

APPENDIX ONE: Member survey responses

Following the release of the Productivity Commission's draft report for the Public Infrastructure Inquiry, Professionals Australia surveyed its engineering membership to seeking responses to Information Request's 11.1 and 11.2.

The detailed responses are been listed below.

Please, in your own words, detail any personal experiences of incidents where poor project scoping, management, lack of oversight, and/or outsourcing by government has caused systematic cost overruns for taxpayer funded projects.

"I run a small civil consulting practice in rural Victoria, predominantly providing services to local government. Poor scoping, inappropriate timing and lack of informed management is part of most projects we deal with. The projects are often unnecessarily over budget or cost more than they should."

"Outsourcing due to boom, bust spending by government means work is outsourced and they drain us dry... Poly gets a pat on back as opening infrastructure worth \$105 million but no one tells the public it should have cost only \$20 million if it were not for that same poly.."

"<Identifier removed> chose to tender the construction management of the work. <Identifier removed> chose a consulting firm to manage the construction of their project. When the contract period for the reservoir was completed the company left site, despite the fact that the reservoir leaked and could not be used by <Identifier removed>; it was not fit for purpose. <Identifier removed> spent the next two years negotiating with the contractor to seal the reservoir and make it fit for purpose. Public Works was not paid by <Identifier removed> for its efforts but it considered that it was its civic duty to ensure that the facility was structurally sound."

"Many infrastructure projects in Council are done by Urban Design or Community Services officers. This normally leads to rework and fixing by the Engineers."

"Inadequate funds to deal with relocation of utilities and the protection of the public from excessive noise and vibration, including heritage buildings."

"Estimating Services are all out sourced to get the replacement value of facilities. We have to review the estimating process of consultants and ask them to redo the valuation and correct their approach often this resulted in variations."

"Over the past 40 years I have observed the reduction of P.E. in State and Local Government. Unfortunately I am not able to provide 'proof' as the detailing of 'what would have been if professionally managed' is not available. The comparison with private enterprise would be interesting, if available - which I doubt for the same reason."

"There is a well-known large 'construction' company which has had, for many years, a reputation for using the 'ignorance' (incompetence?) of government to extract extra profit from projects. When dealing with tenders from this company, I have instructed my staff to assume an additional 5% to cover indirect costs and 10 - 15% for additional direct costs (additional resources, litigation ...). It would be interesting to compare \$s, original tender of final cost for this company's projects."

"As a consultant with 40 years + experience, having worked in the private and government sectors, I have seen many incidents of project failure due to lack of in government knowledge. I work in the Energy Industry, and may millions of dollars have been wasted due to loss of "corporate knowledge" and outsourcing of management/ oversight of projects."

"Appointment of managers who are not engineers leads to misunderstandings when projects are being initiated"

“Lack of detailed whole of life cost analysis; overdesign in order to cover professional incompetency; design drawings were poorly prepared that they lead to variation claims from contractor; lack of experience/commitment from consultancy superintendents leading to contractor to find ways to either poor construction or large variation claims.”

“While this is rife in the private sector I have no experience of taxpayer funded projects.”

“In the development and renewal of a major infrastructure SCADA (control) system, we have experienced decisions based on IT practice rather than a real time control & measurement environment. We have also seen the engagement of contract IT staff that makes recommendations that lend themselves more to extending their own contracts than building the reliable & stable solution needed.”

“I was involved in a road project where the costs blew out. Although the cost blow out is not attributed to poor scoping, management, lack of oversight or outsourcing. It was due to the high turnover of engineering staff of the private consultancy.”

“Poor treatment selection for road maintenance works. Poor or no understanding of contract procedures in procurement of services and materials in the same sorts of contracts as those mentioned above.”

“A major infrastructure project for a new railway station. It was obvious from the start that the project managers had absolutely no experience in any sort of engineering, building construction or estimation of costs or concept of time frames yet were in charge of millions of dollars of the public purse. They couldn't make decisions. Auditors of projects were only trained in auditing to forms - they had never designed or built anything. Might as well had my dentist running the project.”

“I am <Identifier removed> of age with a power station project contracting background on both sides - government and private. Poor specification wording by professional engineering generalists has led to many misunderstandings in my experience which led to sub-optimal technical outcomes, delays and cost overruns. I hesitate to think what problems a non-engineering drafted specification would cause.”

“Too many examples to quote as it is the norm. Biggest risk is that many decisions or variations to solid business cases are politically influenced. Cost blow outs are 90% due to the government, Minister or local reps who believe they are experts in scoping and delivery.”

“Management reluctance in "investing" appropriate resources in the planning and scoping of projects made the amount "known unknowns" balloon during the project delivery phase. Making a mockery of the "aspirational" budget set for the project. To cut a story short, additional funds will need to be clawed away from other projects.”

“Our SPO decided to purchase a Range for our use. They did not check with us (SME) or American SME before signing contract. They have no engineering support, and in fact, have stated they "hate" engineers, and they "hate" Americans. As a consequence, they wasted 12 million dollars trying to make a system which defied physics and logic, work. The purchased Range was never accepted into service, and was never used. It now sits somewhere, being used by the manufacturer for their other projects. Then the SPO stated developing another Range to compensate for this other Range. It also does not perform its required job, but is used to as a unnecessary tool. Wasting at least 3 million and rising still.”

“I am a communications engineer and in my previous company, the managers all had a telecom trade certificates. To them, getting the job done was to get it done as fast of possible with little attention to detail, planning and records. Any documentation was considered to be a pain and used to handball it to the engineers. Drawings produced were substandard without any attention to detail. With poor documentation, any upgrades to the system led to additional problems. After ensuring a high level of documentation, things improved for the company.”

“Design & Construction limiting the role of independent engineering consultants to protect the best interests of the client. Without this independent in place or a limited role due to tight fees the D&C Contractor often take the Micky in terms of under delivering and over running as they greater one on one access to end user groups creating havoc in variations / end user change control.”

“The cost of projects is just as much a problem as cost overruns. And this is because public infrastructure is an afterthought by Federal and State Governments. Even though it is obvious that Governments want to double Australia's population they do not see this as "a project". There is no public infrastructure plan for our cities. Worse, there are no budget provisions for public infrastructure associated with the 240,000 immigrants per year into Australia. Curtin University did some work for Parsons Brinckerhoff and estimated that on average the cost of public infrastructure is \$200,000 per additional person living in Australia. Last year population growth was 400,000 persons. Roughly Government has to set aside \$80 billion per year, which about 20% of the sum of Fed and State Government revenue. Project scoping even if done adequately will always be less than optimal because of compromises needed to accommodate what has appeared in an adhoc manner.”

“This has occurred on numerous occasions due to the recently reliance on external consultants for design and project scoping services. One specific project has experienced delays and cost overruns as a direct result of outsourcing capital work. Most of the costs and delays have resulted from managing minor variations in the contract, rather than in getting the job done.”

“I have personal experience in observations relating to local council area asset management and asset renewal program. Bridge replacement works typically always run over budget while not delivering on road safety standards. Road re-sealing and reconstruction works does not last without unscheduled maintenance with some works failing within weeks of reconstruction.”

“<Identifier removed>. Serious questions have been raised throughout the life of the project regarding the economic evaluation (business case) for the project, the procurement methodology (non-competitive alliance selected), management/oversight etc.”

“Poor design and commissioning of power plant has led to loss of million dollar tax payer money in drain and the cost is still ongoing as to maintain the plant to keep lights on and as plant was built by overseas company parts are procure from them with paying fortunes like big white elephant.”

“<identifier removed>, is driving all planning studies and designs to be outsourced. There has been a loss of experienced staff and I am worried about retention of intellectual property.”

“Public utilities spending millions on advertising how wonderful their products are, when public has no choice in using that product. Public utilities having contract/financial/property disputes which delay projects = if you have the same owner, this should not happen.”

“Specifications by government authorities are somehow "locked in stone" and they are very resistant to change them to reflect changes in technology or society. For instance on recent motorway upgrade the Scope Document produced by Roads Authority referenced numerous conflicting internal specifications which required different levels of testing and accuracy for a ITS traffic flow system (counting vehicle volume, speeds and classifying vehicle types). As <identifier removed>, the only system that could fit the conflicting requirements best was a wireless system from USA, which was so different to the unnecessarily prescriptive specifications (e.g. device must be wired with this particular wire and have a red LED that lights up 3 times within 50milliseconds when a car goes over it) that the roads authority was unable to cope with approving the new technology which was already working in several states of USA. Also roads authority specifications that are too prescriptive for electronic signs and display boards lock infrastructure into going to one of two suppliers (one is the Roads Authority itself) to buy outdated and unreliable electronic signage which increases the cost and time for commissioning. Meanwhile the local church on the highway has installed a generations ahead in technology multicoloured LED display to inform everyone when the next service is.”

“A number of multi-million dollar water projects involving scope creep; limited public sector management/professionals to populate project control groups resulting in favourable decisions for contractors; outsourcing of designs to private sector at up to 300% cost loading compared to public sector costs.”

“Many, mostly related to issues in the delivery phase of projects where projects are being delivered by inexperienced staff with little technical knowledge, resulting in poor quality outcomes, costly re-work or increased maintenance that is often partially born by the organisation when if specifications were enforced and followed many would not occur.”

“Delivery by managing contractor where projects have gone longer and cost more. Insulation scheme, building better schools”

“In my current role I work in various states, as a designer for the National Broadband Network. I have seen time and time again, numerous examples of poor project scoping, management, lack of communication with all stake holders, which has led to projects being delivered incredibly late or designed multiple times only to have an original design implemented.”

“M80 ring road construction between M2 Tullamarine Fwy and M8 Western Fwy is not completed. Four lanes become two lanes on both carriageways make a bottleneck, increasing risk of accidents, increasing GHG emissions form increased fuel use, increasing time for travel, fatigue and increased cost.”

“NSW Floodplain Management Program - The NSW OEH has realigned the NSW flood risk management program as a grant program to local government. The program is now run by non-engineering staff and although there are a few engineers in the lower ranks, decisions regarding priorities, project scoping and oversight but suitably qualified engineering managers no longer exists. There are currently over 200 projects currently being funded, however the lack of engineering expertise is causing significant cost over-runs, investigation and design being undertaken for projects that will never be built and limited number of works projects being implemented, compared to 3-5years ago when engineering managers coordinated the program. This de-engineering by the NSW government OEH of what is essentially a program that manages risks to life and property is causing massive underspends and compromising the outcomes of the NSW flood risk management program due to technically poor decisions and lack of engineering oversight of engineering infrastructure projects.”

“In our organisation we use a very expensive consultant to undertake designs. The process for engaging the consultant is long and costly - even where we would have the skills (or small local consultants) to do the work.”

“Cost over-runs in a small family owned business in Darwin. Probably the result of lack of experience in writing job plans - this occurred mainly on small Structural/Civil projects in the residential sector. Other than, that most of my experiences in the workplace in the Structural Engineering sector have not resulted in cost overruns (but occasionally the client requires extra information in terms of RFI (Request For Information) during the construction stage. A lot of engineering managers do not seem to ever initiate communication with their staff and as an employee you feel that you have to always go and see them. This is common. I think that both managers and employers when giving a task, need to make clear what the expectations are (given that each manager and employer is different). Managing expectations is important through respectful kind communication.”

Considering a specific project, what was the overall % cost overrun resulting from a lack of engineering oversight?

"At least 200%"

"150%"

"30%"

"In my older experience, government contracts had a contingency for extras of 5-10%, which was judiciously used and rarely exceeded, although contractors are notorious for gouging on extras. More recent experience is that contingencies of 1% are targeted with sometimes adverse results caused by non-technical administrators exercising tight control. However, the budget was clearly controlled."

"5 times the cost of internal design. Contractor just kept looking for variations."

"There was no cost overrun for the <identifier removed> but NSW Public Works staff spent 100's of hours finalising the project for which it was not paid."

"Typically 50% is about the number but 200% is not that uncommon."

"30%"

"10%"

"100% Done right by us (engineers) it would have never happened, as we would not have done it the way they did"

"Unfortunately I don't think you will get much here. Estimate: 10% +"

"Transport infrastructure planning committees (inter government and private enterprise consultants milking the system and funds without providing any real practical solutions. Have worked in Govt and now in private enterprise. No Budget initially then funds channeled from other area."

"Not so much a cost overrun, as a shortened project lifetime, which translates to a cost overrun when the systems are renewed twice as often as would have otherwise have been the case - up to 100% increase in lifecycle cost, without considering the loss of facility and reliability to the customer."

"30%"

"2.7 times. Original estimate to do the estimating of replacement value of inland STP internally was \$100,000, external consultants cost \$377,000"

"No specific projects - many small jobs adding up to \$5M"

"20%"

"Australia's "population growth project" has no engineering oversight"

"Very hard to calculate, however we are likely to be living with the consequences for years. Which includes reduced service to the public."

"My experience is about 30-40% for <250k jobs. Larger jobs (>250K) will be ~15-25%."

"Difficult to tell as of yet."

"10%"

"The blowout was about 20% but it wasn't due to engineering oversight. The Consultant involved had a high turnover of engineers on the project. The project ran for about 6 months during which time 4 engineers left the company and 3 engineers had to be quickly redeployed"

"50%"

"25%"

"No particular figures, the costs will arise in the future."

“Cost overruns are difficult to quantify because unit cost estimates are typically used (inherently inaccurate) and cost shifting is used to hide actual costs and performance. The issue is not just inadequate cost estimates on which the budgets are based. The total lack of effective management means that assets are not assessed, prioritised, managed, designed or replaced in a manner that seeks to lower total cost of ownership. There is simply no objective management systems in place. In fact, not even basic policy statements or procedures let alone any system seeking to support best practice outcomes. New works do not meet relevant Australian Standards for bridge works including issues that affect safety of road users. What the council does is simply seek to obtain ongoing annual special rate variation increases above the CPI to cover the budget shortfalls.”

“Public consultation & planning phase - \$145 million
Latest estimate - \$410 million. This is a 280% cost overrun based on the above figures. However, the need for the project at all is questionable.”

“10% and long delays in project handover with testing and verification of a system that is ethernet/IP based when the Road Authority specifications are based on pre-internet telephone modem serial data communications.”

25%

\$5 million approx

Cost overrun not significant. Time overrun is 1-2 years.

Have not been involved in the financial aspects or negotiations involved with these issues.

<identifier removed> The end result was an option which, at a very early project scoping meeting, was referred to as "completely off the table", as works would take place quickly and without large amounts of the public being aware of works, being approved and implemented.

40%

“Poor planning has led to cost increases of 20% in some cases.”

“<identifier removed> Two years before the widening project the <identifier removed> under took installation of barrier rope installation make the road slower for more than half of the year and then started the widening the road removing all installed barriers outer edge and middle, and then re-installed. This unnecessary duplication of safety barriers did not reduce the risk but increased cost to the Victorian and Federal governments. Could have spent the funds on other roads and infrastructure development.”

“Estimate 50% increase in cost blow-outs on the total cost of NSW government spending in flood risk management projects. This is coupled with up to 50-80% underspends (2011/12 & 2012/13) due to new funding rules that diminishes the total annual spend with all NSW government councils.”

“A 50mm asphalt alternative solution was available at less than 50% of the cost and around 10% of the time.”

“I do not know the exact percentage of overrun - the engineering manager did not communicate that.”

What additional concerns or feedback do you have to ensure that government, government departments, authorities and agencies become better informed purchasers, to save taxpayer dollars, protect public safety and deliver infrastructure on-time?

“Environmental and Safety concerns.”

“There is a desperate lack of knowledgeable engineers in the sector and annual funding and budgeting is leading to most projects being delivered when the weather is not suitable.”

“Government has no idea, it is about time we had some decent intelligent people in there to spend public funds efficiently not made stupid decisions.”

“At a time when the community is facing a significant number of risks from various quarters, including environmental, terrorist activities to name but two, it seem to me that it is essential that Governments need a solid, well structured, professional organisation available to meet any unforeseen challenge. <identifier removed> showed how ill prepared America was to put boots on the ground quickly. To be able to react quickly and effectively to an event or disaster you need skilled personnel and an organisational structure in place before something happens. You don't cobble things together after the event. Governments seem to have missed, or worse, ignored this issue to enshrine their own political / philosophical agenda.”

“Recognize that engineers have been delivering successful projects for many decades before the rise of so-called project management professionals.”

“All infrastructure projects should solely be handled by qualified Engineers.”

“Government and their departments need to retain knowledgeable engineers who can discern between bona fide companies and charlatans. In the long term this is cost effective, as the costs of employing such people is small compared to the cost of rectifying failing projects. It also offers safer, more reliable, long lived infrastructure in a more timely and efficient manner.”

“We need Experienced engineers in the organisation to make it an informed purchaser and know what they do not know. We are tending to become a purchaser not knowing what we do not know.”

“More suitably qualified professionals to lead the organisation, and suitably qualified professionals to manage projects. Not to rush on projects and expenditure to meet the end of the financial year expenditure. Better training in-house and for external consultancy. Good training and mentoring for young engineers to cover design, maintenance and construction phases of the works.”

“It's not just a lack of engineering oversight / knowledge at the decision making level, it's that people don't want to listen to what your council as an engineer due to political pressure to do something or associated fear of a career limiting move.”

“It is the private sector consultancies that are blowing out the costs and blaming them on poor scoping from government. Private sector consultancies are creating hostile workplaces where engineers are forced to work unreasonable unpaid overtime. <identifier removed> The private sector have been hiring 457 visa holders to drive down salaries and conditions of the local workforce.”

“An understanding of the long term risks that arise from incompetent decision making.”

“Stop sacking technical staff to save money and employing lawyers and accountants to run engineering departments. Pay reasonable wages to staff so they won't leave. Reduce bureaucracy so good staff don't give up and leave in frustration.”

“Government employees need to learn the technology to be able to specify it. In some cases this is beyond their capability (beyond mine in some cases as a government employee) and a range of options such as the use of consultants, OEM advice, draft specifications or expressions of interest may be useful to issue to the market to gauge the unknown matters. Performance specifications have been widely used so that government ignorance is not displayed, but these can lead to uncompetitive practices.”

“Reality is that the "informed purchaser" is limited to specific individuals at the front line. Given demographic profile of engineers there is a whole generation missing who can step up behind as the experienced ones move on, retire or are pushed out through reforms.”

“The government was told by the Rizzo inquiry that we need more engineers and technical officers to oversee contractors, and DMO bean counters. Instead they are in the process of cutting away a further 20% of staff in this field. This is going to further lead to cost overruns and time delays like the AWD project. Two Years late, and 600 million over budget.”

“Full transparency, independent panel to be used to prepare specifications in conjunction with Government workers.”

“Lack of meticulous planning; Lack of research; Lack of records.”

“Principal Engineers should have at least the same organisational status and authority as Managers.”

“Federal and State Government need to state a Population Target and plan and budget accordingly so that public infrastructure projects can deliver optimal outcomes in functionality and cost.”

“Officers need to be properly resourced to scope a project. This is to ensure that the project delivers value to various users and stakeholders, fit for purpose. Some of the grouses are the management sometimes are not fully appreciate the technical needs of the engineering team. They are too focused on the financial and political outcomes they need to achieve. Some projects are not scoped at all and done by the seat of the pants flying style of project management. Due to the experience and skills of the senior engineers / project managers most of the disasters are averted.”

Go back to traditional design and tender, or an increased independent consultant oversight on design & construct projects. Project managers can be effective but they are not technically adept which is where the main hassles occur since the end users typically are not either.

Specific legislation is required to make government departments including local government accountable. Safety in Design legislation should be extended to cover all public infrastructure works.

There are many; too numerous to capture in such a survey. An informed purchaser cannot afford to 'outsource its brains'. This means that it is essential for purchasers (whether they be government or non-government) must maintain a level of expertise so that project planning, procurement, design, supervision of construction and all associated key activities are carried out with sufficient review and rigor.

“Government needs to be more flexible and open to new technology and ideas from engineers and designers. Public Infrastructure doesn't benefit from innovation in technology and materials as much as IT and telecommunications and racing has done in recent decades. When the Government department in charge of managing the infrastructure being built uses the mentality "if it's not broken then don't fix it" and then rehashes the same old specifications and scope requirements that they used for the previous 10 projects, then designers and engineers find themselves building 1970's or 1980's type technology infrastructure in 2014. Innovation and new technology in infrastructure isn't "risky" or dangerous, it is the lifeblood that ensures we are building infrastructure with the best techniques and materials that the world has to offer. By clinging to conservative notions of best practice meaning to "build it now like we built that last one" is to ignore and turn our collective noses up to the knowledge and advancements that society has developed in the last few decades.”

Provided appropriate workplace IR arrangements are in place (i.e. no more onerous than private sector "frameworks"), public sector in-house skills at operations, engineering and management levels will ensure savings of up to 20% in project delivery costs. Bringing back those skills in-house will also significantly reduce those costs, provided the same IR playing field is applied. Current public sector remunerations that are well below industry benchmarks could be lifted to attract good performers, and the same cost advantages would still apply.

Look for each cent accountability will save millions.

Employ more engineers with experience in infrastructure provision, or completely outsource procurement. Government departments in general should only form policy; they should then engage the private sector to investigate projects to achieve the policy outcome.

Better feedback to suppliers, less advisor attitudes, better understanding of benefits of tolerable risk. Utilisation of engineers as Project managers who have an understanding the end game is more important than each battle. ie helping teams to get the desired output of a high quality value for money project

The drive to outsource everything confuses me. We let staff go and then pay high prices for consultants to do the work they once performed.

When departments have plans they should consider future proofing instead of launching a project with available funds and upgrade it further in few years' time. It is not only the direct cost to the government that needs consideration, but the cost to the community, environment, and safety.

We were able to stop the works before it started and wasted the money

Engineering managers that have had some previous Human resource management experience. A lot of engineers seem to rely too much on their really good mathematical and analytical skills. There seems to be a problem with third party recruiting agents (who themselves are not engineers) go through the recruitment candidate selection process as a ridiculous box ticking, type-casting, pigeon holing exercise. So sometimes the employer does not get an employee to match the employer's needs. There seems to be too much email communication these days. Emails are not necessarily a substitute for talking. In 1969 NASA put man on the moon without sending a single email or text message.