MP140527
MITRE PRODUCT

MITRE

CAA International Structures

Dan Brown
Tom Berry
Steve Welman
E. J. Spear

October 2014

Sponsor: The Federal Aviation Administration
Dept. No.: F094
Project No.: 0214PB01-IF
Outcome No.: 1
PBWP Reference: 1-1.2.B.1-1, "Report on CAA Findings"

Approved for public release
Unlimited Distribution (Case Number 15-0859)

McLean, VA

Center for Advanced Aviation System Development

Abstract

In the summer of 2014, The MITRE Corporation (MITRE) was asked by the Federal Aviation Administration's (FAA) Policy, International Affairs and Environment office to investigate six international Civil Aviation Authorities (CAAs). The six countries, the United Kingdom, Canada, New Zealand, Australia, France, and Germany shared the experience of separating the air navigation service provider (ANSP) from the government CAA.

Although much has been written about the privatization of ANSPs, MITRE found relatively little concerning how that experience affected the CAAs. This report summarizes the governance, autonomy, structure, and funding of each CAA and then discusses any lessons learned from the separation. MITRE used a variety of public sources and interviewed staff members at several CAAs.

Table of Contents

1 Introduction 1
2 Overview and Lessons Learned 3
2.1 Funding 3
2.2 Autonomy and Governance 5
2.3 Structure 6
2.4 Separation of the ANSP from the CAA 7
2.4.1 Developing an Effective Transition Phase 7
2.4.2 CAA Independence and Due Process 8
2.4.3 CAA Employee Recruitment and Retention 8
2.4.4 The CAA's Relationship with the Non-ANSP Portion of the Aviation Industry 8
2.5 Scalability and Complexity 9
2.6 ATC and National Security 9
3 Conclusion 9
Appendix A United Kingdom A-1
A.1 Funding A-1
A.2 Autonomy and Governance A-3
A.3 Structure A-4
A.4 Experience A-5
Appendix B Canada B-1
B.1 Funding B-1
B.2 Autonomy and Governance B-3
B.3 Structure B-3
B.4 Experience B-7
Appendix C New Zealand C-1
C.1 Funding C-1
C.2 Autonomy and Governance C-2
C.3 Structure C-2
C.4 Experience C-5
Appendix D Australia D-1
D.1 Funding D-1
D.2 Autonomy and Governance D-1
D.3 Structure D-2
D.4 Experience D-4

Appendix E France..... E-1
E.1 Funding.....E-1
E.2 Autonomy and Governance.....E-2
E.3 Structure E-2
E.4 Experience.....E-4
Appendix F Germany F-1
F.1 Funding.....F-1
F.2 Autonomy and Governance.....F-2
F.3 Structure F-2
F.4 Experience.....F-3
Appendix G Glossary G-1

List of Figures

Figure A-1. Current Organization of UK's CAA A-5
Figure B-1. Employee Divisions within Transport Canada that Regulate Air Transportation, including the Civil Aviation Directorate B-5
Figure B-2. Transport Canada Organizational Structure by Program B-6
Figure C-1. Current Organization of the CAA of New Zealand..... C-4
Figure D-1. Current Organization of Australia's Civil Aviation Safety Authority D-3
Figure E-1. Organization of Directorates within DGAC E-3
Figure F-1. Organization of the German BAF F-3

List of Tables

Table 1. Characteristics of CAAs 2

Table A-1. Revenues from Regulatory and Non-Regulatory Groups in the UK's CAA, FY2013 (thousands of British pounds) A-2
Table A-2. Forecasted Revenues from Regulatory in the UK's CAA, FY2015 (thousands of British pounds) A-3
Table B-1. Revenues and Expenses Generated by Transport Canada's Aviation Programs and Subprograms, FY2013 (millions of Canadian dollars)..... B-2
Table C-1. Revenues and Expenses of the CAA of New Zealand, FY2013 (millions of New Zealand dollars) C-2
Table D-1. Revenues and Expenses Generated by Australia's CAA, FY2013 (millions of Australian dollars) D-2
Table E-1. Revenues and Expenses for French Air Traffic Service Provision by DGAC, FY2014 ..... E-1

1 Introduction

Prior to the 1980's, most of the world's Civil Aviation Authorities (CAAs) were government-owned entities that provided air navigation services and regulated the safety of the aviation industry. The U.S. Federal Aviation Administration's (FAA's) structure is of this type. But over the last three decades, many countries chose to separate their Air Navigation Service Providers (ANSPs) from their CAAs. Substantial research has focused on what happened to the ANSPs after this separation, but very little attention has been paid to the CAAs.

The FAA's Policy, International Affairs and Environment Office asked the MITRE Corporation (MITRE) to investigate what happened to CAAs that separated from their respective ANSP. This report explores the funding, autonomy, governance, and structure of select CAAs that underwent this separation, with the primary motivation of identifying lessons learned from the experience. A variety of publicly available documents and reports were reviewed, and MITRE conducted interviews with employees at several CAAs.

This report focuses on the CAAs in six countries: the United Kingdom (UK), Canada, New Zealand, Australia, France, and Germany. These CAAs were chosen (in consultation with the FAA) because their level of technological sophistication is similar to the FAA's and because their countries share many common economic and political characteristics with the United States.

The transition to a separate CAA differed slightly for each country in this study. Each was influenced by its own form of government, experience with privatization, the existing funding structure, and other government-regulatory changes happening in other modes of transportation at the time. The solutions these countries implemented to separate the ANSP and CAA are quite diverse.

The primary motivation for three of the separations was financial pressure, while two were a response to regulatory requirements, and one was driven by the inefficiency of operating a combined ANSP and CAA. In addition, the CAAs continued to evolve after the separation, in some cases for reasons unrelated to ANSP separation.

The organizational forms of the six CAAs range from private corporation (UK) to a branch of the government (France), and the ANSPs they oversee are similarly diverse. Some CAAs share oversight of ANSP functions with other government agencies while others keep all ANSP oversight in a single department.

Despite the differences, the separation of the ANSP from the CAA left each country's CAA with the primary objective to ensure that the air transportation system, including airlines, airports, and ANSPs, are operated safely and in accordance with regulations that originate or are approved by the CAA. Most CAAs were also tasked with the following responsibilities: to prevent the ANSP from using its monopoly position to overcharge users, to guarantee that aviation policy decisions enhance national interests, and in contrast to the U.S., to oversee aviation security activities.

In all cases, the separation of the ANSP from the CAA was reasonably successful. There were difficulties in the shift to an independent regulator of a corporatized ANSP, but adjustments were made in response to the difficulties encountered. There are no cases where ANSP separation was reversed and MITRE did not discover any views that the system prior to separation was prefered.

Table 1 is an overview of the CAAs and is followed by Section 2 which presents the general findings and lessons learned for the CAAs examined. Detailed profiles of the individual CAAs are in Appendices A through F.

Table 1. Characteristics of CAAs

	Funding	Autonomy and Governance	Structure
United Kingdom (UK CAA)	• Almost entirely funded by users. • Complex scheme of charges covering nearly all persons, businesses, or organizations in civil aviation. • Required rate of return: 6% • Small grants (£2 million) from British Treasury for non-regulatory activities.	• CAA is a non-profit corporation with a governing board of directors (7-16 members). • Licensed by UK government to provide all services under a monopoly. • Accountable to Secretary of State for Transport to Parliament. • The Secretary of State for Transport appoints all Chair, Deputy Chair and all non-executive board members. The Chief Executive is elected by non-executive members and appoints all other executive positions.	• Five main divisions: Safety and Airspace Regulation; Regulatory Policy; Consumer Protection; Miscellaneous Services; and Subsidiaries. • Operates two subsidiaries – one non-profit, one for profit, that provide consulting services, particularly in the safety area. The non-profit offers services only to the British territories while the for-profit offers them globally. • Relies on European Aviation Safety Authority for certain safety function such as pilot licensing and aircraft certification. • Recently given regulatory oversight of aviation security.
Canada (TCCA)	• CAA funding is determined within the Canadian transportation department's (Transport Canada's) annual budget process. • Payments made by the aviation industry flow to Canada's government or to Transport Canada, not the CAA. • The majority of regulatory payments (84%) come from land lease charges to Canadian airports.	• Government department embedded within Transport Canada. • Director General, Civil Aviation heads the CAA within Transport Canada.	• CAA headquarters is divided into eight branches in headquarters: Policy and Regulatory Services; Standards; Management Services; Civil Aviation Secretariat; National Operations; National Aircraft Certification; International Operations; and Aviation Medicine. • Five regions also have safety oversight responsibilities. • No aviation security responsibility.
New Zealand (CAA NZ)	• Funded mainly by passengers and the aviation industry. • 70% of funding from passenger safety charges (International $1.30 per passenger, domestic $1.70 per passenger). • 18% of funding from industry certification and licensing charges. • 10% of funds from general tax revenues appropriated for specific projects and functions in CAA. • $4 million reserve fund. • Funding structure did not change for over a decade until Cabinet allowed for review every 3 years.	• Government department headed by a board. • Five non-executive members appointed by Minister of Transport. • Non-executive members appoint a Director of Civil Aviation and General Manager of the Aviation Security Service. • Responsible for strategic planning and financial management of CAA.	• Tightly organized with most functions inside the CAA. • Two independent groups: safety regulation and aviation security. • Safety regulation component includes the following groups: Operations and Airworthiness; Aviation Infrastructure and Personnel; Policy and System Interventions; Legal; Organization Development and Strategy; and Corporate Services. • Responsible for aviation security.
Australia (CASA)	• Funded mostly by charges to the aviation industry and government funds.	• Government department. • Governing board of 3-5 members.	• More loosely organized than other CAAs with Aviation and Airports governed separately in

	Funding	Autonomy and Governance	Structure
	• 66% of revenues come from an excise charge on jet fuel. • 23% of revenues are come from general fund appropriations. • Balance from other regulatory charges.	• Non-executive board members appointed by Minister of Department of Infrastructure and Regional Development. • Non-executive board members appoint Director of Aviation Safety. • Board makes decisions about objectives, strategies and policies to be followed by CASA. • Board has varied in size over the years and was abolished in 2003 until it was reinstated in 2009.	the Department of Infrastructure and Regional Development. • Seven major groups: Operations; Airspace and Aerodrome Regulation; Standards; Safety and Education Promotion; Corporate Services; Legal Services; and Industry Permissions. • No aviation security responsibility.
France (DGAC)	• Funded mainly (83%) by users through air navigation service and passenger charges. • 7% operational reserve, ½% reserve for staff costs.	• Government department. • Reports to the Ministry for Transports, Sea, and Fisheries.	• Organized into three main Directorates: Air Transport; Civil Aviation Safety; and Light, General, and Helicopter Services. • The ANSP is only functionally separate from the CAA, but remains within the same organization. • Structure is most similar to U.S. FAA and FAA's ATO. • Responsible for aviation security.
Germany (BAF)	• Fully funded by users through air navigation service charges.	• Government department. • Headed by Director of BAF. • Reports to the Ministry of Transport and Information.	• Narrow focus is on ATC safety oversight. Non-ANSP safety issues are overseen by separate agency, the Federal Aviation Office. • Composed of five departments: Safety Oversight; Economic Oversight; Technology Safety Oversight; Airspace, Flight Procedures, Law; and Central Administration. • No aviation security responsibility.

2 Overview and Lessons Learned

This section summarizes the findings and presents the lessons learned related to each category (Funding, Autonomy and Governance, and Structure) in Table 1 and then describes lessons learned related to the transition from a unified ANSP to a separate ANSP and CAA. The section concludes with comments provided by the CAAs regarding U.S. airspace requirements and national security issues.

2.1 Funding

Most of the CAAs evaluated in this report are funded primarily from payments made by users in the aviation industry, but it is not clear whether these payments should be called taxes, fees, charges, or some combination of these terms. Not only does each country have its own

terminology, but sometimes the defining characteristics of a particular charge, or of the organization imposing the charge, will change over time, while the termimology used for that charge does not. Even within the U.S., these terms are used inconsistently. For the purposes of this paper, we will refer to all payments made by users in the aviation industry as 'charges'.

In France and Germany, the majority of CAA funding comes from the Air Traffic Control (ATC) en route and terminal charges collected by the ANSP. Some other CAA revenue streams come from charges imposed on air fares (France), jet fuel (Australia), and number of passengers (New Zealand). A few CAAs also employ direct user-charges for inspections and certifications. The most complex funding system is in the UK, which spreads charges across the entire aviation industry.

Some CAAs receive revenues from their government's general fund under certain circumstances (UK, New Zealand), but payments made by the aviation industry are still the predominant source of CAA revenues. In contrast, all of the funding for Canada's CAA comes from its transportation department's annual budget.

While these charges generally cover the regulator's costs, there are two specific effects of funding the CAA primarily from charges to the air transportation industry. The first is that the CAAs are vulnerable to unexpected revenue declines if their funding is primarily tied to flight activity (such as air fares, jet fuel, or the number of passengers). To the extent that the CAA's expenses are independent of flight activity and the government views safety regulation as a public good that must be provided no matter the health of the industry, the CAA can be placed in the position of requesting rate increases at the same moment that the industry is dealing with declining revenues. To some extent, this can be offset by the CAA maintaining a contingency fund, similar to that held by many independent ANSPs, but existing CAA contingency funds are insufficient to bridge a significant downturn. Moreover, government CAAs do not have the option of going to the private-debt market to finance their near-term shortfalls as do most independent ANSPs. Without an increase in rates levied on the industry, the CAA's only option is to receive funds from general tax revenues through either a grant or a loan from the government.

The second effect of charging users is to make the CAA's costs more apparent to industry stakeholders and increase the pressure on the CAA to improve productivity and reduce costs, even in times of industry growth. To some extent, this exposure promotes a more efficient regulator, especially since the separation of the ANSP allows the CAA to focus exclusively on its regulatory role. However, it is important that the government ensures that these pressures do not move beyond efficiency improvements and into a reduction in the effectiveness of the safety regulator.

Many of the CAAs we reviewed faced budgetary pressures from insufficient revenues at some point after separation. There is wide variation in the ease with which CAAs may increase revenues. For example, some CAAs (New Zealand, Australia) can only increase revenues by directly petitioning the designated cabinet level minister or legislative body. Other CAAs must navigate through multiple bureaucratic layers to compete for funding (Canada). The UK's CAA may update its complex charging scheme annually and only needs the approval of the Secretary of State for Transport.

However, through these political processes, industry stakeholders become involved with the CAA's funding requests. The CAAs must therefore convince their governing political body that they are already as efficient as possible and that the request for funding ultimately adds more

value to the industry than it costs. This can be a difficult proposition to make, particularly if the funding shortfall is caused by troubles in the aviation industry. Several CAAs expressed that this need to justify their own rates, defend their efficiency, and explain the overall value of their regulatory role were new activities for which they were initially unprepared.

No matter the process for setting the rates, several CAAs emphasized the importance of having a regular review of their funding mechanism to assure that the government consciously determines the adequacy of the CAA's revenues in light of evolving regulatory needs. This was particularly the case for New Zealand, where the CAA rates were left unchanged, even for inflation, for more than 10 years. New Zealand has since made a significant increase in its CAA's rates to bring them back in line in real terms and has implemented a triennial review to prevent a repeat occurrence.

Changing the approach to safety regulation from a compliance-based model to a risk-based model is a common response by the CAAs to the pressure to control costs. Under a compliance-based model, the regulator checks whether all safety standards are being followed with little regard to the probability of non-compliance (based on the company's history) or how much safety is actually compromised by non-compliance. In contrast, a regulator using a risk-based model first determines which standards need to be checked for each company. Lower-risk companies receive less intrusive inspections, and standards that add little to safety are monitored less frequently relative to those that are more critical. CAAs in the UK, Canada, New Zealand, and Australia have moved towards less costly, risk-based approaches, though this change has required a culture shift that they found difficult. There is no evidence that a risk-based approach is less safe than a compliance-based one, but evaluating its effectiveness requires the CAA to have strong internal data collection and quality-control procedures.

2.2 Autonomy and Governance

All of the CAAs except one remained government organizations. In the UK, a non-profit corporation licensed by the government regulates the aviation sector. Although that corporation is funded like a private business, its governing structure more resembles public organization.

Three of the six CAAs examined (UK, New Zealand, and Australia) were relatively autonomous organizations that report directly to the cabinet level minister. They have a governing board of members, who are chosen at the pleasure of that minister. Like a corporation, the board appoints the chief executive officer, but is not directly involved with the CAA's daily operations. The board does make decisions on long term strategic issues confronting the CAA, major financial decisions (e.g., funding requests, investments, etc.), and executive-level performance review and compensation. The board also liaises with stakeholders in the aviation industry.

Separating the CAA and ANSP allows the CAA to focus solely on the regulatory function while the ANSP focuses on ATC provision. However, CAA leadership needs the time to make the organizational adjustments associated with their particular situation after the separation from the ANSP. Experience shows that persistent political interference can limit the CAA's ability to make those adjustments. All CAA's are subject to the control of their government to some extent, but making a CAA a standalone entity, such as the UK's CAA or Germany's BAF, influences the degree of exposure to political intervention. However, the particular governance model for the CAA appears to matter less for the success of its regulatory mission than the general political environment in which it operates.

In the case of Australia's CASA, persistent political intervention with the governing board impaired CASA's performance for years. CASA was originally founded with a governing board similar to the UK CAA, but political involvement led to frequent changes in the organization's Board and executive leadership and ultimately, its basic governance structure.[1] In 2003, the Australian Parliament voted to eliminate CASA's Board and required the chief executive to report directly to the Minister overseeing transportation. This decision was later reversed in 2009 and CASA's Board was reinstated. Today, CASA's governing Board is limited to between 3 and 5 members, one of whom is CASA's Chief Executive, the Director of Aviation Safety. The Minister of the Department of Infrastructure and Regional Development directly appoints all non-executive board members, who in turn select the Director of Aviation Safety (with ministerial approval). The Board is influential in making decisions regarding the "objectives, strategies and policies to be followed by CASA."[2]

Canada uses a more traditional model where the CAA functions relatively autonomously, but is still embedded within a large department that oversees transportation (Transport Canada). The Director General of the Civilian Aviation Directorate heads the CAA within Transport Canada. This position reports to the Assistant Deputy Minister of Safety and Security who is two positions below the Minister of Transport Canada. Ultimately, the Minister of Transport is responsible to Canada's Parliament.[3] Thus, there are many bureaucratic layers which govern Canada's aviation regulator.

There does not seem to be any single best practice among the many differences in governance. There is broad agreement that the CAA function should be solely under government control, but whether it should be within a larger department such as Transport Canada or a separate organization such as the UK CAA seems to matter less.

2.3 Structure

Most CAAs contain almost all aviation functions, similar to how the FAA performs almost all aviation regulatory and policy functions in the United States. France and New Zealand follow this unified structure. In some countries, the broader aviation functions are spread across different government departments. In Australia, for example, the Department of Infrastructure and Regional Development oversees airport, aviation, and air traffic policy, and the Australian Competition and Consumer Commission regulates the ANSP's pricing scheme. The Australian CAA oversees safety and regulation and reports to the Ministry of Transport.

The Australian, New Zealand, and Canadian CAAs develop and enforce their own safety standards. However, within the E.U., the creation of the European Aviation Safety Administration (EASA) has partially consolidated E.U. aviation functions, easing the burden of certain certification and regulatory functions for its members (including France, Germany, and the UK). EASA was created in 2003 and conducts pilot licensing, analysis and safety research, foreign operator authorization, and parts, equipment and aircraft certification. EASA also

---

1 Parliament of Australia. *Aviation safety regulation timeline 1982-2011*. Online resource. <http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BN/1011/Aviation#_Toc284925925>

2 Parliament of Australia. *Civil Aviation Amendment Act of 2009*. ComLaw Database. Online resource. <http://www.comlaw.gov.au/Details/C2009A00019>

3 The Office of the Auditor General of Canada. *Report of the Auditor General of Canada to the House of Commons. Chapter 5: Oversight of Civil Aviation – Transport Canada*. Spring 2012. Online resource. <http://www.oag-bvg.gc.ca/internet/docs/parl_oag_201204_05_e.pdf>

provides advice for drafting European Union (EU) legislation and technical expertise and training for member CAAs. Each member must still implement and enforce its own regulations, but EASA does much of the initial work. EASA is funded by a series of service charges that are set by the European Commission.

2.4 Separation of the ANSP from the CAA

The collective experience after separating the ANSP from its CAA is quite good. The primary responsibility of a CAA is safety regulation. Despite the many approaches to organizing the CAA and the ANSP, in each case the safety record of the ANSP was equal to, or better than, the record prior to the separation and regulatory costs are largely, or completely, supported by aviation users.[4]

2.4.1 Developing an Effective Transition Phase

Despite this general success, the transition process was not without difficulties in most countries. Three particular lessons learned and associated recommendations were repeatedly expressed: operate the CAA and the ANSP as a functionally separate units for a few years prior to complete separation, use that time to develop and review comprehensive written regulations that will form the foundation for the relationship between the CAA and the ANSP, and establish a clear understanding as to the broader division of roles and responsibilities between the CAA and the ANSP.

Prior to separation, a unified ANSP's operating procedures are less formal, especially in a legal sense. Several CAAs explained that those procedures, while written and well established, were too vague in the context of a CAA regulating a corporatized ANSP. By leaving too much open to interpretation, conflicts developed between the CAAs and the ANSPs as to compliance and enforcement. Furthermore, within the formerly unified ANSP, other areas of interaction between operators and regulators were determined by long-established customs and processes, many unwritten, which simply could not be applied between separate, independent organizations. These unresolved ambiguities can create additional problems over time, particularly with changes in technology and the aviation industry. It is worth noting that countries that allowed less time for the transition to an independent CAA were the most adamant about this advice.

This uncertainty in the formal, legal relationship between the CAA and the ANSP occurs at the same time that both new organizations are eager to assert their distinct roles. In interviews, the CAAs also expressed that this initial relationship is further complicated by the staff that stayed at the CAA suddenly overseeing former colleagues employed at the ANSP in an arms-length relationship that is unfamiliar.

By not investing sufficient time prior to the full separation, these problems were left to be resolved between the newly independent organizations in several cases. Ironically, while reducing direct political influence is one reason countries have moved to a corporatized ANSP

---

[4] "The Effects of Air Traffic Control Privatization on Operating Cost and Flight Safety," The Journal of Aviation/Aerospace Education & Research, Volume 14, Article 8, Number 3 JAAER Spring, 2005.

"Air Traffic Control, Characteristics and Performance of Selected International Air Navigation Service Providers and Lessons Learned from Their Commercialization," GAO Report GAO-05-769, July 2005.

"Commercializing Air Traffic Control: Have the Reforms Worked?," MBS, Ottawa, August 15, 2007, page 7.

"Managing the Skies. Public Policy, Organization and Financing of Air Traffic Management," Pg. 199, Clinton Oster, Jr., John S. Strong, Ashgate Publishing, 2007

and independent CAA, leaving the organizations to resolve these problems after separation tends to invite the political participation of the government into the operation of the CAA and the ANSP. While these issues are eventually resolved, it was generally felt that most of the conflicts could have been avoided by more thorough preparation before the separation.

A related recommendation stressed how important it was that the CAA builds a strong working relationship with the ANSP and industry, particularly at the executive level. This can be accomplished by being transparent and making sure that each organization understands the other's positions. Conflict resolution is difficult without such relationships, since the CAA's enforcement options are limited. They cannot, for example, revoke the ANSPs license without causing major repercussions throughout the economy, and ANSPs know this. Political intervention at the cabinet level is the ultimate tool that the CAA could realistically use, but this option creates problems for the CAA as well. Persistent political intervention makes it difficult to lead and establish priorities. However, the CAA appears to have more leverage over a privatized ANSP than a government owned one because the contract for provision could be changed if problems are too severe.

2.4.2 CAA Independence and Due Process

If the CAA is given greater autonomy from the government, then a clear and effective legal avenue to challenge CAA enforcement needs to be established for businesses within the aviation industry as a balance to the CAA's more independent power. In some instances, zealous enforcement by the CAA caused harm to aviation businesses while awaiting appeal.

2.4.3 CAA Employee Recruitment and Retention

Separation from the ANSP can make it difficult for the CAA to recruit and retain personnel with adequate technical knowledge or skill because salaries at the ANSP tended to be higher than at the CAA.[5] After separation, ANSPs usually reduce the number of middle managers and increase employee compensation. Most of the CAA's that separated from their ANSP had difficulty recruiting and retaining skilled labor with ATC experience, making certification and inspection more challenging.

While most CAAs have this problem, there is no clear solution. This is simply a reflection of the general pattern of salaries being lower in the government than in the private sector, or in this case, the corporatized ANSPs. The best the CAAs can do is utilize regular CAA rate reviews, as described in the section on funding, to justify more competitive salaries for certain positions.

2.4.4 The CAA's Relationship with the Non-ANSP Portion of the Aviation Industry

The structural relationship between each CAA, as the regulator, and the non-ANSP elements of the aviation industry (e.g. airlines, airports, flight trainers, pilot certification, general aviation, equipment manufacturing, etc.) was not affected by the ANSP's separation. The CAA maintained the same legal authority to certify skill competencies, monitor performance, inspect operations, and enforce compliance within the industry.

However, the decision of most CAAs to move to a user-pays system increased the incentive and ability of industry to review the CAA's costs at the same time that governments were

[5] Ibid, Managing the Skies.

experiencing broad fiscal pressures. In response, the CAAs have developed more efficient inspection practices, including the risk-based model of safety regulation already discussed.[6] Thus, while the *structural* relationship between each CAA and the non-ANSP aviation industry did not change after the separation of the ANSP, each CAA's *approach* to regulating the non-ANSP portion of the industry changed, focusing more on regulatory efficiency, and this change is related to the separation.

2.5 Scalability and Complexity

During discussions with the CAAs, MITRE asked if there were any issues associated with the separation of the ANSP that would prevent scaling their CAA and regulatory system to the size and complexity of the U.S. NAS. They could not think of any, but were quick to point out that their airspace was quite different from the U.S. Even in large countries such as Australia, the conditions are quite different, with few overflights and the majority of the population living on the east coast of the continent.

Other CAA's regulate complex operations. For example, UK's National Air Traffic Service (NATS) controls operations at one of the busiest and most complex airports in the world, London's Heathrow. As noted earlier, the separation in the UK did not reduce safety. In addition, most ANSPs streamlined their organizations after separation. It is reasonable to assume that the same would happen in the United States, simplifying oversight requirements. There is some evidence to support this point. During the outsourcing of Flight Service Stations by the FAA to Lockheed-Martin, the number of facilities decreased from 58 to 18 saving the FAA $1.7 billion over the 10 year life of the agreement.[7] Likewise, UK NATS reduced the number of control centers from 4 to 2, upgraded its flight data processing and communications systems, and reduced staff by 10% between 2002 and 2007.[8]

2.6 ATC and National Security

One CAA pointed out the importance of defining roles and responsibilities when dealing with national security events. If the ANSP is a private corporation, unless otherwise specified, its authority is only to provide air navigation services. It is the government's responsibility to provide guidance to the ANSP in national security matters such as temporary flight restrictions or responses to terrorist incidents. For ANSPs that are still part of the government, the decision to restrict ATC flows to address national security can be made by those employees. In contrast, a corporatized ANSP may require a government order to alter air traffic for national security reasons, as occurred in the U.S. in 2001.

3 Conclusion

The CAAs we interviewed were unanimous in stating that the separation of the CAA from air traffic service provision was worth it. Among the benefits they expressed were an increased

---

6 The narrower focus of the CAA after separation may have increased the ability of government and industry to observe the regulatory efficiency of the CAA.

7 "The Conversion of Flight Service Statins From FAA to Contract Operations," CC-2007-102 Publication of the Inspector General, U.S. Department of Transportation, October 10, 2007

8 "Managing the Skies," Oster & Strong, 2007, pg. 59.

focus on safety by the Regulator and the ANSP, improved efficiency of the ANSP, reduction in total cost to users, and improved participation by aviation stakeholders.

Although we did not examine the process of separation in detail, the path to separation is well worn. Many of the steps and considerations are detailed in the CANSO Guide to ANSP Privatization.[9]

In summary, this review identified the following recommendations focused on the CAA for any government planning to separate its CAA and ANSP:

- Operate the CAA and the ANSP as functionally separate units for a few years prior to complete separation to allow time and experience to accomplish the tasks listed below.
- The CAA should have clear plans for handling unexpected revenue declines caused by reduction in flight activity. This could include procedures for obtaining government revenue or loans.
- There should be a regular review of CAA charges to assure that the government consciously determines the adequacy of the CAA's funding in light of evolving regulatory needs.
- The CAA should be prepared to justify its own rates, defend its efficiency, and explain the overall value of it regulatory role as part of the regular review of its rates.
- Ensure that the CAA's safety mission has clear priority over cost and efficiency pressures.
- Before separation, the CAA should develop strong internal data collection and quality-control procedures to evaluate its effectiveness as it modifies it regulatory approach in response to cost and efficiency pressures.
- During the transition, develop and review comprehensive written regulations that will form the foundation for the relationship between the CAA and the ANSP.
- During the transition, establish a clear understanding as to the broader division of roles and responsibilities between the CAA and the ANSP.
- During the transition, develop strategies for recruiting and retaining skilled employees in an environment where the ANSP is offering higher salaries. This may require exemptions from existing government pay scales.
- Establish effective legal avenues to challenge CAA enforcement actions as a reasonable counterweight to increased CAA independence.
- While ultimate government control is essential, avoid governance structures and processes that encourage political participation in the operation of the CAA.

[9] "Guide to Separation of Service Provision & Regulation," Civil Air Navigation Services Organization (CANSO), August 2011

Appendix A United Kingdom

The regulatory oversight of civil aviation in the United Kingdom has been licensed to a non-profit corporation, the Civil Aviation Authority (UK CAA). The British Department for Transport originally granted the UK CAA license to regulate and operate air navigation services in 1972, but in 1994 Parliament instructed the UK CAA to divest itself from operating the navigation services. Since that time, the UK CAA has continued to evolve its organizational structure. Post ANSP separation, the UK CAA transferred some of its authority to set aviation safety standards to the European Aviation Safety Agency. It also created two subsidiary companies (e.g., CAA International and Air Safety Support International Ltd) that offer technical consulting to foreign countries. At the end of FY2013, UK CAA employed 947 full time equivalent (FTE) staff.

A.1 Funding

The UK CAA performs both regulatory and non-regulatory functions, and revenue streams can be categorized as such (see Table A-1). Each of the regulatory groups are statutorily bound to recover their costs through charges to the aviation industry. A complex scheme to levy charges on nearly every person, business, or non-profit organization that participates in civilian aviation (see Table A-2. for a more detailed breakdown of this scheme) is used. The Total column of Table A-1. indicates that the three regulatory groups generated nearly £77 million in FY2013, £73 million of which was due to this charging scheme. Every year, the UK CAA forecasts its expected revenues and expenses and modifies the scheme to maintain a legally allowable rate of return on its invested capital, similar to a regulated utility. Currently, the UK CAA is allowed to earn a return of 6 percent on its cost of capital.[10]

The UK CAA also received nearly £49 million in revenue from its non-regulatory groups. The two subsidiaries generated approximately £20 million of that revenue, while the CAA Pension Scheme and EUROCONTROL charges made up most of the remaining funding. And although the UK CAA is required to be self-funded, they did receive a £2 million grant from the British Treasury in FY2013.

[10] Technically, the UK CAA may earn the maximum of 6% on its cost of capital employed or whatever amount would allow it to breakeven after servicing debts and paying corporate taxes.

Table A-1. Revenues from Regulatory and Non-Regulatory Groups in the UK's CAA, FY2013 (thousands of British pounds)

	Statutory and Scheme Charges	Eurocontrol Service Charge	UK Grant	Other	Total
Regulatory Groups					
Safety & Airspace Regulation	58,770	0	0	2,299	61,069
Regulatory Policy	7,800	0	0	1,286	9,086
Consumer Protection	6,097	0	0	718	6,815
Total	72,667	0	0	4,303	76,970
Non-Regulatory Groups					
CAA International	0	0	0	17,114	17,114
Air Safety Support Intl' Ltd.	0	0	0	2,770	2,770
UK Air Traffic Services	0	13,859	0	0	13,859
Miscellaneous	0	0	2,097	13,032	15,129
Total	0	13,859	2,097	32,916	48,872
Total Revenues	72,667	13,859	2,097	37,219	125,842

Source: Civilian Aviation Authority, Annual Report and Accounts 2013;
Air Safety Support International, ASSI Business Plan 2014/15 to 2016/17

The left side of Table A-2. shows the revenues that UK CAA expects to receive in FY2015 from its statutory and scheme charges. Each row refers to a complex series of formulas that apply to all manner of bases. For example, the charges levied on airplane and helicopter operators in the "Air Operator Certification" scheme depend on the type and size of aircraft operated, purpose of flight, number of flights, the number of passengers-kilometers available to be transported, and numerous other factors.[11] The rules governing this single element in Table A-2 are defined in a 21 page document. The rules governing the other elements in Table A-2 are similarly complex.

[11] Civilian Aviation Authority. *Proposed Changes to CAA Scheme of Charges: Air Operator and Police Air Operator Certification Scheme Enclosure.* November 2013. Online resource: <http://www.caa.co.uk/docs/2737/AOC%201415%20Enclosure%20-%20Final%20_V3_.pdf>

Table A-2. Forecasted Revenues from Regulatory in the UK's CAA, FY2015 (thousands of British pounds)

Statutory and Scheme Charges

Safety Regulation

Air Operator Certification	21,455
Airworthiness	11,346
Personnel Licensing	12,658
Aerodrome Licensing	8,294
En Route ATS Regulation	3,931
Aerial Applications	10
General Aviation	291
Aircraft Registration	550
Other Activities	700
Total	59,235

Regulatory Policy Activities

Air Transport Licensing	2,936
Economic Regulation of Airports	3,779
Airports Charges Review	1,193
Total	7,908

Consumer Protection Activities

Air Travel Organizers' Licensing	4,991
Air Travel Trust	268
Total	5,259

Other Charges

Other Activities

Surveys	1,516
Economic Regulation of NATS	1,297
Other	152
Total	2,965

Aviation Security Sectors (planned)

Airports and Airlines	5,273
Cargo	1,869
In-Flight Service Providers	244
Total	7,386

Source: Civilian Aviation Authority, Statutory Charges 2014/15 Consultation Document

A.2 Autonomy and Governance

Governance of the UK CAA is provided by a board of directors with close intervention by the Secretary of State for Transport (SoS). The board may have between 7 and 16 executive and non-executive members. The SoS appoints the board's Chair, Deputy Chair, and all other non-executive board members. The non-executive board members select a Chief Executive, after obtaining approval from the SoS. The Chief Executive, with permission from the Chair and one other board member, selects all other executive positions. When appointing the Director of Airspace Policy, the Chief Executive must also consult with the SoS.

The UK CAA's Board also decides issues of executive compensation, performs audits periodically, manages the organization's pension scheme, grants licenses to Air Traffic Service companies, and occasionally acts as a tribunal for certain types of appeals from the aviation industry.[12]

[12] The Civil Aviation Authority. *The CAA Board – Rules and Procedures*. Online resource. <http://www.caa.co.uk/docs/2348/BoardRolesAndProcedures.pdf>

A.3 Structure

There are five main components of UK CAA (see Figure A-1):

- The **Safety and Airspace Regulation Group** is a relatively new group that combined the former Safety Regulation Group and the Directorate of Airspace Policy. Its two main objectives are to "enhance aviation safety performance by pursuing targeted and continuous improvements in systems, culture, processes, and capability" and to "ensure that the [UK] CAA is an efficient and effective organization which meets Better Regulation principles and gives value for money."[13] Its safety policies and procedures are based on the degree of risk that can be quantified empirically. The *Airspace, Air Traffic Management, and Aerodromes* is a new subgroup that sets safety standards and monitors compliance for each of these three areas.
- The **Regulatory Policy Group** has the primary responsibility to act as the economic regulator of airports and ANSPs. Other duties include making recommendations on trade liberalization policy and conducting statistical and econometric analysis to provide insight on important issues, such as demand forecasts and market competition. The *Consumer Support* subgroup ensures that airlines maintain a certain level of consumer quality, such as offering services for disabled persons and monitoring compliance with flight cancellation policy.
- The **Consumer Protection Group**'s main task is to ensure that airlines and travel organizers offering commercial flights are licensed and financially stable. The group manages the Air Travel Organizers Licensing program, which insures travelers in the event that the airline or travel company goes out of business prior to providing air service.
- Two wholly-owned **subsidiary** companies, *CAA International* and *Air Safety Support International Ltd*. Each subsidiary provides consulting services to countries needing technical expertise in aviation systems, with a particular emphasis on safety. *Air Safety Support International Ltd* is a small, non-profit organization that only offers consulting services to British territories. *CAA International* is a for-profit organization that offers consulting to other interested countries.
- **Miscellaneous services**.[14] The *Corporate Services* subgroup, for example, provides the business support systems, such as information technology and human resources. The *UK AirProx Board*, a subsidiary that is jointly funded with the Ministry of Defense, acts as a repository of de-identified information for situations in which planes' proximities to one another compromised safety. The *CAA Pension Scheme* coordinates the retirement benefits for CAA employees. Finally, the *UK Air Traffic Services* is an accounting program that uses en-route charges to fund legacy costs, such as capital depreciation and the pensions of former employees that left during the ANSP separation.

[13] Civil Aviation Authority. (no date). *Our Role*. Retrieved August 2, 2014, from http://www.caa.co.uk/default.aspx?catid=2345

[14] The Department for Transport plans to transfer authority of operating airport security to the UK CAA in 2015.

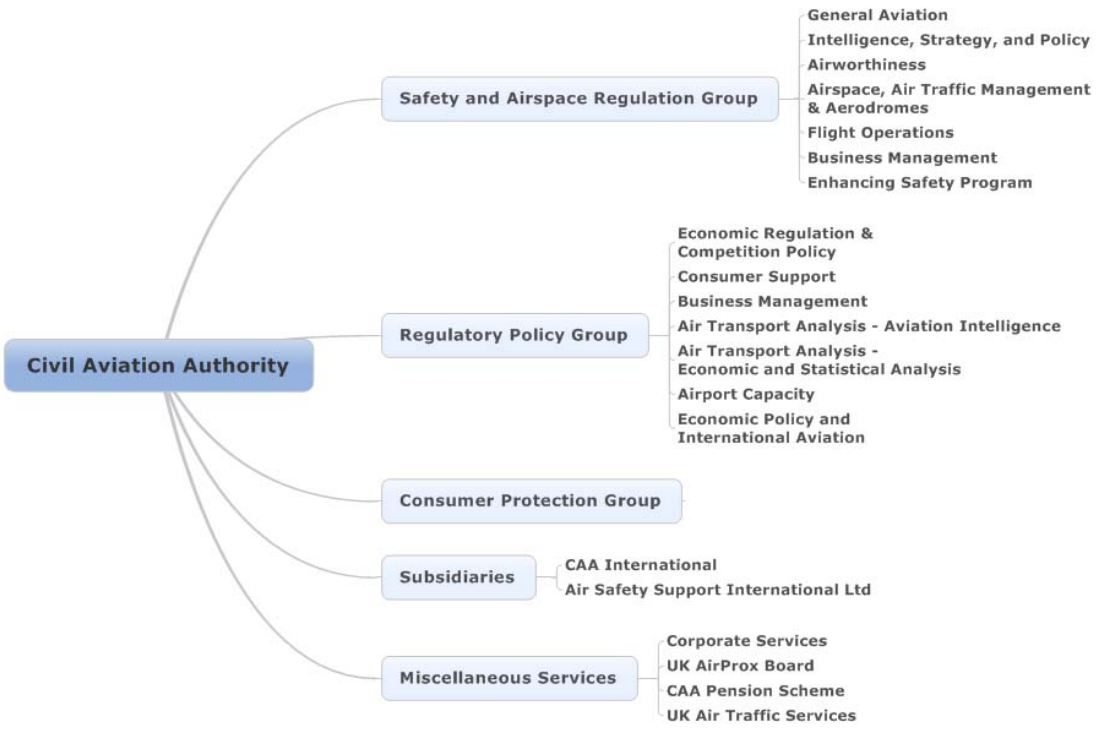

Figure A-1. Current Organization of UK's CAA

A.4 Experience

Prior to the ANSP's separation, the UK CAA was responsible for regulating and operating all air navigation services in the UK. NATS made up the operations component of air navigation services and was the largest component of the UK CAA. And although the corporation was completely self-funded under changes to its charter in 1982, it still needed large sums of public financing for building and upgrading its navigation centers. In 1989 and 1990, multiple reports concluded that NATS should separate from the UK CAA, but the plan encountered resistance from organized labor unions and soon lost momentum.[15, 16]

In 1994, the Conservative Party's Secretary of State for Transport picked the issue back up and stated that his administration was going forward with privatization. It faced the same resistance from labor unions, including questions about why privatization was chosen over other types of separation. The UK CAA reorganized in 1996 and transferred NATS' civil elements into a fully functioning subsidiary company, NATS Ltd in preparation for privatization. However, the Conservative Party's loss in the 1997 General Election shelved the privatization plans. In 1999, Parliament announced a public-private partnership instead, which finally occurred in 2001.

---

15 Carling, Philippa. (1999.) *The Transport Bill: Part I – National Air Traffic Services*. House of Commons Research Paper 99/102. Online resource. <http://www.parliament.uk/briefing-papers/RP99-102.pdf>.

16 Butcher, Louise. (2012.) *Aviation: National Air Traffic Services (NATS)*. House of Commons Standard Notes: SN1309. Online resource. <http://www.parliament.uk/briefing-papers/SN01309.pdf>

Between 1996 and 2001, the UK CAA and NATS were functionally separate but governed by the same authority. During this time, UK CAA determined how NATS was to be regulated. The Safety Regulation Group was tasked with regulating and auditing the performance and safety of NATS operations. The Economic Group made sure that NATS set charges in accordance with its allowable rate of return. The newly formed, "Directorate of Airspace Policy," was tasked with setting up and regulating airspace policy, which it did in conjunction with the Ministry of Defense.

The separation of NATS created only relatively minor changes within UK CAA. For example, the UK CAA set up an expense account to pay for fixed legacy costs (primarily expense accounts for depreciation and pension outlays) that were not moved with NATS during the transfer.[17] Second, the UK CAA noted that it had to hire slightly more staff to address new environmental and meteorological directives.

Of course, other events continued to reshape the UK CAA. The September 11th terrorist attacks greatly expanded security regulations and caused an immediate review of the charges levied on the aviation industry. Other changes addressed the evolving regulatory structure caused by the new European Aviation Safety Authority.

In 2006, an audit noted that different groups within the UK CAA were independently setting standards that some felt made for burdensome and conflicting regulatory policy.[18, 19] Another criticism was that CAA did not have to consider the value of its own regulations and research, since costs could simply be transferred onto captive consumers. Moreover, since cost information was not available, stakeholders could not make informed decisions about the reasonableness of the UK CAA's charging scheme. To address these criticisms, the Safety and Airspace Regulation Group was created by merging separate groups, and the Regulatory Policy Group was given greater authority to streamline policies. To improve efficiency, the UK CAA began moving to a risk-based regulatory approach. It has also increased the level of financial detail in annual reports and online documentation.

---

17 Like other costs resulting from providing air navigation services, these fixed charges are paid by funds from the EUROCONTROL charge.

18 House of Commons Transport Committee. *Thirteenth Report of Session 2005-06: The Work of the Civil Aviation Authority*. October 25, 2006. Online resource. <http://www.publications.parliament.uk/pa/cm200506/cmselect/cmtran/809/809.pdf>.

19 House of Commons Transport Committee. *Thirteenth Report of Session 2005-06: The Work of the Civil Aviation Authority*. October 25, 2006. Online resource. <http://www.publications.parliament.uk/pa/cm200506/cmselect/cmtran/809/809.pdf>. For example, the Economic Regulation Group had an incentive system that penalized NATS for system delays and gave bonuses for meeting system schedules. People argued that this created an incentive to take risks and violate safety regulations.

Appendix B Canada

When Canada's ANSP separated from its CAA, the ministerial department overseeing transportation, Transport Canada, was in the midst of a major reorganization.[20] Transport Canada was originally divided into groups based on the mode of transportation,[21] but it was redesigned to focus on service lines first and transportation mode second. Those initial service lines were Policy, Safety and Security, Programs and Divestiture, and Departmental Administration. Although these service lines largely remained intact,[22] the substructures underlying those groups continued to change. Canada's CAA, Transport Canada Civil Aviation (TCCA) is embedded within the layers of Transport Canada, but remained largely intact during this reorganization process. As of April 2013, the TCCA employed 1,285 FTEs.[23]

B.1 Funding

Note that Transport Canada's CAA is just one of many components within the overall department and does not have authority to directly use any of the revenues generated under its programs. The TCCA's funding is instead determined by Transport Canada's annual budget, so it competes for funding with other components in Transport Canada.

Table B-1 reports the total revenues and expenses of the Transport Canada's aviation programs. There are three important takeaways from this table. First, the programs generate more revenue ($345 million CAD) than direct expenses ($277 million CAD), so aviation regulation appears to be fully funded by the industry. Second, the financial burden of regulating Canada's aviation falls almost entirely on land lease charges to Canadian airports (84% of revenues). The third takeaway is that those lease payments are "non-respendable," which means that they have been appropriated into Canada's Consolidated Revenue Fund and Transport Canada may not use them directly. Appropriating these funds means that Transport Canada's aviation programs had a net cost to Transport Canada of $214 million (CAD) in FY 2013 despite generating $282 million (CAD) in government revenue from the airport lease payments.[24]

---

20 Transport Canada. Departmental Performance Report 1997

21 Prior to Transport Canada's re-organization, it was originally divided into the following groups: Policy and Coordination, Marine, Aviation, Airports, Surface, and Departmental Administration.

22 The Programs and Divestiture Group contained temporary programs that were responsible for operating remote airports and overseeing any financial transactions related to airport commercialization. Today, the divestitures have ended and the group is just called the Programs Group. In addition, Transport Canada's group that performs its business support functions was renamed the Corporate Services Group.

23 Raitt, L. (2013). *House of Commons Committees - PACP (41-1).* Retrieved August 2, 2014, from http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=6250656&Mode=1&Parl=41&Ses=1&Language=E

24 The net cost of $214 million (CAD) was calculated as the respendable revenues Transport Canada received from its aviation programs ($18m+$31m+$1m+$6m+$7m) minus its actual expenses ($277m).

Table B-1. Revenues and Expenses Generated by Transport Canada's Aviation Programs and Subprograms, FY2013 (millions of Canadian dollars)

Respendable Revenues	Air Marketplace Framework (1.1.1)	Airport Infrastructure (1.3.1)	Aviation Safety (3.1)	Aviation Security (4.1)	Total
Inspection and User Charges	0	8	9	0	18
Aircraft Services	0	0	31	0	31
Training and Sales	0	0	1	0	1
Concessions and Rentals	0	5	0	0	6
Miscellaneous	0	0	0	0	0
Airport Lease	0	7	0	0	7
Non-Respendable Revenues					
Airport Lease	0	282	0	0	282
Total Revenues	0	304	42	0	345

Expenses	Air Marketplace Framework (1.1.1)	Airport Infrastructure (1.3.1)	Aviation Safety (3.1)	Aviation Security (4.1)	Total
Planned	4	40	231	46	321
Actual	4	40	199	34	277

B.2 Autonomy and Governance

Canada's aviation regulator is governed by multiple bureaucratic layers. Canada's CAA, the Civilian Aviation Directorate (TCCA) is embedded within the department that oversees transportation, Transport Canada. The TCCA is headed by a Director General, who reports to the Assistant Deputy Minister of Safety and Security. The Assistant Deputy Minister reports to the Deputy Minister of Transport Canada, who reports to the Minister of Transport Canada in turn. Ultimately the Minister of Transport is responsible to Canada's Parliament.[25]

Despite the ministerial oversight of TCCA, most policy and operational decisions are made by the National Civil Aviation Management Executive Committee (NCAMX). Each director in the TCCA sits on this committee, which is chaired by the Director General, Civil Aviation. There are also sub-committees that focus on specific issues like operations, integrated management, and the Civil Aviation Regulations.

B.3 Structure

Figure B-1 highlights the parts of Transport Canada that most directly affects air transportation. The TCCA is embedded within Transport Canada's Safety and Security branch. It has eight subgroups, which have the following functions:

- The **Policy and Regulatory Services** subgroup analyses accident data and develops TCCA's safety policy, including the Canadian Aviation Regulations.
- The **Standards** group sets regulations and standards, provides instruction and guidance for safety inspection, and has oversight of recreational aviation.
- The **Management Services** group provides TCCA's internal quality control and its corporate service functions.
- The **Civil Aviation Secretariat** group handles high profile, strategic issues and public communications.
- The **National Operations** group conducts safety surveillance and applies enforcement mechanisms on ANSPs and certain airlines. The group also conducts TCCA's emergency management responsibilities.
- The **National Aircraft Certification** group ensures that aeronautical manufacturing processes and products adhere to certain safety standards.
- The **International Operations** group ensures that foreign airlines operating in Canadian airspace maintain certain safety standards. The group also assists in other international issues, such as providing technical data to International Civil Aviation Organization (ICAO).
- The **Aviation Medicine** group sets the medical standards and has oversight over aviation employees.

[25] The Office of the Auditor General of Canada. *Report of the Auditor General of Canada to the House of Commons. Chapter 5: Oversight of Civil Aviation – Transport Canada*. Spring 2012. Online resource. <http://www.oag-bvg.gc.ca/internet/docs/parl_oag_201204_05_e.pdf>

The TCCA also has five **regions** (Atlantic, Ontario, Quebec, Prairie and Northern, and Pacific) which provide oversight for most aviation companies not explicitly monitored by TCCA headquarters.

There are also components outside the TCCA but still within Transport Canada that affect civil aviation. These are:

- The **Policy Group** conducts economic and environmental research and crafts legislation to support strategic changes to Transport Canada's remit, such as the privatization of airports and their ANSP. They also act as the liaison to the International Civil Aviation Organization and work on other international policy issues, such as trade liberalization. This group is also responsible for implementing strategic directives that cut across interdepartmental groups and external organizations.
- The **Programs Group** is responsible for coordinating and operating aviation programs not managed elsewhere. For example, the Airport Capital Assistance Program is managed by this group, as is the Air Cargo Security Program and the Safety Management System Program.
- The **Safety and Security Group** houses the TCCA as well as two other operational groups. The **Aviation Security Directorate** is responsible for planning, conducting, and regulating all airport and aviation security operations. The **Aircraft Services** group inspects and operates the aircraft owned by Transport Canada (e.g., search and rescue, training, firefighting, etc.) and provides training for pilots and engineers.

Besides the structure depicted in Figure B-1, Transport Canada also organizes itself based on the programs it administers. Each program aligns with one of Transport Canada's strategic outcomes: to provide an efficient, clean, safe, and secure transportation system. The hierarchy of these work programs is listed in Figure B-2.

Figure B-1. Employee Divisions within Transport Canada that Regulate Air Transportation, including the Civil Aviation Directorate

Transport Canada Program Alignment Architecture 2012-13				
Strategic Outcome 1. An Efficient Transportation				
Program	**Sub Program**			
1.1 Transportation Marketplace Frameworks	1.1.1 Air Marketplace Framework	1.1.2 Marine Marketplace Framework	1.1.3 Surface Marketplace	
1. 2 Gateways and Corridors	1.2.1 Asia-Pacific Gateway and Corridor Initiative	1.2.2 Gateways and Border Crossings Fund		
1.3 Transportation Infrastructure	1.3.1 Airport Infrastructure	1.3.2 Marine Infrastructure	1.3.3 Surface Infrastructure	
	Sub Sub Programs	**Sub Sub Programs**	**Sub Sub Programs**	
	3.1.1 Airport Authority Stewardship	1.3.2.1 Canada Port Authority Stewardship	1.3.3.1 Rail Passenger Stewardship and Support	
	1.3.1.2 Airport Operations	1.3.2.2 Seaway Stewardship and Support	1.3.3.2 Federal Bridge Stewardship	
	1.3.1.3 Small Aerodrome Support	1.3.2.3 Ferry Services Stewardship and Support	1.3.3.3 Highway and Boarder Infrastructure Support	
		1.3.2.4 Port Operations	1.3.3.4 Transit Support System	
1.4 Transportation Innovation.				
Strategic Outcome 2. A Clean Transportation System				
Program	**Sub Program**			
2.1 Clean Air from Transportation	2.1.1 Clean Air Regulatory Framework and Oversight		2.12 Clean Air Programs	
2.2 Clean Water from Transportation	2.2.1 Clean Water Regulatory Framework		2.2.2 Clean Water Regulatory Oversight	
2.3 Environmental Stewardship of Transportation				
Strategic Outcome 3. A Safe Transportation System				
Program	**Sub Program**			
3.1 Aviation Safety	3.1.1 Aviation Safety Regulatory Framework	3.1.2 Aviation Safety Oversight	3.1.3 Airports Capital Assistance	3.1.4 Aircraft Services
		Sub Sub Programs		
		3.1.2.1 Service to the Aviation Industry 3.1.2.2 Surveillance of the aviation system		
3.2 Marine Safety	3.2.1 Marine Safety Regulatory Framework	3.2.2 Marine Safety Oversight	3.2.3 Navigable Waters Protection	3.2.4 Divestiture of Marine Training
3.3 Rail Safety	3.3.1 Rail Safety Regulatory Framework	3.3.2 Rail Safety Oversight	3.3.3 Rail Safety Outreach	
3.4 Road Safety	3.4.1 Motor Vehicle Safety Regulatory Framework	3.4.2 Motor Vehicle Safety Oversight	3.4.3 Motor Carrier Safety	3.4.4 Road Safety Outreach
3.5 Transportation of Dangerous Goods	3.5.1 Transportation of Dangerous Goods Regulatory Framework	3.5.2 Transportation of Dangerous Goods Oversight	3.5.3 Emergency Response for the Transportation of Dangerous Goods	
Strategic Outcome 4. A Secure Transportation System				
Program	**Sub Program**			
4.1 Aviation Security	4.1.1 Aviation Safety Regulatory Framework	4.1.2 Aviation Safety Oversight	4.1.3 Airports Policing Assistance Program	4.1.4 Air Cargo Security Major Crown Project
4.2 Marine Safety	4.2.1 Marine Security Coordination and Collaboration	4.2.2 Marine Security Oversight and Enforcement	4.2.3 Marine Security Regulatory and Policy Framework	
4.3 Surface and Intermodal Security				
The following Program supports all strategic outcomes with this organization				
5.1 Internal Services				
5.1.1 Governance and Management Support	5.1.2 Resource Management Services	5.1.3 Asset Management Services		

Source: Transport Canada's Departmental Performance Review, 2012-13 – Figure 1

Figure B-2. Transport Canada Organizational Structure by Program

B.4 Experience

The National Transportation Act of 1987 directed Transport Canada to divest most of its major transport operations and to conduct oversight at a more regional level. In 1994, the details of this divestiture plan were released. Transport Canada would sell their ANSP and the Canadian National Railroad. Federal airports, public ports, ferry services, marine pilotage and the Great Lakes-St. Lawrence Seaway system would also be commercialized. Over $700 million (Canadian dollars) of annual subsidies were eliminated, and an Open Skies agreement was signed with the U.S.

Between 1994 and 1996, Transport Canada prepared to sell its ANSP. The steps included separating the ANSP from the Aviation group, deciding which employees and physical assets would transferred, negotiating a selling price, and ensuring that government pensions and other employee benefits would transfer. Other major tasks included; updating the Canadian Aviation Regulations (CARS) and developing procedures for audits, unit evaluations and ad hoc inspections.[26] In 1996, NAV CANADA was sold for $1.5 billion (Canadian dollars).

A problem facing Transport Canada was the ability to retain skilled labor since public sector wages are significantly lower than private sector wages.[27, 28] To deal with staff shortages and other resource constraints, the TCCA implemented a more risk-based regulatory approach that used fewer resources. The approach checks whether the internal safety management processes of low-risk organizations, such as NAV CANADA, are functioning well. If safety issues arise, the Regulator may always switch to a more traditional, and more expensive, compliance based process.

It is not clear that the risk-based inspection process has alleviated Transport Canada's resource constraints. In 2012, the Auditor General of Canada found that it was difficult for TCCA to manage the quality of its safety audits and inspections, failed to conduct nearly a third of audits of high-risk companies, and did not understand its future workforce needs.[29, 30] Part of the difficulty stems from having to regulate an increasing number of private companies offering navigation services not performed exclusively by NAV CANADA.

---

26 Auditor General of Canada. "1997 October Report. Chapter 19 – Transport Canada: The Commercialization of the Air Navigation System." 1997. Online resource. <http://www.oag-bvg.gc.ca/internet/English/parl_oag_199710_19_e_8100.html>

27 Pollutants were found at many of the navigation facilities, so Transport Canada remediated many of the sites after the sale.

28 Universal Safety Oversight Audit Programme, International Civil Aviation Organization. *Summary Report on the Safety Oversight Audit Follow-up of Transport Canada*. June 2003. Online resource. <http://cfapp.icao.int/fsix/AuditReps/followup/canada_2003_en.pdf>

29 The audit did not evaluate how well Transport Canada regulated at NAV CANADA.

30 Audit and Advisory Services, Transport Canada. "Review of People Management Practices in Support of Regional Safety and Security Inspectorates." 2012. Online resource. <http://www.tc.gc.ca/media/documents/corporate-services/REVIEW_OF_PEOPLE_MANAGEMENT_PRACTICES_EV27.pdf>

Appendix C New Zealand

The Civil Aviation Authority of New Zealand (CAA NZ) was created in 1992, nearly five years after Airways Corporation (New Zealand's ANSP) separated from its former aviation regulator (the Civilian Aviation Division). Similar to a few other CAAs, CAA NZ has the dual responsibility of providing safety oversight of the aviation industry and of conducting security operations. These two core functions operate almost completely independently from one another within the organization. At the end of FY2013, 214 FTEs performed regulatory duties and 718 FTEs concentrated on security.

C.1 Funding

Similar to other standalone CAAs, most of the funding to ensure safety comes from the aviation industry. In the case of CAA NZ (see Table C-1), this funding comes from charges directly levied on passengers.[31] In FY 2013, the passenger charges provided 70% of funding for CAA NZ's regulatory role, while revenue collected from the aviation industry (e.g., certification and audit charges, professional licensing, etc.) provided 18% of funding. Tax revenues (via Crown funding and Ministry contracts) only provided 10% of CAA NZ's regulatory funds, and these were appropriated to specific projects and tasks. In addition, the organization normally holds nearly $4 million (New Zealand dollars) in reserves to handle financial losses.

The funding structure for CAA NZ's regulatory branch did not change between 1997 and 2012, so the only source of additional revenue came from aviation industry. However, passenger and regulatory charges were fixed in nominal terms, making it increasingly difficult to accommodate growth. In 2010, CAA NZ forecasted that costs would rise much faster than revenues and quickly deplete their financial reserves. In November 2012, the Cabinet allowed CAA NZ to modify its funding structure and agreed to review that structure every three years.

[31] On average, passengers on international flights paid 133% more per flight in charges than did passengers on domestic flights. This was mainly due to higher costs of providing security on international flights.

Table C-1. Revenues and Expenses of the CAA of New Zealand, FY2013 (millions of New Zealand dollars)

Revenues	Regulatory	Security	Total
Passenger Charges	23,862	53,966	77,828
Other Charges on the Aviation Industry	6,056	2,534	8,590
Crown Funding Revenues*	2,219	145	2,364
Ministry Contract Revenues*	1,200	155	1,355
Other Income	510	1,279	1,789
Total	33,847	58,079	91,926

Expenses	Regulatory	Security	Total
Personnel Costs	24,657	58,864	83,521
Depreciation and Amortization	1,224	4,867	6,091
Finance	255	224	479
Other Costs	7,255	13,659	20,914
Total	33,391	77,614	111,005

* Funding provided for specific projects and services

Source: Annual Report of the Civil Aviation Authority of New Zealand, 2012/2013

C.2 Autonomy and Governance

Like three of the other CAAs, the CAA NZ is an autonomous organization that is governed by a Board. Each of the five non-executive members on CAA NZ's Board is appointed by the Minister of Transport, who in turn must respond to Parliament. The Board is expected to liaison with the Minister and with major stakeholders in the aviation industry. These non-executive Board members appoint the Director of Civil Aviation and the General Manager of the Aviation Security Service and ensure proper delegation of responsibilities between these two executive level positions.

The Board also makes decisions regarding long term policy directions, changes to the organization's structure, and any major financial decisions. They also monitor the extent to which NZ CAA's goals and directives are being met, audits the corporation's internal controls, and conduct annual performance and compensation reviews for the Director and General Manager. The Board also audits NZ CAA's financial management.

C.3 Structure

CAA NZ is split between two functionally independent groups, one regulating safety and one providing security operations (see Figure C-1). Four primary groups comprise the safety regulation for CAA NZ:

- The **Air Transport and Airworthiness** group ensures proper inspection and compliance monitoring of most commercial operations.
  - The *Flight Operations* subgroup monitors compliance with safety regulations for New Zealand airlines and foreign airlines operating in New Zealand.
  - The *Air Transport Maintenance* subgroup certifies and audits companies providing maintenance services to airlines.

- The *Aircraft Certification* subgroup certifies the safety of aircraft design, aviation parts, and the process of manufacturing aviation equipment.

- The **General Aviation** group is responsible for ensuring the safety of other types of flight besides traditional air transportation. It was recently separated from the Air Transport and Airworthiness group.
  - The *Special Flight Operations and Recreational Aviation* subgroup certifies and monitors all aspects of safety for recreational aviation and unmanned aerial systems.
  - The *Helicopter and Agricultural* subgroup has safety oversight of helicopters and agricultural aircraft.
- The **Aviation Infrastructure and Personnel** group monitors compliance for other types of safety and regulatory issues.
  - The *Personnel and Flight Training* group conducts professional licensing and medical evaluations of aviation professionals. They also oversee the safety standards and compliance in the flight training industry.
  - The *Aeronautical Services* group conducts aerodrome surveillance, regulates air traffic service and other communication providers, and designates airspace pursuant to CAA NZ's policy.
  - The *Security Regulatory Unit* certifies and regulates all entities with aviation security obligations, including the Aviation Security Service.
  - The *Health and Safety* group monitors compliance for employee health and safety standards (e.g., workplace accidents, handling hazardous materials, etc.).
- The **Policy and System Interventions** group contains the remainder of CAA NZ's core regulatory functions.
  - The *Intelligence, Safety and Risk Analysis* subgroup is responsible for collecting and analyzing data and for implementing CAA NZ's risk-based regulatory system.
  - The *Policy and Regulatory Strategy* group sets Civil Aviation Rules, works with ICAO and other international aviation organizations, and provides policy advice to New Zealand's government.
  - The *Regulatory Investigations* group carries out special types of safety compliance investigations when asked by the Operations and Airworthiness group.
  - The *Safety Investigation* group is CAA NZ's accident investigation unit. They work closely with the Ministry of Transport and the Transport Accident Investigation Commission.
  - The *Safety Promotion* group communicates safety standards to the aviation industry through various channels, including magazines, pamphlets and the CAA NZ's website.

The remaining three groups within CAA NZ's safety regulatory component mainly have managerial and business support responsibilities.

- The **Legal Services** group offers interdepartmental legal support and provides employee training on legal matters.

- The **Organizational Development and Strategy** group is where the human resources, marketing, and administrative functions reside.
- The **Corporate Services** group houses CAA NZ's information technology and finance departments.

The final group in CAA NZ is the **Aviation Security Service**, and it is independent of the CAA NZ's safety regulatory task. The group conducts airport security operations (passenger and baggage screening, access controls, employee screening, etc.) and is managed along regional divisions.

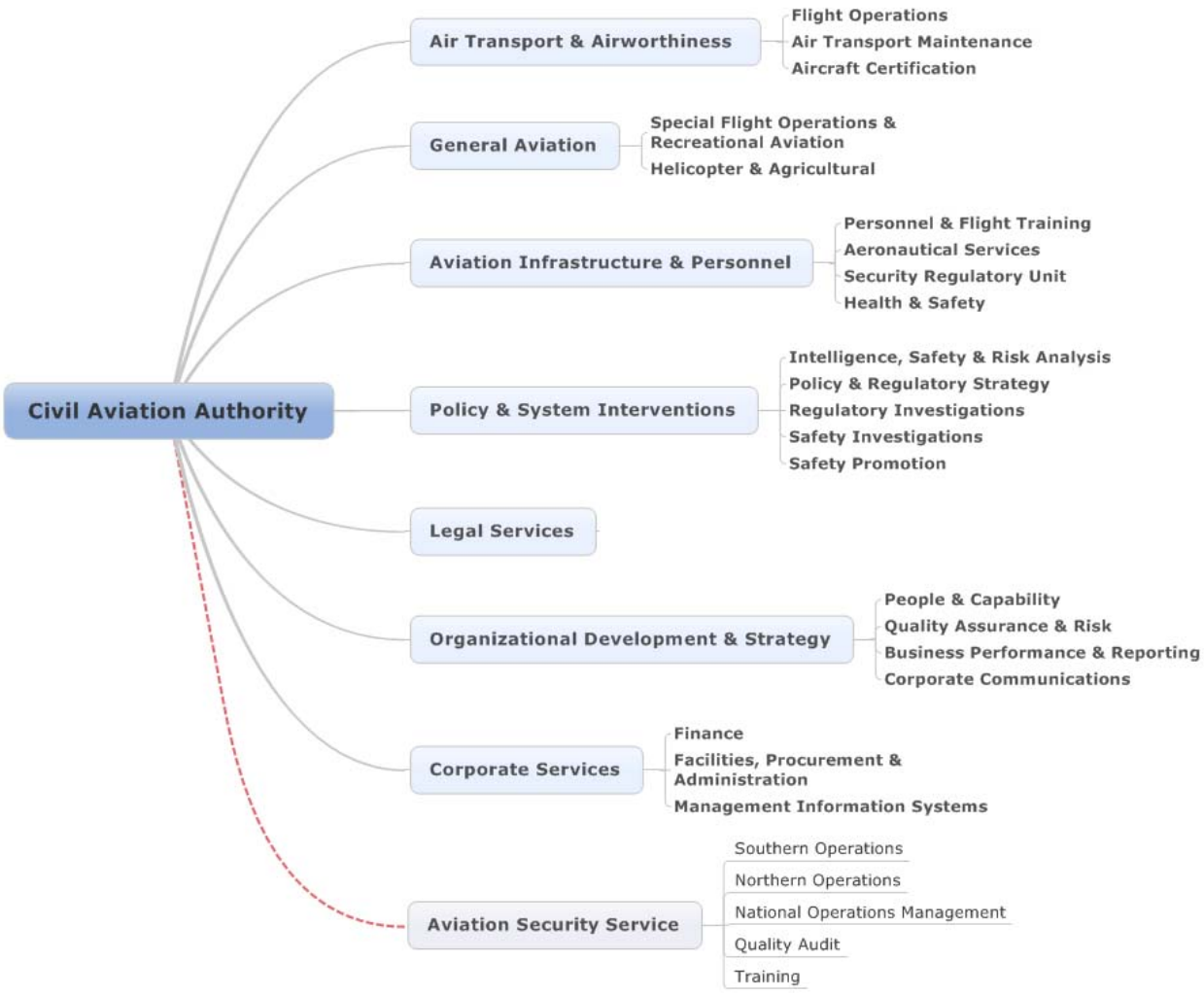

Figure C-1. Current Organization of the CAA of New Zealand

C.4 Experience

In the 1970's, the government owned and operated a large portion of New Zealand's economy. Besides the ANSP, the country's telecommunications, postal services, energy supply and distribution, and the rail network were publicly owned. But a fiscal crisis in 1984 spurred major economic reforms, including floating the currency, introducing a consumption tax over most goods and services, eliminating agricultural subsidies, reducing pension benefits, and commercializing government owned enterprises.[32] The State Owned Enterprises Act of 1986 detailed how these enterprises, which included the ANSP, were to operate after commercialization.

In 1987, the ANSP was separated from the Ministry of Transport. The CAA that remained, the Civil Aviation Division, was renamed the Air Transport Division (ATD) one year later.[33] As detailed in an influential report (Swedavia-McGregor report), the resulting CAA faced a number of problems.[34] Employees complained that there was no clear division of responsibilities between the ANSP and the ATD. Communications were also poor between headquarters and the regional branches, while distinct groups within headquarters had oversight over very similar issues. The report concluded that civil aviation regulation was overly complex, inefficient, confusing and burdensome.

The 1990 Civil Aviation Act enacted into law most of the internal organizational changes recommended by the Swedavia-McGregor report, but the ATD remained within the Ministry of Transport. The Act was amended in 1992 to reverse that decision and create the new, independent CAA NZ. In 1993, the Aviation Security Service moved out of the Ministry of Transport and under the governance of CAA NZ's Board.[35] Three years later, the CAA NZ was given the additional responsibility of providing search and rescue operations.

CAA NZ experienced budget deficits every year for the first five years, despite an increase in passenger charges in 1993 and an increase in regulatory charges in 1995.[36] In 1997, Parliament loaned CAA NZ $1 million (New Zealand dollars), raised the passenger charge once again, and set up a contingency fund of $0.5 million.[37]

Under the 1997 funding arrangement, the CAA NZ's revenues were highly dependent on the health of the aviation industry, even though its safety responsibilities were not. Over the next 15 years, the CAA NZ continually reviewed its budget for the risks that a potential downturn might create. In 2010, budgetary pressures prompted CAA NZ to conduct a formal external review of its revenue scheme. In 2012, the Minister of Transport approved a rate increase and instituted a

---

32 State Services Commission. *New Zealand's State Sector Reform: A Decade of Change*. March 1998. Online resource. <http://www.ssc.govt.nz/decade-of-change>

33 Civil Aviation Authority of New Zealand. "History of Civil Aviation Regulation in New Zealand (website)." Online resource. Last accessed July 29, 2014. <https://www.caa.govt.nz/history/history.htm>

34 Swedavia AB Sweden, and McGregor and Company. Swedavia-McGregor Report: Review of Civil Aviation Safety Regulations and the Resources, Structure and Functions of the New Zealand Ministry of Transport Civil Aviation Division. April 1988. Online resource. <http://www.caa.govt.nz/pubdocs/Swedavia-McGregor_Report.htm>

35 Civil Aviation Authority of New Zealand. "Report of the Civil Aviation Authority of New Zealand and Aviation Security Service for the year ended 30 June 1996."

36 Arthur Andersen Consulting. "Civil Aviation Funding: 1997 Consultation Paper." Report Commissioned by the Civil Aviation Authority of New Zealand. February 1997.

37 Civil Aviation Authority of New Zealand. "Report of the Civil Aviation Authority of New Zealand and Aviation Security Service for the year ended 30 June 1997."

process whereby its funding mechanisms are reviewed every three years. The CAA NZ Chairman recently stated that this funding arrangement is adequate.[38]

Besides having to confront funding issues, the CAA NZ also faces regular criticism from the Office of the Auditor General (OAG). Between 1997 and 2010, the OAG released four reports that found fault with CAA NZ's certification and surveillance methods.[39] Much of the concern of the OAG relates to the use of risk based surveillance tools and their application to certain sectors of aviation and the safety of public transport. Despite this, the safety of public transport remained consistently high for large airlines and improved for medium sized airlines. Agricultural, private helicopter, and private airplane operations had the highest rates of safety failure.

[38] Civil Aviation Authority of New Zealand. "Annual Report – 2012/2013." Online resource. <https://www.caa.govt.nz/about_caa/Annual_Reports/CAA_Annual_Report_2013.pdf>

[39] Office of the Auditor General of New Zealand. "Civil Aviation Authority: Safety Audits – Follow Up Audit." December 2000. Online resource. <http://www.oag.govt.nz/2000/civil-aviation/docs/caa.pdf>

Appendix D Australia

In Australia, the Civil Aviation Safety Authority (CASA) is the safety regulator responsible for civil air operations in Australian territory and for Australian aircraft operating outside its territory. It was created during the separation of the ANSP from its CAA. CASA also regulates certain aspects of the country's airspace.[40] CASA employed 850 FTEs in FY 2013.[41]

D.1 Funding

There are three primary funding sources for CASA (see Table D-1). The largest source (66%) is a charge levied on each liter of jet fuel (Aviation Fuel Charge Revenue).[42] The second largest source is an appropriation from Australia's Consolidated Revenue Fund (Transfer from Department of Infrastructure and Transport). In FY2013, this amounted to $43 million (Australian dollars), or 23% of CASA's total revenue. The third major source of funding comes from licensing, permitting, consulting, and other regulatory charges (Civil Aviation (Fees) Regulations 1995). Unlike the UK CAA's system, CASA generates only 8% of their revenues from such consumer charges. Another difference from other CAAs is that CASA returns any excess revenues to the Consolidated Revenue Fund.

D.2 Autonomy and Governance

CASA has a governing Board of up to 6 members, plus the Director of Aviation Safety. The Minister of the Department of Infrastructure and Regional Development appoints all non-executive board members, who in turn select the Director of Aviation Safety with ministerial approval. The Board decides the "objectives, strategies and policies to be followed by CASA."[43]

Substantial changes to CASA's governing structure have been made since its inception. It was originally founded with a five-member governing board, but the Australian Parliament voted to eliminate the Board altogether in 2003.[44] Between 2003 and 2009, CASA's chief executive reported directly to the Minister overseeing transportation and had no other governing authority. This decision was reversed in 2009 when CASA's Board was reinstated.

---

40 Department of Transport and Infrastructure. *Australia's State Safety Program.* April 2012. Online resource: <https://www.infrastructure.gov.au/aviation/safety/ssp/files/Australias_State_Safety%20Program_2012_FA7.pdf>

41 Civil Aviation Safety Authority of Australia. "Annual Report 2012-2013." Online resource. <http://www.casa.gov.au/wcmswr/_assets/main/lib100228/ar1213.pdf>.

42 The aviation industry was charged an additional $0.08616/liter for aviation gasoline and $0.09536/liter for aviation kerosene in 2012.

43 Parliament of Australia. *Civil Aviation Act 1998 (as amended), section 53*. ComLaw Database. Online resource. <http://www.comlaw.gov.au/Details/C2014C00195/Download>

44 Parliament of Australia. *Aviation safety regulation timeline 1982-2011*. Online resource. <http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BN/1011/Aviation#_Toc284925925>

Table D-1. Revenues and Expenses Generated by Australia's CAA, FY2013 (millions of Australian dollars)

Revenues

Aviation Fuel Charge	121,425
Transfer from Dept. of Infrastructure and Transport	42,824
Civilian Aviation (Fees) Regulations 1995	13,842
Interest Earned	2,672
Other Revenues	870
Other Gains	2,803
Total	184,436

Expenses

Employee Benefits	108,930
Suppliers	50,248
Depreciation and Amortization	12,009
Finance Costs	32
Write-Down and Impairment of Assets	1,200
Net Loss from Disposal of Assets & Losses from Asset Sales	2
Total	172,421

Source: Civil Aviation Safety Authority Annual Report, 2012-13

D.3 Structure

CASA's organizational structure is shown in Figure D-1. The core of CASA's regulatory functions are provided by the following divisions:

- The **Office of the Director of Aviation Safety** is responsible for CASA's international relations and its relations with government and industry, internal governance systems, safety systems (including safety performance and analysis) and knowledge and information management services.
- The **Operations** division, monitors aviation operations and compliance with airworthiness standards and creates the standards for the flight training industry.
- The **Airspace and Aerodrome Regulations** division ensures that the facilities and operations of the Australian ANSP remains in compliance with safety standards. It also regulates aviation rescue operations, aerodrome operations, and air traffic service training.
- The **Standards** division develops those safety standards and regulations with which the first two groups in CASA monitor compliance.

The remaining four groups provide important, but secondary functions to support CASA's regulatory mission.

- The **Safety and Education Promotion** division is responsible for CASA's communications and outreach, and providing internal training.

- The **Corporate Services** division manages most of the business support functions, like information technology and finance.
- The **Legal Services** division represent CASA's interests during court proceedings and criminal investigations, while also offering legal advice to other persons within CASA.
- The **Industry Permissions** division manages all permits, licenses, applications, and certificates that are relevant to the aviation industry.

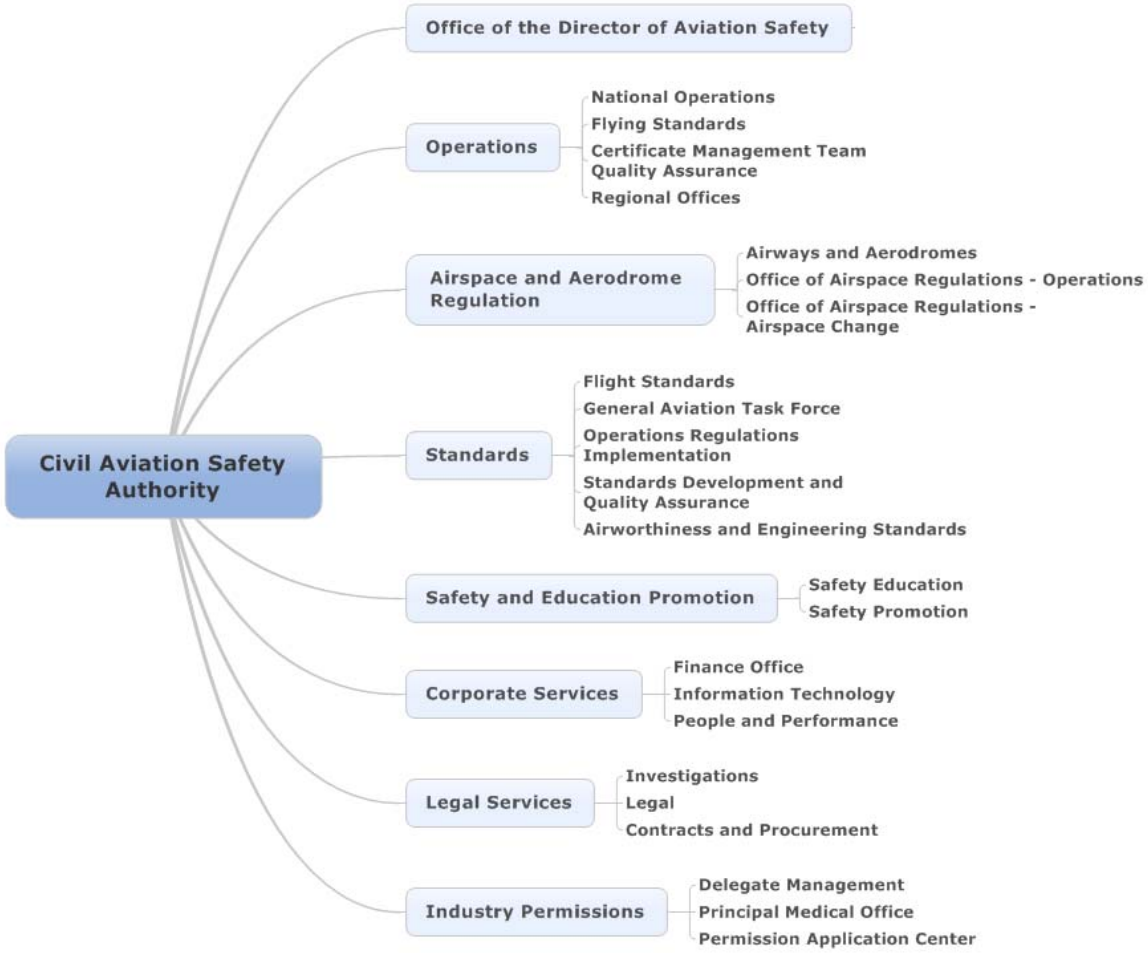

Figure D-1. Current Organization of Australia's Civil Aviation Safety Authority

D.4 Experience

As of 1980, Australia's Department of Transport regulated all modes of transportation, including aviation.[45, 46] But in 1982, the aviation components were moved into a new and autonomous organization, the Department of Aviation. Criticism soon surfaced over the inefficiency of the new Department, particularly in the 1984 book, "Two Years in the Aviation Hall of Doom." The book argued that bureaucratic morass and inefficiencies at the Department of Aviation wasted money and reduced safety. Politicians took note of the growing sentiment, and in 1987, temporarily moved the Department of Aviation back into the Ministry overseeing transportation.

In 1988, the civil aviation safety and navigation service functions were removed from the Ministry once again, and placed under the new, autonomous Civil Aviation Authority. The aviation groups that managed airport operations were also removed and placed in a similarly autonomous agency, although regulatory oversight of airports was a function of the Civil Aviation Authority. The groups responsible for setting international and economic policy and investigating accidents stayed within the Ministry.

The Civil Aviation Authority's primary objective was to improve the economic efficiency of regulating civil aviation. Plans were made to cut employment from 7,300 to 3,500 over five years. Implementing aspects of these plans met with resistance and in-fighting which became public. In 1993, external audits concluded that safety had declined under the Civil Aviation Authority's watch and that the organization did not consistently apply its own safety standards.

In 1995, Parliament decided to separate the air navigation service functions from the Authority. The ANSP became Airservices Australia (ASA), and the remaining regulatory elements became CASA.[47] However, many of CASA's difficulties continued. Turnover in CASA's Board and executive leadership was high, and its relationship with the segments of the aviation industry was poor.[48] Audits of the organization argued that frequent leadership changes made reform impossible. Parliament abolished CASA's Board in 2003 and the chief executive reported directly to the Minister of Transport. The organization underwent a series of administrative reforms, and over time, the situation improved.[49]

In 2007, CASA was given the responsibility of regulating Australian airspace and created the Office of Airspace Regulation group. In 2009, Parliament reinstated CASA's governing Board.

---

45 Unless otherwise noted, many of the facts included in this section come from James (2011).

James, Mathew. *Aviation Safety Regulation Timeline 1982-2011*. Document created for the Parliament of Australia. Updated 2/7/2011. Online resource. <http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BN/1011/Aviation>.

46 James, Mathew. *Aviation Safety Regulation Timeline 1982-2011*. Document created for the Parliament of Australia. Updated 2/7/2011. Online resource. <http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BN/1011/Aviation>.

47 *Air Services Act 1995, Section 77*. Australian Government's ComLaw Database. Online resource. <http://www.comlaw.gov.au/Details/C2004A04931>.

48 Phelan, Paul D. "Statement Regarding the Inquiry into the Administration of the Civil Aviation Safety Authority and Related Matters" 2008. Online resource. <http://www.aph.gov.au/binaries/senate/committee/rrat_ctte/casa/submissions/sub26.pdf>

49 Australian National Audit Office. "Better Practice Guide." March, 2007. Online resource. <http://www.anao.gov.au/uploads/documents/Administering_Regulation_.pdf>.

Appendix E France

The regulation, safety oversight, and provision of air navigation service in France is similar to the United States. ATC is neither privatized nor corporatized and all functions are performed by the French government inside the Director General of Civil Aviation (DGAC), by the Directorate of Air Navigation Services (DSNA) similar to the U.S. FAA and its Air Traffic Organization (ATO). The DGAC is itself a part of the Directorate of the Ministry for Transports, Sea and Fisheries, and the relationship is similar to that of the FAA and the U.S. Department of Transportation.

E.1 Funding

Table E-1 presents DGAC's revenues and expenses. The majority of their revenues come from two main sources, ANSPs (Route and Oceanic charges) and passengers (Civil Aviation charge). An additional 12.4% of revenues come from loans. The budget for the DGAC is one of only two budgets that are an exception to the French principle of budgetary unity. (The other is official publications and administrative information). The budgetary unity principle requires that all government department budgets be included in a single budget document. The exception for DGAC is made because the majority of its funding is derived from airspace user charges.

Table E-1. Revenues and Expenses for French Air Traffic Service Provision by DGAC, FY2014

2014 BACEA (€Millions of Euros)					
Revenues			**Expenses**		
Route and Oceanic charges	€1,189.3	(55.2%)	Salaries	€1,138.8	(52.8%)
Terminal charges	€240.4	(11.2%)	Operations	€158.9	(7.4%)
Royalty Monitoring, Terminal Services and Certification	€32.9	(1.5%)	Staffing provisions	€2.4	(0.1%)
Civil Aviation charge	€356.4	(16.5%)	Grants	€4.3	(0.2%)
Management charges	€5.8	(0.3%)	Financial charges	€36.6	(1.7%)
Miscellaneous	€63.1	(2.9%)	Exterior Agencies	€331.3	(15.4%)
Loans	€267.2	(12.4%)	Loan Repayment	€225.3	(10.5%)
			Investment	€257.5	(11.9%)
Total	€2,155.1		Total	€2,155.1	

An operational reserve of 7% for expenses other than staff is included in the budget. A separate reserve of 0.5% is included for staff expenses.

The majority of revenues (82.9%) are derived from a combination of the route and oceanic, terminal, and civil aviation charges. The majority of expenses (52.8%) are salaries, followed by external organizations, including the ENAC, the French Civil Aviation University (15.4%).

The DSNA charges for air traffic services, which includes DGAC's costs for regulating safety. This means that DGAC is self-supporting and paid by aviation users. The scheme comes from a

standard set by EUROCONTROL guidance which includes en route, arrival, departure, and overflight charges. Each contains a distance factor, a weight coefficient, and a unit rate.[50]

The unit rate is determined by the French state. As of June 2014, the unit rate was €65.92.[51] The unit rate is a cost basis for ATC and consists of two parts, an administrative unit rate and a unit rate based on the number of service units forecasted to be in the airspace of that charging zone for that year. Exemptions exist for VFR flights which begin and end at the same airport, aircraft under 2 metric tons, military flights, and test and training flights.

E.2 Autonomy and Governance

DGAC is a government department, within the Ministry for Transport, Sea, and Fisheries. DGAC is one of eight departments reporting to the French Minister for Transports, Sea and Fisheries. DGAC is headed by a Director General for Civil Aviation.

E.3 Structure

In 2005, France reorganized the DGAC to conform to European Single Sky regulations which require the separation of service provision from safety regulation (see Figure E-1).

- The **Directorate for Air Transport** (DTA) defines the regulations for civil aviation and contains policy and international relations functions. Functions include economic forecasting, air operator certificates, airport modernization, and consumer rights. DTA also has responsibility for environmental issues in aviation, such as noise and emissions. DTA administers a training department with over 7,500 students who are being trained for careers in aviation, like air traffic controllers or professional pilots.
- The **Directorate for Civil Aviation Safety** (DSAC) ensures compliance with safety regulations, and performs monitoring and certification similar to the FAA's Aviation Safety (AVS) department. DSAC also oversees security programs at airline operators, airports, air freight operators, and provides training to security officers.
- The **Directorate for Air Navigational Services** (DSNA) is similar to the FAA's ATO. It provides air navigation services and is responsible for the safe provision of ATC, communications, navigation, and aeronautical information. DSNA has the authority to set and publish the air navigation charging scheme.[52]
- The **General Secretariat** provides support services including human resources, finance, legal affairs and modernization management. This group constructs the budget and oversees research and development initiatives. It also oversees the National School of Civil Aviation and Airport Engineering and other charges to the aviation industry.
- Four departments report directly to the Director General of the DGAC:
    - **Flight Control Organization** acts as an advisory panel and includes experts from various flight disciplines. It is involved in new airline and aircraft launches and also carries out surprise inspections of air carriers and flight schools.

---

50 "Guide for the users of the air navigation charges," DSNA publication, 2012.

51 Monthly adjusted unit rates, https://www.eurocontrol.int/sites/default/files/content/documents/route-charges/unit-rates-and-tariffs/ur-2014-07.pdf, online.

52 The McGill Report on Governance of Commercialized Air Navigation Services, Annals of Air and Space Law, Vol. XXXI, Paul Stephen Dempsey, et al., 2006, pg. 271.

- The **Light, General and Helicopter Service** group serves as a policy advisory and an interface point for users and industry in this sector.
- **Air Transport Gendarmerie** is a branch of the French Gendarmerie (police) and provides police and security in civilian airfields and airports along with intelligence and surveillance for air transportation issues. It is under dual supervision of DGAC and the French Gendarmerie.
- **Staff Cabinet** includes administrative functions for the DGAC.

In contrast to the U.S. system, aviation security operations, policy, and compliance is a responsibility of the Directorate of Civilian Aviation Security (DSAC).

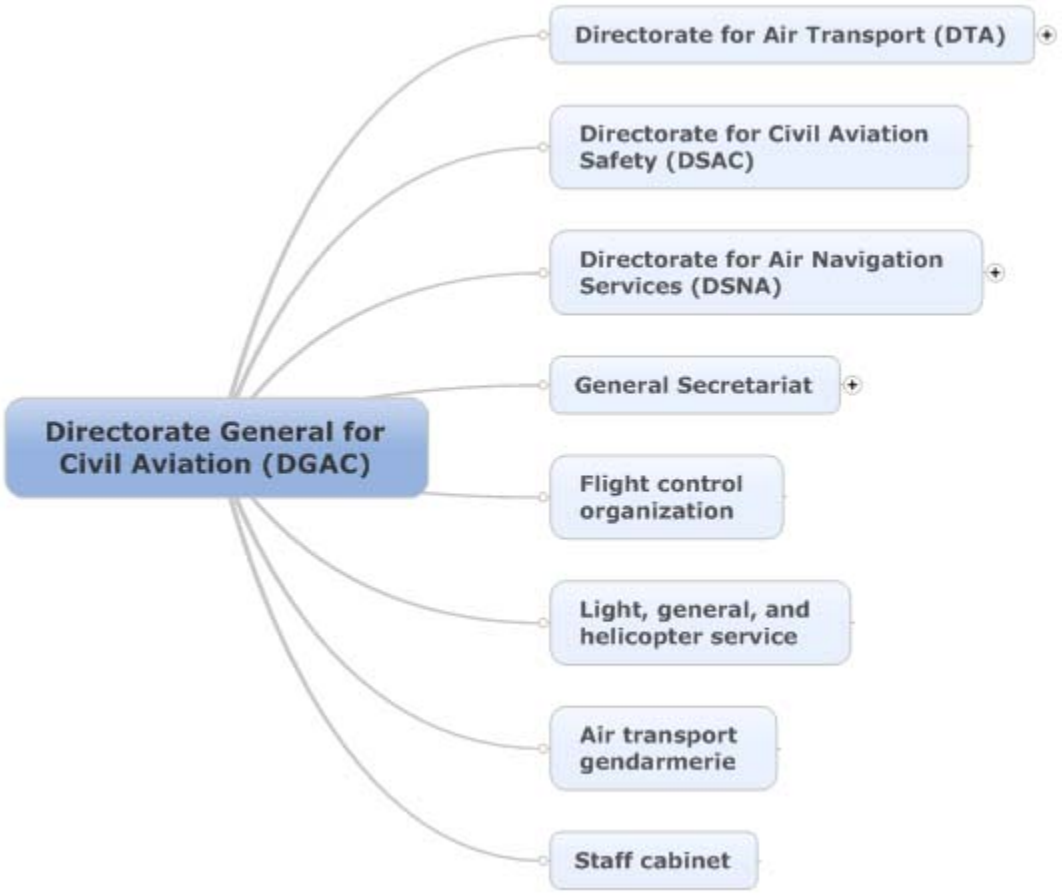

Figure E-1. Organization of Directorates within DGAC

E.4 Experience

The French ATC system is not significantly changed from its pre-separation days. The new ANSP (DSNA) is still a directorate of DGAC and is neither corporatized nor privatized and is conducted by government employees. Safety regulation of ATC remains inside DSNA, but is separated from the air navigation department, similar to the FAA's ATO and AVS.

Appendix F Germany

The provision of ATC in Germany is considered a responsibility of the federal government. In order to address wasteful inefficiency and an inability to keep up with technological, the ANSP incorporated in 1992 and became the Deutsche Flugisicherung (DFS). The DFS is a limited liability (GmbH) corporation that is under control of the BMVI. DFS controls all civil terminal and en route traffic in Germany and is obligated to advise the Ministry of Transport on all ATC matters.[53] DFS also controls all military air traffic during peacetime. The German state owns 100% of DFS and authorized DFS to cooperate with international organizations such as ICAO. The Federal Aviation Office (LBA) has regulatory oversight of other aviation safety matters.

Until recently, the DFS had a significant amount of regulatory and operational responsibilities for air navigation services. In April, 2004, the EU's Single European Sky (SES) regulations were adopted which require the separation of the regulatory authority from the provision of air navigation services. Therefore, in August 2009, Germany created the Federal Supervisory Authority for Air Navigation Services (BAF).[54]

The BAF is focused only on the oversight of ANSPs and is one of BMVI's autonomous executive agencies. Both the BMVI and the BAF regulate the safety of the DFS and other ANSPs in Germany. The BMVI primarily sets the air traffic management (ATM) rules, airspace policy, and the minimum standards for ATM safety. The BAF has the remaining safety oversight responsibilities, including monitoring compliance, taking any necessary enforcement actions, and approving the DFS's charging scheme.[55]

F.1 Funding

The BAF receives its funding from the DFS, which in turn levies user charges that cover both operational and regulatory expenses of air navigation services. Like the French CAA, the DFS funding mechanism is also based on EUROCONTROL's standard guidance. There are several charges including en route, arrival, departure, and overflight charges. Each one contains a distance factor, a weight coefficient, and a unit rate.

The unit rate is determined by the German state. As of June 2014, the unit rate was €77.47. The unit rate is a cost basis for ATC and consists of two parts, an administrative unit rate and a unit rate based on the forecasted number of service units that are generated in the airspace of the charging zone for that year.[56]

---

53 The McGill Report on Governance of Commercialized Air Navigation Services, Annals of Air and Space Law, Vol. XXXI, Paul Stephen Dempsey, et al., 2006, pg. 277.

54 Oversight of air navigation service providers, Federal Ministry of Transport, Building and Urban Development, online, http://www.bmvi.de/SharedDocs/EN/Artikel/LR/oversight-of-air-navigation-service-providers.html?nn=71438, 2014.

55 EUROCONTROL. *Local Single Sky Implementation Plan – Germany: Year 2013, Level 1*. Online resource. <http://www.eurocontrol.int/sites/default/files/content/documents/official-documents/reports/2013-lssip-germany.pdf>.

56 "Establishing Route Charges," EUROCONTROL web page, https://www.eurocontrol.int/articles/establishing-route-charges.

F.2 Autonomy and Governance

Air safety in Germany is performed by two different agencies, the BAF and the LBA. LBA responsibilities include certification, compliance, enforcement and generation and publication of regulations for civil aviation activities outside of ATC. BAF is designated as the National Supervisory Authority for ATC and focuses exclusively on oversight of DFS and ANSPs at airports.

The BAF is separate from the LBA and is headed by a Director who reports to the Ministry of Transport (BMVI). The BMVI is responsible for ensuring consultation takes place between users and DFS. The BMVI also holds bilateral consultation on cost and charges and an annual customer forum on technical and investment issues. DFS is free to set charges but they are approved and reviewed by the economic oversight department of the BAF.

F.3 Structure

The BAF organizational structure is shown in Figure F-1. The groups are:

- The **Safety Oversight of ANS-Organizations, ANS-Personnel** (SOP) group certifies the ANSP (DFS) and the training conducted by DFS. It also certifies agencies that wish to conduct ATC training. SOP performs audits and inspections, ensures the security of facilities, certifies any functional changes to the ATC system, and licenses ATC personnel.
- The **Economic Oversight** (WA) group ensures that charges by the DFS cover the cost of air traffic service provision and regulation. The department also creates the rate structure, supervises the performance plans and targets, and coordinates EU-wide route charges.[57]
- The **Technology Safety Oversight** (ST) group is responsible for interoperability, flight inspection and pattern approval. All activities related to interoperability such as EU regulation compliance, international consultation and working groups are performed by the ST. Other activities include oversight and regulation of flight inspection activities, review of type-certificate issues such as ATC systems and equipment, and changes to traffic control procedures. The ST is also responsible for frequency management and coordinating construction that affects ATC.
- The **Airspace, Flight Procedures, Law** (LFR) group is responsible for the establishment of flight procedures and enforcement of violations of flight procedure rules. They also publish NOTAMS and provide legal representation of the BAF and internal legal advice.
- The **Central Administration** (ZV) provides the BAF's organization, budget, and personnel services. Other services include financial planning, procurement, information technology services.
- Three other offices report directly to the Director of BAF:
  - The **Liaison Office for Military Air Navigation Services** helps coordinate the German military's air navigation service provision under the SES initiative.
  - The **International Coordination** works with ICAO and other international organizations on air navigation policy and harmonization.

[57] BAF website, online. www.baf.bund.de/DE/BAF/Organization/Referat_WA/referatwa_node.html, 2014.

- The **Public Relations** group prepares the BAF's online publications and annual reports, prepares the BAF's press releases, and engages external audiences.

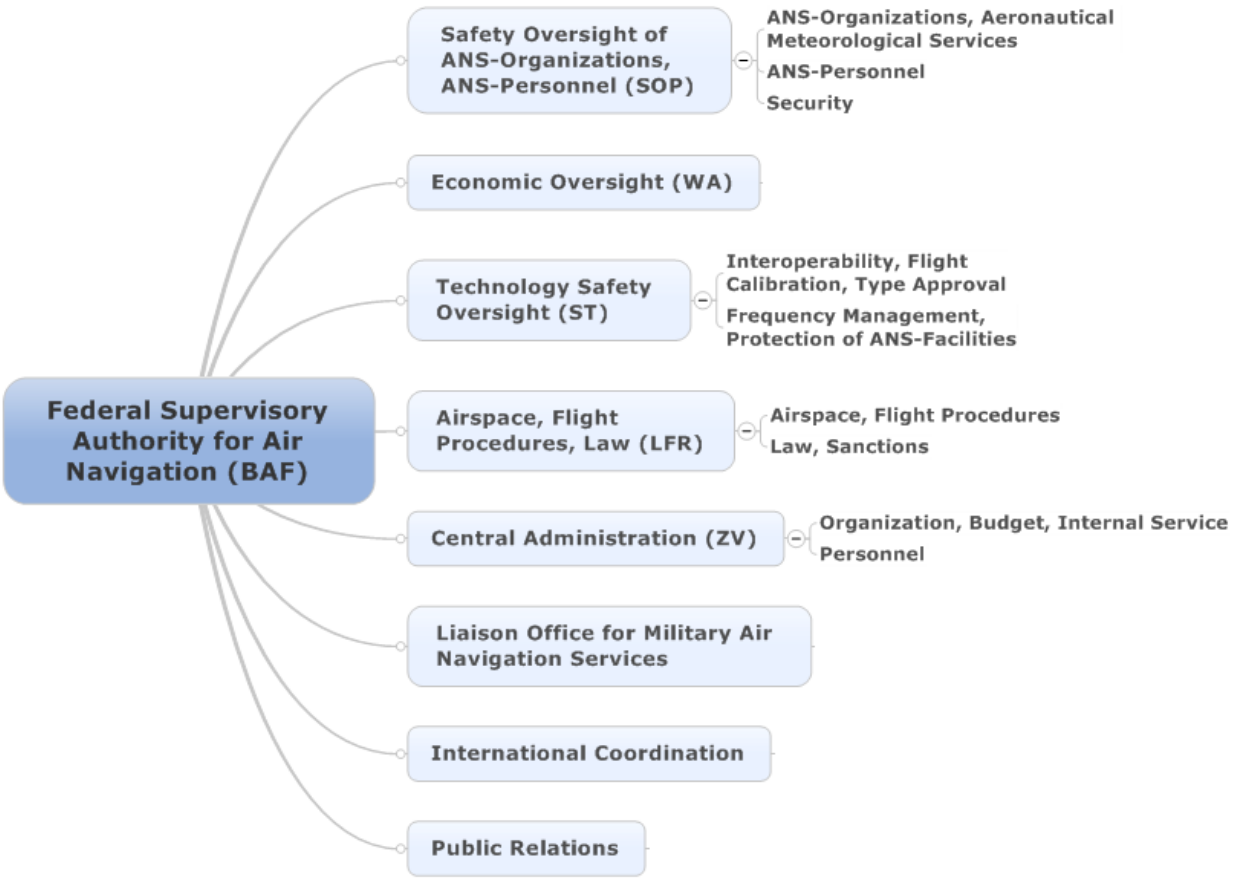

Figure F-1. Organization of the German BAF

F.4 Experience

The BAF is a relatively new agency, created to comply with the European Single Sky requirement for a designated National Supervisory Authority for ATC. It is a standalone agency exclusively for the purpose of overseeing ANSPs in Germany and is not a part of the German Civil Aviation Authority (LBA). The agency has grown significantly since its establishment in 2009. In 2011, DFS reported that the cost of supervision by BAF and EUROCONTROL were €84.3 million, about 8.3% of its costs.[58]

[58] "National Cost Efficiency Germany," Annex to the FABEC (Functional Airspace Block Europe Central) Performance Plan, June 27, 2011. The FABEC is a project sponsored by EUROCONTROL involving six countries: Germany, Belgium, France, Luxembourg, the Netherlands and Switzerland.

Appendix G Glossary

ANSP	Air Navigation Service Provider
ASA	Airservices Australia
ATC	Air Traffic Control
ATD	Air Transport Division
ATM	Air Traffic Management
ATO	Air Traffic Organization
AVS	Aviation Safety
BAF	Federal Supervisory Authority for Air Navigation Services
BMVI	Ministry of Transport and Information
CAA	Civil Aviation Authority
CASA	Civil Aviation Safety Authority
DFS	Deutsche Flugisicherung
DGAC	Director General of Civil Aviation
DSAC	Directorate for Civil Aviation Safety
DSNA	Directorate of Air Navigation Services
DTA	Directorate for Air Transport
EASA	European Aviation Safety Administration
ENAC	French Civil Aviation University
EU	European Union
FAA	Federal Aviation Administration
FTE	Full Time Equivalent
ICAO	International Civil Aviation Organization
LBA	Federal Aviation Office
MITRE	The MITRE Corporation
NAS	National Airspace Systems
NATS	National Air Traffic Service
NZ	New Zealand
OAG	Office of the Auditor General
SES	EU's Single European Sky
SoS	Secretary of State
TCCA	Transport Canada Civil Aviation
UK	United Kingdom

Disclaimer

The contents of this material reflect the views of the author and/or the Director of the Center for Advanced Aviation System Development (CAASD), and do not necessarily reflect the views of the Federal Aviation Administration (FAA) or the Department of Transportation (DOT). Neither the FAA nor the DOT makes any warranty or guarantee, or promise, expressed or implied, concerning the content or accuracy of the views expressed herein.