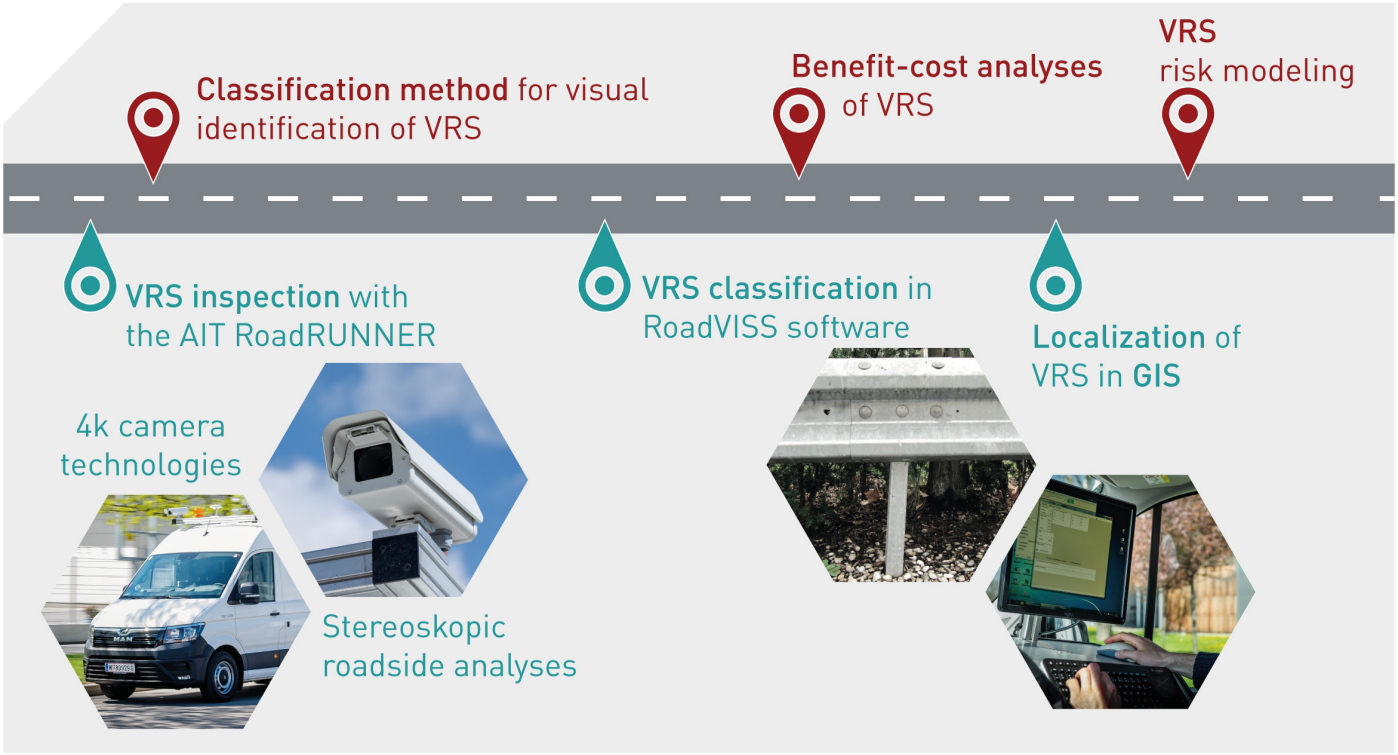
VEHICLE RESTRAINT SYSTEMS: Identification, Classification, Evaluation

RUN-OFF-ROAD CRASHES AS A MAJOR CHALLENGE FOR TRAFFIC SAFETY

Collisions between vehicles leaving the road and unforgiving roadside objects such as trees, poles, road signs and other street furniture are a major road safety problem. On Austrian roads, approximately 5.000 injury crashes occur every year due to run-off-road maneuvers, contributing 25% to fatalities and 16% to serious injuries on road traffic.

The "forgiving roadside" concept is based on the principles of "Vision Zero" advocating that driving errors should not automatically result in serious or fatal injuries. The primary focus is on treatments that bring errant vehicles back into the lane to reduce injury or fatal run-off-road crashes. If a vehicle still hits a road element, the second priority of a forgiving roadside is to reduce the severity of the crash. Hence, vehicle restraint systems (VRS) such as guardrails, concrete barriers and crash cushions play a decisive role in reducing the crash outcome.

In order to identify safety critical road segments, it is necessary to know the location and technical attributes of existing VRS on the network. In the past years, researchers of the AIT Austrian Institute of Technology have developed a novel and innovative approach to investigate, classify and evaluate vehicle restraint systems.



OUR SERVICES

INVESTIGATION

At the beginning of the VRS classification process, the existing systems have to be identified by means of image data processing. Four high-resolution cameras mounted on a special probe vehicle (designation: RoadLab) in different technical configurations and positions provide detailed insights on VRS from different angles (overall view, frontal view of the guardrail, view behind the vehicle restraint system). In this way, a comprehensive VRS inventory with all its individual components can be provided.

CLASSIFICATION

An in-house software solution (RoadVISS – Road Video Information and Survey System) processes the recorded VRS features to determine the distinct system type and safety-related attributes such as containment level, working width class and severity level. This information is stored both in a dedicated database and can also be imported in a GIS software.

ANALYSIS

The information obtained out of the classification process can be used for benefit-cost-analyses, road safety inspections and the evaluation of the effectiveness of different vehicle restraint systems.

REFERENCES

RISKANT: Risk model development for the analysis of stationary objects on highways and expressways
The RISKANT project was designed to develop a risk model for the evaluation of accidents resulting from vehicles crashing against stationary objects on highways and expressways.

SAVeRS: Selection of Appropriate Vehicle Restraint Systems
The aim of the SAVeRS project was to develop a workable and user-friendly tool for the evaluation of Vehicle Restraint Systems in the context of road and environmental conditions.

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH
DI Peter Saleh
Tel +43(0) 50550 6463
Giefinggasse 2, 1210 Wien
peter.saleh@ait.ac.at
www.ait.ac.at/en/frs