

Lateral Position of Vehicles on Road in Winter Conditions

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Aim of the present study is to obtain basic knowledge on lateral control in winter driving environment. We measured the displacement from the lane center position from the road frontal image recorded by the on-board video camera. Also, influencing factors on the lateral deviation, such as road alignment, were analyzed.

The present study developed a method to quantify the degree of deviation from the center of the lane (hereinafter referred to as lateral deviation) by obtaining the location of tracks (ruts) formed on the road surface in the actual winter road environment using images captured by an on-board video camera installed on the dashboard of the survey vehicle.

Fig. 1 shows the results of lateral deviation for National Highway 39. The left side (shoulder side) deviation is positive and the right side (center line side) deviation is negative, based on the lane center position. Lateral deviations were positive at almost all points. Most of the travel paths deviated to the shoulder side, and the lateral deviations were negative at only two locations. The results of the measurement revealed that the lateral deviation of the vehicle pass to the shoulder side is large in the winter driving environment. In particular, the lateral deviation to the shoulder side was greater in curved sections than in straight sections. It is supposed that the drivers' fear of passing an oncoming vehicle may affect the lateral deviation of the travel track.

Based on the results of this study, it is considered that deviation from the center of the trajectory can occur when the road surface becomes icy or snowy. It is desirable to be able to control the lateral direction of traveling on the snow and ice trajectory where the travel resistance is low and the paved road surface is exposed.

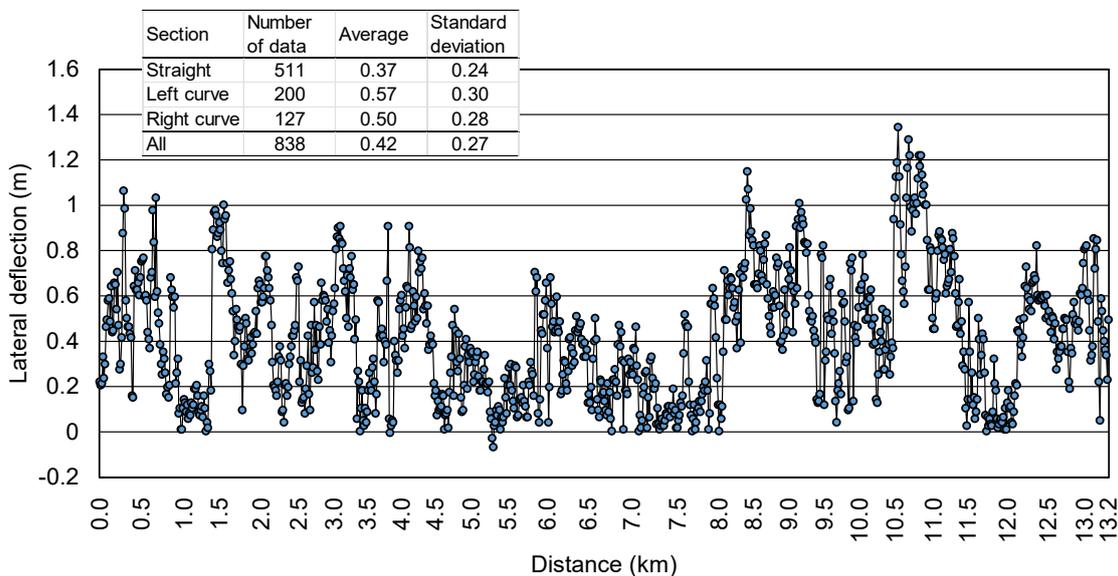


Fig.1 Measured lateral deflection in terms of distance (KP) on National Route 39.