

Understanding the characteristics of road traffic accidents in Thailand Analysis based on Hiyari-Hatto reports

*Takeru Miyokawa¹, Tuenjai Fukuda¹, Atsushi Fukuda¹, Satoru Kobayakawa¹, Paramet Luathep²

Abstract: In Thailand, the fatality rate of traffic accidents is very high, more than 9 times that of Japan. In order to proceed with effective traffic accident countermeasures under such circumstances, it is necessary to grasp what type of traffic accidents are frequently occurring. However, except for roads under jurisdiction of the Department of Highway, analysis by traffic accident type has not been sufficiently conducted, so it is not possible to grasp what type of traffic accidents are common in Thailand. Therefore, in this study, based on the Hiyari-Hatto experiences obtained in the Hiyari map development workshop, we grasped the Hiyari-Hatto events that occurred frequently. Then, we clarified the characteristics of traffic accidents by analyzing those Hiyari-Hatto events in Thailand.

1. Introduction

In order to efficiently implement countermeasures to reduce the increasing number of traffic accidents, it is necessary to understand the causes of traffic accidents in detail. In Thailand, traffic accident data has been collected by the related organization and agency independently. However, collision diagram has not been recorded in most of database, except HIMS by DOH. Thus, we employed Hiyari-Hatto experience instead of traffic accident data to identify typical collision types. Hiyari-Hatto data is data based on subjective evaluation and is not completely coincident with the traffic accident data, but is effective data for grasping the tendency for each traffic accident type. Thus, we collected Hiyari-Hatto experience by organizing Hiyari Map development workshops and identify typical accident types by classifying them into collision types.

2. Collection of Hiyari-Hatto experiences by Workshops

We use Hiyari-Hatto data collected at the workshops organized in Spumburi, Chainato, Saraburi, Nakon Rachashima and Khonkaen by ATRANS, IATSS and Nihon University.

On the workshop, concept of Hiyari-Hatto was explained first. Then, the participants of workshop were requested to identify Hiyari-Hatto spots in terms of driving a car, riding motorcycle, and walking by putting stickers with different colors on the map. Identified Hiyari-Hatto spots were summarized in the three maps. At same time, the participants had to draw Hiyari-Hatto situation like as collision diagram for one typical case. As we explain later, collision types were identified based on drawing and classified into same type.

3. Improvement of Collision Diagram

We arranged the Hiyari-Hatto data mentioned above in correspondence with the Collision Diagram Classification Table. The Collision Diagram is a diagram that represents the form of a traffic accident. The Classification Table is developed based on the classification of traffic accidents and road characteristics.

At first, we tried to arrange the collected Hiyari-Hatto events in the Collision Diagram Classification Table created by the Office of Transportation and Traffic Planning and Policy (OTP), Ministry of Transport in the past. However, since there were many uncorresponding events, we reviewed the classification of the Collision Diagram and added the necessary diagrams to the Classification Table. In addition, some drawing in the Classification Table were difficult to understand, so the way of expression was improved. These activities were carried out by exchanging opinions several times with a group of Dr. Paramate of Prince Songkla University, Thailand. New events in particular are very common in Thailand, such as events related to motorcycle accidents and U-turn lanes on the main highway. The characteristics of the Hiyari-Hatto events that occurred in Thailand were clarified from the updated Collision Diagram Classification Table.

As a result of aggregating Hiyari-Hatto data, it was found that Hiyari-Hatto events can be mainly classified into pedestrian

1 : Department of Transportation Systems Engineering, CST., Nihon-U. 2 : Department of Civil Engineering, Prince of Songkla University

Table 1. the Collision Diagram Classification Table

| Pedestrian | Intersection vehicle from adjacent approaches | Vehicle from opposite direction | Vehicle from one direction | Maneuvering | Overtaking | On path | Off path on straight | Off path on curve | Miscellaneous | Motorcycle accident |
|--|--|--|--|--|--|--|---|--|--|---|
| 000 OTHERS Other pedestrian accidents | 100 OTHERS Other intersection accidents | 200 OTHERS Other opposite direction accidents | 300 OTHERS Other one direction accidents | 400 OTHERS Other maneuvering accidents | 500 OTHERS Other overtaking accidents | 600 OTHERS Other on path accidents | 700 OTHERS Other off carriageway accidents on the straight | 800 OTHERS Other off carriageway accidents on the bend | 900 OTHERS Other passenger and miscellaneous accidents | 090 OTHERS Other accidents caused by motorcycles |
| 001 Hit pedestrian from rear side | 101 Through hits through traffic from adjacent approach | 201 Head on | 301 Rear end in the same lane | 401 Hit with vehicle leaving the parking | 501 Head on with overtaking vehicle | 601 Hit parked vehicle | 701 Off carriageway to the left | 801 Off carriageway during on the right bend | 901 Fall in from vehicle | 091 Frontal collision with a motorcycle running backwards |
| 002 Hit pedestrian emerging in front of back of parked vehicle | 102 Right turn hits through traffic from adjacent approach | 202 Right turn hits through traffic | 302 Rear end during left turn | 402 Hit with vehicle entering the parking | 502 Out of control during overtaking | 602 Hit double parked vehicle | 702 Off carriageway to the right | 802 Off carriageway during on the left bend | 902 Hit train | 092 Collision with a vehicle in the opposite lane while crossing an intersection |
| 003 Hit pedestrian from far side | 103 Left turn hits through traffic from adjacent approach | 203 Right turn hits left turn traffic | 303 Rear end during right turn | 403 Hit during parking | 503 Hit by overtaking vehicle during going straight | 603 Hit car door | 703 Off carriageway to the left and hit the fixed object | 803 Off carriageway and hit the fixed object during on the right bend | 903 Hit railway crossing fence | 093 Collision with a vehicle in the opposite lane while crossing an intersection |
| 004 Hit pedestrian playing, working, lying, standing on carriageway | 104 Through hits right turn traffic from adjacent approach | 204 Right turn hits right turn traffic | 304 Rear end during U-turn | 404 Hit with reversing vehicle | 504 Rear end by overtaking vehicle during pulling out | 604 Hit permanent obstruction | 704 Off carriageway to the right and hit the fixed object | 804 Off carriageway and hit the fixed object during on the left bend | 904 VEHICLE MOVEMENTS NOT KNOWN Vehicle movement not known | 094 Collision between vehicle 2 and motorcycle turning right from blind spot |
| 005 Hit pedestrian walking with the traffic | 105 Right turn hits right turn traffic from adjacent approach | 205 Left turn hits through traffic | 305 Side swipe in parallel lane | 405 Hit fixed object during reversing | 505 Rear end during cutting in | 605 Hit temporary roadwork or other objects | 705 Out of control on carriageway | 805 Off carriageway at the access on the left bend during left turn | 905 Downhill Collision with obstacles | 095 Collision between vehicle 2 and motorcycle turning right from blind spot |
| 006 Hit pedestrian walking against the traffic | 106 Through hits left turn traffic from adjacent approach | 206 Left turn hits left turn traffic | 306 Hit by vehicle changing lane to the right | 406 Hit vehicle leaving driveway | 506 Rear end during overtaking to the left | 606 Hit broken down or accident vehicle | 706 Off carriageway at the access on left side during right turn | 806 Off carriageway at the access on the left bend during right turn | 906 Downhill Frontal collision with on coming vehicle | |
| 007 Hit pedestrian at zebra crossing | 107 Right turn hits left turn traffic from adjacent approach | 207 Through hits U-turn traffic | 307 Hit by vehicle changing lane to the left | 407 Hit vehicle from footway | 507 Rear end by pulling out vehicle | 607 Hit the animal | 707 Off carriageway at the access on left side during right turn | | 907 For pedestrians getting on and off Rear-end collision | |
| 008 Hit pedestrian in footway | 108 Left turn hits left turn traffic from adjacent approach | 208 A vehicle 1 that makes a U-turn involves a vehicle 2 that goes straight | 308 Vehicle making through or right hit by another vehicle making right turn | | 508 Hit by overtaking vehicle during right turn | 608 Hit the falling object from loading vehicle ahead | 708 Mounts the traffic island | | | |
| 009 Hit pedestrian during turning in the access or minor road | | | 309 When vehicle 2 goes straight and turns left, vehicle 1 also turns left and collides | | | 609 Hit opposing vehicle driving illegally | 709 Off carriageway due to opposing traffic | | | |
| | | | 310 Hit vehicle pulling out | | | | 710 Off carriageway and across median | | | |
| | | | 311 When vehicle 1 makes a U-turn, it collides with vehicle 2 that goes straight | | | | | | | |

accidents, intersection accidents (lateral direction, opposite direction), accidents when traveling in one direction, accidents due to start/parking, accidents due to overtaking, accidents by obstacles, accidents due to inability to control, accidents on curves, other accidents, and motorcycle accidents. In particular, in the Collision diagram classification table, there are many event on No.101; an encounter accident at the intersection, No.202; a collision between a straight car and a right turn car at the intersection, and No.311; a collision with a vehicle in the opposite lane during the U-turn. In Thailand, there are few signalized intersections, and there are many intersections with blind spots, so event classified into No.101 was the most reported.

4. Utilize of Collision Diagram

From the above results, we were able to grasp the characteristics of the Hiyari-Hatto event in Thailand using the collision diagram. The results of these Hiyari-Hatto events are expected to be used to some extent for traffic accident countermeasures in Thailand. Currently, we are working on comparing traffic accident data from DOH with the results of the current survey, and we believe that this result will confirm how much the features we have learned from Hiyari-Hatto events correlate with actual accidents. Finally, we can now display the Collision Diagram Classification Table within the ATRANS safety map apps, so we will collect more events and proceed with further analysis.

5. Reference

[1] Tuenjai Fukuda, Atsushi Fukuda and Makoto Okamura : Effort to Raise Awareness of Traffic Safety Using Hiyari Map Development in Thailand, IATSS Review, Vol. 32, No. 4, pp.291-298