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# News Letter

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## Message from the Director-General

The National Institute for Land and Infrastructure Management (NILIM) is the only national research institute in Japan specialized in the fields of housing and infrastructure. Aiming to construct a safe, beautiful and dynamic country, we are conducting studies required for drawing up technological policies of the Ministry of Land, Infrastructure and Transport (MLIT), establishing technical standards, and providing technological assistance to national public works.



In Japan, housing and infrastructure have been constructed as the basis of people's lives. However, the condition of such housing and infrastructure still remains room for improvement for all people to enjoy a safe and active life, and for proudly passing on to the future generations. Technological development needed for constructing infrastructure and using existing stocks more efficiently are also our major assignment.

The NILIM is carrying out the research that are closely related to the lives of citizens and involve technologies from wide-ranging scientific fields. We try to deepen the specialized research and development in those fields, and furthermore we believe that it is important

to make a network among many researchers and engineers, and construct a comprehensive technological system.

The NILIM was established as the successor of the functions conducted by the former Public Works Research Institute, Building Research Institute, and Port and Harbor Research Institute, and consists of members specialized in various research fields. We use this advantage to the full in its research activities, if it says concretely, we place great importance on the NILIM study projects. To carry out them, we set up their topics based on the needs of people as the end users of social infrastructure. And identifying the goals and duration of studies by considering the seeds of technologies of related fields, specialists of diverse research fields gather under project leaders and carry out studies also in cooperation with researchers outside the institute.

The NILIM study projects encompass themes that must be urgently addressed in Japan and some of them are common major problems in many countries. The research outcomes, which will be reflected in the policies and technical standards of the MLIT, will be published in our newsletters, websites, and other printed documents. As well as research activities, the NILIM will furthermore contribute to constructing international networks for research and development and improving technical standards through participating in various international activities.

We hope that you will continue to cooperate with us and support our activities.

**Haruhiko OKUNO, Director-General, NILIM**

## New Main Projects

### 1. Water control technologies to deal with global-scale fluctuations of water cycle

Last year, Europe and Asia were attacked by floods and suffered serious damage. Recently, the number of and the scale of damage by floods and draughts are increasing due to meteorological abnormalities of global scale.

This study aims to develop technologies for using predicted rainfall values, whose precision has improved due to substantial meteorological observations of global-scale from satellites and the development of advanced prediction models, for predicting floods, giving warnings and evacuation orders before floods, landslides, etc., and controlling the discharge from dams during floods and draughts, to prevent and mitigate damage.

Contribution is also aimed for to solving water problems in other regions of Monsoon Asia, which are similar with Japan in meteorological condition, topography, and landuse, by exchanging information about river and debris control.

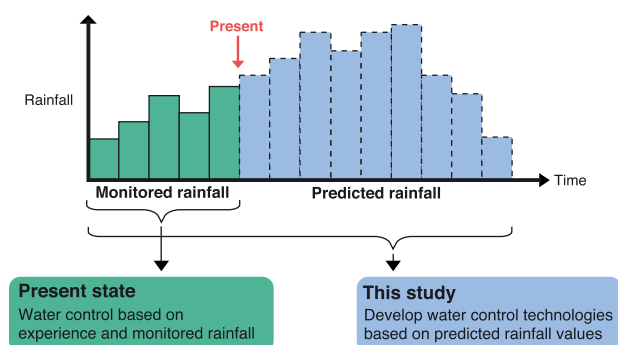


Figure 1 Application of Predicted Rainfall

### 2. Integrated risk management of chemicals in water body

As shown by increasing interests on endocrine disrupting chemicals and the enactment of Pollutant Release and Transfer Register (PRTR), risk management of chemicals is an important topic. The Ministry of Land, Infrastructure and Transport, which is responsible for controlling rivers and other areas of Japan, should identify the actual states of the risk of chemicals, restrict the use of chemicals, and encourage stakeholders along rivers to take voluntary measures.

This study conducts case studies to 1) determine the actual amounts (concentrations) of principal chemicals, which were found likely to be discharged into rivers by preliminary surveys, of those stated in PRTR but not restricted, and 2) identify the changes of their properties in river environments. Communication tools will be also be developed since the results of risk assessment of the chemicals should be communicated to residents, stakeholders, etc. along rivers in manners that are convenient and easy to understand.

The study results will be used to propose a scheme for Integrated risk management of chemicals for entire basins, such as rivers and sewer systems.

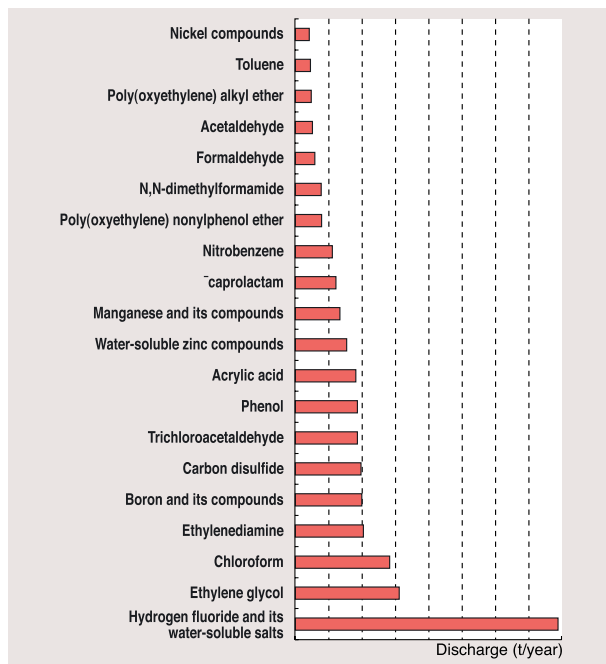


Figure 2 The 20 principal chemicals discharged to public water bodies (2000 and 2001 PRTR pilot projects)

### 3. Building standard and technology systems for intelligent buildings and houses

This study aims to develop intelligent technology systems for buildings and houses, which spontaneously detect external forces and loads acting on building structures and resultant, aging deterioration, and so on, and take necessary control measures, by using advanced information, communication, control technologies, or high performance materials. Building code and standard system will be developed for correctly evaluating the performance of designs, for example, that are equipped with active vibration dampers or smart sprinklers. Under the system rational and economical designs will be realized, which show required performances with reduced cross section of members, reduced fire rating, or increased fire compartment compared to conventional designs with large factors of safety against uncertainty.

The objectives of this study are 1) to develop technological systems for design, construction and maintenance of intelligent buildings and houses, and 2) to provide building code and standard systems to help the performance evaluation to be accepted by the public communities. The systems are to be implemented as standards, guidelines, and technical standards of the Building Standard Law and the Housing Performance Indication System.

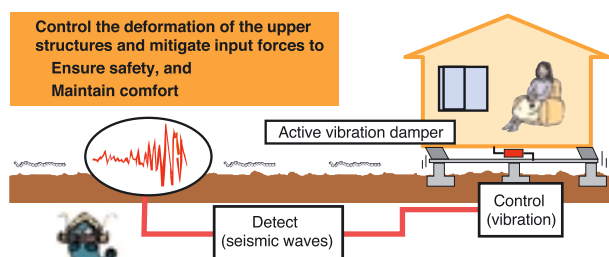


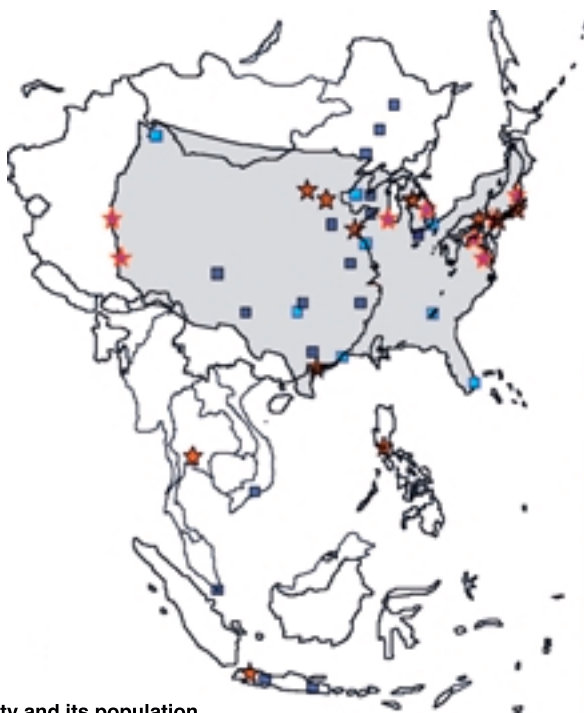
Figure 3 Maintaining earthquake resistance by an active damper

#### 4. Policies for airports development suitable to a future air service network in East Asia

Due to the globalization of the economy and society, the air services for the entire East Asia as a whole, which include both domestic and international routes, should be taken into account for identifying the future air network. Based on the predicted dramatic and large-scale development of the network and traffic volume, proposals for optimum capacities of airports in Japan, the optimum role allocation under various construction restrictions, will be driven. These will include, the optimum period and size for constructing the third Tokyo capital airport, and utilization of local airports. For these proposals, such investigation, analyses of the characteristics of airline formation as a result of alliances among air service companies and with economic indices, and comparison with areas with advanced air services will be done.

Planning and design standards will be prepared so as to deal with diversifying airplanes, such as New Large Aircraft A-380, which is likely to be introduced, and regional jet planes whose use will satisfy air demand for more frequent services. The effects of such diversified planes on airport capacity will be investigated. IT systems for guiding passengers will also be investigated to improve passenger services at air terminals.

To precisely understand the actual movements of passengers in East Asia, a data collecting scheme is to be constructed in liaison with other countries in the area.



#### City and its population

- 1 to 2.49 million
- 2.5 to 4.99 million
- ★ 5 million and more

Figure 4 Comparison of City Layouts in East Asia and North America

#### 5. Enhancement of a multi-modal transportation system

Although there are various modes of transport, they are insufficiently connected, and are inefficient and inconvenient to change modes of transport. Therefore, people excessively and inefficiently use private cars, which are convenient but have serious impacts on global and regional environments and are a cause of global warming, air pollution in cities, deteriorated city transport services, traffic congestion, and reduced amenities of cities. This study project aims to construct a multi-modal transport system that enables optimum allocation of transport among various modes by reflecting the satisfaction of users and the properties of cargo, by investigating the characteristics of road transport and aviation, maritime, and railway services. The project 1) develops methods and technologies for increasing the convenience of passengers and encouraging people to use public transport, 2) investigates multi-modal freight transport systems, which are possibly implemented by revising old business customs, and 3) develops methods for evaluating the effects of various measures in terms of both demand and supply sides of passenger and freight transport.

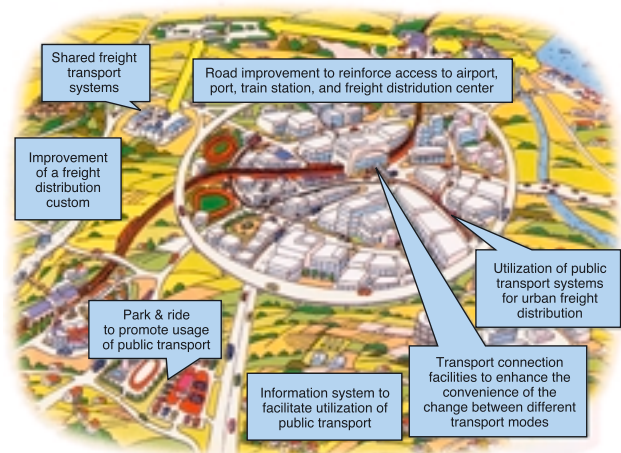


Figure 5 Various scenes of multi-modal transport system

#### 14 Other Main Projects

Title of Project
Measures against Global Warming
Technologies for Zero Emission and Recycling Oriented Society
Stock Management System of Housing and Infrastructure
Toward the Pleasant, Beautiful Tokyo Bay
Sound Hydrological Cycle and Sediment Transport System
Watershed/Urban Regeneration in Accord with Nature
Minimizing natural disaster risks in urban areas
Improving the safety and amenity of road-space
Health-conscious Built Environment
Measures for Condominium Issues
Renaissance of the Urban Area
Advanced Assessment Methods for Public Works Projects
Advanced Cruise-Assist Highway System(AHS)
Applying IT for Comprehensive Land Management System

## The 10th US-Japan Workshop on Advanced Technology in Highway Engineering

The 10th US-Japan Workshop on Advanced Technology in Highway Engineering was held on November 4 to 6, 2002, in Salt Lake City, Utah, US, under the theme of "Travel Demand Management and Operations: An Intermodal and Technology Based Approach."

In the workshop, members from the US described an overview of travel demand management in US, methods for using ITS technologies, ITS and traffic operations in Utah, an overview of incident management systems, and road management during winter-time. Members from Japan gave six presentations, such as an overview of travel demand management in Japan, revitalization of street cars, car sharing, probing-car systems for monitoring traffic conditions, and road management during winter-time. Active discussions were also made. The participants made an on-site inspection of street cars and the Park and Pride system in Salt Lake, and visited Traffic Operations Center.



Photo 1 US-Japan Workshop in Salt Lake City, November 2002

### Meeting with FHWA on bridge technologies

A meeting was held with FHWA on October 24, 2002, in Saint Louis, Missouri, US, to exchange information about bridge technologies. This meeting is usually held together with the UJNR US-Japan Bridge Workshop, which is held in autumn every year. This was the eighth meeting.

From Japan, nine people attended the meeting, including Nakatani (Director of the Bridge Division), Hiromatsu (Bridge Division) and Ishida (Research Administration and International Cooperation Division, now studying in the US) from the National Institute for Land and Infrastructure Management, and six members from the Public Works Research Institute. From the US, Mr. Cooper (Director of the Bridge Department of FHWA) and bridge specialists of the federal and state governments attended.

The meeting started by the participants from both countries giving speeches on bridge management and seismic designs. Then, they discussed about administrative issues based on lists of questions exchanged in advance. The meeting closed after confirming to keep exchanging information.

### RESEARCH REPORT of National Institute for Land and Infrastructure Management (October-December, 2002)

No	Title of Paper	Names of Divisions
5	Probability Characteristics of Surcharge acting on the Mooring Facilities	Port Facilities Division

### TECHNICAL NOTE of National Institute for Land and Infrastructure Management (October-December, 2002)

No	Title of Paper	Names of Divisions
14	FY2000 RESEARCH SUMMARY OF WATER QUALITY CONTROL DEPARTMENT	Water Quality Control Department
24	Road Communication Standards	Information Technology Division
40	QUICK INSPECTION MANUAL FOR DAMAGED REINFORCED CONCRETE BUILDINGS DUE TO EARTHQUAKES Based on the Disaster of 1999 Kocaeli Earthquake in Turkey	Research Center for Disaster Risk Management
43	Land and Infrastructure Management on Water and River from the Historical Viewpoint	Construction Economics Division
48	Macro Traffic Accident Analysis using the Comprehensive Database for Traffic Accident	Advanced Road Design and Safety Division
49	The Analysis between Road Network and Traffic Accident in Urban Area	Advanced Road Design and Safety Division
52	Annual Report of Road-related Research in FY 2001	Road Department, etc.
53	Investigation on the Transition of the Road Traffic Census and the Method for its Improvement	Traffic Engineering Division
54	Preparation of GSE Traffic Simulation Program	Research Coordinator for Advanced Airport Technology
58	Report of the Lecture Meeting of NILIM (2002)	Planning Division



National Institute for Land and Infrastructure Management  
 Ministry of Land, Infrastructure and Transport  
 Asahi 1, Tsukuba, Ibaraki, 305-0804, Japan  
 (Tachihara) Tachihara 1, Tsukuba, Ibaraki, 305-0802, Japan  
 (Yokosuka) Nagase 3-1-1, Yokosuka, Kanagawa, 239-0826, Japan  
 TEL:+81-29-864-7896 FAX:+81-29-864-4432

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