

Valuation of the negative effects of highways on biodiversity and outdoor recreational activities in Denmark

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Abstract

In Denmark, there is a long tradition of using socio-economic impact assessments to support decision making on major infrastructure investments. The main part of such assessments involves cost-benefit analysis (CBA), which is used to compare the costs and benefits of the project in question. Thus, it is a prerequisite that all possible costs and benefits are identified and calculated to obtain a complete and accurate picture of the socio-economic impacts. This also involves identifying non-market costs and benefits, whose values are not revealed by market mechanisms, and incorporating them into the CBA. This study aims to conduct a new primary valuation study in order to determine the non-market values of the negative effects on nature and outdoor recreational activities of highways built through nature areas. In doing so, the study also aims to provide inputs for benefit transfer studies in relation to future CBA of new highway construction in Denmark. We employ discrete choice experiment method and questionnaires were sent to 40.000 randomly selected respondents divided into 6 different splits. The surveys were conducted between January and March 2021 and 14.200 respondents completed the surveys (36%). We find the WTP for reducing noise annoyance is the highest as compared to the other effects across all the splits. The highest WTP (3000 DKK) for noise reduction is found in the split focusing only on outdoor recreational activities. In this, we also find the highest WTP (650 DKK) for highways, which do not act as a barrier for outdoor recreational activities in the surrounding area. Turning to values for biodiversity, respondents have the highest WTP for preventing nature areas with rare and threatened animal species (1600 DKK) and for implementing mitigation measures to reduce roadkill of wild animals (1000 DKK). The WTP results also show the importance of altruistic values, as respondents attach positive values to nature areas located far from where they live but used by many visitors from the surrounding areas. The lowest WTP values are associated with the total amount of nature areas converted to highways.

Last, we show how the results can be used to conduct benefit transfer for similar highway projects in Denmark in the future. As a complement to this, we also give a quick overview of conducting benefit transfer using results from the case-specific splits.