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“Technical Research and Development for Road Policy Quality Improvement” Study Summary

No.	Title	Principal Researcher
No. 30-6	Measures for the use of information on road structures for road maintenance management in local governments	Prof. TSUTSUMI Morito, Univ. of Tsukuba

In order to realize the strategic maintenance and management of roads as infrastructure in local governments, this study aims to promote the use of information on road structures in road maintenance works. The study presents a method of constructing a database at the site of maintenance management according to the circumstances of the local governments and a strategy for its utilization.

1. Backgrounds and Objects

Strategic maintenance and management of infrastructures is required as part of measures against aging of infrastructures, which are the basis of people's lives and socio-economic activities, and roads are not an exception. On the other hand, in recent years, governments have enacted various plans and laws to promote the digitalisation of society and public administration. However, it is difficult for many local authorities to respond immediately to these social demands, as various information about roads is still handled in the field as a huge amount of paper documents.

Therefore, this study aims to clarify the actual situation and issues related to the use of information on road structures, especially in small and medium-sized local governments, with a view to steadily promoting the strategic maintenance and management of infrastructures, and to empirically confirm the construction of a database (DB) that will contribute to solving these issues and the verification of the effects of operational improvements associated with its use. At the same time, the study empirically examines the development of human resources who will be responsible for the proposed measures.

2. Activities in Research Period

While changes based on the points raised in the mid-term evaluation being made, the following three study items in parallel were carried out.

I. Survey on the actual situation of the management of road-related information in local governments: This study surveyed the actual situation of the storage of various materials and data related to roads, their utilization in daily work, and data sharing across organizations and persons in charge, targeting municipalities in Ibaraki Prefecture. Then, the study organized the problems in road maintenance management work, and especially investigated the causes of the difficulty in systemization, keeping in mind the research contents shown in II.

II. An Empirical Study on the Utilization of Information on Road Structures at Local Government Sites; Based on the reasons above mentioned, the direction of the research was revised to the creation of standard specifications for road DB for road maintenance and management, and the demonstration research related to the presentation of draft specifications and operation based on them was carried out. The development of the DB was carried out in an agile manner while conducting interviews with local government officials.

III. Study on Information Sharing and Human Resource Development in Local Governments: Based on the survey in I. above, this study held meetings as a place for municipalities to exchange information on how to deal with issues common to all municipalities, and established "District Subcommittees" in cooperation with the Ibaraki Prefecture Road Maintenance Council and held workshops.

3. Study Results

In the management departments, which are in charge not only of roads but also of land registry surveys, various computer systems have been introduced and used in their daily work for quite some time, such as a

system for viewing road registers and a system for managing non-statutory public property to keep track of so-called non-statutory roads. On the other hand, in maintenance departments, the survey revealed that, although some local governments with large financial resources are making progress in building and introducing road maintenance management systems, most smaller local governments have not yet made use of ICT technology. Based on the results of these surveys as well, it was decided to construct a DB to facilitate the support of daily actions in maintenance work, especially for the purpose of assisting the function and structure of roads. From the survey in this study, it was found that a lot of drawings were taken out to the repair site. In order to construct the DB, QField was employed because it is an Open Source Software that can be used free of charge, and it is possible to browse project files created by QGIS on a PC and to register geographical objects. Based on the demonstration experiment, the draft of the standard specification of the road DB and the guideline about the utilization of it were made with notes. Finally, the study showed the possibility of business improvement based on the concrete business process, and the validity from the viewpoint of the cost based on the operation plans.

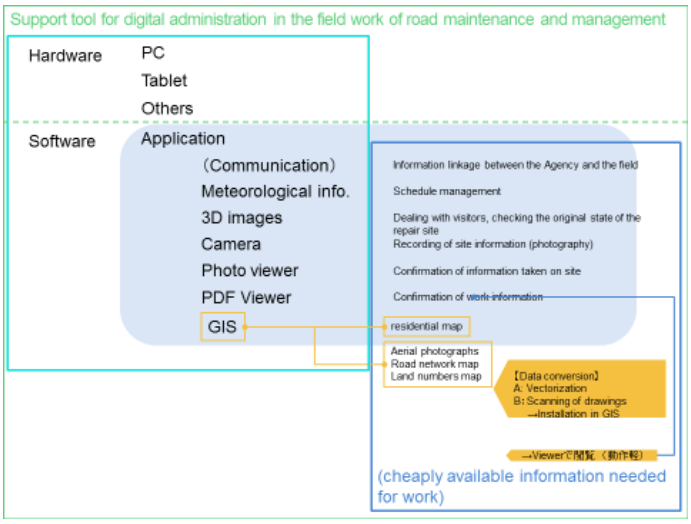

Fig. 1 Draft standard specification for road DB

Fig. 2 DB constructed on mobile terminals based on the standard proposal

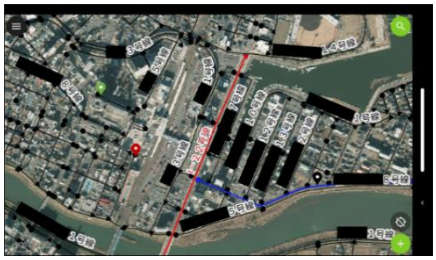

Fig. 3 Example of a browsing screen on a mobile terminal (aerial photo and route network map)

4. Papers for Presentation

YUI Takahiro, TSUTSUMI Morito, ARAI Chino: On the use of mobile devices to support road maintenance works in local governments, Proceedings of infrastructure planning, Vol.63, (CD-ROM No.1206), 2020. (in Japanese)

5. Study Development and Future Issues

To continue demonstration experiments based on the proposed standard specifications for road DB presented in this study, and increase the number of cases of DB construction and its utilization according to the actual conditions of local governments, and share information on them.

6. Contribution to Road Policy Quality Improvement

With the planned establishment of a new Digital Agency, there is an urgent need to promote DX in the various operations of local governments as well as the national government. The results of this research will serve as a starting point for the implementation of DX in road maintenance and management operations.

7. References, Websites, etc.

Under consideration of creating website.