SUMMARY

CO_2 reduction through behavioural change in the transport sector

A quickscan of the CO_2 reduction potential and cost effectiveness of selected measures

Besides encouraging use of more efficient vehicles and more sustainable (alternative) fuels, the government can also employ behavioural measures to reduce road transport CO_2 emissions, i.e. policies that encourage people to drive less, use more sustainable means of transport or use their vehicle more efficiently. There are both 'push' and 'pull' policies available to induce people to adopt the preferred behaviours.

In this study for the Dutch Ministry of Infrastructure and Environment a 'quickscan' analysis was used to estimate the CO_2 reduction potential and social cost-effectiveness of such behavioural measures and the policy investment involved.

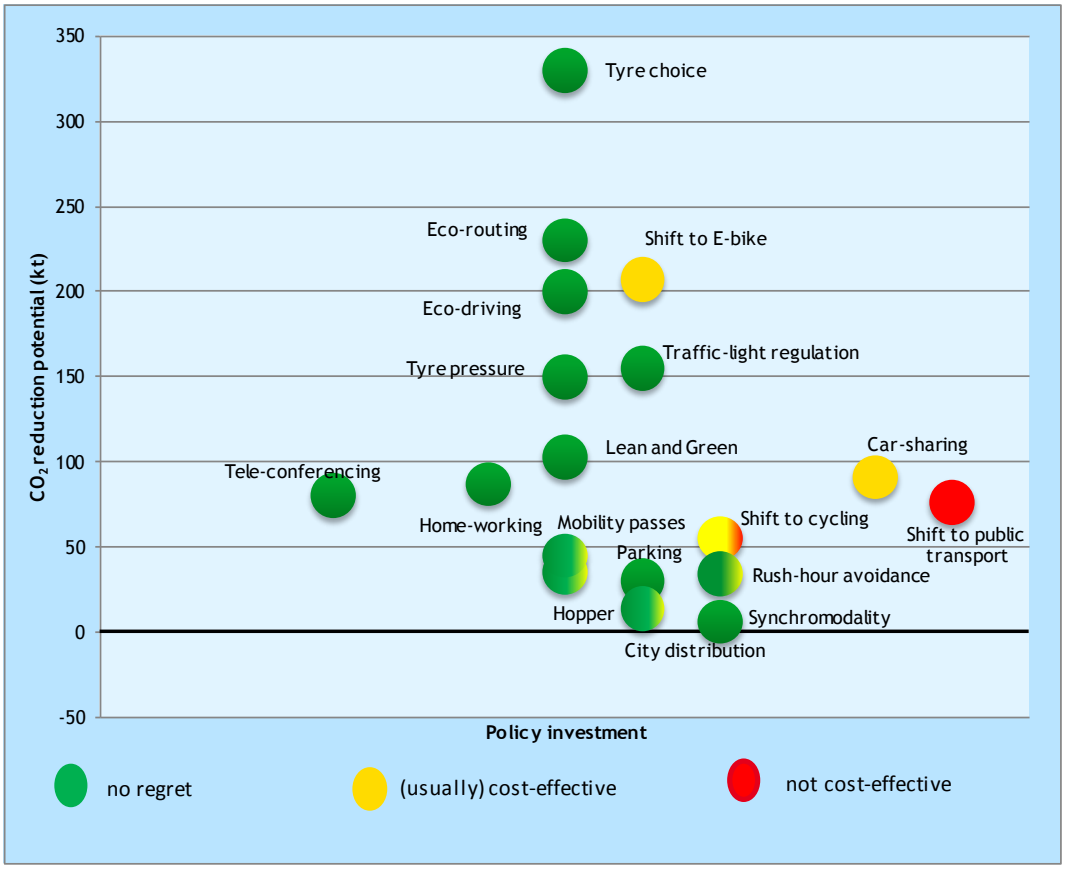
Broad range of road transport behavioural measures
In close cooperation with the Ministry, a number of measures were selected that together cover the various kinds of behavioural change that can help reduce transport CO_2 emissions (Table 1).

Table 1 Behavioural measures investigated

Use of more efficient vehicles	More efficient vehicle use	Use of more sustainable means of transport	Reduction of transport volumes
CO_2 indexed parking fees	Eco-driving	Hopper	Car-sharing
	Eco-routing	Incentives for mobility passes	Working from home
	Traffic-light regulation	Large-scale modal shift to public transport	Tele-conferencing
	Tyre pressure	Large-scale modal shift to cycling	Rush-hour avoidance
	More efficient tyres	Modal shift to E-bikes	More efficient inner-city distribution
		Synchromodality	
Lean and Green Personal Mobility			

Behavioural measures have significant CO_2 reduction potential
Based on the analysis conducted and assuming major, but not extreme, policy investments, we estimate that the investigated measures can lead to a total CO_2 reduction of around 1.5 Mt in 2020 and 2.9 Mt in 2030. There are large uncertainties in these estimates. In addition, second-order effects (such as increases in commuting distance when working part of the time at home) have been ignored. Full realisation of this reduction potential would make a significant contribution to achieving government policy targets for the transport and mobility sector. This study provides an initial review of possible policy interventions to this end, but further study is required to elaborate the issues further.

Figure 1 **CO_2 reduction potential, social cost-effectiveness and policy investment for behavioural measures in the transport sector in 2020 (medium estimate of potential)**



Measures that encourage more efficient vehicle use (e.g. more efficient tyres, eco-routing, eco-driving) have the greatest reduction potential (Figure 1). In the variants considered these measures are cost-effective, moreover, leading to significant benefits in terms of fuel savings at generally low cost .
Modal-shift measures, too, often have significant CO_2 reduction potential, but at the same time they generally involve net social costs. This is primarily because modal shifts lead to a loss of economic welfare for many transport users (they lose the perceived benefits of private car transport), but also because the associated government policy costs are often substantial. Compared with other behavioural measures, this category of measures also require relatively major policy investments (in the form of comparatively high policy costs and/or comparatively high losses of tax revenue). A modal shift to public transport, for example, will probably involve a major policy investment because it implies substantial financial investments in public transport by (local) government. In the case of car-sharing, there will be a relatively significant loss of tax revenue due to a decrease in the total number of (private) cars and thus vehicle-tax income.

Finally, measures aimed at reducing mobility demand (e.g. home-working, tele-conferencing) are also likely to be an effective means of reducing transport CO_2 emissions, in terms of the social costs involved.

Follow-up studies required

This study provides only a first-pass estimate of the potential contribution of behavioural measures to cutting transport CO_2 emissions. The results need to be elaborated in more detail, and more quantitatively, in one or more follow-up studies, to improve understanding of the costs and impacts as well as the potential synergies with other policy targets. There may also be value in discussing the results of the present study with relevant stakeholders. In addition, it is recommended to carry out an integrated analysis of the CO_2 reduction potential of both technical and behavioural measures, not only given the numerous interactions between the two, but also because the government will in all likelihood require both categories to secure the climate targets set out by the Socio-Economic Council (SER). For certain measures, it also makes sense to identify variants that achieve substantial emission cuts at relatively low social cost (by focusing on certain passenger segments, locations and travel motives, for example). There is still a major lack of understanding of the factors determining today's modal split and how this can be steered by local authorities via transport and parking policies and by other means.

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