

Examination of Merging for Avoiding Contact Risk by the Vehicle Trajectory Data Observed

Takashi Kodama¹⁾ Pencreach Yoann²⁾ Shin Hashimoto³⁾ Masakazu Nakanishi³⁾ Jun Tanabe³⁾

1) Hanshin Expressway Company Limited

3-2-4, Nakanoshima, Kita-ku, Osaka, 530-0005, Japan (E-mail: takashi-kodama@hanshin-exp.co.jp)

2) FORUM8 Co., Ltd.

2-15-1, Konan, Minato-ku, Tokyo, 108-6021, Japan

3) Regional Futures Research Center

1-5-17, Dojima, Kita-ku, Osaka, 530-0003, Japan

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At the Hanshin Expressway, in past years, we investigated a method to evaluate the contact risks between vehicles during merging, using vehicle trajectory data observed.

This time, with the goal of quantitatively grasping trends in the occurrence of various risks during merging and quantifying the know-how that contributes to safe driving, as a first step, we focused on the fact that the relative relationship (relative velocity - GAP) between the vehicle ahead (behind) and the merging vehicle differs depending on whether or not the contact risk occurs. Then, at the target merging section, the relationships between vehicles that are less likely to occur the contact risk were organized.

By using this result, even in a mixed environment where both automated and manually driven vehicles coexist, it is possible to search for vehicle ahead and vehicle behind that belong to the avoiding risk area at the merging area. If the velocity is adjusted so that the relative relationship can be secured and the vehicle flows into the GAP, it will be possible to cope with some unexpected behavior of the manually driven vehicle, so the possibility of safe merging increases.

In addition, in the over and wait type merging, it is possible that there was a safer merging order than actual results. In this way, in order to realize safer merging, it was suggested that it may be necessary to focus on the relative relationship between the vehicle ahead (behind) and the merging vehicle during merging, improve it, and review the merging order based on this.

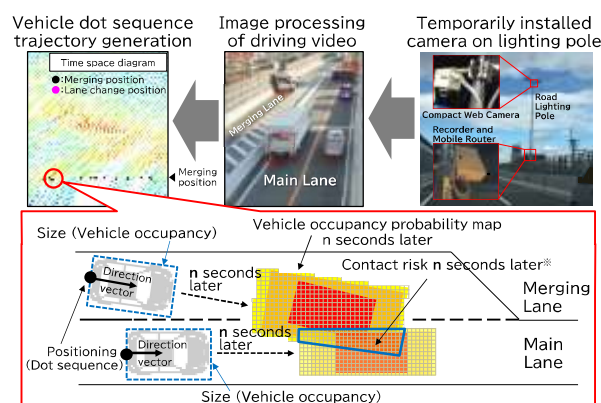


Fig.1 Overview of the contact risk

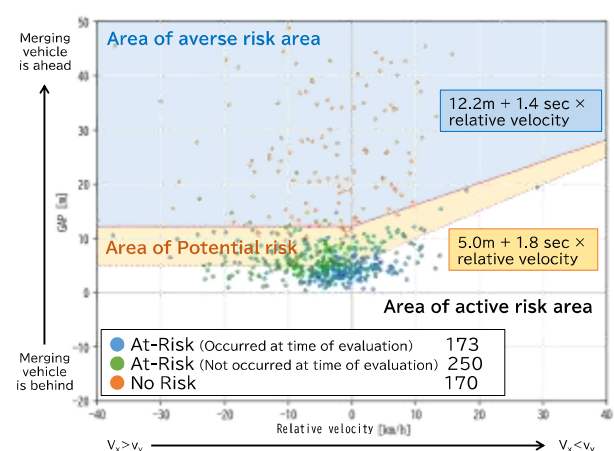


Fig.2 Area of risk with vehicle ahead

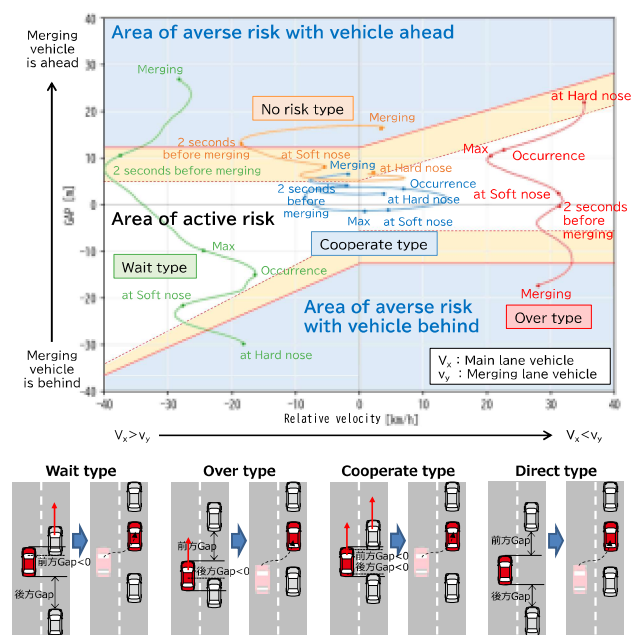


Fig.3 Transition of merging vehicles by type in risk areas