Ex post evaluation of cohesion policy programmes 2000-2006

Work Package 10:
"Efficiency: Unit costs of major projects"

Inception Report

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frontier economics

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1 Introduction

1.0.1 This is the inception report for the Ex post evaluation of cohesion policy programmes 2000-2006, Work Package 10: "Efficiency: Unit costs of major projects" submitted by RGL Forensic Accountants and Consultants in association with Frontier Economics and Faber Maunsell.

1.0.2 The purpose of this inception report is to provide details of how we propose to carry out the project including the proposed methodology, the project team and timetable.

1.0.3 The report is set out as follows:

- Section 2 provides an overview of the overall aim and objectives of the project.
- Section 3 sets out the proposed methodology for undertaking the project.
- Section 4 provides details of the Project team, its organisation and also the timetable for the project.
- Annex A sets out the proposed bibliography for the literature review.
- Annex B sets out the draft Project templates used for gathering data.
- Annex C lists the sample projects to be investigated.

2 Overall aim and objectives

2.1 Introduction

2.1.1 This project is part of a wider ex post evaluation of the cohesion policy programmes 2000-2006 co-financed by the ERDF. The overall evaluation programme consists of 11 'work packages', of which this is Work Package 10: Efficiency – Unit costs of major projects.[1]

2.1.2 This wider context into which the project fits has a number of important implications when planning and carrying out this project:

- The overall aims and objectives of the wider evaluation programme need to be taken into account;
- The project should make full use of any other relevant outputs from the other work packages (if available); and
- The outputs of the project should, where appropriate, be able to be used alongside the output from other work packages.

2.1.3 We note that Work Package 1 of the evaluation programme, Coordination Analysis and Synthesis, is already underway and we expect to liaise closely with that Project Team, and in particular with the team members who are responsible for monitoring this Work Package (Josef Poeschl (wiiw) and Michael Lacave (University of Montpelier)) in order to ensure that the project best fits into the overall programme and where appropriate activities are co-ordinated. We have included in our budget time and expenses for meeting with the team for Work Package 1.

2.1.4 As indicated in the terms of reference the project has a number of objectives which can be summarised as follows:

- To prepare a database of large infrastructure project unit costs for use in the current evaluation of EC-funded infrastructure projects, and in future project planning, appraisal and evaluation.
- Review costs and completion times for the sampled projects.
- Consider the role of ex ante risk assessment in future CBA.
- Assess the estimated and unit costs of jobs created in a sample of ERDF co-financed 'productive investments'.
- Prepare a spreadsheet tool for use by the Commission in future appraisal and evaluation of infrastructure and productive investments.

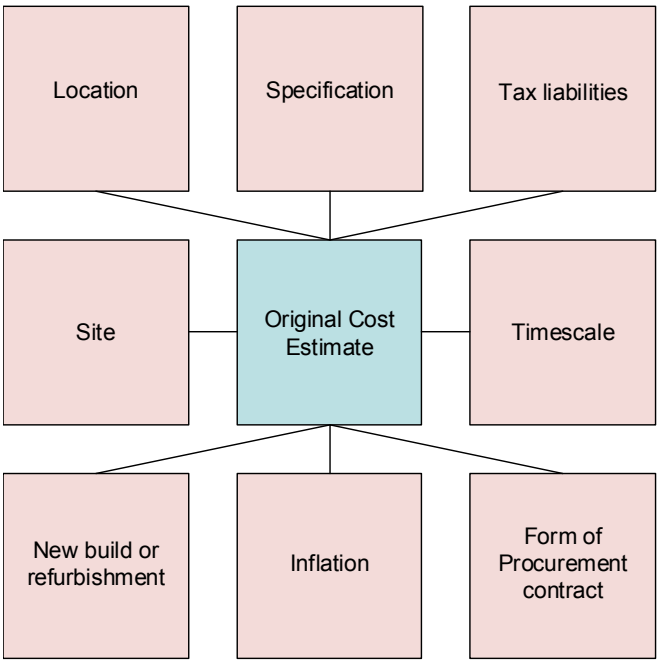
2.1.5 The remainder of this section sets out some of the key issues we expect to encounter in undertaking this study.

2.2 Unit infrastructure costs in future project planning, appraisal and evaluation

2.2.1 Infrastructure costs can vary from project to project for many reasons. A useful framework for considering costs is provided by the Commission's guide: "Understanding and Monitoring the Cost-Determining Factors of Infrastructure Projects", which sets out the following key determinants of cost, as shown in Figure 1 below.

[1] The term "major projects" is defined in Regulation EC 1260/1999.

Figure 1 Key Determinants of Cost



Source: Understanding and Monitoring the Cost-Determining Factors of Infrastructure Projects", European Commission April 1998

2.2.2 Given the inevitable variation in unit costs between projects, it is clear that benchmark costs in project appraisal and evaluation need to be used with caution. Even where two projects share the same physical characteristics (for example, a rural rail line), there are potentially a large number of other factors that can account for very large variations in cost, such as differences in land prices, tax regimes, construction timetables, and so on. For this reason, it is important to assess costs and time schedules with a "value range" framework consisting of lower and upper bound estimates of unit costs and completion times.

2.2.3 However, information on unit costs can play a very useful role in project appraisal and evaluation, including sensitivity analysis.

2.3 Benchmark unit costs in project appraisal

2.3.1 Because of the need to take into account project-specific variables when estimating costs, benchmark costs are, on their own, unlikely to form the basis of reliable future project cost estimates. They can, however, provide a very useful check of whether estimated costs are within an expected value range. Future project proposals that contain estimated costs that fall outside a range (above or below) of plausible benchmark costs may provide an early indication that the project is an "outlier" compared with a sample of similar projects. The reason might, for example, be poor planning or over-design. Such a check could trigger additional reviews by the Commission of project specifications or calls for further project due diligence.

2.3.2 Our approach will aim to develop a reliable benchmarking framework for application to individual infrastructure projects. The objective will be to establish a methodology to build benchmark costs that are directly related to the key cost determinants. For example, our review of each project will identify relevant scoring values for a set of factors which can influence unit

costs, such as those shown in Figure 1. This will allow our statistical analysis to, as far as possible, be used to provide meaningful benchmark ranges of infrastructure unit costs which reflect project specific factors.

2.4 Review cost and time delays for the sampled projects

2.4.1 Our methodology will aim at providing a consistent analysis of project costs and project completion times for 110 "major [infrastructure] projects" and 40 "major [productive investment] projects" co-financed by the ERDF.[3] Assuming that data of reasonable quality can be acquired, this sample size may be sufficient to gain an understanding of the type of projects that experience cost overruns or time delays, or both, and to facilitate the analysis of:

- The project characteristics related to time delays; and
- The project components where costs were under- or over-estimated.

2.4.2 Whenever the data allows, we will try to carry out cross-sectional statistical analysis between different projects with a view to understanding the linkages between the specific characteristics of projects and their performance in terms of cost overruns, time delays, or both. We will carry out cross-sectional analysis across two main dimensions: country and type of project (e.g., sector, sub-sector). The cross-sectional comparison of data will allow us to identify those factors that are inherent to specific countries or project type and the statistical significance of their influence on project performance. The analysis will also try to identify those project characteristics that have a similar impact across countries and project types.

2.4.3 If the poor performance in terms of cost overruns and time delays of a subset of infrastructure projects is substantial compared with the sample average, we will discuss with the Commission the possibility of directing resources towards improving the qualitative assessment of those particular projects with a view to gaining a better understanding of the causes behind such poor performance.

2.5 Reviewing the role of ex ante risk assessment in future cost benefit analysis

2.5.1 Inevitably actual project completion times and project costs will vary from their appraisal estimates. It is important when planning a project that the potential for variation from estimates is understood and taken into account when, for example, assessing funding arrangements and project implementation strategies.

2.5.2 Some projects can be expected to have a greater range of possible expenditures than others; for example, if they include new technologies, or are subject to a greater degree of future price variation.

[3] In the draft Inception Report (submitted to the Commission on 29th August), we had a total of 164 projects in our sample. We have removed projects that are outside the sectors that the Commission wishes to evaluate, namely venture capital funds, ICT, ports, airports and dams, of which there were 14. We are, therefore, left with sample total of 150 projects, consisting of 110 infrastructure projects and 40 productive investments. See Annex C for the revised list.

2.5.3 Our approach will aim at using the data obtained from our statistical analysis of the linkages between project characteristics and their performance to provide the Commission with recommendations on (a) how future ex ante project risk assessments can be improved to ensure that key sources of risk are identified;[4] and (b) facilitate a sensitivity analysis of the potential impact of those risks on project costs and completion times.

2.6 Assessing unit costs of jobs created

2.6.1 As with infrastructure costs, the costs of job creation will vary widely from programme to programme. An assessment of unit costs can however be useful in the context of project planning, appraisal and evaluation, for example:

- A comparison of actual costs versus estimated unit costs per job created can help draw important lessons for the design and implementation of future programmes and project planning.
- A comparison of costs across different types of investment can help prioritise future programmes and projects.

2.7 Developing a spreadsheet tool

2.7.1 The project is expected to generate a large amount of useful and valuable project-specific data which the Commission can use in future project planning, appraisal and evaluation.

2.7.2 As noted in paragraph 2.5.1, the planned statistical analysis should allow us to identify the factors that contribute to the final outcome of each project. If the quality of the data allows, we will summarise these relationships with statistical parameters that could then be used for the estimation of the outcome of future projects.

2.7.3 To facilitate this type of analysis, we will develop a spreadsheet-based tool which will contain the results of our analysis. The tool will be designed to enable the user to input the details of any new projects and estimate expected project unit costs.

2.7.4 We will design the spreadsheet tool to enable the addition of new projects to the database and the ability to enter updated correlation parameters whenever the new evidence gathered may deem it appropriate.

2.7.5 The value of the exercise, and of the potential analysis derived from it, will be enhanced if the database is maintained in the future by means of inputting the characteristics of additional infrastructure projects that will be co-financed with EU funds.

2.8 Availability of data

2.8.1 Securing reliable and comparable data for the projects is likely to prove the major challenge for this study.

2.8.2 Our initial review of the project funding application forms held by the Commission indicates that they provide some information on expected project

[4] As regards the practical use of the findings of this project in future ex ante risk assessment, we will also draw on the "reference class forecasting method" from, for example, Flyvbjerg, Bent (2006), "From Nobel Prize to Project Management: Getting Risks Right", *Project Management Journal*, Vol. 37, No. 3, August, pp. 5-15.

costs, but this is not presented in a consistent format, and typically does not contain much detail of individual cost components.

2.8.3 The Commission has very few, if any, details of actual costs for most of the projects funded by the ERDF. As a result, we will try to obtain this information from government ministries and departments responsible for sponsoring, financing and/or monitoring the projects at the national level.

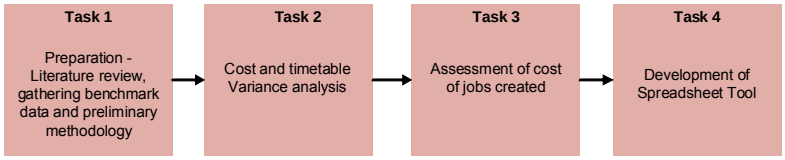
2.8.4 In order to ensure that our proposed approach to information gathering is as effective as possible, given the time and budget constraints of the study, we will pilot test our approach for a representative sample of projects. This will enable us to assess how best to secure information on actual project costs and timetables as well as to understand the reasons for any cost overruns or time delays.

3 Proposed approach to project

3.1 Introduction

3.1.1 Our overall approach to the project is set out in Figure 2 below.

Figure 2: Overall approach



3.1.2 Each of these tasks is described in detail below.

3.2 Task 1: Preparation - Literature review, gathering benchmark data and initial methodology

Introduction

3.2.1 The purpose of Task 1 is to:

- Undertake a literature review
- Identify and obtain benchmark data
- Prepare a preliminary project methodology

3.2.2 The preliminary work undertaken at this stage will help to ensure that the project is completed in an efficient, consistent, and practical manner.

Methodology

3.2.3 The methodology for Task 1 is set out in Figure 3 below.

Figure 3: Methodology – Task 1

3.2.4 Each of these steps is discussed in detail below.

Step 1 - Literature review

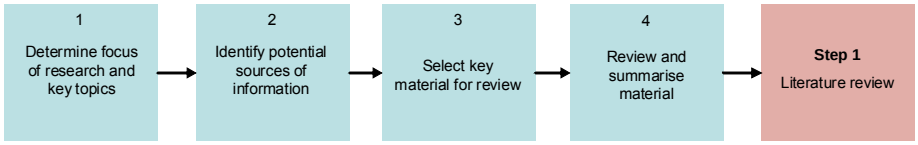
3.2.5 The purpose of the literature review is to:

- Provide input into the determination of appropriate unit cost definitions
- Provide input and background on the detailed methodologies for:
  - using unit cost benchmarks in project appraisal, monitoring and evaluation
  - evaluating cost overruns and completion delays in project evaluation;

- o assessing the impact of ex ante risk assessment;
- o identifying relevant performance indicators for project planning, appraisal and evaluation;
- o identifying sources of benchmark values for project unit costs;
- o identifying potential variables for analysis of project delays and cost overruns.

3.2.6 The methodology for the literature review is set out in Figure 4 below.

Figure 4: Methodology – Step 1 Literature review



3.2.7 The proposed literature to be reviewed is attached as Annex A. We propose to make available to the Commission a draft literature review prior to the First Interim Report, and a final version in the First Interim Report.

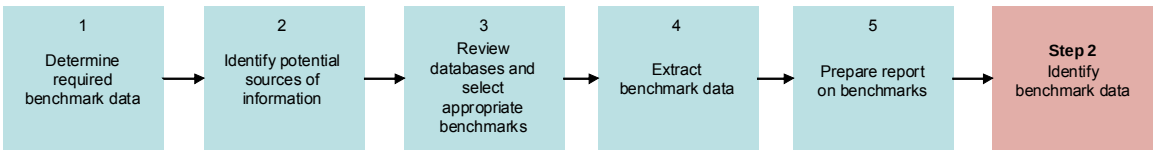
3.2.8 At present, the literature review is very focussed on transport and limited in geographical scope (relying largely on the experiences of Anglo-Saxon countries). We undertake to search for and review literature and benchmarks in the energy and environmental sectors (the latter being particularly relevant for future ISPA and Cohesion Fund evaluation) and to search and review literature more specific to the European Union, especially new Member States.

Step 2 - Identification of benchmark data

3.2.9 This work package will identify and secure the most relevant infrastructure unit cost and job creation cost benchmarks.

3.2.10 The methodology for the cost benchmarking exercise is set out in Figure 5 below.

Figure 5: Methodology – Step 2 Benchmark costs



3.2.11 In addition to potential sources of information gathered in Step 1, we will conduct a search of existing information available within public and commercial databases in the EU and where relevant from further afield. Sources to be investigated will include national transport organisations, government ministries and agencies, research organisations, contractors' associations and bilateral & multilateral financial institutions etc.

3.2.12 Examples of infrastructure cost benchmarking databases that will be reviewed for potential use in the project include:

- Roads – World Bank's Road Costs Knowledge System (ROCKS);

- Railways – International Union of Railways (UIC) Lasting Infrastructure Costs Benchmarking LICB) project;
- UK BERR (formerly DTI) Construction Price Indices;
- The European Investment Bank (EIB) and the European Bank for Re-construction and Development (EBRD); and
- Faber Maunsell's internal project cost information.

3.2.13 Having identified a list of potential sources of benchmark data we will rank them according to agreed criteria in order to identify the most relevant benchmark data for use in the study. Criteria for ranking the benchmarks will include:

- Relevance to the sampled projects
- Statistical strength
- Age of data
- Match to unit cost definitions to be used in the project
- Level of detail of the specific project features

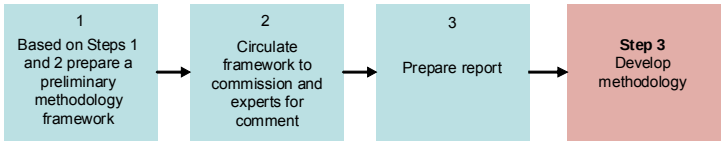
3.2.14 All selected benchmark data will be aggregated into the Project Database. The data will be formatted for each transport mode or project type and for each identifiable project component so that the information can be easily filtered for use in Task 2.

3.2.15 We will normalise benchmark costs to a common currency (€) and date (2008).

Step 3 - Preliminary methodology

3.2.16 Our approach to step 3 is set out in Figure 6 below.

Figure 6: Methodology – Step 3 Develop Methodology



3.2.17 Having read the literature and discussed the project with the Commission we will prepare a draft methodology framework for review by the Commission and, if appropriate, third-party experts.

3.2.18 The draft methodology framework will set out in detail the proposed approach to the project, including:

- Unit cost definitions
- Standard project timelines
- Additional data requirements
- Planned statistical analysis
- Database content
- Approach to ex ante risk assessment review
- Outline of Spreadsheet tool

- Proposed report contents and format

3.2.19 The draft methodology framework will help ensure that the project benefits from the input of a wide range of experience and also that the output of the report meets with the Commission's objectives and expectations. The draft methodology is as set out in this Inception Report.

Additional data requirements

3.2.20 In addition to the calculation of estimated and actual unit costs and timescales, we hope to collect a range of other project-specific data, from the authorities in the Member States, to feed into the statistical analysis on ex ante risk forecasting, cost benchmarking and overrun and delay evaluation.

3.2.21 We will use the literature review to identify relevant project specific variables that may be useful in understanding project overruns and delays and also in using benchmark costs as a basis for assessing future projects.

3.2.22 Project-specific variables that will need to be assessed are likely to include, for example:

- Project ownership and financing structure (are projects with higher debt/equity ratios less likely to experience cost overruns?)
- Project size (are larger projects more likely to experience cost overruns or time delays due to complexity?)
- Project preparation time (are projects with relatively short preparation times more likely to experience time delays?)
- Ex ante project implementation time (does the length of expected implementation time influence the likelihood of time delays or cost overruns?)
- Procurement method (are projects with private sector finance and/or participation more or less likely to experience time delays or cost overruns?)
- Project topography/location
- Tax regime
- Project specification (eg capacity, technical features)

3.2.23 A scoring framework will be developed for these variables to facilitate statistical analysis (by way of example, the extent to which the project is liable to VAT costs can be quantified using bands of tax rates (eg 15-20%), project topography can be graded using a score of, for example, 1=remote rural … 4 = urban etc). This analysis will be based on the use of standard scores which will be applied to each relevant project during the review of the information received from relevant national authorities.

3.2.24 The basis of the scoring system will be considered during the literature review in Task 1. In particular, where the literature identifies particular characteristics as statistically meaningful in determining cost overruns or delays (e.g. the project ownership structure and basis for procurement) then our scoring system will seek to identify those particular project characteristics.

3.2.25 The approach to scoring will be tested during the review of sample files in order to ensure that the scoring approach is a practical one that makes best use of information available. See paragraph 3.3.43 for a description of how this scoring system will be used in the statistical analysis.

Key issues

Unit cost definitions

3.2.26 In order for unit costs to be comparable, both across projects and also when comparing estimated and actual costs, it is critical that appropriately disaggregated definitions are applied. For example, the effects of capacity provision must be taken into account. The cost per kilometre of a dual two lane highway will be lower than that of a dual three lane highway – but not necessarily on a pro rata basis, especially in areas of challenging topography. Ideally, separate benchmark costs would be devised for both generic types of roads, if there was sufficient data. However, it should be noted that for projects in different infrastructure sub-/sectors (i.e. a rail and a road project), unit costs will have to be sufficiently general and not project-specific in order to enable statistically meaningful comparisons.

3.2.27 Inevitably, the information on costs that we will obtain will have been reported at different points in time. In order to overcome this issue and make all unit costs comparable we will always attempt to record information on the price base used for recording the information. Then, using Eurostat published inflation indices for each country we will inflate the cost data to a common 2008 price base.

3.2.28 Another issue is how to deal with different currencies. However, most of the projects in this study have taken place during a period of time and in countries which had adopted the Euro as a single currency. Therefore, the exchange rates between their national currencies and the Euro were already fixed at the time. For countries outside the Euro area, we will convert the values expressed in local currencies into Euros using the historical exchange rate of the time. We will then apply country-specific inflation data to turn these values to a common 2008 price base.

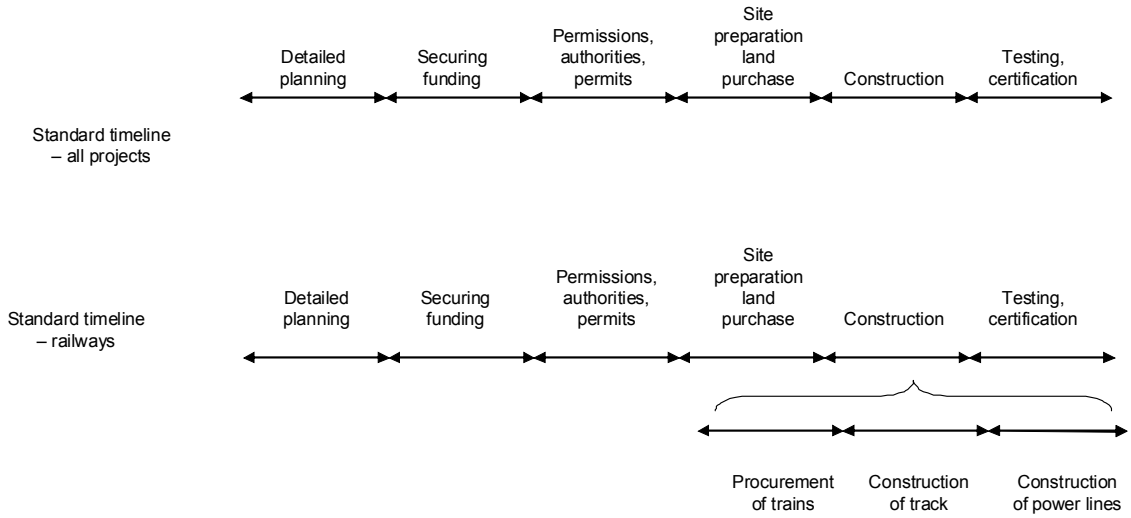
3.2.29 In addition, depending on data availability, it may be useful to identify the key project components and provide a cost benchmark for each of them. For example, in a high speed railway line one could identify station infrastructure, railway track and signalling as key components - assuming all of them are part of the project - and identify benchmark costs for each of them. This could facilitate the analysis of cost overruns (i.e. what project component is likely to experience cost overruns) and time delays, but also the comparison of project components (e.g. cost of rails, cost of sleepers).

Standard project timelines

3.2.30 Different definitions, terminology and project lifecycles can make comparisons across projects difficult. In order to enable meaningful comparisons and support the statistical analysis we will develop standard project timelines with defined project phases. A generic timeline will be used for all projects, with a series of more detailed timeline categories for each major infrastructure category.

3.2.31 This is illustrated in Figure 7 below.

Figure 7: Illustrative approach to standard timelines



3.2.32 It should be noted, however, that project phases often overlap and can be inter-related, especially the early phases. For example, detailed planning will usually not take place until funding is secured and overall funding may not be secured until a certain level of EU funding is secured.

3.3 Task 2: Cost and timetable variance analysis

Introduction

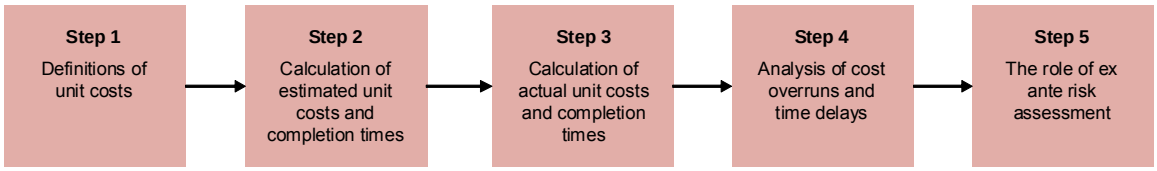
3.3.1 The purpose of Task 2 is to:

- Prepare appropriate cost definitions for the study
- Calculate estimated unit costs and completion times
- Calculate actual unit costs and completion times
- Analyse factors influencing cost overruns and time delays
- Review the ex ante project risk assessments

Methodology

3.3.2 The methodology for task 2 is set out in Figure 8 below.

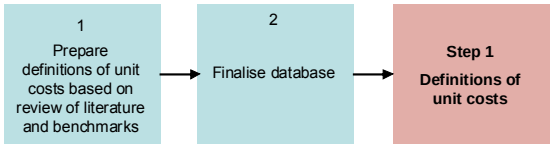
Figure 8: Methodology – Task 2 Calculation of estimated unit costs and completion times



Step 1: Preparation

3.3.3 Prior to compilation of estimate data from project files and other sources, the unit cost definitions will be finalised and the project database constructed.

Figure 9: Methodology – Step 1 Definition of unit costs



Database

3.3.4 We will gather all relevant information for the project in a spreadsheet database (Microsoft Excel). This will include:

- Project information gathered from ERDF application forms
- Project information gathered from relevant national authorities
- External cost benchmarks
- Macro economic data (e.g. price indices, exchange rates)
- Further information obtained from interviews, site visits and other sources

3.3.5 Using the methodology illustrated in Sections 2.3 to 2.7 above, the information will be used to perform the statistical correlation analysis underpinning the spreadsheet-based benchmarking tool, which we will develop for future use by the Commission.

3.3.6 A key advantage of this approach is that it will:

- Allow efficient production of summary reports and detailed reports for each project
- Provide an efficient platform for data entry by several team members
- Facilitate the identification of missing data
- Provide an efficient means of aggregating the data for use in the statistical analysis

Unit cost definition

3.3.7 Unit costs will be devised to cover a number of levels of disaggregation to ensure that for projects where detailed information is not available, some analysis can still be undertaken. For instance for a road scheme:

- Level 1
  - Total cost per km
- Level 2
  - Cost for 2 lane carriageway per km
  - Cost per bridge m2
  - Cost per tunnel km
- Level 3
  - Cost for 2 lane carriageway per km – rural
  - Cost for 2 lane carriageway per km – urban
  - Cost per tunnel –bored per km
  - Cost per tunnel –cut and covered per km

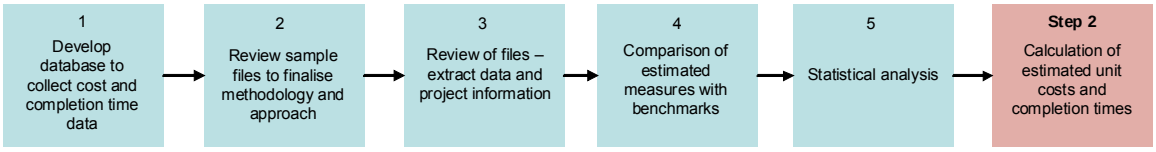
3.3.8 If it is found that any selected disaggregation is not particularly useful as a cost discriminator then the data can be readily re-aggregated to a level which could be more useful.

Step 2: Calculation of estimated unit costs and completion times

3.3.9 At this stage of the project, the data required to calculate estimated unit costs and completion times will have been gathered from the ERDF application forms and entered into the database. Estimated unit costs (for the overall project and for key project components) and project completion times will then be calculated using the project's standard unit cost definitions and project timelines.

3.3.10 Our approach to calculating the estimated unit costs and completion times is set out in Figure 10 below.

Figure 10: Methodology – Step 2 Calculation of estimated costs and completion time



3.3.11 As an illustration of this methodology, the data requirements for a road are likely to include some of the following items:

- Background information: e.g., a general description of the project, location, purpose
- Physical characteristics of road and interchanges: e.g., length of road, number of lanes
- Physical characteristics of environment: e.g., topography, climate
- Estimated costs: e.g., total cost of project, construction costs, financing costs, taxes
- Stated reasons for project delay and cost overrun
- Procurement method

Sample files review

3.3.12 In order to fine-tune our methodology and ensure that it takes into account practical limitations on data availability and quality, and ensure that the approach we take in our review of all projects is consistent, our team will review, for the purposes of the first interim report, a small sample of ERDF project application forms (at least one from each type of infrastructure and for each of the major country groups).

3.3.13 In particular, we will consider the level of information on estimated costs and timetables available in the project submission forms and how this could be used in our planned cost breakdowns and definitions.

Main review of files

3.3.14 After finalising our methodology in the previous step, we will undertake our detailed review of all 115 large infrastructure ERDF project application forms to identify estimated costs and timetables. Each file will be reviewed by a team member and the data identified in the preceding steps will be extracted to our database. Missing data will be noted for further consideration.

3.3.15 We expect to review each file once, and to extract all estimated figures, in addition to relevant background and other information, in a single review. When entering the information gathered into the database, we will use a standard format, in order to enable comparison across projects and further analysis, where appropriate.

Missing information

3.3.16 Once all data has been input from the ERDF project application forms, we will review the extent of relevant data which was not available from this source. Once the extent and nature of missing data is known, we will consider how to handle data gaps, involving the Commission where appropriate.

3.3.17 Options for dealing with gaps in data include:

- Contacting relevant government ministries
- Contacting project sponsors or other stakeholders (e.g., lenders) who may have access to the relevant information

3.3.18 Where data gaps are such that the ability to perform meaningful analysis is significantly limited, and there are no realistic options for securing the necessary data, we will discuss with the Commission the possible replacement of these projects with others within time and budget constraints.

Conversion to constant prices

3.3.19 The data gathered from the project dossiers will be recorded in a variety of different currencies and in different years. So that the unit costs are comparable, we will convert costs to constant Euros using appropriate national indices with an agreed base year.

3.3.20 We will research historical exchange rates and relevant national indices in order to convert all estimates to a comparable constant price. We would expect to use construction indices in our constant price conversion (e.g., cost of construction index released by the Federal Statistical Office of Germany, or cost of construction index released by the Ministry of Public Works and Transport in Spain).

3.3.21 We will consult with the Commission services to make the best use of EUROSTAT data and to ensure consistency with the relevant time-series data used in the other Work Packages of the Ex-Post Evaluation 2000-2006 exercise.

Comparison with benchmarks – a 'sanity check'

3.3.22 Once the data are in a comparable format, we will compare the estimated unit costs and completion times to the benchmarks identified in our review of the literature, previous studies and databases in Task 1. This step will allow us to check whether the unit costs calculated appear plausible, and, if necessary, to perform further work. A further source of checking the results will be to compare against any benchmark costs used on appraisals or evaluations of the projects.

Statistical analysis

3.3.23 A summary of key statistics and background will be prepared for each project (approximately 2-3 pages for each project). This information will be included in the database/spreadsheet tool in order to provide easy access to it for future reference. All information will be expressed on a comparable basis in order to enable quick comparisons between different projects.

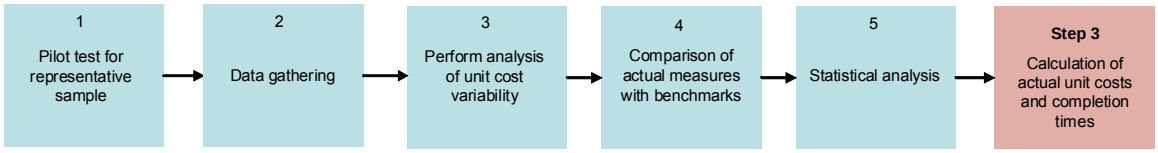
3.3.24 In addition to this, we will prepare a report summarising our overall findings and conclusions in relation to the estimated unit costs presented in the ERDF project application forms, including key statistics (e.g. range, mean, median, standard deviation) for each type of infrastructure project, and our findings in relation to variance to benchmarks.

Step 3 Calculation of actual unit costs and completion times

3.3.25 At this stage, the data required to calculate actual unit costs and completion times will have been sought from the relevant government departments, ministries or other agencies or stakeholders and entered into the database. Actual unit costs and project completion times will then be calculated using standard unit cost definitions and project timelines.

3.3.26 Step 3 will be undertaken in parallel with Step 2, and will follow the approach set out in Figure 11 below.

Figure 11: Methodology – Step 3 Calculation of actual costs and completion time



Pilot test

3.3.27 In order to determine the most appropriate sources of information on actual project costs and timetables, we will undertake a pilot test for the most significant project/country types.

3.3.28 We will contact the relevant government ministries identified in the ERDF project application forms and discuss with them the information requirements of the study. The aim of this exercise will be to determine the most useful sources of information for a particular project type in that particular country.

3.3.29 Having identified the relevant government departments and individuals, we will consider what information is available and in what format. For example, there may be regular project progress reports, or project completion reports which can be usefully employed in the study. We will also review the project templates to take account of the level and type of information being reported to ensure that the templates best fit the available information. For other projects we will send a questionnaire to the relevant government department requesting details of project information required to complete the project template.

3.3.30 The results of the pilot studies will be included as part of the first interim report.

Data gathering

3.3.31 This task is heavily dependent on the receipt of appropriate data from the relevant national authorities.

3.3.32 Our data collection strategy can be summarised by the following set of steps:

(i) the starting point will involve making telephone contact with the relevant parties listed on the ERDF project application forms, beginning with the contact listed for the organisation responsible for project implementation (usually local government in the case of infrastructure projects);

(ii) where this is a private firm (as in the case of productive investments) or a contractor (as can be the case with infrastructure projects) and the contact cannot be located (either due to staff turnover or dissolution/acquisition of the firm itself), the aim is to revert to a relevant government department or agency, which may be necessary in any case to verify the accuracy of the information provided;

(iii) otherwise, where necessary, we will elevate our information requests to the relevant national government department or agency, which may often need to be notified in any case if the local government authority or private firms are reluctant to provide the required information;

(iv) we will also discuss with the EIB, a co-funder on a number of projects, the possibility of making use of their project progress reports to identify actual project costs and timetables for those projects which have been co-financed by the EIB.

3.3.33 Having found a contact that is willing and able to assist in the provision of information, we will describe the objectives of the project and the kinds of information we are seeking. While some countries and/or projects might have a process of official project completion reporting, others may not, in which case collating the data might be more difficult. In such cases, we have developed questionnaires to serve as a more detailed guide to our data requirements and to assist in gathering data from what could be a number of disparate sources within a relevant organisation. (See Annex D for a sample questionnaire for rail projects.)

3.3.34 Once a body of information is received on a project, we will review its level of detail, quality and accuracy and use telephone or email correspondence (as appropriate) to send follow-up queries.

3.3.35 Because the projects have been allocated across a team according to languages, a spreadsheet log of progress and completion of data gathering will be prepared for each country covered by the chosen sample.

Comparison to benchmarks – a 'sanity check'

3.3.36 Once the data is in a comparable format, we will compare the actual unit costs and completion times to the benchmarks identified in our review of the literature, previous studies and databases in Task 1. This step will allow us check whether the unit costs calculated appear plausible, and, if necessary, to perform further work. A further source of checking the results will be to compare against any benchmark costs used on appraisals or evaluations of the projects.

Report

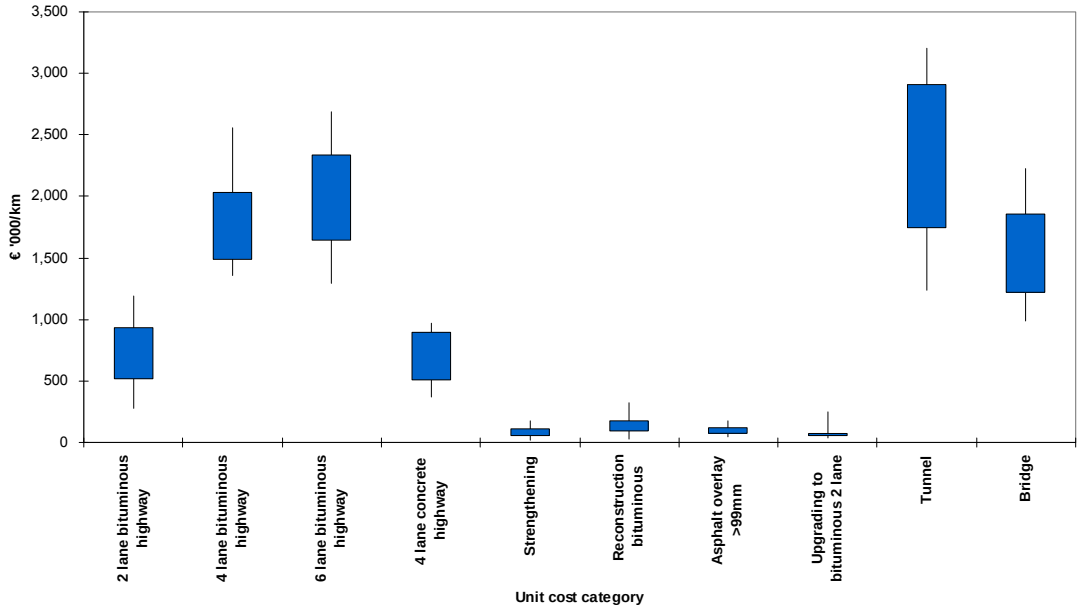
3.3.37 A summary of key statistics and background will be prepared for each project (approximately 2-3 pages for each project, as outlined in paragraph 3.3.23

above). We will extract this information from the database and present it in our report to the Commission.

3.3.38 In addition to this we will prepare a report summarising our overall findings and conclusions in relation to the actual unit costs received from relevant national authorities, including key statistics (e.g. range, mean, median, standard deviation) for each type of infrastructure project, and our findings in relation to variance to benchmarks.

3.3.39 An illustration of the type of analysis we would expect to generate is shown in Figure 12 below.

Figure 12: Example of analysis – unit costs



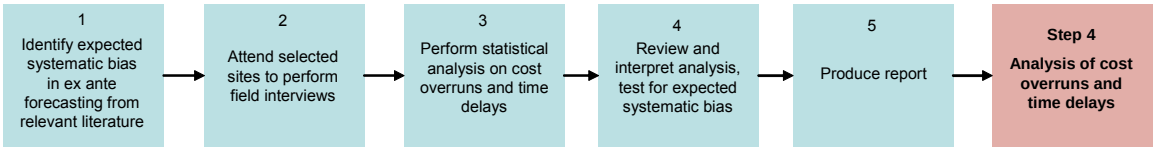
Source: ROCKS, RGL

3.3.40 Figure 12 illustrates the notion behind the "value range" analytical framework mentioned in the introduction to our proposal. Given the unavoidable differences in the scope and design of individual infrastructure projects, it is useful to work with a range of plausible values (with lower and upper bounds) for each of the key project components and/or for the basic project design. This allows us to identify (1) project components and/or design that show a larger variance in their unit costs; and (2) unit costs that are too low or too high in relation to the existing value range.

Step 4: Analysis of cost overruns and project delays

3.3.41 Our proposed methodology for analysing cost overrun and project delays is summarised in Figure 13 below.

Figure 13: Methodology – Step 4 Analysis of cost overruns and time delays



3.3.42 Our review of files will have identified potential factors influencing project cost overruns and time delays which will have been categorised.

3.3.43 If the quality of the data allows, we will undertake an econometric analysis of the projects in order to explore and estimate the linkages between key project characteristics and the performance of the projects in terms of cost overruns, time delays, or both.

3.3.44 We will attempt to test alternative specifications for the estimation of the outcomes and we will use statistical diagnostic techniques to choose the best functional relationship between explanatory factors and the projects' final performance outcomes.

3.3.45 At this stage, we expect to be able to carry out a standard linear regression analysis of the linkages between cost overruns and delays and some of the key characteristics of the projects.

3.3.46 Once estimated, these key relationships will form the backbone of the spreadsheet tool that we will develop for the assessment of future projects by the Commission.

3.3.47 The scope of the quantitative statistical analysis will focus on the correlation between project features and project performance but will not investigate causality. However, a qualitative analysis for a narrower sub-set of projects that experienced either a substantial (definition of "substantial" to be agreed with the Commission) cost overrun or time delay, or both, involving a more detailed assessment of the factors influencing those overruns and delays, could be undertaken in agreement with the Commission.

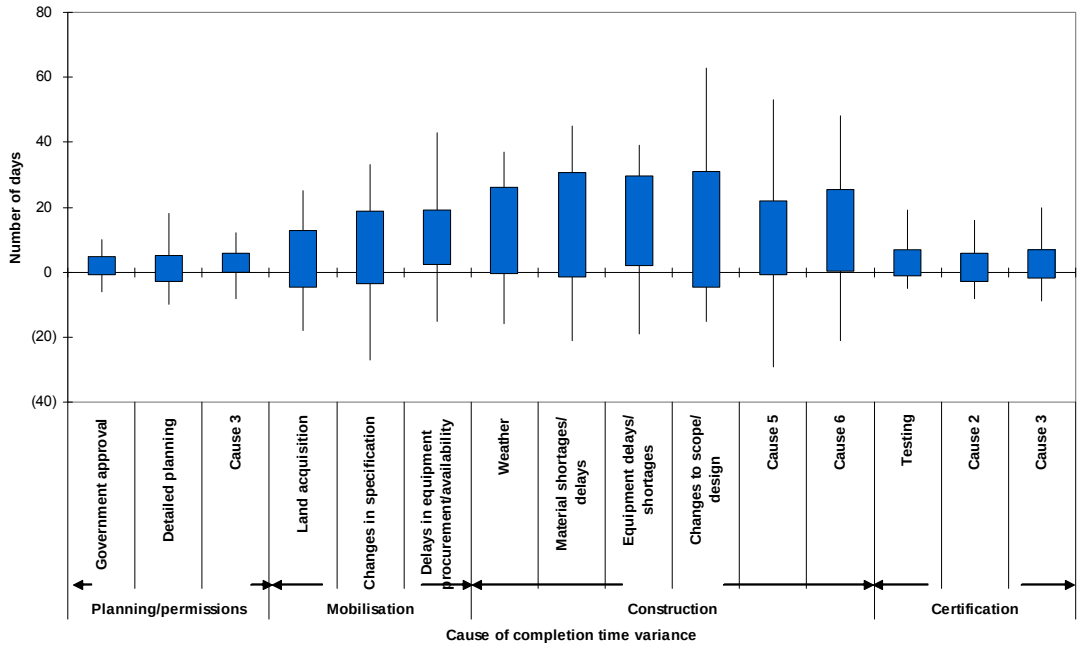
3.3.48 The set of unit cost indicators will focus primarily on supply-side ("output") indicators (e.g. cost per km of newly built highway; cost per wastewater drainage capacity) taking account of the technical specifications of different project designs and key project components (e.g. high-speed versus conventional rail; railway stations versus rail track).

Reporting

3.3.49 Our key findings from the analysis of cost overruns and delays will be included in the 2-3 page summaries (referred to in paragraphs 3.3.23 and 3.3.37 above) for each project. Our report to the Commission will also summarise our overall findings and conclusions in relation to the cost overruns and delays for each type of infrastructure project. This summary report will also include our findings in relation to variance between estimated and actual unit costs, both within the sample in and across the Member States, and to established benchmarks.

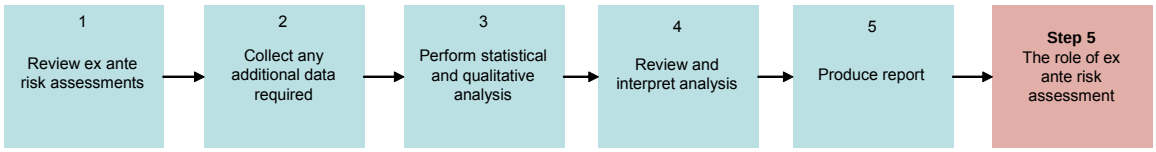
3.3.50 An example of the type of analysis we would expect to provide is shown in Figure 14 below.

Figure 14: Example of analysis of project delays



Step 5: Review of ex ante risk assessments

Figure 15 Methodology – Step 5 review of ex ante risk assessment



3.3.51 The main objectives of this sub-task will be to analyse the extent to which the ex ante risk assessment for each infrastructure project:

(a) correctly identified the relevant sources of risk influencing the project's unit costs and completion times; and

(b) adequately assessed the potential magnitude of these risks in the project's ex ante sensitivity risk analysis.

3.3.52 Such analysis of the ex ante risk assessment will be useful for comparing and assessing the differences between the ex ante estimated and ex-post actual cost levels and completion times for each infrastructure project under evaluation.

3.3.53 The risk analysis will aim at differentiating the impact on cost overruns and time delays of the following taxonomy of risks:

- risk related to project design and project implementation;
- risks outside the control of the project designer or implementation unit and those within their control; and
- risks which are technical (e.g. engineering design difficulties, environmental conditions), financial (e.g. unexpected funding gaps), or political (e.g. approval delays, public opposition).

3.3.54 The key objective of Step 5 will be to help in the statistical analysis, correlating unit costs and project completion times with project characteristics (country, sector, project size, extent of competition at bidding stage, type of contract, (the so called "risk scoping" etc). The statistical analysis in this task is closely related to the statistical analysis to be undertaken in the sub-tasks belonging to step 4 described above.

3.3.55 If the quality of the data allows, in addition to a linear relationship, we will attempt to estimate hurdle-rate functions that would link the presence of certain factors to the probability of cost overruns or time delays. These functions, which could be estimated using standard probit techniques, could contribute to the ex-ante assessment of the level of risk associated with a particular project proposal. If the data gathered allows this type of analysis, we will include it as part of the spreadsheet-based tool.

Optimism bias

3.3.56 There is significant evidence that large infrastructure projects suffer from an optimism bias in costs. For example, a 2002 study of 50 large infrastructure projects in the UK found, on average, an optimism bias of 17% in the construction times and 47% in the construction costs.[5]

3.3.57 Our report will assess the statistical evidence of whether ERDF projects have suffered from systematic optimism bias, and if so analyse this as far as possible, examining different reasons for bias.

3.3.58 Using the data from our analysis and building on previous studies in this area, we will make appropriate recommendations for future project appraisal to fully take into account optimism bias.

Key issues

Availability of Risk analysis

3.3.59 Clearly, where no risk analysis is available, we will not be able to review it.

3.4 Task 3: Assessment of cost of jobs created

Introduction

3.4.1 The purpose of this task is to:

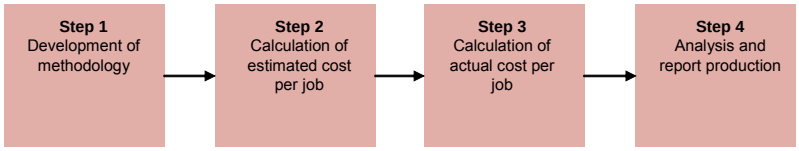
- Calculate and review expected and actual costs per gross job created for a sample of ERDF productive investments
- Consider the extent to which job creation cost benchmarks can usefully be applied to future project planning, appraisal and evaluation.

Methodology

3.4.2 An overview of the work which will be undertaken is set out in Figure 16 below.

Figure 16: Task 3 methodology - Assessment of cost of jobs created

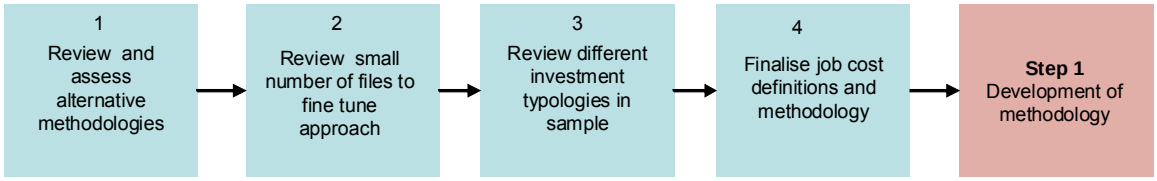
[5] Mott MacDonald (2002), "Review of Large Public Procurement in the UK", HM Treasury, July.



Step 1 Development of methodology

3.4.3 Following the literature search and discussion of preliminary methodology undertaken in Task 1, we will prepare a detailed methodology for the quantification of the cost of gross jobs created. We will categorise projects into different types, based on the mix of the sample projects, so as to tie in with useful benchmarks.

Figure 17: Step 1 – Development of methodology



3.4.4 The purpose of this piece of work is to refine the methodology developed in Task 1 to assess the number and cost of gross jobs created in a way that ensures that:

- a common approach is taken across different sectors;
- the database contains all the necessary fields;
- the approach makes best use of data available in project dossiers; and
- missing data is identified at an early stage.

3.4.5 In line with the Best Practice Framework for Measuring Structural Employment Effects, the analysis will calculate permanent full-time jobs.[6] As a result, it will be important to ensure that a common approach is taken to the:

- classification of direct and indirect jobs;
- identification and treatment of part-time jobs[7]; and
- identification of whether jobs were created for men or women.[8]

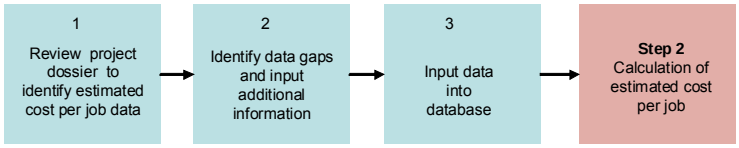
3.4.6 Our approach will be based on the findings of Task 1 which will include a preliminary methodology. The robustness of the methodology and any practical issues or difficulties will be tested against a small sample of files. The preliminary project and cost classifications will be reviewed and amended as necessary.

[6] *Study on Measuring Employment Effects* June 2006 Final Report CSES.
[7] We note also that the Commission's August 2006 Working Document No2 *Indicative Guidelines on Evaluation Methods: Monitoring and Evaluation Indicators* suggested that the appropriate definition of jobs created was full-time equivalent jobs
[8] We note that the Commission's August 2006 Working Document indicated that the jobs created indicator should break this down into jobs created for men and women.

Step 2: Calculation of estimated costs of job creation

3.4.7 Our proposed methodology for Step 2 is set out in Figure 18 below.

Figure 18: Step 2 Calculation of estimated cost of job creation Development of methodology

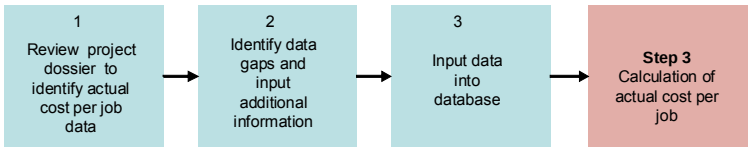


3.4.8 This step involves a review of the ERDF project application forms to identify the information needed to calculate and assess the estimated cost per job created. Key data and information will then be entered into the Project Database.

Step 3: Calculation of actual cost of job creation

3.4.9 Our proposed methodology for Step 3 is set out in Figure 19 below.

Figure 19: Step 3 – Calculation of actual cost of job creation



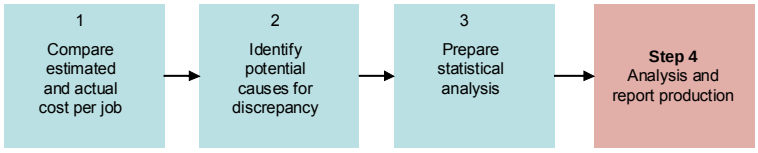
3.4.10 This step involves a review of the information received from relevant national authorities to identify the information required to calculate and assess the actual cost per job created. Key data and information will then be entered into the Project Database.

3.4.11 Where data is incomplete or inconsistent or appears incorrect we will take a view as to what, if any, steps would be appropriate to improve the quality of the database.

Step 4: Analysis and report production

3.4.12 Our proposed methodology for Step 4 is set out in Figure 20 below.

Figure 20: Step 4 - Analysis and report production



3.4.13 Having gathered available relevant information into the database, we will summarise our findings in a report which will include the following:

- An annex containing key data for each project;
- A description of the methodology and definitions employed;
- An analysis of actual costs per job created;
- A review of variances between estimated and actual costs per job created;

- A review of actual costs per job created on a cross-sectional (across sectors) and cross-country basis, where feasible;
- Recommendations for compilation of data in the future.

Key issues

Data availability

3.4.14 The results of this task will inevitably depend on the quality of the data for project cost and number of jobs created. We will adopt a pragmatic approach to dealing with any data quality problems we may encounter. Where appropriate we will make recommendations to the Commission on how best to deal with any shortcomings in the data to maximise the usefulness of the project's analysis and results.

Using benchmark costs

3.4.15 As noted in the CSES (Centre for Strategy and Evaluation Services) report, the application of benchmark costs per job should be treated with considerable caution, and in particular, their usefulness varies depending on the application.

3.4.16 On one hand, for example, it can be useful to compare estimated costs across different projects in order to help prioritise or rank different potential projects. On the other hand, benchmarking actual job creation costs is unlikely to be a useful approach on which to base forecast costs. This is because of the need to take into account the large number of potentially relevant micro and macro project specific factors.

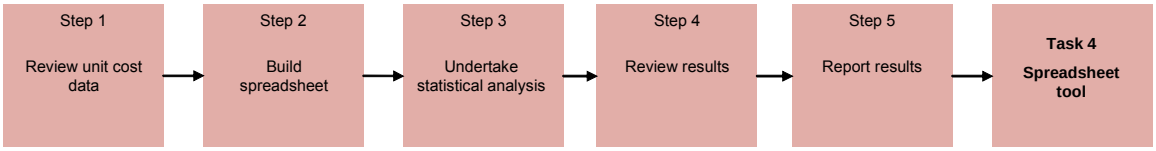
3.4.17 In order to estimate the number of gross jobs created for the 40 productive investments identified in the sample, we will carefully review the best way to estimate (a) their short-run direct employment impact during construction / implementation; and (b) their medium-run direct employment impact during operation. The estimates of medium-run employment effects will be subject to a higher degree of uncertainty given the difficulty of attributing certain employment growth to specific productive investments since there are bound to be several factors influencing employment growth in the medium-run than just the EC-financed project.

3.5 Task 4: Development of an Excel spreadsheet tool

Introduction

3.5.1 The development of an Excel spreadsheet of unit costs will provide a framework to facilitate the future appraisal of infrastructure projects by the Commission. The spreadsheet will be based on the methodology set out in Figure 21 below.

Figure 21 Task 4 development of spreadsheet tool



3.5.2 The unit cost indicators identified in Task 1 and the project features identified in Task 2 will become the entries in the spreadsheet to be developed in task 4.

3.5.3 Projects will be grouped together by sector for analysis (road, rail, urban transport, water supply, wastewater treatment, energy).

3.5.4 The Excel spreadsheet will have the set of key characteristics for every project, identified in Task 2, creating a "project features" database. Some of these project features will be generic across sectors (e.g. country, total cost, completion time); some others will be sector-specific (incremental length of rail lines; incremental length of sewage).

3.5.5 In addition, depending on data availability, the project features to be included in the Excel spreadsheet will also reflect the basic financing features of the project (e.g., debt/equity ratio) and identify the procurement method used to undertake the project, (e.g. standardised public procurement versus alternative procurement methods involving the private sector, such as for example, Design-Build and Operate – DBO, or Design-Build-Finance and Operate - DBFO).

3.5.6 The spreadsheet will be designed to meet two objectives:

- The estimation of the range of unit costs for individual project proposals given the project characteristics. Unit costs will be reported both in current and constant prices and in local currency and/or Euros as appropriate. The spreadsheet tool will be equipped to update the database for future price variability, thereby facilitating the maintenance of data that is comparable across time periods.
- A statistical analysis based on the correlation between the project features (both generic and sector specific) and project performance based on the probability of occurrence of cost overruns and/or time delays derived from the project database analysed in task 2.

3.5.7 The Excel spreadsheet tool will be accompanied with a user manual-style set of instructions to facilitate the inputting of new data and the running of basic statistical analysis by the Commission services.

Key Issues

Data availability

3.5.8 The spreadsheet will be a useful tool as long as the project data are available and of reasonable quality. As described in all the previous steps above, we will aim at reviewing and managing the data inputs to keep the analysis consistent and coherent with the objectives of the overall evaluation exercise.

3.5.9 The conclusions of the unit cost analysis undertaken with the help of the spreadsheet tool will be influenced by the size of the sample and the number of project variables used. Given the composition of the 115 infrastructure project samples, the analysis of road and rail investments (50 and 37 projects, respectively) is likely to yield more robust results than the analysis of water supply or wastewater investments (6 and 3 projects, respectively) given their relatively small sample size.

4 Project team and management

4.1 Proposed team

4.1.1 The proposed team for this assignment comprises experts in accounting, financial analysis, economic analysis, project analysis and appraisal, infrastructure costing, project evaluation, and statistical analysis.

4.1.2 The project team will be drawn from three specialist firms in financial investigation and analysis, economic analysis, and engineering:

Firm	Background
RGL Forensic Accountants and Consultants	A worldwide firm of specialised forensic accountants and consultants. Experienced in a wide range of different types of financial analysis and investigation.
Faber Maunsell	Faber Maunsell is an award-winning, international engineering consultancy specialising in buildings, transportation and environmental services. It is one of Europe's foremost transport planning and engineering consultancies and through its parent company AECOM it is able to draw upon worldwide expertise. Project delivery is one of its strengths and it is very experienced in the costing of the construction of all modes of transport.
Frontier Economics	Frontier Economics is an economics consultancy with over 70 consulting staff, directors and associates in London, Cologne, Brussels and Madrid. Founded in 1999 by a team of highly experienced consulting economists, it is one of the largest economic consulting firms in Europe. Frontier Economics work globally for senior decision-makers in government and business. Frontier Economics has an extensive track record in cost/benefit analysis, public policy and infrastructure analysis, both quantitative and policy/related.

4.1.3 From a contractual point of view, RGL will act as the lead contractor with full responsibility to the Commission for satisfactory completion of the project. Faber Maunsell and Frontier Economics will act as subcontractors to RGL. The allocation of major tasks amongst the firms is set out in Table 1 below.

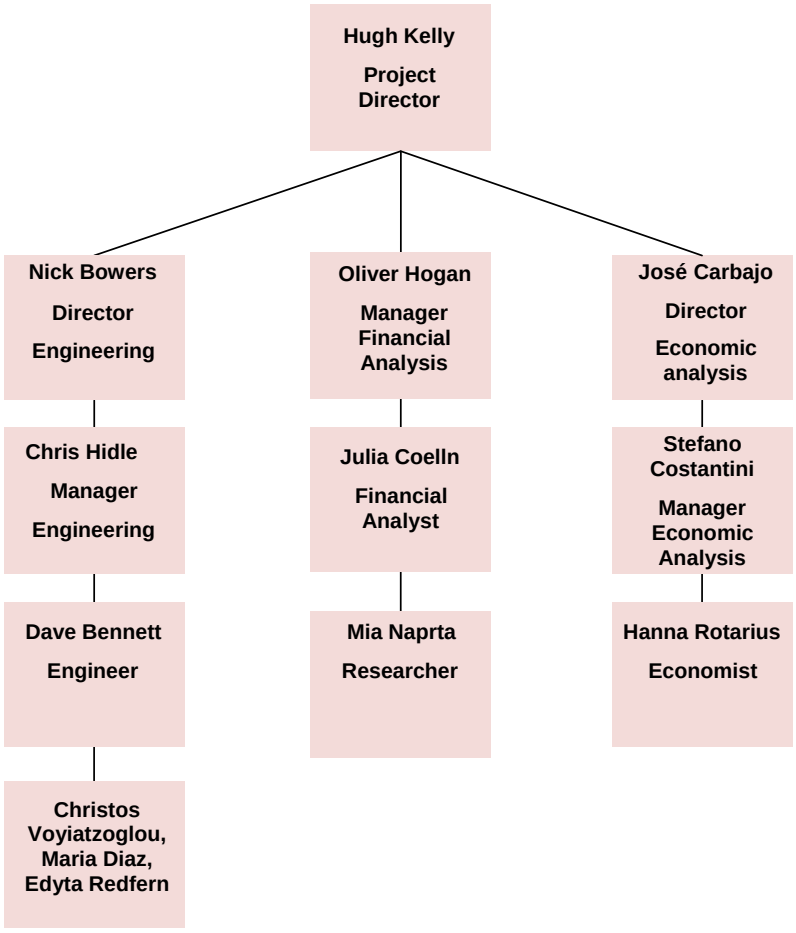
Table 1

	RGL	Faber Maunsell	Frontier Economics
Project management & coordination	✓		
Literature search	✓	Δ	Δ
Identification of benchmarks		✓	
Calculation of unit costs	✓	✓	
Statistical analysis			✓
Calculation of job creation costs	✓		Δ
Development of Spreadsheet tool for future use			✓
✓ = primary responsibility, Δ = supporting input			

Core team structure

4.1.4 Our proposed structure for the core team is set out in Figure 22 below.

Figure 22 Core team structure



4.1.5 The proposed allocation of mandays per task across the core project team is shown in Table 2 below.

Third-party experts

4.1.6 The project team will be assisted by three independent experts who will provide guidance to the team and review key outputs.

4.1.7 The experts are:

- Jacques Timmermans – previously Director of European Court of Auditors with 30 years experience of auditing and evaluating public sector expenditure programmes.
- Bent Flyvbjerg – Professor of Planning at the Department of Development and Planning at Aalborg University, Denmark and Chair in Infrastructure Policy and Planning at Delft University of Technology, Netherlands.
- Nigel Grout – Fellow of the Chartered Institute of Arbitrators and of the Institute of Highways and Transportation, with over 30 years experience as a practising Quantity Surveyor and currently specialising in contract dispute resolution, working exclusively on civil engineering projects.

4.2 Project management and reporting

4.2.1 The timetable for the project is shown in Table 3 below.

4.2.2 As set out in the minutes of the kick-off meeting, the dates for deadlines and Steering Group meetings is set out below.

Report	Deadline	Steering Group
First interim report	5 November 2008	19 November
Second interim report	17 February 2009	26 February
Draft final report	17 April 2009	30 April 2009
Final report	17 June 2009	

4.2.3 We will submit progress reports in the months when there is no other deliverable (these months are likely to be December 2008 and January, March and May 2009) with details of:

- progress since last report;
- major issues/difficulties that have occurred and proposed action; and
- planned activities for following month.

4.2.4 We will attend 3 meetings with the Commission to discuss progress "according to needs arising" as set out in the Terms of Reference for the project and agreed at the kick-off meeting.

4.3 Deliverables

4.3.1 We will produce all reports to a high standard of analysis and language, not least in recognition of the fact that the Commission will be publishing the interim reports for all 10 work packages on the Internet.

Table 2: Allocation of mandays

Task		Step	RGL					Frontier			Faber Maunsel			Total
			James Stanbury	Hugh Kelly	Oliver Hogan	Julia Coelln	Mia Naprta	Jose Carbajo	Stefano Costantini	Hanna Rotarius	Nic Bowers	Chris Hidle	D Bennett, C Voyiatzoglou M Diaz, E Redfern	
			Man-days											
Project management and meetings		Project management	5.0	5.0	4.3	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	**20.3**
		Meetings with commission	0.0	2.5	3.5	0.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0	**18.0**
		Project management and meetings	**5.0**	**7.5**	**7.8**	**0.0**		**0.0**	**9.0**	**0.0**	**0.0**	**9.0**	**0.0**	**38.3**
Task 1 - Review of existing literature and evaluations		Identify and review material	0.0	0.0	2.0	0.0	0.0	0.3	2.5	4.0	0.0	0.0	0.0	**8.8**
		Identify and review existing databases/benchmarks	0.0	0.5	2.0	0.0	0.0	0.0	0.0	0.0	0.5	6.0	8.0	**17.0**
		Prepare methodology	0.3	1.3	3.0	5.0	0.0	0.8	2.0	0.0	1.0	4.5	4.5	**22.3**
		Task 1 - Review of existing literature and evaluations	**0.3**	**1.8**	**7.0**	**5.0**	**0.0**	**1.0**	**4.5**	**4.0**	**1.5**	**10.5**	**12.5**	**48.0**
Task 2 - Unit investment costs of infrastructure projects	2.1	Definitions of unit costs	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.5**
	2.2	Calculation of estimated unit costs and completion times	0.0	2.50	6.0	12.5	3.0	0.0	0.0	0.8	0.0	1.8	18.0	**44.5**
	2.3	Calculation of actual unit costs and completion times	0.0	0.5	3.3	31.0	17.0	0.5	0.5	0.0	0.0	3.0	41.0	**96.8**
	2.4	Analysis of cost overruns and time delays	0.5	2.5	4.3	2.0	0.0	3.0	3.0	12.3	0.0	0.0	9.3	**36.8**
	2.5	The role of ex-ante risk assessment	1.0	1.5	0.0	0.0	0.0	2.0	4.0	12.0	2.0	2.0	2.0	**26.5**
		Task 2 - Unit investment costs of infrastructure projects	**1.5**	**7.00**	**14.0**	**45.5**	**20.0**	**5.5**	**7.5**	**25.0**	**2.0**	**6.8**	**70.3**	**205.0**
Task 3 - Costs per job created in productive investments	3.1	Definitions of employment effects and analysis of investments	0.3	1.8	3.8	1.3	0.0	0.8	2.5	1.0	0.0	0.0	0.0	**11.3**
	3.2	Calculation of estimated costs per job created	0.0	0.25	2.5	11.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	**14.3**
	3.3	Calculation of actual costs per job	0.5	3.0	10.5	21.5	0.0	2.0	0.0	0.0	0.0	0.0	0.0	**37.5**
		Task 3 - Costs per job created in productive investments	**0.8**	**5.00**	**16.8**	**33.8**	**0.0**	**2.8**	**3.0**	**1.0**	**0.0**	**0.0**	**0.0**	**63.0**
Task 4 - Development of a spreadsheet of unit costs	4.1	Develop spreadsheet of costs	0.0	0.5	0.5	0.0	0.0	1.0	3.0	8.0	0.0	0.0	0.0	**13.0**
	4.2	Develop update methodology	0.0	0.0	0.0	0.0	0.0	1.0	3.0	6.0	0.0	0.0	0.0	**10.0**
		Task 4 - Development of a spreadsheet of unit costs	**0.0**	**0.5**	**0.5**	**0.0**	**0.0**	**2.0**	**6.0**	**14.0**	**0.0**	**0.0**	**0.0**	**23.0**
TOTAL MAN DAYS			**7.5**	**21.8**	**46.1**	**84.3**	**20.0**	**11.3**	**30.0**	**44.0**	**3.5**	**26.3**	**82.8**	**377.3**

Table 3: Project timetable

		July				August				Sept				Oct				Nov				Dec				Jan				Feb				March				April				May				June			
	Month	1				2				3				4				5				6				7				8				9				10				11				12			
	Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Task 1	Team mobiilsation and planning																																															
	Identify and review literature																																															
	Identify and review existing databases/benchmarks																																														
	Prepare methodology																																														
	Construct database																																														
Task 2/3	Finalise unit cost definitions																																														
	Pilot tests																																														
	Review of project files for estimates																																														
	Data gathering																																														
	Statistical analysis																																														
	Analysis of cost overruns and time delays																																														
	Review ex ante risk assessments																																														
	Final report production																																														
Task 4	Initial scoping and planning																																														
	Spreadsheet construction																																														
	Testing of spreadsheet																																														
	Working version of spreadsheet for project																																														
	Finalisation of spreadsheet for release																																														
Reports	Inception report								▲																																						
	Monthly reports																								▲				▲							▲						▲							
	First Interim Report																	▲																														
	Second Interim Report																													▲																		
	Draft final report																																					▲										
	Final report																																													▲		
	Steering Group Meetings									▲								▲																▲							▲								
										10/9								19/11																26/2							30/4								
	Experts Meetings													▲												▲								▲														
														14/10												w/b 19/1								w/b 16/3														

Annex A
Literature review
Infrastructure costs literature

Title	Author	Date of Publication
Comparison of Capital Costs per Route-km in Urban Rail	Flyvbjerg et al.	February 2008
Performance of PPPs and Traditional Procurement in Australia	The Allen Consulting Group	November 2007
Policy and Planning for Large Infrastructure Projects: Problems, Causes, Cures	Flyvbjerg	December 2006
Ex Ante Construction Costs in the European Road Sector: A Comparison of Public-Private Partnerships and Traditional Public Procurement	Blanc-Brude et al.	January 2006
Ex Post evaluation of a sample of projects co-financed by the Cohesion Fund (1993-2002)	ECORYS Transport	January 2005
ROad Costs Knowledge System ROCKS	Nogales et al.	December 2004
Procedures for Dealing with Optimism Bias in Transport Planning – Guidance Document	Flyvbjerg & COWI	June 2004
What Causes Cost Overrun in Transport Infrastructure Projects?	Flyvbjerg et al.	January 2004
An Analysis of Cost Overruns and Time Delays of INDOT Projects	Bordat et al.	2004
How common and how large are cost overruns in transport infrastructure projects?	Flyvbjerg et al.	January 2003
Review of Large Public Procurement in the UK	Mott MacDonald	July 2002
Implementation of Rapid Transit	BB&J Consult, S.A.	December 2000
World Bank Urban Transport Strategy Review – Mass Rapid Transit in Developing Countries	Halcrow Fox	July 2000
Understanding and Monitoring the Cost-Determining Factors of Infrastructure	European Commission DGXVI	April 1998
Twenty-one sources of error and bias in transport project appraisal	Peter Mackie, John Preston	1998
Analysis of WSDOT Construction Cost Overruns	Jimmie Hinze and Gregory A Selstead	July 1991
Understanding the Outcomes of Megaprojects – A Quantitative Analysis of Very Large Civilian Projects	Edward W. Merrow	March 1988
International Benchmarking of Track Cost	Oskar Stalder	2001
Choice of Mass Rapid Transit System	Deutsche Gesellschaft für	2002

	Technische Zusammenarbeit	
Comparison of construction costs on motorway projects using measure and value and alternative tendering initiative contractual arrangement Construction Management and Economics, Volume 21, Number 8, December 2003, 831 - 840.	D. A. Langford, P. Kennedy, J. Conlin, N. McKenzie	2003
Review of Highways Agency's Major Roads Programme, Report to Secretary of State for Transport	The Nichols Group	2007
Department for Transport: Estimating and monitoring the costs of building roads in England	National Audit Office	2007
Urban Rail Transit Projects: Forecast Versus Actual Ridership and Cost	Don Pickrell, US Department of Transportation	1990
The Estimation and Treatment of Scheme Costs: Transport Analysis Guidance	UK Department for Transport	2006
Predicted and Actual Impacts of New Start Projects: Capital Cost, Operating Cost and Ridership Data. Draft report.	US Department of Transportation, Federal Transit Administration with support from SG Associates	2003
The Cost and Patronage of Rapid Transit Systems Compared With Forecasts Research Report 352	D. A. Walmsley and M. W. Pickett Crowthorne, UK: Transport Research Laboratory	1992
Are WSDOT's Highway Construction Costs in Line with National Experience?	WS DOT	2005

Costs of job creation literature

Title	Author	Date of Publication
Study on measuring employment effects	CSES	June 2006
Measuring Structural Fund Employment Effects	DG REGIO	March 2007
Direct Job Creation Programs: Evaluation Lessons	Arun S. Roy and Ging Wong	December 1998
Direct Job Creation Programs: Evaluation Lessons on Cost-Effectiveness	Arun S. Roy and Ging Wong	2000
Active Labor Market Programs: A Review of the Evidence From Evaluations	Amit Dar and Zafiris Tzannatos	January 1999
Cost Per Job Associated with EDA Investments in Urban and Rural Areas	Amy K. Glasmeier	2002

Annex B
Project Templates

For each project we will collect data on:

- Project Attributes
- Causes of cost over run and delay
- Project cost estimates and actual costs

Draft templates for infrastructure projects are shown below

General Attributes (all project types)							
	Units	**Input**	**Options**				
Country							
Contract Type			PPP	Traditional	Unknown		
Construction Period	yrs						
Implementation period (planning + construction)	yrs						
Project Complexity		menu	1	2	3	4	
Estimated Project Size	€m	amount					
Procuring agency			Local authority	Ministry of transport	Development agency	Railw ay authority	Other
Funding structure		menu	Govt/ERDF	Govt/ERDF/ EIB	Private Sector		
Predominant Locality			Urban	Rural			
Predominant Terrain			Level	Undulating	Steep	Mountainou s	
Predominant Geology			Soft	Silty / Sandy	Normal	Rock (Blasting)	
Predominant Environmental			Easy	Normal	Difficult		
Project Types							
Rail							
Road							
Urban Transport							
Water							
Project specific attrubutes							
Road Attributes	**Units**						
Length or Road	km						
Attribute 2							
Attribute 3							
Attribute 4							
Attribute 5							
Rail Attributes							
Length of Track	km						
Design Compacity	Passenger Hrs '000						
Proportion of Track in Fixed Link	%						
Average Station spacing	km						
Electrical/Diesel							
Type of Rolling Stock							
Attribute 7							
Attribute 8							
Attribute 9							
Attribute 10							
Urban Transport							
Length of Track							
Design Compacity							
Proportion of Track in Fixed Link							
Number of Stations							
Electrical/Diesel							
Type of Rolling Stock							
Proportion of Elevated Track							
Proportion of Undergournd Track							
Proportion of Underground Stations							
Proportion of Surface Stations							

Cause of Overruns		
Level 1	**Level 2**	
Procurement Issues	Complexity of Contract Structure	Eg Multiple contractors
	Design Changes	Extent of changes in design and scope
	Contractor specific difficulties	Contractor financial difficulties
	Disputes with suppliers	Overruns and delays associated with contractual disputes
	Poor Planning/Methodological errors	
Project specific	Design Complexity	Eg difficulties incoordinating different project components
	Degree of Innovation	New technologies
	Environmental Impact	
Client Specific	Inadequacy of the Business Case	Eg changes in scope
	Large Number of Stakeholders	
	Funding Availability/Problems	Costs associated with delays in availability of funds
	Project Management Team	
Project environment	Public Relations	
	Site Characteristics	
	Permits/Consents/Approvals	
External issues	Political	Change in Government leading to delays/overruns
	Economic	Boomingeconomy increases costs
	Changes in Legislation/Regulations	Tax rates, import duties
	Technology	
	Inflation	
	Exchange Rates	
	Force Majure	
	Other (specify)	

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Estimate

Cost Categories			€m			Physical Units			
Level 2 headings	Level 3 Headings		Level 2 Costs (€m)	Level 3 Costs (€m)		Units	Level 2 Units	Level 3 Units	
Land			12	12		Ha	12	12	
Pavement	*Total level 2 Cost*		550			km	65		
New Construction	**New Construction**								
	One Carriageway	1 Lane				km			
		2 Lane				km			
		3 lane				km			
		4 lane		230		km		25	
		Shoulder				km			
	Two carriageway								
		2 Lane				km			
		4 Lane				km			
		6 lane				km			
		Shoulders				km			
	Rehabilitation								
	One Carriageway	1 Lane				km			
		2 Lane				km			
		3 lane				km			
		4 lane		220		km		20	
		Shoulder		100		km		20	
	Two carriageway								
		2 Lane				km			
		4 Lane				km			
		6 lane				km			
		Shoulders				km			
	Total level 3 Cost			550	ok	km		65	ok
Bridges	*Total level 2 Cost*		150			m2	31000		
	Beam Bridge			30		m2		14000	
	Cantilever			30		m2		12000	
	Arch			50		m2		3000	
	Suspension			40		m2		2000	
	Cable Stay					m2			
	Truss					m2			
	Total level 3 Cost			150	ok	m2		31000	ok
Tunnels	*Total level 2 Cost*		60			km	6		
	Bored			30		km		4	
	Cut and Cover			30		km		2	
	Total level 3 Cost			60	ok	km		6	ok
Other	*Total level 2 Cost*		65						
	Specify 1			10		Specify 1		20	
	Specify 2			50		Specify 2		10	
	Specify 3			5		Specify 3		10	
	Total level 3 Cost			65	ok			40	
TOTAL LEVEL 1 COST				837					

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Actual

Cost Categories			€m			Physical Units			
Level 2 headings	Level 3 Headings		el 2 Costs (€m)	el 3 Costs (€m)		Units	Level 2 Units	Level 3 Units	
Land			10	10		Ha	11	11	
Pavement	*Total level 2 Cost*		650			km	78		
New Construction	**New Construction**								
	One Carriageway	1 Lane				km			
		2 Lane				km			
		3 lane				km			
		4 lane		340		km		27	
		Shoulder				km			
	Two carriageway								
		2 Lane				km			
		4 Lane				km			
		6 lane				km			
		Shoulders				km			
	Rehabilitation								
	One Carriageway	1 Lane				km			
		2 Lane				km			
		3 lane				km			
		4 lane		300		km		41	
		Shoulder		10		km		10	
	Two carriageway								
		2 Lane				km			
		4 Lane				km			
		6 lane				km			
		Shoulders				km			
	Total level 3 Cost			650	ok	km		78	ok
Bridges	*Total level 2 Cost*		156			m2	30000		
	Beam Bridge			39		m2		15000	
	Cantilever			20		m2		10000	
	Arch			55		m2		3000	
	Suspension			42		m2		2000	
	Cable Stay					m2			
	Truss					m2			
	Total level 3 Cost			156	ok	m2		30000	ok
Tunnels	*Total level 2 Cost*		62			km	6		
	Bored			32		km		4	
	Cut and Cover			30		km		2	
	Total level 3 Cost			62	ok	km		6	ok
Other	*Total level 2 Cost*		70						
	Specify 1			10		Specify 1		22	
	Specify 2			55		Specify 2		12	
	Specify 3			5		Specify 3		12	
	Total level 3 Cost			70	ok				
TOTAL LEVEL 1 COST				**948**					

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VARIANCE

Cost Categories			€m			Physical Units			
Level 2 headings	Level 3 Headings		l 2 Costs	l 3 Costs	(€m)	Units	vel 2 U	vel 3 Units	
Land			-2	-2		Ha	-1	-1	
Pavement	*Total level 2 Cost*		100			km	13		
New Construction	**New Construction**								
	One Carriageway	1 Lane		0		km		0	
		2 Lane		0		km		0	
		3 lane		0		km		0	
		4 lane		110		km		2	
		Shoulder		0		km		0	
	Two carriageway			0				0	
		2 Lane		0		km		0	
		4 Lane		0		km		0	
		6 lane		0		km		0	
		Shoulders		0		km		0	
	Rehabilitation			0				0	
	One Carriageway	1 Lane		0		km		0	
		2 Lane		0		km		0	
		3 lane		0		km		0	
		4 lane		80		km		21	
		Shoulder		-90		km		-10	
	Two carriageway								
		2 Lane		0		km		0	
		4 Lane		0		km		0	
		6 lane		0		km		0	
		Shoulders		0		km		0	
	Total level 3 Cost			100	ok	km		13	ok
Bridges	*Total level 2 Cost*		6			m2	-1000		
	Beam Bridge			9		m2		1000	
	Cantilever			-10		m2		-2000	
	Arch			5		m2		0	
	Suspension			2		m2		0	
	Cable Stay			0		m2		0	
	Truss			0		m2		0	
	Total level 3 Cost			6	ok	m2		-1000	ok
Tunnels	*Total level 2 Cost*		2			km	0		
	Bored			2		km		0	
	Cut and Cover			0		km		0	
	Total level 3 Cost			2	ok	km		0	ok
Other	*Total level 2 Cost*		5						
	Specify 1			0		Specify 1		2	
	Specify 2			5		Specify 2		2	
	Specify 3			0		Specify 3		2	
	Total level 3 Cost			5	ok				
TOTAL LEVEL 1 COST				**111**				**-988**	

TIMELINE									
	ESTIMATE				ACTUAL				VARIANCE
	Date		Duration (Mnths)		Date		Duration (Mnths)		Months
	Start	Finish			Start	Finish			
Planning	1 March 2004	1 March 2005	12		1 June 2004	1 August 2005	14		2
Funding	1 March 2005	1 September 2005	6		1 August 2005	1 December 2005	4		-2
Permissions	1 September 2005	1 September 2006	12		1 December 2005	1 September 2006	9		-3
Site preparation	1 September 2006	1 April 2007	7		1 September 2006	1 September 2007	12		5
Construction	1 April 2007	1 September 2007	5		1 September 2007	1 February 2008	5		0
Testing	1 September 2007	1 December 2007	3		1 February 2008	1 March 2008	1		-2
			45				45		0

Annex C

Sample Projects

Total projects: 150. Infrastructure projects: 110. Productive investments: 40.

	Country	Reference	Title	Sector
1	DE	2002DE161PR003	Highway A 17	Road
2	DE	2002DE161PR004	Highway A 113	Road
3	DE	2002DE161PR005	B96n (Federal Road) Neubau der Bundesstrasse B 6n in den Abschnitten Wernigerode-Blankenburg und Quedlinburg-Bernburg	Road
4	DE	2002DE161PR006	Highway A 71	Road
5	DE	2002DE161PR007	B96n (Federal Road) B96n (Federal Road)	Road
6	DE	2003DE161PR006	Ostsee- Autobahn A20	Road
8	DE	2002DE161PR002	Railway Berlin-Frankfurt/O.	Rail
9	DE	2003DE161PR004	City-Tunnel Leipzig City-Tunnel Leipzig modif.	Rail (Tunnel)
10	DE	2003DE161PR005	Südanbindung-Halle	Rail
11	DE	2003DE161PR007	ABS Paderborn- Chemnitz	Rail
12	DE	2005DE161PR002	Halberstadt-Vienenburg Halberstadt-Vienenburg modif.	Rail
13	DE	2005DE161PR005	Grand Projet Rostock - Berlin	Rail
14	DE	2006DE161PR003	Neckermann Renewables Wittenberg	Energy
15	DE	2003DE161PR002	Agrolinz	Productive Investment
16	DE	2003DE161PR008	Otto Verteilzentrum	Productive Investment
17	DE	2003DE162PR002	Sartorius AG	Productive Investment
18	DE	2004DE161PR001	Molkerei Leppersdorf	Productive Investment
19	DE	2004DE161PR002	Südzucker Zeitz	Productive Investment
20	DE	2004DE161PR003	“Euroglas", Osterweddingen	Productive investment
21	DE	2004DE161PR004	RapidEye Brandenburg	Productive Investment
22	DE	2005DE161PR001	Impfstoffwerk Dessau-Tornau	Productive Investment
23	DE	2006DE161PR001	EverQ GmbH, Sachsen-Anhalt	Productive Investment
24	DE	2006DE161PR002	Delipapier GmbH	Productive Investment
25	DE	2006DE161PR008	“Q-Cells", Thalheim	Productive investment

26	ES	2002ES161PR009	Autovía Ruta de la Plata. CN-630 de Gijón a Sevilla. Tramo: Plasencia Sur - Cañaveral Este	Road
27	ES	2004ES161PR023	Autovía de la Plata, CN-630 de Gijón a Sevilla. Tramo: Fuente de Cantos - Límite de la Provincia de Huelva	Road
28	ES	2005ES161PR003	Línea ferroviaria de Alta Velocidad de Levante. Tramo: Elche - Murcia. Acceso a la ciudad de Murcia (Plataforma y vía) Fase I	Rail
29	ES	2005ES161PR005	Nuevo acceso ferroviario de Alta Velocidad a Toledo	Rail
30	ES	2005ES161PR008	Línea de Alta Velocidad León - Asturias. Variante de Pajares. Tramo: Túneles de Pajares, Fase I (Asturias)	Rail
31	ES	2005ES161PR009	Línea de Alta Velocidad León - Asturias. Variante de Pajares. Tramo: Túneles de Pajares, Fase I (Castilla y León)	Rail
32	ES	2006ES161PR001	Línea ferroviaria de Alta Velocidad de Levante. Tramo: Acceso Alicante - Elche. Subtramo: Sax - Elda - Monóvar - Novelda - Monforte de Cid - La Alcoraya (Fase I, Plataforma)	Rail
33	ES	2006ES161PR018	Eje Albacete - Murcia - Cartagena. Tramo Chinchilla - Murcia - Cartagena, entre los PK 366,790 y 410,260	Rail
34	ES	2002ES161PR025	Conducción Júcar-Vinalopó Conducción Júcar-Vinalopó (modif.)	Water supply
35	ES	2003ES161PR021	Modernización de la Acequia Real del Júcar Modernización de la Acequia Real del Júcar (modif.)	Water Efficiency Infrastructure
36	ES	2005ES161PR004	Desaladora de Valdelentisco	Water supply
37	ES	2005ES161PR010	Sistema Automático de Información Hidrológica (SAIH) de la Cuenca del Duero	Water Efficiency Infrastructure
38	ES	2005ES161PR011	Desaladora del Canal de Alicante	Water supply
39	ES	2006ES161PR010	Planta Desaladora para garantizar los regadíos del trasvase Tajo-Segura	Water supply
40	ES	2006ES161PR011	Planta Desaladora para garantizar los regadíos del trasvase Tajo-Segura	Water supply
41	ES	2006ES161PR012	Nueva Desaladora de Aguilas/Guadalentín. Ampliación de la Desaladora de Aguilas	Water supply
42	ES	2006ES161PR013	Conducción de la Desaladora de Carboneras al Valle de Almanzora	Water supply
43	ES	2006ES161PR014	Desaladora de Agua de mar del Bajo Almanzora	Water supply
44	ES	2006ES161PR016	Conducción de Cerro Blanco a la ETAP de El Atabal	Water supply
45	ES	2006ES161PR017	Desaladora del Campo de Dalías y obras complementarias	Water supply
46	ES	2006ES161PR015	Ordenación y terminación de la reutilización de aguas residuales de la Planta Pinedo (Valencia)	Water treatment
47	ES	2002ES161PR022	Delphi Automotive System España, S.A. Delphi Automotive System España, S.A. (modif.)	Productive Investment
48	ES	2003ES161PR002	Fibras del Noroeste, S. A. Fibras del Noroeste, S. A. (modif.)	Productive Investment
49	ES	2003ES161PR019	Biocarburantes de Castilla y León, S.A. Biocarburantes de Castilla y León, S.A.(modif.)	Productive Investment
50	ES	2003ES161PR020	Tableros Tradema, S.A. Tableros Tradema, S.A. (modif.)	Productive Investment

51	ES	2003ES161PR023	Airbus España, S.L. - Cádiz Airbus España, S.L. - Cádiz (modif.)	Productive Investment
52	ES	2003ES161PR026	Petroquímica Española, S.A.. Petroquímica Española, S.A. (modif.)	Productive Investment
53	ES	2004ES161PR004	Intercontinental Química, S.A. Intercontinental Química, S.A. (modif.)	Productive Investment
54	ES	2004ES161PR009	Construcciones Aeronáuticas, S.A. - Sevilla Construcciones Aeronáuticas, S.A. - Sevilla (modif.)	Productive Investment
55	ES	2004ES161PR010	Construcciones Aeronáuticas, S.A. - Cádiz Construcciones Aeronáuticas, S.A. - Cádiz (modif.)	Productive Investment
56	ES	2004ES161PR013	Renault España, S.A. - Sevilla Renault España, S.A. - Sevilla (modif.)	Productive Investment
57	ES	2004ES161PR017	Eco-Teo, S.A. Eco-Teo, S.A. (modif.)	Productive Investment
58	ES	2004ES161PR018	Renault España, S.A. - Valladolid Motores Renault España, S.A. - Valladolid Motores (modif.)	Productive Investment
59	ES	2004ES161PR019	Renault España, S.A. - Valladolid Carrocerías Renault España, S.A. - Valladolid Carrocerías (modif.)	Productive Investment
60	ES	2004ES161PR020	Renault España, S.A. - Palencia Renault España, S.A. - Palencia (modif.)	Productive Investment
61	ES	2005ES161PR006	Renault España, S.A. - Valladolid Diesel	Productive Investment
62	ES	2005ES161PR007	Fibras del Noroeste, S.A.	Productive Investment
63	ES	2006ES161PR003	Productos capilares L'Oreal, S.A.	Productive Investment
64	ES	2006ES161PR004	Punta Umbría Turística, S.A.	Productive Investment
65	ES	2006ES161PR006	Ertisa, S.A.	Productive Investment
66	ES	2006ES161PR007	General Electric Plastics de España, S.C.P.A.	Productive Investment
67	ES	2006ES161PR008	Peugeot - Citroën Automóviles España, S.A.	Productive Investment
68	ES	2006ES161PR009	Compañía Inmobiliaria y de Inversiones, S.A.	Productive Investment
69	ES	2006ES161PR019	CIA ESPAÑOLA DE PETRÓLEOS, SA (CEPSA)	Productive Investment

70	FR	2005FR161PR001	Route des Tamarins	Road
71	FR	2006FR161PR001	TCSP Martinique	Urban transp
72	FR	2006FR161PR002	TCSP Valenciennes	Urban transp
73	FR	2006FR161PR003	TCSP du Douaisis	Urban transp
74	FR	2005FR162PR003	Centre de valorisation organique - Communauté urbaine de Lille métropole	Energy - Environment
75	FR	2006FR162PR001	Programme global d'assainissement de Saint-Etienne - phase 2	Waste water treatment
76	FR	2001FR162PR003	Grand Projet ATMEL	Productive Investment
77	FR	2005FR162PR002	ATMEL	Productive Investment

78	IR	2005IE161PR002	N15 Bundoran/Ballyshannon by-pass	Road
79	IR	2002IE161PR003	N8 Watergrasshill by-pass	Road
80	IR	2002IE161PR004	N11 Rathnew-Ashford by-pass	Road
81	IR	2002IE161PR005	N18 Hurler's Cross by-pass	Road
82	IR	2002IE161PR006	N22 Ballioncolling by-pass	Road
83	IR	2001IE161PR001	Luas Line A (light rail)	Rail
84	IR	2002IE161PR001	Purchase of diesel railcars	Rail (rolling stock)
85	IR	2005IE161PR001	DART Upgrade (DASH)	Rail

86	IT	2003IT161PR003	SS131 "Carlo Felice"- Adeguamento Oristano-Cagliari	Road
87	IT	2003IT161PR005	Autostrada Siracusa-Gela - Sicilia	Road
88	IT	2005IT161PR005	Strada Statale (SS) 131 - Diramazione Centrale Nuorese - Tratta San Simone - San Teodoro	Road
89	IT	2006IT161PR002	SS 114 Orientale Sicula	Road
90	IT	2006IT161PR005	A3 Salerno-Reggio Calabria	Road
91	IT	2006IT161PR006	SS 268 "Del Vesuvio"	Road
92	IT	2003IT161PR001	Raddoppio Palermo-Messina	Rail
93	IT	2003IT161PR002	Potenziamento infrastrutturale e tecnologico della Caserta-Foggia	Rail
94	IT	2003IT161PR012	Ferrovia Circumetnea-Ammodernamento della tratta ferroviaria extraurbana Paternò Adrano	Rail
95	IT	2004IT161PR006	Ferrovia Circumvesuviana - Torreannunziata/Pogiomarino/.../Pompei	Rail
96	IT	2004IT161PR007	Velocizzazione linea ferroviaria Palermo - Agrigento	Rail
97	IT	2004IT161PR010	Raddoppi Bari - Taranto e CTC intera linea Raddoppi Bari - Taranto e CTC intera linea (modif?)	Rail
98	IT	2004IT161PR011	Raddoppio Decimomannu - San Gavino	Rail
99	IT	2006IT161PR003	Tratta Campana della linea AV/AC Roma-Napoli	Rail
100	IT	2003IT161PR007	Metropolitana di Napoli tratta Vanvitelli Dante codice MONTI 402	Urban transp
101	IT	2003IT161PR011	Prolungamento della tratta metropolitana della ferrovia Circumetnea nell'ambito urbano della città metropolitana di Catania	Urban transp
102	IT	2004IT161PR008	Ampliamento aerostazione dell'aeroporto di Catania Fontanarossa	Urban transport
103	IT	2005IT161PR004	Metropolitana di Napoli - Tratta Dante Garibaldi Metropolitana di Napoli - Tratta Dante Garibaldi	Urban transp
104	IT	2006IT161PR013	Metro Napoli "Mostra-S Pasquale"	Urban transp
105	IT	2006IT161PR008	Metropolitana leggera di Cagliari	Urban transp
106	IT	2005IT161PR001	FRI - EL Campania SrL	Energy
107	IT	2005IT161PR006	Acquedotto Gela-Aragona	Water Supply
108	IT	2005IT161PR007	Acquedotto Favara di Burgio	Water supply

109	EL	2003GR161PR006	Restauration du lac de KARLA	Road
110	EL	2003GR161PR008	Completion of EGNATIA Road Axe sections on Macedonia and Thrace	Road
			Completion of EGNATIA Road Axe sections on Macedonia and Thrace	
111	EL	2003GR161PR014	Sections d'Egnatia Odos-IOANNINA-METSOVO	Road
			Sections d'Egnatia Odos-IOANNINA-METSOVO	
112	EL	2003GR161PR015	Construction of Kifissos Avenue	road
113	EL	2004GR161PR001	Egnatia-sections dans la Région de l'Epire	Road
			Egnatia-sections dans la Région de l'Epire	
114	EL	2004GR161PR002	Axe EGNATIA: Ardanio-Ormenio Section Mandra-Psathades	Road
			Axe EGNATIA: Ardanio-Ormenio Section Mandra-Psathades	
115	EL	2004GR161PR003	Attiki Odos	Road
			Attiki Odos	
116	EL	2005GR161PR008	Sximatari Chalkida road axis	Road
			Sximatari Chalkida road axis	
117	EL	2005GR161PR012	Construction of Kifissos Avenue : Section from Km 0+700 to Km 3+060	Road
118	EL	2005GR161PR014	Axe Vertical Egnatia-Derveni-Serrees-Promaxonas. Section Derveni-Dorkoda	Road
119	EL	2005GR161PR015	Operational Completion of Egnatia vertical axis sections Siatista-Krystalopigi.Section Siatista-Rahes-Aliakmon	Road
120	EL	2005GR161PR017	Egnatia Odos - Chrissoupoli - Vaniano (Section Bridge Nestou)	Road
			Egnatia Odos - Chrissoupoli - Vaniano (Section Bridge Nestou)	
121	EL	2003GR161PR013	Restructuring of OSE and implementation of the OSE business plan	Rail
			Restructuring of OSE and implementation of the OSE business plan	
122	EL	2003GR161PR016	Suburban railway Athens/section Athens-Three bridges-SKA-Spata	Rail
			Suburban railway Athens/section Athens-Three bridges-SKA-Spata	
123	EL	2005GR161PR011	Construction d'une nouvelle voie ferroviaire entre Thessaloniki et Idomeni (PHASE I) (Section Polycastro-Idomeni)	Rail
124	EL	2005GR161PR001	New double track railway line section Tithorea-Lianokladhi	Rail
			New double track railway line section Tithorea-Lianokladhi	
125	EL	2005GR161PR002	Modernization of the railway line Athens (SKA) - Thessalonica	Rail
			Modernization of the railway line Athens (SKA) - Thessalonica	
126	EL	2005GR161PR010	Signalling and telecommunications for the railway line Kiato - Athens - Thessaloniki	Rail
127	EL	2006GR161PR004	Construction railway line section Lianokladi-Domokos	Rail
128	EL	2006GR161PR005	Electrification de la traction sur la nouvelle voie de Chemins de fer sur la section de SKA à Kiato	Rail
129	EL	2003GR161PR001	Construction of the Athens Tram	Urban transp
			Developpement du tram d'Athènes	
130	EL	2004GR161PR005	Metro d'Athènes - extension vers Peristeri (travaux d'ingénierie civile)	Urban transp
131	EL	2005GR161PR005	Connection of Greek Gas Transport System to new supply sources in Asia	Energy
132	EL	2005GR161PR006	Extension of the low pressure network for natural gas in Attica	Energy

133	PL	2005PL161PR003	Construction of Pulawy by-pass - Phase I	Road
134	PL	2005PL161PR004	Reconstruction of the national road no. 22 Elblag - Grzechotki section	road
135	PL	2006PL161PR002	Młociny	road
136	PL	2005PL161PR002	Modernisation of Warsaw-Lodz railway line (I:Skierniewice-Lodz Widzew)	Rail
137	PL	2005PL161PR001	The Integrated public transport in Krakow agglomeration - stage I	Urban transp
138	PL	2006PL161PR001	Lodz Regional Tram: Zgierz-Lodz-Pabianice. Task 1, Phase 1 – Lodz	Urban transp

139	PT	2005PT161PR001	Modernização de 57 Unidades Triplas Eléctricas (UTE's) para a CP -Regional	Rail (rolling stock)
140	PT	2003PT161PR005	MST-Metropolitano Ligeiro do Sul do Tejo (1a fase)	Urban transp
141	PT	2005PT161PR003	Parque Pampilhosa da Serra, Energia Eólica, S.A.	Energy
142	PT	2006PT161PR001	Generventos do Pinhal Interior - Energias Renováveis, Soc. Unipessoal,Lda	Energy
143	PT	2006PT161PR002	Parque Eólico do Caramulo	Energy
144	PT	2006PT161PR003	Parque Eólico da Gardunha	Energy
145	PT	2005PT161PR002	BA - Fábrica de Vidros Barbosa & Almeida, S.A.	Productive Investment

146	SL	2005SK161PR002	Zarnovica Sasovske Podhradie	Road

147	UK	2002GB161PR005	Infrastructure Investement- Northern Ireland Natural Gas Project- Gas Pipelines from Gormanstown(Republic of Ireland) to Antrim and from Carrickfergus to Londonderry	Energy
148	UK	2004GB161PR003	Infrastructure Investment-Merseytram Line 1 and City Centre Loop	Urban transp
149	UK	2001GB161PR001	MERSEYSIDE SPECIAL INVESTEMENT FUND	Productive investment
150	UK	2005GB161PR001	Doncaster Sheffield Airport (DSA) and Business Zone	Productive investment

Annex D
Sample questionnaire for rail projects

Costs
Please indicate clearly the dates for which estimated and actual cost data are stated (to facilitate adjustments to a common price base).

We have extracted the estimated cost information available from the ERDF project application forms supplied by the Commission. Where it is possible to provide more detailed breakdowns (for estimates and actuals), please do so.

Cost category	Estimate	Actual
Total cost		
Planning/design cost		
Land acquisition cost		
Track work, of which:		
- single track		
- twin track		
Stations, of which		
- ground level		
- underground		
Bridges		
Tunnels		
Rolling stock		
Other		
- project management		
- publicity		
- technical assistance		
- contingency		
- other (please specify)		

Delivery time

Please provide estimated and actual delivery times in months.

We note that project phases can often overlap, particularly in the early stages. If delivery times are only available for two or more phases in the aggregate, please indicate clearly.

Project stage	Estimate	Actual
Planning		
Securing funding		
Permissions		
Site preparation		
Construction		
Testing/certification		

General attributes

Attribute	Description
Country	
Contract type	
Project complexity	
Procuring agency	
Funding structure and sources	
Predominant locality	
Predominant terrain	
Predominant geology	
Predominant environment	

Rail-specific attributes

Please try to ensure consistency between units of measurement for totals and for individual parts of the road.

Attribute	Number/proportion	Length/area	Cost
Length of rail, of which			
- at grade			
- elevated			
- in tunnel			
Number of bridges, of which:			
- beam bridges			
- cantilever bridges			
- arch bridges			
- suspension bridges			
- cable stay bridges			
- truss bridges			
Tunnels, of which:			
- bored			
- cut and cover			
- open cut			
Design capacity			
Proportion of track in fixed link			
Average station spacing			
Stops			
Controlled junctions			
Depots			
Park-and-ride facilities			
Track guage			
Platform length			
Platform width			

Cost overrun analysis

Please rate the reasons for cost overruns according to the following guidelines.

Scoring for cause of overruns and delays	
No or insignificant cause of over run or delay	0
Minor factor contributing to overrun or delay (<20%)	1
Major factor contributing to overrun or delay (20%- 50%)	2
Very significant contributing factor (>50%)	3

High-level issue	Low-level issue	Examples	Rating
Procurement issues	Contract complexity	Multiple contractors	
	Design changes	Design/scope changes	
	Contractor specific difficulties	Contractor financial difficulties	
	Disputes with suppliers	Contractual disputes	
	Poor planning/ methodological errors		
Project specific	Design complexity	Difficulties in coordinating different project components	
	Degree of innovation	New technologies	
	Environmental impact		
Client specific	Inadequate business case	Changes in scope	
	Large number of stakeholders		
	Funding availability problems		
	Project management team		
Project environment	Public relations		
	Site characteristics		
	Permits/consents/approvals		
External issues	Political	Change in government	
	Economic	Booming economy	
	Legislative/regulatory changes	Tax rates, import duties	
	Technology		
	Inflation		
	Exchange rates		
	Force majeure		
	Other (please specify)		

Project delay analysis

Please rate the reasons for project delays according to the following guidelines.

Scoring for cause of overruns and delays	
No or insignificant cause of over run or delay	0
Minor factor contributing to overrun or delay (<20%)	1
Major factor contributing to overrun or delay (20%- 50%)	2
Very significant contributing factor (>50%)	3

High-level issue	Low-level issue	Examples	Rating
Procurement issues	Contract complexity	Multiple contractors	
	Design changes	Design/scope changes	
	Contractor specific difficulties	Contractor financial difficulties	
	Disputes with suppliers	Contractual disputes	
	Poor planning/ methodological errors		
Project specific	Design complexity	Difficulties in coordinating different project components	
	Degree of innovation	New technologies	
	Environmental impact		
Client specific	Inadequate business case	Changes in scope	
	Large number of stakeholders		
	Funding availability problems		
	Project management team		
Project environment	Public relations		
	Site characteristics		
	Permits/consents/approvals		
External issues	Political	Change in government	
	Economic	Booming economy	
	Legislative/regulatory changes	Tax rates, import duties	
	Technology		
	Inflation		
	Exchange rates		
	Force majeure		
	Other (please specify)		