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# Towards Realizing Safer, Smoother, More Comfortable Road Use

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

## 1. Introduction

Japan's roads have contributed greatly to enriching and improving the 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, and we must realize safer, smoother, and more comfortable road use. 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 a suggestion by the Roads Subcommittee of the Council for Infrastructure<sup>1)</sup> and a proposal by the Basic Policy Group of the same subcommittee.<sup>2)</sup> Conversely, as we work towards realizing road policy, we cannot omit the perspectives of coordination and cooperation with reforms of public services through the thorough use of data and digital technologies and movements towards a green society, including initiatives aimed at

strategies to ameliorate climate change, which the government and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) are moving forward.

This paper takes into consideration the above perspectives as it briefly describes representative initiatives in the Road Traffic Department, based on their relationship with road policy directions.

## 2. Road policy directions and Road Traffic Department initiatives

The (main) relationships between road policy directions concerning the road traffic field and research conducted by the Road Traffic Department are summarized in the table.

Table. (Main) relationships between road policy directions concerning the road traffic field and research conducted by the Road Traffic Department

Road policy directions concerning the road traffic field	Research conducted by the Road Traffic Department
(1) Strengthening growth potential through productivity improvements	
<p><u>a. Ensuring smooth mobility</u>            In addition to improving the road network, etc., realizing stable, maximized use of the road network.            Working towards achieving road traffic management that makes full use of ICT (Big Data, AI, etc.), acquires information about road traffic conditions, and introduces improvement measures to enable smart use of roads.</p>	<ul style="list-style-type: none"> <li>·Examining and developing methods for acquiring information about road traffic conditions in real time</li> <li>·Examining and developing methods for predicting (near-future) road traffic conditions</li> <li>·Examining various (data-based) performance monitoring methods and management strategies</li> </ul>
<p><u>b. Securing strategic flow of people and things</u>            Automating and reducing labor for movement of people and things through automated driving, and realizing safer, more efficient road services.            Supporting 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.</p>	<ul style="list-style-type: none"> <li>·Developing automated driving technologies through road-vehicle linkages (examining specifications for information provision services for merge support, specific assistance information for self-positioning, etc.)</li> <li>·Examining installation methods for automated driving assistance facilities, etc.</li> </ul>
(2) Ensuring public safety and peace of mind	
<p><u>a. Implementing comprehensive traffic safety measures</u>            Promotion of traffic safety measures in main roads, neighborhood roads, and roads used by school traffic to create road areas where everyone can travel in safety and comfort.            Using traffic accident data and Big Data to extract locations with a risk of accidents and to draft and implement appropriate measures.</p>	<ul style="list-style-type: none"> <li>·Establishing methods for using Big Data with the aim of expanding traffic safety measures</li> <li>·Establishing methods for traffic safety measures (including promoting the popularization of speed bumps and other automobile speed limiting facilities, roundabouts, etc.)</li> <li>·Establishing environments for safe, comfortable bicycle use</li> </ul>
(3) Building communities by contributing to improved vitality and quality of life	
<p><u>a. Maximizing use of road spaces according to need</u>            Reconstructing road spaces across the road network to rehabilitate existing roads as human-centered road spaces.            In roads in town centers, rolling out “curbside management” to allow road spaces to be used in various forms, depending on the day of the week and time.</p>	<ul style="list-style-type: none"> <li>·Organizing knowledge about reconstruction of existing road spaces, etc.</li> <li>·Examining methods for forming vibrant road spaces</li> </ul>

In addition to the research shown in the table, the Road Traffic Department is also moving forward with examinations based on the road policy directions regarding means of lowering costs and increasing speed in works to remove utility poles and methods of monitoring routes traveled by special vehicles, among other areas. In addition, we are considering essential reviews of technical standards for road geometric structure and traffic safety facilities, methods of conducting road projects, establishing technologies concerning standards, etc. for data collection, accumulation, and usage methods, and new administrative needs including digital transformation (DX), with a

view towards the ongoing rollout of road policy.

○ Examining methods to estimate daily fluctuating OD traffic volumes in daily and hourly units by utilizing ETC 2.0 probe information, traffic counter traffic volumes, and other constant observation data.

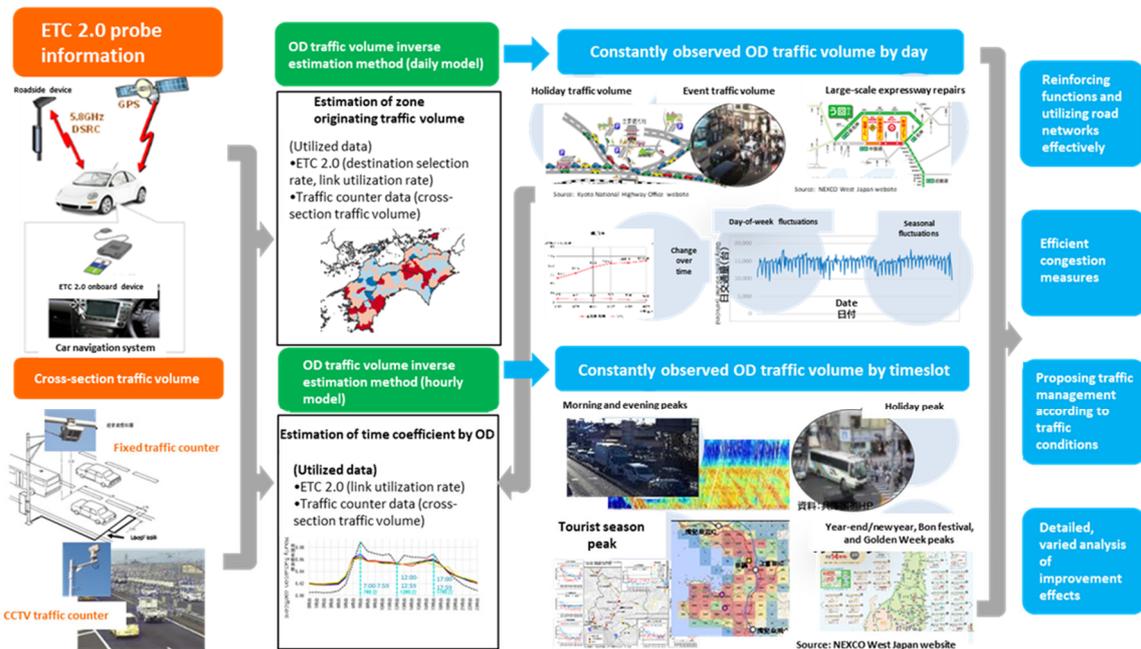


Fig. Estimating constantly observed OD traffic volume using ETC 2.0 probe information, etc.<sup>3)</sup>

### 3. Initiatives for ensuring smooth mobility

We will outline the Road Traffic Department’s initiatives concerning “ensuring smooth mobility” (table, (1)a) among the directions for road policy.

The Road Traffic Department has conducted research aimed at constant observation of road traffic conditions by acquiring travel speed, traffic origins and destinations, and the routes used from ETC 2.0 probe information, in addition to cross-section traffic volumes from traffic counters and road management camera imagery. The figure shows a framework for the constant observation of originating and concentrating traffic volumes (OD traffic volumes) using the observation results, separated by day and timeslot. If we can acquire constantly observed OD traffic volumes, we can use the results of the distribution of traffic volumes to propose function reinforcement strategies for the road network through road

improvement and road traffic management strategies that maximize leverage of existing road functions to combat traffic conditions.

This initiative makes thorough use of data and digital technologies, and at the same time, the effects it brings about may reduce CO<sub>2</sub> emissions through traffic flow improvements and contribute to “realizing a green society.”

### 4. Conclusion

This paper presented some of the Road Traffic Department’s initiatives based on relationships with road policy directions. At the Road Traffic Department, we are keen to continue the necessary research, with an appropriate understanding of the roles that roads should play within road policy.

[References]

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