

# Method of Using ETC2.0 Probe Information for Traffic Safety Measures

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## 1. Introduction

The Ministry of Land, Infrastructure, Transport and Tourism ("MLIT") has been studying traffic safety measures using the data showing the points of sudden deceleration (sudden deceleration data), which is obtained from ETC2.0 probe information, etc. The sudden deceleration data is considered to include not only hard braking to avoid an accident, which is one of the hazardous events close to accident, but simple hard braking in other cases. Similarly, hazardous events are considered to include actions to avoid an accident without using hard braking, situations where two cars suddenly approach to each other without evasive action, etc., as well as actions to avoid an accident by hard braking. It is therefore important to handle the sudden deceleration data properly after understanding such characteristics when using the data.

To this end, NILIM has been grasping the characteristics of occurrence patterns in sudden deceleration and hazardous events. Specifically, occurrence patterns are organized with regard to (a) Non-hazardous events collectible from the sudden deceleration data, (b) Hazardous events collectible from the sudden deceleration data, and (c) Uncollectible hazardous events.

## 2. Grasp of the occurrence patterns of sudden deceleration events and hazardous events using drive recorder data

We analyzed the driving recorder data from the event-recording type and constant-recording type of recorders to grasp occurrence patterns of sudden deceleration events and hazardous events (Refer to Fig. 1). In this study, "sudden deceleration event" was defined as "event where hard braking occurred with the longitudinal acceleration of  $-0.3\text{ G}$  or less" and "hazardous event" was defined as "event with risk of collision, such as action to avoid an accident or close approach of cars."

The event recording drive recorder records video, acceleration data, etc. when sudden deceleration occurred, which enables organization of the occurrence patterns of hazardous events collectible from the sudden deceleration data (B in Fig. 1) and non-hazardous events (A in Fig. 1). The constant recording drive recorder always records video,

acceleration data, etc. during traveling, which enables observation of hazardous events regardless of the extent of sudden deceleration and organization of the occurrence patterns of hazardous events uncollectible from the sudden deceleration data (C in Fig. 1). This study analyzed about 2,000 cases of sudden deceleration events recorded in the event recording drive recorder and about 500 cases of hazardous events observed during 2,000 hours recorded in the constant recording drive recorder.

The result of this analysis showed that non-hazardous events (A) collected from the sudden deceleration data include deceleration behaviors at a stoplight or before right / left turn and that hazardous events (C) uncollectible from the sudden deceleration data include contact avoidance with a bicycle / pedestrian or crossing collision with a bicycle (risk aversion by bicycle).

## 3. Future study

In the future, in order to use the sudden deceleration data effectively, we intend to analyze the characteristics of vehicle behaviors, peripheral environment, etc. in the event of sudden deceleration using the event recording drive recorder data and study a method of discerning whether an action of sudden deceleration corresponds to a hazardous event (distinguish whether A or B).

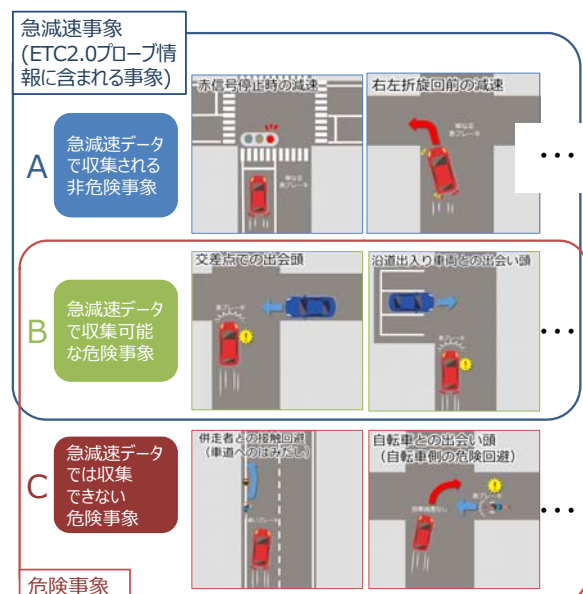


Fig. 1: Occurrence patterns of sudden deceleration events and hazardous events