National Infrastructure Data Collection and Dissemination Plan
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Minister’s Foreword

Australia’s infrastructure networks and assets underpin our economy and society. As Australia continues to grow, it is important that we make wise infrastructure investment decisions—so our roads, rail, ports and other infrastructure best serve Australia’s people and businesses.

There are big opportunities to use improved data and information to deliver better infrastructure services to Australians. As new technologies are developed and rapidly taken up by businesses and organisations more data is being generated and collected, presenting transformative opportunities for the infrastructure sector.

We have put together a Steering Group made up of infrastructure and transport experts from across the public sector, industry and academia to help develop a National Infrastructure Data Collection and Dissemination Plan. Our aim is to develop priority projects to improve the way infrastructure data is collected, shared and used to guide decision making.

One example is a project using GPS data shared by freight operators to better understand where congestion is impacting freight movements. Another is an interactive online Infrastructure Performance Dashboard that summarises transport, telecommunications, water and energy data.

I look forward to seeing the deliverables from the projects in the Data Plan, including those launched as part of its release and those developed over the next five years. The Bureau of Infrastructure, Transport and Regional Economics (BITRE) within my Department will actively monitor and report on these projects. The aim is to deliver data which results in the more efficient use of existing infrastructure—and more efficient investment in new infrastructure.

Paul Fletcher
Minister for Urban Infrastructure and Cities
14 June 2018
Purpose

The purpose of the National Infrastructure Data Collection and Dissemination Plan (Data Plan) is to improve and coordinate information and data collection across key stakeholders, and provide improved and more timely information for infrastructure investment decisions and monitoring of the performance of Australia’s infrastructure networks. Developing opportunities to harness new data sources (including ‘Big Data’) from emerging data sources is also a key aim of the Data Plan.

The Data Plan achieves its aims through identifying and developing priority projects that:

- Fill identified key data and information gaps
- Develop and report performance relevant to infrastructure operators and customers
- Support innovation in data collection and use.

Scope

The Data Plan focuses on data used to assess and inform the performance, investment and planning related to Australia’s transport, water, energy and communications infrastructure networks and assets. Infrastructure use and impact are also assessed as part of the Data Plan.

Project management

The Bureau of Infrastructure, Transport and Regional Economics (BITRE), within the Department of Infrastructure, Regional Development and Cities, led the development of the Data Plan, with assistance from an expert Steering Group (see Appendix A for membership) and state and territory transport agencies, through the Australian Transport Data Action Network (ATDAN) (see Appendix B).

Approach

The Data Plan was developed using a similar process to the New Zealand Transport Domain Plan:

**Identifying Enduring Questions, Gaps and Opportunities (Draft Data Plan)**

- Creating an initial list of ‘Enduring Questions’ to be addressed in the Data Plan, grouped by overarching topic (such as ‘Infrastructure performance’). These questions were developed based on Steering Group feedback and the Terms of Reference for the project (see Appendix C). Enduring Questions are broad ranging and outline the main infrastructure statistical and information needs for the Data Plan.
- Identifying and summarising key data and information sources and using this information to identify data and information gaps and opportunities that relate to the Enduring Questions.
- Develop draft Prioritised Enduring Questions and gaps based on Steering Group feedback. This process serves to manage the scope of the Data Plan.

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2 Key data sources refer to high-level statistical and information sources that relate to transport activity and infrastructure networks.
Finalising Prioritised Enduring Questions and Developing and identifying Priority Projects (Final Data Plan)

• Finalise Priority Enduring Questions based on submissions on the Draft Data Plan and the feasibility of addressing associated data and information gaps.
• Identifying opportunities to expand existing projects and develop new projects to address priority data and information gaps.

Implementation, ongoing tracking and reporting of Priority Projects, and identification of new projects

• Establishing project-specific groups made up of Steering Group and ATDAN members, and other stakeholders, to develop technical details in relation to implementation of projects and initiatives.
• Monitor and report on Priority Projects and associated initiatives through the Data Plan website.
• Identification of new data and information gaps and associated Priority Projects.

Figure 1.1 shows stages and steps of the Data Plan development and implementation process.

Figure 1.1 Approach for developing the Data Plan

3 Submissions closed on 1 November 2017 with nine submissions received. BITRE would like to especially thank the Queensland Department of Transport and Main Roads Qld for their detailed comments.

Enduring Questions

Enduring Questions were grouped into six broad categories:

1. **Infrastructure stocktake**

   These questions seek to provide descriptive statistics on Australia’s major economic infrastructure networks (transport, communications, energy and water). This information is essential for infrastructure planning, measuring performance and understanding the impact of infrastructure.

2. **Infrastructure performance**

   Australians expect their infrastructure networks to support a high quality, first world standard of living. These questions seek to assess the performance of Australia’s major economic infrastructure networks and also develop customer-focused measures of infrastructure performance.

3. **Infrastructure investment and planning**

   Investment in infrastructure has the capacity to stimulate and enhance the productivity of the economy in both the short and long term. It is an investment that has a multiplier effect throughout the economy, generating lasting economic, social and environmental benefits. These questions seek to provide better information to promote sound infrastructure investment, decision making and planning by governments.

4. **Impact of infrastructure**

   Efficient and effective infrastructure is a key driver of the Australian economy and its use has significant environmental impacts, for example, through carbon emissions. Infrastructure, or lack of infrastructure, also has key social impacts, such as, social exclusion. These questions attempt to better assess the economic, environmental, social and safety impacts of infrastructure.

5a. **Infrastructure use – Transport**

   These questions are aimed at improving the quality of freight and passenger data, to enable better informed planning and policy development.

5b. **Infrastructure use – Energy, Water and Communications**

   This section aims to better understand the provision of energy, water and communications services.

6. **Data and information for decision making and innovation**

   These questions relate to improving the availability, discoverability and accessibility of government and non-government transport and infrastructure data and information.

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Prioritised Enduring Questions

Based on consultation and comments received on the Draft Data Plan, Enduring Questions were prioritised depending on the relevance of identified associated data and information gaps and the feasibility (in terms of cost and time) of addressing these gaps as part of the Data Plan.

Priority Enduring Questions serve to manage the scope of the Data Plan and promote the development of achievable Priority Projects. BITRE acknowledges that Enduring Questions, gaps and opportunities not listed are still important and may warrant attention. A full list of Enduring Questions is available at Appendix D.

Table 1.1  Prioritised Enduring Questions, grouped by Enduring Question subject area

<table>
<thead>
<tr>
<th>Topic</th>
<th>Prioritised Enduring Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrastructure Stocktake</td>
<td>EQ 1.2 – What is the condition of Australia’s infrastructure?</td>
</tr>
<tr>
<td>2. Infrastructure and freight performance</td>
<td>EQ 2.1 – How well are Australia’s infrastructure networks performing?</td>
</tr>
<tr>
<td></td>
<td>EQ 2.3 – [Specifically] How well is Australia’s freight sector performing?</td>
</tr>
<tr>
<td>3. Infrastructure investment and planning</td>
<td>EQ 3.1 – How well are infrastructure projects assessed in Australia before they are built?</td>
</tr>
<tr>
<td></td>
<td>EQ 3.2 – What are the planned and actual costs and benefits involved in infrastructure projects?</td>
</tr>
<tr>
<td></td>
<td>EQ 3.3 – How do infrastructure construction costs vary?</td>
</tr>
<tr>
<td></td>
<td>EQ 3.5 – How do we encourage network optimisation solutions to ensure transport network infrastructure use is optimised before major infrastructure investment?</td>
</tr>
<tr>
<td>4. What are the impacts of our infrastructure?</td>
<td>EQ 4.3 – What are the main sources, types and quantities of economic benefits from transport?</td>
</tr>
<tr>
<td></td>
<td>EQ 4.4 – How, when, why and in what numbers do people get injured, or die on Australia’s roads?</td>
</tr>
<tr>
<td>5a. Infrastructure use – Transport</td>
<td>EQ 5.1a – What freight is moving to, from and around Australia, what is it comprised of, how are different industries affecting the volume and value of freight?</td>
</tr>
<tr>
<td></td>
<td>EQ 5.2a – How and when does freight move to, from and around Australia, and by what routes?</td>
</tr>
<tr>
<td></td>
<td>EQ 5.3a – What barriers exist to efficiently transporting freight to, from and around Australia?</td>
</tr>
<tr>
<td></td>
<td>EQ 5.5a – How, when, why and in what numbers do people travel to, from and within Australia, for what purposes, what are the origins and destinations of their journeys?</td>
</tr>
<tr>
<td>5b. Infrastructure use – Energy, Water and Communications</td>
<td>EQ 5.1b – What are the key service characteristics for water, energy and communications (including cost, time, speed, accessibility and reliability) and how do these characteristics affect the amount and type of services provided?</td>
</tr>
<tr>
<td>6. Data and information for decision making and innovation</td>
<td>EQ 6.1 – What infrastructure data and information is currently publicly available and what datasets and information can be made available?</td>
</tr>
<tr>
<td></td>
<td>EQ 6.2 – What data do governments need to provide in order to enable emerging technologies and innovative business models of infrastructure provision and use?</td>
</tr>
</tbody>
</table>
## Priority Projects

### Table 1.2 Prioritised Enduring Questions, associated data and information gaps and projects

<table>
<thead>
<tr>
<th>EQ</th>
<th>Data and Information Gap</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>Data for better infrastructure asset management and the ability to make like-for-like comparisons</td>
<td>Heavy Vehicle Infrastructure Asset Registers</td>
</tr>
<tr>
<td>2.1</td>
<td>Better access to infrastructure performance data and information</td>
<td>Development of Infrastructure Performance Dashboard</td>
</tr>
<tr>
<td>2.1</td>
<td>Consistent and up-to-date road speed performance and reliability measures</td>
<td>Development of road speed performance and reliability measures for major cities</td>
</tr>
<tr>
<td>2.3</td>
<td>Measuring freight performance</td>
<td>Freight performance indicators</td>
</tr>
<tr>
<td>3.1</td>
<td>Information on best-practice modelling assumptions</td>
<td>Developing and Promoting Best Practice Modelling Assumptions</td>
</tr>
<tr>
<td>3.2</td>
<td>Determining the accuracy of benefit cost ratios (BCRs)</td>
<td>Post completion analysis for major infrastructure projects</td>
</tr>
<tr>
<td>3.3</td>
<td>Assessing value for money in infrastructure investments</td>
<td>Cost benchmarking for infrastructure investments</td>
</tr>
<tr>
<td>3.5</td>
<td>Including network optimisation solutions in infrastructure decision making processes</td>
<td>Network Optimisation Framework, Reference Guide and Solution Assessment Tool</td>
</tr>
<tr>
<td>4.3</td>
<td>Measuring transport’s economic contribution</td>
<td>Transport Satellite Account</td>
</tr>
<tr>
<td>4.4</td>
<td>Information on non-fatal hospital admissions</td>
<td>Non-fatal road injury data linkage project</td>
</tr>
<tr>
<td>5.1a</td>
<td>Better understanding the movement of freight to and from ports</td>
<td>Customs freight data analysis project</td>
</tr>
<tr>
<td>5.2a</td>
<td>Determining points of congestion for freight vehicles and when road freight is moved around Australia</td>
<td>Road freight telematics project</td>
</tr>
<tr>
<td>5.3a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.5a</td>
<td>Insights on transient population changes</td>
<td>Telecommunications data pilot study</td>
</tr>
<tr>
<td>5.1b</td>
<td>Reporting on water, energy and communications infrastructure use and performance</td>
<td>Develop non-transport metrics in the Infrastructure Performance Dashboard</td>
</tr>
<tr>
<td>6.1</td>
<td>Data sharing guidance, methods and standards</td>
<td>NSW Data Sharing Taskforce</td>
</tr>
<tr>
<td>6.1</td>
<td>Locating, understanding and utilising available transport and infrastructure datasets</td>
<td>Tracking State and Commonwealth open data developments</td>
</tr>
<tr>
<td>6.2</td>
<td>Open data to support the implementation of Connected and Automated Vehicles (CAVs)</td>
<td>Investigation into key road operator data attributes that will be used as part of the CAV system</td>
</tr>
</tbody>
</table>
Priority Projects – Detailed Description

Priority Data Projects were developed around the prioritised Enduring Questions and data gaps. These projects relate to data priorities, opportunities that come from new and emerging technologies, and improvements to data sharing and accessibility. Projects are summarised in Table 1.2 and discussed in this chapter. Case studies relating to select projects are also outlined.

<table>
<thead>
<tr>
<th>Heavy Vehicle Infrastructure Asset Registers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead agency: Department of Infrastructure, Regional Development and Cities</td>
</tr>
<tr>
<td>EQ 1.2 – What is the condition of Australia’s infrastructure?</td>
</tr>
<tr>
<td><strong>Gap addressed</strong></td>
</tr>
<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td><strong>Objective</strong></td>
</tr>
<tr>
<td><strong>Project update</strong></td>
</tr>
<tr>
<td><strong>Related publication</strong></td>
</tr>
</tbody>
</table>

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Case study 1 - Heavy Vehicle Infrastructure Asset Registers

The image below shows heavy vehicle infrastructure routes in Ravenshoe (Far North Qld). Ratings above the expected level for a particular road type are coloured blue, those within the expected range are coloured green while those with a rating below the expected range are coloured red.

Infrastructure Performance Dashboard

Lead agencies: BITRE, Infrastructure Australia and Data61

EQ 2.1 – How well are Australia’s infrastructure networks performing?

Gap addressed

- Locating and understanding infrastructure datasets.
- Difficulties in comparing infrastructure performance and activity across infrastructure sectors and metrics.

Background

BITRE and other agencies currently publish national-level infrastructure performance data. However, this information is typically published only in report form and some stakeholders have also noted that it is sometimes difficult to locate and understand.

There is an opportunity to develop an infrastructure performance dashboard that enables users to easily track the performance and activity of the transport, water, telecommunications and energy sectors.

Objective

Develop an Infrastructure Performance Dashboard.

Project update

BITRE and Infrastructure Australia are currently working with Data61 to develop an Infrastructure Performance Measurement Dashboard.

The dashboard will cover all major economic infrastructure sectors (transport, telecommunications, water, and energy) and enable national and state-level comparisons. Where possible, the dashboard will have an outcome/customer focus and report on the following indicators types identified in BITRE’s Performance Framework investment; price; timeliness and reliability; safety; and activity (use).

The dashboard will have a similar design and functionality as the recently released COAG performance dashboard (produced by Data61, see Case Study 2).

The dashboard will be publicly released in late 2018.

Case Study 2 – COAG Performance Dashboard

The screen shot (below) is of the front page of the COAG performance dashboard which provides a high-level overview of performance in achieving key COAG commitments in priority areas. The Infrastructure Performance Dashboard will have a similar layout and functionality.
## Road-Speed Performance and Reliability Dashboard

**Lead agencies:** Houston Kemp and BITRE

**EQ 2.1 – How well are Australia’s infrastructure networks performing?**

<table>
<thead>
<tr>
<th>Gap addressed</th>
<th>Consistent national approach for measuring road speed performance and reliability.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The ability to conduct before and after assessments for road infrastructure projects.</td>
</tr>
</tbody>
</table>

**Background**

Houston Kemp has built a prototype road-speed performance dashboard for the Australian road network, using HERE traffic probe data (see Case Study 3 for example output). The dashboard provides information on average road speed performance and network reliability at different times of the day. Performance and reliability measures are available for a number of spatial scales: citywide, major/arterial roads, postcode, point-to-point custom route selection, and for individual roads. Users can also view road performance across several time dimensions, including hourly, AM and PM peak periods, by day of the week, monthly and annually. The prototype version was developed in 2017, using traffic data observed on Brisbane area roads over the period January 2013 to December 2016. The dashboard is currently only available to Infrastructure Department staff under commercial licence.

**Objective**

Expanding road speed performance dashboard to all capital cities and produce public facing metrics.

**Project update**

BITRE has commissioned Houston Kemp to expand the prototype dashboard to include near-real time data for all of Australia, including capital cities and other regional urban areas. Among other uses, the dashboard will enable before and after comparisons to assess changes in road speed performance and reliability following infrastructure projects (e.g. new road construction, road widening projects).

Publicly-accessible road performance measures are also being developed for each capital city, which will be displayed on BITRE’s infrastructure performance dashboard.

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9 The metrics in the expanded dashboard complement existing Austroads National Network Performance Indicators.
Case Study 3 – Prototype road-speed performance dashboard

The screen shot (below) is from the Houston Kemp Dashboard showing speed performance and reliability measures for a select route in Brisbane (first Image) and for the centre of Brisbane.
Freight Performance Indicators

<table>
<thead>
<tr>
<th>Lead agencies: BITRE, state and territory transport departments (through ATDAN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQ 2.3 – [Specifically] How well is Australia’s freight sector performing?</td>
</tr>
<tr>
<td>Background</td>
</tr>
<tr>
<td>Objective</td>
</tr>
<tr>
<td>Project update</td>
</tr>
</tbody>
</table>
### Developing and Promoting Best Practice Modelling Assumptions

<table>
<thead>
<tr>
<th><strong>Lead agencies:</strong> BITRE, state and territory transport departments (through ATDAN)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EQ 3.1 – How well are infrastructure projects assessed in Australia before they are built?</strong></td>
</tr>
<tr>
<td><strong>Gap addressed</strong></td>
</tr>
<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td><strong>Objective</strong></td>
</tr>
<tr>
<td><strong>Project update</strong></td>
</tr>
</tbody>
</table>
## Post Completion Analysis for Infrastructure Projects

**Lead agency:** BITRE

**EQ 3.2 –** What are the planned and actual costs and benefits involved in infrastructure projects?

<table>
<thead>
<tr>
<th><strong>Gap addressed</strong></th>
<th>Limited information on the accuracy of cost-benefit analysis (CBA) predictions and whether projects fulfil their objectives.</th>
</tr>
</thead>
</table>

**Background:** Governments at all levels make infrastructure spending decisions based on CBAs. CBAs are a rigorous, transparent, quantitative method that measures the degree to which individual projects generate net benefits (benefits minus costs) across Australia, and allows comparison and ranking of options and projects. CBAs are conducted ex-ante (before construction), meaning, based on CBAs only, there is limited information on the accuracy of CBA predictions and whether projects fulfil their objectives.

**Objective:** Conduct more independent post completion (ex-post) evaluations of CBAs for infrastructure projects and make findings publicly available.

**Project update**

BITRE has undertaken two rounds of ex-post evaluations of national road investment projects: one in 2005-2007 and the other in 2014-2016. BITRE Research Report 145 synthesises the earlier ex-post evaluation results with the aim of identifying opportunities to improve future CBAs and project appraisal.

Evidence drawn from the ex-post case studies suggests there is much room for improvement in the quality of practical Australian road CBAs if they are to be used as an effective tool for option ranking and project prioritisation purposes. Key areas identified for improvement include:

- CBA documentation
- CBA review
- Traffic forecasts
- Road user benefit assessment
- Project cost estimation

Findings of this report will inform the ongoing update of Australian Transport Assessment and Planning (ATAP) guidelines and Infrastructure Australia’s Assessment Framework, which will in turn contribute to making better infrastructure investment decisions in future.

**Related publication**

- BITRE 2007, Working Papers 70.1 and 70.2, Canberra.
Cost Benchmarking for Infrastructure Investments

Lead agencies: BITRE and state and territory road transport agencies

EQ 3.3 – How do infrastructure construction costs vary?

Gap addressed Assessing value for money for road and other infrastructure investments.

Background: Careful evaluation of infrastructure construction costs is essential to ensure value for money in infrastructure investments, a fact noted by the 2014 Productivity Commission inquiry into Public Infrastructure. In response to the Productivity Commission Inquiry, Australian Government and state and territory governments committed to carrying out regular cost benchmarking for road projects through the Transport and Infrastructure Council (TIC). In cooperation with state and territory road agencies, BITRE subsequently completed a pilot cost-benchmarking study for TIC in 2015, which covered 65 separate road projects.

Objective: Expand and update cost-benchmarking work.

Project update Cost benchmarking of road projects was updated in 2017 to include more-recently completed construction projects. The 2017 cost benchmarks were based on a sample of 34 road projects—28 recently completed and 6 in-delivery—from across seven jurisdictions. The main findings from the analysis include:

- Average road project costs were around $5.1 million per lane kilometre—slightly less than measured in the 2015 cost benchmarking study.
- Average costs vary most significantly with road standard – the average cost of urban and rural freeways/highways was around $5.7 million per lane kilometre, while average costs of lower-standard rural arterials were around $3.8 million per lane kilometre.

A summary report outlining the key findings was released in early 2018, with the next round of road cost benchmarking scheduled to be undertaken in 2019.

BITRE is also scoping possible expansion of the cost benchmarking work to water infrastructure projects.

Related publication


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**Network Optimisation Framework, Reference Guide and Solution Assessment Tool**

<table>
<thead>
<tr>
<th>Lead agencies:</th>
<th>Department of Transport and Main Roads (Queensland)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQ 3.5 – How do we encourage network optimisation solutions to ensure transport network infrastructure use is optimised before major infrastructure investment?</td>
<td></td>
</tr>
<tr>
<td>Gap addressed</td>
<td>Assessing value for money for road and other infrastructure investments.</td>
</tr>
<tr>
<td>Background:</td>
<td>Balancing growing network demand and meeting customer expectations within a constrained funding environment requires government organisations to find greater efficiencies and improved reliability from existing infrastructure assets.</td>
</tr>
<tr>
<td></td>
<td>In the case of the Department of Transport and Main Roads (TMR), network optimisation solutions aim to improve performance by increasing the capacity of, or demand for, elements of our current transport network, without delivering major infrastructure. Recognising the benefits of network optimisation solutions, TMR has developed the framework to prioritise its consideration within its existing planning activities.</td>
</tr>
<tr>
<td></td>
<td>In delivering the right infrastructure at the right time, TMR’s planning and investment processes should prevent or defer costly new projects where viable alternatives exist. Low-cost and non-infrastructure solutions are not always suitable investment options. However, the framework is designed to ensure that TMR’s decision-making processes actively consider all opportunities to extend the life of existing assets before capital expenditure is allocated to build new infrastructure.</td>
</tr>
<tr>
<td></td>
<td>This thinking is reflected in both the Australian Infrastructure Plan and the State Infrastructure Plan, as well as in TMR’s Transport Coordination Plan and Guide to Traffic Impact Assessment.</td>
</tr>
<tr>
<td></td>
<td>Network Optimisation Solutions include supply-side and demand-side interventions. Supply-side interventions alter the supply of network capacity, for example, by improving the management of corridors or reallocating road space between modes. On the other hand, demand-side measures influence the use of the network, by encouraging users to shift from congested modes and routes to those with more capacity.</td>
</tr>
<tr>
<td>Objectives:</td>
<td>1. Provide a consistent governance framework which strongly encourages the consideration of network optimisation solution as part of any infrastructure proposal.</td>
</tr>
<tr>
<td></td>
<td>2. Collect and document existing network optimisation solutions and provide a growing library of ready-to-implement solutions available to TMR staff.</td>
</tr>
<tr>
<td></td>
<td>3. Establish a consistent and efficient method to evaluate network optimisation solutions against traditional infrastructure projects.</td>
</tr>
</tbody>
</table>
## Network Optimisation Framework, Reference Guide and Solution Assessment Tool

### Project update

The Network Optimisation Framework was finalised in 2017 and is being socialised across TMR, with a requirement for new programs and projects to use the framework as part of the Project Assessment Framework.

The Smarter Solutions: Reference Guide containing costings and reference to national and international evaluations for 18 ready-to-implement network optimisation solutions was finalised in 2017. Since then, TMR has commissioned a number of Queensland-specific evaluations including truck restrictions, reversible lanes, public transport jump lanes, public transport board all-doors and variable speed limits. These are available on TMR’s intranet site, in an on-line library designed to house this growing body of knowledge.

More recently, a project to address infrastructure shortcomings of Gympie Road successfully used the Network Optimisation Framework and the Smarter Solutions: Reference Guide to canvas a number of low-cost, optimisation solutions to maximise traffic flow along one of Brisbane’s most congested arterials without delivering high-cost, disruptive major infrastructure.

### Related publications

Measuring Transport’s Contribution to the Economy - Transport Satellite Account

Lead agencies: BITRE and ABS

EQ 4.3 – What are the main sources, types and quantities of economic benefits from transport?

Gap addressed

The total contribution of transport activity to the Australian economy is presently not well understood. While about half of all transport activity is undertaken on a ‘hire-and-reward’ basis, and therefore measured as part of the road transport industry within the National Accounts, about half of all activity is undertaken ‘in-house’ (for example, mining companies transport of iron ore in the Pilbara, WA and many retailers operate their own fleet of delivery vehicles), and therefore allocated to non-transport sectors. This represents a well-recognised, key gap in our understanding of the transport sector, and results in a significant underestimation of the potential total productivity gains that may be achieved from transport policy and infrastructure investment decisions. It also limits the effectiveness of economic evaluations of alternative transport and infrastructure policy and regulatory options, including the likely impacts on other sectors.

A Transport Satellite Account is the means by which the full physical and monetary contribution of all transport activity, across all sectors of the economy, can be accounted for in a single consistent framework. It is an adjunct to, and entirely consistent with, the National Accounts, but “presents a more complete picture of transport activity within the national accounting framework by explicitly measuring transport services in all industries, not just the transport industry”.

This would make it possible to measure transport activity undertaken by all industries, including their costs, capital expenditure, income, employment, hours worked, as well as volume data such as vehicle stocks and even emissions.

Objective

Develop a Transport Satellite Account.

Project update

At its meeting of 22 September 2017, the Transport and Infrastructure Senior Official’s Committee (TISOC) agreed to fund the ABS to develop an Experimental Transport Satellite Account (TrSA) – Phase 1 of a proposed two-stage project. (Phase 2, which would involve production of a full Transport Satellite Account, and include a transport industry survey in 2019-20, is contingent on successful compilation of Phase 1 and subsequent and further TISOC approval.)

The ABS commenced work in January 2018 and will produce Experimental Transport Satellite accounts by end October 2018.

Related publication


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12 As a further example, only around a third of total road vehicle capital and operating expenditure in 2010-11 was made by the transport, postal and warehousing sector ABS (2011), 9269.0 - Business Transport Activity, Australia, 2010-11, Australian Bureau of Statistics, Canberra. http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/9269.0Main+Features12010-11?OpenDocument

Non-Fatal Road Injury Data Linkage Project

**Lead agencies: Austroads, BITRE and Flinders University**

**EQ 4.4 – How, when, why and in what numbers do people get injured, or die on Australia’s roads?**

**Gap addressed**
Nationally consistent source of non-fatal road injury data.

**Background**
There is currently a lack of a reliable, nationally consistent, source of non-fatal crash data. National level data on road-injury related hospital admissions exists, but this gives limited details of the crashes (e.g. location and vehicles involved).

**Objective**
Providing non-fatal road injury data by linking crash data (collected by jurisdictions), hospital data and deaths data.

**Project update**
BITRE is managing an Austroads project, with Flinders University as principal investigators, to provide proof of concept for a national approach to supply routine national data on non-fatal hospitalised road injuries in Australia. While some jurisdictions have undertaken their own linkage projects, this project aims to provide the key benefit of a nationally consistent approach.

This project is currently completing Stage 1 (pilot) including obtaining permission from custodians to link crash data (collected by jurisdictions), hospital data and deaths data (to avoid double counting), using Australian Institute of Health and Welfare Data Linking Unit to link data and analysis of linked data (for example, investigating issues such as cross-border flows).

Transport and Infrastructure Ministers agreed in November 2017 to proceed with Stage 2, development of a historical linked data series, and Stage 3, ongoing annual updates of linked data. This linked data should enable nationally consistent reporting of a linked hospitalised injury series.

**Related publication**
Project outputs are expected to include published reports, conference papers and journal papers covering process, method and results.
### Customs freight data analysis project

**Lead agencies: BITRE**

EQ 5.1a – What freight is moving to, from and around Australia, what is it comprised of, how are different industries affecting the volume and value of freight?

<table>
<thead>
<tr>
<th><strong>Gap addressed</strong></th>
<th>National-level statistics to better understand the movement of freight to and from ports.</th>
</tr>
</thead>
</table>

**Background**

BITRE currently reports on Australia’s international trade using trade data from the ABS, which is based on Customs information collected by the Department of Home Affairs (DHA). This data provides information on commodity type, mode of transport (air or sea), freight volume and value, and port of origin and destination.

However, DHA also collects more detailed data that provides information on how freight is carried (for example, containerised versus non-containerised) and the location (postcode) of the importer or exporter.

In late 2016, the National Transport Commission (NTC) established a data sharing arrangement with DHA for the Australian Government, state and territory transport agencies to access confidentialised Customs import and export data, for the purpose of better understanding local movements of export/import freight. DHA has subsequently provide one year’s worth of data, covering calendar 2017.

BITRE will develop an annual publication reporting domestic movements of import and export freight by end 2018.

**Objective**

Develop use case for the Customs freight data.

**Project update**

BITRE is currently scoping a use case for the Customs freight data, for inclusion as an issue in its Freightline series and thereafter as a regular statistical report.

**Related publication**

- BITRE *Freightline series*
### Lead agencies: BITRE

#### EQ 5.2a – How and when does freight move to, from and around Australia, and by what routes?

#### EQ 5.3a – What barriers exist to efficiently transporting freight to, from and around Australia?

<table>
<thead>
<tr>
<th>Gap addressed</th>
<th>Providing more timely and more detailed information about road freight and road freight vehicle movements, more cost effectively.</th>
</tr>
</thead>
</table>

#### Background

The high cost and significant lag time of collecting freight-related data by traditional surveys means that detailed data on road freight movements in Australia is scarce, not sufficiently timely and not available at a detailed geographic level to reliably inform infrastructure planning. This lack of sufficient data to inform decision making increases the risk of governments either underinvesting, or investing in the wrong places. There is also limited data on congestion that impacts freight flows, which is of particular interest to the public, industry and government.

In 2016, BITRE and ABS, in cooperation with the Australian Trucking Association (ATA), Australian Logistics Council (ALC), freight industry operators and other government agencies, completed a pilot study to test the feasibility and utility of deriving road freight related statistics from road freight vehicle telematics data (see example output in Case Study 4). The pilot study developed experimental indicators for:

- Freight-significant congested network locations
- Average freight vehicle travel speed
- Freight vehicle route choices
- Freight vehicle origin–destination trip movements
- Freight vehicle stop locations and durations.

Since early 2017, BITRE and the ABS have been liaising with the freight industry, government agencies, vehicle telematics service providers and other freight industry stakeholders to develop and commence an ongoing freight telematics data collection.

#### Objective

Develop an enduring road freight telematics data collection and road freight telematics-based statistical outputs.

Planned outputs include:

- Identifying freight-significant congested network locations
- Reporting average freight vehicle travel speeds and travel times for key freight routes
- Identify major freight vehicle routes for key origin–destination pairs
- Estimates of reported freight vehicle origin–destination trip movements
- Freight vehicle stop locations and durations
- Up-to-date indicators of road freight industry activity.

#### Project update

BITRE has now commenced collecting road freight telematics based vehicle movement data, sourced from a small number of freight service providers, and over the course of 2018 is looking to expand this collection to include 20–30 of the largest road freight operators.

#### Related publication

BITRE is aiming to develop some first statistical outputs by end 2018.
Case Study 4 – Road freight telematics pilot study

This figure is based on the GPS sample dataset from the road freight telematics pilot study and shows average truck speeds across roads in the Sydney Greater Metropolitan Area, during the sample period (May 2016). Red sections represent slow average speeds.

This figure is also from the GPS sample dataset. The coloured circles represent truck stops (more than 20 minutes) at popular stop locations, while the coloured road segments show trip counts between stop locations.
**Insights on transient population changes – Cruise Ship Analysis.**

**Lead agencies: BITRE**

**EQ 5.5a –** How, when, why and in what numbers do people travel to, from and within Australia, for what purposes, what are the origins and destinations of their journeys?

**Gap addressed** Insights on transient population changes.

**Background:** State-run Household Travel Surveys and ABS census and Journey to Work surveys provide detailed information on the large scale movement of people in Australia. However, understanding fluctuations in temporary population estimates, which represent actual population counts for areas at particular points in time, are a significant data gap and can potentially provide new insights on large scale movements of people.

Information on changes in temporary populations is particularly relevant for large scale temporary population changes associated with cruise ship arrivals. These population increases lead to increased strain on port infrastructure and transport networks surrounding cruise ship terminals, and are becoming more common with increasing passenger numbers and the growing size of cruise ships.

Anonymised and aggregated telecommunications data are a potential source of information that can fill this data gap.

**Objective:** Conduct a pilot study using telecommunications models to better understand changes in temporary populations associated with cruise ship arrivals.

**Project update** BITRE is negotiating with telecommunications data providers to examine temporary population changes associated with the arrival of Ovation of Seas in Hobart in March 2018.
### NSW Data Sharing Taskforce

**Lead agencies:** Australian Computer Society (ACS) and the NSW Data Analytics Centre (DAC)

**EQ 6.1 – What infrastructure data and information is currently publicly available and what datasets and information can be made available?**

<table>
<thead>
<tr>
<th>Gap addressed</th>
<th>Data sharing guidance, methods and standards</th>
</tr>
</thead>
</table>

**Background**

Despite the potential benefits of increased data sharing and the establishment of state-level legislative reform around public data sharing\(^{15}\), data sharing within government remains a challenge for several reasons.

Many data custodians remain hesitant to share data due to concerns around appropriate use and interpretation of data, concerns about unintended consequences of sharing data, concerns about accidental release of sensitive data and concerns about adherence to privacy legislation.

Aggregation of individual data is a standard approach to reduce the risk that personal information is included in a shared dataset. Part of data sharing challenge is that there is no way to unambiguously determine if there is personal information in aggregated data.

**Objective**

Facilitate data sharing by:

- providing advice on existing relevant legal frameworks
- developing methods and standards for anonymising personal information
- developing methods for testing the existence of personally identifiable data in datasets.

**Project update**

A Data Taskforce led by the ACS, and the DAC has been created to address the overarching challenge of developing privacy preserving frameworks which support automated data sharing to facilitate smart services creation and deployment. This framework will seek to address technical, regulatory, and authorising frameworks. The intention is to identify, adopt, adapt, or develop frameworks for data governance, privacy preservation, and practical data sharing which facilitates smart service creation and cross jurisdictional data sharing between governments.

The Taskforce includes representatives from ACS, the NSW DAC, Standards Australia, the Australian Government’s Digital Transformation Agency (DTA), CSIRO, Data61, the Department of Prime Minister and Cabinet, other Australian Government and state agencies/departments, Gilbert and Tobin, the Communications Alliance, Telstra, IBM, Mastercard, and Microsoft.

**Related publication**


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14 For example, the **NSW Data Sharing (Government Sector) Act 2015**.
### Tracking State and Commonwealth Open Data Developments

**Lead agencies: BITRE and state and territory transport agencies (through ATDAN)**

<table>
<thead>
<tr>
<th>EQ 6.1 – What infrastructure data and information is currently publicly available and what datasets and information can be made available?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gap addressed</strong></td>
</tr>
<tr>
<td><strong>Background</strong></td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td><strong>Objective:</strong></td>
</tr>
<tr>
<td><strong>Project update</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Related publication</strong></td>
</tr>
</tbody>
</table>

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Case Study 5 – Transport for NSW Open Data Hub

Open Data Hub

TfNSW’s Open Data Hub was launched in April 2016 and is the portal to TfNSW’s data and information. It also acts as a showcase for innovation from the use of transport data.

There are now around 5,000 subscribers on the Transport Open Data Hub, including a range of data scientists, researchers, app developers and other members of the community who are deriving benefits from it. There is also a supporting forum which enables active dialogue with the subscriber community that provides the direction for the further release of data sets and continuous improvement in the Open Data Hub.

The image below shows the Product Showcase section of TfNSW Open Data Hub. Users are able to click on individual apps to access more information and to view download links.
## Road Operator Data to Support Connected and Automated Driving

**Lead agencies: Austroads**

**EQ 6.2 – What data do governments need to provide in order to enable emerging technologies and innovative business models of infrastructure provision and use?**

<table>
<thead>
<tr>
<th>Gap addressed</th>
<th>Open data to support the implementation of Connected and Automated Vehicles.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
<td>The ongoing advances in transport technology have the potential to fundamentally improve safety, efficiency, sustainability and accessibility of Australia’s transport systems. Australian governments, industry and research institutions recognise this potential and are actively exploring the best ways to develop and deploy new transport technologies such as Connected and Automated Vehicles (CAVs). The developers of these new transport technologies may require dynamic road operator data, such as speed zone changes, road closures and road works information, to operate effectively. Austroads, as part of the National Policy Framework for Land Transport Technology, is undertaking a project to investigate key road operator data attributes that will be used as part of the CAV system. The project will identify gaps with the current environment and whether a further range of projects are required on this issue, given the work that is being undertaken by road operators.</td>
</tr>
<tr>
<td><strong>Objective</strong></td>
<td>Identify gaps between the road operator data provided to users (developers) and what is likely to be required in future for CAV operations.</td>
</tr>
<tr>
<td><strong>Project update</strong></td>
<td>Austroads have developed a Background Research Working Paper that consolidates available information in the area and informs the most relevant themes and areas to be explored in subsequent interviews. The purpose of the working paper is to set out the questions that will be put to stakeholders. Interviews and a formal workshop occurred during February and will continue for the first half of 2018. A recommendation report will be developed as the final deliverable.</td>
</tr>
<tr>
<td><strong>Related publication</strong></td>
<td>The recommendation report will be made available through the Austroads website.</td>
</tr>
</tbody>
</table>

Next steps

Monitoring and reporting
Priority Projects will be regularly monitored and reported through the Priority Project webpage
https://bitre.gov.au/data_dissemination/priority_projects.aspx. This webpage includes project details,
links to relevant publications and project contact details.

Identifying new Priority Projects
BITRE acknowledges that the infrastructure data and information environment is changing rapidly and
new opportunities to address information and data gaps will arise after the publication of the Data
Plan. Because of this, through ATDAN nominations new Priority Projects will be identified and monitored
after the publication of the Data Plan. Information on these projects will be available through the
Appendix A – Steering Group Members

A Steering Group made up of key transport and infrastructure stakeholders, and research and data analytics groups was established to oversee the development of the National Infrastructure Data Collection and Dissemination Plan. Steering Group members include:

- Dr Gary Dolman, Head of Bureau of Infrastructure, Transport and Regional Economics (BITRE), Department of Infrastructure and Regional Development
- Mr Bill Simpson-Young, Director, Engineering and Design, CSIRO
- Prof Pascal Perez, Director SMART Infrastructure Facility, University of Wollongong
- Mr Roy Cummins, Chief Executive Officer, Port of Brisbane
- Mr Royce Christie, Group Manager, Public Policy and Research, Group Corporate Affairs, Toll Group
- Ms Amanda Clark, Director, Transport, Tourism and Regional Statistics, The Australian Bureau of Statistics
- Mr Jeff Potter, Project Director Productivity and Safety, National Transport Commission
- Mr Phil Davies, Chief Executive Officer, Infrastructure Australia
- Mr Adrian Dwyer, Chief Executive Officer, Infrastructure Partnerships Australia
- Dr Ian Oppermann, Chief Executive Officer and Chief Data Scientist, NSW Data Analytics Centre
- Mr Phil Bullock, Director, Transport Performance and Analytics, Transport for NSW
- Mr Garry Bowditch, Executive Director, Better Infrastructure Initiative, University of Sydney
Appendix B – Australian Transport Data Action Network (ATDAN) Members

ATDAN is an advisory and action group chaired by the BITRE and the Australian Bureau of Statistics (ABS) and comprises representatives from the Commonwealth and jurisdictional transport agencies, including:

- Bureau of Infrastructure, Transport and Regional Economics (BITRE), Co-Chair
- Australian Bureau of Statistics (ABS), Co-Chair
- National Transport Commission
- Australian Local Government Association
- National Heavy Vehicle Regulator
- Transport for NSW
- Transport for Victoria
- Department of Transport (WA)
- Department of State Growth (Tas)
- Department of Planning, Transport & Infrastructure (SA)
- Department of Transport and Main Roads (Qld)
- Department of Infrastructure, Planning and Logistics (NT)
- Transport Canberra
Appendix C – Terms of Reference

The Bureau of Infrastructure, Transport and Regional Economics (BITRE), within the Department of Infrastructure and Regional Development, will lead the development of a Data Collection and Dissemination Plan (the Plan) that:

• Identifies key national infrastructure and transport statistics;
• Develops national infrastructure performance measures;
• Identifies opportunities to use new technologies to collect infrastructure data;
• Develops means of disseminating data to encourage innovation and improved public and private decision making; and
• Promotes and identifies priority projects that:
  - Fill key data gaps
  - Develop and report performance relevant to infrastructure operators and customers
  - Support innovation in data collection and use.

The Plan will improve and coordinate information and data collection across key stakeholders, and provide improved and more timely information for infrastructure investment decisions and monitoring of the performance of Australia’s infrastructure networks. Developing opportunities to harness new data sources (including ‘Big Data’) from emerging data sources will be a key part of the Plan’s development.

A Steering Group will be established to oversee the development and implementation of the Plan and include representatives from:

• The Department of Infrastructure and Regional Development;
• Infrastructure Australia;
• The Australian Bureau of Statistics (ABS);
• Data61;
• State and territory transport departments
• Private industry; and
• Academia.

Collaboration and workshops with key transport and infrastructure stakeholders, and research and data analytics groups will be part of developing the Plan. This will give people working in the transport and infrastructure space an opportunity to highlight what data and information is required to achieve better transport and infrastructure outcomes, and identify methods for obtaining and disseminating this information.

A draft Plan will be available for industry and government comment in six months, and the final Plan will be provided to the Commonwealth Government within 12 months.

Paul Fletcher
Minister for Urban Infrastructure
28/2/17
## Appendix D – Enduring Questions and key data and information sources

### Table D.1 Full List of Draft Enduring Questions

<table>
<thead>
<tr>
<th>Topic</th>
<th>Enduring Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrastructure Stocktake</td>
<td>EQ 1.1 – What infrastructure does Australia have, what is its capacity, geospatial location and value?</td>
</tr>
<tr>
<td></td>
<td>EQ 1.2 – What is the condition of Australia’s infrastructure?</td>
</tr>
</tbody>
</table>
| 2. Infrastructure and freight performance     | EQ 2.1 – How well are Australia’s infrastructure networks performing?  
                                               | EQ 2.2 – How can customer satisfaction measures be combined with other infrastructure performance measures to provide a holistic measure of the performance of Australia’s infrastructure networks?  |
|                                               | EQ 2.3 – [Specifically] How well is Australia’s freight sector performing?   
<p>| 3. Infrastructure investment and planning     | EQ 3.1 – How well are infrastructure projects assessed in Australia before they are built?                                                       |
|                                               | EQ 3.2 – What are the planned and actual costs and benefits involved in infrastructure projects?                                                     |
|                                               | EQ 3.3 – How do infrastructure construction costs vary?                                                                                           |
|                                               | EQ 3.4 – Are Australia’s infrastructure assets sufficient to meet current and projected needs?                                                      |
|                                               | EQ 3.5 – How do we encourage network optimisation solutions to ensure transport network infrastructure use is optimised before major infrastructure investment? |
| 4. What are the impacts of our infrastructure? | EQ 4.1 – In what ways and to what extent does infrastructure provision impact on the environment?                                                  |
|                                               | EQ 4.2 – What are the social impacts of infrastructure?                                                                                           |
|                                               | EQ 4.3 – What are the main sources, types and quantities of economic benefits from transport?                                                     |
|                                               | EQ 4.4 – How, when, why and in what numbers do people get injured, or die on Australia’s roads?                                                   |</p>
<table>
<thead>
<tr>
<th>Topic</th>
<th>Enduring Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>5a. Infrastructure use – Transport</td>
<td>EQ 5.1a – What freight is moving to, from and around Australia, what is it comprised of, how are different industries affecting the volume and value of freight?</td>
</tr>
<tr>
<td></td>
<td>EQ 5.2a – How and when does freight move to, from and around Australia, and by what routes?</td>
</tr>
<tr>
<td></td>
<td>EQ 5.3a – What barriers exist to efficiently transporting freight to, from and around Australia?</td>
</tr>
<tr>
<td></td>
<td>EQ 5.4a – What are the key service characteristics of freight movement services in Australia (including cost, time and reliability) and how do these characteristics affect mode and route choice, and the amount and type of services provided?</td>
</tr>
<tr>
<td></td>
<td>EQ 5.5a – How, when, why and in what numbers do people travel to, from and within Australia, for what purposes, what are the origins and destinations of their journeys?</td>
</tr>
<tr>
<td>5b. Infrastructure use – Energy, Water and Communications</td>
<td>EQ 5.1b – What are the key service characteristics for water, energy and communications (including cost, time, speed, accessibility and reliability) and how do these characteristics affect the amount and type of services provided?</td>
</tr>
<tr>
<td>6. Data and information for decision making and innovation</td>
<td>EQ 6.1 – What infrastructure data and information is currently publicly available and what datasets and information can be made available?</td>
</tr>
<tr>
<td></td>
<td>EQ 6.2 – What data do governments need to provide in order to enable emerging technologies and innovative business models of infrastructure provision and use?</td>
</tr>
<tr>
<td></td>
<td>EQ 6.3 – How can existing and new data be used to enhance transport service delivery? What data can be collected from existing and future transport services and infrastructure?</td>
</tr>
</tbody>
</table>
## Table D.2  Key data and information sources, grouped by Enduring Question subject area

<table>
<thead>
<tr>
<th>Topic</th>
<th>Key data and information sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrastructure Stocktake</td>
<td>Australian Infrastructure Audit (IA). Undertaken every five years and summarises current stock of infrastructure and whether this is sufficient to meet current and projected demand</td>
</tr>
<tr>
<td></td>
<td>Transport and Infrastructure Council Road Expenditure and Condition Plans and Asset Registers</td>
</tr>
<tr>
<td></td>
<td>Infrastructure Yearbook – BITRE— summary statistics for all economic infrastructure types</td>
</tr>
<tr>
<td></td>
<td>An assessment of available data, by sector, is included below:</td>
</tr>
<tr>
<td>Data available?</td>
<td>Gaps?</td>
</tr>
<tr>
<td>Transport</td>
<td>Yes – National and state-level data</td>
</tr>
<tr>
<td></td>
<td>Yes – particularly for rail. Also issues with consistency between collections (e.g. road condition data and detailed road maintenance data).</td>
</tr>
<tr>
<td>Energy</td>
<td>Yes – consistent data available for most states</td>
</tr>
<tr>
<td></td>
<td>Yes – not all states covered for indicators based on the National Electricity Market (NEM)</td>
</tr>
<tr>
<td>Water</td>
<td>Yes – consistent data available for large water providers</td>
</tr>
<tr>
<td></td>
<td>Yes – data missing for small water providers and rural water services</td>
</tr>
<tr>
<td>Communications</td>
<td>Yes – data available for large communication projects (e.g. NBN)</td>
</tr>
<tr>
<td></td>
<td>Yes – limited publicly available data on condition of networks</td>
</tr>
<tr>
<td></td>
<td>BITRE’s review of existing performance frameworks\textsuperscript{17} summarises some available infrastructure performance frameworks.</td>
</tr>
<tr>
<td></td>
<td>Performance data is available for all infrastructure types, specific gaps include:</td>
</tr>
<tr>
<td></td>
<td>• Transport – particularly around comparisons between states and modes</td>
</tr>
<tr>
<td></td>
<td>• Energy – not all states covered, particularly for National Electricity Market (NEM) reliability indicators</td>
</tr>
<tr>
<td></td>
<td>• Water – data missing for small water providers and rural water services, especially in regard to water quality indicators</td>
</tr>
<tr>
<td></td>
<td>• Communications – limited information on internet reliability, actual internet speeds, and service quality for mobile phones</td>
</tr>
</tbody>
</table>

\textsuperscript{16} Appendix D in the Draft Infrastructure Data Collection and Dissemination Data Plan contains more detailed information on key data and information sources.

\textsuperscript{17} BITRE (2017), Measuring Infrastructure Asset Performance and Customer Satisfaction.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Key data and information sources</th>
</tr>
</thead>
</table>
| 3. Infrastructure investment and planning                            | Infrastructure business cases, post completion reports, annual reports, industry reports (e.g. “Electricity Generation Major Projects”)  
BITRE Infrastructure benchmarking report  
Infrastructure asset management models  
State government and BITRE demand forecasting  
State government infrastructure and transport planning documents  
ABS population projections |
| 4. What are the impacts of our infrastructure?                      | Infrastructure business cases  
Benefit realisation studies (ex-post analyses)  
ABS National Accounts (Gross Value Added by industry)  
ABS Census information (e.g. employment/household location and spatial distribution of incomes).  
BITRE Yearbook (transport emissions, safety and freight data help track the broader impacts of transport infrastructure).  
State data collection including vehicle numbers by vehicle type and time of day across the network  
Department of Environment, numerous reports about emissions by sector (e.g. Australia’s Emissions Projections)  
BITRE road safety statistics |
| 5a. Infrastructure use – Transport                                  | Infrastructure Yearbook (BITRE)  
Mode-specific domestic and international freight information (BITRE)  
NTC’s Who Moves What Where Project (Freight)  
New and alternative sources of road traffic-related data, such as, GPS, Bluetooth readers and video imaging detection,  
Household Travel Surveys (states) Journey to Work surveys (ABS)  
Smart card (e.g. Opal, Myki, GoCard) data  
Telecommunications data  
State government road reports and traffic data (numerous sources) |
| 5b. Infrastructure use – Energy, Water and Communications            | Infrastructure Yearbook (BITRE)  
Energy, Water and Communication specific government reports (e.g. ACMA monitoring report) and industry reports (e.g. Optus coverage maps) |
| 6. Data and information for decision making and innovation           | Open data and information portals (data.gov.au and state and territory open data portals)  
Transport and infrastructure data portals (e.g. Aurin Portal)  
Infrastructure Pipeline portal (IPA), [http://infrastructurepipeline.org/](http://infrastructurepipeline.org/) |