Public sector governance

- Central governments, as the primary funding entity, have a desire that major projects should attend to the needs of society, and that the projects that result in greatest benefits should have priority.
- Central governments generally don’t deliver projects themselves: the objective is to pave the way for structured and effective preparation and implementation through good governance.

Principles of good governance

- Accountability: authorities have the ability and willingness to show whether decisions and practices are in conformity with clearly defined and adopted objectives.
- Transparency: decisions and decision-making processes are sufficiently transparent to enable the public sector, as well as civil society, to gain adequate information in relation thereto.
- Effectiveness: government deliverables are of sufficient quality, and delivered cost effectively and in such manner as to realise the purpose of such deliverables.
- Responsiveness: authorities have the capacity and flexibility to respond swiftly to the needs of society and in the public interest.
- Vision: authorities are able to anticipate future problems and needs based on existing data and trend information, and to take into account any expected change(s) and the costs associated therewith (for example demographic, financial, environmental, etc.).
- Rule of Law: authorities ensure that projects are implemented in compliance with applicable laws and regulations.
Policy Instruments

In principle, the public sector has three policy instruments at its disposal:

- The Stick (regulation)
- The Carrot (economic means - incentives, contracts, fees, etc)
- The Sermon (information, advice and guidelines, warnings)

Advice and guidance can be a valuable tool

1. Cost Estimation Guidance
2. Escalation Policy
High-level cost estimation requirements

- Probabilistic cost estimates are required for projects greater than $25 million P90 Outturn
- Road projects should be outturned using escalation rates embedded within the Project Cost Breakdown (PCB) template
- Refer to and follow the Department’s cost estimation guidance
- Revised estimates are expected for each phase (not applicable if two or more phases are combined)

Cost Estimation Guidance

The full suite consisting of six components comprises:
- Overview
- 1: Project Scope
- 2: Base Cost Estimation
- 3A: Probabilistic Contingency Estimation
- Supplementary guidance
- 3B: Deterministic Contingency Estimation
- 4: Escalation

Components of an estimate

Different representations of project cost

<table>
<thead>
<tr>
<th>Different representations of a project cost</th>
<th>Cost Components</th>
<th>Total ($ Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Estimate</td>
<td>Base Estimate</td>
<td>100.00</td>
</tr>
<tr>
<td>Project Estimate (PSO)</td>
<td>Base Estimate + PSO project risk</td>
<td>115.00</td>
</tr>
<tr>
<td>Project Estimate (P90)</td>
<td>Base Estimate + P90 project risk</td>
<td>140.00</td>
</tr>
<tr>
<td>Outturn Estimate (PSO)</td>
<td>Base Estimate + PSO project risk + escalation</td>
<td>124.33</td>
</tr>
<tr>
<td>Outturn Estimate (P90)</td>
<td>Base Estimate + P90 project risk + escalation</td>
<td>151.36</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project Cash Flows</th>
<th>YEAR 1 ($ Millions)</th>
<th>YEAR 2 ($ Millions)</th>
<th>YEAR 3 ($ Millions)</th>
<th>YEAR 4 ($ Millions)</th>
<th>TOTAL ($ Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Estimate</td>
<td>5.00</td>
<td>15.00</td>
<td>40.00</td>
<td>40.00</td>
<td>100.00</td>
</tr>
<tr>
<td>P90 Contingency Allowance (e.g. 15%)</td>
<td>0.75</td>
<td>2.25</td>
<td>6.00</td>
<td>6.00</td>
<td>15.00</td>
</tr>
<tr>
<td>P90 Risk Adjusted Estimate</td>
<td>5.75</td>
<td>17.75</td>
<td>46.00</td>
<td>46.00</td>
<td>115.00</td>
</tr>
<tr>
<td>P90 Outturn Estimate*</td>
<td>5.89</td>
<td>18.12</td>
<td>48.54</td>
<td>50.78</td>
<td>134.95</td>
</tr>
<tr>
<td>P90 Contingency Allowance (e.g. 8%)</td>
<td>2.00</td>
<td>6.00</td>
<td>16.00</td>
<td>16.00</td>
<td>40.00</td>
</tr>
<tr>
<td>P90 Risk Adjusted Estimate</td>
<td>7.00</td>
<td>21.00</td>
<td>56.00</td>
<td>56.00</td>
<td>140.00</td>
</tr>
<tr>
<td>P90 Outturn Estimate*</td>
<td>7.18</td>
<td>22.08</td>
<td>60.35</td>
<td>65.85</td>
<td>155.99</td>
</tr>
</tbody>
</table>

*The P90 Outturn Estimate includes all 15% contingency and all 8% contingency.
The Cost Estimation Process

Guidance Note 2 – Base Cost Estimation

Discusses estimating methods:
- First Principles Estimating (sometimes called a point estimate)
- Unit Rate Estimating
- Global Estimating

Applicability at each phase of the project lifecycle:
Contingency

Current Departmental policy:
• Probabilistic estimates for projects > $25 million
• Deterministic estimates for projects < $25 million

• Because there are no “standards” as such for cost estimation/risk quantification (in the same way there are Australian Standards for engineering designs), it is important that the Department provide robust guidance.

Risk quantification techniques (a selection)
Guidance Notes 3A and 3B

- 3B Deterministic contingency estimation
  - Techniques for assessing and quantifying uncertainty on lower value projects
  - Example template on website

- 3A Probabilistic contingency estimation
  - Three different techniques explained
  - Assessed using Monte Carlo simulation
  - Theory and background provided with Supplementary Guidance

Risk quantification techniques through the project lifecycle
A number of worked examples appear throughout the text with working models also available for download from the website:

### Guidance notes

The cost estimation guidance, published following a thorough public consultation process, comprises the following key components which are available for download:

- Guidance Note – Overview, Version 1.0, August 2018 (PDF: 1.6 MB)
- Guidance Note 1 – Project Scope, Version 1.0, March 2017 (PDF: 354 KB)
- Guidance Note 2 – Base Cost Estimation, Version 1.0, March 2017 (PDF: 504 KB)
- Guidance Note 3A – Probabilistic Contingency Estimation, Version 1.0, November 2018 (PDF: 2.5 MB)
- Guidance Note 3A – Supplementary Guidance, Version 1.0, November 2018 (PDF: 4.4 MB)
  - Risk Factor model 1 (PDF: 84 KB)
  - Risk Factor model 2 (PDF: 86 KB)
  - Risk Factor model 3 (PDF: 129 KB)
  - Risk Factor model 4 (PDF: 92 KB)
- Guidance Note 3B – Deterministic Contingency Estimation, Version 1.0, August 2018 (PDF: 1.4 MB)
  - Range based model 1 (PDF: 87 KB)
- Guidance Note 4 – Escalation, Version 1.0, November 2018 (PDF: 1.4 MB)

### Technical policy/guidance - considerations

- Regulations and guidelines can be an impediment to creative thinking
- If every analyst had their own individual model, it would be impossible to ensure any quality standard
- To maintain consistency you could fill in a template of three-point estimates with standard ranges
- But templates and set ranges ensure that the standard of analysis is very low
- Risk analysis is not a packaged commodity
- Each project is unique (although likely to have commonalities)
- Policy should allow for flexibility within a core set of theoretically sound assumptions
Part II

Closer look at the oversight and implementation of the Department’s Escalation policy

Escalation policy - background

- Choice of escalation rate can be a major driver of the outturn estimate for a multi-year project
- Prior to 2015 jurisdictions submitting funding proposals were free to nominate their own escalation rates
- Justifiably, it was felt that rates being nominated at the time (6% per annum or more) were unrealistic in a deflationary environment
- No consistency between jurisdictions
  - Equity and transparency is important where there is competition between delivery agencies for scarce public funds
Escalation policy - development

• In 2014/15 the Department embarked on a significant journey of escalation policy development
• Development is ongoing

**Aim:**
• Develop a composite index series using an appropriate weighting of each input for a typical road construction project
• Provide a logically built, jurisdiction-specific escalation series for road construction projects
  – Convert cost estimates, developed in today’s dollars, into outturn dollars for budgetary purposes

Principles of an index series

I. Provide robust estimates of movements in actual costs (materials, labour, profit margins) for road construction
II. Be available for all Australian jurisdictions
III. Be based on sound, logical and transparent foundations
IV. Can be calculated using regularly published and publicly available data
V. Recognise costs borne by jurisdictions outside of the construction process itself
Component weights for road construction projects

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Wages</td>
<td>29%</td>
</tr>
<tr>
<td>Engineering Design &amp; Consulting Services</td>
<td>14%</td>
</tr>
<tr>
<td>Plant &amp; Equipment Hire</td>
<td>14%</td>
</tr>
<tr>
<td>Concrete, Cement &amp; Sand</td>
<td>22%</td>
</tr>
<tr>
<td>Bitumen</td>
<td>12%</td>
</tr>
<tr>
<td>Diesel</td>
<td>4%</td>
</tr>
<tr>
<td>Reinforcing Steel</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Project Base Cost</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Escalation Forecasts

- Forecasts for inputs consider a number of factors:
  - Enterprise bargaining agreements
  - Supply/demand for materials across the construction sector more broadly
  - Commodity prices (iron ore, oil)
  - Exchange rates
  - Overall level of aggregate demand (market conditions) within the economy to predict contractor margins
  - Changes in technology and general industry-wide productivity
Implementation

- Department engages BIS Oxford Economics to update forecasts (for the next seven years) on an annual basis
- Jurisdictions are provided with rates and accompanying narrative for comment before forecasts are finalised (collaborative approach)
- A template is provided with escalation rates embedded
  - Outturn estimate is automatically calculated from the project cashflow
Concluding remarks

Sound guidance and policy regarding project cost estimates ensure principles of good governance are being followed.

- **Accountability**
  - Authorities have the ability and willingness to show whether decisions and practices are in conformity with published and adopted objectives.

- **Transparency**
  - Decisions and decision-making processes are sufficiently transparent to enable the public sector, as well as other stakeholders to gain adequate access to information in relation thereto.

- **Effectiveness and effect**
  - Government deliverables are of sufficient quality, and delivered cost effectively and in such manner as to realize the purpose of such deliverables.

- **Responsiveness**
  - Authorities have the capacity and flexibility to respond swiftly to the needs of society and in the public interest.

- **Vision**
  - Authorities are able to anticipate future problems and needs based on existing data and trend information, and to take into account any expected changes and the costs associated therewith (for example demographical, financial, environmental, etc.).

- **Rule of Law**
  - Authorities ensure that projects are implemented in compliance with applicable laws and regulations.

- **Effectiveness and effect**
  - Rigorous project submissions
  - Due diligence activities
  - Incentives to achieve value for money

- **Responsiveness**
  - Authorities are able to anticipate future problems and needs based on existing data and trend information, and to take into account any expected changes and the costs associated therewith (for example demographical, financial, environmental, etc.).

- **Vision**
  - Authorities are able to anticipate future problems and needs based on existing data and trend information, and to take into account any expected changes and the costs associated therewith (for example demographical, financial, environmental, etc.).