

# Project Appraisal Guidelines

## Unit 2.0 Project Management

February 2011

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## 1 Introduction

- 1.1. This PAG Unit introduces the key organisations and people in the appraisal process and sets out their role in overall project planning in accordance with the Project Management Guidelines.

## 2. Key Roles in the Appraisal Process

- 2.1. The key organisations and people in the appraisal process for Major Projects are:
- The **National Roads Authority (NRA)**, the overseeing organisation for all National Road schemes. The NRA is generally the *Sanctioning Authority* although in select cases (for example PPP schemes) the NRA may function as both the *Sponsoring Agency* and the *Sanctioning Authority*; and
  - The **Design Office (DO)**, the organisation managing the various phases of the scheme preparation and supervision of construction – generally a Regional Design Office or Local Authority.
- 2.2. The Design Office typically is the *Sponsoring Agency* and will comprise of the following:
- **Design Office Project Manager (DOPM)** – the person within the Design Office responsible for ensuring the progression of a scheme in accordance with policy and procedures;
  - **Design Team (DT)** – the group undertaking the various phases of scheme preparation on behalf of the Design Office. This may be a team within the Design Office, the Local Authority Road Design Team or an external consultant;
  - **Design Team Leader (DTL)** – the person in the design team responsible for managing the scheme design;
  - **Appraisal Team (AT)** – the group undertaking the project appraisal, including any traffic modelling. This may be a team within the Design Office, the Local Authority Road Design Team or an external consultant. Within this team there will be persons with specific responsibilities for undertaking Cost Benefit Analysis (CBA);
  - **Appraisal Team Leader (ATL)** – person leading the appraisal team and responsible for managing the appraisal process; and
  - **Project Steering Group (PSG)** – responsible for overseeing the project and containing representatives of the NRA and the Design Office.

## 3. Appraisal Deliverables

- 3.1. The set of deliverables required from the appraisal process is influenced by requirements from the NRA and the Department of Transport, alongside those set out by the Department of Finance. Within the context of transportation projects, for which the NRA is the Sanctioning Authority, the appraisal process includes a number of defined deliverables that are required at various stages, and to varying levels of detail, as the scheme progresses. For Major Projects, these deliverables are:

- Project Brief (PB);
  - Traffic Modelling Report (TMR);
  - Cost Benefit Analysis (CBA);
  - Project Appraisal Balance Sheet (PABS);
  - Business Case (BC); and
  - Post Project Review (PPR).
- 3.2. The **Project Brief (PB)** identifies the need for the scheme and sets out the project objectives. It also considers the existing, and likely future, problems and reports on the options that have been considered. It also provides a history of the development of the project.
- 3.3. The **Transport Modelling Report (TMR)** describes what techniques have been used to model the situation, both existing and in the future, and what the forecasted impact of the scheme is.
- 3.4. The **Cost Benefit Analysis (CBA)** report provides an economic assessment of the costs and benefits of the scheme in order to determine if the scheme is economically worthwhile. All of the impacts of the scheme which can be given a monetary value are included in this assessment.
- 3.5. The **Project Appraisal Balance Sheet (PABS)** reports on all of the impacts of the scheme under the Government's five criteria as described earlier. It contains a mixture of quantitative indicators and qualitative statements and provides a concise summary of all of the aspects and impacts of the scheme. It is a key document for decision makers and is to be used to select between route options.
- 3.6. The **Business Case (BC)** brings together the PB, CBA and PABS to form a complete statement documenting the rationale behind, and justification for the project. It is the document that enables the Sponsoring Agency to bring together all of the evidence to support their contention that the scheme should be implemented. It will be the Business Case that the Sanctioning Authority will base its decision upon and it must therefore provide a complete picture of all of the arguments for, and impacts of, the scheme in question.
- 3.7. The purpose of the **Post Project Review (PPR)** is to determine whether:
- The basis on which a project was undertaken proved correct;
  - The expected benefits and outcomes materialised;
  - The planned outcomes were the appropriate responses to actual public needs;
  - The appraisal and management procedures adopted were satisfactory; and
  - If conclusions can be drawn applicable to other projects, to the ongoing use of the asset, or to associated policies.
- 3.8. These appraisal deliverables are required to be prepared, or reviewed, at various stages throughout the life of a Major Project as illustrated in Table 2.1:

Table 2.1: Appraisal Deliverables for Major Projects by Project Phase

Phase	Deliverable					
	PB	TMR	CBA	PABS	BC	PPR
Scheme Concept & Feasibility Studies	Y	Y <sup>(1)</sup>				
Route Selection	Y	Y	Y	Y	Y <sup>(2)</sup>	
Design	Y	Y	Y	Y	Y	
Advance Works & Construction Documents Preparation, Tender & Award	Y	Y	Y	Y	Y	
Construction & Implementation						
Handover, Review & Closeout			Y <sup>(3)</sup>			Y

Note: (1) For Major Schemes. (2) Preliminary Business Case for preferred option required at this stage. (3) CBAs are required on a sample of schemes at this project phase [the NRA should be contacted in advance of this phase to determine whether a CBA is required for the scheme in question].

- 3.9. Further information on reporting requirements is outlined in *PAG Unit 5.6: Reporting*.
- 3.10. The flow chart in Figure 2.1 illustrates when the various deliverables (indicated by underlining) are required in relation to the scheme stage.
- 3.11. In certain cases the project delivery structure may vary from that outlined above. In such cases the roles and duties of the various parties shall be interpreted accordingly. In such cases agreement should be reached in advance with the NRA as to the roles and duties of all parties involved in the appraisal / evaluation process.

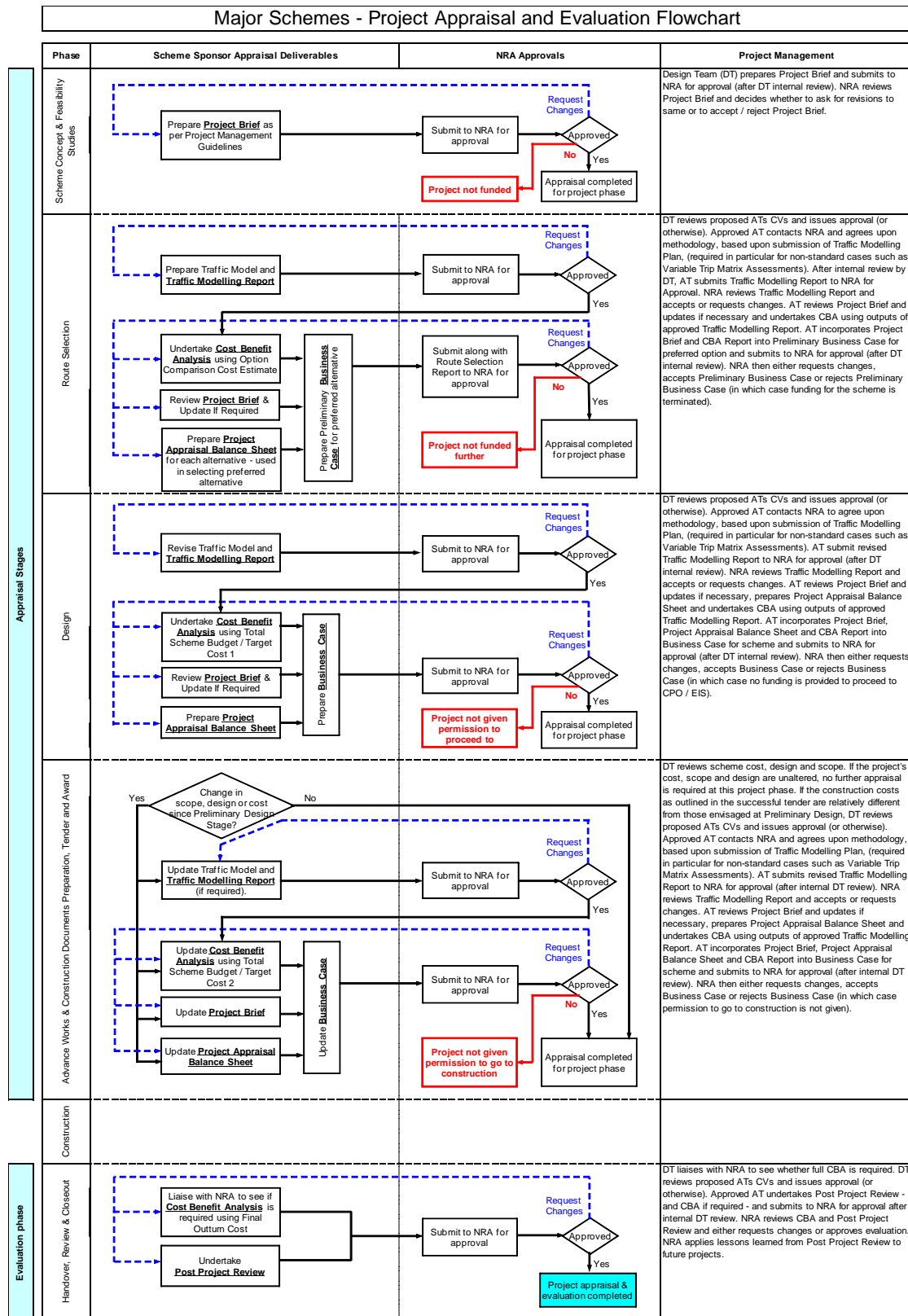


Figure 2.1: Major Schemes – Project Appraisal and Evaluation Flowchart

#### **4. Purpose of Appraisal Deliverables**

- 4.1. The purpose of each deliverable is described below under separate headings for each project phase as defined in the Project Management Guidelines.

##### *Phase 1 Scheme Concept & Feasibility Studies*

- 4.2. The Project Brief should set out the rationale for the project in a clear and concise manner so that the reader can understand why the project is being proposed, what objectives it is seeking to achieve and what other options have been considered with reference to Government policy.
- 4.3. The Project Brief should be submitted to the NRA prior to requesting funding for scheme development and will be used by the NRA to determine whether to grant funding for same.
- 4.4. Any traffic models and/or cost benefit analyses undertaken as part of the feasibility studies should also be reported as a Traffic Modelling Report and Cost Benefit Analysis.

##### *Phase 2 Route Selection*

- 4.5. The Project Brief should be reviewed at this stage and updated to reflect the history of the project and provide further detail on objectives where possible.
- 4.6. The Traffic Modelling Report should document all of the transport modelling work that has been undertaken, including associated data collection, and compare the route options in terms of network performance. The report should provide evidence that it is fit for this purpose.
- 4.7. The Cost Benefit Analysis should present the economic efficiency of the various scheme options based upon Option Comparison Cost estimates.
- 4.8. The Project Appraisal Balance Sheet should be used at this stage to select between possible route options, with scheme impacts classed under the 5 criteria of economy, environment, accessibility & social inclusion, integration and safety.
- 4.9. A Preliminary Business Case will bring the Project Brief, Traffic Modelling Report, Project Appraisal Balance Sheet and Costs Benefit Analysis together with any other information that the sponsoring agency feels is pertinent in terms of making the case for the preferred option.
- 4.10. The Preliminary Business Case should be submitted to the NRA for approval in advance of the formal adoption of the preferred option and will also be used by the NRA to determine whether the scheme should be progressed to preliminary design / land acquisition stage.

*Phase 3 Design*

- 4.11. The Project Brief should be reviewed and updated to reflect the history of the project and should provide firm objectives for the scheme.
- 4.12. The Traffic Modelling Report should be updated if any refinement of the modelling work has been undertaken since route selection to enable more detailed impacts of the scheme to be assessed. The results of the model will be a key input to the design of the scheme at this stage, as well as providing the base data for the economic and environmental assessments. It must therefore be shown to be sufficiently robust for this task.
- 4.13. The Cost Benefit Analysis should present the economic efficiency of the scheme based upon separate Total Scheme Budget and Target Cost 1 scenarios. Separate CBA runs should be provided for 'high', 'medium' and 'low' traffic growth scenarios.
- 4.14. The Project Appraisal Balance Sheet should again summarise the impacts of the scheme against the Government's five criteria of economy, environment, accessibility & social inclusion, integration and safety.
- 4.15. The Business Case should bring together the PB, TMR, CBA, and PABS into a cohesive, structured argument supporting the development of the scheme. The Business Case should be submitted to the NRA for approval prior to seeking NRA's permission to proceed to purchasing the land required for the scheme.

*Phase 5 Advance Works & Construction Documents Preparation, Tender & Award*

- 4.16. Documentation at this stage should be based upon the costs outlined in the successful tender. This will necessitate updates to the CBA, PABS and BC and there may also be updates required to the PB. It is unlikely that the TMR will change at this stage (unless there have been changes to the scope of the project since the preliminary design phase).
- 4.17. The Cost Benefit Analysis should present the economic efficiency of the scheme based upon separate Total Scheme Budget and Target Cost 2 scenarios. Separate CBA runs should be provided for 'high', 'medium' and 'low' traffic growth scenarios.
- 4.18. The Business Case should be submitted to the NRA for approval prior to seeking formal NRA approval for contract award.

*Phase 7 Handover, Review & Closeout*

- 4.19. CBAs are required for a sample of schemes at this phase. The Design Team should liaise with the NRA at this stage to determine whether a closeout CBA is required for their particular scheme. Post Project Reviews are required for all Major Projects at this project phase.



**5. Production of the Deliverables**

5.1. The production of the deliverables requires a number of stages of approval by the Strategic Planning Unit. These requirements are as follows:.

*Phase 1 Scheme Concept & Feasibility Studies*

5.2. The Design Team prepares the Project Brief and submits to the NRA for approval (after Design Team internal review). The NRA reviews the Project Brief and decides whether to ask for revisions to same or to accept / reject the Project Brief. If the brief is accepted, the project may then be given approval to go to the next phase.

*Phase 2 Route Selection*

5.3. The Design Team reviews the Appraisal Team CVs and approves or otherwise.

5.4. The approved Appraisal Team provides the NRA with a Traffic Modelling Plan (TMP) that outlines the proposed modelling methodology and any data collection that will be undertaken. The required content of the TMP is outlined in *PAG Unit 5.6: Reporting*.

5.5. The NRA approves or otherwise the TMP. If approved the Appraisal Team can progress with developing the base year and forecast year traffic models.

5.6. After an internal review by the Design Team, the Appraisal Team submits a Traffic Modelling Report (TMR) to the NRA for approval. The contents of the TMR are discussed in *PAG Unit 5.6: Reporting*. At this stage, the NRA reviews the TMR and either accepts it or requests changes.

5.7. The Appraisal Team reviews the Project Brief and updates it if necessary and undertakes the CBA using the outputs of the approved TMR.



Figure 2.2 Route Selection

5.8. At route selection, the option comparison cost estimate, agreed with the NRA Cost Estimation Unit, should be used in the derivation of the scheme costs (refer to *PAG Unit 6.7: Preparation of Scheme Costs* for further guidance).

5.9. The Appraisal Team prepares the Project Appraisal Balance Sheet (PABS) for each option to use in the selection of the preferred option. The content of the PABS is set out in *PAG Unit 7.0: Project Appraisal Balance Sheet*.

5.10. The Appraisal Team incorporates the Project Brief, PABS and the CBA Report into a Preliminary Business Case for the preferred option and submits it to the NRA for

approval (after Design Team internal review) prior to seeking NRA acceptance of the preferred option.

- 5.11. The NRA then requests changes, accepts or rejects the Preliminary Business Case (in which case project is not approved to go to next stage).

*Phase 3 Design*

- 5.12. The Design Team reviews the Appraisal Team CVs and approves or otherwise.

- 5.13. The Appraisal Team provides the NRA with a Traffic Modelling Plan (TMP) that outlines the proposed methodology and any data collection that will be undertaken – if different from the previous phase. The NRA approves (or otherwise) the TMP. If approved, the Appraisal Team can progress with developing the base year and the forecast year traffic models.

- 5.14. After an internal review by the Design Team, the Appraisal Team submits a Traffic Modelling Report (TMR) to the NRA for approval, following which the NRA reviews the TMR and either accepts it or requests changes.

- 5.15. The Appraisal Team reviews the Project Brief and updates it if necessary, prepares the Project Appraisal Balance Sheet (PABS) and then undertakes the CBA using the outputs of the approved TMR.

- 5.16. At preliminary design stage the CBA should be run both on the basis of Target Cost 1 figures and again on the basis of Total Scheme Budget figures (agreed with the NRA’s Cost Estimation Unit, see *PAG Unit 6.7: Preparation of Scheme Costs* for further instructions). At minimum, each cost figure (Target Cost 1 and Total Scheme Budget) should be run against ‘high’, ‘medium’ and ‘low’ traffic growth projections, yielding a minimum of six scenarios.

- 5.17. The Appraisal Team incorporates the Project Brief, the PABS and the CBA Report into a Business Case (BC) for the scheme and submits it to NRA for approval (after Design Team internal review) prior to seeking NRA approval to purchase any land required for the scheme (e.g. go to CPO).

- 5.18. The NRA then either requests changes, accepts the BC, or rejects the BC (in which case project is not approved to go to next stage).



Figure 2.3 Design

*Phase 5 Advance Works & Construction Documents Preparation, Tender and Award*

- 5.19. The Design Team reviews the scheme’s cost, design and scope. If the project's cost, scope and design are unaltered from preliminary design phase, no further appraisal is required at this project phase.
- 5.20. If the cost, scope or design of the scheme has changed since the preliminary design CBA was completed, the approved Appraisal Team contacts the NRA and agrees upon a revised Traffic Modelling Plan.
- 5.21. If appropriate, the Appraisal Team submits the revised Traffic Modelling Report (TMR) to the NRA for approval (after internal Design Team review). The NRA reviews the TMR and either accepts it or requests changes.
- 5.22. The Appraisal Team reviews the Project Brief and updates it if necessary, prepares the Project Appraisal Balance Sheet (PABS) and undertakes the CBA using outputs of the approved TMR.
- 5.23. The CBA should be run with ‘high’, medium’ and ‘low’ traffic growth scenarios with Target Cost 2 and Total Scheme Budget cost estimates (refer to *PAG Unit 6.7: Preparation of Scheme Costs* for more details).
- 5.24. The Appraisal Team incorporates the Project Brief, the PABS and the CBA Report into a final Business Case for scheme and submits it to the NRA for approval (after internal Design Team review) prior to seeking NRA permission to award the main construction contract.
- 5.25. The NRA then requests changes, accepts or rejects the final Business Case.



*Figure 2.4 Advance Works & Construction Documents Preparation, Tender and Award*

*Phase 7 Handover, Review & Closeout*

- 5.26. The Design Team liaises with the NRA to see whether a full CBA is required.
- 5.27. The approved Appraisal Team undertakes the Post Project Review (PPR) - and CBA if required - and submits it to NRA for approval after an internal review by the Design Team.
- 5.28. At this stage of appraisal, the final outturn cost should be used in the derivation of scheme costs.
- 5.29. The NRA reviews the CBA and the PPR and either requests changes or approves the evaluation.
- 5.30. The NRA applies lessons learned from PPR to the evaluation / management of future projects.



*Figure 2.5 Handover, Review & Closeout*

**6. Responsibilities**

- 6.1. A good understanding of the key responsibilities of each organisation with regards the appraisal of national road schemes is important for all involved. The key responsibilities of each organisation in the appraisal process are defined below:

*National Roads Authority (NRA)*

- The provision and maintenance of the Appraisal Guidelines and updating of associated documentation, for example the technical appendices;
- Provision of advice / support on all appraisal-related matters to Design Teams and Appraisal Teams;
- Approval of the Project Brief;
- Approval of the Traffic Modelling Plan;
- Approval of the Traffic Modelling Report;
- Approval of the Business Case (including CBA Report, Project Appraisal Balance Sheet and Project Brief);
- Advises the Design Team on the need to undertake a CBA at Handover, Review & Closeout;
- Approval of Post Project Review; and
- External audit of appraisal deliverables.

*Design Office Project Manager*

- Overall management of appraisal process;
- Approval of Appraisal Team; and
- Overseeing the internal audit of all appraisal deliverables.

### *Design Team*

- Provision of all inputs/information as required by the Appraisal Team;
- Preparation and internal review of the Project Brief at Overall Project Planning Phase;
- Internal review of the Traffic Modelling Plan;
- Internal review of the Traffic Modelling Report;
- Internal review of the Business Case, CBA Report and Project Appraisal Balance Sheet;
- Review of scheme cost, design and scope at Advance Works & Construction Documents Preparation, Tender & Award phase; and
- Liaison with NRA at Handover, Review & Closeout to establish whether full CBA is required.

### *Appraisal Team*

- Updating of the Project Brief;
- Preparation of the Traffic Modelling Plan;
- Preparation of the Traffic Modelling Report;
- Preparation of the CBA Report;
- Preparation of the Project Appraisal Balance Sheet;
- Preparation of the Business Case; and
- Undertakes Post Project Review.

## **7. Staff Requirements**

- 7.1. Persons involved in the appraisal process must have had some prior experience or have attended an approved formal training course on either project appraisal or CBA. This holds true for both members of the Appraisal Team and for the person responsible for reviewing the appraisal work in the Design Offices.
- 7.2. For Major Projects, the Appraisal Team comprises an Appraisal Team Leader and Appraisal Team Members. The required experience within the Appraisal Team and the Design Office is defined below. Note that the requirements for the Appraisal Team are relevant regardless of whether the team is drawn from the Design Office, or employed as an external consultant.
- 7.3. Appraisal Team Leader: The Appraisal Team Leader must be able to demonstrate knowledge of the appraisal process, including the use of analysis programmes used in traffic modelling and economic assessment. The Team Leader must have been on an approved training course and have detailed experience of appraisal on at least three road projects.
- 7.4. Appraisal Team Member: The Appraisal Team Member must have been on an approved training course or seminar and/or have practical experience in undertaking appraisal. At least one Appraisal Team Member should be included on each Appraisal Team.

**8. Appraisal Team**

- 8.1. The Appraisal Team is to be approved by the DOPM in advance of any phase of the appraisal work commencing.

**9. Audit Process**

- 9.1. During the overall project process there are two levels of audit: internal and external. Both internal and external audits take place at all phases of the appraisal work relating to traffic modelling, CBA, Project Appraisal Balance Sheet, Business Case and Post Project Reviews. Specific auditing requirements relating to these can be found in the relevant chapters.
- 9.2. Internal audits are undertaken by the DOPM and supported by the Appraisal Team. They comprise reviews of the approach and methodology, or any assumptions made in the appraisal work, including any relevant deviations from the appraisal guidelines. The external audit consists of a detailed review and is to be undertaken by either the NRA or an NRA appointed consultant.
- 9.3. Note that in all cases it is the responsibility of the DOPM to ensure that all appraisal deliverables prepared for the scheme are robust and reflect the scheme in the most appropriate manner. It is for this reason that internal reviews are required at all Phases by the DOPM.