

# Road-edge delineation in rural areas: effects on driving behaviour

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## **Abstract**

Drivers driving on lower-class Dutch rural roads without any delineation more frequently drift off the road with their right-hand side tires, thus invoking damage to the edge of the pavement or even ending in an accident. In two experiments, two experimental types of road-edge delineation, one with continuous and one with dashed edge lines, were compared with two control roads, one without lines and one with only a dashed line on the road axis. The first experiment consisted of non-obtrusive video recordings of passing traffic. Vehicle position on the experimental roads was found to be more to the road's centre than on the control roads. The second experiment was a driving test with an instrumented vehicle, during daytime lighting and during darkness. Again, it was found that vehicle lateral position was more central on the experimental roads, especially during darkness. Subjects safely passed oncoming vehicles. Driving speed increased on the experimental roads, compared with the unlined control road, but not beyond speeds found on the axis-lined control road. Driver's mental effort while driving over the experimental roads did not differ from effort while driving over the control roads. Subjectively rated effort was higher for the unlined control road than for the three other roads. Subjects preferred the edge-lined roads to the unlined control road, but not over the axis-lined control road. It was concluded that edge-lines may provide a simple and effective way to induce a more favourable lateral position on rural roads without having negative effects on subjective appraisal, driving performance and mental workload.

## **Introduction**

In the Netherlands roads outside the built-up area are discriminated between by a road classification system. Inherent to this classification is a set of rules for the delineation of these roads. The lowest-level roads with a width under 4.5 m have no lines at all, or a dashed axis line where the road width lies between 4.5 and 5.8 m. Roads broader than 5.8 m have edge lines, but only in addition to an axis delineation. There is no road-class for roads that have only edge lines. The narrow roads in the rural areas are characterised by a great variety of appearances, which may make it very difficult to estimate which traffic situations to expect (Steyvers & Radersma, 1993; Steyvers, in press). The main problem, put forward by the road maintenance authorities, is that drivers have difficulties in following these roads. They drift off the road surface with the right-hand wheels of their vehicle. This causes damage to the