BUNDESAMT FÜR STRASSEN (ASTRA)

CO2-POTENZIAL DES LANGSAM-VERKEHRS
VERLAGERUNG VON KURZEN MIV-FAHRTEN

Schlussbericht
Bern, 4. November 2005

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SUMMARY

As per the CO2 law, by the year 2010 Switzerland is obliged to reduce CO2 emissions by 10% overall compared with 1990 (combustibles -15%, fuels -8%). The current deficit in traffic is around 2.6 million tonnes of CO2 compared with the target. Within the scope of the "Communication for the approval of the CO2 emission level for combustibles", the Federal Council explains how this gap is to be closed. In addition to the proposed principle measures of CO2 tax (combustibles) and climate cent (fuels), significant CO2 contributions can also be expected from promotional measures in non-motorised transport(NMT) in the longer term. The present report quantifies this CO2 potential of non-motorised transport.

The study restricts itself to the transfer potential of short MIT (motorised individual transport) journeys to non-motorised transport. Transfers from PT (public transport) to non-motorised transport(not necessarily energy-relevant) as well as transfers from long MIT (motorised individual transport) routes to combined PT-NMT (public transport - non-motorised transport) routes (primarily a public transport – motorised individual transport discussion) are excluded. From a methodical point of view, a distinction is made between "technical" and "realisable" potential.

› The **"Technical potential"** takes account of external hindrances, such as weather, topography, settlement density, traffic purpose (e.g. luggage/accompanying transport) or complexity of the mobility chains. It is assumed that the other framework conditions (e.g. the available non-motorised transport infrastructure) are optimal for potential transfers. The technical (theoretical) potential is derived in a quantitative-analytical manner. The data basis is the Microcensus on Travel Behaviour 2000. Here, only motorised individual transport trips ("Etappen") up to 5 km and excursions[7] up to 10 km are taken into consideration (or 15 km in the sensitivity calculation), on the assumption that the direct transfer potential is likely to be marginal with greater distances. The assumptions on which the potential calculations have been based have deliberately been chosen conservatively, because various influence factors cannot be operationalised on the basis of the data basis (e.g. precise topographic facts or luggage transport).

› The **"Realisable" potential** also takes into account effective hindrance factors of an economic, social, individual nature, as well as those resulting from (transport) political framework conditions. Three future scenarios of differing transport-political levels of in-

7 Definition of "Excursion": sequence of car, whose first route begins at home and whose last route leads home and with which there are no additional routes home in-between.

tervention are formulated ("reference", "NMT+" and "NMT+/MIT-"). From a methodical point of view, exploitation factors are derived from the "technical" potential on the basis of argumentative-qualitative considerations – based on observations at home and abroad.

Depending on the assumption in terms of the reasonable maximum length of an excursion, a **technical transfer potential** of 17-20%[8] of all MIT-trips (traffic volume) results. This corresponds to around 3-4% of the motorised individual transport – personal kilometres (traffic capacity) or savings of 0.4-0.5 million tonnes of CO2.

TECHNICAL POTENTIAL MOTORISED INDIVIDUAL TRANSPORT->NON-MOTORISED TRANSPORT				
	Town	Aglomeration	Rural area	Total
Rearranged trips (traffic volume)				
Excursions up 10 km	17,9%	16,6%	16,1%	16,9%
Excursions up to 15 km	21,9%	20,1%	18,6%	20,2%
Rearranged Pkm (personal kilometres)				
Excursions up 10 km	3,4%	3,6%	2,5%	3,2%
Excursions up to 15 km	4,5%	4,8%	3,1%	4,2%

Table 5 Trips and personal kilometres, theoretically capable of rearrangement from motorised individual transport to non-motorised transportas % of the total motorised individual transport trips or motorised individual transport personal kilometres (data basis Microcensus on Travel Behaviour 2000: 58,277 motorised individual transport trips).

Depending on the future scenario and assumptions in terms of reasonable maximum excursion length, **achievable potential** of 6% to 15%[9] of all MIT-trips by 2030 results. This corresponds to around 1% to 3% of the motorised individual transport (personal kilometres) or savings of around 0.1 to 0.35 million tonnes CO2. On the other hand, the potential short-term contributions up until 2010 (Kyoto protocol) are negligible, because the implementation of the underlying measures is only realistic in the medium to long term.

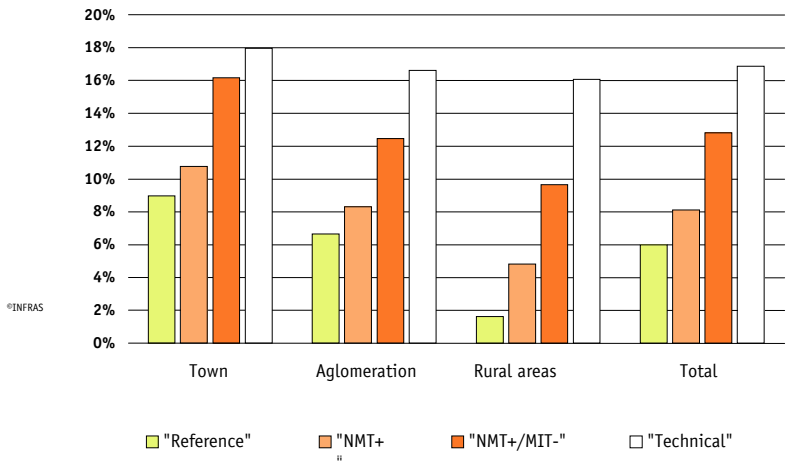
8 Respectively 33% to 40% of MIT-trips up to 5km.

9 Respectively 12% to 30% of MIT-trips up to 5km.

REALISABLE POTENTIAL BY 2030				
	Town	**Aglomeration**	**Rural area**	**Total**
Rearranged trips (traffic volume)				
"Reference"	9,0%	6,6%	1,6%	**6,0%**
"NMT+"	10,8%	8,3%	4,8%	**8,1%**
"NMT+/MIT-"	16,1%	12,4%	9,6%	**12,8% (15,4%)**[1)]
Rearranged Pkm (personal kilometres)				
"Reference"	1,7%	1,4%	0,3%	**1,2%**
"NMT+"	2,1%	1,8%	0,8%	**1,6%**
"NMT+/MIT-"	3,1%	2,7%	1,5%	**2,5% (3,2%)**[1)]

Table 6 Trips and personal kilometres, rearranged from motorised individual transport to non-motorised transport, as % of the entirety of the motorised individual transport trips or motorised individual transport personal kilometres (data basis Microcensus on Travel Behaviour2000: 58,277 motorised individual transport trips).
[1)] Sensitivity calculation: excursions up to 15 km (instead of up to 10 km in basis calculation).

MOTORISED INDIVIDUAL TRANSPORT TRANSFER POTENTIAL BY FUTURE SCENARIOS (NUMBER OF TRIPS)



Figur 3 Trips rearranged from motorised individual transport to non-motorised transportas % of the entirety of the motorised individual transport trips, shown by future scenarios of the "realisable" potential, and comparison with the "technical" potential; basis calculation up to 10 km excursion length (data basis Microcensus on Travel Behaviour2000: 58,277 motorised individual transport trips).

The results show the following:

› Without special measures ("reference") only around half of the technical potential is likely to be achievable by 2030 even in urban areas, even less in rural areas. By themselves, the socio-economic developments, forecast elsewhere, will probably hardly increase

the achievable potential for non-motorised transportcompared with today; the opposite is more likely: individual measures promoting non-motorised transport(e.g. increasing capacity bottlenecks on the roads as a result of reduced public investment levels, increasing numbers of mobile pensioners) are countered by weighty factors hindering non-motorised transport(e.g. a lasting trend towards over-development, decreasing distance to places of education/learning).

- With specific measures promoting non-motorised transport ("NMT+"), it is possible to achieve a certain amount in specific areas; however, international examples and examinations show that, without parallel measures hindering motorised individual transport, the effects are severely restricted.
- Given a time horizon up until 2030 and simultaneous measures promoting non-motorised transportand hindering motorised individual transport (e.g. performance-related charges, access restrictions within towns or re-designation of traffic areas), we assume that it would be reasonable to expect practically complete realisation of the technical potential in urban areas and implementation to a major extent in rural areas ("NMT+/MIT-"). The measures reducing motorised individual transport are likely to have a far greater influence on the realisable transfer conduct than pure measures promoting non-motorised transport. the measures have a more direct effect on today's motorised individual transport journeys (push-measures) than the indirect measures promoting non-motorised transportfor motorised individual transport (pull-measures).
- The realisable potential is almost twice as high for bicycle traffic than for pedestrian traffic. This is particularly so because bicycles cover the greater distance-related stage spectrum and because infrastructure measures can be implemented in a more concrete and thus better perceivable manner.
- The potential is almost twice as high in urban areas than in rural areas. This is because, in particular, the traffic-reducing measures and the measures hindering motorised individual transport are easier to implement in towns. In addition, combined public transport – non-motorised transportinvestments have greater chances of realisation as a result of the more concentrated traffic demand.

Compared with other domestic and foreign examinations of potential, the present study comes to more cautious estimations of potential. This is above all because a more differentiated methodical approach was chosen. Nevertheless, it can be stated that (realisable) CO2 potential is respectable.

› From a traffic point of view: 6-15% of all motorised individual transport trips are of significance when considered from a Switzerland-wide perspective. Corresponding transfers have been demonstrated in selected towns, however only over a longer period of time in cases of a highly resolute transport policy.

› From an energy point of view: 0.1 to 0.35 million tonnes of CO2 savings correspond to around 4% to 14% of the current Kyoto deficit in the field of transport. These are contributions as are hoped for as per the communication for the approval of the CO2 emissions law, for example from the two "additional" measures (i.e. in addition to CO2 charge and climate cent): "Promotion of natural gas and biological fuels" and "Promotion of energy-efficient and environmentally-friendly vehicles via a bonus-premium system". It should be noted that this entire potential applies subject to the (reference) assumption that no fundamental alterations occur in the overriding energy framework conditions (e.g. long-term, lasting energy prices, higher by factors).