

European Transport Conference 2015 – from Sept-28 to Sept-30, 2015

## Evolutions of the reference values used in transport CBA national guidelines of 3 countries and what they reveal

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### Abstract

The paper presents, analyses and compares the evolution of reference values used in national guidelines issued for cost-benefit analysis of transport infrastructure projects, over the last fifty years, in France, UK and Germany.

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Peer-review under responsibility of Association for European Transport

*Keywords:* cost-benefit analysis; reference values; guidelines; transport projects

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### 1. Introduction

Socio-economic analysis of public investment projects has been made for more than fifty years in the USA and some European countries, usually beginning with transport projects. These analyses use reference values to account for the main effects of the projects, and values for externalities have been introduced progressively. This paper presents the evolution of reference values used in national guidelines issued for cost-benefit analysis of transport infrastructure projects, in three countries: France, UK and Germany.

Looking back over the last fifty years, we analyze the evolution of the main unit values, considering their nature and also the dynamics of their unit amounts. The results shed light on the evolution of collective preferences and

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economic knowledge during the last decades, as revealed by transport CBA guidelines. Each country is treated within a specific section, followed by section 4 devoted to the comparisons. But how do these thematic observations actually translate in the end at the level of a transport project? Section 5 presents simulations indicating how the same project would have been assessed using former guidelines, revealing how the diversity of valuation rules has or not a noticeable impact in CBA results. More precisely, we test two benchmark road projects and complete these simulations with a more in-depth analysis of CO<sub>2</sub>, before coming to the conclusive section.

## 2. Evolution of unit values in France

Since the 1950s, economics engineers of the French Ministry in charge of Transportation tried to assess economic value of projects by comparing the benefits of an operation with its costs. This method was first an administration tool for analyzing projects or project options. Then it was gradually used to justify choices made by public authorities when projects are submitted to public inquiry.

The French 1982 transportation law systematized and standardized a practice that had been widespread for nearly 20 years. It required an economic and social appraisal prior to any major transportation infrastructure project.

National guidelines for socio-economic assessment of transport infrastructure projects have been issued every 5 to 10 years during the last fifty years. The first ones were devoted to road projects; they encompassed all transport modes as of 1995. Over the last 20 years or so, they have been founded on the work of national commissions set up by the Commissariat du Plan and its successors, now France Stratégie: reports Boiteux I (1994), Boiteux II (2001), Quinet (2013) and thematic reports on CO<sub>2</sub>, biodiversity, etc.

### 2.1. Appearance and progressive differentiation of unit values

Monetisation of externalities was progressive; their chronological order of appearance is: value of time, operational and fuel costs, comfort, safety, then environmental externalities (CO<sub>2</sub>, pollution, noise, upstream impacts). Table 1 shows the evolution of these criteria's monetisation (a X in this table indicates that the criterion becomes monetised in the corresponding guideline). It must be noted that all these externalities, except climate change, were already mentioned in the first guidelines 50 years ago, even though they could not be monetised at that time due to the state of the art's limits.

The comparison of values over such a long time span is difficult because the indicators and units used for measuring the criteria may have changed. Similarly, differentiations are introduced progressively, for instance depending on transport modes and on the type of areas the infrastructures are built in. As an example, for noise impacts, both the computation method and the measure unit were modified, and the number of differentiation cases has grown a lot. Therefore it has not been possible to analyse the evolution of noise values other than qualitatively.

Table 1: Summary of the main differentiations introduced by each guideline

Guidelines (year)	1962	1964	1986	1995	2004/05	2014
Value of time	X			mode	Urban: purpose ; IdF Interurban: mode x distance	Interurban : purpose
Safety	X		Heavy/light injuries			
Road comfort		X				
Public transport comfort						X
CO <sub>2</sub>				X		
Reliability						X
Air pollution				X	Diffuse/dense urban	Very dense / intermediate urban
Noise				X		Traffic level x local density
Upstream/downstream effects						X

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