

Research Trends and Results

Studying the application of probe data to traffic safety measures

OZAKI Yuta, Researcher
YATA Junichi, Guest Research Engineer
YABU Masayuki, Head
Advanced Road Design and Safety Division, Road Department

(Key words) Traffic safety measure, probe data

1. Introduction

Traffic safety countermeasure projects are carried based on a PDCA cycle consisting of identifying black spots, analyzing causes of the accidents and planning countermeasures, implementing countermeasures, evaluating their effectiveness, and studying and taking supplementary countermeasures, in order to take more effective countermeasures. In the PDCA cycle, it is standard procedure to identify black spots and evaluate countermeasure effectiveness based on accident data. But because traffic accidents occur rarely, a long period of time is required to collect stable accident data.

So at the National Institute for Land and Infrastructure Management, the data properties of various kinds of probe data are organized in order to study methods of effectively identifying black spots.

2. Relationship of abrupt deceleration data with accidents

Figure 1 used abrupt deceleration data from probe data provided by Honda Motor Co., Ltd. to organize and prepare a distribution map of the relationship of the frequency of abrupt deceleration of 0.3G or higher with the number of accidents causing death or injury at every basic road link of DRM in a certain region (below, called “DRM link”). Figure 1 shows that the relationship of the frequency of abrupt deceleration with the number of accidents causing death or injury is greatly scattered and it is difficult to discover a fixed correlation.

So it was decided to narrow the focus to a specified route to compare the frequencies of abrupt deceleration and the numbers of accidents causing death or injury at each DRM link to confirm the correlation. In Figure 2, the relationships of the frequency of abrupt deceleration with the number of accidents causing death or injury at each DRM link are organized in parallel by focusing on a certain section of an arterial road. Overviewing the relationship of the two phenomena in Figure 2 shows that at locations where the number of accidents causing death or injury is higher than it is at other DRM links, abrupt decelerations tend to occur often, and at locations where accidents causing death or

injury are rare, abrupt decelerations tend to occur rarely.

Examining each section in detail reveals that there are characteristic links where, even though accidents do not occur very often, at No. 17 in Figure 2 for example, the frequency of abrupt decelerations is far higher than it is at surrounding DRM links.

Figure 1. Relationship of Frequency of Abrupt Decelerations of 0.3G or more with Number of Accidents Causing Death or Injury

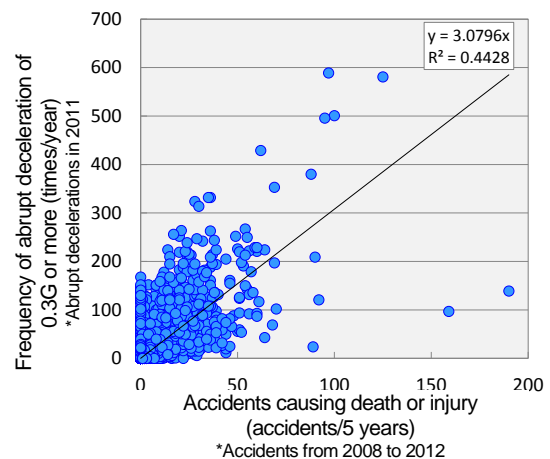
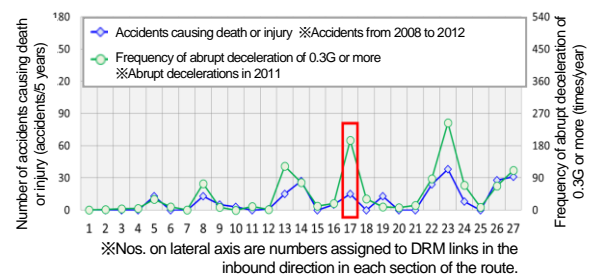


Figure 2. Number of Abrupt Emergency Decelerations and Number of Accidents Causing Death or Injury of Each Basic Road Link of DRM on Arterial Roads



3. Conclusions

In abrupt deceleration data, a correlation with accidents was seen in certain narrow sections. But even in sections which are narrow to a certain degree, there are many locations where the frequency of emergency deceleration occurrences in relation to accidents is much higher than at surrounding locations. It is assumed that the characteristics of occurrence of abrupt decelerations of this kind are also impacted by the road structure etc. In the future, factors such as road structures which impact the characteristics of the occurrence of abrupt decelerations of this kind will be clarified, and the analysis of its relationship with accidents and other studies of its application to the abstraction of accident hot spots will be carried out.