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NATIONAL TRANSPORTATION SAFETY BOARD

Preliminary Observations on the Value of Comprehensive Planning, and Greater Use of Leading Practices and the Training Academy

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Highlights

Highlights of GAO-06-801T, a report to Subcommittee on Aviation, Committee on Commerce, Science and Transportation

NATIONAL TRANSPORTATION SAFETY BOARD

Preliminary Observations on the Value of Comprehensive Planning, and Greater Use of Leading Practices and the Training Academy

Why GAO Did This Study

The National Transportation Safety Board (NTSB) is a relatively small agency that plays a vital role in transportation safety and has a worldwide reputation for investigating accidents. With a staff of about 400 and a budget of $76.7 million in fiscal year 2006, NTSB investigates all civil aviation accidents in the United States, and significant accidents in railroad, highway, marine, and pipeline; and issues safety recommendations to address issues identified during accident investigations. To support its mission, NTSB built a training academy, which opened in 2003 and provides training to NTSB investigators and others. It is important that NTSB use its resources efficiently to carry out its mission and maintain its preeminence. This testimony, based on ongoing work for this committee, addresses the extent to which NTSB follows leading practices in selected management areas, addresses challenges in completing accident investigations and closing safety recommendations, and generates sufficient revenues to cover costs at its academy.

What GAO Recommends

Based on completed work to date, GAO recommends, among other things, that NTSB develop a revised strategic plan that follows performance-based practices, develop a full cost accounting system, and develop a marketing plan for the academy. NTSB agreed with GAO's recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-06-801T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Gerald L. Dillingham at (202) 512-2834 or dillinghamg@gao.gov.

What GAO Found

NTSB has recently made progress in following leading management practices, but overall has a mixed record. For example, NTSB has improved its financial management by hiring a Chief Financial Officer and putting controls on its purchasing activities, which should address past problems with unapproved purchases. However, NTSB lacks a full cost accounting system, which would inform managers of the resources spent on individual investigations and provide data to balance office workload. NTSB has also begun to develop a performance management system that should eventually link each individual's performance to the agency's strategic goals and objectives. However, the performance management system will not be fully functional until NTSB has developed a strategic plan with results-oriented goals and objectives and specific strategies for achieving them, which are lacking in the current strategic plan. Other areas, such as human capital and communications, partially follow leading practices.

Extent to Which NTSB Is Following Leading Practices in Selected Management Areas

Management area	Extent to which NTSB follows leading practices
Strategic planning	○
Performance management	◐
Human capital	◐
Financial management	●
Communications	◐

● Leading practices are mostly followed
◐ Leading practices are partially followed
○ Leading practices are minimally followed

Source: GAO's analysis of NTSB information.

While NTSB is accomplishing its accident investigation mission, it faces challenges that affect the efficiency of the report production and recommendation close out processes. NTSB routinely takes longer than 2 years to complete major investigations. Several factors may affect the length of report production, including several revisions of draft reports through multiple layers of the organization. In addition, the processes for federal transportation agencies to implement NTSB's safety recommendations and for NTSB to change the status of recommendations are lengthy, paper-based, and labor intensive. While Department of Transportation officials have been working with NTSB to find acceptable means of implementing its recommendations, they cite the lengthy rule-making process as a challenge to speedy implementation.

For fiscal years 2004 and 2005, NTSB's academy did not generate sufficient revenues to cover the costs of providing training. As a result, those portions of the academy's costs that were not covered by the revenues from tuition and other sources—approximately $6.3 million in fiscal year 2004 and $3.9 million in fiscal year 2005—were offset by general appropriations to the agency. While NTSB has taken action to generate revenue from other sources, such as renting academy space for conferences, it does not have a marketing plan that seeks to optimize opportunities for additional revenues at the academy.

Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to discuss the reauthorization of the National Transportation Safety Board (NTSB). NTSB is a relatively small agency that plays a vital role in transportation safety. With a staff of about 400 and a budget of $76.7 million in fiscal year 2006, NTSB is charged with investigating every civil aviation accident in the United States and significant accidents in the other modes—railroad, highway, marine, and pipeline—,determining the probable cause of these accidents and issuing recommendations to address safety issues identified during accident investigations. NTSB has gained a worldwide reputation as a preeminent agency in conducting transportation accident investigations. Since 1967, it has issued 1,340 major accident investigation reports, over 130,000 brief accident reports, and made over 12,000 safety recommendations. To support its mission, NTSB built a training academy that opened in 2003 and provides training to NTSB investigators and other transportation safety professionals, including those from foreign countries. It is critical that the agency uses its resources in an efficient manner to carry out its safety mission and maintain its preeminent position. For this reason, you asked us to conduct a comprehensive review of NTSB's management functions such as strategic planning, human capital management, and mission-critical investigation activities. My testimony today is based on our ongoing work for you, and it addresses the extent to which NTSB is (1) following leading practices in selected management areas, (2) addressing challenges in completing accident investigations and closing safety recommendations, and (3) generating sufficient revenues to cover costs at its academy. We will be reporting additional results of our ongoing work to the committee later this year.

In summary:

- While NTSB has recently made progress in following leading management practices, its overall record is mixed. For example, NTSB generally follows leading practices in the area of financial management. Over the last several years, NTSB has hired a Chief Financial Officer and improved its financial management by putting controls on its purchasing activities, which should address past problems with unapproved purchases with government credit cards. However, NTSB lacks a full cost accounting system, which would inform managers of the resources spent on individual investigations and provide data to help assure balanced office workload. Other areas, such as performance management, human capital, and communications, partially follow leading practices. For example, NTSB has begun to develop a performance management system that should eventually link each individual's performance to the agency's strategic goals and objectives. However, the performance management system will not be fully functional until NTSB has a strategic plan with results-oriented objectives and specific strategies for achieving them, which are lacking in the current strategic plan. In the area of human capital management, NTSB has recently developed a draft staffing plan that addresses the agency's skills and competencies needs and includes strategies to increase the number of investigators and thereby strengthen the agency's ability to carry out its transportation safety mission. However, the draft plan does not address organizational structure or the balance between supervisory and nonsupervisory positions. While NTSB has recently taken positive steps to improve communications from senior management to

the staff—such as periodically sending e-mail to all staff to share information on new developments and policies—the agency does not regularly hold general staff meetings or undertake anonymous surveys to obtain employee feedback.

- NTSB is accomplishing its accident investigation mission, but it faces challenges that affect the efficiency of the report production and recommendation close-out processes. In terms of accomplishing its mission, since its inception in 1966, NTSB has investigated over 134,000 transportation accidents, and 82 percent of its recommendations have been implemented, or acceptable progress toward implementation has been made. However, investigations are often—sometimes necessarily—lengthy; NTSB routinely takes longer than 2 years to investigate major accidents. Lengthy investigations, combined with lengthy processes for federal agencies to regulate and industries to implement NTSB's safety recommendations, can work against the goal of improving transportation safety. One factor that adds to the duration of investigations is that when new investigations are launched, inspectors are pulled from working on previous accidents to work on new ones. Other factors that may affect the duration of report production include the multiple revisions of draft investigation reports at different levels in the organizations and resource issues. NTSB has recently taken several actions that may help shorten report development time, such as reemphasizing its policy on holding report development meetings to obtain early buy-in on report messages and holding modal directors accountable for specific issuance dates. We also identified practices in certain offices, such as the use of a project manager or deputy investigator-in-charge to handle report production, which may improve the efficiency of report development if used by all modal offices as they all are similar in what they do. The processes for implementing NTSB's safety recommendations, and for NTSB to change the status of recommendations are also lengthy and labor intensive. As a result, unsafe conditions may continue to exist until federal transportation agencies, and ultimately, transportation industries, fully implement the recommendations, and the extended period it takes to change the status of recommendations ties up NTSB's scarce resources. As of May 2006, 305 of the 852 open recommendations have been in open status for 5 years or more. While Department of Transportation (DOT) officials have been working with NTSB to find acceptable means of implementing its recommendations, they cite the lengthy rule-making process as a challenge to speedy implementation. In addition, the process that NTSB uses to change the status of safety recommendations is paper-based, labor intensive, and relies on a series of sequential reviews that can take months to complete. As a result, resources within NTSB are inefficiently used and DOT agency officials told us they remain unaware whether their response has been accepted or not accepted.

- For fiscal years 2004 and 2005, NTSB's academy did not generate sufficient revenues to cover the costs of providing training. As a result, those portions of the academy's costs that were not covered by the revenues from tuition and other sources—approximately $6.3 million in fiscal year 2004 and $3.9 million in fiscal year 2005—were offset by general appropriations to the agency. Although there is no statutory requirement that revenues from NTSB's academy generate sufficient revenues to cover the costs, NTSB was encouraged in the Senate report accompanying the Fiscal

Year 2006 DOT Appropriations Act to be more aggressive in imposing and collecting fees to cover the costs. While NTSB has taken action to generate revenue from other sources, such as renting academy space for conferences, it does not have a business plan that seeks to optimize opportunities for additional revenues at the academy. Additionally, NTSB is missing opportunities to find other uses for academy space. For example, during fiscal year 2005, less than 10 percent of the total classroom space was used. About 14 percent of the academy students in fiscal year 2005 were NTSB employees. However, in 2006, NTSB employees are scheduled to take 97 percent of their requested training from sources other than the academy, such as DOT's Transportation Safety Institute. The academy is not utilized more by NTSB staff, in part, because the agency has not developed a core curriculum for its staff, which it could then offer at the academy. Furthermore, many academy courses are similar to those taught elsewhere, which may affect the agency's ability to attract non-NTSB students.

Background

NTSB was established in 1966 as an independent government agency located within the newly formed DOT.[1] In 1974, Congress made NTSB completely separate from DOT.[2] NTSB's principal responsibility is to promote transportation safety by investigating transportation accidents, determining the probable cause, and issuing recommendations to address safety issues identified during accident investigations. Unlike other transportation agencies, such as the Federal Aviation Administration (FAA), NTSB does not have the authority to promulgate regulations to promote safety, but makes recommendations in its accident reports and safety studies[3] to other agencies that have such regulatory authority. The federal agencies that receive NTSB recommendations include the DOT's FAA, Federal Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), Federal Transit Administration (FTA), National Highway Traffic Safety Administration (NHTSA), Pipeline and Hazardous Materials Safety Administration (PHMSA), and the U.S. Coast Guard. NTSB also makes recommendations to others, such as state transportation authorities and industries. As figure 1 indicates, NTSB has varying degrees of flexibility in its statutory mandate, as it pertains to initiating an investigation. By statute, NTSB has limited discretion in deciding which aviation accidents to investigate and the greatest amount of discretion to investigate highway accidents.

[1]Department of Transportation Act, P.L. 89-670, Oct. 15, 1966.

[2]Independent Safety Board Act, P.L. 93-633, Title III, 1974.

[3]NTSB conducts safety studies as a result of identifying safety concerns rather than as a result of specific accidents.

Figure 1: NTSB's Investigative Policy by Mode

Mode	Key regulations and policy	Investigation policy
Aviation	49 USC 1131 (a)(1)(A) 49 CFR part 800 ICAO annex 13	Investigates all civil and certain public aircraft accidents in the United States and participates in the investigation of international accidents where the United States is the state of registry, operator, design or manufacture.
Highway	49 USC 1131 (a)(1)(B)	Investigates selected accidents.
Railroad	49 USC 1131(a)(1)(C); 1116(b)(5) 49 CFR part 840	Investigates accidents involving more than one fatality, substantial property damage, or a passenger train.
Pipeline	49 USC 1131 (a)(1)(D)	Investigates accidents in which there is a fatality, substantial property damage, or significant injury to the environment.
Marine	49 USC 1131(a)(1)(E); 1131(b) 49 CFR part 850 US Coast Guard/NTSB memorandum of understanding from 9/12/2002	Investigates selected major accidents and incidents, collisions involving public vessels with any nonpublic vessel, accidents involving significant safety issues related to Coast Guard safety functions, and international accidents within the territorial seas and where the United States is the state of registry.
Hazardous materials	49 USC 1116(b)(5)	Investigates releases of hazardous materials in any mode that involves a fatality, substantial property damage, or significant injury to the environment. For all modes, NTSB also evaluates the adequacy of safe guards and procedures for the transportation of hazardous material and the performance of other departments, agencies, and instrumentalities of the government responsible for the safe transportation of that material.
All modes		Investigates selected accidents that are catastrophic or of a recurring nature.

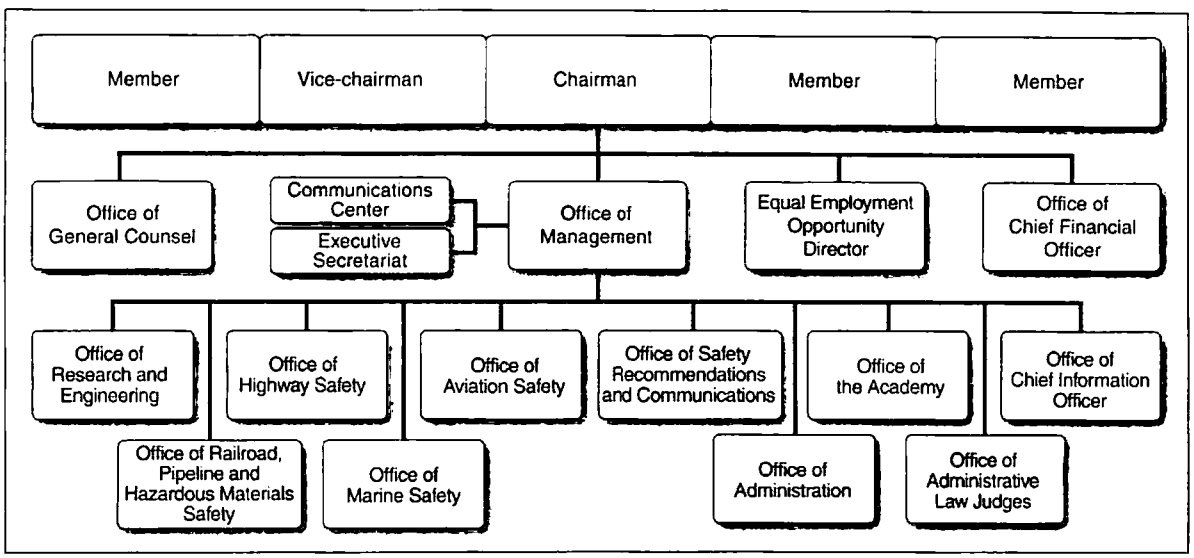
Source: GAO summary of legislation.

NTSB is comprised of a five member board—a chairman, vice chairman, and three members—appointed by the President with the advice and consent of the Senate.[4] The chairman is NTSB's chief executive and administrative officer. As of March 2006, the board was supported by a staff of 396, which includes 210 investigators assigned to four modal offices—aviation; highway; marine; and rail, pipeline, hazardous materials. (See fig. 2.) The agency is headquartered in Washington, D.C., and maintains 10 field offices nationwide and a training academy in Ashburn, Virginia, in suburban Washington, D.C. In recent years, the agency has shrunk in size due to budget constraints, which it has largely dealt with by using attrition to downsize the staff. In 2003, NTSB had 438 full time employees compared with the current level of 396. During the same period, the number of full-time investigators decreased from 234 to 210. NTSB's modal offices vary in size, with the aviation office having 125 employees; the rail, pipeline, and hazardous materials office having 38; the highway office having 30; and the marine office having 16 employees as of May 2006. An additional 42 employees work in the Office of Research and Engineering, which provides technical, laboratory, analytical, and engineering

[4]Not more than three members may be appointed from the same political party. At least three members are appointed on the basis of technical qualification, professional standing, and demonstrated knowledge in accident reconstruction, safety engineering, human factors, transportation safety, or transportation regulation.

support for the modal investigation offices. For example, it is responsible for interpreting data recorders, creating accident computer simulations, and publishing general safety studies. NTSB's budget increased from $62.9 million in fiscal year 2001 to $76.7 million in fiscal year 2006, or about 22 percent. After adjusting for inflation, this represents an increase of about 9 percent. The President has requested $79.6 million for NTSB in fiscal year 2007.

Figure 2: NTSB's Organization

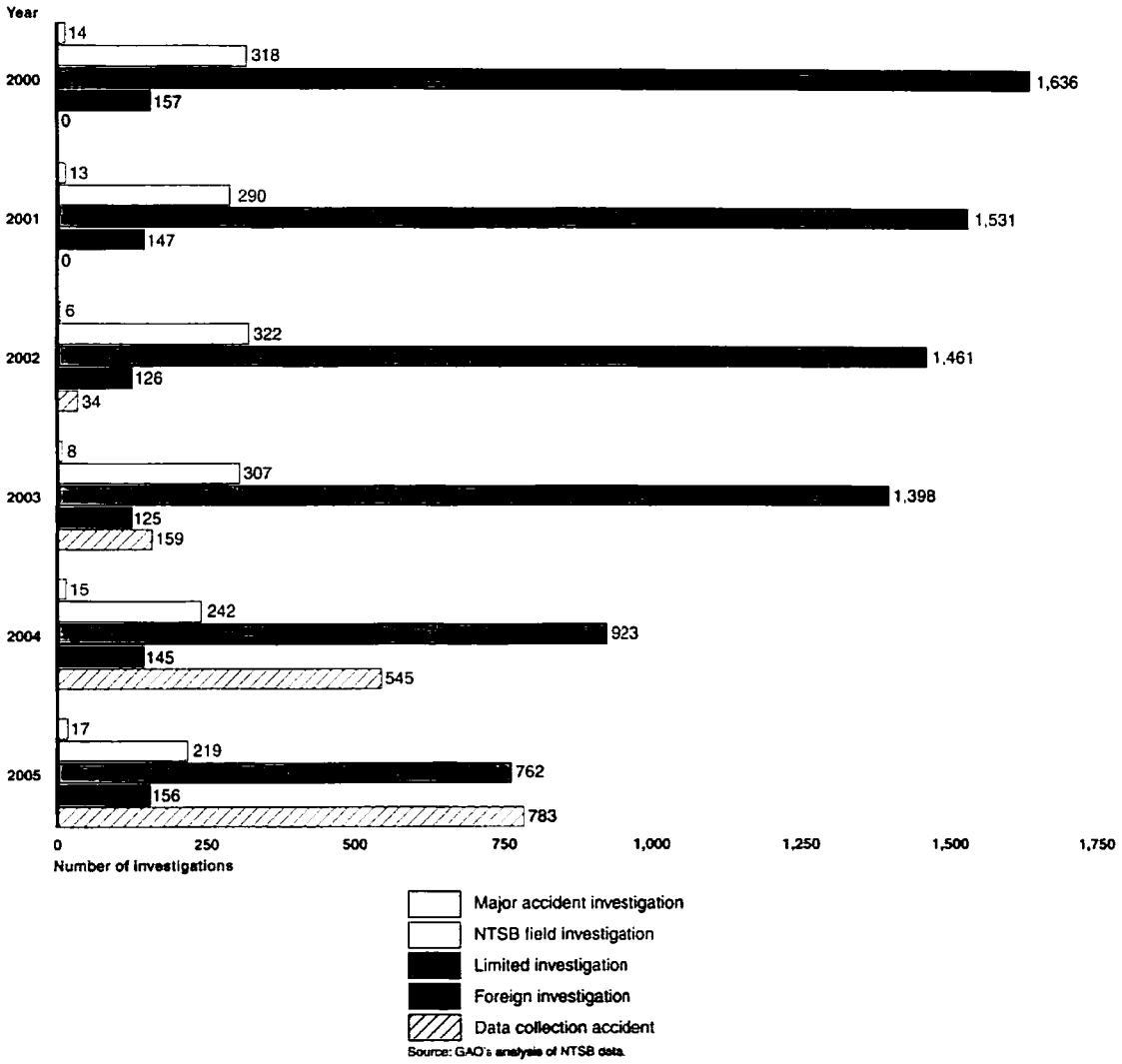


Source: NTSB.

Since 1966, NTSB has investigated over 124,000 aviation accidents and over 10,000 surface transportation accidents. Figure 3 shows the total number of aviation investigations that NTSB has undertaken over the past 6 years and the degree to which NTSB was involved in the investigations. NTSB lacks the resources to conduct on-scene investigations of all aviation accidents. As a result, for general aviation accidents, NTSB delegates the gathering of on-scene information to FAA investigators, as allowed by statute.[5] In these limited investigations, FAA sends the accident information to NTSB, and NTSB then determines a probable cause for the accident. In addition, NTSB participates in the investigations of foreign aviation accidents in conformance with Annex 13 of the International Civil Aeronautics Organization Treaty. These investigations involve a U.S. carrier or U.S.-built aircraft, or occur at the request of a foreign government. NTSB aviation investigators told us that there is often significant value in participating in such investigations; the findings often have safety implications for U.S. carriers, since most foreign airlines use U.S.-made aircraft, engines, and other parts and multiple foreign air carriers operate within the United States.

[5]49 U.S.C Sec. 1132(c).

Figure 3: NTSB Involvement in Aviation Accidents, Fiscal Years 2000-2005



Note: Limited investigations are those in which NTSB delegates the gathering of on-scene information to FAA inspectors.

NTSB Has Made Recent Progress in Following Leading Management Practices, But Overall Record Remains Mixed

Through our work government wide we have identified a number of key functional areas and leading practices in areas that are important for managing an agency. This testimony focuses on NTSB's performance in five key functional areas—strategic planning, performance management, human capital, financial management, and communications—and how NTSB's practices compare to leading practices in those areas. As illustrated in figure 4, NTSB generally is following leading practices in financial management, only

minimally following leading practices in strategic planning, and has mixed results for the other functions. Much of NTSB's progress toward following leading practices is due to recent management initiatives. The report we will be issuing later this year will provide additional information on NTSB's performance relative to these five management functions, as well as information technology, acquisition management (including the agency's use of contracting), knowledge management, and capital decisionmaking.[6]

Figure 4: Extent to Which NTSB Is Following Leading Practices in Selected Management Areas

Management area	Extent to which NTSB is follows leading practices
Strategic planning	○
Performance management	◐
Human capital workforce planning and staff development	◐
Financial management	●
Communications	◐

● Leading practices are mostly followed
◐ Leading practices are partially followed
○ Leading practices are minimally followed

Source: GAO's analysis of NTSB information.

NTSB's Strategic Plan Lacks Certain Performance-Based Elements and Performance Management Plans Closely Follow Leading Practices but are not Fully Functional

The Congress and the President have encouraged better management of federal agencies by means such as results-oriented strategic planning, but NTSB's strategic plan generally does not follow performance-based practices. Without effective short- and long-term planning, federal agencies risk delivering programs and services that may or may not meet the nation's most critical needs. The Government Performance and Results Act of 1993 (GPRA)[7] and guidance contained in the Office of Management and Budget's (OMB) Circular A-11, provide performance-based strategic planning guidelines. GPRA was intended to achieve several broad purposes, including improving federal program effectiveness, accountability, and service delivery, and enhancing congressional decision making by providing more objective information on program performance. GPRA requires federal agencies to develop strategic plans in which they define their missions, establish results-oriented goals, and identify the strategies that will be needed to achieve those goals. For instance, GPRA requires strategic plan updates at least every 3 years, and requires that agencies set objectives and goals that are specific outcomes that the

[7]Pub. L. No. 103-62.

organization wishes to accomplish (called outcome-related objectives).

To its credit, in December 2005, NTSB issued a strategic plan for the years 2006 through 2010, which was the first time the agency had a strategic plan in 6 years. In developing that plan, senior agency officials told us that they modeled their plan on examples from other federal agencies with similar structure and mission, such as the Federal Communications Commission. We compared NTSB's strategic plan to selected elements required by GPRA. (See fig. 5.)

Figure 5: Extent to Which NTSB's Strategic Plan Follows GPRA Elements

GPRA elements	Follows GPRA elements
Mission statement	✓
General goals and objectives	
Approaches or strategies to achieve goals and objectives	
Relationship between general goals and annual goals	
External factors	✓
Program evaluations	
Five year time frame	✓
Stakeholder involvement	

✓ Follows GPRA elements

Source: GAO'a analysis of NTSB data.

While NTSB's 5-year strategic plan has a mission statement, four general goals and related objectives, and mentions key factors, such as declining resources, that could affect the agency's ability to achieve those goals, the plan lacks a number of key elements—including information about the operational processes; skills and technology; and the human, capital, and information resources—required to meet the goals and objectives. In addition, the goals and objectives lack sufficient specificity to know whether they have been achieved. One goal states "NTSB will maintain its response capacity for investigation of accidents and increase its analysis of incidents." An objective of that goal is to "continuously assess the most robust and efficient approaches to accident investigation." Although such a goal is important for the safety of the transportation industry, this and the other three goals and related objectives are not measurable. As a result, it will be difficult for NTSB and others to determine if the goals have been achieved.

In addition, the plan lacks specific strategies for achieving those goals. According to GPRA, the strategies should include a description of the operational processes, skills and technology, and the resources required to meet the goals and objectives. Since NTSB's strategic plan lacks such a description, it does not align staffing, training, or other human resource management to strategic goals. That is, the plan does not explicitly explain

how NTSB will use its resources to meet its mission and goals. While the plan explains that each program office has its own objectives linked to the agency's goals and objectives, the plan contains no information to understand how each office contributes to those goals and objectives. In addition, NTSB's strategic plan does not describe how the performance goals contained in the annual performance plan are related to the general goals and objectives in the strategic plan, as required by GPRA.

GPRA also requires federal agencies to provide a description in their strategic plans of the program evaluations used in establishing or revising general goals and objectives and a schedule for future program evaluation. NTSB's strategic plan lacks this information. As a result of having no program evaluations, it is unclear how or whether NTSB reviews its efforts to identify strengths it can maximize and weaknesses it should address. In developing a strategic plan, GRPA requires agencies to consult with Congress and other stakeholders. We have previously reported that other stakeholders of federal agencies include state and local governments, other federal agencies, interest groups, and agency employees. NTSB's strategic plan does not mention consultation with any stakeholders in its development. Furthermore, board members and agency staff told us that they had no involvement in the development of the strategic plan. Some current and past board members additionally stated that they believed that their involvement would be beneficial in providing a strategic vision for the agency. NTSB's senior management told us they expect to revise the strategic plan in the near future and contacted us regarding assistance to develop a more comprehensive, results-oriented plan as part of this study.

NTSB has begun to develop a performance management system that should eventually link each individual's performance throughout the agency to the agency's strategic goals and objectives. We have reported that performance management systems are crucial for agencies because if developed properly they allow employees to make meaningful contributions that directly contribute to agency goals.[8] NTSB has developed a comprehensive performance management plan for Senior Executive Series (SES) employees that links individual performance to strategic goals. Furthermore, the plan states that NTSB will link performance management with the agency's results-oriented goals and set and communicate individual and organizational goals and expectations. This plan establishes individual performance criteria and the appraisal process. The appraisal process defines performance standards and explains performance elements that determine individual ratings. Because NTSB recognizes in this plan the importance of aligning organizational performance with individual performance and contributions to the agency's mission, the performance management plan is a step in the right direction.

Along with the SES plan, NTSB issued in August 2005 a performance plan for its overall workforce, which includes some elements of linking individual performance to organizational goals. However, without having results-oriented goals in the strategic plan itself, neither of the two performance management plans are fully functional. That is, until NTSB's goals are more fully articulated in the strategic plan, it will be impossible for staff to know whether their performance contributes to meeting those goals. As with

[8]GAO, *Results Oriented Cultures: Creating a Clear Linkage between Individual Performance and Organizational Success*, GAO-03-488 (Washington, D.C.: March 14, 2003).

the strategic plan, NTSB staff was not involved in the development of the performance plan, and there was no mechanism for employee feedback after the plan was initially developed. Employee involvement provides greater assurance that policies are accepted and implemented because employees had a stake in their development.

NTSB's Staffing Plan Is a Step in the Right Direction, but the Organizational Structure Has Not Been Reviewed

NTSB developed a draft agencywide staffing plan in December 2005 that follows several leading practices but lacks a workforce deployment strategy that considers the organizational structure and its balance of supervisory and non-supervisory positions. Existing strategic workforce planning tools and models suggest that certain principles should be followed in strategic workforce planning, such as determining the agency's skills and competencies needs; involving stakeholders (e.g., management and employees) in the planning process; and developing succession plans to anticipate upcoming employee retirement and workforce shifts.[9] Further, in workforce deployment, it is important to have human capital strategies to avoid excess organizational layers and to properly balance supervisory and nonsupervisory positions.[10] NTSB's draft staffing plan addresses the agency's skills and competencies needs and includes strategies to deal with workforce shifts. For example, the staffing plan proposes to increase the number of investigative staff by 21, which will help with the agency's resource needs. In addition, while some stakeholders (i.e., managers) were involved in the planning process, employees were not included. As we mentioned previously in this testimony, employee input provides greater assurance that policies are accepted and implemented because employees have a stake in their development.

To develop the staffing plan, each modal office director submitted to NTSB's Managing Director an ideal staff size for his office, including additional slots for investigators. The increase in investigative staff is consistent with requests by modal offices to enhance their ability to conduct their investigative mission. Managers told us that current staffing constraints inhibited their ability to conduct more accident investigations and indicated an increase in staff would be helpful. For example, directors of the highway and rail/pipeline offices told us they could not initiate investigations on more than two accidents at a time because they lacked sufficient investigative staff to do more.[11] The modal office directors' request for staff resulted in a total agency allotment of 455 full time equivalents (FTEs) plus 20 co-op positions. The Managing Director reduced this number to 404, which corresponds to NTSB's current funding level of 395, allowing for attrition and turnover. The Managing Director's allocation resulted in a proposed increase of 21 investigators agencywide and a proposed reduction of certain staff positions to accommodate the increase in investigators. This increase in investigative

[9]GAO, *A Model of Strategic Human Capital Management*, GAO-02-373SP (Washington, D.C.: March. 15, 2002) and GAO, *Human Capital: Key Principles for Effective Strategic Workforce Planning*, GAO-04-39 (Washington, D.C.: December 11, 2003).
[10]GAO, *Executive Agency Management Diagnostic Survey* (draft).
[11]Each investigative team initially consists of at least one investigator-in-charge and other technical support investigator positions based on the complexity of the accident.

staff is consistent with a recommendation by RAND Corporation, which evaluated NTSB's accident investigation process and workload in 1999.[12] To help implement the realignment, senior managers told us that they would like to transition some existing administrative and support staff with appropriate background and training into investigator roles where possible. The draft plan set a target date of May 2006 to begin creating developmental opportunities for staff to transition to investigative roles and to develop reduction strategies for staff that fall outside the staffing plan.

NTSB Lacks a Strategic Approach to Training Staff

Training is another key area of human capital management. It is important for agencies to develop a strategic approach to training its workforce, which involves establishing training priorities and leveraging investments in training to achieve agency results; identifying specific training initiatives that improve individual and agency performance; ensuring effective and efficient delivery of training opportunities in an environment that supports learning and change; and demonstrating how training efforts contribute to improved performance and results.[13] NTSB has not developed a strategic training plan, nor has it identified the core competencies needed to support its mission and a curriculum to develop those competencies. As a result of not having a core curriculum that is linked in this manner, NTSB lacks assurance that the courses that staff take provide the technical knowledge and skills necessary for them to be competent for the type of work they perform.

Financial Management Is Improved, but NTSB Lacks a Full Cost Accounting System

Sound financial management is crucial for responsible stewardship of federal resources.[14] In recent years, NTSB has made significant progress in improving its financial management. In March 2001, NTSB hired a Chief Financial Officer who has emphasized the importance of sound financial management based on best practices. Similar to private sector companies, government agencies are required to report their financial condition in publicly available financial statements. As a result of actions taken by NTSB, the agency received an unqualified or "clean" opinion from independent auditors on its financial statements for the fiscal years ending September 30 for the years 2003, 2004, and 2005. The audit report concluded that NTSB's financial statements presented fairly, in all material respects, the financial position, net cost, changes in net position, budgetary resources, and financing in conformity with generally accepted accounting principles for the three years. NTSB has also improved its purchasing and contracting activities after identifying problems in those areas in 1999. In 2001, DOT's Office of Inspector General (DOTIG) reviewed the agency's contracting and procurement activities and recommended that NTSB institute accountability and controls in its

[12]RAND Institute for Civil Justice, *Safety in the Skies: Personnel and Parties in NTSB Accident Investigations* (Santa Monica, CA.: 2000).
[13]GAO, *Human Capital: A Guide for Assessing Strategic Training and Development Efforts in the Federal Government, GAO-04-546G* (Washington, D.C.: March 1, 2004).
[14]GAO, *Executive Guide: Creating Value through World-class Financial Management*, GAO/AIMD-00-134 (Washington, D.C.: April 2000).

purchase card program as well as other purchasing activities. As a result of this and another DOTIG audit,[15] NTSB has taken a number of initiatives to improve its purchasing and contracting activities. For example, NTSB restructured its purchase card system and guidelines to address problems, such as unrestrained and unapproved purchases on government credit cards. NTSB hired a manager of the contracting function to manage the agency's acquisition function and implement the DOTIG recommendations. In our full report, we will analyze some of these initiatives in more detail.

In 2000, RAND recommended that NTSB develop systems that would allow the agency to better manage its resources by permitting full-cost accounting[16] of all agency activities.[17] To accomplish this, RAND recommended putting in place a timekeeping system, in which individual project numbers were assigned to each investigation and support activities such as training. With this information, project managers could better understand how staff resources were utilized and project workload could be actively monitored by the Managing Director. NTSB has begun to implement this recommendation by upgrading a software system in November 2005 that tracks employee annual leave and sick leave. However, the system is not being fully utilized to track the number of hours staff spend on each investigation. Also, this system is not used to track time staff spend in training or at conferences. As a result, RAND's previous conclusion that "NTSB managers have little information they can use to plan the utilization of staff resources or manage staff workloads properly" remains current.

Communications from Senior Management to Staff have Increased and Communications Among Offices is Generally In Place, but Upwards Communications Mechanisms Are Lacking

We have identified useful practices related to managing employees that include seeking and monitoring employee attitudes, encouraging two-way communication between employees and management, and incorporating employee feedback into new policies and procedures.[18] In response to issues raised by NTSB employees in a governmentwide survey conducted by OPM in 2004, NTSB's senior management made changes to improve the way it is communicating information to staff. For example, the Managing Director periodically sends "management advisory" e-mail to all staff that share information such as policy changes or new developments at the agency. However, we found no formal processes that encouraged two-way communication, such as town hall meetings, regular staff meetings, or anonymous employee surveys; or incorporated employee feedback into policy-making.

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[15]DOTIG, *Audit of the Purchase Card Program*, FI-2005-072 (Washington, D.C.: Aug. 23, 2005) and *Report on Financial Management Practices and Internal Controls*, FI-2003-004 (Washington, D.C.: Dec. 11, 2002).
[16]Cost accounting involves the accumulation and analysis of financial and nonfinancial data, resulting in the allocation of costs to organizational pursuits such as performance goals, programs, activities, and outputs. Nonfinancial data measure the occurrences of activities and can include, for example, the number of hours worked.
[17]RAND Institute for Civil Justice, 2000.
[18]GAO, *Results-Oriented Cultures: Implementation Steps to Assist Mergers and Organizational Transformations*, GAO-03-669 (Washington, D.C.: July 2, 2003).

The 23 investigators and writer editors with whom we spoke had mixed views on the effectiveness of communications within the agency.[19] The four investigators from one modal office that we spoke with told us that they are pleased to now hear about policy changes at the agency, but said that there is too much reliance on the Internet for these communications. They also told us that although they believe the increased communications are positive, they found it difficult to find the time to read the material and still conduct their regular investigative duties. The four investigators that we spoke with from another modal office agreed that staff meetings occur infrequently and that they do not receive information on new policies from their managers. Further, they said that new policies or agency issues are not discussed with staff prior to issuance, and there was no formal mechanism to provide feedback during the policies' development. In the past, regular formal meetings occurred between union leadership and senior NTSB management, which allowed for such input, but that practice ceased. Although formal communication processes from the staff level to management are lacking, informal e-mail communications do take place occasionally between staff and senior management.

Communication and collaboration across offices at all levels can improve an agency's ability to carry out its mission by providing opportunities to share best practices and helping to ensure that any needed input is provided in a timely manner. We found that communication and collaboration between the Research and Engineering office and the modal offices appears to be regular. This is shown by the inclusion of Research and Engineering staff as core members of major investigative teams. Also, our review of workload in the Research and Engineering office shows a large number of projects that support all modes, and a Research and Engineering manager told us that his office frequently interacts with investigative staff.

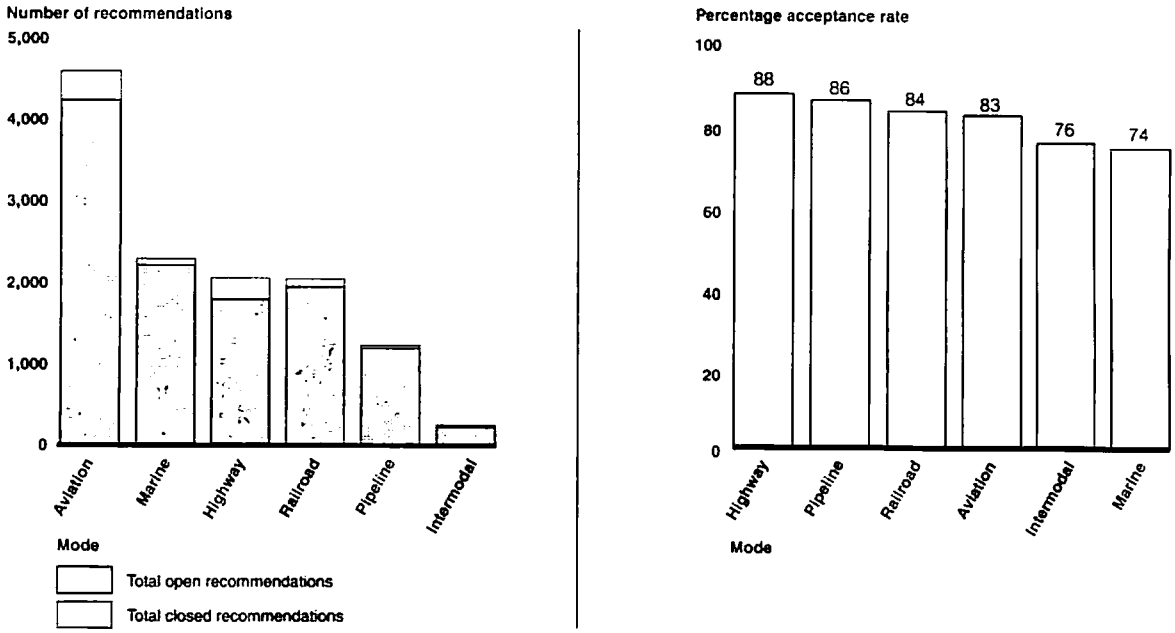
In contrast, NTSB lacks processes that would allow investigators and writer editors to communicate across the modal offices regarding the investigative process and other issues, according to staff we spoke to. The four investigators that we spoke with from one modal office told us that they are isolated from the rest of the agency and that lessons learned are not shared across offices. The investigators from another modal office told us that they are on permanent teams that share the same priorities in completing accident analysis, which enhances communication and teamwork in the office. In addition, in previous years, all writer editors were located in one group and reported directly to the Managing Director. Now, each modal office has its own staff of writers and editors. While they have retained personal working relationships from when they were located in the same office, four of the eight writer editors we spoke with said that they no longer share information with each other regularly.[20] As a result, efficiencies and lessons learned that investigators and writer editor staff in one office might develop might not be shared with other offices. However, NTSB officials pointed out that every 6 months writer editors have the opportunity to meet with the publications specialist for training and to exchange information.

[19]We randomly selected 15 investigators and 8 writer editors evenly across the 4 modal offices and interviewed them to obtain their views on NTSB's processes. The views represent the particular individuals and are not representative of all NTSB investigators and writer editors.
[20]The writer editors held a conference in February 2004.

NTSB Is Accomplishing Its Accident Investigation Mission, but Opportunities Exist to Gain Efficiencies

While NTSB is accomplishing its accident investigation mission, it faces challenges that affect the efficiency of the report production and recommendation close-out processes. In terms of accomplishing its mission, since its inception, NTSB has investigated over 134,000 transportation accidents. Eighty-two percent of its recommendations have been "accepted," a term NTSB uses to include recommendations that recipients have said they would implement as well as those that have already been implemented. Figure 6 shows that highway recommendations have the highest acceptance rate and marine recommendations have the lowest.

Figure 6: Recommendations and Acceptance Rates of Recommendations by Mode, 1967-May 2006

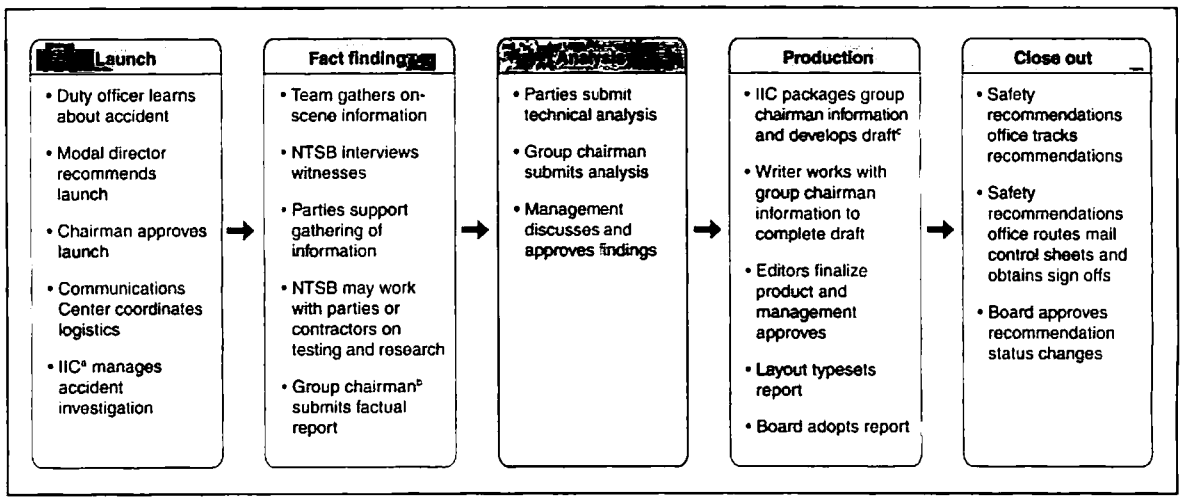


Source: GAO's analysis of NTSB data.

NTSB Investigations Are Often Lengthy, in Part Because Investigators Must Launch New Investigations Before Completing Ongoing Investigations

Investigations have four phases—the "launch," fact finding, analysis, and report production. After a report is issued and recommendations made, the progress of implementing the recommendations is tracked during a fifth close-out phase. Figure 7 describes these phases.

Figure 7: Components of an NTSB Investigation and Recommendation Close Out



Source: GAO's analysis of NTSB information.

[a]IIC is the "investigator in charge."

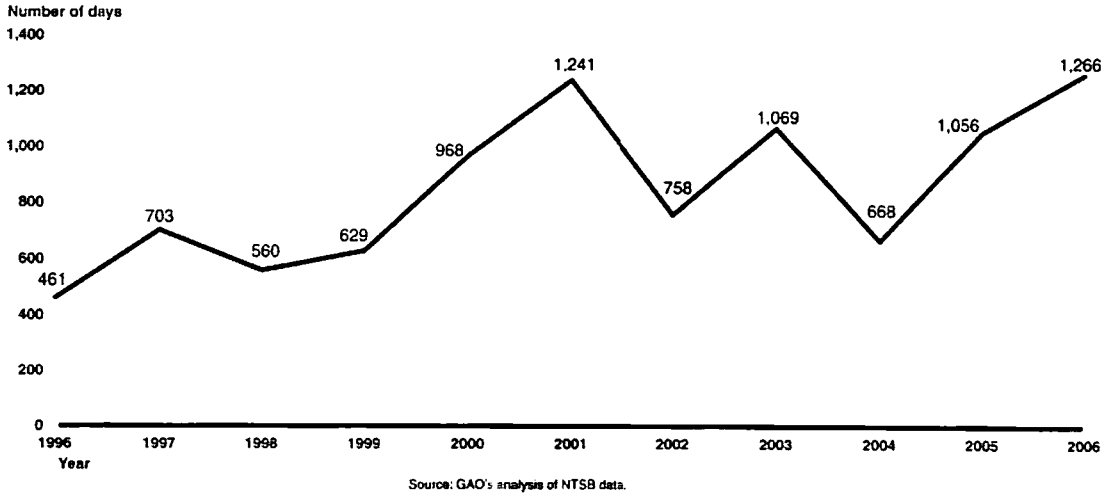
[b]A group chairman is a technical specialist who is responsible for developing the facts and analysis for a particular area of an investigation.

Investigations are often lengthy and sometimes necessarily so. NTSB routinely takes longer than 2 years to complete major aviation investigations. For example, the total time to complete major aviation investigations has increased from an average of about 1.25 years in 1996 to an average of almost 3.5 years in 2006. (See fig. 8.) In 2004, NTSB contracted with Booz Allen Hamilton to examine and make recommendations to improve the report development process and the recommendation close-out process. Booz Allen Hamilton[21] reported that the average time to complete major investigations across all the modes was either 1.8 months or 1.9 months for 4 out of 5 years.[22] Lengthy investigations, combined with lengthy processes for federal agencies to develop regulations based on those recommendations and industries to implement the recommendations can work against the goal of improving transportation safety.

[21] Booz Allen Hamilton, *NTSB Organizational Process and Efficiency Study* (Washington, D.C.: Aug. 12, 2004).

[22]In fiscal years 1999 and 2002, Booz Allen Hamilton found that the average time to complete a major investigation was 1.8 years; in fiscal years 2001 and 2003, the average time was 1.9 years; in fiscal year 2000 the average was 2.4, mainly due to several lengthy aviation investigations that took over 4 years to complete.

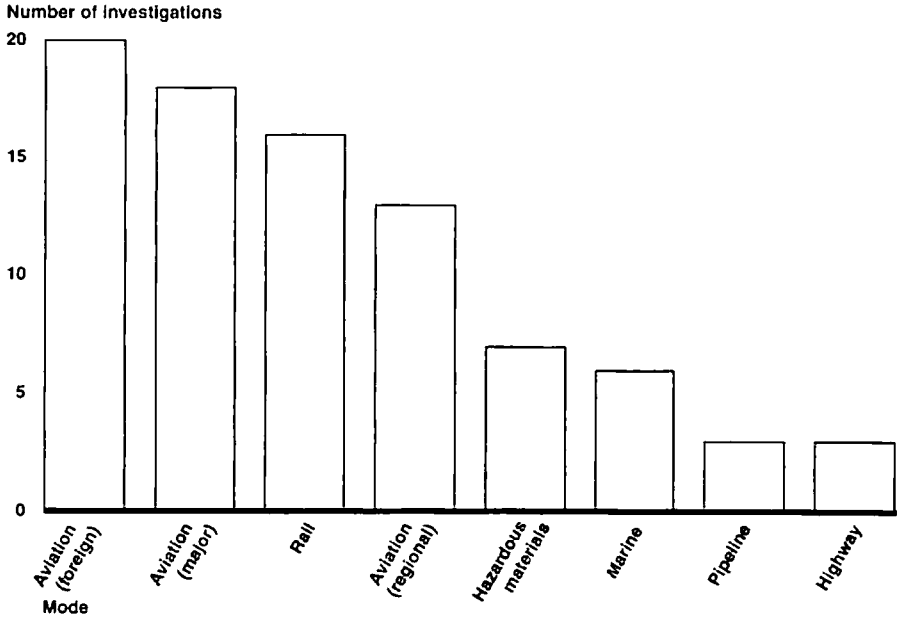
Figure 8: Average Duration of Major Aviation Investigations, 1996-2006



Note: Several complex, lengthy investigations were completed in 2000, including the crash of TWA flight 800, which took over 4 years to complete.

One factor that adds to the duration of investigations is that when new investigations are launched, investigators are pulled from working on previous accidents to work on new ones. For example, when a major commercial aviation accident occurs, an NTSB "go team" is dispatched from Washington D.C., usually within hours of notification of the accident. In such cases, the team members must leave the investigations they had been working on to begin fact-finding on the new accident. In the cases of rail and highway accidents, NTSB investigators must also arrive quickly on scene to gather information because the accident scenes will be cleared quickly so that traffic can resume. The manager of one department told us that all of his ongoing reports would be delayed by 2 months if a sudden launch were to occur. The number of major investigations that are ongoing for each mode is shown in figure 9.

Figure 9: Number of Ongoing Major Investigations by Mode, As of February 2006



Source: GAO's analysis of NTSB data.

Note: This table does not include limited aviation investigations, in which FAA has the primary fact-finding role.

Writing and Report Production Is a Bottleneck in the Process

Another reason for the expansive time frame for accident investigations is that reports receive multiple revisions at different levels in the organization, including the office directors and the Managing Director's office, prior to going to the board members for final voting and approval of the draft report. An investigation report typically goes through the following reviews: the modal office, the Office of Research and Engineering, the Executive Secretariat, the Office of Safety Recommendations, the Office of General Counsel, the deputy managing director, the Managing Director's office, and each board member and the Chairman. For any review, there may be multiple iterations. Eleven investigators and 6 writer editors told us that the review process often results in improved clarity for report recommendations.[23] However, investigators and writer editors also told us that they believe the levels of management review and approval for written products are excessive. All eight writer editors agreed that the reviews by the Executive Secretariat's office, which services a quality assurance function, was a bottleneck for getting products approved. They told us that it is common for correspondence and other products to be delayed in this office for 1 week or more, which they viewed as excessive. While it may be a reasonable expectation for short

[23]Booz Allen Hamilton, however, found that the logic and rationale for changes made during the review process were not transparent.

products, such as correspondence, to be reviewed in less than a week, that expectation may not be reasonable for reports. Booz Allen Hamilton confirmed multiple iterations of review as the draft was routed through numerous offices. On average Booz Allen Hamilton found that there were 7 levels of reviews within a given modal office that resulted in an average of 28 separate reviews. A senior NTSB official stated that the many levels of review were needed to get the appropriate perspectives from relevant offices that had been involved in report development, such as the Research and Engineering Office and Safety Recommendation Office. The official also noted that the process can be streamlined on a case-by-case basis in which the usual process of sequential reviews is replaced with concurrent reviews. The NTSB official told us that there are no explicit criteria for determining when the streamlined process could be used.

NTSB staff with whom we spoke reported that resource issues contributed to other bottlenecks. For example, four writer editors pointed out that NTSB has only one final layout and typesetting person. As of May 2006, the final layout process had a backlog of approximately 10 reports that have been approved for issuance at board meetings but have not yet been published. NTSB adopts about 2 reports a month and issues on average 4 reports a month. In addition, some investigators have the perception that the workload of writer editors is another bottleneck. For example, one investigator told us that he submitted draft reports to the senior writer editor in September 2005, and as of April 2006, no additional writing had been done on his project. Writer editors from each modal office told us they typically worked on five or more products at one time.

Certain Agency Practices May Help Shorten Report Development

NTSB has recently taken several actions that, along with potentially better practices in one modal office, may help shorten report development time. First, in response to a recommendation by Booz Allen Hamilton to gain management's buy-in to the report message before writing the report and thereby reduce the number of review iterations, NTSB management has reemphasized its policy for report development meetings. NTSB has a long-standing order that calls for holding message development meetings with internal stakeholders who will be reviewing the report prior to report writing. According to a senior NTSB official, however, the agency had stopped following that policy before Booz Allen Hamilton conducted its study in 2004. The official further stated that subsequent to that recommendation, NTSB's managing director sent a memorandum reminding staff to follow the policy. While NTSB has no data on whether the message development meetings are actually taking place, officials told us that the managing director's recent emphasis on these meetings was resulting in more of them occurring than in previous years.

Second, since the spring of 2005, NTSB has initiated production meetings with senior management with the goal of reducing the duration of investigations. These meetings occur every 2 weeks and focus on report development and production. NTSB modal directors are held accountable for a specific issuance date within a six month planning

window prior to issuing a report. During the biweekly meetings, the directors discuss with NTSB's Managing Director and senior executives their progress and commitments to complete the investigations. The meetings result in a production schedule that is available for subsequent review. The modal directors stated that they believe the new system is effective in reducing the duration of investigations; however because these meetings began so recently, it is too early to evaluate their effectiveness.

Third, the highway office—which has the swiftest rate of accident investigation completion—uses a concept called a "project manager," who serves as a supervisory writer editor and interface between the investigative staff and the writer editor staff. As a result, the project manager assumes some of the report development roles typically supported by the investigators-in-charge. In comparison, investigators-in-charge in the marine and rail, pipeline, and hazardous materials offices submit a draft report to the writer editor, who then edits and sometimes substantially rewrites the report. In aviation, investigators-in-charge do not write reports, but rather writer editors develop the final report from interim technical reports drafted by specialists on the team. Booz Allen Hamilton recommended that all modes use a project manager or deputy investigator-in-charge so that the expertise of staff can be used more fully. In addition, such a practice might alleviate some of the workload issues that writer editors face as they complete multiple reports. NTSB managers told us that they agree with this recommendation, but they have not implemented it or developed any milestones for implementation.

Fourth, the highway safety office uses an incentive system for performance on developing reports. Booz Allen Hamilton reported the highway safety office rewards staff with a cash bonus for meeting key deadlines for producing accident reports. Again, the study recommended that the highway program be used as a model for the other modal offices. The study further recommended that the incentive program be slightly modified so that the incentives are based on delivering reports before deadlines, rather than meeting deadlines. In that way, the average time standard would be tightened and the overall report development time would be shortened. According to NTSB officials, they are currently examining how to implement improved awards and incentive programs that will result in improved quality and timeliness of report products.

Safety Recommendations Close-out Process Is Time Consuming for Several Reasons

The processes for federal transportation agencies to implement NTSB's safety recommendations, and for NTSB to change the status of recommendations it has made, are also lengthy because of complex processes involving many players. As of May 2006, 305 of NTSB's 852 open recommendations had been open for 5 years or more. Lengthy processes for federal agencies to develop regulations to implement NTSB's safety recommendations and industries to comply can work against the goal of quickly improving transportation safety. In addition, the lengthy, paper-based process for changing the status of recommendations ties up NTSB's scarce resources.

The length of time that NTSB recommendations remain open is due, in part, to challenges faced by federal transportation agencies in implementing those recommendations, particularly those that require changes to federal regulations, which take many years to complete. DOT modal officials with whom we spoke cited a lengthy rule-making process, which includes budgeting and allocating resources to develop the proposed regulation, drafting and receiving comments on proposed rules, and waiting for the industry's subsequent response to implement the final rule. For example, TWA flight 800 crashed off Long Island in July 1996; NTSB issued safety recommendations pertaining to explosive fuel tanks in December 1996. NTSB adopted the accident report with further recommendations to FAA to reduce flammable vapors in aircraft fuel tanks in 2000; FAA issued a notice of proposed rule to address this recommendation in November 2005; the comment period for the notice ended on March 23, 2006. Thus, 10 years after the crash, the final rule has not been issued. Federal transportation officials also said the failure to satisfy a cost-benefit analysis might impede the implementation of NTSB recommendations. Although NTSB is required to only consider the safety implications of its recommendations and not consider the cost factors, if a proposed regulation is not cost beneficial, it cannot be approved by OMB.

Federal officials with whom we spoke at DOT, which receives the bulk of NTSB recommendations, indicated that they have been working with NTSB to find acceptable means of implementing recommendations. The process—recently called Safety With a Team—is designed for NTSB and federal agencies to work in cooperation to address open recommendations and implement needed safety improvements. NTSB and DOT officials told us that this process contributed to the closing of many recommendations. However, the process is not used with the Coast Guard, which has the lowest rate—74 percent—for accepting NTSB recommendations among the modes, as mentioned previously. According to a Coast Guard official we spoke with, the Coast Guard believes that it has an acceptable rate for closing NTSB recommendations and that it does not intend to act on recommendations that it deemed unnecessary.

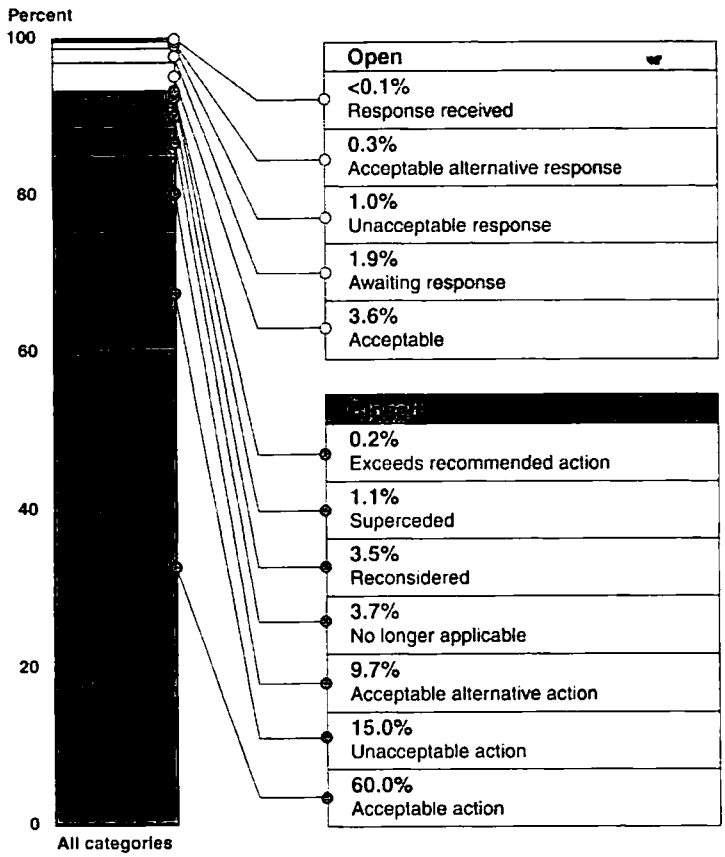
NTSB recognizes that open recommendations can have serious safety implications for the transportation industry. To spur implementation, the agency also publishes a "most wanted" list of what it considers the most serious safety concerns. For example, in 2000 NTSB added to its most wanted list the need to improve the safety of motor carrier operations. NTSB recommended that FMCSA prevent motor carriers from operating if they put vehicles with mechanical problems on the road or unqualified drivers behind the wheel. As recently as May 2006, NTSB issued an additional recommendation that FMCSA "establish a program to verify that motor carriers have ceased operations after the effective date of revocation of operating authority."

The process that NTSB uses to change the status of or close out safety recommendations is paper-based, labor intensive, and relies on a series of sequential reviews; this process can take between 6 and 12 weeks. As a result, NTSB is delayed in communicating with agencies on whether NTSB considers the actions that have been taken to address the recommendation are sufficient to accept the recommendation. Consequently, agencies remain unaware that their response has been accepted or not accepted. And in the case

of DOT, this lack of information affects its ability to accurately report annually to Congress on the status of implementing NTSB's recommendations in all its modal administrations.[24]

The process of closing recommendations is managed by NTSB's Safety Recommendation Office, which has responsibility for maintaining a recommendations database and administering the paper flow to change the status of recommendations. Adding complexity to the process—which NTSB calls the "mail control process"—is the fact that there are 12 separate categories of recommendations status. The 12 categories are listed in figure 10, which also shows the percentage of recommendations in each category as of May 1, 2006.

Figure 10: Status Categories for Recommendations Issued From 1967 to May 1, 2006



Source: GAO's analysis of NTSB data.

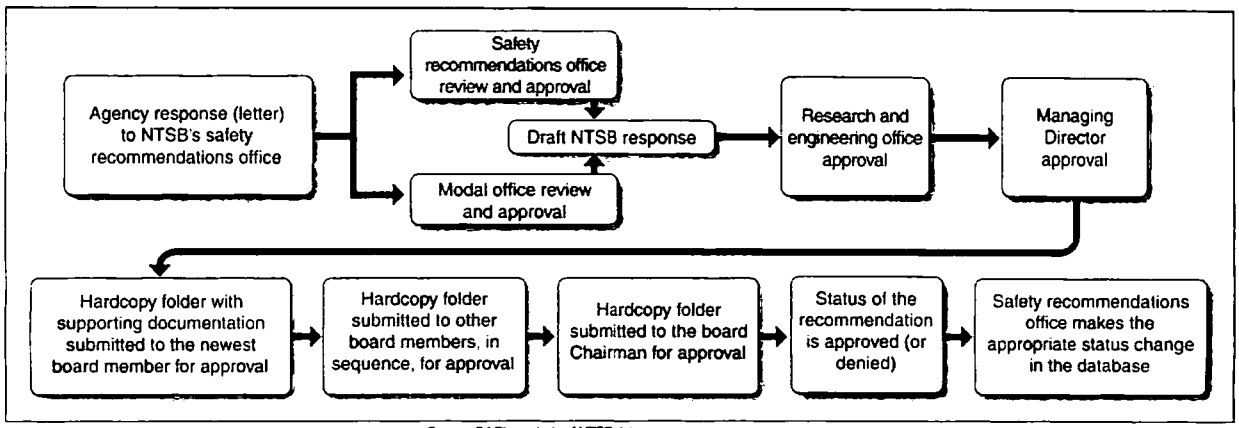
Note: NTSB issued 12,471 recommendations from 1967 to May 1, 2006.

The process begins when NTSB receives documentation from the recommendation

[24] 49 USC Sec. 1135(d). NTSB pointed out that for those recommendations on the Most Wanted List, it specifically updates the list each November to ensure sufficient time for DOT to file its annual report to Congress.

recipient that would change the recommendation's status. The Safety Recommendation Office generates paper folders and supervises a process that is summarized in figure 11. This process involves multiple, sequential approvals starting from the Safety Recommendation Office, to the modal offices and Research and Engineering Office, to the Managing Director's office, to the board members for final approval. Since none of these reviews happen concurrently, some 150 folders are in process at any given time, according to the director of the Safety Recommendations Office. There are no electronic communications or approvals throughout the process. In its study of NTSB, Booz Allen Hamilton identified this as an inefficient process. Officials at NTSB agree that efficiencies could be gained in this process and are considering eventually computerizing a number of processes such as this one. The agency expects to develop such plans after hiring a chief information officer later this year.

Figure 11: NTSB's Recommendation Close-Out Process



Source: GAO's analysis of NTSB data.

NTSB's Academy Does Not Generate Sufficient Revenues to Cover Costs and Is Not Fully Utilized

Although there is no statutory requirement that revenues from NTSB's academy would generate sufficient revenues to cover the costs, in July 2005, NTSB was encouraged in the Senate report accompanying the Fiscal Year 2006 DOT Appropriations Act to be more aggressive in imposing and collecting fees to cover the costs.[25] The academy generates revenues through tuition fees, space rental to other agencies for events such as conferences, and contracts with federal agencies that would allow them to use academy space for "continuity of operations" in emergency situations. To the extent that NTSB maximizes the use of the academy, it can produce additional revenues that may help cover costs.

Academy Costs Have Exceeded Revenues

[25]Senate Report 109-109 accompanying P.L. 109-115, the Transportation, Treasury, the Judiciary, Housing and Urban Development, and Related Agencies Appropriations Act of 2006.

For the first 2 full years of operation, fiscal years 2004 and 2005, NTSB's academy did not generate sufficient revenues to cover the costs of providing training, as shown in table 1. As a result, those portions of the academy's costs that were not covered by the revenues from tuition and other sources—approximately $6.3 million in fiscal year 2004 and $3.9 million in fiscal year 2005—were offset by general appropriations to the agency. The salaries and other personnel related expenses associated with NTSB investigators and managers teaching at the academy, which would be appropriate to include in academy costs, are not included in table 1 because NTSB told us that it does not choose to account for expenses in that manner. In addition, NTSB lacks a full cost-accounting system that would facilitate doing so. The table shows expenses directly associated with the academy and does not include an allocation of agency wide supporting services, such as the Managing Director's office, information technology, human resources, and legal support. Some of the expenses during these 2 years were one-time expenses—such as over $125,000 for furniture and equipment (included in table 1 as office supplies for fiscal year 2005) and $499,000 to move the wreckage of the TWA flight 800 airplane from storage near the crash site in New York to the academy (included in the table as miscellaneous government contract services in fiscal year 2004). Space rental is a fixed annual expense of about $2.5 million. When that fixed expense is excluded from academy expenses, the remaining operating expenses exceeded revenues by about $3.7 million in fiscal year 2004 and about $1.4 million the subsequent year.

Table 1: Direct Expenses and Revenues for the NTSB Academy, Fiscal Years 2004 and 2005 (unaudited)

	FY 2004	FY 2005	Percentage difference
Personnel related	$1,011,716	$978,591	-3%
Travel	$24,428	$56,912	133%
Space rental[a]	$2,521,440	$2,500,896	-1%
Maintenance/repair of buildings	$706,279	$238,203	-66%
Miscellaneous government contract services	$2,204,880	$558,540	-75%
Office supplies	$12,939	$153,249	1084%
Miscellaneous expenses[b]	$29,320	$28,887	-1%
Total expenses	**$6,511,002**	**$4,515,278**	**-31%**
Earned revenue	**$258,760**	**$634,800**	**145%**
Overall deficit	-$6,252,242	-$3,880,478	-38%
Deficit when space rental expense is excluded	-$3,730,802	-$1,379,582	-63%

Source: NTSB.

[a]NTSB leases the academy facility from George Washington University under a 20-year lease that will expire in 2021.

[b]Miscellaneous expenses such as telephone, mail, and photography services and printing.

In addition, while some courses presented during the first 2 years of academy operation

did not recover the costs that NTSB attributes to them, revenues from other courses exceeded the cost. Of the 49 class sessions provided at the academy in fiscal years 2004 and 2005, revenues from 14 sessions, all of which occurred in fiscal year 2005, did not recover their cost, while revenues from the remaining sessions exceeded the cost.[26] According to the academy's deputy manager, courses are only expected to generate enough revenues to offset the costs specifically attributed to the course, with some additional allocation for research and development of other programs and, if possible, other academy costs. Accordingly, tuition prices are determined by estimating those costs (such as course material, contracted instructors and their travel expenses) and dividing that cost by the projected class size. Costs such as the building lease, maintenance, building security, and academy personnel are not allocated to the costs of individual courses.[27] In addition, consideration is given to setting tuition at a level that is competitive with similar courses by other institutions and that is not prohibitively high for prospective students from government agencies, according to the academy official.

Other sources of revenue are needed for NTSB to be able to recover the full costs of the academy. For fiscal year 2004, over $12,000 in revenue (about 5 percent of total revenues) was collected from sources other than course fees to cover some of those costs. For fiscal year 2005, the revenue from other sources increased to over $91,000 (about 14 percent of total revenues). Other sources of income during these 2 years included renting space to other organizations, such as the Society of Automotive Engineers, George Washington University, and the National Association of State Boating Law Administrators for meetings, conferences, and boat storage. In addition, NTSB has contracted with two agencies—the Federal Energy Regulatory Commission and the Virginia Circuit Courts—for continuity of operations. According to NTSB officials, it has explored this option with other organizations, but has not found others who will pay a yearly retainer for the service.[28] While NTSB has taken action to generate revenue from other sources, it does not have a business plan or marketing strategy that seeks to optimize opportunities for additional revenues. According to the academy's deputy manager, NTSB plans to develop a business plan. The agency, however, has no timeframes for doing so.

Our analysis of the academy lease indicates that NTSB has the flexibility to use the facility in other ways to generate revenues or potentially reduce costs. For example, the lease does not preclude NTSB from subletting unused space to other users. Since certain space is already configured as classrooms and the academy is located in an academic setting on George Washington University's suburban Virginia campus, it may be possible to market space to academic users. Furthermore, NTSB is not precluded by its academy

[26]The revenue deficient for the 14 sessions totaled $54,279, and the revenue surplus for the two years totaled $307,203.

[27]If the tuition fee is set by dividing the costs attributable to a course by the projected class size, the fee may not be competitive with fees charged by other institutions offering similar courses. In that case, the projected class size might not be attainable without lowering the tuition to a competitive level, with the result that fee revenues collected might not cover the attributable costs.

[28]NTSB has a memorandum of understanding with GAO for the two agencies to reciprocate in providing continuity of operations. There is no annual fee associated with this agreement, only cost reimbursement after the first 14 days of providing space.

lease or its lease for headquarters space in Washington, D.C., from relocating some headquarters staff to the Virginia facility. The lease for the office space in Washington, D.C., expires in 2011. Such a move, however, would incur one-time costs that include relocating staff, moving furniture and equipment, reconfiguring space and utilities as well as recurring travel costs for staff who must travel between the two locations. Such costs would have to be weighed against the reduced cost of leasing less space in Washington, D.C.

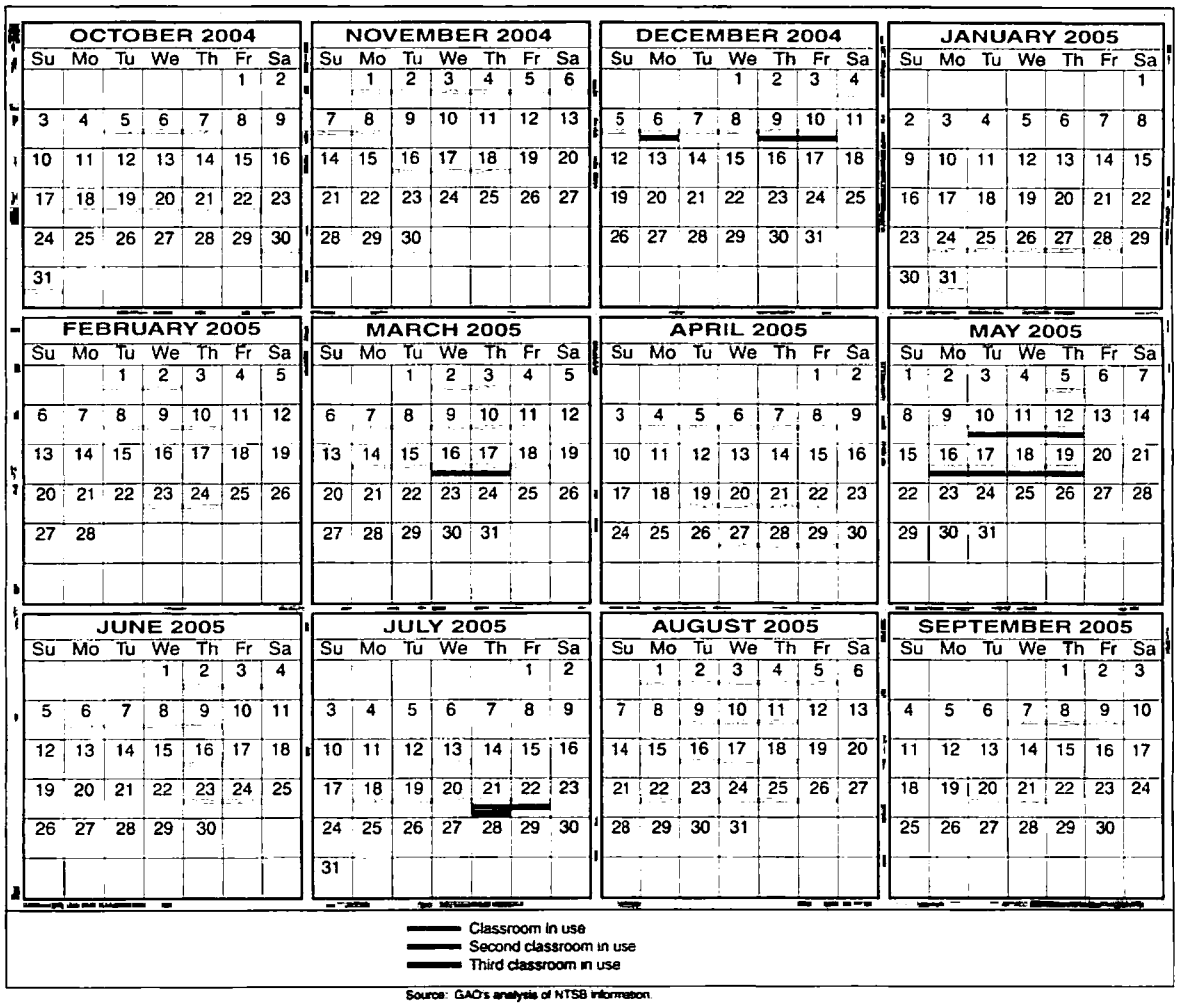
Academy Classrooms Are Significantly Underutilized

NTSB has not maximized the use of the facility, which could generate additional revenues that may help cover costs.[29] We estimate that, overall, less than 10 percent of the total classroom space was used during fiscal year 2005.[30] As shown in figure 12, none of the five classrooms were used for 21 weeks in fiscal year 2005. In addition, at any given time, no more than three classrooms were in use. Figure 12 shows the days in which classroom space was used for 31 class sessions and 12 other events, such as workshops and seminars by organizations that rented the space during fiscal year 2005.

[29]The academy facility contains five classrooms, a large warehouse that houses aircraft and other wreckage, eating and lounge areas, and office space for five employees who constitute NTSB's Washington field office.

[30]We excluded federal holidays and the last week in December from our analysis. In some cases, courses used multiple classrooms. We lacked specific information on which courses used multiple classrooms. To account for that situation, we rounded up the percentage of space utilized. The use of multiple classrooms does not affect the information on the lack of using any classrooms for 21 weeks.

Figure 12: Utilization of Classrooms by Academy Classes and Other Events, Fiscal Year 2005



Source: GAO's analysis of NTSB information.

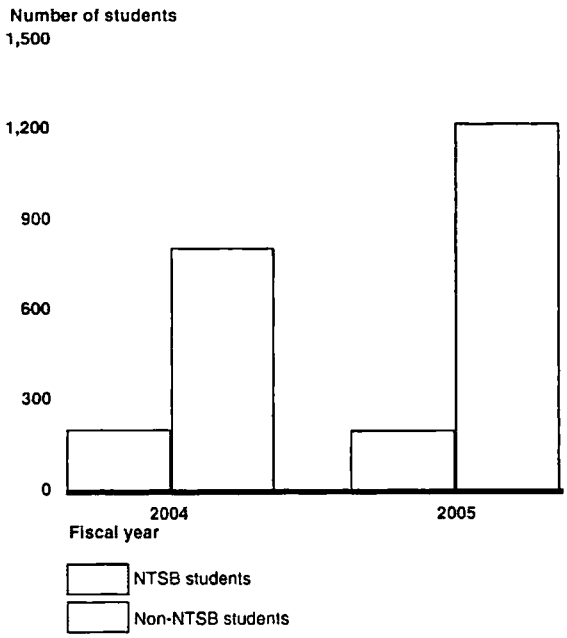
Note: Bars indicate classroom use. For example, two stacked bars indicate that two classrooms were in use on a particular day.

While a relatively small percentage of the academy's students have been NTSB staff, the agency is taking efforts to increase their enrollment at the academy. About 20 percent of the academy's approximately 1,000 students[31] in fiscal year 2004 were NTSB staff, and about 14 percent of the 1,400 students in fiscal year 2005 were NTSB staff. Over the 2 years, about 400 NTSB students[32] attended 38 of the 49 class sessions conducted at the academy during fiscal years 2004 and 2005. (See fig. 13) NTSB is making efforts to have staff more fully utilize the facility. In fiscal year 2004, 1 of 18 sessions was only for NTSB

[31]The total number of students is the sum of the participants in all classes. Individuals who attended more than one class at the academy were, therefore, counted multiple times.
[32]Individuals that attend more than one class are counted multiple times.

investigators; in fiscal year 2005, 5 of 31 sessions were only for NTSB investigators.[33] While increasing the use of the academy by NTSB staff would reduce the costs of sending them to external training, it is important that NTSB not reduce the number of external, paying students in the process.

Figure 13: Number of NTSB and Non-NTSB Students, Fiscal Years 2004 and 2005



Source: GAO's analysis of NTSB data.

NTSB staff receive most of their training from outside the academy, which may be due to the courses lacking the subject matter that they require. Our analysis of staff training requests for fiscal year 2006 showed that 97 percent of all training is expected to be from external sources and the remaining training from NTSB's academy. NTSB staff have requested external training being provided by organizations that include FAA's Transportation Safety Institute, the University of Southern California, the U.S. Department of Agriculture, and Kettering University for training in subjects such as human factors in aviation safety, turbine engine investigation, or automotive design and safety. Training requests cover other specialties such as helicopter training, flight training currency for pilots, technical writing, supervisory and management skills, and industry conferences. Investigators and writer editors with whom we spoke had positive views on the quality of academy training courses but provided several reasons for not taking further courses there. Ten of the 23 investigators and writer editors we interviewed told us that they had taken (or taught) courses at the academy and thought the courses were excellent;[34] none of the investigators and writer editors had anything

[33]These course sessions were Conducting Effective Technical Presentations; two sessions each of Media Training and Major Investigation Protocol and Processes; and a joint training class with the Federal Bureau of Investigation.
[34]Our review of course evaluations for fiscal years 2004 and 2005 indicated high positive responses by students to

negative to say about the quality of any academy course. However, none of the staff we talked with had plans to attend academy training in fiscal year 2007. One reason noted for this situation was the remoteness of Ashburn, Virginia, from their residences. Another reason was the lack of courses on new transportation technologies and the skills and competencies needed by an investigator-in-charge. Eight investigators told us that they find workshops by manufacturers, such as aircraft and automobile manufacturers, more valuable to their work than academy training.

The academy is not utilized more by NTSB staff, in part, because the agency has not developed a core curriculum for its staff that could then be offered at the academy, as mentioned previously in this testimony. The academy only offers one course that is required for NTSB staff—a 2-week course on aviation accident investigation that is required for new NTSB investigator staff. The deputy manager of the academy told us that the academy plans to eventually offer more internal training covering subjects such as management skills, retirement, and computers.[35] However, no milestones or specific plans have been established for that effort.

Although most students at the academy are from outside NTSB, several factors can affect the agency's ability to attract additional outside students. First, the lack of a business or marketing plan may be affecting NTSB's ability to fully utilize the academy. Second, academy training is similar to training provided by other institutions. FRA, FAA, and PHMSA officials told us that their investigators do not attend NTSB training because similar training is provided in-house by DOT's Transportation Safety Institute. For example, an FAA investigator told us that new investigators take a basic accident investigation course at the Transportation Safety Institute and subsequently take mid-career follow-up courses there. Furthermore, our comparison of NTSB's fiscal year 2006 curriculum with that of several other institutions that teach courses on accident investigations showed that other institutions offered courses similar to 12 of NTSB's 19 courses. For example, DOT's Transportation Safety Institute offers basic courses on aviation and bus accident investigations, and the University of Southern California offers a course on human factors related to accident investigations.

Additional Issues Concerning the Academy

You asked that we provide information concerning the academy's use of NTSB investigators as instructors and NTSB's compliance with the Anti-Deficiency Act, with regard to its accounting for its academy lease. Concerning the first issue, academy courses are taught by a combination of academy staff, NTSB investigators and managers, and contractors. Use of investigators as instructors is limited and is likely to have little impact on investigators' overall workload. During fiscal year 2005, 51 NTSB investigators or managers taught at the academy. On average they spent an estimated 22 hours to prepare for and teach courses. (See fig. 14.)

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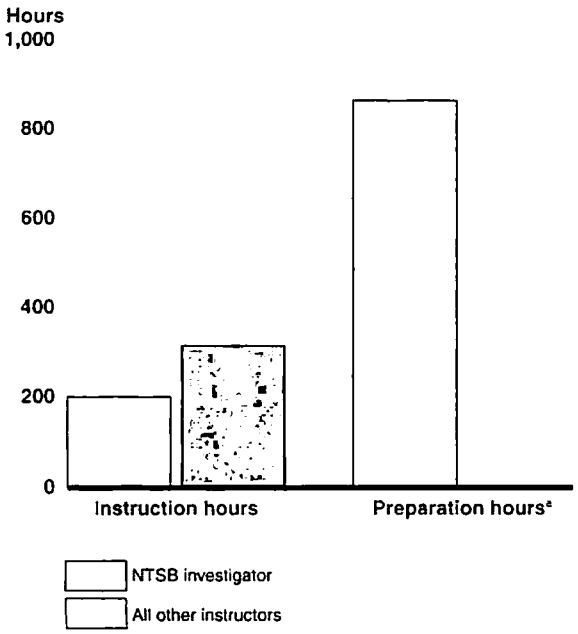
the academy courses. The data lacked information for us to compare evaluations by NTSB students and non-NTSB students.

[35]NTSB is considering contracting out more courses such as these.

Figure 14: Length of Time NTSB Investigators Spent Teaching and Preparing to Teach Academy Courses and the Length of Time All Other Instructors Spent Teaching, Fiscal Year 2005



Source: GAO's analysis of NTSB data.

Note: Other instructors include NTSB academy staff, volunteers, and contract instructors from outside NTSB. Data on the number of hours "other" instructors spent preparing to teach is not collected by NTSB.

Finally, NTSB classified its lease for the academy as an operating lease rather than a capital lease. As a result, NTSB has been noncompliant with the Anti-Deficiency Act because it did not obtain budget authority for the net present value of the entire 20-year lease obligation at the time the lease agreement was signed in 2001. NTSB realized the error in 2003 and reported its noncompliance to Congress and the President. NTSB has proposed in the President's fiscal year 2007 budget to remedy this antideficiency act violation by inserting an amendment in their fiscal year 2007 appropriation that would allow NTSB to fund this obligation from their salaries and expense account through fiscal year 2020.

Conclusions

Mr. Chairman, we have developed several conclusions from our analysis of NTSB to date. To the credit of the current leadership at NTSB, much of the agency's progress toward following leading practices is due to recent management initiatives. The performance management plan, draft staffing plan, and implementation of controls over financial transactions are all positive steps. NTSB's progress in these areas will likely remain incomplete without additional actions, however. For example, without a more comprehensive strategic plan than it currently has, NTSB cannot align staffing, training,

or other human resource management to its strategic goals or align its organizational structure and layers of management with the plan. NTSB will also likely miss opportunities to strengthen the management of the agency until it develops a strategic training plan for its employees, implements a full cost-accounting system, and improves communications within the agency.

We have also concluded that, despite the many safety recommendations NTSB has made and seen implemented over the years of its existence, inefficiencies have resulted from the process that the agency uses to close out safety recommendations. In particular, the absence of a computerized documentation system and the sequential reviews that NTSB currently requires slow the process and prevent expedient delivery of information about recommendation status to affected agencies. Finally, in terms of its academy, NTSB is missing opportunities to increase the value of this asset. Without a comprehensive marketing plan, NTSB will likely be unable to efficiently attract users who would help pay the ongoing costs of the facility.

Recommendations for Executive Action

To improve the efficiency of agency operations, we are making eight recommendations to the Chairman of the National Transportation Safety Board based on our completed work to date. To improve agency performance in the key functional management areas of strategic planning, human capital planning, financial management, and communications, we recommend that the Chairman implement the following three recommendations:

- Improve strategic planning by developing a revised strategic plan that follows performance-based practices; developing a strategic training plan that is aligned with the revised strategic plan and identifies skill gaps that pose obstacles to meeting the agency's strategic goals and curriculum that would eliminate these gaps; and aligning their organizational structure to implement the strategic plan and eliminate unnecessary management layers.
- Develop a full cost-accounting system that would track the amount of time employees spend on each investigation and in training.
- Develop mechanisms that will facilitate communications from staff-level employees to senior management, including consideration of contracting out a confidential employee survey to obtain employee feedback on management initiatives.

To enhance the efficiency of the report development and recommendation close-out processes, we recommend that the Chairman take the following two actions:

- Identify better practices in the agency and apply them to all modes. Consider such things as using project managers or deputy investigators-in-charge in all modes, using incentives to encourage performance in report development, and examining the layers of review to find ways to streamline the process, such as eliminating some levels of review and using concurrent reviews as appropriate.
- Improve the efficiency of the review process for changing the status of recommendations by computerizing the documentation and implementing concurrent

reviews.

To enhance the utilization of the academy and improve the ability to generate revenues that will cover academy costs, we recommend that the Chairman take the following three actions:

- Develop a comprehensive marketing plan for the academy. The plan should consider such things as outreach to potential users, working with USDA and GSA to market it as classroom and conference space, and conducting market research for additional curriculum development. If ethical and conflict-of-interest issues can be addressed, the plan should also consider options for allowing transportation manufacturers to conduct company-sponsored symposia and technical training at the academy facility, which would benefit NTSB investigators in keeping up with new technologies. In addition the plan should consider the feasibility of subleasing a portion of the academy space.
- Develop core investigator curriculum for each mode and maximize the delivery of that training at the academy.
- Conduct a study to determine the costs and feasibility of moving certain functions from headquarters to the academy facility in preparation for the renegotiation of the headquarters lease, which expires in 2011.

Agency Comments

We obtained comments on a draft of this testimony from NTSB. NTSB's Managing Director concurred with our recommendations and provided clarifying comments and technical corrections, which we incorporated as appropriate. In addition, NTSB commented that the draft did not sufficiently distinguish improvements that have been made over the past year. We revised the testimony to more clearly distinguish those actions.

Scope and Methodology

To determine the extent to which NTSB is following leading practices in selected management areas, we reviewed past GAO work on leading management practices in the areas of strategic planning, performance management, human capital management, financial management, and communications. We interviewed NSTB board members, senior officials, managers, investigators, and writer editors regarding their experience with those practices at NTSB, and their perceptions of the effectiveness of those practices. We also determined NTSB's response to recommendations made by the DOTIG. We reviewed NTSB documents, including its strategic, staffing, and performance management plans; management advisory e-mail; and information regarding the current staffing levels; and employees' training plans for 2006.

To determine the extent to which NTSB is developing accident investigation reports and

closing safety recommendations in an efficient manner, we interviewed NTSB investigators, writer editors, managers, and senior officials regarding the investigative process and their role in it. We randomly selected 15 of the 210 investigators and 8 writer editors evenly across the 4 modal offices. The views represent the particular individuals and are not representative of all NTSB investigators and writer editors. We reviewed policy guidance on the investigative process and the level of current and past investigation activity. We examined data on recommendations acceptance rates and close-out status from NTSB's recommendation database, and we determined that the data were sufficiently reliable for the objectives of this review. Additionally, we reviewed studies done by the Rand Corporation and Booz Allen Hamilton that examined NTSB's investigation process and determined the extent to which the agency had implemented their recommendations.

To determine the extent to which NTSB is generating sufficient revenues to cover costs at its academy, we reviewed financial data on NTSB's academy, including the revenues and expenses for fiscal years 2004 and 2005. We reviewed the course curriculum of the academy, and compared it with classes offered by DOT's Transportation Safety Institute, Embry Riddle, the University of Southern California, and the Southern California Safety Institute. We examined data on the student makeup of academy classes and analyzed data on the preparatory and teaching time used by NTSB investigators who taught at the academy. We interviewed NTSB investigators, writer editors, and managers and senior officials at DOT's modal administrations regarding their current and planned use of the academy. Finally, we examined the lease for the academy to determine how NTSB may utilize the space.

We conducted our review from December 2005 to May 2006 in accordance with generally accepted government auditing standards.

Contacts and Acknowledgements

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