



Safety Ratings 2016

Summary



What are safety ratings?

Safety ratings in use today are objective, essential Safe System tools for benchmarking, targeting and monitoring key aspects of road traffic system safety quality and potential for improvement. The safety ratings in use either predict safety outcomes in key accident scenarios for given designs or provide a retrospective assessment based on accident data. Different safety rating systems currently in use provide an impartial means of assessing the relative performance mostly of:

- New vehicles in crash tests and 'on the road' vehicles according to accident statistics.
- Different parts of the road network through road protection scores and risk-mapping.
- Safety equipment: child restraints and motorcycle helmets.

Why use safety ratings?

Ratings as interventions

Safety ratings can be used as an intervention to identify, promote and encourage improved standards and designs to improve levels of accident protection in vehicles and in the road network.

Ratings as monitoring tools

Safety ratings provide a useful policy tool for monitoring the safety quality of the vehicle fleet and the road network and the related intermediate outcomes of specific interventions adopted and implemented in national road safety strategies. Such ratings provide more detailed as well as more immediate information about safety performance than can be achieved by final outcome data on deaths and serious injuries.

Ratings as intermediate outcome targets

Counties with ambitious road safety goals and targets are increasingly using intermediate outcomes (causally related to death and serious injury) for closer safety management. Several countries set such targets using safety rating data. For example, a target can be set to increase the percentage of cars with 5-star Euro NCAP ratings in the national fleet.

Vehicle safety ratings

Predictive systems assess a car's safety performance before it is used on the road. The predictions are based on controlled whole car crash tests of individual models; tests of components of the car which have been proven to be important in accidents; and/or visual inspections and rating of the interior of cars and expert assessments. Examples include Euro NCAP, Australasian NCAP, US NCAP, Japan NCAP, Korean NCAP (South Korea), China NCAP, Asian NCAP, Latin NCAP.

Safety Ratings - Summary

In **retrospective systems**, safety ratings are based on the actual performance of cars in real accidents. Here, the frequency and severity of injury to car occupants in individual model cars are determined by examination of police accident statistics and/or insurance injury claim data. Examples include Folksam car safety rating (Sweden), Used Car Safety Ratings (Australia) and SARAC conclusions (Europe).

Road network safety ratings

Road protection scores (RPS) and star ratings are based on road inspection data and provide a simple and objective measure of the level of safety, which is 'built-in' to the road for different types of road users. Road protection scores can be used in low, middle and high-income countries and are of especial value in providing network safety information where quality accident injury data are not available for use by road designers.

Retrospective safety rating protocols (Risk Mapping) provide a means of measuring and mapping the number of accidents on individual road sections and is used in several Road Assessment Programmes globally (iRAP, EuroRAP etc.). Risk Maps indicate the distribution of road fatalities and capture the combined risk arising from the interaction of road users, vehicles and the road environment.

Protective equipment safety ratings

Ratings in use refer mostly to child restraints (e.g. EuroNCAP testing, UK TRL Child Seat Rating Scheme, UK Consumers Association Which? rating, Australian Child Restraint Evaluation Programme) and motorcycle helmets (e.g. UK Safety Helmet Assessment and Rating Programme - SHARP)

Other safety ratings

Other safety ratings in use are:

- star rating the safety of school walking routes (Australia),
- Q3 - Work-related and commercial transport safety ratings (Sweden),
- ETSC's Road Safety Performance (PIN) Index covers several areas of road safety, including road user behaviour, infrastructure and vehicles, as well as road safety policy-making more generally.

Effectiveness of safety rating systems

In-car safety

Research indicates that a good correlation exists between Euro NCAP test results and real-world injury outcomes. Cars with three or four stars were found to be approximately 30% safer, compared to two star cars or cars without an Euro NCAP score, in car to car collisions. Furthermore, 5-star rated Euro NCAP cars were found to have a 68% lower risk of fatal injury and a 23% lower risk of serious injury compared to 2-star rated cars.

Safety Ratings - Summary

Pedestrian protection

Research has identified a significant reduction of pedestrian injury severity in car to pedestrian accidents for cars with better Euro NCAP pedestrian scoring, especially in urban roads. It has been estimated that for each additional point in the Euro NCAP pedestrian protection score, the probability of pedestrian death in the event of a car-to-pedestrian accident is reduced by 2,5% and the probability of serious injury by 1%.

Road network safety

Studies in Sweden and Britain comparing average fatal and serious accident rates for roads with different star ratings have shown differences in rating of one star to be associated with 25-33% reduction in accidents. A recent Euro RAP review identified an accident rate reduction in the region of 30-50% when moving from a 2-star to 3-star rating, but the reduction is less when moving between higher Star Ratings.

Notes

1. Country abbreviations

 Belgium	BE	 Italy	IT	 Romania	RO
 Bulgaria	BG	 Cyprus	CY	 Slovenia	SI
 Czech Republic	CZ	 Latvia	LV	 Slovakia	SK
 Denmark	DK	 Lithuania	LT	 Finland	FI
 Germany	DE	 Luxembourg	LU	 Sweden	SE
 Estonia	EE	 Hungary	HU	 United Kingdom	UK
 Ireland	IE	 Malta	MT		
 Greece	EL	 Netherlands	NL	 Iceland	IS
 Spain	ES	 Austria	AT	 Liechtenstein	LI
 France	FR	 Poland	PL	 Norway	NO
 Croatia	HR	 Portugal	PT	 Switzerland	CH

2. This 2016 edition of Traffic Safety Synthesis on Safety Ratings updates the previous versions produced within the EU co-funded research projects [SafetyNet](#) (2008) and [DaCoTA](#) (2012). This Synthesis on Safety Ratings was originally written in 2008 and then updated in 2012 and in 2016 by Jeanne Breen, [Jeanne Breen Consulting](#).

3. All Traffic Safety Syntheses of the European Road Safety Observatory have been peer reviewed by the Scientific Editorial Board composed by: George Yannis, NTUA (chair), Robert Bauer, KFV, Christophe Nicodème, ERF, Klaus Machata, KFV, Eleonora Papadimitriou, NTUA, Pete Thomas, Un.Loughborough.

4. Disclaimer

This report has been produced by the National Technical University of Athens ([NTUA](#)), the Austrian Road Safety Board ([KFV](#)) and the European Union Road Federation ([ERF](#)) under a contract with the [European Commission](#). Whilst every effort has been made to ensure that the matter presented in this report is relevant, accurate and up-to-date, the Partners cannot accept any liability for any error or omission, or reliance on part or all of the content in another context.

Any information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use that may be made of the information contained therein.

5. Please refer to this Report as follows:

European Commission, Safety Ratings, European Commission, Directorate General for Transport, October 2016.

