



TRANSPORT AND INFRASTRUCTURE  
COUNCIL

# INFRASTRUCTURE BENCHMARKING REPORT



# Infrastructure Benchmarking

## Background

Australian, State and Territory Governments are committed to improving the infrastructure that is critical to efficient, productive and equitable operations of our economy. Achieving this objective requires efficient procurement processes and careful examination of costs to ensure value for money in infrastructure investments. Governments have cooperated to conclude the first national pilot benchmarking of infrastructure procurement processes and construction costs (as recommended by the 2014 Productivity Commission Inquiry into *Public Infrastructure* and agreed by the Council on 28 August 2014). This report covers the findings of the initial benchmarking and outlines plans for continued and improved future monitoring of infrastructure procurement performance and construction costs.

The analysis was undertaken by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) for the Infrastructure Working Group of the Transport and Infrastructure Council.

## Benchmarking - Procurement Processes

In 2012 Infrastructure Australia recommended timeliness, quantitative and qualitative performance measures based on industry consultation. These measures and targets were used to benchmark a sample of 29 infrastructure projects spread across seven jurisdictions, all undertaken since 2010.

Analysis of the procurement processes found the majority of the projects in the pilot study sample met most timeliness targets and most qualitative and quantitative performance measures specified by Infrastructure Australia. Project phases involving extensive client–contractor interaction (Interaction, Evaluation and Finalisation) were found to be most time-intensive, exhibited most time variation and had poorest compliance with targets (Table 1).

The majority of projects also complied with planned quantitative (Table 2) and qualitative performance benchmarks, however, with two exceptions:

- Almost 80 per cent of sampled projects reported at least one addenda for project changes or missing information; and
- Approximately 57 per cent of sample projects reported at least one material change to terms or scope at the Request for Proposal phase.

These results also highlight areas for potential process improvement; in particular, the data collected through this initial study provides no information about the quality of agency procurement processes (including procurement team skills and agency systems) or the quality of procurement outcomes. For example, extended contractor interaction may contribute to better project outcomes or improve project delivery efficiency, but this is not captured in the pilot study data. Further work is recommended in 2016 to better measure improvement in procurement processes and outcomes.

The experience working with Infrastructure Australia's performance measures highlighted the value of thorough evaluation of infrastructure procurement processes but also highlighted areas where the measures could be improved to capture outcomes and potentially be simplified.

Table 1 Procurement timeliness benchmarking results

| ID                                   | Measure                               | Procurement timeliness summary measures <sup>a</sup> |        |         | IA-target compliance performance |                                 |
|--------------------------------------|---------------------------------------|--|--------|---------|----------------------------------|---------------------------------|
|                                      |                                       | Units  | Median | Maximum | Compliance rate (%)              | Performance rating <sup>b</sup> |
| <b>Pre-procurement phase</b>         |                                       |  |        |         |                                  |                                 |
| TB1                                  | Initial notice of project             | (months)   | 4.5    | 12      | 82                               | ●                               |
| TB2                                  | Commencement market interaction       | (months)   | 2      | 12      | 76                               | ●                               |
| TB3                                  | Formal discussions of project details | (months)   | 1.5    | 12      | 63                               | ●                               |
| <b>EOI phase</b>                     |                                       |  |        |         |                                  |                                 |
| TB4                                  | EOI preparation                       | (weeks)  | 4      | 26      | 63                               | ●                               |
| TB5                                  | EOI evaluation                        | (weeks)  | 3      | 6       | 61                               | ●                               |
| TB6                                  | Alignment sessions and evaluation     | (weeks)  | 2      | 9       | 67                               | ●                               |
| TB7                                  | Approval evaluation outcomes          | (weeks)  | 2.5    | 8       | 50                               | ●                               |
| TB8                                  | Issue of RFP documents                | (weeks)  | 3      | 14      | 65                               | ●                               |
| <b>RFP phase</b>                     |                                       |  |        |         |                                  |                                 |
| TB9                                  | RFP period                            | (weeks)  | 12.5   | 28      | 57                               | ●                               |
| TB10                                 | Interaction period                    | (weeks)  | 10.5   | 20      | 27                               | ●                               |
| TB11                                 | Deadline - Material changes           | (weeks)  | 2      | 13      | 90                               | ●                               |
| TB12                                 | Deadline - Minor changes              | (weeks)  | 1      | 8       | 95                               | ●                               |
| TB13                                 | Final issue of project documents      | (weeks)  | 2      | 16      | 82                               | ●                               |
| <b>Evaluation/finalisation phase</b> |                                       |  |        |         |                                  |                                 |
| TB14                                 | Earliest technical submissions        | (weeks)  | 0      | 5       | 92                               | ●                               |
| TB15                                 | Duration of evaluation                | (weeks)  | 6      | 24      | 30                               | ●                               |
| TB16                                 | Duration of finalisation              | (weeks)  | 4      | 23      | 33                               | ●                               |
| TB17                                 | Approval duration                     | (weeks)  | 1.5    | 10      | 77                               | ●                               |
| TB18                                 | Approval to financial close           | (weeks)  | 5      | 87      | 100                              | ●                               |

a. IA-recommended timeliness targets.

b. Performance indicator colour coding – Green  $\geq 70\%$ , Yellow 35% – 70% and Red  $< 35\%$ .

Source: BITRE estimates based on state and territory data.

Table 2 Quantitative benchmark results

| ID    | Measure   | Divergence summary measures |         | Compliance – Proportion with no divergences |                                 |
|-------|---|-----------------------------|---------|---|---------------------------------|
|       |   | Median                      | Maximum | Compliance rate (%)                         | Performance rating <sup>a</sup> |
| QnB1  | Divergences of planned procurement program from IA's time targets                       | 0                           | 13      | 79  | ●                               |
| QnB3  | Divergences of actual procurement program from planned procurement program              | 1.3                         | 5       | 60  | ●                               |
| QnB4  | EOI response requirements for information relating to the project solution <sup>b</sup> | 0                           | 14      | 63  | ●                               |
| QnB5  | Divergences from the information provided to potential and actual proponents            | 13                          | 34      | 58  | ●                               |
| QnB6  | Planned addenda for changes or for issue of missing information during RFP Phase        | 3.5                         | 40      | 21  | ●                               |
| QnB7  | Material changes to contract terms or scope during the RFP Phase                        | 4.3                         | 10      | 43  | ●                               |
| QnB14 | RFP requirements for project plans exceed requirements to address material Agency risks | 0                           | 0       | 100   | ●                               |
| QnB15 | RFP requirements for design exceed that which represents material risk to the Agency    | 0                           | 6       | 96  | ●                               |

a. Performance indicator colour coding – Green  $\geq 70\%$ , Yellow 35% – 70% and Red  $< 35\%$ .

b. That is, during pre-announcement, EOI or RFP Phases.

Source: BITRE estimates based on state and territory transport agency data.

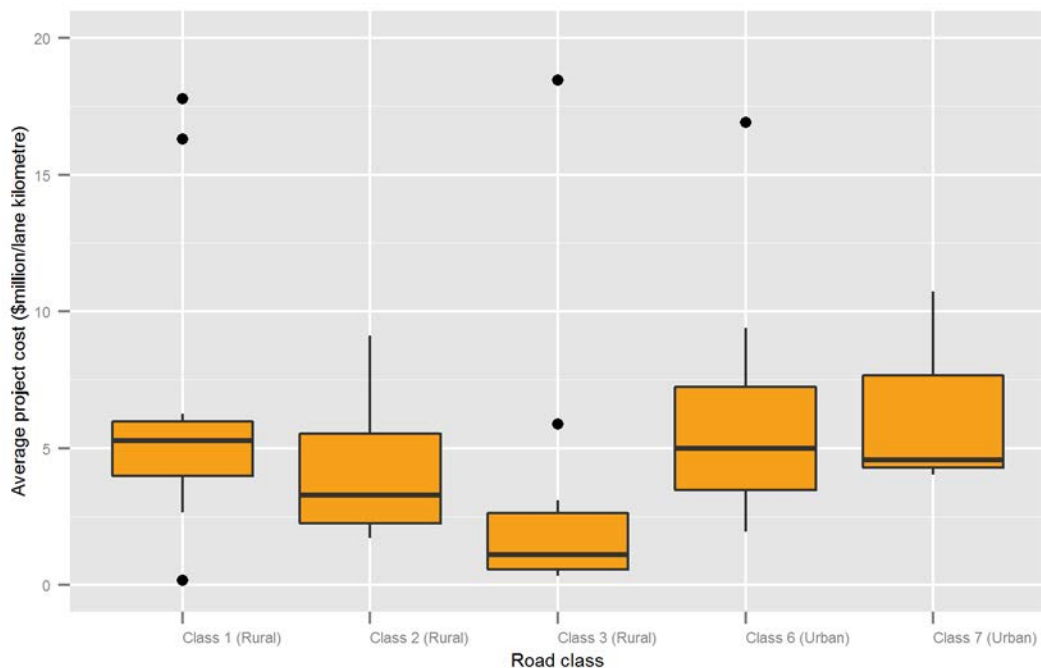
## Benchmarking Construction Costs

The infrastructure construction cost benchmarks presented are of a strategic nature, as recommended in the Productivity Commission's *Public Infrastructure* inquiry report. The results cover a sample of 65 separate road construction projects undertaken since 2010, drawn from across all eight states and territories. Thirty of the projects in the sample have been completed, 26 are currently in delivery and nine projects are at pre-delivery phase. Only completed projects and projects currently in delivery have been included in the benchmarks. New South Wales and Queensland account for just over half of all projects in the sample.

The main findings of the cost benchmarking analysis are:

1. road class is the most significant factor influencing average project costs – average costs of urban and rural freeways/highways are around \$6.0 to \$6.5 million per lane kilometre, while lower standard rural arterials average around \$3.0 million per lane kilometre (Figure 1, Table 3);
2. project management costs typically comprise around 7 per cent of total costs while design and investigation costs typically comprise around 5–6 per cent (Figure 2); and
3. the project sample provides no clear evidence of any time trend in average project costs over the last five years.

Figure 1 Summary cost benchmarks – Project cost per lane kilometre, by road reference class



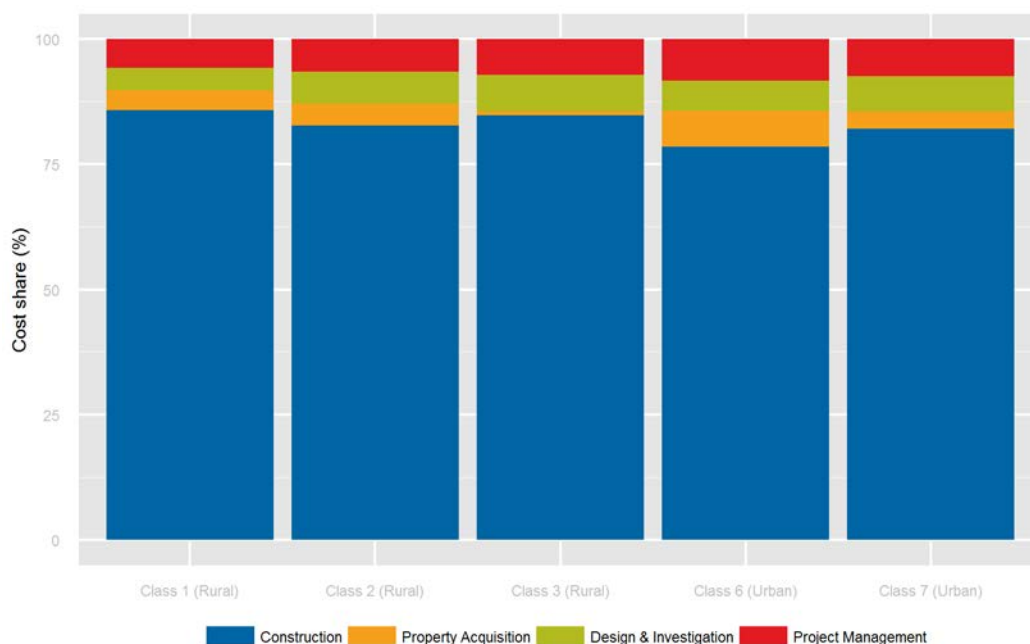
Notes: The filled boxed area shows the middle 50 per cent of projects, the horizontal bar shows the median project cost, vertical bars delineate the cost range covered by 95 per cent of observations and the dots show remaining outliers.

One project, with an average costs in excess of \$30 million, not shown.

Source: BITRE estimates based on state- and territory-supplied data.

This first national cost benchmarking is a significant step to inform efficient and effective project delivery, and identify areas of best practice. Experience from this initial benchmarking highlighted the need to collect additional information about projects (such as project type, construction methodologies, terrain, pavement type) to better understand the causes of cost variations, particularly for the small number of projects that had costs that differed significantly from averages for the class of road.

Figure 2 Average project costs shares, by road class



Source: BITRE estimates based on state- and territory-supplied data.

Table 3 Construction cost benchmarks, by component and road reference class<sup>a</sup>

| Benchmark   | Unit             | Road reference class <sup>b</sup> |         |         |         |         |
|---|------------------|-----------------------------------|---------|---------|---------|---------|
|   |                  | Class 1                           | Class 2 | Class 3 | Class 6 | Class 7 |
| Average project cost  | (\$m/lane km)    | 6.45                              | 4.13    | 2.86    | 7.76    | 6.44    |
| Average project cost (excl. land acquisition & supplementary items) | (\$m/lane km)    | 6.06                              | 3.72    | 2.70    | 5.85    | 4.07    |
| Average construction cost   | (\$m/lane km)    | 5.46                              | 3.40    | 2.47    | 5.06    | 5.11    |
| Average pavement costs  | (\$'000/lane km) | 902.7                             | 981.9   | 230.4   | 995.3   | 891.1   |
| Average bridge costs  | (\$/sq. m)       | 159.1                             | 158.5   | 79.1    | 201.8   | 164.3   |
| Average bulk earthworks costs                                       | (\$/cu m)        | 5090                              | 4150    | 3880    | 3610    | 3650    |

a. The average cost benchmarks reported in the table are based on the sample mean. The data set included only three Class 7 (Urban) road projects, so the reported benchmarks may not be representative of broader selection of Class 7 road projects.

b. Austroads functional road classification definitions: Class 1 – Principal rural highways and freeways connecting major regions and capital cities; Class 2 – Principal rural arterial roads; Class 3 – Main rural arterial roads, not in Class 1 or Class 2; Class 6 – Urban motorways and freeways; Class 7 – Primary urban arterial roads.

Source: BITRE estimates based on state- and territory-supplied data.

Preliminary international comparison provided mixed results – suggesting that average Australian road project costs are below equivalent project costs in the United Kingdom, but above project costs in four continental European countries. It is not clear that overseas and Australian costs used, however, are strictly comparable and further analysis is required for any definitive conclusion.

### Future Monitoring

The Transport and Infrastructure Council consider that this procurement and cost benchmarking analysis represent valuable steps in improving efficient procurement processes and examination of costs to ensure value for money in infrastructure investments. However, the analysis also highlights the need to improve monitoring measures and the need for additional data collection and reporting.

The Council has therefore agreed to:

1. further develop benchmark measures in 2016 – to improve and simplify procurement benchmarks (so they capture outcomes as well as timeliness) and to collect additional information on factors that impact construction costs;
2. undertake another round of procurement and cost benchmarking in 2017, allowing time for inclusion of a sufficient number of new infrastructure projects; and
3. jurisdictions reviewing and improving their procurement and cost management processes in light of the initial benchmarking findings.

