

Summary:

Best Practice Guidelines on Black Spot Management and Safety Analysis of Road Networks

Background and objective

For several years black spot management (BSM) has been and still is a very essential part of the site-specific traffic safety work. In the last 5 to 10 years BSM has been supplemented with network safety management (NSM) in more and more countries. However the current approaches and quality of BSM and NSM differ very much from country to country and the work can be characterised by a lack of standardised definitions and methods.

The objective of this project is thus to describe and develop state-of-the-art approaches and best practice guidelines for BSM and NSM. State-of-the-art approaches are defined as the best currently available approaches from a theoretical point of view, while best practice guidelines are the best approaches from a more practical point of view. Best practice guidelines can be used when the data and resources for developing, implementation and use of a national method are limited. State-of-the-art approaches are described in Elvik (2007). Based on these and an extensive literature survey the best practice guidelines are described in this report.

The key elements of best practice guidelines to BSM and NSM are summarized in the following with regard to classification of roadway elements, identification principles and criteria, accident analysis and evaluation of the treatment. The stage of treatment is not treated in this report.

Classification of roadway elements

In BSM the road system should be divided into smaller roadway elements as for example sections of a specified length, curves with radius within a certain range, tunnels and four-leg junctions for which the general expected number of accidents can be estimated. Use of a sliding window approach should be avoided.

In NSM the road system should be divided into longer road sections with a variable length between 2 and 10 kilometres. The sections should be homogeneous with regard to the parameters that have significant influence on the number of accidents and thus are used as independent variable in accident models.

Identification principles

The identification of black spots and hazardous road sections should rely on a traditional model based or category based method. In addition one should

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examine the use of not accident based identification methods in NSM be examined.

Identification criteria

The absolute difference criterion, also named savings potential, should be used in conjunction with the model or category based method for identification of black spots and hazardous road sections. The criterion should either be a predefined number that the savings potential has to exceed, or a certain percentage of the road network with the largest savings potential depending on how BSM and NSM are organized and divided between different road administrations.

Accident severity should not be an integrated part of the identification in BSM, but should be integrated in NSM due to more accidents at hazardous road sections than black spots. Severity should be integrated by weighting of the most severely injured in the accident. The accidents should be divided into three severity categories, which are weighted by use of monetary valuations and the average number of injured of a given severity in the different categories.

Accident analysis

The analysis stage in BSM and NSM should as a minimum consist of a general accident analysis, drawing and analysis of a collision diagram, a road inspection and relevant supplementary traffic and road analyses. It is suggested that the general accident analysis and the collision diagram in NSM should be combined into an extended collision diagram to identify local accident patterns that might “drown” in the average for the whole road section.

The general accident analysis and the collision diagram should be compared with the normal pattern of traffic accidents for the given type of location.

An active and written assessment should be made of whether the identified locations are true black or hazardous locations or not. This assessment can be based on a comparison of the results from the accident analysis and the road inspection, a comparison with the normal accident pattern, and by taking the result from the traffic and road analyses into consideration.

Evaluation of the treatment

When possible an evaluation of the actual treatment should be made. The evaluation itself should preferably be made as a before-and-after-study controlling for long-term trends in the number of accidents, local changes in traffic volume and regression-to-the-mean by use of correction factors. In addition it should be examined how evaluation of combined retrospective and prospective treatment in NSM can be done in a better way.