
THE COBA 2021 USER MANUAL

PART 0

THE APPLICATION OF THE COBA MANUAL

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1. DETAILED CONTENTS OF THE COBA MANUAL

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2. INTRODUCTION

- 2.1 The Government's approach to the appraisal of all transport projects is set out in WebTAG (Web based Transport Assessment Guidance which is owned and maintained by the Department for Transport (DfT)).
- 2.2 Transport projects are appraised in terms of a number of potential impacts which are grouped under the three headings of Economy, Environment and Society. The COBA (COst Benefit Analysis) program is an economic assessment tool which can be used to assess the Transport Economic Efficiency, Accident and Greenhouse Gases impacts of proposed projects. In particular, COBA compares the costs of a proposed highway scheme with the benefits derived by road users (in terms of time, vehicle operating costs and accidents), and expresses the results in terms of a monetary valuation. The output contributes to the appraisal process in the following ways:
- 'Transport Economic Efficiency': Time and Vehicle Operating Cost (VOC) changes;
 - 'Accidents': Changes in Accident Costs and Casualties;
 - 'Greenhouse Gases': Changes in the amount of fuel used to assist in determining changes in carbon dioxide emissions.
- 2.3 This document is primarily a user manual for the cost-benefit analysis computer program COBA2021. However, it also includes details of basic economic concepts used in the appraisal of highway schemes and provides a useful reference document. The manual is written primarily for use by the Overseeing Organisations' officials and their suppliers engaged in the economic assessment of trunk roads improvement schemes. Administration procedures described therefore refer to those of the Overseeing Organisations.

The Purpose and Role of Cost-Benefit Analysis

- 2.4 The Green Book [HMT, 2018] sets out best practice guidance on assessing and evaluating policies programmes and projects and recommends that options should be appraised using cost-benefit analysis (CBA). The Green Book defines CBA as 'analysis which quantifies in monetary terms as many of the costs and benefits of a proposal as feasible, including items for which the market does not provide a satisfactory measure of economic value.'
- 2.5 CBA therefore entails presenting as many of the impacts of a scheme or option as possible in monetary terms, so that they can be compared in a common unit of measurement. Some valuations can be made using prices paid in markets and predictions of future prices, e.g. fuel prices. The valuation of some other impacts, for which markets do not provide prices, is derived from research, e.g. stated preference studies to derive values of time that are used to convert time saved into a monetary value.
- 2.6 It is currently infeasible or impractical to derive monetary values for some impacts. While these impacts will not form part of a monetised CBA, the Green Book recognises their importance and recommends that supplementary techniques should be used to weigh up non-monetised impacts – it does NOT recommend that consideration should be restricted to those impacts that can be valued in monetary terms (such as those assessed by COBA). The Green Book notes that the most common technique used where there are unvalued costs and benefits is weighting and scoring, or multi-criteria analysis. An example of scoring is the Highways England's Scheme Appraisal Report which scores both monetised and unmonetised impacts for small highway improvement schemes to provide an overall score which is used to compare the merits of schemes with different mixes of monetised and unmonetised impacts.

Application of COBA

- 2.7 COBA is used in the appraisal of Trunk Road schemes in England, Wales and Northern Ireland. In Scotland the equivalent program NESA is used instead of COBA. In addition, COBA is used by many Local Authorities to appraise a wide range of highway schemes. It is maintained by the Highways England.
- 2.8 COBA is only applicable to the assessment of the transport economic efficiency impacts of a scheme where the Overseeing Organisation has agreed that a ‘fixed trip matrix’ approach may be used. This type of assessment is one in which the volume and pattern of trips in the trip matrix is assumed to be unaffected by changes in the costs of using the road network, whether as a result of changes in the demand for travel over time, or as a result of the scheme itself. In England, a fixed matrix assessment is only likely to be acceptable in relation to small schemes costing under £5m (WebTAG unit M2). The alternative will be a variable trip matrix assessment and this will require use of the DfT’s TUBA software to assess the transport economic efficiency impacts.
- 2.9 It should be noted that COBA can still be used to assess the accident impacts of a scheme even where a variable trip matrix assessment is being used. However, it is expected by Overseeing Organisations that the DfT’s COBALT software [DfT, 2013] would normally be used, though both programs should provide the same or very similar results.
- 2.10 COBA requires the user to define the traffic flows and highway network associated both with and without the proposed scheme. Traffic flows will be determined using a method agreed with the Overseeing Organisation and this may involve building a congested assignment traffic model to determine the reassignment effects of the proposed scheme. If a congested assignment model is used, it’s more likely that TUBA and COBALT would be used to undertake economic assessment.

Impacts During Construction and Maintenance

- 2.12 COBA is only concerned with assessing the impacts of a scheme under ‘normal’ operation when roadworks are not present to either construct the scheme or maintain it. Impacts due to temporary roadworks installed for purposes of construction and maintenance will need to be calculated externally to COBA. This can be done using the computer program QUADRO (QUEues And Delays at ROADworks) or other suitable methods.

Overview of the COBA Process

- 2.13 COBA calculates the user costs on the network in terms of the three user cost streams mentioned earlier:
- changes in *time*;
 - changes in *operating costs*; and,
 - changes in *accident costs*.
- 2.14 The total costs of the scheme are considered in terms of:
- capital costs, (including preparation and supervision costs); and
 - changes in the capital cost of maintenance of the network.
- 2.15 Figure 0/1 illustrates how the scheme costs and user cost changes are brought together in the overall appraisal process. The COBA program itself measures costs and benefits over the entire road network affected by a scheme, but assumes that the pattern of trip making (as opposed to the routes used) is unaffected. This is the ‘fixed trip matrix’ approach referred to above (see also Part 1 Chapter 3).

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- 2.16 The parameters controlling the assessment of costs and benefits in COBA are based upon those published in WebTAG, and their values are periodically updated in line with changes in the relevant sections of WebTAG.

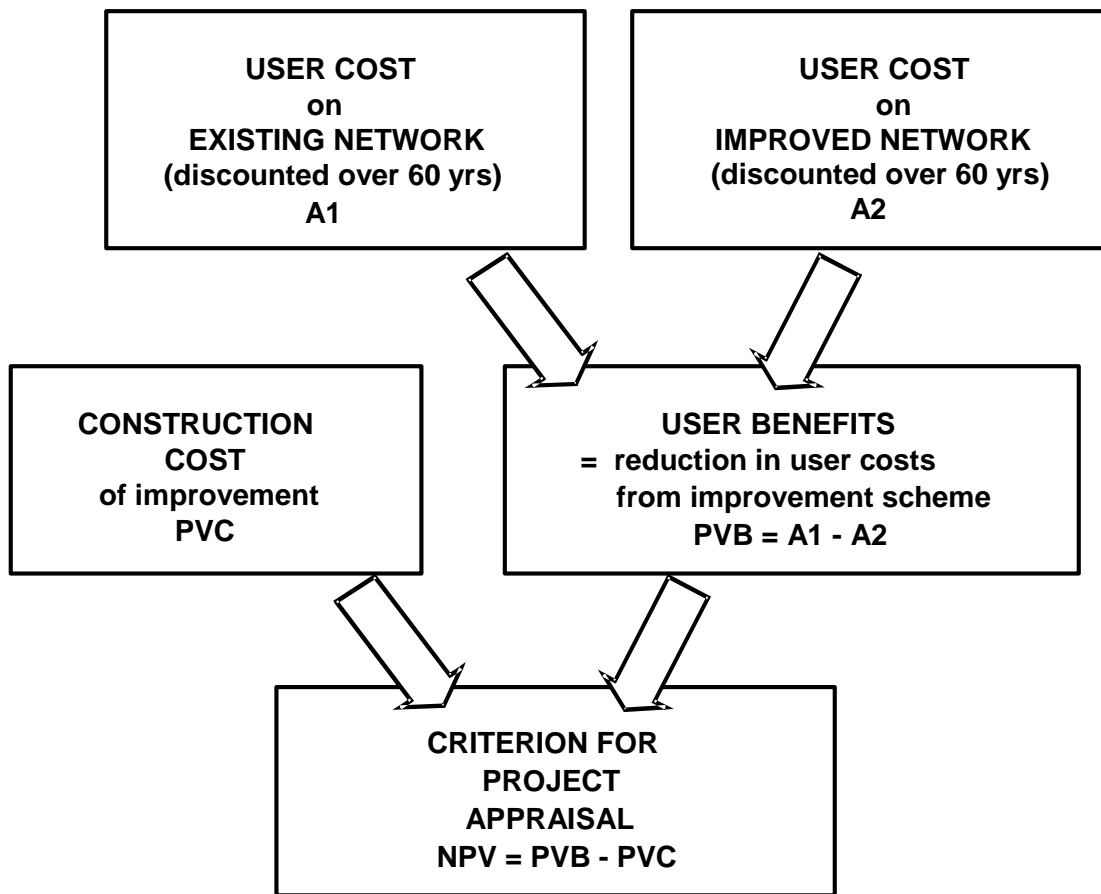


Figure 0/1: The COBA Appraisal Process

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WebTAG Transport analysis guidance: WebTAG, Department for Transport, May 2021.
<https://www.gov.uk/transport-analysis-guidance-webtag>

4. ENQUIRIES

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