

Efficiency of the Investigation of Transport Accidents and Safety Occurrences

Australian Transport Safety Bureau

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Senior Executive Director
Corporate Management Branch
Australian National Audit Office
19 National Circuit
BARTON ACT 2600

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Canberra ACT
14 March 2019

Dear Mr President
Dear Mr Speaker

In accordance with the authority contained in the *Auditor-General Act 1997*, I have undertaken an independent performance audit in the Australian Transport Safety Bureau. The report is titled *Efficiency of the Investigation of Transport Accidents and Safety Occurrences*. Pursuant to Senate Standing Order 166 relating to the presentation of documents when the Senate is not sitting, I present the report of this audit to the Parliament.

Following its presentation and receipt, the report will be placed on the Australian National Audit Office's website — <http://www.anao.gov.au>.

Yours sincerely



Grant Hehir
Auditor-General

The Honourable the President of the Senate
The Honourable the Speaker of the House of Representatives
Parliament House
Canberra ACT

AUDITING FOR AUSTRALIA

The Auditor-General is head of the Australian National Audit Office (ANAO). The ANAO assists the Auditor-General to carry out his duties under the *Auditor-General Act 1997* to undertake performance audits, financial statement audits and assurance reviews of Commonwealth public sector bodies and to provide independent reports and advice for the Parliament, the Australian Government and the community. The aim is to improve Commonwealth public sector administration and accountability.

For further information contact:
Australian National Audit Office
GPO Box 707
Canberra ACT 2601

Phone: (02) 6203 7300
Fax: (02) 6203 7777
Email: ag1@anao.gov.au

Auditor-General reports and information about the ANAO are available on our website:
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Audit team

Michelle Mant
Amanda Ronald
Alexander Wilkinson
Brian Boyd

Contents

Summary and recommendations.....	7
Background	7
Conclusion	8
Supporting findings.....	8
Recommendations.....	9
Summary of entity response.....	10
Key messages from this audit for all Australian Government entities	10
Audit findings.....	13
1. Background	14
Australian Transport Safety Bureau	14
Operational context	15
Audit rationale and approach	15
2. Measuring and supporting operational efficiency.....	17
Does the ATSB have appropriate performance measures to enable an assessment of its investigation efficiency?	17
Does the ATSB collect relevant and reliable information on its investigation efficiency?	23
Does the ATSB's processes for prioritising the oversighting and conduct of investigations support the efficient use of resources?	24
Are opportunities to improve investigatory processes and practices identified and acted upon?.....	28
What controls does the ATSB have in place to assure itself that improvements in efficiency do not compromise the quality of its investigations?.....	32
3. Comparing operational efficiency	34
Has the ATSB analysed changes in its investigation efficiency over time?	34
Has the ATSB become more efficient over time in conducting investigations?	35
Has the ATSB compared its investigation efficiency to other relevant organisations?	37
How does the ATSB's investigation efficiency compare to other relevant organisations?	38
Appendices	45
Appendix 1 Australian Transport Safety Bureau response.....	46

Summary and recommendations

Background

1. The Australian Transport Safety Bureau (ATSB) was established by the *Transport Safety Investigation Act 2003* (TSI Act) as Australia's national transport safety investigation agency. It seeks to improve safety and public confidence in the aviation, marine and rail modes of transport through:

- independent investigation of transport accidents and other safety occurrences;
- safety data recording, analysis and research; and
- fostering safety awareness, knowledge and action.

2. Under the TSI Act, the ATSB focusses on the prevention of future accidents and the improvement of safety. It is not a function of the ATSB to apportion blame or provide a means for determining liability. The ATSB does not investigate for the purpose of taking administrative, regulatory or criminal action.

3. In 2017–18, the ATSB received 15,766 aviation notifications¹, 518 rail notifications and 238 marine notifications in the form of telephone calls, emails and website contact. This resulted in 6,350 being assessed as a safety occurrence and so came under consideration for investigation. Under the TSI Act (section 21), the ATSB may investigate any transport safety matter, and must investigate a transport safety matter if directed in writing by the Minister to do so. While not all of the reported occurrences are investigated, the details of each occurrence are retained within the ATSB's occurrence database, which is analysed to identify emerging trends and issues.

4. The ATSB is a non-corporate Commonwealth entity under the *Public Governance, Performance and Accountability Act 2013* (PGPA Act).² In 2017–18, the ATSB had a full time Chief Commissioner; three part-time Commissioners and 109 staff across its offices within Australia. The staffing profile included 53 aviation, marine and rail safety investigators.

5. There has been growth across all three of the transport modes the ATSB is responsible for investigating. The May 2017 Budget included additional funding of \$11.9 million for the ATSB over five years from 2016–17. The increase in funding was provided to the ATSB to replenish its workforce, and re-profile its capital investment strategies to meet its projected needs in technical equipment, data warehousing and core enterprise systems.

Rationale for undertaking the audit

6. This topic was selected for audit as part of a series of performance audits focussing on the efficiency of entities. The audit was undertaken in the early stages of a significant organisational

1 A range of stakeholders (such as transport operators) are required by law to report transport accidents and incidents to the ATSB. The ATSB can receive multiple reports (notifications) of the same occurrence, and at times, also receives reports of non-transport safety related matters. The ATSB assesses every notification received.

2 The ATSB also receives cost recovery revenue from the states in relation to the ATSB's roles as the national rail investigator, funding for the ATSB's support to Papua New Guinea and Indonesia, along with cost recoveries for training delivery.

change program within the ATSB that is aimed at enhancing operational efficiency and effectiveness.

Audit objective and criteria

7. The objective of this audit was to examine the efficiency of the ATSB's investigation of transport accidents and safety occurrences.

8. To form a conclusion against the audit objective, the following high-level criteria were adopted:

- Has the ATSB put in place efficient processes for the investigation of transport accidents and safety occurrences?
- How well does the ATSB's investigation efficiency compare to its own previous performance, as well as relevant international comparator organisations?

9. The scope of this audit covered the ATSB's activities and processes for the conduct of investigations. The ATSB's operations support functions, systems and processes such as financial and workflow management were also included given the influence they have on operational efficiency.

Conclusion

10. The efficiency with which the ATSB investigates transport accidents and safety occurrences has been declining. The ATSB has recently been focussing its attention on reducing the backlog of old investigations, improving investigation timeframes and taking steps to benchmark its performance against transport investigation entities in some other countries.

11. The ATSB has established key elements of an overall framework to promote efficient investigation processes. There is a focus on clearing the backlog of investigations that have been underway for some time, applying sound processes to decide which notifications merit a safety investigation, and adjusting key performance indicators to identify more realistic completion timeframes for the more complex investigations. The ATSB has also taken a number of actions to give greater attention to the efficiency with which it undertakes transport safety investigations.

12. The efficiency of the ATSB's investigation activities has declined over time both in relation to the length of time taken to complete investigations, and the amount of investigation resources required. The ATSB has recently started taking steps to benchmark its performance against transport safety investigators in some other countries. Analysis of the available data indicates that averaged across the last three years the ATSB has performed well in comparison to the selected countries on a range of efficiency metrics. On an annualised trend basis, the analysis indicates that the ATSB's efficiency has been declining relative to the selected comparators, particularly in relation to resource efficiency.

Supporting findings

Measuring and supporting operational efficiency

13. The ATSB has performance measures in place addressing time efficiency. Timeframe targets have not been achieved by the ATSB, and work is underway to develop more realistic timeframe targets. The ATSB does not publicly report on its resource efficiency.

14. The ATSB collects a range of information that can be used to inform an assessment of its investigation efficiency. Work is underway within the ATSB to improve its collection and analysis of data for this purpose.

15. The assessment and prioritisation processes support the ATSB focussing its investigation resources in the areas that are most likely to result in safety improvements. Action is underway to enhance the way those processes take into account the extent to which investigator resources are available.

16. Organisational change programs have been initiated and opportunities to improve investigatory processes have been identified and are being pursued.

17. The ATSB has had quality controls and processes in place, however they have not been conducive to the timely completion and review of investigations. Since 2017, the ATSB has implemented key review points earlier in the investigations process. As a result, the ATSB has identified improvements in quality and a reduction in the amount of rework required through the various review stages.

Comparing operational efficiency

18. The ATSB has undertaken limited analysis of changes in its investigation efficiency over time. This analysis has focussed on timeliness and the work effort required to complete an investigation.

19. Efficiency has declined over time. Over the last five years, the time taken and resources required by the ATSB to complete investigations has increased significantly.

20. Prior to 2018, the ATSB had not compared its investigation efficiency to other relevant transport safety investigation organisations. Steps are now being taken to benchmark performance against international comparators.

21. Data obtained in connection with this ANAO performance audit indicates that, averaged across the last three years, the ATSB is performing comparably across a range of efficiency metrics. On an annualised basis, the ATSB's efficiency has been declining particularly in terms of resource efficiency where it has fallen behind two of the three countries examined for which data was available.

Recommendations

22. Any findings in the report which the audit team feel warrant Executive accountability to remedy should be included as a recommendation.

Recommendation no.1 The ATSB implement strategies that address the decline in the timely completion of short investigations.

Paragraph 2.8

Australian Transport Safety Bureau response: *Agreed.*

Recommendation no.2 The ATSB report on the efficiency with which it uses resources in undertaking investigations.

Paragraph 2.18

Australian Transport Safety Bureau response: *Agreed.*

Recommendation no.3 The ATSB establish more realistic targets for investigation timeframes addressing both calendar and investigator (effort) days.

Paragraph 3.5

Australian Transport Safety Bureau response: *Agreed.*

Recommendation no.4 The ATSB continue to progress actions that it has recently commenced to benchmark its investigation performance against relevant international comparators and use the results to identify strategies to improve its performance.

Paragraph 3.21

Australian Transport Safety Bureau response: *Agreed.*

Summary of entity response

23. A summary response from the Australian Transport Safety Bureau is provided below, while the letter of response is provided at Appendix 1.

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) acknowledges the findings and recommendations of the ANAO. The ATSB recognises that efficiency is an essential factor in influencing improvements in transport safety. In recent years, the ATSB has undergone transformational change to improve efficiency and effectiveness.

The ANAO's report acknowledges that before the audit the ATSB was already engaged in program to improve efficiency. The ATSB sought and received funding to replenish its workforce and re-profile its capital investment strategies to meet the projected needs in essential technical equipment, data warehousing requirements and core enterprise systems. The ATSB has invested heavily in recruiting, training and mentoring new investigators that will result in enhanced efficiencies as their competencies develop and mature. Further, the ATSB has already commenced a program of work to apply a project management approach to investigations. This program is providing the ATSB with greater visibility of workloads and availability of skills across its workforce.

This audit has assisted the ATSB to make further efficiency improvements. The ATSB will soon release a varied Corporate Plan with more suitable key performance indicators for timeliness and demand/capacity. The ATSB is also working towards fostering further benchmarking work amongst accident investigation agencies around the world. While the ATSB has previously benchmarked the quality of investigations and recognised a best practice approach, a benchmarking focus on investigation efficiency should assist the ATSB and likeminded investigation agencies to learn from each other.

The ATSB continually strives for excellence in all that we do. The ATSB agrees with the recommendations in the ANAO report and has already begun implementing them. Greater efficiency and effectiveness will further enable us to fulfil our important function of improving transport safety in an operating environment of continuing change in the aviation, rail and marine industries.

Key messages from this audit for all Australian Government entities

24. Below is a summary of key messages, including instances of good practice, which have been identified in this audit that may be relevant for the operations of other Commonwealth entities.

Performance and impact measurement

- A well informed triage function aids organisational efficiency. This requires that decisions about which referrals to act upon take into account not only the particular merits of the referral, but also the entity's existing workload and capacity to take on additional work.
- Key performance indicators (including targets) identifying realistic completion timeframes for key outputs aids accountability and can inform entities when performance requires improvement.
- Identifying suitable comparators to assess efficiency against provides entities with a useful indicator of performance. Comparators can include: past performance; organisations with comparable functions or processes; or appropriate targets and benchmarks. When assessing efficiency the comparator benchmark does not need to be the same, particularly if you know what the differences are and the benchmark can be used to assess reasons for variations through time.

Audit findings

1. Background

Australian Transport Safety Bureau

1.1 The Australian Transport Safety Bureau (ATSB) was established by the *Transport Safety Investigation Act 2003* (TSI Act) as Australia's national transport safety investigation agency. It seeks to improve safety and public confidence in the aviation, marine and rail modes of transport through:

- independent investigation of transport accidents and other safety occurrences;
- safety data recording, analysis and research; and
- fostering safety awareness, knowledge and action.

1.2 Under the TSI Act, the ATSB focusses on the prevention of future accidents and the improvement of safety. It is not a function of the ATSB to apportion blame or provide a means for determining liability. The ATSB does not investigate for the purpose of taking administrative, regulatory or criminal action.

1.3 In 2017–18, the ATSB received 15,766 aviation notifications³, 518 rail notifications and 238 marine notifications in the form of telephone calls, emails and website contact. This resulted in 6,350 being assessed as a safety occurrence and so came under consideration for investigation. Under the TSI Act (section 21), the ATSB may investigate any transport safety matter, and must investigate a transport safety matter if directed in writing by the Minister to do so. Figure 1.1 illustrates the types of investigation categories that the ATSB currently undertake. While not all of the reported occurrences are investigated, the details of each occurrence are retained within the ATSB's occurrence database, which is analysed to identify emerging trends and issues.

Figure 1.1: Investigation categories and expected timeframes across aviation, marine and rail.

Category:	Definition:	Default timeframe:
Major (old Major)	Likely to involve significant ATSB and external resources for up to two years. Likely to require supplementary funding.	24 months
Complex (old Level 1,2,3)	Can involve in-the-field ATSB activity, a range of ATSB and possibly external resources for up to one year.	12 months
Defined (old Level 4)	An agreed-scope product with a limited set of findings and a defined-size report.	9 months
Short (old Level 5)	Limited analysis product with only one ATSB resource.	4 months
Brief (equivalent Level 6)	A short factual summary of an occurrence.	1 month

Source: ATSB data.

3 A range of stakeholders (such as transport operators) are required by law to report transport accidents and incidents to the ATSB. The ATSB can receive multiple reports (notifications) of the same occurrence, and at times, also receives reports of non-transport safety related matters. The ATSB assesses every notification received.

1.4 There has not been a major catastrophic event within Australia, as categorised by the ATSB that has required a major investigation to be undertaken under the TSI Act. The ATSB reports on complex investigations, which is a combination of investigations categorised as complex and defined.⁴ The ATSB also reports on short investigations which have been undertaken since 2010. In late-2017, the ATSB introduced and reported against occurrence briefs. These briefs are concise reports that detail the facts surrounding an occurrence, as provided in the initial notification and from any follow-up information. For the purposes of this audit, the ANAO has focussed on complex, defined and short investigations.

Operational context

1.5 The ATSB is a non-corporate Commonwealth entity under the *Public Governance, Performance and Accountability Act 2013* (PGPA Act).⁵ In 2017–18, the ATSB had a full time Chief Commissioner; three part-time Commissioners and 109 staff across its offices within Australia. The staffing profile included 53 aviation, marine and rail safety investigators.

1.6 There has been growth across all three of the transport modes the ATSB is responsible for investigating. The May 2017 Budget included additional funding of \$11.9 million for the ATSB over five years from 2016–17. The increase in funding was provided to the ATSB to replenish its workforce, and re-profile its capital investment strategies to meet its projected needs in technical equipment, data warehousing and core enterprise systems.

Audit rationale and approach

1.7 This topic was selected for audit as part of a series of performance audits focussing on the efficiency of entities. The audit was undertaken in the early stages of a significant organisational change program within the ATSB aimed at enhancing operational efficiency and effectiveness.

Audit objective, criteria and scope

1.8 The objective of this audit was to examine the efficiency of the ATSB's investigation of transport accidents and safety occurrences.

1.9 To form a conclusion against the audit objective, the following high-level criteria were adopted:

- Has the ATSB put in place efficient processes for the investigation of transport accidents and safety occurrences?
- How well does the ATSB's investigation efficiency compare to its own previous performance, as well as relevant international comparator organisations?

1.10 The scope of this audit covered the ATSB's activities and processes for the conduct of investigations. The ATSB's operations support functions, systems and processes such as financial and workflow management were also included given the influence they have on operational efficiency.

⁴ Defined investigations were introduced in 2013.

⁵ The ATSB also receives cost recovery revenue from the states in relation to the ATSB's roles as the national rail investigator, funding for the ATSB's support to Papua New Guinea and Indonesia, along with cost recoveries for training delivery.

Audit methodology

1.11 This audit applied the ANAO's methodology for auditing efficiency, *ANAO Special Considerations for Efficiency Auditing Methodology and Guidance*, which is based on a general model for assessing public sector performance. Efficiency is defined as 'the performance principle relating to the minimisation of inputs employed to deliver the intended outputs in terms of quality, quantity and timing'.⁶

1.12 The methodology recognises that an examination of efficiency needs to be 'fit-for-purpose' for each entity or subject matter being audited. In most cases, this is likely to include:

- identifying if the audited entity has its own efficiency measures in place;
- identifying the relevant inputs and outputs, as well as the policy outcome(s) being sought;
- determining appropriate performance measures, drawing on data for inputs and outputs;
- identifying suitable comparators to benchmark against, to identify relative efficiency; identifying the key operational processes that are used to transform inputs into outputs (or outcomes) and the linkages between these elements; and
- undertaking appropriate audit procedures to understand and account for any material differences in the comparison of measured efficiency.

1.13 Specific audit procedures undertaken include:

- analysis of entity records;
- interviews of management and key stakeholders;
- reviewing and assessing the case prioritisation model used to determine which notifications are investigated⁷;
- analysis of available data; and
- benchmarking with relevant international comparators and the ATSB's past performance drawing on data obtained by the ATSB during the audit.⁸

1.14 The audit was conducted in accordance with the ANAO Auditing Standards at a cost to the ANAO of approximately \$301,000.

1.15 The team members for this audit were Michelle Mant, Amanda Ronald, Alexander Wilkinson and Brian Boyd.

6 This definition is provided in the *Standard on Assurance Engagements ASAE 3500 Performance Engagements* issued by the Auditing and Assurance Standards Board. This Standard is applied by the ANAO in its performance audit work.

7 This included observing the conduct of two of the Safety Reporting daily meetings held at 1:30pm each business day at which decisions are made about which notifications should proceed to an investigation.

8 Separate to data obtained by the ATSB, the ANAO made contact with the Department of Infrastructure, Regional Development and Cities (DIRDC) to independently request a dataset from the International Civil Aviation Organization (ICAO). The ANAO requested three years' of data (2015–16, 2016–17, 2017–18) for international transport safety agencies in five countries: the United States, United Kingdom, Canada, Singapore and New Zealand on the date of each incident/accident investigated and publishing date of each individual report. The ANAO agreed to de-identify the analysis if used in the report. Limitations with the quality of the data prevented the ANAO from using it for the purposes of the benchmarking activity.

2. Measuring and supporting operational efficiency

Areas examined

The ANAO examined whether the ATSB had established efficient processes for the investigation of transport accidents and safety occurrences.

Conclusion

The ATSB has established key elements of an overall framework to promote efficient investigation processes. There is a focus on clearing the backlog of investigations that have been underway for some time, applying sound processes to decide which notifications merit a safety investigation, and adjusting key performance indicators to identify more realistic completion timeframes for the more complex investigations. The ATSB has also taken a number of actions to give greater attention to the efficiency with which it undertakes transport safety investigations.

Areas for improvement

The ANAO has made two recommendations. One relates to short investigations, where recent changed processes have had an adverse impact on completion timeframes.

The second encourages the ATSB to marry its increased focus on timeframe efficiency with greater attention to the resource efficiency of its investigations.

Does the ATSB have appropriate performance measures to enable an assessment of its investigation efficiency?

The ATSB has performance measures in place addressing time efficiency. Timeframe targets have not been achieved by the ATSB, and work is underway to develop more realistic timeframe targets. The ATSB does not publicly report on its resource efficiency.

2.1 The ATSB has defined deliverables, strategies and key performance indicators (KPIs). These have been published in the Portfolio Budget Statements (PBS) and in its Corporate Plan.

2.2 Externally, the ATSB has reported against its KPIs in its Annual Report. More detailed performance reporting has been provided internally against the established KPIs to the ATSB Executive, Commission and Audit Committee. Quarterly reports have also been provided to the Minister.

Time efficiency

2.3 Since 2009, the ATSB has consistently had a KPI that has focussed on the completion and/or publication of complex investigations within a 12 month target timeframe. Since 2010, the ATSB has also had a KPI addressing the timeliness of its short investigation reports against a target timeframe. Although there is no information provided by the ATSB in its public performance reporting of the age of ongoing active investigations, the ATSB does report this information internally.

2.4 Between 2014–15 and 2016–17, the ATSB measured and reported against three KPIs focussed on the timeliness of investigation activities (see Table 2.1). Although the numbers of

reports to be completed per year has been amended, the ATSB's focus on timeliness and publishing complex investigation reports within 12 months has remained a consistent KPI. The ATSB has provided a 'performance-at-a-glance' table which provides three years of trend data relating to the completion rates of investigation reports against targets.

Table 2.1: ATSB key deliverables and key performance indicators

Year	KPI/Deliverable	Target	Deliverable
2014–15	We will assess, classify and publish summaries of accidents and incident occurrences that we receive	Summaries of occurrences are published within 10 working days of receipt	N/A
	Investigation reports are published in a timely manner	At least 90% of complex investigations are published within 12 months. At least 90% of short investigations are published within two months	We will complete and publish safety investigations More complex investigations: up to 60 per annum Short investigations: up to 120 per annum
2015–16	Assess, classify and publish summaries of accident and incident occurrences received. Details of occurrences being investigated are published within one working day. Summaries of aviation occurrences are ready to be published in the public online database within ten working days of receipt.		
	Complex investigation reports are published within 12 months	90%	Complete and publish up to 60 more complex investigations and up to 100 short investigations per annum
	Short investigation reports are completed within two months	90%	
2016–17	Assess, classify and publish summaries of accident and incident occurrences received. Details of occurrences being investigated are published within one working day. Summaries of aviation occurrences are ready to be published in the public online database within ten working days of receipt.		
	Complex investigation reports are published within 12 months	90%	Complete and publish up to 60 more complex investigations and up to 100 short investigations per annum
	Short investigation reports are completed within four months	90%	

Note: In 2016–17, the ATSB amended the timeframe for the completion of short investigation reports. The ATSB advised the ANAO that the two month time frame was an aspirational target, which was set when the short investigation report was shorter and less independent data collection was conducted by team members. In 2016 it was decided that short investigation reports should be expanded to include findings along with a short safety analysis section. This process was developed to ensure independent data collection by the ATSB was robust enough to support an expanded scope investigation if potential safety issues were identified.

Source: ANAO analysis of the ATSB's data.

2.5 As illustrated by Table 2.2, at no stage over the past eight years has the ATSB achieved its timeframe targets for either complex or short investigations. As an overall average, the ATSB

identified that it has generally taken around 19 months to complete a complex report and five and a half months to complete a short investigation report.

Table 2.2: ATSB performance against timeframe targets

Financial year	Complex investigations	Short investigations
2010–11	14%	N/A
2011–12	27%	N/A
2012–13	33%	N/A
2013–14	49%	40%
2014–15	42%	36%
2015–16	29%	31%
2016–17	32%	88%
2017–18	12%	41%

Source: ATSB advice to Commission as at 30 November 2018.

2.6 In 2016–17, the ATSB amended the timeframe for the completion of short investigation reports, doubling it from 90 per cent within two months to 90 per cent within four months. The ATSB achieved a completion rate of 88 per cent against the 90 per cent target. The ATSB advised the ANAO that timeframe was amended to reflect the change in the format of the short investigation reports which were expanded to include findings and a short safety analysis. The Commission agreed to a four month target as the evidence provided suggested that they would be able to reach close to 90 per cent of reports to be completed within that timeframe. There was also a dedicated team that worked solely on the short investigations. In June 2017, this team was disbanded⁹ with only 41 per cent of short investigation reports completed within the four month timeframe for 2017–18.¹⁰

2.7 The ATSB advised in January 2019:

It is unclear exactly what caused the drop in short investigation performance and the drop was likely due to multiple factors. Re-establishing a short investigations team is one way this issue could be addressed.

9 The intention was to add capacity to the broader investigation function and to provide career development opportunities for the short investigation staff.

10 The ATSB advised the ANAO that investigations identified under the Back on Track Program were given priority over this reporting period which also impacted on the completion of short investigations.

Recommendation no.1

2.8 The ATSB implement strategies that address the decline in the timely completion of short investigations.

Australian Transport Safety Bureau response: *Agreed.*

2.9 *The ATSB acknowledges the average increase in time taken to complete short investigations since 2016–17. The ATSB plans to address this issue through the allocation of dedicated investigator resources, within the current organisational structure, to short investigations.*

2.10 In October 2018, the ATSB advised the ANAO that the target of completing 90 per cent of complex investigations within 12 months was driven by the ATSB's perspective as to what may be considered acceptable to industry and directly involved parties, including the next of kin. The ATSB further advised the ANAO that the 12 month target also took into account the International Civil Aviation Organization's (ICAO) International Standards and Recommended Practices manual 'Annex 13 to the Convention on International Civil Aviation, Aircraft Accident and Incident Investigation, Eleventh Edition, July 2016' (Annex 13). Specifically, section 6.5 of Annex 13 states:

In the interest of accident prevention, the State conducting the investigation of an accident or incident shall make the Final Report publicly available as soon as possible, and if possible, within twelve months.

2.11 On 30 November 2018, advice was provided to the Commission on proposed amendments to the ATSB's timeliness KPIs. This advice drew on analysis of performance over time as well as the results of an initial benchmarking exercise undertaken as part of this ANAO performance audit on target timeframes (if any) and actual performance by a number of comparable international transport investigation agencies. Table 2.3 illustrates the changes being considered by the ATSB at the time ANAO audit fieldwork was completed.

Table 2.3: Proposed changes to ATSB's timeliness KPIs

Key performance indicators	2017–18 results	2018–19 budget	2019–20 forward estimate	2020–21 forward estimate	2021–22 Forward estimate
Number of active Complex investigations in progress at each months end (12 month rolling average, as at 30 June).	91	70	60	50	50
Average time taken to complete and publish Complex investigation reports.	23 months	21 months	19 months	18 months	18 months
Number of active Short investigations in progress at each months end (12 month rolling average, as at 30 June).	37	30	40	50	50

Key performance indicators	2017–18 results	2018–19 budget	2019–20 forward estimate	2020–21 forward estimate	2021–22 Forward estimate
Average time taken to complete and publish Short investigation reports.	6 months	6 months	6 months	5 months	5 months

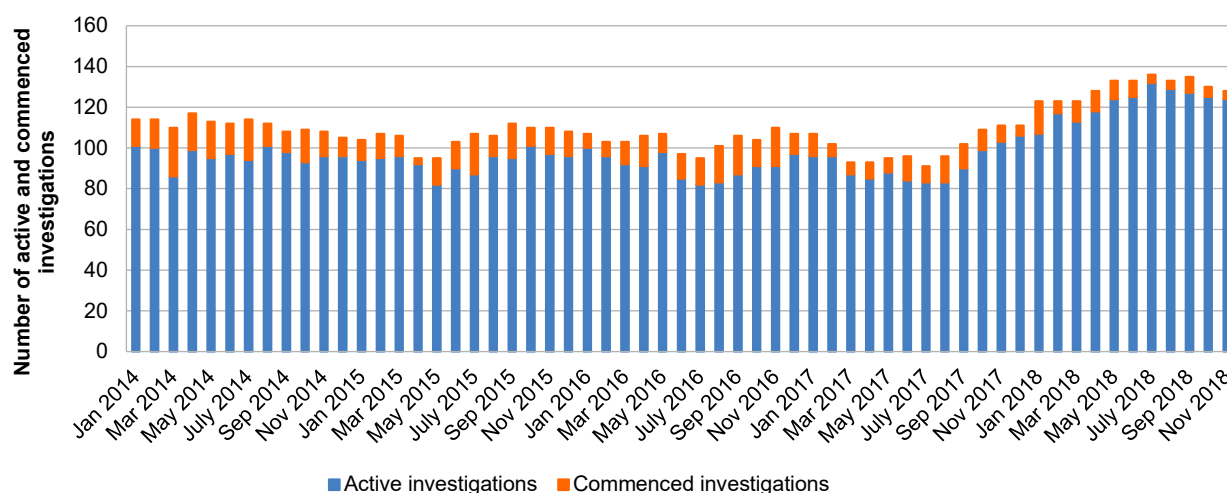
Note: The ATSB advised the ANAO in January 2019 that it intends to gradually adjust the numbers and timeframes over the coming financial years to demonstrate that it is tracking towards the revised targets from 2020–21 onwards. To achieve these amended targets, the ATSB will need to carefully manage a reduction in the number of active complex investigations that it has in progress over the next two reporting periods.

Source: ATSB data.

Resource efficiency

2.12 The ATSB has been meeting its target output for investigations completed (50 to 60 complex investigations and 100 short investigations per annum). These targets have been achieved in an environment where the ATSB has had a large number of ongoing active investigations at the end of each month (see Figure 2.1).

Figure 2.1: Ongoing active investigations and the number commenced since January 2014



Source: ANAO analysis of the ATSB's data.

2.13 As at 30 June 2018, the ATSB had 95 ongoing active complex investigations and 38 ongoing active short investigations, totalling 133 investigations. As at 30 November 2018, the ATSB had 85 ongoing active complex investigations and 37 ongoing active short investigations (122 in total). The ATSB has attempted to reduce the number of ongoing active investigations and to take on less investigations.

2.14 In terms of resources consumed to produce investigation outputs, the ATSB reports internally on calendar and investigator (effort) days. Externally the KPI is based on calendar days only. Reporting solely on calendar days does not give a full picture as the effort logged for an individual investigation that has been underway for a considerable period of time can be minimal (for example, as a result of waiting for external parties to undertake their own investigations or external parties responding to requests from the ATSB).

2.15 Investigator (effort) days are collected by investigators logging a percentage of each work day working on individual investigations. The percentage is converted to hours, based on a 40 hour week. Calendar days are based on recorded investigation dates and workflow stages of the investigation. Table 2.4 outlines the investigation categories and expected calendar and investigator (effort) days (previous and current). Consideration is being given to establishing workload targets for investigators.

Table 2.4: Investigation categories—expected calendar and investigator (effort) days

Investigation categories	Expected calendar days	Expected investigator (effort) days pre-2017	Expected investigator (effort) days since 2017
Major	730	Not prescribed	Not prescribed
Complex	365	44 days	80 days
Defined	275	18 days	26 days
Short	122	13 days	13 days
Briefs	N/A	N/A	1 day

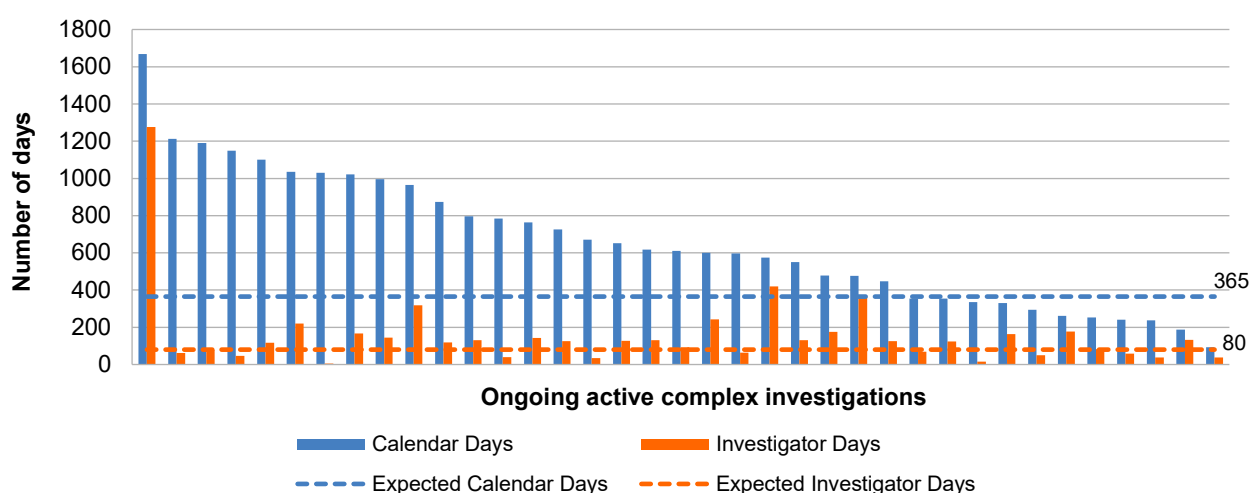
Note: Occurrence briefs were not introduced as ATSB products until mid-2017. The occurrence briefs have expected calendar days of 30, expected investigator days of 1 day.

Source: ATSB data.

2.16 The amendments in 2017 reflect analysis and work completed in 2015, based on investigations that were considered to be high quality, within scope and completed by competent investigators. The analysis highlighted that the expected calendar and investigator (effort) days did not represent the full effort for an investigation.

2.17 Figure 2.2 shows the ongoing active complex investigations as at November 2018 in terms of how they are tracking against expected calendar days and investigator (effort) days. It illustrates that, for many investigations, it continues to take the ATSB longer and require more investigator effort than is targeted.

Figure 2.2: Ongoing active complex investigations as at November 2018



Source: ANAO analysis of the ATSB's data.

Recommendation no.2

2.18 The ATSB report on the efficiency with which it uses resources in undertaking investigations.

Australian Transport Safety Bureau response: *Agreed.*

2.19 *As noted in the report, the ATSB already collects information about investigation efficiency, including investigator effort and costs. The ATSB is working towards using this information more effectively by adopting a data strategy that provides greater access to business information, introducing a project management approach to investigations that allows for improved investigation tracking, and formalising investigation processes (including planning and reviews).*

Does the ATSB collect relevant and reliable information on its investigation efficiency?

The ATSB collects a range of information that can be used to inform an assessment of its investigation efficiency. Work is underway within the ATSB to improve its collection and analysis of data for this purpose.

2.20 The ATSB collects a broad range of data relating to its accident investigations, occurrence data for the three modes and information that could assist in an assessment of its investigation efficiency. The information systems used by the ATSB to support this are the:

- Safety Investigation Information Management System (SIIMS¹¹); and
- Pacific Timesheet.

2.21 The focus of what is reported internally and publicly has mainly involved an examination of the time taken/measured to complete investigation reports (directly linked to its KPIs). Since 2012, this has been complemented by the collection of investigator effort logging.

2.22 ATSB collects data for many aspects of its investigation activities, including:

- effort given to each investigation;
- time taken to complete each investigation phase;
- workflow stages of an investigation;
- trend effort/day data; and
- investigators assigned to individual investigations.

2.23 Information collected and recorded in the SIIMS database allows the amount of time taken to complete individual investigations to be calculated. Executive Directors, Directors and team managers automatically receive a closure report for all investigations closed in the previous week, for their team, branch or division. These reports detail the time and effort taken for each investigation closed.

11 There is a Safety Investigation Quality System (SIQS) in place. The SIQS provides and controls the document framework for the policies, procedures, guidelines and tools to support the investigation process.

2.24 Similarly, the timeliness of active investigations can be calculated using data collected in SIIMS.

2.25 Although the ATSB collects data on a range of investigation activities and workflow stages, limited analysis has been completed in this area. The ATSB advised the ANAO in October 2018 and January 2019 that the key reasons for this relate to:

- staff capacity (due to the focus on completing investigations with a finite number of investigators compared to number of investigations) and the reliance on a small number of the ATSB staff with the skills to undertake this analysis¹²;
- unreliability of data as workflows are suspended and reset; and
- the focus has been directed towards KPI targets and reducing the backlog of older investigations.

2.26 Analysis of workflow stages and key milestones reported in SIIMS would allow the ATSB to identify periods within an investigation whereby the ATSB did not have control over the process. For example, the ATSB relies on the cooperation of various external international entities, such as aircraft manufacturers, when undertaking aviation investigations.

Data limitations

2.27 Due to system limitations, the ATSB has limited visibility across all current investigations. This has increased the difficulty for the ATSB in determining whether there is capacity to initiate new investigations without impacting the timeframes of existing investigations, or having a complete picture of investigator workloads.

2.28 Another limitation is that finance and human resources data is completely separate from the investigation and occurrence data, making visibility of holistic data impossible without considerable manual effort (for example complete costs associated with individual investigations). Manual workarounds increases the risk of errors in performance information produced and reported and currently prevents the ATSB from undertaking a wider range of analysis.

2.29 The ATSB has developed a data strategy that plans to address the limitations raised above and increase the reporting capacity and visibility of all data held within ATSB databases.

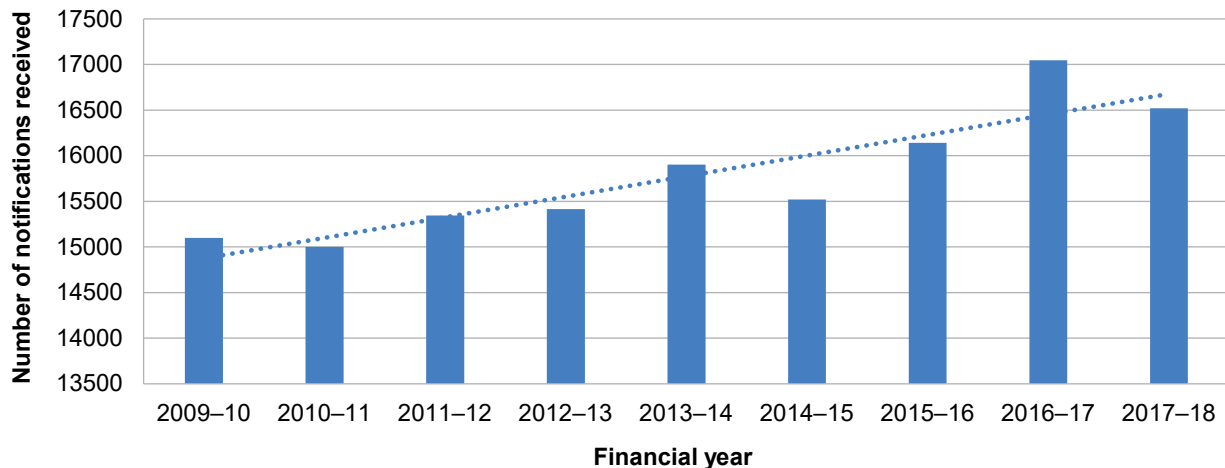
Does the ATSB's processes for prioritising the oversighting and conduct of investigations support the efficient use of resources?

The assessment and prioritisation processes support the ATSB focussing its investigation resources in the areas that are most likely to result in safety improvements. Action is underway to enhance the way those processes take into account the extent to which investigator resources are available.

12 In 2014, the ATSB undertook some analysis on workflow data to show the then Executive and Commission how long each stage of an investigation was taking. Executive papers completed in 2014 also provided detailed information to the Executive on staff workload; investigation timeliness and progress; number of investigations completed; age of investigations and cost of investigations.

2.30 Each year, the ATSB receives more than 15,000 notifications of transport incidents and accidents across the aviation, rail and marine modes. As illustrated by Figure 2.3, the trend has been for an increasing number of notifications over the last nine years.

Figure 2.3: Number of notifications received per year since 2009–10



Source: ANAO analysis of the ATSB's data.

2.31 A notification must be assessed to be a transport safety matter in accordance with section 23 of the TSI Act. The assessed notification must be classified by the anticipated level of resources, or complexity and time required to complete the investigation.

2.32 The Safety Reporting Team Leader runs a daily notifications received report and reads through all notifications received with the past 24 hours. When assessing an aviation notification, Safety Reporting staff:

- perform an initial assessment on the information relating to the notification;
- obtain (if necessary) further information from other parties;
- assess further (when there is sufficient information about the incident); and
- classify the occurrence reports as accidents, serious incidents, incidents (collectively known as occurrences) or events.¹³

2.33 Currently the notifications process is a largely manual undertaking for six full time employees (FTEs) who are required to enter and quality assure more than 15,000 aviation notifications per year. The proposed data strategy aims to automate the notification process, thereby reducing processing time and human effort to process notifications and increase the safety analysis capability through more up to date aviation dataset.

2.34 At 1.30pm each work day, there is a meeting at which the Transport Safety Directors, Manager Safety Reporting and key staff work through the details of occurrences provided by the Safety Reporting team. An assessment is made and, if required, further information is sought to clarify the facts. It is at this meeting that the Directors will often decide to seek more information to further inform their decision making process, to either investigate an occurrence or not. In seeking further information, the ATSB is also able to register more full or accurate details within its

¹³ Events are not considered to be TSI Act reportable and are not transport safety matters.

occurrence database. Of the 50 to 70 notifications received each day, about five per cent (around three) are accidents and serious incidents, which are prioritised for processing into occurrences, whether they are investigated or not.

2.35 The 1.30pm meetings are an efficient and effective process for prioritising and overseeing the conduct and decision to seek further information on the facts of an occurrence, prior to making a decision whether to investigate. As part of the broader 2017–18 organisational change initiatives, and to address the ongoing issues that the ATSB has faced with a backlog of investigations yet to be completed, starting in early 2018 the ATSB has been attempting to better match the number of new investigations to the available resources.

Resource allocation

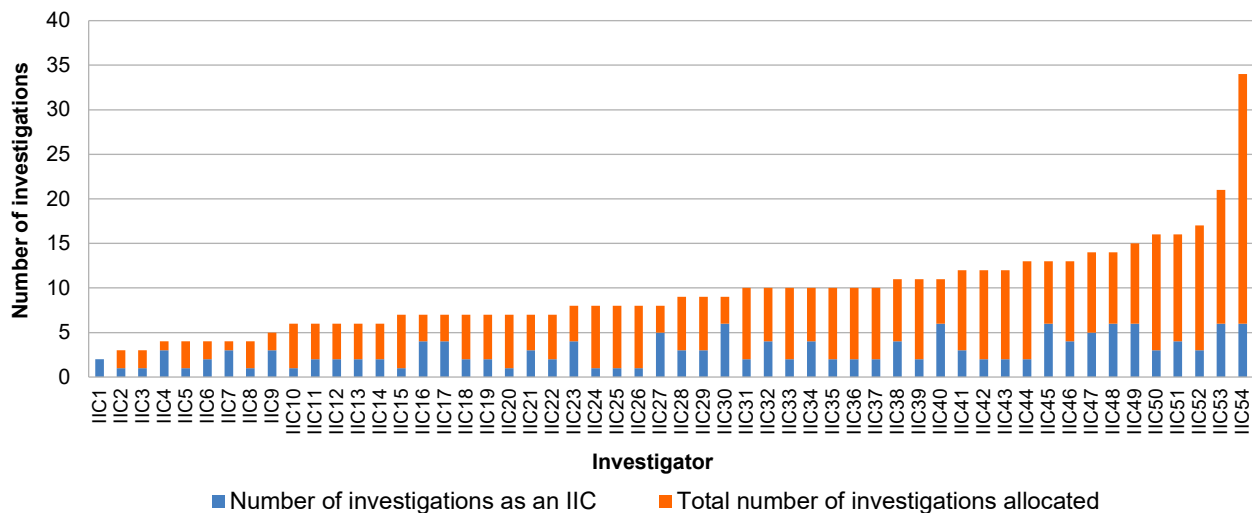
2.36 The ATSB has limited visibility over the resource pool of investigators. This has proven problematic in having an understanding of whether there is capacity to initiate an investigation, whether there are sufficient resources for the investigation and what impact, if any, a further investigation will have on existing investigations. This situation has contributed to investigation delays.

2.37 The ATSB has had an expectation that each investigator in charge (IIC) will manage two investigations simultaneously. Investigator resources are usually decided by investigation level, but also the type of investigation. These general practices follow for occurrence investigations, for example:

- short investigations — single investigator;
- defined investigations — one to two investigators; and
- complex investigations — team of investigators.

2.38 Resources are allocated on a case by case basis. For research and safety issue investigations, often a single investigator is primarily responsible for the bulk of an investigation at all levels. Resources will often be used for part of an investigation only, such as for recorders downloading and analysis, research tasks, and other specialty tasks. The resourcing approach is also affected by the workload of the IIC, availability of other resources, and the profile of the investigation.

2.39 Figure 2.4 illustrates the workload for the investigators as at November 2018, who are balancing investigations, training, mentoring and supervision of the new investigators. On average, an investigator is in charge of three investigations (a minimum of one and as many as six) as well as a team member on a further seven investigations (a minimum of no investigations solely as a team member and a maximum of 28 investigations as a team member, in addition to being in charge of six investigations). The workload allocated to some investigators has also contributed to a backlog with incomplete investigations (see paragraph 2.46). This allocation of investigations is likely to be contributing to the decline in the number of investigations completed per investigator (see Figure 3.5 on page 41).

Figure 2.4: Investigations per investigator as at November 2018

Note: Analysis of the SIIMS database identifies 54 IIC's, rather than 53, due to one investigator being entered twice.
Source: ANAO analysis of the ATSB's data.

2.40 As part the work being developed and implemented to promote a project management approach to investigations, the ATSB has undertaken to gain a better understanding of the current workload for all operational resources, both investigative and non-investigative. As part of this work, the ATSB is developing a tool to provide a holistic view of resource demand. This will be tracked through Microsoft Project and linked to a master resource pool. It is anticipated that this approach will produce a more interconnected reporting view to caseload and capacity at an individual, team and organisational level and will support decision making around the allocation and reallocation of resources to meet demand.

2.41 This approach will enable the ATSB to better track this information in the future, with investigations being managed similar to a project so they can be tracked at a task level. Managers are intended to have a clearer view of resource availability; accountability; level of effort; and duration metrics. It is anticipated that, once fully implemented, and once the model matures, there will be a greater capacity to track overall investigation efficiency, and have greater visibility of the existing commitments and capacity of the pool of investigator resources.

Investigation costs

2.42 The data and process for the budget for investigations is separate to that of the SIIMS investigation database, and therefore not visible to investigators. The ATSB advised the ANAO in January 2019 that it is the responsibility of Managers and Directors to consider costs when planning investigations, undertaking analysis or obtaining data (such as the cost of recovering voice and data recorders). There is no individual budget per investigation, but supplier and employee costs should be able to be tracked against individual investigations using a project code allocated to the investigation.¹⁴

2.43 For the 75 closed investigations in the 2017–18 financial year (across three investigation categories), Table 2.5 illustrates the overall investigation costs across the three investigation

¹⁴ The ATSB has data and information on the costs of investigations as part of its cost recovery processes with the State Governments relating to rail investigations.

categories, showing the range, average and median. The data must be treated with some caution as the project code was not being consistently applied to each investigation, with IICs for only 30 of the investigations providing a cost code so that costs could be attributed to each investigation.

Table 2.5: Investigation costs

Investigation type	Range (\$)	Average cost (\$)	Median cost (\$)
Complex	35,219–233,594 ¹	125,147	125,013
Defined	19,395–217,139	79,243	59,995
Short	1399–30,044	9535	8698

Note 1: Figures exclude the reopening in 2016 of the 2009 investigation into AO–2009–072—Ditching—IAI Westwind 1124A, VH–NGA, Norfolk Island, at a cost of \$1.741million. Including this investigation increases the average cost to \$240,593.

Source: ANAO analysis of the ATSB's data.

Are opportunities to improve investigatory processes and practices identified and acted upon?

Organisational change programs have been initiated and opportunities to improve investigatory processes have been identified and are being pursued.

2.44 To address investigation efficiency and to attempt to meet performance targets the ATSB has introduced short investigation reports (2010) and defined investigation reports (2013).¹⁵ These two types of investigations were established as they are shorter therefore in principle require less effort, less resources, and have restricted scopes and overall shorter reports than the traditional complex investigations.

2.45 In 2017, the ATSB commenced an organisational change program, the 'Evolution Program'. This program is intended to enable better resource allocation and utilisation and to maximise the efficiency and effectiveness of the ATSB operations by addressing the organisational structure, culture, efficiency, learning and development, talent management, succession planning and leadership of the ATSB.

2.46 In May 2017, the ATSB commenced the 'Back on Track Program'. This was to address the ongoing backlog of open investigations that had exceeded their scheduled duration. The ATSB prioritised the completion of up to 56 investigations. This program of work has required a significant diversion of resources from the ATSB's business as usual operations.

2.47 ATSB records examined by the ANAO evidence that, between September 2011 and November 2018 there have also been a range of opportunities to improve investigatory processes and practices identified. The opportunities were in areas such as:

- system enhancements including additional functionality to help investigators plan and manage investigations;
- making timeliness targets more realistic to be achieved;

¹⁵ Defined investigations are counted against the complex target in the PBS, Corporate Plan and Annual Report. There is no public reporting linked directly to defined investigations.

- the development, introduction and administration of a public database schema for the automated submission and receipt of transport safety occurrence reports;
- the development of an enhanced ATSB data warehousing, analysis and business intelligence solution along with development of relevant policies and procedures;
- the investigation scoping process; and
- the extent of quality assurance activities during the investigation phase (rather than relying on high levels of quality control during the report review phase).

2.48 Until 2017, it was common for identified improvement opportunities to not be acted upon. For example, one key paper that was presented to the Executive in September 2015, demonstrated analysis of the ATSB's own performance data highlighted that the then current effort and calendar days were not achievable, nor were they reflective of the full effort of an investigation. The analysis was based on investigations that were considered to have been exemplary in terms of being undertaken by competent investigators and completed within the expected scope for the investigation level. The analysis highlighted that these investigations were still exceeding the expected calendar and effort days.¹⁶ These issues were not addressed until the Evolution Program in 2017.

2.49 Table 2.6 sets out key recent initiatives in place or underway. As a number of these initiatives are underway or yet to be implemented, efficiency gains cannot be assessed at this stage.

16 This analysis is discussed in further detail in Chapter 3.

Table 2.6: Key initiatives to improve investigatory process and practices

Key initiatives	
Back on Track	Recognising that there was a growing backlog of old investigations, the Back on Track initiative was implemented in mid-2017 to identify the oldest and most problematic investigations (up to 56) and fast track their finalisation through the prioritised allocation of resources.
Recruitment of Staff	<p>In 2017–18, the ATSB undertook a major recruitment activity to replenish investigator numbers. A total of 17 investigators were recruited.</p> <p>The new starters require 12–18 months to establish their investigator competencies. Training and mentoring requirements for the new starters has also required a diversion of experienced investigators to support this on-boarding.</p>
1:30pm Safety Reporting daily meeting	In June 2017, the ATSB introduced the daily 1.30pm Safety Reporting meeting, where the Transport Safety Directors, Manager for Safety Reporting and key staff work through the details of occurrences provided by the Safety Reporting team. An assessment is made and, if required, further information is sought to clarify the facts. It is at this meeting that the Directors will often decide to seek more information to further inform their decision making process, to either investigate an occurrence or not. In seeking further information, the ATSB is also able to register more full or accurate details within its occurrence database.
Introduction of formal investigation processes	<p>In June 2017, the ATSB introduced formal investigation processes and key review points. The introduction of formal investigation processes includes:</p> <ul style="list-style-type: none"> • investigation planning to ensure appropriate scope and resources; • safety factor reviews with managers and directors; and • report review (for administrative and readability) by the Communications team.
Multi-modal teams	<p>In 2017, the ATSB introduced a multi-disciplined teams based approach to investigation, cross training provided on all modes, and the commencement of the use of resources across modes. The ATSB has advised the ANAO that:</p> <ul style="list-style-type: none"> • the change has enabled closer standardisation and alignment of procedures between the modes. However, this development is resource intensive and is therefore impacting on current outputs; • opportunities to work in different modes has led to diversity in thinking and analysis for some investigators and, in turn, provided increased deployment capacity and flexibility to accident sites; • the change has allowed greater opportunities for resource levelling too by shifting tasks and investigations that do not need specialist expertise to other investigators with lower workloads. It is expected the realisation of these benefits to be enhanced once the new investigators can be fully utilised; • resource allocation has been more difficult with one large pool; it has been a learning experience however the program management work and introduction of a master resource pool should assist with resource allocation going forward; and • there is now a stricter adherence to procedures and quality standards across the three modes resulting in more work needing to be done in some investigations.

Key initiatives	
Safety Improvement Reference Framework	<p>In mid-2017, as part of the Evolution Program, the Safety Improvement Reference Framework (SIRF) was implemented. This body of work was established to address the known limitations with the previous Safety Investigation Quality System (SIQS) and to improve:</p> <ul style="list-style-type: none"> • ease-of access to operational procedures and guidance; • reduce duplication and some contradictory information by consolidating and improving operational procedures and guidance; • assistive tools — forms, templates, worksheets and reference material for efficiency and consistency; and • updating and improving workflow processes. <p>As part of SIRF — the ATSB has followed the RACI^a model, which is a tool for identifying roles and responsibilities during organisational change process. This has focussed on clarifying roles and responsibilities and increasing accountability for staff at all levels.</p>
Occurrence Briefs	<p>In late-2017, Occurrence Briefs were introduced as a new product for the ATSB where the ATSB can produce short factual briefs based on the information provided to it rather than assign investigation resources ensuring that safety learnings and information can still be disseminated without assigning investigation resources.</p>
Project Management Approach to investigation	<p>In July 2018, the ATSB employed a Director of Program Management who has been tasked with developing and embedding a project management approach to investigations. Expected outcomes of this work will be:</p> <ul style="list-style-type: none"> • a view of all resource demands (both investigative and non-investigative) through the use of a master resource pool; • greater visibility of the skills available within the current workforce and work preferences through the development and ongoing maintenance of a skills matrix; • improved quality assurance for investigations with the introduction of documented milestones throughout the end-to-end investigation life cycle; and • standardisation of investigation tasks and associated timeframes for delivery enabling better resource planning capability and tracking of investigation status.
Data Strategy	<p>The ATSB has access to significant amounts of data, generated within the ATSB (SIIMS), from safety occurrences in three modes and from outside transport agencies. The 2018 Data Strategy has been developed to make all staff use the data available more often and more easily to streamline work practices, inform daily decisions, track ATSB activities and find emerging safety issues. The Data Strategy is focussing on six key areas:</p> <ul style="list-style-type: none"> • automating aviation notifications^b; • making business data more widely available and increasing its use; • making occurrence statistics more widely available and increasing the use of occurrence datasets; • securing a copy of marine occurrence data; • finding emerging safety issues through data; and • ensuring Interoperability of datasets linking public website to SIIMS.
Partnership with RMIT	<p>In December 2018, the ATSB announced a partnership with the Royal Melbourne Institute of Technology (RMIT) to deliver a tertiary pathway for the ATSB investigators and broader industry personnel in Australia and South-East Asia. The Graduate Certificate in Transport Safety course is scheduled to be ready for delivery in July 2019.</p>

Key initiatives

Proposed International Benchmarking Study	In May 2018, the Chief Commissioner raised the advantages of an international benchmarking study at the International Transportation Safety Association (ITSA) meeting in Azerbaijan. As part of this process, it was agreed that the ATSB would present a comprehensive paper to the ITSA 2019 annual meeting in Canada, proposing a formal international benchmarking study to be undertaken. As part of the current audit the ATSB agreed to undertake a preliminary benchmarking activity, requesting assistance from four of its international counterparts. This is discussed in Chapter 3.
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Note a: RACI is an abbreviation for: R=Responsible; A=Accountable; C=Consulted; and I= Informed.

Note b: A project to automate the notification process to address resource constraints and a growing backlog was presented for approval to the ATSB Executive in 2016. This project ran over time and budget. The automation of aviation notifications was not included as part of the initial project, but it did include updating the notifications module.

Source: ANAO analysis of the ATSB's data.

What controls does the ATSB have in place to assure itself that improvements in efficiency do not compromise the quality of its investigations?

The ATSB has had quality controls and processes in place, however they have not been conducive to the timely completion and review of investigations. Since 2017, the ATSB has implemented key review points earlier in the investigations process. As a result, the ATSB has identified improvements in quality and a reduction in the amount of rework required through the various review stages.

2.50 The ATSB was criticised for its investigation report into the 2009 ditching of an aircraft off Norfolk Island¹⁷, due to its delay (nearly three years after the accident) plus the lack of detailed analysis and useful recommendations for avoiding future incidents and accidents. Although the *Aviation Safety Regulation Review 2014* stated this was an 'aberration' and not typical of the high standard that the ATSB usually attains, this had a negative impact on the ATSB's reputation. Similarly, the December 2014 peer review report of the ATSB's investigation methodologies and processes¹⁸ conducted by the Transportation Safety Board of Canada concluded that, when the ATSB methodology is adhered to, and the component tools and processes to challenge and strengthen analysis are applied, the investigation result is more defensible.

2.51 The ATSB has identified that its workflow processes have not been conducive to the timely completion and review of investigations and associated safety activities. The workflow processes incorporated high levels of quality control during the draft report review phase, but contained

17 The ATSB released its final report on the ditching in August 2012. In September 2012, the Senate Regional and Rural Affairs and Transport References Committee commenced an inquiry into Aviation Accident Investigations, its main focus on the investigation of this particular accident. The Committee's May 2013 report included 26 recommendations one of which was for the ATSB to re-open this investigation. Based on the original and additional evidence, a final report on the re-opened investigation was released by the ATSB on 23 November 2017.

18 The review involved examining the conduct of the Norfolk Island investigation and two other investigations similar in scope in order to provide a useful comparison.

limited quality assurance measures within the earlier investigation phases.¹⁹ In May 2017, in an Executive Paper, the ATSB acknowledged that its own investigation workflow processes and practices had directly contributed to its output timeliness issues, principally due to extensive review and rework requirements which were necessary to ensure that a quality report was released.

2.52 Since the broader organisational change initiatives in 2017, and in particular through the SIRF project, there have been major changes to the workflow processes for ATSB investigations. This has seen the increase in controls within the review process where there are multiple layers of review to gain the required level of quality assurance to release an investigation report. The improved workflow process for stages of an investigation currently include:

- planning meetings to ensure appropriate scope and resources;
- required analysis processes;
- safety factor reviews with managers and directors;
- safety factor executive briefs;
- technical review of reports;
- administrative reviews;
- director reviews;
- Commission reviews; and
- external reviews.

2.53 The ATSB advised the ANAO in October 2018 that since these processes have been introduced, and although in the early stages of implementation and application to current investigations, there has been notable improvements in quality and a reduction in the amount of rework required through the various review stages.

2.54 The ATSB further advised the ANAO in October 2018 that it is committed to looking for improvements across the range of investigatory processes and practices to improve efficiency, transparency and to better enable management decisions. As part of the work being undertaken to introduce a program managed approach to investigations, there is also a planned focus on strengthening the assurance processes that support the investigation process. For example, the ATSB is planning to establish an Investigation Review Board to more closely manage quality, risk mitigation and delivery issues.

19 In October 2018, the ATSB advised the ANAO that: it has had some performance issues with staff competency; there has been an overall lack of responsibility and accountability for the completion of investigations; and there have been limited consequences for not completing investigations on time or meeting the performance targets.

3. Comparing operational efficiency

Areas examined

The ANAO examined how well the ATSB's investigation efficiency compares to its own previous performance, as well as some international counterparts.

Conclusion

The efficiency of the ATSB's investigation activities has declined over time both in relation to the length of time taken to complete investigations, and the amount of investigation resources required. The ATSB has recently started taking steps to benchmark its performance against transport safety investigators in some other countries. Analysis of the available data indicates that averaged across the last three years the ATSB has performed well in comparison to the selected countries on a range of efficiency metrics. On an annualised trend basis, the analysis indicates that the ATSB's efficiency has been declining relative to the selected comparators, particularly in relation to resource efficiency.

Areas for improvement

The ANAO has made two recommendations, one focussed on the ATSB establishing realistic performance targets for investigation effort and timeframes to completion.

The second encourages the ATSB to continue with the recent steps it has taken to benchmark its performance against entities in other countries with a similar role.

Has the ATSB analysed changes in its investigation efficiency over time?

The ATSB has undertaken limited analysis of changes in its investigation efficiency over time. This analysis has focussed on timeliness and the work effort required to complete an investigation.

3.1 As discussed from paragraph 2.20 to paragraph 2.26, the ATSB collects data on a range of investigation activities and workflow stages.

3.2 Limited analysis of investigation efficiency has been undertaken by the ATSB. Notable examples of analysis that has been undertaken are:

- In 2014, the ATSB undertook analysis on draft/final report workflow data. This analysis helped to identify that the scheduled timeframes for manager review were unrealistic and has informed the introduction of changes in workflow process and introduction of earlier review points in the investigation process.
- In 2015, analysis was undertaken of expected investigator (effort) days and expected calendar days. The analysis led to a recommendation to revise timeframe expectations. In 2017, as part of the broader organisational change initiatives, the ATSB updated the expected investigator (effort) days based on the data previously provided in 2015. Current expected average effort for ATSB investigations is now:
 - complex — 44 to 80 days;
 - defined — 26 days; and

- short — 13 days.

3.3 The new complex target reflected the older level three target (44 days) and level one target (80 days). Defined was double that of the previous short target, and increased from the old expected 18 days. The former 18 day target was not being achieved. The expected effort for short investigations remained the same at 13 days, as the data illustrated that 13 days was approximately average for short investigations in 2016–17. At this time, there was a dedicated team that was solely responsible for completing the short investigation reports.²⁰

3.4 In 2014, the Transportation Safety Board of Canada made a recommendation as part of a peer review that the ATSB review its schedules for the completion of various levels of investigation to ensure that realistic timelines are communicated to stakeholders. Although targets have been amended for investigations classified as complex or defined, more recent analysis has shown that they are still not reflective of actual effort and actual calendar days. In 2018, the ATSB analysed data over the past five years, which indicated that the average investigator (effort) days were tracking at:

- complex — 150 days;
- defined — 82 days; and
- short — 13 days.

Recommendation no.3

3.5 The ATSB establish more realistic targets for investigation timeframes addressing both calendar and investigator (effort) days.

Australian Transport Safety Bureau response: *Agreed.*

3.6 *As noted in the report, the ATSB will soon publish a variation to the 2018–19 ATSB Corporate Plan with amended key performance indicators (KPIs). These amended KPIs will project more realistic measures around the ATSB's capacity to complete investigations.*

Has the ATSB become more efficient over time in conducting investigations?

Efficiency has declined over time. Over the last five years, the time taken and resources required by the ATSB to complete investigations has increased significantly.

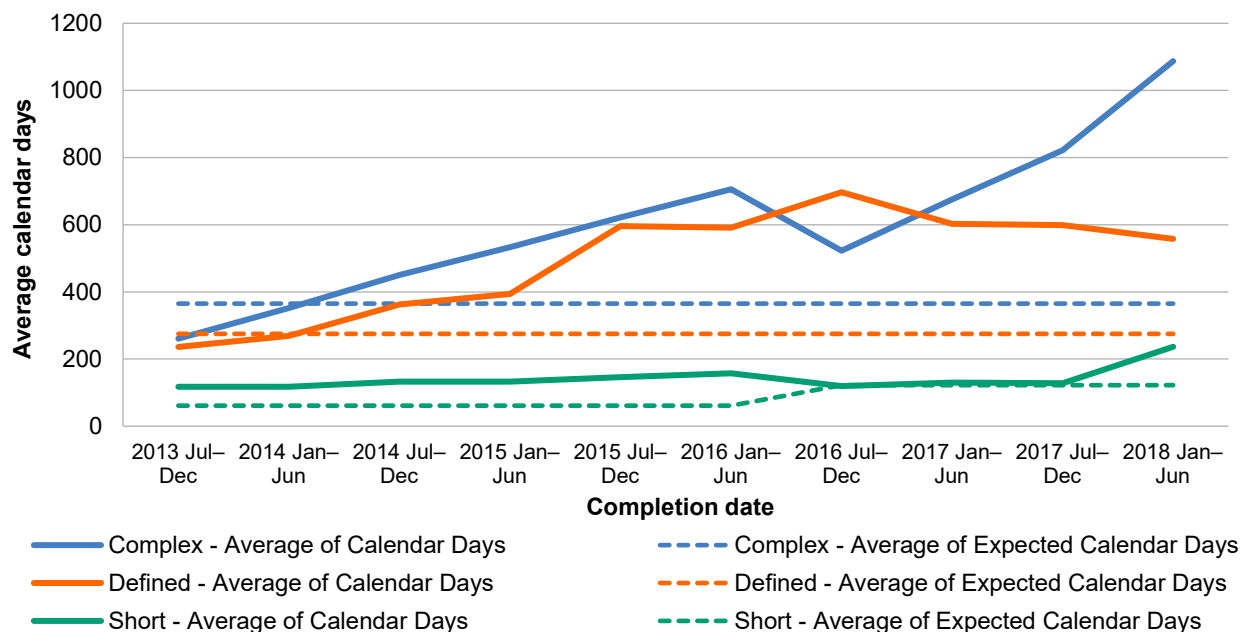
3.7 The ANAO examined the trends over time in the time taken by the ATSB to complete investigations in the complex, defined and short categories. As illustrated by Figure 3.1, the time taken to complete investigations in the:

- short category, remained relatively stable until 2018, averaging 131 days. Following the disbanding of the team focussed on those investigations the time taken in the first six months of 2018 to complete investigations increased to an average of 236 days (an 80 per cent increase on the average over the previous nine periods examined);

²⁰ The short investigation team was disbanded in June 2017 as part of the 2017–18 organisational change initiative.

- defined category increased significantly between 2013 and 2016 from an average of 236 days in the six months to 31 December 2013 to an average of 697 days in the six months to 31 December 2016. Since then, the average has reduced over time and was 558 days for the first six months of 2018. This is still significantly above performance in the earlier part of the period examined by the ANAO (for example, more than double the time that was being taken in the last six months of 2013); and
- complex category, has increased significantly with those investigations completed in the first six months of 2018 taking, on average, nearly three years to be completed. The only period when the average time to complete reduced was in the last six months of 2016.

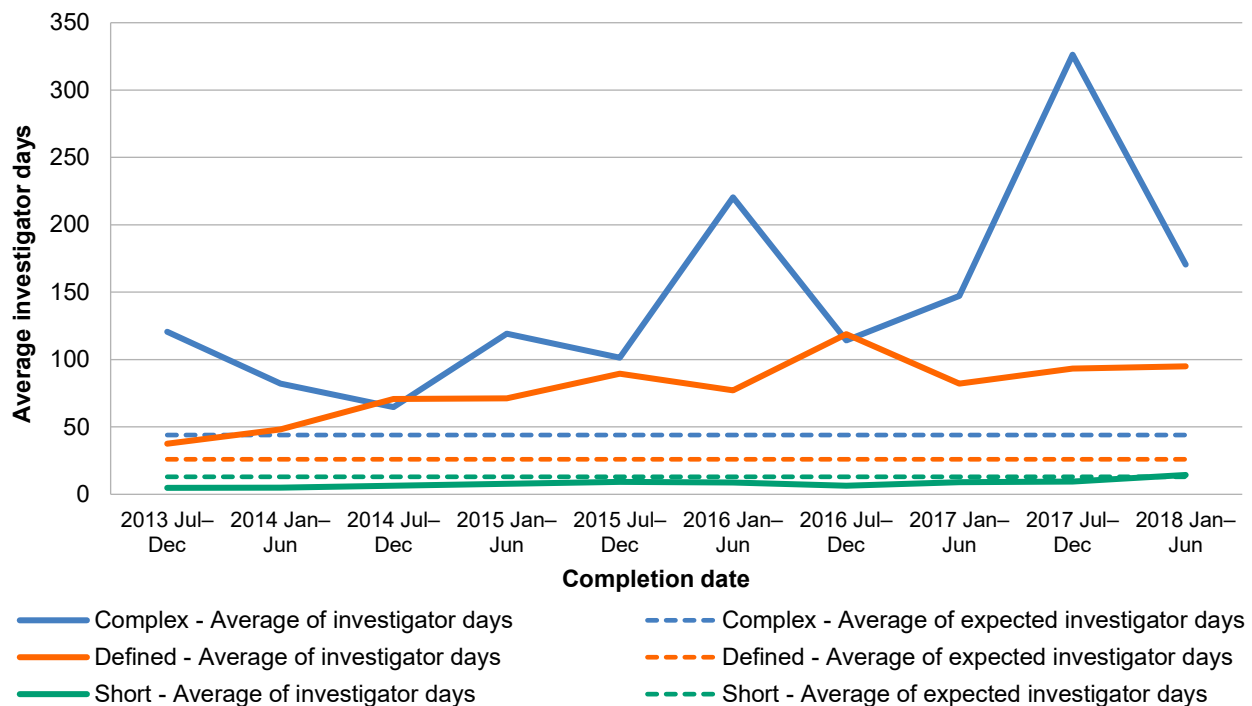
Figure 3.1: Average calendar days to complete investigations



Source: ATSB data.

3.8 The ANAO also analysed the inputs (in terms of effort being logged by investigators) being required to complete ATSB investigations. As illustrated by Figure 3.1 the ATSB has regularly exceeded the number of calendar days in comparison to the expected number of calendar days across complex, defined and short investigations. Further, as illustrated by Figure 3.2:

- for short investigations in 2018, they have remained relatively stable in regards to expected effort (13 days, with an average of 8.8 investigator (effort) days) to complete a short investigation; and
- for complex and defined categories of investigation, the trend is an ongoing increase, well above the expected investigator (effort) days sitting at an average of 150 effort days for complex (expected 80 investigator (effort) days) and an average of 82 (expected 26 investigator (effort) days) for defined.

Figure 3.2: Average investigator (effort) days

Source: ATSB data.

Has the ATSB compared its investigation efficiency to other relevant organisations?

Prior to 2018, the ATSB had not compared its investigation efficiency to other relevant transport safety investigation organisations. Steps are now being taken to benchmark performance against international comparators.

3.9 The ATSB had not, prior to 2018, undertaken any benchmarking of its efficiency performance in comparison to other relevant transport safety organisations.

3.10 In October 2018, in connection with the ANAO audit and as part of the ATSB's representation at the International Transportation Safety Association (ITSA) meeting, the ATSB proposed a benchmarking study to its international counterparts. The ATSB is to present a comprehensive paper to the ITSA 2019 annual meeting in Canada proposing a formal international benchmarking study to be undertaken.

3.11 As part of the audit process, in order to assist the ANAO to address the audit criteria and in order to learn lessons that may help to inform the future direction of the ATSB's key performance indicators, the ATSB requested assistance from four international multi-modal transport safety investigation entities. The entities identified as suitable comparators are from the Asia Pacific region and North American region. Although not all multi-modal investigators, there would be benefits in

consideration being given in future benchmarking exercises to also seeking to include comparators from Europe.²¹

3.12 One of the entities advised the ATSB that it did not have timeliness targets for investigations.²² The entity advised that it would attempt to assist the ATSB with its request, by retro-fitting its data. At the time audit fieldwork was concluded, information from this entity had not been received and therefore is not included in any of the analysis from paragraph 3.24 to paragraph 3.26.

3.13 Three years of data was requested, focussing on investigations into accidents and serious incidents (excluding safety studies/research) across all modes of transport each entity had in its jurisdiction. The request included information relating to the:

- number of investigations completed;
- percentage of investigations published within 12 months²³;
- median age at publishing;
- number of investigation staff participating in complex occurrence investigations; and
- number of active investigations.

How does the ATSB's investigation efficiency compare to other relevant organisations?

Data obtained in connection with this ANAO performance audit indicates that, averaged across the last three years, the ATSB is performing comparably across a range of efficiency metrics. On an annualised basis, the ATSB's efficiency has been declining particularly in terms of resource efficiency where it has fallen behind two of the three countries examined for which data was available.

3.14 As discussed in paragraph 3.13, three financial years of data was obtained from three countries as outlined in Table 3.1.

Table 3.1: Benchmarking data

Financial year	Entity	Number of investigations completed	Median age at publishing (months)	Published within 12 months (%)	Staffing numbers
2015–16	ATSB	56	20	21	50
	Country A	48	16	10	120
	Country B	13	21	0	13

21 For example, through the European Network of Civil Aviation Safety Investigation Authorities which comprises the 28 civil aviation safety investigation authorities of the European Union Member States.

22 This entity reports on products (which is defined more broadly than just investigation reports) and its published Annual Performance Plan for 2017 included average timeframe targets for reports approved by its Board of: less than or equal to 15 months for each of its Office of Aviation Safety, its Office of Marine Safety and its Office of Research and Engineering; less than or equal to 14 months for its Office of Railroad, Pipeline and Hazardous Materials Investigations; and less than or equal to 12 months for its Office of Highway Safety.

23 This was used as it is currently the ATSB's key timeliness KPI for complex investigations.

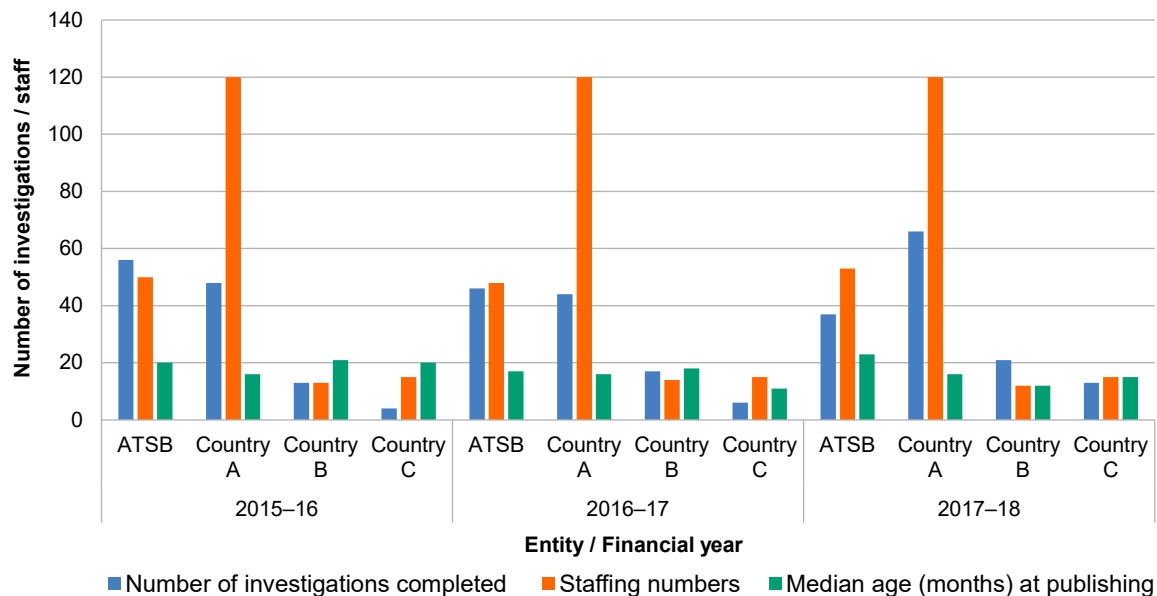
Financial year	Entity	Number of investigations completed	Median age at publishing (months)	Published within 12 months (%)	Staffing numbers
2016–17	Country C	4	20	0	15
	ATSB	46	17	22	48
	Country A	44	16	7	120
	Country B	17	18	6	14
	Country C	6	11	50	15
2017–18	ATSB	37	23	11	53
	Country A	66	16	14	120
	Country B	21	12	14	12
	Country C	13	15	23	15

Note: Staffing numbers for Country A and Country C are based on their average investigator staffing levels. Country B staffing numbers are from its Annual Reports.

Source: ATSB data.

3.15 Figure 3.3 (below) illustrates the ATSB's performance against these three countries for the number of investigations completed; the median age for reports at the time of publishing; and staffing numbers.

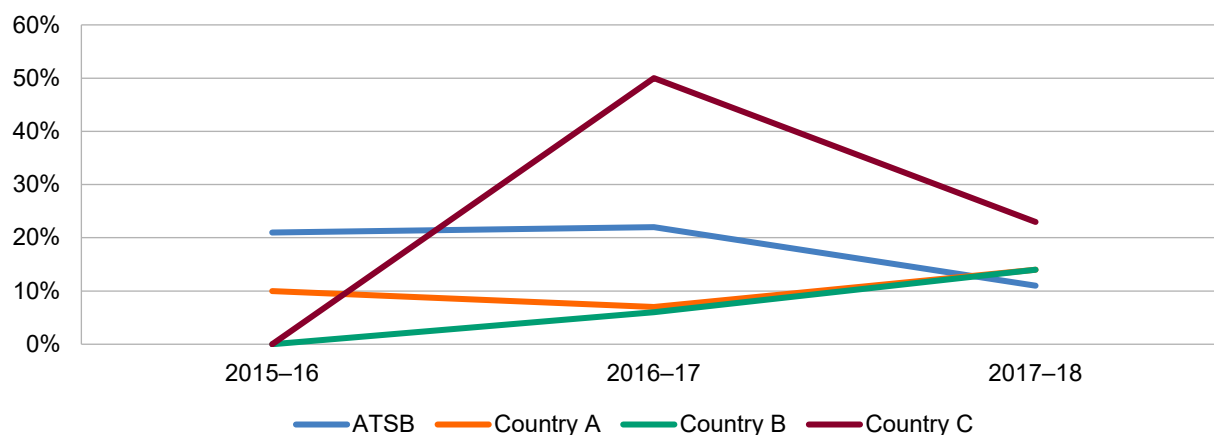
Figure 3.3: ATSB's performance against international comparators



Source: ATSB data.

3.16 Figure 3.4 (below) illustrates the ATSB's performance against the three comparator countries for the percentage of reports published within 12 months.

Figure 3.4: Percentage of reports published within 12 months against international comparators



Source: ATSB data.

3.17 Based on the data received, on an annualised basis, the ATSB's performance against the three comparator countries trend analysis shows:

- the ATSB has a downward trend for the number of investigations completed;
- similar to Country A, the ATSB's median age for publishing remains steady, however Country B and Country C are showing an improvement in the median age it takes to publish their investigations; and
- comparatively, the ATSB is on a downward trend for publishing reports within 12 months, whereas, Country B and Country C are showing an upward trend.
- staffing numbers show little change.

3.18 The ATSB has adopted a more challenging timeliness performance target than the two comparators that have a target in place (Country A and Country B). Compared to the ATSB target of completing 90 per cent of complex investigations within 12 months, the relevant comparators had targets of 75 per cent of investigations completed within 450 days and 70 per cent of investigations completed within 440 work days. There were few instances reported where the comparators were able to complete investigations within 12 months (see Table 3.2). Across the three years, the ATSB performed better than two of the three countries for which data was obtained.

Table 3.2: Percentage of investigation reports published within 12 months

Entity	2015-16	2016-17	2017-18	Three year average
ATSB	21%	22%	11%	18%
Country A	10%	7%	14%	10%
Country B	0%	6%	14%	7%
Country C	0%	50%	23%	24%

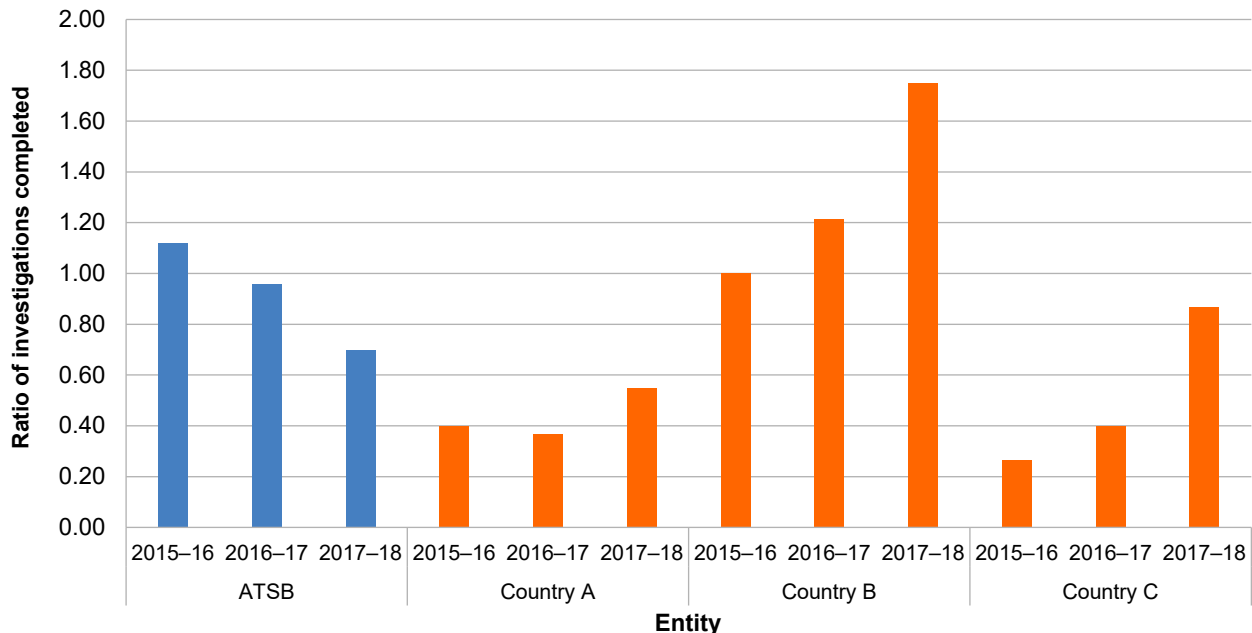
Note: Although Country C does not specify, they generally work to a two year timeframe.

Source: ATSB data.

3.19 As illustrated in Figure 3.5, the ATSB's productivity is on a downward trend whereas the data indicates increasing productivity for Country's A, B and C over the last three financial years. On a

per investigator basis, in 2015–16 the ATSB was producing more reports than the comparators. By 2017–18, ATSB was only producing more reports per investigator than Country A, and produced significantly fewer reports than Country B. The over-allocation of investigator resources by the ATSB (as illustrated in Figure 2.4 on page 27) has likely contributed to reduced investigation closure rates for the ATSB.

Figure 3.5: Number of investigations completed as a ratio of the number of investigators



Source: ANAO analysis of ATSB data.

3.20 In January 2019 the ATSB advised the ANAO that yearly data can be highly variable and can be affected by things beyond an entity’s ability to control, such as several large accidents occurring in one year. The ATSB suggested that an average of the three years of data provided was a preferable approach. An average across the data provided for three financial years is shown below at Table 3.3. The analysis shows that, over the three year period analysed, the:

- ATSB produced significantly more investigation reports per investigator than two of the three comparators, but was less productive than one of the comparators;
- ATSB produced reports within 12 months more often than two of the three comparators (including the other comparator with who produced a similar number of total reports to the ATSB — the other two entities produced significantly fewer reports over the three years); and
- median age of the ATSB’s reports at publishing was greater than each of the three comparators.

Table 3.3: Three year average of benchmarking data

Three year average (2015–16; 2016–17; 2017–18)	Number of investigations completed	Staffing numbers	Median age (months) at publishing	% published within 12 months	Ratio: Number of investigations:Staff
ATSB	46	50	20	18	0.92
Country A	53	120	16	10	0.44
Country B	16	13	17	7	1.23
Country C	7	15	15	24	0.47

Source: ATSB data.

Recommendation no.4

3.21 The ATSB continue to progress actions that it has recently commenced to benchmark its investigation performance against relevant international comparators and use the results to identify strategies to improve its performance.

Australian Transport Safety Bureau response: Agreed.

3.22 *The ATSB recognises that benchmarking is a valuable activity and there is significant scope to progress this work at an international level with counterpart agencies. Benchmarking is a shared responsibility and no other international transport safety investigation agency has yet conducted such an activity. The ATSB is pleased to lead the way.*

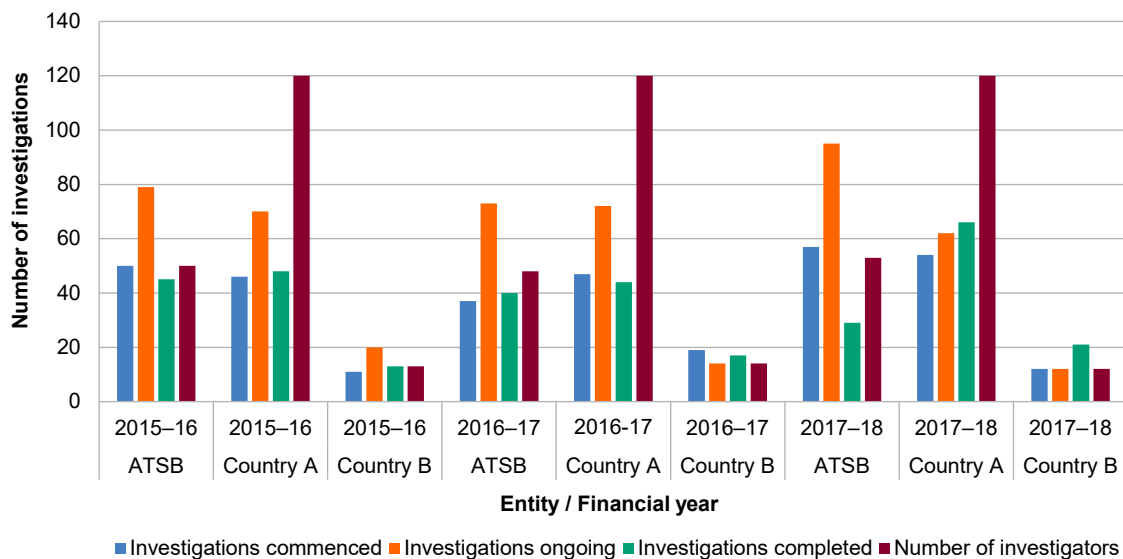
3.23 *As noted in the report, the ATSB will present a paper at the next International Transportation Safety Association (ITSA) meeting proposing a formal international benchmarking framework.*

Additional benchmarking

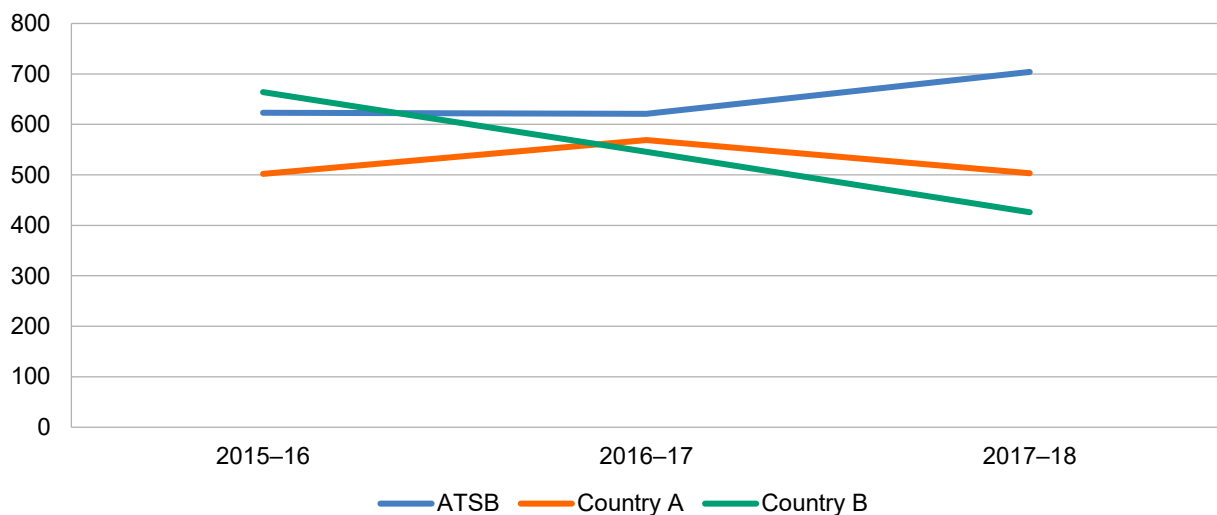
3.24 The ANAO also undertook additional analysis of publicly available information of two countries to compare the ATSB's performance against the numbers of commenced, completed and ongoing active investigations; and the number of investigator staff. Publicly available information on these metrics was not available for two of the comparator countries²⁴ and so the ANAO did not include either country in this analysis. Figure 3.6 illustrates the results of the ANAO's analysis.²⁵ Figure 3.7 illustrates the ATSB's performance against the two comparator countries for the average number of days taken to complete an investigation.

24 For example, one of the comparators does not publicly report on investigations but rather reports on 'products'. A product is defined as 'a completed report, safety study, safety report, accident brief, standalone safety recommendation letter, safety alerts, safety issue/position papers, Most Wanted List items, response to proposed rulemaking, as well as any public hearings or forums held'.

25 Country A and Country B—complex investigations only and for the ATSB it is a combination of complex and defined as it reports these two categories as their complex outputs.

Figure 3.6: ATSB's overall performance against international comparators

Source: ANAO analysis of the ATSB, Country A and Country B benchmarking data.

Figure 3.7: Average number of days to complete an investigation

Source: ANAO analysis of the ATSB, Country A and Country B benchmarking data.

3.25 As is illustrated above in Figure 3.6 and Figure 3.7, the ATSB has:

- commenced more investigations than the comparator countries for 2015-16 and 2017-18, but less than Country A in 2016-17;
- more ongoing investigations than all comparators across all the financial years; and
- took on average at least 100 days more than the comparators based on the reported average days to complete investigations.

3.26 Compared to Country A and Country B, the ATSB has commenced more investigations than it has completed. This is illustrated in Table 3.4. As set out in Table 2.6 on page 30, the ATSB introduced the Back on Track initiative to address a growing backlog of old investigations.

Table 3.4: Ratio of commenced and completed investigations over three financial years

Financial years	Entity	Investigations commenced	Investigations completed	Ratio Commenced:Completed
2015–16 to 2017–18	ATSB	144	114	1.26
	Country A	147	158	0.93
	Country B	42	51	0.82

Source: ANAO analysis.

3.27 When comparing the number of ongoing active investigations to the number of investigators, the ATSB is expecting greater productivity from its investigators than Country A and/or Country B, as shown below in Table 3.5.

Table 3.5: Ratio of ongoing active investigations over the number of investigators over three financial years

Financial years	Entity	Ongoing active investigations	Number of investigators	Ratio Investigations:Investigators
2015–16 to 2017–18	ATSB	82	50	1.64
	Country A	68	120	0.57
	Country B	15	13	1.18

Source: ANAO analysis.



Grant Hehir
Auditor-General

Canberra ACT
14 March 2019

Appendices

Appendix 1 Australian Transport Safety Bureau response



Australian Government
Australian Transport Safety Bureau

Chief Commissioner

Our reference: CC2019/033

4 March 2019

Mr Grant Hehir
Auditor-General
Australian National Audit Office
19 National Circuit
BARTON ACT 2601

Dear Mr Hehir

Efficiency of the ATSB's investigation of transport accidents and safety occurrences

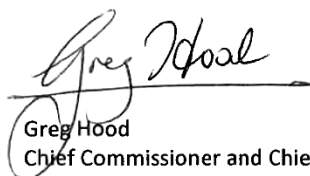
Thank you for providing the Australian Transport Safety Bureau (ATSB) with the opportunity to comment on the Australian National Audit Office's (ANAO) proposed report on the efficiency of the ATSB's investigation of transport accidents and safety occurrences.

From the outset of this endeavour, the ATSB welcomed the ANAO's audit and the opportunities it has presented to demonstrate the ATSB's recent efficiency improvements and reflect upon further improvements. Following discussions with the ANAO throughout the course of the audit, the ATSB has assessed areas for improvement and we have already commenced implementing the recommendations.

Please see the ATSB's formal response to the report and each of the recommendations, for publication in the final report, at [Attachment A](#) and [Attachment B](#).

I would like to thank the ANAO for the professional way in which the audit was conducted and for the work of the audit team in assisting the ATSB in our commitment to continual improvement.

Yours sincerely



Greg Hood
Chief Commissioner and Chief Executive Officer

Attachments

Attachment A: Summary response

Attachment B: Responses to recommendations

62 Northbourne Ave
Canberra ACT 2601
Australia

PO Box 967
Civic Square
ACT 2608 Australia

Web www.atsb.gov.au
Twitter @ATSBinfo

ABN 65 061 156 887