A Prescription for Efficiency: Managing the Canadian Government's Civilian Aircraft Fleet

HAROLD M. KOHN

In Canada, one federal department, Transport Canada, operates and maintains the majority of civilian aircraft used by the federal government. The 90 fixed and rotary wing fleet consists of 29 different aircraft types located at 17 bases across Canada. The fleet is used for flight calibration and inspection; regulatory enforcement, inspection, and monitoring; pilot proficiency training; Canadian Coast Guard operations; and accident investigation by the independent Canadian Aviation Safety Board. The branch within Transport Canada charged with the responsibility of ensuring that the aircraft are safely and efficiently operated is the Flight Services Directorate. The Directorate has been awarded an operating certificate and operates under the same laws and regulations affecting all air carriers in Canada. Although the responsibility for training pilots and aircraft technicians rests with Flight Services, the Directorate provides the aircraft according to the demands of others. Flight Services essentially provides a centralized charter service under management contract with several clients, most of whom are other branches within Transport Canada. Faced with an urgent desire to simultaneously minimize expenditures and maximize the level of service to its clients at an acceptable level of safety, the Flight Services Directorate faces a massive challenge. The multitasked nature of the operation, many different aircraft types, geographic displacement, and a service driven by clients' need have led Flight Services to embark on a series of major initiatives to examine how to maximize efficiency and cost effectiveness. These initiatives include a thorough examination of annual aircraft flying rates, usability, serviceability, labor productivity, and operating costs, including comparisons with the Canadian private sector. In addition, Flight Services has been taking action to rationalize the fleet and has been comparing operations from one base to another. The results of these analyses to date are outlined in this paper.

In Canada, one federal government department, Transport Canada, operates and maintains the majority of civilian aircraft used by the federal government. The 90 fixed and rotary wing aircraft in the fleet are used for flight calibration and inspection; regulatory enforcement, inspection and monitoring; pilot proficiency training; Canadian Coast Guard operations; and accident investigation by the independent Canadian Aviation Safety Board. In addition, Transport Canada provides maintenance assistance to the fleet of the Royal Canadian Mounted Police, as well as maintaining aircraft owned by the Department of the Environment and the Department of Fisheries and Oceans. Approximately 44,000 hr are flown on an annual basis by the Transport Canada fleet (Table 1).

Within Transport Canada, the branch responsible for the safe and efficient operation of the fleet is the Flight Services Directorate. The Directorate's main base is located in Ottawa. Regional and local bases exist at 16 other locations in Canada from St. John's, Newfoundland, to Victoria, British Columbia. Approximately 500 employees work for Flight Services at the 17 bases. Staff members include Coast Guard pilots; quality assurance inspectors; maintenance engineers; avionics technicians; training pilots; maintenance trainers; and planning, administration, and managerial staff. Although Flight Services directly employs only Coast Guard pilots who fly the rotary wing equipment, the other pilots who fly the regulatory and calibration aircraft are directly employed by other branches in Transport Canada engaged in these activities. The training of these pilots, as well as all ground personnel, is, however, carried out by Flight Services. The Flight Services Directorate operates under a government-approved operating certificate that requires Flight Services to operate under the same regulations and laws as any other operator in Canada.

Although Flight Services essentially trains all pilots and ground personnel and maintains the aircraft, all flying operations of the aircraft are controlled by the clients of Flight Services, such as the Canadian Coast Guard, the regulatory branches of Transport Canada, the air navigation branches of Transport Canada, and the Canadian Aviation Safety Board. Tasking of the aircraft is determined by the client, who operates

TABLE 1 THE FLIGHT SERVICES FLEET FOR TRANSPORT CANADA

Aircraft Type	No. in Fleet	Flying Hours in 1984–1985
Bell 206B Jet Ranger	24	10,738
Alouette III SE3160	3	1,790
Sikorsky S–61N	1	623
Bell 212	5	2,626
MBB–BO–105–CBS	2	867
Gulfstream G–1159 (G–II)	1	860
Cessna 182/U206	2	582
DHC–6 Twin Otter	6	3,539
DHC–2 Beaver	4	1,019
Beech 95–B55 Baron	10	3,677
Beech 65–B80 Queen Air	3	1,608
Beech A90 King Air	8	4,102
Beech A100 King Air	6	3,422
Beech 200 Super King Air	1	723
Douglas DC–3	6	3,005
Lockheed 1329 Jetstar	4	1,452
Challenger CL600/601	2	747
Total	88	41,380

Flight Services Directorate, Transport Canada, 2829C Baycrest Drive, Ottawa, Ontario, Canada K1V 7P6.

under a management contract with Flight Services. Budgetary funds are delegated directly to Flight Services and are used by Flight Services to fund the operations of its clients. The management contracts outline the nature and scope of the operations. Flight Services is obligated to meet the needs of its clients by providing the aircraft as well as the training. In essence, because none of the clients operate a scheduled service, Flight Services operates a demand service, not unlike a charter operator. This complicates setting schedules for preventive maintenance and leaves Flight Services little control over the annual flying rates of the aircraft.

Faced with an urgent desire to simultaneously minimize expenditures and maximize the level of service to its clients at an acceptable level of safety, the Flight Services Directorate faces a great challenge. The multitasked nature of the operation, many different aircraft types, geographic displacement, and a service driven by clients' needs have led Flight Services to embark on a series of major initiatives to examine how to maximize efficiency and cost effectiveness. The initiatives include a thorough examination of annual aircraft flying rates, usability, serviceability, labor productivity, and operating costs, including comparisons with the Canadian private sector as well as comparisons between its own bases. In addition, Flight Services has taken action to rationalize and change its fleet to meet clients' needs in a more effective and efficient manner.

The results and uses of this work are outlined in this paper. The concepts described in this paper may be of benefit to other carriers interested in obtaining an accurate measurement of their costs and labor productivity.

THE FLIGHT SERVICES COST ACCOUNTING SYSTEM

In the early 1960s, a cost accounting system known as the Aircraft Cost Accounting System was designed and put in operation in Flight Services. Because the original system had very few checks and balances and contained significant errors in accuracy, the system was revamped in 1983, complete with internal cross checks plus an educational process designed to ensure the accuracy of the information.

The system is composed of two parts, financial and labor. All financial transactions that occur in Flight Services across the country are coded in such a way that costs accruing to specific aircraft are identified to that aircraft and no other. In some cases, specific aircraft cannot be identified for a cost item, such as administrative overhead or cleaning fluid. To solve this problem, a hierarchical system has been developed to classify the cost in the most specific manner. In cases where the aircraft for a specific cost cannot be identified, the aircraft type would be used. For example, if a box of nuts and bolts were bought suitable for King Air 100 aircraft only, the costs associated with the box could not be identified against a specific aircraft. The costs would be shown against the fleet of King Air 100s. The principle used to distribute the costs between the various aircraft in the King Air 100 fleet is that of distributing the indirect costs based on direct cost. In the same way, costs such as management and administrative overhead are distributed against all aircraft in the fleet.

The principle is to identify the specific aircraft, but if this is not possible, the next highest level is used. The current system contains six levels. The elements of cost contained in the system are very disaggregated, but it is possible to aggregate them. The elements used by Flight Services for costing purposes are fuel, materials and supplies, labor, pilot salaries, hangar rentals, and other salaries and costs.

In a similar fashion, approximately 260 maintenance staff across the country fill out daily labor distribution time sheets. Each hour of the day is accounted for and broken down into the same hierarchical structure used for the costs. These labor hours are used to distribute the labor salaries by aircraft. In addition, the system permits an analysis of labor by site and is broken down into 10 shops operated by Flight Services. Hours are further broken down by eight categories of work such as daily inspections, routine maintenance, and snags.

The Aircraft Cost Reporting System has allowed Flight Services to develop accurate costs per hour in two ways: direct and indirect costs, as well as fixed and variable costs. The information can be used for planning and budgeting purposes, as well as to compare the same aircraft type located at different sites. These costs can be used to examine each aircraft within the same type over time to determine whether any particular aircraft is more costly to operate. The cost information can also be used by management to measure costs over time and to study the effects of cost-cutting measures.

The cost information has also been used to compare the cost of operation with that of the private sector (Table 2). This study has shown that based on fares published by over 100 carriers in Canada who fly the same equipment as that of Flight Services, the taxpayer would have to pay twice the current expenditure of $40 million (Canadian) per year if the fleet were leased from the private sector. This study was thoroughly and critically reviewed by the Canadian Auditor General with no issues raised.

TABLE 2 FLIGHT SERVICES COST COMPARISON WITH THE CANADIAN PRIVATE SECTOR

Aircraft Type	Flight Services Cost Per Hour (Canadian $)[a]	Private Sector Long-Term Cost Per Hour (Canadian $)
Alouette III SE3160	777	775
Sikorsky S–61N	3,065	4,223
Bell 212	1,233	1,658
MBB–BO–105–CBS	1,064	N.A.[b]
Gulfstream G–1159 (G–II)	3,522	6,177
Cessna 182/U206	382	432
DHC–6 Twin Otter	626	1,499
DHC–2 Beaver	522	1,635
Beech 95–B55 Baron	419	940
Beech 65–B80 Queen Air	463	697
Beech A90 King Air	673	1,250
Beech A100 King Air	734	1,055
Beech 200 Super King Air	646	1,429
Douglas DC–3	1,068	1,518

[a]Includes 15 percent profit.
[b]Not applicable.

The labor hour analysis (Table 3) has been extended to a point where, for each aircraft in the fleet, it is possible to measure the amount of labor hours required per hour of flying. This ratio can be used for a variety of purposes, such as

1. Measuring labor productivity over time;
2. Measuring labor productivity for the same aircraft type located at different sites, thereby allowing for cross-site comparisons;
3. Measuring labor expenditures on a month-to-month basis;
4. Identifying specific aircraft requiring higher-than-average labor expenditures (making the aircraft a prime candidate for removal from the fleet); and
5. Developing staffing requirements and formulas.

TABLE 3 FLIGHT SERVICES LABOR HOUR ANALYSIS

Aircraft Type	Hands-on Labor Hours Required Per Hour of Flight
Bell 206B Jet Ranger	5.0
Alouette III SE3160	2.6
Sikorsky S–61N	10.1
Bell 212	6.8
MBB–BO–105–CBS	5.4
Gulfstream G–1159 (G–II)	9.2
Cessna 182/U206	2.2
DHC–6 Twin Otter	3.4
DHC–2 Beaver	4.5
Beech 95–B55 Baron	3.5
Beech 65–B80 Queen Air	5.3
Beech A90 King Air	3.6
Beech A100 King Air	4.8
Beech 200 Super King Air	3.1
Douglas DC–3	6.8
Lockheed 1329 Jetstar	17.2
Challenger CL600/601	16.2

OTHER MEASURES OF THE OPERATION

Flight Services has developed measures of performance other than costs and labor productivity, as described earlier.

Serviceability

One of the key maintenance indicators is the serviceability rate, which is defined as the percentage of time aircraft are serviceable and ready for flying during working hours. For the entire fleet, the 1984 rate was 80 percent. During the other 20 percent of the time, the aircraft were unserviceable. Data on the reasons for the unserviceable aircraft are also recorded. For the fleet in general, scheduled maintenance accounts for 59.3 percent of downtime, 24.8 percent of snags, 3.8 percent of waiting for parts, 7.2 percent of aircraft modifications, 3 percent of calibration, and 4.6 percent of other reasons.

These data are kept for each aircraft in the fleet. The information permits management to gauge its level of service provided to the client as well as to pinpoint reasons for unserviceable aircraft. Any extreme or anomalous situations that arise can be dealt with in an informed and effective way. Cross-site comparisons are also being made.

Usability

Although Flight Services is responsible for maintaining the aircraft, it does not itself determine the tasking of the aircraft. This is determined by the clients. However, Flight Services is committed to maximizing the use of the aircraft and in the past has informed clients that certain aircraft are not being used to a maximum and that retention of the aircraft may not be warranted. Rentals can be used when demand is limited.

To this end, Flight Services collects information as to the percentage of time the aircraft are used during the time they are serviceable. For the fleet in total, the usability rate is approximately 60 percent. These data are also available on an individual aircraft basis.

These data are imperative if the fleet is to be used to the maximum extent possible. Current planning studies have target usability rates that in some cases almost double current annual utilization. Only in this fashion can Flight Services ensure that the fleet is fully utilized and that the fleet itself is pared down to the least number of aircraft. To this end, Flight Services is working closely with the clients of the service to improve booking and reservation practices by pilots to ensure maximum utilization of the aircraft.

FLEET RATIONALIZATION

Faced with a fleet comprised of 29 different aircraft types, Flight Services cannot hope to reap any benefits of economies of scale. The fleet mix produces a complex training requirement, large storage areas, large inventories, and so on. To this end, Flight Services has begun to rationalize the fleet with a view to reducing the number of aircraft types, increasing annual utilization, and streamlining the operation. To date, action has already been taken to reduce the flight calibration fleet from eight to four aircraft comprised of two types. This rationalized fleet has produced savings in terms of operating costs as well as staff.

In addition, Flight Services has just completed a proposal to reduce the fleet used by the regulatory inspectors from the current fleet of 38 aircraft comprised of 12 different types to 34 aircraft comprised of five different types by 1995. The proposal is more significant than it first appears because the proposed fleet is intended to cover a projected increase in flying activity of 30 percent over current levels. Despite the increase, no additional maintenance staff will be required, which is a benefit reaped by streamlining the operation. In addition, a life-cycle costing analysis indicates that over 15 years the proposed fleet would save Canadian taxpayers $136 million current dollars. An analysis shows that during the same time period taxpayers would save $170 million by continuing to operate the service within the government rather than leasing the fleet from the private sector on a long-term basis.

CONCLUSION

In the last 2 years, Flight Services has begun to deal with a massive challenge to provide an adequate level of service at an acceptable level of safety despite budget cutbacks. A number of initiatives have taken place that have produced and will produce a more streamlined operation and that provide management with the tools and information vital to the operation of an efficient and cost-effective operation. It has been shown that government can compete with the private sector, despite the burdensome and restrictive costs of government. Future work and initiatives ensure that Flight Services will maintain a competitive position in the aviation industry.

Publication of this paper sponsored by Committee on Airport Landside Operations.

Analyzing the Financial Impact on Airports of Remote Airport Ground Transportation Terminals

RAY A. MUNDY, C. JOHN LANGLEY, AND TIMOTHY D. WARD

Airline deregulation in the United States has had a significant impact not only on the airlines but also on the airports that facilitate air travel. Airline "wars" and competition have received considerable attention, but little has been written on competition among airports for airline travellers. Recent steep discounting of fares between major airport hubs and the withdrawal of major carrier service from many smaller airports has led major airport hubs to expand their geographic base, drawing patrons away from smaller airports nearby (50 to 100 mi). This trend has had obvious negative effects on the smaller airports and positive benefits on the more fortunate, larger hubs, which now enjoy greater revenue from additional patrons. In addition, an upward spiral effect is evident when airlines view the hub as a larger market and add additional or more direct flight service. This only accelerates the move away from smaller airports. Seeking to provide service and profit from this national trend, airport ground transportation operators, airlines, and airports are looking at remote ground transportation terminals in distant cities as a means of facilitating this long-distance traffic and increasing its potential. Some airports are motivated by the obvious financial gain, but others are especially hard pressed to provide roadway and parking space for the private vehicles emanating from this new passenger influx. Remote terminals, however, may have negative financial impacts in the form of lost parking and car rental income. Therefore, a methodology for analyzing the potential market for remote airport ground transportation terminals and their financial impacts is presented in this paper. The methodology is explained through the actual data used in an analysis for the Detroit Metropolitan Airport.

In 1983 Republic Airlines developed a proposal to offer complimentary ground transportation to their Detroit Metropolitan Airport (DMA) hub from selected cities 50 to 100 mi away. The purpose of this paper is to outline the methodology utilized in analyzing the feasibility and financial impacts this proposal would have on DMA.

BACKGROUND

Republic Airlines Proposal

In general, the Republic Airlines proposal was designed to feed passengers into DMA through the use of high-quality ground transportation service. The proposed service would apply principally to passengers who currently originate their trips at airports other than Detroit. This would have the effect of diverting additional passenger traffic to Detroit. The service was to be oriented toward, but not restricted to, passengers who find it preferable to fly Republic Airlines in and out of Detroit.

R. A. Mundy and C. J. Langley, University of Tennessee, 320 Stokely Management Center, College of Business, Knoxville, Tenn. 37996. T. D. Ward, Detroit Metropolitan Airport, Building 515, Detroit, Mich. 48242-9998.