Department of Transport and Regional Services

Australian Transport Safety Bureau

ATSB Annual Review 2000

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Other enquiries to the Australian Transport Safety Bureau:
Address: PO Box 967, Civic Square, ACT 2608 Australia.
Telephone: 1800 621 372
Fax: 02 6274 6474
Email: atsb@atsb.gov.au

Cover design and desktop publishing by David Hope and Lisi Bromley
Edited by Annette Bartlett
Photography by Bill Harvey

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Minister's foreword

I am pleased to introduce the *ATSB Annual Review 2000*, which is an overview of ATSB's safety activities in its first year of operation.

Deputy Prime Minister and Minister for Transport and Regional Services, the Hon. John Anderson MP

The Government established the ATSB on 1 July 1999 to bring together the former Bureau of Air Safety Investigation (BASI), the non-regulatory parts of the Federal Office of Road Safety (FORS) and the Marine Incident Investigation Unit (MIIU).

These organisations all had excellent international reputations, but the creation of the ATSB will make safety investigations even better as a result of sharing resources, ideas and techniques.

The benefits of the multi modal approach are already emerging with the establishment of the bureau's rail safety function, which takes advantages of its aviation, marine and road safety expertise to investigate rail incidents at the invitation of the states.

The ATSB plays a key role in the tripartite structure for aviation safety that includes the Civil Aviation Safety Authority (CASA) and Airservices Australia. The ATSB's independent investigation role is crucial to maintaining public confidence in aviation. Its most important report in 1999–2000 was its investigation into the class 'G' airspace demonstration. The investigation made a major contribution to the development of the Government's measured approach to aviation reform.

The ATSB's role includes managing the Government's $40 million Black Spot Program and coordinating a new national road safety strategy for the decade to 2010. Also noteworthy during the period was ATSB's marine safety role in investigating the *Laura D'Amato* oil spill in Sydney Harbour and collisions involving large ships and fishing vessels.

The *ATSB Annual Review 2000* shows how the ATSB is building on the fine record of its predecessors and contributing to the Government's policy of placing safety at the heart of transport reform.

JOHN ANDERSON

Executive Director's message

Executive Director
Kym Bills

It was my great privilege to be given the task of establishing a new Commonwealth multi modal safety organisation with the creation of the Australian Transport Safety Bureau on 1 July 1999. While an integral part of the Department of Transport and Regional Services for planning and accountability purposes, ATSB has statutory powers for aviation and marine investigation independent of parties that may be the subject of safety investigation. ATSB has a number of other important safety roles from statistical analysis and research to coordinating the national road safety strategy and Black Spot Program. The Bureau also has a growing role in national rail safety.

While ATSB formally reports on its activities to the Government and Parliament through the Departmental annual report, the McGrath review of BASI made the useful suggestion that an additional and more detailed 'annual review' type document would be desirable to improve the Bureau's accountability and to document the safety health of industry. Given the tremendous interest in transport safety and the extent of ATSB's activities, the Bureau intends to prepare an annual review to provide all stakeholders with an overview of its activities and safety in each transport mode. This is the first such review. In future years we hope to refine and develop the content and format of the annual review.

I am proud to work with the dedicated people at ATSB whose achievements are documented in this review. In its first year of operation ATSB had many successes including: the release of major investigation reports on the CASA Class 'G' Airspace demonstration, the *Laura D'Amato* oil spill in Sydney Harbour, and the collision of freight trains at Ararat; contributing to road safety policy development such as on fatigue and lower urban speed limits; developing an upgraded and integrated ATSB web site; and improving road safety through management of the Black Spot and vehicle recall programs.

I believe that ATSB's safety professionals are second to none and that as the component units of ATSB continue to work more closely together, the Bureau will develop further synergies. Collocation in one Canberra headquarters building in early 2001 will assist in this process. The ATSB continues to become better recognised in its own right. The expected release of major reports in 2000–2001 (on Avgas contamination, the QF1 accident in Bangkok and the Whyalla Airlines 904 tragedy) the finalisation of a new National Road Safety Strategy to 2010 and further development of statistical databases and safety material online, is sure to improve this recognition of our role.

ATSB will continue to work with stakeholders in Australia and internationally to save lives and achieve the Government's other transport safety outcomes.

Kym Bills

ATSB role

Objective

Safe transport.

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 data and analysis;
- safety communication and education; and
- safety programs, including the cost-effective treatment of road safety black spots.

Values

ATSB works within the framework set by the Australian Public Service values and code of conduct and the Department of Transport and Regional Services Corporate Plan, Portfolio Budget Statements and 'Results through People' principles.

Of particular importance to ATSB is:

- clear and ethical leadership;
- professionalism and judgement in improving safety outcomes;
- accountability and responsiveness to the Government and to the Parliament;
- open communication and feedback, both externally and internally based on mutual respect and trust;
- encouragement of diversity; and
- risk management.

ATSB's ethics and conflict of interest policy is at Appendix 8.

Environment and stakeholders

ATSB operates in an environment where transport activity is increasing and the Government, Parliament, media and the public expect increasing standards and accountability for transport safety, particularly for fare-paying passengers. ATSB reported to a number of Parliamentary forums in 2000–2001. These are listed at Appendix 7 and discussed throughout this review.

In addition to the Government and Parliament, ATSB's aviation stakeholders include the major Australian airlines, regional airlines, the general aviation sector, pilots, crew, air traffic controllers, licensed aircraft maintenance engineers and others who work in the industry, passengers, and representative bodies, coroners, and international airlines that fly into Australia. ATSB forms part of a tripartite Commonwealth structure for providing safe aviation that also includes the Civil Aviation Safety Authority which has regulatory responsibilities and Airservices Australia which provides air traffic control and fire fighting services. ATSB works closely with the International Civil Aviation Organization and other international bodies that foster aviation safety.

In marine safety, ATSB's stakeholders include major shipping companies and those who crew ships. ATSB works closely with the Australian Maritime Safety Authority, the states and the Northern Territory, industry associations, the International Maritime Organization and other international bodies that foster maritime safety. In road safety, ATSB's stakeholders include vehicle manufacturers, industry associations, truck companies and drivers, the states and territories, road regulators, police, safety researchers, health professionals, drivers and riders and road user bodies. In rail safety, stakeholders include the states and the Northern Territory, the Australasian Railways Association and, as ATSB's role develops, increasingly include rail operators and track owners and those who work in the rail industry or utilise its services.

Departmental Corporate Plan

ATSB contributes to the Department of Transport and Regional Services Corporate Plan for 2000–2001 to 2002–2003 which has the purpose of 'A better transport system for Australia and greater recognition and opportunities for rural, regional and territory communities'.

Under this Plan we serve Australia by helping the Government achieve its policy goals in transport and regional services particularly by providing research, investigative, safety and grants services.

Key strategy areas in the Corporate Plan for which ATSB has a major responsibility include: supporting safer aviation, shipping and land transport services leading to an improvement in transport safety standards and data; delivering national transport safety objectives through road funding programs, for example the Black Spot Program; leading the implementation of the new National Road Safety Strategy to 2010; developing the Commonwealth's role in rail safety and investigation; and improving targeting and timeliness of air and marine safety investigations.

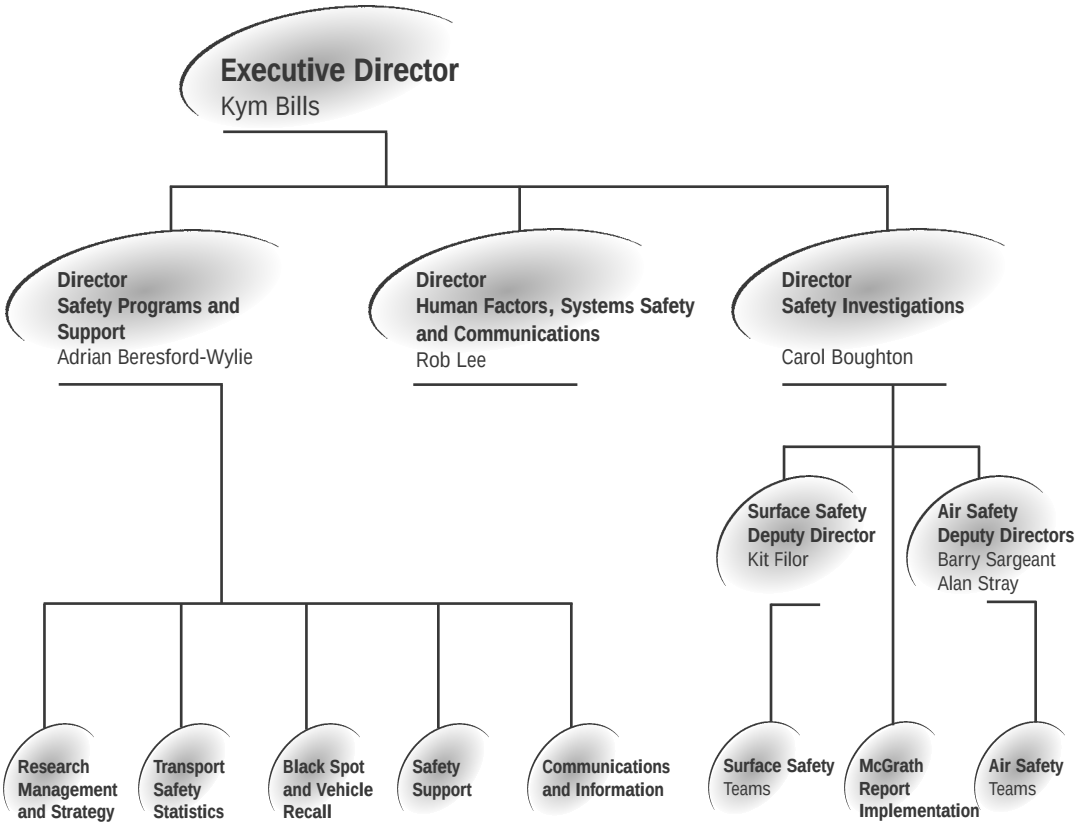
Legal basis for activities

The Commonwealth has a primary Constitutional role with respect to aviation and large ships (for which most rules and standards are developed internationally and global alliances are increasing) and a shared Constitutional role with the states and territories with respect to road and rail.

Specified ATSB senior managers exercise statutory powers delegated by the the Director, Safety Investigations 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 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)). Other senior officers have also been delegated the Secretary's power under subsection 19CU(2) to publish reports. The Director of Air Safety Investigation also has the power to release air safety information under section 19HA and a number of other powers.

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

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.

Ms Carol Boughton

Carol Boughton is Director, Safety Investigations and is responsible for safety investigations across all modes. For the purposes of the *Air Navigation Act 1920* she is the Director of Air Safety Investigation.

Director
Carol Boughton

Ms Boughton is a mathematical statistician by qualification. Her Master of Science thesis is titled *Accident Proneness and Related Subjects*. Her early career involved investigation, research and analysis of road accidents. She gained an international reputation for her research activities and for five years was the senior executive implementing the Australian Government's Road Safety Research and Public Education programs.

She then became Research Manager for Aviation and Safety within the Bureau of Transport and Communications Economics, prior to managing personnel and information systems services across the Department. Moving to the Aviation Division, Ms Boughton had responsibility for oversight of the governance of Airservices Australia and the Civil Aviation Safety Authority. She participated in the Program Advisory Panel established by Minister Sharp, to drive the reform of aviation regulation in Australia. She also became heavily involved in ICAO matters leading a number of Australian delegations, including the Directors of Civil Aviation Conference on Safety Oversight.

Dr Rob Lee

Rob Lee is the Director, Human Factors, Systems Safety and Communications. Dr Lee graduated from the Australian National University in 1970 with First Class Honours in Psychology. In 1974 he completed his PhD in Psychology at the University of St Andrews, Scotland.

Director
Rob Lee

He joined the Bureau of Air Safety Investigation (BASI) in 1983 as the first Chief of the Human Performance and Research Branch. He was appointed Director of BASI in 1989, a position he held until the formation of the new multi modal Australian Transport Safety Bureau in mid 1999. Prior to joining BASI, Dr Lee was Senior Psychologist in the Royal Australian Air Force (RAAF) Operational Command.

Dr Lee is a Group Captain in the Medical Branch of the RAAF Specialist Reserve. He is a member of the European Association of Aviation Psychology, the Aviation Medical Society and the International Society of Air Safety Investigators. In 1989 he won the Henry Wigram Award of the New Zealand Division of the Royal Aeronautical Society. He is a Fellow of the Royal Aeronautical Society.

Dr Lee is co-author of the book *Beyond Aviation Human Factors* published in 1995. One of his co-authors is Professor James Reason.

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.

Director
Adrian Beresford-Wylie

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 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 Barry Sargeant

Barry Sargeant was promoted to Deputy Director Air Safety Investigation in early 1999. In November 1979 he joined the NSW Regional office of the then Department of Transport, as an Examiner of Airmen. He transferred to the Sydney Office of the Bureau of Air Safety Investigation in June 1983 as a Flight Operations investigator, and was subsequently appointed Field Office Manager in 1988.

Deputy Director
Barry Sargeant

During his time in the former Bureau of Air Safety Investigation Mr Sargeant carried out many accident and incident investigations ranging from ultra-light to Boeing 747 aircraft. His most notable achievements include the Monarch Airlines and Aquatic Air investigations, and the investigation of the Beresfield coal train collision. Each of those investigations was unique and had a significant effect on transport safety. He also produced the Class 'G' Airspace final report, and is currently in charge of the Whyalla Airlines accident investigation.

Mr Alan Stray

Alan Stray is a 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 including investigations, quality assurance, confidential reporting and safety information and programs. In recent years his work has involved increasing activity with government and aviation industry agencies in countries of the Asia Pacific Region.

Deputy Director
Alan Stray

Between 1992 and 1994 Mr Stray was an exchange officer with the Transportation Safety Board of Canada. During this time he developed the multi modal series of safety magazines, *Reflexions*, as well as spending one year as a management investigator in the Investigation Branch.

Mr Stray is a Licenced Aircraft Maintenance Engineer, holds an Airline Transport Pilot Licence, and has flown over 11 500 hours in Papua New Guinea, Canada and Australia in a variety of piston engine and turbo-prop aircraft types. He holds management qualifications in addition to his aviation qualifications.

Captain Kit Filor

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

Deputy Director
Kit Filor

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.

Creation of ATSB

The ATSB was created on 1 July 1999 to facilitate a multi modal sharing of safety systems expertise by incorporating the Commonwealth non-regulatory safety roles for the four transport modes of road, rail, marine and aviation.

ATSB is a Bureau within the Commonwealth Department of Transport and Regional Services that is treated as a Division of the Department for administrative purposes. ATSB undertakes open and independent investigations and analyses safety data without fear or favour. Like similar bodies world-wide, to avoid conflicts of interest, there is a clear organisational separation from transport regulators and other parties that may need to be investigated. ATSB is headquartered in Canberra where people are spread across three buildings pending collocation in 2001. ATSB has aviation investigation field offices in Perth, Brisbane and Sydney.

Dr Allan Hawke, the former Secretary of the Department of Transport and Regional Services, when announcing a Departmental reorganisation in June 1999, stated that the ATSB would include the Bureau of Air Safety Investigation (BASI), elements of the Federal Office of Road Safety (FORS), the Maritime Incident Investigation Unit (MIIU) and a new Rail Safety Unit.

Establishment of the ATSB provided an opportunity to 'do things better' by allowing for improved cooperation and exchange of safety information and expertise to be realised. There are also efficiencies to be gained from the sharing of resources, the cross-fertilisation of policies and investigation techniques and from sharing research and data collection methodologies.

ATSB inherited the Portfolio Budget Statements outputs and budgets of its component units but developed its own mission statement and business plan for 1999–2000.

A number of other initiatives undertaken during 1999–2000 set the framework for the sharing of safety expertise.

Peter Saint
Team Leader
Communications and Information

Central communications and support

Communication publications and safety education expertise in the transport modes was brought together to form a new team.

Investigation, research and statistical reports are formatted and distributed centrally under the ATSB logo.

Administrative support and planning personnel who deal with human resources, finance, coordination and other tasks were also collocated in a new team.

Establishment of a multi modal web site

The ATSB uses the World Wide Web as a major channel of communication into the transport industries. Web sites from the former BASI, FORS and MIIU have been amalgamated into a single site to form a permanent and growing resource of readily searchable safety information. Site visitation is high – there were 3.2 million pages downloaded in the 12 months to 30 June 2000.

Most ATSB material is published online and displayed by transport mode. There are sections covering investigation and research reports (both in-house and commissioned), statistics, periodical publications and topical transport safety articles.

The site is used to immediately alert industry, the public and the media to ATSB activities and intentions, particularly when accident investigations commence.

The ATSB is adopting technologies to enable full participation in Commonwealth Government Online business initiatives. The web site already uses online technologies to augment traditional methods of gathering information. For example, members of the aviation community can submit notifiable incidents via a simple and direct online facility.

Ralph Jeffress
Communications and Information

New Certified Agreement

In 1999 the Department of Transport and Regional Services negotiated a new Certified Agreement under section 170LJ of the *Workplace Relations Act 1996* applicable to all employees not engaged under an Australian Workplace Agreement (AWA). As at 30 June 2000, ATSB people on AWAs included four Senior Executive Service officers and two Deputy Directors.

The new Certified Agreement provided for translation to a simplified eight-level APS classification structure and an increase in base salary of two per cent from 1 November 1999 and two per cent from the first pay period on or after 1 November 2000 in recognition

of productivity gains and ongoing commitment to continuous improvement. An additional one per cent is payable from the first pay period on or after 1 July 2001 conditional on the achievement of several productivity indicators. The Certified Agreement remains in force until 31 December 2001 or such time as it is replaced with a new agreement.

Negotiation of the new Certified Agreement involved all at ATSB. Special provision is made for the particular employment conditions of transport safety investigators in section J of the Agreement. This recognises the desire to establish ATSB as a multi modal safety body in which investigators traditionally appointed to one mode may be called upon to assist in other modal investigations. As a result, a four-level Transport Safety Investigator designation and salary structure was established that is aligned to the eight-level APS classification framework. While there remain differences among investigators with respect to certain operational allowances that will be reviewed over time, the new Transport Safety Investigator structure represents a major step towards an integrated investigator remuneration framework. New work level standards, competencies and training and development arrangements are being developed to underpin the new structure.

Multi modal investigator training

ATSB conducts a highly regarded human factors training course for its own investigation personnel in all transport modes. Places on this course are also made available to safety operatives from other industries. Originally developed for the aviation industry, the ATSB human factors course has benefited from widening its scope to include other forms of transport, as well as other industries. The synergies across the varied backgrounds of course members has benefited the learning outcomes of the course, which is examinable and has university accreditation. In 1999–2000 three one-week courses were conducted on 25-29 October, 8-12 November 1999 and 1-5 May 2000 with about 25 people attending each course.

Vlas Otevrel
Air Safety

Multi modal training has also increased the versatility of ATSB investigators, enabling them to contribute to investigations in all modes. However, while multi modal training in human factors and systems safety is generic, investigators still need current technical and operational knowledge in specialist areas. As a result, ATSB investigator training is a combination of both generic and industry-specific topics.

Key modal safety results

Road safety key results

The Government is providing around $40 million per year for the Federal Road Safety Black Spot Program. In 1999–2000 $37.189 million was spent and 381 sites were approved for treatment under the Program. Of these sites 154 were in rural locations involving funding of $19.3 million. Previous evaluation has shown that a reduction of up to two thirds in serious crashes can be expected at treated sites. Estimates suggest that each $40 million investment in Black Spot treatments will reduce road trauma by at least 8 fatalities and 320 serious injuries a year. Descriptions of the Black Spot treatment sites are shown at Appendix 6.

In response to decisions by the Australian Transport Council (ATC), the ATSB has been coordinating the development of a new National Road Safety Strategy for 2001 to 2010.

ATC agreed in May 2000 that the new Strategy would have a national target of a 40 per cent reduction in the road fatality rate to 5.6 fatalities per 100 000 population in 2010 (compared with 9.3 deaths per 100 000 in 1999). Achievement of this target would save around 3600 lives by 2010. ATC also agreed that the Strategy should be launched at the November 2000 ATC and be supported by a series of two-year Action Plans.

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.

Results of 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.

Chris Brooks
Team Leader
Research Management and Strategy

Simulator research has helped to identify low-cost visual modifications to the road environment that can be effective in influencing drivers' choice of speeds in hazardous locations. Two states are now conducting on-road trials of such measures, with ATSB contributing to evaluation costs.

Through its participation in various road safety forums, ATSB has contributed to development of policy on a number of other road safety issues, drawing on its research and statistical resources. Issues addressed have included driver fatigue, alcohol and drug impairment and vehicle safety. Further information about these contributions is provided later in this review.

Rail safety key results

From July 1999 the Rail Safety Unit managed a Standing Committee on Transport (SCOT) consultancy to review and report on state-based rail safety arrangements. As a result of the Australian Transport Council's (ATC) consideration of the final report, *Independent Review of Rail Safety Arrangements* by consultants Booz-Allen & Hamilton the ATSB was asked to develop a national rail statistical database.

The work of the Rail Safety Unit evolved throughout the year to take on the investigation of rail accidents utilising the expertise of aviation and marine investigators. The Minister for Transport and Regional Services announced that ATSB was available to assist with independent rail investigations under state and Northern Territory legislation when requested to do so by state authorities.

The Rail Safety Unit is currently working with the rail industry and consulting with the states and the Northern Territory to fulfil the Government's intention, announced on 13 April 2000, to legislate for the ATSB to conduct independent investigations on the interstate rail system. ATSB is developing a national rail occurrence database initially comprising accidents, but the inclusion of incidents and higher level analysis planned.

Kerryn Macaulay
Team Leader
Rail Safety

At the invitation of the Western Australian Government, an ATSB investigator provided specialist support on human factors issues in the investigation of the collision between a passenger train and a freight train at Zanthus, WA on 18 August 1999. The findings and recommendations of the investigation have resulted in changes to

procedures and upgrades to technology at several locations on the Western Australian section of the interstate rail corridor.

ATSB's conduct of an investigation into a November 1999 accident at Ararat in Victoria was cited by the May 2000 ATC meeting of Transport Ministers as a best-practice example of how open, independent and systemic 'no-blame' investigations can improve rail safety throughout Australia. ATSB recommended that the Victorian rail safety accreditation authority ensure that the safety deficiencies identified in the investigation be reviewed to determine what safety action needs to be taken. Deficiencies identified were:

- The absence of a 'whole of system' hazard analysis to identify safety risks in Victorian rail operations.
- The integrity of main lines was highly susceptible to human error at several locations.
- Training did not define the limits of personnel who may require access to Safeworking equipment or the dangers inherent in exceeding those limits.
- Responsibilities for control of and access to main lines were not clearly defined.
- The non-standardisation of procedures and safety systems within the rail network increased the potential for human error.

Accident at Ararat, Victoria

- Poor control, distribution and logging of Safeworking equipment issued to individuals, including the security of the Safeworking equipment at the Ararat site, increased the potential for non-authorised or erroneous use.
- Little operational rail safety education material had been available to rail employees.
- Inconsistent application of the requirement for operational personnel involved in accidents to be tested for the presence of drugs or alcohol.
- Lack of powers for investigators to obtain information and no legal protection for individuals providing information had the potential to prevent access to critical safety information relating to the accident.

During the course of the investigation, immediate safety action was taken by the Australian Rail Track Corporation to identify risks at four high priority locations in the Victorian interstate rail corridor, assess solution options and plan remedial actions. Rail operator, Freight Victoria completed a preliminary review of their operations and identified five locations where further risk assessment was needed.

The findings and recommendations of that investigation have prompted, among other actions, the commencement of a major project to conduct a 'whole of operation' hazard analysis of the Victorian rail network. It is intended that the emphasis in the analysis will be on the human risks associated with the operation of the rail system and not solely the risks associated with technology or infrastructure.

Marine safety key results

Nick Rutherford
Acting Team Leader
Marine Safety

During 1999–2000, eleven reports of investigations into marine incidents were released made available on the ATSB web site and these are listed at Appendix 2. Fifty accidents and 20 incidents were reported to the Marine Unit. Twelve occurrences were investigated. One of these was conducted on behalf of the New Zealand Transport Accident and Investigation Commission for which the ATSB will not be reporting. Examples of safety issues identified and action taken as a result of the investigations follow.

The investigation into the pollution incident involving the escape of about 300 tonnes of crude oil from the Italian tanker *Laura d'Amato*, identified the cargo pipeline design as a significant contributory

factor. ATSB made a submission on the issue to the IMO Sub-Committee on Bulk Liquids and Gases. As a result, the Sub-committee is reviewing the existing provisions of the International Convention for the Prevention of Pollution from Ships 1974–78.

The safety of fishermen and people in small boats is a continuing concern in terms of safety at sea. Since January 1991 the Inspector of Marine Accidents has reported on, or is in the process of investigating, 21 incidents of collision between trading ships and small fishing or pleasure craft. Fishermen claim that 'near-miss' situations are common and a number of incidents are reported to the ATSB.

That such incidents occur is evidence that, for whatever reason, fishing vessels and other small craft are not being detected visually or by radar by the watch keeping personnel on board trading vessels. There is an obligation on the part of all vessels at sea to maintain a proper lookout. The fact that in some cases the crews of fishing vessels do not maintain a lookout and do not carry radar reflectors, even though their boats may provide a very poor echo, does not excuse trading ships in any failure to keep a proper lookout.

The vast majority of collisions occur due to the lack of a proper visual lookout, or an over reliance on radar detection in circumstances where the set has either not been set-up properly, maintained properly or monitored with sufficient diligence. The following summary underscores the main issues and demonstrates that there are normally no mitigating factors to explain the vast majority of collisions:

- Eighteen collisions occurred in clear weather.
- Three collisions occurred in conditions of heavy rain and poor radar detection conditions.
- Fourteen occurred in darkness, five in full daylight and two occurred in the half light of twilight.
- Eleven collisions occurred between midnight and four o'clock in the morning.
- Seventeen collisions involved commercial fishing vessels and four involved yachts or pleasure craft.
- Five of the 17 fishing vessels were actually engaged in fishing, four were at anchor and eight were in transit.
- Seven small vessels on steady courses were being overtaken by the trading vessel and had been in sight for some time.

Brian McMahon
Surface Safety

- Six vessels were stationary (one drifting and five at anchor).
- On four of the five vessels at anchor no lookout was maintained and the crew members were in bed despite being anchored in open waters in recognised shipping lanes.
- In nineteen incidents no dedicated lookout was being maintained by the fishing vessel.
- A common contributory factor has been that the person keeping watch on the fishing vessel had no training, did not understand the obligations placed on a fishing vessel by the Collision Regulations and did not understand how to use the radar.
- The number of crew typically employed on fishing boats was two or three, which for a sustained 24-hour operation is insufficient to fish and maintain a proper lookout required by the Collision Regulations.

The Australian coast generally enjoys good visibility and has relatively light traffic. It seems probable that watch-keeping officers:

- may be lulled into a sense of false security;
- level of attentiveness (arousal) is reduced in the clear conditions; and
- lose track of time in open sea conditions.

Aviation safety key results

Analysis and research can result in various safety actions, including recommendations and safety advisory notices (SAN) designed to enhance safety through rectification action by manufacturers, regulatory authorities and others. Interim recommendations are those issued whilst an investigation is continuing. Responses to recommendations are published in the Quarterly Safety Deficiency Report, and more recently, on the ATSB web site. Both Airservices and the Civil Aviation Safety Authority (CASA) have agreed to respond to recommendations. Responses to safety advisory notices are not required but ATSB publishes any response received.

Brett Leyshon
Team Leader
Air Safety

The responses to ATSB recommendations (R) and interim recommendations (IR) are classified as follows:

Closed-accepted:	ATSB accepts the response without qualification.
Closed-partially accepted:	ATSB accepts the response in part but considers other parts of the response to be unsatisfactory. However, ATSB believes that further correspondence is not warranted at this time.
Closed-not accepted:	ATSB considers the response to be unsatisfactory but that further correspondence is not warranted at this time.
Open:	The response does not meet some or all of the criteria for acceptability for a recommendation that ATSB considers to be significant for safety. ATSB will initiate further correspondence.

Not all analysis and research arises from occurrence investigations. ATSB initiates Safety Deficiency Advisory Notices (SADN) to identify safety deficiencies within the aviation system.

Nineteen interim recommendations, 40 recommendations and eight safety advisory notices were issued in 1999–2000. The following examples are illustrative of actions taken by regulators, operators and others to improve safety which were made as a direct result of ATSB activities. In addition, the actions taken demonstrate the high level of acceptance by those organisations of the ATSB investigation, analysis and research processes.

SADN 19980068: Investigation into the Class 'G' Airspace Demonstration (Investigation report B98/166).

As a result of an investigation into the Class 'G' airspace demonstration, the former BASI made a number of recommendations (3 IRs and 2 Rs) to CASA. While responses to all recommendations have been received, in relation to ATSB recommendation R19990140 that CASA and the Department of Transport and Regional Services review CASA's corporate governance framework, a number of proposed initiatives are yet to be implemented. This recommendation is therefore continuing to be monitored.

Julian Walsh and Suzanne Garniss Air Safety

SADN 19990006: Joint investigation with the Directorate of Flying Safety – Australian Defence Force (ADF) and ATSB.

The investigation concerned an airborne conflict between a military P-3C Orion and a civil Cessna 402 aircraft engaged in a search and rescue (SAR) operation for missing yachts competing in the 1998 Sydney to Hobart yacht race on 28 December 1998. As a result of the investigation the Directorate of Flying Safety-ADF and ATSB issued 11 safety recommendations. Two of the responses received involving SAR communications and airspace procedures were only partially accepted. Implementation of each of the recommendations will continue to be monitored for 12 months.

SADN 19990035: Uncontained turbine failure – Allied Signal TPE331 engine.

Fracture of the second stage turbine wheel generated fragments which penetrated the engine nacelle of the right engine of a Fairchild Metro II while in flight. One fragment penetrated the fuselage just below a cabin window. The mode of failure of the second stage turbine wheel created a significant hazard to the occupants and operation of the aircraft. A failure of this type represents a significant breakdown in the aviation engineering safety system. Apart from global implications, there are some 207 TPE331 engines installed in an estimated 113 aircraft in Australia, including many in the air transport category.

As a result of an investigation the ATSB issued a number of safety recommendations relating to the turbine wheels and seals which were accepted by the manufacturer and CASA.

SADN 19990042: Cessna 300/400 series elevator trim-tab actuators.

Duncan Boswell, Arjen Romeyn (Team Leader) and Neville Blyth Air Safety

The manufacturer requires the elevator trim tab actuator components be measured for wear, and if either the male or female thread is found to be worn, both must be replaced as a pair. An investigation of an air safety incident, that could have resulted in the loss of an aircraft, found that a maintenance agency had only replaced the male thread, which may have resulted in accelerated wear and failure. There are large numbers of this series aircraft operating in Australia and overseas.

As a result of this investigation ATSB recommended (IR19990187) that Cessna Aircraft Corporation take appropriate action to ensure that Cessna elevator trim-tab actuator component parts affected by this safety deficiency are re-coded so that they cannot be purchased separately. In addition, that the Corporation review comparable designed trim-tab actuators to ensure that they are not affected by this safety deficiency. The Cessna Aircraft company responded on 13 March 2000 accepting the recommendation.

ATSB also issued three safety advisory notices:

- SAN19990188 and SAN19990189 to CASA and the US Federal Aviation Administration to note the safety deficiency identified and take appropriate action.
- SAN19990218 to the US National Transportation Safety Board advising of the recommendation made to the aircraft manufacturer and the above two safety advisory notices issued to CASA and the US Federal Aviation Administration.

The US Federal Aviation Administration (FAA) also raised Recommendation 00.003 supporting the ATSB recommendation and the Cessna Aircraft Company's action.

SADN 20000001: Inspection criteria for RB524D4 engine cold stream nozzles (Boeing 747).

An engine cold stream nozzle on a Boeing 747 failed after departing from Brisbane on 26 December 1999. A large part of the nozzle fell from the aircraft. A fleetwide check by the operator found a further six nozzles cracked in the same area. As a result of an ATSB investigation seven safety recommendations were issued (R20000004 to R20000010).

Actions proposed by the manufacturer, Rolls Royce Commercial Aero Engine Limited (R20000004, R20000007), the certification authority, the UK Civil Aviation Authority (20000005, R20000008) and the US Federal Aviation Administration (20000006, 20000009) were all accepted.

ATSB recommendation R20000010 that the Civil Aviation Safety Authority review Rolls Royce RB211-524D4 engine cold stream nozzle inspection criteria to minimise the possibility of failure during operation has a response status of 'open'.

Bernie Rodgers
Air Safety

SADN 20000014: CF6-80 2nd stage turbine blade fracture (Boeing 767).

Fracture of a 2nd stage turbine blade during the take-off roll resulted in the shutdown of a General Electric CF6-80 engine fitted to a Boeing 767 aircraft. Examination by ATSB investigators found that a 2nd stage turbine blade had fractured as a result of fatigue crack growth. Fatigue crack initiation was associated with a discontinuity, created during casting, in a cooling-air channel web of the firtree root.

As a result of the investigation ATSB recommended that the engine manufacturer General Electric identify the source of the casting defect of the failed HPT blade (R20000025) and that a review be undertaken on the adequacy of turbine blade manufacturing process controls to reduce the likelihood of blades containing casting defects being released into service (R20000026).

General Electric's response of 17 May 2000 which identified the source of the defect and provided advice on an audit of turbine blade manufacturing process controls was accepted. An associated safety advisory notice, SAN20000027, issued to the Federal Aviation Administration resulted in FAA Recommendation 00.058.

Stewart Ross
Air Safety

Transport industry's safety performance statistics

Multi modal trends (fatalities)

Table 1:
Number of Australian transport fatalities, by mode of transport, 1988–89 to 1997–98

	Road	Rail	Water	Air	All modes
1988–89	3064	66	63	64	3257
1989–90	2839	73	78	88	3078
1990–91	2424	64	94	90	2672
1991–92	2280	52	72	47	2451
1992–93	2012	57	78	98	2245
1993–94	2082	40	73	64	2259
1994–95	2097	55	62	47	2261
1995–96	2044	37	54	79	2214
1996–97	1994	38	56	55	2143
1997–98	1839	42	52	64	1997

Source: *Table compiled by ATSB, data sourced from Australian Bureau of Statistics.*

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.*

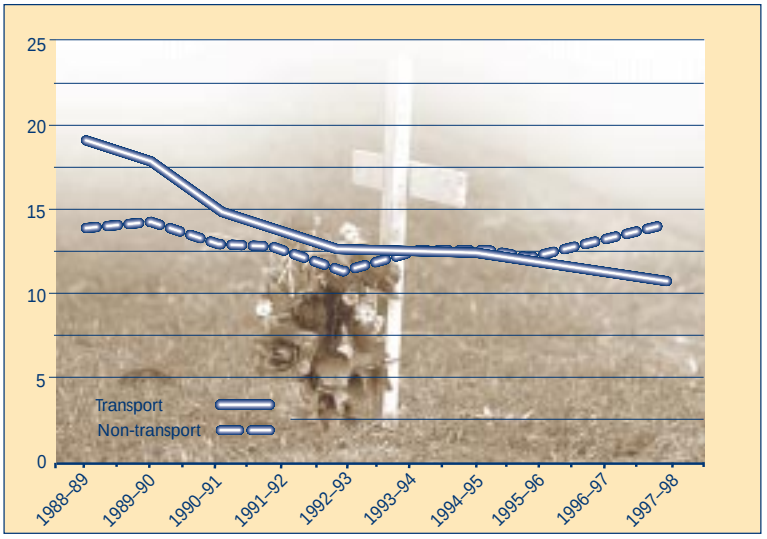
Jim Wylie (Acting Team Leader)
Sue-Ellen Mwesigye and
Thomas Roberts
Transport Safety Statistics

Table 1 presents Australian Bureau of Statistics data on fatalities in each of the major transport modes over the ten years ended 1997–98, the latest years for which these data are currently available. Table 1 shows that between 1988–89 and 1997–98:

- total transport fatalities decreased substantially from 3257 to 1997;

- this was largely attributable to a decrease in road transport fatalities from 3064 to 1839;
- rail transport fatalities fluctuated from year to year but trended downward (from 66 to 42);
- water transport fatalities fluctuated substantially from year to year with only weak evidence of a downward trend; and
- air transport accidents fluctuated substantially from year to year.

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

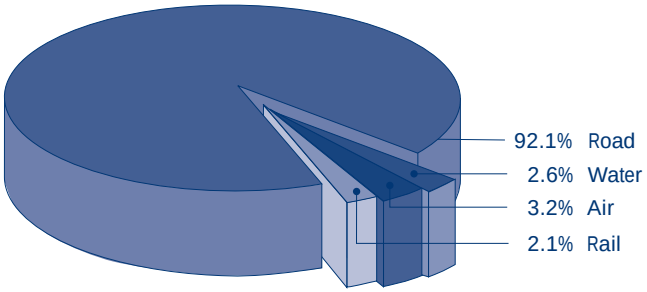


Source: *Chart by ATSB, data sourced from Australian Bureau of Statistics*

Thomas Roberts
Transport Safety Statistics

Figure 1 shows the trend in the per-capita rate of transport fatalities for the latest available ten-year period and compares this with the trend in per-capita non-transport accident fatalities. Per-capita transport fatalities decreased substantially over the ten 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, 1997–98



Source: *Chart by ATSB, data sourced from Australian Bureau of Statistics*

Figure 2 shows that road trauma is by far the largest contributor to transport fatalities, accounting for 92 per cent of total transport fatalities in 1997–98.

Multi modal trends (serious injuries)

Table 2:
Number of 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.*

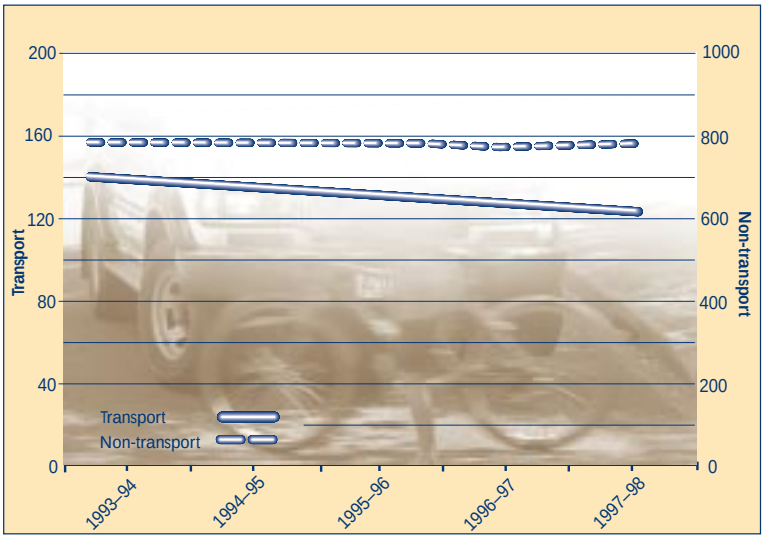
Note: *'Serious injuries' are defined as injuries resulting in admission to hospital for a period of two days or more but not death.*

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 that achieved in reducing road fatalities;
- serious road injuries decreased from 23 880 to 22 647; and
- 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

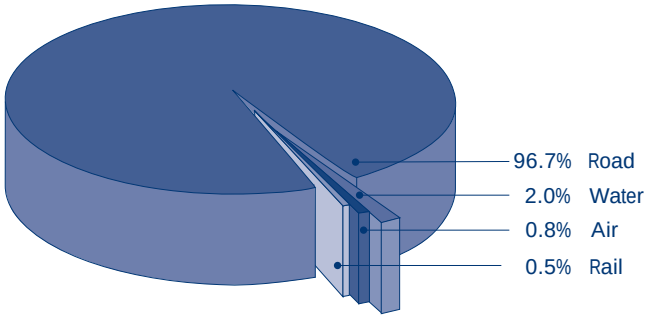


Source: *Chart by ATSB, serious injury data sourced from Australian Institute of Health and Welfare and population data sourced from Australian Bureau of Statistics.*

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 (Figure 2).

Data sources:

Transport casualty data in this section derive from two main sources: fatality data from the Australian Bureau of Statistics Mortality Database and serious injury data from the Australian Institute of Health and Welfare national Morbidity Database. The casualty counts and rates presented from those sources will vary from those reported in specialised single-mode statistical summaries of rail, road, water or air transport casualties. These variations stem from differences in the data sources, scope of events and definitions adopted in each case.

Review of fatality and injury rates across modes

As a first step to the broader analysis of cost-effective measures for improving safety, ATSB initiated a project to examine the feasibility of comparing fatalities and injuries per passenger kilometre across different transport modes. Project results are expected by early 2001.

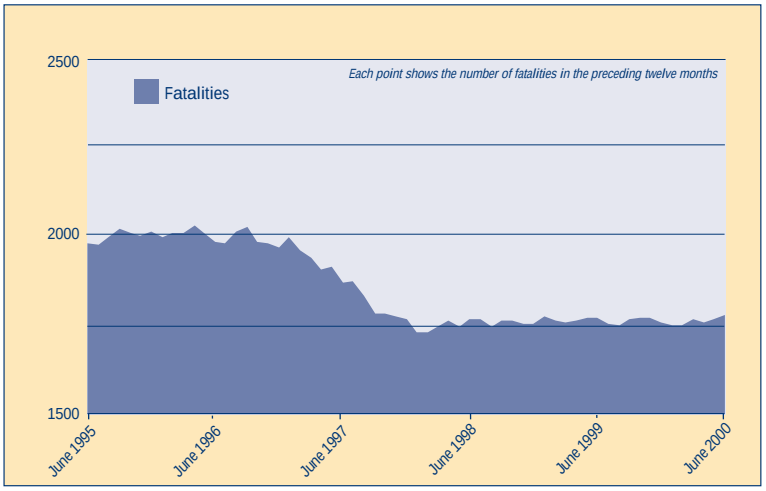
Road safety trends

In recent years there has been a plateau in net road safety gains in Australia.

Figure 5 shows the trend in Australian road fatalities for the five years ended June 2000. A ten per cent fall in road fatalities is evident during this period, but these road safety gains were confined to 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.

No further significant gains were made in 1998 and 1999 and the number of road deaths to the end of June 2000 was slightly above the toll for the same period the previous year.

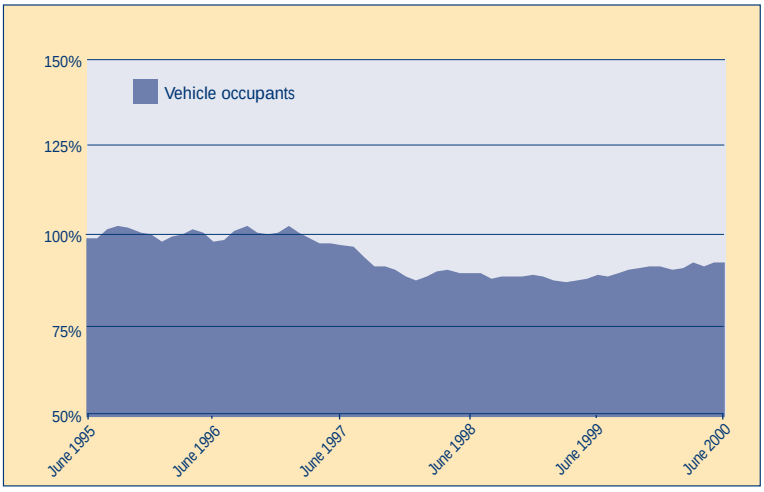
Figure 5:
Australian road fatalities for twelve months to date. Five years ended June 2000

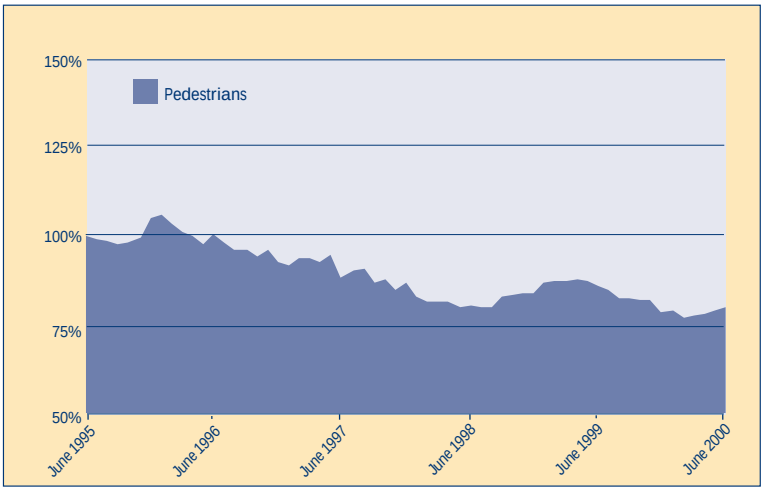


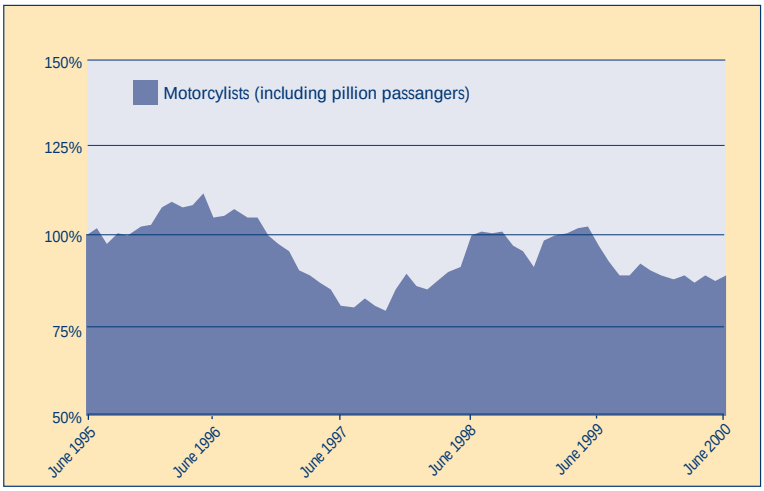
Encouraging trends have, however, been evident in pedestrian and bicyclist road safety (Figure 6).

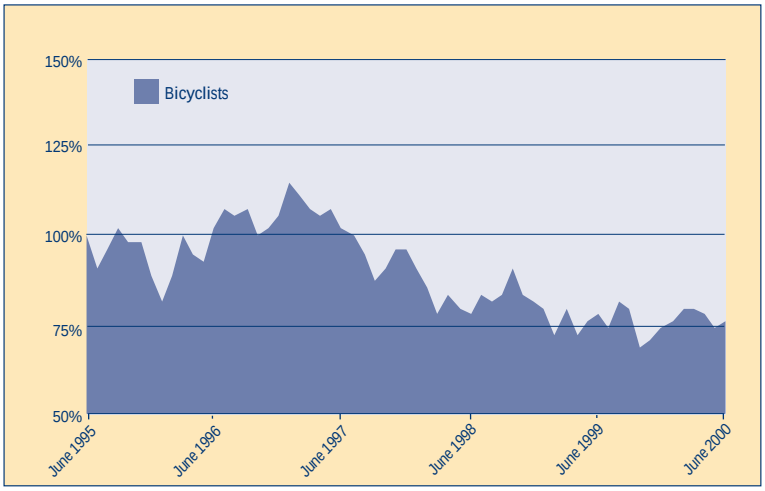
Pedestrian road deaths have decreased over the past five years by an average of 4.4 per cent each year. There has been a fall of 7.4 per cent over the twelve months ended June 2000. This suggests that the national focus given to speed reduction in recent times is paying dividends. This may also be a contributing factor to the reduction seen in bicyclist fatalities.

Figure 6:
Australian road fatalities for twelve months to date, by road user group. Five years ended June 2000









Note: *The number shown at each month represents the number of fatalities in the preceding 12 months expressed as a percentage of the number of fatalities in the 12 months to June 1995.*

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 457 in the twelve months ended June 1995 to 314 in the twelve months ended June 2000. This represents a decrease of 37 per cent in per capita terms (Table 3).

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

Table 3:
Road fatalities per 100,000 population, by State/Territory, twelve months ended June 1995 and twelve months ended June 2000

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Aust.
12 months ended June 1995	10.5	8.4	14.2	11.1	13.1	13.1	30.3	2.6	11.1
12 months ended June 2000	9.1	8.5	8.9	10.0	11.3	10.0	26.8	4.5	9.3
% change 1995–2000	-12.9	1.4	-37.4	-10.3	-14.1	-23.6	-11.6	70.1	-15.6

Note: *Based on Australian Bureau of Statistics population counts for December 1994 and December 1999.*

Truck safety trends

Table 4 shows a reduction over the past five years in fatalities from road crashes involving articulated trucks. These reductions have outstripped those amongst all road fatalities.

Table 4:
Road fatalities involving articulated trucks, twelve months ended June 1995 and twelve months ended June 2000

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Aust.
12 months ended June 1995	73	33	47	17	21	3	4	1	199
12 months ended June 2000	65	..	39	15	9	5	3	1	..
% change 1995–2000	-11	..	-17	-12	-57	67	-25	0	..

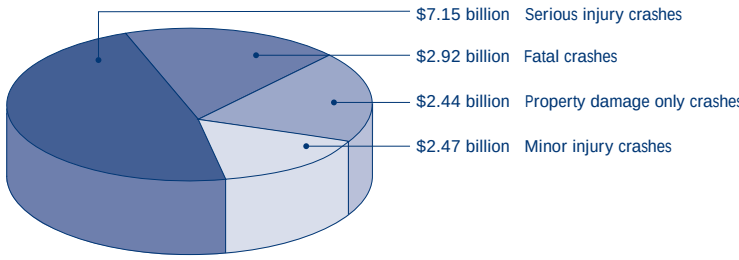
.. denotes data not available.

A high priority has been given to the development of an Australian Truck Crash Database, intended to be a highly detailed and ongoing statistical database covering the 1000 or so serious 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 1 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.

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

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Aust.
Fatalities									
12 months ended June 1994	10	8	10	5	7	0	0	0	40
12 months ended June 1998	23	11	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 a period of 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

With a view to more comprehensive national monitoring of rail safety, the Australian Transport Council agreed at its November 1999 meeting that the ATSB would develop national rail safety statistics with cooperation and input from the state rail safety authorities. The project has proceeded with a high priority with the aim of interfacing with existing state datasets and utilising elements of them as appropriate to achieve the optimum model. Work to date includes:

- discussion with state and Northern Territory regulatory authorities and the rail industry;
- assessment of current state and Northern Territory rail safety databases and alternative data models and classification schemes;
- manual manipulation of database records in an attempt to develop a consistent national format;
- specification of national data scope;
- design of a classification scheme;
- establishment of key definitions; and
- preparation of a prototype publication covering railway accident casualties.

An independent review of data scope, classification scheme and definitions is currently underway.

A key finding to date is that inconsistencies between the rail safety databases of each state and the Northern Territory prevent pooling of the databases into a national dataset. ATSB is currently considering options for further progress on this work.

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 which may show up over a period of time. A computerised 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 1996–1997.

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

Incident by type	1991–97	1998–2000	Total
Grounding	36	5	41
Collision	21	9	30
Fire	11	5	16
Foundering	8	-	8
Structure	5	-	5
Equipment	3	5	8
Berthing	1	5	6
Other	14	3	17
Total	99	32	131

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

Type of vessel	1991–97	1998–2000	Total
Bulk carrier	45	14	59
Tanker	15	7	22
Container	8	2	10
General	9	2	11
Roll on – Roll off	4	1	5
Livestock	3	2	5
Supply/offshore	6	3	9
Tug	3	2	5
Training	3	-	3
Fishing vessel	14	5	19
Pleasure	5	2	7
Other	5	1	6
Total	120	41	161

Aviation safety trends

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

In terms of the aviation industry as a whole in Australia, high capacity operations continue to be the safest in terms of accidents with 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 maximum payload exceeding 4200 kg.

Compared with other sectors of the aviation industry in Australia, as shown in Table 8, both the high capacity and low capacity sectors are remarkably safe in terms of the number of accidents reported per 100 000 hours of aircraft operation.

Mark Stallbaum
Team Leader
Air Safety

Accidents

Table 8:
Accident rates by sector per 100 000 hours flown 1990–1999

	1990	'91	'92	'93	'94	'95	'96	'97	'98	'99
High capacity	0.48	0.41	0.38	0.18	0.33	0.15	0.14	0.00	0.14	1.16
Low capacity	**	1.88	2.69	2.20	1.68	1.65	0.81	0.00	0.73	1.08
Charter	9.68	8.26	9.09	11.10	11.47	8.96	7.03	10.07	8.24	4.13
Agricultural	23.59	22.69	31.24	24.50	18.41	28.10	26.28	24.83	23.73	17.83
Training	6.78	6.54	5.85	8.13	6.32	8.25	5.77	8.35	4.96	7.04
Aerial work	14.23	12.07	12.12	12.23	8.75	6.13	9.23	10.80	5.32	5.74
Private	20.11	27.24	24.01	24.34	18.77	20.31	18.56	16.60	21.18	16.43
Total general aviation	12.93	14.81	14.11	15.02	12.07	12.26	11.28	12.45	11.08	9.01

** *classification not separately* categorised *in 1990*

There are, however, 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, 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 1990–1999

	Aircraft departures (000s)	Passengers (000s)	Hours (000s)
1990	198.0	17 733	413
1991	234.2	22 052	484
1992	252.2	23 566	527
1993	257.7	25 075	562
1994	270.9	27 280	613
1995	285.3	28 815	667
1996	289.2	30 406	711
1997	280.5	30 567	729
1998	277.3	30 395	715
1999	275.7	30 975	685

Ian Brokenshire
Air Safety

Table 10:
Low capacity transport traffic by aircraft departures, passengers carried and hours flown and charter hours flown 1990–1999

	Aircraft departures (000s)	Passengers (000s)	Hours (000s)	Charter hours (000s)
1990	246.0	2 047	183	399
1991	266.2	2 347	206	387
1992	289.9	2 712	219	404
1993	305.3	3 133	228	393
1994	311.4	3 504	238	424
1995	318.2	3 783	243	466
1996	335.2	4 161	246	480
1997	339.6	4 712	272	484
1998	345.2	4 851	273	495
1999	350	5 000	277	505

For all of the aviation sectors of high capacity, low capacity and charter, from 1990 to 1999, there has been steady growth in each of the exposure measures due to increasing activity.

The next three Tables 11, 12 and 13, provide accident information for high capacity, low capacity and charter respectively, for the years 1993 to 1999.

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. The current full definitions of the categories are at Appendix 4. These have varied over time, especially for categories 4 and 5.

For both high and low capacity the majority of accidents are category 4. In contrast, for charter there are more accidents indicating serious safety deficiencies or significant threats to safety of the public.

John Robbins
Air Safety

Table 11:
High capacity accidents by occurrence severity category 1993–1999

	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Total
1993	0	0	0	1	0	1
1994	0	1	0	0	1	2
1995	0	0	0	0	1	1
1996	0	0	1	0	0	1
1997	0	0	0	0	0	0
1998	0	0	0	1	0	1
1999	0	1	1	5	1	8

Table 12:
Low capacity accidents by occurrence severity category 1993–1999

	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Total
1993	0	1	1	2	1	5
1994	0	0	0	2	2	4
1995	0	0	0	2	2	4
1996	0	0	1	0	1	2
1997	0	0	0	0	0	0
1998	0	0	0	1	1	2
1999	0	0	1	2	0	3

John Folley
Air Safety

Table 13:
Charter accidents by occurrence severity category 1993–1999

	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Total
1993	0	1	9	27	7	44
1994	0	2	5	41	2	49
1995	0	1	4	36	1	42
1996	0	0	9	25	1	34
1997	0	0	3	38	8	49
1998	0	1	2	38	0	41
1999	0	0	2	19	0	21

Having eight high capacity accidents in 1999 is 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.

Tables 14 shows the accident rates per 100 000 departures and 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 hours flown 1993–1999

High Capacity

	Accidents	AC dep* (000s)	Hours (000s)	Rate (per 100 000 deps)	Rate (per 100 000 hours)
1993	1	257.6	562	0.4	0.2
1994	2	270.9	613	0.7	0.3
1995	1	285.3	667	0.4	0.2
1996	1	289.2	711	0.3	0.1
1997	0	280.5	729	0.0	0.0
1998	1	277.3	715	0.4	0.1
1999	8	275.7	685	2.9	1.2

Low Capacity

	Accidents	AC dep* (000s)	Hours (000s)	Rate (per 100 000 deps)	Rate (per 100 000 hours)
1993	5	305.3	228	1.6	2.2
1994	4	311.4	238	1.3	1.7
1995	4	318.2	243	1.3	1.7
1996	2	335.2	246	0.6	0.8
1997	0	339.6	272	0.0	0.0
1998	2	345.2	273	0.6	0.7
1999	3	350	277	0.9	1.1

Peter Daly
Air Safety

Charter

	Accidents	Hours (000s)	Rate (per 100 000 hours)
1993	44	397	11.1
1994	49	427	11.5
1995	42	469	9.0
1996	34	483	7.0
1997	49	487	10.1
1998	41	498	8.2
1999	21	508	4.1

International comparison

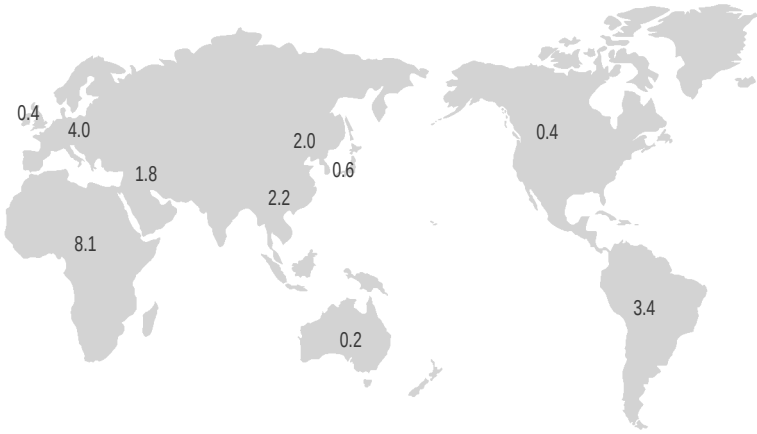
Compared with the rest of the world, Australia has the lowest accident rate for high capacity aircraft.

In Canada for example, the annual accident rate per 100 000 hours for airlines varies annually from 0.4 to 1.2 and was 1.1 in 1998 the latest year available at the time of preparing this review.

International comparisons of high capacity operations are often based on hull lossess per 100 000 departures.

David Burns
Air Safety

Figure 8:
International comparisons: to world average of 1.2 hull losses per million departures 1990–1999



Source: *Flight Safety Foundation*

Figure 8 provides data for the period 1990 to 1999 for the different regions of the world compared to 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 jet aircraft. Oceania covers a large area and goes as far north as Guam where a fatal accident occurred in this period.

Incidents

Compared with accidents there are considerably more incidents recorded.

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

Dan Kennedy
Air Safety

Table 15:
High capacity incidents by occurrence severity category 1993–1999

	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Total
1993	0	0	17	83	579	679
1994	0	0	9	44	763	816
1995	0	0	11	60	715	786
1996	0	0	6	74	661	741
1997	0	0	9	264	575	848
1998	0	0	2	584	793	1379
1999	0	0	0	582	1074	1656

Table 16:
Low capacity incidents by occurrence severity category 1993–1999

	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Total
1993	0	0	19	45	294	358
1994	0	0	5	32	309	346
1995	0	0	0	28	293	321
1996	0	0	0	30	325	355
1997	0	0	5	161	274	440
1998	0	1	2	308	247	558
1999	0	0	4	298	366	668

Rod Fearon
Air Safety

Over the seven years the number of category 3 incidents has declined. On the other hand there have been significant increases in recording of category 4 and 5 incidents in the last couple of years. These increases mainly reflect 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.

Table 17 show 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 a safety culture is becoming more and more entrenched.

Table 17:
Incident rates per 100 000 aircraft departures and hours flown 1993–1999

	High capacity		Low capacity	
	Rate	Rate	Rate	Rate
1993	263.4	121.4	117.3	155.3
1994	301.3	133.3	111.1	141.1
1995	275.5	119.7	100.9	124.5
1996	256.2	107.0	105.9	131.3
1997	302.4	121.6	129.5	148.0
1998	497.3	201.3	161.7	180.6
1999	600.6	241.8	190.9	212.9

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).

Rod Newnham
Air Safety

Table 18:
Estimated cost of aviation accidents in 1996

Category	Cost / losses ($'000)
Productivity losses	65 075
Property damage	20 854
Loss of quality of life	16 100
Insurance administration	3 733
Legal costs	326
Emergency services	988
Accident investigation	1 648
Medical costs	1 314
Rehabilitation/long term care	446
Workplace costs—non-victim	994
Premature funeral costs	64
Total	$111 542

Source: BTE, 1999

Patricia Bianchin
Communications and Information

Modal overviews

Roads

Role

The 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

In response to a decision by the Australian Transport Council, the National Road Safety Strategy Panel and Taskforce has been developing a revised National Road Safety Strategy for the period 2001–2010. The ATSB, as the Chair and secretariat to the Panel and Taskforce, has performed the research and drafting for the Strategy and has managed consultation with the Panel and Taskforce members and other stakeholders. Public comments on the draft Strategy were invited in late 1999. The draft Strategy was considered by the Standing Committee on Transport (SCOT) in April 2000. In May ATC agreed on the framework for a new National Road Safety Strategy to 2010 and that the target for the Strategy be a 40 per cent reduction in the fatality rate per 100 000 population. ATC also agreed that the Strategy be launched at the November 2000 ATC and be supported by a series of two-year Action Plans. SCOT directed the Taskforce to finalise the Strategy in accordance with the ATC decision.

ATC has called for annual reports on progress with implementation of the Strategy. ATSB will coordinate the preparation of these reports using information to be provided by jurisdictions through the Panel.

Russell Crawford
Research Management and Strategy

Black Spot Program

Kevin Rheese
Team Leader
Black Spot and Vehicle Recall

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.

The Government is providing around $40 million per year to the Federal Road Safety Black Spot Program. Almost 400 sites a year throughout Australia are being treated under the Program. Estimates are that each $40 million investment in Black Spot treatments will reduce road trauma by at least 8 fatalities and 320 serious injuries a year.

Previous evaluation has shown that a reduction of up to two thirds in serious crashes can be expected at treated sites, with savings to the community of $4 for every $1 spent.

In the 1999–2000 financial year $37.189 million was spent and 381 money projects were approved (see Appendix 6 for treated sites in 1999–2000).

Since commencement of the Program in 1996, 1815 projects have been approved Australia-wide with a total value of over $185 million. An estimated $40.2 million is available in 2000–2001, and $41.9 million in 2001–2002.

Consultative Panels have been established in each state and territory to comment on proposals nominated and to prepare submissions for consideration and approval by the Parliamentary Secretary to the Minister for Transport and Regional Services. Panels comprise representatives of road user and community groups as well as federal, state and local governments. All Panels have conducted meetings to consider proposals for funding in 2000–2001 and most states have already received advice of approved programs.

Comprehensive 'before and after' evaluation of the Program is being undertaken by the Bureau of Transport Economics. The evaluation commenced mid-2000 and is expected to be finalised by early 2001.

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

Brett Parsons
Black Spot and Vehicle Recall

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*; and
- Provide technical and secretariat services to the Committee to Advise on Recall and Safety.

Andy Read
Black Spot and Vehicle Recall

ATSB monitors approximately 200 active recalls per year and in 1999–2000 was notified by manufacturers of 90 new recalls. In addition, ATSB examined advice from the public and regulatory authorities of 75 safety concerns for investigation.

The Committee to Advise on Recall and Safety (CARS) 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 website: www.atsb.gov.au/road/recalls/recall.cfm

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

brake systems: typical concerns related to brake lines or pads and corrosion of valves. This sort of problem can lead to reduced brake performance or even total loss of brakes.

suspension and steering problems: defective seals, cracking and incorrect torque settings may present an immediate or longer term concern, as components wear, potentially leading to loss of vehicle control.

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.

fuel and oil systems: cracked or leaking components have the potential for causing fires in the engine bay.

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.

Heavy vehicle vibrations and stability

On 2 December 1998 the Minister for Transport and Regional Services announced a consultancy to investigate claims of vibration and stability problems from a number of owners. Roaduser International conducted the consultancy. The investigation was based on the instrumented testing of a sample of heavy vehicles, compared with benchmark vehicles provided by three manufacturers.

Jane Smidmore
Black Spot and Vehicle Recall

The consultant's task was to identify whether any systemic safety deficiency existed in the subject vehicles. The purpose of the investigation was to ensure that vehicles operating on Australian roads are safe. The final report, tabled in the Senate on 18 April 2000,

reflected comments on a draft circulated to interested parties on 2 November 1999.

Apart from the one systemic safety deficiency identified, relating to vehicle handling, the report also identified problems in some of the specific vehicles tested. These were principally related to potential longer-term fatigue and health problems for drivers resulting from increased steering effort and vibration.

Due to the complex issues identified in the investigation, governments, manufacturers, industry and heavy vehicle operators are working together to implement the report's recommendations. ATSB's role is to ensure that all recommendations are implemented in a timely manner and that relevant organisations regularly report on progress. ATSB has established an Internet web site on the report and its recommendations (http://www.atsb.gov.au/road/truck). The site is being updated regularly to ensure interested parties are aware of progress.

The report's 16 recommendations can be divided into three broad categories:

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

Appendix 3 contains a list of the report's recommendations and a summary of responses from industry and others.

Paul Porter
Communications and Information

The first set of recommendations was sent to relevant vehicle manufacturers on 18 April 2000. Since then ATSB has asked manufacturers to provide objective evidence to confirm that problems identified in the specific vehicles have been addressed. Implementation of this set of recommendations is complicated by the current legal actions between manufacturers and vehicle owners. Nevertheless, according to the manufacturers the position at August 2000 with regard to the specific vehicles identified in the report is:

- Kenworth has advised that it has tested vehicle F1 and is confident that it will be able to provide test reports that confirm that the undesirable characteristics identified in the report have been addressed. Kenworth has also stated that vehicle F3 is not

currently registered and has contacted the owner of vehicle F3 but, to date, has not been given access to the vehicle.

- Mack has advised that it has advised the current owners of vehicles F4 and F26 of the modifications it believes are necessary to rectify the problems identified in the report. Unfortunately, to date, both owners have chosen not to make their vehicles available to Mack for modification and testing.
- Ford has advised that it will provide engineering and test reports to confirm the modifications to the relevant Ford vehicles to remove the safety deficiencies identified in the report.

The report also points out gaps in design and manufacturing knowledge in some areas of vehicle behaviour, including oversteering, vibration and bump steer, on which research should be conducted. This 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 and territory authorities and the Vehicle Safety Standards Branch within the Department of Transport and Regional Services. Progress is being achieved with this set of recommendations. Several members of the Australian Motor Vehicle Certification Board (AMVCB) and Technical Liaison Group (TLG) have suggested that the AMVCB and the TLG would be the most appropriate forums to progress the implementation of this set of recommendations. It has also been suggested that the AMVCB and TLG would be the appropriate forums to which interested parties could submit their views on heavy vehicle safety as part of the problem definition process.

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. The 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.

Olivia Sherwood
Research Management and Strategy

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 our partner organisations

under the National Road Safety Strategy, and in other safety forums. It also contributes to work on safety-related regulatory policy 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.

The Program includes national statistical collections and analysis, and research projects on road user, vehicle and road infrastructure safety. Research and statistical reports are widely circulated, and many attract significant media interest.

A list of road safety research and statistical reports released in 1999–2000 is provided in Appendix 2.

National statistics: The statistical program includes collection, analysis and reporting of national statistics on road fatalities and serious injuries, to assist in the development or evaluation of road safety measures.

Established national statistical collections are based on police reports and coroners' records. Work initiated in 1999–2000 will lead to important new datasets to supplement these existing collections.

- ATSB has funded a national pilot project to link police crash data to hospital admission data held by the Institute of Health and Welfare. This project addresses emerging problems in accurately and consistently identifying hospitalisation crashes from police records; it will also allow researchers to explore relationships between crash circumstances and causes, injury outcomes and injury costs. Neither dataset contains personal identifiers; a linking algorithm based on age, sex and date and location of occurrence is being developed.
- ATSB has been a lead member of a collaborative research project to develop a database of 'in-depth' information on vehicles involved in serious crashes. This database is expected to make an important contribution to our understanding of vehicle occupant safety and factors contributing to crashes.
- A high priority has been given to the development of an Australian Truck Crash Database (ATCD) to be constructed from crash records periodically supplied by transport and police

John Goldsworthy
Research Management and Strategy

agencies in each state and territory. The ATCD is intended to be a highly detailed and ongoing statistical database covering the 1000 or so crashes involving articulated and heavy rigid trucks that occur throughout Australia each year.

Agreement to supply records for the ATCD has been reached with relevant agencies. Records on higher severity truck crashes occurring in the first quarter of 2000 have been received from seven of these agencies. A coding framework and database have been developed and pilot tested in consultation with major stakeholders.

ATSB is currently reviewing options for future development of the ATCD based on an evaluation of all aspects of the pilot test, in particular the comprehensiveness of the available crash records.

Heavy vehicle driver fatigue management: This research has focused on projects with a practical application to fatigue management through improved planning of schedules. The work is supporting the development and evaluation of approaches being trialled under the Fatigue Management Pilot Program, which is part of the implementation of the Australian Driving Hours Reform Package. The Pilot involves a number of operators, with fatigue management programs approved by a panel of transport agency officials, police and technical experts which is chaired by Queensland Transport.

ATSB has also contributed to a joint project with the National Road Transport Commission and the New Zealand Land Transport Safety Authority, involving an expert group to examine the application of fatigue research findings to regulatory hours of service regimes.

Speed: Speed is one of the key priority countermeasure areas identified in the National Road Safety Strategy, and has also been identified as a major priority for research effort in consultations on the National Research Strategy.

John Collis
Research Management and Strategy

ATSB research included ongoing work on:

- use of road markings to influence traffic speeds (a possible low-cost alternative to more intrusive engineering measures);
- analysis of 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

- a rural speed case control study to quantify the risks associated with speeding on rural roads.

Alcohol: Research reports on rural drink driving and rehabilitation of drink drivers were published in 1999–2000.

The research report *Drink Driving Offenders in a Rural Community: A Profile of Drink Driving Offenders in Regional Queensland* (CR 183) provides a detailed description of drink driving offenders who took part in a rural drink driving rehabilitation program, 'Under the Limit'. It provides information relevant to targeting the specific needs of this group in terms of rehabilitation, as well as providing the baseline data for the measurement of the effectiveness of the program.

The research report *Drink Driving Rehabilitation: the Present Context* (CR 184) examines the recent research literature on measures to reform drink drivers. The findings were used to guide the implementation and evaluation of the 'Under the Limit' drink driving rehabilitation program.

Road environment: Prior to the introduction of the Federal Road Safety Black Spot Program in 1996, a matrix linking crash types and treatments was developed to provide guidance on the appropriate traffic engineering remedies to address particular types of crashes, and estimates of expected benefits. During 1999–2000, a consultant reviewed and updated this matrix; results will be incorporated in the Notes on Administration for the Program.

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 impacts and no test procedures assessing the effects of different barrier types on motorcycle safety. ATSB funded a small study to explore the feasibility of developing a suitable test program.

Helen Clifton
Black Spot and Vehicle Recall

ATSB also contributed to research on interactions between safety barriers and cars. The results are expected to have implications for both car manufacturers and designers of barriers. The project is being undertaken with funding from a consortium of Australian and Swedish organisations. The contribution by ATSB enabled the addition of concrete barriers to the test program, along with w-beam and wire rope barriers.

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, which contributes to the development and publication of consumer information on vehicle safety.

In addition, 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 a criterion of minimising the total social cost of injuries over the full range of side impact crashes and occupant characteristics encountered in the real world. The project is scheduled for completion at the end of 2000.

Consumer research on head protection for vehicle occupants: Past research has highlighted the potential safety benefits of protective headwear for passenger car occupants. A report published by the Federal Office of Road Safety in 1997 concluded that a specially designed headband could be a practical and effective alternative to a full helmet. While this measure is envisaged as a voluntary, market-driven safety option, it is unlikely that manufacturers will invest in development of the product without evidence of market potential. ATSB undertook a consumer research project to gauge consumer demand; identify priority markets; and explore communication and purchasing issues.

Julika Oster
Executive Support

Learner drivers: An innovative and comprehensive pilot program to reduce novice driver crash rates is under way in the ACT. It includes development of new curriculum materials for school-based education, measures to promote maximum use of the learner period, a public education program targeting parents as well as learners, and other measures extending into the provisional

licensing period to promote continuing learning and improvement. The pilot is of potential national interest, because it is seeking to implement approaches at the cutting edge of best practice. ATSB provided funding to enhance the evaluation of this pilot.

Seeding grants: Each year ATSB awards a number of 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 put forward innovative ideas for research projects. A list of seeding grants awarded in 1999–2000 is included in the Department's Annual Report and can be accessed at the web site www.dotrs.gov.au.

Public communications

ATSB disseminated reports and promotional material and arranged publicity for its research, statistics and the Black Spot Program. Communication campaigns and materials targeting other road safety issues included:

- In cooperation with the Australian Trucking Association, ATSB developed a communication campaign to encourage truck drivers to wear seat belts. The campaign was designed to influence attitudes and effect a change in behaviour. The communication message, based on market research is 'Truck seat belts hold families together' to encourage drivers to consider how a fatal crash would affect their family and friends.
- To help prevent road crashes involving international visitors, particularly during the Sydney Olympics, a fact sheet was distributed on 'International Visitors and Road Safety in Australia', based on a report ATSB published for the Centre for Accident Research and Road Safety – Queensland.

Phill Grabham
Communications and Information

- To alert drivers to the risks they face when braking at various speeds, ATSB re-designed and produced a popular credit card sized card to include more information about safe stopping distances in dry and wet conditions. The card poses the question 'Will you stop in time?' if a child stepped out on to the road 45 metres ahead of a car. Braking distances and consequent speeds at which the car would impact the child are shown on the card.
- 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. Other opportunities for distribution will be considered to reach learner drivers in Australia. ATSB is to seek sponsorship for printing and distribution.

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 is about 1600, stratified to allow comparisons between the different states and territories.

Participation in safety forums

Parliamentary inquiries

ATSB made substantial contributions to Departmental submissions to two Federal Parliamentary inquiries relevant to road safety:

- the Inquiry into Managing Fatigue in Transport, by the House of Representatives Standing Committee on Communications, Transport and the Arts
  - ATSB's input to the submission in July 1999 and oral evidence to the inquiry in November 1999 drew on research and statistics on driver fatigue and fatigue countermeasures, covering both heavy vehicle and light vehicle drivers.
- the Inquiry into Substance Abuse in Australian Communities by the House of Representatives Standing Committee on Family and Community Affairs

Susan Bernardi
Executive Support

– ATSB's provided information in June 2000 on the contribution of alcohol and other drugs to road trauma, which was one of the terms of reference of the inquiry.

ATSB also provides submissions and expert advice to state and territory Parliamentary committees dealing with road safety. In 1999–2000, written submissions were provided to two ACT Legislative Assembly inquiries, dealing with traffic calming (18 August 1999) and urban speed limits (3 December 1999).

Austroads

Austroads is the association of Australian and New Zealand road transport and traffic authorities. It is the road modal group of the Australian Transport Council and acts in this role to advance Australia's broader transport agenda. Austroads core activities are divided into five program areas, each managed by a senior officer from a member organisation. ATSB's Director, Safety Programs and Support is the current Austroads Road Safety Program Manager. ATSB accepted the role in late 1999–2000, formally taking over from the Land Transport Division in July 2000.

Involvement in the Austroads Road Safety Program provides important opportunities for ATSB to influence and contribute to the national road safety agenda. ATSB officers provided advice and administrative assistance to the Austroads Road Safety Program Manager throughout 1999–2000, and coordinated the activities of the Austroads Research Coordination and Advisory Group (RCAG). RCAG provides advice to the National Road Safety Strategy Panel and the Austroads Road Safety Program Manager on research priorities, and also coordinates road safety research activity in the Austroads jurisdictions.

Richard Lathlean
Research Management and Strategy

ATSB was a member of the Austroads Drugs and Driving Working Group, which prepared a report for Australian Transport Council on the contribution of drugs in road crashes, and possible counter-measures.

ATSB was a member of project management teams for Austroads consultancy projects on speed enforcement, rural drink driving and compulsory carriage of drivers' licences.

National Road Safety Strategy Panel

ATSB convenes, chairs and provides secretariat services to the National Road Safety Strategy Panel. This Panel meets twice per year and brings together the 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 Austroads Road Safety Manager; and
- monitor the implementation of the National Road Safety Strategy and Action Plans.

Significant projects for the Panel have been the oversight of development of a revised National Road Safety Strategy and specific plans for Aboriginal and Torres Strait Islander people, youth and international tourists.

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), major rider associations and other stakeholder groups. It is chaired by ATSB and usually meets twice a year in Canberra. Matters considered during the past 12 months included: national consistency in training and licensing, rider safety awareness, unlicensed riding, and issues concerning women motorcyclists. The Committee also provided valuable input to the ATSB Review of Wire Rope Safety Barriers.

Matt O'Keeffe
Black Spot and Vehicle Recall

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 (lead 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); and
- co-authorship (with NRTC) of a paper on Future Directions In Driving Hours Regulation, delivered at the Fourth International Conference on Managing Fatigue in Transportation, in Fremantle (March 2000).

National road safety conference

In November 1999 ATSB hosted jointly with the ACT Government the annual Road Safety Research, Policing and Education Conference, which brought together researchers, government officials and other safety practitioners from all Australian states and territories, and New Zealand.

Road crash costs

ATSB participated in external seminars run by the Bureau of Transport Economics (BTE) on costing of road crashes, and provided statistics and other advice to assist BTE with the preparation of its report, *Road Crash Costs in Australia*, published in May 2000.

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, the Australasian Fleet Managers' Association, and ATSB.

Rail

Role

A Rail Safety Unit was established with the creation of the ATSB to enhance rail safety through the independent, systemic investigation of accidents, incidents and safety deficiencies involving operations on the interstate rail system. The Unit managed a consultancy to review state-based rail safety arrangements and provided administrative services to rail safety authorities in the states and Northern Territory on a transitional basis until 30 June 2000. As noted at page 20, the Australian Transport Council's consideration of the review led to a request by ATC in November 1999 for ATSB to develop a national rail occurrence statistical database. The review report by consultants Booz-Allen & Hamilton is available on the ATSB web site.

Development of a rail investigation capability

The Rail Safety Unit was progressively developed during 1999–2000 using the expertise of professional investigators from the aviation, maritime and road modes so that the well-proven international principles of investigation would be applied to rail.

ATSB assisted with an investigation of an August 1999 accident at Zanthus, Western Australia and, at the request of the Victorian Government, conducted an independent investigation of the head-on collision of two freight trains at Ararat, Victoria on 26 November 1999. Findings and results of these investigations is described in the Rail safety key results section on page 20.

Proposed Commonwealth rail investigation legislation

The Rail Safety Unit developed a Regulatory Impact Statement (RIS) for the future introduction of Commonwealth rail safety legislation. In developing the RIS, the ATSB consulted with industry and state and Northern Territory governments. The proposed legislation will enable the ATSB to investigate occurrences and safety deficiencies on the interstate rail system and protect investigators, witnesses and records.

Andrew Mackay
Surface Safety

Drafting instructions for the rail investigation legislation are nearing completion. The ATSB is developing a draft sample Memorandum of Understanding (MoU) intended for use with the state and Northern Territory governments. The MoUs will serve to clarify the

roles and responsibilities of both the ATSB and the respective governments on matters such as the reporting of occurrences, conduct of investigations, generation of recommendations, and release of safety information. The ATSB will provide copies of the RIS, the Drafting Instructions and a draft sample MoU to state and Territory officials for consideration and comment. The Australian Transport Council in May 2000 asked SCOT to review the proposed legislation.

Participation in safety forums

The ATSB is a committee member on the Standards Australia ME/79 Committee. One of the tasks of the Committee is to develop an Australian standard on rail safety occurrence investigation. The objective of the standard is 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. The Committee is currently considering public comment on the draft standard.

The ATSB is a member of the Rail Safety Consultative Forum and provides advice on its activities, including the development of a national rail safety occurrence database, investigations and investigator training. The Forum was established by the rail safety regulatory authorities in each state and the Northern Territory to bi-annually review and improve rail safety in consultation with a cross-section of rail track owners and operators and other organisations.

ATSB presents at conferences, seminars and to other groups in the rail industry to assist with investigation, human factors and fatigue issues.

Annette Bartlett
Safety Support

Marine

Role

Marine incident investigations have been undertaken by the Marine Incident Investigation Unit (MIIU) since it was formed in 1991, when the regulatory and administrative responsibility for Australian marine safety was vested in the newly formed Australian Maritime Safety Authority. As with BASI's aviation investigations, the MIIU had a well established reputation for conducting highly professional, independent, 'no-blame' investigations to determine the circumstances of an incident and make the issues known within industry so as to help prevent a similar occurrence in the future.

The MIIU, now known as the Marine Unit, forms part of ATSB's Surface Safety Group, together with the Rail Safety Unit. It investigates marine accidents and incidents as defined by the Navigation (Marine Casualty) Regulations under the *Navigation Act 1912*, such as loss of life or serious injury aboard ship; loss of a ship; fires, collisions and groundings; damage to, or caused by, ships; serious damage to the environment caused by a ship; or incidents where any of the above might reasonably have occurred. Details of the scope of marine accidents and incidents investigated are at Appendix 4.

Masters of Australian registered vessels, or of foreign-flag vessels in Australian waters are obliged under the Navigation (Marine Casualty) Regulations to report incidents as soon as practicable to the Inspector of Marine Accidents (a statutory appointment under the Regulations). To overcome practical difficulties of reporting to a number of separate authorities, the regulations recognise reports to the Australian Maritime Safety Authority, or the Australian 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, this may be:

- convening of a Board of Marine Inquiry for an incident in which a full public hearing is deemed necessary (on instructions by the Minister for Transport and Regional Services);
- conducting an investigation by the ATSB or by a specially appointed investigator;
- seeking more information from an owner, employer or other bodies; or
- no further action.

Since 1983 a policy of publishing all investigation reports has been adopted. About 750 copies of each report are printed and distributed to the Australian maritime community and to marine administrations in Australia and overseas, as well as colleges and universities in a number of overseas countries. Reports are also available on the ATSB web site.

Eleven reports of marine incident investigations were publicly released during 1999–2000. The reports included the following investigation into an oil spill in Sydney Harbour.

Cathy Cullen
Surface Safety

Laura D'Amato *oil spill investigation*

The Italian flag tanker *Laura D'Amato* berthed at the Shell Terminal Gore Bay Sydney Australia, at 1224 on 3 August 1999, with about 90 957 tonnes of Murban Crude Oil.

After about four hours of discharging cargo at a slow rate, the Mate directed that two 'cross over' valves in the pumproom should be opened to increase the rate of discharge from two after tanks. This meant using the sea suction line, which was isolated from the sea by two sea-chest valves. The two sea-chest valves had a seal intact between the two valve wheels indicating that they had not been moved since they were sealed 'shut' at the loading port some three weeks previously.

A few minutes after opening the cross over valves a strong smell of crude oil pervaded the jetty and the ship's deck. The two valves were closed and discharge suspended after about ten minutes. Crude oil could be seen welling to the surface adjacent to the ship's pumproom.

The mate and the pumpman went to the pumproom and checked all the valves. They found the two sea-chest valves on the sea suction line were fully open. When the two men attempted to close the sea-chest valves, they found the large, manual, butterfly valves 'back seated' open. To close the valves both men had to use a large wheel key to 'break the seat'. In closing the valves a security seal or seals placed between the two adjacent valve handles were broken.

The investigation established among other things:

- The use of the sea suction line as a cargo pump suction crossover line led to cargo filling the line and escaping through the open sea-chest valves overboard.
- The ship's cargo system did not provide for a separate designated cargo pump suction crossover line or some means of isolating the cargo system from direct connection to the sea-chest.
- The presence, at various times, of seals placed between the sea-chest valves leading to a false assumption on the part of the ship's crew that the sea-chest valves must therefore be shut.
- The false assumption contributed to the fact that the ship's crew did not properly check the sea-chest valves, as required by the International Safety Management Code procedure, the International Safety Guide for Oil Tankers and Terminals Guide

and normal tanker operations, before loading in Jebel Dhanna, in the United Arab Emirates, and discharging in Sydney.

- The crew did not follow the Ship/Shore Checklist procedures, in Jebel Dhanna and Sydney to physically check and identify that the sea-chest valves were in a closed position.
- The probability is that the sea-chest valves were opened at some time after leaving Zhanjiang, in China, and arriving at Jebel Dhanna. There was no operational reason for opening these valves.

Small vessel safety

Of continuing concern is the vulnerability of small vessels to collision with large trading vessels. Between October 1999 and 30 June 2000, there were five collisions between fishing vessels or small pleasure craft. One of these accidents resulted in the death of a fisherman.

An analysis of small boat and large ship collisions is contained earlier in this report.

ATSB will issue safety bulletins to fishermen and masters and watchkeepers aboard ships calling at Australian ports to underline the vulnerability of small vessels.

Participation in safety forums

Marine Accident Investigators' International Forum

Australia is a founder member and in 1999–2000 was Deputy Chair of the Marine Accident Investigators' International Forum (MAIIF) which first met in Canada in June 1992. The 8th meeting of MAIIF was hosted by the Japanese High Marine Accident Inquiry Agency in Tokyo from 5 to 8 October 1999. Forty two representatives from 28 countries met to discuss issues of common interest.

Reports on the adoption of the Code for the Investigation of Marine Casualties and Incidents (IMO Res A.849) indicated growing acceptance of the principles embodied in the Code. The Code has had a positive effect in increasing cooperation between States. Germany announced that the European Union has mandated that the Code should be adopted by all member States.

The Forum has an ongoing work program developing a set of procedures to complement the Code and assist smaller adminis-

trations in conducting investigations. The issue of developing a training regime for accident investigators was also discussed at length and a course building on the elements of the International Maritime Organization's model course is at the planning stage.

Germany presented a paper on voyage data recorders and led a general discussion which concluded in general support for the fitting of voyage data recorders on as wide a range of ships as possible. Also Japan, China, Korea, Germany and Finland presented papers on either specific incidents or on analyses of incidents involving fatigue.

The Forum acknowledged the contribution of the ATSB in maintaining the MAIIF web site.

Japan presented a paper entitled 'Drowsy Watchkeepers'. Two hundred and sixty five incidents were analysed and found that:

- 80 per cent of watchkeepers falling asleep did so while sitting down;
- 84 per cent of vessels were in automatic steering;
- 55 per cent fell asleep between 30 minutes and ten minutes before the casualty;
- 50 per cent of those involved were over 45 years of age;
- 31 per cent of all fatigue-related groundings occurred between 0200 and 0400; and
- in 90 per cent of cases the marine environment was benign.

Korea and New Zealand presented complementary papers on the grounding and loss of a Korean fishing boat South of Bluff, New Zealand. The papers highlighted the benefits of cooperation, cultural issues and the use of interpreters.

The Finnish paper analysed casualties involving pilots, based on a report by marine consultants engaged by the Finnish authorities. The paper underlined the lack of proper pilotage planning and the absence of bridge resource management, which Finland is hoping to introduce as a pre-requisite for pilotage qualifications.

Flag State Implementation Sub-Committee

ATSB was represented at the 8th Session of the Flag State Implementation Sub-Committee of the International Maritime Organization (IMO). Australia, through ATSB, is an active member of the working group on marine casualty analysis. ATSB is

consolidating a paper on lifeboat and life raft safety based on international data.

International Maritime Organization (IMO) submissions

Three submissions were made to IMO as a result of the analysis of marine incidents investigated by the Marine Unit. The submissions were:

IMO Sub Committee	Title	IMO Document Number
Flag State Implementation (FSI)	Fire on board ships	FSI 8/11/1
Flag State Implementation (FSI)	Lifeboat accidents	FS 8/11/3
Bulk Liquid and Gases (BLG)	Tanker cargo piping systems	BLG5/6/3,BLG5/Inf.4

Details of the submissions for fires on board ships and lifeboat accidents are provided below. The submission on tanker cargo piping systems is described in the Marine safety key results section on page 22.

Fires on board ships: In 1998, Australia investigated four very serious casualties involving oil leaking on or near a diesel engine. Any accident is a random event that cannot be anticipated and that four such fires occurred within a six month period would seem to be a statistical anomaly.

In a seven year period 1991–1998, Australia has investigated nineteen serious fires on ships. These involved:

- eight investigations as flag State under the provisions of United Nations Convention on the Law of the Sea 94(7);
- a Royal Australian Navy (RAN) investigation into a fire aboard a RAN tanker; and
- ten investigations as a coastal State or at the request of the flag State.

The impact of these fires in human terms has been grave and in monetary and operational terms very significant. The fires can be categorised as follows:

Accommodation fires: Two of the three accommodation fires most probably had their origins in crew improvised or 'jury rigged' wiring within cabins, to run multiple electrical appliances. In both cases the domestic electrical system operated on 110 Volt 60Hz supply.

Switchboard fires: The extensive damage made analysis difficult. Failure or deficiencies in the circuit breakers housed in the switchboard cabinets initiated both fires.

Boiler fires: Two of the three fires were each associated with the accumulation of soot in areas of tubing in waste heat units which were not efficiently washed. The third fire was largely associated with operator error and underlying poor practice, maintenance and procedures.

Diesel engine fires: Over 50 per cent of fires investigated involved oil fires associated with diesel engines, the majority being as a result of oil spraying on a hot surface. None of these fires involved the high pressure system, rather six fires were associated with the 'low' pressure supply and return fuel lines. All but one resulted in major fire damage to machinery spaces.

Six fires were caused by the failure of a flange on an oil line (fuel oil, lubricating oil, or hydraulic oil). The screws holding the flange had either broken, or loosened with vibration. The probability is that the screws were not properly tightened to a designated torque. A feature common to some of these fires has been the design of access to the flange and the screws and the difficulty (near impossibility) of using a torque wrench on some, or all, of them.

Two fires were caused by the failure of a pressure gauge on a lubricating oil line. One fire resulted from a broken con rod piercing the crankcase and the ignition of the resultant oil mist in the machinery space.

In none of the fires could the source of ignition be established with absolute certainty, although potential sources such as electrical and hot surfaces were present.

Two fires were the result of the failure of flexible fuel hoses on the return or spill line of the fuel system. Two of the three incidents involved unapproved hoses fitted to address problems with chronic engine vibration. Of these, one line failed after about 40 hours due to fatigue, indicating a totally inappropriate hose; the other, a hose of more robust construction, failed after seven years as a result of 'old age'.

The most probable source of ignition in each of the ten fires investigated was some unlagged part of the engine operating at a

temperature in excess of the auto ignition temperature of the oil involved. These were:

- turbo chargers;
- exposed exhaust trunking; and
- cylinder indicator cocks.

Of the eleven fires, six occurred between 2030 and 0630, during a period when the engine room was unmanned.

In seven of the fires the fixed engine room smothering system was used as the primary method of fire fighting.

Lifeboat accidents: Between 1991 and 1998, Australia investigated nine lifeboat accidents, some resulting in serious injury to the crew. The accidents involved lifeboats falling from substantial heights, often at, or above, embarkation deck level. Two accidents occurred on Australian ships, the others involved overseas registered ships. Common factors in the accidents included:

- Limited numbers of individuals on board proficient in launching and recovery of lifeboats, indicating poor drill and instruction procedures.
- Similar release and engine, or other, controls in close proximity, leading to confusion.
- Release controls vulnerable to inadvertent activation.
- Non-standard configuration of release gear between different makes of lifeboat.
- Instructions in languages other than that used as the common language on board.
- Failure to fit retaining strops before entering boats for maintenance, drills or inspection.

There were six incidents of inadvertent, or incorrect, use of lifeboat release controls involving eight certificated personnel and six ratings. This basic statistic would seem to suggest a general lack of knowledge and experience in the operation of lifeboats, particularly those with on-load release mechanisms.

Australia's experience with lifeboat accidents appears to be part of a world-wide trend and, at the 2000 meeting of the IMO's Flag State Implementation Sub-Committee, Australia undertook to collate and analyse the world-wide data on such accidents.

Maritime training courses

International Maritime Academy, Trieste, Italy

The Marine Incident Investigation Unit developed the current International Maritime Organization model course for the investigation of marine casualties and incidents. The course, conducted at the International Maritime Academy in Trieste lasts about 15 days. The Inspector of Marine Accidents coordinated the course in both June-July 1998 and March 1999. Involved in the two courses were 28 students from 27 countries from Asia, South America, Africa, Europe and the South Pacific.

Naval accident investigators' course

The Inspector conducted a ten-day course on safety investigations for RAN personnel in September 1999. The course was based on the Reason methodology followed by the ATSB.

Bridge resource management and advanced pilotage courses

The Marine Unit presented a paper on fatigue at five courses conducted in Sydney.

Presentations

Papers were presented by the Marine Unit to:

- Shell Australia Fire Seminar, Geelong, *Engineering Aspects of the Westralia Fire;*
- International Air Safety Management Conference, Perth, Fathoming It Out – *The development of marine casualty investigations;*
- Fire 99, Hobart, *Ship Fires;*
- Ship 2000, Sydney, *Learning the Lessons – A Global Approach to Marine Casualty Investigations and Ship Fires;*
- Australian Marine Pilot's Association, *Sea Empress – The Failure of a System;* and
- Port State Control 2000, *Where Did It All Go Wrong.*

Aviation

Role

The *Air Navigation Act 1920* (as amended in 1995) requires the mandatory reporting of all aviation accidents and incidents. ATSB is the organisation to which aviation occurrences are to be reported. Once reported, under the *Air Navigation Act 1920* the Director of Air Safety Investigation is provided with powers to enable comprehensive investigation of any occurrence but is not required to investigate all those reported.

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

Occurrence investigations

Occurrences reported in the last five years under the *Air Navigation Act 1920* show a steady increase from 4021 reported in 1995–1996 to 5915 in 1998–1999. In 1999–2000 a total of 5377 occurrences (204 accidents, 5173 incidents) were reported to the ATSB (see Table 19). The increase in occurrences reported can be explained by three contributing factors:

- as noted in an earlier section, aviation activity increased in the period 1990-1999 resulting in an increase in exposure;
- inclusion in the database in 1998 of particular incidents that had previously been reported to ATSB but not recorded; and
- a campaign by the former BASI in 1998 to encourage reporting of occurrences.

Table 19:
Occurrences reported to ATSB over the last five years

	1995–96	1996–97	1997–98	1998–99	1999–00*
Accidents	254	251	244	226	204
Incidents	3767	3711	3990	5689	5173
Total	4021	3962	4234	5915	5377

** Note:* *1999-2000 occurrence numbers are provisional as not all incident reports for this period may yet be entered into the ATSB Occurrence Analysis and Safety Information System (OASIS) database.*

Barry Telfer
Air Safety

Of the occurrences reported to ATSB in 1999–2000, 132 accidents and 583 incidents were investigated. Minor office investigation reports are available on request. More important investigation reports are publicly released.

There was one fatal accident involving a scheduled airline operation (regular public transport) during the period. An investigation commenced into the accident near Whyalla, South Australia, of a Whyalla Airlines Piper Navajo that crashed into the sea during a scheduled airline flight from Adelaide to Whyalla. The wreckage was recovered and the engines, propellers, and other components from the aircraft removed for laboratory examination.

ATSB commenced an investigation, on behalf of the Thai authorities, into the landing accident at Bangkok involving a Qantas Boeing 747-400. ATSB has issued an Interim Factual Report. The investigation is continuing.

ATSB released 130 occurrence investigation reports during 1999–2000. The reports are available on the ATSB web site and listed at Appendix 2. Some significant recommendations from these can be found in the Aviation safety key results section on page 24. A summary of recommendations that remained open at 30 June 2000 is at Appendix 3.

Reduction in aviation investigation backlog

A review of priority setting to ensure the resources available to the ATSB were assigned to those investigations likely to produce the maximum safety value as well as managing the workload of investigators was undertaken. Due to the large number of aviation occurrences reported (see Table 19), aviation investigations were addressed first.

Hazel Berg
Executive Support

Initially attention was given to better managing the work flow through weekly consideration together with close monitoring of the progress with each investigation. Although significant progress was achieved with a 45 per cent reduction in investigations behind their planned milestones, the increasing volume of occurrences being reported together with the workload associated with each investigation meant the number of occurrences identified for investigation could not continue to be undertaken at a high standard.

From 1 April 2000, a new categorisation system (shown at Appendix 4) was introduced which further clarifies the boundary between those reported occurrences that are recorded in the aviation database, OASIS, for trend analysis purposes and those that are subject to investigation by transport safety investigators.

The outcome of these changes is that the number of outstanding aviation investigations reduced from approximately 450 in August 1999 to 120 in June 2000.

Major accident preparedness

In June 2000 Nick Gwyn and Associates were awarded a consultancy to examine the ATSB preparedness for investigation of a major aviation accident. The contract involves examination of internal procedures and systems, including the 'Major Accident Investigation Manual', the familiarity of investigators and administrative support people with them, and relationships with other organisations that would become involved. Advice is also being sought on the most cost-effective way to test the ATSB's ability to undertake a major aviation accident investigation.

Safety deficiency investigations

A safety deficiency investigation is separate from an occurrence investigation and 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.

During December 1999 ATSB was notified of a number of aircraft with fuel systems that had become contaminated. The ATSB assessed that an aviation safety deficiency existed, and commenced an investigation on 12 January 2000. ATSB plans to release its report towards the end of 2000.

The Class 'G' Airspace Demonstration systemic investigation was completed and the report tabled in Parliament on 23 November 1999.

Seventy safety deficiency investigations were initiated either as a result of the notification of deficiencies from accident and incident investigations or from notifications and advice received from the industry.

Mal Gordon
Air Safety

Fifty-one of the deficiency investigations that were commenced during 1999–2000 are still ongoing.

Two safety studies into fuel exhaustion and starvation, and birdstrikes are also in progress.

Systemic Incident Analysis Model

The Systemic Incident Analysis Model (SIAM) is designed to complement the systems safety approach adopted by ATSB. The Model, developed by the former BASI, is based on the pioneering work of Professor James Reason and his colleagues at the University of Manchester who have emphasised the need to consider accidents, incidents and safety deficiencies in the context of the total sociotechnical systems in which they are generated. SIAM provides safety information on:

- defences in the aviation system which failed to allow each occurrence to happen;
- the latent and active failures in the system; and
- the recovery measures that prevented an incident becoming an accident.

Analysis of the SIAM data can help to identify vulnerable areas of the aviation system on which attention needs to be focused.

A report analysing the 1999 SIAM data is expected to be published in December 2000.

Confidential Aviation Incident Reporting system (CAIR)

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, the CAIR system complements Australia's mandatory open reporting system but under the protection of the CAIR system, the reporter's identity remains confidential.

Danuta Pniewski
Air Safety

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 show little variation (see Table 20) which in itself is an indication of ongoing industry support for the system.

Table 20:
CAIR incident reporting in the last five years

Year	Incidents
1995–1996	351
1996–1997	253
1997–1998	287
1998–1999	326
1999–2000	265

Safety promotion

Although not exclusively an activity of the ATSB (CASA has the prime role), aviation safety promotion is clearly important if the lessons identified from occurrence investigations and deficiency examinations are not only to be promulgated to the aviation industry but safety actions taken that are based on those lessons.

Conveying safety messages can use many approaches. The most visible are:

- publication of investigation and safety study reports;
- availability of information, for example from the ATSB web site;
- safety programs;
- presentations at conferences and safety forums;
- involvement in international affairs;
- international involvement;
- contributions to Parliamentary inquiries; and
- participation in coronial inquests.

Following a recommendation of the McGrath Review, ATSB discontinued publication of the former BASI *Asia-Pacific Air Safety* magazine and initiated ATSB Supplements to CASA's *Flight Safety Australia* magazine. A list of the articles published during 1999–2000 in these magazines is at Appendix 5.

David Hope
Communications and Information

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, is currently being upgraded in order to provide greater and more efficient functionality, basic analysis tools and more extensive reporting capabilities. The upgraded version, including supporting documentation, will be made available on a CD-ROM and may also be accessed from the ATSB's web site. The work on this upgrade is to be complete by the end of 2000.

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.

Mark Ogden
Air Safety

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

Safety forums cover a broad spectrum of activities, ranging from the Aerial Agriculture Association of Australia's conferences, to 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. In addition, 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 1999–2000 included:

- Air Accident Investigation Conference – July 1999;
- Airports and Aviation Outlook Conference – August 1999;
- Monash University Accident Research Safety Workshop – August 1999;
- Safeskies 4–5 November 1999;
- Australia and New Zealand Aviation Law Society Annual Conference November 1999; and
- University of Queensland Key Centre Human Factors Winter School – 19 June 2000.

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

The Human Factors Advisory Group aims to provide the Civil Aviation Safety Authority (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.

George Nadal
Communications and Information

Involvement in international affairs

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 International Civil Aviation Organization.

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 the *Air Navigation Act 1920*. Annex 13 is periodically reviewed by ICAO member states to assess its continuing relevance and application to modern aviation. The Accident Investigation Group (AIG) of ICAO convenes Divisional meetings, from which recommendations are made to change, update and improve the Annex. ATSB attends the AIG meetings to ensure that it has direct input into the nature and development of the recommendations for changes to Annex 13. The ATSB represented Australia at the most recent of the AIG Divisional meetings in Montreal, in September 1999.

ATSB attends meetings of the Safety Committee of the International Air Transport Association (IATA) as an observer. The ATSB attends most meetings, other than specific closed sessions that may be for member airlines only. The ATSB provides feedback through this forum to the world airlines on accident and incident reports, safety studies and applications of human factors and system safety principles.

Michael Watson
Air Safety

ATSB has continued to work with both ICAO and IATA by attending and contributing to various safety forums, including:

- IATA Safety Advisory Committee meetings 16-20 August 1999, 14-18 February 2000;
- ICAO Accident Investigation and Prevention meeting 13-24 September 1999;
- European Union Joint Research Centre Human Factors in Accident Investigation – 27 September – 1 October 1999; and
- International Aviation Safety Management Conference 18-21 October 1999.

The ATSB is a corporate member of the international Flight Safety Foundation (FSF), perhaps the world's most important and influential air safety organisation. The FSF has been increasingly involved with both ICAO and IATA, and with agencies such as the US Federal Aviation Administration (FAA), in developing specific accident prevention programs.

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

The ATSB continues to assist the Indonesian investigation authorities in the investigation of the SilkAir MI185 Boeing 737 accident that occurred near Palembang, Sumatra, in December 1997. The ATSB's role is as a member of the Indonesian team. ATSB investigators have assisted in the disciplines of engineering, operations, air traffic control, maintenance engineering, flight recorder replay and analysis, and human factors.

At the request of the Fiji Government, the ATSB conducted the investigation into the accident involving a Bandeirante aircraft on a scheduled flight from Nasori to Nadi. The report, prepared for the Fiji Government, includes 13 recommendations and is available on the ATSB web site.

Contributions to Parliamentary inquiries

Rural and Regional Affairs and Transport: Senior ATSB personnel attended four Senate Committee hearings and were questioned on matters relating to aviation investigations including QF1 in Bangkok, 'G' Airspace, fuel contamination, 1998 Sydney to Hobart yacht race, QF15 in Rome and Qantas and Ansett safety records. Details of these hearings can be accessed at the Hansard record of proceedings on the web site www.aph.gov.au/hansard /index.htm

ATSB appeared twice in relation to the Senate Rural and Regional Affairs and Transport References Committee inquiry into 'The examination of air quality, with particular reference to cabin air quality in BAe-146 aircraft'.

Neville McMartin
Air Safety

At the first appearance in November 1999, the ATSB tabled the report of an incident on 10 July 1997 involving a BAe-146 aircraft being used for freight operations. The report contained two recommendations:

- CASA, in conjunction with the aircraft manufacturer, British Aerospace Plc, address deficiencies that permit the entry of fumes into the cockpit and cabin areas of BAe-146 aircraft; and
- British Aerospace Plc liaise with the engine manufacturer AlliedSignal to investigate failures within the engine that result in fumes entering the cockpit and cabin areas in Bae-146 aircraft.

Further, the ATSB indicated to the Committee that there were two issues for discussion:

- whether there is an immediate safety of flight issue; and
- a quality of air issue, that is, the long-term exposure to cabin air contamination on the health of persons which is a long-term occupational health and safety matter.

Based on occurrences reported to the ATSB, there has only been one incident, the July 1997 incident, for which an immediate safety of flight issue was reported.

At the second appearance in March 2000, the issues had remained unchanged. Australian operators of the aircraft type have continued to implement a program of modifications developed by the engine and aircraft manufacturers.

Inquests

The various State Coroners sought the attendance of Transport Safety Investigators at ten coronial inquests. In all cases the coronial outcomes were in accordance with the ATSB investigation.

Multi modal safety development

Michael Hill
Air Safety

The former BASI had a long association with BHP aviation safety, both in exchanging ideas and information on human factors and systems safety. This contact led to BHP developing a new corporate safety analysis program called the Incident Cause Analysis Method (ICAM). BASI provided informal input to the development of ICAM which was based on the Reason model of systems safety and its earlier application by Shell in the petroleum industry. The Reason model was adopted by BASI in the early 1990s as a guide to the investigation process. The model is also promoted by ICAO.

BHP requested that ATSB work with BHP safety specialists, to train BHP safety personnel in the use of ICAM. BHP paid standard APS consultancy fees for this service, and, subject to ATSB operational priorities, ATSB provided training to BHP on a number of two and

three-day courses, both in Australia and overseas, at BHP's expense. The ICAM program is proving to be a successful safety promotional tool, as it provides a common language of safety which is independent of the specific operational context - such as mining, petroleum, aviation and rail.

The Australian Research Council Key Centre for Human Factors and Applied Cognitive Psychology is a leading human factors teaching, research and consultancy group. The Centre brings together leading experts and researchers in human factors from Australia and around the world, in order to create a program focused on improving human performance. The ATSB attends meetings of the Centre which are held quarterly.

The role of the Nuclear Safety Committee Council is to advise the Chief Executive Officer of the Australian Radiation Protection and Nuclear Safety Agency on issues relating to both nuclear safety and the safety of controlled facilities. Functions of the committee include assessing the safety codes, practices and procedures of controlled facilities and promoting national uniform safety standards for such establishments. The ATSB is a committee member and appointments are for a term of three years, with meetings scheduled on a quarterly basis.

Majella McDonald
Air Safety

Internal management and processes

Financial overview

The ATSB was funded $11.959 million in Departmental expenses for 1999–2000 to deliver and administer key outputs for the Government.

1999–2000	$ million
ATSB Departmental expenses:	
Salary related	7.421
Administered	4.298
Depreciation/Amortisation	0.119
Other expenses	0.287
Total Departmental expenses	12.125
Revenue	(0.166)
Net costs to Department	11.959
Administered expenses:	
Black Spot Program	34.404 #
ATSB–Road safety communications	0.498
Inventory write-down	0.376
OECD – road transport	0.028
Total Administered Expenses	35.306
Capital expenditure:	
Plant & Equipment	0.370
Average Staffing Level	* 112

* *Excludes ATSB senior executive service officers.*

\# *An amount of $37.189 million has been shown elsewhere in the review and represents the total cash payments to the States under the Black Spot Program in 1999–2000 (accrual figures in table).*

Steve Pantelidis
Team Leader
Safety Support

The starting point for 1999–2000 was expenditure in the previous financial year by ATSB's component units. Allocations do not include a number of corporate overheads provided to ATSB by the Department.

Information technology systems review

During 1999–2000 a review of ATSB databases was undertaken. ATSB operates a number of information technology systems to support its safety functions covering air, sea and road. A database is currently being developed to record details of rail accidents and incidents. The largest database operated is the aviation notification system, called Occurrence Analysis and Safety Information System (OASIS).

The purpose of the review was to:

- Assess the current status of the ATSB information systems functionality, interface, information exchange, storage and useability in terms of the business and technical requirements of its users.
- Assess the future requirements of ATSB' expanded user base, in terms of business and technical requirements.
- Advise ATSB on the options available to meet the identified future requirements.

The consultant's report was received on 28 June 2000 and its findings and recommendations are currently being analysed.

Risk management

The ATSB is undertaking a process of risk management which incorporates the identification and prioritisation of risk, assessment of how risks are to be managed and the development of strategies to manage priority risks. An external consultant, Acumen Management, has been engaged to facilitate the development of effective risk management plans which address major risks including:

Ted Smith
Team Leader
McGrath Report Implementation

- Loss of confidence of stakeholders including in transport industries and the travelling public.
- Loss of key people or inadequate skills to meet ATSB's requirements.
- Failure to meet statutory obligations.
- Business continuity issues (such as access to information technology and premises).

A separate consultancy has been let to assist ATSB to plan for the risk of a major aviation transport accident (described in the Aviation modal overview section on page 79). Details of risk management are

being developed as part of ATSB's detailed business planning process and a departmental-wide process to be completed by December 2000.

People profile

ATSB comprises people dedicated to making transport safer and preventing transport deaths and injuries through efficient and cost-effective measures.

ATSB understands that the only way it can deliver the service results expected by the Federal Government is to harness the full capacity and energy of its people. To ensure excellence, ATSB seeks to have well trained leaders and professional staff and good management systems in place and ensure that the DoTRS 'Linking People with Business' policy is understood and utilised. Remuneration must be fair and linked to business priorities within the constraints of the ATSB budget. Teamwork is strongly encouraged. Diversity is valued and ATSB seeks to meet the goals of DoTRS' workplace diversity program by encouraging a diverse range of people to work in ATSB, by encouraging people to develop their diverse skills, by recognising and using diversity and by ensuring the working environment and systems support diversity.

Classification Level	Projected average staffing level 2000–2001
SES Band 2	1.0
SES Band 1	2.5
Transport Safety Investigator 4	3.0
Transport Safety Investigator 3	7.0
Transport Safety Investigator 2	35.5
Transport Safety Investigator 1	6.0
Executive Level 2	6.0
Executive Level 1	10.0
Australian Public Service 6	13.0
Australian Public Service 5	10.0
Australian Public Service 4	10.0
Australian Public Service 3	7.0
Australian Public Service 2	5.0
TOTAL	116.0

Neil Ingram
Safety Support

ATSB's people strive to communicate openly, respectfully and with appropriate frequency and provide each other with regular feedback. Issues identified in staff surveys are followed up. New recruits to the ATSB are supported to ensure that they can be fully effective as soon as possible and key lessons from those departing are captured through exit interviews as part of the implementation of the DoTRS 'Leadership Checklinks' process. Particular accomplishments are highlighted in quarterly reward and recognition arrangements. Coaching, mentoring and skill transfer and backup are part of planning and risk management as well as more traditional forms of training and development. The 'Investors in People' lessons continue to be applied, including evaluating training to ensure that development activities are linked to the results ATSB's people are expected to deliver.

Training and development

ATSB places a high priority on learning and development needs. ATSB is a professional knowledge-based organisation which will retain and build its reputation only if it continues to invest in its people to ensure the currency of their knowledge. As part of performance exchange with supervisors, people at ATSB discuss and agree on learning and development needs for a 6-month planning period and report 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 simulator training and external seminars and courses including Studybank.

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 to ensure continuity of operation. ATSB carefully monitors the age profile of its workforce to ensure that recruitment strategies in specific areas such as Transport Safety Investigators match the expected departures. Sixteen people joined the ATSB in 1999–2000 and 16 people departed. In addition, ATSB employed 11 non-ongoing staff to cover lead times in filling vacant positions and staff absences. ATSB maintains up-to-date consultancy lists particularly in safety research to ensure that non-ATSB resources are available if required.

Dennis Drage and Kate Harris
Safety Support

Occupational health and safety

All ATSB investigators receive specific training on occupational health and safety (OH&S) as part of induction courses. This is a training requirement that forms an essential part of on-site investigation management. In addition, investigators receive up-to-date innoculations against a range of possible hazards to be encountered in field investigation.

In 1999 COMCARE Australia undertook an external audit of OH&S arrangements within ATSB. Overall, the audit determined that the level of operational OH&S issues within the ATSB was well covered. Deficiencies identified, such as appropriate documentation, have since been addressed. A need was also identified to compare the extent of ATSB OH&S compensation claims with other parts of DoTRS.

Following the audit, the ATSB developed a training schedule for all people with supervisory responsibilities to ensure full awareness of requirements under OH&S legislation. As at 1 August 2000, eight officers had completed OH&S training provided by Workcover Australia; remaining officers are to complete training by later in 2000.

A health initiative sponsored by ATSB was to offer innoculations against influenza. Forty-one per cent of ATSB took up the offer. It is anticipated that a reduction in the number of sick leave absences would offset the costs incurred in providing the innoculations.

Future plans

Projects to be undertaken in 2000–2001 include:

- Finalisation of the National Road Safety Strategy to 2010 and first Action Plan.
- Monitoring implementation of the recommendations of the Roaduser International Report on heavy truck vehicle vibration and stability.
- Contribution to the development of a Heavy Vehicle Safety Strategy including establishment and maintenance of the Heavy Vehicle Crash Database and targeted research on fatigue.
- Development of rail safety legislation and the ATSB rail investigation function.
- Development of a national rail safety occurrence database.
- Completion of Qantas QF1 Bangkok accident investigation.
- Completion of Avgas fuel contamination investigation.
- Completion of Whyalla Airlines Flight 904 investigation.
- OASIS aviation database improvements.
- Preparation for a major air accident investigation.
- Fuel starvation and exhaustion occurrences analysis.
- Safety study of birdstrikes.
- 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.
- Analysis of 1999 data from the Systemic Incident Analysis Model.
- Finalisation of risk management consultancy.
- Publication of ATSB annual review in line with recommendations of the McGrath report including an overview of modal safety data.
- Development of a single integrated Internet web site for the ATSB with online access as per Government requirements.
- Review of ATSB publications and better targeting to improve safety impact.

In addition, because of the nature of the reactive investigation work of the ATSB, many other investigations are expected to be undertaken in 2000–2001 which were unknown at the start of the new financial year.

Lisi Bromley
Communications and Information

Other major tasks to be completed in 2000–2001 include evaluating the changed aviation investigation arrangements, considering better ways to write occurrence reports, developing multi modal investigatior training and contributing to the Federal Government's policy for reviews of corporate services and of output prices.

Details of outputs for which ATSB has primary responsibility under the 2000–2001 Portfolio Budget Statements are shown at Appendix 11.

John Collis, Brian Versey and Olivia Sherwood
Research Management and Strategy

Appendixes

Appendix 1: Performance against 1999–2000 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 International Maritime Organisation (IMO) and International Civil Aviation Organisation (ICAO).	*[No performance measures included in the 1999–2000 Portfolio Budget Statements.]*	**1.** ATSB submitted papers to, and participated in, a subcommittee session of the IMO in London. As a result ATSB is to collate and analyse member States' reports on accidents involving lifeboats, which currently feature in a significant number of accidents. ATSB participated in an ICAO Accident Investigation and Prevention Group Divisional meeting over two weeks in September 1999 in Canada.
2. Participate in, and provide policy support and/or secretariat services to committees and working groups: • the Australian Transport Council (ATC) and its sub-structure.	*Quality:* facilitate the deliberations of the planning groups to the satisfaction of the Chair and other members through relevant contributions and assistance in the consideration of various stakeholder views. *Timeliness:* provision of briefing and meeting papers, and resolution of actions, within required timeframes. *Quantity:* two ATC meetings; two Standing Committee on Transport (SCOT) meetings.	**2.** ATSB attended and assisted at two ATC meetings and two SCOT meetings, in particular addressing the National Road Safety Strategy, the rail safety review, and rail investigation.
3. Provide policy advice to the Minister on road transport safety and environmental issues, including: • development of a revised National Road Safety Strategy (NRSS).	*Timeliness:* NRSS by end-1999.	**3.** It is expected that the NRSS from 2001 to 2010 will be launched in November 2000. Completion of the NRSS was delayed to achieve Road Safety Panel consensus and following a SCOT decision to seek further ATC guidance in May 2000.
4. Review national rail safety arrangements and develop a national rail safety regime and associated processes.	*Quality:* in accordance with the ATC directive on safety. *Timeliness:* review of safety arrangements agreed by ATC by November 1999.	**4**. Rail safety review by Booz -Allen & Hamilton completed in accordance with ATC request and report released by ATC in November 1999.

Portfolio Budget Statements output 2.2 — Safety investigations

Activity	*Performance measures*	*Performance achieved*
Air transport safety and security investigation services:	*Quality:* notifications of those actions considered sufficiently serious and on which appropriate safety actions are taken.	**5.** One hundred and thirty occurrence reports were published.
5. Publicly released individual occurrence reports resulting from air transport safety investigations.	Acceptance of recommendations arising from aviation safety-related projects by aviation industry.	**6.** CAIR notifications totalling 164 were issued — within 15 days of receipt.
6. Confidential Aviation Incident Reporting System (CAIR) reports resulting in issue of alert bulletins.	All data analysis projects result in publication of results.	**7.** A summary of a maintenance error project was published in the March–April 2000 CASA *Flight Safety Australia* magazine.
7. Aviation safety-related projects.	*Quantity:* resourced to investigate up to 40 average safety deficiencies resulting in safety recommendations and safety advisory notices.	**8.** Three aviation occurrence data analysis projects are nearing completion on: helicopter accidents, occurrences involving fuel starvation or exhaustion, and the Systemic Incident Analysis Model. The forecast number of projects was not achieved due to diversion of resources to investigation report backlogs.
8. Aviation occurrence data analysis.	Resourced to publish up to 120 occurrence reports.	**9.** Sixty-six safety deficiencies resulting in safety recommendations and safety advisory notices were investigated. Ninety-five per cent of safety deficiencies were assessed and actioned within one month of notification.
9. Investigation of safety deficiencies resulting in safety recommendations and safety advisory notices to Civil Aviation Safety Authority (CASA), Airservices Australia, and other agencies and industry, addressing safety concerns arising from investigations.	Resourced to issue up to 150 notifications resulting from CAIR reports.	
	Resourced to undertake up to four data analysis projects.	
	Timeliness: notifications of sufficiently serious incidents, by CAIR reports issued within 15 days of receipt.	
	Aviation safety-related projects completed within 12 months of commencement.	
	Each safety-deficiency issue assessed and appropriately actioned within one month.	

Portfolio Budget Statements output 3.2 — Administration of programs and grants for communities

Activity	*Performance measures*	*Performance achieved*
12. Administer the Road Safety Black Spot Program.	*Quality:* Government and community satisfaction with the administration of the program, overall, and for 1999–2000. *Quantity:* administer one program per State and Territory, 400 projects. *Timeliness:* timely preparation of State and Territory programs. Progressive payments to States and Territories, based on confirmation of program delivery. *Location:* 50 per cent in rural locations.	**12**. All State and Territory programs approved, comprising 381 projects. Of these, 154 were in rural locations, involving funding of $19.3 million of a total of $37.687 million (includes $0.498 million Public Education funds). Notes on administration for the program were revised and are expected to be distributed in the 2000–2001 financial year. 51 per cent of funding was approved for rural locations.

Portfolio Budget Statements output 4.2 — Safety education and information

Activity	*Performance measures*	*Performance achieved*
13. Develop a road safety research program, and fund and administer selected research projects to underpin the development and imple-mentation of road safety policies and strategies. Promote research findings.	*Quality:* research data contribute to policies and strategies. Contracted research is undertaken in line with set specifications. *Quantity:* approximately 30 projects totalling $2 million. *Timeliness:* 12 safety research projects completed by June 2000. Further 10 safety research projects to be completed by June 2001.	**13.** With the creation of the Australian Transport Safety Bureau funding and relevant performance measures were equally divided with Land Transport Division. Of the 15 projects totalling $1 million allocated to the ATSB, six were completed by the end of June 2000. Research data contributed to House of Representative inquiries into fatigue and substance abuse.

Activity	*Performance measures*	*Performance achieved*
14. Facilitate and publish 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. *Quantity:* publish 25 statistical reports. *Timeliness:* as required and in line with administrative and policy requirements.	**14.** Twenty-two statistical reports were published. Work on a Heavy Vehicle Crash Database continued.
Publish and distribute aviation safety reports and bulletins: **15.** *Regional Airlines Safety* Bulletins. **16.** Aviation Safety Deficiency reports. **17.** *Asia Pacific Air Safety* journal. **18.** Quarterly reports consolidating occurrence investigation information. **19.** Weekly summary of occurrence reports.	*Quality:* acceptance and utilisation of *Regional Airlines Safety* Bulletins by the aviation industry. Acceptance of Safety Deficiency reports and utilisation by the aviation industry. Acceptance of *Asia Pacific Air Safety* journal by subscribers. Industry satisfaction with occurrence investigation information. Recipient satisfaction with occurrence reports information. *Quantity:* four *Regional Airlines Safety* Bulletins. Four Aviation Safety Deficiency Reports. Fifty-two weekly summaries of occurrence reports. *Timeliness:* each publication of *Regional Airlines Safety* Bulletin within three months of the quarter reported. Quarterly occurrence investigation reports completed within three months of the quarter under review. Publication of summary reports within one week of period under review.	**15.** Two *Regional Airlines Safety* Bulletin published. Resources needed for higher priority tasks including the Mobil fuel contamination investigation. **16.** Four Aviation Safety Deficiency reports were published. **17.** One edition of *Asia-Pacific Air Safety* was published. After one quarter, it was replaced by a bi-monthly supplement in Civil Aviation Safety Authority's *Flight Safety Australia* magazine. **18.** Reports were not produced to avoid duplication of information available by direct request, on the web site and in other ATSB reports and bulletins. **19.** Fifty weekly summaries of occurrence reports were published — within one week of period of review. Reports were not produced during the Christmas period.

Activity	*Performance measures*	*Performance achieved*
Management of air transport safety communications services: **20**. Air safety-related data provided to inquirers following database searches. **21.** Attendance at inquests and legal hearings to provide expert advice and evidence. **22.** Subpoenas and writs of non-disclosure to produce documents and information. **23.** Maintenance of the BASI web site as a major repository for up-to-date safety information produced by BASI. **24**. Presentations to industry, conferences, etc.	*Quality:* requests for air safety-related data met to the satisfaction of inquirers, taking into account constraints to the extent of information that can be divulged under legislation. Advice and evidence at inquests and legal hearings that satisfy inquirers. Evidence that the BASI web site is being utilised to meet demands for aviation safety information. Presentations to industry of appropriate professional and technical standard to satisfy audience. Provision of information that fully meets requirements of request to satisfaction of inquirers under subpoenas and writs. *Quantity:* resourced for up to 2500 responses to requests for air safety-related information. Resourced for up to 30 Freedom of Information requests. Resourced for up to 10 inquests and legal hearings. Resourced for up to 50 responses to subpoenas and writs. Resourced for up to 2500 pages of downloaded information per day. Resourced for up to 200 presentations delivered as required. *Timeliness:* 90 per cent inquiries satisfied within 10 days of receipt. Expert advice and evidence in accordance with requirements of legal authorities. Data available on web site within one week of request. Presentations delivered as required.	**20**. Requests for 1986 pieces of safety information were met. The performance target for safety information is demand-driven and proved to be an overestimate as increasing use was made of web site data. There were 38 Freedom of Information requests actioned in accordance with the required timeframes of the *Freedom of information Act 1982*. Two resulted in challenged decisions resolved by internal review. No appeals were made to the Administrative Appeals Tribunal. One request did not meet a mandatory deadline by five days due to delays in locating an archived file. **21**. Ten inquests and legal hearings were attended. **22**. Twenty-three subpoenas and writs of non-disclosure were responded to. The performance target for subpoenas and writs is demand-driven and proved to be an overestimate. **23**. BASI's web site was incorporated into a new ATSB web site and updated daily. Average number of pages of downloaded information per day: BASI: 7118 rest of ATSB: 1734. **24**. One hundred and sixty-nine presentations to industry, conferences, etc. were delivered. Performance measure of 200 proved an overestimate.

Portfolio Budget Statement output 4.4 — Administration of programs and grants for industry

Activity	*Performance measures*	*Performance achieved*
25. Administer contribution to Organisation for Economic Cooperation and Development (OECD) — road transport.	*Timeliness:* payment expected to be made by August 1999.	**25.** Payments to OECD totalling $0.028 million were made in 1999–2000. Future payments will be made by Land Transport Division.

Administered Item 1.2 — Grants to states and territories and local government

Activity	*Performance measures*	*Performance achieved*
26. Road Safety Black Spot Program.	*Outcome:* the initiative will have the direct effect of improving the safety of Australia's roads and in doing so reduce the cost of road trauma. *Quantity:* approximately 400 projects. Payments of $37.793 million. *Location:* 50 per cent in rural and regional Australia.	**26.** All State and Territory programs approved, comprising 381 projects. Of these, 154 projects valued at $19.3 million were in rural and regional Australia. Total payments of $37.687 million (includes $0.498 million Public Education funds) were made in 1999–2000. An evaluation of the Black Spot Program commenced in May 2000 and is expected to be completed by December 2000.

Administered Item 2.1 — Services for industry and economic development

Activity	*Performance measures*	*Performance achieved*
27. Contribution to OECD — road transport.	*Outcome:* improved inter-national competitiveness of road transport facilities to assist economic and employment growth across Australia's regions. *Quantity:* payments of $0.04 million.	**27.** Payment to OECD of $0.028 million was made. Payment below $0.040 million forecast as OECD sought a lower contribution than expected. Future payments will be made by Land Transport Division.

Appendix 2: Statistical, research and investigation reports publicly released in 1999–2000

The following publications were publicly released during 1999–2000. Most publications are available on the ATSB Internet web site or can be obtained by telephoning 1800 621 372.

Road safety statistical reports

- Twelve issues of the monthly bulletin *Road Fatalities Australia*.
- Annual statistical report *Road Fatalities Australia: 1998 Statistical Summary.*
- Collaborative report *Road Fatalities in the Farming Community* undertaken with the Australian Centre for Agricultural Health and Safety.
- Monograph 27 *Road Risk for Sober, Licensed Motorcyclists.*
- Monograph 29 *Alcohol and Road fatalities in Australia 1997.*
- Monograph 30 *International Tourists and Road Risk.*
- Research Report OR 22 *Estimating Road Trauma in the Australian Indigenous Population.*
- Research Report CR 181 *Vehicle Compatibility: Analysis of Fatal Crashes.*
- *Benchmarking Road Safety: The 1997 Report.*
- *Articulated Truck Crash Analysis* (Preliminary report).
- *Articulated Truck Crash Analysis* (Final report).

Road safety research reports

- *Perceptual Countermeasures: Experimental Research* (CR 182).
- *Drink Driving Offenders in a Rural Community: A Profile of Drink Driving Offenders in Regional Queensland* (CR 183).
- *Drink Driving Rehabilitation: the Present Context* (CR 184).
- *Community Attitudes to Road Safety: Community Attitudes Survey Wave 12, 1999* (CR 188).

Aviation safety occurrence investigation reports

Occurrence date	Aircraft involved	Occurrence location	State
06-Apr-95	Kawasaki	Moonee	NSW
26-Feb-97	Hughes Helicopter	32km E Gladstone, Aerodrome	QLD
10-Jul-97	British Aerospace	Epping, Locator	VIC
09-Nov-97	De Havilland	Papua New Guinea	Other
11-Dec-97	British Aerospace	1km NNW Cairns, Aerodrome	QLD
01-Mar-98	Air Tractor	Mount Gambier, Aerodrome	SA
26-Apr-98	Cessna	16km W Eucumbene	NSW
29-May-98	Boeing, Fairchild	22km NE Sydney, Aerodrome	NSW
06-Jun-98	Piper	2km NE Hoxton Park, Aerodrome	NSW
29-Jun-98	Mooney	15km S Leonora, Aerodrome	WA
22-Jul-98	Boeing, Fairchild	Sydney, Aerodrome	NSW
03-Aug-98	De Havilland, Boeing	13km E Brisbane, Aerodrome	QLD
07-Aug-98	Grumman	Minlaton, (ALA)	SA
14-Aug-98	Air Tractor	19km E Rocky Gully	WA
18-Aug-98	Bell Helicopter	Mount Coot-tha, (ALA)	QLD
19-Aug-98	Embraer-Empresa Brasileira De Aeronautica, Fairchild and Beech	30km E Mitton Creek, (ALA)	QLD
21-Aug-98	Cessna	Badu Island	QLD
02-Sep-98	Piper	Olympic Dam, Aerodrome	SA
02-Sep-98	Cessna	Dalgety Downs Station	WA
14-Sep-98	Fairchild, Cessna	Perth, Aerodrome	WA
18-Sep-98	Boeing, British Aerospace	93km SW Lord Howe Island	Other
19-Sep-98	Bell Helicopter	2km W Kajabbi	QLD
19-Sep-98	Beech	Canning Vale	WA
21-Sep-98	Boeing x 2	9km S Bindook, VOR	NSW
23-Sep-98	Beech, Boeing x 2	Melbourne, Aerodrome	VIC
25 Sep 98	Boeing x 2	19km W VIMAV	Other
26-Sep-98	Boeing, Pilatus	Adelaide, Aerodrome	SA
30-Sep-98	Piper	Kilfera Station, 24 km SW Ivanhoe	NSW
4-Oct-98	Fairchild, Cessna	Avalon, Aerodrome	VIC
06-Oct-98	Airbus and Unknown	28km SE Perth, Aerodrome	WA
10-Oct-98	Cessna	15km W Cobar, Aerodrome	NSW
15-Oct-98	Lockheed	Melbourne, Aerodrome	VIC
20-Oct-98	Beech	Coffs Harbour, Aerodrome	NSW
20-Oct-98	Pilatus	19km SSE Port Augusta	SA
21-Oct-98	Aero Commander	Horn Island, Aerodrome	QLD

26-Oct-98	Boeing	BIDDY	WA
29-Oct-98	Boeing x 2	Oodnadatta	SA
07-Nov-98	De Havilland, AA Corp	Canberra, Aerodrome	ACT
10-Nov-98	Beech	Coen Township, (ALA)	QLD
10-Nov-98	Beech and Saab	9km SW Lismore	NSW
13-Nov-98	Embraer-Empresa B. De.	Bundaberg, Aerodrome	QLD
14-Nov-98	British Aerospace	80km SW Cairns, Aerodrome	QLD
20-Nov-98	Fokker B.V. and Airbus	228km N Perth, Aerodrome	WA
21-Nov-98	Cessna	120km W Kalgoorlie Aerodrome	WA
26-Nov-98	Piper	King Island, Aerodrome	TAS
28-Nov-98	Boeing	100 Km SE London	Other
29-Nov-98	Cessna	22km NE Kingscote, Aerodrome	SA
05-Dec-98	De Havilland	Palm Meadows Golf Course	QLD
06-Dec-98	Gates Learjet and Piper	Williamtown, Aerodrome	NSW
15-Dec-98	Boeing, McDonnell Douglas	80km NW Taroom, VOR	QLD
28-Dec-98	Lockheed, Cessna	Tasman Sea	Other
28-Dec-98	Piper and S.O.C.A.T.A.	Bankstown, Aerodrome	NSW
28-Dec-98	*** RAAF, Cessna	Bermagui	NSW
02-Jan-99	Piper	37km E Coolah, Aerodrome	NSW
04-Jan-99	Boeing x 2	37km SSW Mudgee, VOR	NSW
06-Jan-99	Amateur Built Aircraft	Brisbane Water	NSW
10-Jan-99	Cessna	Maroochydore/Sunshine Coast	QLD
16-Jan-99	Britten Norman	Coconut Island, (ALA)	QLD
17-Jan-99	Boeing	Sydney, Aerodrome	NSW
19-Jan-99	Fokker BV, Cessna	4km E Perth, Aerodrome	WA
26-Jan-99	Aerospatiale	Perth	WA
03-Feb-99	Robinson Helicopter	9km ENE Fossil Downs Station	WA
04-Feb-99	De Havilland, Burkhart Grob Flugzeugbau	28km SE Mildura, Aerodrome	VIC
11-Feb-99	Cessna	Port Hedland, Aerodrome	WA
15-Feb-99	Piper	Norfolk Island, Aerodrome	Other
19-Feb-99	Airbus	Townsville, Aerodrome	QLD
20-Feb-99	Agusta, SPA, C Aeronautiche	26km ESE Holbrook, (ALA)	NSW
27-Feb-99	Hughes Helicopter	9km E Ceduna, Aerodrome	SA
03-Mar-99	Airbus	Coolangatta, Aerodrome	QLD
05-Mar-99	Swearingen Aviation	54km NNW Launceston, VOR	TAS
07-Mar-99	Bell Helicopter	282km NNW Coober Pedy	SA
10-Mar-99	Pitts Aviation, Beech	Hoxton Park, Aerodrome	NSW
12-Mar-99	Bell Helicopter	5km SE Cairns, VOR	QLD
12-Mar-99	Short Bros, Cessna	4km N Cairns, Aerodrome	QLD
18-Mar-99	Airbus	150km SW Sydney, Aerodrome	NSW
24-Mar-99	Cessna, Aero Commander	9km NNW Cairns, Aerodrome	QLD

28-Mar-99	Piper Aircraft	28km W Pittsworth	QLD
28-Mar-99	Saab	Bindook, VOR	NSW
02-Apr-99	Amateur Built Aircraft	3km NE Aldinga Aerodrome	SA
07-Apr-99	Boeing x 2	22km NNW Sydney, VOR	NSW
18-Apr-99	Boeing x 2	185km N KIMMI	QLD
23-Apr-99	Boeing x 2	Brisbane, Aerodrome	QLD
24-Apr-99	Boeing	167km ENE Adelaide, VOR	SA
28-Apr-99	Boeing	Sydney, Aerodrome	NSW
01-May-99	HEDARO	Archerfield, Aerodrome	QLD
03-May-99	Boeing x 2	13km E Cairns, Aerodrome	QLD
14-May-99	Piper, Saab	Sydney, Aerodrome	NSW
19-May-99	Beech	46km SW Wilcannia, (ALA)	NSW
20-May-99	British Aerospace	22km NNE Brisbane, Localiser	QLD
20-May-99	Airbus	22km NNE Brisbane, Localiser	QLD
22-May-99	Boeing x 2	15km NNW Melbourne	VIC
26-May-99	Boeing	22km N Sydney, VOR	NSW
28-May-99	Saab, Cessna	Shellys, Non Directional Beacon	NSW
30-May-99	Cwth Aircraft Corp	Nowra, Aerodrome	NSW
06-Jun-99	Boeing	20km NNW Cairns	QLD
09-Jun-99	Boeing	700km NE Sydney, Aerodrome	Other
22-Jun-99	Boeing	37km E Brisbane, Aerodrome	QLD
27-Jun-99	Boeing	Coolangatta, Aerodrome	QLD
02-Jul-99	Airbus	Canberra, Aerodrome	ACT
09-Jul-99	Robinson Helicopter	Ross River Homestead	NT
17-Jul-99	Lockheed Georgia	Richmond, Aerodrome	NSW
18-Jul-99	Boeing and Beech	3km WNW Melbourne, VOR	VIC
25-Jul-99	Fairchild, De Havilland	2km NNE Latrobe Valley	VIC
28-Jul-99	British Aerospace, Swearingen Aviation and British Aerospace	9km NNE Brisbane, Aerodrome	QLD
04-Aug-99	Sikorsky	Barrow Island, Aerodrome	WA
06-Aug-99	Fokker B.V. x 2	130km S Carnarvon, VOR	WA
02-Sep-99	Saab and Boeing	Sydney, Aerodrome	NSW
02-Sep-99	Boeing	Perth, Aerodrome	WA
03-Sep-99	Piper, Saab	Griffith, Aerodrome	NSW
10-Sep-99	* Beech	Williamtown, Aerodrome	NSW
23-Sep-99	** Boeing	Bangkok, Aerodrome	Other
10-Oct-99	Bell Helicopter	World Trade Centre, (ALA)	VIC
11-Oct-99	De Havilland, Piper	10km NE Dubbo, Aerodrome	NSW
11-Oct-99	Pacific Aerospace Corporation	Tamworth, Aerodrome	NSW
14-Oct-99	Cessna	7km NE Esk	QLD
14-Oct-99	Piper	Mackay, Aerodrome	QLD

15-Oct-99	Kawasaki	Joondalup Lake	WA
18-Oct-99	Boeing x 2	28km NW Wagga Wagga, VOR	NSW
25-Oct-99	Airbus	Melbourne, Aerodrome	VIC
04-Nov-99	Boeing	Melbourne, Aerodrome	VIC
09-Nov-99	Embraer-Empresa Brasileira De Aeronautica and Cessna	9km ENE Cairns, VOR	QLD
17-Nov-99	De Havilland, Cessna	13km WSW Cairns, Aerodrome	QLD
17-Nov-99	Mikoyan Gurevich x 2	56km NNW Adelaide, Aerodrome	SA
24-Nov-99	Cessna	83km SSE Mornington Island	QLD
30-Nov-99	Amateur Built Aircraft	Childers, (ALA)	QLD
01-Dec-99	Cessna	6km NE Gisborne	VIC
27-Dec-99	Boeing	Melbourne, Aerodrome	VIC
17-Jan-00	Cessna	Croker Island, Aerodrome	NT
18-Feb-00	* Lockheed Georgia	Darwin, Aerodrome	NT
31-May-00	* Piper	28km SE Whyalla, Aerodrome	SA

** preliminary report*

*** interim factual report*

**** joint investigation with Australian Defence Force, Directorate of Flying Safety*

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 were publicly released during 1999–2000.

Safety deficiency notification number	Subject	Addressee
R199900195	Kawasaki 47G3B-KH4 engine-cooling fan blade fractures	Civil Aviation Safety Authority (CASA)
R199900196	Kawasaki 47G3B-KH4 engine-cooling fan blade fractures	CASA
R199900197	Kawasaki 47G3B-KH4 engine-cooling fan blade fractures	Kawasaki
R20000025	General Electric CF6-80A engine second-stage turbine blade fracture	General Electric
R20000026	General Electric CF6-80A engine second-stage turbine blade fracture	General Electric

SAN20000027	General Electric CF6-80A engine second-stage turbine blade fracture	Federal Aviation Administration (FAA), USA
R20000040	Reliability of Norfolk Island forecasts	CASA
R20000003	Facilities at Cairns Airport to allow the Aviation Rescue and Fire Fighting (ARFF) to launch its water rescue boat	ARFF Unit
R19990220	Management of Flight Services	Airservices Australia (AsA)
R20000004	Cracking of cold stream nozzles of Rolls Royce RB524D4 engines	Rolls Royce Ltd
R20000005	Cracking of cold stream nozzles of Rolls Royce RB524D4 engines	Civil Aviation Authority (CAA), UK
R20000006	Cracking of cold stream nozzles of Rolls Royce RB524D4 engines	FAA, USA
R20000007	Cracking of cold stream nozzles of Rolls Royce RB524D4 engines	Rolls Royce Ltd
R20000008	Cracking of cold stream nozzles of Rolls Royce RB524D4 engines	CAA, UK
R20000009	Cracking of cold stream nozzles of Rolls Royce RB524D4 engines	FAA, USA
R20000010	Cracking of cold stream nozzles of Rolls Royce RB524D4 engines	CASA
R19980258	CAO fuel tank drain requirements for light aircraft	CASA
IR19990187	Cessna 300/400 series trim tab actuators	Cessna Aircraft Corporation
SAN19990188	Cessna 300/400 series trim tab actuators	CASA
SAN19990189	Cessna 300/400 series trim tab actuators	FAA, USA
SAN19990218	Cessna 300/400 series trim tab actuators	National Transportation Safety Board (NTSB), USA
R19990109	Single vacuum pump power source in private instrument flight rules aircraft	CASA
R19990110	Single vacuum pump power source in private instrument flight rules aircraft	CASA
IR19990190	In-flight emergency response (IFER) practices and procedures by military air traffic control officers	Australian Defence Force
IR19990150	Passenger oxygen system and cabin altitude alert systems in Beechcraft Super King Air 200 aircraft	Raytheon Aircraft
IR19990151	Passenger oxygen system and cabin altitude alert systems in Beechcraft Super King Air 200 aircraft	CASA
IR19990152	Passenger oxygen system and cabin altitude alert systems in Beechcraft Super King Air 200 aircraft	FAA, USA

IR19990153	Passenger oxygen system and cabin altitude alert systems in Beechcraft Super King Air 200 aircraft	Raytheon Aircraft
IR19990154	Passenger oxygen system and cabin altitude alert systems in Beechcraft Super King Air 200 aircraft	CASA
IR19990155	Passenger oxygen system and cabin altitude alert systems in Beechcraft Super King Air 200 aircraft	FAA, USA
IR19990172	Electrical wiring and fuel line proximity	CASA
IR19990173	Electrical wiring and fuel line proximity	FAA, USA
IR19990174	Electrical wiring and fuel line proximity	Raytheon Aircraft
R19980156	System Investigation into factors underlying air safety occurrence in the Sydney terminal area airspace	AsA
R19980157	System Investigation into factors underlying air safety occurrence in the Sydney terminal area airspace	AsA
R19980158	System Investigation into factors underlying air safety occurrence in the Sydney terminal area airspace	AsA
R19980159	System Investigation into factors underlying air safety occurrence in the Sydney terminal area airspace	AsA
R19980160	System Investigation into factors underlying air safety occurrence in the Sydney terminal area airspace	AsA
IR19990112	Uncontained turbine failure – Allied Signal TPE 331 engine	Allied Signal
IR19990113	Uncontained turbine failure – Allied Signal TPE 331 engine	Allied Signal
IR19990114	Uncontained turbine failure – Allied Signal TPE 331 engine	Allied Signal
IR19990115	Uncontained turbine failure – Allied Signal TPE 331 engine	CASA
SAN19990116	Uncontained turbine failure – Allied Signal TPE 331 engine	FAA, USA
SAN19990055	Management of Flight Services	AsA

Other aviation safety reports

Report number	Subject
B98/166	Systemic Investigation into the Class G Airspace Demonstration
QSDR 1/1999	*Quarterly Safety Deficiency Report
QSDR 2/1999	*Quarterly Safety Deficiency Report
QSDR 3/1999	*Quarterly Safety Deficiency Report
QSDR 4/1999	*Quarterly Safety Deficiency Report
RASB 3/1998	Regional Airlines Safety Bulletin
RASB 1/1999	Regional Airlines Safety Bulletin

* *The Quarterly Safety Deficiency Report consolidates and identifies the recommendations and safety advisory notices that have been made in a three-month period.*

Marine safety occurrence investigation reports

Ref. No.	Vessel type	Occurrence type	Occurrence date	Occurrence location
137	Helix	Engine Room Fire	17 Oct 1998	Brisbane (QLD
138	Britoil 22	Contact	18 Nov 1998	Off Coast (WA)
139	Norvantes	Grounding	19 Nov 1998	Karumba (QLD)
140	Iron Spencer	Grounding	3 Dec 1998	Port Hedland (WA)
141	Claudia	Contact	16 Dec 1998	Bass Point (NSW)
142	Tasman	Fire	19 Dec 1998	Melbourne (VIC)
143	Aurora Australis	Engine Room Fire	14 Jan 1999	Off Sth Coast (WA)
144	Cemtex General and Tina	Collision	2 Feb 1999	Off Noosa Head (QLD)
146	Olympic Symphony	Equipment Failure	28 Apr 1999	Moreton Bay (QLD)
147	New Reach	Grounding	17 May 1999	Heath Reef (QLD)
149	Laura D'Amato	Pollution (Oil Spill)	3 Aug 1999	Gore Bay (Sydney)

Rail safety occurrence investigation reports

- Collision between Freight Train 9784 and Ballast Train 9795, Ararat Victoria, 26 November 1999. ATSB conducted this investigation on behalf of the Victorian Government.
- Collision between the Indian Pacific passenger train and a freight train, Zanthus, Western Australia, 18 August 1999. ATSB participated in this investigation at the request of the Western Australian Government.

Appendix 3: Responses to safety recommendations

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

Aviation recommendations

Recommendations issued during the course of an investigation deal with the immediate safety of flight issues, and are prefixed with the letters IR to indicate an Interim Recommendation. Recommendations usually incorporated in a final report are prefixed with the letter R.

Under existing memoranda of understanding both the Civil Aviation Safety Authority (CASA) and Airservices Australia have agreed to respond to the ATSB within 60 days of the date of issue of any safety recommendation.

Recommendations issued:	59
Responses received:	72 *
Responses accepted:	44

* *A response to a recommendation issued before the end of 1998–1999 and received in 1999–2000 is included in these figures.*

The status of the following recommendations was open at 30 June 2000, that is, the ATSB is continuing to monitor actions to address the recommendations (indicated by the code **M**) or additional detail is yet to be provided (indicated by the code **O**).

Note: Additional information may have been provided to the ATSB since 30 June 2000.

Recommendation	Issue date	Receiving organisation	Response due date	Date response received
R19980143/Occurrence 199704287 The Bureau of Air Safety Investigation (BASI) recommends that the Civil Aviation Safety Authority (CASA) develop and publish an effective procedure by which pilots can ensure radio equipment is fully functional prior to flight.	05-Nov-1998	CASA	04-Jan-1999	27-Sep-1999 **M**

Recommendation	Issue date	Receiving organisation	Response due date	Date response received
R19980244/Occurrence 199800067 BASI recommends that Boeing Helicopter Systems review the fuel filter warning light colour and the appropriateness of the Flight Manual instructions that allow a flight to be completed after such a warning.	30-Mar-1999	Boeing Helicopter Systems.	30-May-1999	07-Jul-1999 **O**
R19980281/Occurrence 199802830 BASI recommends that the Civil Aviation Safety Authority mandate the compliance of all manufacturers' service bulletins relating to the provision of upper body restraint to occupants of FAR part 23 certified aircraft engaged in fare-paying passenger operations, and emphasise compliance with their instructions on the correct use of the restraint systems.	31-Mar-1999	CASA	30-May-1999	04-Aug-1999 **M**
IR19990072/Occurrence 199805068 BASI recommends that Saab Aircraft AB fit the ice-speed modification of the stall warning system to the world-wide fleet of Saab 340 aircraft, as a matter of priority.	03-Jun-1999	Saab Aircraft AB	03-Aug-1999	06-Aug-1999 **M**
IR19990076/Occurrence 199805068 BASI recommends that CASA examine the circumstances surrounding this occurrence and take whatever steps it considers necessary to ensure the safety of the Saab 340 fleet operating within Australia.	03-Jun-1999	CASA	03-Aug-1999	13-Aug-1999 **M**
IR19990079/Occurrence 199900970 BASI recommends that CASA amend current procedures/airspace for aircraft operating into and departing from Hoxton Park in order to reduce the potential for further aircraft collisions.	08-Jun-1999	CASA	08-Aug-1999	13-Sep-1999 **O**

Recommendation	Issue date	Receiving organisation	Response due date	Date response received
R19990052/Occurrence 199702276 BASI recommends that CASA, in conjunction with the aircraft manufacturer British Aerospace Plc, address deficiencies that permit the entry of fumes to the cockpit and cabin areas of BAe146 aircraft. These deficiencies should be examined by the regulatory authority as part of its responsibilities for initial certification and continued airworthiness of the BAe 146 Aircraft.	06-Sep-1999	CASA	05-Nov-1999	14-Mar-2000 **M**
R19990140/Investigation Report B98/166 BASI recommends that CASA and the Department of Transport and Regional Services review CASA's corporate governance framework.	23-Nov-1999	CASA	22-Jan-2000	14-Mar-2000 **O**
IR19990151/Occurrence 199902928 BASI recommends that CASA reassess the appropriateness of current maintenance procedures for the testing of automatically deployable passenger oxygen systems and cabin altitude alert systems, to ensure complete system operation.	07-Oct-1999	CASA	07-Dec-1999	28-Jan-2000 **M**
R19990200/Occurrence 19980587 The Directorate of Flying Safety – ADF and the Bureau of Air Safety Investigation (ATSB) recommends that CASA, in conjunction with AusSAR and Airservices Australia, determines appropriate separation standards for the safe operation of aircraft involved in search and rescue operations.	04-Jan-2000	CASA	04-Mar-2000	18-Apr-2000 **O**
R20000010/Occurrence 199906038 ATSB recommends that CASA review Rolls Royce RB211-524D4 engine cold stream nozzle inspection crieria to minimise the possibility of failure during operation.	07-Jan-2000	CASA	07-Mar-2000	**O**

Recommendation	Issue date	Receiving organisation	Response due date	Date response received
R20000009/Occurrence 199906038 ATSB recommends that the US Federal Aviation Administration review Rolls Royce RB211-524D4 engine cold-stream nozzle inspection criteria to minimise the possibility of failure during operation.	07-Jan-2000	US Federal Aviation Administration	10-Mar-2000	25-Jan-2000 **M**
R20000006/Occurrence 199906038 ATSB recommends that the US Federal Aviation Administration notify all operators under its jurisdiction using Rolls Royce RB211-524D4 or similar engines, of the possibility of failure of the cold-stream nozzle during operation.	07-Jan-2000	US Federal Aviation Administration	10-Mar-2000	25-Jan-2000 **M**
R20000003/Occurrence 199901009 ATSB recommends that the Aviation Rescue and Fire Fighting (ARFF) unit and Cairns Port Authority examine the adequacy of current launch facilities for the ARFF rescue boat against the benefits that might accrue from a launch ramp on or adjacent to the airport.	07-Feb-2000	Airservices Australia	07-Apr-2000	08-Mar-2000 **M**

Heavy vehicle recommendations

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.

ATSB was asked to monitor and report on the implementation of the report's 16 recommendations. ATSB wrote on 18 April 2000 to a number of organisations and vehicle manufacturers that will be responsible for implementing particular recommendations, seeking advice on intended actions (see page 55 for further details).

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

Recommendations 1, 2, 5 and 10: Vehicle manufacturers, with the cooperation of owners, are the only group able to rectify the identified problems associated with specific vehicles. The status of actions follow.

No	Recommendation	Status
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.	Ford, Kenworth and Mack have all responded. • Ford (which primary carriage) has taken action on this recommendation, and is progressing toward rectification of all affected vehicles; • Kenworth intends to review the specification of all its vehicles that have the WD2-460 suspension, to identify any customer concerns; • Mack has advised that it does not use suspensions with the identified behavioural characteristics.
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.	Ford, Kenworth and Mack have all responded. • Ford – *refer to comments above*; • Kenworth – *refer to comments above*; • Mack has stated that it does not use the Hendrickson WD2-460 suspension.
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.	Kenworth and Mack have responded (*the Ford vehicle tested did not need action with relation to increased steering effort*). Both Kenworth and Mack commented that the vehicles were tested on a relative basis (against benchmark vehicles), and the report does not identify a standard that the vehicles are required to achieve. ATSB is following up with Roaduser International.
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.	Ford, Kenworth and Mack have all responded. • Ford — *refer to comments above*; • Kenworth — considers no action necessary. ATSB is assessing response. • Mack — advised that non-standard suspension on vehicle F4 may be contributing to that vehicle's problems. ATSB is assessing response.

Recommendations 3, 4, 6, 7, 8, 9 and 12: relate to improvements to vehicle design practice and standards. They are to 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.

No	Recommendation
3.	Action should be taken to ensure that manufacturers do not in future build 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 which makes them unduly sensitive to the fitment of softer front springs, should be identified. Once robust test methods have been defined, the cooperation 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.

10. 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.

Status

All recipients have responded to this and all following recommendations:

- the State and Territory registering authorities and Kenworth have proposed to work through the Australian Motor Vehicle Certification Board and Technical Liaison Group to progress implementation of these recommendations;
- the Federated Chamber of Automotive Industries has challenged many of the recommendations and focused on the need for better control of the introduction of after-market modifications. The ATSB is assessing this response; and
- Land Transport Division and NRTC are considering their relationship and roles with respect to the implementation of the recommendations.

Recommendations 11, 13, 14, 15 and 16: relate to research and will be considered as part of the Department of Transport and Regional Services research program. Advice will be sought from groups including the NRTC, Austroads and the Federated Chamber of Automotive Industries. The recommendations have also been drawn to the attention of the House of Representatives Standing Committee on Communications, Transport and the Arts inquiring into fatigue.

Appendix 4: Occurrence categories

Aviation occurrence categories as at 30 June 2000

Category 1

Category 1 accidents and incidents (hereafter called 'occurrences') are those where the facts indicate a significant threat to the safety of the travelling public or are the subject of widespread public interest and a Commission of Inquiry is instituted.

Category 2

Category 2 occurrences are those where the facts indicate a significant threat to the safety of the travelling public or are the subject of widespread public interest. A Commission of Inquiry is not instituted.

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, which from trend or safety analysis require investigation.

Category 5

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

Marine occurrence categories

The Inspector of Marine Accidents is a statutory appointment under the provisions of the Navigation (Marine Casualty) Regulations. The Inspector has discretionary powers to investigate any marine 'incident', as defined by the Regulations, that comes within the Commonwealth's jurisdiction. It is neither practicable nor desirable to investigate all such incidents. However, it is policy to investigate all incidents that fall within the categories of a 'very serious' or 'serious' casualty as defined under the International Maritime Organization circular 'Reports on Casualties and Incidents' (MSC/Circ. 827, MEPC/Circ. 333). Other incidents, that may suggest a trend or potential trend in unsafe operation, are investigated in an attempt to pre-empt serious accidents.

Appendix 5: Aviation safety magazine articles in 1999–2000

ATSB's Asia-Pacific Air Safety *magazine September 1999*

- *ATSB – a new challenge* by Dr Rob Lee.
- *The ATSB – an introduction* by Mr Kym Bills.
- *Fuel for thought* – discusses misfuelling issues.
- *Defence sense: avoiding low-level military traffic.*
- *Clear to land – or is it?* – discusses how difficult it can be to see an aircraft on a runway from the cockpit of an aircraft on final approach.
- *Collision avoidance procedures at non-controlled aerodromes.*
- List of investigations finalised 1 April – 30 June 1999.
- *Safety action 1 April-30 June 1999* – details interim recommendations, recommendations and safety advisory notices issued in the period.
- *Preliminary investigation of the accident of Embraer Bandeirante DQ-AFN*.
- *Air Safety Occurrence Reports* – summarises three reports.
- Letter to the Editor: A *decision-making strategy for pilots.*
- *BASI's Melbourne Office Closed.*
- *Studies reveal passenger misconceptions about brace command and brace position*, by Daniel Johnson, Ph.D, Interaction Research Corporation.
- *Melting moments: understanding carburettor icing* by John Marshall.
- *The Language Barrier* BASI recommends an English language competency requirement for student pilots of non-English speaking background.
- *The new Australian Transport Safety Bureau.*
- Air safety accident or incident reporting form – for reporting under the *Air Navigation Act 1920.*
- Confidential Aviation Incident Reporting (CAIR) system and incident report form.

CASA's Flight Safety Australia *magazine – ATSB Supplement, March – April 2000*

- *Aviation Safety Occurrence Statistics* – from January 1997 to December 1999.
- *The Systemic Incident Analysis Model – a new approach to safety information.*
- List of recently completed investigations.
- *Safety snippets* – summarises three investigation reports: Boeing 747-238 cold stream nozzle cracks; Unforecast weather risk at Norfolk Island; and Tiger Moth crash puzzle.
- *Maintenance 'error'- lessons from the ATSB Survey* [of 1998] by Alan Hobbs.
- *Confidential Aviation Incident Reporting* (CAIR).

CASA's Flight Safety Australia *magazine – ATSB Supplement, May – June 2000*

- List of recently completed investigations.
- S*afety briefs* – summarises three investigation reports: Loss of control in windy conditions; Helicopter crashed after windscreen fog distracted pilot; and Separation infringement after missed approach.
- *Helicopter crash in bad weather.*
- A*nalysing runway incursions*, by Sarah-Jane Crosby.
- *Confidential Aviation Incident Reporting* (CAIR).

Appendix 6: Black Spot Program treatments in 1999–2000

Local Gov.	Treatment location	Estimated cost
New South Wales		
Albury	Roundabout - Burrows Road and Logan Road	$250,000
Armidale	Install medians with upgraded linemarking and signage - Barney St	$45,000
Armidale	install medians with upgraded linemarking and signage - Dangar Stt	$40,000
Auburn	Roundabout - Auburn Rd and Chiswick Rd And Water St	$80,000
Bankstown	Shoulder seal and culvert extension - Henry Lawson Drive	$120,000
Bathurst	Install traffic signals - William St and Howick St	$200,000
Baulkham Hills	Jersey kerb/linemarking/cyclist lane - Renown Rd	$300,000
Baulkham Hills	Reconstruct curves - Old Pitt Town Rd and Terry Rd To George St	$250,000
Blacktown	Roundabout - Prince St and Second Ave	$60,000
Blacktown	Roundabout - Kurrajong Ave and Oxford Lane	$30,000
Broken Hill	Median and right turn channelisation - Oxide St and Wolfram St	$200,000
Byron	Right turn lane - Shirley St and Dryden St	$60,000
Coffs Harbour	Install traffic signals - Pacific Hwy S H 10 and Marcia St	$200,000
Coffs Harbour	Install traffic signals - Pacific Hwy - S H 10 and Thompsons Rd	$200,000
Dubbo	Roundabout - Fitzroy St and Tamworth St	$200,000
Eurobodalla	Widen/seal - George Bass Drive and Illabundah Drive	$350,000
Fairfield	New signals - Fairfield St and Donald St	$85,000
Fairfield	Non-skid surface - Wallgrove, Redmayne and Chandos Rds	$72,000
Fairfield	Ban movements East leg of Malabar St/median island - Sackville St	$15,000
Fairfield	New signals - Fairfield St and Pine Rd	$140,000
Gosford	Redesign roundabout - Ocean Beach Rd and Rawson Rd	$250,000
Gosford	Roundabout - Barrenjoey Rd and Bourke Rd	$200,000
Gosford	Raised seagull island with acceleration lane - Maitland Bay Drive	$100,000
Gosford	Traffic signals and improve channelisation - Terrigal Drive M R 505	$160,000
Goulburn	Channelisation/pedestrian refuges/roundabout - Goldsmith St	$250,000
Great Lakes	Non-skid surface/guardrails - Tea Gardens Rd	$85,000
Great Lakes	Install guardfence and enhance clearzone - The Lakes Way - M R 111	$450,000
Greater Lithgow	Widen pavement/install right turn bays - Main street	$300,000
Hastings	Realign and widen curve/install guardfence - Oxley Hwy	$500,000
Hastings	Realign intersection and provide right turn bay - Rawdon Island Rd	$460,000

Hornsby	Roundabout - Oxford St and Essex St And Chester St	$90,000
Ku-Ring-Gai	New signals - Werona Ave and Powell St	$100,000
Ku-Ring-Gai	Roundabout - Lady Game Drive and Grosvenor Rd	$180,000
Lake Macquarie	Protected right turn bay and left turn lane - St Johns Rd	$70,000
Lake Macquarie	Non-skid surface - Pacific Hwy and Oakdale Rd	$20,000
Lake Macquarie	Pedestrian fencing - Pacific Hwy - S H 10	$40,000
Lake Macquarie	Install painted seagull junction - Warners Bay Rd & Bayview St	$200,000
Liverpool	Install stop signs and central median - Forbes St & Lachlan St	$12,500
Liverpool	Install stop signs and central median - Fourth Ave and Fourteenth Ave	$12,500
Marrickville	Provide mast arm - Marrickville Rd and New Canterbury Rd	$20,000
Marrickville	Mast arm and upgrade signal display - Illawarra Rd and Sydenham Rd	$20,000
Mudgee	Roundabout - Mortimer St and Perry St	$100,000
Nambucca	Modify horizontal alignment and widen pavement - Scotts Head Rd	$210,000
Newcastle	New signals - Stewart Ave (S H 10) and Parkway Ave	$250,000
Newcastle	Non-skid surface - Newcastle Rd - M R 82 and Morehead St	$20,000
Newcastle	Redesign roundabout and signposting - Newcastle Rd	$125,000
Parramatta	Double right turn bays - Marsden Rd and Victoria Rd	$190,000
Penrith	Seal shoulders/edgelines and guideposts - Cranebrook Rd	$100,000
Penrith	Non-skid surface - The Northern Rd and Littlefields Rd	$48,000
Penrith	Seal shoulders - The Northern Rd and Grover Crescent To 200M	$250,000
Penrith	Install traffic signals - Mamre Rd and Saddington St	$100,000
Randwick	New signals - Coogee Bay Rd and Brook St	$90,000
Randwick	Install traffic signals - Anzac Parade and Moverly St	$100,000
Rockdale	Pedestrian signals - Princes Hwy and Bay St, The Seven Ways	$30,000
Rockdale	Protected right turn lane - Bestic St & General Holmes Drive	$150,000
Ryde	New signals - Blaxland Rd and Florence Ave	$80,000
Ryde	Non-skid surface - Lane Cove Rd and Quarry Rd & Hancott St	$52,000
Shellharbour	Pedestrian signals - King St and Queen St	$130,000
South Sydney	Mast arm and upgrade lanterns - Cleveland and Elizabeth Sts.	$30,000
South Sydney	Provide mast arm - Chalmers St and Cleveland St	$20,000
Sutherland	Right turn bays - President Ave and Sylvania Rd & Wyralla Rd	$90,000
Sutherland	Install traffic signals - Birdwood St and Princes Hwy	$130,000
Tweed	Traffic signals with pedestrian crossings - Terranora Terrace and Boyd St	$160,000
Wollongong	Stagger intersection - Campbell St and Thompson St	$200,000
Wollongong	Roundabout - Campbell St and Keira St	$150,000
Wollongong	Roundabout - Fowlers Rd and Lakelands Drive	$90,000

Woollahra	Provide mast arm - New South Head Rd and Ocean St	$20,000
Wyong	Channelisation - seagull turning bay - Pacific Hwy - S H 10 and Johns Rd	$300,000
Wyong	Seagull treatment with left turn deceleration lane - Pacific Hwy	$200,000
Young	Reconstruct and seal - Gunning To Temora Rd	$225,000

Victoria

Banyule	Linemarking to separate traffic - Oriel Rd, Livingstone St, Banksia St	$6,000
Banyule	Double right and split phase - Mcarthur Rd & Burke Rd North	$25,000
Banyule	Install contrasting median right turn lanes line - Sherbourne Rd	$45,000
Banyule	Realignment and delineation - Burke Rd North & Hartlands Rd	$130,000
Cardinia	Seal shoulders/modify turn lanes - Berwick By-Pass and Bayview Rd	$268,000
Cardinia	Shoulder seal/guardrail/signs - Beaconsfield, Quamby Rd & Salisbury Rd	$51,500
Cardinia	Flashing lights to signals ahead warning sign - Princes Hwy and Army Rd	$15,000
Cardinia	Shoulder seal/guardrail/signs - Healesville-Kooweerup Rd and Taylor Rd	$51,500
Cardinia	Roundabout - Wellington Rd and Belgrave - Gembrook Rd	$200,000
Cardinia	Shoulder seal/delineation - Healesville-Kooweerup Rd and Evans Rd	$51,500
Casey	Fully controlled right turn East to South - Heatherton Rd	$10,000
Casey	Roundabout - Codrington St and Lyall St	$40,000
Ballarat	Roundabout - Lydiard St and Chisholm St and Brougham St	$121,000
Ballarat	Roundabout - Macarthur St and Burnbank St	$192,000
Ballarat	Roundabout - Ballarat - Bunnyong Rd and York St	$132,000
Ballarat	Road narrowings/channelisation/kerb extensions - Wendoure Parade	$80,000
Boroondara	Pedestrian fencing - High St and Oswin St and Valerie St	$10,000
Boroondara	Improve lighting - Burwood St and Power St	$3,000
Boroondara	Improve lighting - Riversdale Rd and Auburn Rd	$3,000
Darebin	Fully controlled right turn East & West approaches - Murray Rd	$16,000
Darebin	Fully controlled right turn/kerbworks/linemarking/signage - High St	$25,000
Darebin	Fully controlled right turn East and West - Bell St and St Georges Rd	$50,000
Greater Bendigo	Fealign intersection - Calder Hwy and Olympic Parade	$90,000
Greater Bendigo	Roundabout - Long Gully - White Hills Rd and Prouses Rd	$220,000
Greater Bendigo	New signals - Myrtle St and Hargreaves St	$86,000
Greater Bendigo	Improve lighting - Mcivor Hwy (Pall Mall) and view street to Chapel St	$47,000
Greater Bendigo	Partial control right turn - Calder Hwy and Thistle St	$12,000
Greater Bendigo	Remove cross traffic and provide sheltered right turn - Russell St	$25,000
Greater Bendigo	Realignment and delineation - Elmore - Barnadown Rd and Englishs Rd	$60,000
Greater Bendigo	Channelisation - Thistle St and Breen St	$18,000
Greater Bendigo	Indent angle bays/protected right turn lanes - View St and Waterloo St	$53,000
Greater Bendigo	Widen pavement & contrasting median surface - Thistle St & Myrtle St	$210,000

Hobsons Bay	Roundabout - Melbourne Rd and Stevedore Stt, Station St	$220,000
Monash	Traffic signals - Forster Rd and Ricketts Rd/Hardner Rd	$265,000
Port Phillip	Pedestrian fencing: Fitzroy St & between Park St & Park Lane	$12,000
Port Phillip	Install mast arm - Hotham St and Inkerman St	$10,000
Port Phillip	Install mast arm - Kings Way and Park St	$10,000
Port Phillip	Install mast arm - Hotham St and Alma Rd	$10,000
Port Phillip	New signals plus substantial kerb realignment - Fitzroy St and Grey St Rd	$390,000
Stonnington	Fully controlled right turn North to West - Malvern Rd and Burke Rd	$60,000
Stonnington	Install lanterns on back of existing mast arms - High St and Williams Rd	$4,000
Stonnington	Install mast arm and improve visibility of lanterns - Waverley Rd	$23,000
Whittlesea	Street lighting - Cooper St and Yale Drive And Merri Creek	$27,000
Yarra	Off-peak fully controlled right turn from East approach - Nicholson St	$14,000
Yarra	Fully controlled right turn approaches - Heidelberg Rd & Grange Rd	$15,000
Yarra	New and upgraded street lights - Bridge Rd and Church St	$10,000
Yarra	Pedestrian fences/colour marked pedestrian walks - Swan St & Church St	$25,000
Yarra	Install mast arm & lantern on East approach - Bridge Rd & Burnley St	$14,000
Colac-Otway	Roundabout - Grant St and Skene St	$92,000
Golden Plains	Shoulder seal/guardrail - Meredith- Steiglitz Rd and Duggan Rd	$65,000
Grt Dandenong	Five lane treatment and fully controlled right turn - Corrigan St	$240,000
Grt Dandenong	Roundabout - St James Ave and St Johns Ave	$50,000
Hepburn	Shoulder seal/delineation/guide posts - Kyneton - Trentham Rd	$130,000
Horsham	Splitter islands/kerb returns/improve signage - Darlot St	$38,000
Hume	Fully controlled right turn - Pearcedale Parade & Dimboola Rd	$45,000
Hume	Seal shoulders - Cooper St and Hume Hwy And Merri Creek	$105,000
Hume	Seal shoulders - Vineyard Rd and Mc Dougall to Mitchells Lane	$60,000
Hume	Fully controlled right turn North to West - Pascoe Vale Rd	$12,000
Hume	Fully controlled right turn NE to NW - Pascoe Vale Rd and Dimboola Rd	$12,000
Hume	Right turn lane - Broadmeadows Deviation Rd and North Circular Drive	$10,000
Hume	Fully controlled right turn East to North - Barry Rd and Longford Crescent	$12,000
Hume	Seal shoulders - Mickleham Rd and Hillview Rd and Craigieburn Rd	$140,000
Hume	Pavement linemarking of left turn arrows - Pascoe Vale Rd & Coleraine St	$10,000
Hume	Pedestrian signals - Mickleham Rd and Gladstone Park Drive	$25,000
Kingston	Resurface outbound carriageway - Nepean Hwy & Elm Grove & White St	$77,000
Kingston	Install mast arms - Clayton Rd and Bourke Rd	$12,000
Kingston	Install pedestrian operated signals - Nepean Hwy & Oak Ave	$65,000
Kingston	Right turn lane/fully control West to South right turn - Dandenong Rd	$145,000
Knox	Partial control right turn North to West - Stud Rd and Boronia Rd	$6,000
Knox	Realignment/delineation/shoulder sealing - Wellington Rd	$55,000

Knox	Fully controlled right turn/extend right turn lane - Dawson St	$55,000
La Trobe	Seal centre median shoulder - Princes Hwy and Moe - Glengarry Rd	$304,000
Macedon Ranges	Improve delineation of curves - Ashbourne Rd and Donalds Rd Daniels Rd	$15,000
Manningham	Install mast arm and advance signage - Manningham Rd and Bridge St	$15,000
Manningham	Reconstruct and widen road - Warrandyte - Ringwood Rd and Royden Rd	$100,000
Manningham	Half sea gull islands - Blackburn Rd and Beverly St	$25,000
Manningham	Extend right turn lane - Doncaster Rd and Tunstall Rd	$25,000
Maribyrnong	High entry angle slip lane - West Gate Freeway and Williamstown Rd	$100,000
Maribyrnong	Right turn lane/partial right turn signal and left turn slip lane - Ashley St	$140,000
Maroondah	Mast arms/upgrade lighting/pedestrian fencing - Ringwood St	$65,000
Maroondah	Skid resistance overlay - Maroondah Hwy and Oban Rd	$52,000
Maroondah	Fully controlled right turn in Dorset Rd - Dorset Rd and Eastfield Rd	$45,000
Maroondah	Detector loops - Wantirna Rd and Barkly St, Haig St	$8,000
Mildura	Splitter islands - Fifteenth St and Ontario Ave	$55,000
Mildura	Splitter islands/signs - Jacaranda S, Fitzroy Ave & Nardoo St	$55,000
Moyne	Seal shoulders - Warrnambool - Caramut Rd and Koroit - Woolsthorpe Rd	$46,000
Murrindindi	Curve treatments - Maroondah Hwy and Mckenzie Rd And Anderson Rd	$290,000
Murrindindi	Skid resistant surfacing - Broadford - Flowerdale Rd and Horans Track	$41,500
Nillumbik	Roundabout - Yan Yean Rd and Kurrak Rd	$260,000
Nillumbik	Shoulder seal - Eltham-Yarra Glen Rd and Lindon Strike Court	$200,000
Nillumbik	Roundabout - Heidelberg - Kinglake Rd and Kangaroo Ground	$260,000
Nillumbik	Fully controlled right turn - Ryans Rd and Wallowa Rd	$27,000
Surf Coast	Shoulder seal - Great Ocean Rd and Melba Parade and Boundary Rd	$351,000
Surf Coast	Seal shoulders/guardrail - Great Ocean Rd and Lorne Township	$488,750
Warrnambool	Traffic calming/turn lane - Pertobe Rd and Merri St and Stanley St	$115,000
Warrnambool	Channelisation - Princes Hwy (Raglan Parade) and Kepler St	$50,000
Whitehorse	Skid resistant surfacing - Maroondah Hwy and Middleborough Rd	$76,000
Whitehorse	New signals - Canterbury Rd and Terrara Rd	$120,000
Whitehorse	Install illuminated signs and pedestrian fences - Maroondah Hwy	$11,000
Whitehorse	Pedestrian signals - Springfield Rd and between Beverley Crescent	$35,000
Yarra Ranges	Flare intersection and install splitter islands - Cambridge Rd	$32,000
Yarra Ranges	Pedestrian operated traffic signals - Church St & Badgers Creek Rd	$67,000
Yarra Ranges	Pavement regulation & improved delineation - Inverness & Browns Rds	$83,000
Yarra Ranges	Widen pavement & install kerb and channel - Monbulk Rd	$85,000

Queensland

Atherton	Widen bridge by replacement/seal approach shoulders - Peterson Creek	$495,000
Beaudesert	Improve geometry of intersection - Mt Linday Hwy and South St	$200,000

Bowen	Realign intersection - Bowen Development Rd and Pelican Creek Rd	$50,000
Brisbane	Modify signals - Albany Creek Rd and Gayford St and Maundrell Terrace	$60,000
Brisbane	Modify signals - Oxley Rd and Sherwood Rd	$60,000
Brisbane	Modify signals - Rose St, Dawson St and Dickson St	$40,000
Brisbane	Modify signals - Sandgate Rd and East West Arterial Rd	$60,000
Brisbane	Realign Chatsworth Rd/provide right turn pocket - Boundary Rd	$100,000
Brisbane	Install traffic signals - Lytton Rd and Hemmant Tingalpa Rd	$130,000
Brisbane	Modernisation works to existing roundabout - Rode Rd and Bilson Rd	$100,000
Brisbane	Modify traffic signals/install turn pockets & slip lanes - Rochedale Rd	$500,000
Bundaberg	Install traffic signals - Maryborough St and George St	$45,000
Burdekin	Install roundabout - Maidavale Rd and Ivory Rd	$90,000
Caboolture	Roundabout - Mackie Rd and Old Gympie Rd	$50,000
Caboolture	Install roundabout - Bailey Rd and Ewart St & Bayview Terrace	$45,000
Caboolture	Install roundabout - Morayfield Rd and Uhlmann Rd	$150,000
Caboolture	Install roundabout - Cross St and Webster Rd	$50,000
Cairns	Non-skid surface/reconstruct elevation & curb/Yorkeys Knob roundabout	$168,000
Cairns	Widen shoulders/install non skid surface/elevation - Gillies Rd	$265,000
Cairns	Seal shoulder/edge lining & curve delineation - Yarrabah Rd	$500,000
Cairns	Seal shoulders/edgelining/install non skid surface - Rudder St	$320,000
Cairns	Seal shoulders/edgelining/non skid surfacing - Brinsmead-Kamerunga Rd	$270,000
Cairns	Channelisation - Martyn St and Minnie St	$100,000
Cook	Widen shoulders & improve alignment & elevation/signage - Palm Creek	$256,000
Cook	Seal shoulder/provide improved alignment - Endeavor Valley Rd	$400,000
Diamantina	Widen & lower crests/improve grades on the slopes - Sandhill Crossings	$350,000
Douglas	Construct barrier on approaches/sealed parking areas - Rex Lookout	$235,000
Douglas	Seal shoulder/skid resistant overlay/guardrail - Captain Cook Hwy	$345,000
Gold Coast	Improve sight lines/provide protected lane - Robina Parkway	$30,000
Gold Coast	Remodel signals/provide island/install pedestrian signals - Thrower Drive	$200,000
Gold Coast	Install pedestrian operated signals - Gold Coast Hwy and Boyd St	$120,000
Hervey Bay	Medians with turn protection/improved lighting - Charlton Esplanade	$34,000
Hervey Bay	Install traffic signals - Boat Harbour Drive & Denman Camp Rd	$115,000
Hervey Bay	Install medians/improved street lighting - Tavistock St and Exeter St	$40,000
Ipswich	Modify signals - Brisbane Rd and Stafford Rd	$30,000
Ipswich	Modify signals - Brisbane St and East St	$90,000
Ipswich	Modify signals - Queen St, Redbank Plains Rd and Alice St	$80,000
Ipswich	Modify signals - Collingwood Drive and Namatjira Drive	$200,000
Kingaroy	Slip lane with indented right turn lane - Redmans Rd	$160,000
Logan	Modify signals - Browns Plain Rd & Waller Rd & Parkland Ave	$15,000

Logan	Modify signals - Loganlea Rd and Nujooloo Rd	$15,000
Logan	Modify signals - Chambers Flat Rd and Muchow Rd	$15,000
Logan	Modify approach - Springwood Rd and Dennis Rd	$40,000
Logan	Modify signals - Wembley Rd and Wilbur St	$65,000
Logan	Install traffic signals - Loganlea Rd and Short St & Moloney Rd	$120,000
Longreach	Install roundabout - Ibis St and Pelican St	$10,000
Longreach	Construct roundabout - Ibis St and Swan St	$10,000
Mackay	Install traffic signals - Bridge Rd and Holland St	$110,000
Mareeba	Seal shoulders/provide delineation/edge lining - Peninsula Dev. Rd	$115,000
Maryborough	Install traffic lights - Alice St and March St	$160,000
Redland	Install traffic signals - Ney Rd and School Rd	$200,000
Redland	Bitumen widening - Rickertt Rd and West Of Thornlie Rd	$75,000
Redland	Shared footway/pedestrian refuge - Long St and Bloomfield St	$46,000
Redland	Install roundabout - Middle St and Passage St	$125,000
Toowoomba	Remodel signals/install right turn lanes - Herries St & West St	$335,000
Townsville	Modify signals - Charters Towers Rd and Bayswater Rd	$60,000
Winton	Upgrade signage & delineation - Manuka St	$10,000

Western Australia

Armadale	Install 300mm traffic signal aspects on all approaches - Nicholson Rd	$10,000
Armadale	Install roundabout - Church Ave and Third Rd	$65,000
Armadale	Install roundabout - Church Ave and William St	$65,000
Armadale	Install roundabout - Church Ave and Fourth St	$54,000
Bayswater	Skid resistant surfacing - Walter Rd and Lennard St	$20,000
Bayswater	Install skid resistant surfacing - Benara Rd and Camboon Rd	$48,000
Bayswater	Install skid resistant surfacing at all approaches - Broun Ave and Coode St	$85,000
Bayswater	Install skid resistant surfacing - Walter Rd and Grey St	$38,000
Bunbury	Install roundabout/two truncations to improve visibility - Clifton St	$95,000
Bunbury	Upgrade geometry & signals/install non skid surfacing - Blair St	$95,000
Bunbury	Install skid resistant surfacing - Spencer St, Stirling St and Arthur St	$9,500
Canning	Improve road lighting along 3km length - Ranford Rd and Bannister Rd	$168,000
Canning	Install roundabout/upgrade lighting/footpath extension - Treasure Rd	$52,600
Canning	Resurface intersection approaches - Manning Rd & Lawson St	$48,000
Joondalup	Install seagull island - Marmion Ave and Flinders Ave	$6,000
Joondalup	Modify left turn lane in Templeton Cres. to high angle - Wanneroo Rd	$7,500
Joondalup	Install seagull island - Marmion Ave and Prendiville Ave	$6,000
Joondalup	Relocate power poles & install left turn slip lane - Marmion Ave	$30,000
Joondalup	Install roundabout - Whitfords Ave and Northshore Drive	$130,000

Joondalup	Install single lane roundabout - Allenswood Rd & Blackall Dve	$75,000
Kalgoorlie-Boulder	Install turning lanes/modify signals & phasing - Hannan St	$95,000
Melville	Install seagull island - Canning Hwy and Rome Rd	$10,000
Melville	Install traffic signals with turn arrow - Marmion St and Davey St	$80,000
Cockburn	Modify signals including right turn pockets - Rockingham Rd	$120,000
Cockburn	Install left & right turn pockets & seagull island - North Lake Rd	$50,000
Cockburn	Install left & right turn lanes/traffic islands on Armadale Rd - Warton Rd	$92,000
Geraldton	Flashing lights/upgrade lighting/remark median lines - Place Rd	$85,000
Geraldton	Install street lighting - Brand Hwy and Broadhead Ave	$121,000
Geraldton	Close specific lanes using traffic islands - Cathedral Ave and Sanford St	$20,000
Geraldton	Close side road & provide access to adjacent residential cell - Phelps St	$80,000
Geraldton	Upgrade street lighting - Geraldton - Mount Magnet Rd	$133,000
Geraldton	Left turn only from Gregory St to Shenton St/lower crest in Shenton St	$90,000
Geraldton	Install roundabout - Fifth St and Central St	$118,000
Geraldton	Construct acceleration lane exit of Mount Magnet Rd	$86,000
Geraldton	Remove sweeping curve/install 70 degree traffic island - Eastward Rd	$32,000
Gosnells	New footpath & new pedestrian crossing - Albany Hwy	$40,000
Greenough	Widen intersection, modify traffic islands, Mount Magnet Edwards Rd	$175,000
Mandurah	Traffic islands in Cooper Street/sweep widening/signage - Anstruther Rd	$20,000
Mandurah	Skid resistant surfacing - Mandurah Terrace/Anstruther Rd and Henson St	$25,000
Narrogin	Install roundabouts/nibs/pedestrian islands - Williams Narrogin Hwy	$235,000
Nedlands	Replace stop signs/install no standing signs & lines - Bruce St	$1,000
Nedlands	Improve lighting & sighting distance - Hampden Ave and Monash Ave	$1,700
Nedlands	Install roundabout - Waratah Ave and Adelma Rd	$67,300
Nedlands	Install island/reconstruct NE lane to 70 degree alignment - Brockway Rd	$20,900
Nedlands	Improve signs/linemarking/relocate signal - Railway Rd	$1,960
Nedlands	Install roundabout - Carrington St and Dalkeith Rd	$55,200
Perth	Install larger signal aspects/install pedestrian signal - Sutherland St	$3,500
Rockingham	Install seagull island - Read St and Swinstone St	$20,000
Rockingham	Install seagull island - Read St and Goongarie Drive	$20,000
Rockingham	Install roundabout - Patterson Rd & Read St + Flinders Lane	$220,000
Rockingham	Install roundabout - Flinders Lane and Kent St	$110,000
Rockingham	install seagull island & lighting - Read St and Rand Ave	$45,000
Roebourne	Install retro-reflective pavement markers/line marking - Dampier Rd	$35,039
Roebourne	Channelise/install 2 traffic islands - Dampier Rd and Balmoral Rd (East)	$11,461
Roebourne	Install roundabout - Balmoral Rd and Warambie Rd	$70,000
Albany	Install roundabout/replace bridge barriers - Campbell Rd & Cockburn Rd	$178,000

Boddington	Widen seal/increase radii of curves - Albany Hwy	$286,000
South Perth	Install roundabout - Labouchere Rd and Preston St	$48,000
South Perth	Install roundabout - Labouchere Rd and Thelma St	$45,000
South Perth	Install roundabout - Labouchere Rd, Angelo St and Amherst St	$56,000
Stirling	Install roundabout - Sackville Terrace and Duke St	$95,000
Stirling	Install traffic signals - Erindale Rd and North Beach Rd	$104,000
Swan	Ban parking adjacent intersection/reduce lanes - Viveash Rd	$70,000
Swan	Install roundabout/relocate power pole - Camboon Rd	$100,000
Toodyay	Construct dedicated turn pockets - Northam-Toodyay Rd	$160,000
Cambridge	Install seagull island, extend medians, relocate bus shelter - Grantham St	$40,000
Claremont	Install signs, install skid resistant surfacing, signal backboards - Gugeri St	$20,000
Mosman Park	Close median at hwy/change priority at Kinnear Ramble & village	$24,950
Victoria Park	Skid resistance, signage, lighting, modify signa - Berwick St	$50,000
Victoria Park	Install median island, skid resistant surfacing - Berwick St and Mackie St	$14,000
William	Install turning pockets/nibs/pedestrian islands - Albany Hwy	$250,000

South Australia

Adelaide	Pedestrian crossing facilities - Grenfell St and King William St	$100,000
Adelaide Hills	Shoulder seal guardrail - Gorge Rd	$100,000
Adelaide Hills	Seal shoulders/guardrail - Burnside - Balhannah Rd	$150,000
Adelaide Hills	Seal shoulders/guardrail - Magill - Lobethal Rd	$150,000
Adelaide Hills	Shoulder seal/guardrail - Gorge Rd	$240,000
Barossa	Widen seal/improve delineation/junction improvement - Cockatoo Lane	$160,000
Barossa	Remove roadside hazards/increase seal width - Barossa Valley Way	$70,000
Barossa	Raised median & safety bars/road widening - Light Pass Rd	$40,000
Burnside	Minor widening & sealing shoulders - Waterfall Gully Rd	$150,000
Port Adelaide	Separate turning lanes and median - Churchill Rd and Duncan Rd	$20,000
Port Adelaide	Raised median & advisory speeds on curve - Churchill Rd and Rumble Rd	$20,000
Grant	Shoulder sealing & reconstruct superelevation - Princes Hwy	$140,000
Grant	Seal shoulders - Keith - Mt Gambier Rd and 10km North of Mt Gambier	$80,000
Renmark Paringa	Shoulder seal/guardrail - Ral Ral Ave	$100,000
Kangaroo Island	Widen carriageway and realign curve - North Coast Rd and Ten Tree Rd	$97,500
Lacepede	Seal shoulders - Riddoch Hwy and Desert Camp - Kingston - Bordertown	$40,000
Mitcham	Shoulder seal/guardrail - Blackwood - Goolwa Rd	$180,000
Mount Barker	Seal shoulders/guardrail - Aldgate - White Hill Rd	$315,000
Mount Barker	Turning lane - Aldgate - White Hill Rd and River Rd	$70,000
Mount Barker	Seal shoulders/guardrail - Blackwood - Goolwa Rd	$100,000
Mt Remarkable	Improve delineation & install raised pavement markers - Main North Rd	$25,000

Onkaparinga	Shoulder seal/guardrail - Blackwood - Goolwa Rd	$180,000
Onkaparinga	Flush median with pedestrian protuberance, street lighting - Regency road	$50,000
Salisbury	Left turn lane on Waterloo corner road, upgrade lighting - Heaslip Rd	$60,000
Tea Tree Gully	Shoulder seal/guardrail - Tea Tree Gully - Mannum Rd	$470,000
Unley	Protected right turn lanes at young street/pedestrian refuges	$51,000
Unley	Pedestrian actuated crossing - Goodwood Rd & Tram Line/Lily St	$85,000
Victor Harbor	Phoulder seal/guardrail - Yankalilla - Victor Harbor Rd	$150,000

Tasmania

All of Tasmania	National exchange of vehicle/driver information system	$97,200
Brighton	Exclusive left turn lane - East Derwent Hwy and Gage Rd	$140,000
Brighton	Line marking/pedestrian refuges/upgrade existing refuges - Scotts Rd	$7,000
Burnie	Improved delineation - West Mooreville Rd	$5,000
Central Highlands	Guard rail and warning signs - Torhill Rd	$10,000
Clarence	Right turn lanes/pedestrian refuges - Clarence St and Scott And High St	$30,000
Derwent Valley	Improved signing/delineation and protect roadside hazards - Lyell Hwy	$50,000
Glenorchy	Pedestrian refuges, median island & kerb extension - Albert Rd	$130,000
Glenorchy	Provision of right turn lane - Claremont Link Rd and Canberra Rd	$8,000
Glenorchy	Traffic signals - Derwent Park Rd and Gormanston Rd	$20,000
Hobart	Pedestrian refuge and provision of non-skid pavement - Elizabeth St	$295,000
Hobart	Modify and extend islands - Sandy Bay Rd and Beach Rd and Wayne Ave	$2,000
Hobart	Install kerb extensions/pedestrian refuge/fencing - Churchill Ave	$5,000
Hobart	Give way sign/improve delineation by road markings - Proctors Rd	$6,000
Huon Valley	Provide guardrail - Nicholls Riveulet Main Rd	$10,000
King Island	Construct standard T junction - King Island Main Rd and South Rd	$52,700
King Island	Reconstruction and realignment/removal of vertical curves - Millwood Rd	$21,350
Kingborough	Improved signing and narrowing approach widths - Summerleas Rd	$10,000
Latrobe	Guard rail protection - Cethana Tourist Rd	$8,000
Launceston	Alignment signs and chevron alignment markers - Russells Plains Rd	$4,000
Meander Valley	Guard rails and signage - Longridge Rd	$3,500
Meander Valley	Guardrails, signage, remove vegetation - Osmaston Rd	$4,500
Meander Valley	Ugrade guardrailing and signage, remove vegetation - Westwood Rd	$5,000
Meander Valley	Upgrade guardrail and signage to 3.11 standard - Union Bridge Rd	$7,000
Meander Valley	Guard rails on all approaches and sign bridges - Cheshunt Rd	$8,000
Meander Valley	Install guard rails, curve warning signs - Bracknell Rd	$10,000
Sth Midlands	Reseal junction, repaint holding line, barrier line - Tunnack Main Rd	$5,000
Sth Midlands	Square up junction and seal/give way sign - Lovely Banks Rd	$6,000
Sth Midlands	Square up junction and remove embankment - Inglewood Rd	$10,000

Waratah-Wynyard	Install median islands and kerb extension works - Gibbons St	$9,000
West Tamar	Guard rail protection - Frankford Main Rd	$10,000

Australian Capital Territory

ACT	Install traffic signals - Limestone Ave and Anzac Parade	$23,000
ACT	Improve linemarking/signage/footpaths & pram crossing - Parkes Way	$70,000
ACT	Provide traffic islands, channelisation - Canberra Ave	$25,000
ACT	Improved delineation/signs/shoulder treatments - Mugga Lane	$246,000
ACT	Install traffic signals - Northbourne Ave and Elouera St	$250,000

Northern Territory

Coomalie Community	Improve delineation, signs and remove verge hazards - Coach Rd	$28,400
Dagaragu Community	Widen seal on section - Daguragu Rd	$270,000
Darwin	Traffic signals - Gilruth Ave and Gardens Hill Rd	$100,000
Darwin	Traffic islands, no-u-turn, ban parking, turning lines - Woods St	$ 18,000
Darwin	Right turn bays - Stuart Hwy, Duke St and Burt St	$100,000
Darwin	Improve street lighting - Bagot Rd from Stuart Hwy to Fitzer Drive	$410,000

Appendix 7: Contributions to Parliamentary inquiries in 1999–2000

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

- ATSB provided input on road and aviation safety issues to a Departmental submission to the Inquiry.

Inquiry into Substance Abuse in Australian Communities by the House of Representatives Standing Committee on Family and Community Affairs:

- ATSB provided input on road safety issues.

ACT Legislative Assembly inquiries (Standing Committee on Planning and Urban Services):

- ATSB provided input on road safety issues relating to traffic calming and urban speed limits.

Inquiry into the examination of air quality, with particular reference to cabin air quality in BAe-146 aircraft by the Senate Rural and Regional Affairs and Transport References Committee, November 1999 and March 2000.

Senate estimates hearings: ATSB attended the following hearings of the Senate Rural and Regional Affairs and Transport Legislation Committee and provided advice on safety topics including the following:

- 1 December 1999: QF1 Bangkok aviation investigation, 'G' Airspace investigation report.
- 7 February 2000: QF1 Bangkok, fuel contamination, Cessna Tasmania investigation and 1998 Sydney to Hobart yacht race.
- 3 May 2000: QF15 Rome Airport aviation investigation, Qantas and Ansett safety, Zanthus and Ararat rail investigations, proposed rail investigation legislation, and heavy vehicle investigation report.
- 24 May 2000: Qantas and Ansett safety, heavy vehicle investigation, Black Spot Program, Cessna Tasmania aviation investigation, proposed rail investigation legislation.

Details of these hearings can be accessed at the Hansard record of proceedings on the web site www.aph.gov.au/hansard/index.htm.au

Appendix 8: Ethics and conflict of interest policy

ATSB follows the following codes of practice and values as applied in the Australian Public Service and the Department of Transport and Regional Services:

Australian Public Service code of conduct

Section 13 of the *Public Service Act 1999* requires that in the course of APS employment an APS employee must:

- behave honestly and with integrity;
- act with care and diligence;
- treat everyone with respect and courtesy, and without harassment;
- comply with all applicable Australian laws (for this purpose Australia law means any Act, or any instrument made under an Act, or any law of a State or Territory, including any instrument made under such a law);
- comply with any lawful and reasonable direction given by someone in the employee's Agency who has authority to give that direction;
- maintain appropriate confidentiality about dealings that the employee has with any Minister or Minister's member of staff;
- disclose, and take reasonable steps to avoid, any conflict of interest (real or apparent) in connection with APS employment;
- use Commonwealth resources in a proper manner;
- not provide false or misleading information in response to a request for information that is made for office purposes in connection with their APS employment;
- not make improper use of inside information; or the employee's duties, status, power or authority; in order to gain, or seek to fain, a benefit or advantage for the employee or for any person;
- at all times behave in a way that upholds the APS Values and the integrity and good reputation of the APS;
- while on duty overseas, at all times behave in a way that upholds the good reputation of Australia; and
- comply with any other conduct requires that is prescribed by the regulations.

Australian Public Service values

Section 10 of the *Public Service Act 1999* outlines APS Values, which are to apply to the APS. Through the Code of Conduct, all APS employees are required to uphold these Values.

1. The APS is apolitical, performing its functions in an impartial and professional manner.
2. The APS is a public service in which employment decisions are based on merit.
3. The APS provides a workplace that is free from discrimination and recognises and utilises the diversity of the Australian community it services.
4. The APS has the highest ethical standards.
5. The APS is openly accountable for its actions, within the framework of Ministerial responsibility to the Government, the Parliament and the Australian public.
6. The APS is responsive to the Government in providing frank, honest, comprehensive, accurate and timely advice and in implementing the Government's policies and programs.
7. The APS delivers services fairly, effectively, impartially and courteously to the Australian public and is sensitive to the diversity of the Australian public.
8. The APS has leadership of the highest quality.
9. The APS establishes workplace relations that value communication, consultation, cooperation and input from employees on matters that affect their workplace.
10. The APS provides a fair, flexible, safe and rewarding workplace.
11. The APS focuses on achieving results and managing performance.
12. The APS promotes equity in employment.
13. The APS provides a reasonable opportunity for all eligible members of the community to apply for APS employment.
14. The APS is a career-based service to enhance the effectiveness and cohesion of Australia's democratic system of government
15. The APS provides a fair system of review of decisions taken in respect of APS employees.

Department of Transport and Regional Services code of conduct and values

Department of Transport and Regional services recognises that its employees are its greatest asset and is committed to the highest standards of conduct and ethics.

DoTRS encourages employees to aspire to the highest standards of probity, integrity and conduct; of efficiency, and responsiveness to governments, while providing frank and fearless advice.

Employees are obliged to observe the requirements of the Code of Conduct and to behave in a way that upholds the APS Values.

Public Service Regulation 2.1 stipulates that an APS employee must not, except in the course of their duties as an APS employee, or with the Agency Head's express authority, give or disclose, directly or indirectly, to any person any information about public business or anything of which the employee has official knowledge.

However, the Code of Conduct does not regulate employee behaviour and where conduct falls below the standard required, employees will have this brought to their attention in accordance with the performance strategies outlined in the Breach of the Code of Conduct guidelines.

A significant breach of the Code is likely to amount to misconduct and lead to disciplinary action. Disciplinary provisions include a range of possible sanctions, including dismissal.

Employees with concerns regarding the application or contravention of the Code in a particular situation should consult their immediate supervisor, Branch head, and Division head if clarification is required.

While all employees are required to observe the APS Code of Conduct and uphold the APS Values, the Department also stresses that their employees be:

- honest and professional;
- accountable for their actions; and
- responsive to the needs of Government, business partners and colleagues.

The Department believes that a safe, fair, diverse and flexible workplace, where people are trusted, is the best work environment. This trust is fostered by:

- communicating openly and regularly;
- recognising people's contribution and investing in their potential; and
- leading by example and with clarity.

ATSB investigation ethics policy

In the conduct of safety investigations, the following professional ethics policy of the former Bureau of Air Safety Investigation continues to be applied. The policy is currently being updated and incorporated into the ATSB Policy and Procedures Manual for the conduct of investigations.

Standards of ethical conduct for BASI Air Safety Investigators.

1. The BASI code of ethical conduct complements current Departmental and Public Service rules and procedures and defines what constitutes professional behaviour for air safety investigators.
2. Traditionally, the public servant's obligation to act ethically arose from an expectation that officials, who enjoy a privileged position in relation to government and its resource, should at all times conduct themselves honestly and disinterestedly, as trustees of 'the public interest'. Today, there is a greater expectation by the community that public servants will be publicly accountable for a lack of propriety in any area of decision making.
3. Rules and guidelines govern most aspects of public service behaviour, but in special situations public servants must apply general principles and values based on the nature of their public service work. Air safety investigators are one group who often work in special situations. Some of the APS publications that provide guidance to these standards are listed in Part 1.
4. During the Staunton Seaview inquiry, individual officers of the Civil Aviation Safety Authority (CASA) were found to have misappropriated public monies. The issue was not that the individuals had spent monies not officially allocated to them, but that self interest rather than public benefit was perceived to have influenced the manner in which the monies were expended. The Wheelahan Falcon Airlines inquiry found that potential conflict

of interest issues were not ethically managed in the relationship between CASA and Falcon Airlines.

5. Under the *Air Navigation Act 1920 Part 2A*, BASI investigators have considerable statutory power with which they are charged to respond to the needs of the government and the community with respect to aviation safety. In this context, investigators can call upon their personal standards of conduct, but their actions must be based on the values established within the public service and be able to withstand public scrutiny.
6. BASI investigators are generally covered by established public service guidelines regarding ethical practice, as found in the Public Service Act and Regulations, and summarised in the publication APS Values and Standards of Conduct produced by the Public Service and Merit Protection Commission. However, investigators often operate in unusual and sometimes unpredictable situations for which existing guidelines may be inadequate. In this environment, they are expected to apply sound ethical judgement. Accordingly, more specific guidance on what constitutes expected ethical conduct and how investigators should balance the competing merits of alternative courses of action is warranted.
7. Ethical conduct appropriate to BASI investigators must therefore be consistent with existing Public Service standards whilst reflecting those aspects unique to the air safety investigation environment.
8. BASI investigators must, therefore, in their conduct toward their employer:
   - act in accordance with laws, regulations, determinations, industrial awards and agreements, and departmental instructions which are applicable to the performance of their duties, and the administrative and legal measures established to enhance accountability;
   - perform their official duties honestly, faithfully and efficiently;
   - exercise due diligence, care and attention and at all times seek to achieve high standards in the discharge of their duties;
   - avoid waste, abuse and extravagance in the provision or use of public resources;
   - expose fraud and corruption of which the officer becomes aware; and

- not bring their employer into disrepute through their private activities.

9. BASI investigators must, in their conduct toward their colleagues and BASI stakeholders in the performance of their official duties:
   - ensure that the rights of the public, the industry and their colleagues are respected;
   - ensure that all advice provided to BASI stakeholders is honest, impartial and comprehensive. An individual holding strong personal beliefs on certain issues should manage the potential dilemma to prevent any conflict with their official duties; and
   - ensure that their official powers and position are not used improperly for personal advantage and that any conflict between personal interests and official duty that may arise is resolved in favour of the public interest.
10. BASI investigators must, to further Australian and international aviation safety:
   - use the best available expertise and technology, to ensure that all items presented as facts or physical evidence during an investigation have been checked as far as is practicable for validity;
   - ensure that each item of information leading to fact determination is properly documented and maintained on the BASI database for possible future re-examination and analysis;
   - pursue all avenues of fact determination to assess potential safety action, whether specific to the particular occurrence or applicable to a wider application;
   - direct the investigation to ensure that all safety deficiencies are addressed to prevent similar occurrences, with particular emphasis on the identification and assessment of any systemic/organisational deficiencies for possible safety recommendation action;
   - remain open-minded to the introduction of new evidence or opinions as to interpretation of facts as determined through analysis, and be willing to reassess one's own findings accordingly;
   - use speculation only as a tool for facilitating the testing of hypotheses during the analysis of the factual information;

- not divulge fragmentary or unsupported information concerning an occurrence to parties outside the investigation regardless of how publicly important such parties may purport to be;
- avoid actions or comments which might reasonably be perceived to favour one party over another;
- be alert to the feelings, sensibilities and emotions of involved persons, and avoid actions which might aggravate what may already be a delicate situation;
- maintain an awareness of safety developments in domestic and international aviation;
- encourage uninhibited, informal interchange of views among aviation safety professionals, both domestic and international; and
- encourage open-minded, uninhibited dialogue between BASI investigators with the aim of using constructive criticism to achieve the highest standard of safety output.

Criticism of BASI investigators or of their investigations by parties external to BASI should be responded to in accordance with the process for managing such concerns as described in Chapter 2 of Part 1.

ATSB investigation conflict of interest policy

The ATSB Executive Director issued the following advice to ATSB employees on 30 June 2000.

This advice incorporates revised arrangements that are to be followed in light of the Whyalla Airlines experience (a copy of the ATSB media release of 13 June 2000 on this topic is at Attachment A).

One of the McGrath Review of BASI recommendations was: 'That BASI institute a formal 'Conflict of Interest' policy and ensure sign-off against this policy prior to any staff member commencing work on any major investigation'. As noted in the previous policy released on 14 December 1999, with the creation of the ATSB this recommendation is applicable to all Bureau investigators.

All APS employees and hence all ATSB staff are bound by the new *Public Service Act 1999*. Under this Act, the APS Code of Conduct is mandatory so that: 'an employee must disclose, and take reasonable steps to avoid, any conflict of interest (real or apparent) in

connection with APS employment.' Agency Heads have an additional duty to promote the APS Values including ensuring the 'highest ethical standards' and accountability 'within the framework of Ministerial responsibility, to the Government, the Parliament and the Australian public.' Under the *Public Service Act 1999* an Agency Head may impose sanctions on an employee found to have breached the Code of Conduct ranging from reprimands and fines to dismissal.

In relation to avoidance of a conflict of interest, ATSB employees are to review their financial and other private interests and inform their Director in writing (email is OK) if there is anything that could be regarded as a pecuniary or other conflict of interest (eg ownership of airline shares; close family directorship of a transport-related company). The DoTRS People & Organisation Branch will provide further clarification of this in the Corporate Services section of the Intranet.

In relation to investigators, the high profile Whyalla Airlines case raised an issue with perceptions of potential conflict based upon previous industry employment. Such perceptions could also have occurred based on an investigator's other relevant background such as a family or personal relationship. An investigator who is asked to investigate a high profile occurrence where there is the potential for a real or apparent conflict of interest, or relevant background of this potentially controversial type, must immediately raise the issue with the Team Leader who will contact a Deputy Director and the ATSB Executive. If operational requirements of the ATSB require the investigator to investigate the occurrence, a written declaration should be placed on the investigation file (see Attachment B). A statement is also to be placed on the ATSB web site as soon as possible indicating the relevant background of one of the investigators (like a 'Laws clause'). An example is at Attachment C. Investigators who follow these procedures can expect full support from management in the event of media scrutiny.

Attachment A

ATSB Media Release – 13 June 2000

WHYALLA AIRLINES INVESTIGATION

The Australian Transport Safety Bureau tonight announced that, with great regret and after serious consideration, it is withdrawing Mr Bob Armstrong from the investigation into the Whyalla Airlines accident.

The ATSB values deeply its reputation for the highest standards of investigation. Mr Armstrong embodies these standards.

The ATSB's regret is that the appearance of a conflict of interest may have been created by unjust claims made in relation to his previous service – perhaps 100 hours of flight time – with Whyalla Airlines over the period 1995–97.

Mr Armstrong was open and up-front with Bureau management and with other parties to the investigation, including the South Australian police, about this period of limited service. Nothing more could have been asked of him.

Bureau management took the matter seriously, and considered how best to ensure that no reasonable query could be made against the investigation team. We settled upon the addition of a more senior investigator to oversight the inquiry. Of substantial significance in this decision was the impossible restriction that would apply to investigations if, for example, this principle extended to ex-Airservices Australia employees, requiring us to bar any ex-Airservices employee from investigating air traffic control incidents. As there is only one employer of civilian air traffic services officers in Australia, a perpetual scope for conflict exists.

However, given that the appearance of a conflict has been raised in this case, and given that the Bureau necessarily accords absolute primacy to the integrity and independence of its investigation, the ATSB has withdrawn Mr Armstrong.

The Bureau will in future make public to all media at the outset of its investigations whether an investigator has any apparent conflict. It will not, however, withdraw officers if the conflict is – as it was in this case – judged to be marginal at best.

Attachment B

Conflict of interest declaration for investigation file

I,…….. have reviewed my financial and other private interests and hereby declare that there is no conflict of interest between them and my official duties. Should any conflict, real or apparent, arise between my personal interests and my official duties I agree to notify my Team Leader or other senior officer immediately to enable relevant Deputy Directors and the ATSB Executive to be informed as soon as possible.

I further declare that I have relevant personal background in relation to the investigation involving

……

…… / /

Signed Dated

Attachment C

Example of web site notification of possible relevant background

15 June 2000

ALICE SPRINGS –
ALLEGED BREAKDOWN OF SEPARATION – 9 JUNE 2000

The Australian Transport Safety Bureau has commenced an investigation into a reported High Profile incident where the crews of an A320 aircraft and a Boeing 767 took evasive action in response to a Traffic Alert and Collision Avoidance System (TCAS) Resolution Advisory when they were apparently cleared to fly at the same flight level in opposite directions.

The ATSB investigation team includes investigators with specialist Air Traffic Control and Human Performance skills.

One aspect of the investigation will involve the highly technical Australian Advanced Air Traffic System (TAAATS) environment, consequently it is appropriate and necessary that the team include investigators with specialist skills in that area. One investigator's skills were developed during previous employment with Airservices Australia in the development phase of TAAATS.

The team has been structured in such a manner as to ensure that any perceptions of a conflict of interest have been assessed and appropriate management processes applied.

In accordance with ATSB procedures, all reports and recommendations arising from this investigation will be scrutinised by a review panel consisting of senior ATSB management.

Prior to the review panel's final scrutiny, the standard process where Interested Parties have the opportunity to comment on the draft report will occur to ensure fairness and accuracy.

Contact: Peter Saint, Team Leader, Communications and Information (02) 6274 6590

Appendix 9: Policy on goods and services received by ATSB free of charge

The Executive Director issued the following policy advice to ATSB employees on 14 December 1999:

ATSB has an obligation (see Australian Accounting Standard AAS 29) to report annually all goods and services received free of charge.

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

Recommendation 13 from the McGrath Review is:

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.

The Australian Accounting Standard (AAS 29) requires the Department to report as a note in its financial statements, resources received free of charge. A note detailing free resources received by the Department is included in its financial statements.

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. Such goods or services received must be reported in the Department's annual financial statements.

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. For example, where ATSB sponsors the attendance of an officer from another organisation on a training course, as a goodwill gesture. These transactions also need to be recorded and reported. The Support Unit is available to assist in estimating the cost of the service provided.

Until we gain experience with the range of activities which should be captured by this requirement, I would like to see all potential

activities recorded. An appropriate judgement as to what needs to be reported for 1999–2000 can then be made, as well as the development of reporting guidelines for 2000–2001.

The table below details the information to be provided. Should any of the services received or provided be under a Memorandum of Understanding this will need to be included in the detail provided. This table will be available as a proforma on the N drive in a directory called 'freegoods' and electronic copies of the completed form should be forwarded to Ted Smith.

If you are unsure whether a transaction should be reported, Ted Smith on ext 6409 is able to provide advice.

An example proforma for goods and services received free of charge follows.

Received by ATSB	Provided by ATSB
• Provider (e.g. Qantas)	• Receiver (e.g. Airservices)
• Description of Goods or Service (eg Travel to accident)	• Description of Goods or Service
• Date	• Date
• Value/Resources (eg Cost of Ticket)	• Value/Resources (eg Hours works & level)
• Officer receiving	• Name of officer
• Reason (e.g. Investigation QF1 accident)	• Reason (e.g. Under Airservices MoU)

Goods and services received by ATSB free of charge in 1999–2000

Gratuity	Provider	Notional cost	Rationale for service
Air travel for four investigators from Sydney to Bangkok	Qantas	$2800	The QF1 investigation team travelled to Bangkok on a special chartered flight with the Qantas team.
Accommodation and meals 20-21 October 1999	Australian Agricultural Company	$270	The owner of the Wrotham Park Station provided accommodation and meals during the on site phase of an investigation into a fatal aviation accident
Return air travel from Sydney to Auckland	Air New Zealand	$883.40	Familiarisation visit for one aviation investigator
Air travel Leinster to Perth	Skywest	$290.40	Familiarisation visit for one aviation investigator
Return air travel on a chartered flight from Kalgoorlie to Zanthus	Western Aust. Department of Transport	Not available	ATSB assisted with a WA Government investigation into a train collision at Zanthus
Freight train trip	Freightcorp	Not available	Familiarisation visit for three potential rail investigators
Passenger train trip	Great Southern Railway Ltd	$57	Familiarisation visit for one potential rail investigator
One night's accommodation and breakfast	Australian Brewers Association (sponsors of conference)	$200	Presentation of ATSB paper Drink Driving and Road Trauma at International Conference of the Medical Advisory Group.

Return air travel from Melbourne to Auckland	Air New Zealand	$920	Familiarisation visit for one aviation investigator
Return air travel from Perth to Leinster to Mount Keith	Skywest	$640.50	Familiarisation visit for one aviation investigator
Return air travel from Perth to Laverton	Skywest	$693	Familiarisation visit for one aviation investigator
Return air travel from Canberra to Brisbane (via Sydney)	Ansett	$762.74	Familiarisation visit for one aviation investigator

Note: *In addition to the foregoing, ATSB received travel and accommodation benefits in return for providing safety services. For example, this occurred during the year with BHP (see page 86).*

Appendix 10: Progress in addressing McGrath Report recommendations

On 9 February 1999 the Minister for Transport and Regional Services released the terms of reference for an independent Review of the Bureau of Air Safety (BASI). The Review Team was Mr Paul McGrath AM, former Chief Executive Officer of AMSA and Ms Loretta Power, an officer from the Department of Transport and Regional Services seconded to the Review.

The final report on the Review of BASI was presented to the Deputy Prime Minister and Minister for Transport and Regional Services, Hon. John Anderson MP on 6 August 1999. The Minister said, 'The McGrath Report confirms that Australia's overall aviation safety record compares well with world wide aviation accident rates and that BASI makes a significant contribution to the maintenance and enhancement of aviation safety and receives widespread industry recognition and support.'

The Review report states that, 'Put simply, much about BASI is very good and has the potential to be made better. What is needed now is significant improvements in strategic focus and fundamental management skills to create an organisation that would be even more favourably regarded.'

In an interim report to the then Secretary of the Department of Transport and Regional Services, Dr Allan Hawke, Mr Paul McGrath AM recommended that a multi modal safety organisation be created. The Secretary accepted this recommendation and the Australian Transport Safety Bureau (ATSB) was created on 1 July 1999 as a divisional level unit within the Department.

The McGrath Report contained a large number of recommendations. Some of the recommendations were BASI-specific and would needed to be considered against the expanded organisational role for ATSB. Others were more easily be applied to the whole of the new safety body. To implement these recommendations some organisational adjustments were required within the aviation group of ATSB. The prime purpose of these changes was to ensure that only those accidents and incidents that are likely to lead to improvements in aviation safety are fully investigated and targeted programs of investigation are carried out in the general aviation sector. To complement its accident and incident investigation role, ATSB will also carry out a number of safety studies each year.

The policy statement, 'A Measured Approach to Aviation Safety Reform', by the Hon. John Anderson MP, Deputy Prime Minister and Minister for Transport and Regional Services, in November 1999 confirmed that the ATSB will be Australia's prime investigatory agency for aviation accidents and incidents.

The creation of the ATSB as a unit within DoTRS has meant that staffing, remuneration and conditions of service are covered by the *Public Service Act 1999* and the Departmental Certified Agreement. Specific conditions for Transport Safety Investigators have been negotiated and are set out in Appendix J of the 1999–2001 Certified Agreement. Senior management have been placed on AWAs as recommended by the McGrath Report.

Corporate planning remains linked to DoTRS planning because ATSB is not a separate legal entity like the Civil Aviation Safety Authority (CASA) or Airservices Australia. Budget funding is also linked to DoTRS appropriation allocations and ATSB's share of the departmental 'cake' will be subject to the Government's objectives for transport and regional services. Further detail on progress against the recommendations follows.

A summary of progress on McGrath Report recommendations

R1 *In consultation with the Government, BASI should re-define and set priorities for its core business. In so doing, it should give particular attention to its role as the independent assessor/adviser of aviation safety on behalf of the government and the community and become the investigatory agency in respect of Departmental functions with aviation safety implications, including aviation security.*

Status: Trial of new priorities from 1 April 2000. Secretary Hawke did not agree that aviation security should be part of ATSB. Primary aviation investigation role was confirmed by Minister in November 1999.

R2 *BASI should provide regular reports to government and the community about the 'safety health' of the industry. This should take due account of the aviation safety indicator/trends currently published by CASA and other agencies with a role in aviation safety. In so doing BASI should ensure effective use of the extensive range of data which it collects on behalf of government.*

Status: ATSB made a presentation to the Senate Committee in July 2000 on the 'safety health' of the aviation industry (see Aviation safety trends, page 41). A report analysing 1999 Systemic Incident Analysis Model aviation data is to be published in December 2000.

R3 *BASI should review the resource allocation associated with its international activities and in other areas in which improvements to its operations are suggested in this report. The intention should be to ensure adequate capability to meet its responsibilities to the government and community in respect of its continuing oversight of the Australian industry.*

Status: Initial review completed for 1999–2000. Guidelines for participation in international activities have been issued. Non-investigation international program has been agreed for 2000–2001.

R4 *That consideration be given to amending the Functions of the (BASI) Director as defined in Clause 19GB of the* Air Navigation Act 1920 *to spell out the wider powers available to the Bureau via the provision of Sub-clause (c) and (d) of Clause 19GB. Consideration should also be given to enshrining accountability requirements of the Bureau, such as corporate planning and annual reporting in the Air Navigation Act.*

Status: Initial bid for legislation developed and will be progressed in 2001. Inappropriate to enshrine separate ATSB planning and reporting guidelines in legislation as ATSB is part of DoTRS and its planning and reporting requirements.

R5 *That BASI renegotiate the Memorandum of Understanding with CASA and Airservices Australia to provide for best efficiency in accident/incident investigation, without compromising the Bureau's absolute discretion in deciding when an investigation should be undertaken and how it should be performed.*

Status: Airservices MoU completed. CASA MoU – considering draft including an agreed clause re R7.

R6 *That BASI's role as the Commonwealth's prime aviation accident/incident investigatory agency be confirmed.*

Status: Included in November 1999 Ministerial Aviation Statement.

R7 *Recognising that CASA has prime Commonwealth responsibility for promotion of aviation safety, but that BASI does have legitimate role in safety promotion, the Bureau should seek to negotiate a complementary role. This is to ensure that its potential contribution can be realised, together with the other desirable effects associated with its current participation in such activities.*

Status: Agreed as part of R8: This issue is covered in draft MoU as per R5 and complementarity is ongoing.

R8 *BASI should co-operate with CASA to produce a single Commonwealth safety promotion magazine that realises the legitimate aspirations of both agencies in regard to aviation safety and which also assists in presenting both as competent committed Australian safety organisations. Consideration should also be given to the usefulness of industry survey to ascertain the most suitable content.*

Status: Agreement reached with CASA and a separate ATSB Supplement is now part of CASA's *Flight Safety Australia* magazine (12 month trial).

R9 *Resources released in BASI as a result of a lesser role in aviation safety promotion should be retained in the Bureau and directed to other important safety activities as indicated elsewhere in this report.*

Status: Saving will be used for other targeted sector publications and the ATSB Annual Review 2000.

R10 *Recommendations in BASI reports should identify the significant factors relating to the safety problem and the desired safety outcome. As far as possible, they should not prescribe solutions.*

Status: Advice was sent to aviation investigators on 24 November 1999 reinforcing this practice.

R11 *That BASI review the suitability of its contribution to the general aviation and specialist aviation sectors with a view to ensuring that the legitimate safety needs of these sectors are met and are accepted by the sector as having been met.*

Status: Targeted program as part of new occurrence investigation policy (R1) and a program of specific sector publications is underway.

R12 *That an Aviation Safety Consultative Committee be established which comprises members carefully selected for their individual and collective ability to assist BASI to understand and respond to industry concerns and aspirations and to review BASI performance at regular intervals.*

Status: ATSB is a member of the Australasian Flight Safety Forum and liaises with other aviation safety bodies and sectors.

R13 *The Bureau should include details in its annual reporting of any services obtained without charge from industry. Reported detail should include aspects such as the type of service, identification of the carrier involved, the notional cost and the rationale for the service.*

Status: Minute by the Executive Director was sent to all ATSB staff on 14 December 1999 and report included in ATSB Annual Review 2000 (see Appendix 9).

R14 *That the Secretary of the Department of Transport and Regional Services institute a review process to be applied when deemed appropriate and prior to releasing a report into an accident/incident or other investigation to ensure that the BASI processes are equitable in their treatment of all interested parties.*

Status: ATSB has established an internal review panel to supplement existing processes including interested party drafts. ATSB's Executive Director releases all high profile reports. Reports are provided to the Secretary prior to release. The Secretary retains the ability to determine that ATSB has been equitable in the handling of an investigation; and he has developed procedures within DoTRS to ensure a degree of independent scrutiny can be applied if necessary.

R15 *That BASI continue as an operational unit within the Department of Transport and Regional Services.*

Status: ATSB incorporating BASI is an operational unit within DoTRS.

R16 *That BASI staff members continue to be employed under the provisions of the Public Service Act.*

Status: ATSB people are employed under the provisions of the *Public Service Act 1999* like the rest of DoTRS.

R17 *That an integrated multi modal Commonwealth transport safety bureau be created. This bureau would bring together the aviation and maritime accident/investigation units in the Department, together with the safety capability in the Department's rail and road units.*

Status: ATSB created 1 July 1999 incorporating non-regulatory safety units in all four modes.

R18 *That the Secretary of the Department of Transport and Regional Services consider delegating to the Executive Director of the Australian Transport Safety Bureau the direct responsibility for releasing the BASI reports in future.*

Status: Executive Director has the delegation to receive and release all investigation reports and releases all high profile reports. The Director of Air Safety Investigation releases other reports and air safety information.

R19 *BASI prepare annually a stand-alone and comprehensive Corporate Plan, or equivalent, suitable to reinforce its image as an independent agency, and of quality similar to that expected by Government of agencies such as the Civil Aviation Safety Authority and the Australian Maritime Safety Authority. This could then become a subset of the Department's Corporate Plan. Alternatively an abridged version of a more extensive BASI plan could be included in the Department's document.*

Status: ATSB's business plan is developed annually and links to the DoTRS Corporate Plan and Portfolio Budget Statements (PBS). ATSB's plan and budget is agreed in the context of other DoTRS divisional plans and budgets. ATSB is not an independent agency except in respect of investigations and safety analysis.

R20 *The BASI Corporate Plan be subjected to the external review processes and Ministerial approval applied to other safety authorities.*

Status: ATSB's annual plan is scrutinised by the Departmental Executive and Executive Board before approval.

R21 *That BASI develop appropriate, challenging and objective Key Performance Indicators for inclusion in the plan.*

Status: Development has commenced with input to PBS and Key Performance Indicators will continue to be refined.

R22 *The financial component of the plan be upgraded substantially so as to give clear, unequivocal information regarding BASI's application of financial and related resources.*

Status: Additional financial reports have been developed as part of the departmental Financial Management System, Insight. ATSB is reviewing its corporate services and will review its output prices as part of the Federal Government's policy.

R23 *The Corporate Plan be used by BASI management as an important and enshrined element of overall management of the Bureau. Position duty statements and performance appraisal should make due reference to the Corporate Plan, especially in regard to achievement against Key Performance Indicators.*

Status: Branch business plans have been developed and are linked to the DoTRS Corporate Plan and ATSB business plan. Individual development plan discussions held in February and August each year. Duty statements and work level standards are under review.

R24 *Subject to Ministerial approval, BASI consult widely on its draft Corporate Plan and invite input thereto annually.*

Status: See R20 – ATSB Plan will remain linked to DoTRS Corporate Plan and PBS and decisions on it will involve balancing resource allocations with other DoTRS Divisions.

R25 *That the annual reporting process of BASI be reviewed with the intention of improving both accountability and image. Special consideration should be afforded to production of a stand-alone BASI document which could either be published as a component of the DoTRS Annual Report or, if this is not appropriate, could be presented as an Annual Review.*

Status: Inaugural ATSB Annual Review 2000 report to be published in October 2000.

R26 *Consistent with the need to exhibit greater accountability, BASI should report annually on aspects such as:*

- *Achievement against the Key Performance Indicators included in the enhanced Corporate or Business Plan;*
- *Extent of acceptance and implementation by CASA and other relevant parties of BASI recommendations, with particular reference to those not accepted/implemented; and*
- *Application/effectiveness of BASI resources, including financial and human aspects.*

Status: See R25 – Reporting to be part of annual review based on PBS outputs and will include information on recommendations. The annual review will be refined in future years.

R27 *BASI continue to obtain its corporate services from the Department, but become more involved in and accountable for this aspect. Bureau management should place higher priority on developing a better relationship with Corporate Division, with the intention of negotiating improved service at more reasonable cost. In this regard, consideration of the general principles underlying the purchaser provider approach could assist BASI management in their negotiations.*

Status: ATSB is part of DoTRS and a participant in its Corporate Services Review which should improve transparency and efficiency of corporate services.

R28 *BASI accommodation should preferably be separate from that of the Department and of equivalent standard. The cost should reflect that of the specific accommodation.*

Status: Cox building lease signed. Currently negotiating fit out requirements and ATSB expects to move to new accommodation in early 2001. Collocation of ATSB in the whole of the Cox building was revenue neutral to DoTRS.

R29 *BASI should seek an indication from departmental management on possible future funding levels to assist in resource and project management decisions. It should also seek advice as to the extent that the benefits of improved efficiency and/or more appropriate cost attribution can be directed to increasing the technical/professional capability and output of the Bureau, and/or providing a remuneration structure that is more consistent with industry arrangements; ie the likely Departmental policy on gainsharing.*

Status: ATSB is part of DoTRS Executive Board budget review processes. In addition to a budget for 2000–2001 ATSB has been given a budget for 2001–2002 to manage towards.

R30 B*ASI management should give priority to:*

- *Developing better inter-personal relationships with the management of Corporate Division;*
- *Improving the BASI contribution to development of corporate policies;*
- *Negotiating BASI specific requirements more effectively; and*
- *Advocating the corporate position to Bureau staff.*

Status: In 1999-2000 the Department established an Executive Group (Executive Board in 2000–2001) which includes the ATSB Executive Director as a full member. The Executive Director is therefore involved in corporate policy development and in negotiating ATSB-specific requirements. The Executive Director and other ATSB SES are required to advocate the DoTRS corporate position to ATSB staff.

R31 *That BASI develop as a matter of priority an enhanced categorisation methodology which provides for much better differentiation of occurrences with the intention of using this system to determine more accurately and so control the workload and associated resource and skill requirements.*

Status: Considered as part of the wider workload commenced on 1 April 2000 (see R1). Further enhancements are likely in 2000–2001.

R32 *BASI should develop a strategic, structured approach to workload management based on a broad policy of applying resources to 'likely best safety outcomes'.*

Before starting (or continuing) an investigation, BASI should critically assess:

'Is the potential investigation likely to improve appropriately the knowledge of aviation safety issues and so provide potential for improved safety outcomes?'

The basis for ascribing priority should be:

'The extent of likely improvement in aviation safety outcomes'.

Each investigation should include provision for formal review at discrete milestones to enable decisions to be made about whether it should continue or be curtailed.

Status: See R31. Workload is prioritised based on the criteria suggested. Milestones and review depends on the category and complexity of the investigation.

R33 *After development of the policy in draft form it should be subjected to widespread consultation with the broadest possible range of interested parties. After review, and due consideration of matters raised in the consultation, Ministerial endorsement of the policy should be sought.*

Status: The draft policy was advised to the Secretary and the Minister. Evaluation and refinement of workload arrangements will be based on investigator input. Final policy will be promulgated widely.

R34 *The agreed policy should be firmly enshrined in BASI management and operational procedures; and should be appropriately promulgated, especially in BASI public interfaces.*

Status: Agreed as per R33. ATSB Policy and Procedures being updated.

R35 *Particular attention should be paid to a workload management policy which makes due provision for the involvement of BASI in increased proactive activities, including the investigation of accidents/incidents in other than the fare-paying passenger segment of the industry. For the non-fare-paying segment, greater use should be made of general reports dealing with more often encountered accidents/incidents which are wide ranging and of high quality and specifically intended to reduce the extent of investigatory work needed in many instances.*

Status: Agreed. See R1, R31–34

R36 *Priority should be afforded to finalisation of the Memorandum of Understanding (MoU) with the State coroners which defines the extent of involvement of BASI in future coronial inquiries and which recognises the Bureau's safety charter and resource capability. If agreement cannot be reached, BASI should operate in a manner consistent with its safety objectives, while continuing to seek to put in place alternative arrangements intended to satisfy the needs of State coroners.*

Status: Reviewing draft MoU with Australian Coroners' Society Inc.

R37 *BASI continue to develop a strategy of improving its internal accident/incident investigation management capability, with the intention of then using external resources to assist in specific, and particularly major, investigations.*

Status: See R31-35. Resourcing and preparedness for a major accident are under review.

R38 *That a strategic review of the BASI database requirements be undertaken with the intention of ensuring that the system provided:*

- *is strategically focused;*
- *meets the legitimate needs of intended users, especially government aviation agencies;*
- *uses contemporary database management techniques;*
- *is user-friendly;*
- *provides for appropriate user interaction via the Internet; and; and*
- *will ensure minimum realistic total operational cost to the Bureau.*

Status: Review of ATSB IT systems has been completed and the final report detailing options for the way forward has been received and is under consideration.

R39 *That BASI continue to focus on the fare-paying sector of the industry in accordance with Government policy, but in setting priorities and allocating resources also allow for a measured role in the other sectors.*

Status: Part of new investigation policy (see R1, R9, R11 and R31-35).

R40 *BASI develop a structured program to assist peak aviation bodies to contribute effectively to investigation of accidents/incidents in their particular sector. This could include the creation of clear guidelines, appropriate training and protection under the* Air Navigation Act 1920 *if the organisation were to act on behalf of BASI.*

Status: Assistance is ongoing but structured program will follow (see R1, R9, R11 and R31-35).

R41 *In consultation with the Civil Aviation Safety Authority, BASI monitor and publish, where appropriate, assessments of the factors and/or trends leading to accidents in each aviation sector (e.g. general aviation) and significant subsector (e.g. agricultural, ultralight). These should be used as a basis for deciding the scope and priority of any Bureau involvement in an investigation and to assist peak bodies carrying out investigations.*

Status: See R2 and R11.

R42 *BASI review its current practices regarding involvement in overseas work. Specifically, an internal, BASI specific, departmental policy should be prepared which provides for careful assessment of both the relative benefits and adverse implications, with the intention of ensuring a measured, strategic involvement in all aspects of its international role in future.*

Status: International activities reviewed for 1999–2000 and will be again for 2000–2001 (see R3). Guidelines on participation in overseas activities have been agreed and issued to staff.

R43 *That a program of desktop and full-scale exercises be funded and implemented with the intention of ensuring that BASI is well prepared for a major aviation accident.*

Status: Consultant has been selected and work has commenced. Report is expected to be completed by October 2000.

R44 *That arrangements be put in place to ensure ready access to adequate funding to enable an investigation into a major accident to proceed without delay and without compromising the effectiveness of the investigation.*

Status: Will be reviewed pending completion of consultancy (R43). Federal Government's new flexible budgetary arrangements will enable use of departmental resources in the event of a major accident pending any necessary new appropriation.

R45 *That BASI set challenging but reasonable targets for report preparation and issue and that such targets be included in the BASI Corporate Plan, communicated to interested parties and achievement against them be reported on in the Annual Report.*

Status: See R1, R19-21; achievement included in ATSB annual review.

R46 *That for more complex reports, BASI should seek to accelerate publication of the section providing factual information so that this is made available to the industry as early as possible.*

Status: Interim reports and recommendations are released for complex investigations as early as possible.

R47 *The BASI laboratory function should be treated as a stand-alone cost centre; opportunities should be sought for commercial activities and the real cost should be reported annually in the context of an ongoing review of the desirability of continuing to operate the facilities.*

Status: Cost centre established; all pricing to be reviewed as part of the DoTRS output pricing review process with Department of Finance and Administration.

R48 *Remuneration of BASI technical professional staff should be one of the factors considered in the revised industrial relations arrangements recommended in section 7.3.3. Decisions on remuneration should take due consideration of the market conditions applicable to each category of Air Safety Investigator and not necessarily apply across the board.*

Status: Remuneration levels agreed as part of the departmental 1999–2001 Certified Agreement and must be balanced against ATSB's budget constraint.

R49 *The structure of BASI and the remuneration of its senior management be considered in the context of the recent departmental decision to establish the Australian Transport Safety Bureau.*

Status: New ATSB structure in place; senior management are remunerated through Australian Workplace Agreements (AWAs).

R50 *That BASI develop a strategic resource plan which takes into account the need to reduce the current attrition rate and the associated workload associated with training of new staff members. The objective should be to ensure a more stable longer-term workforce that is well qualified and equipped to handle the anticipated future workload insofar as such can be estimated in an environment in which a significant component of such work will continue to be reacting to unpredictable events.*

Status: Workplace planning is ongoing. Training and development is in accordance with Secretary's Statement of Skills and ATSB investigator competencies. Budget places constraints on remuneration and recruitment in advance of staff departures.

R51 *That the staffing and development strategies for other than Air Safety Investigators be reviewed as a matter of priority.*

Status: Considered as part of workforce planning Corporate Services review and ongoing reviews of Secretary's Statement of Skills.

R52 *That opportunities be sought to improve the quality of work offered to non-investigatory staff, including an assessment whether any part of investigator work could be satisfactorily re-allocated to other staff.*

Status: New positions (Australian Public Service Level 5) established. Also part of R1, R31, R32 and ongoing review.

R53 *That BASI consider whether it would be practicable to cooperate with an Australian tertiary institution to develop aviation safety courses to suit their specific requirements and which could be offered by distance learning and lead to formal post-graduate qualifications for staff members undertaking such training.*

Status: A number of possibilities are being assessed.

R54 *That the Bureau ensures that priority is given to management training for people with the potential to progress to more senior levels in BASI.*

Status: Ongoing, including through DoTRS programs and on-the-job.

R55 *That the Secretary of the Department of Transport and Regional Services agree that BASI (and the Australian Transport Safety Bureau) should have industrial relations arrangements that are more suited to the special nature of the work and skill requirements than can be provided in the current Department-wide approach.*

Status: Section J of the departmental 1999-2001 Certified Agreement covers specific issues relating to Transport Safety Investigators. AWAs agreed with senior management.

R56 *That BASI (or the Australian Transport Safety Bureau) management take prime responsibility for negotiation of terms and conditions for their staff. The outcome should be more consistent with aviation industry and other Commonwealth aviation agency practices than at present providing this can be achieved within budgetary allocations. This should involve either a separate Certified Agreement or a stand-alone addendum to the Departmental agreement.*

Status: Executive Director was heavily involved in 1999–2001 Certified Agreement negotiations (see R55) and negotiated

Deputy Director AWAs. ATSB faces a budget constraint like other Divisions of the Department (see R48).

R57 *That consideration be given to introduction of Australian Workplace Agreements for more senior BASI (or Australian Transport Safety Bureau) staff, with such being introduced voluntarily at first but becoming the permanent arrangement when positions are next filled.*

Status: SES and two aviation Deputy Directors have Australian Workplace Agreements (see R49).

R58 *That BASI institute a formal 'Conflict of Interest' policy and ensure sign-off against this policy prior to any staff member commencing work on any major investigation.*

Status: Minute sent by Executive Director to all ATSB people on 14 December 1999 and revised on 30 June 2000 (see Appendix 8).

Appendix 11: ATSB performance measures in 2000-–2001 Portfolio Budget Statements

Portfolio Budget Statements output 1.1 – Policy advice and ministerial services

1. Participate in international and regional forums, such as IMO, ICAO, IATA, ISASI, MAIIF.

   Quantity: 12 Safety meetings per annum (including IMO, ICAO, MAIIF, ISASI, IATA)

   Quality: Australia's contribution is consistent with the forum's goals and objectives and Australia's transport and trade objectives.

2. Participate in, and provide policy support and/or secretariat services to, committees and working groups: The Australian Transport Council (ATC) and its sub-structure.

   Quantity: Two ATC, two SCOT and two Rail Group meetings.

   Quality: Facilitate the deliberations of the committee and working groups to the satisfaction of the Minister and Secretary through relevant contributions and assistance in the consideration of various stakeholder views.

   Timeliness: Provision of briefing and meeting papers, and resolution of actions, within required timeframes.

3. Provide advice to the Ministers on the outcomes and relevance of maritime safety investigations to maritime safety policy and related safety issues.

   Quantity: Advice on up to 15 investigations.

   Quality: In accordance with the Ministers' standard performance measures for policy advice.

   Timeliness: In accordance with the Ministers' standard performance measures for policy advice.

4. Provide policy advice to the Ministers on road transport safety including:

   Quality: In accordance with the Ministers' standard performance measures for policy advice.

5. Facilitate the development and implementation of the new National Road Safety Strategy.

   Quantity: One National Road Safety Strategy.

   Quality: National Road Safety Strategy agreed by jurisdictions.

   Timeliness: The National Road Safety Strategy to be agreed and implemented in 2000–2001.

6. Facilitate the development of a Heavy Vehicle Safety Strategy.

   Quality: Heavy Vehicle Safety Strategy agreed with jurisdictions and stakeholders.

7. Participate in the Austroads Road Safety Program.

   Quality: Quality of Department of Transport and Regional Services contribution to Austroads Program meets expectations of other participating jurisdictions.

   Timeliness: Austroads program deadlines set by ATC, or agreed with other jurisdictions, are met.

8. Provide advice to the Ministers on rail transport safety issues and on the outcomes and relevance of rail safety investigations.

   Quantity: Advice on four safety investigations.

   Quality: In accordance with the Ministers' standard performance measures for policy advice.

   Timeliness: In accordance with the Ministers' standard performance measures for policy advice.

9. Provide advice to the Ministers on the outcomes and relevance of air safety investigations to air safety policy and related safety issues.

   Quantity: Advice on up to 50 key investigations.

   Quality: In accordance with the Ministers' standard performance measures for policy advice.

   Timeliness: In accordance with the Ministers' standard performance measures for policy advice.

10. Prepare briefs and other advice for the Ministers.

    Quantity: Briefs: (Minutes) 230.

    Quality: Policy briefs and other advice are in accordance with the Ministers' Standard Performance Measures for Policy Advice.

    Cabinet submissions prepared in accordance with Cabinet timetable and guidelines set out in PM&C Cabinet Handbook.

    Timeliness: Policy briefs and other advice are in accordance with the Ministers' Standard Performance Measures for Policy Advice. Cabinet submissions prepared in accordance with Cabinet timetable and guidelines set out in PM&C* Cabinet Handbook.

    ** PM&C: Department of the Prime Minister and Cabinet*

11. Draft responses to parliamentary questions, including preparing for possible questions, and maintaining (and providing to the Ministers) key facts relevant to the portfolio.

    Quantity: Parliamentary Questions-24 for ATSB.

    Quality: Parliamentary questions to accord with standards and procedures in PM&C's Guidelines for presentation of Ministerial Statements, Reports and Government Responses to the Parliament.

    Timeliness: Parliamentary questions to accord with standards and procedures in PM&C's Guidelines for presentation of Ministerial Statements, Reports and Government Responses to the Parliament.

12. Attend and provide input to Parliamentary hearings. Prepare responses to parliamentary inquiries and reports.

    Quantity: Parliamentary Committee: 7 briefings, 2 submissions.

    Quality: Parliamentary Committee Hearings to accord with standards and procedures in PM&C's Guidelines for presentation of Ministerial Statements, Reports and Government responses to the Parliament.

    Timeliness: Parliamentary Committee Hearings to accord with standards and procedures in PM&C's Guidelines for presentation of Ministerial Statements, Reports and Government Responses to the Parliament.

    Quantity: Senate Estimates Committee – 20 draft responses to questions on notice for ATSB.

    Quality: Parliamentary Committee Hearings to accord with standards and procedures in PM&C's Guidelines for

presentation of Ministerial Statements, Reports and Government responses to the Parliament.

Timeliness: Parliamentary Committee Hearings to accord with standards and procedures in PM&C's Guidelines for presentation of Ministerial Statements, Reports and Government Responses to the Parliament.

13. Draft replies for correspondence to the Ministers.
Quantity: Ministerial Correspondence-150 draft replies for the Minister and Parliamentary Secretary.

Quality: Ministerial services will accord with the quality and timeliness standards laid down in the Ministers' Standard Performance Measures for Ministerial Services.

Timeliness: Ministerial services will accord with the quality and timeliness standards laid down in the Ministers' Standard Performance Measures for Ministerial Services.

14. Prepare speeches and presentations for the Ministers.

Quantity: Provide input in speeches and presentations for the Ministers as required.

Quality: Ministerial services will accord with the quality and timeliness standards laid down in the Minister's Standard Performance Measures for Policy Advice.

Timeliness: Ministerial services will accord with the quality and timeliness standards laid down in the Minister's Standard Performance Measures for Policy Advice.

Portfolio Budget Statements output 2.2 – Safety investigations

15. Publicly released individual occurrence reports resulting from air transport safety investigations.

Quantity: Capacity to publish up to 230 Occurrence Reports.

Quality: Requests for information are handled to the satisfaction of the person/organisation requesting.

Timeliness: Investigation occurrence reports produced in accordance with ICAO standards.

16. Confidential Aviation Incident Reporting system (CAIR) reports resulting in notifications of alert bulletins.

Quantity: Capacity to issue up to 150 notifications resulting from CAIR Reports.

Quality: Notifications of those actions which are considered sufficiently serious and on which appropriate safety actions are taken.

Timeliness: Notifications of sufficiently serious incidents, from CAIR Reports issued within 15 days of receipt.

17. Aviation occurrence data analysis.

    Quantity: Capacity to undertake up to four data analysis projects.

    Quality: All data analysis projects result in publication of results.

18. Aviation safety-related projects.

    Quantity: Capacity to undertake two aviation safety related projects.

    Quality: Acceptance of recommendations arising from Aviation safety-related projects by the aviation industry.

    Timeliness: Aviation safety-related projects completed within twelve months of commencement.

19. 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.

    Quality: Acceptance of recommendations arising from Aviation safety-related projects by the aviation industry.

    Timeliness: Each safety deficiency issue assessed and appropriately actioned within one month.

20. Investigations of maritime accidents/incidents to identify circumstances and establish causes.

    Quantity: Findings published in up to 15 reports and six presentations.

    Quality: Impartial investigations undertaken in accordance with legislation/regulations and procedural guidelines.

Timeliness: Median time of 27 weeks to complete investigations and finalise reports.

21. Investigations of rail safety incidents to identify circumstances and establish causes.

    Quantity: Findings published in up to four reports.

    Quality: Impartial investigations undertaken in accordance with relevant legislation/regulations and procedural guidelines.

    Timeliness: Median time of 27 weeks to complete investigations and finalise reports.

22. International investigation of transport incidents and accidents, including the provision of technical assistance to regional authorities.

    Quantity: Provision of limited assistance as required given ATSB's capacity.

    Quality: Technical assistance which meets user requirements.

    Timeliness: Staged responses with individually agreed timeframes depending upon complexity and priority given other commitments.

23. Undertake vehicle defect investigations as required.

    Quantity: Undertake up to 75 vehicle defect investigations.

    Quality: Stakeholders have an increased awareness of vehicle safety.

    Timeliness: In line with agreed procedures for management of safety investigations.

24. Monitor vehicle recalls.

    Quantity: Monitor the effectiveness of up to 85 safety recalls.

    Quality: Consumer Affairs Division are kept up-to-date on the status of vehicle recalls.

    Timeliness: In line with agreed procedures for monitoring of vehicle safety recalls.

Portfolio Budget Statements output 3.3 – Services to regional communities, including administration of programs and grants for communities

25. Administer the Road Safety Black Spot Program.

    Quantity: Administer one program per State and Territory, 400 projects in total. Location: 50 per cent in rural locations.

    Quality: In accordance with the Ministers' standard performance measures for administering grants programs. Government and community satisfaction with the administration of the program. Independent review by BTE of the program's effectiveness.

    Timeliness: Timely preparation of State and Territory programs. Progressive payments to States and Territories, based on confirmation of program delivery.

Portfolio Budget Statements output 4.2 – Safety education and information

26. Provision of Transport safety related information to inquirers via database searches.

    Quantity: Capacity to provide up to 5000 responses to requests for 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.

    Timeliness: 90 per cent of inquiries satisfied within 10 days of receipt.

27. Maintenance of the ATSB web site as major repository for up-to-date safety information produced by ATSB.

    Quantity: Capacity to add up to 300 reports to the web site.

    Quality: Evidence that the ATSB web site is meeting user requirements for transport safety information.

    Timeliness: Data available on web site at the same time as it is publicly available.

28. Presentations to industry, conferences etc.

    Quantity: Capacity for up to 200 presentations delivered as required.

    Quality: Presentations to industry of appropriate professional and technical standard to satisfy audience.

    Timeliness: Presentations delivered as required.

29. Freedom of Information requests.

    Quantity: Capacity for up to 30 FOI requests.

    Quality: FOI requests dealt with in accordance with FOI Guidelines.

    Timeliness: FOI requests dealt with in accordance with FOI Guidelines.

30. Attendance at inquests and legal hearings to provide expert advice and evidence.

    Quantity: Capacity for up to ten inquests and legal hearings

    Quality: Advice and evidence at inquests and legal hearings which satisfies inquirers.

    Timeliness: Expert advice and evidence in accordance with requirements of legal authorities

31. Subpoenas and writs of non-disclosure to produce documents and information.

    Quantity: Capacity for up to ten responses to subpoenas and writs.

    Quality: Provision of information that fully meets requirements of request to satisfaction of inquirers under subpoenas and writs.

    Timeliness: Expert evidence and advice in accordance with requirements of legal authorities.

32. Develop a road safety research program, and fund and administer selected research projects to underpin the development and implementation of road safety policy and strategies. Publish and promote research findings.

    Quantity: Approximately 15 projects.

    Quality: Research data contribute to policies and strategies. Contracted research is undertaken in line with set specifications.

    Timeliness: Six safety research projects completed by June 2001.

33. Facilitate and publish statistical analysis and data collection to assist in the conduct of formal road safety investigations and the development of policies and strategies.

    Quantity: Publish 25 statistical reports.

    Quality: User satisfaction with published statistical information.

34. 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.

    Timeliness: First statistical report published by December 2000.

35. 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.

    Quantity: Publish four statistical reports.

    Quality: User satisfaction with published statistical information.

36. Liaise with rail safety accreditation authorities in meetings and forums.

    Quantity: Four meetings per annum.

    Timeliness: Meeting reports produced within one week of meeting.

37. Publish and distribute maritime safety reports.

    Quantity: Findings published in up to 15 reports.

    Quality: Acceptance and utilisation of marine safety reports by the maritime industry.

38. Publish and distribute rail safety reports.

    Quantity: Findings published in up to four reports.

    Quality: Acceptance and utilisation of rail safety reports by the rail industry.

39. Publish and distribute aviation safety reports and bulletins. Specific aviation sector safety bulletins.

    Quantity: Two safety bulletins for each target aviation sector.

    Quality: Acceptance and utilisation of the safety bulletins by target sector.

    Timeliness: Each publication of a safety bulletin within three months of the half year reported.

40. Aviation Safety Deficiency Reports.

    Quantity: Four Aviation Safety Deficiency Reports.

    Quality: Acceptance of Safety Deficiency Reports and utilisation by the aviation industry.

41. Contribution to CASA's *Flight Safety Australia* Magazine.

    Quantity: Contributions to six editions of 'Flight Safety'.

    Timeliness: Copy for 'Flight Safety' is provided by due date and no changes are required.

42. Quarterly reports consolidating occurrence investigation information.

    Quality: Recipient satisfaction with occurrence reports information. Industry satisfaction with occurrence investigation information.

    Timeliness: Quarterly occurrence investigation reports completed within three months of the quarter under review.

43. Weekly summary of occurrence reports.

    Quantity: 52 weekly summaries of occurrence reports.

    Quality: Recipient satisfaction with occurrence reports information. Industry satisfaction with occurrence investigation information.

    Timeliness: Publication of summary reports within one week of period under review.

Administered Program Group 1 – Services to communities administered on behalf of the Commonwealth Program 1.2 Grants to State/Territories and Local Government – Road Safety Black Spot Program

Quantity: Approx: 400 projects.

Cost: Appropriation of $42.183m. Expenses of $41.035m.

Location: 50 per cent in rural and regional Australia.

Quality: Effectiveness: Improve the safety of Australia's roads and, in doing so, reduce the cost to the community of road trauma.

(See Output 3.3 on page 171 above for performance information).