

# Utilization of On-vehicle Sensing Technology for Road Management

(Research period: FY2016 to FY2018)

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## 1. Introduction

The Ministry of Land, Infrastructure, Transport and Tourism ("MLIT") aims to shorten the number of days required to examine applications for vehicles with dimension, weight, or other exceeding the standard to travel through a road to approximately ten days in average by 2020. As one of the activities to this end, the MLIT plans to conduct automatic examination using the data collected on the shapes of roads using the sensing technology.

## 2. Survey of on-vehicle sensing technology by offering experiment to the public

In order to examine low-cost technologies that provide data accuracy required for the examination above, etc., NILIM conducted verification in January 2017 through an experiment offered to the public. Consequently, equipment was confirmed that meets the budget (not more than 15 million yen) and accuracy requirements (the position information of natural features measured is within the standard deviation of 25 cm).

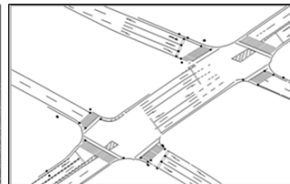


Fig. 1: Point group data image

Fig. 2: Plotting result image

Table 1: Main assessment results of the publicly offered experiment

Assessment item	Description of assessment	Number of participants that meet requirements
Accuracy	Technology available to obtain the absolute accuracy of 1/500	8 out of 9 participants
Equipment cost	Absolute accuracy of 1/500 can be obtained and equipment cost is about 15 million yen	4 out of 9 participants
Detection of natural features	Possible to detect measurable natural features at verification spot	9 out of 9 participants
Ease of installation / removal	Prepared a manual for equipment installation / removal	6 out of 9 participants

## 3. Drafting of functional requirements for on-vehicle sensing technology

Based on the results of the experiment in section 2 above, etc., we prepared "Proposal for functional

requirements of measuring equipment, etc." and "Drawing procedure proposal," which are both required for Regional Development Bureaus, etc. to collect measurement data and prepare drawings. Each Regional Development Bureau introduced the on-vehicle sensing technology using this "Proposal for functional requirements of measuring equipment, etc."

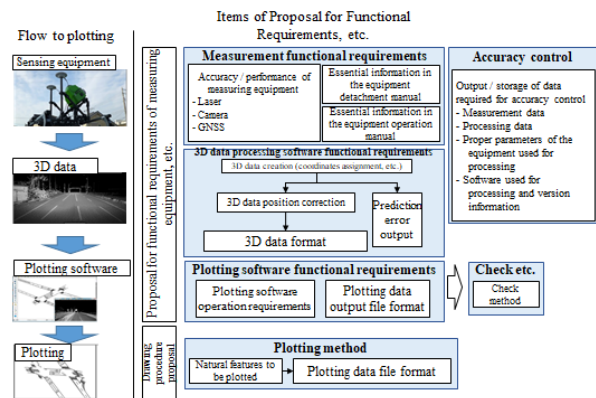


Fig. 3: Flow to plotting and relationship of items in the Proposal for Functional Requirements, etc.

Table 2: Outline of matters described in the Proposal for Functional Requirements, etc.

Proposal for functional requirements including measuring equipment	<ul style="list-style-type: none"> <li>- Describe the requirements for measurement data processing software (post-processing) and plotting processing software in addition to the measuring device requirements.</li> <li>- Accuracy and performance are subject to the "Standards for the Geographical Information Authority of Japan Operation Rules" (partially revised, March 31, 2016)</li> <li>- Describe measurement data format and definition of items of information in possession</li> <li>- Describe the requirements for installation in vehicles.</li> </ul>
Drawing procedure proposal	<ul style="list-style-type: none"> <li>- Describe the outline of natural features to be plotted.</li> <li>- Outline of target natural features is described through extraction from "Road Base Map Information (maintenance promotion version) Product Specification (Draft) (May 2015 version)."</li> <li>- Describe the definition of the file format of plotting data and the required accuracy of plotting data.</li> </ul>

## 4. Conclusion

For fiscal 2019, it is planned to collect data on local roads for which 5 or more applications are annually submitted (about 13,000 km) using the on-vehicle sensing technology introduced by each Regional Development Bureau.<sup>1)</sup>

See the following for details.

1) The 18th Logistics Subcommittee --- Improvement of the oversize/overweight vehicle passage permission system [http://www.mlit.go.jp/policy/shingikai/road01\\_sg\\_000421.html](http://www.mlit.go.jp/policy/shingikai/road01_sg_000421.html)