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Forschungspaket VeSPA: Synthesebericht

Paquet de recherche VeSPA: Synthèse

Research Package VeSPA: Synthesis

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Summary

Introduction

The accident occurrence in road transport has changed substantially over the last 40 years (1975 – 2015). In spite of a big increase of the overall transport performance, the number of accidents with human injuries has decreased in this period by approximately 30%. Specifically remarkable are the reductions of serious injuries (ca. 75%) and deaths (ca. 80%), whereas the number of light injuries show an increase of approximately 15% over the years. Despite this generally positive development Switzerland currently still reports about 250 deaths and 3'800 seriously injured persons in road transport every year (rounded numbers for 2015). The federal action program for more safety in road transport «Via sicura» initiated by the federal office of environment, transport and energy (UVEK) aims to substantially increase the safety of road users over the next years. The implementation of the measures in Via sicura is carried out stepwise by means of gradual adjustments of the road traffic act.

Since 1926 the traffic accident statistics serves as the key monitoring instrument for evaluating the outcome of the measures taken. However only since 2011 it is possible to link the accident statistics (VU) with other registers of the federal roads office (FEDRO) and data sources such as :

- Register of administrative measures (ADMAS)
- Register of vehicles and owners (MOFIS)
- Medical statistics of hospitals
- Statistic data of accident insurances

This newly developed data pool (VeSPA-data pool) allows for detailed analysis and evaluation of different factors affecting the accident occurrence. The research package „Road safety gains resulting from datapooling and structured data analysis: Measures and potentials in the field of road infrastructure“ (VeSPA) consists of 5 subprojects. In the first project stage the scope was focused on Humans / Society, Situation / Infrastructure, Vehicles, Weather and Medical Impacts. Additionally the first stage was also used to test data consistencies and linkage for the years 2011 and 2012. In the second project stage the results of the subprojects were modelled holistically and the two subprojects TP1-M (Transport users) and TP2-M (Infrastructure) were further detailed and examined in terms of possible measures and their accident reduction potentials.

Results of Subprojects

In the first project stage the data evaluation focused on a separate analysis of influencing factors within the 5 subprojects. In contrast the second project stage aimed at a combined analysis of all influencing parameters in the two subprojects. Although the two projects followed different methodological approaches (microscopic versus macroscopic approach in accident research), they complemented one another in terms of specific comparisons, interpretations and mutual checks of the respective results.

Proposed measures from subprojects

The measures developed in the subprojects were grouped into four influencing spheres: technical measures (*engineering*), information and education (*education*), surveillance and avengement (*enforcement*) and economic measures (*economy*). The following table shows the measures applying to road users (TP1-M, V-x) and infrastructure (TP2-M, I-x) referring to the mentioned influencing spheres and subgrouped into specific fields of action. It is however a short-list of measures for which an accident-reducing potential of ≥ 50 accidents / year (accidents with personal injuries incl. deaths) was estimated. This corresponds to somewhat more than 1% of the annual number of accidents with serious injuries and deaths on Swiss roads (2015).

Tab. Z1 Measures with an accident-reduction potenzial (ARP) of ≥ 50 accidents / year and assigned to the fields of action

Influencing sphere	Field of action	Measure	ARP / a	
Education	Fitness to drive	V-5 Use of Hazard Perception Test (HPT)	> 60	
	Prevention, training, campaigns	No new measures with reported potential		
	Information / Training on driver assistance systems	New field of action, measure(s) to be defined		
Enforcement	Implementation of remaining Via sicura (VS-x) measures	VS-18 Quality assurance concerning fitness to drive and updating of minimum medical requirements	n. a.	
		VS-19 Alcohol breath-test that will stand up in court	n. a.	
		VS-20 Additional training for fallible drivers	n. a.	
		VS-21 Obligation of data recorders for speeders (Blackbox)	n. a.	
		VS-22 Alcohol-based immobilizer	74	
	Surveillance, sanctions, obligations	V-4 Extension of vehicle confiscation (also for repeated violation concerning the influence of intoxicating substances (drugs and alcohol))	90	
		I-10 Intensification of local speed enforcement on motorways	60	
	Regulations outside of CH (Admittance, standards)	New field of action, measure(s) to be defined		
	Engineering	Vehicles	V-1 Obligation for Permanent Running Lights for cyclists	800
			V-2 Promotion of Autonomous Emergency Braking Assistance (AEBS)	> 540
V-3 Use of intelligent speed adaption (ISA) (TP1-M)			200	
I-5 Promotion of intelligent speed adaption (ISA) and / or sanctioning speeders with ISA systems (TP2-M)			40 – 160	
I-6 Promotion of driver assistance systems – focus on following distance, braking and Car-to-X-communication			130	
I-1 Definition of a minimum standard for safer design (planned and existing roads)			940	
Infrastructure (planning methodology, norms and standards, ISSI tools)		I-4 Optimization of bicycle route planning regarding safety aspects	290	
		I-3 Standardization of roads („self-explaining roads“)	385	
		I-7 Further improvement and application of safety recommendations for commercial and industrial areas	90	
		I-8 Evaluation of road network hierarchy and modifying it regarding safety aspects	80	
		I-11 Thresholds for pedestrian accident numbers (pedestrian black spots)	55	
		Infrastructure (Existing road network)	I-2 Safety improvement programs for the existing road network	905
			a Curves in the rural road network	260
b Motorcycles (accidents on main track)			220	
c Junctions with right of way and highly frequented access road connections (to private properties or parking spaces)			200	
d Bicycles at junctions			165	
e Roundabouts		60		

Tab. Z1 Measures with an accident-reduction potenzial (ARP) of ≥ 50 accidents / year and assigned to the fields of action

Influencing sphere	Field of action	Measure	ARP / a
	Road infrastructure data	New field of action, measure(s) to be defined	
Economy	Collective steering Co-financing	I-9 (Co-) Financing a safe road infrastructure	70
	Individual incentives	New field of action, measure(s) to be defined	

It can be realized that measures within the influencing spheres of education and economy contain comparatively minor impacts. On the other hand, from additional measures in the influencing sphere of enforcement and complementary to the Via sicura (VS-x) measures yet to be implemented, substantial reduction potentials can be expected. Furthermore it is evident that great safety gains can be achieved with measures in the field of engineering.

Measures in the field of action „infrastructure“ (subproject TP2-M) follow mainly existing approaches, which have been already brought up during the developing processes of Via sicura and VESIPO. Analysis showed that in this field new and innovative approaches hardly exist but they are not necessarily required either. The potential to improve road safety in the field of infrastructure lies in a much more consistent implementation of already existing approaches and standards.

Recommendations for future activities in road safety

Integral point of view and basic options of action

In view of future activities in road safety it is recommended that a much more integral point of view should be emphasized. The fields of activity investigated in this work could thus be covered much more efficiently and a better synergetic impact can be expected.

Future activities in road safety should furthermore be aligned with basic options of action. These were identified as follows: « cultivation and broadening of existing knowledge-base », « preservation and development of successful activities », « elimination of deficits » and « anticipation / reaction and active shaping of developments and trends ».

Overview and priorities

The recommendations for future activities in road safety are visualized in the following figure. The fields of activity are integrated on the one hand within the four influencing spheres (education, enforcement, engineering and economy) and on the other hand assigned to the four basic options of action as mentioned above. The 5 fields of action with dashed edges have only an indirect reference to the research effectuated in the subprojects of VeSPA (stage 2); yet they seem relevant in terms of relevance and effectiveness of an integral point of view.

In view of the diverging accident-reducing potentials it is recommended to set specific priorities. Regarding the future developments and trends four focused actions are suggested: „statistics“, „education / enforcement“, „vehicles“ and „infrastructure“ (including economic aspects respectively).

These focused actions need to be pursued with different intensities, which however lead in an overall view to an integral and promising approach. For the focused actions „vehicles“ and „infrastructure“ for which intensified activities are strongly recommended, three different strategies or options of action can be identified which consist of an either « classic », a « progressive » or an « integral » approach. The question which of these approaches should be applied to which focused action in road safety, needs to be further analysed and discussed in view of the results of this research package.

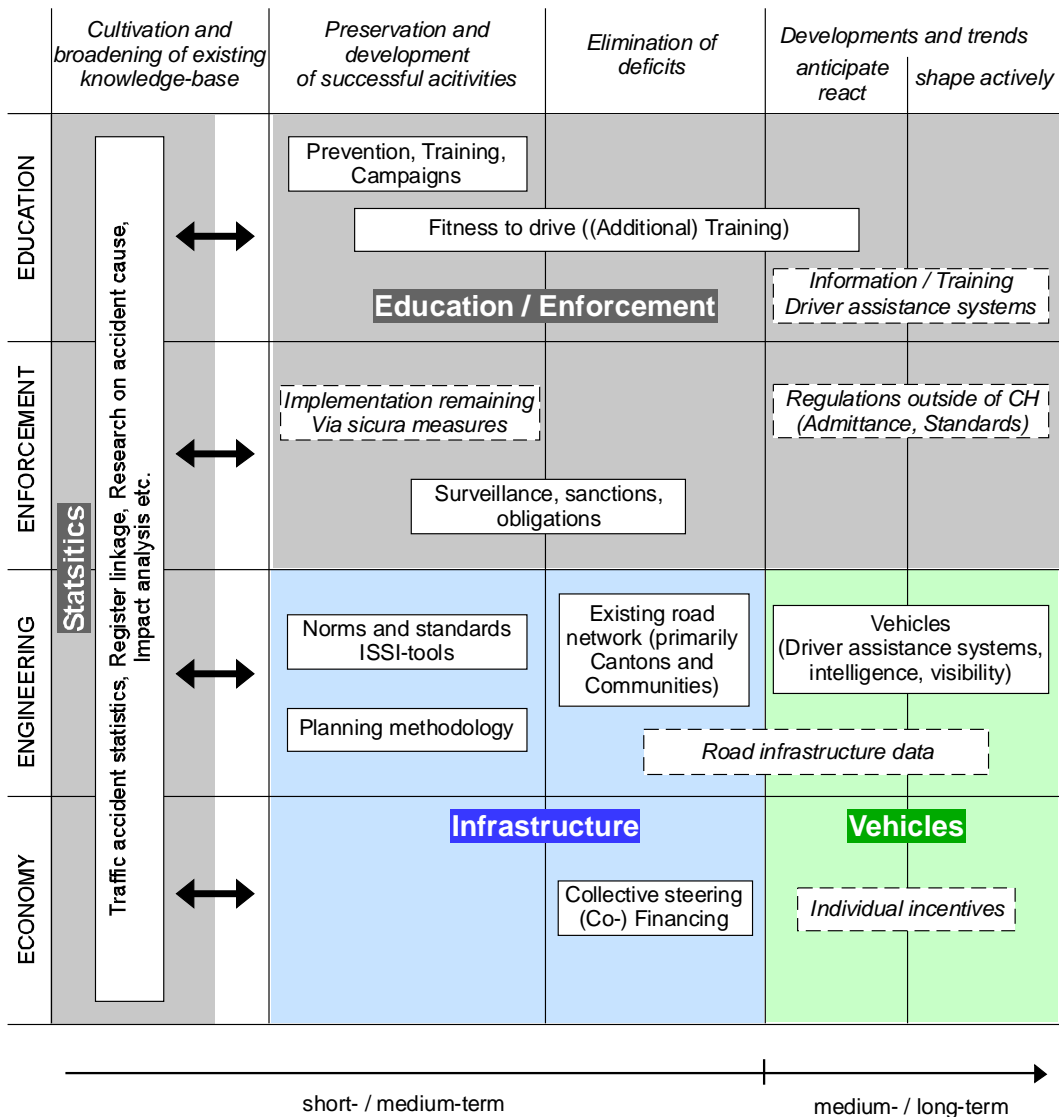


Abb. Z1 Recommendation concerning fields of activities und focused action in future road safety works

Areas for further research

In the course of this research package several research and knowledge gaps could be filled. Nevertheless the rapid development namely in the field of technology implies a strong need for future research in road safety. Respective topics were identified in the two subprojects and comprise a more accurate impact assessment of several measures as well as an improved database for pedestrian and bicycle traffic and an optimized implementation of standards referring to road safety.

Further areas of research were also identified during synthesis works. Topics like a better knowledge of human-machine-interfaces referring to driver-assistance systems, specific requirements for infrastructure data in order to optimize the vehicle-road-interaction and a better knowledge of how countries with their own car-production industry meet the challenges of automated road transport should be further investigated.