

# APO Bulletin

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## Aviation Accident Investigation Costs

All costs (or costs avoided) born by all parties expected to result from proposed FAA investments, regulations, and AIP grants should be considered in the conduct of benefit cost analysis of these proposed activities. One such cost is the expense of investigating aviation accidents. Investigations involve the expenditure of resources by several entities, including the National Transportation Safety Board (NTSB), the Federal Aviation Administration (FAA), and the private sector. This analysis estimates costs incurred by governmental entities for accident investigation. It also provides approximations for costs incurred by the private sector. These values, grouped by NTSB investigation type, are summarized in Table 1.

**TABLE 1**

<b>AVIATION ACCIDENT INVESTIGATION COSTS</b>					
<b>(2000 dollars)</b>					
<b>Type of NTSB Investigation</b>	<b>Cost</b>				
	<b>NTSB</b>	<b>FAA</b>	<b>Total Federal</b>	<b>Private</b>	<b>Total</b>
Major	\$1,411,700	\$398,000	\$1,809,700	\$4,368,300	\$6,178,000
Field Office:					
Regular	\$32,900	\$15,000	\$47,900	\$49,400	\$97,300
Limited	\$300	\$8,000	\$8,300	0	\$8,300
<u>Weighted Average</u>					
<u>By User Type</u>					
Air Carrier (including Air Taxi)	\$93,900	\$33,800	\$127,700	\$240,300	\$368,000
General Aviation	\$6,700	\$9,500	\$16,200	\$9,800	\$26,000

Since some air carrier accidents are followed by NTSB major investigations and others by field office regular investigations, average air carrier accident investigation cost is also reported in Table 1. It is a weighted average of major and field office regular accident investigation costs where the weights are the number of major and field office regular air carrier investigations actually conducted. Similarly, a general aviation average is presented. It is a weighted average of NTSB field office regular investigations and limited investigations where the weights are the respective number of such investigations conducted.

### **Derivation of Federal Accident Investigation Cost Estimates**

The NTSB is responsible for the investigation of all aircraft accidents. It conducts two types of investigations: major investigations which are directed by NTSB headquarters in Washington and field office investigations which are conducted by its field offices. Major investigations are conducted primarily for major air carrier disasters involving numerous fatalities and substantial property damage. They are characterized by the dispatch of an investigative party—go team—to the accident site and usually involve substantial support by the FAA and involved private parties such as the airline, airframe and engine manufacturers, avionics manufactures, component and sub-component suppliers, labor representatives, etc.

Field investigations are further divided into regular investigations and limited investigations. Field office regular investigations are much smaller in scope than major investigations. They are conducted for air carrier accidents involving limited loss of human life and for most fatal general aviation accidents. Limited field office investigations are conducted for most other accidents. FAA provides significant support to NTSB in the conduct of field office investigations.

NTSB cost estimates were derived from budget, staffing, and activity data. An eight-year period—FY-1991 through FY-1998—was selected so as to capture a wide range of accident experience, both in terms of numbers of accidents and complexity of the investigations required. For this period, the total amount of the NTSB budget devoted to aviation safety was first determined. This involved taking the portion of the budget dedicated directly to aviation safety and adding to it a proportional allocation of costs joint to aviation as well as other forms of transportation, including a portion of policy, administration, and research and development expenditures. Total aviation safety costs were then assigned to five different types of investigations conducted by NTSB: major air carrier investigations, field regular investigations, field limited investigations, foreign major investigations, and other foreign investigations. Assignment was based on the number of full time equivalent employees dedicated to or supporting each type of investigation relative to total full time equivalent employees. The costs assigned to each type of accident were then divided by the total respective number of accidents in each investigation category to arrive at a per accident investigation cost.

Because FAA is a much larger organization than NTSB with many responsibilities, only one of which is accident investigation, budget data was not used directly. Rather, it was necessary to determine the amount of costs across FAA that are attributable to accident investigation. This was done by undertaking a special study of accident investigation costs based on models developed for A Cost Allocation Study of FAA's FY 1995 Costs. This special study identified accident investigation costs attributable to FAA's Office of Accident Investigation, Flight

Standards Service, Aircraft Certification Service, Office of Aviation Medicine, and to the conduct of flight inspections.<sup>1</sup>

Costs attributable to the Office of Accident Investigation, Flight Standards, and Aircraft Certification were assigned to the same accident categories as were NTSB costs. This assignment was made utilizing data on hours expended by FAA to investigate various accident types relative to total investigation hours as compiled by the FAA Office of Accident Investigation's Accident Investigation Quality Assurance Program. Office of Aviation Medicine and flight inspection costs were assigned to major investigations and regular field investigations by dividing their respective amounts by the total number of these types of accidents. This was done to reflect that these cost are approximately constant across these accident investigation types. Allocated Federal costs by type of accident investigation and entity incurring the cost are reported in Table 2.

**TABLE 2**

<b>FEDERAL ACCIDENT INVESTIGATION COSTS BY COMPONENT</b>						
<b>(2000 dollars)</b>						
<b>Type of Investigation</b>	<b>NTSB</b>	<b>FAA</b>				<b>Total</b>
		<b>AVR</b>	<b>Flight Inspection</b>	<b>Aviation Medicine</b>	<b>Total</b>	
<b>Major</b>	\$1,411,700	\$397,000	\$600	\$400	\$398,000	\$1,809,700
Field Office:						
Regular	\$32,900	\$14,000	\$600	\$400	\$15,000	\$47,900
Limited	\$300	\$8,000	0	0	\$8,000	\$8,300
<u>Weighted Average By</u>						
User Type:						
Air Carrier (including Air Taxi)	\$93,900	\$32,800	\$600	\$400	\$33,800	\$127,700
General Aviation	\$6,700	\$9,300	\$100	\$100	\$9,500	\$16,200

<sup>1</sup> FAA FY 1995 Accident Investigation Costs," GRA Incorporated, April 2, 1997.

## **Approximation of Private Sector Accident Investigation Costs**

The NTSB go team conducts an investigation by forming as many as ten investigative sub-teams. Each sub-team, lead by an NTSB investigator, investigates a particular subject matter area such as power plants, airframes, avionics, control systems, operations, human factors, weather, survivability, and air traffic control. Most sub-team members, known as "parties," are from private industry and are invited to participate in the investigation by the NTSB. The party system allows the NTSB to leverage its resources and personnel by bringing to the investigation the technical expertise of the companies and entities (labor representatives, airlines, manufacturers, suppliers of components and sub-components, etc.) that were involved in the accident or that might have specialized knowledge to assist the investigation.

This procedure results in significant investigation costs being incurred by the private sector. No systematic measures are available for this cost. However, an approximation may be made based on NTSB's cost. Discussions with NTSB and examination of NTSB accident reports suggested that about 6 private sector parties participate in major accident investigations and 3 private sector parties in regular field investigations. Assuming that each of the private sector parties supports half of the investigative sub-teams at the same level of cost as incurred by NTSB for each sub-team, private costs may be approximated as 3 times NTSB costs for major investigations and 1.5 times NTSB costs for regular field investigations. In addition, the private sector typically pays to remove aircraft wreckage. Aviation insurance industry sources placed this cost at about \$133,000 per major accident.

Applying these assumptions and values yields the approximation to private sector cost presented in Table 3.

**TABLE 3**

<b>APPROXIMATION OF PRIVATE SECTOR ACCIDENT INVESTIGATION COSTS (2000 dollars)</b>	
<b>Type of Investigation</b>	<b>Cost</b>
Major	\$4,368,300
Field Office:	
Regular	\$49,400
Limited	0
<u>Weighted Average By User Type</u>	
Air Carrier (including Air Taxi)	\$240,300
General Aviation	\$9,800

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