ESTIMATES

Transportation Safety Board of Canada

Performance Report

For the period ending
March 31, 2000

Canada

Improved Reporting to Parliament
Pilot Document

The Estimates of the Government of Canada are structured in several parts. Beginning with an overview of total government spending in Part I, the documents become increasingly more specific. Part II outlines spending according to departments, agencies and programs and contains the proposed wording of the conditions governing spending which Parliament will be asked to approve.

The *Report on Plans and Priorities* provides additional detail on each department and its programs primarily in terms of more strategically oriented planning and results information with a focus on outcomes.

The *Departmental Performance Report* provides a focus on results-based accountability by reporting on accomplishments achieved against the performance expectations and results commitments as set out in the spring *Report on Plans and Priorities.*

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Foreword

On April 24, 1997, the House of Commons passed a motion dividing on a pilot basis the *Part III of the Estimates* document for each department or agency into two separate documents: a *Report on Plans and Priorities* tabled in the spring and a *Departmental Performance Report* tabled in the fall.

This initiative is intended to fulfil the government's commitments to improve the expenditure management information provided to Parliament. This involves sharpening the focus on results, increasing the transparency of information and modernizing its preparation.

The Fall Performance Package is comprised of 83 Departmental Performance Reports and the President's annual report, *Managing for Results 2000*.

This ***Departmental Performance Report,*** covering the period ending March 31, 2000 provides a focus on results-based accountability by reporting on accomplishments achieved against the performance expectations and results commitments as set out in the department's *Report on Plans and Priorities* for 1999-00 tabled in Parliament in the spring of 1999.

Results-based management emphasizes specifying expected program results, developing meaningful indicators to demonstrate performance, perfecting the capacity to generate information and reporting on achievements in a balanced manner. Accounting and managing for results involve sustained work across government.

The government continues to refine its management systems and performance framework. The refinement comes from acquired experience as users make their information needs more precisely known. The performance reports and their use will continue to be monitored to make sure that they respond to Parliament's ongoing and evolving needs.

This report is accessible electronically from the Treasury Board Secretariat Internet site: http://www.tbs-sct.gc.ca/rma/dpr/dpre.asp

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Transportation Safety Board of Canada

Departmental Performance Report

for the Period Ending
March 31, 2000

Benoît Bouchard
Chairperson
Transportation Safety Board of Canada

Stéphane Dion
President
Queen's Privy Council for Canada

Canada

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Section I: The Chairperson's Message

The Transportation Safety Board of Canada (TSB) celebrated its 10th anniversary at the end of this reporting period. Over that period, I believe the TSB has been very successful in identifying safety deficiencies and in conveying key safety messages to the public, industry and regulators. Numerous safety actions have been taken in Canada and abroad to reduce transportation risks as a result of the TSB's work.

An independent survey of persons with a direct interest in the TSB's findings confirmed that people have a high opinion of the TSB and high level of confidence in its work. The investigation process is considered good and the Board's reports are well received. There is also wide-spread agreement among people surveyed that the TSB does contribute in a positive manner to the advancement of transportation safety.

In the aftermath of recent high profile accidents such as the crash of Swissair flight 111, the crash of an Air Canada flight in Fredericton, the Mont St. Hilaire train derailment and the sinking of the Flare, the TSB has taken the opportunity to make itself better known to Canadians. I have personally participated in the public release of a few of the Board's final reports. In the course of some investigations I have met with representatives of the local communities and with families of the victims to explain the role of the TSB in advancing transportation safety. I believe that through this public presence and other communications initiatives over the past two years Canadians have gained an enhanced understanding of the work of the TSB in addressing transportation safety issues.

The TSB also enjoys an excellent reputation worldwide. In the past year, the TSB has worked closely with the International Maritime Organization on projects such as marine accident investigation standards, the introduction of voyage data recorders on ships, and the delivery of accident investigation training for representatives of third world countries. Work was also done with the International Civil Aviation Organization. The TSB's flight recorder analysis system continues to be recognized as a world leader. A total of six countries now use this system under licensing agreements.

The transportation industry continues to evolve at a very rapid pace. The TSB has taken many steps to keep up with the technology, the industry consolidation and globalization, the emergence of Canada as a major exporter of regional jets and rail cars, the growing demands for information, the increased level of litigation, the evolving needs of families of the victims, and the very competitive marketplace for highly skilled personnel. All these demands combine to create significant pressures on the TSB's financial and human resources. Initiatives are currently underway to seek some relief from these pressures.

Based on the record of the past 10 years, I am very optimistic that the Board will meet all the safety investigation challenges ahead and will maintain its worldwide reputation for excellence.

Section II: Departmental Performance

II.1 Societal Context

Objective:

The objective of the TSB is to advance transportation safety by:

- conducting independent investigations including, when necessary, public inquiries, into selected transportation occurrences in order to make findings as to their causes and contributing factors;
- identifying safety deficiencies as evidenced by transportation occurrences;
- making recommendations designed to eliminate or reduce any such safety deficiencies; and
- reporting publicly on its investigations and on the findings in relation thereto.

Strategic Priorities:

The TSB has targeted its activities towards providing quality, timely investigations reports to those in the transportation industry, governments or in international organizations who can make changes to advance transportation safety. Specifically we have targeted results in the following areas:

- increasing the proportion of reports that meet the one year standard for publication

- finalizing a performance measurement framework with appropriate indicators

- enhancing our communication tools to enable those who can influence change to have the means to obtain required safety information quickly and easily, this includes the Canadian public.

Key Co-delivery Partners:

The TSB reports annually to Parliament on its activities, findings, and recommendations through the President of the Queen's Privy Council, and as such is not part of the transportation portfolio. It is not uncommon for Canadians to associate the TSB with Transport Canada. However, the TSB and Transport Canada are completely separate organizations. The creation of the TSB as an independent agency eliminated the conflict of interest that existed when government bodies regulated or operated transportation activities and also investigated the failures associated with their own regulations and operations. The legislation gives the TSB the exclusive authority to make findings as to causes or contributing factors when it investigates a transportation occurrence. The

TSB's investigative process is explained in Appendix A. Other departments (e.g. Transport Canada, National Energy Board, etc.) may however investigate for any other purposes.

The Ministers of Transport Canada and the National Energy Board often send an observer to accident sites in order to evaluate the occurrence from the perspective of their organization's responsibilities and to determine if any immediate action is required to ensure that they are meeting their responsibilities.

There are many individuals and groups cooperating with the TSB in the fulfillment of its mandate. During the course of an investigation the TSB interacts directly with a number of individuals such as: survivors, witnesses, next-of-kin, and operators. The TSB also interacts with a number of other organizations and agencies such as: coroners, police, manufacturers, owners, insurance companies, as well as other federal government departments and agencies. The cooperation of all these individuals and organizations is essential to the conduct of the TSB's business.

The TSB has no authority to implement changes; its mandate is limited to the identification of safety deficiencies and the communication of credible safety messages and persuasive arguments to influence change. The TSB can therefore be deemed successful when others (e.g. regulators, operators, manufacturers, etc...) implement actions to mitigate risks. As such, the TSB is one of many Canadian and Foreign organizations in improving transportation safety. The charts in Appendix B illustrate the many groups with whom the TSB may cooperate or interact in the course of its investigations.

Social and Economic Factors:

The TSB operates within the context of the very large and complex Canadian transportation system. This system is very dynamic and in a constant state of change. This results in particular challenges for the TSB.

Public Interest in Transportation Safety: Transportation safety has always been a matter of public concern in Canada. This is largely due to the essential social and economic role that the transportation system plays in this country. New information demands have evolved in the aftermath of recent accidents, like: the crash of Swissair Flight 111 near Peggy's Cove, the train derailment in Mont St Hilaire, the capsizing of the True North near Tobermory, and the pipeline incident involving the spill of petroleum products near Prince George. News media expect real-time, round-the-clock, on-site coverage. The expectations of the next-of-kin for support from the investigating agencies have also

increased. They have an enormous thirst for up-to-date factual information; most wish to follow closely the progress of the investigation. Given the loss they suffered, great care must be exercised in communicating with them. Fulfilling these evolving needs is proving to be a major challenge within existing resource levels.

Government Policy and Industry Environment: In recent years, partly as a result of government initiatives and partly in response to commercial imperatives, various changes have occurred that may influence transportation safety. Among the changes, are the privatization of Crown corporations and the commercialization of many Transport Canada operations in all modes. The highly competitive environment in all elements of the transportation industry and the demands by the public and shippers for an almost accident-free transportation system are also significant considerations. The recent turmoil associated with the consolidation of Canada's major air carriers has also increased public concerns about aviation safety.

Impact of Technology on Transportation: Over the last 30 years, the rate of technological change in the transportation industry has been very rapid. This is largely due to significant advances in computer and electronics technology, the development of new materials, and their application to the transportation industry. These advances affect all modes of transportation, and while many of them enable investigators to perform their work more effectively, they also make the job of investigation and safety analysis increasingly complex and specialized. The increased reliance on automation poses particular problems for analysing failures at the human-machine interface.

Level of Activity: More than 3,000 transportation occurrences are reported each year in accordance with federal reporting requirements. The TSB bases its decision to investigate on its Occurrence Classification Policy (see TSB web site at www.tsb.gc.ca for details). The prime criterion for deciding to investigate is whether an investigation is likely to lead to a reduction in risk to persons, property or the environment. Government-wide reductions in resources over the past number of years have led the TSB to review this classification policy. The TSB has withdrawn from investigating some accidents less likely to result in safety actions, even when they involve fatalities. This has resulted in some adverse public reaction and the TSB has come under increased public scrutiny.

Recruitment and Retention of Personnel: The recruitment and retention of personnel represents a major challenge for the TSB. The TSB operates within a very competitive market place where there is limited availability of skilled personnel. The TSB competes in hiring these people, mostly from outside the public service, who bring the required technical skills and knowledge in a given mode and then spends at least two years training them to become investigators. This training, which is not available in traditional institutions of learning, combined with the experience in investigating makes our investigators in all occupational groups, at all levels, very attractive to other government

departments and to the industry. Factoring in that the government has difficulty competing with the salaries and benefits offered by the industry adds another dimension to the problem. The TSB must also contend with employee insecurity resulting from limited resources and increasing workloads over the past number of years, perceived internal pay inequities, and the implementation of the Universal Classification System.

Swissair Flight 111 accident investigation: The crash of Swissair Flight 111 near Peggy's Cove in Nova Scotia on September 2, 1998 severely tested the resources of the TSB. This was the most complex transportation accident in Canadian history which required the mobilization of the majority of the TSB resources thus creating backlogs in other work. On-going efforts to complete this investigation continue to consume considerable TSB resources and only limited progress has been achieved in catching up on the backlogs. This investigation has shown how the TSB is vulnerable if more than one major occurrence happens in any given year.

II.2 Performance Results Expectations and Chart of Key Results Commitments

Chart of Key Results Commitments		
Transportation Safety Board of Canada		
To provide Canadians with:	**To be demonstrated by:**	**Achievement reported in:**
Advancements in safety through independent, objective and timely analysis of safety failures in the federally regulated transportation system.	• Identification of safety failures in the marine, rail, pipeline and air transportation systems.	• DPR Section II.3, page 9 and in TSB Annual Report to Parliament
	• Reduction in risks to persons, property and the environment through the use of investigation findings by governments and industry.	• DPR Section II.3, page 9 and in TSB Annual Report to Parliament
	• Public access to safety information and recommendations.	• DPR Section II.3, page 12 and in TSB Annual Report to Parliament
	• Satisfaction with quality and timeliness of findings and recommendations.	• DPR Section II.3, page 14 and in TSB Annual Report to Parliament
	• Awareness by Canadians of the Board's role in advancing transportation safety.	• DPR Section II.3, page 12 and in TSB Annual Report to Parliament
	• National and international recognition of the Board as an authoritative and independent resource in the area of transportation safety.	• DPR Section II.3, page 18 and in TSB Annual Report to Parliament

In addition to the key results commitments outlined in the preceding table, the TSB is reporting on the following other planned results.

Other Planned Results
Increasing the proportion of reports that meet the one year standard for publication.
Finalizing a performance measurement framework with appropriate indicators.
Enhancing our communication tools to enable those who can influence change to have the means to quickly and easily obtain required safety information.

II.3 Performance Accomplishments

Transportation Safety Board of Canada [1]	
Planned Spending	$23,280,000
Total Authorities	$40,420,266
1999-2000 Actuals	$39,127,740

In order to present the best possible performance summary this report combines statistical trends, qualitative indicators and anecdotal evidence. Nonetheless, the challenge for future TSB performance reports will be to develop better performance indicators of public and industry satisfaction, and of the long-term, broader impact of TSB performance on transportation safety in Canada.

The following symbols are used to indicate the results achieved:

☐: work is underway

✔: objectives achieved.

1:The summary financial information presented for the business line includes three figures. These are intended to show the following:
- what the plan was at the beginning of the year (**Planned Spending**);
- original spending plans plus additional spending Parliament has seen fit to approve in Supplementary Estimates in relation to new collective bargaining obligations and the Swissair accident investigation (**Total Authorities**);
- total expenditures incurred (**Actuals**).

Planned Results Commitments		Results
1.	Identification of safety failures in the marine, rail, pipeline and air transportation systems.	✔
2.	Reduction in risks to persons, property and the environment through the use of independent, credible and timely investigation findings by governments and industry.	✔

Our Accomplishments:

Overall, the TSB has been successful in identifying safety failures and in reducing risks in the transportation systems. All TSB investigations result in widely distributed reports identifying safety failures and, where appropriate, containing recommendations to reduce risks.

In 1999-2000, the TSB started 82 investigations and completed 81 reports that were released to the public, many of which were for investigations initiated in previous years. In addition to these reports, the TSB issued a total of 36 safety outputs (recommendations, safety advisories and information letters) as indicated in figure 1.

The TSB started 82 investigations and released 81 investigation reports in 1999-2000.

It should be noted that in recent years the TSB has adopted a more open and collaborative approach in its investigations. More information is provided to the persons with a direct interest in the findings throughout the investigation process permitting them to take immediate safety actions. It is now frequent practice to observe safety actions being taken by industry and governments during the course of the TSB investigations. Rather than issuing recommendations, the TSB then can report on the corrective actions already taken by industry and government agencies.

Figure 1

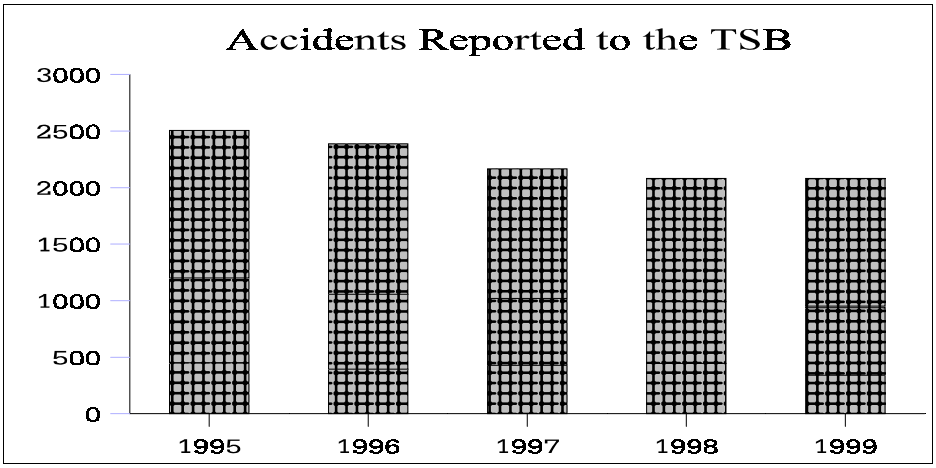
TSB Safety Outputs			
	1997	1998-1999	1999-2000
Recommendations	13	16	14
Safety Advisories	16	21	10
Information Letters	6	11	12
Safety Actions Taken During Investigations *	103	191	63

* In previous years safety actions taken during investigations were computed on the basis of the calendar year but with the change to the Act in 1998, these actions will now be reported on a fiscal year basis. For 1998-1999, to bridge the gap, the numbers are for a 15 month period beginning with 1 January 1998.

The number of reported accidents has decreased by 15% since 1995.

In 1999, a total of 2,141 accidents and 1,264 incidents were reported in accordance with the TSB's regulations for mandatory reporting. There were also 488 voluntary incident reports. The number of accidents in 1999 increased by 3% from 1998, but has decreased by 15% since 1995. This reduction cannot be attributed to the efforts of any specific organization. Improvements in transportation safety are the result of the combined efforts of many participants including manufacturers, carriers, crews, regulators, as well as the TSB. The numbers are also affected by changes in activity levels.

Figure 2 (numbers are by calendar year)



In order to help assess its contribution to the advancement of safety the TSB assesses the responses to its recommendations. In 1999-2000, the TSB received responses to 20 recommendations, some relating to recommendations issued in the previous year. The results of this assessment are shown in figure 3.

Figure 3

Assessment of Responses to TSB Recommendations - Current Year						
1999-2000 (Year response received)	Fully satisfactory attention to safety deficiency	Satisfactory intent to address safety deficiency	Attention to safety deficiency satisfactory in part	Unsatisfactory attention to safety deficiency	To be assessed	Total
Marine	0	4	2	0	0	6
Pipeline	1	0	0	0	0	1
Rail	0	3	0	0	2	15
Air	4	4	0	0	0	8
Total	5	11	2	0	2	20

Over a longer time frame, the response to TSB recommendations is very positive. Figure 4 illustrates the assessment of responses to TSB recommendations issued since 1990. Over the past year, the TSB has noted an improvement in the attention given to reducing or eliminating the safety deficiencies identified, especially by Transport Canada.

Figure 4

Assessment of Responses to TSB Recommendations (1990-1999)						
	Fully satisfactory attention to safety deficiency	Satisfactory intent to address safety deficiency	Attention to safety deficiency satisfactory in part	Unsatisfactory attention to safety deficiency	To be assessed	Total
Marine	44	30	23	6	0	103
Pipeline	14	17	2	1	0	34
Rail	67	39	30	35	2	173
Air	92	48	33	49	0	222
Total	217	134	88	91	2	532

Furthermore, a number of safety actions were undertaken by the industry and by government before the TSB completed its investigations and issued reports (refer to figure 1). These safety actions are also the result of TSB efforts to identify safety deficiencies.

On September 2, 1998 Swissair flight 111 crashed into the ocean off the coast of Peggy's Cove, Nova Scotia fatally injuring all 229 occupants on board. This resulted in the most complex transportation accident investigation ever in Canada. Since that date TSB staff have worked tirelessly on this investigation. Costs of $46.4 million have been incurred to date. Six interim recommendations and 2 safety advisories have been issued to Canadian, American and European authorities, resulting in a number of safety actions to reduce risks. Safety actions initiated to date include:

- the removal of metalized mylar thermal acoustical insulation blankets in some 1,500 aircraft and its replacement with other materials
- the review of flammability test criteria and methods used by regulatory authorities and commitment to change
- the preventive inspection and repair of wiring particularly in MD-11 and similar aircraft
- the preventive inspection and repair of map reading lights in MD-11 aircraft
- the removal of similar in-flight entertainment systems in other Swissair aircraft
- the review by regulatory authorities of specifications for flight recorder recording capacity and power supply
- the modification of standard operating procedures for aircraft to land immediately upon detection of smoke in the cabin.

This single investigation has already led to significant advancements in transportation safety. However, the investigation is still on-going as a number of safety deficiencies with potential for safety actions have yet to be fully analyzed.

Planned Results Commitments		Results
3.	Public access to safety information and recommendations through innovative and cost-effective information methods and technologies.	✔
4.	Awareness by Canadians of the TSB's role in advancing transportation safety.	✔
5.	Enhancing our communication tools to enable those who can influence change to have the means to quickly and easily obtain required safety information, this includes the Canadian public.	✔

Our Accomplishments:

In 1999-2000, the TSB published 81 occurrence reports, as well as monthly and annual statistical reports. The TSB continues to publish the *Reflexions* safety digest for each transportation mode. These digests contribute to the advancement of transportation safety by reflecting on the safety lessons learned from accident and incident investigations. Extremely positive feedback has been received from around the world on these publications. In 1999-2000, the TSB published 4 issues with a constant readership estimated at 100,000.

The TSB web site is averaging 200,000 hits per month.

The TSB makes use of its Internet site to make all its reports and other transportation safety information available to Canadians. This initiative has proven to be a cost-effective way of disseminating information. Planning documents such as this report, the annual report and others were added to the site in last fiscal year. The site is averaging 200,000 visits per month**.** This represents a tenfold increase in traffic over the past 18 months. A large portion of this increase is due to the on-going significant interest in the Swissair flight 111 investigation. However, traffic to other portions of the TSB web site has also increased significantly. Visitors to the site are Canadians and people from all around the world.

The TSB has successfully implemented an electronic occurrence data sharing system with Transport Canada. It is anticipated that this will facilitate the fulfilment of their mandate by providing direct access to the "live" TSB occurrence database. Further, a user trial was initiated with industry to assess the utility of a web-based database access system, with the view to developing an effective method to improve the availability of occurrence data to industry and the public at minimum cost.

The TSB also publishes on a yearly basis a leaflet entitled *Key Safety Issues* . The TSB's annual report for 1999-2000 contains the yea r 2000 version which outlines those issues that in the Board's opinion pose enough risk to transportation safety to justify extra efforts by the transportation industry and government agencies to prevent further accidental losses. The TSB believes that by highlighting such safety issues it can increase the awareness of industry and governments, with a view to the implementation of safety actions which will reduce or eliminate the attendant safety risks.

For the most part, the TSB performs its work outside of the public eye, garnering media attention only in the first few days following a high profile accident. However, people closer to the investigative process know that a thorough investigation and analysis take time, and that those first few days in the field are only the beginning of a prolonged team effort. This all changed with the Swissair Flight 111 crash in September of 1998, from

day one the media attention has been intense and regular. For example CNN has dedicated hours to briefings provided by the investigator-in-charge and members of his team. The interest of the next-of-kin has also been very intense and constant, understandingly, but the response to their demands has added to the time of the investigation process and has undoubtably created a precedent for future investigations. This change is not limited to major investigations. We are also experiencing increased interest of this nature in mid-sized investigations.

Feedback from the media is generally favourable to the TSB and findings are well communicated to Canadians in both the printed and electronic media. The media coverage of the Swissair accident certainly helped to bring the message to many Canadians. Overall, recognition of the TSB's name by the media and the public continues to increase. More and more Canadians now recognize the TSB name and can make a distinction between TSB and Transport Canada. As the TSB becomes better known the demands for both its work and the timeliness of that work increase.

The TSB continues to make efforts to make itself better known to Canadians. Particular efforts are made on an on-going basis to explain to Canadians the role of the TSB in advancing transportation safety. One of the mechanisms used to promote the TSB to Canadians is the participation of the TSB Chairperson in the public release of high-profile occurrence reports. This year the release of the Board's report on the Air Canada crash in Fredericton, New Brunswick and the release of the report on the sinking of the Flare in Halifax, Nova Scotia gave the Chairperson and the TSB the opportunity to meet with regional members of the transportation community and the local media. These meetings were well received by the community and the media. The Chairperson also met with representatives of the local communities of Lévis and Mont St. Hilaire, Quebec following the high profile derailment of a train containing large quantities of petroleum products and the subsequent huge fire.

Planned Results Commitments		**Results**
6.	Increasing the proportion of reports that meet the one year standard for publication.	☐
7.	Satisfaction with quality and timeliness of findings and recommendations.	☐
8.	Finalizing a performance measurement framework with appropriate indicators.	☐

Our Accomplishments:

The TSB has previously stated its goal of producing a final report within one year of the occurrence. As of 31 March 2000, there were 71 investigations that had been in process for more than a year. Of these 71 investigations, 27 were assessed as having potential for significant safety improvement. Notwithstanding the emphasis placed on report timeliness by the Board, adherence to the one-year standard has yet to be achieved. For the 81 reports completed in this period, the average time in process was about 21 months, up from 18 months in 1998-1999, as shown in figure 5.

The TSB did not meet its one-year standard for the completion of investigations.

In 1999-2000, the backlog of investigations in process increased by 1% compared to 1998-1999 (144 ongoing investigations vs.142). However, there has been a 13% reduction since 1995-1996.

Figure 5

TSB Productivity*

	Marine		Rail / Pipeline		Air		Total	
	1998-1999	1999-2000	1998-1999	1999-2000	1998-1999	1999-2000	1998-1999	1999-2000
Investigations started	25	26	12	13	44	43	81	82
Investigations completed	44	27	24	14	51	40	119	81
Average duration of completed investigations (# of days)	624	685	648	842	416	527	560	636

* These numbers are based on the fiscal year.

In 1999-2000 the TSB mandated an independent contractor to conduct a survey of "Persons with a direct interest in the findings of the TSB". This target group included: manufacturers, operators, survivors, next of kin and regulators. The objectives of this survey were to measure the degree of satisfaction on the quality and the timeliness of the TSB's work, and to establish a base line measure for future performance assessments. Overall, satisfaction and confidence in the TSB is high among persons with a direct interest (see key survey results in figure 6). Close to 86 per cent of people surveyed have a good or excellent opinion of the TSB. Work done by the TSB is regarded as beneficial

"She understand the need for the slow, detailed process. She wants the real reasons for the crash to come out so it doesn't happen again. She thinks the Canadian investigators are doing an excellent job."

(Comments from a Swissair next of kin, the Ottawa Citizen, August 2000)

to the general public and final reports are felt to be unbiased and technically sound. The investigation process is considered good. Approximately 80 per cent of people surveyed indicate that the identification of safety deficiencies and TSB recommendations are well received. Most persons with a direct interest state that the TSB needs to improve the timeliness of its reports. Complete survey results will be available on the TSB web site.

Figure 6

Key PDI Survey Results (in %)					
	Excellent	Good	Fair	Poor	Don't Know
Overall opinion of TSB	38	48	12	2	-
TSB advances transportation safety	41	45	7	7	-
Investigation process	22	55	15	5	3
TSB reports	28	56	11	5	-
Report timeliness	13	44	25	18	-
Recommendations	11	59	11	2	17

There are a number of factors contributing to the lack of timeliness of reports. The on-going Swissair flight 111 investigation continues to consume considerable resources that cannot be made available for other investigations. Staff turnover, combined with difficult recruitment and a very long training process, also impedes the timely completion of reports. Numerous external pressures, including government-wide initiatives such as the Universal Classification System and the Financial Information Strategy implementation, have also had an impact. However, the TSB has undertaken a number of measures to address this issue of timeliness and improve its performance.

In accordance with its Integrated Safety Investigation Methodology (ISIM), the TSB has defined precise specialized training profiles for all operational employees. Over the past two years, all investigators were trained on ISIM, in project management and in team

leadership. In 1999-2000 the TSB invested $1,038,000 in training and development activities; an average of $4,783 per full-time employee. Similar training programs are now held on a periodic basis for all new investigators. This extensive training program will help improve productivity.

Employee retention is a significant obstacle to achieving the one year standard. The generally lower government salary scales for specialists compared with industry makes it difficult for the TSB to recruit and retain highly skilled professionals. The TSB must therefore constantly renew itself and develop new personnel. The ability to recruit and retain staff has been curtailed by increased workloads and reduced levels of resources in both the operations areas and in the Human Resources area. In 1999-2000 the TSB recruited 6 investigators while 9 retired or left to pursue other career alternatives. This problem will require particular attention over the next few years if the TSB is to increase its overall skill levels and maintain its readiness to respond to occurrences. The need to have back up capacity has been felt particularly with massive resource requirements for the Swissair investigation. Plans are currently being prepared to develop a recruitment campaign and a developmental program for investigators. These measures will ensure that the TSB can maintain an adequate staff complement to meet operational requirements.

In 1999-2000 the TSB recruited 6 investigators while 9 retired or left to pursue other career alternatives.

A new time accounting system was implemented in April 2000 to permit the measurement of the effort involved in each investigation. This tool will enable management to better allocate and manage the human resources available, while also facilitating the costing of various activities and projects.

The TSB has also recently commissioned an independent review of its capacity to fulfill its mandate within the current resource level. This review will examine the current trends and pressures that could affect the TSB over the next five years and assess their impact on resource requirements. The results of this review will be used by TSB management to discuss future resource requirements with Treasury Board officials. It is expected that incremental resources will be required in order for the TSB effectively do its job.

The development of a comprehensive performance management framework is progressing well. Work was undertaken on the implementation of activity based costing. A baseline assessment of comptrollership was completed. A survey of persons with a direct interest was completed and a survey of other stakeholders is being planned. A quality assurance program is being developed and implemented. These initiatives are the building blocks that will form a comprehensive performance management framework when they are all brought together and integrated. It is expected that another 18 months

will be required to fully implement and to report on the basis of the new performance management framework. The TSB wants to ensure that performance measurement is done not only to satisfy government requirements, but also to assist in the planning and management of operations.

More work is needed in this area for the TSB be able to report meaningfully on its performance.

The TSB is encountering some difficulty in defining good performance measurement indicators due to the fact that it is but a single (small) player among many with responsibilities for advancing transportation safety. It is virtually impossible to measure accurately the impact of the TSB on transportation safety. No two investigations are identical. Some lead to significant safety improvements, and some do not. There is no good way to link costs incurred by the TSB directly to specific improvements in transportation safety. More work is needed in this area for the TSB be able to report meaningfully on its performance.

Planned Results Commitments		Results
9	National and international recognition of the Board as an authoritative and independent resource in the area of transportation safety.	✔

Our Accomplishments:

The TSB provides accident investigation services relating to short-line railways to the province of Ontario.

The TSB is very well recognized at both the national and international levels. A number of Memoranda of Understanding have been negotiated to facilitate cooperation with other Canadian organizations. These organizations recognize the professionalism and expertise of the TSB in its field of competence and have come to rely on the TSB's findings. This recognition transcends the federal and provincial jurisdictions. For example, at the request of the provincial government the TSB has successfully conducted an investigation into a short-line railway accident in Temagami, Ontario. The TSB also provided specialized assistance in human factors to assist in the investigation of a mining incident in northern Ontario.

The Canadian transportation industry has also developed a high level of confidence in the work of the TSB. This is demonstrated by numerous invitations to present papers and to participate in various conferences and technical meetings related to transportation safety. Examples include the Aero Vision 2000 conference, the Canadian Aviation Safety Seminar, the National Association of Chief Coroners and Chief Medical Examiners conference, and meetings of the Railway Association of Canada, the Canadian Energy Pipeline Association, the Canadian Marine Advisory Council, the Canadian maritime Law Association, Maritech 99, the Association québécoise des transporteurs aériens, the Northern Air Transport Association, the Air Transport Association of Canada and many others.

> "My experience was that the people at the TSB always exhibited both professionalism and integrity."
>
> *(Quote from a senior official of a transportation industry association)*

The TSB's engineering facilities continue to be of particular interest to officials from government, industry and academia. A number of visits and briefings were provided to enhance awareness and understanding of how scientific methods and technology are used during TSB investigations. In particular, the TSB's flight recorder playback capabilities attract world-wide attention. The *Recorder Analysis and Presentation System* (RAPS) developed by the TSB is currently in use under licensing agreement by six other countries: the USA, Germany, France, Australia, Finland and Taiwan. A total of nine foreign government safety agencies currently contribute to a cost sharing agreement to further enhance and develop this system. This initiative has permitted a much bigger investment in the improvement of this system than the TSB alone could afford.

> Foreign country contributions have increased fourfold the TSB investment in the enhancement of the RAPS used to analyse the black boxes retrieved from aircraft accidents.

The Integrated Safety Investigation Methodology training program developed by the TSB has drawn a lot of interest amongst other safety organizations within and outside of Canada. Numerous requests have been received for participation in these training sessions. Although the TSB is not in the business of providing training to others, vacant seats in the investigator training sessions have been offered to representatives of other transportation safety agencies. To date participants from the United States and the Netherlands have benefited from this training program.

The TSB actively supports the work of two organizations of the United Nations: the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO). The TSB has participated in the delivery of marine accident

investigation courses sponsored by the IMO and given annually to third world country representatives at the International Maritime Academy at Trieste, Italy. TSB staff have regularly supported the Canadian delegation to the IMO Maritime Safety Committee, Flag State Implementation Sub-Committee, and Ship Design and Equipment Sub-Committee meetings. The TSB also participated in the International Electrical Committee Voyage Data Recorder Working Group and the National Transportation Safety Board sponsored conference on transportation recorders. The TSB led the Canadian delegation to the ICAO Accident Investigation Group meeting and will coordinate Canadian comments in response to ICAO issued state letters resulting from that meeting. The TSB has also been granted observer status at the annual meetings of European Civil Aviation Accident Investigation Group of Experts.

The TSB also participates in such international associations as the Marine Accident Investigators International Forum, the International Society of Air Safety Investigators, the International Ergonomics Association and the Flight Safety Foundation.

II.4 Other Performance Issues to Note

Government Wide Priorities

The TSB has contributed to the achievement of two of the government wide priorities set out in the Speech from the Throne in October 1999.

The TSB has contributed to a **Strong and United Canada** by working on a collaborative basis with the provinces. Collaborative arrangements are in place with the Chief Medical Examiners of each province. Arrangements are also in place with a number of provincial governments with respect to short-line railways under provincial jurisdiction. These arrangements call for the TSB to provide accident investigation services to the provinces (refer to page 19 for specific accomplishments). Rather than developing their own expertise, the provinces have chosen to seek assistance from the TSB on a cost-recovery basis. These arrangements provide the provincial governments with a cost-effective and efficient response to their needs.

The TSB has also contributed to **Canada's Place in the World** by participating in a number of international initiatives led by the International Maritime Organization and the International Civil Aviation Organization (refer to pages 20-21 for details). Canada is recognized as a world leader in the field of transportation accident investigation. The TSB's flight recorder system is used under licence by six other countries and the Integrated Safety Investigation Methodology is attracting considerable interest from other safety organizations. The TSB is frequently called upon by foreign governments to assist in portions of investigations of accidents within their country. Furthermore, the TSB's

work on the Swissair flight 111 investigation has demonstrated the technical expertise and competence of our people and has won praise from all over the world.

Service Improvement Initiative

The TSB has undertaken work towards the government wide commitment to improve Canadian's satisfaction with government service delivery. The first step was to conduct a survey of persons with a direct interest in the TSB's findings in order to establish a baseline against which improvements can be measured. This survey was completed in 1999-2000 (refer to pages 16-17 for details). Initiatives are now underway to address the areas in need of improvement, with a particular emphasis on improving the timeliness of reports.

The TSB is also involved in inter-departmental efforts to define the role of the federal government in providing assistance to families of transportation accident victims. This initiative arose in the aftermath of major aircraft accidents around the world over the past two years and the growing demands of families for information.

The TSB is also currently reviewing its Regulations in order to streamline the reporting requirements imposed on the transportation industry and to simplify the language used in order to facilitate its understanding by all Canadians.

Financial Information Strategy and Universal Classification System

The TSB is actively working on the implementation of the government's Financial Information Strategy and the preparatory work for the implementation of the Universal Classification System. The TSB is currently on target to meet the government wide implementation time lines on both initiatives. However, both initiatives are consuming considerable TSB resources not only from the Corporate Services area but also from the Operational areas.

Section III: Consolidating Reporting

III.1 Modernizing Comptrollership

Although the TSB is not one of the pilot departments, in 1999-2000 the TSB completed a base line assessment of the status of comptrollership within the organization. This assessment was done using the Financial Capability Model developed by the Office of the Auditor General of Canada. The results of this assessment will be available on the TSB web site. Using the results of the base line assessment, a multi-year work plan is currently being developed to define the TSB's priorities and strategies for modernizing comptrollership. As a leader among small agencies on the implementation of this government initiative, the TSB has made a commitment to share its experience with other small agencies.

III.2 Materiel Management

In preparation for the implementation of the Financial Information Strategy and accrual accounting, the TSB has completed a full inventory of its capital assets and stocks of consumable materials. The historical cost of these assets have been identified and the current depreciated value has been calculated. This process revealed that many TSB assets are old and in need of replacement. A new computerized asset management system was purchased and will be implemented shortly. This system will be fully integrated with the TSB's financial management system. Work on the determination of asset life cycles is almost completed and will serve as a basis for the development of multi-year capital asset replacement plans. The identification and valuation of stocks of consumable materials has also been completed and areas for reductions in the stocks on hand have been identified.

The TSB has also recently undertaken the restructuring of its materiel management function. Roles and responsibilities have been clarified. Contracting and procurement activities will be more closely integrated with the management of assets. New competency profiles will be developed for all materiel management staff and a developmental training program will be implemented to upgrade the skills and knowledge of staff.

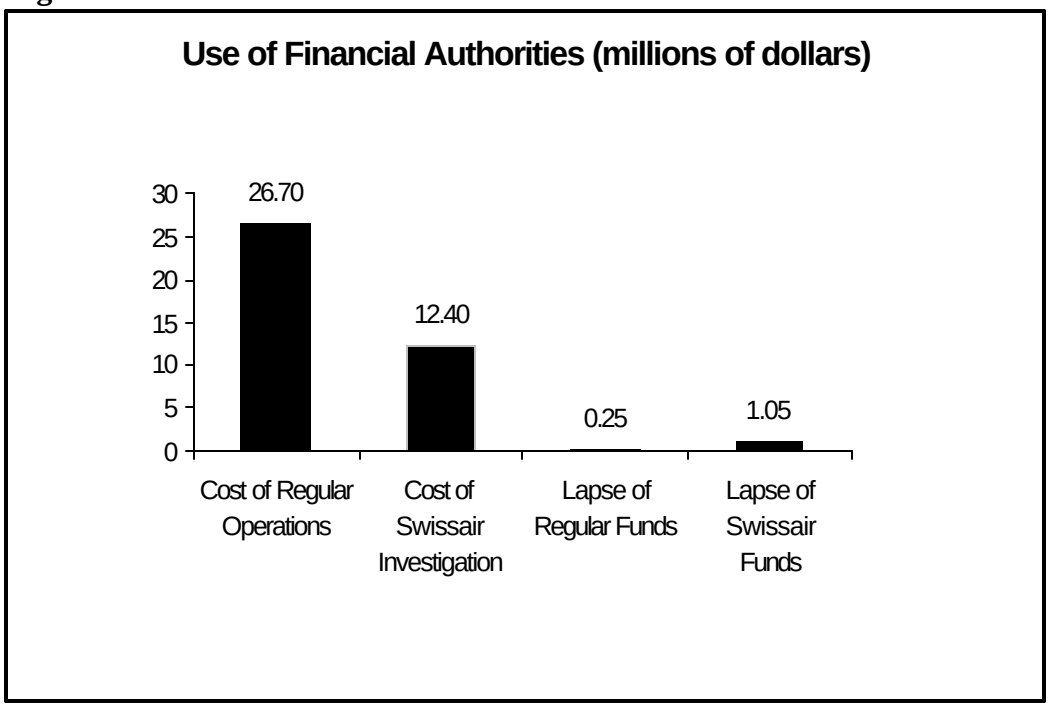
Section IV: Financial Performance

IV.1 Financial Performance Overview

The TSB started the year with authorities of $23.3 million. Supplementary Estimates in the amount of $15.4 million were then approved for the carry-forward of the previous year's lapse, collective bargaining adjustments and for the extraordinary costs of the Swissair Flight 111 investigation. Transfers in the amount of $1.8 million were also made from Treasury Board votes thereby increasing total authorities to $40.4 million. In 1999-2000, the TSB spent $39.1 million of its $40.4 million total authorities. The lapse of $1.3 million is due to lower spending than anticipated on the Swissair investigation and an unused balance of approximately $250,000 in salaries due to job vacancies.

The total expenditures of the TSB, minus Swissair, represent an approximative cost of $0.84 per Canadian citizen. With Swissair investigation costs included, the number rises to $1.28 per Canadian citizen. For this amount Canada maintains the capability to investigate major failures in four different modes of the national transportation system.

Figure 7



IV.2 Financial Summary Tables

The following tables are the only ones that apply to the TSB:

Table 1: Summary of Voted Appropriations

Table 2: Comparison of Total Planned Spending to Actual Spending

Table 3: Historical Comparison of Total Planned Spending to Actual Spending

Financial Table 1: Summary of Voted Appropriations

Financial Requirements by Authority ($ millions)			
Vote	**Planned Spending**	**1999-2000 Total Authorities**	**Actual**
Canadian Transportation Accident Investigation and Safety Board			
15 Operating expenditures	20.3	37.0	35.7
(S) Contributions to Employee Benefit Plans	3.0	3.4	3.4
Total Department	**23.3**	**40.4**	**39.1**

Total Authorities are Main Estimates plus Supplementary Estimates plus other authorities.

Note: Total Authorities and Actual expenditures are significantly higher than Planned Spending due to the Swissair accident investigation and new collective bargaining obligations.

Financial Table 2 : Comparison of Total Planned Spending to Actual Spending

Departmental Planned versus Actual Spending ($ millions)			
	1999-2000		
Business Line	**Planned**	**Total Authorities**	**Actual**
FTEs	234	234	217
Operating	22.8	39.8	37.8
Capital	0.5	0.6	1.3
Grants & Contributions	-	-	-
Total Gross Expenditures	**23.3**	**40.4**	**39.1**
Less:			
Respendable Revenues	-	-	-
Total Net Expenditures	**23.3**	**40.4**	**39.1**
Other Revenues and Expenditures			
Non-respendable Revenues	-	-	-
Cost of services provided by other departments	2.6	2.6	2.5
Net Cost of the Program	**25.9**	**43**	**41.6**

Note: Total Authorities and Actual expenditures are significantly higher than Planned Spending due to the Swissair accident investigation and new collective bargaining obligations.

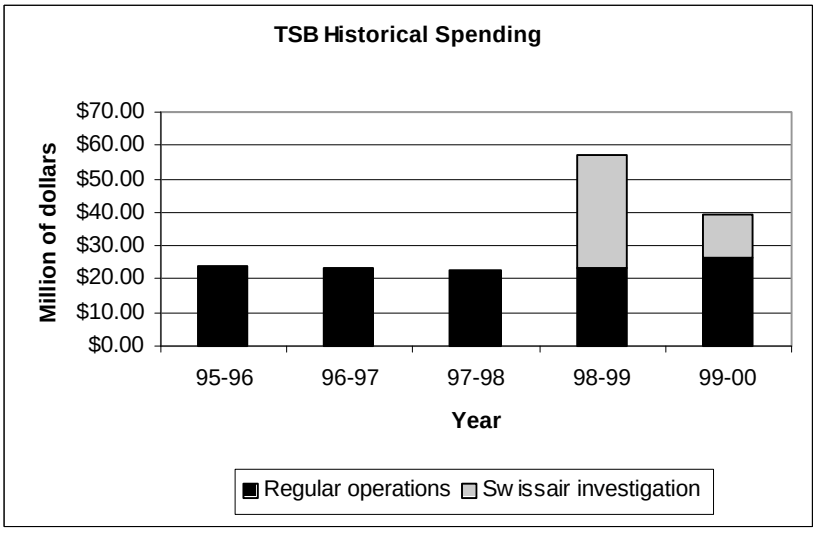
Financial Table 3: Historical Comparison of Total Planned Spending to Actual Spending

Historical Comparison of Departmental Planned versus Actual Spending ($ millions)					
			1999-2000		
	Actual 1997-1998	Actual 1998-1999	Planned Spending	Total Authorities	Actual
Canadian Transportation Accident Investigation and Safety Board	22.7	57.3	23.3	40.4	**39.1**
Total	**22.7**	**57.3**	**23.3**	**40.4**	**39.1**

Total Authorities are Main Estimates plus Supplementary Estimates plus other authorities.

Note: Total Authorities and Actual expenditures are significantly higher than Planned Spending due to the Swissair accident investigation and new collective bargaining obligations.

Figure 8



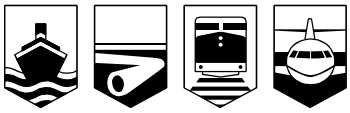
In 1998-1999 and 1999-2000 spending is much higher due to Swissair investigation costs of $34.0 million and $12.4 million respectively.

Section V: Departmental Overview

V.1 Mandate, Vision and Mission

The Transportation Safety Board of Canada (TSB) is an independent agency created in 1990 by an Act of Parliament (*Canadian Transportation Accident Investigation and Safety Board Act*). Under this legislation, the TSB's only object is the advancement of transportation safety in the federally regulated elements of the marine, rail, pipeline, and air transportation systems. This mandate is fulfilled by conducting independent investigations including, when necessary, public inquiries into transportation occurrences. The purpose of these investigations and inquiries is to make findings as to the causes and contributing factors of the occurrences and to identify safety deficiencies which in turn may result in recommendations designed to improve safety and reduce or eliminate risks to people, to property and to the environment. The TSB has the exclusive authority to make findings as to causes and contributing factors when it investigates a transportation occurrence.

Our Mission: to advance transportation safety.



The jurisdiction of the TSB includes all transportation occurrences in or over Canada. The Board may also represent Canadian interests in foreign investigations of transportation accidents involving Canadian registered, licensed, or manufactured ships, railway rolling stock, or aircraft. In addition, the Board carries out some of Canada's obligations related to transportation safety at the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO).

Our Vision is to:

- reduce safety risks in the Canadian transportation system through the provision of relevant, timely and accurate information and compelling arguments for change.
- tailor our communications to meet the needs of the different interested groups.
- employ effective and efficient processes driven by multi-disciplinary teams with clear accountability and responsibilities, and by the TSB's core values.
- provide a positive work environment where the staff have the opportunity to develop the necessary functional, process and interpersonal skills to excel.

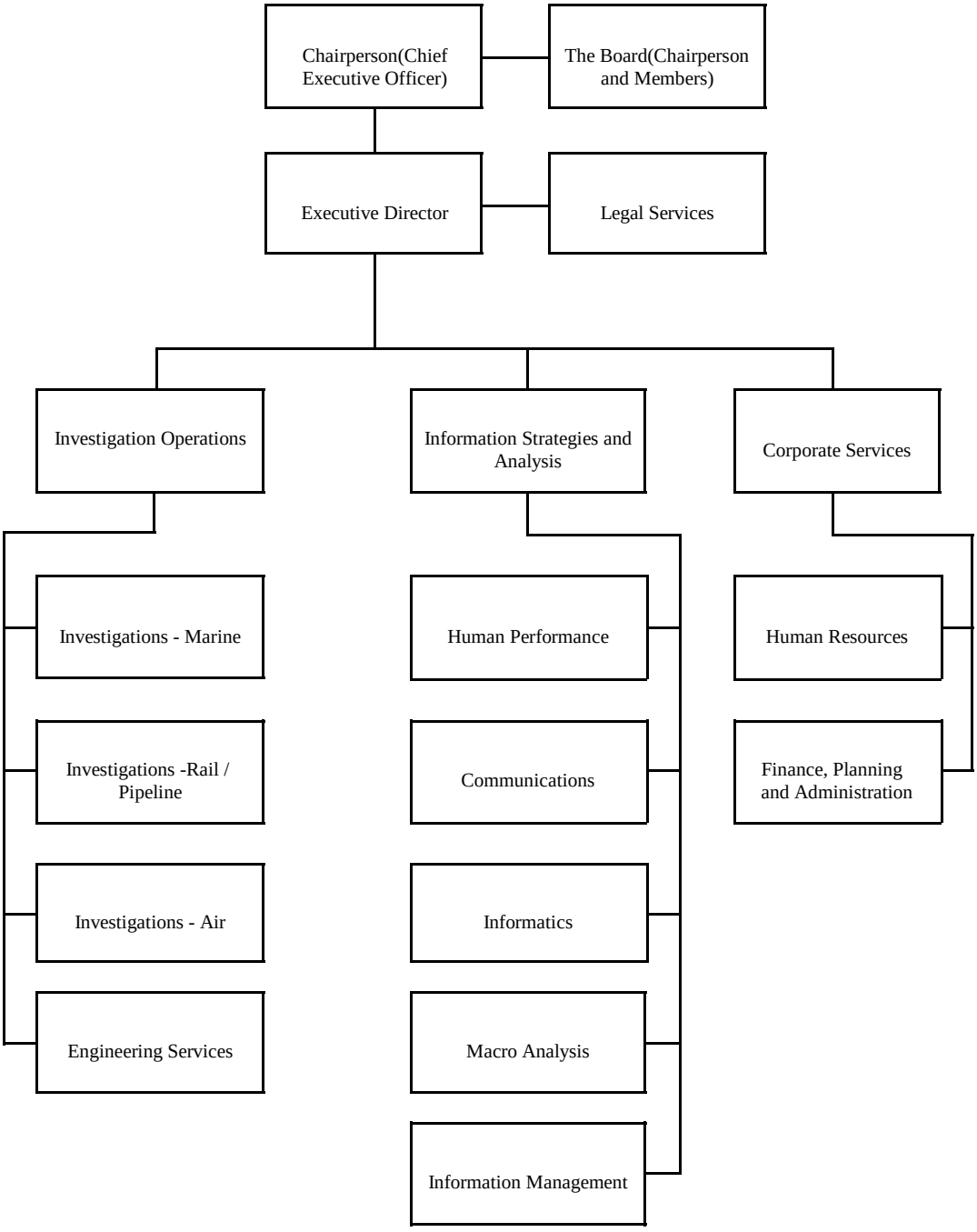
V.2 Departmental Organization

The TSB provides services to Canadians in general and to various identifiable groups such as manufacturers, owners, operators and regulators within the transportation system through one business line: the advancement of transportation safety. This business line is then sub-divided into two service lines: Investigations and Corporate Services.

The Investigations service line consists in the conduct of independent investigations into transportation occurrences involving ship, railway, pipeline and aircraft operations and the preparation of reports on the findings and any safety deficiencies identified, including recommendations based on the findings. This service line includes the activities of the Investigation Operations Directorate, the Board Members' office, and the activities of the Human Performance Division and the Macro Analysis Division of the Information Strategies and Analysis Directorate.

The Corporate Services service line consists in the provision of internal management and support services in the areas of human resources, finance, administration, informatics, policy and planning, and communications. This service line includes the activities of the Corporate Services Branch, and the activities of the Communications, Informatics and Information Management Divisions of the Information Strategies and Analysis Directorate.

Figure 9: TSB Organizational Chart



Section VI: Other Information

VI.1 Contacts for Further Information

For further information you may contact:

Jean L. Laporte
Director, Corporate Services
Transportation Safety Board of Canada
Place du Centre
200 Promenade du Portage
4th Floor
Hull, Quebec
K1A 1K8

E-Mail: jean.laporte@tsb.gc.ca
Telephone: (819) 994-8004
Facsimile: (819) 997-2239

Additional information is also available on the TSB departmental web site at:
www.tsb.gc.ca

VI.2 Legislation Administered and Associated Regulations

The TSB has sole responsibility to Parliament for the following Acts and associated Regulations:	
Canadian Transportation Accident Investigation and Safety Board Act	R.S.C., 1998, c. 20

A copy of the *Canadian Transportation Accident Investigation and Safety Board Act* is available on the TSB web site. Associated regulations are available in printed format only.

VI.3 Statutory Annual Reports and Other Departmental Reports

Under its legislation the TSB must report to Parliament on its activities, findings and recommendations for each fiscal year. The *1999-2000 Annual Report to Parliament* is available from the TSB upon request. The legislation also requires that the Auditor

General of Canada conduct an annual audit of the TSB's accounts and transactions and that the audit report be laid before each House of Parliament. The 1999-2000 financial statements and audit report are also available from the TSB upon request.

The TSB reports publicly on all its investigations. All TSB investigation reports since 1995 are available on the TSB web site. The TSB also publishes periodic statistical reports for each one of the four transportation modes. These reports are also available on the TSB web site. Finally, the TSB publishes a periodic safety magazine titled *Reflexions*.

Appendices

A - Description of TSB Investigation Process

B - TSB Cooperation / Interaction

C - Internet Addresses for Other Organizations

Appendix A
Description of TSB Investigation Process

The TSB has the discretion to choose which occurrences to investigate. In essence, the TSB's policy is to investigate the occurrences which have a reasonable potential to result in safety action or which generate a high degree of public concern for transportation safety.

The TSB's operating philosophy is one of openness, fairness, competence and integrity. Thus, investigations and public reports are designed to maximize information to advance safety while respecting the rights of those involved.

Occurrence Classification Policy

Approximately 3,500 transportation occurrences are reported to the TSB each year in accordance with its reporting requirements. Practical considerations dictate that only a small proportion of these be investigated. Numerous occurrences warrant a TSB investigation in that they offer potential for acquiring new knowledge of the underlying safety deficiencies compromising safe transportation operations. But most reported occurrences by themselves offer little scope for adding to the TSB's knowledge of the underlying safety deficiencies. However, a broad examination of sets of such occurrences involving similar phenomena or contributory factors is at times warranted.

Effective resource management and the advancement of transportation safety will depend upon the TSB's timely identification of individual occurrences, as well as unsafe situations or conditions, with potential for significant safety payoff. To this effect, the TSB has developed a five level classification system. Each occurrence is classified based on a risk assessment process and a decision is made whether to investigate or not.

The primary criterion for determining if an occurrence in any mode will be investigated is whether or not such analysis is likely to lead to a reduction of risk to persons, property, or the environment. Other criteria include:

- consideration of any TSB obligations or commitments under international agreements, assistance to the provinces or other nations, etc.
- consideration of the degree of public expectation of a TSB investigation.

The complete occurrence classification policy and the detailed considerations for the assessment of risk are described on the TSB Internet site.

Investigation Process

Field Phase

The number of investigators deployed to an occurrence site to conduct an investigation varies from one investigator for a relatively straight forward investigation to upwards of 20 to 30 for a major investigation*. The field phase can last from one day to several weeks or more. In all cases, an investigator-in-charge is appointed to lead the investigation. Generally, the field phase includes examination of the occurrence site, field examination of the equipment, vehicle or wreckage, witness interviews, the collection of pertinent documents and the selection and removal of specific wreckage items for further examination.

Post-Field Phase

A large number of activities take place from the time that the investigation team returns from the occurrence site until the investigator-in-charge produces the initial draft report. This phase can take up to six months depending on the size and complexity of the investigation. Some of the activities which may be conducted during this phase are collection and examination of all pertinent Transport Canada / National Energy Board, company, vehicle and other records, interviews with company and Transport Canada / National Energy Board personnel, laboratory examination of selected wreckage, readout and analysis of recorders, simulation work and review of autopsy and toxicology reports. The investigator-in-charge, with the support of other investigators on the team, is responsible for collating and analysing all the information collected and for producing a draft report.

Report Production

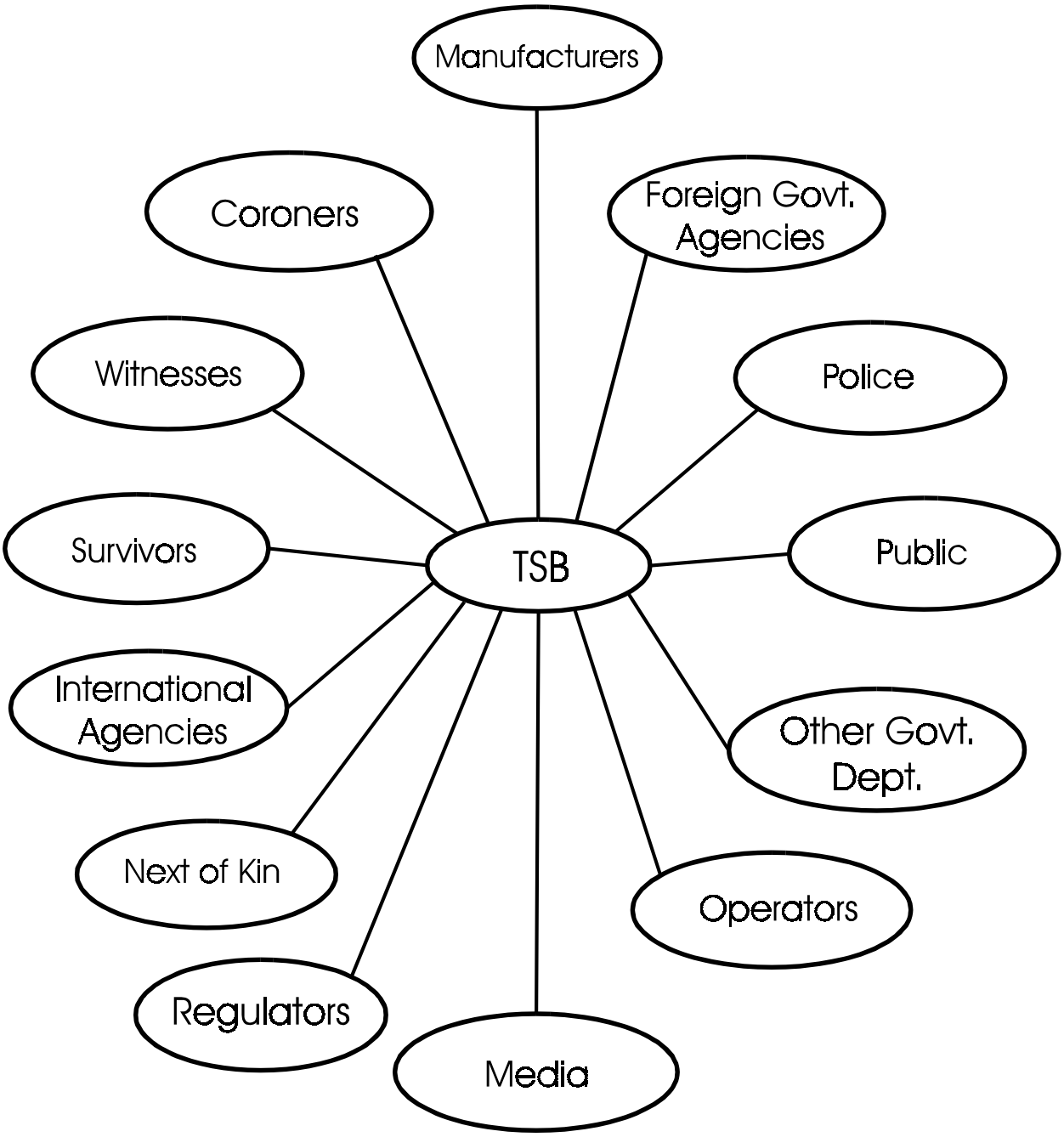
The draft investigation report is reviewed by the Board and may be accepted as the Board's draft report, amended or returned for further staff work. Once approved the Board's draft report is sent on a confidential basis to ¨persons with a direct interest in the findings¨ for review and comment. Comments received from persons with a direct interest are considered by the Board and may result in changes to the report. This process ensures both fairness and the accuracy of the report. The occurrence report is then finalized, printed and released to the public. The TSB performance standard is to release reports within one year of the date of the occurrence. However, occurrence reports for major, very complex or unusual investigations may take longer.

* Note: Swissair is outside the scope of the normal process and at the height of the activity, the TSB investigator-in-charge was directing or coordinating the efforts of approximately 4,000 government employees, contractors and volunteers. The field phase for this investigation has extended beyond the one year mark.

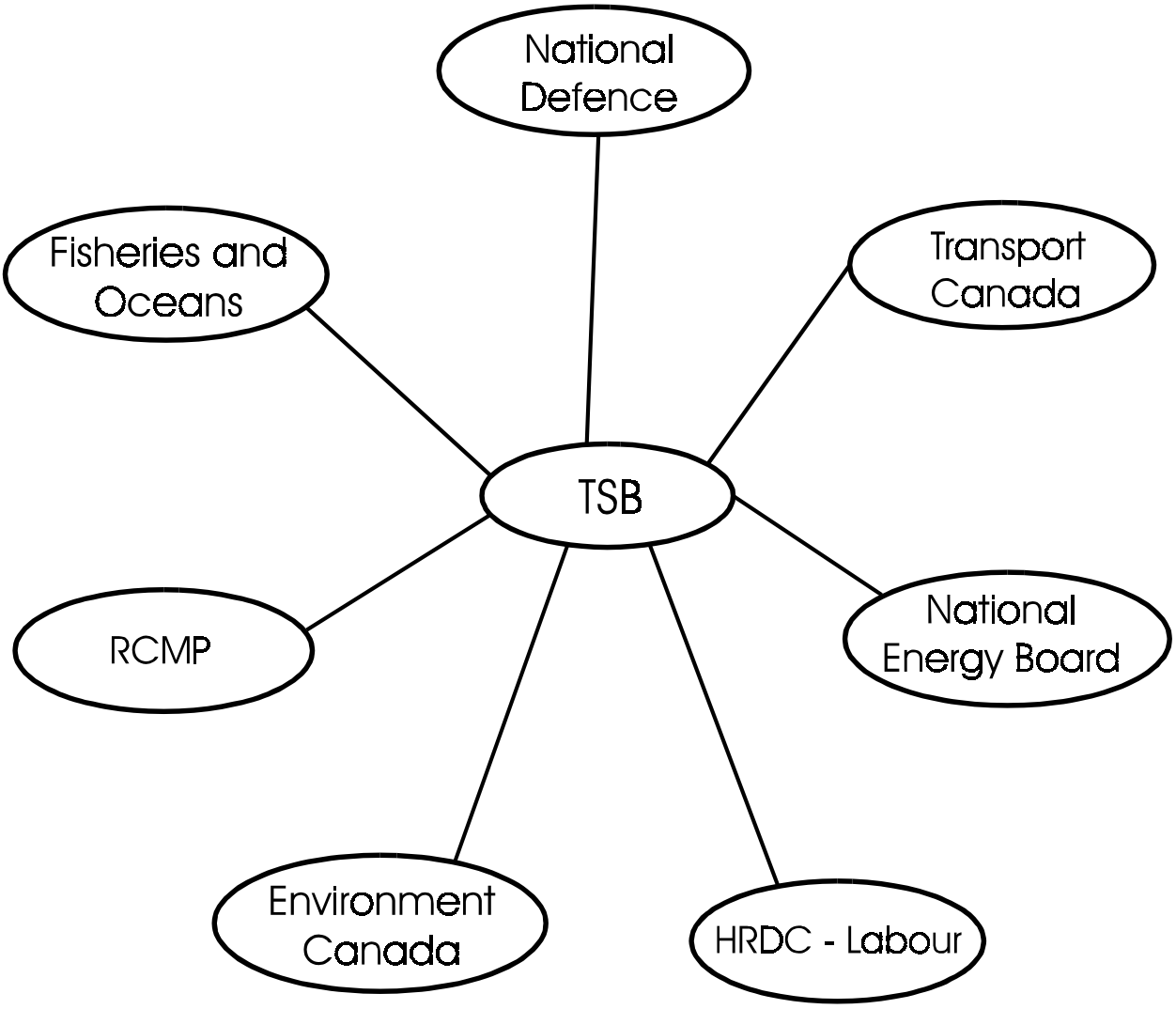
Key Safety Issues List

The TSB investigates and analyses specific accidents and incidents. It also monitors general trends and emerging safety issues, and maintains lists of significant safety concerns. There are a number of areas where the risk to safety is sufficient to warrant extra efforts by the transportation industry and government, to address these risks and reduce further accidental losses. The TSB believes that working together, participants in the Canadian transportation community can reduce or eliminate the safety deficiencies associated with these key safety issues. Each year, in conjunction with its Annual Report, the TSB reports this list of significant safety issues to Parliament. The most recent list of key safety issues is accessible on the TSB Internet site.

Appendix B
TSB Cooperation / Interaction



Appendix B
TSB Cooperation / Interaction (Federal Government)



Appendix C
Internet Addresses of Other Organizations

More information on transportation safety in Canada is available from other federal government agencies who also play a role in this area. The Internet addresses for the main organizations are as follows:

Transport Canada ..... www.tc.gc.ca

National Energy Board ..... www.neb.gc.ca

Fisheries and Oceans - Canadian Coast Guard ..... www.ccg-gcc.gc.ca

Canadian Transportation Agency ..... www.cta-otc.gc.ca

Royal Canadian Mounted Police ..... www.rcmp-grc.gc.ca

Human Resources Development Canada ..... www.hrdc-drhc.gc.ca

National Defence ..... www.dnd.ca

More information on transportation safety in selected countries is available on the following web sites:

United States
- National Transportation Safety Board . . . . . www.ntsb.gov
- Federal Aviation Administration . . . . . www.faa.gov

Australia
- Australian Transportation Safety Board . . . . . www.atsb.gov.au

France
- Bureau enquêtes accidents . . . . . www.bea-fr.org

United Kingdom
- Air Accidents Investigation Board . . . . . www.open.gov.uk/aaib

International
- International Civil Aviation Organization . . . . . www.icao.int
- International Maritime Organization . . . . . www.imo.org
- International Transportation Safety Association . . . . . www.itsasafety.org/ITSA

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