

### ■ FY 2019 NILIM budget estimate request

Planning and Research Administration Department Planning Division, Administrative Coordination Department Planning and Coordination Division

In its budget estimate request for FY2019, the NILIM will request an R&D budget for 17 tasks (amounting to 220 million yen), including the following 5 new tasks (amounting to 70 million yen) in the 4 important fields of "Disaster prevention, disaster mitigation, and crisis management", "Infrastructure maintenance and management", "Productivity mission", and "Improvement of region creation and ease of living".

#### ■ Disaster prevention, disaster mitigation, and crisis management

Research regarding breach perception and prediction of actual state of flooding for information transmission to facilitate evacuation/flood prevention - Aiming to achieve zero delays in escape

In order to achieve zero delays in escape, and with the aim of further enhancing the provision of information/advice to municipalities, etc., we will develop a flood outbreak perception and real-time mapping system to perceive breaches and provide information on the actual state of flood outbreak in addition to information on river water levels that has conventionally been available.

Development of technology to rapidly determine soundness of base buildings that have been struck by earthquakes - To quickly and accurately determine whether government office buildings can be entered immediately after earthquake

We will produce a manual for determining the soundness of buildings from both structural and non-structural perspectives in order to help building managers, who are not necessarily architecture experts, to determine whether it is possible immediately after an earthquake has struck to enter municipal government office buildings, etc. that serve as response bases in times of disaster.

#### ■ Productivity mission

Development of terminal congestion index to contribute to improved punctuality of container ships - Aiming to ensure punctuality of global supply chain

The punctuality of major container routes has been dropping dramatically due to congestion at container terminals. By performing analysis of the state of use of the world's major container terminals using AIS data, and clarifying the terminals where delays are likely to occur, we will make it possible for shippers to select routes that have excellent punctuality and this will also lead to improvement of the management of Japan's terminals.

#### ■ Improvement of regional creation and ease of living

Research regarding wide-area cooperation of city functions in provincial cities - Aiming to burden of citizens' movement through wide-area cooperation

For provincial cities where there is severe depopulation, we will support the planning of wide-area cooperation by ascertaining regional issues and creating guidance for improvement policies from the perspective of movement (transportation) of citizens, which becomes an issue when carrying out wide-area cooperation to service by division the city functions that cannot be maintained by municipalities alone.

Development of evaluation techniques for effective application of environmental conservation technology in coastal areas - Visualization of values of ecosystem services

We will develop evaluation techniques to contribute to effective application of environmental conservation technology in coastal areas, making it possible to take into account the natural environment, social environment and regional characteristics.

**Details** ☛ NILIM website (Press briefing materials published on August 29, 2018)

<http://www.nilim.go.jp/lab/bcg/kisya/journal/kisya20180829.pdf>

### ■ Overhaul of Facility for Testing Collisions between Actual Cars and Protective Fences

Road Traffic Department, Road Safety Division

The Facility for Testing Collisions between Actual Cars and Protective Fences, which had been no longer in use due to being in a state of disrepair, was overhauled with an increased maximum vehicle weight of 25 tons, putting it among the top category nation-wide.

Overhauling this facility has made it possible to test the performance of protective fences under the same conditions as the design vehicle load of 25 tons established in the Road Structure Ordinance (collision testing in the previous facility was carried out with a gross vehicle weight of 20 tons). Since the time of the PWRI, the predecessor to the NILIM, this facility has been used to conduct many collision tests in order to establish technical standards and specification documents for protective fences. This facility has been used not only by the NILIM, but also for many experiments for the development and improvement of protective fences by road managers and protective fence manufacturers. Going forwards, it is hoped that the use of this facility will lead to development of protective fences contributing to further improvement of safety of road traffic, such as with protective fences for high-standard roads including temporary two-lane roads and community roads, etc.

**Details and test video** ☛ Road Traffic Department, Road Safety Division website

<http://www.nilim.go.jp/lab/geg/index.htm>



Photo: Testing collision between actual car and protective fence  
A driver-less car is accelerated by special driving equipment, made to collide with the protective fence at a set collision speed and angle, and the performance of the protective fence is evaluated.

## Support for real-time flood prediction and operation of sewage facilities, and citizens' countermeasure activities

Water Quality Control Department, Wastewater System Division

The NILIM has formulated draft guidelines for introduction of technology to reduce flood damage in urban areas, which has been occurring frequently in recent years due to sudden downpours, etc.

This technology predicts rainfall and analyzes outflow in real-time based on radar rain gauge and water gauge information, and provides facility managers and citizens with flood information based on predicted sewer pipe water level and internal waters. In this way, the technology makes it possible to reduce flood damage by effectively operating existing flood countermeasure facilities such as rainwater collection pipes, etc., and promotes citizens' self-help/cooperation activities. Since FY2015, the NILIM has implemented experimental research relating to this technology in Fukui City and Toyama City under the Breakthrough by Dynamic Approach in Sewage High Technology Project (B-DASH Project). In the experimental research, preliminary calculations were made of the difference in flood damage between cases where the current operating methods are used in relation to drainage pumps of rainwater collection pipes, and cases where operation was based on information transmitted using this technology.

As a result, it was confirmed that a reduction of flood area of approximately 19% could be anticipated for rainfall with an annual exceedance probability of around in the target area. Also, from citizen questionnaire surveys, etc., we learned that the introduction of this technology could be expected to promote self-help/cooperation activities to a greater extent than prior to its introduction.

These results have been compiled and the "Draft guideline for introduction of rainfall management technology for local downpours in city areas" has been formulated. It is hoped that the introduction of this technology will reduce the flood disasters in urban areas that have been occurring frequently in recent years.

**Details** NILIM Water Quality Control Department website  
<http://www.nilim.go.jp/lab/ebg/b-dash.html>

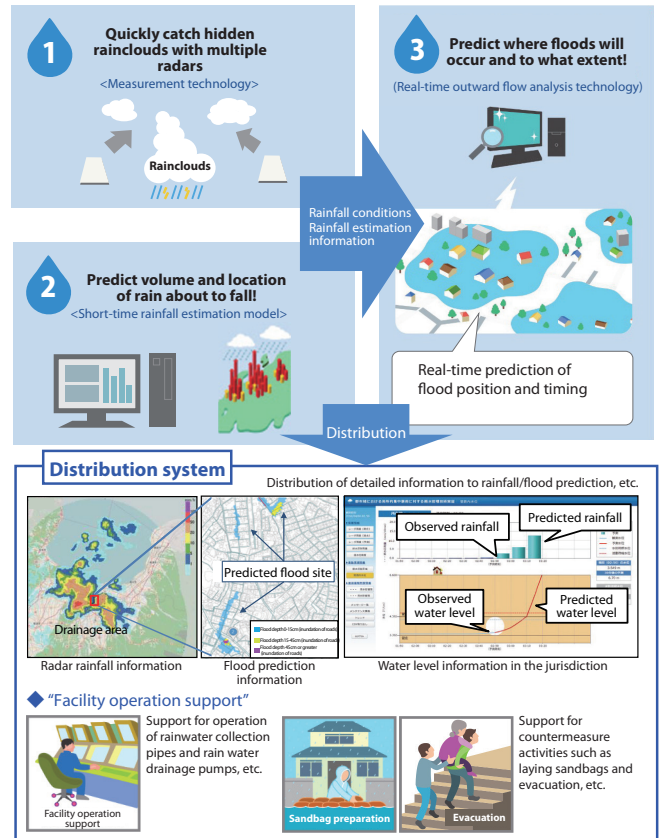


Image: Technology overview

## Publication of draft guideline explaining residential planning techniques with consideration for child-rearing safety, comfort and ease of living

Housing Department, Research Coordinator for Housing Performance

The NILIM has published research results with technical explanation of residential planning techniques with consideration for child-rearing safety, comfort and ease of living, as a draft guideline for households that are considering raising children.

Households that are hoping to have and raise children want to enjoy housing where they can live with peace of mind. To that end, this draft guideline was created for the spread of housing with functions/specifications, etc. that are ideal for raising children in safety and comfort.

The draft guideline is based on the assumption that it will be used as technical information when businesses plan/design housing supply or when standards are created for national/municipal support systems. To make it easy for these users to apply, the draft guideline has been created with the following points in mind:

- ① Explanation of items for consideration in planning and standards required in performance/specifications, etc. of each item respectively for housing (private/shared areas), sites, location environment, community, and child-rearing support services.
- ② Explanation of priority of items for consideration in requirements/recommendations, etc. for each type of housing, including ownership, ways of building, new construction and existing housing, etc.

Going forwards, we will endeavor to spread the draft guideline.

**Details** NILIM website (NILIM Research Report No. 59)  
<http://www.nilim.go.jp/lab/bcg/siryou/rpn/rpn0059.htm>



Photo: Example of considerations

Above: Securing unobstructed view of living room so that children can be regarded even while working in the kitchen  
 Below: Movable storage partitions making it possible to change room arrangement as children grow older

## ■ “4th Investigative Committee Meeting for Plans to Reduce High Tide Risk in Waterside Land, etc.” was held

Coastal, Marine and Disaster Prevention Department, Coastal Disaster Prevention Division

Together with holding the “4th Investigative Committee Meeting for Plans to Reduce High Tide Risk in Waterside Land, etc.”, we published the “Guideline for plans to reduce high tide risk in waterside land, etc.”

In Japan’s harbors, distribution functions and companies are concentrated in so-called waterside land on the sea side from coast preservation facilities, and in Japan’s three main bays forming the core of economic activities, at least 80% of harbor-facing areas are waterside land.

At the Bureau of Port and Harbor, an “Investigative Committee Meeting for Plans to Reduce Storm Surge Risk in Harborside Land, etc.” consisting of experts was established due to the possibility of significant congestion of Japan’s harbor distribution networks and the production activities of location-selecting companies due to flood damage caused by high tides, and this Investigative Committee Meeting has been considering high tide countermeasures.

At its 4th and final meeting, deliberation was carried out with the aim of compiling guidelines, the results of which were published by the Bureau of Port and Harbor as a guideline consisting of a “Phase-specific high tide response plan” detailing disaster prevention activities to be taken in advance based on weather information, etc., such as evacuation of workers, etc. from harbor waterside land and movement of freight to higher ground, etc., as well as an “Area disaster



Photo: 4th Investigative Committee Meeting

Guideline for for plans to reduce high tide risk in harbor, waterside land, etc.

March 2018  
MLIT Bureau of Port and Harbor

Image: Guideline

prevention plan” to be taken concerning necessary hard and soft policies in cooperation with the relevant parties for installing surveillance cameras and taking measures to stop water from getting into warehouses and electrical facilities, etc. in areas where there is significant damage.

Going forwards, the NILIM too will provide necessary technical support for high tide countermeasure initiatives in harbors based on this guideline.

**Details** → Bureau of Port and Harbor website (Investigative Committee Meeting for Plans to Reduce High Tide Risk in Waterside Land, etc.)

[http://www.mlit.go.jp/kowan/kowan\\_fr7\\_000071.html](http://www.mlit.go.jp/kowan/kowan_fr7_000071.html)

## ■ Publication of results of “Collaborative research regarding statistical information relating to movement of people based on application data of cell phone base stations

Urban Planning Department, Urban Facilities Division Research Center for Infrastructure Management, Information Platform Division

The NILIM published the results of “Collaborative research regarding statistical information relating to the movement of people based on application data of cell phone base stations” as NILIM materials, and a briefing session was held on June 1, 2018.

Statistical information regarding movement of people, as generated from cell phone base stations’ application data, has the advantage of excellent statistical reliability thanks to large sample size (around 76 million at NTT DoCoMo, for example) and other factors. However, although this statistical information on movement can be used to estimate the number of people staying in each area, it could not be used to ascertain the numbers of people moving between areas or their means of movement, etc.

Therefore, the NILIM, through joint research with NTT DoCoMo and The University of Tokyo, has developed techniques to estimate the volume of people moving between areas and the ratios of means of transport used (airplane, bullet train, etc.) with the aim of boosting the applicability of this statistical information in urban transport planning, etc. These results have now been compiled in NILIM materials, and a briefing was held on June 11, 2018 (see link below). We hope that this will be of assistance in the work of people involved in various fields such as urban transport planning, etc.

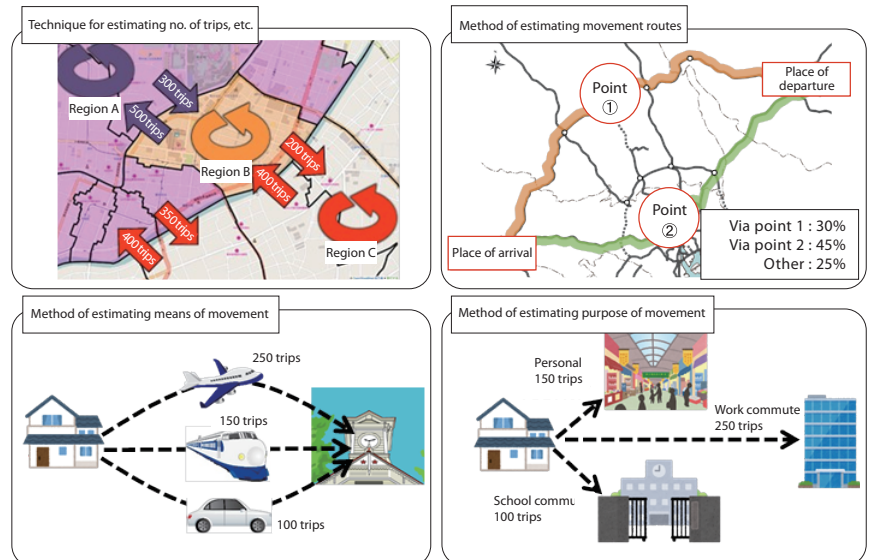


Image: Example of research achievements

**Details** → NILIM website (NILIM materials no. 1015) <http://www.nilim.go.jp/lab/bcg/siryounn/tnn1015.htm>

**Details** → Results briefing <http://www.nilim.go.jp/lab/qbg/houkokukai/20180611.html>

## ● Publications (research results)

Download here <http://www.nilim.go.jp/lab/bcg/siryou/index.htm>



### NILIM Research Reports

No.	Title	Department/Division
59	Research into planning techniques for households considering childcare	Housing Department
60	Understanding and analysis of effects of human disasters in harbor/marine transportation on international marine container transport	Port Systems Division

### NILIM Project Research Reports

No.	Title	Project Leader
58	Research relating to comprehensive evaluation techniques and planning methods for energy-saving performance of business constructions	Head of Building Department
59	Research relating to earthquake-proofing priority evaluation of sewer pipelines	Research Coordinator for Wastewater Energy Management and System Restoration
60	Development of performance evaluation technology for existing residential buildings, etc. aimed at promoting and regenerating stock of used residence distribution	Head of Housing Department
61	Research relating to international expansion policy for technologies and standards in the harbors field	Head of Port and Harbor Department

### NILIM Materials

No.	Title	Department/Division
971	A Study on Evaluation of Urban Public Spaces - field survey-based examination of procedures to evaluate the quality of public spaces	Urban Planning Department, Urban Facilities Division
981	Performance Validation Test Protocols on NDT Tools for Road Bridge and Structures: NDT Tools for Internal Defects of Concrete Structure	Bridge and Structures Division
997	Report about a characteristic and the countermeasure of the damage to sewer pipes caused by The 2016 Kumamoto earthquake	Wastewater System Division
998	B-DASH Project No. 17 Guideline of introducing stormwater management technology for localized torrential rain in urban areas (Draft)	Water Quality Control Department
999	Consideration of spatial arrangement of habitats focusing on diversity and durability of life in enclosed bays	Marine Environment and Emergency Management Division
1000	Points to note in planning/construction of improvement of existing river dikes in harbor coastal areas	Coastal Disaster Prevention Division
1001	Research regarding seismic intensity calculation method for verification of direct pile-type shore bridges taking into account the nonlinearity of ground affected by seismic motion	Port Facilities Division
1002	Consideration regarding technique of calculating furrow excavation volume of airport asphalt surfaces	Airport Facilities Division
1003	B-DASH Project No.18 Guideline for introducing a microalgae cultivation system with carbon dioxide which captured from digestion gas in the sewage treatment plant (Draft)	Wastewater and Sludge Management Division
1004	Design Guideline for Buildings at Disaster Bases (Draft)	Building Department
1005	Research report regarding earthquake-proofing of wet tile finishing exterior materials for reinforced concrete structures and earthquake-proof evaluation and testing methods	Housing Production Division
1006	FY2016 Annual Report of Road Survey Expenses, etc.	Road Traffic Department, Road Safety Division Research Center for Infrastructure Management
1007	Report of the 1st Evaluation Committee of NILIM in FY 2017	Research Administration and Evaluation Division
1008	FY2017 compilation of NILIM lectures	Planning and Research Administration Department
1009	Guidance for road space reorganization supporting region building (Draft)	Landscape and Ecology Division
1010	Handbook for river managers to exterminate foreign plants (Draft)	Landscape and Ecology Division

## ● Receive information on research performed at NILIM

### • NILIM email service

Twice a month, we deliver the latest information introducing various research activities conducted by NILIM and lecture meetings, etc. Register here (URL and QR code) <http://www.nilim.go.jp/lab/bcg/mailmag/index.html>



### • 2018 Annual Report of NILIM

This website introduces NILIM research activities and achievements, as well as details of the latest research activities to be formally initiated in the future. Go to this website: <http://www.nilim.go.jp/lab/bcg/siryou/2018report/index.htm>

Please take our reader survey: <http://www.nilim.go.jp/lab/bcg/siryou/newsletter/nwsltr.htm>



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