Practical application of a public involvement-type system for planning and evaluating road traffic safety measures

1. Background and goals

In 1997, the year this project started, about 10,000 people each year died in road traffic accidents in Japan. After the beginning of the twenty-first century, this number significantly decreased, but there are still an excessive number of road traffic accident-related fatalities. Even though fatality rates have been cut in half, the present need for further reduction remains unchanged.

Developing increasingly sophisticated road traffic safety measures for further reduction of traffic accidents will require not only governmental policies, but public involvement as well. This project aims at constructing public involvement-based road traffic safety policies and evaluation systems, using these as tools to conduct pilot surveys, and verifying their effects.

2. Research content

This project consists of four pillars, based on which local governments can reduce road traffic accidents by half over the medium term:

1. Objective data assessment of road traffic accidents and "*hiyarihatto* experiences"(1)
2. Information exchange among citizens, and between citizens and local governments
3. Training and utilization of experts
4. Quantitative evaluation of the effects of road traffic safety measures

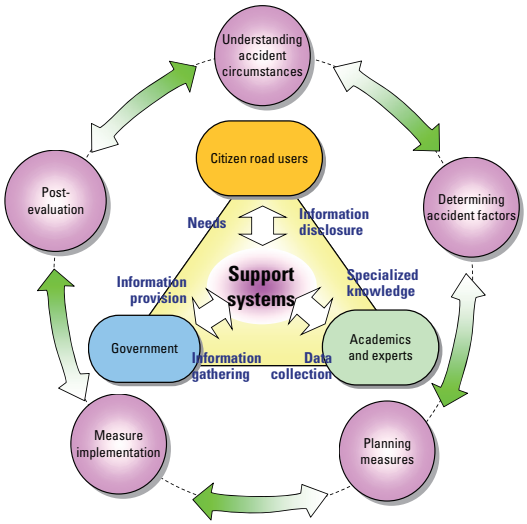

Figure 1. Road traffic accident reduction system for local governments

To put this into practice, we developed a road traffic accident reduction system for local governments that utilizes Web-based GIS and the Internet, and applied this system to the city of Kamagaya, Chiba Prefecture, as a case model. The system is composed of four subsystems, allowing for implemen-

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(1) "*Hiyarihatto* experiences": Named after a Japanese term referring to a close call, *hiyarihatto* experiences are subjective reports by road users who experience feelings of fright and danger on roads.

tation of road traffic safety measures according to the PDCA cycle.(2)

(1) Road traffic safety measure support subsystem

Utilizing a road traffic accident database as its core, this system allows for advanced GIS(3)-based aggregation, searching, and spatial analysis of accident data. Using the *hiyarihatto* map creation system, which will be described in the following section, the road traffic safety measure support system is capable of integrating accident data with *hiyarihatto* experience reports from road users and district residents.

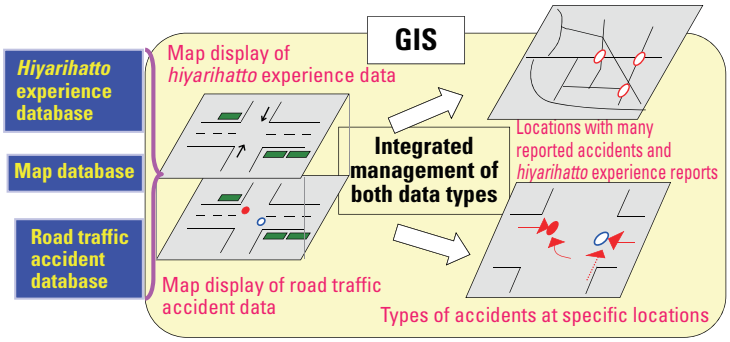

Figure 2. GIS integration of data regarding accidents and *hiyarihatto* experiences

The system thus allows extraction of locations with road traffic safety problems, making it possible to organize information in various ways, such as by type of accident and by conditions under which accidents occur.

(2) Road traffic safety information web-based subsystem

This subsystem is composed of a *hiyarihatto* map creation system and a road traffic safety information website. The *hiyarihatto* map creation system allows road users and area residents to participate via reporting their *hiyarihatto* experiences using a website managed by local governments, which uses this information to generate a *hiyarihatto* map. The road traffic safety information website has information related to traffic safety policies managed by local governments, and such collection of information from road users and area residents along with information presentation and dissemination by

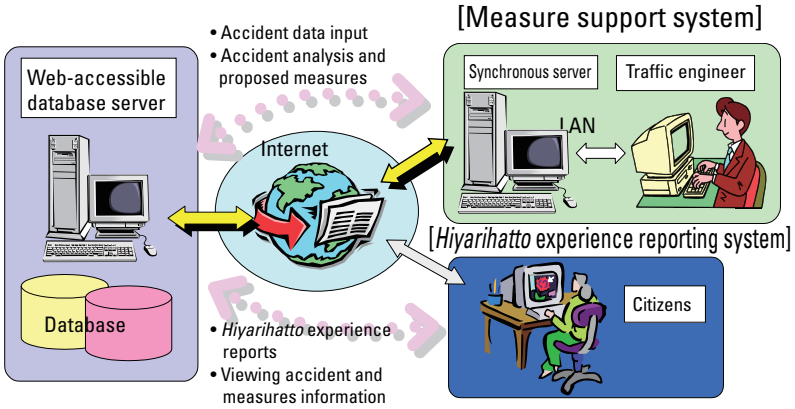

Figure 3. Road traffic safety information web-based subsystem

(2) PDCA cycle: A method of continual operational process management performed by repeatedly Planning, Doing, Checking, and Acting.

(3) GIS: Geographic information system. This refers to technologies for comprehensively managing and processing data with associated positioning information (spatial data) and presenting that data visually, allowing for advanced analysis and rapid decision making (Source: http://www.gsi.go.jp/GIS/whatisgis.html).

local governments enables the sharing of traffic safety information between local governments and citizens.

(3) Road traffic safety measures examination subsystem

This subsystem uses investigation and analysis of locations extracted from the road traffic safety measures support subsystem as candidates for installing measures, allowing for scientific identification of accident factors and subsequent prioritization of safety measures. This mechanism employs not only traditional forms of public involvement, such as questionnaires and briefings, but also workshops and pilot surveys that allow citizens to be directly involved in the examination and implementation of measures.

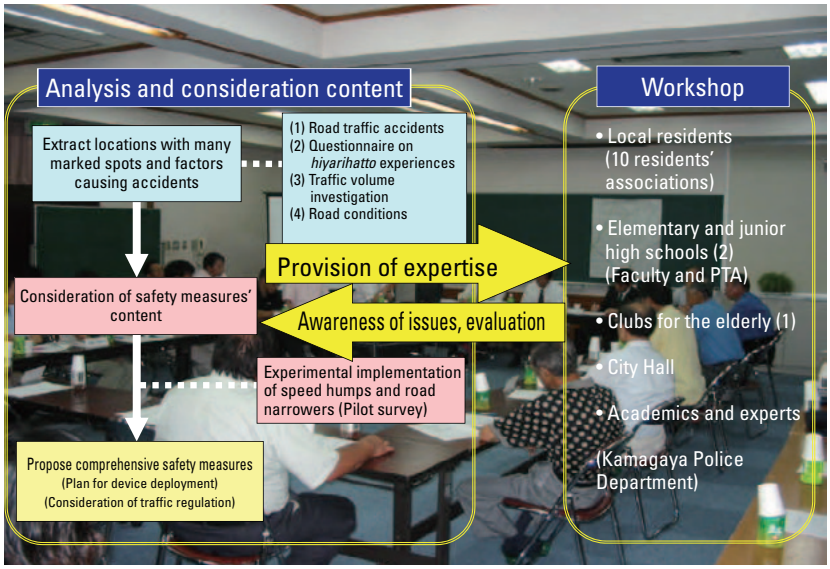

Figure 4. Framework of road traffic safety system measures in the Higashi-hatsutomi district

(4) Road traffic safety measures implementation evaluation subsystem

This subsystem evaluates the effects of implemented traffic safety measures and provides feedback, allowing further improvements to be made based on the subsystem's evaluations. Two forms of evaluation can be performed: objective evaluations based on quantitative comparison of the situation before and after measure implementation, according to the aforementioned road traffic safety measure support and road traffic safety information web-based subsystem, and subjective evaluations based on collecting and sorting road user and area resident opinions regarding road

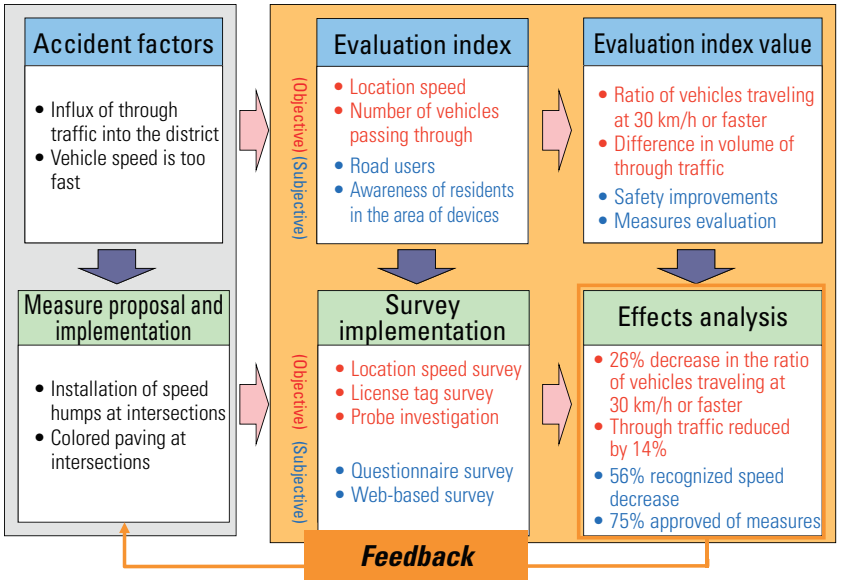

Figure 5. Measure effect evaluation subsystem (speed reduction measures)

traffic safety measures, according to the road traffic safety information website.

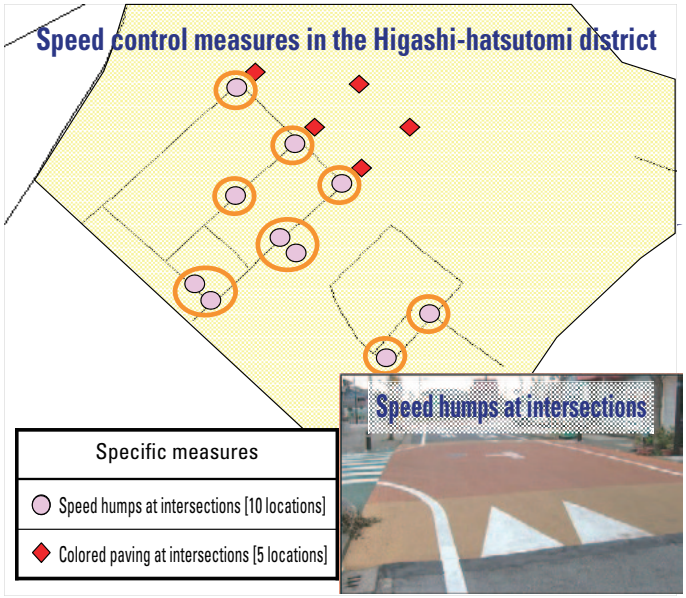

Figure 6. Installing speed humps, etc. at intersections (Higashi-hatsutomi district)

From 2001 to 2002 in Kamagaya, we initiated a pilot survey and evaluated the effects regarding measures for intersections with high accident rates, and verified an approximate 60% reduction in traffic accidents. Encouraged by these results, in 2004 we performed a pilot survey on comprehensive safety measures regarding through-traffic on residential roads in Kamagaya's Higashi-hatsutomi 4-chome district, which covers an area of approximately 64 ha containing 1,800 households. Based on information sharing and consensus building at a workshop hosted by local government representatives, the local city hall, and experts, the district implemented measures such as installing speed humps at ten intersections, resulting in an approximately 56% accident reduction. Furthermore, the number of reported sudden *hiyarihatto* experiences and locations fell by 77% and 65%, respectively. Based on these experiences and results in Kamagaya, we created and verified our workflow and developed a training program for users.

3. Conclusions

We have transferred the system from Kamagaya to the neighboring cities of Ichikawa and Shirai, which have approximately four times and one half the population of Kamagaya, respectively, with the goal of clarifying challenges to system construction and operation. This has helped verify the versatility and effectiveness of the "Kamagaya Scheme." We have also realized multilingualization of the system through the use of Internet-based translation services such as application service providers, and have begun operation of the system in Penang, Malaysia.

4. Future outlook

Dissemination and continuation of the "Kamagaya Scheme" will require (1) the hosting of seminars for agencies responsible for traffic safety policy implementation, (2) implementing workshops related to safety technologies and administrative practices for road traffic safety engineers, (3) supporting implementation and operation of the scheme, and (4) supplementing the various databases used in the scheme and promoting sharing between local governments. We believe that doing this will make our system an increasingly useful tool for countries to collaboratively share experiences and accumulate data relating to road traffic safety measures.