# Towards the Realization of the Roles Roads Should Play

TAKAMIYA Susumu(Ph.D.Science), Director, Road Traffic Department

*(Keywords) road traffic management, traffic safety, road space reconstruction, automated driving, road traffic data*

## 1. Introduction

Japan's roads have contributed greatly to improving the affluence and quality of the lives of the citizenry as important infrastructure forming the backbone of the country. Despite a social environment that in recent years encompasses issues like a decreasing population, the arrival of a super-aged society, and the need for revitalization of local economies, roads must continue to play this role while appropriately incorporating elements such as technical innovation. In addition, from the point of view of the direction taken by mid- to long-term road policy, the roles that roads should play are being reconsidered, such as the need for roads themselves to become a place to be, rather than just a space to move people and things. The substance of these matters has been organized in the suggestion of the Road Subcommittee of the Council for Infrastructure[1)] and the proposal of the Basic Policy Group of the same Subcommittee.[2)]

This paper briefly describes representative initiatives in the Road Traffic Department in the road traffic field in particular, based on their relationship with the roles that roads should play.

## 2. Effective Use of Road Networks

In addition to developing the road network, serious consideration should also be given to the perspectives of stable use of the road network and maximizing the utilization of road functions. For this point of view, it is necessary to work towards achieving road traffic management that makes full use of ICT (Big Data, AI, etc.), acquires information about road traffic conditions, and introduces appropriate improvement measures to enable smart use of roads.

The Road Traffic Department is conducting research aimed at understanding road traffic conditions in real time by acquiring travel speed, distributions of originating and concentrating traffic volumes and information on routes automobiles use from ETC 2.0 probe information and other sources, in addition to traffic volumes from traffic counters and road management camera imagery. Using this information, we will work on research aimed at road traffic management, such as forecasting near-future road traffic conditions and examining methods to actively control them.

## 3. Realizing Traffic Safety

Further promotion of traffic safety measures in main roads, neighborhood roads and roads used by school traffic is expected to create road areas where everyone can travel in safety and comfort. For this point of view, it is necessary to effectively extract locations with a risk of accidents and to draft and implement appropriate traffic safety measures by using Big Data, in addition to traffic accident data.

The Road Traffic Department is using Big Data that includes traffic accident data and ETC 2.0 probe information to conduct research aimed at effectively extracting accident risk locations where accidents and sudden braking occur and appropriately extracting district through-routes that automobiles take using neighborhood roads in particular. In addition, for neighborhood roads, we are moving forward with research into effectively placing individual measures to control automobile travel speed and traffic passing through districts and methods of reaching consensus with a view towards implementing control measure, and we will support the roll-out of "Zone 30 Plus (traffic safety measures in neighborhood streets that appropriately combine 30 km/h zone limits, speed bumps, etc.; Fig. 1)".

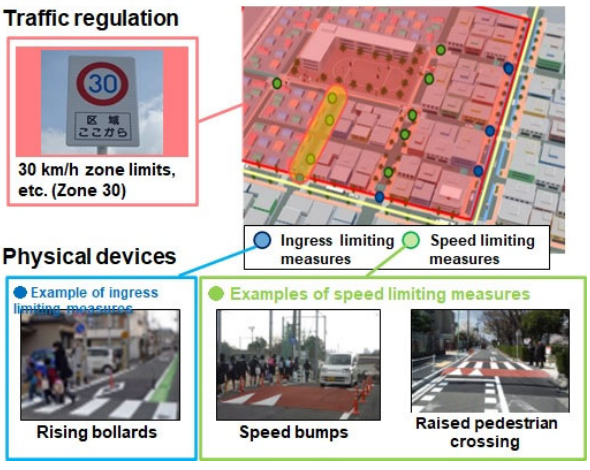


Fig. 1. Images of Zone 30 Plus (traffic safety measures in neighborhood streets)

## 4. Constructing Road Spaces Suited to Diverse Needs

In conjunction with bypass development, it is desirable to examine road space reconstruction over the entire road network, such as rehabilitating the road that was mainly used previously (the existing road) to make a human-focused road space, and to turn the existing road into a safe, comfortable, vibrant road space. In addition, in roads located in town centers, "curbside management" should be rolled out to allow road spaces to be used in various forms, including as drop-off/pick-up zones or open-air cafés, depending on the day of the week and time.

The Road Traffic Department is working on research aimed at achieving the reconstruction of existing roads in conjunction with bypass development and the creation of vibrant road spaces through gathering case examples and findings, examining road space formation techniques, and other methods.

## 5. Realizing Automated Driving

Automating and reducing the work needed for transporting people and things through automated driving is expected to realize safe, efficient road services, as well as improving productivity, contributing to the formation of local communities where life and livelihood are sustainable, and realizing sustainable economic and social activities. In addition to using expressways and other roads that form the backbone of the country, automated driving could also be used to assure transport modes in regions surrounding rest areas in semi-mountainous zones, for example, where government contact points and other services needed in day-to-day life are likely to converge.

For the automated driving technology, automatic braking based on detection information from on-board sensors and other autonomous vehicle technologies for safe driving are being developed and are in the process of being implemented in vehicles. However, with a view towards more effective automated driving, we could conceivably support appropriate vehicle control by providing automobiles with information that the roads hold to supplement situations where the information from autonomous vehicle technologies is not sufficient on its own.

The Road Traffic Department will use the public-private joint research framework to evaluate technical specifications for areas including technologies for information provision services for merge support, which we aim to realize in expressways, and self-positioning in self-driving vehicles.

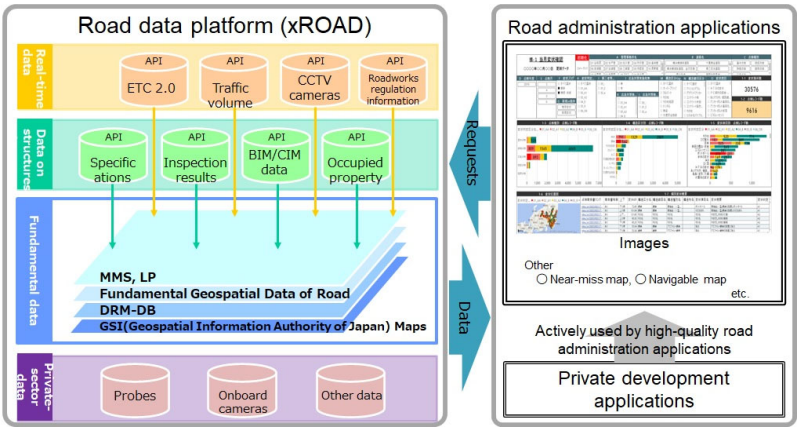


Fig. 2. Road data platform (xROAD) and its use

## 6. Effective Use of Road Traffic-related Data

The above discusses Road Traffic Department initiatives based on their relationships with the roles that roads should play. However, gathering road traffic-related data appropriately and using it effectively seems to be an important key in implementing these initiatives. The Road Bureau of the MLIT is building a "road data platform" (Fig. 2) that centralizes and makes available the data collected and held by road administrators and others, and is moving forward with examinations aimed at realizing such outcomes as ongoing monitoring of road traffic conditions, etc., upgrading information provision services, and data-driven management, to name but a few.

Through close coordination with the Road Bureau, the Road Traffic Department will conduct further research with a view towards building the road data platform, as well as building techniques for evidence-based policy-making that uses it.

## 7. Conclusion

This paper presented some of Road Traffic Department's initiatives aimed at realizing the roles that roads should play. At the Road Traffic Department, we are keen to continue the necessary research, with an appropriate understanding of the roles that roads should play.

[References]

1) Suggestion of the Road Subcommittee of the Council for Infrastructure: *Road and Traffic Innovation: --- Toward the Realization of Affluent Lifestyles through the Pursuit of Functional Improvement and Utilization of Roads---*, Aug. 2017
https://www.mlit.go.jp/common/001201778.pdf

2) Proposal of the Basic Policy Group, the Road Subcommittee of the Council for Infrastructure: *2040 Vision for Roads in Japan: To Shape a Better Future for People*, Jun. 2020

https://www.mlit.go.jp/road/vision/pdf/01.pdf