



The marking of bicycle crossings at signalised intersections

The idea behind marking bicycle crossings is to make car drivers look out for cyclists. Furthermore, the aim is to separate bicycles from vehicles within the intersection. A before/after accident study reveals that marking bicycle crossings at signalised intersections improves cyclists' safety.

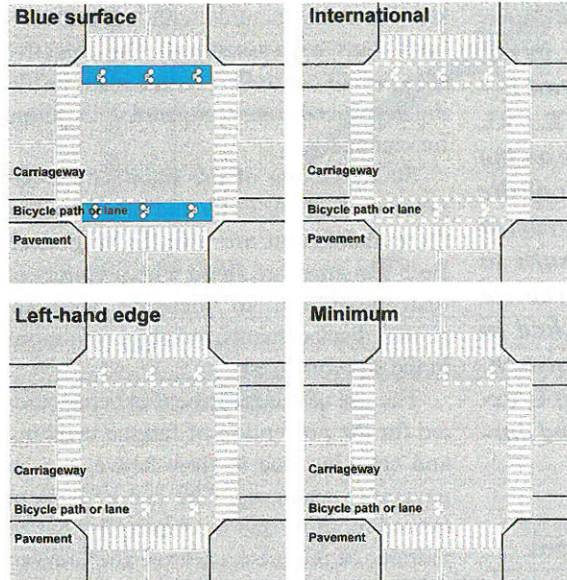
In Denmark marked bicycle crossings are often used to improve the safety and peace of mind of cyclists. Where a bicycle path or lane runs into an intersection, it is considered necessary to draw more attention to the conflicts between cyclists and vehicles. One solution is to mark the bicycle crossing with broad white broken lines or with a blue surface and bicycle symbols on the crossing. The blue surface is normally used at intersections where there are many cyclists and at intersections with a high risk for cyclists.

Results

The before/after accident study is based on 248 recorded accidents which occurred at 47 signalised intersections, where 111 bicycle crossings were marked over the period 1989–94. The accidents were divided into two groups. Bicycle and moped accidents, which could be affected by the marked bicycle crossings, were labelled **bicycle and moped**. The rest of the accidents were labelled **other**. It should be mentioned that other road measures, e.g. bicycle paths, were provided with the marking of bicycle crossings at some of the intersections.

The marking of bicycle crossings resulted in a significant reduction of 36% in the number of bicycle accidents. The number of killed and severely injured cyclists was reduced significantly by 57%. No changes in the number of moped and other accidents were observed. However, a small increase in other accidents was found due to an increased accident rate between left-turning cars and pedestrians.

Marked bicycle crossings seemed to have only a minor effect on the number of



The four types of marked bicycle crossings in the before/after accident study.

accidents between right-turning cars and cyclists going straight on. However, these accidents became less severe. The study reveals a reduction of approximately one-third in the number of accidents between left-turning cars and cyclists going straight on. The study also shows a reduction in the number of accidents between cars and cyclists going straight on.

The bicycle crossing marked with a blue surface is frequently used in Denmark. At the intersections where the blue surfaces were applied, the number of bicycle accidents was reduced by 38%, and the number of killed and severely injured cyclists decreased by 71%. The accidents related to the bicycle crossings marked only with broad white broken lines and bicycle symbols are too few to make an accurate statement about their safety effect.

Single accidents on slippery markings at intersections

A study of two-wheeler single accidents at intersections was carried out because it has been suggested that the markings may be slippery in wet road conditions and therefore constitute a risk. Reading the descriptions of some 738 police recorded accidents indicates that markings at intersections are rarely the cause of the accident. Only two descriptions led to the conclusion that

markings caused the accident. In both cases, the zebra crossings were mentioned and both accidents happened in wet road conditions. It is safe to say that markings at intersections, e.g. marked bicycle crossings, do not increase the number of police recorded single accidents perceptibly where two-wheelers crash because of slippery markings.

Bicycle	Expected	Observed
Accidents	53	34
Killed	2	0
Severely injured	24	11
Slightly injured	11	14

The number of expected and observed killed and injured cyclists and bicycle accidents after the application of marked bicycle crossings at signalised intersections.

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