

## Early Verification of Effectiveness of Traffic Safety Countermeasures Based on Traffic Behavior

OZAKI Yuta, Researcher

KAMIYA Sho, Visiting Researcher, TAKAMIYA Susumu, Head (Dr. (Arts & Science))  
Road Division, Road Traffic Department

(Key words) Traffic behavior, early verification of effectiveness of countermeasures

### 1. Introduction

The widely used method of verifying the effectiveness of a traffic safety countermeasure is to compare the number of accidents before and after the countermeasure is taken using traffic accident data, but because traffic accidents occur very rarely at individual locations such as intersections, it takes a long time, many years in fact, to collect the traffic accident data necessary to verify the effectiveness of countermeasures. So there are cases where the effectiveness of a countermeasure is quickly verified by, in addition to referring to traffic accident data, analyzing traffic behavior to efficiently manage traffic safety.

The Road Division has, based on a number of trials of countermeasure effectiveness evaluations done based on analysis of traffic behavior, organized concepts guiding this approach to prepare a guideline on evaluating effectiveness based on traffic behavior analysis.

### 2. Preparing the guideline

The handbook organizes the traffic behavior analysis procedure, outlines and methods of obtaining and using evaluation indexes, and analysis method, and case studies of the use of the method at individual locations. It introduces a variety of evaluation indexes including traveling speed and collision area entrance time difference, etc. Here “collision area entrance time difference” means the difference between the times that potential victims of an accident, a pedestrian walking in a pedestrian crossing and a car turning left or right, or a car turning right and a car coming from the opposite direction for example, each enter the area where they may collide, and is an index of the danger of an accident based on the rule: the smaller the difference, the greater the danger. Figure 1 is a schematic figure showing the collision area

entrance time difference of a pedestrian walking in a pedestrian crossing and a car turning left.

### 3. Example of analysis of effectiveness of a countermeasure based on traffic behavior

As a countermeasure for a place where cars turning left have collided with pedestrians crossing in a pedestrian crossing zone, the corner radius was reduced to slow the left turn speed, and a video camera was used to measure and analyze a number of evaluation indexes based on traffic behavior before and after the countermeasure.

Figure 2 shows change of the collision area entrance time difference after the countermeasure. After the countermeasure was taken, the collision area entrance time difference was larger and the particularly dangerous phenomenon of less than 2 seconds was observed less often.

Figure 3 shows the change of the traveling speed during left turning after the countermeasure was taken. The percentage of cars turning left at the high speed of 30km/h or more fell after the countermeasure.

The results of collecting accident data for several years and comparing the number of accidents before and after the countermeasure was taken after evaluating the effectiveness of the countermeasure by analyzing traffic behavior at the location, show that accidents fell from 1.75/year to 0.75/year, showing that it is possible to estimate the effectiveness of a traffic safety countermeasure by evaluating the effectiveness of countermeasures based on traffic behavior.

### 4. In Conclusion

The guideline is counted on being used as reference material by regional development bureaus to quickly evaluate the effectiveness of countermeasures based on traffic behavior analyses.

Figure 1. Schematic Figure of Evaluation Indexes

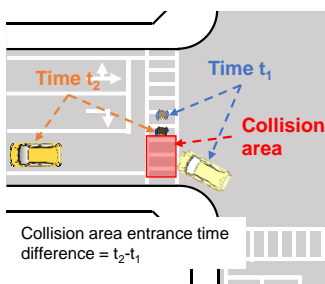


Figure 2. Comparison of Collision Area Entrance Times Before and after Measure

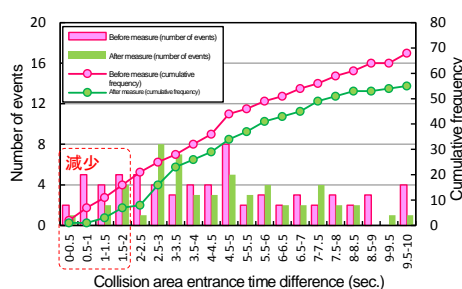


Figure 3. Comparison of Left-turn Traveling Speed Before and after Measure

