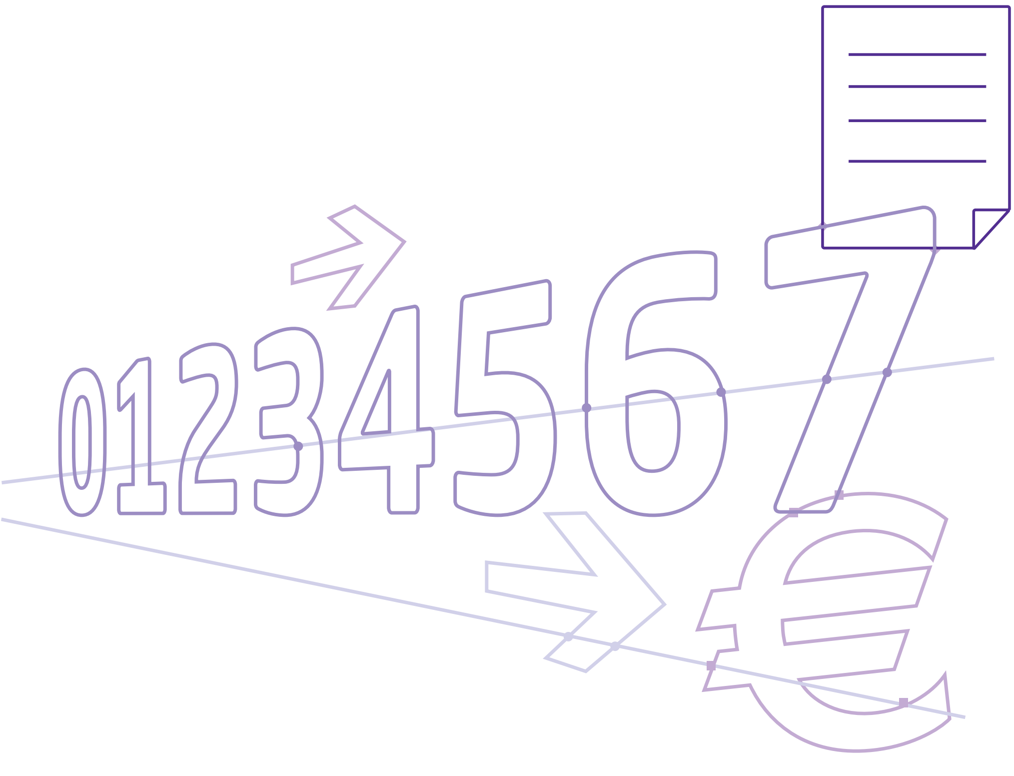
COST MANAGEMENT GUIDELINES FOR PUBLIC TRANSPORT INVESTMENT PROJECTS

1 SEPTEMBER 2010



Údarás Náisiúnta Iompair
National Transport Authority

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Foreword

The National Transport Authority (the NTA) funds public transport infrastructure projects in the Greater Dublin Area. Such projects are generally sponsored, by the NTA's partner organisations: the Railway Procurement Agency for Luas and Metro projects; and the CIÉ Group companies for other transport modes, in particular, Iarnród Éireann – Irish Rail for DART, commuter and regional railway projects. Those organisations are the contracting entities for such projects.

In order to fulfil its statutory duty to secure the provision of public transport infrastructure on a value for money basis, the NTA requires that the Sponsoring Agencies follow clear processes with respect to cost estimation and cost management, that these processes follow best practice as far as possible, that the NTA is informed on all cost related issues as projects progress, and that at each key milestone in the development of a project the NTA is consulted and sufficiently informed about the developing project costs to make sound decisions on the authorisation of the next stage of work.

These Cost Management Guidelines cover the cost management of both conventionally procured investment projects and Public Private Partnership (PPP) projects, are to be applied to all projects which the NTA is funding, and are applicable from 1st September 2010. They are to be read in conjunction with NTA's separate guidelines for the management of conventionally procured and PPP projects, as appropriate, along with other Government guidance on particular aspects of project development and implementation.

I wish to thank the Railway Procurement Agency and Irish Rail for their assistance and contributions and I also wish to acknowledge the consultants, Booz & Company, who prepared these Guidelines for the NTA.

Gerry Murphy
Chief Executive

1. Introduction

1.1 Purpose Of The Guidelines

The National Transport Authority (NTA) is responsible for sanctioning the delivery of public transport projects in the Greater Dublin Area by the Sponsoring Agencies: the Railway Procurement Agency (RPA); and the CIÉ Group companies.

As Sanctioning Authority with accountability for the use of public funds by the Sponsoring Agencies, the NTA has a duty to oversee the budgeting and management of the costs of capital projects by the Sponsoring Agencies.

These Cost Management Guidelines are part of the NTA's overall suite of guidance documents and should be read in conjunction with the relevant Project Management Guidelines (PMGs)[1].

The PMGs provide the overall framework for the NTA's oversight of the development, management and delivery of NTA sanctioned projects by the Sponsoring Agencies, and the requirements for regular reporting to the NTA via the 'Gate' process necessary to provide the NTA with the degree of visibility and certainty that is appropriate for a Sanctioning Authority.

These Cost Management Guidelines define the minimum requirements of the Partner organisation with respect to the determination, management and reporting of a project's costs, and describe the cost related documentation that is required at each stage of the Gate process.

Within the context of these Guidelines, the Partner organisations are expected to continue to apply their own cost management processes, but they should specifically address any explicit requirements specified in these Guidelines, and should always be able to demonstrate that the processes set out in these Guidelines have been followed. No deviation from these Guidelines should be made without the approval of the NTA.

It should be noted that these Guidelines do not aim to be a full statement of the duties and statutory obligations of the Partner organisations for their projects. Responsibility for ensuring that schemes are progressed in accordance with applicable legislation, standards and other applicable guidelines remains with the Partners and their project teams.

1 Guidelines for the Management of Public Transport Investment Projects delivered by Conventional Procurement, National Transport Authority, 1st July 2010 Guidelines for the Management of Public Transport Investment Projects delivered through Public Private Partnerships, National Transport Authority, 1st September 2010

1.2 Applicability

1.2.1 Conventionally procured PPP projects

These Guidelines apply to all conventionally procured projects that are governed by the PMGs (see section 1.2 of the PMGs).

1.2.2 PPP projects

For all PPP projects funded by the NTA, these Guidelines apply in their entirety, with Section 4 setting out certain additional requirements for PPP projects. Section 4 applies only for PPP projects and should be ignored for conventionally procured projects.

1.3 Interaction With Other Guidance

In developing their project management processes, the Partner organisations are required to comply with other Government guidelines including:

- Department of Finance:
  - *Guidelines for the Appraisal and Management of Capital Expenditure Proposals in the Public Sector, February 2005 ('DoF Guidelines');*

  For conventionally procured projects:

  - *Capital Works Management Framework, July 2009* (DoF *CWMF)*

  For projects delivered through PPPs:

  - *Guidelines for the Provision of Infrastructure and Capital Investments through Public Private Partnerships: Procedures for the Assessment, Approval, Audit and Procurement of Projects, July 2006 ('the DoF Main PPP Guidelines');*
  - *Technical Guidance Note: Assessment of Projects for Procurement as PPPs, November 2006;*
  - *Value for Money and the Public Private Partnership Procurement Process, October 2007 ('the DoF PPP VfM Guidelines').*
- Department of Transport:
  - *Post Project Review Methodology for Transport Projects, February 2009.*
  - *Guidelines on a Common Appraisal Framework for Transport Projects and Programmes, June 2009 ('DoT Common Appraisal Guidelines').*

These Cost Management Guidelines are based on and consistent with the DoF CWMF, in particular:

- *Guidance Note GN 1.3 Budget Development*
- *Guidance Note GN 2.2 Planning and Control of Capital Costs*

These Cost Management Guidelines follow the terminology used in the PMGs.

1.4 Structure Of These Guidelines

After this introductory section 1, these Guidelines are structured to provide the NTA's requirements of the Partner organisations with respect to:

- Engaging with the NTA and reporting on the costs of projects (Section 2);
- Cost management procedures, and the cost related documentation associated with each phase of the Gate review process (Section 3);
- Cost management for PPP projects (Section 4);
- Cost estimation (Section 5);
- Risk management (Section 6);
- Change control and contingency management (Section 7).

2. Requirements for Engaging with the NTA

As set out in the PMGs, the NTA requires the Partner organisations to engage with the NTA at different levels – principally at programme level, but the reporting for conventional projects above the thresholds defined in the PMGs and for all PPPs, is at the project level. The documentation required at the project level is set out in the PMGs.

These Guidelines concentrate on the cost related components of such documentation.

2.1 Regular Reporting

As set out in the PMG, each Partner organisation is required to provide regular (monthly) financial and progress reports to the NTA on each project for which the NTA is providing funding and attend regular (monthly) monitoring meetings to review their portfolio of NTA-funded projects.

The **cost related** components of the regular project progress reports to be discussed at the regular monitoring meetings are:

- Project level summary of Reported Budget Expenditure; amount to date, amount approved, forecast to completion and any variances;
- Short written narrative summary indicating "Red Amber Green" status of the project against budget and schedule, signalling any changes in forecast to completion and the reasons for them;
- Identification of any issues or new risks affecting scope, cost or programme;

2.2 Reporting Through The Gate Review Process

2.2.1 Cost Development Process

For each project for which the NTA is providing funding, the Partner organisation is required to report to the NTA on the developing cost estimate and business case at each Gate in the Gate review process. The cost related components of the required documentation are summarised in Table 2.1.

2.2.2 Project Execution Plan and Funding Plan

At the end of each Phase, the Partner organisation will prepare a preliminary Project Execution Plan (PEP) for the next Phase, including a preliminary resources plan so that any funding needs can be put forward at the relevant Gate review and funding arrangements can be agreed with the NTA.

The PMGs define the purpose of the Project Execution Plan as being to provide a core project management document which can be used to monitor the Scope of the Project with regard to expenditure and compliance to standards and policy. It lists the contents a typical PEP has to have to be compliant with the DoF CWMF Guideline GN 1.1. Of significance from a cost management point of view is the requirement that the PEP should contain a project cost plan and cost management procedures.

Table 2.1: Gate review process cost related documentation

Project Phase	Title	Cost related Deliverables
Phase 0	*Programme Overview and Requirement Definition*	• Prefeasibility report & Requirements statement (Project Brief).
Phase 1	*Scheme Concept and Feasibility*	• Feasibility Working Cost (FWC); • Preliminary Business Case.
Phase 2	*Option Selection*	• The Option Selection Report; • Project appraisal report (project and option definition, option selection and appraisal).
Phase 3	*Outline Design*	• Outline Scheme Target Cost (TC1); • Detailed Business Case report.
Phase 4	*Statutory Processes*	• Updated Scheme Cost (TC2); • Updated Detailed Business Case.
Phase 5	*Advanced Works and Prepare Procurement*	• The postTender Total Scheme Budget (TC3); • The postTender Project Appraisal and • Final Business Case documentation.
Phase 6	*Construction and Implementation*	• Final Account Report.
Phase 7	*Closeout and Review*	• Final Outturn Cost (FOC); • Post Completion Review report; • Post Project Review report.

2.3 Ad Hoc Issues Arising Between Gates

It is expected that, throughout the duration of any project, ad hoc issues may arise between Gate reviews requiring the approval of or decision by the NTA. Because, by their very nature, such ad hoc issues cannot be tied to specific documentation requirements, the NTA requires the Partner organisation to determine and present the appropriate amount of cost information to enable the NTA to satisfactorily resolve each issue.

3. Cost Management Procedures

3.1 Requirements For Cost Management

The NTA requires its Partner organisations to robustly and efficiently plan, manage and control their costs by adopting a structured and proactive approach to cost management at a programme level, with the objective of achieving:

- Delivery of the Capital Programme within budget constraints;
- Improved and informed decision making; and
- Enhanced knowledge and understanding of the Capital Programme, etc.

3.1.1 NTA Responsibility

As Sanctioning Authority with accountability for use of public funds, the NTA has a responsibility to:

(a) Gain assurance that best practice cost estimation processes are embedded in its Partner organisations; and

(b) For any project funded by the NTA:

- Obtain clear, precise, auditable reporting of Project costs;
- Oblige the Partner organisation to provide early notification of potential cost changes; and
- Ensure the Partner organisation employs best practice cost management to ensure cost control.

3.1.2 Partner Responsibility

To this end, the NTA requires its Partner organisations to:

(a) Develop, maintain, and implement a robust and comprehensive set of Cost Management procedures; and

(b) Comply with the requirements of these Guidelines to facilitate the NTA's monitoring and supervision role.

The Partner organisations' Cost Management procedures should comply with good practice and the DoF Capital Works Management Framework, **Guidance Note GN 2.2 Planning and Control of Capital Costs),** and cover:

- Project Reviews;
- Capital Cost Planning;
- Managing Value and Complexity;
- Cost Control in Design Development;
- Whole Life Cost Appraisal;
- Managing Corrective Action and Change Control; and
- Risk Management Tasks

For any project funded by the NTA, the primary responsibility for cost management lies with the relevant Partner organisation, and the NTA requires the Partner organisation to implement its own Cost Management procedures to manage and control costs.

However, the NTA also requires its Partner organisations to comply with these and other NTA guidelines in providing appropriate reporting to the NTA throughout the entire life of a project, from initial concept through to service operation.

3.1.3 Good Practice Cost Management

Good practice cost management involves:

- Cost Management Principles set cost management policy and objectives;
- Roles & Responsibilities identify a hierarchy of cost management reports, data structure, and personnel include training and awareness;
- Core Processes – develop processes for Strategic cost planning, Capital Programme Cost Management, and Project Cost Management;
- Budgeting – set up tools for cost modelling, and cradle to grave cost planning;
- Cost Reporting identify monitoring and review cycles, and basic cost reporting information; and
- Financial & Cost Controls – processes for Payment, Cost Verification/Approvals, Final Accounts, Commercial Close, Lessons Learned, Cost Feedback that bring consistency and visibility.

In managing cost it is also necessary to understand risk, set appropriate contingency levels, and control change and the use of contingency, including in the management of claims.

Appendix 1 shows the components of a typical process for determining, monitoring, and controlling an organisation's project costs, allocating responsibilities, defining the necessary flow of information between parties, and sets out approvals and authority levels appropriately.

3.2 Budgeting And Cost Control Activities By Phase

Project costs will advance through levels of increasing certainty as a project progresses, and so cost estimates (and consequently project appraisals) will require continuous updating at each Phase. For any project funded by the NTA, the NTA requires the responsible Partner organisation to set up and implement appropriate processes and procedures to enable it to properly monitor and control project costs as the project progresses.

Such processes shall provide for:

- Setting realistic cost baselines to be used for monitoring and controlling costs;
- Progressive updating of scheme costs and budget throughout the life of the Project;
- Progressive updating of scheme appraisal throughout and beyond the life of the Project; and
- Reporting on costs and appraisal to NTA in accordance with the Gate review process.

The Scheme cost estimate shall be progressively refined through all stages of the project, and an audit trail shall be maintained to comprehensively demonstrate how the Scheme cost developed from the estimate at the commencement of the overall project planning phase to the Final Accounts at completion and close out.

The following sections set out the NTA's requirements with respect to refining the Scheme cost estimate and Project Budget, and updating the Project Appraisal, as the Project progresses through the Phases laid down in the relevant version of the PMGs, and how such developments are to be reported to the NTA via the Gate review process.

3.3 Requirements Definition (Phase 0)

Cost management requirements of the Partner organisation in the preProject (Requirements Definition) Phase of a project include:

- Inputs: assemble all prior information, previous studies, and any appraisal work into an information dossier for the project;
- Costing: collate any available prefeasibility cost information and, where appropriate, make initial assessments of major issues related to scope and potential risks that may need to be mitigated;
- Cost model: develop a cost model based on benchmark cost data to provide an initial order of magnitude costing
- Appraisal: make an initial assessment of the business requirement with respect to the wider investment programme, and identify inter-dependencies with other projects;
- Reporting: prepare a PreFeasibility Report and a Requirements Statement in the form of a Project Brief (as per DoF CWMF Guideline GN 1.2) to include an indicative all-encompassing budget estimate to cover all project costs through to entry into service operation, including risk and contingency provision and an allowance for inflation; separately, prepare a Phase 1 work scope budget for approval.

3.4 Scheme Concept And Feasibility (Phase 1)

3.4.1 Inputs/Activities

Feasibility studies shall be commissioned as required to establish the quantitative and cost aspects of the project.

The cost model shall be further developed to include in-house project management costs, property costs, survey and investigation costs, design and consents process costs, as well as projected construction/supply costs and allowances for risk, contingency and inflation, and ongoing operations and maintenance costs to the level of detail necessary for the preliminary project appraisal.

The Partner organisation should also determine and the affordability constraints within which options will be developed.

3.4.2 Project Costs

Through benchmarking and elemental costing, a Feasibility Working Cost (FWC) shall be prepared for the Scheme, taking account of the stage of development the Scheme has reached. The FWC shall be compliant with DoF CWMF Guidance Notes GN 1.1 and GN 1.3.

3.4.3 Project Appraisal

A preliminary financial and economic appraisal of the project shall be undertaken, in accordance with the DoF Guidelines and the DoT *Common Appraisal Guidelines* (at a sufficient level of detail to enable a final and reasoned decision to be made on whether or not to proceed), in the form of a Preliminary Business Case based on the FWC estimate.

3.4.4 Reporting

The Feasibility Working Cost (FWC) and Preliminary Business Case for the project shall be reported to the NTA.

3.5 Option Selection (Phase 2)

3.5.1 Inputs/Activities

Requirements of the option selection phase, in accordance with the DoT's *Common Appraisal Guidelines* and the NTA's Programme management Guidelines, include:

- A 'Do Nothing' or a 'Do Minimum' scenario shall be developed as a baseline;
- Alternative solutions shall be developed as 'Do Something' options for appraisal against the baseline;
- Consideration shall be given to whether the same outcome might be achieved through management options, rather than investment options, or whether the outcome can be achieved incrementally;

- Integration issues, either between packages at the project level, between projects at a programme level, or with other organisations shall be examined as appropriate.

3.5.2 Project Costs

Preliminary estimates of the initial capital costs of the base case (either the 'Do Nothing' or 'Do Minimum') and the 'Do Something' options shall be determined. These should be prepared at the level of detail appropriate for the initial project appraisal. Consideration should be given to whether the operating, maintenance and renewal costs could vary significantly between options. If that is the case then whole life cost differentials should be considered in option selection. A cost benchmarking report should be prepared. Key cost drivers will be identified at this stage.

3.5.3 Project Appraisal

Phase 2 marks the start of the detailed project appraisal. The project base case and option selection, definition, comparative evaluation and initial appraisal of the preferred scheme are critical activities underpinning the ultimate detailed business case for the preferred Scheme.

The Phase 2 project appraisal will be undertaken in accordance with the requirements of the DoT Capital Appraisal Guidelines, but only indicative projections of operating, maintenance and renewal costs for the period of the appraisal need be used at this stage.

3.5.4 Reporting

As the Gate at the end of the Option Selection Phase is not an NTA Hold Point (except on PPP projects), the Partner organisation is expected to take full responsibility for the Gate 2 Review. However, a Phase 2 Project Appraisal Report must be prepared to document the option selection process and demonstrate that there continues to be merit in the project. On PPP projects a full Gate review is required with NTA.

3.6 Outline Design (Phase 3)

3.6.1 Inputs/Activities

The main activities of this Phase are to:

- Carry out investigations to underpin the design or specification;
- Undertake the outline design or, for systems, develop technical requirements specifications;
- Prepare a detailed contracting and procurement strategy;
- Consider resourcing for integration of the Scheme;
- Determine the extent of land required; and
- Determine the scope of the environmental and other assessments required.

3.6.2 Project Costs

The Outline Design phase requires the development of the Outline Scheme Target Cost (TC1) involving identification, estimation, and projection of all costs that will be incurred in realising the deliverables for the preferred option (including VAT where applicable), and completing the whole life cost plan.

The Partner organisation shall arrange for an independent Peer Review of all of the elements making up the TC1 estimate.

The process for developing the Outline Scheme Target Cost shall involve first developing a Scheme Base Cost, then augmenting the Scheme Base Cost with the allowances for inflation and risk defined below. Comprehensive documentation shall be provided to support both of these stages and retained.

Scheme Base Cost

The Scheme Base Cost shall comprise a point estimate *excluding any provision for risk and inflation*. This Scheme Base Cost shall be the best estimate of the final outturn cost of the scheme at current rates and prices for the scope of works as is known at the date of estimate preparation.

The outline Scheme Base Cost shall be based on the point estimate (with a stated level of confidence expressed as a probability percentage) for each of the principal cost headings related to:

- Surveys and investigations (including topographical, geotechnical, archaeological, environmental base-lining, traffic, etc.) as applicable;
- Planning, design, environmental impact assessment and obtaining consents (where required);
- Advanced works contracts (if applicable);
- Main construction and other main supply (e.g. systems and rolling stock) contracts;
- Direct works to be undertaken by the Partner organisation;
- Contract supervision;
- Land and Property (if applicable);
- Project management;
- Partner costs including integration costs (if applicable); and
- Other Third Party costs (if applicable).

Outline Scheme Target Cost (TC1)

The Outline Scheme Target Cost (TC1) shall comprise the outline Scheme Base Cost plus provisions for:

- An allowance for inflation:
  - Each component of the estimate should be assigned an inflation rate to be used to express the cost in the year(s) of expected expenditure;
  - The year(s) of expenditure must be based on the outline Project Programme which must reflect a realistic scenario, taking into account project planning and development durations as well as construction; and
  - Inflation rates may be different for specific cost elements but assumptions made in determining the most appropriate inflation rate to use should be clearly identified in the estimate;
- An assessment of Contractor's risk; and
- A provision for contingency, to cover the Employer's risks.

The Contractor's and Employers' known risks shall be determined by quantified risk assessment techniques, based on an understanding of known risks captured in workshops, and the DoF CWMF contract conditions (or project specific risk allocations in the case of PPP projects).

Any known risks shall be investigated at suitable depth by the Partner organisation such that, where they are transferred by the DoF CWMF contract conditions, the Contractor has sufficient information for him to price the risk without adding an excessive premium, and where they are retained by the Employer a risk allowance can be included in the Partner organisation's budget.

To make reasonable but not excessive allowance for unknown Employer's risks, a percentage contingency shall be determined, based on evidence and analysis from previous projects of a broadly similar nature (whether the Partner's own projects or as researched in conjunction with their professional advisors).

Risk Identification, Mitigation and Management

The Partner organisation shall ensure that risk assessments and reviews take place and that key risks are identified and assessed with respect to likely impacts and required mitigations. The Partner organisation shall inform the NTA of the results of these reviews and provide updates on the management of Top Risks as part of the regular reporting process. A risk management report should be appended to the Scheme cost estimate report.

The Partner organisation should also ensure that any impact of risk mitigation on Scheme scope, benefits or outputs is analysed and reported to the NTA.

Value Management

The Partner organisation shall ensure that value management processes are being applied and that the results of this are explicitly reflected in the costs reported at this Phase. A value management report should be appended to the Scheme cost estimate report. The Partner organisation also should ensure that any impacts on the Scheme benefits or outputs as a result of the value management process are taken into account, and reported to the NTA.

3.6.3 Whole life cost estimate

In addition to preparing capital cost estimates for a project, in order to prepare the project appraisal it will also be necessary to establish whole life cost estimates for the project in accordance with the requirements of the DoT Capital Appraisal Guidelines. These will need to include projections of operating, maintenance and renewal costs for the period of the appraisal.

3.6.4 Project Appraisal

During Phase 3, the project appraisal shall be updated and refined to reflect the more detailed cost estimate and risk assessment developed during the Outline Design process. The whole life costing, project benefits, disbenefits, impacts and objectives achievement shall be updated to reflect any changes in the Scheme or its outputs. Detailed quantitative analysis shall be undertaken during this Phase, in accordance with the DoT *Common Appraisal Guidelines* and any additional guidelines that may be produced by the NTA.

3.6.5 Reporting

The Outline Scheme Target Cost (TC1) shall be reported to the NTA at the Gate 3 review, for validation of the inflation, risk and contingency provisions used.

The updated project appraisal shall be reported in the form of a Detailed Business Case report which, in accordance with the DoT *Common Appraisal Guidelines*, will include the option selection and assessment tasks undertaken in Phase 2, and the Whole life cost estimate.

3.7 Statutory Processes (Phase 4)

3.7.1 Inputs/Activities

During this Phase, for projects requiring statutory approval, the Partner organisation will prepare the application for Railway Order and/or other statutory approvals, including preparation of environmental impact statement, identification of land take requirements, and other required statements.

3.7.2 Project Costs

The Outline Scheme Target Cost shall be updated as required, to reflect the assessment of environmental impacts (with the potential for that to lead to mitigation works being proposed to bring the severity of impacts to an acceptable level), the assessment of land costs, and the costs of any works required as a result of conditions imposed in the Railway Order or other consent to produce Outline Scheme Target Cost 2 (TC2).

3.7.3 Project Appraisal

The Partner organisation shall update all appraisal modelling results and the Detailed Business Case to reflect the costs in TC2.

3.7.4 Reporting

The Outline Scheme Target Cost 2 (TC2) and updated Detailed Business Case shall be reported to the NTA.

3.8 Advance Works, Further Design & Procurement (Phase 5)

3.8.1 Inputs/Activities

The key activities of Phase 5 include:

- Land acquisition;
- Advance works contracts, as required – letting and supervision;
- Design and specification development (which can be full design for a traditional employer designed contract, finalisation of sufficient designs and requirements for a Design & Build contract, or finalisation of requirements specifications for systems and other supply contracts such as rolling stock acquisition);
- Value engineering and value management;
- Updated risk assessment and Scheme cost estimate (in two stages);
- Updated business case (in two stages);
- Preparation of procurement documentation for the main contracts;
- Peer review;
- Shortlisting of tenderers (if 2 stage procurement is applicable);
- Tender processes up to preparation of report on tenders and, subject to approvals by the Partner organisation's Board and the NTA, readiness to award the main works and supply contracts.

3.8.2 Project Costs

Updated Target Cost (TC3)

An updated Target Cost 3 (TC3) shall be prepared taking account of the Contract Sums for the main contracts and any changes to base costs for other headings in the Scheme Base Cost (such as land & property). The Partner organisation shall arrange for an updated independent Peer Review of all of the elements making up the TC3 estimate.

3.8.3 Project Appraisal

The Partner organisation shall ensure that the project appraisal is updated with the pretender cost estimate, risk assessment and any changes to the scheme impacts, benefits or outputs.

Posttender, the Partner organisation shall ensure that the project appraisal is validated and updated, in accordance with DoF and DoT guidance, to reflect the results of the tendering process. The outcome will be reported in the Final Business Case report.

3.8.4 Reporting

The Target Cost 3 (TC3) and Final Business Case for the project shall be reported to the NTA.

By this stage, the Partner organisation should have developed a change control process, procurement strategy and risk management plan.

3.9 Construction And Implementation (Phase 6)

3.9.1 Inputs/Activities

Phase 6 covers the award and administration of the project contracts through to their completion, along with any internal works orders placed with Partner organisation's specialist/direct works divisions.

This phase includes the integration of the various works and supply elements to deliver the planned outputs assumed in the business case, the testing and commissioning of both the elements and the overall system, obtaining safety case approvals and any other necessary acceptance processes, putting the new, extended or upgraded asset(s) into passenger service, and the review and authorisation of final accounts on the various contracts.

3.9.2 Project Costs

Following the completion of each of the main works and supply contracts, the contractor shall be obliged to submit a final statement of account in accordance with the relevant conditions of contract. This, and any reference to conciliation (and/or arbitration), shall be dealt with in accordance with the Partner organisation's procurement processes taking into account relevant DoF CWMF Guidelines. The NTA shall be kept informed of any matters referred to conciliation or arbitration.

Where the final outturn cost of the final account (as agreed, or as determined by conciliation or arbitration) exceeds the tender sum, the Partner organisation shall be required to obtain the approval of the NTA to discharge the balance payable to the contractor. In order for the Partner organisation to comply with this requirement in the case of conciliation or arbitration, any settlement offers/ approaches made within conciliation processes and any sealed offers made within arbitration processes shall be agreed in advance with the NTA[2].

3.9.3 Project Appraisal

There is no requirement for project appraisal documentation in this phase.

3.9.4 Reporting

Project Reporting and Payment

The Partner organisation shall follow its own internal processes for reporting progress and financial management of NTAfunded projects. Monthly progress reports and financial reports relating to each contract, each project and each programme shall be prepared.

The Partner organisation shall handle monthly requests for release of funds from the NTA at a programme level, but backup details shall also be provided at project or contract level depending upon the size of contracts and as agreed with the NTA. Such backup will include the Partner organisation's project and programme level reports as issued to their monitoring and advisory committees/project boards along with summaries prepared for their main Boards.

The Partner organisation shall maintain such records as are necessary in order to properly assess and make a considered determination on any claim(s) submitted, particularly where the issue of quantum of work is being claimed or disputed.

2 *The process of obtaining the NTA's consent to discharge the balance payable to the contractor should be followed in all cases where the final outturn cost exceeds the tender sum, notwithstanding any final and legally binding arbitration ruling which the NTA will respect in giving such consent.*

The NTA shall be advised, as early as possible, of contractual claims and projected cost over runs. The Partner organisations shall consult with the NTA on their proposed approach to handling significant contractual claims.

Final Account Report

Once the final outturn costs of the final accounts for all contracts and work orders making up a project have been determined, the Partner organisation shall prepare a Final Account Report relating to the various contracts and work orders.

As the Final Account Report information will be central to the Project Completion Review report, which is a Phase 7 deliverable, the Partner organisation shall prepare the information according to DoF CWMF Guidance Note *GN 4.1 Project Review on Completion*. In effect, the Partner organisation should carry out as much of the Completion Review as possible prior to settlement of the final account.

It is recognised that some of the key deliverables required for Phase 6, in particular the Final Account Report, may not be completed by this time. Where this arises, the deliverables will therefore carry forward to Phase 7.

The Partner organisation shall advise the NTA of deliverables that will be required to carry forward to Phase 7 and shall also advise of any outstanding payments and/ or deductions to be made from the various contracts/ work orders after the conclusion of Phase 6

All outturn cost information from the Final Account Report should be added to the Partner organisation's cost database for use in preparing the cost estimates for future projects.

3.10 Closeout And Review (Phase 7)

3.10.1 Inputs/Activities

Phase 7 covers the resolution of all outstanding contractual and residual issues relating to the Scheme and its closeout. It also deals with the review of the project to ascertain the lessons to be learned for future schemes.

The key activities of Phase 7 include:

- Management of the Defects Period;
- Closeout of all land and property issues;
- Confirmation of the outturn costs, outputs and outcomes/benefits;
- Post completion review;
- Post project review.

3.10.2 Project Costs

The final outturn cost, Final Outturn Cost (FOC), shall be produced by aggregating the final outturn costs for each of the principal cost headings across all contracts and work orders to reflect the final account settlement values for all the main contracts.

3.10.3 Project Appraisal

Post Completion Review

As set out in the PMGs, upon completion of the project the Partner organisation is required to undertake a Post Completion Review to evaluate the performance of the project contractors and consultants, and review the outturn costs, design, value management and risk management.

Post Project Review

Also as set out in the PMGs, one year after project opening, the Partner organisation is required to appoint an independent person to undertake a Post Project Review to evaluate all phases of the project and the appraisal and project management procedures used, and examine whether the expected benefits and outcomes materialised.

3.10.4 Reporting

Upon completion of the Post Completion Review, a Post Completion Review report shall be prepared for the NTA to present 'Lessons Learned', and identify any actions to improve project management in the future. The Final Outturn Cost (FOC) shall be forwarded to the NTA as part of the approval of project closedown.

Upon completion of the Post Project Review, a Post Project Review report shall be prepared for the NTA to:

- Identify actions to improve project appraisal, planning or implementation;
- Describe systems put in place to monitor costs and benefits over the life of the scheme; and
- Identify any plans to expand or enhance the project at a future date.

4. Additional Procedures for PPP Projects

4.1 NTA Requirements For PPP Projects

This Section 4 sets out the NTA's cost management requirements for public transport investment projects delivered through Public Private Partnerships.

It identifies the NTA's cost management requirements for PPP projects which are additional to those for conventionally procured projects set out throughout the remainder of these Guidelines.

For PPP projects, the NTA requires its Partner organisations to comply with all of the requirements set out in the preceding Section 3 and also with the additional requirements set out in this Section 4.

4.2 Deliverables

The cost related deliverables associated with each Phase of the Gate review process for conventionally procured projects are summarised in Table 2.1 above.

Table 4.1 summarises the additional cost related deliverables for PPP projects as set out in the NTA Project Management Guidelines for PPP Projects[3].

The main differences are that for PPP projects Phase 5 is divided into five subphases and a series of VfM and Affordability tests are required.

Table 4.1: Additional Cost Related Deliverables for PPP projects

Project Phase	Phase Description	Additional Cost Related Deliverables for PPP projects *
Phase 3	Outline Design	• Preliminary draft Shadow Bid; • Formal VfM Test 1 and PPP Procurement Assessment.
Phase 5A	Further Design, Advanced Works & Procurement thro' to Financial Close	• Legal Strategy; • Finalised Shadow Bid; • Public Sector Benchmark (PSB); • Formal VfM and Affordability Test 2 on foot of quantifications in PSB; • The draft tender documents (ITN or similar).
Phase 5B		• Report on initial tenders; • Interim VfM and Affordability Test 3A.
Phase 5C		• Report on (BaFO stage) tenders; • Formal VfM and Affordability Test 3B.
Phase 5D		• Interim VfM and Affordability Test 4A.
Phase 5E		• Formal VfM and Affordability Test 4B.

** Note that relevant confidentiality protocols are to be followed when access to cost information is sought or provided.*

3 *Guidelines for the Management of Public Transport Investment Projects delivered through Public Private Partnerships, National Transport Authority, 1st September 2010*

The DoF Main PPP Guidelines include specific appraisal requirements for PPP projects in general in 1.7, and with respect to affordability (Section 1.13), and value for money (Section 1.14). Value for money has to be considered both for the project as a whole (at the programme level) in accordance with the DoT Common Appraisal Guidelines, and at the level of the PPP contract itself, including comparison with the Public Sector Benchmark (the PSB).

4.3 Phase 3

4.3.1 Preliminary Draft of Shadow Bid

A preliminary draft of the Shadow Bid Model (SBM) for the PPP element of the project will be developed in Phase 3 based on the outline design for the overall Scheme, the procurement strategy proposed (including the Output Definition and Performance Metrics paper for the PPP), and the Scheme cost estimate.

4.3.2 First VfM Test and PPP Procurement Assessment

Although considered informally in the previous phases, the first formal run of the PPP VfM Test (as required by paragraph 1.8 of the DoF PPP VfM Guidelines[4]) is undertaken in Phase 3 to confirm "whether, and in what form[5], a PPP arrangement has the potential to offer a value for money solution for procuring the project". This should build on the earlier, informal work on VfM such that a robust PPP strategy can be put forward to the Gate Review at the end of Phase 3.

4.4 Phase 5

4.4.1 The Shadow Bid

Phase 5A will include finalising the SBM for those elements of a PPP project to be included in the PPP contract.

4.4.2 Public Sector Benchmark

Phase 5A will also include preparing a Public Sector Benchmark (PSB) for the elements of a PPP project. The DoF Main PPP Guidelines (Section 2.7.2), stipulate that the PSB should be a comprehensive estimate of the cost (including risk valuations) of procuring those elements of the project that the private sector is to be invited to tender for in the PPP contract.

The PSB should be based on the whole life cost to the Sponsoring Agency of procuring (those elements of) the project using traditional procurement, and should include risks. The PSB should not include any costs (or risks) which will be borne directly by the Sponsoring Agency irrespective of the procurement method used, and which are therefore not part of the PPP contract.

4 More fully described in the Department of Finance's Technical Guidance Note: Assessment of Projects for Procurement as PPPs, November 2006

5 For example, Design Build and Maintain (DBM), Design Build Finance Operate and Maintain (DBFOM), etc.

All cost estimates for both the PPP and PSB alternatives shall be prepared in accordance with these guidelines, and all other applicable Government cost management guidelines.

The Sponsoring Agency will be responsible for ensuring all DoF requirements are fully adhered to in the preparation of the PSB.

4.4.3 Second VfM Test

The second formal PPP VfM Test (as required by paragraph 1.9 of the DoF PPP VfM Guidelines) is undertaken in Phase 5A to determine whether, in light of the quantifications in the PSB, the conclusion reached in the PPP Procurement Assessment undertaken in Phase 3 still holds.

4.4.4 Updating of VfM test

Throughout the remainder of Phase 5, the VfM test will be further updated as each subphase produces more precise information, as follows:

- Phase 5B VfM test 3A incorporates the firstround tender prices;
- Phase 5C VfM Test 3B incorporates the BaFO-round Tender prices, and comparison of highest ranked bidder with the PSB;
- Phase 5D VfM Test 4A incorporates the Finalised commercial terms.
- Phase 5E VfM Test 4B incorporates the Finalised PPP contract.

4.4.5 Non-PPP Elements

The estimates for the conventionally procured elements of a PPP project will be updated in Phase 5A alongside finalising the SBM for the PPP element, in order to develop Target Cost 3 (TC3).

5. Cost Estimation

Cost Estimation Requirements

The NTA requires its Partner organisations to develop, maintain, and implement a robust and comprehensive set of Cost Estimation procedures.

The Partner organisations' Cost Estimation procedures should comply with good practice and the DoF Capital Works Management Framework, **Guidance Note GN 1.3 Budget Development,** and cover:

- Establishing and maintaining the Project Budget;
- Providing for Risk and setting Contingencies;
- Providing for Inflation.

In order to be able to compare costs across projects, the NTA requires all cost estimates presented to the NTA by each Partner organisation to be based on a common approach and a standard overview cost breakdown including, but not limited to:

- Design costs showing external consultants and internal resources
  - Predesign/feasibility including planning, design, and environmental impact
  - Design for statutory procedures plus investigatory work
  - Detailed design for procurement
- Enabling works and other upfront contracts
- Tendering costs
- Construction and other main supply works costs
- Contract supervision construction management costs
- Land and property acquisition
- Communications Costs
- Risk, Contingency-Exceedances/reductions on tendered construction costs
- Project management-technical, financial, legal costs over all cycles

The NTA will work with each Partner organisation to develop the most appropriate cost breakdown structure to use for the standard overview for that Partner organisation.

The costs in each of the agreed summary cost headings shall be shown as both absolute amounts and, for the purpose of comparison with other projects, as percentages of the total project cost.

For any project funded by the NTA, the primary responsibility for cost estimation lies with the project's Partner organisation, and the NTA requires the Partner organisation to implement its own Cost Estimation procedures to estimate costs and build up a budget, and to comply with these and other NTA guidelines insofar as they provide guidance with respect to the estimation of costs.

The base cost will be derived from the best information available with respect to quantities and unit costs. Such information will be documented and verified to the extent that it can by peer review and other independent estimates.

The Project budget shall be built up from the base cost in accordance with these Guidelines and the Partner organisation's cost estimation procedures.

5.2 Good Practice Cost Estimation

5.2.1 Cost Estimation Process

The cost estimation process covers the early stages of the cost management process as shown in Figure 2.

As a project progresses, the certainty of cost estimates increases: scope can be more precisely defined, actual costs begin to replace estimated costs, market factors begin to materialise, and risk events either eventuate or fall by the wayside. Project cost estimation procedures should be designed to incorporate all such movements in cost, provide for appropriate documentation as an audit trail, and in conjunction with the risk management procedures, define how the risk funding and contingency should be modified as the level of certainty increases.

As each Project phase is completed, the certainty of the cost estimate will have increased and should reflect the level of design achieved and the most recently passed Gate.

The documentation required by the NTA at each Gate is set out in Section 3.2 of these Guidelines.

5.2.2 Budget Buildup

The Project Budget should be set at a level which includes the Base cost; plus sufficient funding to enable the Project to be completed in the event of a likely combination of the as known (subject to QRA) and unknown risks actually eventuating; and an allowance for inflation properly calculated in accordance with the projected expenditure profile and economic parameters.

The Project Budget should be made up of:

- **Base Cost** The standard direct cost to construct the works, based on applying unit rates and benchmarks within the cost breakdown structure, and including preliminaries, enabling works, temporary works, etc.;

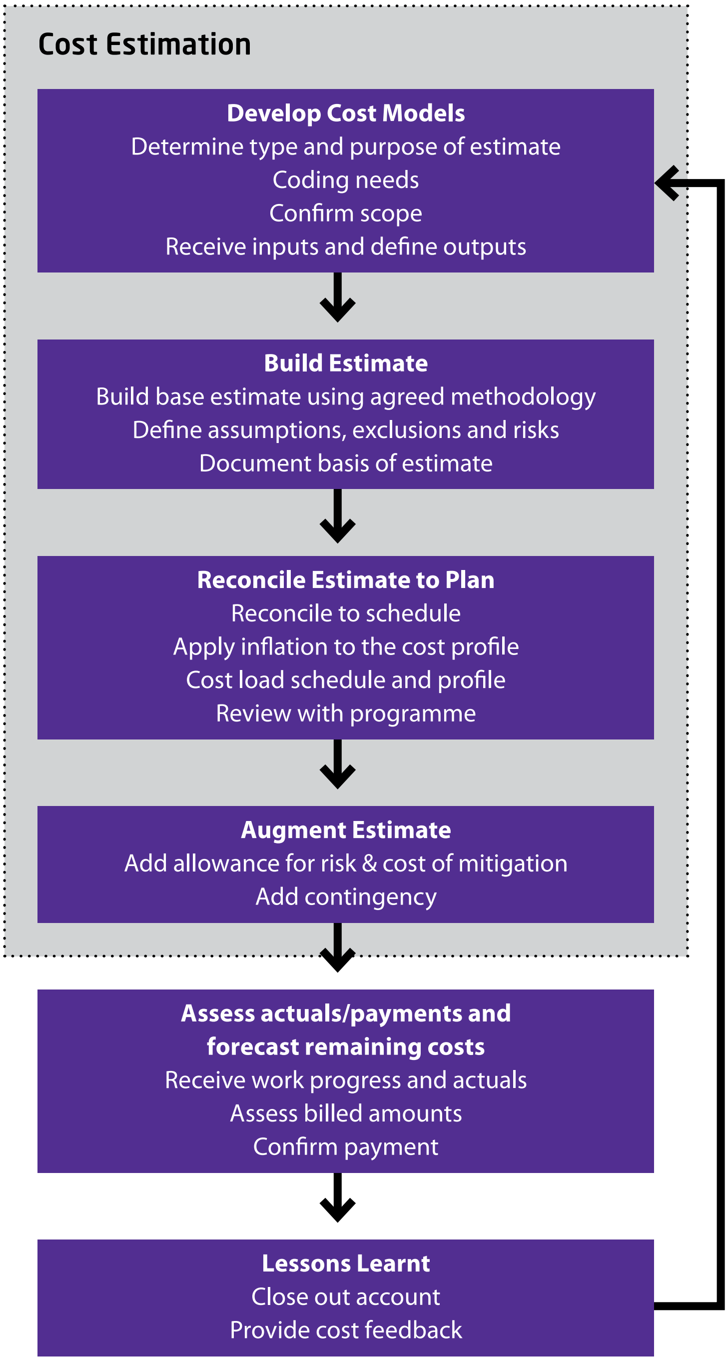
- **Project Specifics** identified factors that differentiate a project from a base build project to: typically logistical, location, phasing, etc. (the works that make a project unique) [This list is not definitive and does not represent all specifics, as they will depend on the projects];
- **Provisional Sums** Sums provided for work whether or not identified as being for defined or undefined work;
- **On-Costs** Development, investigations, design, and project management costs expended by the agencies in the delivery of a project;
- **Risk** risks identified prior to making commitment and the costs relating to solutions to mitigate, accept or transfer the risks, including the more nebulous issues such as price changes due to market factors;
- **Opportunities** a value for alternative methods that may create savings;
- **Contingency** It is also essential that rules are established for determining the appropriate levels of contingency to be set aside to cover unknown risks. [Note: Requirements for the use and management of contingency funds is covered in section 6.2].

When preparing estimates for main contract construction works which involve challenging or cutting edge technologies or engineering solutions (e.g. large cable stayed structures or long large bore tunnels), it is essential that sufficient research be carried out and data assembled to ensure that the estimate takes account of the most recent experiences in Ireland and beyond and where deemed appropriate, modern construction techniques.

Where VAT is included in a scheme cost estimate, the VAT rates applied must be identified within the cost estimate to help facilitate adjustment in the event of a change of the applicable rates.

Inflation must be allowed for using appropriate inflation indices to convert the expected expenditure in any future year to the prices of the year concerned (i.e. Nominal costs). The indices used must be in accordance with recognised practice and must be fully documented.

Figure 2: The Cost Estimation Process as Part of Cost Management



6. Risk Management

6.1 Risk Management Requirements

The NTA requires its Partner organisations to develop, maintain, and implement a robust and comprehensive set of Risk Management procedures.

The Partner organisations' Risk Management procedures should comply with good practice and the DoF Capital Works Management Framework, and should cover the identification, management, and resolution of all categories of risk throughout the life of a project including:

- Establishing project output, schedule, and cost objectives;
- Identifying risks to these objectives and a risk management strategy;
- Preparing and updating Risk Registers;
- Investigating and quantifying probability and extent of risk impact;
- Defining mitigation actions and owners;
- Determining and updating prudent post mitigation risk provisions in budgets;
- Prioritising risk management actions;
- Monitoring and reviewing the process.

For any project funded by the NTA, the primary responsibility for risk management lies with the project's Partner organisation, and the NTA requires the Partner organisation to implement its own Risk Management procedures including estimating the potential cost impacts of known risks and allowing for unknown risks with contingency provisions, and to comply with these and other NTA guidelines insofar as they provide guidance with respect to risk management.

The NTA particularly requires its Partners to initiate the quantitative assessment of risks as early as possible in the development of the Project.

Prior to going to tender, the Partner organisation shall, for each individual risk that is assessed as having significant impact and probability, undertake whatever tests and investigations are necessary and proportionate to reduce uncertainty or resolve the conditions generating the risk. Such information shall be fully documented and the paperwork provided to the bidders for the contract such that the amount of risk provision in the received bids is minimised. Where a Partner organisation chooses not to investigate such risks, it should keep records as to why that was considered prudent.

6.2 Good Practice Risk Management

6.2.1 Risk Management Overview

Risk can be defined as the possibility of an uncertain event or condition occurring which, if it occurs will have a discernable effect on one or more scheme objectives. A project risk if it occurred could manifest itself by impacting on either one or more of the various criteria by which project success is measured (i.e. cost, time, performance-functionality and/or quality)

Risk Management aims to:

- Provide a structured framework for Risk Management to occur;
- Identify risks;
- Assess the risks qualitatively and quantitatively; and
- Respond to the risks by either eliminating or mitigating and managing.

Risk Management procedures should define:

- Risk management strategy guidelines;
- When risk management should be applied on a phase by phase basis;
- How to apply these procedures;
- Who is involved; and
- The outputs expected.

The implementation of a risk management strategy and active management of project risk should:

- Minimise the impact of project risks on scheme objectives (e.g. on or below budget and on or ahead of programme);
- Maximise opportunities to improve the scheme objectives by reducing cost or programme;
- Facilitate long term project planning as opposed to crisis management;
- Facilitate the management of scheme contingency;
- Enable detailed forecasting of final outturn cost; and
- Facilitate the optimum transfer of risk through the main construction contract.

As schemes are developed through feasibility, design, statutory process and construction, risk items are identified and assessed and are either eliminated or managed and mitigated where possible. To be effective, these key tasks must be carried out in a systematic and structured manner. It is a continuous process throughout the development and implementation of a scheme and it is important that all parties to the process are kept fully aware of the need to develop optimum value for money solutions and to actively seek to eliminate or manage risks.

Risk will be identified and accounted for within project deliverables to varying degrees as the project moves through the various phases, with the stages of risk management being:

- Identification;
- Initial qualitative assessment ;
- Assessment of options for mitigation;
- QRA;
- Risk management;
- Identification of additional risks and QRA; and
- Risk reporting for lessons learnt.

In the context of improving value for money, it is important to recognise that some risks may constitute opportunities, rather than threats, in terms of achieving scheme objectives (e.g. an item which if it occurs will result in a cost or time saving). Such items should be identified and considered in accordance with the risk management procedures.

6.2.2 Cost/Schedule Risk Management Strategy

It is critical that adequate Scheme Contingency be allowed for within the scheme cost estimate to make provision for risks which could be encountered during the delivery of the project, but it must not be set at such a high level that it relieves the pressure to deliver economically. In order to ensure that this is the case and that risk management is approached in a systematic and structured manner, a (cost/schedule) Risk Management Strategy (RMS) must be prepared at the latest by the outset of Phase 3.

The RMS strategy will, typically, detail the following:

- (Cost/schedule) Risk Manager's details;
- Timetable for (cost/schedule) Risk Management Meetings and Workshops and the production of the Risk Register;
- Identification of key stakeholders who will input into (cost/schedule) Risk Management Process and the completion and maintenance of the (cost/schedule) Risk Register;
- Procedures for control and monitoring of risk (e.g. regularity of reviews of the (cost/schedule) Risk Register – strategic points – and feedback systems);
- Proposed methodologies for risk identification, analysis and quantification (e.g. software if applicable);
- Specific Triggers for the identification of risk (symptoms and/or warning signs);
- Requirements for identifying the need for further meetings and/or workshops during the delivery of the project in addition to those detailed in the RMS;
- (Cost/schedule) Risk Response Strategy How risks might be eliminated or mitigated and managed;
- Proposed format of(cost/schedule) Risk Register (must be prepared to accompany all scheme cost estimates produced by the Partner organisation);
- If appropriate, how risks are to be qualitatively assessed; and
- The proposed probability percentiles to be applied in reporting cost and schedule risk (typically P80).

The results of this work should be appended, in the form of a (cost/schedule) risk management report, to the Scheme cost estimate (TC1) at Phase 3, updated for subsequent estimates TC2 and TC3 if appropriate.

7. Change Control and Contingency Management

7.1 Change Control And Contingency Management Requirements

The NTA requires its Partner organisations to develop, maintain, and implement a robust and comprehensive set of Change Control procedures for use in controlling the project scope, in the effective management of claims, and the drawdown of risk and contingency provisions in project budgets.

The Partner organisations' Change Control procedures should comply with good practice and the DoF Capital Works Management Framework, **Guidance Note GN 2.2** *Planning and Control of Capital Costs***,** and cover:

- Change management; and
- Recording of change.

For any project funded by the NTA, the primary responsibility for change control lies with the project's Partner organisation, and the NTA requires the Partner organisation to implement its own Change Control procedures to estimate the cost of a change, and to comply with these and other NTA guidelines insofar as they provide guidance with respect to change control and the management of claims.

Material change (as defined by the thresholds in the PMGs) to the scope, cost, and/or schedule is subject to NTA approval. In the event that a change (or the cumulative effect of a number of minor changes) merits a revision to the previously approved scheme cost estimate, the proposed amendment must be provided to the NTA for direction and/or approval to revise the scheme cost estimate. The NTA shall consider the matter and shall either approve the revision or alternatively, if deemed necessary, shall issue such guidance as to the effect of the change on the progress of the scheme and/or how the change is to be dealt with.

Updated scheme cost estimates issued to the NTA for approval must contain a reconciliation with the superseded estimate clearly illustrating where significant changes (or bundles of more minor changes that can be considered together) have been incorporated into the revised estimate.

Throughout the project, the expenditure or drawdown of the total contingency should be measured against the initial contingency forecast. If, at any point, the current cost estimate plus the estimate of contingency required to completion becomes greater than the approved budget, and the design team is unable to find compensating savings in other firmer cost areas, the NTA must be notified and a way forward discussed through the regular engagement processes defined in the PMGs.

7.2 Good Practice Change Control

7.2.1 Overview of Change Control and Major Projects

Project cost estimates and schedules should be reviewed periodically to ensure that:

- All information available at the time of the review has been included;
- The estimates continue to reflect the current status of the project; and
- The Project schedule and Target Cost are still attainable.

Where any change or issue with a cost impact occurs, irrespective of its value, the current approved scheme cost estimate should be reviewed to ensure that the cost associated with the change can be absorbed by the appropriate risk provision within the approved scheme cost estimate without meriting a revision of the estimate. Change management procedures should contain a strategy for dealing with these matters in a structured and controlled fashion.

The causes of change pre and post the commencement of the main construction contract will be different reflecting the risk transfer inherent in the contract award.

The project risk register must be maintained and updated through all phases of the scheme and should take account of any changes whether or not meriting revisions to the scheme cost estimate.

It should be noted that change can also result in reduced costs (e.g. reduced scope or value engineering impacts), in which case a downward adjustment of the scheme cost estimate or target cost should be made.

7.2.2 Pre-Construction

Every effort should be made to identify and implement measures which will minimise change during the development of the scheme to contract award, and on to closeout. Strict compliance with the change approval procedure is a key measure in this regard.

Other measures that should be considered include:

- Considering targeted concentration of resources on problem areas – deep investigation of high risk areas;
- Increasing the scope of advance works contracts to improve the initial efficiency of the main construction contract and where appropriate deal with high risk items; and
- Ensuring the scheme cost estimates and the project risk register each take full account of current information.

In updating the PEP prior to the start of Phase 6, a postcontract change management plan should be included to give practical guidance to those involved in the supervision of the works and integrate the requirements of the Change control procedures with the requirements of the main construction contract.

7.2.3 PostContract Claims and Variations to Final Account

All changes through the construction phase and on to closeout should be monitored and subject to approval of change requests.

Monitoring issues which arise postcontract and reconciliation of these with the risk register is particularly important in terms of managing Contractor claims for additional payment. Periodic (at least quarterly) reviews, including recalculation of the Quantitative Risk Analysis if appropriate, should be carried out throughout the construction phase.

Good practice change management requires that the anticipation and where possible the prevention or at least mitigation of any issues likely to have material impact on the project scope, cost or schedule. These should be brought to the attention of the Sanctioning Authority in accordance with established change management procedures.

Any formal communications and/or agreements made with the Contractor during the course of the works which materially impacts on risk should be reflected in the risk register. Those items included within the risk register in relation to the main construction account should when considered with the current valuation of the works including variations and claims enable the projection of the final outturn of the main construction contract account at any time during the construction of the works.

Risk identification postcontract (during the construction and closeout phases) should include study of available documentation including the Contractor's applications for payment, correspondence and minutes of meetings to ensure that the risk register comprises a true and comprehensive representation of the risks facing the Employer during and after the completion of the works.

7.2.4 Management of Risk and Contingency Provisions

Good practice calls for proposed changes (or bundles of more minor changes that can be considered together) which materially impact on cost or risk to be allocated to a specific risk or contingency provision and, when a change is approved, for the costs associated with the change to be drawn down from that risk provision and the cost estimate adjusted accordingly.

In the event that the project specific risk provisions or a particular cost heading or aspect of the works such as 'potential for enhanced finish to structures' are exceeded, it is accepted that contingency may be transferred from one aspect to another where the occurrence of change and the resulting cost has not materialised to the same level as provided for. In such circumstances, care should be taken to ensure that this is in fact the case and supporting calculations and documentation should be maintained to substantiate any such decision if called upon to do so. Contingency should not be transferred from one cost heading to another without due consideration and the proper authority as set out in the Partner organisation's procedures.

As the scheme develops and progresses through the Phases, the level of information in relation to scheme specifics will increase. Generally this increase in the level of information should lead to a corresponding increase in the degree of cost certainty attainable in relation to the accuracy of the scheme cost estimate. This will typically be manifested in a move from elemental estimating to more unit cost estimating coupled with a decrease in the level of the scheme contingency particularly in relation to the scheme specific risk provision as risk items are either eliminated or become works activities. Whilst this process will be ongoing during the delivery of a scheme, it is recommended that the scheme specific risk provision only be revised if appropriate at specific key points.

Appendix 1: The Cost Management Process

The three flowcharts presented here demonstrate the use of good practice cost management principles in pre-defining the steps involved in determining, monitoring, and controlling a complex organisation's Project costs, allocating responsibilities between the various stakeholders, and defining the necessary flow of information between them.

This particular process chart utilises the three headings of:

- Budget verification;
- Cost alignment; and
- Cost control

Budget verification

Step	Action	Responsibility							Record
		Project Manager	Risk Management / Value Management / Quality Management	Design Management & Work Package Management	Cost Manager/ Budget Manager	Client Support (Finance & Business)	Client Senior Management	Client Organisation and Governance	
A1	Identify all of the financial constraints								Contemporary Record
A2	Review capital budgets prepared by the relevant business unit.								
A3	Review the assumptions made in the preparation of the Business Case and update								Assumptions Register
A4	Review project objectives in terms of time, cost and quality in order to understand project drivers and to assist in the budget verification process.								
A5	Identify the risks that could possibly lead to cost overruns.								Risk Register
A6	Produce the Project Brief specifying the relevant constraints and indicate how these must be managed in terms of time, cost and quality.								Project Brief
A7	Confirm the project scope (Project Manager) and produce WBS (Project Controls Manager).								Scoping Document
A8	Price the brief – estimate the cost of the new infrastructure at a WBS level 1 to support client Finance, cost structures and Business Planning.								Draft Priced Estimate Compliant with finance and cost structure requirements
A9	Benchmark and compare								
A10	Allocate the Overall Budget into a Cost Breakdown Structure that is aligned with the project Work Breakdown Structure.								Budget Estimate
A11	Evaluate the benefit of the new project relative to the overall business objectives								
A12	Compare the estimated cost of the options with the business case to test affordability to confirm that the equation balances.								
A13	Review whether solution is affordable or requires further a re evaluation		Solution not affordable						
A14	END	Solution affordable							Confirmed Budget Allowance

Cost alignment

Step	Action	Responsibility							Record
		Project Manager	Risk Management / Value Management / Quality Management	Design Management & Work Package Management	Cost Manager/ Budget Manager	Client Support (Finance & Business)	Client Senior Management	Client Organisation and Governance	
A1	**Cost Estimation**								
A2	Preparation of Cost Estimates.								
A3	**Cost Alignment**								
A4	Establishment and review of Design Contingencies.								
A5	Ensure the design is developed within the context of achieving the Brief requirements.								
A6	Limit the value of individual variations without prior approval from the Project Manager								
A7	Monitor the total value of variations against the anticipated draw down of contingencies.								
A8	Identify compensating savings to counterbalance the effect of variations.								
A9	Review Change Control procedures in accordance with the contract and impact on Construction	PP01							
A10	END								

Cost control

Step	Action	Responsibility							Record
		Project Manager	Risk Management / Value Management / Quality Management	Design Management & Work Package Management	Cost Manager/ Budget Manager	Client Support (Finance & Business)	Client Senior Management	Client Organisation and Governance	
A1	**Cost Control**								
A2	Formulation of an appropriate procurement strategy (Procurement Manager).								
A3	Continued cost checking of design								
A4	Ensure risk management and mitigation activities are undertaken and monitored.								
A5	Implement a robust change control procedure.								
A6	**Contingency Management**								
A7	Identify the Risks								
A8	Assess the correct level of contingency								
A9	Manage the contingency draw down								
A10	**Cash Flow Forecasting**								
A11	Identify the value of works expected to be carried out at given points in time.								
A12	Identify short term and long term cash flow requirements								
A13	Present cash flow forecasts to Client in form of line charts or histograms.								Cash flow Forecast
A14	**Cost Reporting**								
A15	Provide period cost reports that align with client requirements								
A16	**Claims**								
A17	Anticipate problems and effect actions to prevent claims arising.								
A18	Investigate claims thoroughly to ensure they are in accordance with the contract.								
A19	Challenge Claim								
A20	**Interim and Final Accounts**								
A21	Review change control register and audit outputs.								Final Account
A22	END								

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