

Promotion of Study on Maintenance of Social Capital

Maintenance Research Committee

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1. Introduction

The Ministry of Land, Infrastructure, Transport and Tourism ("MLIT") released the "Estimation of future maintenance / renewal cost of social capital in the fields under the control of the MLIT" in November 2018. In this release, long-term cost is expected to increase from 5.2 trillion yen in fiscal 2018 about 1.3 times in 20 years and 30 years, respectively, and to 7.1 trillion yen at maximum, about 1.4 times, in 26 years. This estimation is based on implementation of infrastructure maintenance in accordance with the concept of preventive maintenance, while much more increase is expected when based on the concept of breakdown maintenance. Accordingly, R&D activities are continuously required that contribute to realization of sustainable / effective infrastructure maintenance by improving efficiency such as active use of new technologies and data.

2. Maintenance research in NILIM

Under the aforementioned circumstances, in order to establish a maintenance cycle, the NILIM is promoting R&D of technologies for maintenance with attention to the viewpoint of management. NILIM is also working for information sharing among individual fields in order to contribute to solution of common issues in maintenance. In addition, the NILIM is promoting R&D for maintenance using the framework of the government's science and technology innovation policy, such as the Cross-ministerial Strategic Innovation Promotion Program ("SIP") and the Public/Private R&D Investment Strategic Expansion Program

(PRISM), as well as methods in cooperation with private sectors, such as the Breakthrough by Dynamic Approach in Sewage High Technology" (B-DASH) Project.

The table below shows policies in each field and activities based on the viewpoint of promoting maintenance cycle establishment.

3. Conclusion

While continuing to grasp on-site issues and needs and trend of up-to-date technologies, we intend to implement R&D activities on maintenance and technical guidance for site workers after reviewing existing study results and strive to transmit externally results, progress, etc. of R&D activities.

Table. Organization of activities in each field

Activity type	Maintenance related matters	Road	River	Sewerage	Housing / building
Policy	Legal stipulation etc.	<ul style="list-style-type: none"> Legal stipulation of inspections (Sep. 2013) Visual proximity inspection 	<ul style="list-style-type: none"> Legal stipulation of inspections (Dec. 2013) Inspection by visual inspection or other proper method 	<ul style="list-style-type: none"> Legal stipulation of inspections (Nov. 2015) Inspection by visual inspection or other proper method 	<ul style="list-style-type: none"> Revision of the periodic reporting system (Apr. 2018) Obligation of overall sounding and other examinations every 10 years from completion, outer wall repair, etc. in addition to conventional periodic examinations
Promotion of maintenance cycle establishment	Standard / manual development	<ul style="list-style-type: none"> Setting of soundness judgment types Formulation of periodic inspection procedures (road bridge, road tunnel, etc.) 	<ul style="list-style-type: none"> Setting of judgment standards for inspection result evaluation Revision of the inspection procedures for levees and other river management facilities and channels, and formulation of comprehensive dam inspection procedures 	<ul style="list-style-type: none"> Setting of judgment standards for inspection survey evaluation Revision of sewerage maintenance guidelines Formulation of B-DASH (Sewer Management System Technology) guidelines 	<ul style="list-style-type: none"> Tile outer wall / mortar finish outer wall diagnosis guidelines for preventing disasters by peeling off
	Inspection / diagnosis	<ul style="list-style-type: none"> Visual proximity inspection of road bridge Demonstration of robots etc. (Social infrastructure maintenance SIP, FY2014-FY2018) 	<ul style="list-style-type: none"> Demonstration of maintenance / inspection technology with 3D laser scanner and 3D multibeam scanning sonar and of robots etc. that efficiently conduct scouring grasp of river bed, and reconnaissance survey of river revetment (FY2014-FY2016, Social infrastructure maintenance SIP) 	<ul style="list-style-type: none"> Development of screening techniques for telecamera survey (FY2010-FY2012, comprehensive project) Research on required level of new type pipeline examination equipment (FY2013-FY2016, comprehensive project) Development of sewer pipe examination priority judgment system (FY2013-FY2016, comprehensive project) 	<ul style="list-style-type: none"> Developed the outer wall diagnostic equipment that automatically runs on walls (FY2010-FY2012, preventive maintenance comprehensive project) Study on rationalization of the wet outer wall examination method (Standard improvement / promotion project, FY2015-FY2016)
Promotion of maintenance cycle establishment	Actions	<ul style="list-style-type: none"> Implementation of bid contract method, etc. with technical proposal / negotiation responding to technical issues of construction works and repairs at scattered sites (MLIT) Development of an estimation method of maintenance / repair work cost responding to on-site conditions etc. (FY2013-FY2016, comprehensive project) 		<ul style="list-style-type: none"> Estimation material for sewerage control by organizations concerned (Sewerage Works Association, etc.) 	<ul style="list-style-type: none"> Development of information tools for prompting building owners / administrators to improve / repair outer walls (FY2013-FY2016, comprehensive project)
	Record	<ul style="list-style-type: none"> Use of tablets in inspection, etc. Renewal / use of the data of national road bridge database, etc. (bridge specification information, inspection results) 	<ul style="list-style-type: none"> Use of tablets in inspection, etc. Renewal / use of the data of river maintenance database (RMDIS) Renewal / use of the data of dam maintenance database 	<ul style="list-style-type: none"> Use of tablets in inspection, etc. Engineering material preparation for accumulation and utilization of sewer pipeline information (FY2013-FY2016, comprehensive project) 	<ul style="list-style-type: none"> Engineering material preparation for creating electronic data and database of periodic reports (FY2013-FY2016, comprehensive project)
		<ul style="list-style-type: none"> Development of facility information collection / summarization technology (FY2013-FY2016, comprehensive project) 			

Source: Report on General Technology Development Project "Development of Technologies for Accumulating and Utilizing Information in Order to Streamline and Upgrade Maintenance of Social Capital" (modified in part)