

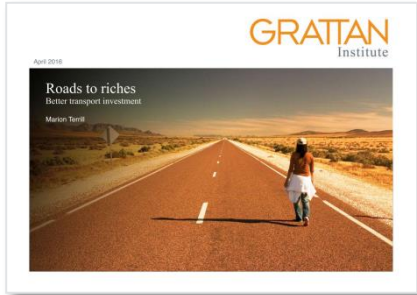


Cost overruns on transport infrastructure projects

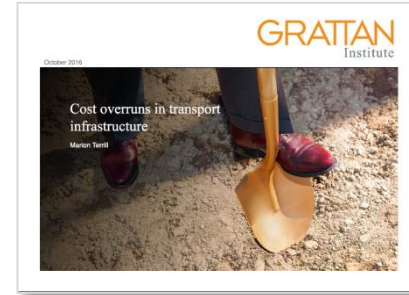
Lucille Danks
Research conducted with Marion Terrill

July 2017

Transport spending as investment



Roads to riches:
Better transport investment

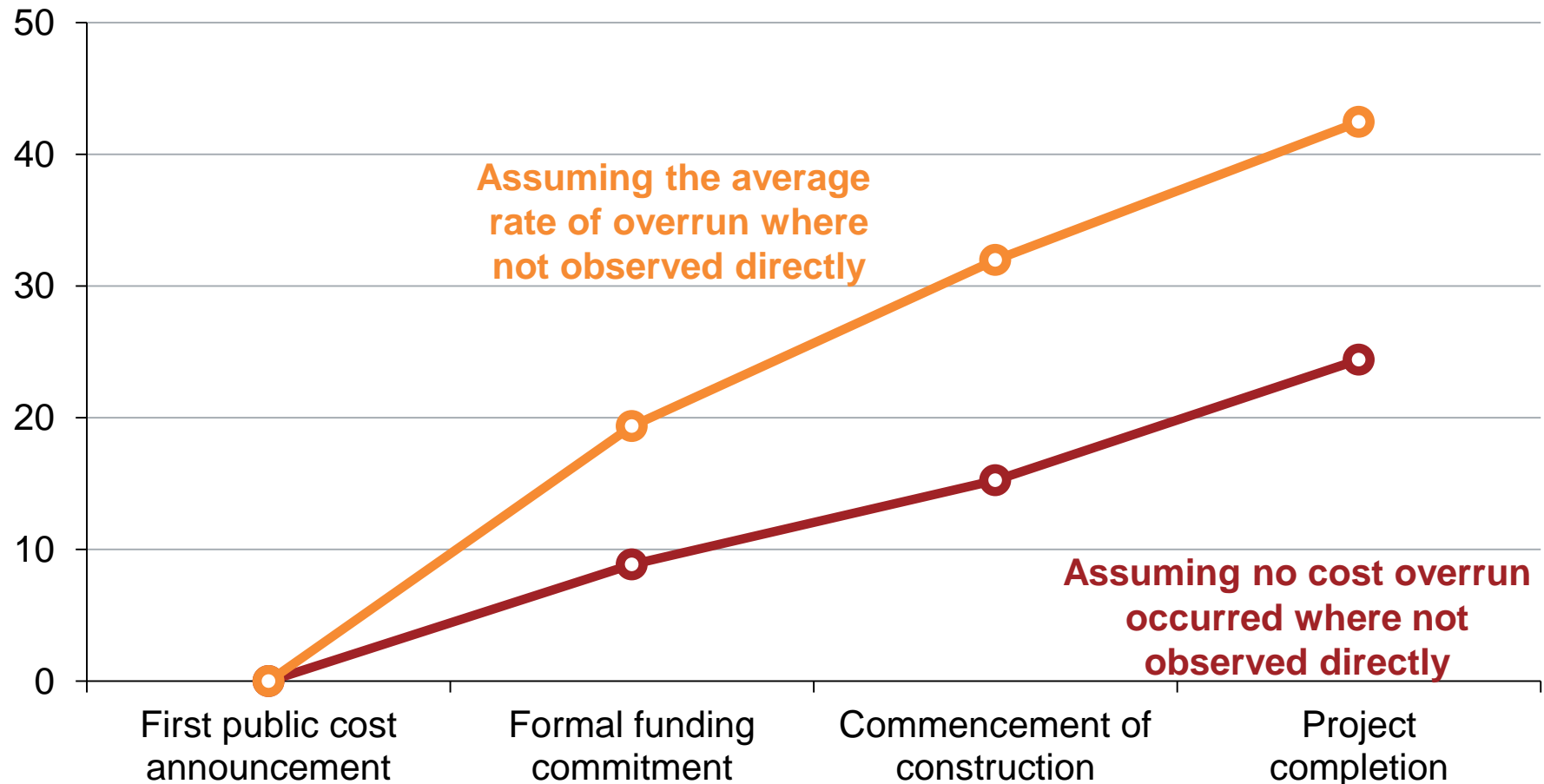


Cost overruns
in transport
infrastructure



Cost overruns occur at all stages

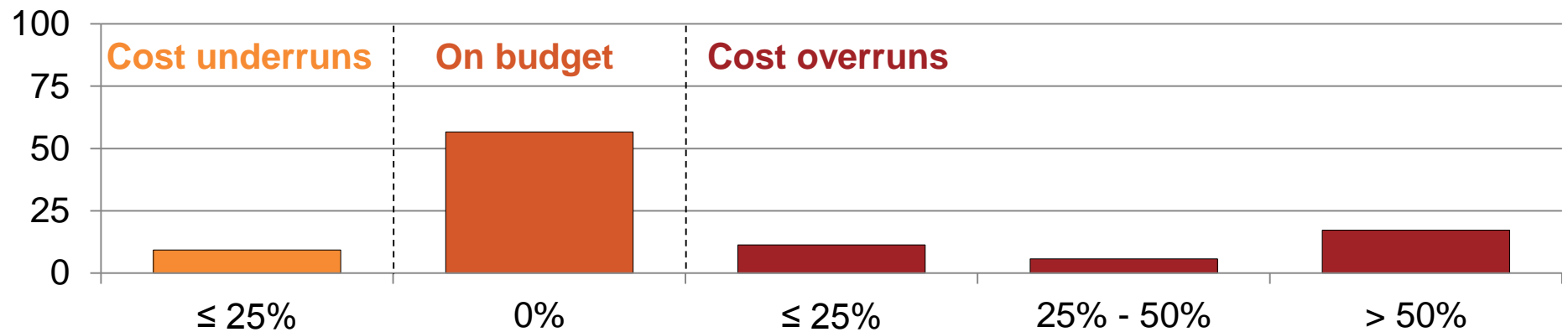
Average cost overrun rates as a proportion of initial costs by project stage, per cent



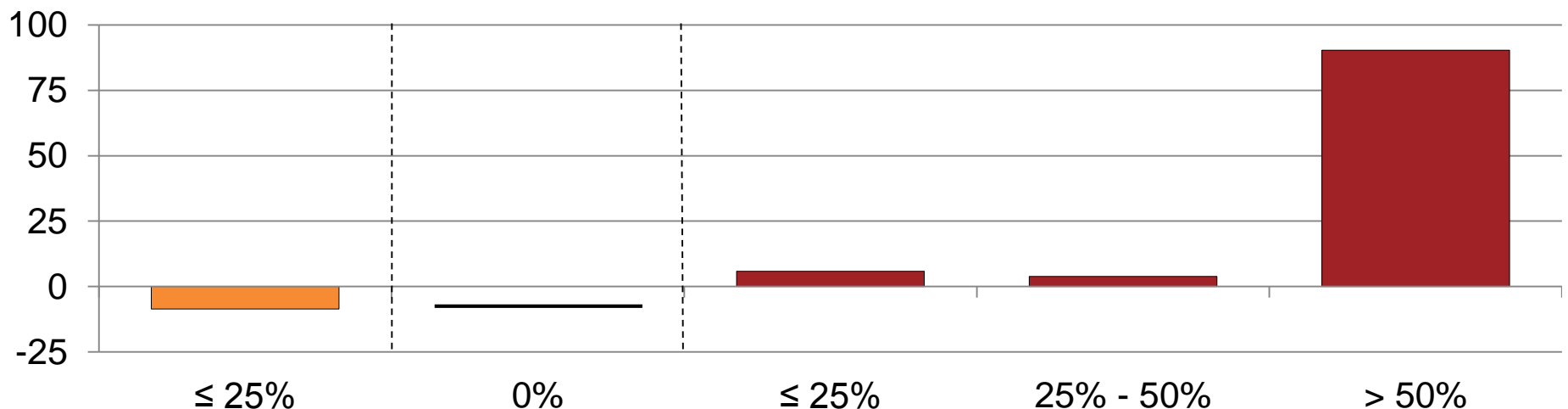
Notes: Australian transport projects completed between 2001 and 2015.
Source: Investment Monitor, Grattan analysis

90% of cost overruns are attributable to the 17% of projects with huge cost overruns

Frequency of cost overruns as a proportion of all projects, per cent

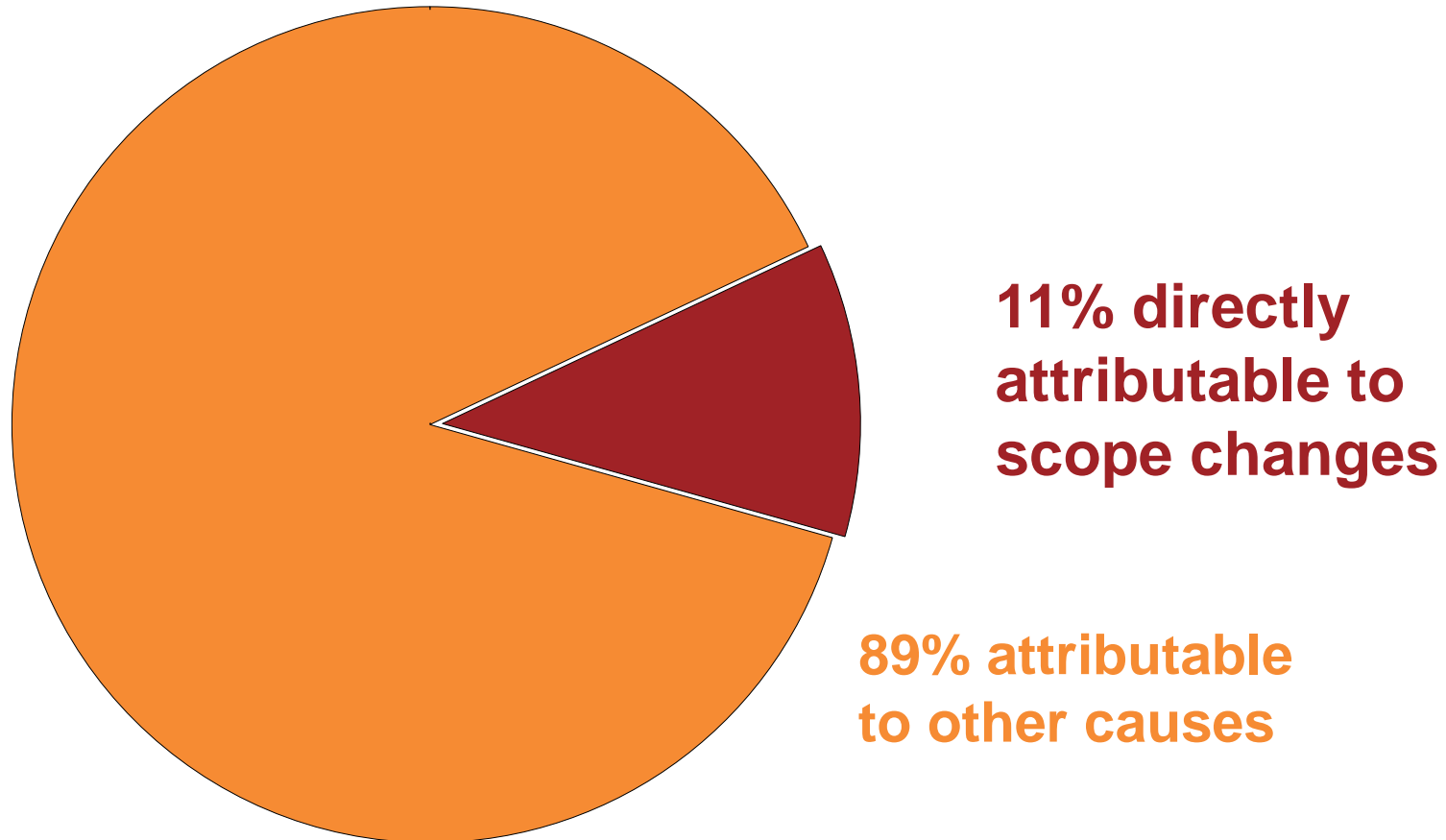


Value of cost overruns as a proportion of total cost overruns, per cent

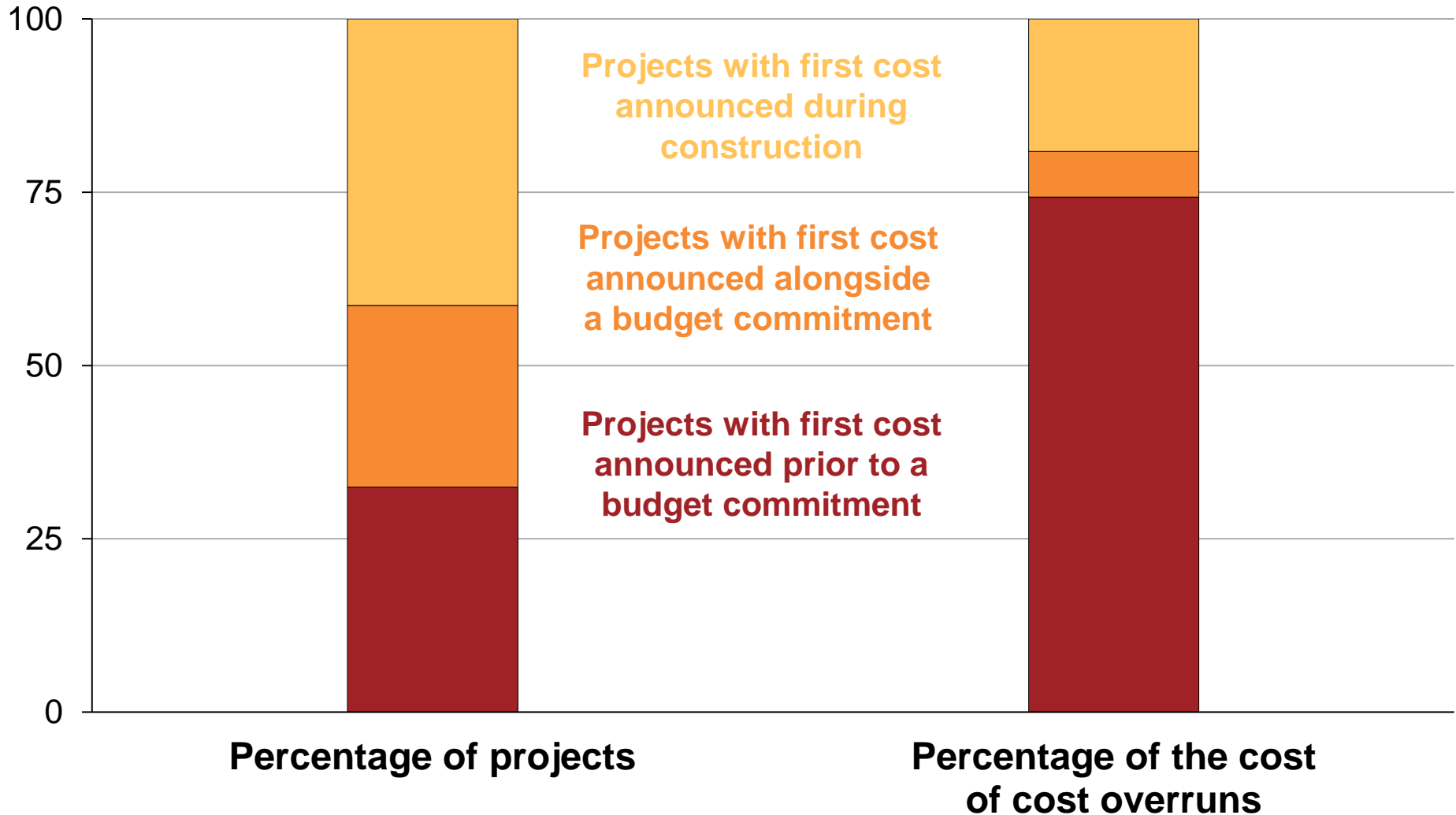


Most cost overruns are not attributable to scope changes

Average proportion of cost overruns by cause, per cent



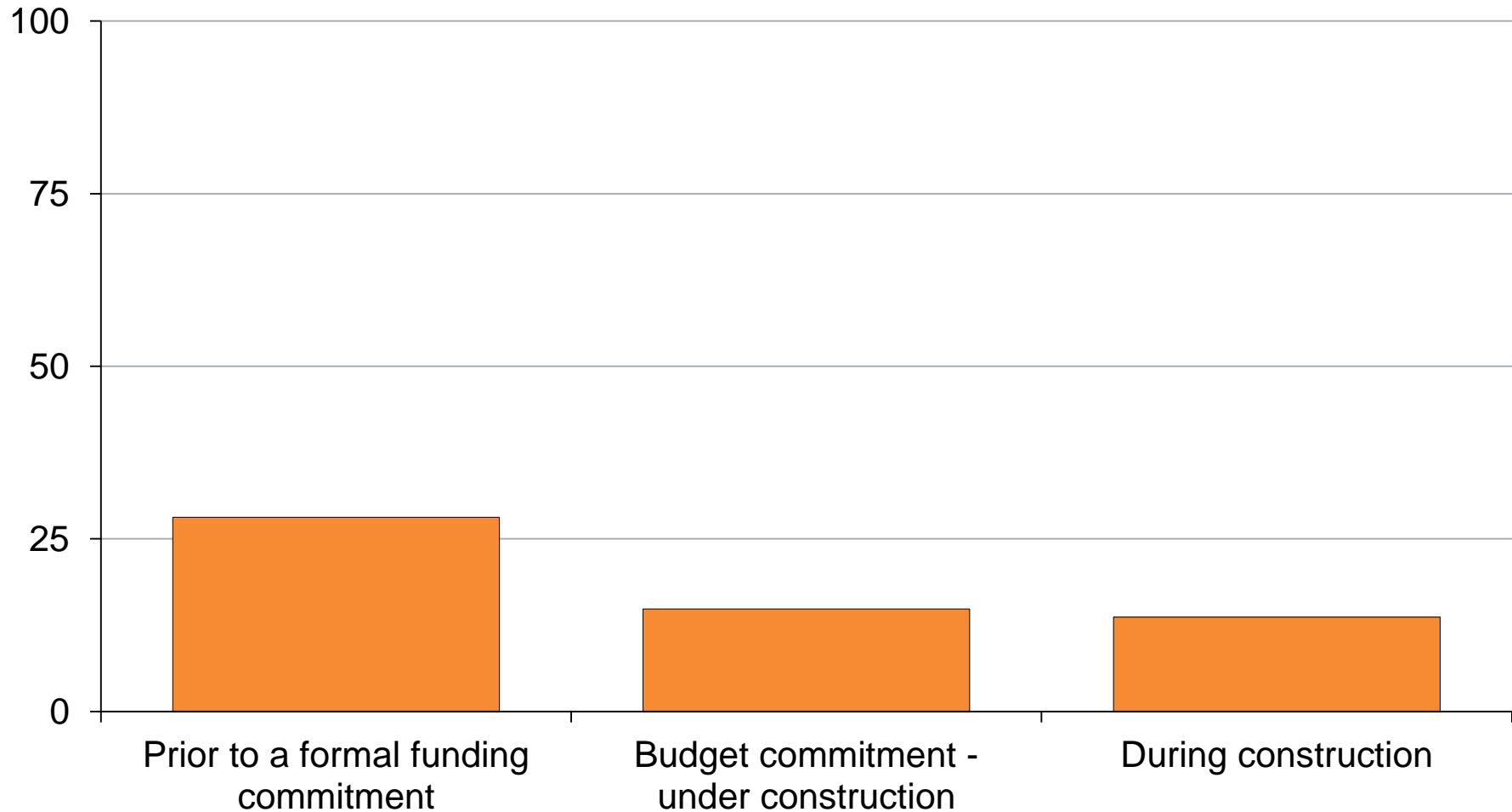
74% of cost overruns are attributable to the 32% of projects with costs announced prematurely



Notes: Australian transport projects completed between 2001 and 2015.
Source: Investment Monitor, Grattan analysis

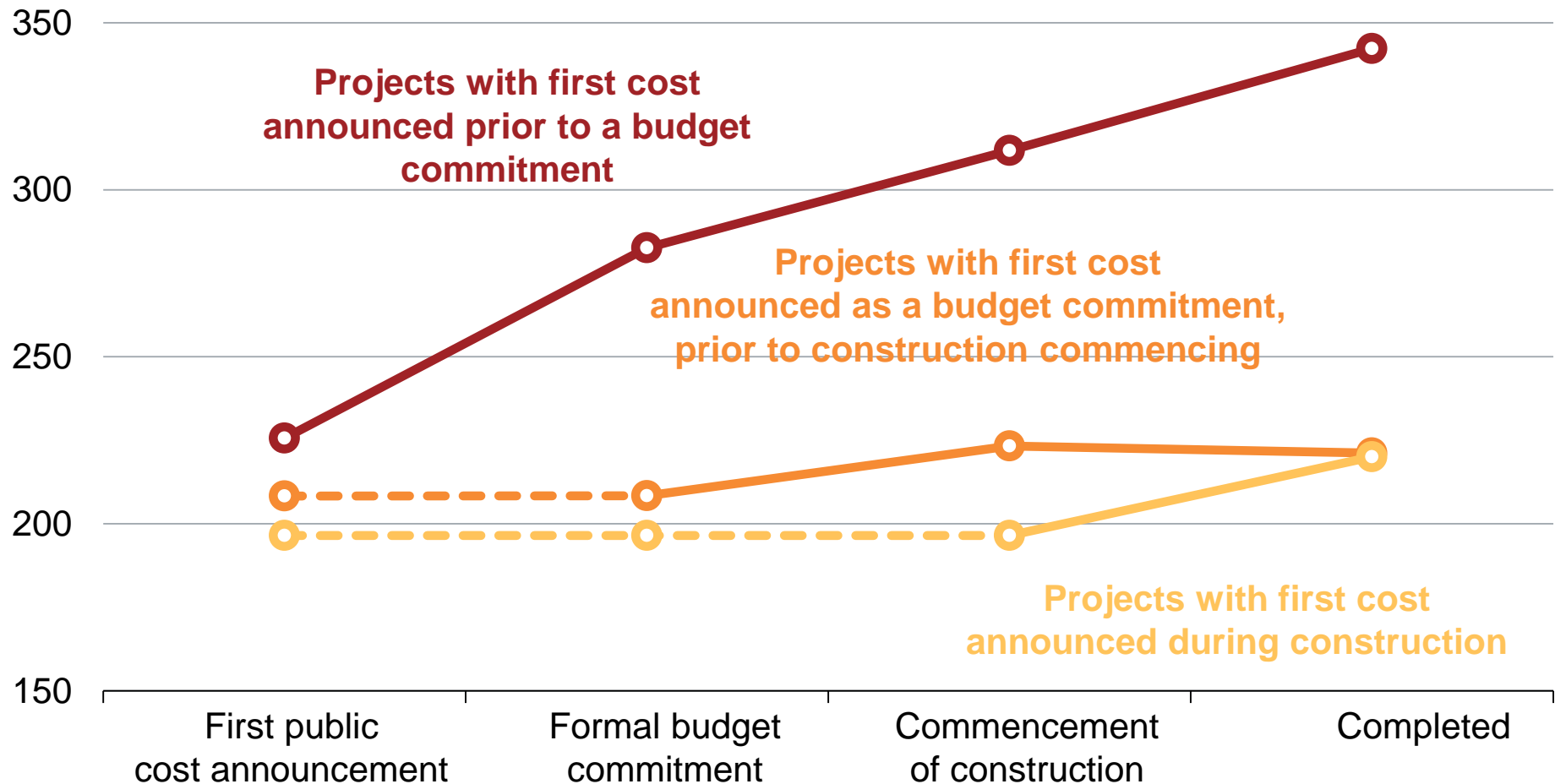
Few projects are cancelled once announced

Proportion of projects cancelled at each project stage, per cent



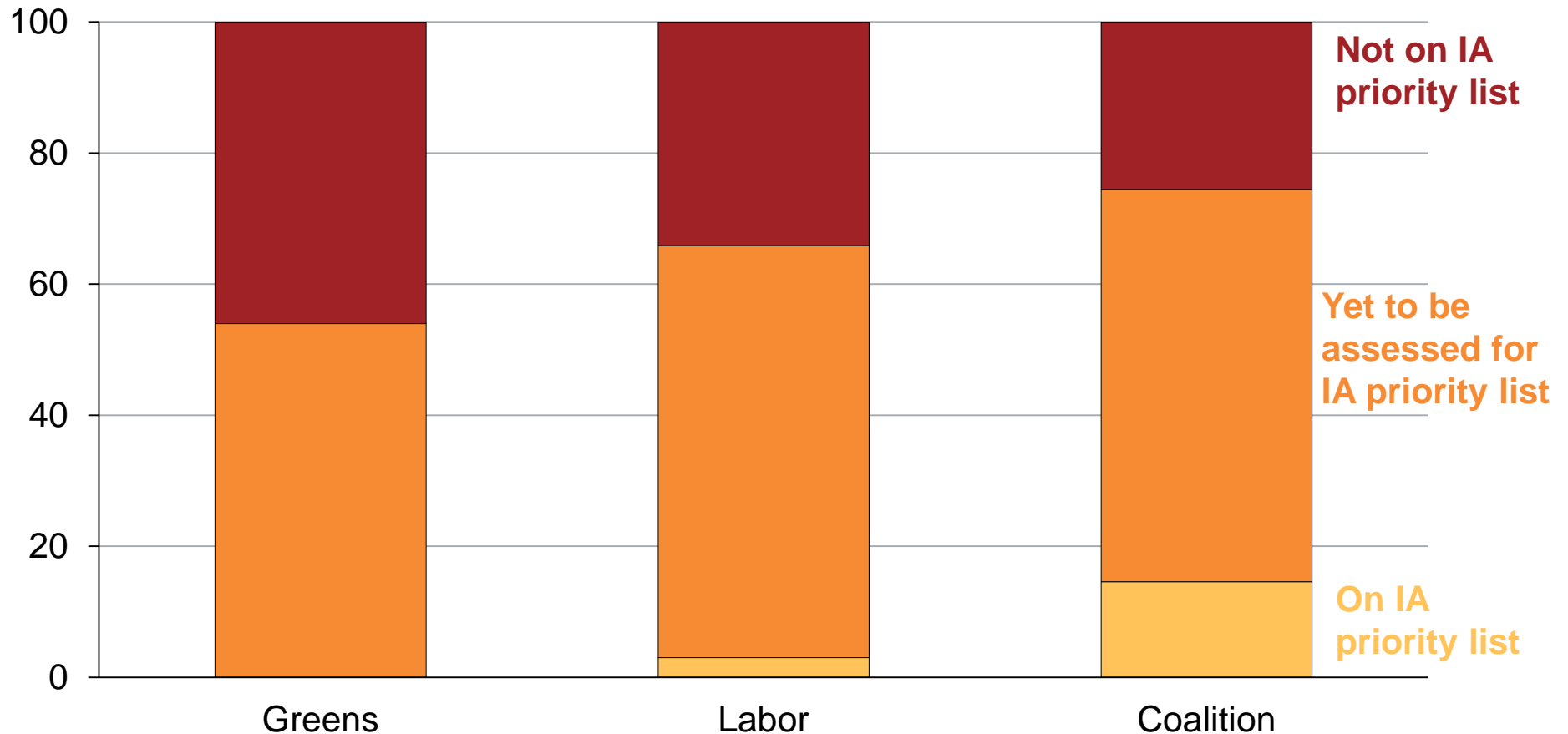
Projects announced earlier have larger cost overruns at all stages of the project lifecycle

Average project size of each cohort by project stage, \$2016 millions



Most money committed during the 2016 election was not for Infrastructure Australia approved projects

Proportion of transport infrastructure election commitments by IA approval status, per cent

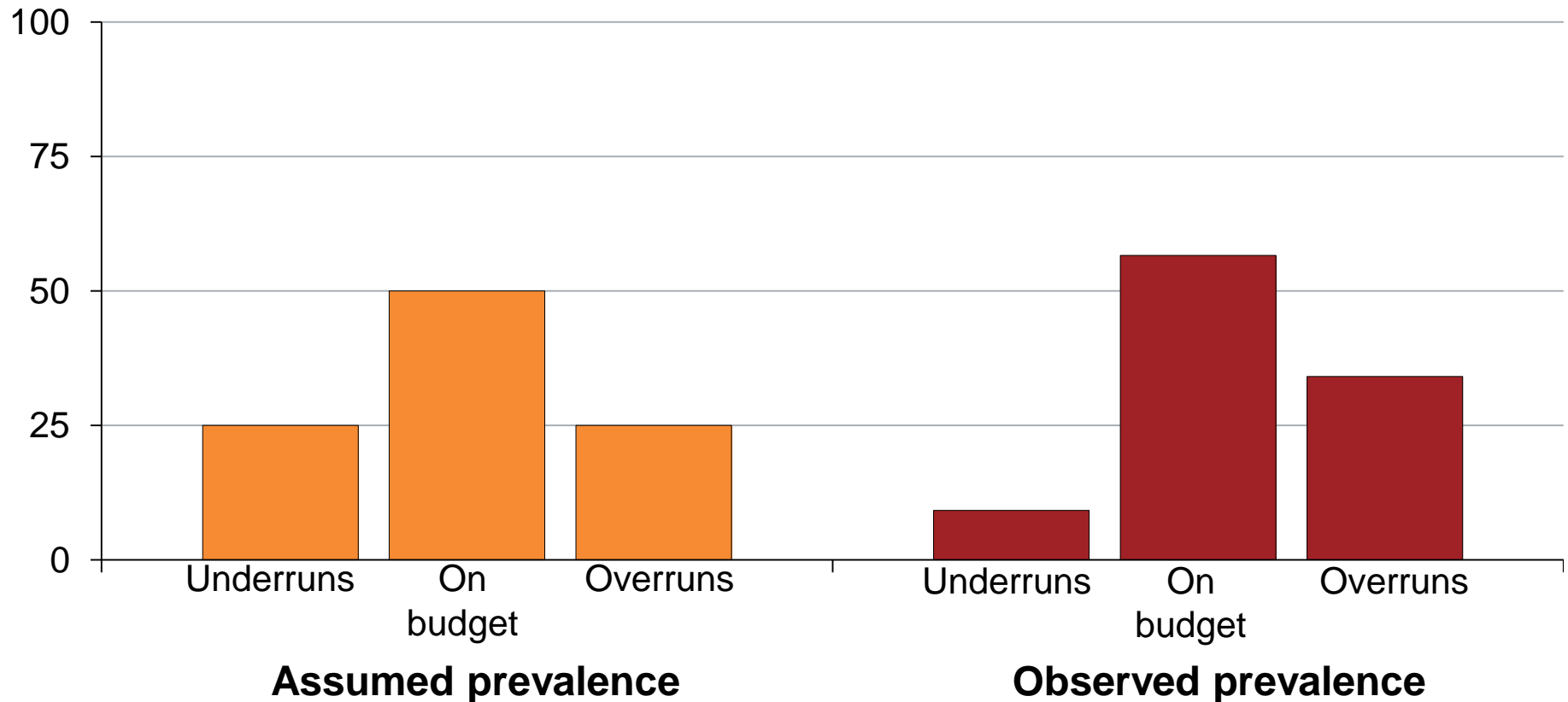


Notes: Includes projects where a specific dollar amount could be discerned from campaign material or, in the case of the Coalition, from the 2016–17 budget papers. Excludes projects for which construction had already commenced by June 2016.

Source: Liberal Party (2016); Australian Labor Party (2016b); Australian Greens (2016a); Treasury (2016) Treasury (2014); Infrastructure Australia (2016d); Grattan analysis.

Experts systematically underestimate the likelihood of cost overruns

Average magnitude of cost overruns on Australian transport infrastructure projects completed between 2001 and 2015 by mode, per cent

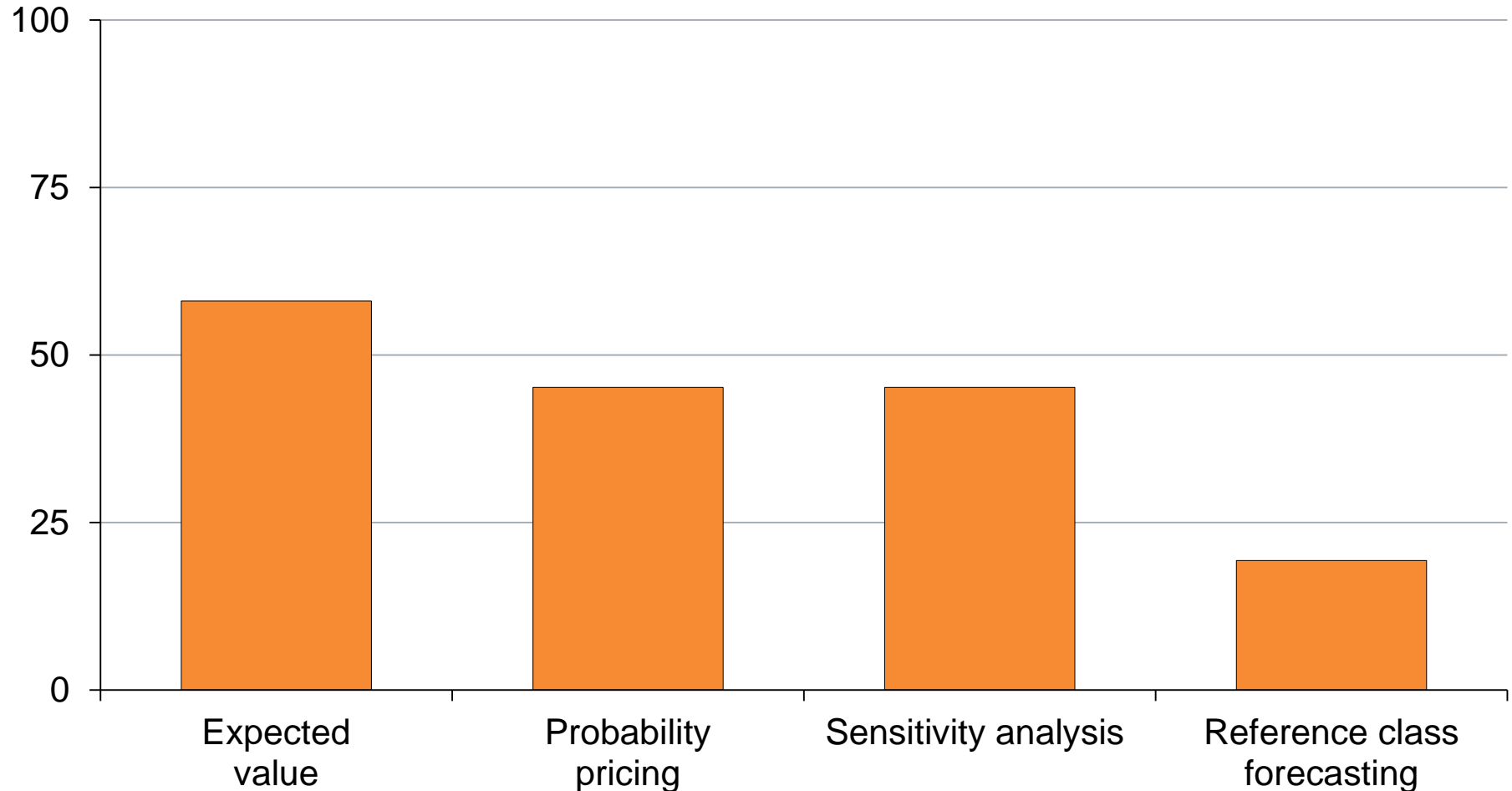


Notes: The assumed prevalence of cost overruns is inferred from the common representation of cost risk as symmetrically distributed in cost estimation guidance. See appendix B.2.5 of *Terrill and Danks (2016)* for further details.

Source: Australian risk management guidelines listed in Appendix A.4 of *Terrill and Danks (2016)*, and Investment Monitor; Grattan analysis.

Australia's guidelines on risk measurement do not recommend any approach consistently

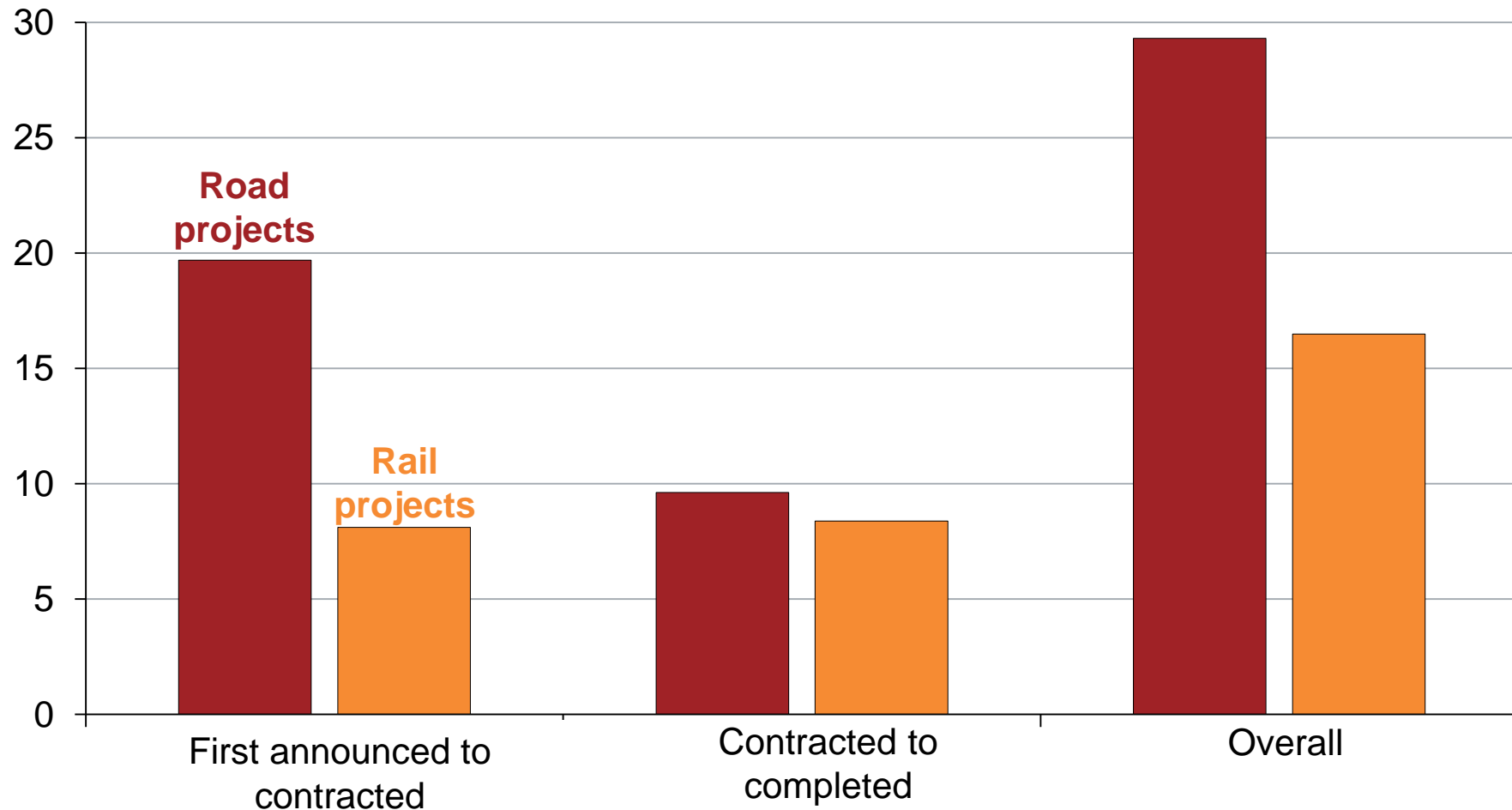
Proportion of transport infrastructure risk assessment guidelines recommend the use of each key risk assessment tool, per cent



Notes: Prevalence rates were calculated over the subsample of each of these guidelines which provided quantitative risk measurement guidance.
Source: Australian risk management guidelines listed in Appendix A.4 of *Terrill and Danks (2016)*, and Investment Monitor; Grattan analysis.

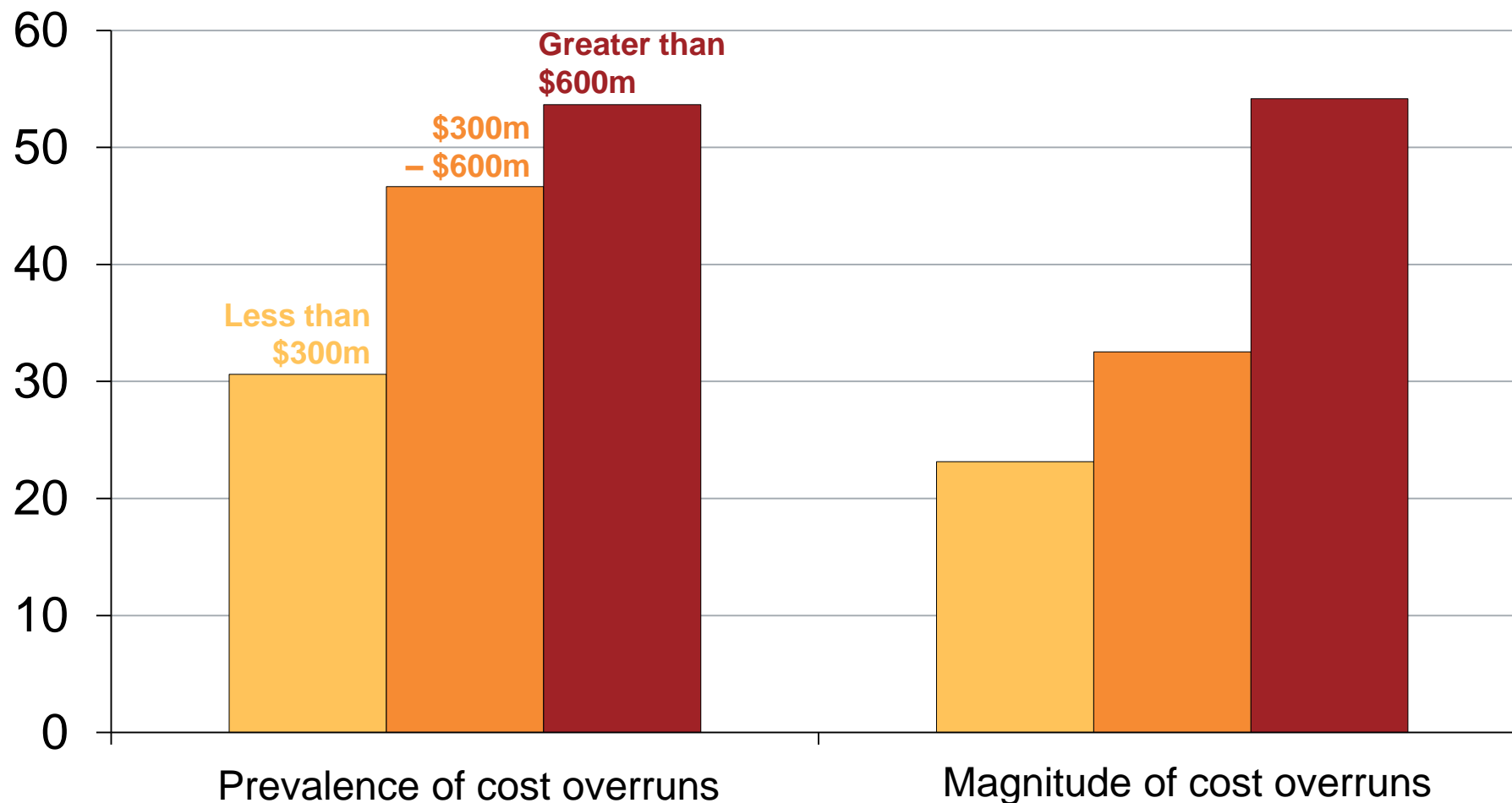
Both road and rail projects suffer from cost overruns, but at different stages

Average magnitude of cost overruns by mode, per cent



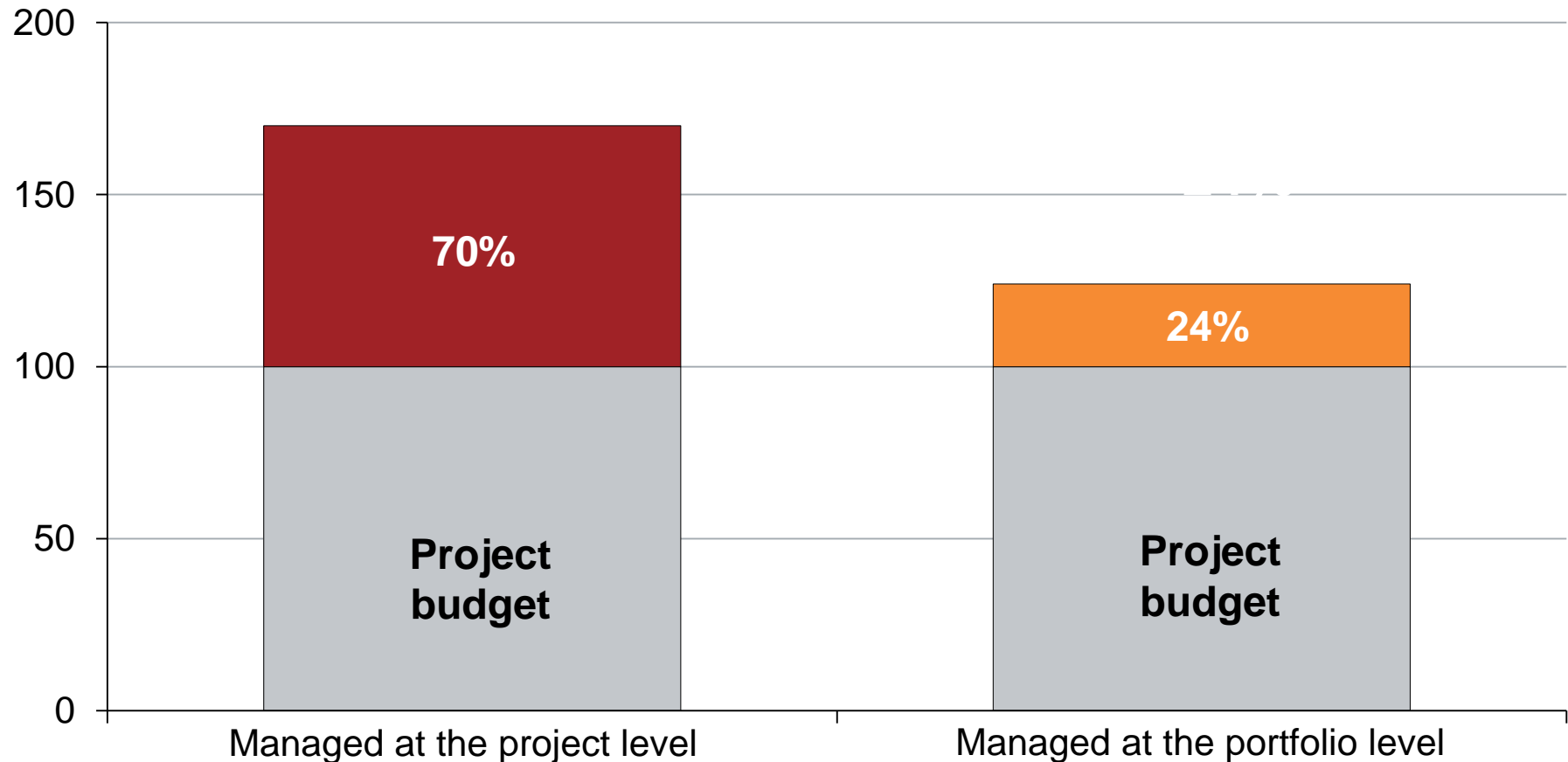
Big projects have larger cost overruns

Average prevalence and magnitude of cost overruns by project size, per cent



Small contingencies can achieve a lot when they are managed at the portfolio level

Value of the contingencies to ensure projects will finish within initial budget commitments with 90 per cent probability, per cent of initial project value



Any questions?

Prevalence of cost overruns

Table B.1: Results of logit regression with instance of cost overrun in given period as dependent variable

Feature	First cost estimate to final cost estimate		Prior to budget commitment		Budget commitment to start of construction		During construction	
	Marginal effect	signif.	Marginal effect	signif.	Marginal effect	signif.	Marginal effect	signif.
Announced prematurely	0.13	*			0.02		0.11	*
Days pre-construction (log)	0.04	***	0.11	***	0.08	*	-0.02	
State								
Queensland (small state)	-0.13	**	-0.07	*	0.05		-0.17	***
Victoria	-0.00		0.15		0.16		-0.01	
WA	-0.19	***	-0.09	***	-0.06		-0.19	***
Road	-0.06		-0.02		0.12		-0.12	*
Constructed post-GFC	0.05		-0.09		-0.04		0.03	
Cost (real) when construction commenced	-0.21	***	-0.04		-0.17	***	-0.14	**
Announced within 180 days of an election	0.06	***	0.07	***	0.03		0.01	
	-0.02		0.37	*	-0.12	**	0.03	

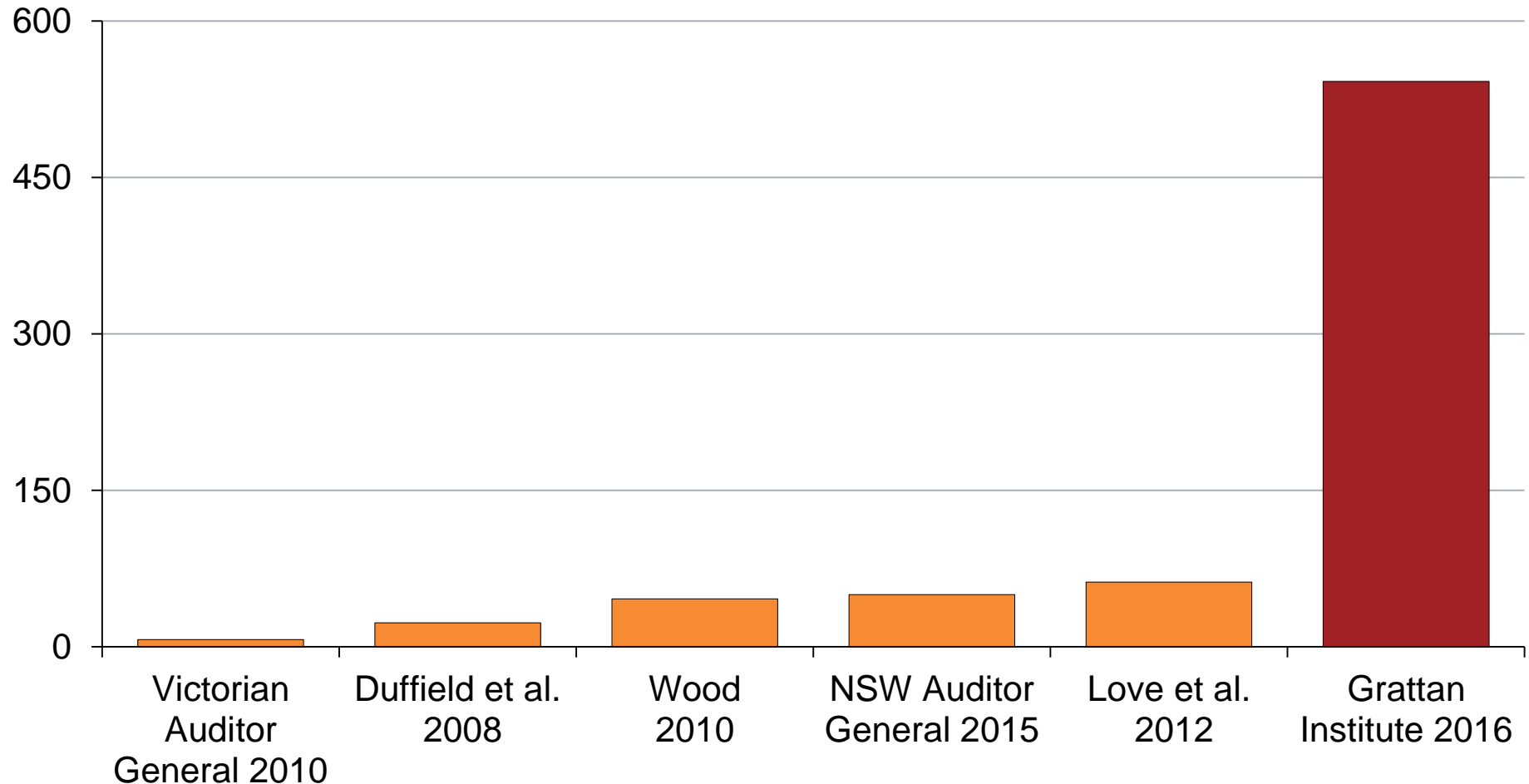
Magnitude of cost overruns

Table B.2: Results of log-linear regression with instance of cost overrun in given period as dependent variable

Feature	First cost estimate to final cost estimate		Prior to budget commitment		Budget commitment to start of construction		During construction	
	Coefficient	signif.	Coefficient	signif.	Coefficient	signif.	Coefficient	signif.
(Intercept)	0.07		-0.78	**	-0.90	***	0.76	***
Announced prematurely	0.14	*			-0.13	*	0.05	
Days pre-construction (log)	0.00		0.08	*	0.13	***	-0.05	***
State								
Queensland (small state)	0.04		-0.06		0.05		0.01	
Victoria	0.09		0.12		0.06		0.02	
WA	-0.05		-0.09		-0.03		0.00	
Road	0.23	***	0.09		0.27	***	-0.03	
Constructed post-GFC	0.19	***	0.02		0.07		0.06	
Cost (real) when construction commenced	-0.02		0.12		-0.05		-0.06	
Announced within 180 days of an election	0.03		0.07	**	0.06	**	-0.07	***
	0.23	**	0.50	***	-0.32	***	0.17	**

This report analyses nine times more completed projects than previous studies

Sample sizes of Australian studies on transport infrastructure cost overruns



Notes: Australian transport projects completed between 2001 and 2015.
Source: Investment Monitor, Grattan analysis and cited studies