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Autumn 2010

N I L I M

Notification

"Road Traffic Census", which can also be called the national census of roads, to be performed from September to November

Road Department, Traffic Engineering Division

A road traffic census, will be performed this autumn. The results of this survey will be used as basic documents to be used to estimate future transportation demand and to plan, construct, and manage roads. This time, the survey will be improved in a variety of ways to ensure a more advanced and more efficient survey.

The road traffic census, which is a survey performed nationwide to clarify the actual state of roads and road traffic throughout Japan, was performed first as a nationwide traffic survey in 1928, and has been conducted approximately once every 5 years since 1980. Its results are used effectively as basic documents to predict future traffic demand, and to plan, construct, and manage roads.

The road traffic census consists of two surveys: an origin and destination (OD) survey and a traffic volume survey. The OD survey is a statistical survey of road users' departure locations, intended destinations, purposes of travel and state of daily travel, etc. But the ordinary traffic volume survey, which is a survey of actual state of roads and road traffic, consists of surveys of road conditions, traffic volumes, and traveling speed.

This road traffic census is improved in the following ways with technical support by the Traffic Engineering Division in order to perform a more advanced survey more efficiently than the preceding survey (2005).



Photo 1. Traffic Volume Survey by mobile vehicle detectors

- The main purpose of the survey is to obtain basic data necessary to predict future traffic demand, and centered on the OD survey, to create a system to survey the actual state of roads and road traffic which should also be clarified.
- The OD survey introduces a simplified questionnaire and a postal survey in order to reduce the burden on respondents.
- For the traffic volume survey, new districts have been set as the foundation for the survey, in order to be able to set survey ranges efficiently for each survey.
- The road status survey improved or eliminated survey items of use in predicting future traffic demand and other future road policies.
- The traffic volume survey mainly concerned future traffic demand predictions, for example, by checking the occurrence and concentration of traffic volume in the OD survey. It adds mechanical surveys such as constant traffic volume monitoring equipment, mobile vehicle detectors (Photo 1), etc. The survey was simplified to two vehicle categories to make this possible.
- The travel speed survey collected travel data for vehicles equipped with communication type car navigation systems, which have come into wide use in recent years, and surveyed travel speeds not only during traffic congestion, but when there was no traffic congestion (Fig. 1).

But traffic volume and travelling speed change from moment to moment, and it is necessary to observe the traffic state at normal times in order to effectively and efficiently implement traffic smoothing measures based on these. The Traffic Engineering Division plans to continue to develop technologies to efficiently obtain and process traffic data and apply it to practical tasks.

We earnestly request the cooperation of those selected as respondents to the OD survey.

2010 Road Traffic Census: Nationwide Road and Street Traffic Census (Top Page) (<http://www.mlit.go.jp/road/h22census/>)

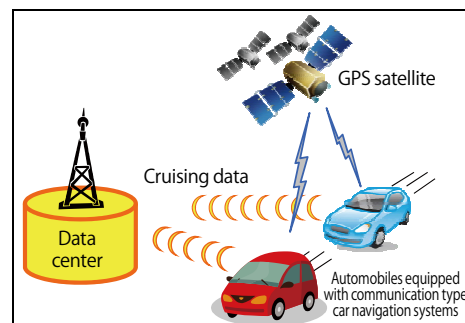


Figure 1. Traveling Speed Survey Using Cruising Data from Automobiles Equipped with Communication Type Car Navigation Systems

Research Result

**To Rational maintenance of Steel Bridges
-Partial Re-painting Technical Manual for Steel
Bridges (Draft)-**

Road Department, Bridge and Structures Division

A manual of coating technology which can be used to guide economical repainting only at the ends of girders where corrosion occurs locally on road bridges has been prepared and is being distributed nationwide.

Coating deterioration and corrosion of painting on steel bridges has, instead of occurring uniformly, tended to advance locally. So even when most of the paint on a bridge is sound, severe corrosion may occur in a narrow range at the ends of girders and other parts in a poor corrosion environment, And in particular, on the bearings even if the range of the corrosion is narrow, the advance of local corrosion, for example, causing section loss, may inflict serious damage on the load bearing capacity of the bridge.

In the past, boundaries with old paint films were weak points, and technology was inadequate, so it was difficult to adequately remove deteriorated coating or rust. In many cases, therefore, bridges were totally repainted after allowing the deteriorated coating to broaden to cover the

entire bridges. So NILIM studied a method which can be applied to repaint only narrow areas of severe coating deterioration and rust with good quality coating and to treat the weak points on the boundaries with the old remaining paint films. As a result, execution experiments with models which simulate narrow execution conditions at the ends of girders cut from an actual bridge have shown that it is necessary to replace the paint with a heavy-duty coating using organic zinc rich paint in order to provide corrosion protection performance, and that it is possible to remove all old coating and rust etc. at the corresponding area with blasting. In addition to that, technical guidelines presenting the surface preparation method which combines the open blasting, vacuum blasting and power tools, and execution evaluation method for

painting works, have been made. Also, regarding treatment methods for boundaries with old paint films, where the painting type is susceptible to corrosion, the properties of painting materials and the adhesiveness, and execution properties between the old and the new paintings have been considered, and overcoating specifications with superior durability have been developed as shown in Figure 1 and Photo 1.

The results of these research efforts have been published as “Partial Re-painting Technical Manual for Steel Bridges (Draft)”, which is being distributed to regional development bureaus nationwide and trial executions are now underway in each region. Web page of the Bridge and Structures Division. (<http://www.nilim.go.jp/lab/gcg/index.htm>)

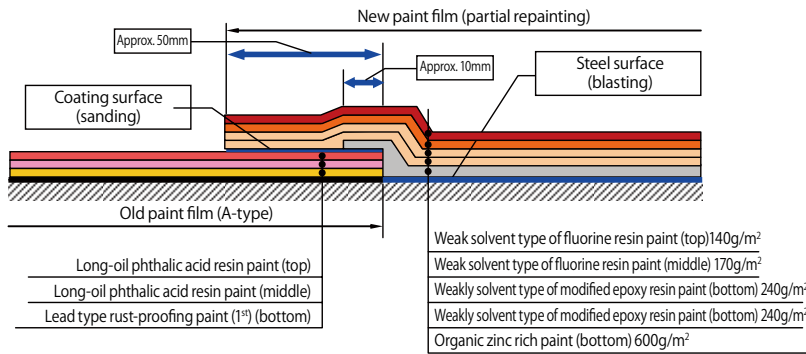


Figure 1. Overcoating Paint Specifications



Photo 1. After Partial Repainting

Research Result

Development of Urban Space Evaluation and Planning Technologies for Effective Heat Island Measures - For Measures “Putting the Right Material in the Right Place” -

Urban Planning Department, Urban Development Division
Building Department, Environmental and Equipment Standards Division

These divisions are working to develop evaluation technologies which can be applied to comparative studies of the effectiveness of different measures to permit the implementation of effective heat island measures adapted to regional characteristics and planning technologies, simulation software etc. which will contribute to the creation of low carbon cities.

Since 2004, the Ministry of Land, Infrastructure, Transport and Tourism has, based on the General Framework of Heat Island Measures, been conducting research and development and applying simulation software which can be used for comparative studies of the effectiveness of different measures such as greening and water retentive pavement, energy-efficient buildings, ventilation paths, and so on in order to implement effective measures.

To develop this simulation software, the Urban Planning Department and the Building Department of the NILIM have joined with concerned organizations and universities to use super computers to perform calculations to predict the flow of wind around buildings and the distribution of air temperature in the 23 wards of Tokyo and to observe weather at 190 locations in the waterfront and downtown areas of Tokyo and to conduct wind tunnel tests to clarify the effects of ventilation paths*.

Based on the results of these efforts, simple simulation software which can be used to predict and study the effect of various heat island measures on a personal computer (Fig. 1) is nearly ready for practical application, and the release of this software to local governments etc. is scheduled for the coming year. It is intended to provide concerned officials in the national government and in local governments with tools they can use to personally trial calculate the effectiveness of revegetation, cool roofs, water retentive pavements, energy conservation, ventilation paths, and various other heat island measures in specific regions, enabling them

to contribute to the proposal of effective measures adapted to actual regional conditions.

And recent years have brought a demand for heat island measures to be linked to global warming mitigation measures, but methods of evaluating and planning heat island measures which will effectively serve as global warming mitigation countermeasures adapted to individual regions have still not been established.

We have continued the above research with our concerns widened to encompass the creation of low-carbon cities. And in order to advance heat island measures which also consider CO₂ reduction as part of city planning, we are working to develop evaluation tools which can be applied to study the effects of CO₂ reduction when planning heat island measures on the district scale, and conducting research to prepare guidelines to the implementation of effective city planning.

* General Technology Development Project, Development of Thermal Environment Evaluation and Countermeasure Technologies for Urban Space (2004 to 2006)
(<http://www.nilim.go.jp/lab/jeg/heat.htm>)
Urban Planning Department, Urban Development Division
(<http://www.nilim.go.jp/lab/jeg/index.htm>)



Figure 1. Image of Simulation Software Now Under Development for Future Practical Application

Conference Report

The 3rd International Conference on Transport and Logistics (T-LOG 2010)

Port and Harbor Department, Port Systems Division

This event was held in the Nishijin Plaza at Kyushu University in the City of Fukuoka from September 6 to 8. Researchers and practitioners in the international and urban logistics field, mainly from Asia including Japan, attended, hearing about 100 presentations.

This conference was held in the Nishijin Plaza at Kyushu University in the City of Fukuoka as the third conference in the series, preceded by the 2005 conference in Singapore and the 2007 conference in Shenzhen, China.

The conference consisted of a half day plenary session (Photos 1, 2) with two keynote lectures (Japan and Korea) and a panel discussion. Then two parallel sessions featuring the presentation of academic and practical papers were held for one and a half days in two rooms. And finally, for half a day the participants took part in technical visits to the Port of Hakata and logistics facilities (Photo 3). In the parallel sessions, a total of 97 papers were presented and discussed. These included presentations of advanced researches and the recent state of logistics infrastructures related to logistics policy and statistics, model development and prediction, logistics in developing nations and cross-border transportation, intermodal transportation, increasing sizes of ships and terminal operation, environmental issues, risk management, ITS and supply chain management, etc. The presenters represented

Japan, Korea, Taiwan, Singapore, China, Thailand, Australia, Indonesia, Malaysia and many other countries. Of the total of 130 participants, about half came from overseas.

From the NILIM, members of the Port and Harbor Department and the Road department gave a total of seven presentations as shown on the table, as also acted members of the local organizing committee.

The conference is held once every 2 years, and the next will be held in 2012, although the host country is not yet decided.

Conference web page: (<http://www.t-log.info/3rd-Tlog/index.html>)

Analysis for Facilitating the Efficient Use of Official Port Cargo Statistics - Case Study in Myanmar Port Cargo Statistics
Impact of International Transportation Infrastructure Development on a Landlocked Country: Case Study in the Greater Mekong Subregion
How International Cargo Flow will Change by Expansion of Panama Canal? -An Approach using the World Model for International Cargo Simulation
Transport Characteristics and Road Structure Factors Influencing Container Truck Route Selection
Factors of choosing port to call for shipping companies based on Analytic Hierarchical Process
Blockade Risk of the Straits of Malacca and Singapore: Scenario Analysis with International Cargo Flow Simulation
Forecasting Future Amount of Trade and Maritime Container Cargo Based on International Economic Scenario



Photos 1, 2. Keynote Lecture in the Plenary Session



Photo 3. Tour of Port of Hakata

Event

Fishing Census of Gobies at Shibaura Island

Coastal and Marine Department,
Marine Environment Division

An event combining pleasure with a research purpose, it gave people the chance to savor an estuarine environment close at hand in the center of the city and to take part in an environmental survey through goby fishing, an activity which anyone can enjoy.

The second Fishing Census of Gobies was held this year on September 12 (Sunday) on the South Seawall on Shibaura Island in Minato Ward, Tokyo (Photo 1). The Tokyo Metropolitan Government Bureau of Port and Harbor, Minato Ward, Certified NPO Umijuku, Tokyo University of Marine Science and Technology, and NILIM, formed the Executive Committee, which held this event as part of the Shibaura Island Habitat Creation Project.

In the winter, Japanese common gobies form nesting holes in 6 to 8m of mud, then the males protect and incubate the eggs which the female has laid inside the holes. In the spring, the 2 to 3 cm juveniles swim back into the river mouth and remain in the shallow flats near the shore. In the summer, they grow to from 6 to 10cm in the brackish water at the river mouth, and in the

autumn, they grow to between 15 and 20cm and move into the deep parts of the bay where they mature to become one-year fish (they seem to occasionally include those which mature for 2 years). The division focused this research on the goby, a species with a unique life cycle, as the index species to evaluate the environment from the deep part of the bay to the estuary.

This goby fishing census was planned to implement a public participation survey, so many specimens would be efficiently sampled and measured at the same time. It would help the residents to understand the importance of environmental restoration in Tokyo Bay.

This summer set new records for heat, but on the census days, many people, 87 in 36 groups, participated even under the painful heat inflicted on them by the sunlight. For this survey, the organizers obtained special permission for the participants to enter the seawall



Photo 1. Fishing Census on the South Seawall of Shibaura Island



Photo 2. Observing Living Organisms in the Tide Pool at the Terraced Seawall

along the Shibaura Island South Sea Wall. They could fish near the water's edge by descending the rock filled slope type seawall from the pedestrian deck to savor the sensation of the channel environment close at hand. And at the same time, they enjoyed the fishing census as they caught crabs between the rocks and encountered wharf roaches.

When they finished, they had caught at total of about 140 fish, which far exceeded previous catches, with the goby accounting for nearly half at 65 specimens. The average length of the goby was 11.5 cm, about 2 cm longer than those caught during the previous census in July, confirming that the gobies were growing well in this region.

On that day, after the goby fishing census, those participants who wished to do so, also descended to a tide pool of the Habitat Creation

Project site. There they observed living organisms in the tide pool and on the crab panels (concrete walls designed as crab habitats) on the terraced seawall (Photo 2). We are confident that by taking part in goby fishing and observing the tide pool in this way, the residents, and the children in particular, will be able to get a little closer to, and gain a new interest in, the natural world.

Our division aims to perform goby habitat censuses at other locations and also perform biological surveys such as genetic analysis and otolith analysis to clarify the life cycle of Japanese common gobies and develop measures to conserve and restore them.

For details concerning the Shibaura Island Habitat Creation Project, please go to the project information web site (<http://www.meic.go.jp/Shibaura/>).

Schedule of Principal Events (November 2010 to January 2011)

Scheduled days	Event name
November 6	Open to the public: Public Works Day
November 16 to 19	19th Conference on Public Works Research and Development in Asia
December 1	2010 Conference of the National Institute for Land and Infrastructure Management

PROJECT RESEARCH REPORT of National Institute for Land and Infrastructure Management (January-October, 2010)

No.	Title of Paper	Names of Project Leaders
29	Research on International Logistics Network and Infrastructure Investment in the era of Economic Partnership in Eastern Asia	Director of the Port and Harbor Department
30	Development of Damage Estimation Methods for Infrastructures and the Applications for Disaster Mitigation Practices	Director of the Research Center for Disaster Risk Management
31	Research on restoration of water circulation in collaboration with community activities	Director of the Environment Department
32	Development of Performance Evaluation Methods for Innovative Structures applying Advanced Structural Materials	Director of the Building Department

RESEARCH REPORT of National Institute for Land and Infrastructure Management (January-October, 2010)

No.	Title of Paper	Names of Divisions
39	Container Terminal Investment and their Effects on Decreasing Transport Cost in China by Applying the Model for International Cargo Simulation (MICS)	Port Systems Division
40	Model Development of Multimodal International Logistics Flow in East and Southeast Asia and Policy Evaluation of Logistics Infrastructure in ASEAN Countries	Port Systems Division
41	Study on Advanced Methods in Design and Maintenance of Airport Pavements	Airport Facilities Division
43	Dependence of Wind-Driven Current on Wind Stress Direction in a Small Semienclosed, Homogeneous Rotating Basin	Coastal Zone Systems Division

TECHNICAL NOTE of National Institute for Land and Infrastructure Management (September-October, 2010)

No.	Title of Paper	Names of Divisions
596	Report for quality of road runoff	Road Environment Division
598	The Study on the Improvement of the Emergency Management System in the United States after Hurricane Katrina	Flood Disaster Prevention Division
600	Study on Ship Dimensions by Statistical Analysis	Port Planning Division
601	Analysis on World Container Ship Movement and Containerized Cargo Flow (2010)	Port Planning Division
602	Estimating the Economic Effects of Maritime Container Cargo Exports by Interregional Input-Output Table at the Prefecture Level	Port and Harbor Department
603	Transition and Present Situation of International Route and Traveler in Local Airports	Airport Planning Division
604	Revised PCN Calculation Method for Airport Pavement in Japan	Airport Facilities Division

* For details concerning the state of issuing of documents, etc., see the web site.

- Documents issued by the NILIM can be viewed at our web site. (<http://www.nilim.go.jp/lab/bcg/siryou/index.htm>)
- NILIM research activities and achievements are now available on the web site (<http://www.nilim.go.jp/lab/bcg/siryou/2010report/index.htm>), as Annual Report 2010.



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