
**Department of Transport and Regional Services**

**Australian Transport Safety Bureau**

# ATSB Annual Review 2001

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# Contents

# Executive Director's message

This is ATSB's second Annual Review and covers the financial year from 1 July 2000 to 30 June 2001, the Bureau's second year of operation. While not a formal requirement, the Annual Review is prepared to consolidate key safety data and references for the information of our stakeholders and to improve accountability.

As detailed in this Review, ATSB had many safety achievements in 2000–01. In road safety, in addition to statistical analysis, research projects, vehicle safety investigation and administering the Federal Black Spot Program, we coordinated Australia's new National Road Safety Strategy for 2001–10 and the Action Plan for 2001 and 2002. The Strategy was launched by Deputy Prime Minister Anderson and State Ministers in November 2000. In marine safety, a final investigation report was released into the *Bunga Teratai Satu* grounding, with recommendations made for improving Great Barrier Reef safety. Captain Kit Filor served as chair of the Marine Accident Investigators International Forum. In aviation safety, major reports were released into the Bangkok QF1 747 overrun accident undertaken on behalf of the Thai authorities and into the Avgas contamination that had grounded thousands of smaller aircraft in Australia. ATSB also made important recommendations associated with the Whyalla Airlines accident investigation and the investigation into issues surrounding maintenance problems with Ansett's 767 fleet. In rail safety, progress was made in developing national best-practice investigation guidelines and in building a national occurrence database.

In Canberra, all Bureau staff and our technical analysis facilities were collocated in the refurbished ATSB building at 15 Mort Street. This will further assist the synergies and shared knowledge that were sought when ATSB was established. ATSB actively participated in the output pricing review process coordinated by the Department to meet Finance requirements for all our key outputs to be reviewed and benchmarked before the May 2002 Budget.

Key staff departures included two Directors and a Deputy Director. Director Dr Rob Lee, a human factors and air safety international

expert and former long-serving Director of BASI, retired in November 2000, while Director Carol Boughton, who had an international reputation in road safety and several years in aviation safety, retired in January 2001. Deputy Director Barry Sargeant, who had built his reputation with the Monarch 1993 air accident investigation, retired in May 2001. The one-person Sydney office was closed with the retirement of Frank Henry. I gratefully acknowledge the contributions made by Rob, Carol, Barry and Frank, and wish them all well.

In January 2001, ATSB was accepted as a member of the International Transportation Safety Association, whose membership includes the chairmen of key multimodal safety bodies such as Canada's Transportation Safety Board (TSB), the US NTSB, and the Dutch TSB. In 2000–01, the Bureau also made good progress in its preparedness for a major aviation accident investigation. This included participation in a large airport exercise, the conclusion of a consultancy by Gwyn Associates that provided guidance for improvement, establishment of a major accident control centre, improved equipment for investigators, and a five-day major accident management training course by a group of international experts. Because Australia has not had a major air accident since 1968, it is important to prepare, to exercise, and to participate in overseas investigations to the extent that resources allow. For this reason, ATSB assisted with the investigation into the October 2000 SQ006 major 747 accident in Taipei.

I acknowledge the support and understanding during the year of our Portfolio Minister, the Hon. John Anderson; Minister in the Senate, the Hon. Ian Macdonald; Parliamentary Secretary, the Hon. Ron Boswell; and Departmental Secretary, Mr Ken Matthews. I am grateful to ATSB's highly professional and committed staff for the progress we have made in 2000–01 in consolidating as a Bureau and in improving transport safety and look forward to their continuing support in meeting our many challenges in 2001–02.

Kym Bills

# ATSB's mission statement

## Objective

Safe transport.

## Our mission

To maintain and improve transport safety and public confidence through excellence in:

- open and independent 'no-blame' systemic transport accident, incident and safety deficiency investigation;
- safety research and data analysis;
- safety communication and education; and
- safety programs, including the cost-effective treatment of road safety Black Spots.

## Our environment and values

ATSB operates in an environment where transport activity is increasing and the Government, Parliament, media and the public expect increasing standards of transport safety, particularly for fare-paying passengers. ATSB is a bureau within the Department of Transport and Regional Services that is operationally independent and has a strict organisational separation from transport regulators and other bodies that may need to be investigated. ATSB undertakes investigations and analyses safety data without fear or favour and in so doing helps to improve safety and maintain public confidence that the safety of the transport system is not being compromised.

We believe in the importance of 'Investors in People' and work within the framework set by the Australian Public Service Values and Code of Conduct and the DoTRS Corporate Plan and Portfolio Budget Statements. Of particular importance to us are clear and ethical leadership; professionalism and judgement; risk management; accountability and responsiveness; and encouragement of diversity, teamwork and trust.

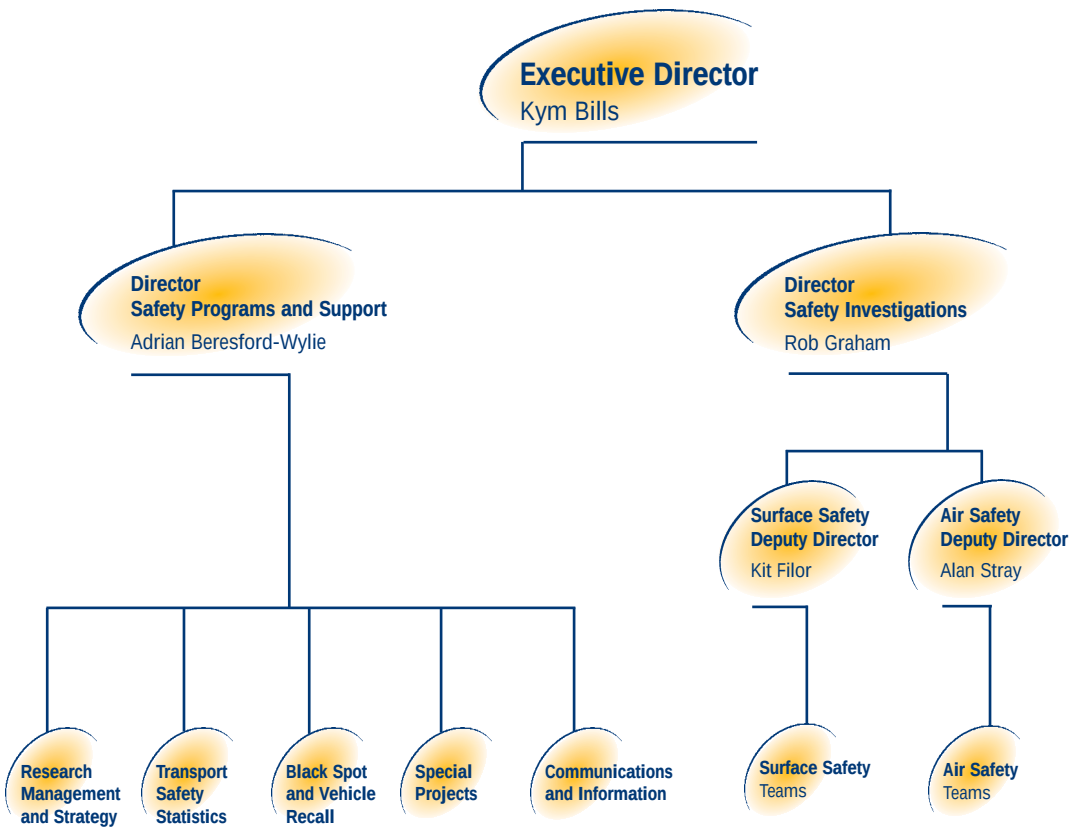
## Our strategy

We will pursue our Mission by:

- focussing on occurrences, unsafe situations and data where the greatest safety benefit can be gained through timely investigation, safety analysis, research and safety programs;
- developing legislation, regulations and guidance material to better apply our skills consistently across all transport modes except where differences are justified by safety data or our constitutional role; and
- better matching the delivery of our outputs to the needs of our stakeholders including through use of the Internet.

Building on our values and strengths, training our people, using our resources to best effect, and working closely with stakeholders, we will produce the professional safety outputs outlined in the Portfolio Budget Statements. This will optimise the safety knowledge, attitudes, behaviour and results from our allocated budget and thereby contribute to 'a better transport system for Australia'.

# ATSB organisation chart



# Executive profile

## Mr Kym Bills

Kym Bills was appointed Executive Director of the newly formed Australian Transport Safety Bureau on 1 July 1999. Prior to his current position with ATSB, Mr Bills was First Assistant Secretary of the Department's Maritime Division from 1994 to 1998 and subsequently of its Corporate Division. He was also a Director of ANL Ltd during its restructuring from September 1995 to the signing of sale contracts at the end of 1998 and a member of the Board of the Australian Maritime Safety Authority from 1995 to 1997.

**Executive Director**
**Kym Bills**

Mr Bills has held a number of public service positions since 1978 in the Australian Taxation Office, the Department of Foreign Affairs, the Office of National Assessments, the Department of Immigration and Ethnic Affairs, the Department of Finance, the Department of Transport, and the Department of Workplace Relations and Small Business. Interspersed with his public service career, Mr Bills has spent seven years working outside the public service including in academia. Mr Bills holds degrees from the universities of Adelaide, Flinders, Oxford and ANU and is a fellow of a number of professional bodies.

## Mr Adrian Beresford-Wylie

Adrian Beresford-Wylie took up the position of Director, Safety Programs and Support in January 2000. In 1998–99, he was an adviser on maritime and land transport issues to the Hon. John Anderson MP, Deputy Prime Minister and Minister for Transport and Regional Services.

Prior to joining Mr Anderson's Office, Mr Beresford-Wylie was a senior officer with the Maritime Transport Division of the Department of Transport and Regional Services. During a four-year period with the

**Director**
**Adrian Beresford-Wylie**

Maritime Transport Division, Mr Beresford-Wylie headed areas responsible for coastal shipping and shipping reform, international maritime issues and liaison with ANL Ltd, the former Federal Government-owned shipping line. In 1995, Mr Beresford-Wylie was seconded to the Asset Sales Task Force of the Department of Finance to assist with the sale of ANL Ltd. He has been a member of Australian delegations to the OECD's Maritime Transport Committee and the International Maritime Organization's Legal Committee.

Mr Beresford-Wylie has tertiary qualifications in law and economics from the Australian National University and the College of Law in Sydney. He began his public service career in 1984 as a Foreign Affairs Officer with the Department of Foreign Affairs. After six years with that Department, including a posting to New Zealand, he worked as a banking and finance solicitor with a large Sydney law firm before returning to the Australian Public Service in 1990 as a senior finance officer with the Department of Finance. Between 1991 and 1994, Mr Beresford-Wylie worked with Telecom Australia as a corporate account executive.

## Mr Rob Graham

As Director, Safety Investigations, Rob Graham is responsible for aviation, marine and rail investigation. He joined ATSB in June 2001, having previously worked for the New Zealand Civil Aviation Authority as General Manager, Aviation Services. There he was responsible for airport operations, air traffic control, Part 141 training, licensing, search-and-rescue and aviation security.

**Director**
**Rob Graham**

Previously, Mr Graham was Director, Safety and Environment within Airservices Australia. Having worked in aviation since 1972, he has extensive experience in safety management, air traffic control, aviation systems implementation and CNS/ATM.

## Mr Alan Stray

Deputy Director
Alan Stray

Alan Stray is Deputy Director, Air Safety Investigation. He has been an Air Safety Investigator with the ATSB and its predecessor, the Bureau of Air Safety Investigation, since January 1987. Mr Stray has managed all areas of ATSB's aviation operations and during the period January to June 2001, acted as Director Safety Investigations. In recent years, his work has involved increasing activity with government and aviation industry agencies in countries of Asia-Pacific Region.

Between 1992 and 1994, Mr Stray was an exchange officer with the Transportation Safety Board of Canada. During that time he was a management investigator in the Investigation Branch and developed the multimodal series of safety magazines, *Reflexions*, designed around the successful *BASI Journal*, which he had produced for a number of years.

Mr Stray is a Licensed Aircraft Maintenance Engineer, holds an Airline Transport Pilot Licence, and has flown in Papua New Guinea, Canada, USA and Australia in a variety of piston-engine and turbo-prop aircraft types. He holds management and aviation qualifications.

## Captain Kit Filor, PSM

Deputy Director
Kit Filor

Kit Filor is the Deputy Director, Surface Safety Investigation and is responsible for marine and rail safety investigations.

After a career at sea on tankers and as Master on cross-channel ferries in the UK, Captain Filor and his family emigrated to Australia where he took up a position as a Commonwealth marine surveyor in Devonport. After two years, he moved to Canberra to the Ship Operations Section in the Marine Safety Division. He became increasingly involved in marine casualty investigation.

Captain Filor was appointed Inspector of Marine Accidents on 1 January 1991 when the Marine Incident Investigation Unit was formed as an independent investigation body separate from the Australian Maritime Safety Authority.

Captain Filor was instrumental in formulating the International Maritime Organization (IMO) Code for the Investigation of Marine Casualties and Incidents. He has re-written the IMO Model Course for the Investigation of Marine Accidents and Incidents and is a regular lecturer at the International Maritime Academy in Trieste, Italy. He is Chairman of the Marine Accident Investigators' International Forum.

In 1996, he was awarded the Public Service Medal in the Queen's Birthday Honours for services to marine safety.

# Key modal safety activities and results

## Road

The ATSB coordinated the development of a new National Road Safety Strategy for 2001 to 2010 and the associated Action Plan for 2001 and 2002. Both were approved by the Australian Transport Council (ATC) and launched by the Minister for Transport and Regional Services and State and Territory Ministers in November 2000. ATSB funds research, and the collection and analysis of national road crash statistics, to guide the development and review of road safety policies and programs.

The Government is providing around $40 million per year for the Federal Road Safety Black Spot Program. In 2000–01, 455 sites were approved for treatment under the Program. Of these sites, 229 were in rural locations involving funding of $25.6 million. For a description of the Black Spot treatment sites, see appendix 6.

ATSB investigated more than 50 vehicle safety defects to assist Treasury under the Trade Practices Act and monitored over 100 voluntary vehicle safety recalls.

Results of ATSB research quantifying links between travel speed and road trauma have been widely cited in policy papers produced by other agencies (both in Australia and overseas) on urban speed management, including moves toward wider application of 50 km/h speed limits on local residential streets in Australia. The speed research results have also been used by ATSB and other agencies in public education campaigns on speed risks. Community attitude surveys are showing evidence of increasing public awareness of speed risks, increased public support for speed restrictions, and less permissive attitudes toward speeding.

Through its participation in various road safety forums, ATSB has contributed to development of policy on several other road safety issues, drawing on its research and statistical resources. Further information about these contributions is provided later in this review.

## Rail

Work towards developing an independent rail safety investigation capability progressed this year through the conduct of investigations at the invitation of State Governments and the development of Commonwealth multimodal safety investigation legislation that is to include interstate rail. Agreement was reached with State rail accreditation authorities on the initial structure of a national rail occurrence database.

ATSB drew on marine and aviation expertise to conduct or assist with investigations under the jurisdiction of State law on accidents that occurred in Wodonga and Footscray in Victoria. For training purposes, ATSB also participated in an investigation conducted by an interstate rail operator at Deep Lead in Victoria.

Progress in addressing the findings of an ATSB investigation into a collision between two freight trains in Ararat, Victoria that occurred on 26 November 1999, is realising significant and wide-ranging safety benefits for the Victorian Government. In response to the report's recommendations, a 'whole of operation' hazard analysis of the Victorian rail network was undertaken, rail safety legislation was amended to provide protection against self-incrimination for persons assisting safety investigations and infrastructure changes were implemented at the collision site.

ATSB also worked with Standards Australia to develop national guidelines for rail safety investigation.

## Marine

Thirty marine accidents and 14 incidents were reported to the Marine Unit. Ten occurrences were investigated and seven final reports were released.

These included the report of the investigation into the grounding of the Malaysian registered container ship *Bunga Teratai Satu* on 2 November 2000 on Sudbury Reef off Cairns. Public attention was focussed on this vessel which, having earlier disembarked its pilot, grounded shortly after the mate on duty omitted to alter course at a waypoint.

The ATSB report of the *Bunga Teratai Satu* incident identified the significant unsafe act resulting in the grounding. The report of the incident made several recommendations for ship operators and for the operators of Reefcentre at Hay Point.

## Aviation

There were 216 aviation accidents and 5916 incidents reported to ATSB in 2000–01. ATSB released 103 final investigation reports including major reports on an icing incident involving Saab VH-LPT at Eildon Weir, the systemic investigation into Avgas fuel contamination, and the accident report into the VH-OJH QF1 747 runway overshoot in Bangkok. ATSB initiated an investigation into maintenance problems involving Ansett's 767 fleet and widened the investigation to include all Class-A aircraft. Seventy-three recommendations and three safety advisory notices were issued including in relation to QF1, Avgas, Whyalla Airlines and Class-A aircraft maintenance. The Bureau was gratified by the extent of safety action undertaken in response to many of its reports and recommendations.

A new Memorandum of Understanding was agreed between ATSB and CASA. Major aviation accident investigation preparedness was enhanced through a range of measures, including in response to recommendations made in a consultancy by Gwyn Associates (see appendix 9).

Improvements were made to the OASIS aviation database as a platform for further enhancements in 2001–02 that should improve functionality for analysis and linkage to the ATSB web site.

# Communications and information

ATSB seeks to maintain and improve transport safety through excellence in safety communication and education. The Communications and Information Unit plays an important role in helping the Bureau achieve that goal.

The Unit:

- coordinates public communication and media activities;
- designs and publishes safety investigation and education materials;
- provides information to stakeholders and the community;
- manages the Bureau's web site.

Communications and Information has particular oversight of:

- the ATSB supplement in *Flight Safety Australia*;
- media releases;
- the Bureau's Media Manual;
- issues likely to provoke national media interest;
- corporate graphic standards and style;
- materials in support of major public communication events and launches.

## Media

Communications and Information coordinated two major media conferences on the release of the reports *Systemic Investigation into Fuel Contamination* and *Boeing 747-400 Accident at Bangkok International Airport on 23 September 1999*. These conferences stimulated significant media coverage and public interest in transport safety issues and raised awareness of the ATSB's role in transport safety. ATSB also supported the ministerial release of the *National Road Safety Strategy 2001–2010*.

The ATSB communicates with the media through its 24-hour information hotline number, business hours media contact officer, and after-hours duty officer roster (24 hours, seven days a week). Given the scope of the ATSB's work and the public interest in its activities and investigation findings, a coordinated and well-planned media response capability is essential.

Media training was conducted during the year to ensure that those nominated to the task of media relations were equipped to meet the requirements of their roles.

The Unit developed an information kit that described and explained the ATSB and its various functions. This included a range of backgrounders and fact sheets, several of which were completed and published by the end of 2000–01.

Appropriate venues have been planned and designed within the ATSB to allow for the staging of media interviews on significant safety messages and occurrences. New portable and fixed background displays have also been developed.

## Web site

Because ATSB uses the Internet to communicate with stakeholders, clients, transport industries, the media and the public, the unit is responsible for developing and maintaining the ATSB web site, www.atsb.gov.au.

Users can access information according to transport mode. The site contains accident and other reports, research publications, motor vehicle recall information, Black Spot accident locations, learner-driver advice, accident and incident statistics, media releases and articles of interest.

The site offers information produced or commissioned by the ATSB in easily searchable, accessible and downloadable formats. It also allows users to order road safety materials online, and provides a secure means for the public to report air safety accidents or incidents. The site's free subscription service announces new releases and developments to interested parties and industry stakeholders.

The site attracts many visitors and the number increases markedly when high-profile information is released.

ATSB is addressing new Commonwealth requirements governing the provision of online information and services. These relate to Australian Government Locator Service metadata, accessibility for the disabled, and privacy policy.

## Information requests

The Unit's public communications operations respond to a large and diverse number of requests for safety information. Responses range from giving verbal advice on child restraints and road safety issues to distributing reports, statistical monographs and road safety public education materials. The Unit also provides the media with a point of contact and promotes public awareness of ATSB's resources. During the year, it responded to almost 9000 requests for safety information.

The Unit was involved in the design, printing, distribution and publicity of the *National Road Safety Strategy 2001–2010* and the *2001–2002 Action Plan*. It also administered Deeds of Grant to the Motorcycle Council of New South Wales for the national television promotion of motorcycle safety awareness and to the Injury 2000 Conference, the peak Conference on injury prevention in Australia.

Communications and Information updated and reprinted road safety resources as required: for example, wallet-sized cards were developed to show the relationship between vehicle speed and impact speed as well as standard drink information. A brochure on driver fatigue was also updated to include information about urban fatigue. The Unit also helped promote the Federal Black Spot Program and produced materials to encourage drivers to respond to Vehicle Recall Notices.

To help new drivers improve their awareness and attitudes towards road safety issues, Communications and Information produced, with the Australian Driver Trainers' Association, the package *New Facts for Learner Drivers*.

## Graphic design

The Unit's in-house graphic design and publishing capability ensures quality control of publications produced both internally and outside the organisation.

## Investigation reports

The Unit was responsible for the release of all draft and final investigation reports and recommendations in accordance with legislation, regulations and procedural guidelines. In 2000–01, it released seven final maritime reports and 103 final aviation reports.

The Unit was also responsible for the release of three other aviation-related reports and information papers and a range of other material.

## Freedom of information

In 2000–01, the unit actioned 22 Freedom of Information requests in accordance with the required timeframes of the *Freedom of Information Act 1982*. One request resulted in a challenged decision being resolved by internal review. There were no appeals made to the Ombudsman or the Administrative Appeals Tribunal.

The unit also responded to 23 subpoenas and writs of non-party disclosure within required timeframes.

# Human factors course and training

ATSB periodically offers an introductory, five-day course in Human Factors for Transport Safety Investigators. The course provides a general overview of human factors in safety-critical systems and allows participants to improve their skills in accident analysis. Originally designed to meet the training needs of ATSB air safety investigators, the course is now available to a limited number of State and industry participants in aviation and other modes.

The course introduces the following critical issues relevant to safety in the aviation, land transport and maritime environments:

- advanced technology human factors
- crew resource management and communication
- ergonomics
- fatigue
- groups at work
- human error
- investigating management and organisational factors
- limitations of human perception, attention and memory
- operational decision-making
- physiological and medical factors
- rule-violations and their role in safety
- the Reason model of organisational accidents
- witness interviewing.

In 2000–01, ATSB offered the course from 13 to 17 November and from 26 February to 2 March. About 25 participants attended each course.

A scoping study was commissioned in the spring of 2000, to identify options for an accredited course in Transport Safety Investigator Training, using an open-tender process. The need for ongoing

professional development was identified in an ATSB risk profile and as a required element to allow ATSB to meet the Secretary's Statement of Skills and the Department's commitment to on-going accreditation as an 'Investors in People' organisation.

Recognising the multimodal structure of ATSB, the scoping study by CIT Solutions identified a number of benefits in the introduction of a Diploma course in Transport Safety Investigations. These included issues such as more effective team working, professional credibility and enhanced recognition.

In February 2001, a second open tender process led to a contract being awarded to CIT Solutions to undertake the design and development of a Diploma course for Transport Safety Investigators. The basic concept is for a modular course that embraces generic and specialised training available, as appropriate, to meet general work practice and work skills consistent with the Secretary's Statement of Future Skills and specific ATSB requirements.

The course will be developed in 2001–02. Some units of the course may be open to external participants once the Diploma is established.

# Transport industry's safety performance statistics

## Multimodal trends (fatalities)

**Table 1:**
**Australian transport fatalities, by mode of transport, 1991–92 to 2000–01**

| | Road | Rail | Water | Air |
|---|---|---|---|---|
| 1991-92 | 2084 | 54 | 69 | 46 |
| 1992-93 | 1874 | 55 | 69 | 63 |
| 1993-94 | 1994 | 37 | 71 | 63 |
| 1994-95 | 1984 | 55 | 58 | 56 |
| 1995-96 | 1986 | 37 | 51 | 68 |
| 1996-97 | 1873 | 38 | 55 | 34 |
| 1997-98 | 1768 | 42 | 47 | 51 |
| 1998-99 | 1774 | .. | .. | 44 |
| 1999-00 | 1783 | .. | .. | 45 |
| 2000-01 | 1775 | .. | .. | 57 |

*Source:* *Figures for road and air were sourced from ATSB.*

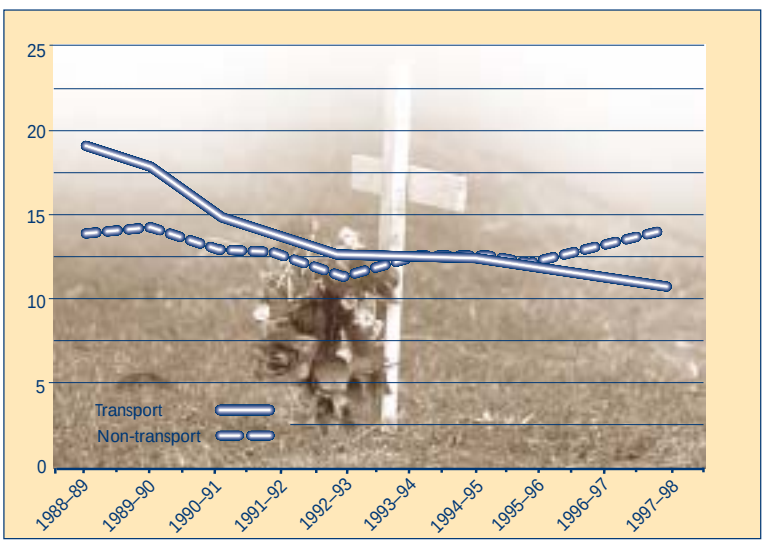
*Figures for rail and water were sourced from the Australian Bureau of Statistics and compiled by the ATSB.*

*Notes:* *[..] Denotes data is unavailable.*

Table 1 presents ATSB and Australian Bureau of Statistics data on fatalities in each of the major transport modes over the last decade. Table 1 shows that between 1991–92 and 2000–01:

- The total number of fatalities decreased in all modes except air.
- The most substantial reduction was in road transport where fatalities decreased from 2084 to 1775.
- Rail transport fatalities fluctuated from year to year but trended downward (from 54 in 1991–92 to 42 in 1997–98, the latest data available).
- Water transport fatalities fluctuated substantially from year to year with evidence of a downward trend.
- Air transport fatalities fluctuated substantially from year to year with no significant trend.

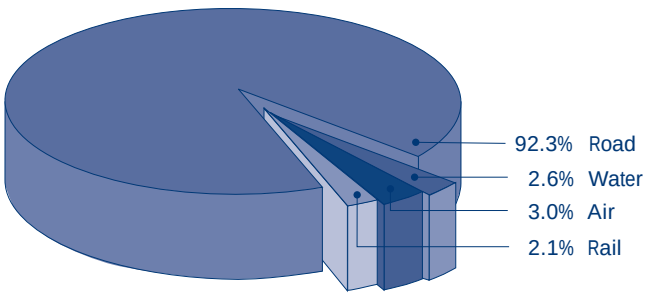
**Figure 1:**
**Transport fatalities (all modes) and non-transport accident fatalities per 100 000 population, Australia, 1988–89 to 1997–98**




*Source:* *Chart by ATSB, data from all modes sourced from Australian Bureau of Statistics for comparability.*

Figure 1 shows the trend in the per-capita rate of transport fatalities for the latest available 10-year period and compares this with the trend in per-capita non-transport accident fatalities. Per-capita transport fatalities decreased substantially over the 10 years ended 1997–98 (from 19.4 to 10.7 fatalities per 100 000 of population), whereas per-capita non-transport accident fatalities remained largely unchanged.

**Figure 2:**
**Transport fatalities by mode of transport, Australia, 2000–01**




*Source:* *Actual figures for road and air from ATSB. Estimates for water and rail based on Australian Bureau of Statistics data.*

Figure 2 shows that road trauma is by far the largest contributor to transport fatalities, accounting for an estimated 92 per cent of total transport fatalities in 2000–01.

## Multimodal trends (serious injuries)

**Table 2:**
**Australian transport serious injuries by mode of transport, 1993–94 to 1997–98**

| | Road | Rail | Water | Air | Total |
|---|---|---|---|---|---|
| 1993–94 | 23 880 | 145 | 484 | 251 | 24 760 |
| 1994–95 | 23 605 | 117 | 478 | 244 | 24 444 |
| 1995–96 | 23 554 | 106 | 521 | 242 | 24 423 |
| 1996–97 | 22 924 | 112 | 458 | 247 | 23 741 |
| 1997–98 | 22 647 | 121 | 476 | 190 | 23 434 |

*Source:* *Table compiled by ATSB. Data sourced from Australian Institute of Health and Welfare.*

*Includes:* *Transport accidents to, from or as part of recreational activities; water transport accidents in all water expanses, estuaries, rivers, lakes and dams; air transport accidents involving powered and unpowered aircraft.*

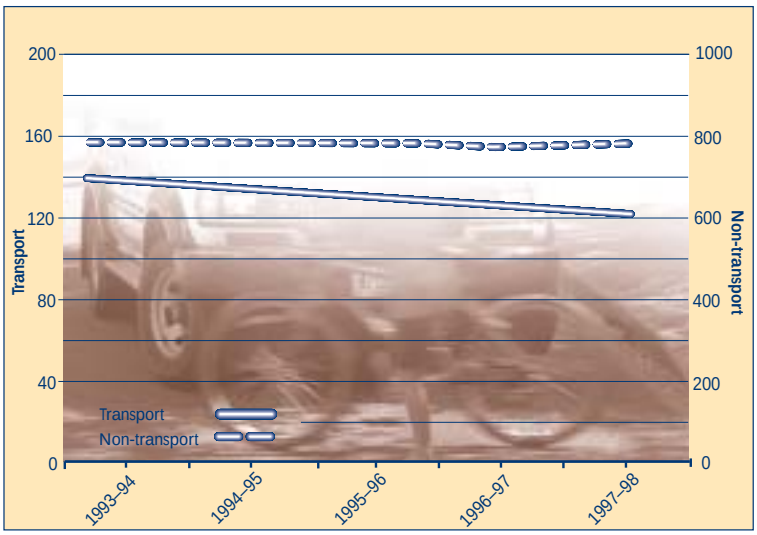
*Excludes:* *Accidents to persons engaged in the maintenance or repair of transport equipment or vehicle not in motion, unless injured by another vehicle in motion; suicide or self-inflicted injury; homicide and injury purposely inflicted by other persons.*

*Note:* *'Serious injuries' are defined as injuries resulting in admission to hospital for a period of two days or more but not death.*

Table 2 presents Australian Institute of Health and Welfare data on serious injuries in each of the major transport modes over the five years ended 1997–98, the latest years for which these data are currently available. Table 1 shows that between 1993–94 and 1997–98:

- Total transport-related serious injuries decreased steadily from 24 760 to 23 434.
- This decrease was substantially more modest (5.4 per cent) than that shown in table 1 for transport fatalities over the same period (11.6 per cent).
- This difference stemmed largely from more modest success in reducing serious road injuries than in reducing road fatalities.
- Serious road injuries decreased from 23 880 to 22 647.
- Serious injuries in rail, water and air transport all fluctuated over the period with no clear trends except for a substantial fall in serious injuries related to air transport during 1997–98.

**Figure 3:**
**Transport serious injuries (all modes) and non-transport accident serious injuries per 100 000 population, Australia, 1993–94 to 1997–98**

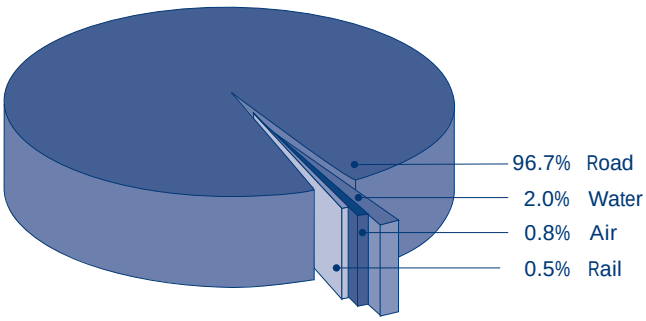



*Source:* *Chart by ATSB, serious injury data sourced from Australian Institute of Health and Welfare and population data sourced from Australian Bureau of Statistics.*

*Note:* *'Serious injuries' are defined as injuries resulting in admission to hospital for a period of two days or more but not death.*

Figure 3 shows the trend in the per-capita rate of transport serious injuries for the latest available five-year period and compares this with the trend in per-capita non-transport accident serious injuries. Per-capita transport serious injuries decreased over the five years ended 1997–98 by a significantly greater margin (from 138 to 125 serious injuries per 100 000 of population) than did per-capita non-transport accident serious injuries.

**Figure 4:**
**Transport serious injuries by mode of transport, Australia, 1997–98**




*Source:* *Chart by ATSB. Data sourced from Australian Institute of Health and Welfare.*

*Note:* *'Serious injuries' are defined as injuries resulting in admission to hospital for a period of two days or more but not death.*

Figure 4 shows that road trauma is by far the largest contributor to transport serious injuries. Road trauma accounted for 96.7 per cent of all transport serious injuries in 1997–98, a similar result to that shown for transport fatalities (fig. 2).

## Data issues

Since 1997–98 there has been a problem in obtaining reliable, consistent data on serious road injuries across all jurisdictions. ATSB is working with stakeholders to formulate a workable definition able to be applied consistently across all jurisdictions. A workshop has been arranged for late 2001 to determine a practicable definition of serious injury for statistical reporting purposes and to identify the respective roles of various data sources such as hospitals, police and related authorities.

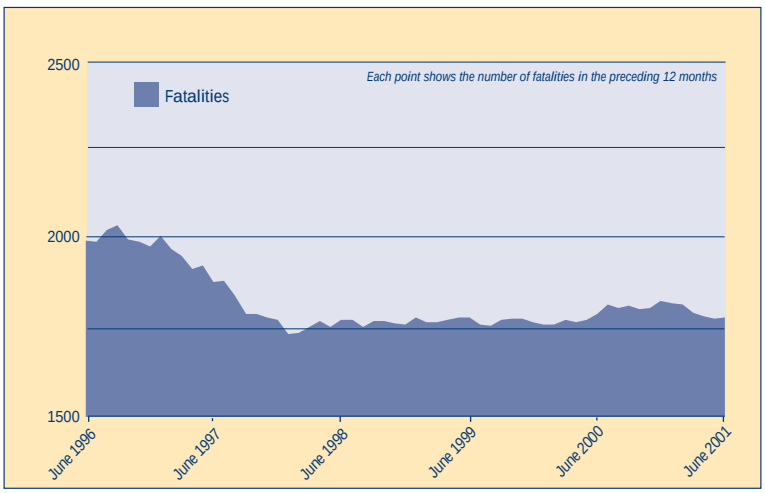
## Road safety trends

In recent years, there has been a plateau in net road safety gains in Australia with an increase in fatalities in calendar year 2000. There was an encouraging decrease of 4.9 per cent in road fatalities in the first six months of 2001 compared with the same period in 2000.

Figure 5 shows the trend in Australian road fatalities for the five years ended June 2001. A 10 per cent fall in road fatalities is evident during this period, with road safety gains greatest in 1997. The road

toll in that year was reduced by more than 200 on the annual toll of earlier years and represented the lowest road toll in Australia since 1950.

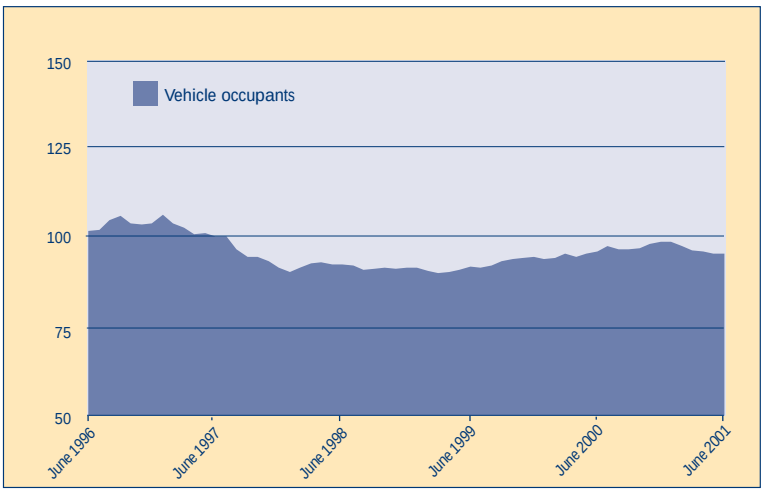
**Figure 5:**
**Australian road fatalities for 12 months to date. Five years ended June 2001**

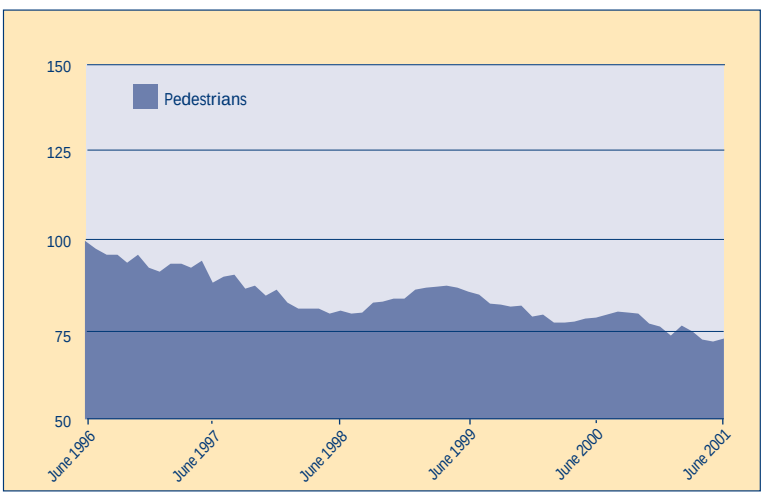


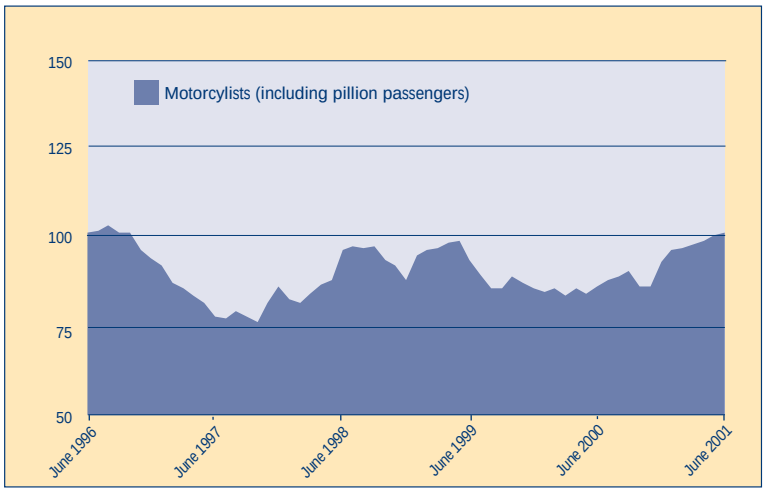

While recent trends in vehicle occupant and motorcyclist fatalities are of concern, encouraging trends have been evident in pedestrian and bicyclist road safety (fig. 6).

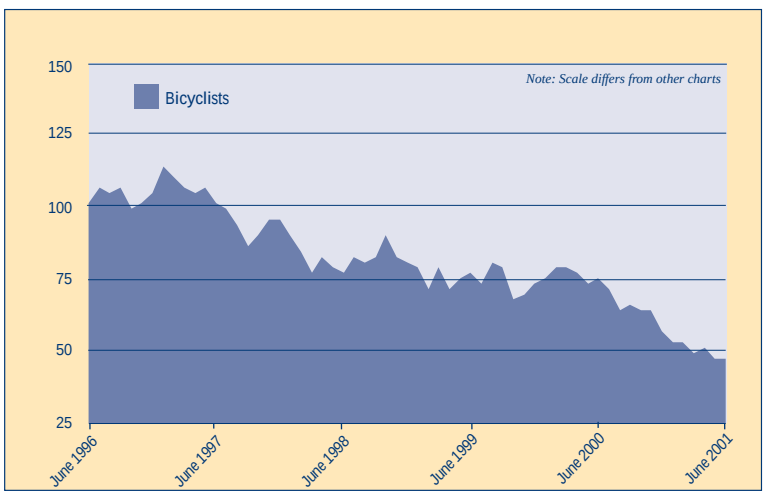
Pedestrian road deaths have decreased over the past five years by an average of 6.2 per cent each year. There has been a fall of 7.4 per cent over the 12 months ended June 2001. This suggests that the national focus given to speed reduction in recent times is paying dividends. This may also be a contributing factor to the reduction seen in bicyclist fatalities.

**Figure 6:**
**Index of Australian road fatalities for 12 months to date, by road user group. Five years ended June 2001 (June 1996 = 100)**






The most significant inroads into reducing road trauma over the past five years have been made in Queensland. The Queensland road toll has been reduced from 391 in the 12 months ended June 1996 to 308 in the 12 months ended June 2001. This represents a decrease of 26 per cent in per capita terms (table 3).

Queensland's success has been based upon a high degree of collaboration between police and road transport authorities to identify the issues where big gains could be made.

**Table 3:**
**Road fatalities per 100,000 population, by State/Territory, 12 months ended June 1996 and 12 months ended June 2001**

| | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Aust. |
|---|---|---|---|---|---|---|---|---|---|
| 12 Months ended June 1996 | 9.9 | 9.4 | 11.8 | 13.0 | 12.9 | 13.7 | 32.8 | 6.9 | 10.9 |
| 12 Months ended June 2001 | 8.6 | 8.7 | 8.6 | 10.6 | 10.5 | 13.2 | 27.0 | 6.4 | 9.2 |
| % change 1996-95 to 2000-01 | -13.1 | -8.0 | -27.4 | -18.5 | -18.6 | -4.0 | -17.7 | -7.0 | -15.7 |

*Note: Calculated using ATSB data for fatalities and Australian Bureau of Statistics population counts for December 1995 and December 2000.*

## *Truck safety trends*

Table 4 shows an increase over the past five years in fatalities from road crashes involving articulated trucks.

**Table 4:**
**Road fatalities involving articulated trucks, 12 months ended June 1996 and 12 months ended June 2001**

| | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Aust. |
|---|---|---|---|---|---|---|---|---|---|
| 12 Months ended June 1996 | 59 | 36 | 44 | 21 | 16 | 4 | 0 | 0 | 180 |
| 12 Months ended June 2001 | 77 | 37 | 36 | 20 | 9 | 6 | 5 | 2 | 192 |
| % change 1995-96 to 2000-01 | 30.5 | 2.8 | -18.2 | -4.8 | -43.8 | 50.0 | .. | .. | 6.7 |

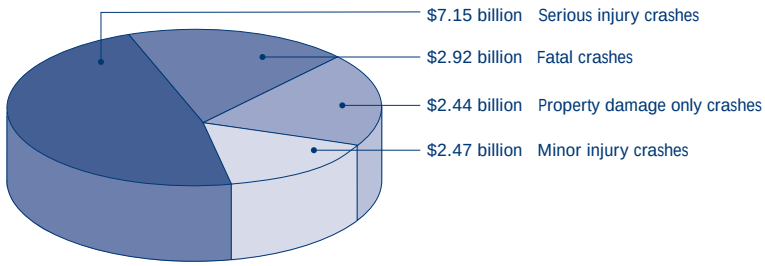
*Note: [..} Not applicable*

A high priority has been given to developing an Australian Truck Crash Database, intended to be an ongoing statistical database covering the 1000 or so casualty crashes involving articulated and heavy rigid trucks that occur throughout Australia each year.

## *Cost of road accidents*

Road crashes impose a substantial financial burden on the Australian community as a whole and on particular groups within the community. The cost of road crashes in Australia in 1996 has recently been conservatively estimated at $15 billion in 1996 dollar values (Road Crash Costs in Australia, Bureau of Transport Economics Report 102, 2000). Figure 7 shows the breakdown of these costs across crashes of different severity categories.

**Figure 7:**
**Annual cost of road crashes in Australia, 1996, by type of crash**




Serious injury crashes are the largest contributor to the cost of road trauma.

## Rail safety trends

Table 5 presents the latest available five-year trends in rail fatalities and serious injuries. It is based on data sourced from the Australian Bureau of Statistics and the Australian Institute of Health and Welfare, the only sources of national rail safety data currently available pending the establishment of a National Rail Occurrence Database coordinated by the ATSB.

**Table 5:**
**Rail fatalities and serious injuries, 12 months ended June 1994 and 12 months ended June 1998**

| | NSW | Vic. | Qld | SA | WA | Tas. | NT | ACT | Aust. |
|---|---|---|---|---|---|---|---|---|---|
| *Fatalities* | | | | | | | | | |
| 12 months ended June 1994 | 10 | 8 | 10 | 4 | 5 | 0 | 0 | 0 | 37 |
| 12 months ended June 1998 | 22 | 12 | 2 | 1 | 5 | 0 | 0 | 0 | 42 |
| *Serious injuries* | | | | | | | | | |
| 12 months ended June 1994 | 80 | 22 | 24 | 7 | 10 | 2 | 0 | 0 | 145 |
| 12 months ended June 1998 | 66 | 18 | 19 | .. | 13 | 3 | 0 | 2 | .. |

*Note:* *'Serious Injuries' are defined as injuries resulting in admission to hospital for two days or more but not death.*

*Based on rail fatality counts provided by Australian Bureau of Statistics and counts of rail accident hospital admissions provided by the Australian Institute of Health and Welfare.*

*[..] Data suppressed due to State privacy restraints.*

## Marine safety trends

An important function, in addition to the publication of reports of marine incidents, is to identify and analyse trends or patterns of incidents that may show up over a period. A database has been developed to hold the essential details of each reported incident.

The last published set of statistical data, and analysis, covered the calendar years 1998–2000.

**Table 6:**
**Marine incident investigations by incident type, 1 January 1991 to 31 December 1997, 1 January 1998 to 30 June 2000 and 1 July 2000 to 30 June 2001**

| Incident type | 1991-97 | 1998-2000 | 2000-01 | Total |
|---|---|---|---|---|
| Grounding | 36 | 5 | 5 | 46 |
| Collision | 21 | 9 | 1 | 31 |
| Fire | 11 | 5 | 1 | 17 |
| Foundering | 8 | - | - | 8 |
| Structure | 5 | - | - | 5 |
| Equipment | 3 | 5 | 2 | 10 |
| Berthing | 1 | 5 | - | 6 |
| Other | 14 | 3 | 1 | 18 |
| **TOTAL** | **99** | **32** | **10** | **141** |

**Table 7:**
**Number of vessels involved in incident investigations by vessel type, 1 January 1991 to 31 December 1997, 1 January 1998 to 30 June 2000 and 1 July 2000 to 30 June 2001.**

| Vessel type | 1991-97 | 1998-2000 | 2000-01 | Total |
|---|---|---|---|---|
| Bulk carrier | 45 | 14 | 4 | 63 |
| Tanker | 15 | 7 | - | 22 |
| Container | 8 | 2 | 2 | 12 |
| General | 9 | 2 | 1 | 12 |
| Roll on/roll off | 4 | 1 | - | 5 |
| Livestock | 3 | 2 | - | 5 |
| Supply/offshore | 6 | 3 | - | 9 |
| Tug | 3 | 2 | - | 5 |
| Training | 3 | - | 1 | 4 |
| Fishing vessel | 14 | 5 | 1 | 20 |
| Passenger | - | - | 2 | 2 |
| Pleasure | 5 | 2 | - | 7 |
| Other | 5 | 1 | - | 6 |
| **TOTAL** | **120** | **41** | **11** | **172** |

## Aviation safety trends

International comparisons show Australia's relatively favourable aviation safety record.

In terms of the aviation industry as a whole in Australia, high-capacity operations continue to be the safest, with continuing extremely low accident rates.

Accident information is usually presented in terms of the different sectors of the aviation industry—high-capacity, low-capacity, charter, agriculture, training, aerial work and private (including business). High-capacity aircraft are those with a seating capacity greater than 38 seats or a maximum payload exceeding 4200 kg.

In Australia, as shown in table 8, both the high-capacity and low-capacity categories are very safe in terms of the number of accidents reported.

## *Accidents*

Table 8 provides information on aviation accidents and fatal accidents over the 10-year period 1991 to 2000.

**Table 8:**
**Accidents and fatal accidents by category, calendar years 1991–2000**

| | 1991 | '92 | '93 | '94 | '95 | '96 | '97 | '98 | '99 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|
| *High capacity* | | | | | | | | | | |
| All accidents | 2 | 2 | 1 | 2 | 1 | 1 | 0 | 1 | 7[a] | 3 |
| Fatal accidents | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Low capacity* | | | | | | | | | | |
| All accidents | 4 | 6 | 5 | 4 | 4[b] | 2 | 0 | 2 | 3 | 3 |
| Fatal accidents | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| *General aviation* | | | | | | | | | | |
| All accidents | 259 | 233 | 256 | 206 | 216 | 203 | 229 | 208 | 166 | 187 |
| Fatal accidents | 21 | 25 | 22 | 25 | 22 | 23 | 17 | 23 | 21 | 16 |

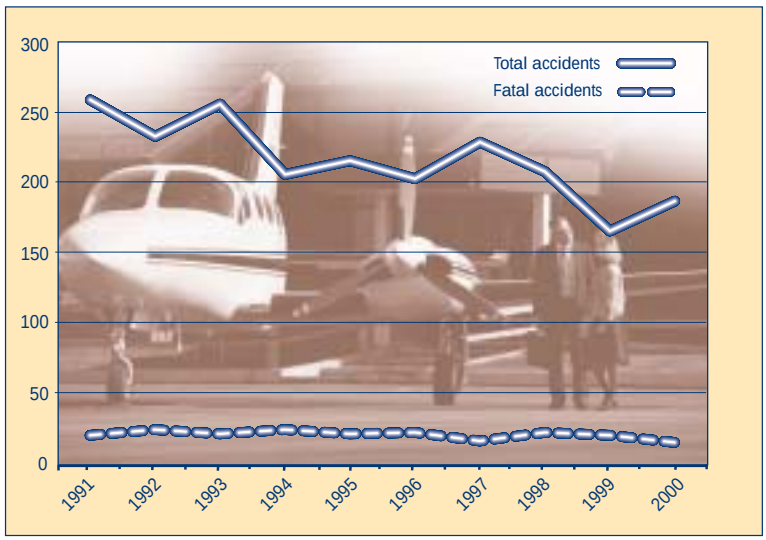
*(a)* *Includes 5 accidents where aircraft were on the ground and are included in the statistics because passengers were on board.*

*(b)* *Includes one RPT training flight with two fatalities.*

While caution needs to be exercised because of the small numbers involved, the table shows a low and stable pattern for accidents in both the high- and low-capacity regular public transport categories.

For the general aviation sector, the number of accidents each year is larger and there is scope to examine trends with more confidence. Figure 8 shows all general aviation accidents and fatal accidents over the decade to 2000.

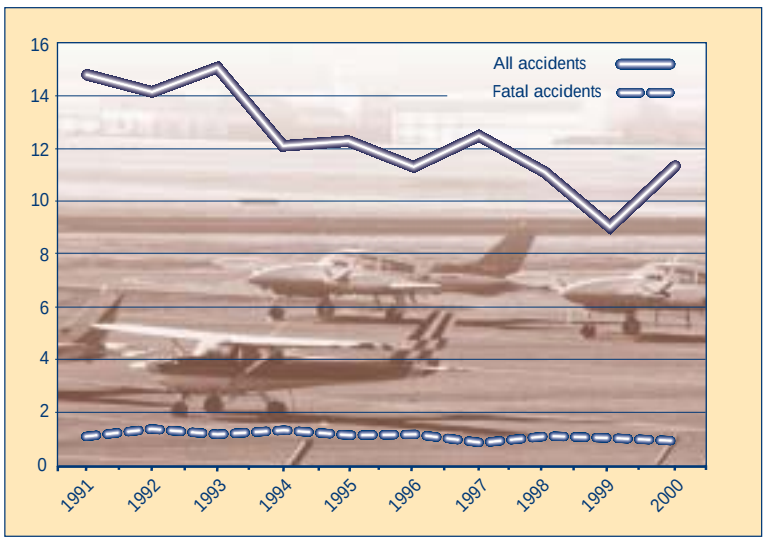
**Figure 8:**
**General aviation—fatal accidents and total accidents, calendar years 1991–2000**




The chart shows that there has been a downward trend in total accidents recorded in the general aviation sector. It is noted that while there had been an upswing during the year 2000, this was more or less of similar magnitude to upswings for several other years during the decade and does not affect the significance of the overall improving trend for accidents.

An additional perspective may be obtained by examining accident rates based on the number of hours flown. Figure 9 shows accident rates for the general aviation sector in Australia over the 10 years 1991 to 2000.

**Figure 9:**
**General aviation—accident rates per 100 000 hours flown, calendar years 1991–2000**




The chart illustrates the significant trend decrease in overall accident rates over the last decade. A complicating factor at the end of 1999 and the beginning of 2000 was the Avgas contamination crisis, which grounded several thousand general aviation aircraft. This complicates interpretation of the apparent increase in the accident rate between 1999 and 2000.

In addition to hours flown, there are other measures of exposure to risk that can also be used to develop accident rates. These are shown in table 9 for high-capacity operations, and in table 10 for low-capacity and charter operations. The three measures of exposure to risk depicted are aircraft departures, passengers carried, and hours of operation. Information on charter operations is only available for one of the three measures, that is, hours flown.

**Table 9:**
**High-capacity transport traffic by aircraft departures, passengers carried and hours flown, calendar years 1990–2000**

| Year | Aircraft departures (000's) | Passengers (000's) | Hours flown (000's) |
|---|---|---|---|
| 1990 | 199.2 | 17 461.1 | 412.3 |
| 1991 | 233.8 | 21 504.4 | 483.4 |
| 1992 | 250.7 | 22 754.7 | 525.1 |
| 1993 | 258.5 | 24 728.5 | 553.5 |
| 1994 | 271.2 | 27 287.7 | 612.5 |
| 1995 | 293.4 | 29 017.4 | 666.1 |
| 1996 | 299.6 | 30 686.3 | 704.5 |
| 1997 | 295.1 | 31 163.1 | 718.2 |
| 1998 | 293.1 | 31 081.7 | 708.5 |
| 1999 | 293.4 | 31 724.2 | 709.5 |
| 2000* | 318.5 | 33 728.4 | 767.7 |

*Note:* ** Provisional data*
*Source:* *DoTRS Avstats*

**Table 10:**
**Low-capacity transport traffic by aircraft departures, passengers carried and hours flown and charter hours flown, calendar years 1990–2000**

| Year | Aircraft departures (000's) | Passengers (000's) | Hours flown (000's) | Charter hours (000's) |
|---|---|---|---|---|
| 1990 | 244.8 | 2004.4 | 180.7 | 399.5 |
| 1991 | 266.6 | 2348.9 | 205.9 | 386.5 |
| 1992 | 291.4 | 2747.4 | 220.5 | 403.9 |
| 1993 | 305.1 | 3156.8 | 230.4 | 393.4 |
| 1994 | 311.1 | 3496.2 | 244.9 | 424.4 |
| 1995 | 310.1 | 3580.6 | 248.1 | 465.7 |
| 1996 | 324.8 | 3881.5 | 258.2 | 480.4 |
| 1997 | 325.0 | 4111.9 | 276.7 | 483.7 |
| 1998 | 329.5 | 4161.8 | 285.5 | 494.6 |
| 1999 | 331.3 | 4306.2 | 285.4 | 504.6 |
| 2000* | 323.3 | 4615.0 | 284.1 | 505.4 |

*Note:* ** Provisional data*
*Source:* *DoTRS Avstats*

For all of the aviation sectors of high-capacity, low-capacity and charter, from 1990 to 2000, there has been steady growth in each of the exposure measures due to increasing activity.

Tables 11, 12 and 13 provide accident information for high-capacity, low-capacity and charter respectively, for the years 1993 to 2000.

The data is presented in terms of the categories used by the ATSB to record accidents and incidents. In broad terms the higher the number, the less serious the occurrence. Categories 1 and 2 are applied where there was a significant threat to safety of the public, while category 4 is an occurrence where the facts do not indicate a serious safety deficiency. For the current full definitions of the categories, see appendix 4. These have varied over time, with the balance between categories 4 and 5 influenced by resource availability including investigator workload.

For both high- and low-capacity, most accidents are category 4. In contrast, for charter there have been more accidents indicating serious safety deficiencies or significant threats to safety of the public until recent years.

Having seven high-capacity accidents in 1999 was not in keeping with the trend from previous years. Five of these occurred when the aircraft was on the ground and are included in the statistics because passengers were on board. Three of the seven accidents were of a more serious nature.

**Table 11:**
**Accidents involving Australian-registered aircraft carrying out high-capacity air transport operations by investigation category, calendar years 1993–2000**

| | Investigation Category | | | | |
|---|---|---|---|---|---|
| Year | 2 | 3 | 4 | 5 | Total |
| 1993 | - | - | 1 | - | 1 |
| 1994 | 1 | - | - | 1 | 2 |
| 1995 | - | - | - | 1 | 1 |
| 1996 | - | 1 | - | - | 1 |
| 1998 | - | - | 1 | - | 1 |
| 1999 | 1 | 2 | 3 | 1 | 7 |
| 2000 | 1 | - | 2 | - | 3 |

**Table 12:**
**Accidents involving Australian-registered aircraft carrying out low-capacity air transport operations by investigation category, calendar years 1993–2000**

| | Investigation Category | | | | |
|---|---|---|---|---|---|
| Year | 2 | 3 | 4 | 5 | Total |
| 1993 | 1 | 1 | 2 | 1 | 5 |
| 1994 | . | . | 4 | . | 4 |
| 1995 | 1 | . | 3 | . | 4 |
| 1996 | . | 1 | 1 | . | 2 |
| 1998 | . | . | 2 | . | 2 |
| 1999 | . | 1 | 2 | . | 3 |
| 2000 | 1 | . | 2 | . | 3 |

**Table 13:**
**Accidents involving Australian-registered aircraft carrying out charter operations by investigation category, calendar years 1993–2000**

| | Investigation Category | | | | |
|---|---|---|---|---|---|
| Year | 2 | 3 | 4 | 5 | Total |
| 1993 | 1 | 9 | 27 | 7 | 44 |
| 1994 | 2 | 5 | 40 | 2 | 49 |
| 1995 | 1 | 4 | 36 | 1 | 42 |
| 1996 | . | 9 | 24 | 1 | 34 |
| 1997 | . | 3 | 38 | 8 | 49 |
| 1998 | 1 | 3 | 37 | . | 41 |
| 1999 | . | 2 | 19 | . | 21 |
| 2000 | 1 | 1 | 9 | 15 | 26 |

Table 14 shows the accident rates per 100 000 departures and per 100 000 hours of operation for each of high-capacity, low-capacity and charter for 100 000 hours of operation respectively. In relative terms, both high-and low-capacity aircraft operations have significantly lower accident rates than charter operations.

## Table 14:
## Accident rates per 100 000 aircraft departures and per 100 000 hours flown, calendar years 1993–2000

*High-capacity*

| Year | Accidents | AC deps (000's) | Hours (000's) | Rate (per 100 000 deps) | Rate (per 100 000 hours) |
|---|---|---|---|---|---|
| 1993 | 1 | 258.5 | 553.5 | 0.4 | 0.2 |
| 1994 | 2 | 271.2 | 612.5 | 0.7 | 0.3 |
| 1995 | 1 | 293.4 | 666.1 | 0.3 | 0.2 |
| 1996 | 1 | 299.6 | 704.5 | 0.3 | 0.1 |
| 1997 | 0 | 295.1 | 718.2 | 0.0 | 0.0 |
| 1998 | 1 | 293.1 | 708.5 | 0.3 | 0.1 |
| 1999[(a)] | 7 | 293.4 | 709.5 | 2.4 | 1.0 |
| 2000 | 3 | 318.5 | 767.7 | 0.9 | 0.4 |

*(a)* *Includes five accidents while aircraft were on the ground; three of the seven were more serious.*

*Low-capacity*

| Year | Accidents | AC deps (000's) | Hours (000's) | Rate (per 100 000 deps) | Rate (per 100 000 hours) |
|---|---|---|---|---|---|
| 1993 | 5 | 305.1 | 230.4 | 1.6 | 2.2 |
| 1994 | 4 | 311.1 | 244.9 | 1.3 | 1.6 |
| 1995 | 4 | 310.1 | 248.1 | 1.3 | 1.6 |
| 1996 | 2 | 324.8 | 258.2 | 0.6 | 0.8 |
| 1997 | 0 | 325.0 | 276.7 | 0.0 | 0.0 |
| 1998 | 2 | 329.5 | 285.5 | 0.6 | 0.7 |
| 1999 | 3 | 331.3 | 285.4 | 0.9 | 1.1 |
| 2000 | 3 | 323.3 | 284.1 | 0.9 | 1.1 |

*Charter*

| Year | Accidents | Hours (000's) | Rate (per 100 000 hours) |
|---|---|---|---|
| 1993 | 44 | 396.5 | 11.1 |
| 1994 | 49 | 427.2 | 11.5 |
| 1995 | 42 | 468.8 | 9.0 |
| 1996 | 34 | 483.3 | 7.0 |
| 1997 | 49 | 486.7 | 10.1 |
| 1998 | 41 | 497.5 | 8.2 |
| 1999 | 21 | 507.5 | 4.1 |
| 2000 | 26 | 508.7 | 5.1 |

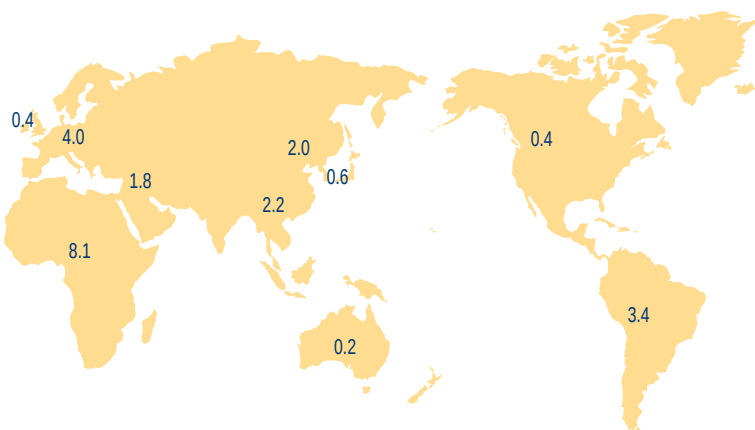
## *International comparison*

Compared with the rest of the world, Australia has the lowest accident rate for high-capacity aircraft (see fig. 10).

In Canada for example, the annual accident rate per 100 000 hours for such airlines varies annually from 0.4 to 1.2 and was 1.1 in 1998.

International comparisons of high-capacity operations are often based on hull losses per million departures.

**Figure 10:**
**International comparison of hull losses per million departures, calendar years 1990–1999**




*Source:* *Flight Safety Foundation*

Figure 10 provides data for the period 1990 to 1999 for the different regions of the world compared with the world average of 1.2 hull losses per million departures. While Oceania, including Australia, is the lowest for the world at 0.2 hull losses per million departures, Australia has never had either a hull loss or a fatal accident involving a high capacity jet aircraft. Oceania covers a large area and goes as far north as Guam.

### *Incidents*

Compared with accidents, there are considerably more incidents recorded.

Table 15 provides the incidents recorded by investigation category for high-capacity aircraft, and table 16 the incidents recorded by category for low-capacity aircraft.

**Table 15:**
**Incidents involving Australian-registered aircraft carrying out high-capacity air transport operations by investigation category, calendar years 1993–2000**

| | Investigation Category | | | |
|---|---|---|---|---|
| Year | 3 | 4 | 5 | Total |
| 1993 | 16 | 81 | 576 | 673 |
| 1994 | 8 | 46 | 763 | 817 |
| 1995 | 10 | 55 | 711 | 776 |
| 1996 | 5 | 60 | 660 | 725 |
| 1997 | 7 | 264 | 572 | 843 |
| 1998 | 2 | 580 | 781 | 1363 |
| 1999 | 1 | 551 | 1058 | 1610 |
| 2000 | 2 | 85 | 1620 | 1707 |

**Table 16:**
**Incidents and serious incidents involving Australian registered aircraft carrying out low-capacity air transport operations by investigation category, calendar years 1993–2000**

| | Investigation Category | | | | |
|---|---|---|---|---|---|
| Year | 2 | 3 | 4 | 5 | Total |
| 1993 | - | 12 | 44 | 297 | 353 |
| 1994 | - | 5 | 26 | 307 | 338 |
| 1995 | - | - | 26 | 294 | 320 |
| 1996 | - | - | 28 | 328 | 356 |
| 1997 | - | 4 | 156 | 277 | 437 |
| 1998 | 1 | 2 | 314 | 257 | 574 |
| 1999 | - | 2 | 289 | 382 | 673 |
| 2000 | - | 2 | 42 | 748 | 792 |

Over the eight years, the total number of incidents has steadily increased. (Changes in investigation category definitions over time complicate comparisons.) These increases mainly reflect improved reporting and changes in the recording policy that were implemented by the then Bureau of Air Safety Investigation. Previously, certain types of occurrence, although reported to the Bureau, were not included in the database. An example is the inclusion of all bird strikes instead of only those that caused damage to aircraft. Improved reporting by airlines is indicative of an improving safety culture.

Table 17 shows the different incident rates for high-capacity and low-capacity respectively.

Active encouragement of the reporting of all incidents is essential. Information received from British Airways is an example of an airline that has been successful with their internal reporting system. Reports to British Airways have increased from 2500 reports in 1992 to more than 8000 in 1999. The increase is not considered as showing a problem but rather as indicating that a safety culture is becoming more and more entrenched.

**Table 17:**
**Incident rates per 100 000 aircraft departures and per 100 000 hours flown, calendar years 1993–2000**

| | High-capacity | | Low-capacity | |
|---|---|---|---|---|
| | Rate deps | Rate hours | Rate deps | Rate hours |
| 1993 | 260.3 | 121.6 | 115.7 | 153.2 |
| 1994 | 301.3 | 133.4 | 108.7 | 138.0 |
| 1995 | 264.5 | 116.5 | 103.2 | 129.0 |
| 1996 | 242.0 | 102.9 | 109.6 | 137.9 |
| 1997 | 285.6 | 117.4 | 134.4 | 157.9 |
| 1998 | 465.1 | 192.4 | 174.2 | 201.0 |
| 1999 | 548.7 | 226.9 | 203.1 | 235.8 |
| 2000 | 535.9 | 222.3 | 244.9 | 278.8 |

## *Cost of aviation accidents*

As with other transport modes, accidents result in considerable losses to the community in terms of costs, fatalities and injuries. The Bureau of Transport Economics (BTE) has estimated the cost of aviation accidents to be close to $112 million in 1996 (see table 18).

**Table 18:**
**Estimated cost of aviation accidents in 1996**

| Category | Cost / losses ($ 000's) |
|---|---|
| Productivity losses | 65 075 |
| Property damage | 20 854 |
| Loss of quality of life | 16 100 |
| Insurance administration | 3733 |
| Legal costs | 326 |
| Emergency services | 988 |
| Accident investigation | 1648 |
| Medical costs | 1314 |
| Rehabilitation/long term care | 446 |
| Workplace costs—non-victim | 994 |
| Premature funeral costs | 64 |
| **Total** | **$111 542** |

*Source: BTE, 1999*

# Modal overviews

## Road

### *Role*

ATSB aims to improve national road safety by undertaking research projects, collecting and analysing statistics, coordinating the National Road Safety Strategy, managing vehicle safety inspections and recalls, administering the Federal Road Safety Black Spot Program and providing a range of safety communication, liaison and information services.

### *Safety programs*

#### National Road Safety Strategy and Taskforce

Working with the National Road Safety Strategy Panel and Taskforce appointed by the Standing Committee on Transport (SCOT), ATSB successfully coordinated the development of a new *National Road Safety Strategy for 2001–10* and an associated *Action Plan for 2001 and 2002*. Both were approved by the Australian Transport Council (ATC) and launched by Ministers in November 2000. ATSB provided the chair and secretariat to the Panel and Taskforce, performed the research and drafting, and managed consultation with the Panel and Taskforce members and other stakeholders.

The Strategy provides a framework that complements the strategic road safety plans of State, Territory and local governments and other stakeholders in road safety. The target of the Strategy is to reduce the annual number of road fatalities per 100 000 population by 40 per cent, from 9.3 in 1999 to no more than 5.6 in 2010.

Annual reports on progress in implementing the Strategy and Action Plan will be provided to ATC. ATSB now has an agreement from jurisdictions concerning the process for providing these reports and will coordinate their preparation through the Panel.

#### Black Spot Program

The objective of the Federal Road Safety Black Spot Program is to reduce the social and economic costs of road trauma by the identification and cost-effective treatment of sites and areas with a

record of casualty crashes. The Program was introduced in 1996 as a cost-effective initiative to reduce the national road toll.

Site treatments generally involve the upgrade of existing infrastructure or the provision of new safety measures at the location. Examples include traffic signals, roundabouts, lighting, pedestrian facilities, traffic islands, delineation (line marking and raised reflective pavement markers delineating the traffic lanes), sealing road shoulders, guide posts, guard fencing, removal of roadside hazards, signs and other accepted or engineered treatments that may be considered to reduce the incidence of crashes at the location

In the 2000–01 financial year, total cash of $41.182 million was allocated and 455 projects were approved (see appendix 6 for treated sites in 2000–01).

From commencement of the Program in 1996 until 30 June 2001, 1911 projects have been approved Australia-wide with a total value of over $198 million. An estimated $42.1 million is available in 2001–02 in cash terms ($48.346 million in accrual terms).

Consultative Panels have been established in each State and Territory to comment on proposals nominated and to prepare submissions to the Minister for Transport and Regional Services for consideration and approval by the Parliamentary Secretary. Panels comprise representatives of road-user and community groups as well as Federal, State and local governments. Most Panels have conducted meetings to consider proposals for funding in 2001–02 and most States have already received advice of approved programs.

On 15 August 2001, the Parliamentary Secretary for Transport and Regional Services, Senator Ron Boswell, released a Bureau of Transport Economics (BTE) report of the Program following a comprehensive ‘before and after’ evaluation to determine what actual outcomes were being achieved. The evaluation confirmed that the Program is highly effective, returning savings to the community of $14 for every dollar spent. In its first three years, the Program is estimated to have saved at least 32 lives and to have prevented more than 1500 serious crashes. Further benefits will continue to accrue over the life of the treatments that were installed. The BTE report can be accessed online at www.dotrs.gov.au/bte/docs/r104/htm/contents.htm.

All projects approved under the Federal Road Safety Black Spot Program are listed on the ATSB's web site www.atsb.gov.au/road/blackspot/intro1.cfm

The Minister approved the allocation of $0.5 million from the Australian Land Transport Development (ALTD) Act for ATSB's road safety public communication activity in 2000–01. The money was used to fund learner-driver, motorcycle, truck and other road-safety material and its printing, storage and distribution.

### *Motor vehicle recall*

The principal functions of the Vehicle Recall and Investigations Unit are to:

- Undertake investigations in response to reports of safety defects in the design, manufacture or assembly of vehicles and components.
- Monitor the effectiveness of road vehicle safety recalls in the context of an industry standard Recall Code of Practice and the *Trade Practices Act 1974* (under which regulatory power lies with the Treasury).
- Provide technical and secretariat services to the Committee to Advise on Recall and Safety (CARS).

ATSB monitors over 100 active recalls per year and in 2000–01 was notified by manufacturers of 112 new recalls. In addition, ATSB examined advice from the public and regulatory authorities of 64 safety concerns for investigation.

The Committee to Advise on Recall and Safety provides a forum for exchange of recall information and related vehicle safety concerns between government, industry and State registering authorities. The Committee is chaired by ATSB.

Vehicle recalls are posted on ATSB's web site www.atsb.gov.au/road/recalls/recall.cfm

The following major categories of defects were involved in recalls notified during the year:

- *Tyres.* Failure of tread at speed can cause loss of control, which has led to fatalities.

- *Seat belts.* Insecure seat-belt anchorages and child restraints have been recalled.
- *Electrical systems.* Wiring faults or component failures may often be associated with loss of power to items such as headlights or wipers, and may even result in vehicle fires.
- *Truck steering and brakes.* Loose components requiring inspection and tightening have been recalled.
- *Airbags.* Electrical interference or abnormal corrosion of the airbag control unit may give rise to inadvertent airbag deployment. Unintentional deployments can be a concern, particularly if the occupant is not wearing a seat belt and is out-of-position, for example, when leaning forward to start the engine.

### National road safety statistics

The statistical program includes the collection, analysis and reporting of national statistics on road fatalities and serious injuries to assist in the development or evaluation of road safety measures. Work under way in 2000–01 will lead to important new datasets to supplement these existing collections:

- ATSB has been working with States and Territories to develop the Australian Truck Crash Database (ATCD). The database is intended to provide crash details of articulated and heavy rigid trucks. The Bureau is analysing and evaluating the data provided. A report will be ready in early 2001–02.
- Collaborating with NTI Insurance and the Australian Trucking Association, ATSB has begun an analysis of insurance industry information on major truck crashes. The study will provide valuable details on heavy vehicle crashes from an industry viewpoint.
- Established national statistical collections are largely based on police reports and coroners' records. Much of this is manually coded by ATSB contractors onto a computer database. From mid-2001, selected information from coroners' records will be available online through Monash University's National Coroners' Information System (NCIS). ATSB has provided financial support and comments on data coverage for the development of this system. When operational, the NCIS should provide more timely and convenient access to information needed by ATSB to analyse and report on road fatalities.

The generation of nationally focussed statistical information by the Unit provides a strong quantitative basis for policy development and evaluation. The work of the Unit contributes significantly to Commonwealth Government policy, and to project and program initiatives related to road safety (see, for example, the report *Bull Bars and Road Trauma*).

In addition to its interaction with relevant Commonwealth, State and Territory departments, the Unit liaises extensively with a wide variety of interested parties including road safety committees, transport associations, insurance groups, road-user representatives, road transport manufacturers, the media, academia and the public.

### *Road Safety Research Program*

The Road Safety Research Program underpins the Federal policy role in road safety. It provides input to policy formulation and review conducted in consultation with partner organisations under the National Road Safety Strategy, and in other safety forums. It also feeds into work on safety-related issues undertaken by the Land Transport Division of the Department of Transport and Regional Services.

Most research and statistical work is contracted out to private sector consultants or academics. ATSB officers identify the directions, manage the projects, exercise quality control and use the material in policy or operational advice and to convey key safety messages.

The Program includes research projects on road-user, vehicle and road infrastructure safety. Research reports are widely circulated, and many attract significant media interest. Major reports released in 2000–01 included:

- *Demonstration Project for Fatigue Management Programs in the Road Transport Industry: Summary of Findings.*
- *Effectiveness of ADR 69: A Case-Control Study of Crashed Vehicles Equipped with Airbags.*
- *Fatigue Expert Group: Options for Regulatory Approach to Fatigue in Drivers of Heavy Vehicles in Australia and New Zealand.*

The Program also promotes the enforcement of seat-belt use, random breath testing, speed limits and continuing improvements in design rules for vehicle safety.

**Heavy vehicle driver fatigue management:** This research examines how improved schedule planning can help manage fatigue. It assists in developing and evaluating approaches trialled under the Fatigue Management Pilot Program, which implements in part the Australian Driving Hours Reform Package. The Pilot involves several operators, with fatigue management programs approved by a panel (chaired by Queensland Transport) of transport agency officials, police and technical experts.

ATSB also contributed to a joint project with the National Road Transport Commission and the New Zealand Land Transport Safety Authority. The project involved an expert group who examined how fatigue research findings might be applied to regulatory hours of service regimes. The group's report was published jointly by ATSB and the National Road Transport Commission (NRTC) in February 2001.

**Speed:** Speed is a key priority countermeasure area identified in the National Road Safety Strategy, and has been identified as a major priority for research effort during consultations on the National Research Strategy. Ongoing ATSB research examined:

- the use of road markings to influence traffic speeds (a possible low-cost alternative to more intrusive engineering measures);
- the effects of travel speed on trip times in urban areas (a critical issue in policy decisions on speed management, and also potentially useful in public education strategies on speed choices); and
- the risks associated with speeding on rural roads.

**Road environment:** Roadside safety barriers are required to meet performance standards based on crash tests with medium-sized cars. Motorcycle rider groups, in Australia and overseas, have raised concerns that there are no comparable standards for motorcycle crashes and no test procedures for checking the effects of different barrier types on motorcycle safety. ATSB funded a small study to explore the feasibility of developing a suitable test program, and published a report on this work.

**Vehicle safety standards:** The Land Transport Division of the Department of Transport and Regional Services manages research into regulatory tests for vehicle standards. ATSB statistical collections provide essential input to this work. In partnership with other agencies, ATSB has also funded research into the occupant

protection performance of vehicles in real-world crashes. Published results benefit potential buyers.

In past financial years, ATSB contributed to an innovative project on vehicle side-impact protection, in partnership with other government agencies, industry and academic research organisations. Primary funding was provided under the Australian Research Council's Strategic Partnership with Industry Program. At present, many manufacturers use a combination of crash tests and simulation techniques to design safer vehicles. However, optimisation of vehicle design has been focused mainly on performance in one or two specific test configurations. The aim of this project (which complements work on regulatory side-impact standards) was to develop a more sophisticated approach, based on minimising the total social cost of injuries over the full range of side-impact crashes and occupant characteristics encountered in the real world. This project was completed in 2000–01. Monash University Accident Research Centre and other members of the research consortium have presented results of this research at the international Enhanced Safety of Vehicles conference, and further publications are expected.

**Seeding grants:** Each year, ATSB awards several small-scale research grants, based on competitive evaluation of proposals submitted in response to national advertising. The grant scheme provides an opportunity for researchers and community groups to submit innovative ideas for research projects. For a list of seeding grants awarded in 2000–01 see appendix 11.

**Driver-trainer materials:** ATSB, in conjunction with the Australian Driver Trainers Association (ADTA), developed a package of safety resource materials for use by driver trainers and learners. The package consists of full colour A4 sheets on various topics, separately identified for learners and parents, and an explanatory booklet for the driver trainer. The content, designed to complement material currently available from State licensing offices, focuses on risk factors for young drivers, strategies for managing risks, and hazard recognition. A major aim is to encourage learners to build up driving hours in different conditions before driving alone. There is explicit encouragement of a partnership between the learner driver, the professional driving instructor and parents/supervisors. ATSB will initially distribute the package to ADTA members, but copies will be available to other driver trainers on request. Trainers, learner drivers and their families will also find the material on the ATSB web site.

**Community attitudes:** ATSB conducts an annual national survey of community attitudes and beliefs about road safety issues to assist with development and review of policies and programs.

Issues examined include perceived causes of road crashes, exposure to random breath testing, attitudes to speed and drink driving, perceptions of police enforcement, reported usage of seat belts and involvement in road crashes. The sample size (about 1600) is stratified to allow comparisons between the different States and Territories.

**Roaduser:** In 1998, Roaduser International Pty Ltd was commissioned by the then Federal Office of Road Safety (FORS) to investigate alleged problems with the dynamic behaviour of certain types of heavy trucks. Following the investigation and a period of consultation and comment, a final report was presented to the Minister for Transport and Regional Services. It is the responsibility of ATSB to oversee the implementation of the Roaduser International report recommendations.

### *Participation in safety forums*

**Parliamentary inquiries:** ATSB co-ordinated the preparation of the Federal Government Response to the Inquiry into Managing Fatigue in Transport (House of Representatives Standing Committee on Communications, Transport and the Arts). The response involved significant contributions by Divisions in the Department, portfolio agencies such as CASA, and external agencies. The response can be accessed at the Departmental web site http://www.dotrs.gov.au/pubs/bmo/index.htm

ATSB also provided submissions and expert advice to State and Territory Parliamentary committees dealing with road safety. In 2000–01, ATSB officers provided oral evidence to the Victorian Parliamentary Road Safety Committee's Inquiry into Rural Road Safety and Infrastructure.

**Austroads:** Austroads is the association of Australian and New Zealand road transport and traffic authorities. As the road group of the Australian Transport Council, it advances Australia's broader transport agenda. Austroads' core activities consist of five program areas, each managed by a senior officer from a member organisation. ATSB's Director of Safety Programs and Support also manages Austroads' Road Safety Program.

Involvement in the Austroads Road Safety Program allows ATSB to influence and contribute to the national road safety agenda. Throughout 2000–01, ATSB officers provided advice and administrative assistance to the Austroads Road Safety Program Manager, and coordinated the activities of the Austroads Research Coordination and Advisory Group (RCAG). RCAG advises the National Road Safety Strategy Panel and the Austroads Road Safety Program Manager on research priorities, and coordinates road safety research in the Austroads jurisdictions.

ATSB was a member of the project management team for the Austroads report to Australian Transport Council on School Bus Safety.

**National Road Safety Strategy Panel:** ATSB convenes, chairs and provides secretariat services to the National Road Safety Strategy Panel. The Panel meets twice a year and brings together key stakeholders in road safety, including representatives of transport agencies, police, user groups and industry. Its main functions are to:

- coordinate national research on road safety issues;
- provide a forum for jurisdictions to share experiences on road safety initiatives and outcomes;
- provide advice to the Executive Director of the ATSB and to the Austroads Road Safety Manager;
- monitor the implementation of the National Road Safety Strategy and Action Plans.

**Committee to Advise on Recall and Safety:** The Committee includes representatives of government, industry and road user (consumer) groups. It examines allegedly unsafe vehicle parts, accessories and unsafe practices, including appropriate means of overcoming demonstrated safety problems.

**Motorcycle Safety Consultative Committee:** The Motorcycle Safety Consultative Committee provides a forum for constructive consultation on national motorcycle safety issues between the Federal Government (represented by ATSB and other Departmental staff as appropriate), major rider associations and other stakeholder groups. It is chaired by ATSB and usually meets twice a year in Canberra.

**Road Safety Black Spot Program consultative panels:** Panels in each State and Territory include representatives of the relevant State or Territory road and transport agency, local government, and community and road user groups. The panels consider and comment on all nominations for Black Spot treatment.

**Heavy vehicle driver fatigue:** In addition to the research and inputs to national reviews noted above, ATSB has contributed to the development and evaluation of strategies for managing heavy vehicle driver fatigue through:

- participation in the Project Team for the Heavy Vehicle Fatigue Management Pilot (led by Queensland Transport);
- input to the work of the Expert Group on Truck Driving Hours (a group of technical experts convened by ATSB, the National Road Transport Commission and the New Zealand Land Transport Safety Authority to examine the application of fatigue research findings to regulatory controls on hours of service);
- participation in the Fatigue Reference Group established by the NRTC to deal with issues relating to heavy vehicle driving hours and fatigue management, under the Third Heavy Vehicle Reform Package.

**Fleet safety:** There is growing interest in the potential road safety benefits of workplace-based fleet safety programs. A Fleet Safety Forum has been formed to facilitate cooperation and coordination of effort in this area. Membership includes State road safety agencies, ATSB, and researchers.

## Rail

### *Role*

ATSB's role in rail covers development of an investigation capability and a national statistical database on safety occurrences, advice and training to the rail industry on ATSB's internationally adopted best investigative practices in aviation and marine and a proposed limited involvement in research where resources permit.

### *Development of a rail investigation capability*

ATSB continued to pursue a role to initiate independent investigations nationally on the interstate rail system under Commonwealth legislation. Pending introduction of the legislation,

ATSB's Team Leader, Rail Safety assisted in the development of Standards Australia guidelines for rail-safety investigation and participated in State Government investigations on request. Specialist expertise in human factors, technical analysis, systemic investigation and engineering was made available from the aviation and marine areas of ATSB to assist with these investigations. Consistent with ATSB current practices to call upon external expertise where necessary, assistance was obtained on transport medical issues, technical aspects of rolling stock and track and train derailment modelling.

The Rail Safety Unit worked closely with the Department's Legal Group to develop a draft *Transport Safety Investigation Bill*, which, it is hoped, can be introduced into Parliament after the Federal Election.

### *Participation in State Government investigations*

ATSB was involved in three investigations during 2000–01.

ATSB was invited by an interstate rail operator, National Rail Corporation, to join an investigation team that included the Australian Track Access Corporation and invited consultants. A fire had destroyed three road/rail units aboard a 'Trailerail' train which had been travelling between Melbourne and Perth on 21 April 2000 at Deep Lead, about 14 km north of Stawell in Victoria. Under Victorian rail legislation, National Rail Corporation is required to undertake an investigation into the causes of an accident and report to the regulating body, the accreditation authority. With the approval of the accreditation authority, ATSB participated in the investigation as a training exercise.

At the invitation of the Victorian Government, ATSB led an investigation into a derailment of an XPT train travelling between Sydney and Melbourne, which occurred on 25 April 2001 in Wodonga, Victoria. The leading bogie on the fifth passenger carriage derailed on a tight curve. The train was stopped quickly by the driver, and this minimised the potential for a more serious accident. The investigation involves parties from industry and government in South Australia, New South Wales and Victoria.

Unlike the previous two investigations, which occurred on the defined interstate rail track, ATSB led an investigation at the invitation of the Victorian Government to investigate an accident on the intrastate passenger line in Footscray, Victoria, which occurred on 5 June 2001.

### *Development of an accident and incident database*

Progress is being made in the development of a National Rail Occurrence Database in close consultation with State Rail Safety Accreditation Authorities. Substantial progress has been made towards agreement on definitions of core data items to be included in the database, core outputs and a workable database structure.

### *Participation in safety forums*

During 2000–01, ATSB participated in a variety of forums to assist safety practices in the rail industry, to build on a network of contacts throughout the industry and to keep up to date on policy and technical issues associated with its developing investigation capability.

Discussion with the States on ATSB's role in rail took place at a number of meetings throughout the year to discuss the Commonwealth's proposed investigation legislation (which was opposed by States), development of a national accident and incident database, ATSB training for rail investigators and development of 'trigger' guidelines for the conduct of independent investigations. ATSB provided briefing material for and attended two meetings with Transport Ministers of the Australian Transport Council and nine meetings with heads of transport departments and senior policy officials of the Australian Transport Council's supporting bodies (two meetings of the Standing Committee on Transport (SCOT), three meetings of a SCOT sub-group and four meetings of the SCOT Rail Group). In addition, ATSB met with accreditation authorities and rail industry representatives of the Rail Safety Consultative Forum at four meetings.

ATSB continued to provide expert advice to the Standards Australia ME/79 Committee in its development of an Australian standard on rail safety occurrence investigation. The objective of the standard was to provide appropriate guidance to the rail industry and governments, in order to ensure a nationally consistent approach to the conduct of systemic, 'no-blame' investigations. There was some resistance within the Committee to some of the detail of the standard and to its introduction as part of the Railway Safety Management series, AS 4292. As a compromise, the Committee agreed to Standards Australia producing a guideline document only.

A presentation on international best practice safety investigation from the marine perspective was provided to the Australian Rail

Safety 2001 'Codes of Practice' conference, presented as the first safety 'summit' by the Australasian Railway Association. ATSB also attended the Rail Industry and Workload Project Consortium's fourth meeting at the University of South Australia, which discussed the implications of the House of Representatives Standing Committee on Communications, Transport and the Arts (Neville Committee) report on fatigue *Beyond the Midnight Oil*.

ATSB presented two training workshops on best practices for safety investigations to the WA Government operator Westrail (prior to its sale) on 16 and 17 October and 18 and 19 October 2000. The workshops adopted a multimodal approach for concept discussion and syndicate work in relation to human factors and the Reason model for systemic investigations. This was supported by practical examples from the rail, aviation and marine transport modes to illustrate the generic theory.

### *Training for rail industry personnel*

Three rail industry personnel representing operators, track access providers and rail accreditation authorities completed an ATSB human factors training course in Canberra on 13–17 November 2000. A further seven attended the course from 26 February to 2 March 2001.

### *Research*

A payment of $5000 was made to Monash University to help meet the set-up costs of the Seventh International Symposium on railroad-highway grade crossings. The conference is scheduled to be held in Australia in February 2002.

ATSB undertook an analysis of level crossing accidents based on data held in its Fatality Crash Database, which holds detailed records of fatal road crashes in Australia since 1988. The analysis is planned to be published on the ATSB web site after it has been considered by Ministers of the Australian Transport Council.

ATSB helped the Bureau of Transport Economics begin a study to estimate the cost of rail accidents. The methodology would be similar to that adopted for other studies in the aviation and road transport modes.

# Marine

## *Role*

Marine transport accounts for 73.7 per cent of the value of all imports and exports of cargo into Australia, and plays a significant role in coastal trade. Australia also relies on a major offshore industry fleet that supports oil and gas exploration off the Australian coast. Accordingly, a safe and efficient marine transport system is an essential part of the Australian economy.

The Marine Investigations Unit investigates accidents and incidents involving Australian-registered ships anywhere in the world, foreign flagships within the Australian territorial sea, or where evidence relating to an accident is found in Australia. Marine incidents, as defined by the Navigation (Marine Casualty) Regulations, include:

- loss of life or serious injury aboard a ship;
- the loss of a ship;
- fires, collisions and groundings;
- damage to, or caused by, ships;
- serious damage to the environment caused by a ship.

Masters of Australian-registered vessels, or of foreign-flag vessels in Australian waters must, under the Navigation (Marine Casualty) Regulations, report incidents as soon as practicable to the Inspector of Marine Accidents (a statutory appointment under the Regulations). To overcome difficulties in reporting to several separate authorities, the Regulations recognise reports to AMSA, including the Australian Search and Rescue Coordination Centre. On receiving a report of an incident, the Inspector decides what action to take. Depending on the type and severity of the incident, the Inspector may:

- Conduct an ATSB investigation.
- Seek more information from the owner, operator, crew or other bodies.
- Take no further action.

The Inspector of Marine Accidents in the Marine Unit has a delegation under Part 3 of the Navigation (Marine Casualty) Regulations (formed under the Navigation Act 1912) to appoint investigators, as appropriate, to investigate marine accidents and

incidents. The Secretary has delegated his power to publish marine investigation reports under subregulation 16(6) of the Regulations to the ATSB Executive Director.

The purpose of an investigation is to determine and report the circumstances and causes of an incident. This is to promote industry awareness of such causes with the aim of preventing a similar occurrence in the future.

In making findings of the causes of a particular incident, it is not the function of the Unit to assign fault or determine civil or criminal liability. Results of an investigation are not binding on the parties to any legal, disciplinary or other proceedings.

The Unit normally undertakes around 10 to 12 investigations each year. Most investigations involve foreign flagships.

The Unit publishes reports on all accidents investigated. About 1000 copies are distributed to the Australian maritime community and to marine administrations in Australia and overseas, as well as to colleges and universities in several overseas countries.

### *Bunga Teratai Satu*

The Malaysian flag container vessel *Bunga Teratai Satu* ran aground at full speed on Sudbury Reef, south of Cairns, on 2 November 2000.

The ship had previously disembarked the Great Barrier Reef pilot at about 0550, and was proceeding without a pilot. The master had left the bridge at about 0630, leaving the mate, who held a Master Class 1 certificate of competency, in charge of the navigation. The ship was steering about 120 degrees true.

The mate's wife was travelling with him for the first time. At about 0640, while still in range of the mobile phone network, the mate made several calls to contact his mother-in-law and children in Karachi. Shortly after asking his wife to come to the bridge at about 0700, he finally contacted Karachi. He spoke briefly on the phone and then handed it to his wife, who was on the starboard bridge wing. He stayed close by, listening to the conversation. The call lasted almost 15 minutes.

The lookout on watch usually plotted for the mate the ship's position from the global positioning system (GPS). At 0700, he plotted the ship's position several miles from Fitzroy Island, which

was close to the ship's waypoint for altering to a course of 169 degrees true. The lookout then moved to the bridge front and waited for the mate to return to the wheelhouse. At about this time, the GPS alarm indicated the ship had arrived at the waypoint and a 'cross-track' error (off-course) alarm would have sounded. However, the alarm failed to alert the mate to the developing situation.

The mate and his wife returned to the wheelhouse at about 0715 and began to make coffee. The mate looked at the 0700 position and first told the lookout that his position was wrong. He then seemed to realise that something was wrong. At about 0720, he ordered the lookout to take the wheel and to alter course to starboard. By this time, the lookout could see a low-lying sand cay to starboard, and queried the order. The mate then ordered him to alter course to port and to bring the ship through 300 degrees to a course of 180 degrees. Before the lookout could react, *Bunga Teratai Satu* took the ground at about 20 knots. At about this time the master arrived on the bridge, asked the mate what was going on, and stopped the engine.

The ship sustained relatively minor damage. No oil or other pollutants escaped from the vessel, and it was refloated 12 days later on 14 November. Once inspected, the ship continued its voyage to Sydney, where it unloaded all its cargo before returning to Singapore for repairs.

The investigation found that the grounding occurred after the mate was distracted for about 15 minutes by a telephone conversation between his wife and his family overseas.

The evidence also suggested several latent factors:

1. From about 0645 to 0715, the mate should have been checking the ship's course, speed and position or attending to his other watchkeeping duties. Instead, he was preoccupied with arranging and making several private telephone calls while the ship was in cellular phone range of the coast.
2. The mate's watch on 2 November 2000 showed poor motivation and fell well below proper professional standards.
3. The ship's GPS cross-track error alarm was neither loud enough nor strident enough to attract urgent attention.
4. Inadequate bridge resource management allowed a simple error by one person to result in a serious accident.

The report also addressed issues related to the Great Barrier Reef Ship Reporting scheme (REEFREP).

*Bunga Teratai Satu* was reporting under REEFREP. For about three hours until the time of the grounding, the container ship was visible on the radar screen of Green Island radar, one of four radars covering the limited areas of the reef at the entrance to the compulsory pilotage areas. These radars are compliance monitoring devices that are also part of an advisory service to improve navigation safety and prevent pollution in the Great Barrier Reef. Reefcentre operators have specific instructions to contact ships that fail to make an anticipated alteration of course or that enter a pre-set 'restricted' area.

In this case, the operator, who had taken over the watch at 0700 in the operations centre near Mackay, did not notice that *Bunga Teratai Satu* had not altered course off Fitzroy Island. Just 20 seconds before *Bunga Teratai Satu* crossed into the restricted area off Sudbury Reef, there was a partial failure of one of the radars in Torres Strait. While the operator was recovering lost targets in the Strait, the computer alarm 'bleep' and the error message relating to the container ship's incursion into the restricted area, failed to be noted.

The ship-reporting system generates 17 different alarms, only three of which are urgent. The sheer volume of alarms received during a watch, and the lack of differentiation between urgent and routine messages, desensitised the operators.

The report made several recommendations to the ship owner regarding alarms on the GPS as well as bridge organisational issues. ATSB also recommended that a review consider the feasibility of upgrading the Great Barrier Reef Ship Reporting Scheme. The recommendations require serious consideration because of the need for safe navigation of all vessels at all times, particularly in the environmentally sensitive area of the Great Barrier Reef.

Recommendations for ship operators were that they:

- Review the feasibility of introducing bridge resource management principles to ship operations, particularly to navigation.
- Investigate the advisability of permitting private mobile telephone usage on the bridge when there is a single officer in charge of navigation.

- Review ship operating procedures with a view to adopting appropriate current International Chamber of Shipping guidelines.
- Examine the feasibility and the advantages or disadvantages of fitting audible GPS alarms in positions other than at the GPS display and, in conjunction with equipment manufacturers, review the volume and characteristics of critical GPS alarms.

Recommendations for Reefcentre were that the operators:

- Review the system of 'alerts', message priorities and the extent of restricted areas south of the compulsory pilotage limits.
- Review the role of Reefcentre and the present system of ship reporting to determine the feasibility of providing an advisory service.

### *Padang Hawk*

There was one incident of a shift of cargo following liquefaction of a cargo of nickel ore aboard the Singapore flag bulk carrier *Padang Hawk*. The report concluded that factors contributing to the incident included the fact that the cargo was loaded with excessive moisture and that, in heavy seas, it changed state from a solid to a viscous liquid in the majority of cargo holds. It was also noted that there was no test to specifically ascertain the transportable moisture limit of nickel ore.

The Inspector of Marine Accidents informed the International Maritime Organization (IMO) of the incident and sent a report on the liquefaction of cargo aboard *Padang Hawk* to IMO with a copy of the ATSB report on the incident. The report generated considerable interest from the maritime and nickel mining industries. It has been reproduced in part in several maritime publications and was presented at the IMO by the French maritime authorities with a view to developing standards for testing and safe carriage of the cargo by sea.

### *Ariake*

The report of the investigation into the collision between the British flag container ship *Ariake* and a tug while the ship was being assisted to its berth in Brisbane examined human factors issues as they related to handling of the tugs.

The report concluded that the collision resulted from a number of factors one of which was that the tug was initially 'washed in' under the ship's stern after an astern movement on the ship's port main engine. Another factor was that the tug master was probably experiencing some effects of fatigue at the end of a reasonably busy night shift. The conclusions ended with the statement that there were still some apparent human factors issues with the control of this class of tug and that further training was indicated in emergency procedures for tug masters.

Recommendations in the report on the collision between *Ariake* and the tug noted that actions that might alleviate problems identified by the investigation would be to:

- Clarify, document and standardise the range of options for impending loss of control situations in this class of tug.
- Increase the frequency of experiential training for such options.

### *Warden Point*

The report on the failure of steering gear on the Australian flag vessel *Warden Point* during heavy weather concluded that this had occurred as a result of the steering pump motors failing after contact with seawater.

The vessel, bound for Melbourne with a cargo of fly ash, was in heavy seas with waves sweeping over the lower poop deck. A leaking hatch lid for the rope locker aft permitted seawater to enter the rope locker and the steering flat, so that water was soon running over the steering motors. Both steering motors failed and the engine was stopped. Once headway was lost, the ship rolled heavily in beam seas.

Both steering motors were damaged beyond repair and the crew had to use a lower rated motor to restore steering. While this was being done, the cargo shifted, causing a list and the ship was diverted, initially to Newcastle and then, to Port Kembla. At Port Kembla new steering motors were fitted, repairs were carried out to the rope locker hatch lid and the cargo was trimmed. The voyage to Melbourne was then resumed.

The report recommended that the ship operators and the Australian Maritime Safety Authority review the physical properties of fly ash with a view to establishing a safe method of carrying the cargo by sea.

On 21 April 2001, just prior to publishing the report on this incident on *Warden Point*, the ship (of summer deadweight 6127.7 tonnes) experienced another shift of its cargo of fly ash en route to Melbourne. The ship was rolled heavily to starboard by two large waves and developed a starboard list of 10 degrees after cargo shifted in both holds. The ship was hove to and cargo was trimmed to bring the vessel upright. It was estimated that 184 tonnes of cargo had shifted to cause the list.

### *Small vessel safety*

Collisions between ships and fishing boats continue to occur despite numerous reports on such incidents being widely circulated within the industry. A report on the collision between the Liberian flag woodchip carrier, *Craig The Pioneer* and the Australian fishing vessel *Maybell II* at night in fine weather conditions with good visibility concluded that:

- The watchkeepers on the bridge of the ship did not maintain a proper lookout, either by sight or by radar, also that the lookout would have to be considered seriously deficient not to have seen the trawler.
- The crew of the trawler were on deck concentrating on recovering nets when the collision occurred and were not keeping a proper lookout. As well, the vision of the crew of the trawler was significantly impaired from working under bright lights.

The report, in a section on collisions and causal factors, stated it appeared that proper lookouts were not being kept and that seafarers must appreciate the need to maintain such lookouts at all times.

In June 2000, a collision between the Australian fishing vessel *Sue M* and the bulk carrier *Star Sea Bridge* resulted in the death of the fishing vessel's skipper. ATSB will release its report once criminal proceedings against the master and officer of the watch of *Star Sea Bridge* are completed.

Two further collisions between a small vessel and a large trading ship were reported during 2000 and 2001. ATSB is investigating one of these; AMSA has launched a prosecution with respect to the other.

In October–November 2000, the Executive Director issued two sets of safety pamphlets, one for fishers and the other for masters of large vessels. The pamphlets (15 000 copies) emphasised that anyone in

charge of vessel at sea must maintain a proper and effective lookout. They also stressed that despite modern electronic aids, small vessels may not be detected on a radar screen.

### *Accidents involving ships' lifeboats*

In last year's Annual Review, ATSB reported on a paper on lifeboat accidents (FSI 8/11/3) it had submitted to the International Maritime Organisation's (IMO's) Flag State Implementation Sub-Committee. The investigation of two further accidents involving lifeboats is under consideration. One of these is being investigated in cooperation with the Canadian Transport Safety Board. A lifeboat accident aboard *Washington Trader* off Abbot Point, Queensland, was similar in all respects to a fatal accident involving a sister ship in Canada, just three weeks after the *Washington Trader* accident.

A report on the investigation of a lifeboat accident aboard the Antigua and Barbuda flag vessel *Waddens* at Cairns highlighted an issue that is receiving considerable attention. One of the two crewmembers in the lifeboat was injured and required hospitalisation and subsequent repatriation. While the report ruled out mechanical failure of the release system as a factor in the incident, it concluded that the locking devices for the release lever were not engaged and that the release lever was operated inadvertently. Issues of poor ergonomic design contributing to the accident were that the release lever was fitted in a position where it might interfere with access to and from the boat and, if the release lever was not locked, it could be moved accidentally, releasing the boat.

### *Policy and legislation*

The review of the *Navigation Act 1912*, published in June 2000, made several recommendations concerning marine accident investigation legislation:

- The legislation should continue to provide for investigations of marine casualties and incidents separately from regulatory safety functions.
- The Navigation (Marine Casualty) Regulations should be amended to require every incident investigation report to contain recommendations aimed at enhancing safety and preventing recurrence of the same type of incident.
- The Navigation (Marine Casualty) Regulations should be amended to allow the Inspector of Marine Accidents to

investigate incidents on behalf of other Flag States, consistent with IMO Resolution A.849 (20).

- ATSB should continue to consult with the States and Northern Territory marine accident investigation authorities to ensure that Commonwealth and State/Territory legislation provides for appropriate coverage of marine incident investigations by each jurisdiction.

The recommendation concerning the publishing of recommendations has been adopted as a matter of policy, pending legislation covering all ATSB investigation functions being introduced.

In February 2001, the Executive Council agreed on several amendments to the Navigation (Marine Casualty) Regulations. These brought the Regulations more into line with equivalent air investigation provisions for confidentiality and access to evidence, and make it easier to obtain a search warrant. Also, importantly, new provisions to assist foreign administrations in marine accident investigation gave practical effect to the IMO Resolution A.849 (20), which recommended adopting a Code for the Investigation of Marine Casualties and Incidents. The Code itself forms a schedule to the amended Regulations.

## *Participation in safety forums*

### Marine Accident Investigators' International Forum (MAIIF)

Australia is a founding member of MAIIF, which was formed in Canada in 1992. In 2000, at the ninth meeting of MAIIF in Belize City (hosted by the Maritime Register of Belize), 37 delegates represented 29 authorities drawn from 27 countries.

A one-day workshop promoted ongoing work on a MAIIF marine investigations procedures manual.

Delegates presented papers on investigator training, fishing vessel safety, further developments in voyage data recorders, pilot-master communications and lifeboat release hooks. These and other topics resulted in wide-ranging discussions and valuable exchanges of knowledge and experience.

South-East Asian administrations have become increasingly involved. This was underscored by an excellent paper from the Republic of Korea ('Collisions in Reduced Visibility') and another from Japan that analysed groundings and collisions in the Inland

Sea. The Inland Sea is one of the most densely trafficked waterways in the world, and the paper examined the competing interests of commercial shipping and traditional fishing interests, along with technical navigation issues

Delegates voted that Australia assume the Chair following the resignation of the Hong Kong representative. The tenth meeting will be in Busan, Republic of Korea in October 2001.

### IMO Flag State Implementation Sub-Committee

The ninth meeting of the IMO Flag State Implementation Sub-Committee was held from 19 to 23 February 2001. ATSB took part in the annual analysis of marine casualties, which the group coordinator presented to the Sub-Committee.

At the Sub-Committee meeting of 2000, some flag states had expressed doubt about the significance of lifeboat accidents. Consequently, Australia was invited to collate reports of lifeboat accidents presented to IMO over the last five years and to research the issue. Information from reports received during the year, as well as details obtained from AMSA and other maritime administrations around the world, showed that accidents involving ships' lifeboats were occurring frequently and often resulted in deaths and/or serious injuries. Without exception, all the accidents occurred during lifeboat drills or port state control inspections.

In nearly all the lifeboat-accident cases reviewed, more than one contributing factor was identified:

- Fifty-four per cent involved issues of maintenance.
- Thirty-six per cent identified issues of poor or inadequate design.
- Fifty per cent involved issues of crew training or procedures.
- Thirty per cent revealed shortcomings in operating manuals or other documentation.

Most accidents highlighted the ship crew's lack of knowledge in operating and maintaining 'on load' hook-release mechanisms

The review paper noted that lifeboat accidents continue to occur and that modern designs, while intended to make the seafarer's life safer, have created increasingly sophisticated items of equipment. The ability of many crews to competently operate and maintain

these boats and their launching systems does not match the relevant legislative and technical developments.

Australia's paper was introduced through the Working Group on Casualty Analysis. The Flag State Implementation Sub-Committee then passed it to the Sub-Committees on Design and Equipment and Standards of Training and Watchkeeping for further consideration.

### Maritime training

ATSB was again invited to coordinate the IMO model course on marine casualty and incident investigation conducted at the International Maritime Academy, Trieste. ATSB could not meet this request on this occasion, but helped the Marine Department of Hong Kong conduct the inaugural marine casualty investigation course under the IMO – Hong Kong memorandum for technical cooperation. This course brought together senior investigators representing 24 administrations from Iran, Pakistan, India, Maldives, Sri Lanka, Bangladesh, Myanmar, Thailand, Vietnam, Cambodia, Malaysia, Singapore, Indonesia, the Philippines, China and North and South Korea, as well as officers from Hong Kong. Shipping representatives from Hong Kong also attended as observers.

### Presentations

The Marine Unit presented papers to:

- Spillcon 2000 *(Shipping Incidents—Why?)*
- BHP Newcastle *(Organisational Accidents)*
- Advanced Marine Pilot Training *(Organisational Accidents)*
- Australian Association of Marine and Ports Authorities *(State/Commonwealth Jurisdictional Issues)*
- Westrail, WA *(Safety Investigations Course)*
- Rail Industry Advisory Group *(Systemic Investigations)*
- WA Rail Conference *(Rail Safety Investigations—Where Now?)*

# Aviation

## *Role*

The ATSB is the agency of the Commonwealth Government that is responsible for the independent investigation of accidents, incidents and safety deficiencies involving civil aircraft in Australia. The ATSB performs this role under Annex 13 to the Convention on International Civil Aviation (Chicago Convention 1944) which has legal force through Part 2A of the *Air Navigation Act 1920*.

All aircraft accidents and incidents, as defined in Part 2A of the *Air Navigation Act 1920*, that have occurred within Australia, must be reported to the ATSB, which then determines whether an investigation is required. Selective investigation concentrates resources on the detailed analysis of occurrences that offer the greatest potential to enhance aviation safety.

The *Air Navigation Act 1920* allows for the investigation of safety deficiencies, however identified.

The ATSB is also empowered to assist in investigations of accidents and serious incidents involving Australian-registered aircraft overseas as well as investigations of occurrences that do not involve Australian-registered aircraft.

Factors that could lead to a decline of safety standards are also examined by the ATSB. For example, the aviation fuel contamination problem from December 1999 was a unique event that highlighted several deficiencies in global aviation fuel standards. The ATSB investigation report led to ongoing improvements in worldwide fuel-refining standards.

The ATSB does not identify any one factor as the most important in a particular occurrence and it presents its results as 'findings' and 'significant factors'. Similarly, in the presentation of results, the use of the term 'cause' is avoided. This is because most occurrences result from a complex interaction of many factors. Failing to address them all can seriously reduce the investigation's effectiveness. The results of investigations performed by the ATSB are produced as alert bulletins, information circulars, aircraft accident/incident reports and safety recommendations. ATSB's recommendations are, however, purely advisory.

Specified ATSB senior managers exercise statutory powers delegated by the Executive Director, who has been designated the Director of Air Safety Investigation to investigate air safety occurrences and safety deficiencies under Part 2A of the *Air Navigation Act 1920*. The Secretary of the Department of Transport and Regional Services has delegated to the ATSB Executive Director his functions and powers under this Act to receive reports on investigations (section 19CT) and to approve and publish investigation reports (19CU(1) and (2)). ATSB's Director Safety Investigations has also been delegated the Secretary's power under subsection 19CU(2) to publish reports. The Director of Air Safety Investigation and delegates also have the power to release air safety information under section 19HA and a number of other powers.

### *Occurrence investigations*

Occurrences reported in the last five years under the *Air Navigation Act 1920* show a steady increase from 3962 reported in 1996–97 to 5478 in 1999–2000. In 2000–01, 6132 occurrences (216 accidents, 5916 incidents) were reported to the ATSB (see table 19). The increase in occurrences reported is explained by:

- As noted in an earlier section, aviation activity increased in the period 1990–2000, resulting in an increase in exposure.
- Included in the database in 1998 were particular incidents that had previously been reported to ATSB but not recorded.
- BASI (now ATSB) had campaigned in 1998 to encourage reporting of occurrences.
- Improved operator safety culture increases reporting.

**Table 19:**
**Air safety occurrences reported to the ATSB, 1 July 1996 to 30 June 2001**

| Occ. Type | 1996-97 | 1997-98 | 1998-99 | 1999-00 | 2000-01 |
|---|---|---|---|---|---|
| Accident | 251 | 244 | 226 | 203 | 216 |
| Incident | 3711 | 3990 | 5687 | 5275 | 5916 |
| **Total** | **3962** | **4234** | **5913** | **5478** | **6132** |

*Financial years*

Major investigations completed during 2000–01 include the Qantas B747-400 runway overrun accident at Bangkok International Airport in September 1999, the contamination of aviation gasoline (Avgas) in late 1999 that led to the grounding of thousands of piston-engine aircraft across eastern Australia, and the stall of a Saab 340A turbo-propeller aircraft over Eildon Weir, Victoria in November 1998.

ATSB released 103 final occurrence investigation reports during 2000–01. These are available on the ATSB web site and are listed at appendix 2.

Some significant recommendations released during this period include:

1. *Whyalla Airlines accident recommendations (Air Safety Recommendations R20000249, R20000248, R20000250)*

   During the investigation of the Whyalla Airlines Piper Chieftain accident, ATSB recommended that:

   - provision be required for adequate emergency and life-saving equipment during overwater flights where an aircraft is operating beyond the distance from which it can reach the shore with all engines inoperative.
   - CASA ensure that the requirement include aircraft carrying fewer than 10 passengers.
   - operators equipped with turbo-charged engines be alerted to the potential risks of engine damage associated with detonation, and encourage the adoption of conservative fuel leaning practices.

   CASA accepted the last two recommendations and while sympathetic to the first, said it wished to consult more widely with the aviation community and other stakeholders before taking further action.

2. *Sydney power failure recommendations (Air Safety Occurrence Report 200002836)*

   On 6 July 2000, Sydney Terminal Control Unit (TCU) lost power for 14 seconds. The failure affected TCU air traffic control (ATC) workstations, software switching of voice communications channels, satellite communications, provision of the Sydney Terminal Approach Radar to Melbourne and Brisbane, and operational room lighting. Although the ATC workstations

automatically began rebooting after the initial 14-second outage, they were not available for about seven to 10 minutes. While ATSB could not discover the reason for the power outage, it made six recommendations to Airservices, all of which have been accepted.

3. *Qantas runway overrun recommendations (Investigation Report 199904538)*

   On 23 September 1999, a Qantas Boeing 747-438 aircraft overran runway 21 Left (21L) while landing at Bangkok International Airport. The aircraft had landed long and aquaplaned on a runway affected by water following very heavy rain. As a result of the investigation, ATSB made four recommendations to CASA concerning:

   - flight crew procedures and training;
   - flight and duty time scheduling;
   - emergency procedures training legislation;
   - auditing of human factors and management processes.

   ATSB also made a recommendation to the Federal Aviation Administration and the Joint Aviation Authority concerning design requirements of high-capacity aircraft.

   ATSB is awaiting responses to all these recommendations.

4. *Avgas fuel contamination recommendations (Investigation Report 'Systemic Investigation into Fuel Contamination')*

   Following the grounding of large numbers of piston-engine aircraft across eastern Australia in early January 2000 as a consequence of using contaminated Avgas, ATSB initiated a major safety deficiency investigation into the circumstances of the contamination. As a result of the investigation, ATSB made 24 recommendations relating to:

   - the management of the processes for the manufacture of Avgas;
   - the development and use of international standards for Avgas, including their use in ensuring the fitness for purpose of Avgas used in aircraft;
   - the use of regulatory oversight as an effective defence in ensuring that fuel quality as a safety-critical aviation system is, and remains, consistently fit for purpose, and the need to eliminate any diffusion of responsibility among regulators who have the potential to regulate aviation fuel quality.

Some of these recommendations have been acted upon while others are still being considered by the recipients.

5. *Boeing 767 maintenance recommendations (Recommendations R20010092; R20010093)*

   In January 2001, ATSB commenced an investigation of Ansett's omission to undertake specified maintenance requirements for Boeing 767 aircraft. The investigation includes examination of:

   - Boeing aircraft airworthiness;
   - Ansett's maintenance quality assurance system;
   - CASA's systems for compliance, including procedures delegating responsibilities to airlines for regulatory compliance and linkages with the US FAA.

   It is essential that the Australian system for continuing airworthiness of Class-A aircraft is robust in itself and is not reliant on actions that may, or may not, be taken by other national airworthiness authorities.

   ATSB has recommended that CASA:

   - take steps to ensure that the continuing airworthiness requirements for Australian registered Class-A aircraft are not compromised through any lack of action by the national airworthiness authorities of other countries;
   - take responsibility to ensure that all service bulletins relevant to Australian registered Class-A aircraft are received and assessed for safety of flight implications. The assessment process should ensure that those aspects affecting the safety of flight of Class-A aircraft are implemented or mandated as necessary and that appropriate systems are in place to ensure compliance.

   CASA has indicated that an expert panel is comprehensively reviewing ATSB's recommendations.

For a summary of recommendations that remained open at 30 June 2001, see appendix 3.

### *Reduction in investigation backlog*

During the year, the backlog in the completion of investigation reports remained stable at around 120. Twenty-nine outstanding occurrences were more than 12 months old.

Commitments to training, review and a rise in administrative workload for investigators reduced the time available for completing investigation backlog tasks. However, this situation did not detract from the quality of the output. The high standard of investigation reports was maintained while successful innovations in report structure were introduced.

### *Safety deficiency investigations*

A safety deficiency investigation is separate from an occurrence investigation and routinely leads to the issuing of formal recommendations to industry bodies to address the deficiencies, which often feature as significant factors or findings in an occurrence investigation.

For example, on 22 December 2000, following consultation between CASA and Ansett Airlines, the Ansett Boeing 767 fleet was grounded after it was discovered that certain structural inspections for cracks in the tail area had not been carried out.

Initial indications were that a significant safety deficiency existed within the Ansett system of maintenance. As a result, on 11 January 2001, the ATSB formally initiated an investigation into the matter.

As noted above, the ATSB investigation included consideration of aspects of the systems within Ansett, CASA, Boeing, and the FAA relevant to continuing airworthiness.

On 9 April 2001, the ATSB was notified that cracks had also been located during inspections of the engine pylon wing attachment fittings on the aircraft.

On 10 April 2001, the Bureau widened its safety deficiency investigation to include a review of procedures employed by manufacturers, regulatory and certifying authorities and airline operators for the control of continuing airworthiness of Class A aircraft as defined in the *Civil Aviation Regulations 1998*.

On 12 April 2001, the ATSB released two safety recommendations to CASA as outlined at page 73 of this Annual Review.

The ATSB investigation is continuing.

### *Confidential Aviation Incident Reporting (CAIR) Program*

CAIR helps to identify and rectify aviation safety deficiencies. It also performs a safety education function so that people can learn from the experiences of others. Established in 1988, CAIR complements Australia's mandatory open reporting system. Under the protection of the CAIR Program, the reporter's identity remains confidential.

While the ATSB receives the majority of its incident reports through the open system under the *Air Navigation Act 1920*, approximately 300 confidential reports are received annually from a range of individuals that includes pilots, engineers, air traffic service officers, flight attendants, maintenance workers and passengers. The number of incident reports received over the last five years shows good industry support (see table 20). In 2000–01, 207 CAIR notifications and 6 alert bulletins were issued.

**Table 20:**
**CAIR incident reporting 1 July 1996 to 30 June 2001**

| | |
|---|---|
| 1996–97 | 253 |
| 1997–98 | 287 |
| 1998–99 | 326 |
| 1999–2000 | 265 |
| 2000–01 | 357 |

### *Safety promotion*

ATSB, with CASA, provides safety information to the aviation industry. The lessons ATSB draws from its occurrence investigations and deficiency examinations provide the industry with a sound basis for safety actions.

The Bureau promotes aviation safety by:

- publishing investigation reports and safety studies;
- providing information on its web site;
- maintaining safety programs like INDICATE;
- delivering presentations at conferences and safety forums;
- involvement in international cooperation;
- contributing to Parliamentary inquiries;
- participating in coronial inquests;

- publishing the ATSB Supplement in the CASA's *Flight Safety Australia*. (For a list of articles published during 2000–01 in this magazine, see appendix 5.)

### INDICATE

The INDICATE safety program continues to be well received by the aviation community both within Australia and overseas. The objective of the program is to provide simple guidelines to operators on how to implement a safety management program within a company. The emphasis of the program is placed on the proactive identification of safety hazards, through the participation of those at all levels through the company, before the hazards lead to accidents or incidents.

Over 400 program packages have been dispatched to individuals and organisations since the program's launch in late 1997. Although the majority of the programs have been distributed within the aviation industry, many have been sent to organisations from other transport modes and, indeed, other industries as the principles embodied in the program are generic.

The database, which forms part of the INDICATE safety program package, was upgraded in 2000–01 in order to provide greater and more efficient functionality, basic analysis tools and more extensive reporting capabilities. The upgraded version, including supporting documentation, has been made available on a CD-ROM and may also be accessed from the ATSB's web site.

### Presentations at conferences and safety forums

Effective safety systems depend on communication, a free exchange of information between safety professionals, and the education of all those directly involved, from the operators at the 'sharp end' to executive management.

Conferences serve a vital function in facilitating this communication, and also provide a means of establishing personal networks where critical safety information can be accessed or exchanged quickly and allow immediate action to be taken to rectify problems.

Through participation in conferences and other safety forums, ATSB transport safety investigators have developed numerous contacts in Australia and throughout the world that both facilitate and enhance the investigation process.

Safety forums cover a broad spectrum of activities including the Royal Aero Clubs and flying training schools, Aerial Agriculture Association of Australia's conferences, Regional Airlines of Australia conference, Regional Airspace Users Advisory Committee, State Government disaster management planning committees; airport emergency planning committees, and meetings of the CASA's Flight Safety Forums. All play an important part in maintaining and enhancing the knowledge, skills and expertise of ATSB's people and in transferring this more widely.

In addition, participation in specialist professional conferences in areas such as engineering, human factors, flight operations, air traffic control, cabin safety and flight recording play an important role in the maintenance of skills and professional development of ATSB investigators. Such participation is central to the generation of innovative new ideas to meet the operational safety challenges of the changing aviation environment.

Presentations provided by ATSB at various meetings also provide an important means of safety education by conveying the lessons learnt from the ATSB's investigations and safety studies.

Safety venues attended by ATSB in 2000–01 included:

- Lectures to aviation classes at High Schools and Colleges throughout Australia and at Cranfield University, UK.
- International Society of Aeromedical Services and Flight Nurse Association Conference 2000, Melbourne, July 2000.
- Fifty-third Flight Safety Foundation Annual International Air Safety Seminar, New Orleans, LA, October 2000.
- International Society of Air Safety Investigators Annual Training Seminar, Shannon, Ireland October 2000.
- ICAO 37th Directors General of Civil Aviation Meeting, Wellington, NZ, November 2000.
- Flight Safety 2000 Conference, Taipei, Taiwan, December 2000.
- Eighteenth International Cabin Safety Symposium, Los Angeles, CA, January 2001.
- International Transportation Safety Association meeting, Wellington NZ, February 2001.
- Eleventh International Symposium on Aviation Psychology, Columbus, OH, March 2001.

The Australasian Flight Safety Council meets twice each year. Members represent the airlines in Australia and New Zealand and government agencies such as Defence and the ATSB. The Council objective is to share information for the overall improvement of aviation safety. Of particular continuing interest is bird strikes.

The Human Factors Advisory Group aims to provide the CASA Board with industry expertise on current and emerging aviation performance issues such as human factors education, training and awareness initiatives, at both the individual and organisational level. The Group, which includes the ATSB, meets on a quarterly basis.

The ATSB contributes to CASA's Flight Safety Forums by providing presentations on safety issues. The Forums aim to provide the general aviation sector of the industry with safety feedback based on occurrence reports and safety studies.

### Involvement in international cooperation

As aviation is an international endeavour, aircraft accidents and incidents, regardless of location, are of direct interest to the global industry.

Aviation operations internationally, and within different countries are carried out in accordance with the standards and recommended practices of ICAO.

The investigation of aircraft accidents and serious incidents is carried out in accordance with Annex 13 to the 1994 Convention on International Civil Aviation. The formation of ICAO was originally based on this Convention. Australia has incorporated the provisions of Annex 13 into Part 2A of the *Air Navigation Act 1920*. ICAO has indicated that the next amendment to Annex 13 will take effect on 1 November 2001.

ATSB has continued to work with ICAO by attending and contributing to the Regional training seminar for air safety investigators held in Bangkok, Thailand during January 2001.

On 25 August 2000, ATSB and the Malaysian Department of Civil Aviation signed a Memorandum of Understanding concerning cooperation on matters of air safety, with particular reference to the investigation of accidents and serious incidents. The Memorandum is consistent with the Standards and Recommended Practices of

ICAO Annex 13, and sets out provisions for cooperation in the exchange of information, training and communication.

On 11 April 2001, ATSB and the Aviation Safety Office of the General Administration of Civil Aviation of China signed a Memorandum of Understanding concerning cooperation in air safety investigation and training.

ATSB is a corporate member of the international Flight Safety Foundation (FSF), perhaps the world's most important and influential private air safety organisation. The FSF has developed accident programs with the International Civil Aviation Organization, the International Air Transport Association and the US Federal Aviation Administration.

In January 2001, ATSB was accepted as a member of the International Transportation Safety Association (ITSA), whose membership includes key independent multimodal safety bodies such as Canada's Transportation Safety Board (TSB), the United States National Transportation Safety Board (NTSB) and the Dutch Transportation Safety Board (DTSB). The Executive Director attended ITSA's annual meeting (Wellington NZ, 26–27 February 2001), at which members shared key safety information of mutual interest. The next ITSA meeting will be held in Helsinki (27–29 May 2002).

All of these activities contribute to ATSB's continuing ability to assist in achieving safe aviation in Australia and internationally.

The ATSB assisted a number of countries in the Region with materials failure analysis and flight recorder replay and analysis work. This work was in support of investigation activities in countries including Malaysia, Indonesia, Papua New Guinea, and New Zealand.

At the request of the Aviation Safety Council of Taiwan, the ATSB is assisting in the investigation into the accident involving a Boeing 747 aircraft during takeoff on a scheduled flight from Taipei. Australia appointed an ATSB investigator as accredited representative and ATSB's involvement is continuing in the areas of investigation management, operations, air traffic control, and human factors including management and organisational issues.

### Contributions to Parliamentary inquiries

On 10–11 July 2000 and 4 May 2001, ATSB provided advice at Senate Rural and Regional Affairs and Transport Legislation Committee hearings on CASA administration (air operator maintenance, regulation and oversight). Further contributions are outlined at appendix 7.

### Inquests

The various State Coroners sought the attendance of transport safety investigators at 10 coronial inquests. In all cases, the coronial outcomes were in accordance with the ATSB investigation.

# Internal management and processes

## Financial overview

Including $0.5 million from ALTD-administered funds, the ATSB had $14.591 million to produce its safety outputs in 2000–01 compared with a budget of $13,541 million and funding on a comparable basis in 1999–2000 of $13.851 million. The additional funding enabled a number of one-off expenditures to be made including for major accident preparedness and investigator equipment, several redundancy packages, an expense relating to the Department's different treatment of smaller assets, and the production and handling of road safety material.

## Comparisions

| | 1999-00 ACTUAL $ million | 2000-01 BUDGET $ million | 2000-01 ACTUAL $ million | 2001-02 BUDGET $ million |
|---|---|---|---|---|
| **ATSB Departmental expenses** | | | | |
| Employee Expenses | 7.421 | 8.945 | 9.137 | 8.924 |
| Suppliers Expenses | 4.296 | 3.903 | 4.521 | 3.461 |
| Depreciation/amortisation | 0.119 | 0.119 | 0.156 | 0.182 |
| Other expenses | 0.287 | 0.074 | 0.277 | 0.120 |
| Total Departmental expenses[1] | 12.124 | 13.041 | 14.091 | 12.687 |
| Revenue | 0.163 | 0.085 | 0.256 | 0.085[2] |
| Net costs to Department | 11.961 | 12.956 | 13.835 | 12.602 |
| Less DSU expenses | -0.233[3] | -0.233 | -0.233 | |
| Revised net costs to Department | 11.728 | 12.723 | 13.602 | 12.602 |
| Plus devolution of Corporate costs | 1.229[4] | | | |
| Comparable net costs to Department | 12.957 | 12.723 | 13.602 | 12.602 |
| **Administered expenses[5]** | | | | |
| Black Spot Program (PBS) | 36.700 | 39.066 | 38.694 | 48.346[6] |
| Road Safety Public Communication Funding | 0.498 | 0.500 | 0.500 | 0.500 |
| Total administered expenses | 37.198 | 39.566 | 39.194 | 48.846 |
| **Capital expenditure** | | | | |
| Plant & Equipment | 0.370 | 0.798 | 0.909 | 0.892 |
| **Average staffing level** | 116 | 114 | 114 | 110 |
| Less DSU Resources[7] | - 4 | - 4 | - 4 | |
| Total ASL | 112 | 110 | 110 | 110 |

The 2001–02 Portfolio Budget Statements include ATSB's Departmental operating expenses in Output Group 1 in two outputs:

1. *Total expenses excludes expenditure for Road Safety Public Communication: this expenditure is funded from the Administered Black Spot Program. (Revenue line in table also excludes these funds which are recorded under Administered expenses.)*
2. *ATSB is able to retain any revenue above forecast to supplement its resources.*
3. *This figure represents transfer of 'Divisional Support Unit' or DSU expenses which came into effect in 2001-02 and is shown to aid in comparison.*
4. *Some corporate costs and funding that were devolved to ATSB from 2000-01 are added into 1999-2000 to allow comparison among years. Other costs that the Department meets on behalf of ATSB are not devolved or included in this total.*

5. *Accrual figures only shown. Road safety public communication money is spent by ATSB on road safety as approved by the Minister and Parliamentary Secretary.*

6. *The accrual budget for 2001-02 has since been revised to take account of adjustments from 2000-01, consisting of a higher than expected prepayment of $371 000 and a $264 000 carryover of underexpenditure.*

7. *Four FTEs subtracted from prior years to enable comparison with 2001-02 in which these DSU staff positions have moved to a centrally pooled arrangement.*

The Department's Business Group (Finance and Business Management Branch) has provided the following advice to compare ATSB's operating funding budget in 2000–01 and ATSB's budget for 2001–02 in the new output format.

**ATSB funding by output ($ million)**

| | 2000-01 Budget | 2001-02 PBS | 2001-02 Revised |
|---|---|---|---|
| **1.1 Policy Advice and Legislation, Ministerial Services** | | | |
| ATSB[1] | 1.798 | 1.645 | 1.466 |
| CORP[2] | 0.966 | 0.798 | 0.736 |
| CUC[3] | 0.016 | 0.013 | 0.011 |
| **1.1 Sub total** | **2.780** | **2.456** | **2.213** |
| **1.3 Safety Services** | | | |
| ATSB | 11.743 | 10.749 | 11.721 |
| CORP | 6.968 | 6.836 | 5.884 |
| CUC | 0.111 | 0.091 | 0.094 |
| **1.3 Sub total** | **18.822** | **17.676** | **17.699** |
| **TOTAL ATSB** | **21.602** | **20.132** | **19.912** |

1. *Funding to ATSB.*
2. *Corporate funding within the Department attributed to ATSB.*
3. *Capital use charge attributable to ATSB.*

## Risk management

The ATSB developed a risk management plan in partnership with Acumen Alliance (the Department's consultant). This plan incorporates the identification and prioritisation of risks, assessment of how risks are to be managed and the development of

strategies to manage priority risks. Some of the identified major risks include:

- loss of confidence of stakeholders (including in transport industries and the travelling public);
- loss of key people or inadequate skills to meet the Bureau's requirements;
- failure to meet statutory obligations;
- inappropriate administration of legislation;
- business continuity issues (including access to IT, premises).

A separate consultancy was let to help the ATSB prepare for a major transport accident (see appendix 9). Funding for a major accident investigation is to be provided from within departmental resources until a special appropriation can be approved (if necessary). Details of the outcomes of this process have been incorporated into the ATSB's Risk Management Plan.

## People profile

The Department seeks to develop a satisfied, capable and productive workforce, enabling the Department to achieve its business results.

The Bureau recognises that its most important resource is its people: people who are dedicated to making transport safer and preventing transport deaths and injuries through efficient and cost-effective measures. Staff are aware of, and work within, the APS Values and Code of Conduct set out in the Public Service Act and are also aware of their responsibilities under the Audit and Financial Management and Accountability Acts. Because of the sensitive nature of their work, ATSB investigators have adopted additional policies relating to investigation ethics and conflict of interest (see *ATSB Annual Review 2000*, appendix 8).

The ATSB ensures clear linkages are made between individual Plans on a Page, Bureau unit business plans and the DoTRS Corporate Plan and Portfolio Budget Statements.

The ATSB seeks regular staff feedback to improve its operations. Applying workplace diversity, ATSB seeks to recruit and retain a diverse group people who are encouraged to work to the best of their ability within a team structure. The ATSB is totally committed to developing and maintaining a workplace that is safe, diverse, fair and flexible and where people achieve their potential.

| Classification level | Projected average staffing level 2001-02 |
|---|---|
| Executive Director | 1.0 |
| Director | 2.0 |
| Deputy Director Transport Safety Investigator | 2.0 |
| Team Leader Transport Safety Investigator | 7.0 |
| Senior Transport Safety Investigator | 38.0 |
| Transport Safety Investigator | 3.0 |
| Executive Level 2 | 5.5 |
| Executive Level 1 | 12.0 |
| Australian Public Service Level 6 | 13.0 |
| Australian Public Service Level 5 | 12.5 |
| Australian Public Service Level 4 | 7.5 |
| Australian Public Service Level 3 | 5.0 |
| Australian Public Service Level 2 | 1.5 |
| **TOTAL** | **110** |

## Training and development / Investors in People

The Bureau meets the identified development needs of staff within the context of the Secretary's Statement of Future Skills Requirements and encourages its staff to maintain and improve their professional qualifications and capabilities. ATSB is committed to maintaining accreditation as an 'Investor in People'.

The Bureau places a high priority on learning and development needs. The ATSB is a professional knowledge-based organisation that will retain and build its reputation only if it continues to invest in its people to ensure the currency of their knowledge and to meet the requirements of relevant work level standards. As part of performance exchange with supervisors, ATSB staff discuss and agree learning and development needs for the plan period and reported on learning and development activities for the previous period. Learning and development activities take many forms from on-the-job learning and reading the latest literature, to flight training and external seminars and courses, including through Studybank. A particular focus of development in 2000–01 was major aviation accident preparedness and a week-long specialist training course was provided in-house by international experts. Work on an investigators' Diploma was another focus for future training.

## Workforce planning

The specialist nature of ATSB tasks requires a specialised and highly skilled workforce not easily replaced. An active strategy of workforce planning has been adopted by the Bureau to ensure continuity of operation. The ATSB carefully monitors expected staff departures to ensure appropriate recruitment strategies are in place for specific positions such as Transport Safety Investigators. However, resources limit what is possible and many ATSB staff are highly sought after in higher paying organisations. The ATSB also maintains consultancy lists to ensure that non-Bureau staff resources are available if required.

## Asset management

The ATSB has assets valued at approximately $0.91million[8] (including the OASIS database, Scanning Electron Microscope and other specialist software and technical equipment). Assets for this purpose are generally individual items of $5000 or more and are subject to depreciation. The ATSB also has many other assets classified as 'portable and attractive' for which it maintains a register (including Psion hand-held computers and mobile phones).

## Access and equity

The National Road Safety Strategy 2001–10 adopted by ATC in November 2000 notes that not all road users enjoy the same level of safety and contains the strategic objective of improving equity among road users. These groups include youth and older people, indigenous, non-English speaking background, residents of rural and remote areas and some pedestrians, cyclists and motorcyclists. The *National Road Safety Action Plan for 2001 and 2002* provides for the development and implementation of programs targeting these groups. The ATSB is contributing to the implementation of the Action Plan and Strategy through its research and statistical programs, through facilitating and encouraging jurisdictions to share relevant experiences and through the ATSB's management of the Road Safety Black Spot Program. This program is administered to ensure an equitable distribution of funding among States and Territories and between rural and urban areas.

The *Charter of Public Service in a Culturally Diverse Society* represents a nationally consistent approach to ensuring that

*8. Based on Insight information as at 30 June 2001.*

government services are delivered in a way that is sensitive to the language and cultural needs of all Australians. The Department is committed to ensuring its programs are accessible and equitable to all Australians. The ATSB places all key reports on its web site in PDF, and increasingly in HTML, format.

## Aboriginal reconciliation

The Council of Australian Governments (COAG) has requested that Ministerial Councils develop action plans, performance reporting strategies and benchmarks for Aboriginal reconciliation where these do not already exist. ATC Ministers noted this request at the November 2000 meeting and asked that officials develop appropriate frameworks for their consideration. COAG expects such plans to be in place by the end of 2001.

The National Road Safety Strategy seeks to reduce the road casualty rate for indigenous people and other groups for whom there are special road safety concerns. The *National Road Safety Action Plan for 2001 and 2002* proposes to:

- Develop and implement appropriate measures arising from the Aboriginal Road Safety Working Group.
- Conduct an annual Aboriginal and Torres Strait Islander Road Safety Forum.
- Investigate the feasibility of formally recording road safety outcomes for indigenous people to enable development of more effective programs.
- Develop culturally appropriate road safety programs.

The ATSB is contributing to the implementation of the Action Plan and Strategy through its research and statistical programs and through facilitating and encouraging jurisdictions to share relevant experiences. It is also re-convening the Working Group.

## Disability strategy

The Department is also committed to the Commonwealth's Disability Strategy. The ATSB is increasingly placing its key reports on the web site using HTML where this is practicable to assist those with a disability.

## Government Online and E-services Initiative

ATSB on-line activities are running concurrently with DoTRS. The Bureau is implementing various requirements and initiatives in conjunction with ETC Pty Ltd, the Department's online consultants, and is at a similar stage to other divisions. Identified services and initiatives include:

- re-development of the OASIS aviation occurrence database;
- an aviation occurrence online searchable database;
- an online searchable database containing information derived from the Confidential Incident Reporting (CAIR) program;
- an online form for reporting an aviation bird strike;
- an online searchable database for the Road Safety Black Spot Program;
- an online form for nominating a road safety Black Spot;
- a searchable online database for motor vehicle recalls;
- restricted online information about disarming motor vehicle airbags;
- online application facility for a road safety seeding grant; and
- a marine incident online searchable database.

## Occupational health and safety

All ATSB investigators receive specific training on occupational health and safety (OH&S) as part of their induction courses. In addition, investigators are inoculated against possible hazards to be encountered in field investigation.

The training schedule developed last financial year to ensure full awareness of requirements under OH&S legislation for all people with supervisory responsibilities was completed in 2000–01, with Workcover Australia providing all necessary training.

The health initiative sponsored by ATSB last financial year to offer influenza inoculations was conducted again in 2000–01 with 42 per cent of ATSB staff taking up the offer.

## Output Pricing Review

The ATSB, as part of the Department of Transport and Regional Services, expects to enter a multi-year pricing agreement with

Government for its functions, including safety investigation, to take effect from Financial Year 2002–03. A team is involved with the management of this process and the determination of the price for this function. This team also maintains the currency of the ATSB's 2001–02 Business Plan, including input to Additional Estimates for the Portfolio Budget Statements, review of the ATSB's Risk Management Plan, oversight of the development of the stakeholder relations management plan and other related strategic activities.

# Future plans

Projects to be undertaken in 2001–02 include:

- Develop a new multi-modal Transport Safety Investigation Bill that will more clearly establish and define ATSB's role and responsibilities, including for interstate rail safety investigation. New regulations, updated policies and procedures, and formalised investigator training will also be developed to dovetail with the new legislation.
- Develop the Commonwealth's role in rail safety, including the continued development of the national rail occurrence database in consultation with States and the Northern Territory.
- Improve targeting and timeliness of air and marine safety investigations.
- Develop a Transport Safety Investigator diploma course.
- Continue ATSB preparation for a possible major transport accident investigation.
- Improve industry liaison to assess safety needs and the effectiveness of our outputs, convey key messages and receive feedback.
- Expand our capacity to undertake aviation safety research and analysis.
- Update our guidelines for vehicle recall and the Black Spot Road Safety Program.
- Further enhance the OASIS aviation database.
- Continue to monitor implementation of the recommendations of the Roaduser International Report on heavy truck vehicle vibration and stability and prepare appropriate status reports for interested parties.
- Contribute to the development of a Heavy Vehicle Safety Strategy including establishment and maintenance of the Heavy Vehicle Crash Database and targeted research on fatigue.
- Complete the safety deficiency investigation into the maintenance issues involving Ansett 767s and other Class-A aircraft.

- Complete the Whyalla Airlines Flight 904 accident investigation.
- Complete the WA Police Air Wing Cessna 310 accident investigation.
- Complete the Burketown King Air accident investigation.
- Complete the Beech 1900D incident investigation.
- Progress aviation investigation Memoranda of Understanding including with Coroners and with countries in the region and those that are not signatories to ICAO Annex 13.
- Develop a single integrated Internet web site for the ATSB in cooperation with the Department, with online access according to Government requirements and improve online access to ATSB safety material.

In addition, because of the nature of the reactive investigation work of the ATSB, many other investigations will be undertaken in 2001–02 that were unknown at the start of the new financial year. Other major tasks to be completed in 2001–02 include contributing to the Federal Government's policy for reviews of corporate services and of output prices.

For details of outcomes for which ATSB has primary responsibility under the 2001–02 Portfolio Budget Statements, see appendix 10.

# Appendixes

# Appendix 1: Performance against 2000–01 Portfolio Budget Statements

## *Portfolio Budget Statements Output 1.1—Policy advice and ministerial services*

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 1. Participate in international and regional forums such as: IMO, ICAO, IATA, ISASI, MAIIF | *Quality:* Australia's contribution is consistent with the forum's goals and objectives and Australia's transport and trade objectives.<br><br>*Quantity:* 2 IMO Legal Committee meetings per year.<br><br>12 safety meetings including International Maritime Organisation (IMO), International Civil Aviation Organisation (ICAO), Marine Accident Investigators International Forum (MAIIF), International Society of Air Safety Investigators (ISASI), and International Air Transport Association (IATA). | ATSB contributed to several international transport safety forums in accord with the goals and objectives of the relevant international bodies.<br><br>ATSB participated in and submitted a paper on Lifeboat Accidents to an IMO Subcommittee meeting in London, attained the Chairmanship of the MAIIF at its 9th meeting in Belize, achieved valuable peer cooperation at the ISASI World Conference in Shannon Ireland, and contributed to its first ITSA meeting as a member, in Wellington New Zealand. |
| 2. Participate in, and provide policy support and/or secretariat services to, committees and working groups:<br><br>• The Australian Transport Council (ATC) and its sub-structure. | *Quality:* Facilitate the deliberations of the committee and working groups to the satisfaction of the Chair and other members through relevant contributions and assistance in the consideration of various stakeholder views.<br><br>*Timeliness:* Provision of briefing and meeting papers, and resolution of actions, within required timeframes.<br><br>*Quantity:* 2 ATC meetings; 2 SCOT meetings; 2 Rail Group meetings | ATSB attended and assisted at 2 ATC meetings, 2 SCOT meetings and 2 Rail Group meetings.<br><br>ATSB contributed relevant briefing within required timeframes towards the ATC November 2000 launch of the National Road Safety Strategy 2001-2010 and Action Plan, States agreement to a new approach to a national rail safety information database, significant progress on the proposed Commonwealth legislation for rail safety investigations on the interstate rail system, and some progress on national best practice rail safety investigation. |

## *Portfolio Budget Statements Output 2.2—Safety and security investigations*

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 3. Provide advice to the Ministers on the outcomes and relevance of maritime safety investigations to maritime safety policy and related safety issues. | *Quality and Timeliness:* In accordance with the Ministers' standard performance measures for policy advice.<br>*Quantity:* Advice on up to 15 investigations. | 7 maritime accident or incident reports were published in accordance with legislation, regulations and procedural guidelines.<br>The median time of 44 weeks taken to complete reports exceeded the target of 27 weeks. This target was unrealistic given interested party procedures and staff resource constraints. |
| 4. Provide policy advice to the Ministers on road transport safety and environmental issues, including:<br>• Facilitate the development and implementation of the new National Road Safety Strategy.<br>• Facilitate the development of a Heavy Vehicle Safety Strategy.<br>• Participate in the Austroads Road Safety Program. | *Quality:* In accordance with the Ministers' standard performance measures for policy advice.<br>*Quality:* National Road Safety Strategy 2001-2010 and associated Action Plan 2001 & 2002 agreed by all jurisdictions.<br>*Quality:* Heavy Vehicle Safety Strategy agreed with jurisdictions and stakeholders.<br>Quality of DoTRS contribution to Austroads Program meets expectations of other participating jurisdictions.<br>*Timeliness:* The National Road Safety Strategy to be agreed and implemented in 2000–01.<br>Austroads Program deadlines set by ATC, or agreed with other jurisdictions, are met. | National Road Safety Strategy and Action Plan approved by ATC and launched by Minister in November 2000. 2 meetings of the body directed by ATC to monitor implementation of the Strategy were convened by ATSB.<br>NRTC (lead agency) has postponed start of work on this strategy: priority given to Third HV Reform Package.<br>Financial contributions and participation, including provision of the Program Manager and participation in projects, have met the Commonwealth's obligations.<br>National Road Safety Strategy approved by ATC in November 2000; implementation commenced.<br>Deadlines for planning of 2001-2003 program met and proposed program approved by Austroads Council. Relevant ATC deadlines met. |

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 5. Provide advice to the Ministers on rail transport safety issues and on the outcomes and relevance of rail safety investigations. | *Quality:* In accordance with the Ministers' standard performance measures for policy advice.<br>*Quantity:* Advice on 4 safety investigations. | ATSB has provided 6 advice submissions involving rail. Legislation to enable ATSB to instigate rail investigations on interstate rail routes is being drafted. ATSB commenced two rail investigations for the Victorian Government in April and June 2001. |
| 6. Provide advice to the Ministers on the outcomes and relevance of air safety investigations to air safety policy and related safety issues. | *Quality:* In accordance with the Ministers' standard performance measures for policy advice.<br>*Quantity:* Advice on up to 50 key investigations. | In accordance with the Ministers' standard performance measures for policy advice, 58 high profile reports have been sent to the Minister, exceeding the target of advice on 50 key investigations in particular because a number of Category 4 reports were classified as high profile as there was Regular Passenger Transport (RPT) involvement and strong public interest. |
| 7. Air transport safety investigation services: | *Quality:* Notifications of those actions which are considered sufficiently serious and on which appropriate safety actions are taken.<br>Acceptance of recommendations arising from Aviation safety-related projects by aviation industry.<br>All data analysis projects result in publication of results.<br>Requests for information are handled to the satisfaction of the person/organisation requesting. | ATSB issued 73 air safety recommendations to CASA, Airservices Australia and other parties, 57 responses were received and 23 responses accepted. Details outlined in Appendix 3.<br>All requests were handled to the satisfaction of the person/organisation requesting. |

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 8. Publicly released individual occurrence reports resulting from air transport safety investigations. | *Quality:* Investigation occurrence reports produced in accordance with ICAO standards.<br>Quantity: Capacity to publish up to 230 Occurrence Reports. | 103 occurrence reports were published in accordance with ICAO guidance. This outcome is below the target mainly due to reclassification of minor category 4 incidents as category 5, which cut the numbers of investigation reports generated. |
| 9. Confidential Aviation Incident Reporting (CAIR) reports resulting in notifications or alert bulletins. | *Quantity:* Capacity to issue up to 150 notifications resulting from CAIR Reports.<br>*Timeliness:* Notifications of sufficiently serious incidents, from CAIR Reports issued within 15 days of receipt. | 207 CAIR 'for your information' notifications and 6 alert bulletins were issued. All notifications were issued within 15 days of receipt, most within 3 days. |
| 10. Aviation occurrence data analysis. | *Quantity:* Capacity to undertake up to 4 data analysis projects. | 2 aviation occurrence data analysis projects completed in 2000-2001. |
| 11. Aviation safety-related projects. | *Quantity:* Capacity to undertake 2 aviation safety related projects.<br>*Timeliness:* Aviation safety-related projects completed within twelve months of commencement. | 1 aviation safety-related project published within 12 months of commencement. |
| 12. Investigation of safety deficiencies resulting in safety recommendations and safety advisory notices to CASA, Airservices, other agencies and industry, addressing safety concerns arising from investigations. | *Quantity:* Capacity to investigate up to 40 safety deficiencies resulting in safety recommendations and safety advisory notices.<br>*Timeliness:* Each safety deficiency issue assessed and appropriately actioned within one month. | 44 safety deficiencies resulting in safety recommendations and safety advisory notices were investigated.<br>All safety deficiencies were assessed and actioned within one month of notification. |

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 13. Investigations of maritime accidents/incidents to identify circumstances and establish causes. | *Quality:* Impartial investigations undertaken in accordance with legislation/regulations and procedural guidelines.<br>*Quantity:* Findings published in up to 15 reports and 6 presentations.<br>*Timeliness:* Median time of 27 weeks to complete investigations and finalise reports. | 7 maritime accident or incident reports were published in accordance with legislation, regulations and procedural guidelines.<br>The median time of 44 weeks taken to complete reports exceeded the target of 27 weeks.<br>This target was unrealistic given interested party procedures and staff resource levels. |
| 14. Investigations of rail safety incidents to identify circumstances and establish causes. | *Quality:* Impartial investigations undertaken in accordance with relevant legislation/regulations and procedural guidelines.<br>*Quantity:* Findings published in up to 4 reports.<br>*Timeliness:* Median time of 27 weeks to complete investigations and finalise reports. | ATSB's multimodal safety investigation legislation which will enable ATSB to instigate rail investigations on interstate routes was developed.<br>ATSB commenced rail investigations for the Victorian Government in April and June 2001. |
| 15. International investigation of transport incidents and accidents, including the provision of technical assistance to regional authorities. | *Quality:* Technical assistance which meets user requirements.<br>*Quantity:* Provision of limited assistance as required given ATSB's capacity.<br>*Timeliness:* Staged responses with individually agreed timeframes depending upon complexity and priority given other commitments. | ATSB contributed to 15 international investigations of transport accidents and incidents.<br>Responses to technical assistance requests satisfied the mutually agreed task definitions in terms of extent of analysis, mode of reporting and timeframe. |

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 16. Motor vehicle safety inspections and recalls:<br>• Undertake vehicle defect investigations as required.<br>• Monitor vehicle recalls. | *Quality:* Stakeholders have an increased awareness of vehicle safety.<br>*Quality:* In line with agreed procedures for management of safety investigations.<br>*Quantity:* Undertake up to 75 vehicle defect investigations.<br>*Quality:* In line with agreed procedures for monitoring of vehicle safety recalls.<br>Consumer Affairs Division are kept up-to-date on the status of vehicle recalls.<br>*Quantity:* Monitor the effectiveness of up to 85 safety recalls. | Vehicle recall numbers higher than expected, as vehicle manufacturers are increasingly proactive in instigating recalls, due to higher consumer awareness.<br>51 vehicle safety investigations were undertaken in line with agreed procedures. Vehicle safety investigation numbers depend on reports to ATSB by vehicle users.<br>111 vehicle recalls monitored in accordance with agreed procedures and for their effectiveness.<br>Status of vehicle recalls is updated regularly on ATSB's web site. |

## *Portfolio Budget Statements Output 3.3—Services to regional communities, including administration of programs and grants for communities*

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 17. Administer the Road Safety Black Spot Program. | *Quality:* In accordance with the Ministers' standard performance measures for administering grants Programs. | The Black Spot Program is administered in accordance with the Minister's standard performance measures. |
| | Government and community satisfaction with the administration of the Program. | Feedback through Community Panels indicates strong support for the program. |
| | Independent review by BTE of the Programs effectiveness. | An evaluation of the Black Spot Program is being undertaken by BTE. |
| | *Quantity:* Administer one Program per State and Territory, 400 projects in total. | All State and Territory programs approved, comprising 455 projects. Of these, 229 projects valued at $25.6 m were in rural and regional Australia. All Programs approved within the year 2000-2001. |
| | *Timeliness:* Timely preparation of State and Territory Programs. | |
| | Progressive payments to States and Territories, based on confirmation of Program delivery. | Total cash payments of $41.182m were made in 2000-2001. |
| | *Location:* 50% in rural locations. | |

## *Portfolio Budget Statements Output 4.2—Safety and security education and information*

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 18. Provision of transport safety-related information: | *Quality:* Requests for transport safety-related information met to the satisfaction of inquirers, taking into account constraints on extent of information which can be divulged under legislation.<br>*Timeliness:* 90% inquiries satisfied within 10 days of receipt. | All requests for information met the satisfaction of the inquirer and the target of 90% within 10 days was achieved. |
| 19. Transport safety related information provided to inquirers via database searches. | *Quantity:* Capacity for up to 5000 responses to requests for transport safety-related information. | Requests for 8,878 items of safety information were met. Performance was better than the target of a 10-day turnaround.<br>Requests for 252 items of road safety research information were responded to: 45% of requests were responded to the same day, 26% in 1-4 days, and the remainder in over 4 days. |
| 20. Maintenance of the ATSB web site as a major repository for up-to-date safety information produced by ATSB. | *Quality:* Evidence that the ATSB website is meeting user requirements for transport safety information.<br>Data available on web site at the same time as it is publicly available.<br>*Quantity:* Capacity to add up to 300 reports to the web site. | Higher than targeted site visitation figures and daily incoming inquiries for further information are evidence that the web site is meeting demand. In 2000-2001, 340 reports were added to the web site.<br>Most safety information is made available on the web site concurrently with print publication. |
| 21. Presentations to industry, conferences etc. | *Quality:* Presentations to industry of appropriate professional and technical standard to satisfy audience.<br>*Quantity:* Capacity for up to 200 presentations delivered as required. | 125 presentations to industry, conferences, etc. were delivered. Praise received for the high standard and informative nature of ATSB presentations. |

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 22. Freedom of Information requests. | *Quality:* FOI requests dealt with in accordance with FOI Guidelines.<br>*Quantity:* Capacity for up to 30 FOI requests. | There were 22 Freedom of Information requests actioned in accordance with the required timeframes of the Freedom of Information Act 1982. |
| 23. Attendance at inquests and legal hearings to provide expert advice and evidence. | *Quality:* Expert advice and evidence in accordance with requirements of legal authorities.<br>Advice and evidence at inquests and legal hearings which satisfies inquirers.<br>*Quantity:* Capacity for up to 10 inquests and legal hearings. | 10 inquests and legal hearings were attended and expert advice was provided in accord with Coroners Court procedures and to the Coroners' satisfaction. |
| 24. Process subpoenas and writs of non-disclosure to produce documents and information. | *Quality:* Provision of information that fully meets requirements of request to satisfaction of inquirers under subpoenas and writs.<br>*Quantity:* Capacity for up to 10 responses to subpoenas and writs. | 23 subpoenas and writs of non-disclosure were responded to in accordance with the needs of the applicant and the requirements of the subpoena and writs of non disclosure. |
| 25. Develop a road safety research Program, and fund and administer selected research projects to underpin the development and implementation of road safety policies and strategies. Publish and promote research findings. | *Quality:* Research data contribute to policies and strategies. Contracted research is undertaken in line with set specifications.<br>*Quantity:* Approximately 15 projects.<br>*Timeliness:* 6 safety research projects completed by June 2001. | 15 projects were administered and 6 were completed. All contracted research complied with documented project specifications.<br>Research findings were used by a range of stakeholders in the development of road safety policies, strategies and action plans, including the new National Road Safety Strategy. |
| 26. Facilitate and publish road safety statistical analysis and data collection to assist in the conduct of formal road safety investigations and the development of policy and strategies. | *Quality:* User satisfaction with published statistical information.<br>*Quantity:* Publish 25 statistical reports. | 25 statistical reports were published. Reports were produced on time and were appreciated by the media and other interested parties. |

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 27. Facilitate and publish statistical analysis and data collection specifically relating to heavy vehicles to assist in the development of heavy vehicle policy and road transport reform. | *Quality:* User satisfaction with published statistical information.<br>*Timeliness:* First statistical report published by December 2000. | Work on a heavy vehicle crash database continued. ATSB information on heavy articulated vehicles well received by industry. |
| 28. Facilitate and publish rail safety statistical analysis and data collection to assist in the conduct of rail safety investigation and the development of policy and strategies. | *Quality:* User satisfaction with published statistical information.<br>*Quantity:* Publish 4 statistical reports. | Work on a rail safety statistical database development continued but delay in agreement with state rail accreditation authorities delayed publication of data. |
| 29. Liaise with rail safety accreditation authorities in meetings and forums. | *Quantity:* 4 meetings per annum.<br>*Timeliness:* Meeting reports produced within one week of meeting. | ATSB met with accreditation authorities and rail industry representatives at 4 meetings of the Rail Safety Consultative Forum and participated in 3 SCOT sub-group meetings to discuss best practice rail safety investigation plus proposed Commonwealth rail safety investigation legislation. Reports were produced immediately after each meeting. |
| 30. Publish and distribute maritime safety reports. | *Quality:* Acceptance and utilisation of marine safety reports by the marine industry.<br>*Quantity:* Findings published in up to 15 reports. | 7 marine accident or incident reports were published.<br>The median time of 44 weeks taken to complete reports exceeded the target of 27 weeks.<br>This target was unrealistic given interested party procedures and staff resource levels.<br>Various industry sectors have complimented the reports and training colleges in Australia and overseas are using them. |

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 31. Publish and distribute rail safety reports. | *Quality:* Acceptance and utilisation of rail safety reports by the rail industry.<br>*Quantity:* Findings published in up to 4 reports. | ATSB's multimodal safety investigation legislation which will enable ATSB to instigate rail investigations on interstate routes was developed.<br>ATSB commenced rail safety investigations for the Victorian Government in April and June 2001. |
| 32. Publish and distribute Specific Aviation Sector Safety Bulletins. | *Quality:* Acceptance and utilisation of the Safety Bulletins by the target sector.<br>*Timeliness:* Each publication of a Safety Bulletin within 3 months of the half year reported.<br>*Quantity:* 2 Safety Bulletins for each target aviation sector. | 1 Specific Aviation Sector Bulletin was published during 2000-2001. This was below target as bulletin production was hampered by IT issues and resource limitations. |
| 33. Publish and distribute Aviation Safety Deficiency Reports | *Quality:* Acceptance of Safety Deficiency Reports and utilisation by the aviation industry.<br>*Quantity:* 4 Aviation Safety Deficiency Reports. | 4 Aviation Safety Deficiency Reports were published as estimated. |
| 34. Contribution to CASA's 'Flight Safety' Magazine. | *Quantity:* Contributions to 6 editions of 'Flight Safety'.<br>*Timeliness:* Copy for 'Flight Safety' is provided by due date and no changes are required. | 6 bi-monthly supplements in the Civil Aviation Safety Authority's 'Flight Safety Australia' magazine were submitted. Copy is consistently high standard and provided on time. |
| 35.Publish and distribute Quarterly reports consolidating occurrence investigation information. | *Quality:* Industry satisfaction with occurrence investigation information. Recipient satisfaction with occurrence reports information.<br>*Timeliness:* Quarterly occurrence investigation reports completed within 3 months of the quarter under review. | No quarterly reports were produced. This avoided duplication of information available by direct request, on the web site, and in other ATSB reports and bulletins. |

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| 36. Publish and distribute weekly summary of occurrence reports. | *Quantity:* 52 weekly summaries of occurrence reports.<br>*Timeliness:* Publication of summary reports within one week of period under review. | 51 weekly summaries of occurrence reports were published within 3 working days of the period under review. |

## *Administered Program Group 1 - Services to communities administered on behalf of the Commonwealth*

### Administered Program 1.2 - Grants to States/Territories and Local Government

| *Activity* | *Performance measures* | *Performance achieved* |
|---|---|---|
| Road Safety Black Spot Program<br>Revised estimate reflects that the actual rephasing of unspent and unexpensed funds from 1999-2000 was less than the amount included at Budget, expensing of prepayments raised in 1999-2000, raising of prepayments in 2000-01 and economic parameters. | *Effectiveness:* Improve the safety of Australia's roads and, in doing so, reduce the cost to the community of road trauma.<br>*Quantity:* Approx 400 projects.<br>*Cost:* Appropriation of $41.182m. Expenses of $39.566m.<br>*Location:* 50% in rural and regional Australia. | An evaluation of the Blackspot Program is being undertaken by BTE.<br>All State and Territory programs approved, comprising 455 projects. Of these, 229 projects valued at $25.6 m were in rural and regional Australia.<br>Total cash payments of $41.182m were made in 2000-2001. |

# Appendix 2: Statistical, research and investigation reports publicly released in 2000–01

The following publications were publicly released during 2000–01. Most publications are available on the ATSB Internet web site or otherwise can be obtained by telephoning 1800 621 372.

## *Road safety statistical reports*

- Twelve issues of the monthly bulletin *Road Fatalities in Australia*.
- Monograph 1 *Never Licensed Motorists.*
- Monograph 2 *Road Safety 1997.*
- Monograph 3 *Pedestrian Safety*.
- Monograph 4 *Motorcycle Safety*.
- Monograph 5 *Alcohol and Road Fatalities.*
- Monograph 6 *Road Safety 1998.*
- Monograph 7 *Fatal Articulated Truck Crashes.*
- Research Report CR 196 *Road Trauma and Overseas Born Road Users: A Study of the Australian Resident Population*.
- Research Report CR 195 *Bicycle Helmets and Injury Prevention: A Formal Review.*
- Research Report CR 200 *Bull Bars and Road Trauma*.
- *Benchmarking Road Safety: The 1998 Report.*
- *Transport Safety in Australia: Statistical Summary 1997–98.*

## *Road safety research reports*

- *Development of Measures of Fatigue: Using an Alcohol Comparison to Validate the Effects of Fatigue on Performance (CR 189).*
- *Evaluating a Regulated Hours Regime On-Road and Alternative Compliance Regime under simulated Conditions (CR 190).*
- *On-road Evaluations of a Regulated Hours Regime and an Alternative Compliance Regime (CR191).*
- *Demonstration Project for Fatigue Management Programs in the Road Transport Industry – Summary of Findings (CR192).*
- *Effectiveness of ADR 69: A Case-Control Study of Crashed Vehicles Equipped with Airbags (CR199).*
- *Motorcycle and Safety Barrier Crash-Testing: Feasibility Study (CR201).*
- *Fatigue Expert Group: Options for Regulatory Approach to Fatigue in Drivers of Heavy Vehicles in Australia and New Zealand (CR202).*

## *Aviation safety occurrence investigation reports*

| Occurrence date | Manufacturer | Occurrence location | State |
|---|---|---|---|
| 13 Feb 1998 | Bell Helicopter | Mangalore, Aerodrome | Vic |
| 30 Oct 1998 | Cessna | 4 km S Gumadeer | NT |
| 11 Nov 1998 | Saab | Eildon Weir | Vic |
| 30 Dec 1998 | British Aerospace | Brisbane, Aerodrome | Qld |
| 27 Jan 1999 | Piper | 9 km N Moorabbin, Aerodrome | Vic |
| 02 Mar 1999 | Burkhart Grob, Piper | 3 km S Waikerie, Aerodrome | SA |
| 16 Mar 1999 | Boeing | Sydney, Aerodrome | NSW |
| 22 Mar 1999 | Boeing | 56 km E Cowra, Non Directional Beacon | NSW |
| 04 Apr 1999 | Boeing | Melbourne, Aerodrome | Vic |
| 28 Apr 1999 | Beech x 2, Piper, and De Havilland | 37 km S Port Macquarie, Aerodrome | NSW |
| 01 May 1999 | Embraer-Empresa Brasileira De Aeronautica, Piper | 13 km W Cairns, Aerodrome | Qld |
| 23 Apr 1999 | Saab x 2 | Mount Isa, Aerodrome | Qld |
| 25 May 1999 | Cessna, Boeing | 6 km NE Shute Harbour, (ALA) | Qld |
| 01 Jun 1999 | Embraer-Empresa Brasileira De Aeronautica | 87 km NW Tindal, Aerodrome | NT |
| 21 Jun 1999 | Raytheon | 72 km E Edinburgh, Aerodrome | SA |
| 04 Jul 1999 | Fokker B.V. | Norfolk Island, Aerodrome | Other |
| 10 Jul 1999 | Eagle | Avalon, Aerodrome | Vic |
| 16 Jul 1999 | Cessna | 46 km SW Onslow, Aerodrome | WA |
| 27 Jul 1999 | Boeing x 2 | 37 km SE Maroochydore, VOR | Qld |
| 17 Jul 1999 | Tupulov, Boeing | Lajak (Reporting Point) | Other |
| 25 Jun 1999 | De Havilland | 407 km NW Cairns, Aerodrome | Qld |
| 20 Aug 1999 | Airbus | Adelaide, Aerodrome | SA |
| 10 Sep 1999 | Beech | Williamtown, Aerodrome | NSW |
| 23 Sep 1999 | Boeing | Bangkok, Aerodrome | Other |
| 09 Oct 1999 | Fokker | Norfolk Island, Aerodrome | Other |
| 20 Oct 1999 | Cessna | Wrotham Park, Aerodrome | Qld |
| 24 Oct 1999 | Robinson Helicopter | Binnu, 83 km N Geraldton, Aerodrome | WA |
| 30 Oct 1999 | Piper | 9 km WNW Oberon | NSW |
| 15 Nov 1999 | Israel Aircraft, De Havilland | 185 km E Williamtown, Non Directional Beacon | Other |
| 24 Nov 1999 | Cessna | 83 km SSE Mornington Island, (ALA) | Qld |

| | | | |
|---|---|---|---|
| 25 Nov 1999 | British Aerospace | Kalgoorlie/Boulder, Aerodrome | WA |
| 28 Nov 1999 | Cessna | 3 km E Canberra, Aerodrome | ACT |
| 07 Dec 1999 | Fairchild | Mount Isa, Aerodrome | Qld |
| 28 Dec 1999 | Fairchild | Townsville Aerodrome | Ql |
| 17 Jan 2000 | Robinson Helicopter | Jandakot, Aerodrome | WA |
| 21 Jan 2000 | British Aerospace | 241 km E Darwin, Non Directional Beacon | NT |
| 21 Jan 2000 | Cessna | 1 km S Verona Sands | Tas |
| 31 Jan 2000 | Piper | Point Cook, Aerodrome | Vic |
| 18 Feb 2000 | Lockheed | Darwin, Aerodrome | NT |
| 18 Feb 2000 | Beech | Humpty Doo, 37 km SE Darwin, Aerodrome | NT |
| 02 Mar 2000 | Brantly International | Raymond Island | Vic |
| 08 Mar 2000 | Cessna | 104 km ESE Kingscote, Aerodrome | SA |
| 01 Mar 2000 | Fairchild x 2 | 93 km SSE Mackay, VOR | Qld |
| 12 Mar 2000 | Amateur Built | Toowoomba, (ALA) | Qld |
| 19 Apr 2000 | Embraer-Empresa Brasileira De Aeronautica | 52 km W Cairns, Aerodrome | Qld |
| 18 Apr 2000 | Boeing | Brisbane, Outer Marker | Qld |
| 10 May 2000 | Boeing | Auckland, Instrument Landing System | Other |
| 10 May 2000 | Fairchild | 1 km S Cowra | NSW |
| 05 May 2000 | Cessna | Darwin, Aerodrome | NT |
| 23 May 2000 | Piper | 31 km N Amberley, Non Directional Beacon | Qld |
| 13 May 2000 | Boeing | Richmond | NSW |
| 31 May 2000 | ** Piper | 28 km SE Whyalla Aerodrome | SA |
| 31 May 2000 | Boeing | Perth, Aerodrome | WA |
| 09 Jun 2000 | Boeing, Airbus | 222 km SSE Alice Springs, VOR | NT |
| 14 Jun 2000 | Cessna | 100 km E Halls Creek, Aerodrome | WA |
| 30 Apr 2000 | British Aerospace | 56 km N Perth, Aerodrome | WA |
| 22 Jun 2000 | British Aerospace | 28 km E Darwin, Aerodrome | NT |
| 24 Jun 2000 | Beech | 2 km NW Leonora, Aerodrome | WA |
| 11 Jun 2000 | Boeing | Cairns, Aerodrome | Qld |
| 01 Jul 2000 | HEDARO | Maroochydore/Sunshine Coast, Aerodrome | Qld |
| 06 Jul 2000 | | Sydney, Aerodrome | NSW |
| 26 May 2000 | Boeing | 1500 km SW Los Angeles, Aerodrome | Other |
| 12 July 2000 | Bell Helicopter | 11 km S Aberdeen | NSW |
| 06 Jul 2000 | Beech, Cessna | 11 km WSW Brisbane, Aerodrome | Qld |
| 16 Jul 2000 | Boeing | Cairns Aerodrome | Qld |

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|---|---|---|---|
| 21 Jul 2000 | Boeing | Adelaide, Aerodrome | SA |
| 21 Jul 2000 | Boeing | Melbourne, Aerodrome | Vic |
| 18 Jun 2000 | Kawasaki | El Questro ALA | WA |
| 24 Jul 2000 | *Bell Helicopter | ìKenela Parkî, 1 km NW Marlborough | Qld |
| 17 Jul 2000 | Messerschmitt-Bolkow-Blohm | 9 km E Warragamba Dam, VTC Check Point | NSW |
| 27 Jul 2000 | British Aerospace | 185 km NW Brisbane, Aerodrome | Qld |
| 30 Jul 2000 | British Aerospace | Canberra, Aerodrome | ACT |
| 06 Aug 2000 | Bell Helicopter | Norman Reef ALA | Qld |
| 08 Aug 2000 | Boeing | Sydney, Aerodrome | NSW |
| 24 Jul 2000 | Saab | 37 km N Sydney, Aerodrome | NSW |
| 21 Aug 2000 | Airbus | 644 km W Adelaide, VOR | SA |
| 10 Aug 2000 | Piper | 111 km NE Port Hedland, Non Directional Beacon | WA |
| 04 Sep 2000 | *Beech Super King Air | 65 km ESE Burketown ALA | Qld |
| 06 Sep 2000 | Boeing | 489 km ESE Singapore Jatcc, Aerodrome | Other |
| 07 Sep 2000 | Boeing | Adelaide, Aerodrome | SA |
| 02 Sep 2000 | British Aerospace, Cessna | 6 km ESE Darwin, Aerodrome | NT |
| 02 Sep 2000 | Cessna | 3 km W Bowen, Aerodrome | Qld |
| 16 Oct 2000 | Boeing x 2 | Sapda IFR | Other |
| 23 Oct 2000 | Saab | 5 km SSE Melbourne Aerodrome | Vic |
| 24 Oct 2000 | Piper, De Havilland | 19 km SSW Taree non directional beacon | NSW |
| 13 Oct 2000 | Kawasaki, Boeing | 4 km N Sydney, Aerodrome | NSW |
| 01 Nov 2000 | Airbus | Sydney Aerodrome | NSW |
| 27 Oct 2000 | Boeing | 796 km S Guam, Aerodrome | Other |
| 08 Nov 2000 | Cessna | Aurukun, (ALA) | Qld |
| 28 Nov 2000 | Piper | 41 km SW Adelaide, Aerodrome | SA |
| 26 Dec 2000 | British | 222 km N Williamtown, Aerodrome | NSW |
| 20 Dec 2000 | Cessna | Meekatharra, aerodrome | WA |
| 26 Jan 2001 | *Cessna | 3 km E Newman, Aerodrome | WA |
| 22 Jan 2001 | Cessna | 111 km N Bourke, Aerodrome | NSW |
| 29 Jan 2001 | Bell Helicopter | 8 km SSW Sarina | Qld |
| 04 Feb 2001 | Cessna | 1 km E Lake Evella, Aerodrome | NT |
| 21 Jan 2001 | Boeing | En route Honolulu - Sydney | Other |
| 13 Mar 2001 | Amateur Built | Nangiloc | Vic |
| 17 Apr 2001 | Aerospatiale | 22 km WNW Darwin VOR | NT |
| 10 May 2001 | Boeing | 200 km S Kingscote | SA |

| Report number | Subject |
|---|---|
| BE/20000028 | Examination of Damaged Wing Leading Edge Wiring Airbus Industrie A320 Aircraft |
| BS/20000002 | Systemic Investigation into Fuel Contamination |
| BS/20000022 | Safety Deficiency Investigation into Australia registered Boeing 747-300 aircraft take-off performance requirements from Bangkok airport |

** Preliminary report*

*** Interim factual report*

## *Aviation safety deficiency notifications*

Safety advisory deficiency notifications are initiated by investigators to identify safety deficiencies within the aviation system. The following reports of investigations into identified deficiencies and associated recommendations were publicly released during 2000–01.

| Safety deficiency notification number | Subject | Addressee |
|---|---|---|
| R20000042 | Incorrect bleed air line installation in B200s | Raytheon Aircraft |
| R20000043 | Incorrect bleed air line installation in B200s | Raytheon Aircraft |
| R20000044 | Incorrect bleed air line installation in B200s | Federal Aviation Administration (FAA) |
| R20000045 | Incorrect bleed air line installation in B200s | Civil Aviation Safety Authority (CASA) |
| R20000095 | Inadequate Traffic Alerts in Glider Towing Operations | Gliding Federation of Australia |
| R20000096 | Inadequate Traffic Alerts in Glider Towing Operations | CASA |
| R20000097 | Inadequate Traffic Alerts in Glider Towing Operations | Gliding Federation of Australia |
| R20000098 | Inadequate Traffic Alerts in Glider Towing Operations | Gliding Federation of Australia |
| R20000115 | Systemic Investigation into Fuel Contamination | CASA |
| R20000116 | Systemic Investigation into Fuel Contamination | CASA |
| R20000117 | Systemic Investigation into Fuel Contamination | CASA |
| R20000118 | Systemic Investigation into Fuel Contamination | CASA |
| R20000119 | Systemic Investigation into Fuel Contamination | CASA |
| R20000120 | Systemic Investigation into Fuel Contamination | CASA |
| R20000121 | Systemic Investigation into Fuel Contamination | CASA |
| R20000122 | Systemic Investigation into Fuel Contamination | CASA |
| R20000123 | Systemic Investigation into Fuel Contamination | CASA |

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| R20000124 | Systemic Investigation into Fuel Contamination | CASA |
| R20000125 | Systemic Investigation into Fuel Contamination | CASA |
| R20000126 | Systemic Investigation into Fuel Contamination | CASA |
| R20000127 | Systemic Investigation into Fuel Contamination | CASA |
| R20000128 | Systemic Investigation into Fuel Contamination | CASA |
| R20000129 | Systemic Investigation into Fuel Contamination | CASA |
| R20000130 | Systemic Investigation into Fuel Contamination | CASA |
| R20000131 | Systemic Investigation into Fuel Contamination | CASA |
| R20000132 | Systemic Investigation into Fuel Contamination | CASA |
| R20000133 | Systemic Investigation into Fuel Contamination | CASA |
| R20000181 | ACAS Considerations for 10–30 seat aircraft | CASA |
| R20000182 | ACAS Considerations for 10–30 seat aircraft | CASA |
| R20000183 | ACAS Considerations for 10–30 seat aircraft | CASA |
| R20000184 | ACAS Considerations for 10–30 seat aircraft | CASA |
| R20000186 | Systemic Investigation into Fuel Contamination | CASA |
| R20000187 | Systemic Investigation into Fuel Contamination | CASA |
| R20000198 | Situational awareness by pilots OCTA | CASA |
| R20000199 | Situational awareness by pilots OCTA | CASA |
| R20000231 | Integrity of cabin public address and interphone systems on B747-400 aircraft | FAA |
| R20000231 | Integrity of cabin public address and interphone systems on B747-400 aircraft | Joint Aviation Authority |
| R20000234 | Emergency procedures and emergency procedures training for cabin crew | CASA |
| R20000235 | Flight and duty times | CASA |
| R20000238 | CASA systems audit policies and procedures | CASA |
| R20000239 | CASA regulation of HCRPT operations on wet/contaminated runways pending promulgation of CASR Part 121A | CASA |
| R20000248 | Carriage of life jackets or equivalent flotation devices in air transport aircraft | CASA |
| R20000249 | Carriage of life jackets or equivalent flotation devices in air transport aircraft | CASA |
| R20000250 | OPS - Leaning Practices for Turbo-charged Engines | CASA |
| R20000284 | Incorrect bleed air line installation in B200s | CASA |
| R20000285 | Personal relationships and ATC functions | Airservices Australia (AsA) |
| R20000294 | Sydney TAAATS UPS Failure | AsA |
| R20000295 | Sydney TAAATS UPS Failure | AsA |
| R20000296 | Sydney TAAATS UPS Failure | AsA |
| R20000297 | Sydney TAAATS UPS Failure | AsA |
| R20000298 | Sydney TAAATS UPS Failure | AsA |
| R20000299 | Sydney TAAATS UPS Failure | AsA |
| R20000300 | Situational awareness by pilots OCTA | CASA |
| R20010017 | Systemic Investigation into Fuel Contamination | CASA |
| R20010018 | Systemic Investigation into Fuel Contamination | CASA |

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|---|---|---|
| R20010019 | Systemic Investigation into Fuel Contamination | CASA |
| R20010032 | Outcomes from Maintenance Safety Survey | Maintenance organisations |
| R20010033 | Outcomes from Maintenance Safety Survey | CASA |
| R20010034 | Outcomes from Maintenance Safety Survey | CASA |
| R20010035 | Outcomes from Maintenance Safety Survey | Maintenance organisations |
| R20010036 | Outcomes from Maintenance Safety Survey | Maintenance organisations |
| R20010037 | Outcomes from Maintenance Safety Survey | CASA |
| R20010038 | Outcomes from Maintenance Safety Survey | CASA |
| R20010039 | Outcomes from Maintenance Safety Survey | Maintenance organisations |
| R20010040 | Outcomes from Maintenance Safety Survey | CASA |
| R20010083 | Wire strike | CASA |
| R20010092 | Grounding of Boeing 767 aircraft VH-RMD E, F, G, H, K, L on 22 Dec 2000 due to the omission of required structural inspections. | CASA |
| R20010093 | Grounding of Boeing 767 aircraft VH-RMD E, F, G, H, K, L on 22 Dec 2000 due to the omission of required structural inspections. | CASA |
| SAN20000278 | DME-700 Overheating/Smoke in the Cockpit | CASA |
| SAN20000279 | DME-700 Overheating/Smoke in the Cockpit | FAA |
| SAN20010046 | ENG-Piston Engine Component life in Commercial Operations | CASA |

## *Other aviation safety reports*

- *ATSB Survey of Licensed Aircraft Maintenance Engineers in Australia* (Air Safety Information Paper)
- *Aircraft Maintenance Safety Survey – Results* (Air Safety Occasional Paper 101)
- *Helicopter Operations Safety Bulletin* (No. 1)

## *Marine safety occurrence investigation reports*

| Report number | Vessel | Occurrence type | Date | location |
|---|---|---|---|---|
| 145 | *Waddens* | Equipment failure (lifeboat) | 14 Feb. 1999 | Cairns Qld |
| 148 | *Padang Hawk* | Loss of stability | 28 July 1999 | Coral Sea |
| 151 | *Craig the Pioneer /FV May Bell II* | Collision | 9 Oct. 1999 | Near Port Stephens NSW |
| 152 | *Warden Point* | Equipment failure (steering) | 11 Nov. 1999 | Near Newcastle NSW |
| 153 | Tug *Redcliffe/Ariake* | Collision | 24 Jan. 2000 | Brisbane River Qld |
| 157 | *Amarantos* | Contact (wharf) | 10 April 2000 | Wallaroo SA |
| 162 | *Bunga Teratai Satu* | Grounding | 2 Nov. 2000 | Sudbury Reef Qld |

# Appendix 3: Responses to safety recommendations

ATSB issued public recommendations on aviation and heavy vehicle safety and received the following responses.

## *Aviation recommendations*

Recommendations usually incorporated in a final report are prefixed with the letter R.

Under existing Memoranda of Understanding, both CASA and Airservices Australia have agreed to respond to the ATSB within 60 days of the date of issue of any safety recommendations. No other organisations are obliged to respond to ATSB safety recommendations. The ATSB issued 73 recommendations and has received 51 responses, of which 23 have been accepted and nine have yet to be assessed.

The status of the following recommendations is:

- open, indicating that the ATSB is continuing to monitor actions to address the recommendations;
- closed, indicating that the implementation of the recommendation will not be pursued; or
- no response had been received from the organisation targeted by the recommendation at 30 June 2001.

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000042**<br><br>The ATSB recommends that Raytheon Aircraft review the Engine Bleed-Air Warning System post-maintenance procedures to include a functional system test to verify that the failure warning correctly annunciates the failed system. | 22-Dec-2000 | Raytheon Aircraft | 20-Feb-2001 | No response received at 30 June 2001. |
| **R20000043**<br><br>The ATSB recommends that Raytheon Aircraft ensure some positive means of preventing the possibility of system crossconnection of the bleed air failure pressure transmitters. | 22-Dec-2000 | Raytheon Aircraft | 20-Feb-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000044**<br><br>The ATSB recommends that the United States Federal Aviation Administration monitor the aircraft manufacturer to ensure that this safety deficiency is addressed. | 22-Dec-2000 | United States Federal Aviation Administration | 20-Feb-2001 | No response received at 30 June 2001. |
| **R20000096**<br><br>The ATSB recommends that CASA review the assessment process for the issue of a radiotelephone operator certificate of proficient or equivalent, as specified by Civil Aviation Regulations subregulation 83A(2) and subregulation 83E(1)(a) and establish competency standards for those applicants for whom English is a second language, especially in respect of a candidate's ability to effectively communicate and comprehend traffic information. | 08-Sep-2000 | CASA | 07-Nov-2000 | Open |
| **R20000115**<br><br>The ATSB recommends that Mobil Oil Australia review its understanding of process interrelationships and of its ability to control processes when considering planned and unplanned changes to a process within a refinery unit. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |
| **R20000116**<br><br>The ATSB recommends that Mobil Oil Australia review and clarify its procedures for managing refinery units during abnormal operations. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000117**<br><br>The ATSB recommends that Mobil Oil Australia review its processes for assessing the reliability of individual components within a refinery and their potential to contribute to undesired outcomes. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |
| **R20000118**<br><br>The ATSB recommends that Mobil Oil Australia review its procedures to ensure that in safety critical areas, decisions are fully implemented and progress in following up recommendations and implementing decisions is regularly reported and reviewed. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |
| **R20000119**<br><br>The ATSB recommends that Mobil Oil Australia establish as a part of its management of change process a mechanism for systematically identifying undesirable outcomes that should be considered in hazard or risk assessment processes. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |
| **R20000120**<br><br>The ATSB recommends that Mobil Oil Australia review the effects, as contaminants of the end product, of all chemicals that could be in the process stream, with particular attention to process chemicals that are introduced during the manufacturing process. As part of the hazard assessment processes, the review should include the expected products of reaction as possible contaminants of the end product. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000121**<br><br>The ATSB recommends that Mobil Oil Australia develop quality assurance processes comprising practical validation of end products to ensure that they are not inadvertently rendered hazardous. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |
| **R20000122**<br><br>The ATSB recommends that Mobil Oil Australia review its processes for managing the contractual arrangements for contracts that have the potential to significantly affect its fuel quality and safety objectives. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |
| **R20000123**<br><br>The ATSB recommends that Mobil Oil Australia review the effectiveness of its processes to ensure that it fulfils the requirements of its accredited quality assurance system, including its processes for the management of contractual relationships. | 30-Mar-2001 | Mobil Oil Australia | 29-May-2001 | No response received at 30 June 2001.* |
| **R20000124**<br><br>The ATSB recommends that the American Society for Testing and Materials include a description of the limitations of applicability of standard D91097 in the scope of the standard. | 30-Mar-2001 | American Society for Testing and Materials | 29-May-2001 | No response received at 30 June 2001. |
| **R20000125**<br><br>The ATSB recommends that the Defence Evaluation and Research Agency (UK) include a description of the limitations of applicability of Defence Standard 91 90 issued 8 May 1996, in the scope of the standard. | 30-Mar-2001 | Defence Evaluation and Research Agency (UK) | 29-May-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000126**<br><br>The ATSB recommends that the American Society for Testing and Materials review standard D910 97 in relation to the maximum permissible quantities of undesired compounds in Avgas, either individually or collectively. | 30-Mar-2001 | American Society for Testing and Materials | 29-May-2001 | No response received at 30 June 2001. |
| **R20000127**<br><br>The ATSB recommends that the Defence Evaluation and Research Agency (UK) review Defence Standard 91 90 issued 8 May 1996, in relation to the maximum permissible quantities of undesired compounds in Avgas, either individually or collectively. | 30-Mar-2001 | Defence Evaluation and Research Agency (UK) | 29-May-2001 | No response received at 30 June 2001. |
| **R20000128**<br><br>The ATSB recommends that the American Society for Testing and Materials develop and promulgates definitions for necessary physical and chemical properties of aviation fuels that are not currently defined, whether these are expected to be tested as a part of batch specification or not. | 30-Mar-2001 | American Society for Testing and Materials | 29-May-2001 | No response received at 30 June 2001. |
| **R20000129**<br><br>The ATSB recommends that the Defence Evaluation and Research Agency (UK) develop and promulgate definitions for necessary physical and chemical properties of aviation fuels that are not currently defined, whether these are expected to be tested as a part of batch specification or not. | 30-Mar-2001 | Defence Evaluation and Research Agency (UK) | 29-May-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000130**<br>The ATSB recommends that CASA identify and adopt an appropriate specification for each grade of fuel that is approved for use in Australia, or in aircraft on the Australian civil register. | 30-Mar-2001 | CASA | 29-May-2001 | No response received at 30 June 2001. |
| **R20000131**<br>The ATSB recommends that CASA, either by itself, or in cooperation with other organisations, develop a process to satisfy itself that fuel that is fit for purpose is consistently supplied to aircraft. | 30-Mar-2001 | CASA | 29-May-2001 | No response received at 30 June 2001. |
| **R20000132**<br>The ATSB recommends that CASA develop appropriate lines of communication to ensure that it is made aware in a timely manner of information relating to the management of situations related to fuel quality that could affect the safety of flight. | 30-Mar-2001 | CASA | 29-May-2001 | No response received at 30 June 2001. |
| **R20000133**<br>The ATSB recommends that CASA ensure that prior to any significant devolution or change in regulatory process, appropriate measures are taken to ensure that aviation safety is not diminished. | 30-Mar-2001 | CASA | 29-May-2001 | No response received at 30 June 2001. |
| **R20000181**<br>The ATSB recommends that CASA mandate the fitment and use of an Airborne Collision Avoidance System in all aircraft with a passenger seating capacity of 10–30 seats engaged in Regular Public Transport operations and set a timetable for the introduction of such equipment. | 24-Apr-2001 | CASA | 23-Jun-2001 | Closed |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000182**<br><br>The ATSB recommends that CASA consider the requirement for the fitment and use of a suitable Airborne Collision Avoidance System in aircraft engaged in the carriage of passengers for hire or reward in other than Regular Public Transport operations. | 24-Apr-2001 | CASA | 23-Jun-2001 | Closed |
| **R20000183**<br><br>The ATSB recommends that CASA expand the requirements for the carriage and activation of transponders with the object of maximising the effectiveness of airborne collision avoidance systems. | 24-Apr-2001 | CASA | 23-Jun-2001 | Open |
| **R20000184**<br><br>The ATSB recommends that CASA review the current level of education among all levels of the industry with a view to maximising transponder activation in all airspace. | 24-Apr-2001 | CASA | 23-Jun-2001 | Open |
| **R20000186**<br><br>The ATSB recommends that CASA review its relationship with other regulatory bodies to clarify the limits of their respective regulatory powers and responsibilities with respect to aviation fuels, to ensure that aviation safety issues are effectively regulated. | 30-Mar-2001 | CASA | 29 May 2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000187**<br><br>The ATSB recommends that Workcover Victoria review its relationship with other regulatory bodies to clarify the limits of their respective regulatory powers and responsibilities with respect to aviation fuels, to ensure that aviation safety issues are effectively regulated. | 30-Mar-2001 | Workcover Victoria | 29-May-2001 | No response received at 30 June 2001. |
| **R20000198**<br><br>The ATSB recommends that CASA ensure that any company registered for farepaying passenger operations has standard operating procedures that are adequate for selfseparation assurance. | 24-Apr-2001 | CASA | 23-Jun-2001 | Open |
| **R20000199**<br><br>The ATSB recommends that CASA review its educational program for all levels of pilot licences to improve pilot understanding of separation assurance techniques. | 24- Apr-2001 | CASA | 23-Jun-2001 | Open |
| **R20000231**<br><br>The ATSB recommends that the FAA and JAA review the design requirements for high-capacity aircraft to ensure the integrity of the cabin interphone and PA systems, particularly with respect to cabin/flight deck communications, in the event of runway overruns and other relatively common types of events which result in landing gear and lower fuselage damage. | 18-Apr-2001 | FAA & JAA | 17-Jun-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000234**<br><br>The ATSB recommends that CASA consider the following issues as requirements for operators when developing new emergency procedures training legislation:<br><br>• How flight crew should gather and evaluate relevant information and make a decision regarding which type of emergency response is most suitable.<br><br>• How cabin crew should communicate with each other and the flight deck in emergency situations (in terms of technique, terminology, and methods to ensure that accurate information reaches the flight deck).<br><br>• How cabin crew should communicate during an emergency on the ground when there is a loss of PA and interphone communications.<br><br>• How cabin crew should systematically and regularly identify problematic situations in an aircraft during an emergency (including guidelines on what types of information are most important and ensuring that all areas of the aircraft are examined).<br><br>• Leadership and coordination functions of cabin crew supervisors during an emergency situation. For example, how the supervisors should assess the situation (particularly in circumstances that had not been clearly defined), assign roles and responsibilities amongst the cabin crew, coordinate the gathering of information, and coordinate the distribution of information. | 18-Apr-2001 | CASA | 17-Jun-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| • How cabin crew should effectively obtain information from passengers concerning safetyrelated issues.<br><br>• How cabin crew should effectively use language and assertiveness for crowd control and managing passenger movement towards exits during emergency situations, as well as passenger control outside the aircraft.<br><br>• That cabin crew supervisors are provided with appropriate resources to ensure that they can effectively communicate with other areas of the cabin during emergency situations (e.g. providing the supervisor with ready access to an `assist' crewmember at their assigned location). | | | | |
| **R20000235**<br><br>The ATSB recommends that CASA review the intent of CAO 48 to ensure that operators consider all duties associated with a pilot's employment (including managerial and administrative duties) when designing flight and duty time schedules, and that this requirement is not restricted to situations where there are one or two pilots. | 18-Apr-2001 | CASA | 17-Jun-2001 | No response received at 30 June 2001. |
| **R20000238**<br><br>The ATSB recommends that CASA consider widening its existing skillbase within the compliance Branch to ensure that CASA audit teams have expertise in all relevant areas, including human factors and management processes. | 18-Apr-2001 | CASA | 17-Jun-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20000239**<br><br>The ATSB recommends that CASA ensure that all Australian operators of high-capacity jet aircraft have in place procedures and training to ensure flight crews are adequately equipped for operations on wet/contaminated runways. | 18-Apr-2001 | CASA | 17-Jun-2001 | No response received at 30 June 2001. |
| **R20000249**<br><br>The ATSB recommends that CASA ensure that Civil Aviation Orders provide for adequate emergency and life saving equipment for the protection of farepaying passengers during overwater flights where an aircraft is operating beyond the distance from which it could reach the shore with all engines inoperative. | 30-Oct-2000 | CASA | 29-Dec-2000 | Open |
| **R20000300**<br><br>The ATSB recommends that CASA, in conjunction with Airservices Australia, review the existing airspace model with a view to enhancing conflict recognition and resolution for farepaying passenger operations to/from noncontrolled aerodromes. | 24-Apr-2001 | CASA | 23-Jun-2001 | No response received at 30 June 2001. |
| **R20010015**<br><br>The ATSB recommends that CASA consider revising CASA Safety Aircraft Surveillance Report 604 form to require a response date for acquittal of discrepancies. | 09-Mar-2001 | CASA | 08-May-2001 | Open |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20010016**<br><br>The ATSB recommends that CASA consider revising CASA Safety Trend Indicator form to indicate organisational nonacquittal of Aircraft Surveillance Report ASSP 604 forms within the last 12 months. | 09-Mar-2001 | CASA | 08-May-2001 | Open |
| **R20010017**<br><br>The ATSB recommends that the Department of the Treasury review its relationship with other regulatory bodies to clarify the limits of their respective regulatory powers and responsibilities with respect to aviation fuels, to ensure that aviation safety issues are effectively regulated. | 30-Mar-2001 | Department of the Treasury | 29-May-2001 | No response received at 30 June 2001. |
| **R20010018**<br><br>The ATSB recommends that the Australian Competition and Consumer Commission review its relationship with other regulatory bodies to clarify the limits of their respective regulatory powers and responsibilities with respect to aviation fuels, to ensure that aviation safety issues are effectively regulated. | 30-Mar-2001 | Australian Competition and Consumer Commission | 29-May-2001 | No response received at 30 June 2001. |
| **R20010019**<br><br>The ATSB recommends that Consumer and Business Affairs Victoria review its relationship with other regulatory bodies to clarify the limits of their respective regulatory powers and responsi-bilities with respect to aviation fuels, to ensure that aviation safety issues are effectively regulated. | 30-Mar-2001 | Consumer and Business Affairs Victoria | 29-May-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20010032**<br><br>The ATSB recommends, where possible, maintenance organisations should avoid performing the same task on each element of critical multiple redundant systems on airline aircraft during the same maintenance visit, whether or not the aircraft is being maintained in accordance with ETOPS requirements. | 16-Feb-2001 | Maintenance organisations | 17-Apr-2001 | No response received at 30 June 2001. |
| **R20010033**<br><br>The ATSB recommends that CASA ensure through hours of duty limits, or other means, that maintenance organisations manage the work schedules of staff in a manner that reduces the likelihood of those staff suffering from excessive levels of fatigue while on duty. | 16-Feb-2001 | Maintenance organisations | 17-Apr-2001 | No response received at 30 June 2001. |
| **R20010034**<br><br>The ATSB recommends that CASA ensure that Aircraft Maintenance Engineers and Licensed Aircraft Maintenance Engineers are provided with appropriate recurrent training. | 16-Feb-2001 | CASA | 17-Apr-2001 | No response received at 30 June 2001. |
| **R20010035**<br><br>The ATSB recommends that maintenance organisations introduce clear error – reporting policies in order to encourage staff to report incidents related to human error. Such policies should set out in advance the consequences that will result should maintenance personnel report that they have made an error. | 16-Feb-2001 | Maintenance Organisations | 17-Apr-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20010036**<br><br>The ATSB recommends that maintenance organisations ensure that engineering personnel receive regular feedback on maintenance incidents in order to learn from such incidents. | 16-Feb-2001 | Maintenance Organisations | 17-Apr-2001 | No response received at 30 June 2001. |
| **R20010037**<br><br>The ATSB recommends that CASA, when conducting surveillance of maintenance organisations, consider the existence of an error reporting policy as a positive safety indicator. | 16-Feb-2001 | CASA | 17-Apr-2001 | No response received at 30 June 2001. |
| **R20010038**<br><br>The ATSB recommends that CASA require Aircraft Maintenance Engineers and Licensed Aircraft Maintenance Engineers to undergo appropriate human factors training addressing nontechnical performance in areas such as coordination, communication and the management of time pressures. | 16-Feb-2001 | CASA | 17-Apr-2001 | No response received at 30 June 2001. |
| **R20010039**<br><br>The ATSB recommends that maintenance organisations ensure that ground equipment, tooling and spares holdings are appropriate, and that there are systems in place to ensure that maintenance equipment is adequately maintained. | 16-Feb-2001 | Maintenance Organisations | 17-Apr-2001 | No response received at 30 June 2001. |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20010040**<br><br>The ATSB recommends that CASA, when conducting surveillance of maintenance organisations, ensure that ground equipment, tooling and spares holdings are appropriate, and that there are systems in place to ensure that equipment is adequately maintained. | 16-Feb-2001 | CASA | 17-Apr-2001 | No response received at 30 June 2001. |
| **R20010083**<br><br>The ATSB recommends that the Civil Aviation Safety Authority:<br><br>(i) require the fitment of approved Wire Strike Protection System kits for all helicopters engaged in low flying activities for which a kit exists; and<br><br>(ii) that only agricultural spray kits compatible with Wire Strike Protection Systems be approved for fitment to these helicopters.<br><br>This recommendation was previously issued by the Bureau of Air Safety Investigation as R19950120. | 05-Apr-2001 | CASA | 04-Jun-2001 | Open |
| **R20010092**<br><br>The ATSB recommends that CASA take steps to ensure that the continuing airworthiness requirements for Australian registered Class A aircraft are not compromised through any lack of action by the national airworthiness authorities of other countries. | 12-Apr-2001 | CASA | 11-June-2001 | Open |

| Recommendation | Issue date | Receiving organisation | Response due date | Status |
|---|---|---|---|---|
| **R20010093**<br><br>The ATSB recommends that CASA take responsibility to ensure that all service bulletins relevant to Australian registered Class A aircraft are received and assessed for safety of flight implications. The assessment process should ensure that those aspects affecting the safety of flight of Class A aircraft are implemented or mandated as necessary and that appropriate systems are in place to ensure compliance. | 12-Apr-2001 | CASA | 11-June-2001 | Open |

## *Heavy vehicle recommendations*

### Heavy vehicles

On 2 December 1998, the Minister for Transport and Regional Services announced a consultant study to investigate claims of vibration and stability problems from a number of owners of heavy vehicles. Roaduser International conducted the consultancy, its final report tabled in the Senate on 18 April 2000.

The Minister for Transport and Regional Services, Mr John Anderson, asked the Australian Transport Safety Bureau (ATSB) to monitor and report on the implementation of the recommendations made in the Roaduser International report. These 16 recommendations are divided into three broad categories:

- action to be taken on specific vehicles (recommendations 1, 2, 5, 10);
- improvements to vehicle design practice and standards (3, 4, 6, 7, 8, 9, 12); and
- areas of possible further research (11, 13, 14, 15, 16).

(All roaduser recommendations are listed at the end of this section).

The status of actions to address the report's recommendations is shown below in the above three categories.

### Status summary for action to be taken on specific vehicles

*(recommendations 1, 2, 5 and 10)*

The first set of recommendations was sent to the relevant vehicle manufacturers on 18 April 2000. Vehicle manufacturers, with the cooperation of owners, are the only group able to rectify the identified problems associated with specific vehicles. The current position with regard to the specific vehicles identified in the report is that:

**Status:**

- Kenworth has provided evidence of testing in order to substantiate its claims that F1 is safe for operational use. This information was provided on Friday, 22 December 2000. No substantiation has been received in relation to vehicle F3.
- The ATSB has written to the current owners of both F4 and F26. A copy of the Roaduser report was sent to them drawing

their attention to the recommendations and noting that the ATSB understands they have been contacted by Mack and are satisfied with the way Mack is dealing with the recommendations. The ATSB is awaiting confirmation of this position from the current owners of vehicles F4 and F26.

- Ford and Hendrickson have provided technical clarification on how the modifications to F6 have addressed the safety deficiencies identified in the Roaduser International report.
- The ATSB has selected an appropriately qualified consultant to review all evidence provided in response to this first set of the Roaduser International report recommendations. The ATSB has requested that a final report be provided by mid-July 2001.

### Action on improvements to vehicle design practice and standards
*(recommendations 3, 4, 6, 7, 8, 9 and 12)*

Improvements to vehicle design practice and standards will be implemented by manufacturers, as well as regulatory bodies including the National Road Transport Commission (NRTC), State authorities, and regulatory areas within the Department of Transport and Regional Services.

The second set of recommendations was sent to manufacturers, the Federal Chamber of Automotive Industries (FCAI) and regulatory bodies, including the National Road Transport Commission (NRTC), State/Territory authorities and the regulatory areas within the Department of Transport and Regional Services. Progress is continuing with this set of recommendations, which addresses gaps in design and manufacturing knowledge in some areas of vehicle behaviour, including oversteering, vibration and bump steer.

**Status:**

The Technical Liaison Group, which includes representatives from manufacturer, industry and regulatory bodies (Federal and State/Territory), considered means of addressing recommendations relating to improvements in vehicle design standards and practices (Recommendations 3, 4, 6, 7, 8, 9, 12) at its meeting of 14 March 2001.

It was agreed that there were areas of commonality between the Roaduser recommendations and measures being considered by the Performance Based Standards project currently being undertaken by the NRTC and Austroads. Therefore, some of the

performance measures and methods of assessment proposed by the PBS project may provide input for the development of possible regulatory or other approaches to address the recommendations. The use of PBS research can be further considered once the next phase of PBS, assessing the current Australian fleet against proposed performance measures, is underway.

The NRTC will be conducting workshops to obtain feedback from interested parties following the release of proposed performance measures to be used in PBS.

#### Areas of possible future research

*(recommendations 11, 13, 14, 15 and 16)*

The third set of recommendations relates to areas of possible further research. These recommendations are being reviewed by the Department of Transport and Regional Services and will also be the subject of consultation with relevant groups including the NRTC, Austroads and the Federal Chamber of Automotive Industries. These recommendations have also been drawn to the attention of the House of Representatives Standing Committee on Communications, Transport and the Arts, which is inquiring into fatigue.

**Status:**

The ATSB commissioned ARRB Transport Research Ltd to determine the state of knowledge on the extent to which vibration in heavy truck cabs:

- contributes to driver fatigue and represents a safety hazard; and
- constitutes a health hazard to truck drivers.

The ARRB Transport Research Ltd final report was published in July 2001.

### *Roaduser International report recommendations*

#### Recommendations for action to be taken on specific vehicles

*(recommendations 1, 2, 5 and 10)*

1. Action should be taken to identify and evaluate prime movers which have safety deficiencies similar to those identified for vehicle F6; such deficiencies in handling stability relate principally to drive axle suspension characteristics but the

evaluation process should consider other influences such as steering axle suspension understeer inherent in prime mover designs.

2. Such vehicles, including vehicle F6 and other Ford LT 9513 prime movers fitted with Hendrickson WD-2 460 suspension, should be rectified through appropriate means of mechanical intervention.

5. Action should be taken to advise the owners of prime movers F1, F3, F4 and F26 concerning the test results in relation to increased steering effort required and the need for rectification or restriction to certain types of operation.

10. Action should be taken to advise the owners of prime movers F1, F3, F4 and F6 concerning the ride quality test results and to recommend rectification of the vibration problems. The manufacturers of these vehicles should also be advised of the test results and the recommendation for rectification.

**Recommendations on improvements to vehicle design practice and standards** *(recommendations 3, 4, 6, 7, 8, 9 and 12)*

3. Action should be taken to ensure that manufacturers do not build future vehicles that exhibit the non-understeering behaviour identified in this report.

4. The use of regulation or other means should be considered for controlling certain characteristics of suspensions fitted to the drive axles of prime movers, with regard to their influence on handling quality and the maintenance of understeering behaviour in particular.

6. Action should be taken to develop robust front axle bump steer test methods and to develop reliable and predictable means of rectification. The truck maintenance community should be educated concerning the importance of bump steer and appropriate means of assessment and rectification where problems are identified.

7. Prime mover makes and models with inherent geometric bump steer, to a level that makes them unduly sensitive to the fitment of softer front springs, should be identified. Once robust test methods have been defined, the co-operation of all truck manufacturers should be sought to provide test results to a national government agency and to provide advice on

rectification. Education material should then be prepared addressing:

- The safety-relevance of undesirable bump steer
- Recommended test and assessment methods
- Prime mover makes and models with higher propensity to bump steer and which are sensitive to modifications
- Recommended means of rectification, taking into account potential adverse effects on vibration levels
- Best maintenance practice to minimise bump steer effects.

8. The use of regulation or other means should be considered to identify and control certain characteristics of suspensions and steering systems fitted to the front axles of prime movers, with regard to their influence on unwanted steering disturbances, and bump steer in particular.

9. Publicity of the drive axle handling deficiencies and front axle disturbance characteristics identified in this study should be undertaken to assist in identifying existing problem vehicles, including those modified in service.

12. In the development of remedial actions, standards, vehicle designs, retrofits and modifications, due attention must be paid to the interaction between vibration and handling, so that actions in one area will not adversely affect performance in the other area. Prime mover manufacturers and vehicle repairers should pay increased attention to the important and sensitive interaction between the front suspension design, excessive ride vibrations and unwanted steering effects, particularly where the steering geometry involves bump steer effects.

### Areas of possible future research

*(recommendations 11, 13, 14, 15 and 16)*

11. Joint industry-government action should be launched to develop effective means of contributing to the management of driver health risks in relation to excessive prime mover vibration, including:

- The availability of seat vibration test information in a consistent format.
- The development of general guidelines for acceptable vibration measures in a range of operating environments.

13. Given the importance of driver fatigue in truck safety, and on-going research in this area, it is recommended that the relationship between levels of seat vibration, driver fatigue and driving hours be further investigated.

14. Given the importance of improving truck driver occupational health and safety, research should be initiated into the health effects of vibration on truck drivers and the development of standards for acceptable levels of seat vibration, taking into account operating conditions, speed environment, daily exposure and duration of engagement in the particular operating environment.

15. The influence of unwanted steering disturbances, and bump steer and on-centre steering variability in particular, on driver fatigue should be investigated.

16. Research should be carried out to investigate the effects of prime mover handling (from highly understeering through to neutral steering) on ease of steering control and safe operation under all road conditions.

## Appendix 4: Aviation occurrence categories

The first step in an incident or accident investigation is to categorise the occurrence according to the expected safety education and enhancement potential. Current aviation occurrence categories are as follows:

### Category 1

Category 1 occurrences are those involving High-capacity Air Transport operations where the facts indicate a significant threat to the safety of the travelling public and are the subject of actual or likely widespread public interest.

### Category 2

Category 2 occurrences are those involving other than High-capacity Air Transport operations where the facts indicate a significant threat to the safety of the travelling public and are the subject of actual or likely widespread public interest.

### Category 3

Category 3 occurrences are those where the facts indicate actual or potential serious safety deficiencies or there is significant concern for public safety. The category is used when there is a need for an in-depth investigation to determine the facts.

### Category 4

Category 4 occurrences are those where the facts do not indicate a serious safety deficiency but investigation is required to substantiate the initial reported facts. The circumstances are sufficiently complex to require detailed information from the pilot, operator and/or other involved parties. This category may also include a selection of occurrences identified as involving characteristics that from trend or safety analysis require investigation.

### Category 5

Category 5 occurrences are those primarily of statistical interest and are generally not investigated.

**Note:** While ATSB and its predecessor BASI have utilised a five-category scale (1 = most serious; 5 = least serious) for many years, definitions have changed from time to time and care needs to be taken in comparing across time. Changes have been made, in part, because categories are used as a proxy for resources devoted to investigations and serve an internal management function.

# Appendix 5: Aviation safety magazine articles and media notices in 2000–01

## *Aviation safety articles*

CASA's *Flight Safety Australia* magazine (ATSB supplement), July – August 2000

- *A most dramatic runway incursion*
- *Safety briefs* – summaries of three investigation reports: Piper Chieftain VH-MZK experienced two engine failures due to significant mechanical damage during a flight from Adelaide to Whyalla; crew of a Metroliner instructed to follow a Jetstream but mistook another aircraft as its lead; a fatigued pilot of a Piper Pawnee ran into a moving car and proceeded to continue with crop-spraying operations.
- *Inexperience ends in tragedy*
- *Reason in the method: why we need a reporting culture*
- *Confidential Aviation Incident Reporting* (CAIR)

CASA's *Flight Safety Australia* magazine (ATSB supplement), September – October 2000

- *Recently completed investigations* – lists investigations from 13 February 1998 to 1 July 2000
- *Human factor maintenance error led to jammed cyclic*, by Sam Webb
- *Safety briefs* – summaries of six investigation reports: engines of a Shrike Commander lost power due to fuel exhaustion crashing into sea 400 metres short of the threshold of the runway; flight instructor dies due to injuries incurred after a forced crash-landing as a result of insufficient fuel; crew of Boeing 747 unable to move any throttle levers until descent due to moisture on the cables freezing to seals and fairleads; fatigue, inadequate rest and inexperience attributed to pilot's death and the destruction of a Cessna 172; safety deficiency in the use of conditional clearances contributed to a near runway incursion; pilot fatally injured when his Air Tractor 802A impacted the ground at an airshow due to an unsuccessful upward pitch manoeuvre.
- *Fatigue is a safety threat*, by Sarah-Jane Crosby
- *Confidential Aviation Incident Reporting* (CAIR)

CASA's *Flight Safety Australia* magazine (ATSB supplement), November – December 2000

- *Recently completed investigations* – lists investigations from 2 March 1999 to 24 July 2000
- *Chieftain investigation leads to safety recommendations*
- *Safety briefs* – summaries of three investigation reports: collision between a Piper Pawnee and an Astir CS glider, both pilots fatally injured; a Tupulov 154C (TU154) using transponders transmitting in metres rather than feet came perilously close to crashing with a Boeing 747 (B747) which could not display the TU154; a small fire erupted in the electrical equipment bay of a BAe 146 just prior to departure after the RCCB failed leading to the failure of the AC power supply; number of failures in the elevator trim tab actuators of a Cessna 402 led to the discovery that only the least expensive part, the male screw assembly, had been replaced during an overhaul; a King Air disintegrated upon ground impact fatally injuring its eight occupants; a malfunctioning engine fire warning system on a Fairchild Metro SA227-AC after crew failed to follow emergency checklist actions in full.
- *Mate, I take pressurisation more seriously now*, by Michael Watson
- *Confidential Aviation Incident Reporting* (CAIR)

CASA's *Flight Safety Australia* magazine (ATSB supplement), January – February 2001

- *Recently completed investigations* – lists investigations from 22 March 1999 to 10 August 2000
- *Safety briefs* – summaries of six investigation reports: Boeing 767-300 minor tail skid strike during takeoff; incorrect recording of cargo weight on a Boeing 747; pilot untrained for flight during non-visual meteorological conditions results in triple fatality in a PA-28-181; pilot of a Piper Chieftain forced to shut down right engine during flight when it vented oil; visibility reduced to less than 600 metres after landing of a Boeing 767 at Perth airport; faulty engine-driven fuel pump connection and selection of electric fuel pump in off position during takeoff cited as possible contributing factors in a fatality involving a single-seat RV-3 amateur-built aircraft.

- *Keeping your distance*
- *Confidential Aviation Incident Reporting* (CAIR)

CASA's *Flight Safety Australia magazine* (ATSB supplement), March – April 2001

- How does the ATSB identify a safety problem in the aviation industry? – includes a list of Category Four occurrences in January 2001
- Training operations: know your fuel usage
- Safety briefs – summaries of six investigation reports: portion of fan blade in right engine of a Boeing 767 blows off; source of contaminated fuel sample from a Boeing 737 could not be established; helicopter impacts shallow water during a low-level turn in adverse conditions; CASA accepts recommendation for the fitment of aural cabin altitude alert warnings systems to pressurised craft after pilot in command of a King Air lost consciousness from hypoxia; Beechcraft Queen Air pancaked into a hillside, seriously injuring its six occupants; Lockheed Hercules L382G substantially damaged during landing after failed extension of left main gear.
- Breaking new ground: one man's reflection, by Sarah-Jane Crosby
- Confidential Aviation Incident Reporting (CAIR)

CASA's *Flight Safety Australia magazine* (ATSB Supplement), May – June 2001

- *Recently completed investigations* – lists investigations from 30 October 1998 to 29 January 2001
- *Safety briefs* – summaries of three investigation reports: crew of a Fokker 28 experienced a severe vibration from the left main landing gear as the brakes were applied during a landing roll after the left main outboard wheel had separated from the landing gear assembly; an unexplained power loss plunged the Sydney Terminal Control Unit into partial darkness and caused the Air Traffic Control workstations to go blank during a routine inspection; a pilot and three passengers on a charter flight in a Cessna 210M sustained serious injuries during a forced landing

following a rough-running engine and sudden loss of power due to the failure of the number-one cylinder through fatigue cracking.

- *Why investigate fuel?*, by Mike Watson
- *Behind the Investigation*, by Mike Cavanagh
- *Confidential Aviation Incident Reporting* (CAIR)

### *Media notices*

All media notices below were posted on the ATSB web site on the dates indicated.

Media notices annotated by [*] were also distributed to news media services.

**7 July 2000 –** Sydney power outage, Sydney air traffic services centre, 6 July 2000. Announcement of investigation into a reported loss of power at the Sydney Air Traffic Services Centre

**4 August 2000 –** Cessna 206 aircraft near Cairns. Announcement of investigation into disappearance from radar of Cessna 206 aircraft near Cairns.

**7 August 2000** – Helicopter accident, Norman Reef, 30 NM NNE Cairns Qld. Announcement of investigation into helicopter crash near Norman Reef.

**5 September 2000** – Beech King Air accident, 80 NM SW Normanton Qld. Announcement of investigation of Beech King Air wreckage, which crashed after it climbed through its assigned flight level.

**5 September 2000** – Beech King Air accident, 80 NM SW Normanton Qld. Further information provided regarding of investigation of Beech King Air wreckage, which crashed after it, climbed through its assigned flight level.

**6 September 2000** – Beech King Air accident, 80 NM SW Normanton Qld. Further information on Beech King Air investigation.

**4 October 2000** – Hughes Helicopter VH-THM. Information relating to ATSB's decision not to conduct an on-site investigation of fatal crash of Hughes 300 helicopter VH-THM.

**1 November 2000** – Airbus A340 loss of direction control while landing on runway at Sydney. Announcement of analysis of occurrence regarding an Airbus A340 which lost control while landing on runway 16 Right at Sydney Airport.

**2 November 2000** – ATSB investigates 24 000 tonne container vessel running aground on Sudbury Reef. Announcement of the Taipei's Aviation Safety Council's request for ATSB assistance in the investigation of the tragic accident at Chiang Kai-Shek International Airport, Taipei involving a Boeing 747-400 operated by Singapore Airlines.

**2 November 2000** – ATSB investigates 24 000 tonne container vessel running aground on Sudbury Reef Announcement of investigation of container vessel Bunga Teratai Satu which ran aground on Sudbury Reef in the Great Barrier Reef marine park.

**8 November 2000** – Release of road safety monograph. Announcement of release of monograph, Australia's International Motorcycle Safety Performance 1987 to 1997.

**8 November 2000** – Investigation into landing accident involving a Cessna 404. Announcement of investigation into landing accident involving a Cessna 404 scheduled passenger service from Cairns to Aurukun in Queensland.

**14 November 2000** – Investigation of grounding of the container vessel Bunga Teratai Satu in the Great Barrier Reef. Further information regarding investigation of grounding of the container vessel Bunga Teratai Satu in the Great Barrier Reef.

**15 November 2000** – Aircraft Accident. Announcement of investigation into engine failure experienced by a Piper Aerostar when landing at Hay Aerodrome.

**16 November 2000** – Aircraft Accident. Announcement of investigation into an accident involving a (GA)-200 agricultural aircraft striking power lines resulting in the death of the pilot.

**12 January 2001*** – Safety deficiency investigation. Investigation into circumstances of omission by Ansett to undertake specified maintenance requirements for Boeing 767 aircraft.

**29 January 2001** – Three aircraft accident. Investigation into three aircraft accidents that occurred over January holiday weekend: Beech 23 Musketeer at Canberra Airport; Pitts Special near Brisbane; Cessna 310 near Newman.

**30 January 2001*** – Information needed about the crash at Canberra airport. Call for witnesses of the accident at Canberra airport involving a single-engine Beech Musketeer, in which four people were fatally injured.

**31 January 2001*** – Australian Transport Safety Bureau investigates Emirates Airlines occurrence at Melbourne.

Investigation of Singapore-bound Emirates Airlines Boeing 777 stalled takeoff from runway due to engine failure.

**1 March 2001*** – Poor watchkeeping procedures cause another collision. Investigation reveals failure to keep proper lookouts aboard the Liberian woodchip carrier Craig The Pioneer and the Australian prawn trawler May Bell II resulted in collision between the two.

**13 March 2001*** – Important air safety investigation information. Request for editors and chiefs-of-staff to update files and contact lists in recognition of the establishment of the ATSB.

**29 March 2001*** – Media conference. Invitation to attend media conference to release the aviation fuel (Avgas) contamination report.

**30 March 2001*** – Release of investigation report on contaminated aviation gasoline. Release of report on contaminated gasoline (Avgas) investigation that followed the grounding of thousands of piston-engine aircraft across Australian in January 2000.

**10 April 2001*** – Safety deficiency investigation. Announcement of commencement of investigation into circumstances surrounding the omission by Ansett to undertake specified maintenance requirements for Boeing 767 aircraft.

**12 April 2001*** – ATSB releases two air safety recommendations relating to airline aircraft maintenance requirements. Announcement of expanded scope of safety deficiency investigation into airline aircraft maintenance requirements.

**20 April 2001** – *Sydney Morning Herald* article of 20 April and the ATSB. Article incorrectly reflects status of ATSB's investigation of Ansett.

**25 April 2001*** – Release of QF1 Bangkok accident investigation. Announcement of release of report on the Qantas B747-400 runway overrun accident at Bangkok International Airport on 23 September 1999.

**25 April 2001*** – Media conference regarding Boeing 747-438 (QF1) accident. Invitation to attend media conference regarding Boeing 747-438 (QF1) accident at Bangkok, Thailand.

**31 May 2001*** – Human error leads to grounding. Announcement of release of report on the grounding of the container ship Bunga Teratai Satu on Sudbury Reef off Cairns, due to inattentiveness of ship's mate.

# Appendix 6: Black Spot Program treatments in 2000–01

| Local Gov. | Treatment – Location | Estimated cost |
|---|---|---|
| **New South Wales** | | |
| Albury | Roundabout - McDonald Rd & Kotthoff St | $30 000 |
| Albury | Controlled right turn - David St & Wilson St | $18 000 |
| Albury | Roundabout - Kiewa St & Hovell St | $30 000 |
| Ballina | Horizontal alignment /realign junction - Teven Rd & Eltham Rd | $200 000 |
| Bankstown | Traffic signals - Canterbury Rd & Claribel St | $200 000 |
| Bathurst | Centre medians/linemarking - Lambert St & Peel St | $15 000 |
| Bathurst | Cross roads - Great Western Hwy (Stewart St) | $300 000 |
| Bathurst | Roundabout - Piper St & George St | $220 000 |
| Bathurst | Close median/alternate access - Great Western Hwy & Gilmour St | $75 000 |
| Blacktown | Modify signals - Flushcombe Rd & Great Western Hwy | $35 000 |
| Blacktown | Resurface intersection and approaches - Doonside Rd & Horsley Rd | $30 000 |
| Broken Hill | Kerb blisters/painted median - Ryan St & Creedon St | $12 000 |
| Broken Hill | Signalise junction - Silver City Hwy & Gypsum St | $175 000 |
| Byron | Roundabout - Ewingsdale Rd & Banksia Dr. | $230 000 |
| Campbelltown | Roundabout - Leumeah Rd & Parkhill Ave | $60 000 |
| Campbelltown | Traffic signals - Moore Oxley Bypass & Broughton St | $45 000 |
| Canterbury | Traffic calming scheme - Homer St, Hocking Ave & Watkin Ave | $120 000 |
| Canterbury | Modify signals - Homer St & Bayview Ave | $10 000 |
| Canterbury | Roundabout - Chalmers St & Chapel St | $30 000 |
| Canterbury | Install slow point - Burwood Rd, Bridge Rd & Tobruk Ave | $20 000 |
| Canterbury | Roundabout - Gould St & Redman St | $20 000 |
| Canterbury | Roundabout - Hillcrest St & The Broadway | $35 000 |
| Canterbury | Traffic calming scheme - Ninth Ave & Sixth Ave | $20 000 |
| Canterbury | Install slow point - Fifth Ave & Eighth Ave | $35 000 |
| Canterbury | Roundabout - The Boulevarde & Renown St | $25 000 |
| Canterbury | Traffic calming scheme - Payten Ave | $120 000 |
| Canterbury | Traffic calming scheme - Punchbowl Rd & Victoria Rd | $20 000 |
| Canterbury | Install slow point - Fore St & High St | $20 000 |
| Canterbury | Install slow point - Ninth Ave, Lincoln St & Albert St | $40 000 |
| Canterbury | Roundabout - Hillcrest St & Rosemont St | $20 000 |
| Canterbury | Install right turn/modify signals - Haldon St & The Boulevarde | $55 000 |
| Cessnock | Roundabout - Cumberland St & Cooper St | $200 000 |
| Cessnock | Roundabout - Lang St & Boundary St | $180 000 |
| Coffs Harbour | Curve reconstruction/road widening - Coramba Rd | $500 000 |

| | | |
|---|---|---|
| Coolamon | Roundabout - Regional Rd 240 & Regional Rd 243 | $100 000 |
| Cootamundra | Roundabout - Sutton St & Mackay St | $215 000 |
| Cowra | Construct medians/reinforce priority signs - Darling St & Vaux St | $30 000 |
| Dumaresq | Realign and reconstruct 1.1 km of road - Waterfall Way | $400 000 |
| Dungog | Widen pavement/guardfence - Clarence Town Rd | $230 000 |
| Fairfield | Pedestrian protection - Canley Vale Rd & Sackville St | $50 000 |
| Fairfield | Resurface intersection/modify signals - Fairfield St & Woodville Rd | $90 000 |
| Fairfield | Roundabout - Harris St & Thomas St | $70 000 |
| Fairfield | Improve sight distance - Sackville St & Harris St | $18 000 |
| Gloucester | Guardfence/reduce speed limit-The Bucketts Wy & Merewether Lane | $240 000 |
| Gosford | Roundabout/extend median-Pacific Hwy, Wisemans Ferry & Kangoo Rds | $300 000 |
| Gosford | Roundabout - Russell St & Althorp St | $120 000 |
| Great Lakes | Realign road - The Bucketts Way | $120 000 |
| Great Lakes | Safety barrier/delineation- The Lakes Way | $150 000 |
| Great Lakes | Remove crest/guardfence/seal shoulders - Bucketts Wy & Ribbons Rd | $450 000 |
| Greater Taree | Protected right turns/improve channelisation - High St & Manning St | $115 000 |
| Greater Taree | Protected right turns/improve channelisation - Combined St & Primose St | $102 000 |
| Griffith | Roundabout/extend islands- Yambil St & Bonegilla Rd | $100 000 |
| Gundagai | Realign curves - Gocup Rd | $486 000 |
| Hastings | Traffic island - Hill St & Grant St | $20 000 |
| Hastings | Traffic island - Granite St & Savoy St | $20 000 |
| Hastings | Increase sight distance/improve alignment - Oxley Hwy & Rosewood Rd | $500 000 |
| Hastings | Roundabout - Hill St & Lord St | $210 000 |
| Holroyd | Resurface intersection/modify signals - Cumberland Hwy & Dunmore St | $30 000 |
| Holroyd | Three tadpole treatment - Gozo Rd | $30 000 |
| Holroyd | Roundabout - Old Prospect Rd & Braeside Rd | $40 000 |
| Holroyd | Resurface intersection - Cumberland Hwy & Merrylands Rd | $75 000 |
| Hornsby | Resurface intersection - Cumberland Hwy & The Comenarra Pkwy | $95 000 |
| Hornsby | Resurface intersection - Cumberland Hwy & Carlingford Rd | $70 000 |
| Inverell | Modify signals/kerb blisters/median - Urabatha St (Inverell to Yetman Rds) | $18 000 |
| Kempsey | Reconstruct and realign road - Crescent Head Rd & Maria River Rd | $450 000 |
| Kogarah | Resurface intersection/modify signals - King Georges Rd & Hillcrest Ave | $95 000 |
| Ku-Ring-Gai | Right turn phasing out - Koola Ave & Birdwood Ave | $100 000 |
| Lake Macquarie | Right turn bays/raised medians/power poles - Cary St | $220 000 |
| Lake Macquarie | Guardfence/non-skid pavement - Wangi Rd & Onslow Rd | $350 000 |
| Lake Macquarie | Power poles/install bus bay/alignment - Pacific Hwy (sth of Sherburn Pl) | $240 000 |
| Lithgow | Add right turn phase - Mort St & Bridge St | $10 000 |
| Liverpool | Modify signals - Bathurst St & Elizabeth St | $30 000 |
| Liverpool | Traffic signals - Elizabeth Dr & Marsden Rd | $225 000 |
| Marrickville | Controlled right movements/modify signals - Liberty St & Stanmore Rd | $50 000 |
| Marrickville | Resurface intersection/modify signals - Gt Western Hwy, West & Flood St | $100 000 |

| | | |
|---|---|---|
| Marrickville | Pedestrian protection - Livingstone Rd, New Canterbury Rd & Gordon St | $50 000 |
| Merriwa | Guardfence/enhance clearzone - Golden Hwy & Merriwa Rd | $450 000 |
| Moree Plains | Priority signs/kerb blisters - Edward St & Anne St | $12,800 |
| Moree Plains | Crossing with new kerb blisters - Adelaide St | $12 000 |
| Mudgee | Intersection lanes/kerbed median - Castlereagh Hwy & Mortimer St | $75 000 |
| Nambucca | Realign road/widen pavement/delineation- Scotts Head Rd | $433 000 |
| Newcastle | Right storage lanes/traffic signals - Tudor St & Gordon Ave | $100 000 |
| Newcastle | Non-skid pavement/Chevrons- Pacific Hwy, Northcott Dr & Kahibah Rd | $325 000 |
| Newcastle | Power poles/left deceleration lane/chevrons - Industrial Dr | $300 000 |
| Newcastle | Median/guardfence/horizontal alignment - Pacific Hwy & Scenic Dr | $330 000 |
| Newcastle | Close street - Werribi St & Baruda St | $60 000 |
| Orange | Roundabout - Dalton St & Anson St | $200 000 |
| Parkes | Islands/priority signs - Dalton St & Middleton St | $25 000 |
| Parramatta | Roundabout - Marion St & Wigram St | $21 000 |
| Parramatta | Install slow points - Park Rd, Dora Cres & Bennetts Rd | $30 000 |
| Parramatta | Roundabout - Buller St & Grose St | $50 000 |
| Parramatta | Roundabout/pedestrian refuge - Alfred St, Virginia & Hassall Sts | $90 000 |
| Parramatta | Resurface intersection/modify signals - Marsden Rd, Vict. Rd & Wharf Rd | $100 000 |
| Parramatta | Minor intersection - Marian St & Mountford Ave | $30 000 |
| Parramatta | Upgrade signal displays - River Rd & Victoria Rd | $25 000 |
| Parramatta | Roundabout - Bogalara Rd & Bulli Rd | $60 000 |
| Parramatta | Traffic calming/guardfence/signalling - Wentworth Ave (Fyall Ave/Hart Dr) | $50 000 |
| Parramatta | Traffic calming - Wentworth Ave (Bungaree Rd to Barangaroo Rd) | $150 000 |
| Parramatta | Resurface intersection/modify signals - Guildford Rd & Woodville Rd | $100 000 |
| Parramatta | Traffic calming - Clyde St (William St to Willmott Ave) | $499 000 |
| Parramatta | Speed reduction devices - Caroline Chisholm Dr, Churchill Dr, Willmott Ave | $35 000 |
| Penrith | Modify signals - Copeland St & Parker St | $35 000 |
| Penrith | Resurface intersection/modify signals - Mulgoa Rd & Western Expressway | $100 000 |
| Port Stephens | Traffic signals/reduce speed limit - Pacific Hwy & Tomago Rd | $290 000 |
| Port Stephens | Guardfence & shoulder - Nelson Bay Rd & East of Port Stephens Dr. | $220 000 |
| Richmond River | Install traffic calming scheme at shopping centre - Pacific Hwy | $250 000 |
| Rockdale | Pedestrian protection/modify signals - Bryant St & Princes Hwy | $25 000 |
| Ryde | Non-skid pavement - Dehli Rd | $150 000 |
| Shellharbour | Roundabout - George St, Beverley Ave & Brian Ave | $40 000 |
| Shoalhaven | Guardfence - Princes Hwy & Tindalls Lane | $150 000 |
| Shoalhaven | Seal section - Forest Rd | $60 000 |
| Sutherland | Right turn bays/close various side streets - President Ave | $70 000 |
| Sydney | Modify signals - Elizabeth St & Park St | $40 000 |
| Sydney | Modify signals - Elizabeth St & Liverpool St | $40 000 |
| Tumut | Widen shoulders/guardfence/remove hazards - Tumbarumba to Tumut Rd | $110 000 |
| Wagga Wagga | Roundabout improvements - Glenfield Rd & Fernleigh Rd | $90 000 |

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| Warringah | Resurface intersection/delineation- Wakehurst Pkwy & Warringah Rd | $95 000 |
| Wingecarribee | Guardfence - Oxley Hill Rd (Orchaard Rd to Parry Dr) | $50 000 |
| Wingecarribee | Raised channelisation etc - Illawarra Hwy & Sheepwash Rd | $400 000 |
| Wollondilly | Guardfence - Cordeaux Rd & William James Dr | $80 000 |
| Wollondilly | Reflective markers/guideposts/warning signs - Menangle Rd & Finns Rd | $10 000 |
| Wollondilly | Warning signs/new pavement/new safety fence - Menangle Rd | $75 000 |
| Wollondilly | Guardfence/reflective markers/signs - Remembrance & Razorback Rd | $143 000 |
| Wollondilly | Delineation - Silverdale Rd & north of Werriberri Rd | $100 000 |
| Wollondilly | Widen pavement/painted right turn bay - Remembrance Dwy & Cawdor Rd | $50 000 |
| Wollondilly | Widen pavement - Remembrance Dwy & Tylers Rd | $20 000 |
| Wollongong | Guard fencing - Mount Ousley Rd | $260 000 |
| Wollongong | Right turn phase - Springhill Rd & Bridge St | $50 000 |
| Wollongong | Change phasing - Old Princes Hwy Robson St & Rothery Rd | $50 000 |
| Woollahra | Modify signals/pedestrian protection - New South Head Rd & O'Sullivan Rd | $55 000 |
| Wyong | Pedestrian signals - The Entrance Rd (Elsiemer St to Stella St) | $85 000 |
| Wyong | Painted median/set back hazards - Main Rd (Cross St to Dunleigh St) | $320 000 |
| Wyong | Extend median/pedestrian refuge/close street - Wallarah Rd & Bertha St | $220 000 |
| Yass | Widen bridge/guardfence/delineation - Kangiara Creek Bridge | $360 000 |

## Victoria

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|---|---|---|
| Alpine | Curve widening/turnout delineation/guidepost upgrade - Mt Buffalo Rd | $200 000 |
| Ballarat | Roundabout - Dana St & Armstrong St | $160 000 |
| Ballarat | Channelisation - Grant St & Anderson St | $23 000 |
| Ballarat | Kerb extensions/splitter islands - Sturt St & Armstrong St | $130 000 |
| Ballarat | Kerb extensions/splitter islands - Dana St & Ripon St | $90 000 |
| Ballarat | Kerb extensions/splitter islands - Sturt St & Ripon St | $180 000 |
| Ballarat | Kerb extensions/splitter islands - Murrumbeet Main Rd & Errard St | $180 000 |
| Ballarat | Roundabout - Main St & Humffray St | $150 000 |
| Banyule | Roundabout - Edwin St & St Hellier Rd | $20 000 |
| Banyule | Anti skid surfacing - Plenty Rd & Settlement Rd | $44 000 |
| Banyule | Anti skid surfacing - Plenty Rd & Metro Ring Rd | $87 000 |
| Banyule | Roundabout - Burgunday St & Studley Rd | $80 000 |
| Banyule | Controlled right turn/antiskid - Karringal Dr & St Helena Rd | $75 000 |
| Banyule | Controlled turn/antiskid - Bell St, Upper Heidelburg Rd, Burgundy St | $60 000 |
| Banyule | Delineation improvements - Oriel Rd & Livingston Rd | $80 000 |
| Banyule | Roundabout - Sherbourne Rd & Rattray Rd | $195 000 |
| Bayside | Roundabout - New St & Bent Ave | $130 000 |
| Cardinia | Provide tactile edgelines - Princess Hwy, McMullen Rd & Michael St | $20 000 |
| Cardinia | Seal shoulder - Princess Freeway (East of Snell Rd & Brew Rd) | $270 000 |
| Cardinia | Realign/widen road/delineation - Bunyip-Tonimbruk Rd & Cemetary Lne | $290 000 |
| Cardinia | Seal shoulders - Beaconsfield Emerald Rd & Stoney Creek Rd | $75 000 |

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| Casey | Seal shoulder - South Gippsland Hwy, Hallam Rd & Thompsons Rd | $325 000 |
| Casey | Seal shoulder - South Gippsland Hwy, Abbotts Rd & Hallam Rd | $265 000 |
| Casey | Seal shoulder - South Gippsland Hwy, Thompsons Rd & Camms Rd | $200 000 |
| Colac-Otway | Seal shoulders - Great Ocean Rd (North of Grey River) | $264,500 |
| Corangamite | Relocate Hawks Nest Rd - Princes Hwy West & Hawks Nest Rd | $310 000 |
| Corangamite | Earthworks/guardrail/delineation - Timboon-Nullawarre Rd & Curdies Riv. | $34,500 |
| Darebin | Fully controlled right turn - Albert Rd & Murray Rd | $32 000 |
| Darebin | Five lane treatment/mast arms/new pedestals - Victoria & Separation St | $100 000 |
| Delatite | Seal shoulders/guardrail - Mount Buller Rd & Carters Rd | $320 000 |
| East Gippsland | Delineation improvements - Great Alpine Rd & Collins Rd | $30 000 |
| Frankston | Seal shoulders - McClelland Dr & Edward St, Alder St | $75 000 |
| Frankston | Ban right turns, provide lanes - Cranbourne Frankston Rd & Clarendon St | $80 000 |
| Frankston | Ban right turns, extend lanes - Cranbourne Frankston Rd & Lindrum Rd | $55 000 |
| Gannawarra | Splitter islands/signs - Victoria St & Vaughan St | $20 000 |
| Glen Eira | Roundabout - Orrong Rd & Riddell Parade | $74 000 |
| Glen Eira | Splitter islands - Grange Rd & Leila Rd | $20 000 |
| Glen Eira | Roundabout - Kambrook Rd & Station St | $105 000 |
| Glen Eira | Right turn lanes/fully controlled right turn - Centre & East Boundary Rd | $310 000 |
| Golden Plains | Seal shoulders - Sago Hill Rd & Kopkes Rd | $48,875 |
| Gtr Bendigo | Improve lighting - Calder Hwy, McIvor Hwy & Alder St | $130 000 |
| Gtr Bendigo | Roundabout - Bendigo-Maryborough Rd, Olympic Pde & Helms St | $230 000 |
| Gtr Bendigo | Roundabout - Bendigo-Rosedale Rd & Ryalls Lane | $263 000 |
| Gtr Bendigo | New median and pedestrian crossing - Hargreaves St & Mitchell St | $55 000 |
| Gtr Bendigo | Roundabout - St Aidans Rd, Cousins St & Crook St | $100 000 |
| Gtr Dandenong | Roundabout - Walker St & Langhorne St | $25 000 |
| Gtr Dandenong | Improve conspicuity of roundabout - Cleeland St & David St | $10 000 |
| Gtr Dandenong | Curb outstands/improve roundabout visibility - David St & James St | $25 000 |
| Gtr Dandenong | Truncate service road/remodel intersection - Cheltenham Rd & Bridge Rd | $40 000 |
| Gtr Dandenong | Intersection signals - Cheltenham Rd & Parkmore Shopping Centre | $80 000 |
| Gtr Geelong | Fully controlled right turn - Princes Hwy & Gordon Ave | $34,500 |
| Gtr Geelong | High skid resistant pavement - Princes Hwy & Cutherbertson Rd | $92 000 |
| Gtr Shepparton | Extend medians/additional island/revised linemarking - Maude St | $20 000 |
| Gtr Shepparton | Signage/delineation - Rea St & Corio St | $5 000 |
| Hume | Guide posts/edgelines/earth barrier - Sunbury Rd & Tullamarine Fwy | $78 000 |
| Indigo | Tactile rumble strips - Murray Valley Hwy & Chiltern-Howlong Rd | $3 000 |
| Indigo | Seal shoulder - Murray Valley Hwy & Bryants Gap Rd | $120 000 |
| Indigo | Skid resistant surfacing - Buckland Gap Rd & Fighting Gully Rd | $30 000 |
| Kingston | Lane treatment/pedestrian refuge - McLeod St, Station St & Myola St | $136 000 |
| Kingston | Right turn lane on south approach - Clayton Rd & Fairbank Rd | $100 000 |
| La Trobe | Flashing lights - Princes Hwy East & Breed St | $25 000 |
| Macedon Ranges | Traffic island - Melbourne-Lancefield Rd & Woodend-Wallan Rd | $20 000 |

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| Macedon Ranges | Seal shoulder - Melbourne-Lancefield Rd (Konagaderra to Gisborne Rd) | $450 000 |
| Manningham | Seal shoulders/guideposts/advisory speed - Warrandyte & Blackburn Rd | $115 000 |
| Manningham | Splitter islands - Warrandyte Rd & Andersons Creek Rd | $110 000 |
| Maroondah | Guard rail - Canterbury Rd, Lowen Ave & Mountainview Rd | $26 000 |
| Melbourne | Pedestrian signals/close 2 median openings - Peel St & Dudley St | $45 000 |
| Melton | Seal shoulder - Hopkins Rd & Boundary Rd | $104 000 |
| Mildura | Roundabout - Fourteenth St & Morpung Ave | $220 000 |
| Mitchell | Street lighting - Northern Hwy & Green St | $40 000 |
| Mitchell | Traffic signals - Northern Hwy & Rutledge St | $235 000 |
| Mitchell | Seal shoulders - Goulburn Valley Hwy & Upper Goulburn Rd | $287 000 |
| Mitchell | Seal shoulders - Goulburn Valley Hwy & Trawool Creek | $463 000 |
| Mitchell | Seal shoulders - Epping-Kilmore Rd & Hume Fwy | $253 000 |
| Monash | Roundabout - Batesford Rd & Collins St | $76 000 |
| Moonee Valley | Fully controlled right turn - Pascoe Vale Rd, Gaffney St & Peck St | $40 000 |
| Moreland | Fully controlled right turn - Murray Rd & Elizabeth St | $45 000 |
| Mornington | Staggered T intersection - Frankston-Flinders Rd & Bittern-Dromana Rd | $140 000 |
| Mt Alexander | Splitter islands/kerb extensions - Hargreaves St & Lyttleton St | $43 000 |
| Mt Alexander | Seal shoulder - Bendigo-Sutton Grange Rd & Faraday-Sutton Grange Rd | $85 000 |
| Nillumbik | Guard rail/tree removal - Eltham Yarra Glen Rd, Ridge Rd & Gills Rd | $25 000 |
| Nillumbik | Guard rail - St Andrews Rd, Watery Gully Rd & Couties Rd | $38 000 |
| Nillumbik | Seal shoulders/guard rail - Research-Warandyte Rd & San Angelo Rd | $51 000 |
| Nillumbik | Seal shoulders - Yan Yean Rd, Kurrack Rd & Heard Ave | $94 000 |
| Port Phillip | Anti skid surfacing - Fitzroy St & Princess St | $30 000 |
| Surf Coast | Seal shoulders/delineation - Barrabool Rd & Devon Rd | $46 000 |
| Warrnambool | Roundabout - Timor St & Japan St | $84 000 |
| Warrnambool | Roundabout/splitter islands - Lava St & Japan St | $84 000 |
| Warrnambool | Roundabout - Simpson St & Verdon St | $84 000 |
| Warrnambool | Splitter islands - Howard St & Princess St | $30 000 |
| Wellington | Seal shoulders - Princes Hwy East & Denison Rd | $140 000 |
| Whitehorse | Fully controlled right turn - Elgar Rd & Belmore Rd | $10 000 |
| Whitehorse | Roundabout - Roslyn St & Puerta St | $80 000 |
| Whittlesea | Roundabout - Station St & Paschke Ave | $60 000 |
| Whittlesea | Fully controlled right turn - High St & Memorial Ave | $30 000 |
| Wodonga Rural | Left hand turn slip lane - Melbourne Rd & Melrose Dr | $130 000 |
| Yarra Ranges | Guard rail - Warburton Hwy & Sports Reserve Entrance | $8 000 |
| Yarra Ranges | Improve deflection at roundabout - Cardigan Rd & Pembroke Rd | $25 000 |
| Yarra Ranges | Traffic signals - Edward Rd & Viwpoint Dr | $72 000 |
| Yarra Ranges | sight distance/delineation/shoulders - Victoria Rd & Coldstream West Rd | $62 000 |

## Queensland

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| Beaudesert | Channelise intersection - Mt Lindsay Hwy & Stockleigh Rd | $200 000 |
| Beaudesert | Channelise intersection - Mt Lindsay Hwy, Cedar Grove & Cedarvale Rd | $200 000 |
| Boulia | Widen pavement - Diamantina Developmental Rd (Boulia to Dajarra) | $120 000 |
| Bowen | Widen pavement - Rose Bay Rd (Horseshoe Bay to Poinciana Dr) | $40 000 |
| Bowen | Roundabout - Herbert St & Williams St | $200 000 |
| Bowen | Roundabout - Herbert St & Livingstone St | $200 000 |
| Brisbane | Install signals - Archerfield Rd & Boundary Rd | $250 000 |
| Brisbane | Remodel intersection/traffic signals/turn pockets - Wynnum & Riding Rd | $120 000 |
| Burdekin | Roundabout - Munro St & Parker St | $80 000 |
| Burdekin | Improve sight lines/signs/resurfacing - Giddy Rd & Old Clare Rd | $65 000 |
| Burdekin | Roundabout - Chippendale St & Queens St | $70 000 |
| Burdekin | Roundabout - Mackenzie St & Munro St | $70 000 |
| Burdekin | Channelise intersection/roundabout - Airdmillan Rd & Chippendale St | $50 000 |
| Caboolture | Roundabout - Annie St, Bertha St & Margaret St | $100 000 |
| Caboolture | Traffic islands banning right turns - Station Rd & D Aguilar Hwy | $30 000 |
| Cairns | Modify signals/improve surface - Sheridan St & Upward St | $145 000 |
| Cairns | Seal shourlder/edgeline/delineation/nonskid - Gordonvale-Atherton Rd | $235 000 |
| Calliope | Lighting/signage/channelisation/roundabout - Hampton Dr & Elizabeth St | $150 000 |
| Charters Towers | Install signs - Dalrymple Hwy & Hewett St | $10 000 |
| Charters Towers | Channelisation/signage - Hackett Terrace & Bridge St | $50 000 |
| Cooloola | Upgrade bridge - Traveston Rd (at No 2 Creek 1.1 km from Bruce Hwy) | $97 000 |
| Diamantina | Pullover areas/signage - Birdsville Dev. Rd & Diamantina Dev. Rd | $200 000 |
| Douglas | Staggered intersection/ban parking/nonskid surface - Macrossan St | $265 000 |
| Etheridge | Alignment/resurfacing/signage/linemarking - Forsayth-Georgetown Rd | $210 000 |
| Gatton | Reconstruct intersection - Gatton-Clifton Rd & Wells Rd | $45 000 |
| Gladstone | Right turn signals, change cycle-reprogram - Auckland St & Tank St | $15 000 |
| Gold Coast | Signage/right turn bay - Gold Coast Hwy, Pine Ridge Rd & Ct. Cook Dr | $150 000 |
| Gold Coast | Modify signals/right turn bay - North St & Scarborough St | $150 000 |
| Gold Coast | Modify signals/right turn bay - Gold Coast Hwy, Olsen Ave & Oxley Dr | $150 000 |
| Gold Coast | Signage/right turn bay - Gold Coast Hwy, Pacific Fair Dr & Mermaid Ave | $150 000 |
| Hervey Bay | Medians/traffic islands - Charlton Esplanade, Bideford St & Tavistock St | $30 000 |
| Hervey Bay | Traffic signals - Old Maryborough Rd & Main St | $150 000 |
| Hervey Bay | Seal shoulder - Booral Rd (Shore Rd to Beck Rd) | $150 000 |
| Ipswich | Traffic signals - Hunter St & Haig St | $150 000 |
| Ipswich | Traffic signals - Cascade St & Wildey St | $180 000 |
| Ipswich | Install Signals - Thorn St, Limestone St & Brisbane Rd | $350 000 |
| Kingaroy | Traffic signals - Haly St & Fisher St | $160 000 |
| Logan | Roundabout - Waller Rd & Vansittart Rd | $17,500 |
| Logan | Roundabout - Second Ave & Third Ave | $170 000 |
| Mareeba | Seal shoulders - Mossman-Mt Molloy Rd (7Km from Captain Cook Hwy) | $237 000 |

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| Maroochy | Extend kerbs/signage/delineation - Carter Rd & Blaxland Rd | $10 000 |
| Maroochy | Non-skid surface/signage - Mons Rd (Parsons Rd to Mons School Rd) | $60 000 |
| Maroochy | Signage/delineation/edgelines - Chevallum Rd | $5 000 |
| Monto | Improve visibility/pavement markings/turn protection - Monto Overbridge | $20 000 |
| Mundubbera | Realign/resurface - Boondooma Rd | $31 000 |
| Murweh | Roundabout - Bentwell St, Well St & Partridge St | $193 000 |
| Pine Rivers | Islands/pedestrian crossing points - Camelia Ave (Mirbella & Illawarra St) | $60 000 |
| Redland | Modify signals - Redland Bay Rd, Vienna Rd & Lyndon Rd | $33 000 |
| Rockhampton | Roundabout - North St & Murray St | $120 000 |
| Rockhampton | Roundabout - Moores Creek Rd & Feez St | $320 000 |
| Thuringowa | Roundabout - Kern Brothers Dr & Sandstone Dr | $52 000 |
| Thuringowa | New signals/new surface - Upper Ross River Rd & Allambie Lane | $400 000 |
| Thuringowa | Seal shoulders/guardrail - Mt Spec Rd | $60 000 |
| Toowoomba | Modify signals - Bridge St & Holberton St | $25 000 |
| Toowoomba | Roundabout - Hursley St & McDougall St | $112,500 |
| Torres | Roundabout/improved lighting - Ring Rd & Hastings St | $200 000 |
| Townsville | Modify signals - Eyre St & Gregory St | $60 000 |
| Townsville | Sheltered right turn lane - Kings Rd & Albury St | $10 000 |
| Townsville | Modify signals - Denham St & Sturt St | $22 000 |
| Townsville | Modify signals - Percy St & Crauford St | $500 000 |
| Townsville | Modify signals - Railway Ave & Putt St | $60 000 |
| Townsville | Traffic calming scheme - Flinders St East (Denham St to Wickham St) | $90 000 |
| Townsville | Modify signals - Ross River Rd & Briarfield St | $150 000 |
| Townsville | Modify signals - Charters Towers Rd & Philp St | $60 000 |
| Townsville | Modify signals - Bundock St & Heatleys Pde | $62 000 |
| Warwick | Roundabout - Percy St & Wantley St | $50 000 |

## Western Australia

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|---|---|---|
| Armadale | Roundabout - Railway Ave & Owen Rd | $90 000 |
| Bayswater | Skid resistant surfacing - Grand Promenade & Walter Rd West | $90 000 |
| Belmont | Roundabout - Belmont Ave & Campbell St | $85 000 |
| Bruce Rock | Traffic islands - York Merredin Rd | $50 000 |
| Bunbury | Roundabout - Wisbey St & Woodrow St | $45 000 |
| Busselton | Left turn/channelisation - Tuart Dr, Layman Rd & Wonnerup South Rd | $38,667 |
| Cambridge | Roundabout - Grantham St & Brookdale St | $50 000 |
| Cambridge | Roundabout - The Boulevard & Grantham St | $140 000 |
| Cambridge | Traffic signals - The Boulevard & Howtree Pl | $131 000 |
| Cambridge | Roundabout - The Boulevard & Empire Ave | $110 000 |
| Cambridge | Extend median through intersection - The Boulevard & Brookdale St | $16,600 |
| Canning | Modify left turn pocket - Ranford Rd & Waratah Blvd | $24 000 |
| Canning | Left turn lane/non skid surface - South St, Ranford Rd & Bannister Rd | $80 000 |

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| Capel | Edgeline/raised pavement markers - Bussell Highway H43 | $125 000 |
| Carnamah | Widen seal - Brand Hwy & Eneabba Dr | $98 000 |
| Claremont | Channelise intersection - Stirling Rd & Claremont Cres | $73 000 |
| Claremont | Modify roundabout - Gugeri St & Leura Ave | $30 000 |
| Cockburn | Reseal approaches - North Lake Rd & Phoenix Rd | $15 000 |
| Cockburn | Ban right turn movements - Rockingham Rd & Coleville Rd | $35 000 |
| Cockburn | Traffic signals - Rockingham Rd & Lancaster St | $175 000 |
| Collie | Edgelines - Coalfields Hwy H45 (10 km South of Bunbury) | $92 000 |
| Coorow | Widen intersection/improve street lighting - Midlands Rd & South St | $73 000 |
| Esperance | Reconstruct and realignment of road bend - Pink Lake Rd | $20 000 |
| Geraldton | Channelisation/pedestrian refuge - North West Coastal Hwy & Eighth St | $150 000 |
| Geraldton | Left lane/right pocket - Mt Magnet Rd, Rifle Rng Rd & Connelly St | $112 000 |
| Geraldton | Roundabout - Bayly St & George Rd | $60 000 |
| Geraldton | Modify traffic islands/left turn lanes - Flores Rd & Place Rd | $5 000 |
| Geraldton | Roundabout - Lester Ave & Fitzgerald St | $100 000 |
| Geraldton | Roundabout - Cathedral Ave & Maitland St | $130 000 |
| Geraldton | Channelisation/lane definition/right turn lanes - Flores Rd & Webberton Rd | $10 000 |
| Geraldton | Roundabout - Eighth St & Pass St | $100 000 |
| Gosnells | High entry angle left turns/anti skid treatment - Spencer Rd & Langford Ave | $48 000 |
| Gosnells | Roundabout - Brixton St & Dulwich St | $60 000 |
| Harvey | Modify channelisation - Old Coast Rd & Lucy Victoria Ave | $13 000 |
| Harvey | Edgelines/raised pavement markers - Perth to Bunbury Hwy | $91 000 |
| Harvey | Edgelines - Perth to Bunbury Hwy | $90 000 |
| Irwin | Street lighting/splitter island/repair pavement - Brand Hwy & Philbey Rd | $24 000 |
| Joondalup | Modify intersection - Whitfords Ave & Eddystone Ave | $60 000 |
| Kalgoorlie | Modify signals/traffic islands - Hannan St & Lionel St | $40 000 |
| Kalgoorlie | Street lighting - Lionel St (Oberton St to Johnson St) | $95,900 |
| Kalgoorlie | Modify signals/traffic islands - Hannan St & Wilson St | $100 000 |
| Kalgoorlie | Street lighting - Brookman-Hay St (Porter St to Lane St) | $69,300 |
| Kalgoorlie | Street lighting - Piccadilly St (Maritana St to Hawkins St) | $92,400 |
| Kalgoorlie | Street lighting - Graeme St (Hare St to Killarney St) | $57,400 |
| Kalgoorlie | Roundabout - Hannan St & Lane St | $150 000 |
| Kalgoorlie | Street lighting - Lionel St (Egan St to Oberton St) | $96,600 |
| Kulin | Modify intersection - Gorge Rock Lake Grace Rd & Kulin Holt Rock Rd | $80 000 |
| Kulin | Widening approaches - Gorge Rock Lake Grace Rd | $75 000 |
| Kulin | Realigning minor road approach - Gorge Rock Lake Grace Rd & Lange Rd | $30 000 |
| Kwinana | Modify traffic signals - Gilmore Ave, Sulphur Rd & Summerton Rd | $25 000 |
| Kwinana | Roundabout - Sulphur Rd & Meares Ave | $42 000 |
| Lake Grace | Islands/left turn - Collie Lake King Rd, Gorge Rock Lake Grace Rd | $50 000 |
| Melville | Seagull island - Murdoch Dr & Marsengo Rd | $10 000 |
| Melville | Seagull island - North Lake Rd & Archibald St | $10 000 |

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| Melville | Seagull island - Murdoch Dr & Hawke Pass | $12 000 |
| Melville | Seagull island - South St & Prescott Dr | $8,500 |
| Melville | Seagull island/modify radius on left turn island - South St & Findlay Rd | $16,500 |
| Melville | Seagull island/traffic island - Canning Hwy & Lentona Rd | $11 000 |
| Melville | Roundabout/improved lighting - Kintail Rd & Forbes Rd | $45 000 |
| Melville | Roundabout /improved lighting - North Lake Rd & Kitchener Rd | $45 000 |
| Melville | Extend median islands - Canning Hwy, Norma Rd & Dunkley Ave | $12 000 |
| Melville | Stagger intersection - Preston Point Rd & Swan Rd | $25 000 |
| Melville | Seagull islands - Canning Hwy,Point Walter Rd & Mckimmie Rd | $18 000 |
| Melville | Seagull island/widen median - Riseley Rd & Karoonda Rd | $35 000 |
| Melville | Roundabout - Petra St & View Tce | $30 000 |
| Melville | Pedestrian safety fencing - South St & Calley Dr | $12 000 |
| Morawa | Kerbline/move stop sign/extend traffic island - Winfield St & Prater St | $11,690 |
| Murray | Edgeline/raised pavement markers - Pinjarra Rd | $55 000 |
| Nedlands | Improve sight lines/Warning signs - Brockway Rd & John XXXIII Ave | $1,750 |
| Nedlands | Modify intersection/remove vegetation - Gordon St & Williams Rd | $4,920 |
| Nedlands | Improve sighting/left turn slip - Stubbs Tce & Selby St | $13,500 |
| Northam | Roundabout - Chidlow St & Burgoyne St | $57,830 |
| Port Hedland | Right pocket/widen seal/median/light poles - Port Hd Rd & Cooke Pt Dr | $100 000 |
| Port Hedland | Raised reflective pavement markers - Murdoch Dr | $3,150 |
| Port Hedland | Raised reflective pavement markers - Hamilton Rd | $4,100 |
| Rockingham | Seagull treatment in median - Read St, Robinson Rd & Access Rd | $40 000 |
| Roebourne | Realignment/sealing - North West Coastal Hwy & Cleaverville Beach Access | $32 000 |
| South Perth | Seagull treatment - Manning Rd & Gillon St | $15 000 |
| Stirling | Modify left turn lanes - West Coast Hwy, Karrinyup Rd & Marmion Ave | $116 000 |
| Swan | Roundabout - Beach Rd & Crocker Rd | $60 000 |
| Swan | Traffic signals - Malaga Dr & Victoria Rd | $65 000 |
| Victoria Park | Left turn lane - Canning Hwy & Berwick St | $180 000 |
| Vincent | Modify intersection/left turn lane - Fitzgerald St, Carr St & Stuart St | $10 000 |
| Wanneroo | Extend left slip lane - Gnangara Rd & Hartman Dr. | $200 000 |
| Wanneroo | Traffic island/hazard boards/warning signs - Ocean Reef Rd & Hartman Dr | $34 000 |
| Wanneroo | Left turn island/give way sign/hold line - Hartman Dr & Prindiville Dr | $10 000 |

## South Australia

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| Adelaide Hills | Signs/modify intersections/reseal - Tiers Rd, Vickers Rd & Baldocks Rd | $80 000 |
| Adelaide Hills | Guardfence/seal shoulders - Tea Tree Gully - Mannum (Gumeracha) | $350 000 |
| Adelaide Hills | Guardfence/seal shoulders - Tea Tree Gully - Mannum (Inglewood) | $260 000 |
| Adelaide Hills | Guardfence/seal shoulders - Upper Sturt Rd, Parkgate Pl & Hill St | $350 000 |
| Barossa | Remove hazards/widen seal/improve delineation - Angaston - Birwood | $172 000 |
| Barossa | Remove hazards/widen seal/edgelines - Barossa Valley Way | $200 000 |
| Gawler | Roundabout/improve junctions - Adelaide Rd, 6th, 7th, 12th & 19th Sts | $142 000 |

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| Grant | Modify intersection - Carpenters Rock Rd & Kongorong-Tantanoola Rd | $26,350 |
| Kangaroo Ild | Widen seal/improve curve - North Coast Rd & Shoals Bay Rd | $120 000 |
| Marion | Right turn lane/channelisation - Seacombe Rd & Diagonal Rd | $25 000 |
| Mid Murrary | Modify traffic control layout - Tea Tree Gully - Mannum & Mt Torrens | $10 000 |
| Mid Murrary | Barrier fence/sight distance/seal shoulders - Tea Tree Gully - Mannum | $65 000 |
| Mitcham | Guideposts/advisory signs - Upper Sturt Rd | $40 000 |
| Mitcham | Guardfence/seal shoulders - Upper Sturt Rd & Hawthorndene Dr | $350 000 |
| Mitcham | Guardfence/shoulders - Upper Sturt Rd, Sheoak Rd & Hawthorndene Dr | $250 000 |
| Onkaparinga | Guardrail/ trees/delineation/shoulders - Blewitt Springs Rd & Main Rd | $84,500 |
| Playford | Roundabout - McKenzie Rd & Hamblyn Rd | $116,909 |
| Port Adelaide | Roundabout - Gill St & Campbell St | $35 000 |
| Port Adelaide | Wombat crossing/edge lines/bike lanes - Dale St | $35 000 |
| Port Adelaide | Traffic islands - Hanson Rd & Francis St | $20 000 |
| Port Adelaide | Traffic islands - Wingfield Rd & South Tce | $20 000 |
| Port Lincoln | Intersection/lighting/sight distance - New West Rd & Oxford Tce | $51,700 |
| Salisbury | Modify slip lane - Salisbury Hwy, Waterloo Corner Rd & Park Tce | $20 000 |
| Tea Tree Gully | Upgrade junctions - One Tree Hill Rd, Golden Grove Rd & Shillabeer Rd | $304,960 |
| Yorke Peninsula | Widen seal/improve delineation - Port Wakefield - Yorketown | $120 000 |

## Tasmania

| | | |
|---|---|---|
| Break Oday | Guardfence - Tasman Hwy (Falmouth Rd to Esk Main Rd) | $3 000 |
| Central Coast | Turn into T junction - Leven St & Jermyn St | $40 000 |
| Central Hlds | Sight benching - Lyell Hwy & Tarleton St | $5 000 |
| Central Hlds | Pavement shape correction - Lyell Hwy (600 m West of Hollow Tree Rd) | $5 000 |
| Clarence | Provision of minor turns/pedestrian refuges/seal shoulder - South Arm Rd | $275 000 |
| Clarence | Modify signals/delineation - Rosny Hill Rd & Cambridge Rd | $35 000 |
| Clarence | Traffic islands - East Derwent Hwy & Nietta Rd | $35 000 |
| Clarence | Guardfence - East Derwent Hwy (Grass Tree Hill Sth Rd to Saunderson Rd) | $5 000 |
| Clarence | Guardfence - East Derwent Hwy (Grass Tree Hill Rd to Saunderson Rd) | $2 000 |
| Clarence | Guardfence - East Derwent Hwy | $5 000 |
| Devonport | Threshold treatment - Ronald St & Oldaker St | $10 000 |
| Devonport | Roundabout - Best St & Percy St | $85 000 |
| Devonport | Redirect traffic/splitter islands/modify Intersection - Stephen St & Wright St | $30 000 |
| Flinders | Guardrail - Memana Rd (Harleys Bridge) | $14 000 |
| George | Guardrail - East Tamar Hwy (South of Williams Creek Bridge) | $7,500 |
| Glamorgan | Curve widening/guardrail - Tasman Hwy (Near Cherry Tree Farm Access) | $5 000 |
| Hobart | Pedestrian kerb extensions - Collins St (Barrack St to Harrington St) | $12 000 |
| Hobart | Signage/delineation - Brooker Hwy & Domain Hwy | $10 000 |
| Hobart | Remove trees/delineation - Southern Outlet, Davey St & Olinda Grove | $15 000 |
| Hobart | Modify signals/traffic island/kerb blister/sight line - Alexander St | $20 000 |
| Hobart | Delineation/protect hazard - Kalang Ave (Lumeah Ave to Bimburra Rd) | $60 000 |

| | | |
|---|---|---|
| Hobart | Modify signals/sight line/left hand kerb blister - Liverpool St & Molle St | $15 000 |
| Hobart | Median/pedestrian refuges/turn lanes - Augusta Rd (Giblin St to Carlton St) | $5 000 |
| Hobart | Roundabout/pedestrian refuge - King St & Princes St | $20 000 |
| Kingborough | Signage/delineation - Huon Hwy (Sandfly Rd to Krause & Collins Rd) | $5 000 |
| Latrobe | Guardrail - Frankford Main Rd (17km from Port Sorell Main Rd) | $15 000 |
| Launceston | High skid resistance - Trevallyn Rd (Northbank Rd to Kings Bridge) | $45 000 |
| Launceston | Improve signing/delineation - Caroline St & Westbury Rd | $5 000 |
| Launceston | Edgelimes/U-turn/delineation - West Tamar Hwy & Mowbray Connector | $50 000 |
| Launceston | Extend guardrail - West Tamar Hwy (access to Marine Centre) | $2,500 |
| Launceston | Kerb/modify intersection - Normanstone Rd & Westbury Rd | $125 000 |
| Meander Valley | Widen pavement - Osmaston Rd (North of Cluan Rd) | $10,500 |
| Meander Valley | Improve super elevation/re-seal - Blackstone Rd | $18 000 |
| Meander Valley | Pedestrian refuges/line marking - Westbury Rd | $16 000 |
| Sorell | Guardrail - Arthur Hwy (Sorell Rivulet Bridge) | $3,500 |
| Southern Midls | Relocate junction - Tunnack Main Rd & Woodsdale Rd | $10 000 |
| Waratah-Wyd | Improve signing/realignment - Bass Hwy, Calder Hwy, York St & Inglis St | $230 000 |

## Australian Capital Territory

| | | |
|---|---|---|
| ACT | Traffic lights - Captain Cook Cres & Stuart St | $360 000 |
| ACT | Traffic lights - Cotter Rd & Dudley St | $130 000 |

## Northern Territory

| | | |
|---|---|---|
| Alice Springs | Pedestrian crossing - Gap Rd (Park Cres to Speed St) | $150 000 |
| Coomalie | Delineation/ signs/safety barriers - Coach Milton Rd | $79 020 |
| Darwin | Left turn signals - Vanderlin Dr & Berrimah Rd | $100 000 |
| Darwin | Left turn signals - Trower Rd & Rapid Creek Rd | $80 000 |
| Darwin | Left turn signals - McMillans Rd & Amy Johnson Ave | $50 000 |

# Appendix 7: Contributions to Parliamentary inquiries in 2000–01

### *House of Representatives*

Inquiry into Managing Fatigue in Transport, by the House of Representatives Standing Committee on Communications, Transport and the Arts:

- ATSB co-ordinated the preparation of the Federal Government Response to the Inquiry report *Beyond the Midnight Oil*.

### *Senate*

ATSB attended the following hearings of the Senate Rural and Regional Affairs and Transport Legislation Committee:

- 10–11 July 2000 and 4 May 2001: CASA Administration—Air Operator Maintenance, Regulation and Oversight.
- 22 and 24 November 2000: Supplementary 2000–01 Budget Hearings.
- 19 February 2001: Additional Estimates 2000–01 Budget Hearings.
- 29-31 May 2001: 2001–02 Budget Hearings.

Details of these hearings are available at the Hansard record of proceedings on the web site www.aph.gov.au/hansard/senate/commttee/comsen.htm

# Appendix 8: Goods and services received by ATSB free of charge

ATSB seeks to report annually all goods and services received free of charge.

This was included in the 1999 McGrath Report as a recommendation to ensure transparency and accountability.

Recommendation 13 from the McGrath Review states:

> ATSB should include details in its annual reporting of any services obtained without charge from industry. Reported details should include aspects such as the type of service, identification of the carrier involved, the notional cost and the rationale for the service.

Free resources are those goods and services that ATSB receives for which there is no financial obligation. For example, where an air safety investigator receives, and accepts, an invitation to travel with an airline to observe cabin or cockpit management practices and if the invitation had not been accepted the Bureau would have been required to purchase a ticket for that leg of the flight.

There may also be occasions where ATSB provides goods or a service to another Government Department or industry body free of charge. In these cases ATSB will have paid for the goods or service and decided to absorb the cost rather than recover it. An example would be where ATSB sponsors the attendance of an officer from another organisation on a training course as a goodwill gesture.

## *Goods and services received by ATSB free of charge in 2000–01*

| Gratuity | Provider | Notional cost | Rationale for service |
|---|---|---|---|
| Return airfares | Sunstate Airlines | Not available | Cockpit familiarisation & industry liaison Brisbane–Gladstone–Brisbane. |
| Airfares | Pilatus Australia | Not available | Cockpit familiarisation & industry liaison Melbourne–Canberra. |
| Return airfares | Ansett International | $2080.40 | Familiarisation flight Sydney–Osaka. |
| Boat fares | Great Adventures P/L | $139 | Travel to Normal Reef from Cairns for accident recovery action. |
| Return airfares | Celsius Hawker Pacific | Not available | Non-destructive testing of crankshaft, Whyalla Airlines investigation. |
| Return airfares | RAAF | Not available | Measure noise levels (flight duration 1.5 hours) for accident investigation. |
| X-rays (x 15) | Canberra Imaging Group | $1000 | Investigation of aircraft parts. |
| Return airfares | Skywest Airlines | Not available | Industry liaison & cockpit familiarisation Perth–Albany–Perth. |
| Return airfares | Maroomba Airlines | Not available | Industry liaison & cockpit familiarisation Perth–Mt Magnet–Perth. |
| Course attendance for two investigators | Standard Aero | $1700 each | Attendance at Rolls Royce Allison 250-C20 Full Authority Digital Engine Control Course (condensed version) |
| Course attendance | CASA | Not available | Five-day 'Bagshaw' lead audit course provided by CASA. |
| Accommodation & meals for two<br><br>ASC/ATSB | Taiwan Aviation Safety Council (ASC) | $1068 each | Accident investigation assistance by ATSB for SQ006 in accordance with the Memorandum of Understanding. |
| Travel and accommodation | BHP | Not available | Human factors presentation. |

# Appendix 9: The Gwyn Associates major aviation accident review consultancy

### *The Report*

While there has not been a major aviation accident in Australia since 1968, ATSB commissioned a Review of its major accident preparedness in 2000. Its consultant, Gwyn Associates, delivered its report and recommendations on 23 February 2001. The consultancy cost $57 750.

The Report stated:

> As its overall conclusion, the Review found that, prior to changes initiated by the ATSB in January 2001, the Air Safety group (in ATSB) was unlikely in the short term to be able to deal fully effectively with a major accident, but that this situation could be greatly altered and improved, if action recommended in this report was taken and the required resources made available without delay.

The Report indicated that a significant reason why ATSB may not be fully able to deal with a major jet accident involving large-scale loss of life was that it has never happened in Australia and only about one-third of investigators had had relevant experience overseas. However, it acknowledged that if such an accident occurred, ATSB investigators would probably be supplemented by experts from the Defence Force, US NTSB, the aircraft manufacturer, the airline, CASA, and others.

The Report stated:

> Of the 20 recommendations, which are grouped under seven headings, eleven have been accepted in full. Eight others have been accepted in part or in principle. One is under consideration. Only one has been tacitly not accepted.

As indicated by the level of acceptance, the Review made a valuable contribution to assist ATSB to improve its preparedness. The recommendation not accepted related to resuming publication of a magazine on Air Safety: ATSB contributes instead to CASA's bi-monthly *Flight Safety* magazine and, given finite resources, seeks to publish sector-specific material (including through the Internet) in preference to a generalist magazine. The recommendation that was being considered was subsequently agreed. It concerned a new allowance to compensate air investigators for being restricted out-of-hours in order to be available to investigate an occurrence. Unlike

the consultant, Bureau management did not agree that it would be the most efficient use of ATSB resources to staff field offices in Melbourne and Sydney in addition to field offices in Perth and Brisbane.

The Secretary of the Department provided ATSB with additional funding for 2000–01 to implement a major accident preparedness plan as recommended by the consultant. Upgraded equipment was provided to all investigators and a major accident coordination centre was established. The Secretary, in a Minute dated 31 January 2001, confirmed and clarified ATSB's operational independence under existing legislative arrangements (see attachment A). A multimodal Transport Safety Investigation Bill is currently being drafted and may be introduced in Parliament after the Federal Election.

ATSB is working with the Department's Aviation Division, Emergency Management Australia (EMA) and other key stakeholders to improve major accident response procedures and documentation (including ATSB's 'key posts' list and major accident manual). The Bureau has participated in recent airport accident exercises in several State capitals and will participate in future exercises.

ATSB has joined the International Transportation Safety Association (ITSA) to improve its links to other major world independent investigation bodies and the Executive Director attended ITSA's meeting in Wellington on 27 and 28 February 2001.

Internal debriefing sessions have been held on ATSB's investigation of the QF1 Bangkok 747 accident and assistance to Taiwan for the SQ006 Taipei 747 accident.

International experts with extensive experience from NTSB, ICAO, and Boeing conducted a five-day major accident management course for ATSB investigators in June 2001. Provided by the Southern California Safety Institute, the course included invaluable first-hand material and guidance on the management of many of the recent major world aviation accidents, including lessons from experience.

While already much improved compared with ATSB's first year, the Bureau will continue to progress its major accident investigation preparedness in 2001–02.

**Attachment A**

## *Secretary's Minute concerning ATSB's operational independence*

**ALL ATSB STAFF**

**ATSB GOVERNANCE AND RELATIONSHIP WITH THE DEPARTMENT**

For some months, and particularly over the Christmas break, I have been considering how best to describe the appropriate role and governance arrangements for the ATSB within the Department with a view to improved mutual understanding concerning ATSB's independent investigation role and my role as Secretary. I have also discussed the issues with Kym Bills. I would like to outline the position I have reached and some fine tuning of arrangements.

### International and legislative issues

ATSB's Mission as stated in your business plan includes "to maintain and improve transport safety and public confidence through excellence in open and independent 'no-blame' systemic transport accident, incident and safety deficiency investigation…". International best practice for this role has been substantially derived from the aviation sector.

Australia is a signatory to the Convention on International Civil Aviation and Annex 13 to that Convention deals with aircraft accident and incident investigation. Annex 13 states at clause 5.4 that:

> *'the accident investigation authority [in the State of Occurrence] shall have independence in the conduct of the investigation and have unrestricted authority over its conduct.'*

Late last year, pursuant to the Convention, ICAO published the first edition of a 'Manual of Aircraft Accident and Incident Investigation', chapter 2 of which provides guidance concerning the accident investigation authority:

> *'legislation must establish an accident investigation authority… that defines [its] rights and responsibilities… [and] the accident investigation authority must be strictly objective and totally impartial and must also be perceived to be so. It should be*

*established in such a way that it can withstand political or other interference or pressure*'.

Part 2A of the *Air Navigation Act* 1920 contains the provisions for Australian aviation occurrence investigation. The Act does not establish an accident investigation authority in terms of an organisational entity but mostly in terms of the powers of a Director of Air Safety Investigation. The Secretary also has important powers to designate a Director of Air Safety Investigation and to receive and release (or not release) a final investigation report. I have delegated these powers to ATSB's Executive Director. I have made a similar delegation for marine investigation reports and in addition, have agreed that the marine casualty regulations be changed to give the Executive Director (rather than as currently the Secretary or Minister) the power to terminate an investigation and also to liaise with foreign States over which State will conduct an investigation. These changes have received Ministerial approval.

On my recommendation, the Minister has agreed to proceed with a new multimodal Transport Safety Investigation Bill that will more clearly establish and define ATSB's role and responsibilities and in due course incorporate aviation and marine investigation powers.

**Independence and resources**

I think it is important to emphasise that Annex 13 requires ATSB to have independence in the conduct of investigations and to be strictly objective and impartial. I totally support and expect ATSB to operate in this way. ATSB appropriately has no regulatory role and no-one whether regulator, operator, service provider, or in the Department should interfere with the conduct of any ATSB investigation. To reinforce the reality and perception of this within the Department, I have decided that the Executive Director of ATSB will both report direct to me and be shown on the DoTRS organisation chart accordingly, and that all arrangements for advising me and the rest of the Department about ATSB investigations (for example, proposed safety action that may be controversial) are to be determined by the Director, Safety Investigations and Executive Director of ATSB. In addition, ATSB's Executive Director will approve all the Bureau's international travel and for travel involving accident or serious incident investigation this will be constrained only by ATSB's other operational and budget priorities and the general rules governing overseas travel throughout the Department and the APS. For other international travel, including by the ATSB

SES, I have requested that the Executive Director consult with the Departmental Executive before finalising such approvals himself.

If there were to be a major transport accident involving large loss of life, I am conscious that the Bureau is likely to urgently require additional resources and assistance. While I cannot write a blank cheque, I do note the new budgetary flexibilities available to Secretaries of Departments to seek to rapidly provide such additional resources. For the recent 'Bad Air day' major accident exercise based in Melbourne I received notice that I would be asked to authorise an additional $1 million and I established that I was in a legal position to commit these funds if they were needed.

If there was a major air accident, I expect Aviation Division to assist ATSB with such tasks as coordination of briefing and arrangements for victims and relatives, and general administrative help. To this end, it is important that clear and current procedures are developed in a timely manner by ATSB and Aviation Division in concert with relevant external bodies such as Emergency Management Australia.

For day-to-day activities, ATSB's budget will continue to be determined in the context of the outputs required by Ministers and other departmental priorities within the appropriation DoTRS receives. However, the output pricing review to be undertaken in respect of safety investigations and other ATSB outputs by September 2001, provides an opportunity to benchmark and re-assess the resources that are needed to efficiently and effectively deliver ATSB's safety outputs.

**Limits to independence**

I am committed to the professional, technical and operational independence of the ATSB for the purposes of its role in conducting investigations. However, it is important to recognise that ATSB is not an independent body for all purposes – as indicated in the example of budgeting, it remains a part of the Department of Transport and Regional Services. In this context, I think there may be a need to better understand the legal roles and responsibilities that I carry as Secretary and CEO of the Department.

Under the *Public Service Act* 1999, I am responsible under the Minister in all matters relating to the Department and to assist the Minister to fulfil his Parliamentary accountability obligations. I have responsibilities for the reputation of the Department and for all its employees including as regards discipline and ethics, and must

uphold the APS code of conduct and promote the APS values. Under the *Financial Management and Accountablity Act* 1997, I am CEO responsible for the efficient, effective and ethical management of all parts of the Department. This includes responsibility for resource allocation and for the delivery of departmental outputs in the Portfolio Budget Statements. Members of the Executive Board (including ATSB's Executive Director), the CFO and other departmental officers provide assistance to me with these roles and responsibilities. ATSB is an integral part of the Department and is treated as a Division for the purposes of these legal requirements.

**Accountability**

I expect ATSB to not only undertake its specialist investigation, research, statistical and other roles and deliver the outputs listed in the PBS, but also to manage its finances and be fully accountable, through the Minister, to the Parliament (as is the rest of the Department). The decision to produce an ATSB Annual Review was an excellent step in this direction. Accountability also requires a significant amount of work on such matters as preparing briefings and answers to Parliamentary questions and correspondence, and it requires ethical conduct such as abiding by the guidelines on contact with Opposition parties or the media. In return, ATSB investigators can expect 'top cover' for their role including in response to unfair attacks on their independence and objectivity. The Minister is acutely aware of the importance of this as was demonstrated recently in his response to some public comments by Mr Dick Smith.

While there may be future changes that can usefully be made to enhance ATSB's independent investigation role, I believe that it is very important to have a clear understanding of the current governance arrangements. I hope sincerely that this Minute will contribute to improved mutual understanding and clarity to enable continued excellence in delivery of safety outputs by all staff in ATSB.

Ken Matthews
31 January 2001

# Appendix 10: ATSB performance measures in 2001–02 Portfolio Budget Statements

Key result 1 identified in the Department's 2001–02 Corporate Plan is *Transport systems which are safer, more efficient, internationally competitive, sustainable and accessible.* The ATSB seeks to contribute to this result through the following key strategies and effectiveness measures:

| ATSB Key Strategies | ATSB Effectiveness – Achievement of key result |
|---|---|
| Progress implementation of the Commonwealth's responsibilities under the new National Road Safety Strategy and Action Plan. | Contribution to a demonstrable reduction in the road toll and other road crash costs |
| Improve targeting and timeliness of air and marine safety investigations | Reduction in the backlog of investigations and more regular reports of comprehensive pro-active safety studies |
| Develop the Commonwealth's role in rail safety and investigation. | Enhanced investigation of rail safety on the interstate system by utilising cooperative investigations agreements with the States/NT and other authorities, and developing a national rail safety database. |

## *ATSB output framework performance measures 2001–02*

The ATSB contributes to the Department of Transport and Regional Services' Outputs Framework through Output 1.1 – Policy Advice & Legislation, Ministerial Services and Output 1.3 – Safety Services.

The following performance measures illustrate how ATSB's outputs in 2001–02 will contribute to the achievement of the Portfolio Outcome of 'a better transport system for Australia and greater recognition and opportunities for local, regional and territory communities'.

## *Output 1.1—Policy advice & legislation, ministerial services*

The Department provides policy advice and other services to its Ministers with respect to all modes of transport. Matters on which policy advice is provided include: cross-modal measures and

projects, maritime issues, road and rail regulation reform and infrastructure development, environmental issues, transport safety and security issues, air transport and airport services, and international transport issues such as participation in international and regional forums and meeting international obligations. Other services include implementation and administration of maritime, aviation and road legislation; and oversight of Portfolio authorities and Government Business Enterprises.

*Relevant PBS Quality Performance Indicator(s) for Output No 1.1—Policy Advice & Legislation, Ministerial Services*

- Ministers and Ministers' offices satisfied with the quality of policy advice and legislation development, and Department meets standards for policy advice, legislation and ministerial services.
- *Target:* 95 per cent level of satisfaction as assessed using office feedback sheets.

### *Output 1.3—Safety services*

The Australian Transport Safety Bureau (ATSB), located within the Department, undertakes independent transport safety investigations to ensure the maintenance, and continuing improvement, of high standards of safety to the travelling public and transport industry operators. The ATSB also undertakes transport safety statistical analysis and research, disseminates transport safety information to industry and the Australian public, and administers the Blackspot Road Safety Program.

*Relevant PBS Quality Performance Indicator(s) for Output No 1.3—Safety Service*

- Publications to increase and improve stakeholder knowledge of transport safety, and to contribute to policies, strategies and action plans;
- Stakeholder acceptance of safety messages, including consideration and implementation of recommendations, safety advisory notices and other safety actions;
- Publications are in accordance with departmental standards;

*[Relevant PBS Quality Performance Indicator(s) for Output No: 1.5 Services to Communities—See also Administered Program Group 1.2 below for the Black Spot Program]*

- The ATSB ensures that recipients of funding meet terms and conditions of funding; and
- Administration of Road Safety Black Spot Program in accordance with legislation, Government policy, and Departmental standards.

### *Administered program groups 1.2—Grants to States Territories and Local Government*

As identified above, the ATSB administers the Road Safety Black Spot Program under Administered Program Group 1.2—Grants to States/Territories and Local Government.

*Relevant performance indicators for 2001–02 for the Black Spot Program*

- *Effectiveness:* Improved safety of Australia's roads and, thereby, reduced cost to the community of road trauma.
- *Quality:* A reduction in the number of serious crashes at identified and treated sites with a consequent reduction in the cost to the community of road trauma.
- *Quantity:* Approximately 400 projects completed.
- *Cost:* $48.8m
- *Location:* Fifty per cent in rural and regional Australia.

# Appendix 11: Road safety research grants 2000–01

## *Successful applications*

Three grants were awarded for work to be undertaken under the Road Safety Research Grant Scheme funded by the Australian Transport Safety Bureau:

### 1. Evaluating and Improving Fleet Safety in Australia

*Applicant:* Dr Will Murray of the Centre for Accident Research and Road Safety – Queensland (CARRS-Q); $12,231.

This proposal supports Action Area 1.8 in the National Road Safety Action Plan: 'Improve the safety of work related road use'. It will bring together and extend work done in Australia on promoting the safe use of the light vehicles (such as cars and vans) in company fleets. Fleet vehicles form a very significant proportion of total vehicle usage and total road crashes.

The project will clarify the extent of the problem and evaluate current and earlier fleet safety programs, providing case study examples and models of best practice for use throughout government and industry.

### 2. The Older Driver: Evaluation of the Effect of the 'Wiser Driver Course' on Driving Behaviour and Road Safety

*Applicant:* Mr Keith Wiltshire of the Hawthorn Community Education Project, Victoria; $14,938.

This project supports Action Area 5.1 in the National Road Safety Action Plan: 'Develop and implement programs targeted at road user groups for whom road safety is a particular concern'.

Older drivers have been shown to be involved in more crashes per distance travelled than those in the middle age brackets.

The Action Plan calls for development, trial and evaluation of training programs to improve older driver's safety and mobility.

This project will evaluate one such program, the 'Wiser Driver Course', developed in metropolitan Melbourne by the Hawthorn Community Education Project. Surveys before and after training will be used to assess the impact of the course and its usefulness to older drivers.

The findings of the study are expected to be of importance to many other communities throughout Australia that run, or are planning, similar courses for older drivers.

### 3. Beliefs and Attitudes about Speeding and its Countermeasures

*Applicants:* Dr Julie Hatfield and Assoc. Prof. R F Soames Job of the University of Sydney; $24,995.

This project supports Action Area 1.3 in the National Road Safety Action Plan: 'Improve compliance with speed limits'.

A community survey will be used to assess beliefs and attitudes about speeding, speed enforcement and penalties, and other speed countermeasures.

Where possible, results will be compared to similar data collected in 1993. This information will assist in determining feasibility, design and refinement of public education and information programs to achieve positive behaviour changes. It will assist in targeting effective messages to specific groups in society.