

Intersection accidents in Japan

Nobuyuki Uchida
Japan Automobile Research Institute (JARI)
Ibaraki
Japan

Abstract

In Japan, many fatal accidents with two vehicles at crossroads happen at intersections with good visibility, such as those located in rice fields. The present study investigated a possible causative factor of these accidents from the perspective of visual search performance, and one possible countermeasure to prevent these accidents was examined. Two experiments were conducted using the advanced driving simulator of the Centre for Environmental and Traffic Psychology (University of Groningen). In the experiments typical sceneries of rice field intersections were projected on a 165 degrees horizontal screen. It has been found that a vehicle on collision course appears not to move but remains static in the other driver' s peripheral visual field. In the first experiment, peripheral vision's detection performance of both a vehicle on collision course, and of a vehicle not on collision course were studied. It was shown that a vehicle that is not on collision course can be easily detected. On the other hand, the detection of a vehicle on collision course was much more delayed, especially when the object was further in the peripheral visual field. In the second experiment, the effect of road side fences on the detection of a vehicle on collision course was studied. Fences were set along the road side of the crossing path, making a vehicle on collision course abruptly appear from behind a fence. With fences, the detection was earlier than without fences.

Introduction

In Japan, along with the development of motorization, many rural roads in rice field areas have been improved. Some of such roads are used as a by-path in order to avoid the main road congested with traffic. Although these rural roads have a lot of intersections, every few hundred meters usually, it is seemingly not such a problem to use them because of their good overview (figure 1). There are no obstacles (e.g. trees, houses or buildings) which blocking the view of drivers in detecting potential hazards. However, many fatal accidents involving two vehicles at crossroads occur at these intersections with good visibility.

Recent research estimates indicate that the number of the fatal accidents is above four hundred per year (Fujita et al., 1998). This is about 5% of the total annual fatalities that occur in Japan. An in-depth study which investigated causative factors of this type of accidents reported that 56% of accidents occurred because of 'failed to detect the other vehicle on collision course' (Takubo, 1998).