilots, observers, and mission scanners that are critical for ASAR missions. Washington CAP has set a goal of 55 qualified mission pilots, but has only been able to achieve 46 to date. Seven of these pilots are located in Eastern Washington; 39 are in Western Washington.

According to WASAR, in 1998, there were over 200 privately-owned aircraft available at the call of WSDOT for ASAR. As of 2007, the resource dropped to 29 aircraft and 101 qualified flight crews. This decline is due, in part, to the increasing cost of general aviation, which has reduced the number of volunteers. In addition, with improved search technology there has been a reduction in the number of searches to volunteer for, so volunteer interest may be waning as a result.

Recommendations

WSDOT Administration of ASAR

Recommendation 1. The Washington ASAR program should remain in WSDOT.

Recommendation 2. WSDOT should assess whether the ASAR program should remain in the WSDOT Office of Emergency Management, or be moved to the Aviation Division.

Recommendation 3. WSDOT should cross-train existing WSDOT staff to lead air searches, in order to provide back-up to the aviation emergency coordinator. (Some cross-training is occurring, and it should continue.)

Recommendation 4. WSDOT should take steps to make the ASAR program more transparent to its cooperating agencies and volunteers. This includes transparency in policies and process, agreements with stakeholder groups, methods for making search assignments, and criteria for assignment to ASAR volunteer rosters.

Recommendation 5. WSDOT should work more closely with CAP, WASAR and other aviation stakeholders to improve relationships with those organizations, including holding regular meetings to maintain good working relationships and improve the flow of information.

Recommendation 6. WSDOT should report to the Joint Transportation Committee by September 1, 2013, on steps taken to implement recommendations contained in this report.

ASAR Training

Recommendation 7. WSDOT and CAP, in cooperation with WASAR and others, should coordinate ASAR training courses to maximize the effectiveness of limited resources.

- To the extent possible, courses offered by WSDOT and CAP should be uniform to provide transferability at course completion.
- Course materials should, to the extent practical, be developed jointly and shared among organizations conducting training.
- WSDOT should explore opportunities to utilize qualified instructors, including CAP and WASAR instructors for training using WSDOT approved media in order to reduce workload on paid staff.

Recommendation 8. WSDOT should work to expand ASAR training course offerings in Central and Eastern Washington, to make it easier for Central and Eastern Washington pilots to participate in ASAR.

Recommendation 9. WSDOT should more clearly designate training required to participate in ASAR missions.

Enhancements to General Aviation Safety

Recommendation 10. Organizations involved in general aviation should strongly encourage pilots to file flight plans or leave itineraries for every flight.

Recommendation 11. Organizations involved in general aviation should conduct on-going pilot safety education about the importance of using emergency beacons and following other flight safety policies.

Recommendation 12. The Aircraft Owners and Pilots Association, in conjunction with WSDOT and others, should encourage aircraft owners to equip their aircraft with 406 emergency beacons.

Recommendation 13. Aircraft registration renewals, aviation newsletters and magazines, and community colleges aviation courses should all be employed to enhance general aviation safety awareness.

APPENDIX

Summaries of Participating Agencies

As part of the Joint Transportation Committee's study related to aviation search and rescue, the Committee was directed to establish a Work Group of agencies and organizations having a direct interest or involvement in aviation search and rescue. As background for the study, the study staff worked with these agencies and organizations to develop white papers describing each of those parties represented on the Work Group, and their role relative to aviation search and rescue in Washington.

Aircraft Owners and Pilots Association (AOPA)

Civil Air Patrol (CAP)

Civil Air Patrol - United States Air Force (CAP-USAF)

Federal Aviation Administration (FAA)

United States Air Force Rescue Coordination Center (AFRCC)

Washington Air Search and Rescue (WASAR)

Washington Military Department - Emergency Management Division (WMD-EMD)

Washington Pilots Association (WPA)

Washington State Department of Transportation (WSDOT)

Washington State Patrol (WSP)

Aircraft Owners and Pilots Association

The Aircraft Owners and Pilots Association (AOPA) is a non-profit tax exempt individual membership association. AOPA was incorporated in 1939 and is headquartered in Frederick, Maryland. Its membership consists mainly of general aviation pilots in the United States, with over 400,000 members in 2012, including over 11,600 in Washington. AOPA members represent two-thirds of the nation's 624,000 certified pilots.

The AOPA serves the interests and needs of its members as aircraft owners and pilots, and establishes and articulates positions to promote the economy, safety, utility, and popularity of flight in general aviation aircraft. It does so by:

- advocating on behalf of its members;
- educating pilots, nonpilots, and policy makers;
- supporting activities that ensure the long-term health of general aviation;
- working to keep general aviation accessible; and
- securing resources to fund its efforts.

AOPA's efforts are in part supported by the AOPA Foundation, a 501(c)(3) tax-exempt organization, which educates the public on the value of general aviation. The AOPA Foundation supports efforts to improve aviation safety through the Air Safety Institute, to preserve community airports, and to encourage learning to fly for career and personal benefit.

AOPA's Airport Support Network (ASN) program is the primary link between the Association and the airports it strives to protect. Through this program, an AOPA member-volunteer monitors and reports on local airport issues, serving as the association's "early warning system." AOPA currently has over 2,200 ASN volunteers at airports around the country, including 80 in Washington State.

Role in Aviation SAR

Members of the AOPA, as well as other pilots, are served by aviation SAR efforts. They may not be formally involved in SAR as a member of AOPA, but may be involved in aviation SAR activities through membership in other organizations such as Civil Air Patrol and the Washington Air Search and Rescue. While AOPA does not have the ability to provide SAR resources, they do share SAR information with their members through outreach and communication tools.

Search and Rescue Assets

None provided directly.

Program Funding

AOPA's general revenues are derived from membership dues and membership products and services. AOPA Foundation funding is largely provided through tax deductible donations. The Foundation's annual budget is approximately \$8 million. No AOPA funds are directed to aviation SAR in Washington State.

Civil Air Patrol (CAP)

The Civil Air Patrol (CAP) is a congressionally-chartered, federally-supported, non-profit corporation that serves as the official civilian auxiliary of the United States Air Force. CAP is a volunteer organization that performs three congressionally assigned missions: emergency services, which includes both air and ground search and rescue including disaster relief, aerospace education and a cadet program. CAP directly supports DOD forces, and many other federal agencies, primarily Dept. of Homeland Security. The CAP National HQ oversees eight regional commands and 52 wings, one in each State, plus Washington D.C. and Puerto Rico. The total national budget is about \$30 million annually.

As of 2011, CAP has 34,800 senior members and 26,000 cadets. The senior members are civilians and are not paid by the U.S. government for their service, but instead pay annual membership fees.

CAP operates the largest single engine aircraft fleet in the world, with 550 fixed wing aircraft, predominantly Cessnas, 42 gliders for cadet flights, roughly 960 ground vehicles, and a national digital radio communication network. In addition to CAP's own aircraft, member-owned aircraft are also available for air search and rescue. CAP has the largest civilian emergency communications network in the country. The nationwide system is comprised of short range VHF land mobile radios, using more than 500 repeaters and a medium to long range high frequency capability. There are 2,000 fixed radios and 7,675 mobile radios.

Headquarters for the Washington State Wing of the CAP is located at McChord Field, Joint Base Lewis McChord; there are 1,450 members in 27 units across the state. CAP operates a variety of missions in the area of emergency services which includes air search and rescue, disaster relief, counterdrug, and homeland security.

Role in Aviation SAR

CAP will provide search and rescue support to State and local authorities upon request. When a request for assistance has been received from an authorized agency (which includes WSDOT's Aviation Division) and the decision has been made for CAP to participate, the appropriate personnel will be alerted by wing and local commanders through established alerting procedures.

Search and Rescue Assets

There are approximately 1,450 CAP members in Washington, of whom 50% are cadets and 50% are senior members. The Washington Wing has about 45 search-mission qualified pilots, and nearly 100 members qualified as mission observers. Assets include eleven aircraft, with nine located in western Washington and two in eastern Washington; twenty ground vehicles and ten VHF repeaters.

Program Funding

CAP receives funding from membership dues, corporate donations, Congressional appropriations, and private donations. About 37 of the CAP Wings receive funding from state governments, ranging from \$5,000 to \$550,000 from the State of Alaska. The Washington Wing does not receive state funding.

Civil Air Patrol-United States Air Force (CAP-USAF)

The CAP-USAF is headquartered at Maxwell Air Force Base, Montgomery, Alabama. It is responsible for ensuring that the Civil Air Patrol, as the Air Force Auxiliary, is organized, trained and equipped to fulfill Air Force assigned missions, including air search and rescue. CAP-USAF provides day-to-day oversight for Civil Air Patrol programs with particular emphasis on safety and programmatic requirements. CAP-USAF personnel are the primary functional interface between other federal agencies and the CAP as the auxiliary performs homeland security, disaster response, citizen development and aerospace education missions. CAP-USAF provides assistance and oversight on search and rescue, disaster relief and other emergencies and contingencies nationwide. Headquarters CAP-USAF is staffed with 18 active-duty military and civil service members.

Additionally, presence in all 50 states, the District of Columbia and Puerto Rico is made possible through eight geographic regions. CAP-USAF's total personnel component, including all regions, is about 94 members. These members are assigned to one of 24 locations across the country. The CAP-USAF Pacific Liaison Region is headquartered at Beale Air Force Base in Marysville, CA, and the CAP-USAF Assistant Director of Operations Office is located at Joint Base Lewis-McChord in Washington state. Furthermore, Air Force Reservists complement the CAP-USAF team with approximately 160 attached members, with four attached members serving in Washington and Oregon.

Role in Aviation SAR

CAP-USAF personnel provide administrative assistance and operational oversight, as needed, on SAR missions performed by the Civil Air Patrol. No actual SAR missions are performed by CAP-USAF personnel.

Search and Rescue Assets

CAP-USAF does not maintain any SAR assets.

Program Funding

CAP-USAF, as an Air Force organization, receives funding through the Department of Defense/Air Force budget process.

Federal Aviation Administration (FAA)

The Federal Aviation Administration (FAA) is the national aviation authority of the United States. The agency has the authority to regulate and oversee all aspects of civil aviation in the United States (U.S.). Works and provides support to the Air Force Rescue Coordination Center (AFRCC). The AFRCC is the United States inland search and rescue coordinator responsible for coordinating on-land federal SAR activities in the 48 continuous United States, Mexico and Canada. The FAA maintains an alerting system and the rescue satellite aided tracking information for the AFRCC to use in their 24/7 operations. The AFRCC maintains lists of federal and state organization, which can conduct or assist in search rescue efforts.

The FAA's major roles include:

- Regulating U.S. commercial space transportation.
- Regulating air navigation facilities and flight inspection standards.
- Developing civil aeronautics and aviation technology.
- Issuing, suspending, or revoking pilot certificates.
- Regulating civil aviation to promote safety through flight standards district offices.
- Developing and operating a system of air traffic control and navigation for both civil and military aircraft.
- Researching and developing the National Airspace System and civil aeronautics.
- Developing and carrying out programs to control aircraft noise and other environmental effects of civil aviation.
- Provide support in air search and rescue operations.

The FAA is divided into nine regions plus the headquarters in Washington D.C. The Northwest Mountain Region includes Colorado, Idaho, Montana, Oregon, Utah, Washington and Wyoming; the headquarters is located in Renton, Washington.

FAA Role in Search and Rescue

The FAA's role in search and rescue in Washington includes the following:

- Provide support to Air Force Rescue Coordination Center/United States Coast Guard/other search and rescue organizations on a 24/7 basis.
- Provide flight plan information.
- Provide last known aircraft position.
- Provide airport searches.
- Provide operational priority to search and rescue aircraft.

Search and Rescue Assets

- Systems and technology to support search and rescue operations by providing information and data.

United States Air Force Rescue Coordination Center (AFRCC)

The Air Force Rescue Coordination Center (AFRCC) serves as the single agency responsible for coordination of federal aeronautical SAR activities in the 48 contiguous United States. It also provides SAR assistance to Mexico and Canada.

The AFRCC, located at Tyndall Air Force Base, Florida, is assigned to 1st Air Force, and operates 24/7. The center directly ties into the Federal Aviation Administration's alerting system and the U.S. Mission Control Center. The Center processes approximately 20 incidents per day, consisting of beacon alerts and other SAR taskings; such as overdue aircraft, missing persons and rescues. In addition to the Search and Rescue Satellite Aided Tracking information, the AFRCC computer system contains resource files that list federal and state organizations, which can conduct or assist in SAR efforts throughout North America. AFRCC uses state-of-the-art technology including a network of satellites for monitoring emergency locator transmitter signals. These systems help reduce the critical time required to locate and recover people in distress.

Role in Washington Aviation SAR

Agreements are currently in place between the AFRCC and Washington Military Department's Emergency Management Division (EMD) and Department of Transportation (ASAR program) for procedures to address search and rescue. The AFRCC investigates the request, coordinates with federal, state, and local officials, and determines the type and scope of response necessary. Most emergencies involve contacting the EMD Emergency Operations Center (EOC) in the case of a land or aviation distress situation, or the US Coast Guard for marine distress notices. Aviation emergency notifications are channeled 24/7 to WSDOT to provide a single point of contact. In the case of a general aviation interstate, military or large commercial aircraft, the AFRCC retains overall jurisdiction but recognizes the sovereignty of the State of Washington and partners with it to coordinate the operation within its borders. At the state's request, the AFRCC may coordinate federal (Department of Defense) support to civil search and rescue; both air and ground, and may also coordinate with the US Coast Guard for their support in the inland area.

The AFRCC presents a mobile Basic Inland SAR Course to Civil Air Patrol wings, state, and local agencies throughout the United States, to educate SAR personnel in current best practices and procedures, thus improving national SAR capability. These are held monthly, throughout the country. The AFRCC also assigns instructors to the National SAR School at the U.S. Coast Guard Reserve Training Center, Yorktown, Virginia. These instructors teach the Inland Search Planning Course both at Yorktown and throughout the United States and abroad. Washington State hosts this course every two to three years, last held at the Washington EMD in January, 2012.

Search and Rescue Assets

AFRCC does not have air search assets but can request them from the Naval Air Station Whidbey, Fairchild Air Force Base near Spokane, and from Joint Base Lewis-McChord near Tacoma. Coast Guard assets may also be requested.

Program Funding

The AFRCC does not provide any direct funding to aviation SAR in Washington; however, it can request air assets from other Federal agencies.

Washington Air Search and Rescue (WASAR)

The Washington Air Search and Rescue (WASAR) was formed in 1993 as a 501c3, tax deductible, charitable corporation by the Washington Pilots Association (WPA). WASAR is directed by a board of eight directors, four appointed and four elected. Two of the appointed directors must be the current and past Presidents of the WPA and one of the director positions must be offered to a representative of the Civil Air Patrol (CAP). WASAR was established to support Air Search and Rescue and disaster relief activities directed by the Air Search and Rescue Program of the Washington State Department of Transportation (WSDOT). The membership is made up of volunteers and includes members of the CAP, WPA, military and County Sheriff personnel. These members are state trained and qualified search pilots and observers, along with communication/support personnel.

WSDOT provides training to WASAR which is required at least every two years to maintain a pilot's qualified status on the search specialty list that is used to call pilots in for search and rescue missions. All emergency workers must be registered with the WSDOT Air Search and Rescue Program in order to be involved in air search and disaster relief missions. Emergency workers must meet all training requirements for their specialty area as set out by the WSDOT Air and Rescue Program in order to become qualified and registered. To become a member, an applicant is required to attend a WSDOT orientation meeting, successfully complete certain designated courses and to complete CPR training. Applicants are then subject to a background check which includes driving record, criminal background and FAA records. Since WASAR's original bylaws limited training activity to that directed by WSDOT aviation, there are fewer qualified pilots and volunteers with reductions in WSDOT training. WASAR has recently revised its bylaws to allow training by WASAR instructor pilots in order to serve other organizations such as the Coast Guard and local law enforcement agencies.

If WASAR members have to pay for aviation fuel and oil or auto fuel and oil while activated for a WSDOT search and rescue mission, they can receive reimbursement from WSDOT for these expenses. WASAR has also provided funds for lodging and meals for volunteers involved in search or training activities.

Role in Aviation SAR

Members and equipment are available 24 hours a day to assist the WSDOT in air search and rescue operations. WASAR provides emergency airlift and other special services to support State and county agency needs. WASAR has purchased equipment to benefit WSDOT aviation SAR activity including a satellite communication system and computers for the Emergency Services trailer, GPS tracking units for SAR sorties, and digital cameras.

Search and Rescue Assets

In 1998, over 200 privately owned aircraft were available at the call of the WSDOT Air Search and Rescue Program and included turbine helicopters, floatplanes, and single and twin-engine fixed wing aircraft. By 2007, this resource dropped to 29 aircraft and 101 qualified crew. Today there are five aircraft, six qualified pilots, and eight scanner/observers in WASAR.

Program Funding

WASAR operates on a nonprofit basis, obtaining its funds primarily from donations via affiliation with Local Independent Charities of America. WASAR therefore appear in the Federal, and several county and state combined fund drive campaigns in Washington.

Washington Military Department (WMD)

The Washington Military Department's mission is to minimize the impact of emergencies and disasters on people, property, environment, and the economy of Washington State; provide trained and ready forces for state and federal missions; provide structured alternative education opportunities for at risk youth. It is organized into seven functional areas:

- The Office of the Director (Office of The Adjutant General) functions include policy, strategic planning, homeland security, policy-level interface with executive and legislative branches of state, local, federal and foreign governments, and command of Air and Army National Guard forces.
- Washington Army National Guard commands include the 81st Heavy Brigade Combat Team, 66th Theater Aviation Command, 96th Troop Command and the 205th Training Regiment, whose soldiers operate from military facilities in 33 Washington communities. The Army National Guard is supported by state employees who provide capital construction, real property, facilities operations, maintenance and environmental protection staffing.
- Washington Air National Guard commands include the 141st Air Refueling Wing, 194th Regional Support Wing, and the Western Air Defense Sector, whose airmen operate from military facilities in seven Washington communities. The Air National Guard is supported by state employees who provide property, facilities operations, maintenance and environmental protection staffing.
- Washington State Guard is an all-volunteer unit organized under the Military Department, recognized under RCW 38.14 and the US State Defense Forces Act (32 USC Sec. 109). They normally serve without remuneration and meet at least monthly within organized units throughout the State.
- Emergency Management Division units include Planning, Exercise and Training; Programs, Mitigation, Response and Recovery; and Homeland Security/Enhanced 911. The division is comprised of Washington State employees operating from the Washington State Emergency Operations Center (EOC) at Camp Murray, and a satellite office in Pasco.
- Washington Youth Academy is part of the National Guard Youth Challenge Program, and works with 16-18 year-old high school dropouts. Program participants have the opportunity to retrieve high school credits for returning to high school, earning a high school diploma or completing GED requirements.
- National Guard STARBASE Program is a DoD-funded youth program aimed at stimulating student interest in Science, Technology, Engineering, and Mathematics (STEM).

Emergency Management Division (EMD)

The focus of the Emergency Management Division is to build statewide capability and capacity to prepare for, respond to, recover from and mitigate the effects of disasters and emergencies. The State Emergency Operations Center (EOC) coordinates support from all state agencies, mutual aid, and

commercial services that support local jurisdictions, and also serves in a back-up capability for many local jurisdictions. Its core capabilities include:

- Maintaining a statewide system of linked Emergency Operations/Coordination Centers. The EOC provides situational analysis, information gathering and data, emergency operations coordination and communications.
- Maintaining a training and exercise program that identifies and upgrades skills.
- Maintaining an active hazard awareness, public education and public information program to promote preparedness by public agencies, the private sector, and individuals.
- Developing a statewide system for delivery of emergency resources.
- Assisting communities in disaster recovery, including administration of FEMA recovery programs.
- Maintaining the statewide E911 system.
- Maintaining the Comprehensive Emergency Management Plan and the State Hazard Mitigation Plan.
- Helping local jurisdictions with grant writing to enhance their emergency management capabilities.

Emergency Management Division (EMD) Rescue Coordination Role

The EMD coordinates support from other agencies as required by each emergency. For an aviation SAR, the State Emergency Operations Center (SEOC) acts in this coordination role.

The SEOC, which includes the Alert and Warning Center (AWC) is located with EMD at Camp Murray, and is staffed by EMD State Emergency Operations Officers 24/7. The AWC receives initial all-hazard emergency calls and coordinates support for land SAR operations. The State Emergency Management Director appoints the State Coordinator of Search and Rescue Operations to coordinate state/federal support for land SAR. The State SAR coordinator also manages the Emergency Worker Program which covers land SAR volunteers. Chief law enforcement officers are in charge of all land SAR incidents within their jurisdiction.

Aviation SAR is the responsibility of the WSDOT Aviation Emergency Services Coordinator. Once the missing aircraft is located, SAR responsibility is transferred from WSDOT to local law enforcement authorities.

WMD Role in Aviation SAR

Under a MOU between WMD and WSDOT, the AWC receives initial electronic distress beacon and missing aircraft alerts from the Air Force Rescue Coordination Center (Tyndall AFB, Florida) or the FAA Flight Services Stations.

The AWC follows guidelines in the EMD/WSDOT MOU to process the notification and contact the on-call WSDOT ASAR coordinator. If there is an aircraft SAR mission, the overall responsibility for launching air search resources remains with the WSDOT Aviation Emergency Services Coordinator.

SAR Resources

The Military Department has no land or air SAR resources except for the agency fixed and mobile communication systems and emergency coordination facilities located at Camp Murray (SEOC).

Currently the WSDOT Aviation Emergency Services mobile command unit (trailer) is located at WSDOT headquarters in Olympia and is available for use by the state Rescue Coordination Center (joint WMD/WSDOT staffing) when activated during a disaster or large-scale land SAR mission.

Program Funding

Aviation SAR is funded by the General Aviation Fuel Tax revenue with additional indirect program support costs funded by WSDOT. Aviation SAR financial resource management is executed by WSDOT. The Washington Military Department does not receive any funding from the aviation fuel tax.

The WMD coordinates statewide emergency management missions from a broad spectrum of agencies with subject matter expertise in specialized areas that make them a “best fit” for the mission area to maximize public safety and minimize resource costs. Aviation SAR is an example of the role that Emergency Management plays in supporting overall missions that are “owned” by other agencies. However, aviation resources required for a specific mission are directly coordinated by WSDOT as the agency having incident command authority.

The Washington Military Department EMD Emergency Operations Center (EOC) serves as the initial point of contact for notification by the Air Force Rescue Coordination Center (AFRCC) and, occasionally, the Federal Aviation Administration (FAA) of electronic distress beacon activations and overdue aircraft. The State Emergency Operations officers (SEOO) process the calls in accordance with the MOU with WSDOT.

There are approximately 80 Aviation SAR related calls per year to the EOC. There is a small amount of EOC duty officer cost to receive and process these calls. Specifically, currently the WMD estimates that each call requires approximately ten minutes of processing time for a total personnel cost (salary and benefits) of less than \$500.00 per year that is included within the Emergency Operations Center budget (50%/50%) funded through General Fund State (GFS) and Federal Emergency Management Performance Grants (FEMA-DHS) and minimal facility costs are 100% GFS. 7-24 Draft

Washington Pilots Association (WPA)

The Washington Pilots Association (WPA) is a non-profit (501c7 corporation) organization of pilots and others interested in aviation focused on serving pilots and promoting general aviation in Washington State. The WPA's purpose, as set forth in its mission statement is "to advance the interest of General Aviation in Washington State through advocacy, outreach, education and social activities".

WPA membership varies with the economy, ranging between 850 and 1000 members, out of about 10,000 licensed pilots in the State. WPA has 20 local chapters in Washington, distributed throughout the state. The chapters generally hold monthly meetings, often featuring guest speakers, and sponsor other events which may involve social activities, training and/or educational events.

The WPA advocates on state and local aviation issues to preserve the right to fly and for airport maintenance and protection. WPA and its affiliation with the Aviation Coalition advocate for pilots at the state level. State legislation has been enacted for airport encroachment protection and more recent legislation grants limited liability immunity to aviation search and rescue volunteers. The WPA has also worked with other organizations to retain and even reopen airports. The WPA is not, however, affiliated with the WSDOT, FAA, or any other governmental organization.

Role in Aviation SAR

Members of the WPA, as well as other pilots, are served by aviation SAR efforts. They may not necessarily be formally involved in SAR as a member of WPA, but may be involved in aviation SAR activities through membership in other organizations such as Civil Air Patrol and the Washington Air Search and Rescue (WASAR).

The WPA initially formed WASAR with a \$6000 donation, with the intention that a non-profit (501c3) corporation could be formed to allow tax-deductible donations for SAR. The initial WASAR bylaws established all WPA members as voting WASAR members for direction, but did not allow SAR participation without additional qualification.

Program Funding

The WPA is a private non-profit organization and is funded by members—pilots and others interested in aviation. It does not receive funds from the Aviation Division of the WSDOT or the FAA.

Washington State Department of Transportation Air Search and Rescue

The WSDOT Aviation Division is responsible by statute (RCW 47.68.380) for the coordination and management of all aerial search and rescue within the state. This includes coordinating all aircraft used in search and rescue operations requested through the Aviation Division. The Aviation Division is also responsible for search and rescue activities involving electronic signaling devices such as emergency locator transmitters, emergency position indicating radio beacons and personal locator beacons associated with aeronautical use. This coordination and management of all aerial SAR does not include SAR operations conducted by the chief law enforcement officer of each political subdivision (RCW 38.52.400).

The **aviation emergency services coordinator**, within the Aviation Division of WSDOT, but officed within the Office of Emergency Management, administers the program by coordinating the use of aviation assets for air search and rescue operations and for disaster relief efforts. Resources the aviation emergency coordinator may request include: Civil Air Patrol, Washington Search Air and Rescue, Washington State Patrol, US Coast Guard, Naval Air Station Whidbey SAR, US Air Force, US Army, Washington National Guard, US Customs and Border Protection, County Sheriff Air Support Units, and other aviation organizations. The services available are: air searches to locate aircraft, air rescue coordination, airspace coordination, aviation support for land search and rescue, and aviation support for disaster responses. The program provides training in aerial search and rescue for other organizations across the State. The program also registers and coordinates the air search and rescue volunteers that are used by the program in accordance with WAC 468-200.

Role in Aviation Search and Rescue

The WSDOT Aviation Division is legally responsible for managing all search and rescue operations for aircraft within the State, as well as coordinating the use of aviation assets for disaster relief efforts. The WSDOT aviation emergency services coordinator is the incident commander, and after reviewing the information makes the decision on the type and amount of resources needed to support the search and rescue mission. The WSDOT Aviation Division also executes missions to locate and silence emergency distress beacons.

Search and Rescue Assets

WSDOT owns and operates one Cessna fixed wing aircraft and one mobile incident command trailer that contains a 2 person communications room, planning room, complete office along with a generator that can run for 72 hours before refueling. The communications include: two VHF-FM radios, one aircraft VHF-AM, a Satellite broadband internet system, a satellite cell phone, a wide band receiver, a WSDOT/WSP 800 Mhz. radio, and 10 computers.

Program Funding

The 2011-13 biennial appropriation from the State Aviation Account is \$384,000. WSDOT does not receive federal funds for this activity; however, federal resources may be made available at no cost to the state.

Washington State Patrol (WSP)

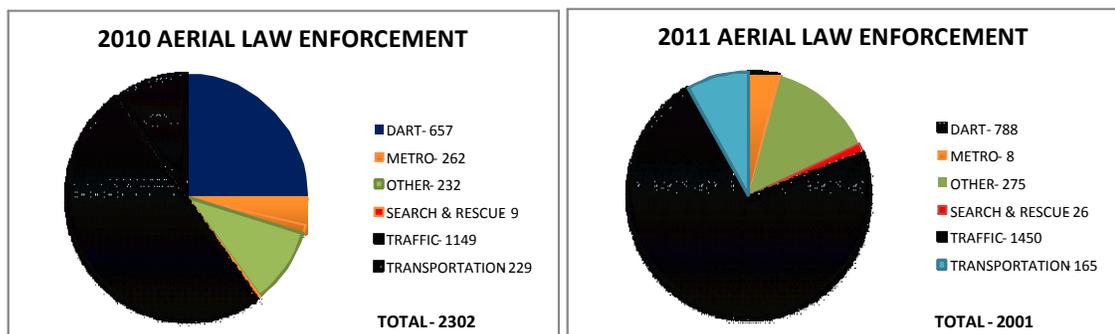
The Washington State Patrol serves and protects the people and property in Washington State through traffic law enforcement and other services. The WSP administers the state crime and toxicology laboratories, coordinates the state's emergency communications linkage, and is the central repository for criminal history information and fingerprints. The WSP provides fire protection services as well as traffic, criminal, and investigative assistance to local jurisdictions.

The WSP Aviation Section provides aerial traffic enforcement, traffic congestion management, and other aerial law enforcement services in support of the Patrol's public safety mission. The Aviation Section assists troopers in detecting traffic violations from the air including participation in a rush hour traffic management program in King and Pierce counties. It provides assistance to agency staff and local jurisdictions with drug enforcement, aerial surveillance, and transporting critical medical supplies. They also are utilized for emergency response and search and recovery efforts, and in helping reduce vulnerability to terrorism, for which the federal government funded the aircraft infra-red (FLIR) equipment. The Aviation Section also provides air transportation for the Governor and state agencies.

Role in Aviation SAR

The WSP Aviation Section provides aerial search and rescue support for missing persons, aircraft, ships, or other craft in distress or imminent danger. The WSP Aviation Section supports the State Emergency Management Division at Camp Murray, the US Coast Guard, the Washington National Guard, County Emergency Operation Centers, State Agencies, and local public safety partners. The WSP routinely provides transmission of "real-time" aerial video from aircraft to requesting public safety partners and Emergency Operation Centers during natural disasters and readiness exercises.

For 2010 and 2011 the WSP provided the following aerial law enforcement services:



DART – DUI Aerial Response Team, using FLIR equipped airplanes to track and apprehend impaired or reckless drivers. Performed in conjunction with troopers and improved communications including citizen reports.
 OTHER – narcotic, emergency, lojack, maintenance, media & PR, photo, pursuit, security, surveillance, training.

Search and Rescue Assets

- Two 7- or 8-passenger King Air multi-engine aircraft, and five Cessna fixed wing aircraft, including two equipped with forward looking infrared (FLIR) cameras
- Full radio communication capabilities, including VHF, 400, 700, and 800 MHz
- 24/7 availability
- Eight pilots, four maintenance technicians and two support staff

Search and Rescue Funding

The Washington State Patrol Aviation Section does not have dedicated funding for SAR missions. All SAR missions are performed during routine patrol operations or upon request and in conjunction with our public safety missions.

Agenda: July 31, 2012 Aviation Search and Rescue Work Group

1. Opening Remarks—Gene Baxstrom (10 minutes) 9:00-9:10
2. Introductions by Study Group members—All (20 minutes) 9:10-9:30
 - a. Description of agency role in WA Search and Rescue
 - b. introduce support people
3. Study process (15 minutes) 9:30-9:45
 - a. Background and Legislative history—Hayley Gamble and Jerry Long
 - b. Study process and schedule--All
 - c. What are the study issues, include study questions in proviso
 - d. Final report objectives: findings, alternatives w/ pros and cons
4. Current Washington approach for aviation SAR (30 minutes) 9:45-10:15
 - a. Chris Long, Washington Military Department
 - b. Tom Peterson, WSDOT
 - c. Dan Conley, USAF Rescue Coordination Center
 - d. Comments by others directly involved (CAP, WASAR, WSP)
5. Discussion of Washington Process—All (60 minutes) 10:15-11:15
 - a. What works well
 - b. What are areas that could be improved
 - c. To what extent does duplication of services and training exist?
Is that a good or bad thing?
6. Aviation SAR in other states (20 minutes) 11:30-11:50
 - a. Survey of other states—Hayley Gamble and Laura Zanzig
 - b. Comments by other group members
7. Discussion by All (45 minutes) 11:50 – 12:25

What changes in the current Washington approach, or alternative approaches to organize WA Search and Rescue, should we evaluate this summer? (Changes and alternative structures will be evaluated prior to next meeting.)

 - a. Evaluation will include the following:
 - i. Effectiveness, cost, funding, and other implications
 - ii. Description of advantages and disadvantages of current and alternative structures
 - b. Evaluation will also consider the questions posed in proviso directing the study
 - i. Is there duplication of training? If so, where, and is that a problem?
 - ii. What is the best use of state and federal dollars?
 - iii. What alternative source of funding should be considered?
8. Next steps (15 minutes) 12:25-12:40
 - a. Schedule for study—Gene Baxstrom
9. Closing comments—All (15 minutes) 12:40-12:55

July 31, 2012 Search and Rescue Work Group Meeting

Meeting Time: 9:00 am - 1:00 pm

Location: Olympia

Policy Group Members

| | |
|-------------------------|------------------|
| Atkins, Tristan | WSDOT |
| Himmel, John | WSDOT |
| Peterson, Tom | WSDOT |
| Magonigle, Maj Gen Gary | Military Dept |
| Hardin, Kurt | Military Dept |
| Long, Chris | Military Dept |
| Swisher, Dan | Military Dept |
| Lehman, Col David | Civil Air Patrol |
| Green, Lt Col Tom | Civil Air Patrol |
| Nakauchi, Jim | CAP-USAF |
| Huss, Capt Rob | WSP |
| Nobach, Lt Jim | WSP |
| Smith, Les | AOPA |
| Jensen, Tom | WPA |
| Towers, Matt | WASAR |
| Mayer, Gary | FAA |
| Conley, Danny R | AFRCC |

Legislators

Honeyford, Sen. Jim
Klippert, Rep. Brad

Staff Workgroup Members

Baxstrom, Gene
Fleckenstein, Mary
Gamble, Hayley
Long, Jerry
Zanzig, Laura
Cummings, Alyson - OFM

Others:

Hatteberg, Jeff WSP

Other Legislative

Staff Present:

Gatto, Samantha
Cadena, Lyset
Plasencia, Sonia

Study on Aviation Search and Rescue Washington State Air Search and Rescue History

The Washington State Aeronautics Commission was established in 1947, and operated as an independent entity until 1977, when its duties were transferred to the newly established Transportation Commission and the Department of Transportation (DOT).

The Air Search and Rescue Program was implemented in 1967 and funded through a pilot's registration fee.

When the program first moved to WSDOT, it was known as the Aeronautics Division. In the mid-1990s its name was changed to the Aviation Division (AD).

In 1996, Washington Administrative Code (WAC) 468-200 was implemented, requiring that all emergency workers be registered with the WSDOT-AD in order to be involved in air search and rescue missions. The WAC also requires that emergency workers meet all training requirements for their specialty as set out by WSDOT-AD in order to become qualified and registered.

The 2001 Transportation Budget (ESSB 5327) included a proviso that directed the Joint Legislative Audit and Review Committee (JLARC) to conduct a performance audit to evaluate the advantages and disadvantages of removing the entire aviation division from WSDOT.

In 2002 the Joint Legislative Audit and Review Committee (JLARC) completed a study evaluating the option of removing the Aviation division from WSDOT and creating a separate Department of Aviation. They concluded the Aviation Division should remain at WSDOT.

In 2003 a WSDOT Search & Rescue Study Team developed recommendations to consider "efficiencies, issues and emerging trends" in aviation SAR. Study recommendations focused on SAR operation and protocol improvements within the existing WSDOT aviation program. Recommendations included developing a comprehensive SAR plan, improving the SAR volunteer base, and developing an outreach and communications strategy for SAR.

Substitute Senate Bill 5414 passed in 2005, which repealed the \$15 pilot registration fee and eliminated the aircraft search and rescue safety and education account. The aviation fuel tax was increased from 10 cents to 11 cents per gallon, with the additional revenues deposited into the Aeronautics Account. Air Search and Rescue is presently funded from the Aeronautics Account at approximately \$400,000 per biennium. The program is funded for one FTE, rescue training, operation of a search and rescue plane, and limited volunteer reimbursements.

A budget Decision Package was submitted by WSDOT in 2007 to move SAR responsibility from WSDOT to the state Military department. During the budget process the topic of moving Aviation SAR was discussed by various parties including the Governor's Office, Washington State Patrol, the state Military Department, and WSDOT. No funding was proposed to be transferred with the duties of aviation SAR and this proposal did not move forward. Reasons given for the proposed transfer by WSDOT included consolidation of all SAR responsibilities, cost savings to the state, more revenue for other aviation activities, removal of duplication of effort and more effective

coordination of SAR. WSDOT acknowledged there would be a need for a specialized staffer for aviation SAR wherever it was housed.

Also in 2007 a draft bill (0123.1) was widely circulated, but never introduced, that proposed transferring responsibility for aviation SAR to the state military department and was part of the WSDOT budget decision package.

In Fiscal Year 2012, the Air Search and Rescue Program was transferred within WSDOT from the Aviation Division to the Emergency and Security Operations Office of the WSDOT Maintenance Program. During the 2012 legislative session Senate bill 6430 was introduced but did not pass. This bill proposed transferring responsibility for aviation SAR to the state military department.

The 2012 Transportation Budget (ESHB 2190) included a proviso directing the Joint Transportation Committee to examine SAR in Washington.

RCW 47.68.380 outlines the responsibilities of the Aerial Search and Rescue Program and makes the aviation division of the DOT responsible for the conduct and management of all aerial search and rescue within the state. This includes search and rescue efforts involving aircraft and airships. The division is also responsible for search and rescue activities involving electronic emergency signaling devices such as emergency locator transmitters (ELT's) and emergency position indicating radio beacons (EPIRB's).

Presentation by WSDOT's Aviation Emergency Coordinator, Tom Peterson, to July 31, 2012 ASAR Work Group Meeting

Aerial Search and Rescue (SAR) in Washington State

Process Overview




SAR Plans and Agreements

- WORLD SAR PLAN
 - International Civil Aviation Organization (ICAO) & International Maritime Organization (IMO) Treaties
 - International Aeronautical & Marine SAR (IAMSAR) Manual
- NATIONAL RESPONSE FRAMEWORK – (NRF)
 - Emergency Support Function (ESF) 9 Search & Rescue
- US SAR PLAN
- US Supplement to IAMSAR Manual
 - Maritime Addendum
 - Land SAR Addendum
 - Aviation SAR Addendum
- US Air Force / Washington State Agreements
 - Memorandum of Understanding
 - Memorandum of Agreement
- WA State Law
 - RCW 47.68.380 / RCW 38.52.400
 - WAC 408-200 / WAC 118-04
- WA Comprehensive Emergency Management Plan (WA CEMP)
 - Emergency Support Function 9 – Search and Rescue



The SAR Mission

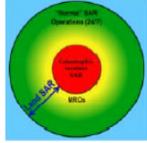
Locate, access, stabilize and transport missing persons as quickly and safely as possible to save life, limb, eyesight, and prevent undue suffering, using aviation resources solely or in conjunction with other forces. MNI

This can be for missing or overdue aircraft, missing persons in the urban or wilderness environment, or because of natural or man made disasters.



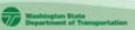
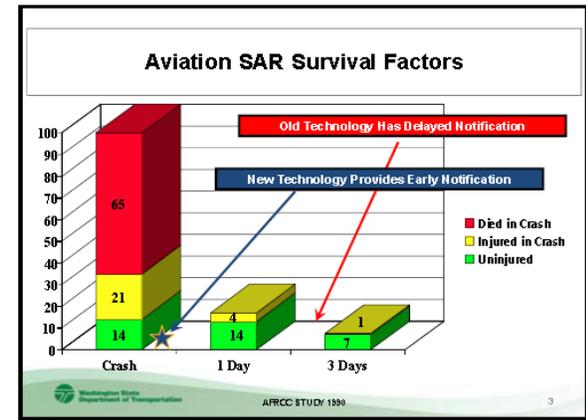
Three levels of SAR

- Olive model – Green, Yellow, Red
 - Day-to-day SAR incidents
 - Missing aircraft
 - Emergency distress beacons
 - Assisting ground SAR missions



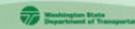
WA Rescue Coordination Center activated at State Emergency Operations Center (SEOC)

- Mass Rescue Operations (MRO)
 - Lewis Thurston County Floods 2007
- Critical Incident SAR (CISAR)
 - Volcano, Lahar, Earthquake, Tsunami Scenarios

Three Segments to Process

- Determination / Investigation
 - Gather information/ Size Up
- Alerting / Activation
 - Notification of Resources
 - Coordination with other Partners
- Execution / Operations
 - Resources to the field
 - Mission Safety

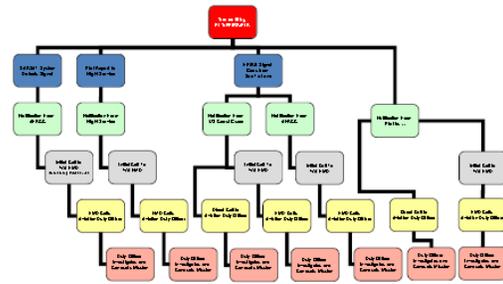


Six Step Decision Making Process

SCORPA

- S - Size up the incident – nature, hazards, size of area
- C - Contingencies – What could make things worse?
- O - Objectives – Strategies, assignments, investigate, search
- R - Resources – What, where, when, how & how fast
- P - Plan - Responsibilities, organization
- A - Action – Implement IAP, supervise/coordinate, repeat process

Electronic Distress Beacon Notification Flow Chart



Normal Operations

• Reports of Missing, Overdue, or Aircraft In Distress

- FAA / Flight Service System (FSS) to Air Force Rescue Coordination Center (AFRCC)
- AFRCC to State Emergency Operations Center (SEOC)
- SEOC to WSDOT

OR

- Public Safety Access Point (PSAP) to SEOC to WSDOT
- PSAP to WSDOT

THEN

WSDOT contacts SEOC and AFRCC and PSAP/Local jurisdiction to start coordination

Non-Standard Operations

• Friends of pilot initiate own search

- Do not contact FAA/FSS/SEOC or AFRCC
- Causes critical time delay
 - Survival rate declines
 - Critical information degraded
 - Erroneous assumptions can be communicated as factual information

• FAA or FSS contacts local jurisdiction directly

- FAA/FSS or local jurisdiction starts SAR
- Does not coordinate with SEOC or WSDOT
- Complicates process and causes delays
 - Resources activated with full coordination picture

Normal Operations

• Reports of Emergency Locator Transmitters (ELT), Emergency Position Indicating Radio Beacon (EPIRB) or Personal Locator Beacons (PLB)

- Search and Rescue Satellite System (SARSAT) to AFRCC
- AFRCC to SEOC
- SEOC to WSDOT

OR

- FAA to AFRCC
- AFRCC to SEOC
- SEOC to WSDOT

THEN

WSDOT starts evaluation process
Calls airports, towers, operators, or registration information to resolve. Activates resources to locate and silence if warranted.

Technology

- Digital 406 MHz Emergency Locating Transmitter (ELT)
- Radar Forensics
 - Update ASAR theory
 - New best practices
- Cell Phone Forensics

406 Digital Beacons

Digital 406 MHz ELT

- Provides ID of source – boat, aircraft, hiker, etc.
- Provides contact information for quicker verification
- Provides very small initial search area – two miles
- 8 percent false alarm rate vs. 97 percent



Radar Forensics

- Available in 1-2 hours
- Discreet code / good Last Known Position (LKP)= Quicker
- Notification to on-site 12 hours or less: average = 4 hours
- New system available since 2004

Depiction of Satellite Position with 406MHz Beacon – 2 Mile Circle



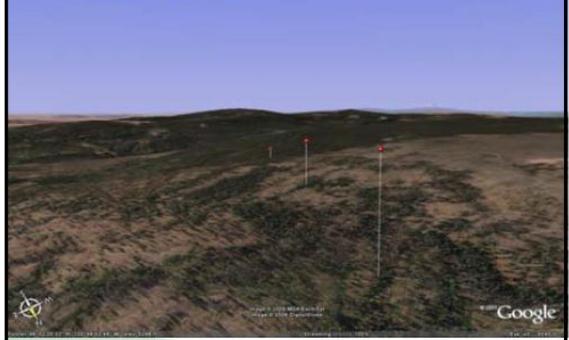
Each Dot = 12 Seconds = 1 RADAR Sweep



Depiction of Airborne Reports of Beacon – 12,500 square miles



Each Dot = 12 Seconds = 1 RADAR Sweep





Initial Tactics

- Alerting and activation
 - Mission numbers
 - Short messaging system – texts
 - Phone calls to critical staff / partners
- Local jurisdiction coordination
- Base of operations determination
- Resource requests
- Investigative information retrieval
- Route / electronic searches

Cell Phone Forensics

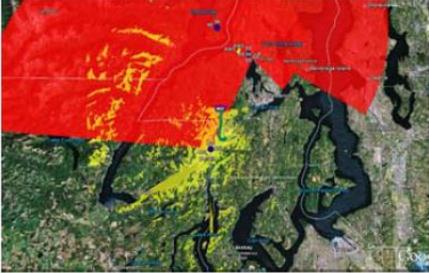
- Available in 1-4 hours
- From CAP member through AFRCC
- Specific Call Data included
- Reception Propagation and Cell Tower Sector Maps
- Legal agreements at AFRCC

Resource Selection

- Response time
- Scope dependent
 - Electronic
 - Protracted – wide area
 - Time / Weather factor
- Operational area environment
- Appropriateness of resource



Cell Phone Forensics




Review of 50-state Aviation Search and Rescue Survey

Note to readers: This data was collected by a Senate Committee Services intern through a combination of telephone interviews and email correspondence directly with the states. Thirty-one states and the District of Columbia provided responses with varying levels of specificity. It should be noted that this is raw data from the states themselves, meaning there is potential for misunderstanding or misinformation. However, this gives us a general idea of how aviation search and rescue (SAR) is conducted across the country.

Observations

1. All states are different. Topography, resources at the local, state, regional and federal level, and volume of aviation activity all affect how SAR is conducted in each state. There is no one-size-fits-all. As expected, the number of incidents of actual downed aircraft roughly correlated with the number of general aviation aircraft registered in the state.

2. Of the thirty-two states that responded to our survey, twenty-four (75%) have their state Emergency Management Division responsible for aviation SAR. State law enforcement agencies were the next most common, followed by the Department of Transportation (DOT).

Because nineteen states did not provide responses, this data is supplemented with information from the Air Force Rescue Coordination Center (AFRCC). Forty-eight states and the District of Columbia have agreements with the AFRCC. Of these, twenty-nine (60%) listed their state Emergency Management Division as responsible.

3. Washington's neighbor states (Oregon, California, Idaho, Montana, and Nevada) have either their state DOT or state Emergency Management Division responsible for aviation SAR. Colorado, which we often use as a comparison state, has the Civil Air Patrol (CAP).

4. Lead agency resources range from none (no aircraft) to numerous (as in the case of Colorado, with CAP as lead).

5. Most states do not have a dedicated funding source or designated budget for aviation SAR. Rather, this is just another expense from their general fund or elsewhere.

6. Number of staff dedicated to aviation SAR varied widely (from none to fifty), reflecting the individualized approach each state takes to aviation SAR. The larger staff numbers were reported when aviation SAR is considered one task within a larger agency, rather than being a dedicated task for one person, as it is in some states.

7. Most states rely heavily on volunteer resources, CAP being the main source for those volunteers. Twenty-eight of the thirty-two states reported they relied on volunteers.

A complete list of the survey results can be found at

http://www.leg.wa.gov/JTC/Documents/Studies/SAR/AllStateData_LZ%2011x17.pdf

Aviation Acronym List

| | |
|---------|--|
| AES | Aviation Emergency Services (WSDOT) |
| AFB | Air Force Base |
| AFRCC | Air Force Rescue Coordination Center |
| AOPA | Aircraft Owners and Pilots Association |
| ARNG | Army National Guard |
| ASAR | Aviation Search and Rescue |
| ATC | Air Traffic Control |
| ATM | Aircrew Training Manual |
| CAP | Civil Air Patrol |
| CEMP | Comprehensive Emergency Management Plan |
| ELT | Emergency Locator Transmitter (Example: 406 MHz Beacon) |
| EMD | Emergency Management Division (within WA Military Dept.) |
| EOC | Emergency Operations Center |
| EPIRB | Emergency Position Indicating Radio Beacon |
| FAA | Federal Aviation Administration |
| FAC | Forward Air Controller |
| FAR | Federal Aviation Regulations |
| FLIR | Forward Looking Infrared |
| FSS | Flight Service System |
| F/W | Fixed Wing |
| GPS | Global Positioning System |
| ICS | Incident Command System |
| IFR | Instrument Flight Rules |
| KM | Kilometer |
| LOA | Letter of Agreement |
| MEDEVAC | Medical Evacuation |
| MOU | Memorandum of Understanding |
| NAS | Naval Air Station |
| NAVAID | Navigational Aid |
| NIMS | National Incident Management System |
| NRF | National Response Framework |
| NTSB | National Transportation Safety Board |
| NVS | Night Vision Devices |
| PLB | Personal Locator Beacon |
| PSAP | Public Safety Access Point |
| RCW | Revised Code of Washington |
| SAR | Search and Rescue |
| SEOP | State Emergency Operations Center |
| SVFR | Special Visual Flight Rules |
| TFR | Temporary Flight Restriction |
| USAFCAP | United State Air Force-Civil Air Patrol |
| USAFRCC | United States Air Force Rescue Coordination Center |
| VFR | Visual Flight Rules |
| WAC | Washington Administrative Code |
| WACEMP | Washington Comprehensive Emergency Management Plan |
| WASAR | Washington Air Search and Rescue |
| WMD | Washington Military Department (National Guard) |
| WPA | Washington Pilots Association |
| WSP | Washington State Patrol |