



How would setting policy priorities according to cost–benefit analyses affect the provision of road safety?

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Abstract

This paper analyses how setting priorities for road safety strictly according to cost–benefit analysis would affect the provision of road safety in Norway and Sweden. The paper is based on recent analyses of the efficiency of road safety policies in these two countries. The argument sometimes made by critics of cost–benefit analysis, that only a few road safety measures are cost-effective (have benefits greater than costs), is not supported. Cost-effective road safety policies could prevent between 50 and 60% of the current number of road accident fatalities in both Norway and Sweden, if pursued consistently during a period of 10 years (2002–2011). If current policies are continued, only about 10–15% of the current number of road accident fatalities are likely to be prevented during the next 10 years. A number of sources of inefficiency in road safety policy are identified. A source of inefficiency is anything that prevents policy priorities from being set according to cost–benefit analysis. These include: (a) lack of power, which means that national governments do not have the formal authority to introduce a certain road safety measure, in Europe, this applies to new vehicle safety standards, which are passed almost exclusively by the European Union; (b) the existence of social dilemmas, which means that measures that are cost-effective from a societal point of view are not so from the point of view of individual road users; (c) priority given to other policy objectives, in particular regional development. Scarcity of resources, which obtains when public budgets have to be increased to make room for all cost-effective measures, was not found to be a constraint. All cost-effective measures can be funded within current budgets, provided the use of inefficient measures ceases.

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1. Introduction

Road safety has been greatly improved in many motorised countries since the number of road accident fatalities reached an all-time high around 1970. Nevertheless, there is still a large potential for further improving road safety, even in countries that have a comparatively good road safety record, like Norway and Sweden (Elvik, 2001a,b). Current road safety policies in these two countries are, however, rather ineffective in improving road safety. Recent analyses (Elvik, 1999a, 2001a; Elvik and Amundsen, 2000) indicate that current policy priorities are inefficient in both Norway and Sweden. These analyses conclude that road safety could be improved substantially if policy priorities were based on cost–benefit analyses to a greater extent than they are today.

The use of cost–benefit analysis to set priorities for road safety policy, is controversial. At least two arguments are often made against the use of cost–benefit analyses to set priorities for road safety:

1. Cost–benefit analysis is based on the assumption that road safety ought to be provided only to the extent that there is a demand for it (i.e. a willingness-to-pay for reduced risk). But, critics claim that one of the major problems of road safety policy, is that there is no demand for road safety. Hence, providing for road safety only to the extent that monetary benefits exceed costs will not result in a large improvement in safety. An OECD report (OECD Scientific Expert Group, 1993), for example, is based on the assumption that road safety needs to be “marketed” otherwise there will be an insufficient demand for it.
2. It is unethical to reject proposals for improving safety simply because monetary benefits are believed to be smaller than monetary costs.

Based on these arguments, this paper examines whether it is true that setting priorities for the provision of road safety according to cost–benefit analyses would in fact lead only to a small improvement in safety. The main question to be discussed is: does setting priority for road safety measures on the basis of cost–benefit analysis greatly restrict the scope for improving road safety? Next, the question is asked: what

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prevents priorities from being based on cost–benefit analysis, given the fact that such policy priorities would improve road safety more than current policy priorities are doing? The objective of the paper is to try to identify and assess the contributions of various constraints to road safety policy making, in particular constraints that prevent priorities from being based on cost–benefit analysis. The ethical objections to using cost–benefit analysis will not be considered. A brief discussion is given in another paper (Elvik, 2001b).

2. Analyses of road safety policies in Norway and Sweden

2.1. Alternative strategies for road safety policy

Road safety policies in Norway and Sweden have recently been analysed (Elvik, 1999a, 2001a; Elvik and Amundsen, 2000). In these analyses, four main strategies for improving road safety were developed for both Norway and Sweden:

1. Continuing current road safety policy, the business-as-usual strategy.
2. Basing road safety policy strictly on cost–benefit analyses, the cost–benefit strategy.
3. Basing road safety policy on the principles of Vision Zero, the Vision Zero strategy.
4. Implementing all potentially effective road safety measures to the maximum conceivable extent, the maximum safety potentials strategy.

Each of these strategies was assumed to apply for 10 years: 2002–2011. Each strategy consisted of a number of road safety measures that were regarded as potentially effective. A measure was classified as potentially effective if:

1. evaluation studies have found that it reduces the number of accidents or the severity of injuries, or if;
2. the measure is known to favourably affect one or more risk factors that are known to contribute to accidents or injuries. As an example, all measures known to reduce driving speeds were regarded as potentially effective, because reduced speed is known to lead to fewer and less serious accidents (Elvik et al., 1997).

2.2. Screening of potentially effective road safety measures

In order to develop the strategies, a broad range of road safety measures was screened for the purpose of determining potential effectiveness. Of 132 road safety measures screened for Norway, 59 were regarded as potentially effective. Of 139 road safety measures screened for Sweden, 62 were regarded as potentially effective. Table 1 lists all measures that were considered.

Table 1 also presents the benefit–cost ratio in current use and optimal use (to be defined later) for all measures that were included in a formal assessment of costs and benefits.

The term “inapplicable” in the column referring to optimal use indicates that it would be optimal not to use the measure at all.

Measures were excluded from a formal analysis of costs and benefits if one or more of the following five conditions obtained:

1. The effects of the measure on accidents or injuries were too badly known for meaningful quantification.
2. The measure was ineffective, which means that, according to available evaluation studies it did not reduce the number of accidents or the severity of injuries.
3. The measure has already been fully implemented. In Norway, for example, more than 99% of motorcyclists wear crash helmets.
4. The measure overlaps another measure or is dominated by it. As an example, general rehabilitation and reconstruction of existing roads was assumed to overlap both cross section improvements and changes in road alignment. To avoid double counting, just one of the measures was included.
5. The measure was analytically intractable, meaning that it was difficult to define its level of use in a way that permits costs and effects to be calculated. Land use planning is an example of a measure that was classified as analytically intractable.

For road safety measures that are currently being used, four alternatives were developed for use of the measure:

1. The measure is not used at all.
2. The measure is used to the same extent as today.
3. The measure is used to a somewhat higher extent than today.
4. The measure is used to the maximum conceivable extent.

For measures that are not currently used, or used only to a very minor extent, the alternatives for their use were:

1. The measure is not introduced at all.
2. The measure is introduced at the start of the last year of the period, 2011, and has an effect during 1 year (the final year of the planning period).
3. The measure is introduced at the start of the first year of the period, 2002, and has an effect during 10 years (all years of the planning period).
4. The measure is introduced retroactively at the start of the first year of the period, 2002, and is retrofitted on all older vehicles in the same year.

The four strategies that were developed can briefly be described as follows. The business-as-usual strategy consists of road safety measures that are used at present, and of new measures, which it has been decided to introduce. The cost–benefit strategy consists of all road safety measures whose marginal benefits are greater than or equal to the marginal costs. Marginal benefits were defined as total benefits for all transport policy objectives. Benefits were assessed in terms of current, official monetary valuations of

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