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HEATCO

Developing **H**armonised **E**uropean **A**pproaches for **T**ransport **Co**sting and Project Assessment

Specific Support Action

PRIORITY SSP 3.2: The development of tools, indicators and operational parameters for assessing sustainable transport and energy systems performance (economic, environmental and social)

Deliverable 1
Current practice in project appraisal in Europe
Analysis of country reports

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HEATCO Work Package 3: Current practice in project appraisal in Europe

Deliverable 1/Volume 1 (main text)

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1 Introduction

1.1 Background

The primary objective of HEATCO is the development of harmonised guidelines for project assessment and transport costing at an EU level. Work package 3 contributes by compiling and analysing current practice of appraisal work in the EU Member States and Switzerland.

The work of HEATCO is based on a number of EU projects that have considered the issue of appraisal in the EU as part of their work - especially EUNET and UNITE. The objectives, recommendations and results from these two projects are briefly outlined here to illustrate a section of the background literature which HEATCO is drawing from and expanding on.

The objective of EUNET was to develop a comprehensive method for modelling and then assessing the socio-economic impacts of new strategic transport initiatives. EUNET had three core objectives which were;

– the development of a new regional economic/transport modelling approach;

– to produce recommendations on costs, prices and values including a set of standardised 'European' values to feed into the assessment process; and

– to develop an assessment method and prototype assessment software.

It is the work completed for the second objective (determining a set of standardised values) that has the most relevance for the HEATCO work.

To determine the appraisal methods and values currently being used by EU Member States a data collection exercise was completed. The country specific data is compared in Grant-Muller et al (1999) for 1997. The results from this exercise showed that different methods, definitions and values were being used across the EU for appraisal. Nellthorp et al (1998) presents the recommendations regarding how individual impacts should be defined, valued and measured in the European appraisal context for EUNET (given the existing differences across the EU). It is these definitions of impacts (e.g. casualty severity) that have been used in HEATCO to determine any discrepancies across the country appraisals seven years on from the initial EUNET survey.

The main recommendations resulting from the EUNET work was that a common appraisal framework was needed for the appraisal of European Transport projects coupled with common basic rules for carrying out the appraisal (e.g. common definitions and methods). The result was that the methodology, rules and impacts to be included in the appraisal were standardised across the project case studies. One issue that was not resolved in this project was whether a common EU value or country specific values should be used in the appraisal. This issue was taken forward in UNITE.

The overall aim of UNITE was to support policy makers in setting charges for the use of transport infrastructure by the provision of appropriate methodologies and empirical evidence. UNITE had three core objectives which were;

– to develop pilot transport accounts for all modes;

– to provide a comprehensive set of marginal cost estimates for Europe; and

– to deliver a framework for the integration of accounts and marginal costs.

A small section of this work involved considering what valuation conventions should be used across the EU countries to provide consistency across the project for these three objectives. Nellthorp et al. (2000) presents this work, which included consideration of the issue of using common EU values or country specific values in appraisal work.

UNITE concluded that a common EU value should be used for the impacts of transboundary air pollution and the costs from global warming given their EU wide significance. However, for all other impacts country specific values should be used, as this would allow differences in willingness to pay experienced in the different countries to be highlighted. Prices were also valued at factor costs due to the focus on the cost side of the transport accounts, which are mainly valued using this convention. Other recommendations were that values should grow over time with real incomes and that a standard discount rate of 3% should be used unless there is support for an alternative real social discount rate in a particular country. The result of the research was that the methodology, values for transboundary air pollution, global warming, discount rate and valuation method of prices were all standardised across the UNITE projects.

Furthermore, the work of HEATCO draws on the conclusions from the IASON project. The objective of IASON was to develop rules for social cost-benefit analysis of transport projects and policies with a focus on indirect effects.

Since the completion of the EUNET and UNITE research projects the EU has expanded to 25 countries and there is a greater need to review appraisal practice in the context of trans European Network funding. HEATCO takes the work of UNITE, EUNET and IASON forward through a strong involvement with National Governments and relevant stakeholders to formulate a view regarding

which aspects of the appraisal procedure should be harmonised for project assessment and transport costing at the EU level.

1.2 Structure and content of report

This report presents the overall results of Work Package 3: "Analyse existing practice" (hereafter WP3) of the HEATCO project.

The work in WP3 has provided a solid structured base of information at country level on existing practice of infrastructure appraisal and transport costing in EU Member States and Switzerland, as a non-EU country. This information is a precondition for the analyses and recommendations put forward in subsequent work packages. In addition, WP 3 offers an overall overview and comparison of the methods across the countries, which is valuable in its own right.

The work completed in WP3 is reported on three levels each targeting different types of users. The first level is this main report presenting an overview of findings across countries and summarising the actual trend of appraisals in the EU. The second level is the annexes to this report offering more detailed data at country level but in a form of tables making it easy both to study the situation in the countries and compare across the countries. The third level is the full database with all collected data in the form of the country reports. This is delivered as a CD-ROM in addition to the main report.

The work of WP3 falls into two broad areas;

– collection of information on current practice; and

– analysis and comparison of existing practice[1].

The work completed updates and expands the country data first collected in EUNET in 1997 through a country based proforma with an emphasis on cost-benefit analysis. It is through comparing this country data that WP4 will make recommendations on how to harmonise appraisal practice in the EU drawing on the conclusions from the EUNET, UNITE and IASON projects.

The analysis and comparison of existing practice of project assessment and transport costing has highlighted a number of similarities and differences across countries and modes. The authors acknowledge that national guidelines are generally the results of a long tradition and development of project appraisal. They are not based on the same methodological framework and they are used in different regulatory contexts. For this reason procedures and values used are different. However, from the HEATCO perspective of developing a harmonised "state-of-the-art" approach for assessing European infrastructure projects a comparison and analysis is required.

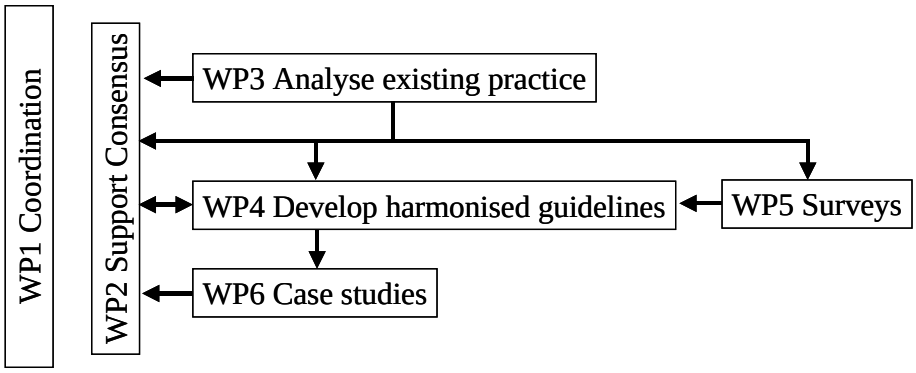
[1] Which will be deepened in WP4.

Furthermore, the authors acknowledge that the information reflected in the country reports usually only represents a subset of all processes involved in project appraisal from project planning to realisation.

1.2.1 WP3 in the HEATCO project

The role of WP3 in the HEATCO-project is illustrated in the figure below. The review and analysis of current project assessment practice feeds into WP2 (Support consensus), which is devoted to organising the stakeholder involvement and WP4 (Develop harmonised guidelines), where a proposal for harmonised guidelines will be prepared. Furthermore, the work of WP3 feeds into WP5 (Surveys) which are performing selected contingent valuation studies.

Figure 1.1 Work package contributions



This report is Deliverable 1 of the HEATCO project. The complete list of deliverables in the HEATCO project is shown in the table below.

Table 1.1 Deliverables of HEATCO

Deliverable number	Description/title
D1	Current practice in project appraisal in Europe
D2	State of the art in project assessment
D3	Documentation of issues to be considered when developing proposal for harmonised guidelines
D4	Results of stated preference surveys
D5	Proposal for harmonised guidelines
D6	Case study results
D7	Final report

1.2.2 Structure of Deliverable 1

At the outset, elements of infrastructure appraisal were divided into six main components, which are described in separate chapters. These chapters follow a description of the methodological framework for WP3 (Chapter 2):

– Chapter 3: *General principles for infrastructure appraisals*;

– Chapter 4: *Construction related costs*;

– Chapter 5: *User benefits and vehicle operating costs*;

– Chapter 6: *Safety*;

– Chapter 7: *Environmental impacts*; and

– Chapter 8: *Indirect socio-economic effects*.

Chapter 9 provides a summary and some concluding remarks on the findings.

As the purpose of this report is to provide an overview of existing practice of project appraisal most country specific details are, as mentioned, presented in Annexes I-XII. These annexes provide important input to other work packages, especially WP4.

Detailed comparisons of key figures are part of WP4. A compilation of key values can, however, be found in this report for discount rates (Section 3.3), appraisal periods (Section 3.3), system operating costs and maintenance for road (Annex V), system operating costs and maintenance for rail (Annex V), values of travel time savings (Section 5.1), road freight driver and crew time related transport costs (Section 5.4), safety (Section 6.3) and climate change (Annex X).

The country reports are presented in "Deliverable 1/Volume 2 (country reports)" (electronic version).

2 Methodological framework for WP3

2.1 Tasks

The work undertaken in WP3 falls, as mentioned into two broad areas, each consisting of several sub-tasks. The two areas are described below.

2.1.1 Collection of information on current practice

The first part of the work involved a review of state-of-the art recommendations and guidelines from ECMT, TINA, EU and international organisations (including 5th FP projects) to provide a benchmark for current national practices (see also list of references).

On the basis of this review, a delimitation of the project was made and a framework for the analysis developed.

The cornerstone of this framework is the proforma for country reports, which was developed by COWI with help of ITS and with valuable contributions from HEATCO project partners. One country report was completed for each surveyed country covering all modes.

The main advantages of using a proforma for country reports are;

- data/information are collected in a common format and structure for all countries and modes;
- all topics are covered;
- it allows a comprehensive analysis of differences and similarities in current practice of project appraisal; and it
- allows the use of a common set of definitions.

Despite the great effort put into defining the concepts and terms used in the proforma it cannot be avoided that in some cases the reviewers using the proformas have had a different interpretation of the terms used. In the analysis presented here it has therefore been necessary to make some minor corrections to the country reports supplied to COWI and ITS. When such changes have been

made it is clearly stated in the relevant table/figures or in the text. Changes have only been made in case it is clear from the other information given in the country report that the reviewer has had a different understanding of the terms used/setup than the intention of the developers of the proforma for country reports.

The country reports are one of two main outputs from WP3. They are, as mentioned, available in electronic format in "Deliverable 1/Volume 2 (country reports)". The completion of the proforma for country reports was done in close cooperation with national authorities responsible for infrastructure appraisal.

2.1.2 Analysis and comparison of existing practice

The information contained in the country reports formed the basis for the analysis and comparison of existing practice of project appraisal across countries.

The analysis has concentrated on identifying differences in approaches, definitions, valuation methods and gaps of knowledge. No attempt has been made to compare monetary values across countries, which will be covered by WP4 of HEATCO. However, a compilation of selected key figures can, as mentioned, be found in this report. It has become clear that a lot of work is going on at the moment in the field of project appraisal. Several countries are in the process of revising national guidelines for project appraisal and updating money values - including the methodology. Accordingly, the content of this report should be seen as a snap shot on the existing practice of project appraisal in Europe.

The results of the analysis are presented in this report.

2.2 Key concepts and definitions

A critical issue when comparing appraisal practices across countries is to make sure the same definitions are being used. In the proforma for country reports several references are made to the definitions used in the EUNET study. These are discussed in the relevant sections of this report.

2.2.1 Types of analysis

The definitions of "types of analysis" referred to throughout this report/country reports are listed below:

– *Cost Benefit Analysis (CBA)*: The effects are assigned a monetary value, and included in an overall economic appraisal of the total value of the project in monetary terms.

– *Multi-Criteria Analysis (MCA)*: The effects are not assigned a monetary value, but are included in an overall project appraisal by assigning non-monetary weights to the individual effects.

– *Quantitative Measurements (QM)*: The effects are estimated in physical units or numbers (cardinal scale), but in contrast to the multi-criteria analysis (MCA) no specific weights are assigned to allow an aggregation of the effects to a single criterion.

– *Qualitative Assessment (QA)*: The effects are classified into one of several ranked categories (ordinal scale) based on well-defined standard criteria for each of the categories, which are invariant from project to project.

– *Not covered:* No systematic appraisal methods are used. Also includes free format verbal description of effects.

– *Not relevant*

For the presentation of the data, the two categories *Qualitative assessment (QA)* and *Not covered* have been merged into one category. The authors acknowledge that it makes a big difference whether an effect is not covered at all or is treated by qualitative assessment. However, given that the focus here is on the formalised framework for project appraisal - mainly CBA - this simplification has been made.

2.2.2 Country grouping

To allow comparisons of regional similarities and differences in project appraisal the surveyed countries have been grouped into three regions. The country grouping is shown in Table 2.1.

Table 2.1 Country grouping

Region	No. of countries	Countries
North/West	11	Austria (AT), Belgium (BE), Denmark (DK), Finland (FI), France (FR), Germany (DE), Ireland (IE), Netherlands (NL), Sweden (SE), Switzerland (CH), UK (UK)
East	8	Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Slovak Republic (SK), Slovenia (SI),
South	6	Cyprus (CY), Greece (EL), Italy (IT), Malta (MT), Portugal (PT), Spain (ES)

Information on the practice of project appraisal for Luxembourg could not be obtained despite considerable efforts. This implies that the analysis presented here covers 25 countries; all EU Member States (excl. Luxembourg) and Switzerland as a non-EU country.

3 Appraisal methodology

This chapter presents the general principles for appraisal of transport infrastructure projects in the surveyed countries[2].

The structure of the chapter is as follows:

– Section 3.1: *Standardisation of principles*;

– Section 3.2: *Appraisal methodology*; and

– Section 3.3: *The use of CBAs*.

The treatment of the specific elements of the project appraisal is, as mentioned, covered in Chapters 4-8.

3.1 Standardisation of principles[3]

The first impression when comparing the country reports is that the degree of standardisation of principles for project appraisal varies considerably across countries and modes.

The differences across modes are illustrated in Figure 3.1. The figure shows the level of standardisation for the particular mode in the relevant country. The ranking of "sophistication" is as follows: PC software[4] - Official requirements - Official recommendations - Other - No formulation of principles, i.e. if for example both PC software and official recommendations exist in a particular country for a particular mode the figure below reflects "PC software".

PC software is only used for the appraisal of road projects. Four of the eight countries, which use PC software, are from the North/West region; namely Finland, Sweden, Switzerland[5] and the UK. The remaining four countries are from the East region. Three of these (Czech Republic, Estonia and Slovak Re-

[2] The information presented in this chapter refers to Section 2 in the country reports.
[3] The country specific details on *standardisation of principles* are presented in Annex II.
[4] Computer model or spreadsheet application.
[5] PC software (NISTRA) is currently in testing phase. In parallel a CBA-norm is in preparation which will become part of NISTRA.

public) refer to the use of HDM-4, whereas Poland uses a PC tool (SIMIC) for collection of data for projects co-financed by the EU.

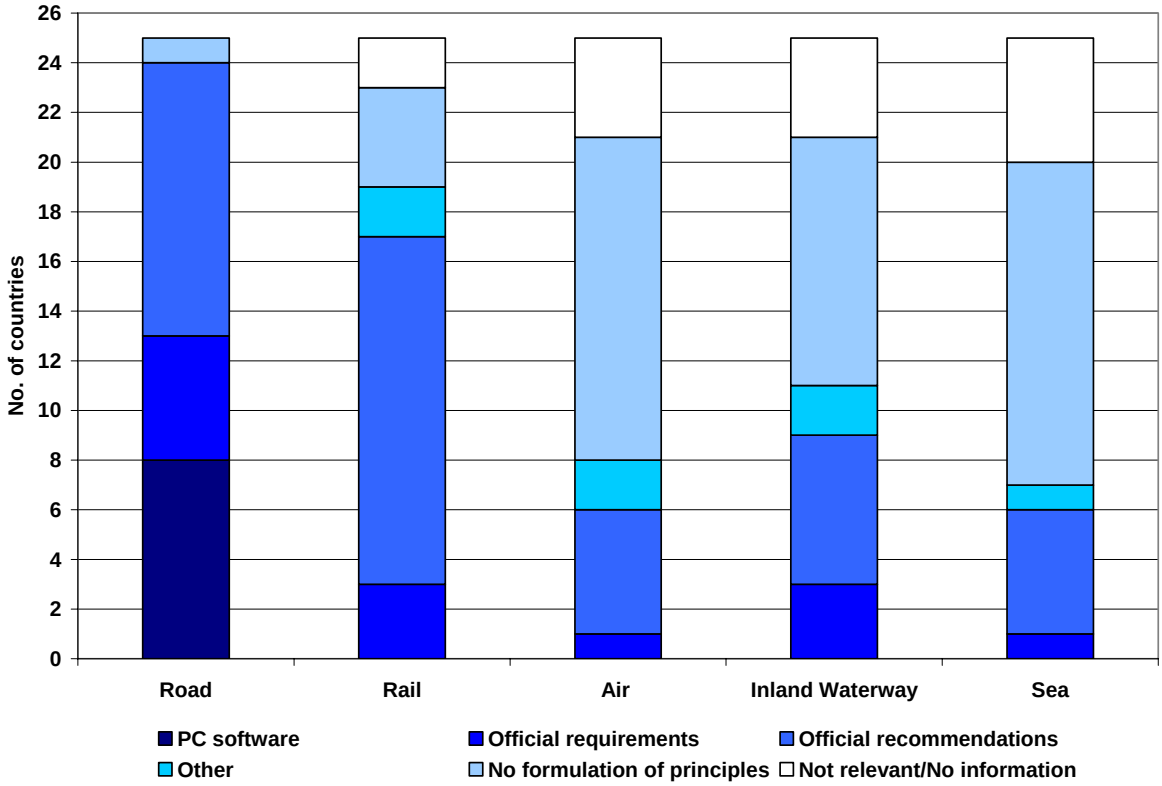
Furthermore the analysis of the degree of standardisation shows that;

– many of the countries in the East region draw upon the *Guide to cost-benefit analysis of investment projects* prepared for the Evaluation Unit - DG Regional Policy - European Commission;

– several countries have entirely separate frameworks for analysing different modes; and

– the appraisal framework for rail seems less standardised than for road[6] and only around one third of the countries have formulated principles for the appraisal for air, inland waterway and sea transport projects.

Figure 3.1 Degree of standardisation of principles by mode[7]



Note: See Annex I for details

The authors acknowledge that the guidelines reported in the country reports usually only represent a subset of the processes involved in project appraisal

[6] The EIB is working on RAILPAG, guidelines for rail assessment.

[7] See country reports for references to sources documents.

from project planning and realisation. Furthermore, in some countries (e.g. Italy and Portugal) there is no standardised methodology for project appraisals. For these countries the country reports reflects the "normal approach".

3.2 Appraisal methodology[8]

3.2.1 General approach

The general impression when comparing the current practice of transport project appraisal in the surveyed countries is that a wide range of methods for project assessment are used.

All the countries surveyed use cost-benefit analysis (CBA)[9] for the appraisal of road projects (see Figure 3.2). Note the "ranking of methods" is as follows: CBA - MCA - QM - QA/NC - No information/Not relevant, i.e. if for example both CBA and MCA is used in particular country the figure below reflects CBA. The same "ranking" has been used for all figures of this type throughout the report.

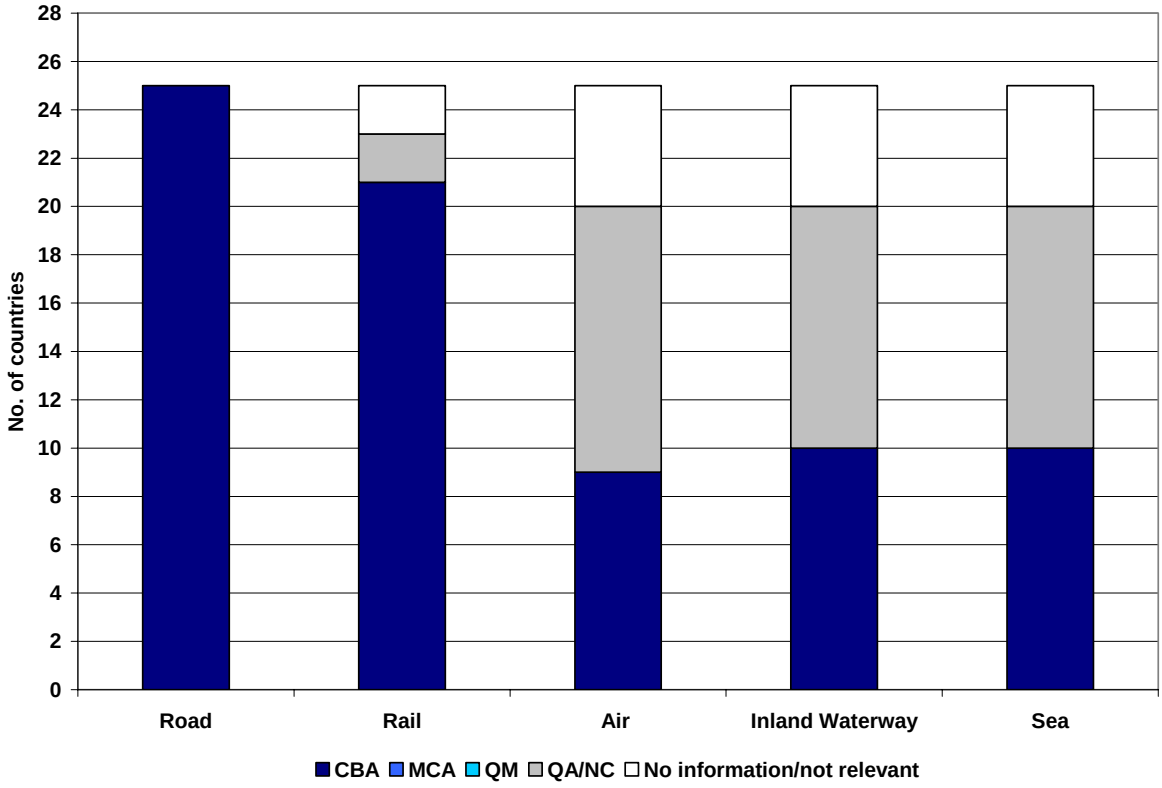
The CBA is not used in isolation in the majority of countries. In 15 countries the CBA is used together with other quantitative measures (QM), qualitative assessments (QA) and/or multi-criteria analysis (MCA).

In the East region of the EU, CBA is most commonly or exclusively used for projects, which are promoted for co-funding from the EU. In Latvia, for example, cost-benefit analysis for rail, sea and air is only used under such circumstances, whereas CBA is sometimes also used for locally financed road projects. However, the country reports show that CBA is gaining acceptance also for locally financed projects in several of the countries in the East region of the EU.

[8] The country specific details on *appraisal methodology* are presented in Annex II.

[9] See Section 2.2 for the definition of types of analysis.

Figure 3.2 Types of analysis by mode (no. of countries using relevant type of analysis by mode)



Note: The ranking of types of appraisal is as follows: CBA - MCA - QM - QA/NC - No information/ not relevant, i.e. if for example both CBA and MCA is used the figure reflects CBA. For details see Annex II.

3.2.2 Coverage of main effects[10]

Theoretically, all benefits and costs should be accounted for in the cost-benefit analysis. In practice though, many effects are left out either due to difficulties of estimating a trustworthy money value, difficulties of quantifying the effects or because the effects are considered to be of minor importance.

For the analysis of how the main elements of a CBA are treated in the appraisal framework in the surveyed countries, the effects have been grouped into 11 categories, which are listed in Table 3.1.

The list of main effects covers;

- infrastructure costs (*construction costs, system operating cost and maintenance*);
- user benefits (*passenger transport time savings, vehicle operating costs, benefits to goods traffic*); and

[10] The country specific details on *coverage of main effects* are presented in Annex III.

– externalities (*safety, noise, air pollution - local/regional, climate change*).

Furthermore; the analysis covers *user charges and revenues* and *disruption from construction*.

Table 3.1 11 main categories of effects

• Construction costs • Disruption from construction • System operating cost and maintenance • Passenger transport time savings • User charges and revenues • Vehicle operating costs	• Benefits to goods traffic • Safety • Noise • Air pollution - local/regional • Climate change

Coverage of main effects by country

The first rough indication on differences in current practice of project appraisal in the surveyed countries is given in Figure 3.3 and Figure 3.4. The figures show how many of the main effects are included in the CBA, MCA etc. for road and rail, respectively.

The numbers presented in the figures are only indicative, as the current practice might differ from the guidelines and some guidelines do not predefine which elements to include in the project appraisal.

The Dutch guidelines, for example, pre-describe that all relevant effects should be monetised if possible and give a number of recommendations on how these effects should be measured in a sensible way.

Three interesting points are apparent from Figure 3.3 and Figure 3.4;

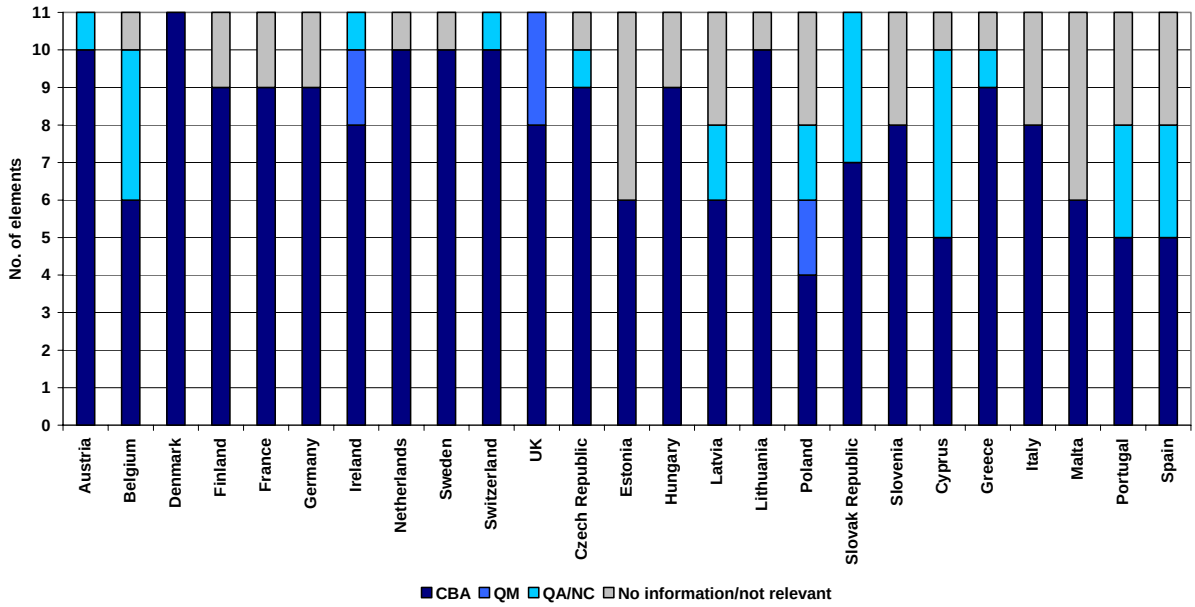
– the range of effects covered differs a lot across countries (from four in Poland to 11 in Denmark);

– nine countries cover seven or fewer effects for road- only one of these are in the North/West region; and

– the coverage for road project appraisals is greater than for rail (see also next section)

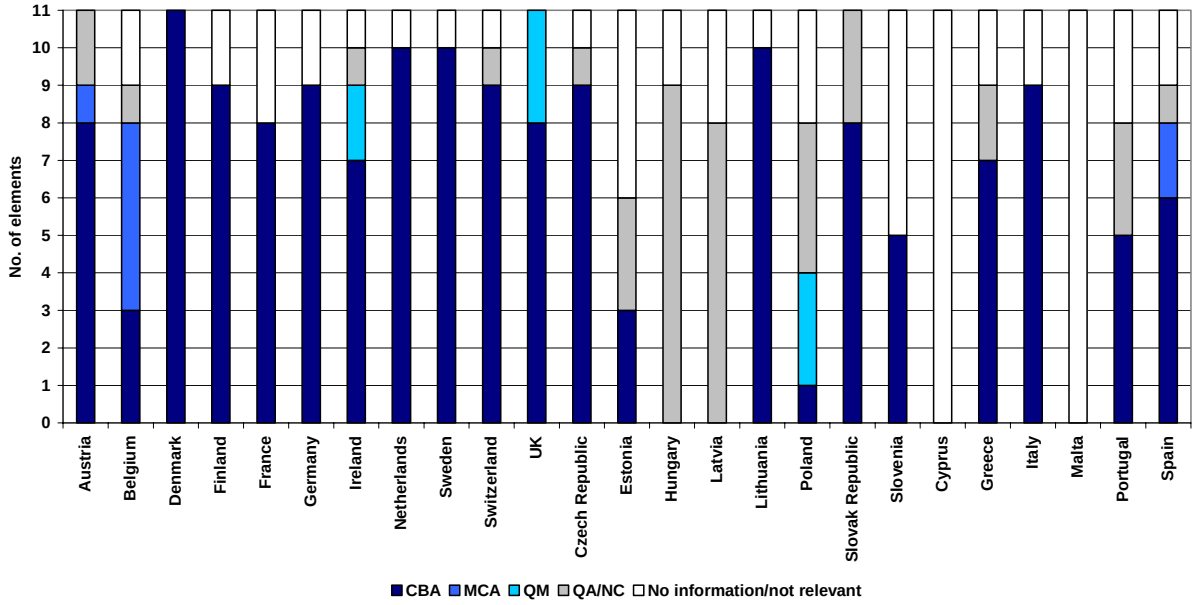
The coverage for air, inland waterway and sea is less comprehensive than for road and rail (see Annex III).

Figure 3.3 Coverage of main effects by country - Road (no. of elements covered by each type of analysis by country)



Note: For details see Annex III.

Figure 3.4 Coverage of main effects by country - Rail (no. of elements covered by each type of analysis by country)



Note: For details see Annex III.

Coverage by main effect

Figure 3.5 and Figure 3.6 show how each of the main effects are covered by the 25 countries under consideration for road and rail, respectively. It is clear that;

– the majority of effects are assigned a money value and included in a CBA in the majority of countries for road projects;

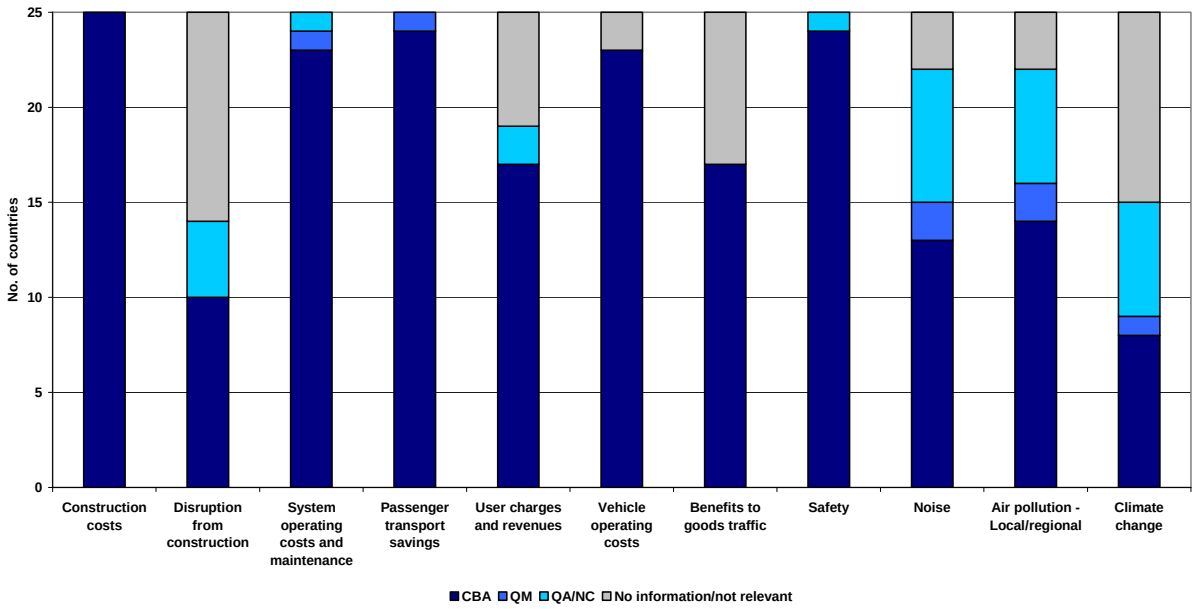
– the effects most often included in the CBA are *construction costs, system operating costs and maintenance, passenger transport time savings, vehicle operating costs* and *safety*; and

– the effects which are most often excluded in the CBA are *disruption from construction, noise, air pollution - local/regional* and *climate change.*

The data shows that only a few countries in the East and South regions of the EU include the effects of *noise, air pollution - local/regional* and *climate change* in their appraisals.

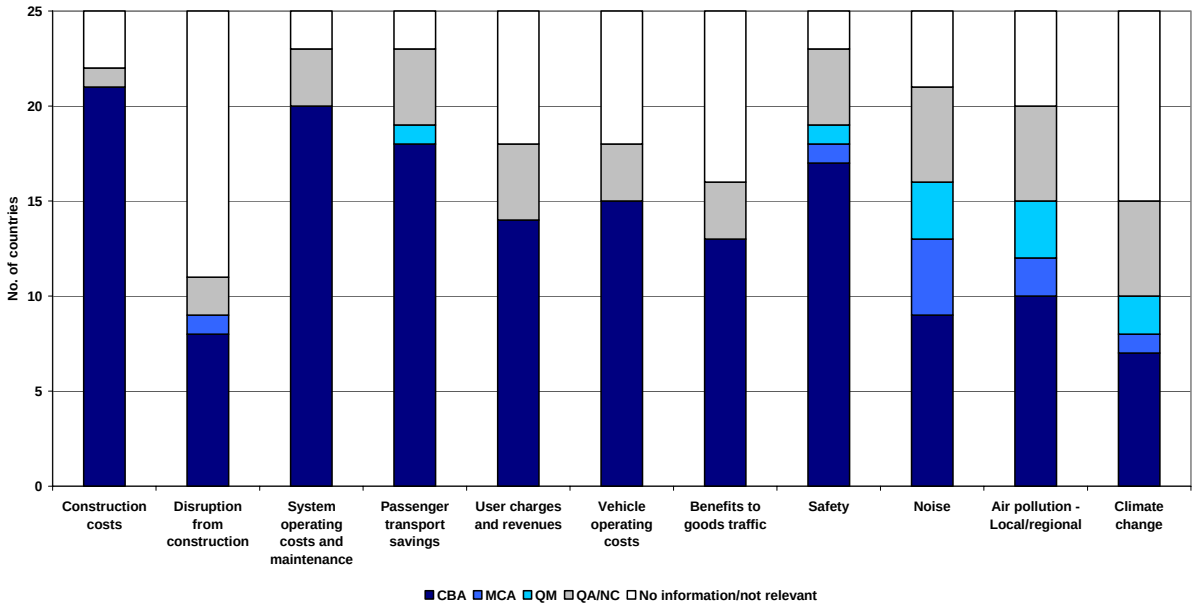
As seen previously, the appraisal framework for rail seems less developed in the majority of countries compared to road. From Annex III, which shows how the specific effect is treated in each country, it is clear that the framework for project appraisal is only slightly developed for air, inland waterways and sea.

Figure 3.5 Coverage of main effects - Road (no. of countries)



Note: For details see Annex III.

Figure 3.6 Coverage of main effects - Rail (no. of countries)



Note: For details see Annex III.

3.3 The use of cost-benefit analysis[11]

All the countries surveyed do, as mentioned, use cost-benefit analysis in some form in project appraisals. This section highlights differences and similarities in the general principles for conducting and using cost-benefit analysis.

3.3.1 The role of the cost-benefit analysis

The role of CBA differs from country to country. In most countries the CBA is used as a mean to choose between different project alternatives (including "do-nothing"), to prove the necessity of a measure and/or to prioritise between different variants. In a few countries, for example Belgium and partly the UK, the CBA works as an input to a multi-criteria analysis. In the UK the weights placed on any of the impacts are at no stage made explicit, so it can be argued that the approach cannot be called a MCA in its purest form. The UK is currently moving away from this approach towards a more purist CBA approach in which more impacts are valued.

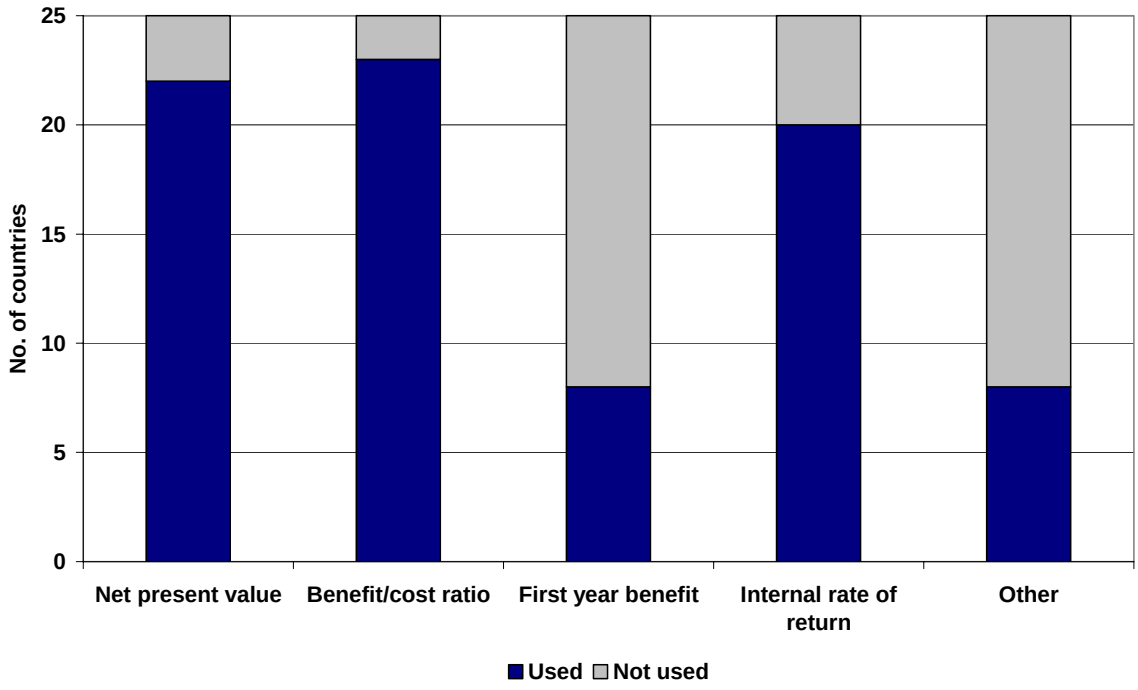
The country reports show that currently the predominant motivation for using CBA in the East region is to qualify for EU co-funding. However, it is also clear from the country reports that several countries are in the process of developing a framework for project assessment also for projects which are financed with national money only.

[11] The country specific details on *the use of cost-benefit analysis* are presented in Annex IV.

3.3.2 Criteria used

All countries, except Finland and Sweden, use more than one criterion for evaluating the costs and benefits of a project. The net present value and the benefit/cost ratio are the most widely used followed by the internal rate of return (see Figure 3.7). The category "other" includes, for example, the pay back period (the Netherlands, Czech Republic and Slovak Republic) and NPV/public sector support (UK).

Figure 3.7 Criteria used, when using CBA (no. of countries)



Note: For details see Annex IV.

The information given above reflects the requirements/recommendations of national guidelines. Accordingly, specific project appraisals may use additional/other criteria for evaluating the feasibility of investment projects. Furthermore, there are slight differences across countries regarding the definitions of the mentioned criteria.

3.3.3 Factor costs or market prices

In UNITE it was decided that prices should be valued at factor costs, and not market prices, due to the focus in that project on the cost side of transport accounts.

The difference in definition between market prices and factor costs is set out below (Nellthorp et al (2000)). Essentially;

- consumption and production are subject to a range of indirect taxes, including VAT, fuel duty, vehicle ownership taxes, property taxes etc.;
- consumption and production may also be subsidised;
- in the factor cost unit of account, items are valued as if no indirect taxation or subsidy were applied; whereas
- in the market price unit of account, items are valued as if they were being traded in consumer markets with all indirect taxes and subsidies in place.

There is no consensus on the unit of account of appraisals. Around half the countries refer to factor costs and half to market prices (see Table 3.2).

Table 3.2 Unit of account - Factor cost or market prices

Unit of account	No. of countries	Countries
Factor costs	13	*North/West:* Austria, Finland, Germany, Netherlands, Switzerland *East:* Estonia, Hungary, Lithuania, Poland *South:* Cyprus, Greece, Portugal, Spain
Market prices	12	*North/West:* Belgium, Denmark, France, Ireland, Sweden, UK *East:* Czech Republic, Latvia, Slovak Republic, Slovenia *South:* Italy, Malta

Note: For details see Annex IV.

In numerical terms the difference between market prices and factor costs varies from country to country, depending on the average rate of indirect taxation (net of subsidy) on consumer expenditure. The difference varies from 7.7% in Switzerland to 25% in Hungary.

The case for using factor costs is often that many of the items on the cost side, for example construction costs, are conventionally measured in factor costs.

The often quoted advantage of referring to market prices, as the unit of account, is that these are reflected in the market and are therefore easier to understand for outsiders and that willingness-to-pay studies reflect market prices.

HEATCO's recommendation on which unit of account to use is discussed in WP4.

3.3.4 Distortion effects from tax financing

Infrastructure projects (especially road and rail) are mostly financed through taxation. Generally taxation reduces output in the economy and causes a deadweight loss to society. Four of the 21 countries for which the information is

available take distortion effects from tax financing into account (see Table 3.3). Some of these countries only include distortion effects for some modes.

In Denmark and Slovenia 20% is added to the net costs financed through public funds. Sweden uses a similar approach by adding 30% on the resources from the general budget[12].

Table 3.3 Distortion effects

	No. of countries	Countries
Include distortion effects	4	*North/West:* Denmark, Sweden *East:* Slovenia *South:* Greece
Do not include distortion effect	17	*North/West:* Austria, Belgium, Finland, France, Germany, Netherlands, Switzerland, UK *East:* Czech Republic, Hungary, Lithuania, Poland, Slovak Republic *South:* Italy, Malta, Portugal, Spain

Note: No information for Ireland, Estonia, Latvia and Cyprus. For details see Annex IV.

3.3.5 Discount rate/risk assessment/appraisal period

The main results of a project appraisal are normally based on what is considered the most likely values/effects on the stream of costs and benefits. Due to the long time horizon of the appraisals (the time span in which benefits and costs are included) there will normally be uncertainty about the "most likely values/effects". The treatment of risks is therefore often a key component of project appraisal.

There are many different ways of handling risks. These include;

- incorporating risks in the discount rate; and/or
- scenario analyses.

Nine of the 25 surveyed countries use a discount rate which includes a risk premium, whereas 13 countries (of which four also include a risk premium in the discount rate) use scenario analyses.

Caution should be applied when referring to the number of countries which use a risk-adjusted discount rate, as no distinction is made here between the risk related to the specific project or the general risk related to "all projects" (like for example the risk related to the development in the business cycle).

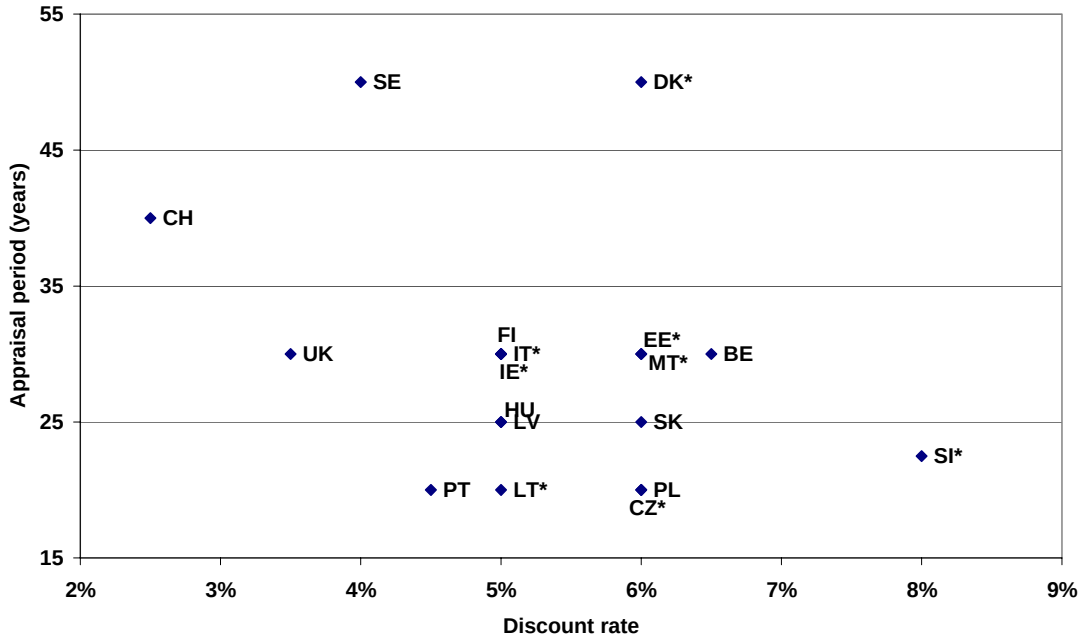
The relationship between the risks, the discount rate and the appraisal period is illustrated in the Dutch guidelines. Furthermore they reflect well different approaches to handling risks.

[12] In Greece no specific value is given in guidelines.

In the Netherlands, the choice of time horizon is part of the handling of risks section in the guidelines, which suggests (preferred)[13] that a project specific mark-up on the risk-free discount rate should be used or alternatively (second best option) explicitly include risk in the valuation of specific effects (and use the risk free discount rate of 4%). In practice none of these approaches are used, because it is too difficult to estimate a project specific mark-up or include risks in the valuation. Hence, an alternative second-best option is used, namely adding a standard mark-up of 3% (indicative) to the risk-free interest rate. The guidelines in the Netherlands also pre-describe that the basic idea of "risk aversion" should be followed. Hence it is not considered good practice to use a 4% risk free discount rate together with a large time horizon.

Figure 3.8 illustrates the recommended discount rate together with the normal appraisal period for the countries under consideration. An asterisk (*) marks that the discount rate includes a risk-premium. For country codes please refer to Table 2.1. It is worth noting that the appraisal period has a larger impact on the net present value the lower the discount rate is. The country specific numbers are presented in Table 3.4.

Figure 3.8 The discount rate vs. the appraisal period



Note: An asterisk (*) marks that the discount rate includes a risk-premium. For details see Annex IV.

[13] The Dutch guidelines do not pre-describe one method which is mandatory to use. They describe the best (preferred) approaches and a number of second best alternatives.

Table 3.4 Discount rate and appraisal period

Region	Country	Discount rate	Appraisal period (years)
North/West	Austria	2-3%	/
	Belgium	6.5%	30
	Denmark	6%	50
	Finland	5%	30
	France	8%	/
	Germany	3%	/
	Ireland	5%	30
	Netherlands	4%	Infinite
	Sweden	4%	40-60
	Switzerland	2-2.5%	40-infinite
	UK	3.5%	30
East	Czech Republic	5-7%	20
	Estonia	6%	30
	Hungary	5%	25
	Latvia	5%	20-30
	Lithuania	5%	20
	Poland	6%	20
	Slovak Republic	6%	20-30
	Slovenia	8%	20-25
South	Cyprus	6-12%	/
	Greece	/	/
	Italy	4-6%	30
	Malta	6%	30
	Portugal	3-6%	20
	Spain	6%	/

Note: For details on how the information given in the country report have been interpreted see Annex IV.

It cannot be concluded that countries that include a risk premium in the discount rate on average use a higher discount rate. However, it can be concluded that the discount rates used in general exceed the recommendation of UNITE (3%). In DG Regional Policy's *Guide to cost benefit analysis of investment projects* 5% is used as a standard benchmark, but the project appraiser are allowed to use a different value.

There are no clear regional differences in the choice of discount rate.

3.3.6 Transboundary effects

Transboundary effects are those which impact on "non-residents" and/or "foreign" areas. This issue is therefore often highly relevant for the appraisal of Trans-European Network-projects.

More specifically the issue on how to treat transboundary effects arises for[14];

- projects for which part of the impact is felt by international traffic using the network sections improved by the project;

- projects for which impacts may occur beyond the boundaries of the country containing the project, e.g. air pollution; and/or

- projects which span more than one country (including Trans-European Networks)

There is no consensus on whether or not transboundary effects should be included in the project appraisal. The majority of countries do not include transboundary effects in the project appraisal, but six countries (Austria[15], Belgium, Sweden, Switzerland, the UK[16] and Spain[17]) - of which five are countries in the North/West region - include transboundary effects in some form in their project appraisals[18].

There seems to be some consensus on the treatment of transboundary effects when they are included. In Austria, Sweden, Switzerland and Spain transboundary and national effects are treated equally. In the UK, it is not made explicit in the guidelines how to treat transboundary effects. No information is available on how transboundary effects should be treated in Belgium.

It is worth noting that the methods used for particular projects could differ from those reflected in the national guidelines. For example, in the Danish assessment of a fixed link across the Fehmarn Belt, the results were presented for both "national" and "including transboundary effects", despite this not being a requirement of the national guidelines for project appraisal[19].

[14] See Nellthorp et al (1998), page 31.
[15] In Austria transboundary effects are only included for inland waterways.
[16] The UK includes transboundary effects within the UK territory.
[17] In Spain transboundary effects are only included for EU co-financed projects.
[18] There might be some inconsistency as climate change is a transboundary effect.
[19] See Danish Ministry of Transport (2004).

4 Construction related costs

The direct costs of building and maintaining the infrastructure is naturally one of the cornerstones of transport infrastructure project appraisal. This chapter presents how *construction related costs* are treated in the appraisal frameworks in the surveyed countries[20].

The structure of the chapter is as follows:

– Section 4.1: *Construction costs*;

– Section 4.2: *Disruption from construction*; and

– Section 4.3: *System operating costs and maintenance*.

Finally, Section 4.4 presents some information on the appraisal of *build-operate-transfer (BOT)* projects.

The country specific details on *construction related costs* are presented Annex V.

4.1 Construction costs

The direct costs of building the infrastructure, i.e. *construction costs*, are included in the appraisal by all surveyed countries.

Differences, however, exist across countries regarding which elements to include in *construction costs*, how to handle the *residual value* and which *lifetimes* to use for various components.

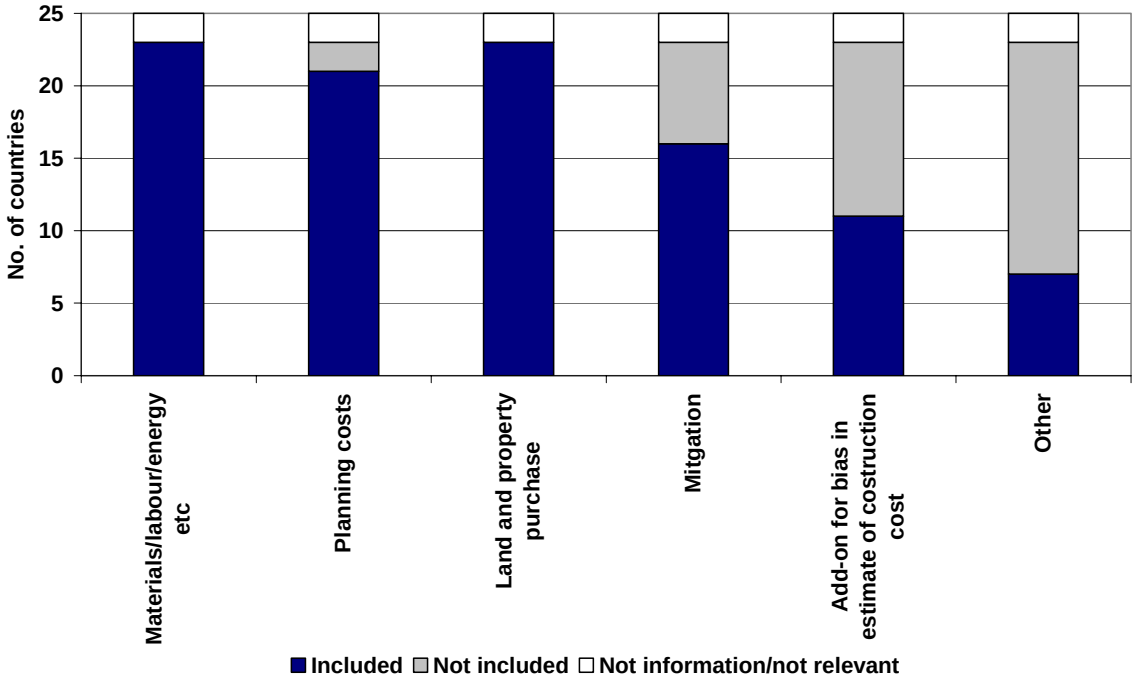
4.1.1 Elements

All countries for which the information is available include *materials/labour/energy etc.* and *land and property purchase* in the CBA (see Figure 4.1). Most countries include *planning costs* and *mitigation*, whereas only around half of the surveyed countries include an *add-on for bias in estimate of construction costs.*

[20] The information presented in this chapter refers to Section 3 in the country reports.

The category *other* referred to in the figure below includes among other things; legal transaction costs in Ireland and incremental administration cost (production support and administration costs) in Sweden.

Figure 4.1 Elements of construction costs included in CBA (no. of countries)



Note: For details see Annex IV.

4.1.2 Terminal/residual value and lifetime of components

In theory, the time horizon of the infrastructure appraisal should equal the lifetime of the infrastructure. As described in Chapter 3, the appraisal period is, however, often shorter than the lifetime of the infrastructure due to uncertainty. This introduces the issue of residual value.

For three countries the issue of residual value is not relevant because they use an appraisal period which is infinite or equal to the lifetime of the infrastructure (see Table 4.1). For the other 21 countries the issue of residual value is relevant. Of these countries 18 include the terminal/residual value, whereas three do not[21].

For those countries which include the terminal/residual value straight line depreciation[22] is the most common method for estimating the terminal/residual value. However, many different approaches are used - often depending on the mode.

[21] No information for Cyprus.

[22] Fixed % of original value per year.

Table 4.1 Treatment of terminal/residual value

	No. of countries	Countries
Include terminal/residual value	18	*North/West:* Austria, Belgium, Denmark, Finland, France, Switzerland, UK *East:* Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia *South:* Greece, Italy, Spain,
Do not include terminal/residual value	3	*North/West:* Ireland, *South:* Malta, Portugal
Do not include terminal/residual value, because appraisal period equals lifetime or infinite	3	*North/West:* Germany[23], Netherlands, Sweden

Note: No information for Cyprus. Ireland does not include the residual value, because it is argued to be low after 30 years (which is the appraisal period). It could be argued that this is the same as using an appraisal period, which equals the lifetime of the infrastructure. However, Ireland is here categorised as "Do not include terminal/residual value".

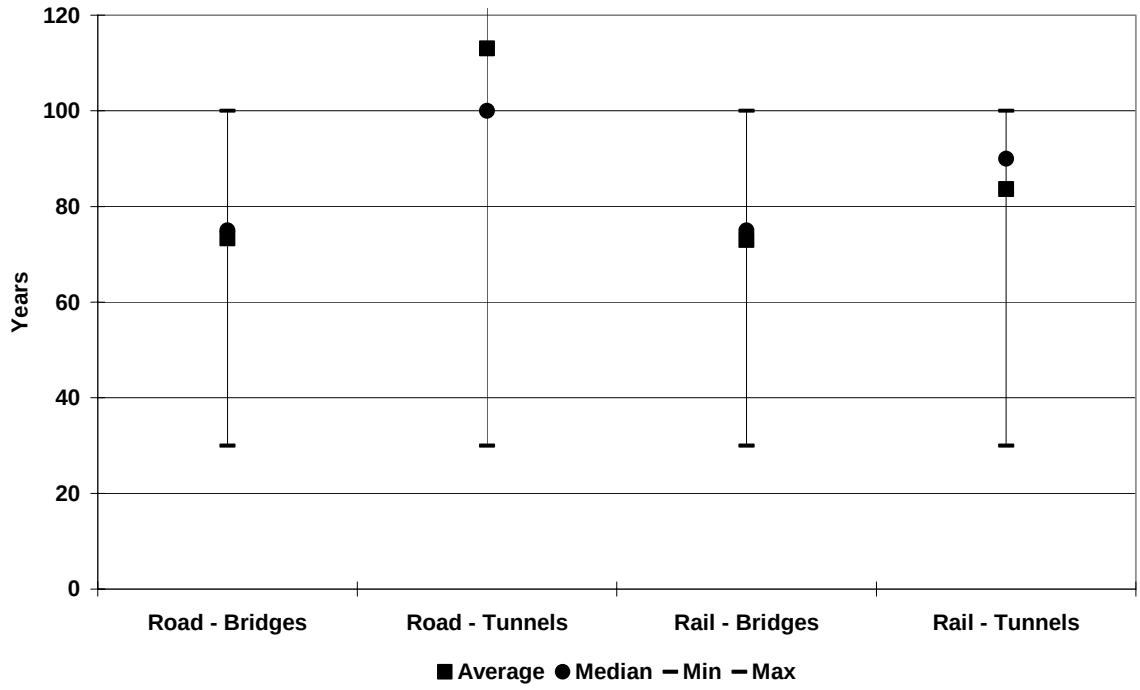
As can be seen from Figure 4.2, which illustrates the range of lifetimes used for selected components[24], there is no consensus on lifetimes of components. The figure shows the average, median, minimum and maximum lifetimes used. The differences are so large that they cannot simply be explained by "local conditions" (e.g. climate, quality of construction, level of maintenance)[25].

[23] For road and inland waterways.

[24] For several countries the data is not available.

[25] The lifetimes of other components are covered in HEATCO, Deliverable 2.

Figure 4.2 Lifetimes used for selected components (average, median, min and max)[26]



Note: The scale on the secondary axis has been cut off at 120, despite maximum lifetime for road tunnels are 500 years (Lithuania). For details see Annex V.

4.1.3 Uncertainty/bias in construction cost estimate

It is a well-known fact that many transport infrastructure projects experience budget overruns, whereas few end up less costly than originally estimated. This relates to the issues of uncertainty, additional project requirements (e.g. environmental standards) during the planning and implementation period and/or optimism bias.

The issue of uncertainty/optimism-bias is not only related to the construction cost estimate - it also relates to the estimates on benefits and other cost estimates. The focus here is, however only on the uncertainty/optimism-bias on the construction cost estimate[27].

The majority of the surveyed countries have systematic methods to tackle uncertainty/bias in the construction cost estimate (see Table 4.2).

[26] Based on data presented in Annex V.

[27] The issue of uncertainty is also related to the choice of discount rate (see chapter 3).

Table 4.2 Systematic methods to tackle uncertainty/bias in construction cost estimate

Category	No. of countries	Countries
Used	14	*North/West:* Austria, Belgium, Denmark, Finland, Germany, Ireland, Netherlands, Switzerland, UK *East:* Lithuania, Slovak Republic *South:* Cyprus, Greece, Malta
Not used	6	*North/West: Sweden* *East:* Czech Republic, Hungary *South:* Italy, Portugal, Spain

Note: No information for Estonia, Latvia, France, Poland and Slovenia.

Most often this comprises a form of standard mark-up on construction costs, which can vary with the stage of the process.

Denmark and the UK are two of the countries which are using more advanced methods for handling uncertainty/optimism-bias.

The UK uses a "top-down approach" where information from a class of similar or comparable (finalised) projects is used to estimate the average budget overrun. Contrary, the Danish approach is a "bottom-up approach" (called *successive calculation*), which focuses on project specific risks[28].

Furthermore, the Netherlands is currently considering using an approach similar to the method of the UK.

4.2 Disruption from construction

Disruption from construction refers for example to the delays to traffic caused during the construction phase.

There is no consensus on how to treat *disruption from construction*. 11 countries include *disruption from construction* in the cost-benefit analysis (See Table 4.3). On top of this three countries include *disruption from construction* in the project appraisal with a qualitative description. Furthermore, it is apparent from the table below that the information on how to treat this effect is not available/not relevant for a number of countries.

[28] The two methods are described in detail in HEATCO, deliverable 2.

Table 4.3 Disruption from construction

Category	No. of countries	Countries
Included in CBA	11	*North/West:* Austria, Belgium, Denmark, Ireland, Netherlands, UK *East:* Estonia, Lithuania, Slovak Republic *South:* Greece, Malta
Included in project appraisal with qualitative description	3	*North/West:* Switzerland *East:* Poland *South:* Cyprus
No information/Not relevant	11	*North/West:* Finland, France, Germany, Sweden *East:* Czech Republic, Hungary, Latvia, Slovenia *South:* Italy, Portugal, Spain

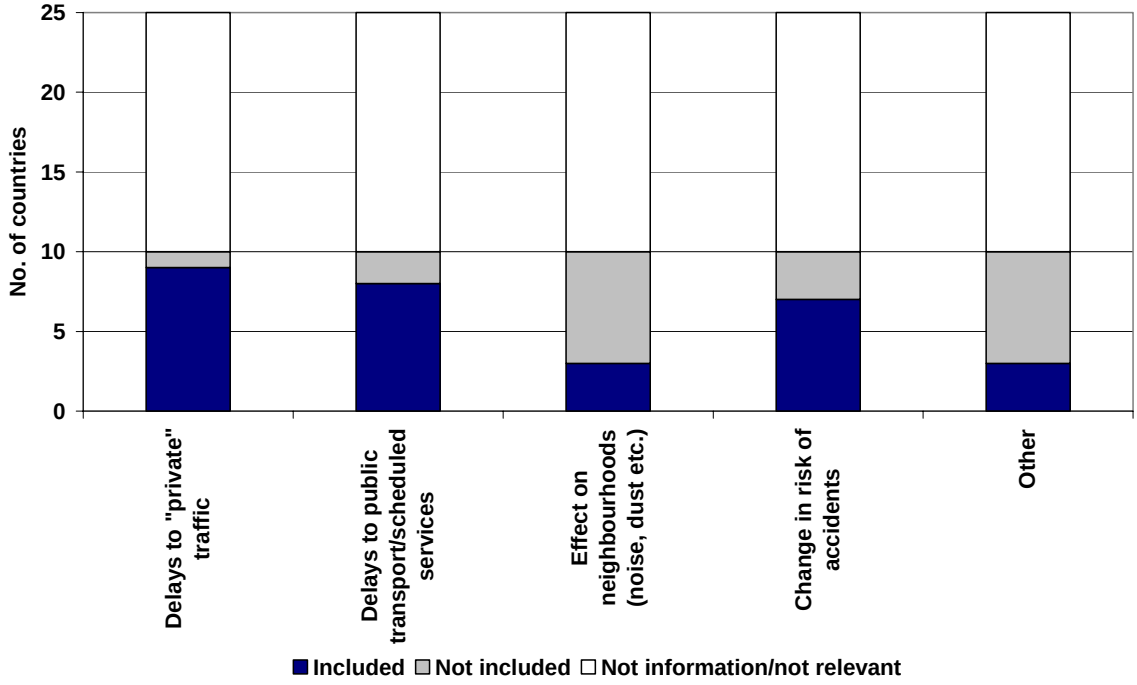
Note: See Annex III for details.

As can be seen from Figure 4.3 there is also no consensus on the elements of *disruption from construction*. The figure below illustrates the number of countries that include various elements of *disruption from construction*. The information is only available/ relevant for ten countries, which probably reflects the number that quantify and monetise.

The effect of *delays* and *change in risk of accidents* are the most common elements of disruption from construction, whereas the effects on neighbourhoods are seldom included in the appraisal.

Caution should be applied when interpreting these results as the information is only available/relevant for a limited number of countries and because there are large variations across modes. Furthermore, this effect is difficult to quantify, so it is often not monetised in practice despite the recommendations given in the guidelines.

Figure 4.3 Elements included in disruption from construction (no. of countries)



Note: For details see Annex V.

4.3 System operating costs and maintenance

System operating costs and maintenance are included in the appraisal in the vast majority of countries (see Section 3.2 and Annex III for details).

4.3.1 Definition

System operating costs and maintenance were defined in the EUNET study as; "costs consisting of the costs of infrastructure operation (e.g. signalling/traffic control), the costs of maintenance (e.g. cleaning, minor repairs, winter servicing) and the costs of renewal (e.g. road surfacing)".

The definition used in 20 of the surveyed countries is consistent with that suggested in EUNET (see Table 4.4). Only one country - Switzerland, uses a definition which is not consistent with that of EUNET.

Table 4.4 Definition of system operating costs and maintenance

Category	No. of countries	Countries
Definition consistent with EUNET definition	20	*North/West:* Austria, Denmark, Finland, France, Germany, Ireland, Sweden, UK *East:* Czech Republic, Estonia, Hungary, Lithuania, Poland, Slovak Republic, Slovenia, *South:* Greece, Italy, Malta, Portugal, Spain
Defined, but not consistent with EUNET definition	1	*North/West:* Switzerland
Not defined	3	*North/West:* Belgium, Netherlands *East:* Latvia
No information/Not relevant	1	*South:* Cyprus

Note: For details see Annex V. In Denmark *system operating costs and maintenance* is not defined. In practice the EUNET definition applies.

4.3.2 Standard figures

Around half of the surveyed countries have standard figures for operation and maintenance costs for road, whereas only around 25% of the countries have standard figures for rail[29].

It is, however, not necessarily the same that standard figures exist and that standard figures are used. In Austria, for example, standard figures are available both as a percentage of construction costs and as a fixed amount per kilometre. However, in the appraisal of road projects project specific estimates are used in most cases.

The standard figures are normally expressed as a fixed amount per km or a fixed percentage of construction costs[30]. In Sweden, however, a standard formula for road operation and maintenance costs is used[31].

For details on the standard figures see Annex V. The discussion on the exact numbers is covered in HEATCO, Deliverable 2.

4.3.3 Existing network

The completion of an infrastructure project normally changes the traffic in other parts of the network due to mode or route changes. This changes the cost of operation, maintenance and renewal of the existing infrastructure.

[29] See Annex V for details.
[30] See Annex V for details.
[31] See country report for details.

There is no consensus on whether or not the changes in the costs of the existing network should be included in the project appraisal. Around half of the surveyed countries include this effect[32] and there are variations across modes (in Austria for example the effect is only included for *rail*).

4.3.4 Cost function/marginal costs

System operating and maintenance costs are in the vast majority of the countries based on an *average costs* approach. In fact only three countries (Ireland, Sweden and the UK) use a *marginal costs* approach - and in the UK and Ireland this is supplemented by an average cost approach.

4.4 Appraisal of build-operate-transfer projects

To lower total infrastructure costs an increasing number of countries are using a build-operate-transfer (BOT) arrangement. In a typical BOT arrangement, the private sector designs and builds the infrastructure, finances its construction and owns, operates and maintains it over a period ("concession" period), often as long as 20 or 30 years. Traditionally, such projects provide for the infrastructure to be transferred to the government at the end of the concession period.

For the majority of the countries under consideration the appraisal technique is similar for build-operate-transfer projects and public projects. This could reflect a limited experience with BOT-arrangements. In fact several countries have no experience with BOT arrangements. Some countries such as the UK require BOT proposals to be benchmarked against a public sector comparator to demonstrate that BOT is better value for money than conventional public procurement.

A few countries have different requirements for the appraisal of BOT-projects. In Austria, for example, a higher discount rate is used for BOT-projects compared to the appraisal of public projects.

[32] See Annex V for details.

5 User benefits and vehicle operating costs

The value of travel time and vehicle operating costs are two of the key components in transport appraisal. This chapter presents how user benefits and vehicle operating costs are treated in the appraisal framework in the surveyed countries[33].

The structure of this chapter is as follows:

– Section 5.1: *Value of time savings*;

– Section 5.2: *Reliability, congestion and service quality*;

– Section 5.3: *Vehicle operating costs*;

– Section 5.4: *Commercial goods traffic*;

– Section 5.5: *User charges and revenues.*

The country specific details on *user benefits and vehicle operating costs* are presented in Annex VI.

5.1 Value of travel time savings

All the countries surveyed include passenger travel time savings in transport appraisal. The majority of countries (19) also use a common definition for passenger travel time, which is consistent with that suggested in EUNET "the time needed to undertake personal travel from origin to destination including in-vehicle time and interchange". The countries that differ are: Austria and the Netherlands though both have a definition similar to EUNET Belgium and Latvia where there is no definition but the general approach is consistent with the EUNET definition; and finally Germany whose definition differs from EUNET, as only ‘in-vehicle time’ is included.

Differences however exist regarding whether or not guideline values for travel time savings are provided by the respective national governments and whether or not these values have to be adhered to in an appraisal (see Table 5.1). As

[33] The information presented in this chapter refers to Section 4 in the country reports.

can be seen from this table no guideline values exist for seven countries (e.g. Estonia and Portugal). For countries where guideline values exist none stipulate that the values are compulsory. The table also shows that the majority of the countries with no national guideline values are from the South and East regions (with the exception of the Flanders region of Belgium and Luxembourg). Those countries with guideline values that are almost always used in appraisal come from the North/West regions of the EU (with the exception of the Czech Republic).

Table 5.1 Use of VTTS values in Appraisal

	No. of Countries	Countries
Values in guidelines are used in almost all circumstances. Justification for use of alternative values must be given.	10	*North/West*: Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, Switzerland, UK *East*: Czech Republic
Guideline values do not have to be used	6	*East*: Hungary, Latvia, Lithuania, Slovak Republic, Slovenia *South*: Malta
Guideline values are only used in the absence of local data and/or are rarely used	4	*North/West*: Austria, Belgium (Wallonia region) *South*: Spain, Greece
There are no guideline values (Values surveyed in the HEATCO project should be viewed as typical values only.)	7	*North/West*: Belgium (Flanders region), Luxembourg *East*: Poland, Estonia *South*: Cyprus, Italy, Portugal,

Table 5.2 provides a summary of the range of approaches and methods used in the EU countries to derive values of travel time savings. The majority (65%, 17 countries) determine separate values of time for work and non-work trips. There is no guideline methodology or 'typical' methodology for Cyprus, Poland and Luxembourg. The remaining seven countries (23%) use average values for travel time. One country – Italy has typical values for both work and non-work values. The most common method used to construct the value of work time savings, is the cost saving method using wage rate studies. Such an approach is used by over half the countries that differentiate between work and non-work values. With respect to methods used to value non-work time savings there does not appear to be a single most common method. Instead a range of approaches are used the most popular being some relationship to the value of the wage rate. The data shows that the majority of the countries in the North/West regions of the EU differentiate between work and non-work values, whilst it is more common in the South and East regions to use average values for travel time savings.

Table 5.2 Approaches for estimating values of travel time

Values	Method	No. of countries	Countries
Work Values	Cost Saving	10	*North/West*: Denmark, Finland, France, Germany, Ireland, UK *East:* Latvia, Slovenia. *South*: Greece, Malta
	Hensher	1	*North/West*: Sweden
	WTP	1	*North/West*: Netherlands
	Other	5	*North./West*: Austria, Switzerland. *East*: Lithuania *South:* Italy*, Portugal*
Non-work	% of Wage Rate	6	*North/West*: Denmark, Finland, Ireland *East*: Latvia, Slovenia. *South*: Portugal*
	WTP	6	*North/West*: Germany, Netherlands, Sweden, Switzerland, UK *South*: Greece,
	International comparisons	1	*South*: Malta
	Other	4	*North/West*: Austria, France *East*: Lithuania,. *South*: Italy*
Average	Wage Rate Studies	2	*North/West:* Belgium (Wallonia region) *East*: Slovak Republic
	WTP	2	*East*: Czech Republic *South*: Spain.
	Other	3	*East:* Hungary, Estonia* *South*: Italy*
No Guidelines		6	*North/West*: Luxembourg *East*: Poland, Estonia *South*: Cyprus, Italy, Portugal.

* guideline values only

There are many ways in which values of travel time saving can be disaggregated and therefore there is some variation between EU countries regarding this disaggregation (see Table 5.3). For example, the French values vary with the length of journey made, work/non-work, mode of transport and urban or inter-urban trips. The Netherlands differs from France in that it provides different values for travel time for different income groups, but not for journey length or urban/non-urban. Switzerland has average values for the non-work categories

of shopping and leisure, whilst Hungary differentiates by weekday and weekend trips. The Czech Republic and Belgium however do not differentiate between different types of trip.

As can also be seen from Table 5.3, after differentiating between work and non-work values of time, the next most common category that countries use to differentiate values of time is mode of transport (car, bus, rail, etc.). In the main, however modal values of travel time savings are only available for road and rail transport. Sweden and France are the only countries to provide a value of time specifically for passenger air travel.

Table 5.3 Values of travel time differentiated by category for passenger travel

	No. of countries	Countries
No guideline values	5	*North/West*: Luxembourg *East*: Estonia, Poland, Slovenia** *South*: Cyprus, Italy, Portugal
No differentiation	2	*North/West*: Belgium *East:* Czech Republic
Differentiation by		
Work/Non-work	17	*North/West*: Austria, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, Switzerland, UK, *East*: Latvia, Lithuania, Slovenia** *South*: Greece, Italy*, Malta, Portugal*
Mode of Transport	16	*North/West*: Austria, Denmark, Finland, France, Germany, Netherlands, Sweden, Switzerland, UK, *East:* Hungary, Latvia, Lithuania, Slovak Republic *South*: Italy*, Malta, Portugal*, Spain
Length of journey	3	*North/West*: France, Switzerland, Sweden
Multiple non-work categories	9	*North/West:* Denmark, Finland, France, Ireland, Switzerland, UK, Netherlands *East*: Latvia, *South*: Italy*, Portugal*,
Delays	2	*North/West*: Denmark, Sweden
Urban/ Interurban	1	*North/West*: France
Weekday/weekend/average	1	*East:* Hungary
Income Group	2	*North/West*: Netherlands, Switzerland
Passenger/ Driver	2	*North/West*: Netherlands, UK

Note: * Typical degree of differentiation only

**values were not available for HEATCO

Where countries calculate both work trip and non-work trip values 10 countries further divide non-work trips into commuting and leisure/ shopping/ other. These countries are; the UK, Netherlands, Italy, Finland, France, Denmark, Switzerland and Portugal, Latvia and Ireland. The North and West regions seem to typically disaggregate values of travel time savings into more categories than countries in the South and East regions.

Table 5.5 sets out example guideline values of travel time savings for trips made by car. As can be seen from this table there is variation between countries in the numeraire, price base and unit of account, as well as in the actual values themselves. Some values are presented in factor prices (e.g. Austria) and some in market prices (e.g. Finland), whilst the price base varies from 1992 (Spain) to 2004 (Malta). All countries in the North/ West region use person hours as the unit, which differs from the South and East regions where the unit of vehicle hours is more prominent.

With respect to the actual values of travel time savings direct comparisons are difficult due to the differences in price base, etc. already noted. However, there does appear to be a significant range. Taking work trips as an example at one end we have Denmark with 252 DKK per person-hr which is approximately equal to 34 euros per person-hr (2001 market prices). This is at the higher end of the range with countries such as Germany, and Ireland. At the lower end of the range is for example the value of travel time used for work trips in Latvia, 2.98 LVL per person-hr (2002 market prices) - just over 4 euros per person-hr. On average the countries in the North/West region have higher values of travel time savings for work trips than in the South and East regions, though it should be noted that average values are commonly used instead of separate work and non-work values in the South and East regions.

There are great differences between the EU countries regarding whether and how the values of travel time savings change over time. Table 5.4 provides a summary of the approaches. The most common methods are to increase the real VTTS over time in line with gross average salaries and GDP. However, nine countries currently have no guidelines and six have a ‘no real growth’ policy with respect to their value of travel time savings.

Table 5.4 Rate of change of value of travel time savings

Categories	No. of countries	Countries
No Guidelines	8	*North/West*: Luxembourg *East:* Latvia, Poland *South:* Cyprus, Greece, Spain, Italy, Portugal
No Growth in the real value	6	*North/West:* Austria, Belgium, Finland, Germany, Sweden *East:* Czech Republic
Rate of Growth		
GDP	5	*North/West*: Denmark, Ireland, Netherlands, UK *East:* Slovak Republic
Domestic Consumption variations	1	*North/West:* France
Gross average salaries	5	*North/West*: Switzerland *East:* Estonia, Lithuania, Slovenia *South:* Malta
Fixed Rate	1	*East:* Hungary

Table 5.5 Examples of VTTS for car trips[34]

	Country	Currency	Numeraire	Price Base	Unit	Work	Non work	Average	VTTS values relates to
North / West	Austria	Euro	Factor	1995	Person-hr	8,503	1,526	--	Average Road Vehicle
	Belgium	BEF	Factor	1996	Person-hr	---	---	315	All land Based modes
	Denmark	DKK	Market	2001	Person-hr	252	56	---	Average Road Vehicle, Non work = commuting trips
	Finland	Euro	Factor	2000	Person-hr	24,08	4,07	---	
	France	Euro	Market	2000	Person-hr	11,10	10,00	---	All modes urban only, non work = commuting trips
	Germany	Euro	Factor	1998	Person-hr	27,92	3,83	---	
	Ireland	Euro	Market	2002	Person-hr	26,50	8,10	---	Non work = All commuting trips
	Luxembourg	---	---	---	---	---	---	---	No Guidelines
	Netherlands	NLG	Factor	1998	Person-hr	48,40	14,40	---	Values are for all income groups, Non work = commuting trips
	Sweden	SEK	Market	2001	Person-hr	238	42	---	Average Road vehicle
	Switzerland	CHF	Market	2003	Person-hr	32,5	21,36	---	Average Road Vehicle, non work = commuting trips
	UK	GBP	Market	2002	Person-hr	26,43	5,04	---	Work value = drivers of cars, Non work value = all commuting trips
East	Czech Republic	CZK	Factor	2003	Person-hr	---	---	116	All journey purposes
	Estonia	---	---	---	---	---	---	---	No Guidelines
	Hungary	HUF	Factor	2002	veh-hr	---	---	1781	Average Road vehicle, Week day, All journey purposes
	Latvia	LVL	Market	2002	Person-hr	2.98	0,45	---	Average road vehicle, work trips = business / mangers, non work trip = commuting
	Lithuania	LTL	Market	2003	veh-hr	27,8	6,9	---	
	Poland	---	---	---	---	---	---	---	No Guidelines
	Slovak Republic	SK	Market	2003	Person-hr			243	Average Road vehicle
	Slovenia	---	---	---	---	---	---	---	Guidelines no available for HEATCO
South	Cyprus	---	---	---	---	---	---	---	No Guidelines
	Greece	Euro	Market	2001	Person-hr	---	---	5,16	Average Road Vehicle, Interurban only
	Italy	Euro	Market	1997	Person-hr	25,78	10,63	---	Average Road Vehicle, non work = commuting trips, Typical values
	Malta	Euro	Market	2004	Veh-hr	11,89	3,48	---	
	Portugal	ECU	Market	1994	Person-hr	24,5	3,9	---	non work = commuting
	Spain	ESP	Market	1992	veh-hr	---	---	1415	Average Road Vehicle

[34] The values have not been converted to a common, base unit and currency. This is part of Work Package 4.

5.2 Reliability, congestion and service quality

One of the issues that HEATCO is considering is how congestion is included in the appraisal process. The survey therefore questioned whether reliability, congestion or service quality was included in the appraisal framework. The majority of countries indicated that these types of benefits were not included as a separate category. Table 5.6 provides a summary of those countries that do include reliability, congestion and service quality in their appraisal. It should however be noted that the majority of these countries do not monetise these user benefits.

Only the UK, Netherlands and Sweden specifically include reliability as a monetised input. Currently Sweden, Denmark and UK (rail) have guideline monetary values for delay (travel time in excess of expected) in their appraisal guidelines. In terms of passenger overcrowding on public transport only France (where values of travel time savings are multiplied by 1.5 in over-crowded situations) and the UK (rail only) have guideline values.

Table 5.6 Country responses to the issue of whether reliability, congestion and service quality are included in rail and road appraisal frameworks

Mode	Type of benefit	No. of countries	Countries
Road	Reliability	7	*North/West:* Denmark, Netherlands, Sweden, Switzerland, UK, *East:* Czech Republic, Slovenia
	Congestion	8	*North/West:* Denmark, France, Netherlands, Switzerland, *East:* Poland, Slovak Republic, Slovenia, *South:* Cyprus
	Service Quality	3	*North/West:* France, Switzerland *South:* Spain
Rail	Reliability	7	*North/West:* Austria, Denmark, Netherlands, Sweden, UK *East:* Czech Republic, Slovenia
	Congestion	4	*North/West:* Denmark, Netherlands, *East:* Czech Republic, Slovenia
	Service Quality	5	*North/West:* Austria, France, UK *East:* Czech Republic *South:* Spain

Note: this table shows the countries that include these impacts in some way in their appraisal. This does not imply that these impacts are included in a CBA. See Annex VI for more country specific details.

5.3 Vehicle operating costs

All countries include vehicle-operating costs as part of a cost benefit analysis for the appraisal of road transport projects. Finland was the only country that broke down vehicle operating costs for sea travel and Austria the only country for inland water. No countries prescribe how vehicle-operating costs should be included in air sector appraisals. The majority of the country data relates to road and rail appraisal and a summary of the differences and similarities between countries is provided in Figure 5.1 and in Annex VI tables VI.3 and VI.4.

The results show that the most common components that are used to determine vehicle operating costs are;

– repair and maintenance;

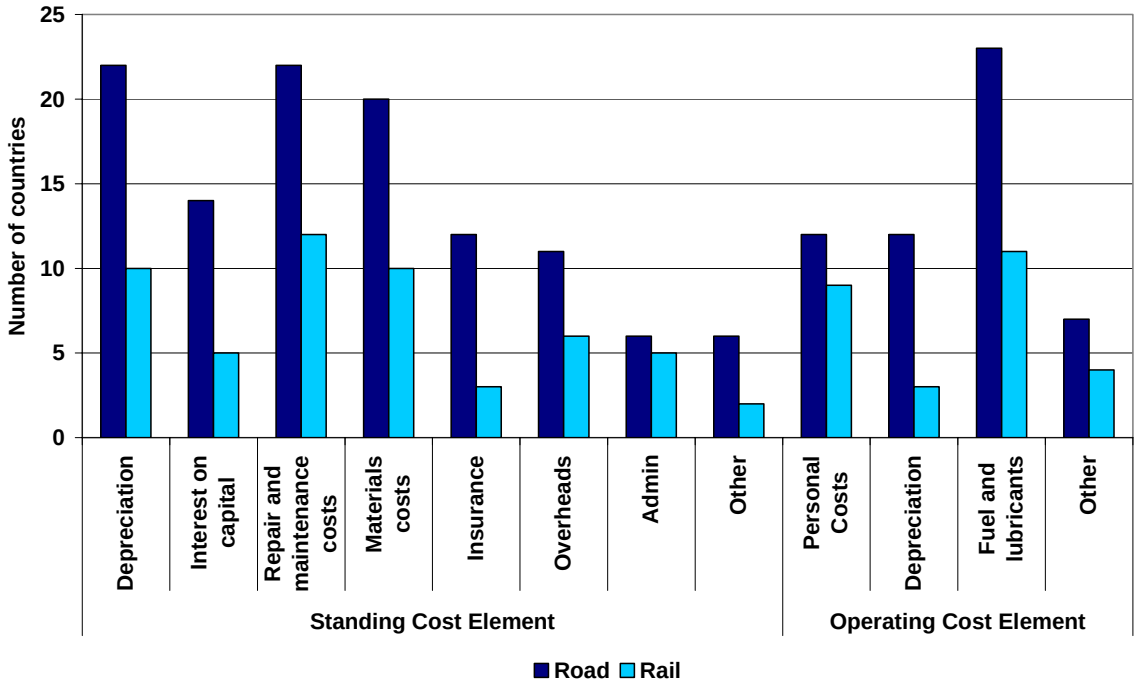
– depreciation of vehicles;

– fuel and lubricants; and

– material costs.

The inclusion of any of the other components is on a country-by-country basis. While the components of vehicle operating costs may not be exactly the same for all countries this element of the appraisal shows some similarities across all EU countries irrespective of their region.

Figure 5.1 Vehicle operating costs for rail and road (differences and similarities between current practices



Note: 23 countries provided information for road VOC and 12 for Rail VOC. For country specific details see Annex VI.

The survey data implies that standard values and models are commonly used in road projects to determine vehicle operating costs, as shown in Table 5.7. Countries that use standard values have values that state how much vehicle operating costs are based on distance (e.g. standard cost per vehicle km). Countries that use standard models stipulate the formula to be used to determine vehicle operating costs. Some countries have both standard values and standard models (e.g. Latvia). For all other modes bespoke models are usually constructed, with recommendations provided on what should be included in these models.

Table 5.7 Method used to calculate VOC in road transport appraisal (Countries)

Models	No. of countries	Countries
Standard Values and Standard Models	4	*East:* Czech Republic, Hungary, Latvia *South:* Greece
Standard Values	11	*North/West:* Austria, Belgium, Denmark, Finland, France, Germany, Switzerland *East:* Slovak Republic, Slovenia *South:* Cyprus, Malta
Standard Model	6	*North/West*: Ireland, Sweden, UK *East:* Estonia, Lithuania *South:* Portugal
Bespoke Model/No guidelines on model form/values	5	*North/West:* Austria, Luxembourg *South:* Italy, Malta, Portugal

A sample of values of VOC are provided in Annex VI/Table VI.5.

5.4 Commercial Goods Traffic

All countries include commercial goods traffic in their appraisal (but four have no guideline values). Table 5.8 provides the components used to calculate commercial goods traffic user benefits. All countries (where guidelines are provided) include vehicle operating costs and driver and crew wages. This is included both as a time related and distance related element. Sweden is the only country that calculates freight user benefits, which include the costs of goods whilst in transit, plus a time related costs per hour for delays and distance related cost to include risk of damage to goods. The Netherlands has a different approach to the rest of the EU countries in terms of the methodology used to value time savings to commercial goods traffic, as they used a willingness-to-pay survey to determine a value for all costs together. This means that the costs cannot be broken down individually. There is less guidance available for modes other than road and rail.

Table 5.8 Basis of the freight user benefits

		No. of countries	Countries
Vehicle operating costs including driver and crew wages	Distance related – (per km)	22	All (minus) those with no guidelines
	Time related (per hr)	22	All (minus) those with no guidelines
Cost of goods whilst in transit	Time related (per hour)	6	Austria (only rail), Netherlands, Sweden, Czech Republic (only rail), Slovak Republic
Other Costs	Time related per hr e.g. delay	1	Sweden
	Distance related per km e.g. risk of damage	1	Sweden
No Guidelines		4	Luxembourg, Estonia, Poland, Cyprus

Note: Additional information on countries in Annex VI/Table VI.6

Table 5.9 provides the values of time used in the EU countries for the category of time savings of driver and crew. This table highlights the range of currency's, units, price base and basis of the value used in the EU. For example, only seven of the 16 countries have their values of time in Euros. By converting these values into Euros (bearing in mind that the base years are still different) France (2000 market prices) has one of the highest cost per vehicle-hour at 31.4 Euros. In comparison the Czech Republic cost per vehicle-hour is in the region of 3.59 euros (2003 market prices) somewhat lower than France. To provide a true comparison between the values it will be necessary to take account of the use of factor/ market prices, price base and unit (person-hr/ vehicle hr) in addition to the current exchange rate, which is undertaken in deliverable 2.

A number of EU countries do not have guidelines for freight values of travel time savings particularly in the East and South EU regions. The use of the unit vehicle hours is more prominently used in freight across all regions than for the passenger transport values.

5.5 User charges and revenues

For the majority of countries (16) the definition of user charges and revenues is consistent with that suggested by EUNET "money payments between parties in the transport industry, in compensation for a complete transport service". The remaining countries do not have a definition (see Annex VII/Table VII.7).

Germany and Portugal do not include user charges in their CBA, while there are currently no guidelines for Estonia, Poland, Cyprus, Malta and Luxemburg to include user charges and revenues in their appraisal.

Table 5.9 Road freight driver and crew time related transport costs

Region	Country	Currency	Factor/ Market prices (M/F)	Price Base	Unit	HGV (> 3.5 tonnes)	Lorries with trailers and articulated vehicles	VTTS values relates to
North/ West	Austria	Euro	F	1995	Veh-hr	21,08	30,52	
	Belgium	BEF	F	1996	Person-hr	900	---	Only Applicable to the Wallonia Region
	Denmark	DKK	M	2001	Person-hr	156	---	
	Finland	Euro	F	2000	Person-hr	17,31	---	
	France	Euro	M	2000	Veh-hr	31,40	---	
	Germany	Euro	F	1998	Person-hr	22,76	25,34	
	Ireland	Euro	M	2002	person-hr	26,50	---	
	Luxembourg	---	---	---	---	---	---	No Guideline Values
	Netherlands	Euro	F	---	Veh-hr	38	---	VTTS encompasses all components of costs for road except reliability
	Sweden	---	---	---	---	---	---	Values embedded in Vehicle operating costs
	Switzerland	CHF	M	1998	Person-hr	100,00	---	
	UK	GBP	M	2002	Person-hr	10,18	---	
East	Czech Republic	CZK	F	2003	Veh-hr	113	---	
	Estonia	---	---	---	---	---	---	No Guideline Values
	Hungary	HUF	F	2002	Veh-hr	6847	---	
	Latvia	LVL	M	2002	Veh-hr	5,71	---	Greater than 16t truck
	Lithuania	LVL	M	2003	Veh-hr	22,7	40,0	
	Poland	---	---	---	---	---	---	No Guideline Values
	Slovak Republic	---	---	---	---	---	---	Time costs of 9 Sk/tonne-hr
	Slovenia			---	---	---	---	Guidelines Values not available to HEATCO
South	Cyprus	---	---	---	---	---	---	No Guideline Values
	Greece	---	---	---	---	---	---	No Guideline Values
	Italy	---	---	---	---	---	---	No Guideline Values
	Malta	Euro	M	2004	Veh-hr	4,25	---	
	Portugal	Euro	M	2004	Veh-hr	8,70	---	
	Spain	ESP	M	1992	Veh-hr	2500	---	

6 Safety

The cost of accidents is a dominant socio-economic cost of transport. This chapter presents how *safety* is treated in the appraisal framework in the surveyed countries[35].

The structure of the chapter is as follows:

– Section 6.1: *Coverage*; and

– Section 6.2: *Monetised impacts*.

The country specific details on *safety* are presented in Annex VII.

6.1 Coverage

Savings in accidents are included in some form in the appraisal framework for all countries under consideration.

With a few exceptions savings in accidents are assigned a money value for inclusion in the appraisal if CBA is used for the relevant mode, i.e. only in a few cases is CBA used without including safety aspects. The exceptions are listed in the table below by mode.

Table 6.1 Countries which do not include safety in CBA (given CBA is used)

Mode	Countries
Road	Belgium
Rail	Belgium, Poland and Greece
Air	Greece
Inland waterway	Austria, Italy
Sea	Greece and Italy

Note: See Annex III for details

[35] The information presented in this chapter refers to Section 5 in the country reports.

In Belgium, safety aspects are given a qualitative description for road projects, while included in a MCA for rail[36]. In Greece, CBA is used for rail, air and sea, but safety is only covered by qualitative measures for rail and air, and by quantitative measures for sea. In Poland safety is not part of CBA in the majority of projects. But, as in the case of user benefits, safety is included in the CBA of some projects in Poland - especially projects which are co-financed by EU funds. In Austria, safety aspects are covered in a qualitative description for inland waterways. In the UK, CBA is used for all modes, but the use of monetary values for safety for air, inland waterway and sea is on a project by project basis.

6.2 Monetised impacts

A number of different approaches exist for estimating the monetised value of accident savings; different types of costs are included, different estimations techniques are applied and different definitions are used.

Differences and similarities of the approaches taken across countries are described below.

6.2.1 Types of costs included

The value for accident savings can consist of three main elements[37];

– material damage;

– personal loss for casualties; and

– costs to society.

The majority of the surveyed countries include all three elements (see Annex VII for country specific details). The exceptions are shown in Table 6.2.

None of the countries in the North/West region leave out any of the main elements for the valuation of accident savings.

[36] The NMBS (Belgian railways) states that in the business case (for rail projects) it is preferred to have an indicator for benefits which can be measured, combined with target values (quantitative assessment). If this is not possible, a qualitative assessment can be made instead. In the next step, Safety is included in the MCA, which is carried out by the NMBS (the NMBS does not have standard methods how they perform their MCA). Concerning other modes, in Flanders it is not defined how this is treated. In Wallonia, safety is not an element of the application for finance at SOFICO (EIB).

[37] The proforma for country reports mentioned a fourth category *hazards related to transport of dangerous goods.* However, none of the surveyed countries include this element.

Table 6.2 Countries which do not include the relevant element in the value for accident savings

Main element	Countries
Material damage	Italy, Portugal
Personal loss for casualties	Hungary
Costs to society	Latvia, Slovenia, Spain

Note: Excluding Belgium (no money value) and Malta (no information available)

The main elements of *material damage* are *cost of damage to vehicle etc.* and *cost of lost or damaged goods*. All countries, which include material damage in the valuation and for which the information is available/relevant, include costs of damage to vehicle except Ireland and the Czech Republic.

Around half of the countries include *costs of lost or damaged goods*. Six counties include *other* elements than the two main elements in the valuation of accident savings.

At least five different approaches exist for estimating *personal loss for casualties.* The approaches are outlined in Table 6.3 (see Annex VII for details).

Table 6.3 Approaches for estimating personal loss for casualties

Approach	No. of countries	Countries
Stated preference/contingent valuation (only)	7	*North/West:* Finland, Ireland, Netherlands [2)], Sweden, Switzerland, UK *South:* Italy [1)]
Gross production loss (only)	4	*North/West:* Germany *East:* Lithuania, Slovenia, Slovak Republic
Other (only)	5	*North/West:* Austria *East:* Czech Republic, Latvia *South:* Portugal, Spain
Combination of stated preference/contingent valuation and gross production loss	2	*North/West:* France *East:* Estonia
Combination of gross production loss and other	2	*North/West:* Denmark[3] *East:* Poland

Note: Excluding Belgium (not relevant), Hungary (not relevant), Cyprus (no information/Consultant can choose the method to calculate accident costs provided they can support their choice), Greece (no information/ Consultant can choose the method to calculate accident costs. The recommendation is to collect information from insurance companies) and Malta (no information). 1) The monetisation happens with a variety of approaches. 2) Guidelines do not predefine which effects to be included and which values to be used. 3) The Danish approach is currently under revision

Nine of the 20 countries for which the information on how costs to society are estimated is available/relevant include all four main elements;

– medical treatment;

– legal and court costs and administration;

– emergency services; and

– net production loss.

The nine countries are Austria, Finland, France, Germany, Netherlands, Sweden, Hungary, Lithuania and Slovak Republic.

The remaining countries leave out one or more effects (see Annex VII for details).

6.2.2 Definitions

EUNET used the following definitions for different types of casualties:

– *Fatality:* Death within 30 days for causes arising out of the accident;

– *Serious injury:* Casualties who require hospital treatment and have lasting injuries, but who do not die within the recording period for a fatality; and

– *Slight injury:* Casualties whose injuries do not require hospital treatment or, if they do, the effects of the injuries quickly subside.

16 of the 25 surveyed countries use a definition which is consistent with that suggested in EUNET[38]. Two of the remaining countries use the same grouping of types of accidents, but with different definitions. For more details see Table VII.6 in Annex VII.

The vast majority of countries ignore non-reported accidents. Only three countries (Denmark, Sweden and Switzerland) correct for non-reported accidents. For more details on unit of measurement see Annex VII.

6.2.3 Values/estimation of effect

EUNET documented that the measurement and definition used for casualties is of great importance. An adjustment was made to put the appraisal values on a common basis. This reduced the difference in the fatality values from a factor of 48 to 4.5 (EUNET, Deliverable 19, page 30).

[38] This includes Sweden, which actually has a slightly difference definition of severe injuries. The Swedish definition of severe injuries includes all persons hospitalised even if the injuries are short term.

A simple example for two countries which use a definition which is consistent with that of EUNET, Portugal and France illustrate the range of values currently used. Portugal uses a value for a statistical life of 320,000 EUR (year 2004), whereas France uses a figure of 1,500,000 EUR (year 2001). Table 6.4 shows an illustrative sample of values for safety. This table highlights the range of currencies, units, price base used in the EU. The specific values are discussed and evaluated in WP4, which will also discuss the issue of using common European values or country specific values.

Table 6.4 Valuation of safety - Cost per fatality (road and rail)

Region	Country	Unit	Factor/Market	Year	Value
North/West	Austria				
	Belgium				
	Denmark	DKK	M	2001	8,223,000
	Finland	Euro	M	2000	1,934,161
	France	Euro	M	2000	1,500,000
	Germany	Euro	F	1998	1,176,000
	Ireland				
	Netherlands	Euro	M	1998	1,500,000
	Sweden	SEK	M	2001	17,511,000
	Switzerland	CHF	F	1998	3,311,700-3,330,700
	UK	GBP	M	2002	1,249,890
East	Czech Republic	CZK	M	/	9,606,000
	Estonia				
	Hungary	HUF	F	2002	98,000,000
	Latvia	LVL	M	2002	230,000
	Lithuania	LTL	M	2003	1,018,269
	Poland				
	Slovak Republic	SK	M	2003	5,000,000
	Slovenia				
South	Cyprus				
	Greece				
	Italy	Euro	M	1998	465,000
	Malta				
	Portugal	Euro	M	2004	320,000
	Spain	ESP	M	1992	25,000,000

Note: For Switzerland the low value refers to road and the high to rail due to different costs to society.

There is no consensus on whether or not the values for accident savings should grow over time.

In 11 of the 21[39] countries for which the information is available/relevant the values grow over time (see Annex VII for details).

Among these countries there is, however, no consensus on the basis for the rate of change. In six countries (Cyprus, Estonia, Ireland, Poland, Slovak Republic and the UK) the rate of change is linked to GDP, whereas two countries (Lithuania and Slovenia) use time series analysis. Four countries (France, Hungary, Ireland and Switzerland) use *other* approaches. In France, the value for material damages is constant, whereas the part related to the value of human life/injuries changes according to final domestic consumption per capita. In Hungary, the values are increased by 4% p.a., whereas the values used in Switzerland increase with the real wage.

In the remaining 10 countries (Austria, Czech Republic, Denmark, Finland, Germany, Italy, Latvia, Portugal, Spain and Sweden) values are constant.

The proforma for country reports also contains a small section on how the change in accidents/PIA/casualties is estimated. Most often this is estimated on the basis of *general guidelines on accident risk (accident/vkm) both before and after the project*[40].

[39] Excluding; Belgium (not relevant), the Netherlands (no information), Greece (no information) and Malta (no information).

[40] For country specific details see Annex VII.

7 Environmental impacts

The environmental external effects of transport cover a wide range of different impacts, including for example noise, local/regional air pollution and climate change.

This chapter presents how environmental impacts are treated in appraisal practice in the surveyed countries[41]. The structure of the chapter is as follows:

– Section 7.1: *Noise*;

– Section 7.2: A*ir pollution - local/regional*;

– Section 7.3; *Climate change*; and

– Section 7.4: *Other environmental impacts*.

The country specific details on *environmental effects* are presented in Annexes VIII-XI.

7.1 Noise

Often infrastructure projects affect the noise level in certain areas.

All countries, except three, take this effect into account in some form in the project appraisal. 13 countries include the effect on noise levels with a money value (see Table 7.1).

[41] The information presented in this chapter refers to Section 6 in the country reports.

Table 7.1 Coverage - Noise

Approach	No. of countries	Countries
Included in CBA	13	*North/West:* Austria, Denmark, Finland, France, Germany, Netherlands, Sweden, Switzerland *East:* Czech Republic, Hungary, Lithuania, Poland, Slovenia
Not included in CBA, but covered by MCA, QM and/or QA	9	*North/West:* Belgium, Ireland, UK *East:* Latvia, Slovak Republic *South:* Cyprus, Greece, Portugal, Spain
Not covered/No information	3	*East:* Estonia *South:* Italy, Malta

Note: See Annex VIII for details.

There is a clear regional tendency in the treatment of noise. None of the countries in the South region include *noise* with a money value, whereas all but three countries in the North region include noise in the CBA. Around half of the countries in the East region include noise with a money value.

7.1.1 Types of costs included

Noise effects are normally considered to consist of two elements;

- noise annoyance; and
- health related costs.

All countries, which include noise with a money value in the appraisal[42], include the effect of *noise annoyance*. All these take into account the effect of annoyance in dwellings, whereas around half (France, Germany, Lithuania, Slovenia, Sweden and Switzerland) also include the annoyance at *other locations.*

Only five countries (Denmark, France, Lithuania, Poland and Switzerland) include *health related costs* related to noise with a money value. Only Lithuania and Switzerland bases health related costs on a *dose-response* assessment.

This is in fact one of the special features of Swiss practice of project appraisal. The approach is based on a recent study, which showed that noise is related to ischaemic heart diseases and to hypertension related diseases, which both lead to premature deaths (measured in years of life lost) and hospital treatment. In Switzerland health costs are equivalent to one seventh of the costs of noise annoyance (measured by hedonic pricing).

[42] And for which detailed information is available.

For more details see Annex VIII.

7.1.2 Valuation techniques

The money value of noise annoyance is based on *hedonic pricing* in all countries except for Germany, where the money value is based on *stated preference/contingent valuation* analysis. In Austria both hedonic pricing and *stated preference/contingent valuation* is used.

The money value for *health related costs* is derived from different sources in the five countries where included. France and Lithuania base their money value on hedonic pricing, whereas Switzerland base it on a combination of *stated preference/contingent valuation* and an assessment of the *net production loss/costs of medical treatment.* Poland bases it solely on *net production loss/costs of medical treatment*, whereas Denmark uses a rather pragmatic approach assuming that *health related costs* are 50% of *noise annoyance*[43].

For more details on valuation techniques see Annex VIII.

7.1.3 Values

UNITE recommended that the values should grow over time with real incomes. This is not consistent with country practice (see Annex VIII).

In fact it is only in France that the values are linked to the GDP. In the other countries values are constant.

A sample of values for noise is shown in Table 7.2. As can be seen from the table there is variation between countries in the numeraire, price base and unit of account. This naturally complicates a comparison. However, there appears to be a significant range. A detailed comparison of the values is made in WP4.

[43] A new study on external costs of transport is under way in Denmark.

Table 7.2 Noise costs per Decibel (dB) per person and year (road and rail)

Region	Country	Differentiation	Unit	Year	Factor / market prices	Annoyance in general	Annoyance in areas with noise					
							> 50 db(A)	> 55 db(A)	> 60 db(A)	> 65 db(A)	> 70 db(A)	> 75 db(A)
North / West	Austria	Only road noise	Euro	1997	Market	44						
	Germany	Noise exposure in built-up areas	Euro	1998	Factor	55						
	Sweden	Only road noise	SEK	2001	Market		51	810	1750	3020	6780	16220
	Switzerland	Annoyance in dwellings	CHF	2000	Market	800						
East	Hungary	Annoyance from road noise	HUF	2002	Factor	8000						

7.2 Air pollution - Local/Regional

Transport infrastructure projects often affect local and regional air pollution. The vast majority of the surveyed countries take this into account in some form in the project appraisals.

As can be seen from Table 7.3, 14 countries include the effect on air pollution with a money value, whereas eight countries include it in the project appraisal in form of a qualitative description, quantitative description and/or multi-criteria analysis.

Table 7.3 Coverage - Air pollution Local/Regional

Approach	No. of countries	Countries
Included in CBA	14	*North/West:* Austria, Denmark, Finland, France, Germany, Netherlands, Sweden, Switzerland *East:* Czech Republic, Hungary, Lithuania, *South:* Cyprus, Greece, Italy
Not included in CBA, but covered by MCA, QM and/or QA	8	*North/West:* Belgium, Ireland, UK *East:* Latvia, Poland, Slovak Republic *South:* Portugal, Spain
Not covered/No information	3	*East:* Estonia, Slovenia *South:* Malta

For local/regional air pollution there is also regional differences. Only three of the 11 countries in the North/West region do not include the effect with a money value, where three of eight countries in the East region include it in the CBA. For the countries in the South region, three out of six countries include it with a money value.

7.2.1 Elements included

There is no consensus on which elements should be included in the monetary valuation.

Figure 7.1 shows the number of countries that are including each of six selected effects in the valuation (see Table 7.4 for an explanation of abbreviations) plus a category *other*.

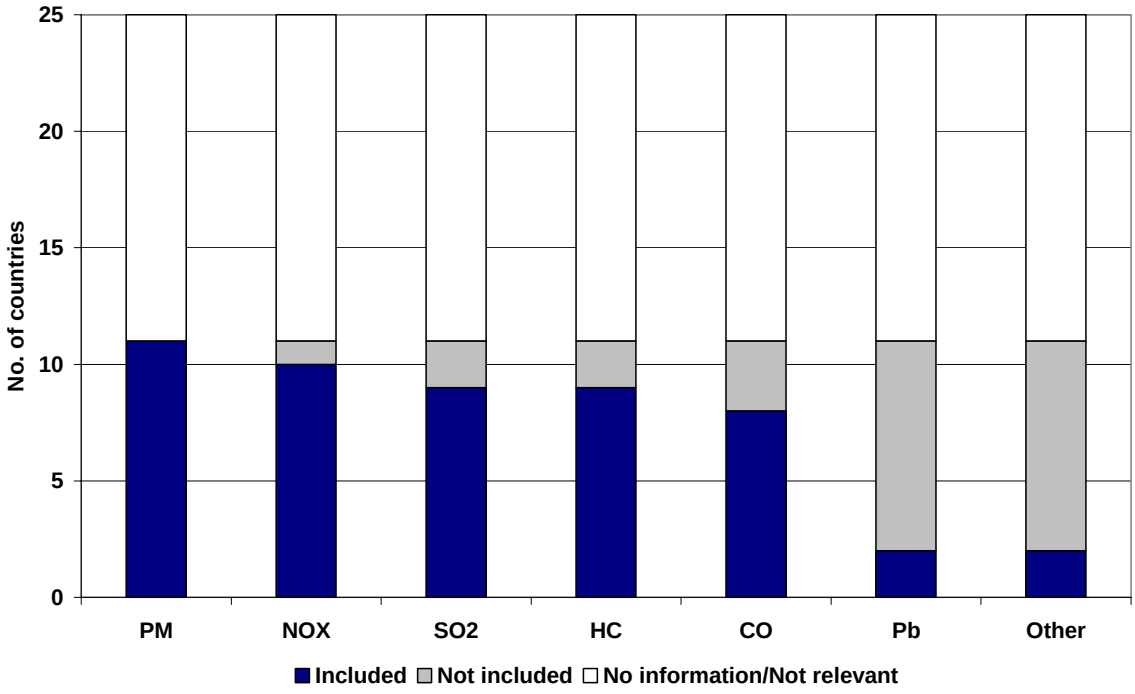
Table 7.4 Abbreviations

• PM: Particulate matter • NO_X: Nitrogen oxides • SO_2: Sulphur dioxide	• HC: Hydrocarbons, volatile organic compounds • CO: Carbon monoxide • Pb: Lead

The majority of countries which include *air pollution - local/regional* with a money value in the project appraisal include PM, NO_x, SO_2, HC and CO. Only *Pb* is not included in the appraisal in the majority of countries.

The category *other* include; carcinogenic species (Germany) and polycyclic aromatic hydrocarbons (Hungary and Germany).

Figure 7.1 Elements included in money valuation (no. of countries)



Note: For three of the 14 countries which include the effect on local/regional air pollution with a money value, no information is available on which elements are included.

There is consensus to include *particulate matter*. However, the definition differs across countries (see table below). It's important to note that the different fractions of PM can be transformed into each other[44].

[44] In Switzerland the following figures are used: PM10 from PM2.5 multiply with 1.32; PM10 from TSP multiply by 0.55.

Table 7.5 Definition of PM

Definition of PM	No. of countries	Countries
PM	5	*North/West:* Austria, Germany, Sweden *East: Hungary* *South: Greece*
PM10	5	*North/West:* Denmark, France, Switzerland *East:* Lithuania *South:* Italy
PM2.5	1	*North/West:* Finland
PM1.0	0	
Other	1	*East:* Hungary

Note: Hungary use both PM and *Other*; No information for Czech Republic, Ireland.

7.2.2 Valuation techniques

The majority of the surveyed countries base their money value for *air pollution - local/regional* on the *impact pathway approach*. However, as can be seen from Table 7.6, many different approaches are used. Some countries use more than one approach for estimating the money value.

Table 7.6 Monetisation method

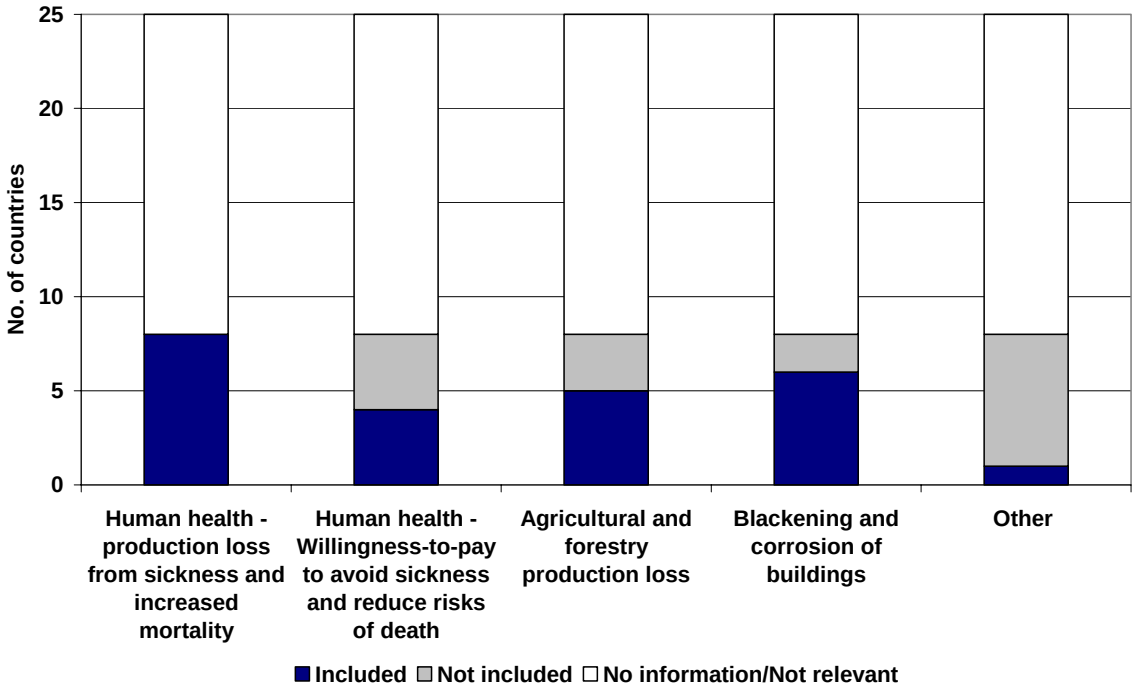
Monetisation method used	No. of countries	Countries
Impact pathway approach	9	*North/West:* Finland, Netherlands, Sweden, Switzerland *East:* Czech Republic, Hungary, Lithuania *South:* Greece, Italy
Other damage cost approach	5	*North/West:* France, Germany, Netherlands, Sweden *East: Lithuania*
Avoidance costs (cost of avoiding emission)	3	*North/West:* Denmark, Netherlands *East:* Lithuania
Avoidance costs (cost of avoiding damage)	0	
Other	1	*North/West:* Austria

Note: Sweden also use avoidance costs. However, excluded from table as no details on cost of avoiding emission or cost of avoiding damage. No information for Ireland. UK use impact pathway approach for "typical" values.

There is no consensus on which effects to include in the money value for *air pollution - local/regional*. This is illustrated in Figure 7.2 below.

All countries, which include the effect on air pollution with a money value and for which the information is available, include *Human health - production loss from sickness and increased mortality*. Four to six countries include the other three mentioned effects.

Figure 7.2 Effects included in money value (no. of countries)



7.2.3 Values

The money value for local and regional air pollution is, as seen previously for *safety* and *noise*, in most countries constant over time. In fact, the money value only changes over time in three countries, namely France, Lithuania and Switzerland.

A sample of values for local and regional air pollution is shown in Table 7.7. As can be seen from the table there is variation between countries in the numeraire, price base and unit of account. This naturally complicates a comparison. However, it is clear that there is a significant range, e.g. in Finland a figure of 13421 EUR/ton is used for SO_2 compared to a figure of 1555 Euro/ton in Austria.

A detailed comparison of the values is made in WP4.

Table 7.7 Selection of key figures for local/regional air pollution (costs per ton, kg - road and rail)

Region	Country	Differentiation	Unit	Year	Factor/market prices	CO	CO-eq.	CH	NO_X	NO_X-eq.	SO_2	PM	PM 2,5	PM 10
North / West	Austria	Urban roads	Euro/t	1997	factor	9,08		4.454,84	3.677,26		1.555,20	1.380,78		
		Non-urban roads	Euro/t	1997	factor	3,63		1.725,98	736,06		327,03	290,69		
		Rail	Euro/t	1998	factor		5,08							
	Denmark	Roads in urban areas	DKK/kg	2001	market	0,61		40,34	72,28		39,41	132,54		
		Roads in rural areas	DKK/kg	2001	market	0,20		13,45	24,09		13,14	44,18		
		Rail	DKK/kg	2001	market	0,01		32,88	118,07		71,94	117,57		
	Finland	Urban roads	Euro/t	2000	market	24,00		67,00	1.111,00		13.421,00		201.879,00	
		Non-urban roads	Euro/t	2000	market	1,00		67,00	435,00		1.994,00		6.308,00	
		Rail (diesel) urban	Euro/t	2000	market	15,00		236,00	1.622,00		16.575,00		66.959,00	
		Rail (diesel) non-urban	Euro/t	2000	market	1,00		236,00	186,00		612,00		1.896,00	
		Rail (electric train)	Euro/t	2000	market			---	1.536,00		1.037,00		1.094,00	
		Maritime (open sea)	Euro/t	2000	market	0,40		137,00	301,00		327,00	3.410,00		
		Maritime (coast)	Euro/t	2000	market	2,00		153,00	397,00		547,00	5.610,00		
		Maritime (inland)	Euro/t	2000	market	23,00		197,00	569,00		684,00	9.580,00		
		Maritime (port)	Euro/t	2000	market	19,00		148,00	1.062,00		2.283,00	26.880,00		
	Germany	Long-range effects of emissions (health damage, losses in forestry; damage to water supply and distribution and to soil protection; loss of recreational facilities)	Euro/t	1998	factor					365,00				
	Sweden	Regional effects	SEK/kg	2001	market			31.00 (VOC)	62,00		21,00			
	Switzerland	Road	CHF/kg	2000	market				9,00					27,00
		Road and rail (health costs)	CHF/kg	2000	market				16,50					
		Road and rail (damage to vegetation)	CHF/kg	2000	market				1,50					
		Rail (damage to buildings)	CHF/kg	2000	market				12,50					
East	Lithuania	Roads transport	LTL/t	2004	factor									24,00
		Sea transport	LTL/t	2004	factor									39,00
South	Portugal	Value used in the Extension of the Lisbon Metro asessment	Ecu/t	1994	market	6.230,00		6.230,00	6.230,00					
		Value used in the Extension of the Lisbon Metro asessment (CO_2)	Ecu/t	1995	market									

7.3 Climate change

This section considers effects on global warming and ozone depletion - effects which are global in nature.

There is, as mentioned in Section 3.2 no consensus on whether or not *climate change* should be included in a cost-benefit analysis. How climate change is treated in the surveyed countries are summarised in Table 7.8.

There are clear regional differences on the treatment of *climate change.* Only three of the countries in the North/West region do not include climate change effects in a CBA, whereas only one of the countries in the East region and one country in the South region include the effect of climate change in a cost-benefit analysis.

Table 7.8 Coverage - Climate change

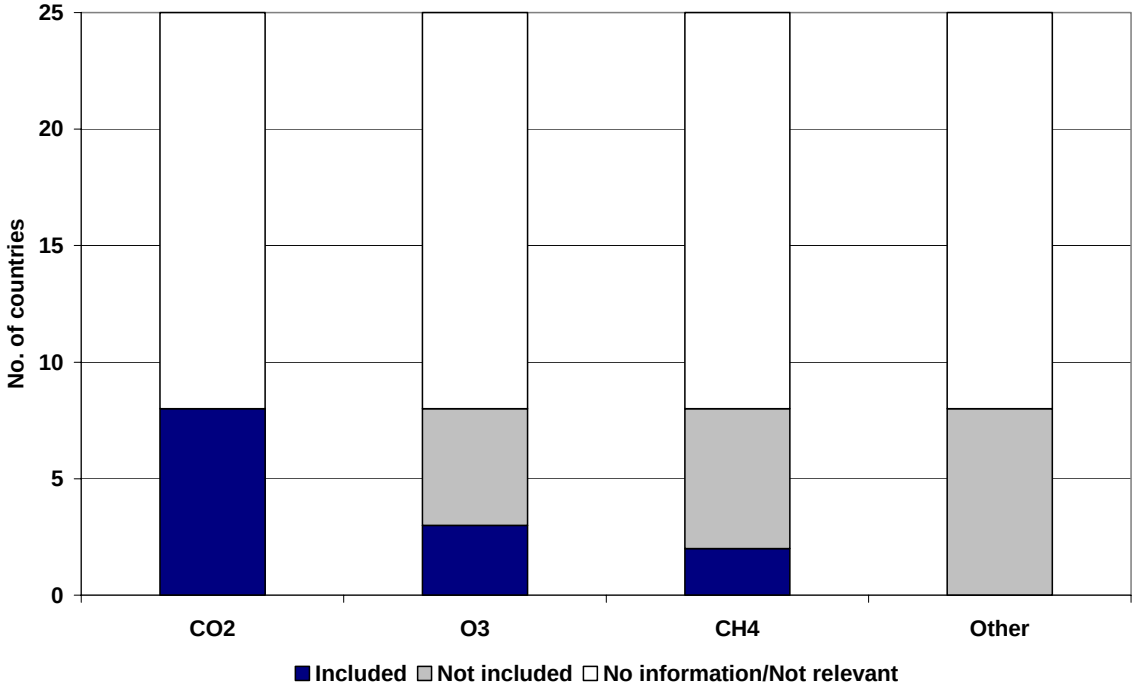
Approach	No. of countries	Countries
Included in CBA	9	*North/West:* Austria, Denmark, Finland, Germany, Netherlands, Sweden, Switzerland *East:* Czech Republic *South:* Italy
Not included in CBA, but covered by MCA, QM and/or QA	8	*North/West:* Belgium, Ireland, UK *East:* Czech Republic, Slovak Republic *South:* Greece, Portugal, Spain
Not covered/No information	9	*North/West:* France *East:* Estonia, Hungary, Latvia, Lithuania, Poland, Slovenia *South:* Cyprus, Malta

Note: For country specific details and differences across modes, see Annex III.

7.3.1 Elements included

All countries which include *climate change* in the appraisal include *carbon dioxide (CO_2)* in the appraisal. Less than half of the surveyed countries which include *climate change* include *ozone (O_3)* and *methane (CH_4).*

Figure 7.3 Elements include in monetary valuation (no. of countries)



7.3.2 Valuation technique

The data shows that there is no single common approach for assessing the money value of *climate change* effects. As can be seen from the table below, three countries use the *damage cost approach* and four the avoidance cost approach. As can bee seen all countries which use the avoidance cost approach (for which the information is available) refer to the costs of avoiding emission.

Table 7.9 Monetisation method

Monetisation method used	No. of countries	Countries
Damage cost approach	3	*North/West:* Finland, Netherlands *South:* Italy
Avoidance costs (costs of avoiding emission)	4	*North/West:* Austria, Germany, Sweden, Switzerland
Avoidance costs (costs of avoiding damage)	0	
Other	2	*North/West:* Austria, Denmark

Note: The Netherlands also use avoidance costs. However, not included in Table as no details on cost of avoiding emission or cost of avoiding damage.

7.3.3 Values

Direct comparisons of actual values are difficult due to the differences in price base etc. However, there does appear to be a significant range. At the top end we have Germany, which uses a value of 205 Euro/ton. At the lower end of the range is Finland, which uses a value of 32 Euro/ton[45].

In most countries the values for *climate change* are constant. In fact it is only in France that the value changes over time. In France the carbon price is supposed to increase yearly at a rate of 3% after 2010. This increase is coherent with a scenario where flexibility mechanisms such as tradable emissions or others are widespread and nuclear energy is used.

Table 7.10 Change in values over time

Category	No. of countries	Countries
Constant (real terms)	7	*North/West:* Austria, Denmark, Finland, Germany, Italy, Sweden, Switzerland
Relationship with economic growth	0	
Other:	1	*North/West:* France

7.4 Other environmental impacts

The proforma for country reports also contains a small section on *other environmental impacts.*

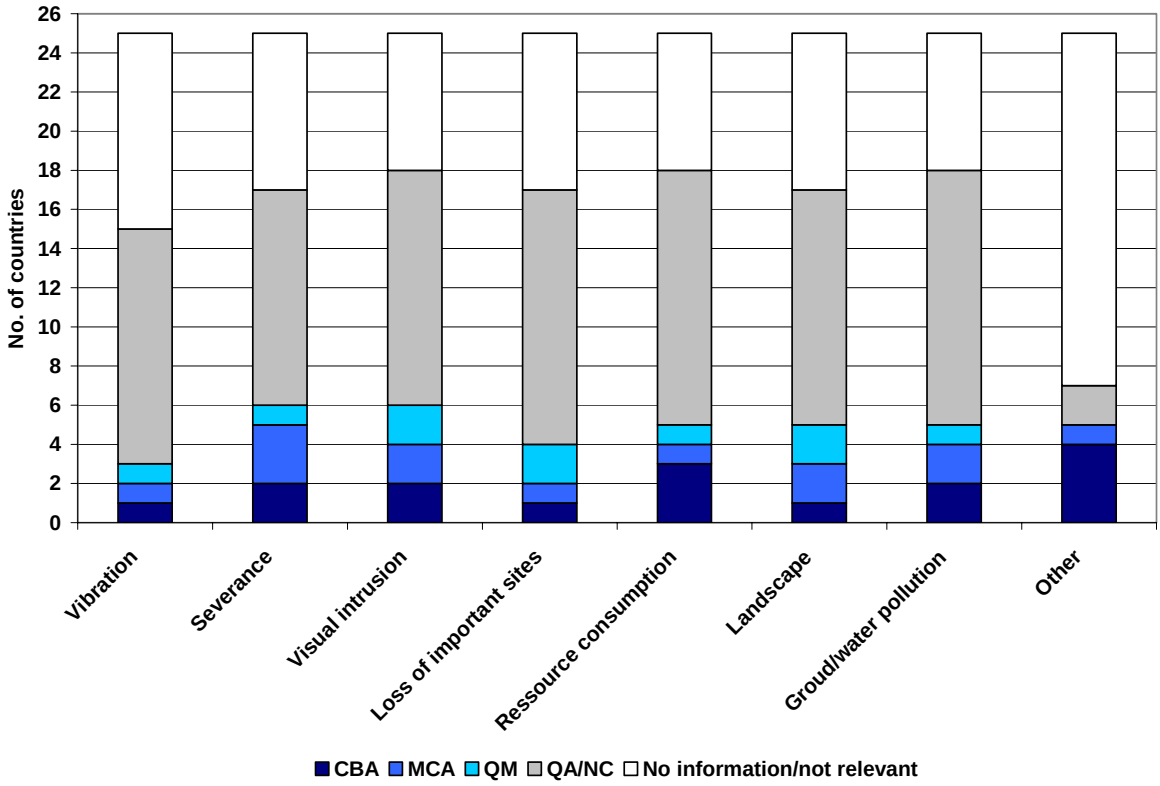
Figure 7.4 illustrates how seven selected *other environmental impacts* are covered. As can be seen only a few countries include the effects with a money value, especially taking into account that in the country report for the Netherlands it is stated that all the effects are (potentially) included in a cost-benefit analysis. Apart from the Netherlands, only Denmark, France, Germany and Switzerland include some of the effects in a cost-benefit analysis. Otherwise *other environmental effects* are generally covered by a qualitative assessment - if covered at all.

Some countries (for example the UK) are, however, considering how monetised values could be employed to value some of these impacts.

For country specific details see Annex XI.

[45] The conversion and comparison of values is part of WP4. For more details see Annex X.

Figure 7.4 Coverage - other environmental effects (no. of countries)



8 Indirect socio-economic effects

The primary focus in the country reports is on direct effects. However, the proforma for country reports also contains a small section on the coverage of indirect socio-economic effects. The chapter provides a short overview on how *indirect socio-economic effects* are treated in the appraisal framework in the surveyed countries.[46].

Table 8.1 shows the categories for indirect socio-economic effects covered by the proforma for country reports.

Table 8.1 Indirect socio-economic effects - categories

• Land use • Economic development • Employment - short term (building phase) • Employment - medium/long term • Cohesion - national level • Cohesion - EU level	• Urbanisation • Network effects • Effects on state finances • Equity • (Other)

Several countries include one or more of these effects in some form in the infrastructure project appraisal (see Table 8.2).

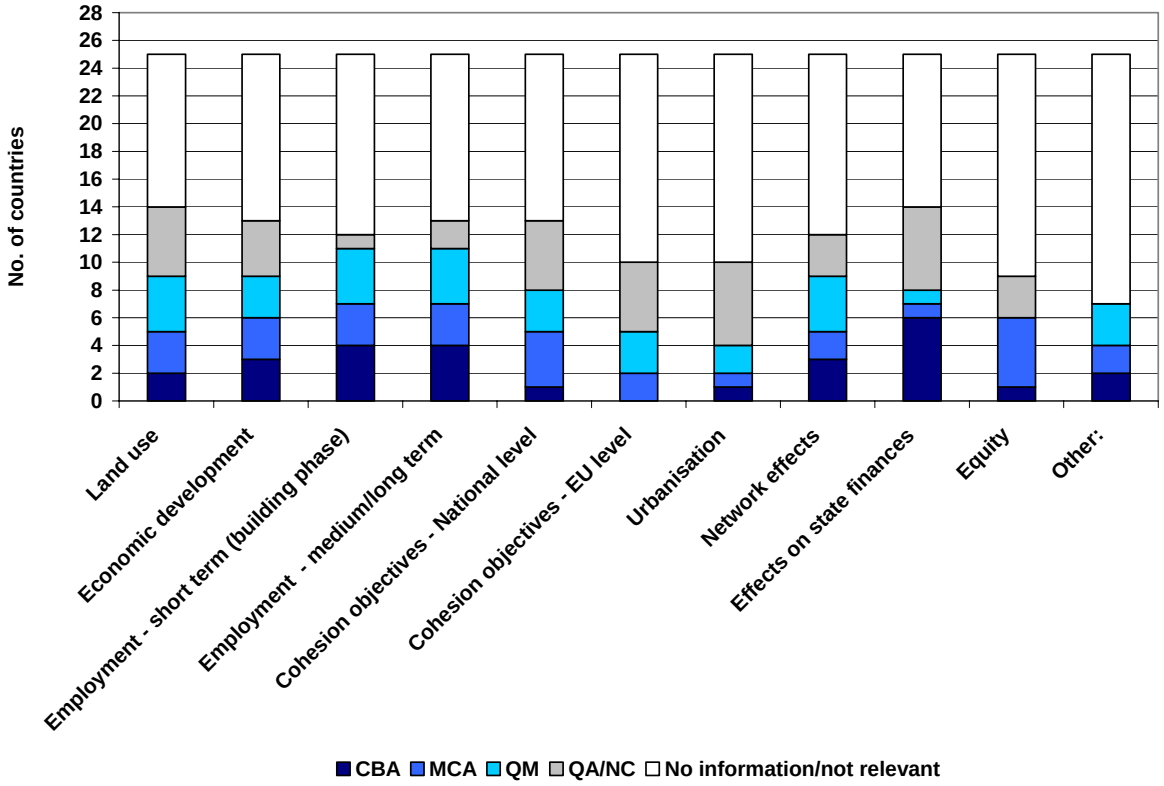
Table 8.2 Coverage of indirect socio-economic effects

Category	No. of countries	Countries
Included in project appraisal in some form	16	*North/West:* Denmark, France, Germany, Ireland, Netherlands, Sweden, Switzerland, UK *East:* Czech Republic, Hungary, Latvia, Lithuania, Poland, Slovak Republic *South:* Italy, Spain
Not included in project appraisal	9	*North/West:* Austria, Belgium, Finland *East:* Estonia, Slovenia *South:* Cyprus, Greece, Malta, Spain

[46] The information presented in this chapter refers to Section 7 in the country reports.

Figure 8.1 shows how each of the above mentioned effects are covered in the surveyed countries. As can be seen only a few countries include the effects with a money value, especially taking into account that in the Netherlands, all mentioned effects are potentially included in CBA except for EU level cohesion objectives. For country specific details on the coverage of indirect socio-economic effects see Annex XII.

Figure 8.1 Coverage indirect socio-economic effects



Despite that not many details are available on the treatment of indirect socio-economic effects, a few interesting cases for some of the effects are worth mentioning.

In France, for example, the direct and indirect effects on *employment* in the areas local to project are evaluated for two different phases;

i. Three effects during the *building phase* are evaluated; employment in the building site (direct effect), employment related to supply to the building site and other upstream activities (indirect) and revenue effect (indirect).

ii. Several effects related to the *exploitation and maintenance phase* are evaluated; employment relating to tolling activities, other employments of the concessionary and the sub-concessionary, road maintenance, po-

lice, taxes, other indirect effects generated by maintenance, intermediate consumption of restaurants and hotel etc.

Similarly, Italy has a method for assessing the *effects on the economy* of the realisation of an infrastructure project. The effects are estimated on the basis of regional input-output matrixes. This allows calculating the direct and indirect effects on the economy by sector of activity.

9 Conclusion

The primary objective of HEATCO is the development of harmonised guidelines for project assessment and transport costing at an EU level. Work Package 3 contributes by collecting, compiling, analysing and comparing the existing practice of project appraisal in EU Member States[47] and Switzerland.

This report presents the overall findings of the analysis and country comparison. Most of the country specific details are presented in Annexes I-XII. The data presented in the annexes are an important input to Work Package 4, which develops recommendations for harmonised guidelines for project appraisal. The cornerstone of the work completed in Work Package 3 has been the proforma based country reports, which are delivered on a CD-ROM in addition to the main report ("Deliverable 1/Volume 2" (country reports)).

The analysis and comparison of existing practice of project assessment and transport costing has highlighted a number of similarities and differences across countries and modes. The authors acknowledge that national guidelines are generally the results of a long tradition and development of project appraisal methods. National guidelines are not based on the same methodological framework and they are used in different regulatory contexts. For this reason procedures and values used are different. However, from the HEATCO perspective of developing a harmonised "state-of-the-art" approach for assessing European infrastructure projects a comparison and analysis is required. Similarities between countries will make harmonisation easier, whilst differences will make it more difficult. The main findings are summarised here.

The first impression when comparing the country reports is that the principles for project appraisal and transport costing vary considerably across countries and modes. The vast majority of the countries in the North/West region of the EU have comprehensive guidelines for project appraisal, whereas the guidelines in the South and East regions seem less developed. Furthermore, the appraisal framework for rail seems less standardised than for road and only around one third of the surveyed countries have formulated principles for the appraisal of air, inland waterway and sea transport projects.

The data shows that all the surveyed countries use cost-benefit analysis in some form. In the East region of the EU, cost-benefit analysis is most commonly or

[47] No information on Luxembourg could be obtained despite considerable efforts.

exclusively used for projects which are promoted for EU co-funding. However, the country reports show that cost-benefit analysis is gaining acceptance also for locally financed projects in several of the countries in the East region of the EU.

For the analysis the elements of cost-benefit analysis were grouped into 11 categories.

The analysis shows that there are large differences between the surveyed countries regarding whether and how the 11 main effects should be included in the project appraisal.

The vast majority of the surveyed countries include; *construction costs*, *system operating and maintenance costs*, *passenger transport savings*, *time savings to goods traffic*, *vehicle operating costs*, *user charges and revenues* and *safety* effects with a money value. Around half of the countries also include *noise effects* and the effects on *local and regional air pollution* in a cost-benefit analysis. *Climate change effects* and *disruption from construction* are in most countries not included with a money value in the project appraisal. In general countries in the East and South regions of the EU seldom include environmental effects with a money value.

There is no convergence on whether the unit of account of the cost-benefit analysis should be market prices or factor costs. Likewise there is no convergence on which discount rate and appraisal period to use.

Only a few countries include distortion effects from tax financing and transboundary effects. However, there seem to be some consensus on the treatment of distortion effects from tax financing and transboundary effects when they are included.

There is more convergence on how to treat *construction costs*, though there are still some differences on which elements to include, how to treat the residual value and which lifetimes to use for various components. The majority of countries have systematic methods to tackle uncertainty/optimism-bias in the construction cost estimate. Most often this comprises a form of standard mark-up on the construction cost estimate. Only a few countries use more advanced methods.

Most countries do - as mentioned above - include *system operating costs and maintenance*, and the majority of countries use a definition which is consistent with the EUNET definition. Around half of the countries have standard figures for operating costs and maintenance. Though, in many cases project specific estimates are used.

For *user benefits* and v*ehicle operating costs* there are a number of similarities across countries. The data shows that all countries include travel time savings in the appraisal and that these are included via a cost-benefit analysis. Furthermore, most countries disaggregate travel time savings. The most common forms of disaggregating are work and non-work and by mode of transport.

In addition, the survey has showed that all countries (where information was provided) include vehicle operating costs savings associated with road transport in an appraisal via a cost-benefit analysis. There also appears to be a great deal of similarity in the definition of vehicle operating costs between countries.

There are, however, also important differences for user benefits and vehicle operating costs. There appear to be a number of popular methods for assessing travel time savings, but there does not appear to be a single common approach. With respect to time savings for work trips the most popular valuation method is the cost saving approach, whereas for non-work trips willingness-to-pay approaches and a relationship to the wage rate are the most used valuation approaches. Furthermore there are important differences between EU regions (North/West, South and East). For example, for non-work time savings the willingness-to-pay approach is used extensively in the North/West region but not in the East and South regions. It is also more common to have travel time savings guideline values that are commonly used in appraisal in the North/West region, than in the East and South regions and countries in the North/West region are more likely to differentiate their values of travel time saving into a number of different categories (e.g. work/ non work; by mode, etc.).

For safety there are also both similarities and differences across countries. The vast majority of countries do, as mentioned above, include safety effects in a cost-benefit analysis and there seems to be consensus to include all three effects; material damage, personal loss for casualties and costs to society in the money value. There is not a single common approach for estimating the money value of any of these three effects. Furthermore the survey has showed that a significant range of values are used for safety and that there is no consensus on whether or not values should increase over time. The survey also showed that 16 of the 25 countries use a definition of different accident types which is consistent with the definition of EUNET.

Noise is included in a cost-benefit analysis in around half of the surveyed countries. There are clear regional differences on how to treat noise effects. None of the countries in the South region include noise in a cost-benefit analysis, whereas all but three countries in the North/West region include noise in a cost-benefit analysis. Around half of the countries in the East region include noise effects in a cost-benefit analysis.

All countries, which include noise with a money value, include noise annoyance, whereas only a few include health costs related to noise. The money value of noise annoyance is in all countries except one, based on hedonic pricing. The recommendation of UNITE that values should grow over time is not consistent with country practice.

For local and regional air pollution there is no consensus on which elements to include for cases where the effect is included with a monetary value - which around half of the surveyed countries do. There is also no consensus on valuation techniques, though the impact pathway approach is most commonly used.

There are clear regional differences on the treatment of *climate change* effects. All countries in the North/West region, except three, include climate change effects in a cost-benefit analysis, whereas as only one country in the East region and one country in the South region include climate effects with a money value. The data also shows that there is no single common approach for assessing the money value and that a significant range of values are used.

Only very few countries include other environmental effects than noise, air pollution - local/regional and climate change in a cost-benefit analysis. Some countries are however considering how to include more environmental effects in a cost-benefit analysis. The picture is the same for *indirect socio-economic effects*. Only very few countries include these in a cost-benefit analysis.

In general it can be concluded that the main challenges to the development and use of harmonised guidelines are;

- significant regional differences in the approach to and tradition for transport project appraisals;
- the appraisal framework for road is far more developed than for especially air, inland waterways and sea transport;
- lack of consensus on which elements to include in the cost-benefit analysis (especially environmental effects);
- lack of consensus on approaches to valuation; and
- the significant range of values used (e.g. for safety).

10 References

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Annex I: Standardisation

Table I.1 Standardisation of principles

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	3	5	5	4,5	6
	Belgium	3,5	3	5	5	5
	Denmark	3	3	5	5	5
	Finland	1,2	2	6	2	2
	France	3	3	4	3	5
	Germany	2	2	6	2	6
	Ireland	3	3	3	3	3
	Netherlands	2	2	2	2	6
	Sweden	1,3	3	3	3	3
	Switzerland	1,2	4	5	5	5
	UK	1,3	3	3	3	3
East	Czech Republic	1,3	3	5	3	5
	Estonia	1,3	3	5	5	5
	Hungary	3	5	5	5	5
	Latvia	3	5	5	5	5
	Lithuania	2,3	3	5	5	5
	Poland	1,3	3	5	5	5
	Slovak Republic	1,2,3	3	5	5	5
	Slovenia	3	3	5	5	5
South	Cyprus	2,3,5	6	6	6	6
	Greece	3,4	4	4	4	4
	Italy	3	3	3	3	3
	Malta	2	6	6	6	6
	Portugal	5	5	5	6	5
	Spain	3	3	3	6	3

Codes:

1 : PC software
2 : Official requirements
3 : Official recommendations
4 : Other
5 : No formulation of principles
6 : Not relevant/ No information

Annex II: Appraisal methodology

Table II.1 General appraisal framework

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1,2	4	1	5
	Belgium	1,3	1,2	4	4	4
	Denmark	1	1	4	4	4
	Finland	1,3	1,3	5	1,3	1,3
	France	1	1	5	1	5
	Germany	1,4	1,4	5	1,4	5
	Ireland	1,3,4	1,3,4	1,3,4	1,3,4	1,3,4
	Netherlands	1,3	1,3	1,3	1,3	1,3
	Sweden	1	1	1	1	1
	Switzerland	1,2	1	4	4	4
	UK	1,2,3,4	1,2,3	1,2,3,4	1,2,3,4	1,2,3,4
East	Czech Republic	1,2	1,2	4	1,2,3,4	4
	Estonia	1	1	4	4	4
	Hungary	1,2	4	4	4	4
	Latvia	1	4	4	4	4
	Lithuania	1	1	1,3	4	1,3
	Poland	1,2	1	4	4	4
	Slovak Republic	1,2	1	4	4	4
	Slovenia	1	1	4	4	4
South	Cyprus	1,2,4	5	5	5	5
	Greece	1,4	1,4	1,4	5	1,4
	Italy	1	1	1	1	1
	Malta	1	5	5	5	5
	Portugal	1	1	1,4	5	1
	Spain	1,2	1,2	1,2	5	1

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: In Latvia CBA is used for rail, sea and air in case the project is promoted to get EU-funding. In Germany the guidelines reported in the proforma have been used for selecting projects for the federal transport investment plan. They are relevant for early stage project assessment of long-distance infrastructure projects. However, as the appraisal of infrastructure projects for airports and sea port is not in the responsibility of the federal institutions they are not covered in the guidelines. This does not mean that there are no appraisal guidelines for air and sea in Germany.

Annex III: Coverage of main effects

Table III.1 Coverage - Construction costs

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1	5	1	5
	Belgium	1,4	1	4	4	4
	Denmark	1	1	4	4	4
	Finland	1	1	5	1	1
	France	1	1	1	1	1
	Germany	1	1	5	1	5
	Ireland	1	1	5	5	5
	Netherlands	1	1	1	1	1
	Sweden	1	1	1	1	1
	Switzerland	1	1	4	4	4
	UK	1	1	1	1	1,3
East	Czech Republic	1	1	4	1	4
	Estonia	1	1	4	4	4
	Hungary	1,2	4	4	4	4
	Latvia	1	5	5	5	5
	Lithuania	1	1	3	4	1,3
	Poland	1	1	4	4	4
	Slovak Republic	1,2	1	4	4	4
	Slovenia	1	1	4	4	4
South	Cyprus*	1	5	5	5	5
	Greece	1	1	1	5	1
	Italy	1	1	1	1	1
	Malta	1	5	5	5	5
	Portugal	1	1	1	5	1
	Spain	1,2	1,2	1,2	5	1

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

*) Correction made compared to country report; Cyprus: "1" for road.

Table III.2 Coverage - Disruption from construction

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	4	4	5	1	5
	Belgium	1,4	2	4	4	4
	Denmark	1	1	4	4	4
	Finland	5	5	5	5	5
	France	5	5	5	5	5
	Germany	5	5	5	5	5
	Ireland	1	1	5	5	5
	Netherlands	1	1	1	1	1
	Sweden	5	5	5	5	5
	Switzerland	4	5	5	5	5
	UK	1,4	1,4	1,4	1,4	1,4
East	Czech Republic *	5	5	5	5	5
	Estonia	1	1	4	4	4
	Hungary	5	5	5	5	5
	Latvia	5	5	5	5	5
	Lithuania	1	1	3	4	4
	Poland	4	4	4	4	4
	Slovak Republic	1,2	1	4	4	4
	Slovenia	5	5	5	5	5
South	Cyprus	4	5	5	5	5
	Greece	1	1	1	5	1
	Italy	5	5	5	5	5
	Malta	1	5	5	5	5
	Portugal	5	5	5	5	5
	Spain	5	5	5	5	5

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

*) Correction made compared to country report.

Table III.3 Coverage - System operating costs and maintenance

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1	5	1	5
	Belgium	1,4	1,4	4	4	4
	Denmark	1	1	4	4	4
	Finland	1	1	5	1	1
	France	1	1	5	1	1
	Germany	1	1	5	1	5
	Ireland	1	1	1	1	1
	Netherlands	1	1	1	1	5
	Sweden	1	1	1	1	1
	Switzerland	1	1	4	4	4
	UK	1	1	1	4	4
East	Czech Republic	1	1	5	1	4
	Estonia	1	1	4	4	4
	Hungary	1,2	4	4	4	4
	Latvia	1	4	4	4	4
	Lithuania	1	1	1	4	1
	Poland	3	4	4	4	4
	Slovak Republic	1,2	1	4	4	4
	Slovenia	1	1	4	4	4
South	Cyprus	4	5	5	5	5
	Greece	1	1	1	4	4
	Italy	1	1	1	1	1
	Malta	1	5	5	5	5
	Portugal	1	1	1	5	1
	Spain	1,2	1,2	1,2	5	1

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

Table III.4 Coverage - Passenger transport time savings

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1	5	1	5
	Belgium	1,4	4	4	4	4
	Denmark	1	1	4	4	4
	Finland	1,3	1,3	5	1,3	1,3
	France	1	1	1	1	1
	Germany	1	1	5	1	5
	Ireland	1	1	1	5	1
	Netherlands	1	1	1	1	5
	Sweden	1	1	1	1	1
	Switzerland	1	1	5	5	5
	UK	1	1	1	1	1
East	Czech Republic	1	1	4	4	4
	Estonia	1	4	4	4	4
	Hungary	1,2	4	4	4	4
	Latvia	1	4	4	4	4
	Lithuania	1	1	1	4	1
	Poland	3,4	3,4	4	4	4
	Slovak Republic	1,2	1	5	5	5
	Slovenia	1	1	4	4	4
South	Cyprus	1	5	5	5	5
	Greece	1	1	5	5	5
	Italy	1	1	1	1	1
	Malta	1	5	5	5	5
	Portugal	1	1	1	5	1
	Spain	1,2	1,2	1,2	5	1

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

Table III.5 Coverage - User charges and revenues

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1	4	4	4	5
	Belgium	1,4	1	4	4	4
	Denmark	1	1	4	4	4
	Finland	1	1	5	1	1
	France	1	1	1	1	1
	Germany	5	5	5	5	5
	Ireland	1	1	1	1	1
	Netherlands	1	1	1	1	1
	Sweden	1	1	1	1	1
	Switzerland	1	1	5	5	5
	UK	1	1	1	1,4	1,4
East	Czech Republic	1	1	4	1,4	4
	Estonia	5	5	5	5	5
	Hungary	1,2	4	4	4	4
	Latvia	5	4	4	4	4
	Lithuania	1,3	1	1	5	1
	Poland	1	4	4	4	4
	Slovak Republic	4	1	4	4	4
	Slovenia	1	5	4	4	4
South	Cyprus	4	5	5	5	5
	Greece	1	5	5	5	5
	Italy	1	1	1	1	1
	Malta	5	5	5	5	5
	Portugal	5	5	5	5	5
	Spain	5	1,2	5	5	5

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

Table III.6 Vehicle operating costs

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1	5	1	5
	Belgium	1	5	5	5	5
	Denmark	1	1	4	4	4
	Finland	1	1	5	1	1
	France	1	1	1	1	1
	Germany	1	1	5	1	5
	Ireland	1	5	5	5	5
	Netherlands	5	5	5	5	5
	Sweden	1	1	1	1	1
	Switzerland	1	1	5	5	5
	UK	1	1	1	1	1
East	Czech Republic	1	1	4	4	4
	Estonia	1	4	4	4	4
	Hungary	1,2	4	4	4	4
	Latvia	1	4	4	4	4
	Lithuania	1	1	1	5	1
	Poland	5	5	5	5	5
	Slovak Republic	1,2	1	4	4	4
	Slovenia	1	5	4	4	4
South	Cyprus	1	5	5	5	5
	Greece	1	1	5	5	5
	Italy	1	1	1	1	1
	Malta	1	5	5	5	5
	Portugal	1	1	1	5	1
	Spain	1,2	1,2	1	5	1

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

Table III.7 Coverage - Goods traffic user benefits

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1	5	1	5
	Belgium	5	5	5	5	5
	Denmark	1	1	4	5	5
	Finland	5	5	5	5	5
	France	1	1	5	1	1
	Germany	1	1	5	1	5
	Ireland	1	1	5	5	5
	Netherlands	1	1	1	1	1
	Sweden	1	1	1	1	1
	Switzerland	1	4	5	5	5
	UK	1	1	1	1,4	1,4
East	Czech Republic	1	1	4	1,4	4
	Estonia	5	5	5	5	5
	Hungary	1,2	4	4	4	4
	Latvia	1	4	4	4	4
	Lithuania	1	1	1	4	1
	Poland	5	5	5	5	5
	Slovak Republic	1	1	4	4	4
	Slovenia	1	5	4	4	4
South	Cyprus	1,4	5	5	5	5
	Greece	1	1	1	4	4
	Italy	5	1	5	5	5
	Malta	5	5	5	5	5
	Portugal	5	5	5	5	5
	Spain	5	5	5	5	1

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

Table III.8 Coverage - Safety

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1	5	4	5
	Belgium	4	2,4	4	4	4
	Denmark	1	1	4	4	4
	Finland	1,3	1,3	5	1,3	1,3
	France	1	1	1	1	1
	Germany	1	1	5	1	5
	Ireland	1	1	1	1	1
	Netherlands	1	1	1	1	1
	Sweden	1	1	1	1	1
	Switzerland	1	1	5	5	5
	UK*	1	1	1	1	1
East	Czech Republic	1	1	4	4	4
	Estonia	1	4	4	4	4
	Hungary	1,2	4	4	4	4
	Latvia	1	4	4	5	4
	Lithuania	1	1	1	4	1
	Poland	1,3	3	4	4	4
	Slovak Republic	1,2	1	4	4	4
	Slovenia	1	1	4	4	4
South	Cyprus	1	5	5	5	5
	Greece	1	4	4	4	3
	Italy	1	1	1	5	5
	Malta	1	5	5	5	5
	Portugal	1	1	1	5	1
	Spain	1,2	1,2	1,2	5	1

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

*) Correction made compared to country report for UK, as if included in air, sea and inland waterway appraisal they are included in CBA.

Table III.9 Coverage - Noise

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	2	5	4	5
	Belgium	4	2,4	4	4	4
	Denmark	1	1	4	4	4
	Finland	1,3	1,3	5	1,3	1,3
	France	1	1	1	1	1
	Germany	1	1	5	1	5
	Ireland	3	3,4	3,4	3,4	3,4
	Netherlands	1,3	1,3	1,3	1,3	1,3
	Sweden	1	1	1	1	1
	Switzerland	1,2	1	5	5	5
	UK *	3,4	3,4	3,4	3,4	3,4
East	Czech Republic	1	1	4	5	4
	Estonia	5	5	5	5	5
	Hungary	1,2	4	4	4	4
	Latvia	4	4	4	4	4
	Lithuania	1,3	1,3	1,3	4	3
	Poland	1,3	3	4	4	4
	Slovak Republic	4	4	4	4	4
	Slovenia	1	1	4	4	4
South	Cyprus	4	5	5	5	5
	Greece	4	4	4	4	4
	Italy	5	5	5	5	5
	Malta	5	5	5	5	5
	Portugal	4	4	4	5	4
	Spain	4	2	2	5	4

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

*) Correction made compared to country report

Table III.10 Coverage - Air pollution, Local/Regional

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1	5	1	5
	Belgium	4	2,4	4	4	4
	Denmark	1	1	4	4	4
	Finland	1,3	1,3	5	1,3	1,3
	France	1	5	5	5	5
	Germany	1	1	5	1	5
	Ireland	3	3	3	3	3
	Netherlands	1,3	1,3	1,3	1,3	1,3
	Sweden	1	1	1	1	1
	Switzerland	1	1	5	5	5
	UK *	3,4	3,4	3,4	3,4	5
East	Czech Republic	1	1	4	1	4
	Estonia	5	5	5	5	5
	Hungary	1,2	4	4	4	4
	Latvia	4	4	4	4	4
	Lithuania	1	1	1	5	1
	Poland	4	4	4	4	4
	Slovak Republic	4	4	4	4	4
	Slovenia	5	5	5	5	5
South	Cyprus	1	5	5	5	5
	Greece	1	1	1	3	5
	Italy	1	1	1	1	1
	Malta	5	5	5	5	5
	Portugal	4	4	4	5	4
	Spain	4	2	4	5	4

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

*) Correction made compared to country report

Table III.11 Coverage - Climate change

Region	Country	Road	Rail	Air	Inland waterway	Sea
North/West	Austria	1,2,3	1	5	1	5
	Belgium	4	2,4	4	4	4
	Denmark	1	1	4	4	4
	Finland	1	1	5	1	1
	France	5	5	5	5	5
	Germany	1	1	5	1	5
	Ireland	4	4	4	4	4
	Netherlands	1,3	1,3	1,3	1,3	1,3
	Sweden	1	1	1	5	5
	Switzerland	1	1	5	5	5
	UK *	3,4	3,4	3,4	3,4	3,4
East	Czech Republic	4	4	4	1	4
	Estonia	5	5	5	5	5
	Hungary	5	5	5	5	5
	Latvia	5	5	5	5	5
	Lithuania	5	5	5	5	5
	Poland	5	5	5	5	5
	Slovak Republic	4	4	4	4	4
	Slovenia	5	5	5	5	5
South	Cyprus	5	5	5	5	5
	Greece	5	5	5	3	3
	Italy	1	1	1	1	1
	Malta	5	5	5	5	5
	Portugal	4	4	4	5	4
	Spain	4	4	4	5	4

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

Note: Shading indicate that CBA is not used for any of the 11 main effects for relevant combination of country and mode.

*) Correction made compared to country report

Annex IV: The use of CBA's

Table IV.1 Criteria used in CBA

Region	Country	Net present value	Benefit/cost ratio	First year benefit	Internal rate of return	Other
North/West	Austria [a)]	Yes	Yes	No	Yes	Yes
	Belgium [a)]	Yes	Yes	No	Yes	No
	Denmark	Yes	Yes	No	Yes	No
	Finland	No	No	No	No	Yes
	France	Yes	Yes	Yes	Yes	No
	Germany	No	Yes	No	No	Yes
	Ireland	Yes	Yes	No	Yes	No
	Netherlands	Yes	Yes	Yes	Yes	Yes
	Sweden	No	Yes	No	No	No
	Switzerland	Yes	Yes	No	No	No
	UK	Yes	Yes	No	No	Yes
East	Czech Republic	Yes	Yes	No	Yes	Yes
	Estonia	Yes	Yes	Yes	Yes	No
	Hungary	Yes	Yes	Yes	Yes	Yes
	Latvia [a)]	Yes	Yes	No	Yes	No
	Lithuania	Yes	Yes	No	Yes	No
	Poland	Yes	Yes	No	Yes	No
	Slovak Republic	Yes	Yes	Yes	Yes	Yes
	Slovenia	Yes	Yes	No	Yes	No
South	Cyprus [a)]	Yes	Yes	Yes	Yes	No
	Greece [a)]	Yes	Yes	Yes	Yes	No
	Italy	Yes	Yes	No	Yes	No
	Malta	Yes	Yes	No	Yes	No
	Portugal [a)]	Yes	No	No	Yes	No
	Spain	Yes	Yes	Yes	Yes	No

Codes:
/: No information
-: Not relevant

a) Varies by mode/appraisal

Table IV.2 Unit of account

Region	Country	Unit of account	Standard factor from factor to market prices
North/West	Austria	1	1.23
	Belgium	2	/
	Denmark	2	1.17
	Finland	1	/
	France	2	/
	Germany	1	/
	Ireland	2	1.19
	Netherlands	1	/
	Sweden	2	1.23
	Switzerland	1	1.077
	UK	2	1.209
East	Czech Republic	2	1.19
	Estonia	1	1.18
	Hungary	1	1.25
	Latvia	2	/
	Lithuania	1	/
	Poland	1	/
	Slovak Republic	2	1.19
	Slovenia	2	1.20
South	Cyprus	1	/
	Greece	1	/
	Italy	2	/
	Malta	2	/
	Portugal *	1	/
	Spain	1	/

Codes (factor costs or market prices)
1: Factor costs
2: Market prices
/: No information
-: Not relevant

*) Correction made compared to country report.

Table IV.3 Are distortion effects from tax financing included in the evaluation?

Region	Country	Distortion from tax financing
North/West	Austria	No
	Belgium	No
	Denmark	Yes
	Finland	No
	France *	No
	Germany	No
	Ireland	/
	Netherlands	No
	Sweden	Yes
	Switzerland	No
	UK * a)	No
East	Czech Republic	No
	Estonia	/
	Hungary	No
	Latvia	/
	Lithuania	No
	Poland	No
	Slovak Republic	No
	Slovenia	Yes
South	Cyprus	/
	Greece a)	Yes
	Italy *	No
	Malta	No
	Portugal	No
	Spain	No
Codes: /: No information -: Not relevant		

a) Varies by mode/appraisal

* Corrections made compared to country report; "No" for France and Italy due to comments, "No" for UK.

Table IV.4 Discount rate

Region	Country	Dicount rate	Any differentiation in the rate?
North/West	Austria *	2-3%	Yes
	Belgium [b)]	6.5%	Yes
	Denmark	6%	No
	Finland	5%	No
	France	8%	No
	Germany	3%	No
	Ireland	5%	Yes
	Netherlands	4%	Yes
	Sweden	4%	No
	Switzerland	2-2.5%	No
	UK	3.5%	Yes
East	Czech Republic	5-7%	No
	Estonia	6%	Yes
	Hungary	5%	No
	Latvia	5%	Yes
	Lithuania	5%	Yes
	Poland	6%	No
	Slovak Republic	6%	No
	Slovenia	8%	No
South	Cyprus	6-12%	Yes
	Greece	/	Yes
	Italy	4-6%	No
	Malta	6%	No
	Portugal	3-6%	No
	Spain	6%	No

Codes:
/: No information
-: Not relevant

a) Varies by mode/project

b) Wallonia

* Correction made compared to country report; 2-3% for Austria instead of 2.5% due to comments.

Table IV.5 Appraisal period

Region	Country	Appraisal period (years)
North/West	Austria [a)]	/
	Belgium [a) b)]	30
	Denmark [a)]	50
	Finland	30
	France [a)]	/
	Germany [a)]	/
	Ireland	30
	Netherlands	Infinite
	Sweden [a)]	40-60
	Switzerland [a)]	40-infinite
	UK * [a)]	30
East	Czech Republic [a)]	20
	Estonia [a)]	30
	Hungary [a)]	25
	Latvia * [a)]	20-30
	Lithuania [a) d)]	20
	Poland [a)]	20
	Slovak Republic [a) b)]	20-30
	Slovenia [a)]	20-25
South	Cyprus [a)]	/
	Greece [a)]	/
	Italy [c)]	30
	Malta	30
	Portugal	20
	Spain [a)]	/
Codes: /: No information -: Not relevant		

a) Varies by mode/project

b) Wallonia

c) Maximum

d) Usually 20 years. Minimum 10.

* Correction made compared to country report for Latvia, Slovak Republic and UK.

Table IV.6 Have principles on how to make sensitivity analyses explicitly been formulated?

Region	Country	Sensitivity analysis
North/West	Austria	Yes
	Belgium	Yes
	Denmark	Yes
	Finland	Yes
	France	Yes
	Germany	No
	Ireland	Yes
	Netherlands	Yes
	Sweden	No
	Switzerland	Yes
	UK	Yes
East	Czech Republic	Yes
	Estonia	Yes
	Hungary	Yes
	Latvia	/
	Lithuania	/
	Poland	Yes
	Slovak Republic	Yes
	Slovenia	Yes
South	Cyprus	Yes
	Greece	Yes
	Italy	Yes
	Malta	Yes
	Portugal	No
	Spain	No

Codes:
/: No information
-: Not relevant

Table IV.7 How are risks evaluated?

Region	Country	Included in discount rate	Scenario analysis	Other
North/West	Austria	Yes	No	Yes
	Belgium	/	/	/
	Denmark	Yes	Yes	No
	Finland	No	No	Yes
	France	No	Yes	No
	Germany	No	Yes	No
	Ireland	Yes	No	Yes
	Netherlands	No	Yes	Yes
	Sweden *	No	No	No
	Switzerland	No	No	Yes
	UK	No	Yes	Yes
East	Czech Republic	Yes	Yes	Yes
	Estonia	Yes	No	No
	Hungary	No	No	Yes
	Latvia	No	Yes	No
	Lithuania	Yes	Yes	Yes
	Poland	No	Yes	No
	Slovak Republic	No	Yes	No
	Slovenia	Yes	No	No
South	Cyprus	No	Yes	No
	Greece	No	Yes	No
	Italy	Yes	Yes	No
	Malta	Yes	No	No
	Portugal	No	No	Yes
	Spain	No	Yes	No

Codes:
/: No information
-: Not relevant

* Correction made compared to country report for Sweden due to comments.

Table IV.8 What is the geographical range covered and in case transboundary effects are included; how are they valued?

Region	Country	Only national	Including transboundary effects	Both	If included; How:
North/West	Austria	Yes	No	Yes	1
	Belgium *	Yes	Yes	Yes [a)]	/
	Denmark	Yes	No	No	-
	Finland	Yes	No	No	-
	France	Yes	No	No	-
	Germany	Yes	No	No	-
	Ireland	Yes	No	No	-
	Netherlands	Yes	No	No	-
	Sweden	No	Yes	No	1
	Switzerland *	Yes	Yes	Yes	1
	UK *	Yes	Yes	Yes	/
East	Czech Republic	Yes	No	No	-
	Estonia	Yes	No	No	-
	Hungary	Yes	No	No	-
	Latvia	Yes	No	No	-
	Lithuania	Yes	No	No	-
	Poland	Yes	No	No	-
	Slovak Republic	Yes	No	No	-
	Slovenia	Yes	No	No	-
South	Cyprus	Yes	No	No	-
	Greece	Yes	No	No	-
	Italy	Yes	No	No	-
	Malta	Yes	No	No	-
	Portugal	Yes	No	No	-
	Spain	No	No	Yes	1
Codes: /: No information -: Not relevant					**Codes:** 1: Equally 2: With PPP 3: Other /: No information -: Not relevant

* Correction made compared to country report for Belgium, Switzerland and UK as "Yes" to "Both".

Annex V: Construction related costs

Table V.1 Elements included in construction costs

Region	Country	Materials/labour/energy etc	Planning costs	Land and property purchase	Mitgation	Add-on for bias in estimate of costruction cost	Other
North/West	Austria [a)]	Yes	Yes	Yes	Yes	Yes	Yes
	Belgium [a)]	Yes	Yes	Yes	Yes	No	No
	Denmark	Yes	Yes	Yes	No	No	No
	Finland	Yes	No	Yes	Yes	Yes	No
	France	Yes	Yes	Yes	No	No	Yes
	Germany	Yes	Yes	Yes	Yes	No	No
	Ireland	Yes	Yes	Yes	Yes	Yes	Yes
	Netherlands [a)]	Yes	Yes	Yes	Yes	No	No
	Sweden [a)]	Yes	Yes	Yes	Yes	No	Yes
	Switzerland	Yes	Yes	Yes	Yes	Yes	Yes
	UK [a)]	Yes	Yes	Yes	Yes	Yes	Yes
East	Czech Republic	Yes	Yes	Yes	Yes	Yes	No
	Estonia	Yes	Yes	Yes	No	No	No
	Hungary	Yes	No	Yes	Yes	No	Yes
	Latvia	Yes	Yes	Yes	No	No	No
	Lithuania	Yes	Yes	Yes	No	No	No
	Poland	Yes	Yes	Yes	No	Yes	No
	Slovak Republic	Yes	Yes	Yes	Yes	Yes	No
	Slovenia	Yes	Yes	Yes	No	Yes	No
South	Cyprus	/	/	/	/	/	/
	Greece [a)]	Yes	Yes	Yes	Yes	No	No
	Italy [a)]	/	/	/	/	/	/
	Malta *	Yes	Yes	Yes	Yes	No	No
	Portugal	Yes	Yes	Yes	Yes	Yes	No
	Spain	Yes	Yes	Yes	Yes	Yes	No

Codes:
/: No information
-: Not relevant

a) Varies by mode/appraisal

* Correction made compared to country report for Malta due to comments.

Table V.2 Terminal/residual value

Region	Country	Terminal/residual value	If "Yes"; What depreciation method
North/West	Austria [a)]	Yes	2
	Belgium [a)]	Yes	3
	Denmark	Yes	1
	Finland	Yes	1
	France [a)]	Yes	/
	Germany	No	-
	Ireland	No	-
	Netherlands *	No	-
	Sweden	No	-
	Switzerland [a)]	Yes	1
	UK [a)]	Yes	1,2,3
East	Czech Republic	Yes	1
	Estonia	Yes	1
	Hungary	Yes	1
	Latvia	Yes	1
	Lithuania [a)]	Yes	1
	Poland* [a)]	Yes	1,2
	Slovak Republic	Yes	1
	Slovenia [a)]	Yes	1
South	Cyprus	/	/
	Greece [a)]	Yes	1,3
	Italy [a)]	Yes	/
	Malta	No	-
	Portugal	No	-
	Spain*	Yes	/
Codes: /: No information -: Not relevant			**Codes:** 1: straight line 2: Declining balance 3: Other

a) Varies by mode/appraisal

* Correction made compared to country report; Netherlands: "No" as time horizon infinite; Poland: "2" due to comments; Spain: "/" due to comments.

Table V.3 Lifetimes for selected components

Region	Country	Road - Bridges	Road - Tunnels	Rail - Bridges	Rail - Tunnels
North/West	Austria	75	100	70	80
	Belgium [b)]	50	100	50	100
	Denmark	100	100	100	100
	Finland				
	France				
	Germany	50	50	75	75
	Ireland				
	Netherlands				
	Sweden	60			
	Switzerland	75	100	75	100
	UK [c)]	100	100	100	100
East	Czech Republic	100	100	50	
	Estonia	100	100	100	100
	Hungary	60			
	Latvia [c)]	100		100	
	Lithuania [a)]	75	500		
	Poland				
	Slovak Republic [a)]	55	70	55	70
	Slovenia	85		85	
South	Cyprus				
	Greece	75	90	75	90
	Italy	100		100	
	Malta				
	Portugal	30	30	30	30
	Spain *	30	30	30	75

Codes:
/: No information
-: Not relevant

a) Average values for bridges

b) Wallonia

c) Maximum

* Correction made compared to country report

Table V.4 Uncertainty/optimism-bias

Region	Country	Systematic methods to tackle uncertainty/bias in construction cost estimate
North/West	Austria	Yes
	Belgium	Yes
	Denmark	Yes
	Finland	Yes
	France	/
	Germany	Yes
	Ireland	Yes
	Netherlands	Yes
	Sweden	No
	Switzerland	Yes
	UK	Yes
East	Czech Republic	No
	Estonia	/
	Hungary	No
	Latvia	/
	Lithuania	Yes
	Poland	/
	Slovak Republic	Yes
	Slovenia	/
South	Cyprus	Yes
	Greece	Yes
	Italy	No
	Malta	Yes
	Portugal	No
	Spain	No
Codes: /: No information -: Not relevant		

Table V.5 Disruption from construction

Region	Country	Delays to "private" traffic	Delays to public transport/scheduled services	Effect on neighbourhoods (noise, dust etc.)	Change in risk of accidents	Other
North/West	Austria [a)]	No	No	Yes	No	Yes
	Belgium	Yes	No	No	No	Yes
	Denmark	Yes	Yes	Yes	Yes	Yes
	Finland [a)]	/	/	/	/	/
	France	-	-	-	-	-
	Germany	-	-	-	-	-
	Ireland	Yes	Yes	No	Yes	No
	Netherlands [a)]	/	/	/	/	/
	Sweden	-	-	-	-	-
	Switzerland	-	-	-	-	-
	UK [a)]	Yes	Yes	No	Yes	No
East	Czech Republic	-	-	-	-	-
	Estonia	Yes	Yes	Yes	Yes	No
	Hungary	-	-	-	-	-
	Latvia	-	-	-	-	-
	Lithuania [a)]	Yes	Yes	No	Yes	No
	Poland	-	-	-	-	-
	Slovak Republic	Yes	Yes	No	Yes	No
	Slovenia	-	-	-	-	-
South	Cyprus	-	-	-	-	-
	Greece [a)]	Yes	Yes	No	No	No
	Italy	-	-	-	-	-
	Malta	Yes	Yes	No	Yes	No
	Portugal	-	-	-	-	-
	Spain	-	-	-	-	-

Codes:
/: No information
-: Not relevant

a) Varies by mode/appraisal

Table V.6 Definition - System operating and maintenance costs

Region	Country	Consistent with EUNET definition?
North/West	Austria	Yes
	Belgium	n.d.
	Denmark	Yes
	Finland	Yes
	France	Yes
	Germany	Yes
	Ireland	Yes
	Netherlands	n.d.
	Sweden	Yes
	Switzerland	No
	UK	Yes
East	Czech Republic	Yes
	Estonia	Yes
	Hungary	Yes
	Latvia	n.d.
	Lithuania	Yes
	Poland	Yes
	Slovak Republic	Yes
	Slovenia	Yes
South	Cyprus	-
	Greece	Yes
	Italy	Yes
	Malta	Yes
	Portugal	Yes
	Spain	Yes

Codes:
n.d.: Not defined
/: No information
-: Not relevant

Table V.7 Standard figures - System operation and maintenance costs

Region	Country	Standard figures
North/West	Austria [a)]	1,2
	Belgium [a)]	2, No
	Denmark	No
	Finland [a)]	/
	France	2
	Germany [a)]	/
	Ireland	No
	Netherlands	1
	Sweden [a)]	/
	Switzerland	1,2
	UK [a)]	No
East	Czech Republic	No
	Estonia	2
	Hungary [a)]	2
	Latvia	2
	Lithuania [a)]	2, No
	Poland	No
	Slovak Republic * [a)]	2
	Slovenia [a)]	1,2
South	Cyprus	-
	Greece [a)]	/
	Italy [a)]	/
	Malta	1
	Portugal	2
	Spain	1,2

Codes:
1: Yes, fixed percentage of construction costs
2: Yes, as fixed amount per km
/: No information
-: Not relevant

a) Varies by mode/appraisal

* Correction made compared to country report for Slovak Republic.

Table V.8 Standard figures for operation and maintenance costs - Road

Region	Country	Description	Value	Unit	Year
North/West	Austria	Average value	7567.28	EUR/lanekm	2001
	Belgium	/	/	/	/
	Denmark	/	/	/	/
	Finland	/	/	/	/
	France	Mountain	610000	FF/km	1994
		Hilly terrain	570000	FF/km	1994
		Flat terrain	530000	FF/km	1994
	Germany	Renewal of motorways (average costs)	105000	EUR/km	1998
		Renewal of federal roads (average costs)	27100	EUR/km	1998
		Ann. maint. costs for different road types			
		Ann. maint. costs: 2+1 cross section	12900	EUR/km	1998
		Ann. maint. costs: Road tunnel with 2 tubes / 2 carriage ways per tube	255600	EUR/km	1998
		Ann. maint. costs: Road tunnel with 2 tubes / 3 carriage ways per tube	291400	EUR/km	1998
		Ann. maint. costs: 1 tube / 2 carriage ways per tube	168700	EUR/km	1998
	Ireland	-	-	-	-
	Netherlands	Road, operation and maintenance (all modes)	3%	% of construction costs	-
	Sweden	(Function: see country report)			
	Switzerland	(see country report)			
	UK	-	-	-	-
East	Czech Republic	/	/	/	/
	Estonia	Total costs per km	19000	EEK/km	2003
		Including summer maintenance	13000	EEK/km	2003
		Winter maintenance	6900	EEK/km	2003
	Hungary	Moterway	45248000	HUF/km	2002
		Trunk road	27582000	HUF/km	2002
	Latvia	Asphalted road (width 29,0 m)	11500-14000	LVL/km (y)	2002
		Asphalted road (width 27,0 m)	11200-13500	LVL/km (y)	2002
		Asphalted road (width 23,0 m)	10400-13000	LVL/km (y)	2002
		Asphalted road (width 20,0 m)	10000-12000	LVL/km (y)	2002
		Asphalted road (width 15,0 m)	9000-11000	LVL/km (y)	2002
		Asphalted road (width 13,0 m)	6800-8500	LVL/km (y)	2002
		Asphalted road (width 11,5 m)	6300-8000	LVL/km (y)	2002
		Asphalted road (width 11,0 m)	6000-7500	LVL/km (y)	2002
		Asphalted road (width 7,5 m)	3000-4500	LVL/km (y)	2002
		Gravel road (width 10,5 m)	1800-2600	LVL/km (y)	2002
		Asphalted road (width 6,5 m)	2000-3500	LVL/km (y)	2002
		Gravel road (width 9,5 m)	1500-2200	LVL/km (y)	2002
		Asphalted road (width 6,0 m)	1800-3100	LVL/km (y)	2002
		Gravel road (width 7,5 m)	1200-1900	LVL/km (y)	2002
		Asphalted road (width 3,50 m)	700-1200	LVL/km (y)	2002
		Gravel road (width 5,5 m)	600-1000	LVL/km (y)	2002
		Asphalted road (width 3,5 m)	700-1100	LVL/km (y)	2002
		Gravel road (width 4,5 m)	500-900	LVL/km (y)	2002
		Asphalted road (width 3,0 m)	500-800	LVL/km (y)	2002
		Gravel road (width 3,5 m)	400-700	LVL/km (y)	2002
	Lithuania	/	/	/	/
	Poland	-	-	-	-
	Slovak Republic	Motorways	1055.46 th	SK/km/year	2003
		1st class roads	324.55 th	SK/km/year	2003
		All network - average	178.30 th	SK/km/year	2003
	Slovenia	/	/	/	/
South	Cyprus	/	/	/	/
	Greece	/	/	/	/
	Italy	/	/	/	/
	Malta	Raod, operation and maintenance	3%	% of construction costs	-
	Portugal	Maintenance	3000-6000	EUR/km	2003
		Cost of renewal for Itinerarios Principales and Complementarios with two lanes (IP and IC) - on a 10 year basis for renewal	350000	EUR/km (per year)	2003
		Cost of renewal for Estradas Nacionales and Estradas Regionales with two lanes (EN and ER) - on a 10 year basis for renewal	250000	EUR/km (per year)	2003
		Concessions	600000	EUR/km	2003
	Spain	Maintenance, two lane roads (increasing with lifetime)	100000	Ptas/km/ year (first year)	1987
		Maintenance, one lane roads (increasing with lifetime)	150000	Ptas/km/ year (first year)	1987
		Renewal, two lane roads	20000000	Ptas/km every 8 years	1987
		Renewal, one lane roads	10000000	Ptas/km every 8 years	1987
		Maintenance and renewal	1.5%	% of construction costs	-

Table V.9 Standard figures for operation and maintenance costs - Rail

Region	Country	Description	Value	Unit	Year
North/West	Austria	Substructures	0.005	% of construction costs	2000
		Tracks	0.0231	% of construction costs	2000
		Catenary and telecommunication	0.0145	% of construction costs	2000
		Security and remote control	0.0353	% of construction costs	2000
		Power supply	0.0072	% of construction costs	2000
		Environmental install.	0.005	% of construction costs	2000
		Tunnel	0.005	% of construction costs	2000
		Bridges	0.005	% of construction costs	2000
	Belgium	/	/	/	/
	Denmark	/	/	/	/
	Finland	/	/	/	/
	France	/	/	/	/
	Germany	Roadbed	0.0035	% of construction costs	1998
		Tunnel	0.0014	% of construction costs	1998
		Bridge	0.0042	% of construction costs	1998
		Track	0.0308	% of construction costs	1998
		Intersection structure	0.0042	% of construction costs	1998
		Rentaining walls	0.0035	% of construction costs	1998
		Structural works	0.028	% of construction costs	1998
		Signal installation	0.021	% of construction costs	1998
		Communication system	0.035	% of construction costs	1998
		Rail power supply	0.028	% of construction costs	1998
		Overhead traction wire	0.021	% of construction costs	1998
		Noise barrier	0.0007	% of construction costs	1998
	Ireland	-	-	-	-
	Netherlands	Rail, operation and maintenance (all mod	3%	% of construction costs	-
	Sweden	-	-	-	-
	Switzerland	not available			
	UK	-	-	-	-
East	Czech Republic	/	/	/	/
	Estonia	/	/	/	/
	Hungary	-	-	-	-
	Latvia	-	-	-	-
	Lithuania	/	/	/	/
	Poland	-	-	-	-
	Slovak Republic	-	-	-	-
	Slovenia	/	/	/	/
South	Cyprus	/	/	/	/
	Greece	/	/	/	/
	Italy	/	/	/	/
	Malta	-	-	-	-
	Portugal	Maintenance costs (with mechanical sign	400	EUR/km/year	/
		Maintenance costs (with digital signalling	1200	EUR/km/year	/
	Spain	operation and maintenance	9140000	Ptas/km/year	1990

Table V.10 Existing network

Region	Country	Are changes in costs of the existing network taken into account?
North/West	Austria	Yes
	Belgium	n.d.
	Denmark	Yes
	Finland	n.d.
	France	n.d.
	Germany	No
	Ireland	Yes
	Netherlands	n.d.
	Sweden	Yes
	Switzerland	Yes
	UK	Yes
East	Czech Republic	Yes
	Estonia	Yes
	Hungary	No
	Latvia	n.d.
	Lithuania	Yes
	Poland	No
	Slovak Republic	Yes
	Slovenia	n.d,
South	Cyprus	-
	Greece	Yes
	Italy	No
	Malta	Yes
	Portugal	No
	Spain	No

Codes:
n.d.: Not defined
/: No information
-: Not relevant

Table V.11 Cost function/marginal costs

Region	Country	How is the cost function/marginal costs assessed?
North/West	Austria	1
	Belgium	/
	Denmark	1
	Finland	/
	France	/
	Germany	1
	Ireland	1,2
	Netherlands	/
	Sweden	2
	Switzerland	1
	UK	1,2
East	Czech Republic	1
	Estonia	1
	Hungary	1
	Latvia	/
	Lithuania	1
	Poland	1
	Slovak Republic	1
	Slovenia	1
South	Cyprus	-
	Greece	1
	Italy	1
	Malta	/
	Portugal	1
	Spain	/

Codes:
1: Total average costs (long run
2: Marginal costs (short run)
/: No information
-: Not relevant

Table V.12 BOT-projects

Region	Country	Is the appraisal technique similar for BOT-projects and public projects?
North/West	Austria	No
	Belgium	/
	Denmark	Yes
	Finland	Yes
	France	/
	Germany	/
	Ireland	/
	Netherlands	Yes
	Sweden	/
	Switzerland	Yes
	UK	Yes
East	Czech Republic	Yes
	Estonia *	/
	Hungary	No
	Latvia	/
	Lithuania *	/
	Poland	Yes
	Slovak Republic	Yes
	Slovenia	Yes
South	Cyprus	/
	Greece	Yes
	Italy	Yes
	Malta *	/
	Portugal	Yes
	Spain	Yes
Codes: /: No information -: Not relevant		

* Correction compared to country report for Estonia. Lithuania and Malta due to comments.

Annex VI: User benefits and Vehicle operating costs

Table VI.1 Valuation methodology for passenger travel time savings

Region	Country	Value of time study	Journey Purpose		
			Work	Non work	Average
North/ West	Austria	1995 (Road), 2000 (Rail)	f(50% of national income, employed population and working hours)	f(50% of national income, population, hours not sleeping and working)	----
	Belgium	1996	----	----	wage rate studies, international comparisons and additional factors (a)
	Denmark	Unknown	Cost saving	(%age of wage rate)	----
	Finland	1999/2000	Cost saving	(%age of wage rate)	----
	France	Unknown	Cost saving	(survey of literature)	----
	Germany	1991	Cost saving	Willingness-to-pay (SP/RP surveys)	----
	Ireland	2004	Cost saving	(43% of wage rate)	----
	Luxembourg	---	(b)	(b)	(b)
	Netherlands	1997	Willingness-to-pay (SP/RP survey)	Willingness-to-pay (SP/RP surveys)	----
	Sweden	1995	Hensher	Willingness-to-pay (SP/RP surveys)	----
	Switzerland	2004	Other	Willingness-to-pay (SP/RP surveys)	----
	UK	2003	Cost saving	Willingness-to-pay (SP/RP surveys)	----
East	Czech Republic	2003	----	----	Willingness-to-pay (RP)
	Estonia	N/A	----	----	(1/3rd of gross salary costs)
	Hungary	2003	----	----	(%age of GDP/capita)
	Latvia	2002	Cost saving	(% of wage rate) (c)	----
	Lithuania	2003	f(GDP/capita, wage rate, international comparisons)	(25% of work VTTS)	----
	Poland	----	(b)	(b)	(b)
	Slovak Republic	2003/4	----	----	Wage rate studies
	Slovenia	2004	Cost saving	(30% of wage rate)	----
South	Cyprus	----	(b)	(b)	(b)
	Greece	----	Cost saving	Willingness-to-pay	----
	Italy	----	Other (d)	Other (d)	Other (e)
	Malta	----	Cost saving	(International comparisons)	----
	Portugal	2004	(%age of regional GDP/capita)	(%age of wage rate) (g)	----
	Spain	1992 (road) 1991 (rail)	----	----	(revealed preference)

Key
(a) Only the WallonIa region publishes VTTS guidelines
(b) No Guidelines
(c) Commute 30% of wage, shopping 25% of wage, leisure 20% of wage
(d) W/NW values: hourly extra agriculture work (ISTAT data) corrected through co-effficients for journey purpose provided by the Ministry of Transport
(e) Average values: average hourly value of one working hour calculated by the Bank of Italy Annually
(h) "Commute" trips 75% of value of business trips, "other" trips 50%

(a) Only the WallonIa region publishes VTTS guidelines, (b) No Guidelines, (c) Commute 30% of wage, shopping 25% of wage, leisure 20% of wage, (d) W/NW values: hourly extra agriculture work (ISTAT data) corrected through co-effficients for journey purpose provided by the Ministry of Transport, (e) Average values: average hourly value of one working hour calculated by the Bank of Italy Annually, (h) "Commute" trips 75% of value of business trips, "other" trips 50%.

Table VI.2 Inclusion of reliability, congestion and service quality in appraisal

Region	Country	Included	Road			Rail		
			Reliability	Congestion	Service Quality	Reliability	Congestion	Service Quality
North/West	Austria	Yes	No	No	No	Yes	No	Yes
	Belgium	No/unknown	-	-	-	-	-	-
	Denmark	Yes	Yes	Yes	No	Yes	Yes	No
	Finland	No/unknown	-	-	-	-	-	-
	France	Yes	No	Yes	Yes	No	No	Yes
	Germany	No/unknown	-	-	-	-	-	-
	Ireland	No/unknown	-	-	-	-	-	-
	Luxembourg	No/unknown	-	-	-	-	-	-
	Netherlands	Yes	Yes	Yes	No	Yes	Yes	No
	Sweden	Yes	Yes	No	No	Yes	No	No
	Switzerland	Yes	Yes	Yes	Yes	No	No	No
	UK	Yes	Yes	No	No	Yes	No	Yes
East	Czech Republic	Yes	Yes	No	No	Yes	Yes	Yes
	Estonia	No/unknown	-	-	-	-	-	-
	Hungary	No/unknown	-	-	-	-	-	-
	Latvia	No/unknown	-	-	-	-	-	-
	Lithuania	No/unknown	-	-	-	-	-	-
	Poland	Yes	No	Yes	No	No	No	No
	Slovak Republic	Yes	No	Yes	No	No	No	No
	Slovenia	Yes	Yes	Yes	No	Yes	Yes	No
South	Cyprus	Yes	No	Yes	No	No	No	No
	Greece	No/unknown	-	-	-	-	-	-
	Italy	No/Unknown	-	-	-	-	-	-
	Malta	No/unknown	-	-	-	-	-	-
	Portugal	No/unknown	-	-	-	-	-	-
	Spain	Yes	No	No	Yes	No	No	Yes

Table VI.3 Vehicle operating costs - Road

Region	Country	Standing cost component								Operating cost Element				How are the VOC calculated		
		Depreciation	Interest on capital	Repair and maintenance costs	Materials costs	Insurance	Overheads	Admin	Other	Personal Costs	Depreciation	Fuel and lubricants	Other	Standard Vales	Standard Model	Bespoke Model
North/ West	Austria	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	Yes
	Belgium	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
	Denmark	Yes	No	Yes	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No
	Finland	Yes	Yes	Yes	Yes	No	No	Yes	No	No	Yes	Yes	No	Yes	No	No
	France	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No
	Germany	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	Ireland	Yes	No	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	Yes	No
	Luxembourg	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Netherlands	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Sweden	Yes	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	Yes	No
	Switzerland	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No
	UK	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	No	Yes	Yes	No
East	Czech Republic	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Yes	No
	Estonia	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	No
	Hungary	Yes	No	Yes	No	No	No	No	Yes	No	No	Yes	No	Yes	Yes	No
	Latvia	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No
	Lithuania	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	No
	Poland	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Slovak Republic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	No
	Slovenia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	No
South	Cyprus	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No
	Greece	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	No
	Italy	Yes	No	Yes	No	Yes	Yes	No	No	Yes	No	Yes	No	No	No	Yes
	Malta	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes	No	Yes
	Portugal	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes	Yes
	Spain	Yes	No	Yes	Yes	No	No	No	No	No	Yes	Yes	No	Yes	No	No

Table VI.4 Vehicle operating costs - Rail

Region	Country	Standing cost component								Operating cost Element				How are the VOC calculated?		
		Depreciation	Interest on capital	Repair and maintenance costs	Materials costs	Insurance	Overheads	Admin	Other	Personal Costs	Depreciation	Fuel and lubricants	Other	Standard Vales	Standard Model	Bespoke Model
North/ West	Austria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	No	Yes
	Belgium	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Denmark	/	/	/	/	/	/	/	/	/	/	/	/	No	No	Yes
	Finland	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	France	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Germany	Yes	Yes	Yes	No	No	No	No	No	Yes	No	Yes	Yes	Yes	No	No
	Ireland	No	No	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	No	Yes
	Luxembourg	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Netherlands	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Sweden	/	/	/	/	/	/	/	/	/	/	/	/	No	Yes	No
	Switzerland	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes	Yes	Yes	No	No
	UK	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	Yes	No	No	Yes
East	Czech Republic	Yes	No	Yes	Yes	No	Yes	No	No	Yes	No	Yes	No	No	No	Yes
	Estonia	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Hungary	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Latvia	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
	Lithuania	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	Poland	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Slovak Republic	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	No	No	No	Yes
	Slovenia	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
South	Cyprus	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Greece	Yes	Yes	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No	Yes
	Italy	Yes	No	Yes	No	No	Yes	No	No	Yes	No	Yes	No	Yes	No	No
	Malta	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Portugal	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	Spain	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No
Codes: /: No information																

Note: Not all countries have guidelines for VOC data for rail.

Table IV.5 Examples of vehicle operating costs for passenger car

Region	Country	Currency	Factor/ Market	Price Base	Value	Unit	Value applies to
North / West	Austria	Euro	Factor	1995	8,852	€/100vkm	Cars (invariant with speed and distance)
	Belgium	BEF	Factor	1981	5.4	BEF/vkm	Cars (wear, maintenance and oil only)
		BEF	Factor	1999	3.35	BEF/l	Fuel (Petrol only)
	Denmark	DKK	Market	2001	1,83	DKK/km	Car
	Finland	Euro	Factor	2000	0,09	€/vkm	Car
	France	FF	Market	1994	0.43	FF/vkm	Light vehicle - ordinary maintenance, pneumatics and lubricants
		FF	Market	1994	0.14	FF/vkm	Light vehicle - vehicle depreciation
	Germany	Euro	Factor	1998	10.04	€/100 km)	Operating basic costs (urban, car, gasoline)
		Euro	Factor	1998	27.92	€/hour	Personel costs (passenger car)
	Ireland	Euro	Market	2002	0,07	€/vkm	non fuel operating costs (assuming 50mph speed and average car)
	Luxembourg	---	---	---	---	---	---
	Netherlands	---	---	---	---	---	---
	Sweden	---	---	---	---	---	Standard model used
	Switzerland	CHF	Market	2000	0.18	CHF/vkm	Car vehicle operating costs
		CHF	Market	2000	0.5	CHF/l	Fuel (road traffic)
	UK	GBP	Market	2002	0.04	£/km	Non fuel operating costs (assuming 50mph speed and average car)
		GBP	Market	2002	0.05	£/km	Fuel costs (assuming 50mph speed and average car)
East	Czech Republic	CZK	---	---	---	---	HDM4 model used
	Estonia	EEK	Market	2002	3,04	EEK/vkm	Typical road user costs (car) - Roughness IRI 2
	Hungary	HUF	Factor	2002	20.7	HUF/vkm	Road/light vehicle - fixed costs only
		HUF	Factor	2002	7.0	HUF/vkm	Road/light vehicle - variable costs
	Latvia	LVL	Market	2002	0,15	LVL/km	Car
	Lithuania	---	---	---	---	---	HDM4 model used
	Poland	---	---	---	---	---	---
	Slovak Republic	SK	Market	2003	0.16	sk/km	Value for car tyres
		SK	Market	2003	0.98	sk/km	Value for car repair and maintenance
		SK	Market	2003	35	sk/l	Value for fuel
	Slovenia	---	---	---	---	---	---
South	Cyprus	---	---	---	---	---	Model is based on vehicle type, speed and fuel consumption
	Greece	---	---	---	---	---	---
	Italy	Euro	Market	2002	0,22	€/vkm	1501-2000cc car - typical value used only
	Malta	---	---	---	---	---	---
	Portugal	ECU	Market	1996	0,18	Ecu/vkm	National roads private car
	Spain	ESP	Market	1988	2,7	ptas/vkm	Depreciation value only. VOC calculated using a standard model

Table VI.6 Basis of the freight user benefits

Regin	Country	Transport Costs		Cost of goods whilst in transit	Other costs (damage, uncertainty and other "quality" factors		Comments
		Vehicle Operating Costs including					
		(Distance related - per km)	(Time related - per hr)	(Time related - per hr)	(Time related - per hr)	Distance related - per km	
North/West	Austria	Yes	Yes	---	---	---	
	Belgium	Yes	Yes	---	---	---	No guidelines - typical appraoch only
	Denmark	Yes	Yes	---	---	---	
	Finland	Yes	Yes	---	---	---	
	France	Yes	Yes	Yes			A single value additional to transport costs is given to represent the benefits to the forwarder
	Germany	Yes	Yes	---	---	---	
	Ireland	Yes	Yes	---	---	---	
	Luxembourg	---	---	---	---	---	No Guidelines
	Netherlands	Yes					A single vale for time savings for goods traffic is used.
	Sweden	Yes	Yes	Yes	Yes	Yes	
	Switzerland	Yes	Yes	---	---	---	
	UK	Yes	Yes	---	---	---	
East	Czech Republic	Yes	Yes	Yes (rail only)			
	Estonia	---	---	---	---	---	
	Hungary	Yes	Yes	---	---	---	
	Latvia	Yes	Yes	---	---	---	
	Lithuania	Yes	Yes	---	---	---	
	Poland	---	---	---	---	---	No Guidelines
	Slovak Republic	Yes	Yes			---	
	Slovenia	Yes	Yes	---	---	---	
South	Cyprus	---	---	---	---	---	No Guidelines
	Greece	Yes	Yes	---	---	---	
	Italy	Yes	Yes	---	---	---	No Guidelines - typical approach only
	Malta	Yes	Yes	---	---	---	
	Portugal	Yes	Yes	---	---	---	No Guidelines - typical approach only
	Spain	Yes	Yes	---	---	---	

Table VI.7 User charges and revenues

Region	Country	Definition of user charges and revenues consistent with EUNET?	Are User Charges and Revenues included in the appraisal?
North/ West	Austria	Yes	Yes
	Belgium	n.d.	Yes
	Denmark	n.d.	Yes
	Finland	Yes	Yes
	France	Yes	Yes
	Germany	n.d.	No
	Ireland	Yes	Yes
	Luxembourg	/	/
	Netherlands	n.d.	Yes
	Sweden	Yes	Yes
	Switzerland	Yes	/
	UK	Yes	Yes
East	Czech Republic	Yes	Yes
	Estonia	n.d.	/
	Hungary	Yes	Yes
	Latvia	n.d.	Yes
	Lithuania	Yes	Yes
	Poland	Yes	/
	Slovak Republic	Yes	Yes
	Slovenia	Yes	Yes
South	Cyprus	n.d.	/
	Greece	Yes	Yes
	Italy	n.d.	Yes
	Malta	n.d.	/
	Portugal	Yes	No
	Spain	Yes	Yes

Codes:
/: No information
n.d.: Not defined

Annex VII: Safety

Table VII.1 Type of costs included in monetised accident costs

Region	Country	Type of costs included in monetised accident costs			
		Material damage	Personal loss for casualties	Costs to society	Hazards related to transport of dangerous goods
North/West	Austria	Yes	Yes	Yes	No
	Belgium	-	-	-	-
	Denmark	Yes	Yes	Yes	No
	Finland	Yes	Yes	Yes	No
	France	Yes	Yes	Yes	No
	Germany	Yes	Yes	Yes	No
	Ireland	Yes	Yes	Yes	No
	Netherlands	Yes	Yes	Yes	No
	Sweden	Yes	Yes	Yes	No
	Switzerland	Yes	Yes	Yes	No
	UK	Yes	Yes	Yes	No
East	Czech Republic	Yes	Yes	Yes	No
	Estonia	Yes	Yes	Yes	No
	Hungary	Yes	No	Yes	No
	Latvia	Yes	Yes	No	No
	Lithuania	Yes	Yes	Yes	No
	Poland	Yes	Yes	Yes	No
	Slovak Republic *	Yes	Yes	Yes	No
	Slovenia	Yes	Yes	No	No
South	Cyprus	Yes	Yes	Yes	No
	Greece	Yes	Yes	Yes	No
	Italy	No	Yes	Yes	No
	Malta	/	/	/	/
	Portugal	No	Yes	Yes	No
	Spain	Yes	Yes	No	No

Codes:
/: No information
-: Not relevant

* Correction made compared to country report

Table VII.2 Elements included in material damage (if included)

Region	Country	Elements included material damage		
		Costs of damage to vehicle	Cost of lost or damaged goods	Other
North/West	Austria	Yes	No	No
	Belgium	-	-	-
	Denmark	Yes	Yes	No
	Finland	Yes	No	No
	France	Yes	Yes	Yes
	Germany	Yes	No	No
	Ireland	No	Yes	No
	Netherlands	Yes	Yes	No
	Sweden	Yes	No	No
	Switzerland	Yes	Yes	Yes
	UK	Yes	No	No
East	Czech Republic	No	No	Yes
	Estonia	Yes	Yes	No
	Hungary	Yes	No	No
	Latvia	Yes	No	Yes
	Lithuania	Yes	Yes	Yes
	Poland	Yes	No	No
	Slovak Republic	Yes	Yes	No
	Slovenia	Yes	No	Yes
South	Cyprus	/	/	/
	Greece	/	/	/
	Italy	-	-	-
	Malta	/	/	/
	Portugal	-	-	-
	Spain	Yes	Yes	No

Codes:
/: No information
-: Not relevant

Table VII.3 Estimation of personal loss for casualties (if included)

Region	Country	How is "personal loss for casualties" estimated? Stated preference/contingent valuation	Gross production loss	Other
North/West	Austria	No	No	Yes
	Belgium	-	-	-
	Denmark	No	Yes [b)]	Yes
	Finland	Yes	No	No
	France	Yes	Yes	No
	Germany	No	Yes [b)]	No
	Ireland	Yes	No	No
	Netherlands	Yes [a)]	No	No
	Sweden	Yes	No	No
	Switzerland	Yes	No	No
	UK	Yes [a)]	No	No
East	Czech Republic	No	No	Yes
	Estonia	Yes [a)]	Yes [b)]	No
	Hungary	-	-	-
	Latvia	No	No	Yes
	Lithuania	No	Yes [b)]	No
	Poland	No	Yes	Yes
	Slovak Republic	No	Yes	No
	Slovenia	No	Yes [b)]	No
South	Cyprus	/	/	/
	Greece	/	/	/
	Italy	Yes [a)]	No	No
	Malta	/	/	/
	Portugal	No	No	Yes
	Spain	No	No	Yes

Codes:
/: No information
-: Not relevant

a) Added component; relatives and friends

b) Including "lost leisure time"

Table VII.4 Elements included in costs to society (if included)

Region	Country	Elements included in "Costs to society"				
		Medical treatment	Legal and court costs and admin.	Emergency services	Net production loss	Other
North/West	Austria	Yes	Yes	Yes	Yes	No
	Belgium	-	-	-	-	-
	Denmark	Yes	No	Yes	Yes [a)]	No
	Finland	Yes	Yes	Yes	Yes	No
	France	Yes	Yes	Yes	Yes	No
	Germany	Yes	Yes	Yes	Yes [a)]	No
	Ireland	No	Yes	Yes	No	No
	Netherlands	Yes	Yes	Yes	Yes	No
	Sweden	Yes	Yes	Yes	Yes	No
	Switzerland	Yes	Yes	Yes	Yes	Yes
	UK *	Yes	Yes	Yes	Yes	No
East	Czech Republic	No	No	No	No	Yes
	Estonia	Yes	No	Yes	No	No
	Hungary	Yes	Yes	Yes	Yes	No
	Latvia	-	-	-	-	-
	Lithuania	Yes	Yes	Yes	Yes	No
	Poland	Yes	No	Yes	Yes [a)]	No
	Slovak Republic	Yes	Yes	Yes	Yes [a)]	No
	Slovenia	-	-	-	-	-
South	Cyprus	Yes	No	Yes	No	No
	Greece	Yes	No	Yes	Yes	Yes
	Italy	Yes	Yes	Yes	No	Yes
	Malta	/	/	/	/	/
	Portugal	No	No	No	Yes	No
	Spain	-	-	-	-	-

Codes:
/: No information
-: Not relevant

a) Included in "gross production loss"

* Correction made compared to country report

Table VII.5 Distinction between types of casualties

Region	Country	How is the distinction between different types of casualties?
North/West	Austria	2
	Belgium	-
	Denmark	1
	Finland	2,3
	France	1
	Germany	1
	Ireland	1
	Netherlands	5
	Sweden [a)]	1
	Switzerland	4
	UK	1
East	Czech Republic	3
	Estonia	1,3
	Hungary	1
	Latvia	3
	Lithuania	1,2,3
	Poland	1
	Slovak Republic	1
	Slovenia	1
South	Cyprus	1
	Greece	1
	Italy	3
	Malta	1
	Portugal	1
	Spain	3

Codes:
1: Fatality, serious injury, slight injury - consitent with EUNET definition
2: Fatality, serious injury, slight injury - deviation from EUNET definition
3: Fatalities, injuries
4: Other
5: No information

a) Sweden has a slightly difference definition of severe injuries. The Swedish definition of severe injuries includes all persons hospitalised even if the injuries are short term.

Table VII.6 Unit of measurement

Region	Country	What is the unit of measurement?
North/West	Austria	1,2
	Belgium	-
	Denmark [a)]	1,2,3
	Finland	2
	France	5
	Germany	1
	Ireland	1
	Netherlands	5
	Sweden [a)]	2,3
	Switzerland [a)]	1,2,3
	UK	2
East	Czech Republic	1,2,3
	Estonia	1,2,3
	Hungary	2,3
	Latvia	1
	Lithuania	1,2,3
	Poland	1,2,3
	Slovak Republic	1,2,3
	Slovenia	1,2,3
South	Cyprus	2
	Greece	2
	Italy	2
	Malta	1,2,3
	Portugal	1,2,3
	Spain	1,2,3

Codes:
1: Number of accidents (reported)
2: Number of accidents with person injuries (reported)
3: Number of casualties
4: Other
5: No information

a) Corrected for non-reported accidents (Correction made compared to country report for Sweden due to comments)

Table VII.7 Change in values over time

Region	Country	Do values change over time?	If "yes"; what is the basis for the rate og change		
			Relationship with GDP	Time series analysis	Other
North/West	Austria	No	-	-	-
	Belgium	-	-	-	-
	Denmark	No	-	-	-
	Finland	No	-	-	-
	France	Yes	No	No	Yes
	Germany	No	-	-	-
	Ireland *	Yes	Yes	No	No
	Netherlands	/	/	/	/
	Sweden	No	-	-	-
	Switzerland	Yes	No	No	Yes
	UK	Yes	Yes	No	No
East	Czech Republic	No	-	-	-
	Estonia *	Yes	Yes	No	No
	Hungary *	Yes	No	No	Yes
	Latvia	No	-	-	-
	Lithuania	Yes	No	Yes	No
	Poland	Yes	Yes	No	No
	Slovak Republic	Yes	Yes	No	No
	Slovenia	Yes	No	Yes	No
South	Cyprus	Yes	Yes	No	No
	Greece *	/	/	/	/
	Italy	No	-	-	-
	Malta	/	/	/	/
	Portugal	No	-	-	-
	Spain *	No	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report; Estonia: "No" for time series due to comments; Greece: "/" due to comments; Hungary: "Yes" as yes to "Other"; Ireland: "Yes" to "Relationship.." as linked to GNP per capita; Spain: see comments.

Table VII.8 Estimation of effects

Region	Country	How is the change in risk of accidents etc. estimated?	If "1"; depending on: Infrastructure type	Speed	Traffic volume	Traffic type/composition	If "2"; but: Actual accident risk before project	A function of antual and general risk
North/West	Austria	1	Yes	No	No	No	-	-
	Belgium	/	/	/	/	/	/	/
	Denmark	1	Yes	Yes	Yes	No	-	-
	Finland	1	/	/	/	/	-	-
	France *	1	Yes	No	Yes	No	-	-
	Germany	1	Yes	Yes	No	Yes	-	-
	Ireland	1,3	/	/	/	/	-	-
	Netherlands	/	/	/	/	/	/	/
	Sweden	1,2	Yes	Yes	No	Yes	No	Yes
	Switzerland	1	Yes	No	No	No	-	-
	UK	3	-	-	-	-	-	-
East	Czech Republic	1	Yes	Yes	Yes	Yes	-	-
	Estonia	1,2	Yes	Yes	Yes	No	Yes	Yes
	Hungary *	/	/	/	/	/	/	/
	Latvia	1	Yes	No	Yes	No	-	-
	Lithuania	1,2	Yes	Yes	Yes	No	Yes	No
	Poland	1	Yes	Yes	No	No	-	-
	Slovak Republic *	1	Yes	Yes	Yes	Yes	-	-
	Slovenia	1	Yes	Yes	Yes	No	-	-
South	Cyprus	1	Yes	Yes	Yes	Yes	-	-
	Greece	1	Yes	Yes	Yes	Yes	-	-
	Italy *	1	No	No	Yes	No	-	-
	Malta	1	Yes	Yes	Yes	Yes	-	-
	Portugal *	1	Yes	No	No	No	-	-
	Spain	1	Yes	No	No	No	-	-

Codes:
1: General guidelines on accident risk both before and after project
2: General general guidelines on risk after project, but…
3: Other
/: No information
-: Not relevant

/: No information
-: Not relevant

* Correction compared to country report.

Annex VIII: Noise

Table VIII.1 Elements included in valuation

Region	Country	Noise annoyance	Health related costs	Other
North/West	Austria	Yes	No	No
	Belgium	-	-	-
	Denmark	Yes	Yes	No
	Finland	Yes	No	No
	France	Yes	Yes	No
	Germany	Yes	No	Yes
	Ireland *	-	-	-
	Netherlands	/	/	/
	Sweden	Yes	No	No
	Switzerland	Yes	Yes	No
	UK *	-	-	-
East	Czech Republic	/	/	/
	Estonia	-	-	-
	Hungary	Yes	No	No
	Latvia *	-	-	-
	Lithuania	Yes	Yes	Yes
	Poland	Yes	Yes	No
	Slovak Republic *	-	-	-
	Slovenia	Yes	No	No
South	Cyprus *	-	-	-
	Greece *	-	-	-
	Italy	-	-	-
	Malta	-	-	-
	Portugal	-	-	-
	Spain *	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report as noise not included with a money value. Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Table VIII.2 Noise annoyance - experienced in?

Region	Country	Dwellings	Other locations
North/West	Austria	Yes	No
	Belgium	-	-
	Denmark	Yes	No
	Finland	Yes	No
	France	Yes	Yes
	Germany	Yes	Yes
	Ireland	-	-
	Netherlands	/	/
	Sweden	Yes	Yes
	Switzerland	Yes	Yes
	UK *	-	-
East	Czech Republic	/	/
	Estonia	-	-
	Hungary	Yes	No
	Latvia	-	-
	Lithuania	Yes	Yes
	Poland	Yes	No
	Slovak Republic *	-	-
	Slovenia	Yes	Yes
South	Cyprus *	-	-
	Greece	-	-
	Italy	-	-
	Malta	-	-
	Portugal	-	-
	Spain	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report as noise not included with a money value. Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Table VIII.3 Basis for estimating health related costs

Region	Country	Dose-response based on exposure	Other
North/West	Austria	-	-
	Belgium	-	-
	Denmark	No	Yes
	Finland	-	-
	France	No	Yes
	Germany	-	-
	Ireland	-	-
	Netherlands	/	/
	Sweden	-	-
	Switzerland	Yes	No
	UK	-	-
East	Czech Republic	/	/
	Estonia	-	-
	Hungary	-	-
	Latvia	-	-
	Lithuania	Yes	No
	Poland	No	Yes
	Slovak Republic	-	-
	Slovenia	-	-
South	Cyprus	-	-
	Greece	-	-
	Italy	-	-
	Malta	-	-
	Portugal	-	-
	Spain	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report: as noise not included with a money value.

Table VIII.4 Estimation of annoyance

Region	Country	Stated preference/contingent valuation	Hedonic pricing	Other
North/West	Austria	Yes	Yes	No
	Belgium	-	-	-
	Denmark	No	Yes	No
	Finland	/	/	/
	France	No	Yes	No
	Germany	Yes	No	No
	Ireland	-	-	-
	Netherlands	/	/	/
	Sweden *	No	Yes	No
	Switzerland	No	Yes	No
	UK *	-	-	-
East	Czech Republic	/	/	/
	Estonia	-	-	-
	Hungary	No	Yes	No
	Latvia	-	-	-
	Lithuania	No	Yes	No
	Poland	/	/	/
	Slovak Republic	-	-	-
	Slovenia *	/	/	Yes
South	Cyprus	-	-	-
	Greece	-	-	-
	Italy	-	-	-
	Malta	-	-	-
	Portugal	-	-	-
	Spain	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report; Sweden: "No" to other, as adjusted hedonic price method; Slovenia; "Yes" to "Other". Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Table VIII.5 Estimation of health related costs

Region	Country	Stated preference/contingent valuation	Hedonic pricing	Other
North/West	Austria	-	-	-
	Belgium	-	-	-
	Denmark	No	No	Yes
	Finland	-	-	-
	France	No	Yes	No
	Germany	-	-	-
	Ireland	-	-	-
	Netherlands	/	/	/
	Sweden	-	-	-
	Switzerland	Yes	No	Yes
	UK	-	-	-
East	Czech Republic	/	/	/
	Estonia	-	-	-
	Hungary	-	-	
	Latvia	-	-	-
	Lithuania	No	Yes	No
	Poland	No	No	Yes
	Slovak Republic	-	-	-
	Slovenia	-	-	-
South	Cyprus	-	-	-
	Greece	-	-	-
	Italy	-	-	-
	Malta	-	-	-
	Portugal	-	-	-
	Spain	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report as noise not included with a money value.

Table VIII.6 Do values change over time?

Region	Country	Do values change over time?	If "Yes"; what is the basis for the rate of change		
			Relationship with GDP	Time series analysis	Other
North/West	Austria	No	-	-	-
	Belgium	/	-	-	-
	Denmark	No	-	-	-
	Finland	No	-	-	-
	France	Yes	Yes	No	No
	Germany	No	-	-	-
	Ireland	-	-	-	-
	Netherlands	/	/	/	/
	Sweden	No	-	-	-
	Switzerland	No	-	-	-
	UK *	-	-	-	-
East	Czech Republic	/	/	/	/
	Estonia	-	-	-	-
	Hungary	No	-	-	-
	Latvia	-	-	-	-
	Lithuania *	No	-	-	-
	Poland	No	-	-	-
	Slovak Republic	-	-	-	-
	Slovenia	/	/	/	/
South	Cyprus	-	-	-	-
	Greece	-	-	-	-
	Italy	-	-	-	-
	Malta	-	-	-	-
	Portugal	-	-	-	-
	Spain	-	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report for Slovenia. Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Annex IX: Air pollution - Local/Regional

Table IX.1 Elements included in monetary valuation

Region	Country	PM	Nox	SO2	HC	CO	Pb	Other
North/West	Austria	Yes	Yes	Yes	Yes	Yes	No	No
	Belgium	-	-	-	-	-	-	-
	Denmark	Yes	Yes	Yes	Yes	Yes	No	No
	Finland *	Yes	Yes	Yes	Yes	Yes	No	No
	France	Yes	No	No	No	No	No	No
	Germany	Yes	Yes	Yes	Yes	Yes	No	Yes
	Ireland	-	-	-	-	-	-	-
	Netherlands	/	/	/	/	/	/	/
	Sweden *	Yes	Yes	Yes	Yes	No	No	No
	Switzerland	Yes	Yes	No	No	No	No	No
	UK *	-	-	-	-	-	-	-
East	Czech Republic	/	/	/	/	/	/	/
	Estonia	-	-	-	-	-	-	-
	Hungary	Yes	Yes	Yes	Yes	Yes	No	Yes
	Latvia	-	-	-	-	-	-	-
	Lithuania *	Yes	Yes	Yes	Yes	Yes	Yes	No
	Poland	-	-	-	-	-	-	-
	Slovak Republic	-	-	-	-	-	-	-
	Slovenia	-	-	-	-	-	-	-
South	Cyprus	/	/	/	/	/	/	/
	Greece *	Yes	Yes	Yes	Yes	Yes	Yes	No
	Italy *	Yes	Yes	Yes	Yes	Yes	No	No
	Malta	-	-	-	-	-	-	-
	Portugal	-	-	-	-	-	-	-
	Spain	-	-	-	-	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report; Finland: No for *other*, as soiling not emission, but effect; Sweden: No for *other*, as VOC equivalent to *HC* (yes for *HC*); Lithuania: No for *other* as "tyres" not *air pollution*; Greece: No for *other*, as ozone part of *climate change* and VOCs equivalent to *HC* (yes for *HC*); Italy: No for *other*, as VOC equivalent to *HC* (yes for *HC*). Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Table IX.2 Which PM

Region	Country	Which PM?
North/West	Austria	PM
	Belgium	-
	Denmark	PM10
	Finland	PM2.5
	France	PM10
	Germany	PM
	Ireland	-
	Netherlands	/
	Sweden	PM
	Switzerland	PM10
	UK *	-
East	Czech Republic	/
	Estonia	-
	Hungary	PM, Other
	Latvia	-
	Lithuania	PM10
	Poland	-
	Slovak Republic	-
	Slovenia	-
South	Cyprus	/
	Greece	PM
	Italy	PM10
	Malta	-
	Portugal	-
	Spain	-

** Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.*

Table IX.3 Monetisation method

Region	Country	Impact pathway approach	Other damage cost approach	Avoidance costs	Other
North/West	Austria	No	No	No	Yes
	Belgium	-	-	-	-
	Denmark	No	No	Yes	No
	Finland	Yes	No	No	No
	France	No	Yes	No	No
	Germany	No	Yes	No	No
	Ireland	-	-	-	-
	Netherlands	Yes	Yes	Yes	No
	Sweden	Yes	Yes	Yes	No
	Switzerland	Yes	No	No	No
	UK *	-	-	-	-
East	Czech Republic	Yes	No	No	No
	Estonia	-	-	-	-
	Hungary	Yes	No	No	No
	Latvia	-	-	-	-
	Lithuania	Yes	Yes	Yes	No
	Poland	-	-	-	-
	Slovak Republic	-	-	-	-
	Slovenia	-	-	-	-
South	Cyprus	/	/	/	/
	Greece	Yes	No	No	No
	Italy	Yes	No	No	No
	Malta	-	-	-	-
	Portugal	-	-	-	-
	Spain	-	-	-	-
Codes: /: No information -: Not relevant					

* Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Table IX.4 If avoidance costs; What types of avoidance costs

Region	**Country**	**If "Avoidance costs";** Costs for avoiding emission	Costs of avoiding damage
North/West	Austria	-	-
	Belgium	-	-
	Denmark	Yes	No
	Finland	-	-
	France	-	-
	Germany	-	-
	Ireland	-	-
	Netherlands	/	/
	Sweden	/	/
	Switzerland	-	-
	UK	-	-
East	Czech Republic	/	/
	Estonia	-	-
	Hungary	-	-
	Latvia	-	-
	Lithuania	Yes	No
	Poland	-	-
	Slovak Republic	-	-
	Slovenia	-	-
South	Cyprus	/	/
	Greece	-	-
	Italy	-	-
	Malta	-	-
	Portugal	-	-
	Spain	-	-

Codes:
/: No information
-: Not relevant

Table IX.5 What elements are included?

Region	Country	Human health - production loss from sickness and increased mortality	Human health - Willingness-to-pay to avoid sickness and reduce risks of death	Agricultural and forestry production loss	Blackening and corrosion of buildings	Other
North/West	Austria *	/	/	/	/	/
	Belgium	-	-	-	-	-
	Denmark	/	/	/	/	/
	Finland	Yes	No	Yes	Yes	No
	France	Yes	Yes	No	No	No
	Germany	Yes	No	Yes	Yes	Yes
	Ireland	-	-	-	-	-
	Netherlands	/	/	/	/	/
	Sweden	/	/	/	/	/
	Switzerland	Yes	Yes	Yes	Yes	No
	UK *	-	-	-	-	-
East	Czech Republic	/	/	/	/	/
	Estonia	-	-	-	-	-
	Hungary	Yes	No	No	No	No
	Latvia	-	-	-	-	-
	Lithuania	Yes	Yes	No	Yes	No
	Poland	-	-	-	-	-
	Slovak Republic	-	-	-	-	-
	Slovenia	-	-	-	-	-
South	Cyprus	/	/	/	/	/
	Greece	Yes	Yes	Yes	Yes	No
	Italy	Yes	No	Yes	Yes	No
	Malta	-	-	-	-	-
	Portugal	-	-	-	-	-
	Spain	-	-	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report; "/" for Other for Austria.

Table IX.6 Do values change over time?

Region	Country	Do values change over time?	If "Yes"; what is the basis for the rate of change		
			Relationship with GDP	Time series analysis	Other
North/West	Austria	No	-	-	-
	Belgium	-	-	-	-
	Denmark	No	-	-	-
	Finland	No	-	-	-
	France	Yes	No	No	Yes
	Germany	No	-	-	-
	Ireland	-	-	-	-
	Netherlands	/	/	/	/
	Sweden	No	-	-	-
	Switzerland	Yes	No	No	Yes
	UK *	-	-	-	-
East	Czech Republic	/	/	/	/
	Estonia	-	-	-	-
	Hungary	No	-	-	-
	Latvia	-	-	-	-
	Lithuania	Yes	No	Yes	Yes
	Poland	-	-	-	-
	Slovak Republic	-	-	-	-
	Slovenia	-	-	-	-
South	Cyprus	/	/	/	/
	Greece	No	-	-	-
	Italy	No	-	-	-
	Malta	-	-	-	-
	Portugal	-	-	-	-
	Spain	-	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Annex X: Climate Change

Table X.1 Elements included

Region	Country	CO2	O3	CH4	Other
North/West	Austria	Yes	No	No	No
	Belgium	/	/	/	/
	Denmark	Yes	No	No	No
	Finland	Yes	Yes	No	No
	France	/	/	/	/
	Germany	Yes	No	No	No
	Ireland	-	-	-	-
	Netherlands	/	/	/	/
	Sweden	Yes	No	No	No
	Switzerland	Yes	No	No	No
	UK *	-	-	-	-
East	Czech Republic	Yes	Yes	Yes	No
	Estonia	-	-	-	-
	Hungary	-	-	-	-
	Latvia	-	-	-	-
	Lithuania	-	-	-	-
	Poland	-	-	-	-
	Slovak Republic	-	-	-	-
	Slovenia	-	-	-	-
South	Cyprus	-	-	-	-
	Greece	-	-	-	-
	Italy	Yes	Yes	Yes	No
	Malta	-	-	-	-
	Portugal	-	-	-	-
	Spain	-	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Table X.2 Monetisation method

Region	Country	Avoidance costs	Damage costs	Other
North/West	Austria	Yes	No	Yes
	Belgium	/	/	/
	Denmark	No	No	Yes
	Finland	No	Yes	No
	France	/	/	/
	Germany	Yes	No	No
	Ireland	-	-	-
	Netherlands	Yes	Yes	No
	Sweden *	Yes	No	No
	Switzerland	Yes	No	No
	UK *	-	-	-
East	Czech Republic	/	/	/
	Estonia	-	-	-
	Hungary	-	-	-
	Latvia	-	-	-
	Lithuania	-	-	-
	Poland	-	-	-
	Slovak Republic	-	-	-
	Slovenia	-	-	-
South	Cyprus	-	-	-
	Greece	-	-	-
	Italy	No	Yes	No
	Malta	-	-	-
	Portugal	-	-	-
	Spain	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report

Table X.3 If avoidance costs; What type of avoidance costs?

Region	**Country**	**If "Avoidance costs";** Costs for avoiding emission	Costs of avoiding damage
North/West	Austria	Yes	No
	Belgium	/	/
	Denmark	-	-
	Finland	-	-
	France	/	/
	Germany	Yes	No
	Ireland	-	-
	Netherlands	/	/
	Sweden	Yes	No
	Switzerland	Yes	No
	UK	-	-
East	Czech Republic	/	/
	Estonia	-	-
	Hungary	-	-
	Latvia	-	-
	Lithuania	-	-
	Poland	-	-
	Slovak Republic	-	-
	Slovenia	-	-
South	Cyprus	-	-
	Greece	-	-
	Italy	-	-
	Malta	-	-
	Portugal	-	-
	Spain	-	-

Codes:
/: No information
-: Not relevant

Table X.4 Valuation - Climate Change - Value per ton CO_2

Region	Country	Value	Unit	Year
North/West	Austria	94.47	Euro/ton	1998
	Belgium	/	/	/
	Denmark	0.3	DKK/kg	2001
	Finland	32	Euro/ton	2000
	France	100	Euro/ton	/
	Germany	205	Euro/ton	1998
	Ireland	-	-	-
	Netherlands			
	Sweden	1.5	SEK/kg	2001
	Switzerland	0.12-0.17	CHF/kg	2000
	UK	-	-	
East	Czech Republic	/	/	/
	Estonia	-	-	-
	Hungary	-	-	-
	Latvia	-	-	-
	Lithuania	-	-	-
	Poland	-	-	-
	Slovak Republic	-	-	-
	Slovenia	-	-	-
South	Cyprus	-	-	-
	Greece	-	-	-
	Italy			
	Malta	-	-	-
	Portugal	-	-	-
	Spain	-	-	-

Codes:
/: No information
-: Not relevant

Table X.5 Change over time

Region	Country	Do values change over time?	If "Yes"; what is the basis for the rate of change		
			Relationship with GDP	Time series analysis	Other
North/West	Austria	No	-	-	-
	Belgium	/	/	/	/
	Denmark	No	-	-	-
	Finland	No	-	-	-
	France *	Yes	No	No	Yes
	Germany	No	-	-	-
	Ireland	-	-	-	-
	Netherlands	/	/	/	/
	Sweden	No	-	-	-
	Switzerland	No	-	-	-
	UK *	-	-	-	-
East	Czech Republic	/	/	/	/
	Estonia	-	-	-	-
	Hungary	-	-	-	-
	Latvia	-	-	-	-
	Lithuania	-	-	-	-
	Poland	-	-	-	-
	Slovak Republic	-	-	-	-
	Slovenia	-	-	-	-
South	Cyprus	-	-	-	-
	Greece	-	-	-	-
	Italy	No	-	-	-
	Malta	-	-	-	-
	Portugal	-	-	-	-
	Spain	-	-	-	-

Codes:
/: No information
-: Not relevant

* Correction made compared to country report. Correction made compared to country report for UK, as values given in country report are for typical values. None of the environmental effects (Noise, local/regional air pollution, climate change) are currently included as monetary values in the national guidelines for the UK.

Annex XI: Other environmental impacts

Table XI.1 Other environmental impacts

Region	Country	Vibration	Severance	Visual intrusion	Loss of important sites	Ressource consumption	Landscape	Groud/water pollution	Other
North/West	Austria	2,3	2,3	2,3	2,3	2,3	2,3	2,3	5
	Belgium	5	5	5	5	5	5	5	5
	Denmark	4	4	4	4	4	4	4	1
	Finland	4	4	4	4	4	4	4	5
	France	5	4	4	4	1	4	4	1,4
	Germany	4	1	4	4	4	1,4	1	1
	Ireland	5	5	5	4	4	4	4	5
	Netherlands	1,3	1,3	1,3	1,3	1,3	1,3	1,3	5
	Sweden	5	5	5	5	5	5	5	5
	Switzerland	5	2	1	5	1	5	2	1
	UK	3,4	3,4	3,4	3,4	3,4	3,4	3,4	5
East	Czech Republic	5	5	3	3	5	3	5	5
	Estonia	4	4	4	4	4	4	4	5
	Hungary	4	4	4	4	4	4	4	5
	Latvia	5	5	4	5	4	4	4	5
	Lithuania	4	5	5	5	5	5	5	5
	Poland	4	4	4	4	4	4	4	4
	Slovak Republic *	4	4	4	4	4	4	4	4
	Slovenia	4	4	4	4	4	4	4	5
South	Cyprus	5	5	5	5	5	5	5	5
	Greece	5	4	5	5	5	5	5	5
	Italy	4	4	4	4	4	4	4	5
	Malta	5	5	5	5	5	5	5	5
	Portugal	4	4	4	4	4	4	4	5
	Spain	4	2,4	2,4	4	4	2,4	4	2

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant

* Correction made compared to country report

Annex XII: Indirect socio-economic effects

Figure XII.1 Coverage - Indirect socio-economic effects

Country group	Country	Land use	Economic development	Employment - short term (building phase)	Employment - medium/long term	Cohesion objectives - National level	Cohesion objectives - EU level	Urbanisation	Network effects	Effects on state finances	Equity	Other:
North/West	Austria	-	-	-	-	-	-	-	-	-	-	-
	Belgium	-	-	-	-	-	-	-	-	-	-	-
	Denmark	3,4	3,4	3,4	3,4	3,4	3,4	4	3,4	1	5	3,4
	Finland	-	-	-	-	-	-	-	-	-	-	-
	France	1	5	1	1	5	5	5	5	5	5	3
	Germany	4	4	1	1	4	4	4	1	4	4	1
	Ireland	5	4	5	5	5	5	5	5	5	5	5
	Netherlands	1,3	1,3	1,3	1,3	1,3	5	1,3	1,3	3	1,3	5
	Sweden	5	5	5	5	5	5	5	5	1	5	5
	Switzerland	2	5	5	5	2,4	5	5	5	1	2,4	2
	UK	2	2	2	2	2	2	4	1	1	2	5
East	Czech Republic	2	2	2	2	2	5	2	2	2	2	5
	Estonia	-	-	-	-	-	-	-	-	-	-	-
	Hungary	4	2	5	4	2	2	5	2	4	2	2
	Latvia	4	4	4	4	4	4	4	4	4	5	5
	Lithuania	3	3	3	3	3	3	3	3	1	5	1
	Poland	3,4	1,3,4	3	3	3,4	3,4	5	3,4	1	5	3,4
	Slovak Republic	3	1	1	1	4	4	3	3	4	4	5
	Slovenia	-	-	-	-	-	-	-	-	-	-	-
South	Cyprus	-	-	-	-	-	-	-	-	-	-	-
	Greece	-	-	-	-	-	-	-	-	-	-	-
	Italy	4	3	3	3	4	4	4	4	4	4	5
	Malta	-	-	-	-	-	-	-	-	-	-	-
	Portugal *	-	-	-	-	-	-	-	-	-	-	-
	Spain	4	4	2,4	2,4	4	4	4	4	4	2,4	5

Codes:

1: Cost-benefit analysis (CBA)
2: Multi-criteria analysis (MCA)
3: Quantitative measurement (QM)
4: Qualitative assessment/Not covered (QA/NC)
5: No information/not relevant