Interim evaluation report (draft): Traffic Safety Research Subgroup

1. Objectives

This Research has the following three objectives.

(1) Manifestation and systematization of knowledge on traffic accidents

We will carry out detailed demonstration analyses of the causes and mechanisms of traffic accidents, and build a database on accidents by cause and by mechanism. Then, by utilizing this database in coordination with the Geographic Information System (GIS), etc., we will process the information so that it is more easily understood by common citizens, as well as by relevant personnel, and will then present it.

(2) Survey on other countries' social systems related to traffic safety

We will survey other countries' systems that investigate the social structures for preventing the recurrence of accidents, as well as the bearing of responsibilities related to accidents, and then will conduct evaluations, including those relating to social background factors that lead to differences and/or similarities with Japan. We will also extract various measures used to enhance safety that have not yet been implemented in Japan.

(3) Examination of the development of a system for comprehensively evaluating traffic safety programs, and analysis of what form future traffic safety programs should take, based on this system

We will extract measures for enhancing traffic safety in Japan from analyzing other countries' survey findings outlined in (2) above, and, by combining these extracts effectively, we will comprehensively evaluate, using the system developed in (1), to what degree they can contribute to reducing traffic accidents. Moreover, we will use these results to propose future traffic safety measures for Japan.

2. Members

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3. Target achievements

The ultimate goal of the Traffic Safety Research Subgroup is to obtain the

knowledge/information and the technology/tools needed to effectively achieve “traffic safety,” which is a social objective. Specific outcomes that are expected from this research are as follows.

3-1. Development of a system for evaluating traffic accident countermeasures

Using traffic accident risk analysis models as the basis, a system for evaluating traffic accident countermeasures incorporating GIS will be developed. This system will be made available on the web. Citizens and various entities related to traffic safety will be able to learn the actual status of traffic accidents. As a result, moreover, citizens will be able to adjust their traffic behavior due to their knowledge of the actual status of traffic accidents. On the other hand, various entities related to traffic safety will be able to carry out appropriate traffic accident countermeasures by sharing greater amounts of traffic accident information and will be able to contribute to enhancing traffic safety as a result.

3-2. Development of a system for comprehensively evaluating traffic safety programs

Using a system for evaluating traffic safety programs as a basis, we will construct a system for comprehensively evaluating traffic safety programs that can appropriately evaluate the cost efficiency of various traffic safety program options. By using this system, we can study traffic safety measures from a comprehensive perspective, thereby contributing to appropriate decision making by planners, policy planners, and NPOs, etc., related to traffic safety.

3-3. Proposal of new traffic safety program options

Through surveys of other countries that implement advanced traffic accident countermeasures, we will discover new program options not yet carried out in Japan, and will present new traffic safety program options based on them. By using a system for comprehensively evaluating traffic safety programs, we can propose measures that should be tackled anew in a specific region after comprehensively evaluating various traffic safety measures carried out in that region.

4. Status and self-evaluation

4-1. Manifestation and systematization of knowledge on traffic accidents

This topic was studied according to the following three steps.

(1) Construction of an accident risk analysis model

We improved the accident risk analysis model that had been studied at the research office to which the members in charge are affiliated. This model was created, based on a total of 3,838 accidents that occurred at 190 intersections (with traffic signals) within Tokyo between 1992 and 1994. It uses, as explanatory variables, factors such as traffic volume, traffic signals/regulations, a road's contour and number of traffic lanes, and the surrounding environment, and calculates the risks of traffic accident occurrence at four-way (four-leg) intersections. To be more precise, the model takes note of the accident occurrence process according to the type of accident (such as rear-end collision, an accident between a car turning right and a car heading straight ahead, an accident between a vehicle and pedestrian, and a bicycle accident), and calculates the number of traffic accidents that are expected to occur for each leg of the intersection. Explanations are provided using ten types of explanatory variables (the database has about 150 different types of explanatory variables). This model has proven that risks can be estimated for about 70% of all intersections.

(2) Construction of a countermeasure evaluation system

We used the above accident risk analysis model to create a system that can be operated easily with the Geographic Information System (GIS). In other words, with the purpose of making our research results useful in real life, we designed the system, first and foremost, from the perspective of the users (such as people in charge of devising traffic accident countermeasures, as well as road managers) to enable easy operation and data expansion/updates. The characteristic of this system is that, instead of displaying on the GIS the traffic accidents themselves that have occurred, it displays accident risks. This way, the privacy related to each accident case can be protected. At the same time, this characteristic makes it possible to evaluate, in more scientific terms, traffic accident countermeasures that until now had relied on a person's intuition and experience.

(3) Running the countermeasure evaluation system on the web

We anticipated that the countermeasure evaluation system mentioned above would be processed and presented in ways that the general public could understand easily. We therefore designed the system so that it could be displayed on the web. Although users cannot expand or update the data and targets, they can see at a glance what type of accidents occur and for what reasons they occur at major intersections in each region. By looking at this website, people can increase their awareness on traffic safety. At the same time, knowledge on traffic accidents and their countermeasures can be shared among various entities, such as administrators of traffic and roads, drivers, and area residents. This makes it easier for them to hold

meaningful discussions based on scientific fact and knowledge. As a result, various traffic accident countermeasures can be implemented more easily, and traffic safety can ultimately be expected to be enhanced.

4-2. Survey on other countries' social systems related to traffic safety

In 2002, the number of traffic accident victims in Japan fell for the first time in twelve years, both in terms of the number of accidents and casualties. Although the number dropped to one-half that of peak periods, the situation is still serious and should by no means be viewed without concern. From now on, with the aging of the population, there will be an increase in people who are vulnerable from a standpoint of traffic safety. The number of victims is therefore anticipated to grow. Unlike these situations in Japan, the UK has in recent years shifted its policies and succeeded in dramatically reducing the number of traffic accidents. Of the industrialized nations, the UK has very few victims and traffic accident occurrences.

Therefore, for this survey, we have aimed at investigating and analyzing the factors that led to the reduction seen in the UK, which is said to have succeeded in its traffic safety measures, and, based on comparisons with Japan, we aimed to investigate the key factors for reducing future traffic accidents, as well as what form future policies should take.

(1) The UK's traffic safety measures as seen from its administrative and road policies

After the 1980s, the UK underwent major changes regarding administrative organization and business structure as a result of a change in government policies. To introduce the mechanism of market economy into the administration, the country installed a system for establishing independent administrative corporations (that separated policy making departments from policy implementation departments), the New Public Management System, and a system called the Citizen's Charter. Through measures such as these, improvements were made to make public services more efficient and higher in quality. When we compare the UK's general administrative/business planning systems and road management system with Japan's systems related to traffic and road planning, we find that the UK's systems possess the following qualities not found in those of Japan: (a) clear-cut goal setting, (b) business evaluation system, and (c) collaborations between various institutions, among others.

As the basic concepts of designing traffic policies and road planning systems in the UK, these three items are being reflected in "turning the Highway Agency into an independent administrative corporation" separate from the central government; in

the Traffic Calming project that serves as a traffic safety countermeasure in city areas; in the White Paper on New Transport (1998) aimed at decreasing the use of automobiles as a means of transportation and at promoting the use of public transportation; and in other items.

(2) A system for realizing traffic safety policies in the UK

- Road planning for the benefit of road users

  The UK's road plans place importance on the collaboration between the central government and road managers/citizens. When road plans are drawn up, they are done systematically in line with Route Management Strategies (RMS). That is, the issues and problems of various routes are shared with area residents, beginning at the concept stage, to come up with collaborative road plans that are rooted in the regional community. Under the RMS, evaluations are made mostly based on achievements. A numerical goal is set for each route, with emphasis placed on the degree of fulfillment. Through this system, countermeasures and implementation plans that cater to the specific area are created.

- Securing of road safety

  One of the unique characteristics of the UK's road planning is the system of Road Safety Audits, or RSA. Under this system, an auditing team comprised of traffic safety experts conducts inspections during various stages of the road-designing process. If an auditing team detects a problem, the road designer makes modifications accordingly. Roads that were targets of auditing incorporate evaluation data such as accident records that are provided through monitoring activities conducted after the roads are opened for service RSA is a system of auditing that focuses on safety performance. It was established as a system during the early 1990s, with the objectives of enhancing safety and reducing overall costs. The UK was the first in the world to introduce this system, and the concept is rapidly spreading, most notably in the EU countries.

  Therefore, reduction of traffic accidents in the UK was made possible by RMS and RSA, which are systems of planning and auditing that support these business measures and road developments/improvements. As perspectives necessary for traffic safety measures in Japan, creation of frameworks for cooperative road planning with roadside residents, as well as for new road planning that incorporates road safety auditing systems, would become necessary.

4-3. Self-evaluation

First, our traffic safety research can be evaluated as having produced almost unprecedented, innovative results never before seen in Japan. This was because (1) we improved a model that can clearly show the circumstances and mechanisms of traffic accident occurrences at intersections and used it to develop a system that can display the information on a GIS, and (2) we enabled this system to be seen on the web, allowing the general citizens and persons concerned to clearly understand various information on traffic accidents. We can also use this system to analyze what influence the provision of information on traffic accidents has on general citizen's awareness and behavior. In this respect, we strongly expect this survey research to develop and expand even further in the future

Second, we investigated in detail traffic safety policies recently implemented in the UK and learned the actual status of such policies. At the same time, by comparing the UK with Japan, we were able to obtain insight into our country's future traffic safety measures. In this sense, we believe that our findings can be highly evaluated for their usefulness. We strongly hope that this knowledge and information will be used effectively, especially in investigating comprehensive traffic safety measures in the future.

Therefore, the achievements of this subgroup can be evaluated to be outstanding in terms of their novelty, social usefulness, and future expandability.